

End of Well Report Utah FORGE 16B(78)-32



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II. Introduction

Northing of Wellhead	13987765.96 ft (UTM 4263471.065)
Easting of Wellhead	1097907.09 ft (UTM 334642.081)
KB Elevation	5447.65 ft (confirm)
GL Elevation	5415.65 ft
Kick-off Depth	5,600 ft KB
Azimuth of Tangent	105°
Build Rate	5.5° /100 ft
TD Northing	UTM 4263110.666 LL: 38.501242, -112.882661
TD Easting	UTM 335832.0477 LL: 38.501242, -112.882661
Total Measured Depth	10,700.97 ft
True Vertical Depth at Toe	8,262.48 ft
Horizontal Offset	4,079.22 ft

III. Operational and Scientific Objectives

The objectives of this well were to:

- Provide a doublet pair to Well 16A(78)-32 with a trajectory of nominally 105° at an inclination of 65° to the vertical. Establishing a connection with well 16A(78)-32 (through hydraulic fractures created in April 2022) is the primary objective. Build angle at 5.5° /100 ft MD so that Well 16B(78)-32 is vertically offset from Well 16A(78)-32 by 300 ft TVD.
- Drill and complete to accommodate fiber optics for the University of Texas and Rice University research programs.
- Leave the production section (from the 11-3/4-inch casing shoe at 4,837 feet MD to TD at 10,947 ft MD¹) openhole - not exceeding ten days - to accommodate potential openhole stress measurements for the Battelle research program.
- Core the toe section of this well (final 500 ft before TD) in strategic sections to search for fractures, tracers, and other fracture diagnostics (e.g., microproppant) that were injected during the hydraulic fracturing at the toe of Well 16A(78)-32. Core was also allocated for geologic characterization, mechanical properties measurements, and other R&D activities. The core bit size is 8-3/4-inch and will need to be reamed out to 9-1/2-inch.

¹ Unless stated specifically otherwise, MD is relative to the rig's RT/KB.

- Also, acquire core from a vertical section of the well in granite for geologic characterization and mechanical properties determinations. The planned depth was 4,970 to 5,030 ft MD. The actual coring depth 4,855 to 4,878 ft MD.
- Acquire multiple openhole and cased hole logs - in particular, multiple ultrasonic and resistivity imaging runs, a quad combo at TD, and cement evaluation runs. This also includes monitoring for tracers and microproppant from the stimulations at the toe of Well 16A(78)-32. Plan on production logging (PLT) suites or at least high-resolution temperature to look for fractures in communication with Well 16A(78)-32.

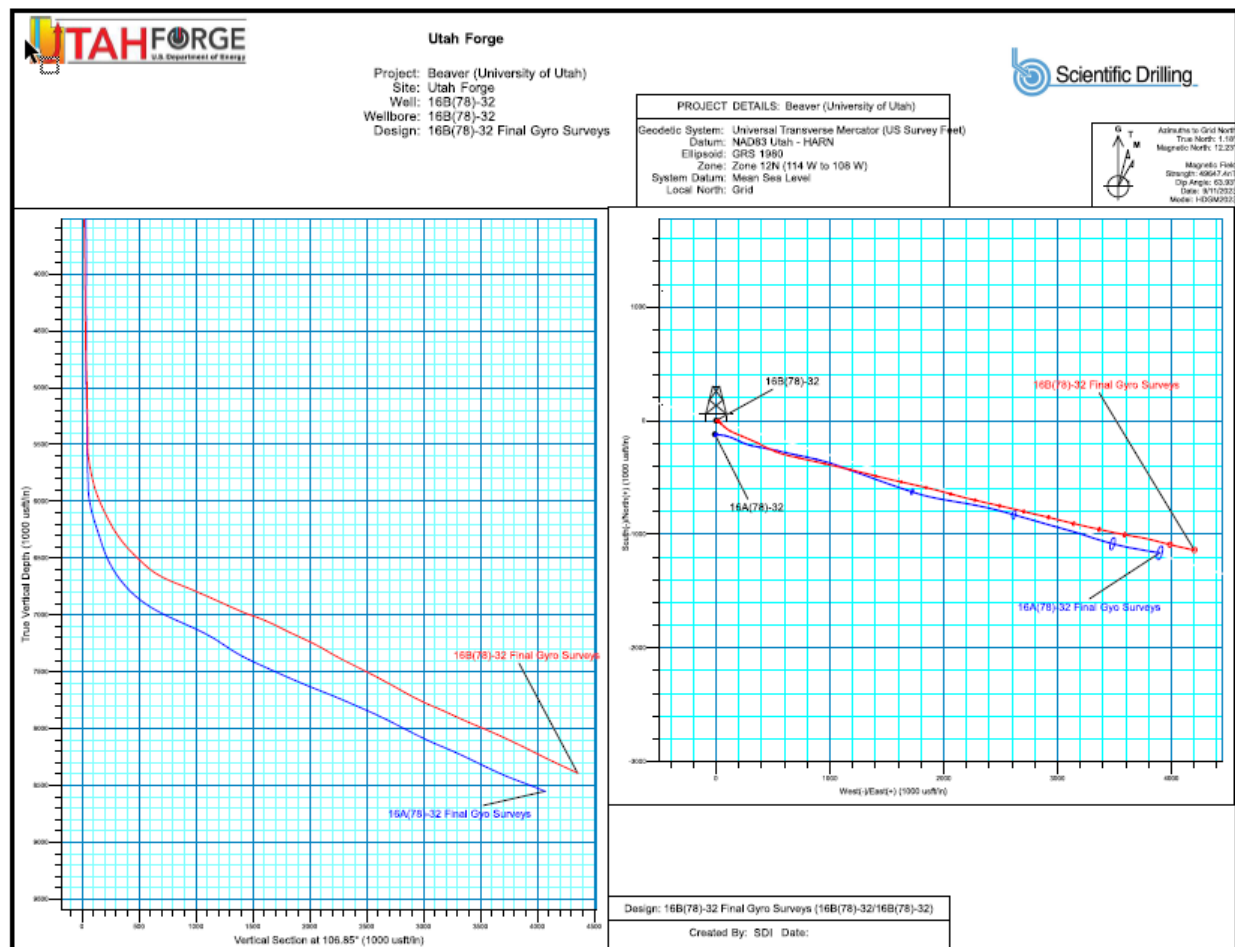


Figure 1. As drilled trajectory of well 16B(78)-32 (shown in red).

Carry out limited injection/circulation testing to do preliminary evaluations of connectivity between the two wells. Monitor wellhead pressures in all offsets when possible.

Near-bit vibrations will be measured in all sections of the hole (providing low and high-frequency data from near-bit pucks, centerline centralizers and in BHA sensor packages). Ensure that the complete waveforms are made available, and that high frequency data are acquired. The primary goals of this are evaluating drilling dysfunction and assessing if formation mechanical properties can be inferred independent of logging. We are also interested in crosswell logging in the future. Attempt to reduce rugosity by bit redesign, BHA modifications, and running RSS.

IV. Well Specifics

The surveyor's report on spud location is as follows.

“The rectangular coordinate location of the "as-located" location of well FORGE 16B (78)-32 is as follows: the centerline of existing well no. FORGE 16A (78)-32, being located within the NW 1/4 of the SW 1/4 of section 32, township 26 south, range 9 west, of the Salt Lake base and meridian, being more completely described as follows: centerline of well being located $S00^{\circ}21'51''E$, along the section line 972.30 feet, and $N90^{\circ}00'00''E$, 522.84 feet from the west quarter corner of section 32, township 26 south, range 9 west, of the Salt Lake base and meridian.”

IV.1 Well Location

The 1.9 square mile FORGE location is just west of the Mineral Mountains, and it is 217 miles south of Salt Lake City and 10 miles NNE of Milford. Figure 2 shows the location of the FORGE site relative to Milford, UT. Starting from the intersection of UT-257 and UT-24 in Milford, Utah, directions, and approximate mileages are as follows.

- Take UT-257 north for ~4.4 miles.
- Turn right (east) onto Geothermal Plant Road and continue for ~2.7 miles.
- Turn left (northeast) onto Antelope Point Road (paved) and continue for ~3.5 miles.
- Turn right (east) onto Salt Cove Road (unmarked, graded road) and continue to the wellsite location, following rig signs or similar.

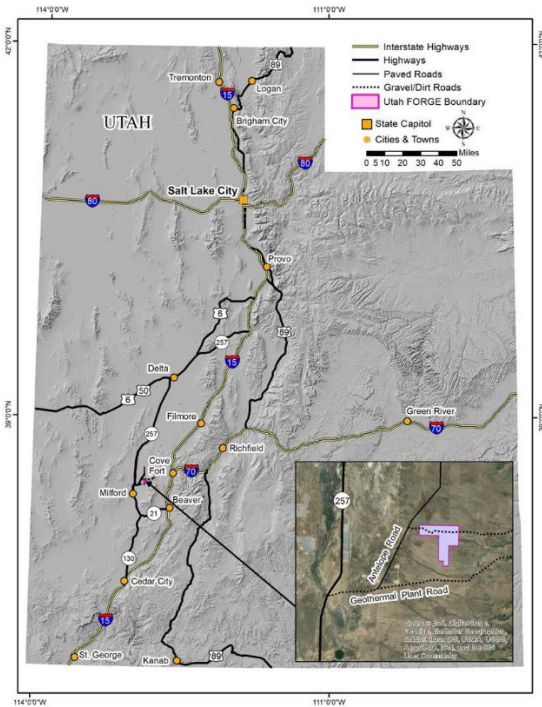


Figure 2. (at left) This map of Utah shows the general location of FORGE. The inset shows specific directions starting from Milford, UT (north is up). Those directions are available in Section III.1 (above).

Figure 3 (below) is an aerial view of the site.

IV.2 Well Plan and As-Built Diagram

Figure 1 shows the as-drilled trajectory. Figure 4 shows the planned trajectory and Figure 5 is a repeat of Figure 1 for comparison with Figure 4.

Notice that the final 760 ft of well 16B(78)-32 were uncased.



Figure 4. Plan view showing wellbore spud location for well 16B(78)-32, and its azimuth, drilling from west to east. North is to the top of this image. The location of 16A(78)-32 is also shown (spud and toe)

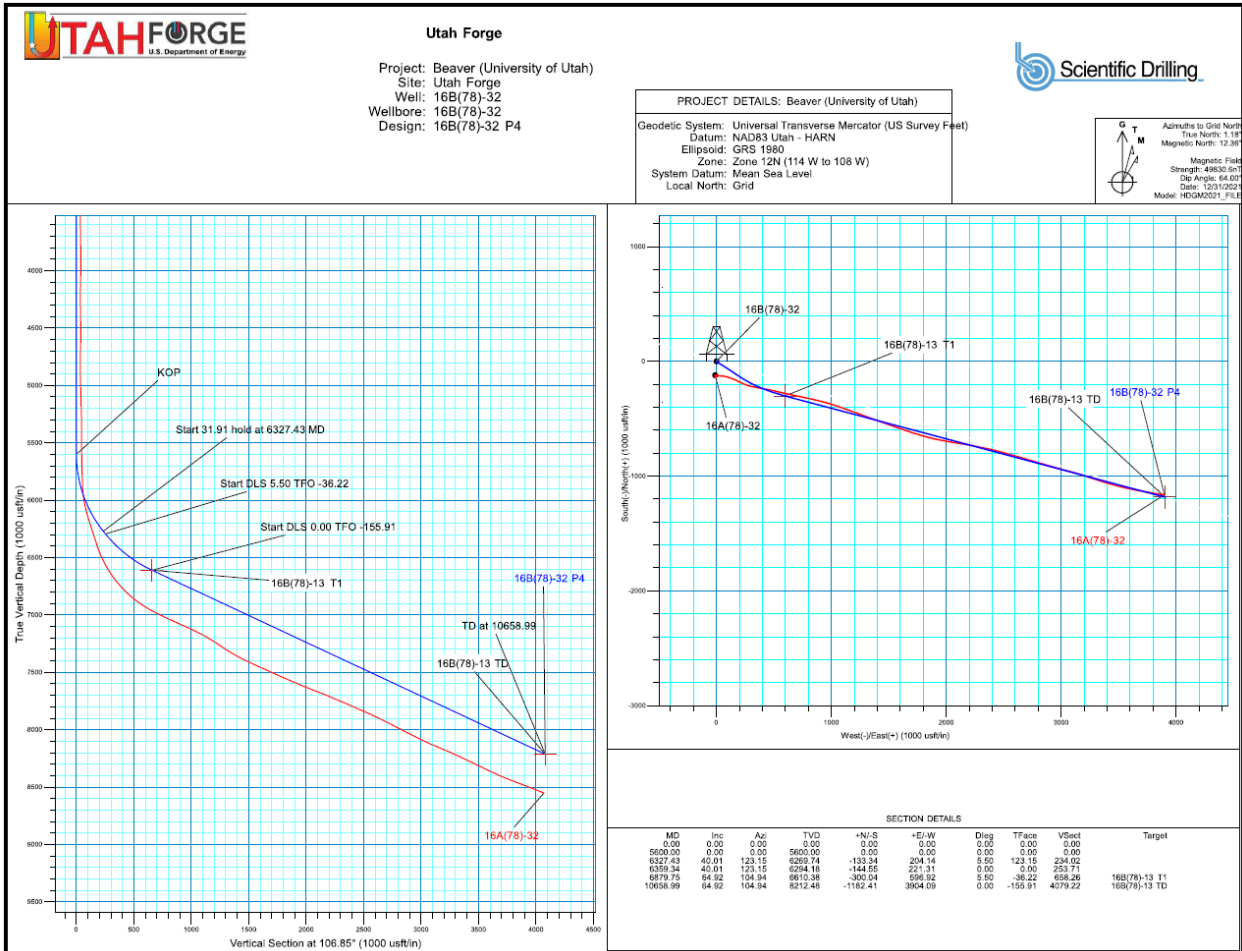


Figure 4. Planned well trajectory (well 16B(78)-32) - shown in blue.

IV.3 Drilling, Testing and Completion Summary

Table 1 shows the bit schedules. Bits were intentionally pulled green to allow comparisons of performance. Appendix B is a compilation of all BHAs that were run during drilling.

IMPORTANT NOTE: BITS WERE RUN ON A PRESCRIBED SCHEDULE AND WERE COMMONLY PULLED GREEN, WELL BEFORE POTENTIAL ON-BOTTOM TIME.

Table 1. Bit Program

Bit Number	Bit Size	Vendor	Bit Type	Bit Code	Bit S/N	Depth		Feet Drilled	Comments	BHA
						In	Out			
1	22	NOV	PDC	TK99	A297420	115	1,146	1,031	Spud well April 26, 2023	BHA #1
2	14.75	Other	Mill Tooth	XR+C	PS4257	1,146	1,181	35	Drill out 16" casing shoe track + 35 ft of new hole	BHA #2
3	14.75	NOV	PDC	TKC66-A4	A297421	1,181	4,353	3,172		BHA #3
4	14.75	NOV	PDC	TKC83	A298775	4,353	4,845	492		BHA #4
5	9.5	San Joaquin	TCI	MX-S50R	W45J6	4,845	4,855	10	Drill out 11-3/4" casing shoe track + 10 ft of new hole	BHA #5
6	8.75	Canamera	Core	CCI-913	3409-05	4,855	4,871	16	Cut 16.5 ft of core & recovered 15.1 ft	BHA #6
7	8.75	Canamera	Core	CCI-713	3409-03	4,871	4,878	7	Cut 7.0 ft of core & recovered 5.0 ft with 2.0 ft of rubble	BHA #7
8	9.5	NOV	Particle Drilling	E1451	A298243	4,878	4,910	32	Ream 8-3/4" core hole from 4,855 to 4,878 to 9-1/2". Continue Particle Drilling to 4,910 ft.	BHA #8
9	9.5	NOV	Particle Drilling	E1451	A298244	4,910	4,978	68	Particle Drilling 9-1/2" hole from 4,910 to 4,978 ft.	BHA #9
5 / Run 2	9.5	San Joaquin	TCI	MX-S50R	W45J6	4,978	4,980	2	Clean to bottom and circulate out all Particle Drilling 2mm steel shot + 2 ft of new hole.	BHA #10
10	9.5	NOV	PDC	TKC73-A1	A298328	4,980	5,269	289	Directional tools flatlined. Tried to re-start. TOOH to evaluate.	BHA #11
10 / Run 2	9.5	NOV	PDC	TKC73-A1	A298328	5,269	5,957	688		BHA #12
11	9.5	NOV	PDC	TKC73-A1	A298330	5,957	6,545	588		BHA #13
12	9.5	NOV	PDC	TKC83	A298355	6,545	6,610	65	Pulsar on directional tool failed.	BHA #14
13	9.5	NOV	PDC	TKC83	A298353	6,610	6,950	340		BHA #15
14	9.5	NOV	PDC	TKC83	A298354	6,950	7,584	634		BHA #16
15	9.5	NOV	PDC	TKC83	A298358	7,584	8,085	501		BHA #17
16	9.5	NOV	PDC	TKC83	A298356	8,085	8,585	500	Drilling with Eavor Insulated drill pipe.	BHA #18
17	9.5	Baker	PDC	D406V	5341818	8,585	9,255	670	Drilling with Eavor Insulated drill pipe.	BHA #19
12 / Run 2	9.5	NOV	PDC	TKC83	A298355	9,255	9,800	545		BHA #20
5 / Run 3	9.5	San Joaquin	TCI	MX-S50R	W45J6	9,800	9,800	0	After TOOH discovered drop gyro failed. TIH with drill string and TCI bit to re-run gyro on Wireline.	BHA #21
18	8.75	Canamera	Core	CCI-713	4219-01	9,800	9,817	17	Cut 17.5 ft of core & recovered 15.5 ft	BHA #22
5 / Run 4	9.5	San Joaquin	TCI	MX-S50R	W45J6	9,817	9,817	0	TIH with drill string and TCI bit to run gyro survey on Wireline.	BHA #23

Bit Number	Bit Size	Vendor	Bit Type	Bit Code	Bit S/N	Depth		Feet Drilled	Comments	BHA
						In	Out			
19	8.75	Baker	TCI	VGD-38CH	5344137	9,817	9,823	6	Drill core stub + 6 ft of new hole.	BHA #24
20	8.75	Canamera	Core	CCI-913	3409-05	9,823	9,853	30	Cut 30.0 ft of core & recovered 28.4 ft	BHA #25
21	9.5	San Joaquin	TCI	XLS-30DX	5243758	9,853	9,863	10	Ream 8-3/4" core hole from 9,800 to 9,853 to 9-1/2" + drill 10 ft new hole.	BHA #26
22	9.5	Baker	PDC	D406VX	5342357	9,863	10,250	387		BHA #27
23	8.75	Canamera	Core	CCI-713	3409-01	10,250	10,256	6	Cut 6.6 ft of core & recovered 5.5 ft	BHA #28
24	8.75	San Joaquin	TCI	HR-50DX	T46ZX	10,256	10,264	8	Drill core stub + 8 ft of new hole.	BHA #29
25	8.75	Canamera	Core	CCI-913	3409-05	10,264	10,271	7	Cut 7.8 ft of core & recovered 4.5 ft	BHA #30
24 / Run 2	8.75	San Joaquin	TCI	HR-50DX	T46ZX	10,271	10,274	3	Drill core stub + 3 ft of new hole.	BHA #31
26	8.75	Canamera	Core	CCI-713	3409-03	10,274	10,304	30	Cut 30.0 ft of core & recovered 27.9 ft	BHA #32
27	8.75	NOV	PDC	TKC63	A299586	10,304	10,430	126	Continue drilling 8-3/4" hole to the next core point.	BHA #33
28	8.75	Canamera	Core	CCI-713	3409-03	10,430	10,460	30	Cut 30.0 ft of core & recover 25.7 ft	BHA #34
24 / Run 3	8.75	San Joaquin	TCI	HR-50DX	T46ZX	10,460	10,462	2	Drill core stub + 2 ft of new hole.	BHA #35
29	8.75	Canamera	Core	CCI-713	3409-03	10,462	10,493	31	Cut 31.0 ft of core & recovered 27.0 ft	BHA #36
21 / Run 2	9.5	San Joaquin	TCI	XLS-30DX	5243758	10,493	10,503	10	Ream 8-3/4" core hole from 10,250 to 10,493 ft + drill 10 ft new hole.	BHA #37
30	9.5	Baker	PDC	DD506V	5341859	10,503	10,947	444	TD well June 17, 2023	BHA #38
31	9.5	StabilDrill	Bullnose Reamer		801784	10,947	10,947	0	Reaming run to prepare wellbore for Battelle/Baker in situ stress testing.	BHA #39
21 / Run 3	9.5	San Joaquin	TCI	XLS-30DX	5243758	10,947	10,947	0	Circulation for wellbore cooldown @ 9,006 ft MD	BHA #40
21 / Run 4	9.5	San Joaquin	TCI	XLS-30DX	5243758	10,947	10,947	0	Circulation for wellbore cooldown @ 9,104 ft MD	BHA #41
32	9.5	San Joaquin	TCI	SS617PS	38794	10,947	10,947	0	Reaming run after Battelle/Baker in situ stress testing program.	BHA #42
N/A									7" casing fiber-optic "dummy run" (see BHA record for details)	BHA #43
31 / Run 2	9.5	StabilDrill	Bullnose Reamer		801133	10,947	10,947	0	Reaming run after 7" casing fiber-optic "dummy run"	BHA #44
24 / Run 4	8.75	San Joaquin	TCI	HR-50DX	T46ZX	10,947	10,947	0	Spot bentonite pill from 10,947 to 10,215 ft MD	BHA #45
33	5.5	San Joaquin	TCI	211	13127	10,947	10,947	0	Drill out cement in shoe track and cleanout bentonite pill to TD	BHA #46
33 / Run 2	5.5	San Joaquin	TCI	211	13127	10,947	10,947	0	TIH and circulate to replace wellbore fluid w completion fluid.	BHA #47

The generic activities that occurred were as follows (also reported in Table 2).

- The well was spudded at 02:30 on April 26, 2023, drilling 22-inch surface hole.
- TD for the surface hole was reached at 1,146 ft MD on April 26, 2023.
- 16-inch surface casing was run, with the shoe at 1,136 ft MD.
- On April 27, 2023, surface casing was successfully cemented with 144 bbl of cement to the surface. 1500 psi was held for 30 minutes.
- On April 29, 2023, the shoe track was drilled out with a 14-3/4-inch mill-tooth bit, drilling ahead to 1,156 ft MD.
- On April 29, 2023, start drilling the 14-3/4-inch intermediate section with an SDI 7/8 5.7, 1.5° bent motor and a PDC bit. Drilled to 4,353 (May 1, 2023) and trip out of the hole. Significant vibrations.
- On May 1, 2023, return to drilling with a new SDI 7/8 5.7 stage, 0.13 rev/gal mud motor, full gauge roller reamer and MWD tools.
- On May 2, 2023, reach intermediate TD at 4,845 ft MD.
- On May 3, 2023, ran 11-3/4-inch, 65 ppg, JFE110T BTC casing to a shoe depth of 4,837 ft MD.
- On May 3, 2023, pumped primary cement treatment (549 bbl of 14 ppg cement). Good returns but cement fell.
- On May 4, 2023, pumped the first top job. The second top job was pumped on May 5, 2023.
- On May 8, 2023, cement was drilled out, along with 10 ft of new hole using a 9-1/2-inch insert bit. A FIT was performed to 9.8 ppg.
- On May 8, 2023, log from 4,845 ft to the surface with temperature, gamma ray, PFlex Cement Evaluation, Isolation Scanner and Array Sonic.
- The first core run was on May 8/9, 2023, coring from 4,855 to 4,871 ft MD with an 8-3/4-inch coring assembly.
- On May 10, 2023, the second coring run was from 4,871 to 4,878 ft MD.
- On May 10, 2023, reamed cored section of the hole from 4,855 to 4,878 ft MD with the Particle Drilling assembly. Particle drill 9-1/2-inch hole from 4,878 to 4,910 ft. ROP started to slow (from 30 to 40 ft/hr) to 5 ft/hr at ~4,900 ft.
- On May 11, 2023, Particle drill with a new bit from 4,910 to 4,978 ft MD. Pump viscous sweeps to circulate out particles. Drill and ream to 4,980 ft with a tricone bit.
- On May 13, 2023, stage in the hole with a 9-1/2-inch bit with a Sanvean sensor and the Halo directional assembly. Drill from 4,980 to 5,269 ft MD. Directional tools failed at this depth.
- On May 13-15, 2023, stage in the hole with a Sanvean sensor and the Halo assembly with no mud motor and without the Ripstick. Drill from 5,269 to 5,480 ft MD. At 5,480 ft MD, start the build (~100 ft early because of vibrations. Drill ahead to 5,537 ft MD. Drill ahead (still on build) to 5,957 ft MD.

- On May 16, 2023, drill from 5,957 to 6,545 with the Halo directional assembly and no mud motor or RipStick. POOH and run the RSS assembly (new 9-1/2-inch bit, other fixtures, and RSS).
- On May 17, 2023, field gyro runs.
- On May 17/18, 2023, drilled from 6,545 ft MD to 6,610 ft MD and pulsar failed.
- On May 17, run back in the hole with a new bit and a new RSS assembly. On May 18, 2023, drill from 6,610 to 6,754 ft MD. Troubleshoot encoder on top drive.
- Later, on May 18, 2023, drill ahead from 6,754 to 6,773 and later to 6,777 and later to 6,950 ft MD while encoder was repaired. Drop a gyro and log the hole on May 19, 2023, with an FMI and UBI.
- On May 20, 2023, trip in the hole with a 9-1/2-inch stiff Halo assembly (BHA #16). Drill ahead from 6,950 to 7,584 ft MD. Trip out of the hole for a 1° motor.
- On May 21, 2023, trip in the hole with a 9-1/2-inch PDC bit, and a 1° Tangent motor assembly (BHA #17). This was an Insulated Drill Pipe run. Drill ahead from 7,584 to 8,085. Trip out of the hole as planned on May 22, 2023.
- Mixed run of insulated and non-insulated drill pipe. On May 22/23, 2023, drilled from 8,085 to 8,585 ft MD (sliding and rotating). Trip out of the hole and lay down the insulated drill pipe.
- On May 24, 2023, SLB ran an FMI and UBI suite from 8,508 to 6,700 ft MD. The temperature on the second run reached 272°F.
- Ran 25 stands of non-insulated S-135 drill pipe (25 stands) and crossed over to insulated drill pipe at 3,369 ft MD. Drilled ahead with 1° motor from 8,585 to 9,255 ft MD (May 25, 2023). Trip out of the hole and lay down insulated drill pipe.
- On May 26, 2023, make up BHA#20 and trip in the hole (7.15 motor ...) and on May 27, 2023, drill ahead from 9,255 to 9,800 ft MD. Run gyro on May 28, 2023.
- On May 29, 2023, cut 8-3/4-inch core from 9,800 to 9,817 ft MD. Polished bottom? (six foot discrepancy)
- On June 1/2, 2023, core from 9823 to 9853 ft MD.
- On June 3, 2023, safety ream from 9733 to 9853 ft MD with 9-1/2-inch insert bit. Drill 10 ft of new hole.
- Drill ahead on June 4, 2023, with a 9-1/2-inch PDC (bit #24 and BHA #27) from 9863 to 10,250 ft MD.
- On June 5, 2023, core from 10,250 to 10,264 ft MD.
- On June 6, drill 8-3/4-inch pilot hole (TCI) reaming and drilling ahead to 10,264 ft MD.
- On June 7, 2023, cored from 10,264 to 10,271 ft MD.
- On June 8, polish bottom of hole with 8-3/4-inch TCI and safety ream and drill ahead to 10,274 ft MD.
- On June 10/11, 2023, core from 10,274 to 10,304 ft MD.
- On June 11, 2023, drill with 8-3/4" PDC from 10,304 to 10,430 ft MD as pilot hole for the core assembly.

- On June 12/13, 2023, core from 10,430 to 10,460 ft MD.
- On June 14, 2023, drill ahead 2 ft to 10,462 with an 8-3/4-inch TCI bit.
- On June 15, 2023, core from 10,462 to 10,493 ft MD.
- On June 16, 2023, ream with 9-1/2-inch PDC bit from 10,250 to 10,493 ft MD and drill ahead to 10,503 ft MD with a TCI bit, motor, and roller reamers.
- On June 17, 2023, rotate and slide from 10,503 to 10,947 ft MD.
- On June 18, run UBI from 9,400 ft to 4,837 ft MD. On June 18/19, 2023, run triple combo and FMI through the bit from 10,727 ft MD to surface (3,700 ft MD).
- On June 19, 2023, run temperature on wireline (could not get past 7,030 ft).
- On June 19, 2023, ran UBI from 4,836 ft to surface.
- On June 20/21, 2023, run 9-1/2-inch reaming assembly.
- On June 22, 2023, circulate and cool the hole for Bakr pipe-conveyed logging tools. Ran a gyro and cooled the hole.
- On June 23, 2023, commence Battelle and Baker Hughes operations for measuring in situ stress.
- On July 3, 2023, end of Battelle and Baker Hughes operations.
- On July 3/4, 2023, ream hole and rig up SLB for first circulation testing between well 16A(78)-32 and the open hole production section (all) of well 16B(78)-32.
- On July 4, 2023, perform the first circulation test. Shut-in both wells for night.
- On July 5, 2023, perform a second circulation test. Shut-in both wells; bleed off well 16B(78)-32 and rig up for casing running (July 6, 2023).
- On July 6, 2023, carry out dummy casing run.
- On July 7/8, 2023, ream the hole.
- On July 8/9, 2023, spot bentonite (64 bbl).
- On July 10-12, 2023, run casing with fiber optic strings.
- On July 13, 2023, cement the production casing.
- On July 14/15, 2023, install wellhead and BOPE. Tested and found that the top seal on the CSBS metal seal inside the adaptor flange was leaking. It was possible to test the bottom two seals. The leak was repaired after the rig was gone.
- On July 16, 2023, drilled out the shoe track and drilled and washed out the bentonite to 10,947 ft MD.
- On July 17, 2023, ran Isolation Scanner and cement bond log.
- On July 18, 2023, pumped the third circulation test (well 16B(78)-32 was cased to 10,208 ft MD. Shut-in both wells and maintained wellhead pressure in well 16B(78)-32 at about 500 psi.
- On July 20, 2023, circulation test and a PLT/PTS in well 16A(78)-32 while pumping.
- On July 20, 2023, start rigging down.
- Rig released at 18:00 on July 21, 2023.

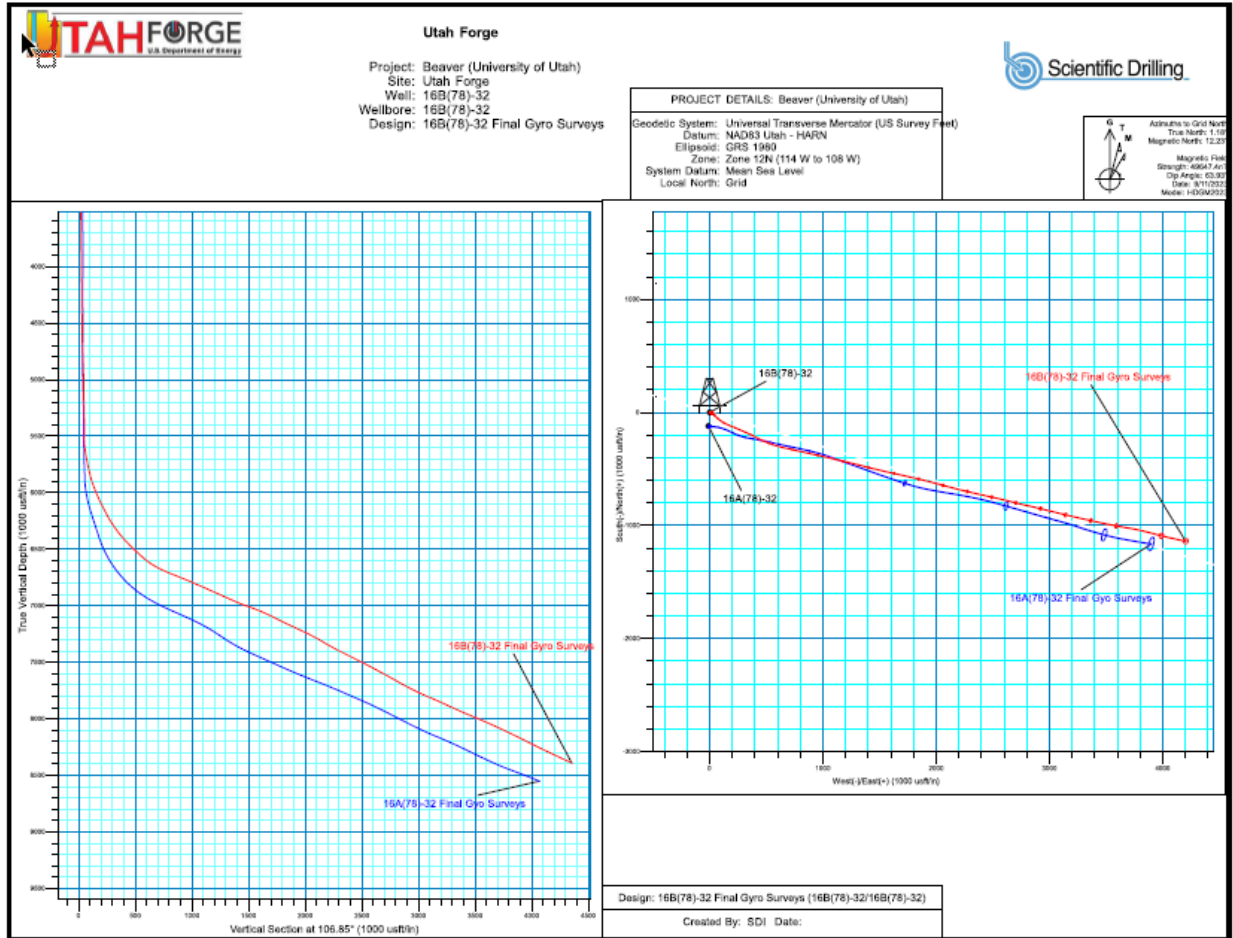


Figure 5. As built well trajectory.

Table 2. Well activities

Date	Activity
April 26, 2023	Spud, drilling 22-inch surface hole.
April 26, 2023	TD for the surface hole was reached at 1,146 ft MD and run 16-inch surface casing
April 27, 2023	Cement surface casing
April 29, 2023	Start drilling the 14-3/4-inch intermediate section with an SDI 7/8 5.7, 1.5° bent motor and a PDC bit. Drilled to 4,353 (May 1, 2023) and trip out of the hole. Significant vibrations.
May 1, 2023	Return to drilling with a new SDI 7/8 5.7 stage, 0.13 rev/gal mud motor, full gauge roller reamer and MWD tools.
May 2, 2023	Reach intermediate TD at 4,845 ft MD.
May 3, 2023	Run and cement 11-3/4-inch, 65 ppf, JFE110T BTC casing to a shoe depth of 4,837 ft MD.
May 6, 2023	Drill out shoe and log to surface with temperature, gamma ray, PFlex Cement Evaluation, Isolation Scanner and Array Sonic.

May 8-10, 2023	Coring
May 10-11, 2023	Particle drilling pilot
May 13, 2023	Stage in the hole with a 9-1/2-inch bit with a Sanvean sensor and the Halo directional assembly. Drill from 4,980 to 5,269 ft MD. Directional tools failed at this depth.
May 13-15, 2023	Stage in the hole with a Sanvean sensor and the Halo assembly with no mud motor and without the Ripstick. Drill from 5,269 to 5,480 ft MD. At 5,480 ft MD, start the build (~100 ft early because of vibrations. Drill ahead to 5,537 ft MD. Drill ahead (still on build) to 5,957 ft MD.
May 16, 2023	Drill from 5,957 to 6,545 with the Halo directional assembly and no mud motor or RipStick. POOH and run the RSS assembly (new 9-1/2-inch bit, other fixtures, and RSS.
May 17/18, 2023	Run back in the hole with a new bit and a new RSS assembly and drill from 6,610 to 6,950 ft MD while encoder was repaired.
May 19, 2023	Drop a gyro and log the hole on May 19, 2023, with an FMI and UBI.
May 20, 2023	Trip in the hole with a 9-1/2-inch stiff Halo assembly (BHA #16). Drill ahead from 6,950 to 7,584 ft MD. Trip out of the hole for a 1° motor.
May 21-23, 2023	Trip in the hole with a 9-1/2-inch PDC bit, and a 1° Tangent motor assembly (BHA #17). This was an Insulated Drill Pipe run (Eavor). Drill ahead from 7,584 to 8,585.
May 24, 2023	FMI and UBI suite from 8,508 to 6,700 ft MD.
May 25, 2023	Drilled ahead with 1° motor from 8,585 to 9,255 ft MD. Trip out of the hole as planned and lay down insulated drill pipe.
May 26, 2023	Trip in the hole (7.15 motor) and on May 27, 2023, drill ahead from 9,255 to 9,800 ft MD.
May 29-June 15, 2023	Coring and drilling ahead to 10,493 ft MD
June 17, 2023	Rotate and slide from 10,503 to 10,947 ft MD.
June 18-19, 2023	Log with UBI, FMI, and triple combo
June 20/21, 2023	Run 9-1/2-inch reaming assembly
June 22, 2023	Circulate and cool the hole for Baker pipe-conveyed logging tools. Ran a gyro and cooled the hole.
June 23-July 3, 2023	Battelle and Baker Hughes operations for measuring in situ stress.
July 3-5, 2023	Ream the hole and carry out two circulation experiments
July 6, 2023	Dummy casing run to confirm three strings of fiber optics could be run.
July 7/8, 2023	Ream the hole
July 8/9, 2023	Spot bentonite (64 bbl) to isolate openhole section
July 10-12, 2023	Run casing with fiber optic strings
July 13, 2023	Cement production string.
July 14/15, 2023	Install wellhead and BOPE
July 16, 2023	Drilled out the shoe track and drilled and washed out the bentonite to 10,947 ft MD.
July 17, 2023	Ran Isolation Scanner and cement bond log.
July 18-20, 2023	Two additional circulation tests and a PLT/PTS survey
July 21, 2023	Rig released.

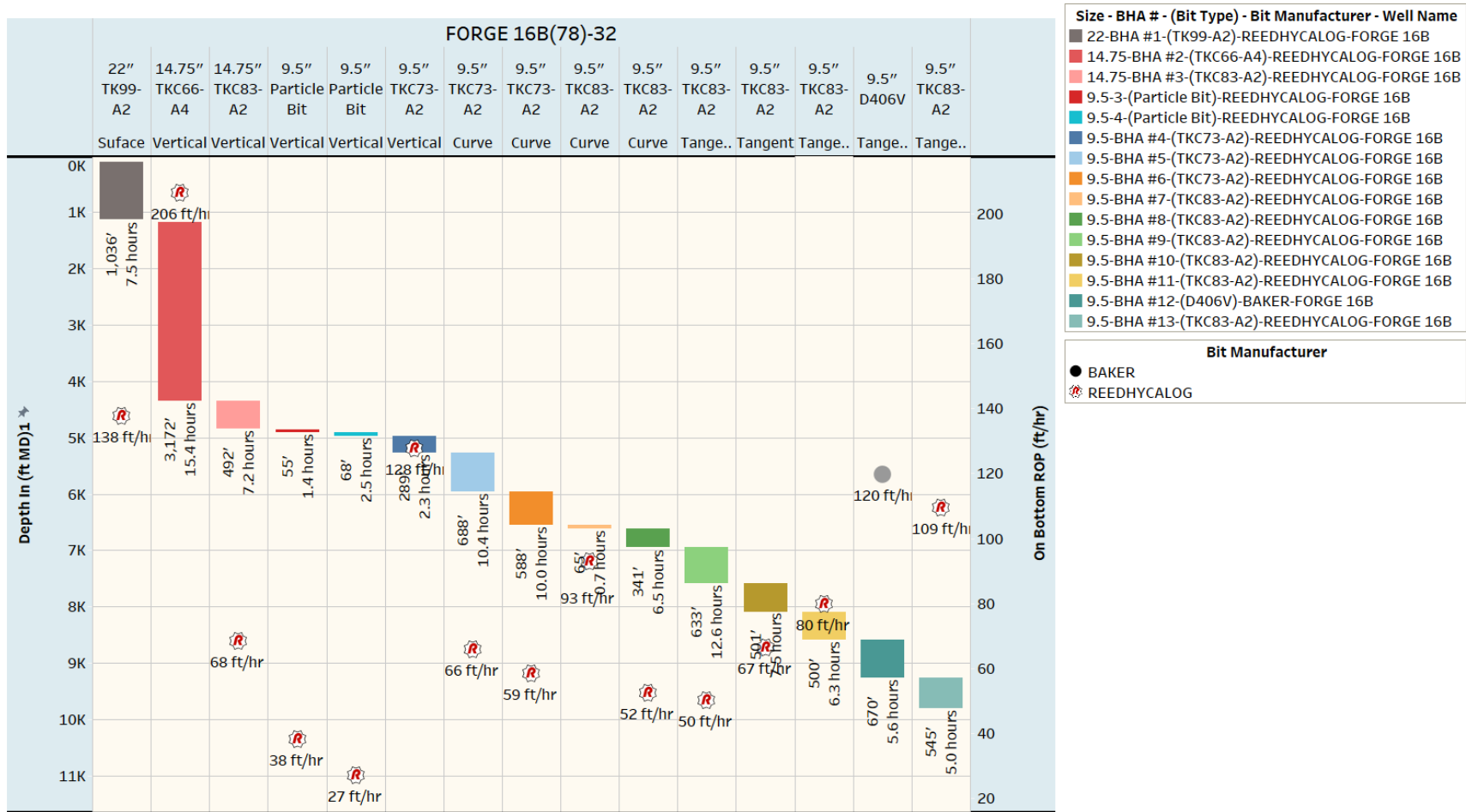


Figure 6. ReedHycalog drilling summary. Refer to Table 1 to see the correct BHA numbers

IV.4 Days versus Depth

Figure 7 is a plot of days versus depth.

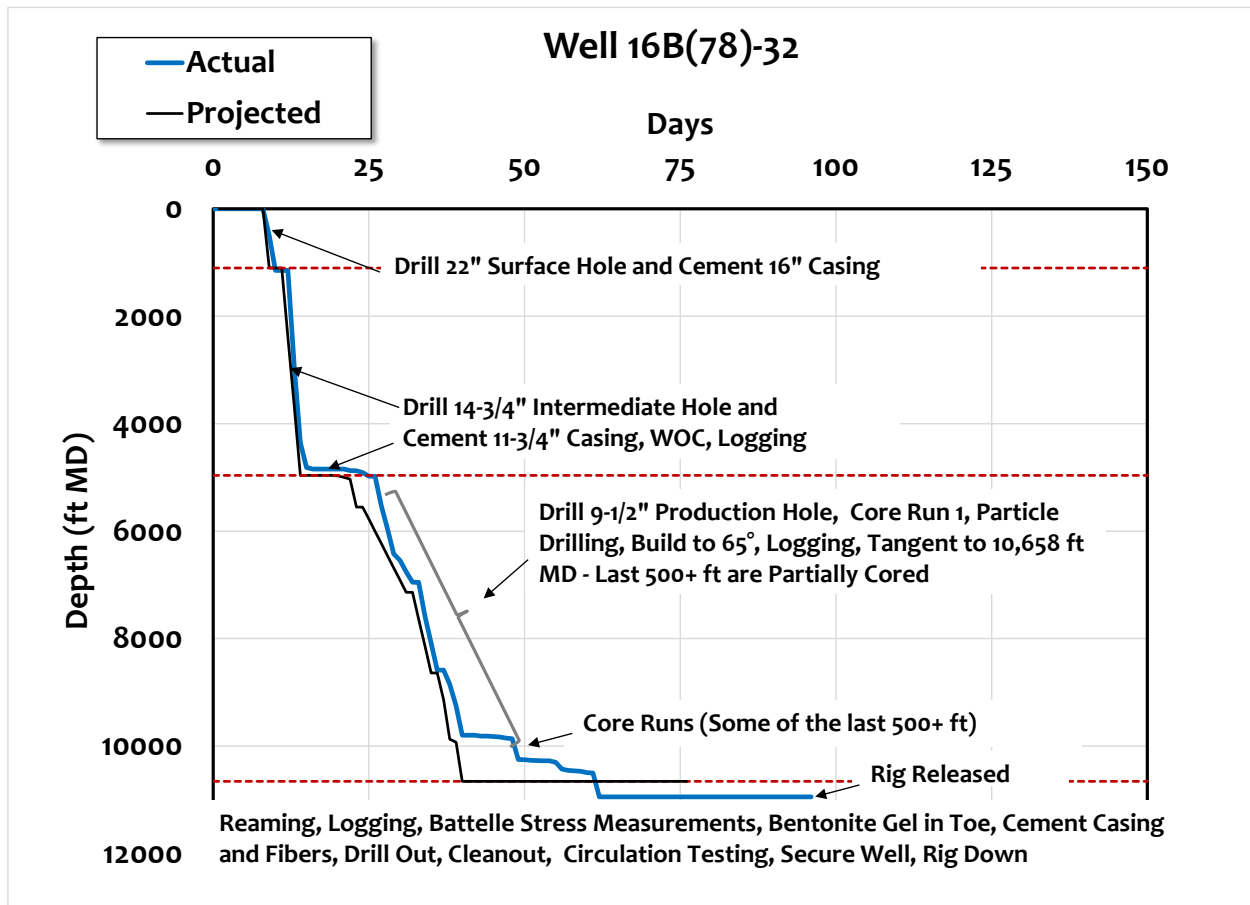


Figure 7. Days versus depth.

IV.5 Directional Activities

Both Rotary Steerable Systems (RSS) and conventional motors were used on this well. BHAs are described in the text and an SDI (Scientific Drilling International) retrospective is provided in Appendix E.

V. 22-inch Hole to 1,036 ft and 16-inch Casing

The 22-inch surface hole was drilled with a TK99-A2 bit to 1,036 ft MD (BHA #1). This is shown in Figure 8. After cementing in 16-inch casing, the 16-inch shoe track and 35 ft of new hole were drilled with a 14.75-inch mill tooth bit.

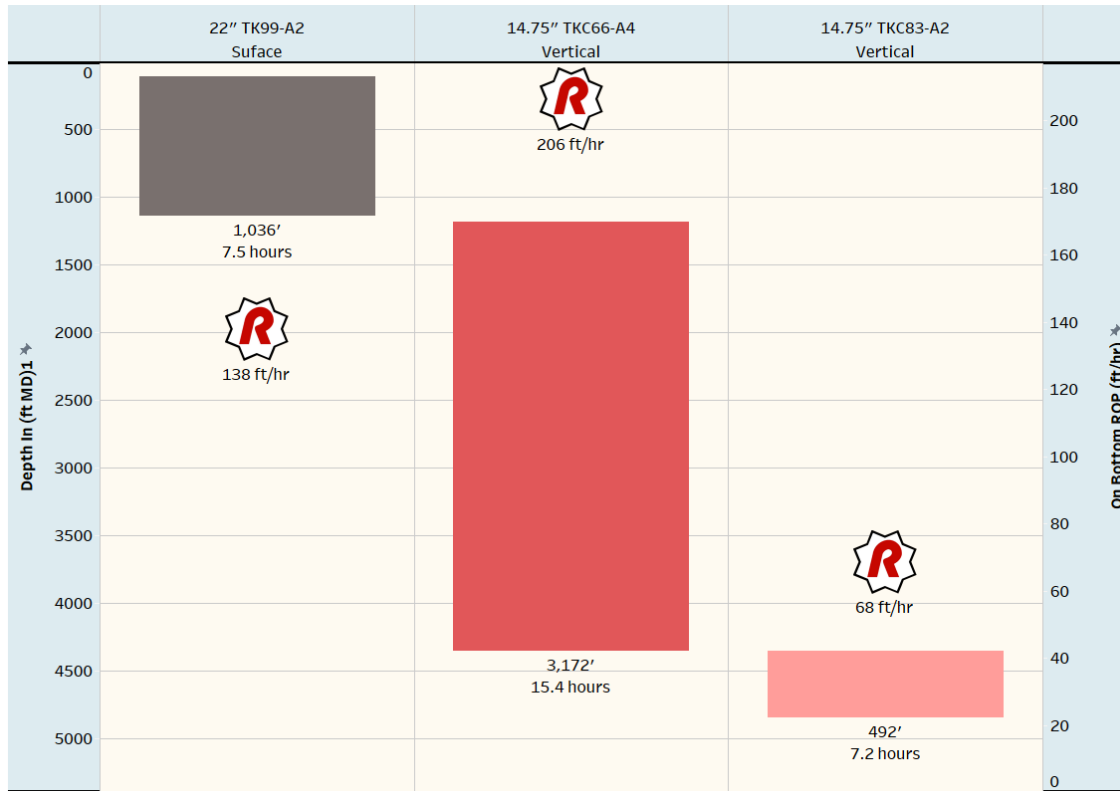


Figure 8. This schematically shows the bits and the drilling hours for the first three PDC bits. There is another BHA for drilling out the 16-inch casing shoe track and 35 ft of new hole. The surface hole was drilled (BHA #1) with a TK99-A2 bit (22-inch). Bits for the intermediate hole (BHA #3 and BHA #4) are also shown.

V.1 Drilling Objectives

The objectives were to drill adequate surface hole to isolate the nonpotable aquifer.

V.2 22-inch Bit Program, BHAs, and Performance

The mud system was 15 ppb bentonite. Clay was encountered at 807 ft and subsequently at 1033 ft MD; the rig circulated bottoms up. The rig ran sweeps of microcellulose walnut powder and sawdust.

After/during the drilling of the surface hole, ReedHycalog recommended:

“Hole was building angle on a straight motor. ROP was limited to try to maintain vertical inclination. Next, we’ll consider increasing RPMs and lowering WOB. This could be done with Rotary or Flowrate depending on rig capabilities. Higher RPM will bring the BHA back towards vertical.”

Figures 9 through 14 document surface hole drilling performance.

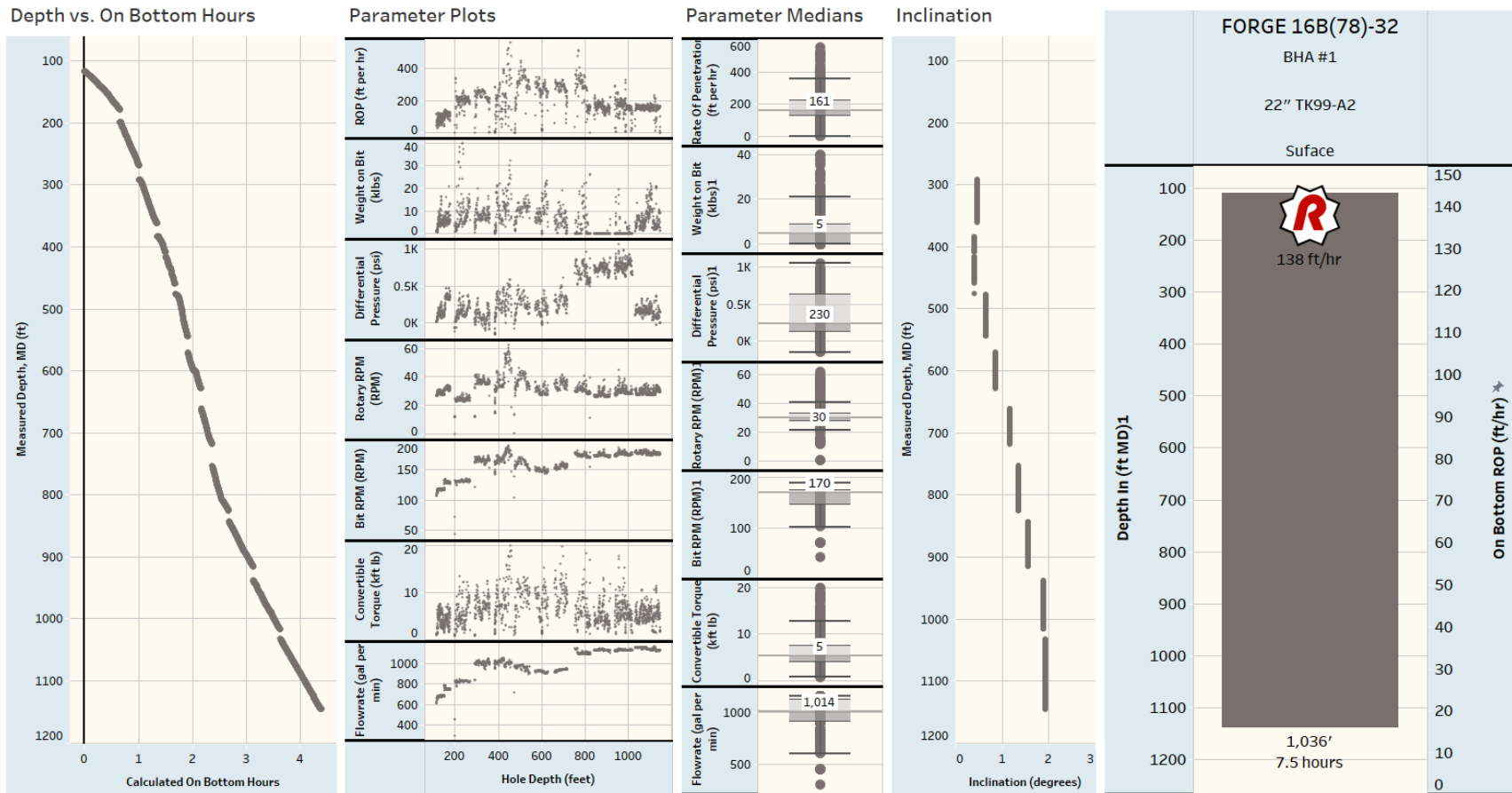


Figure 9. BHA #1 - 22-inch hole. The average ROP was 138 ft/hr

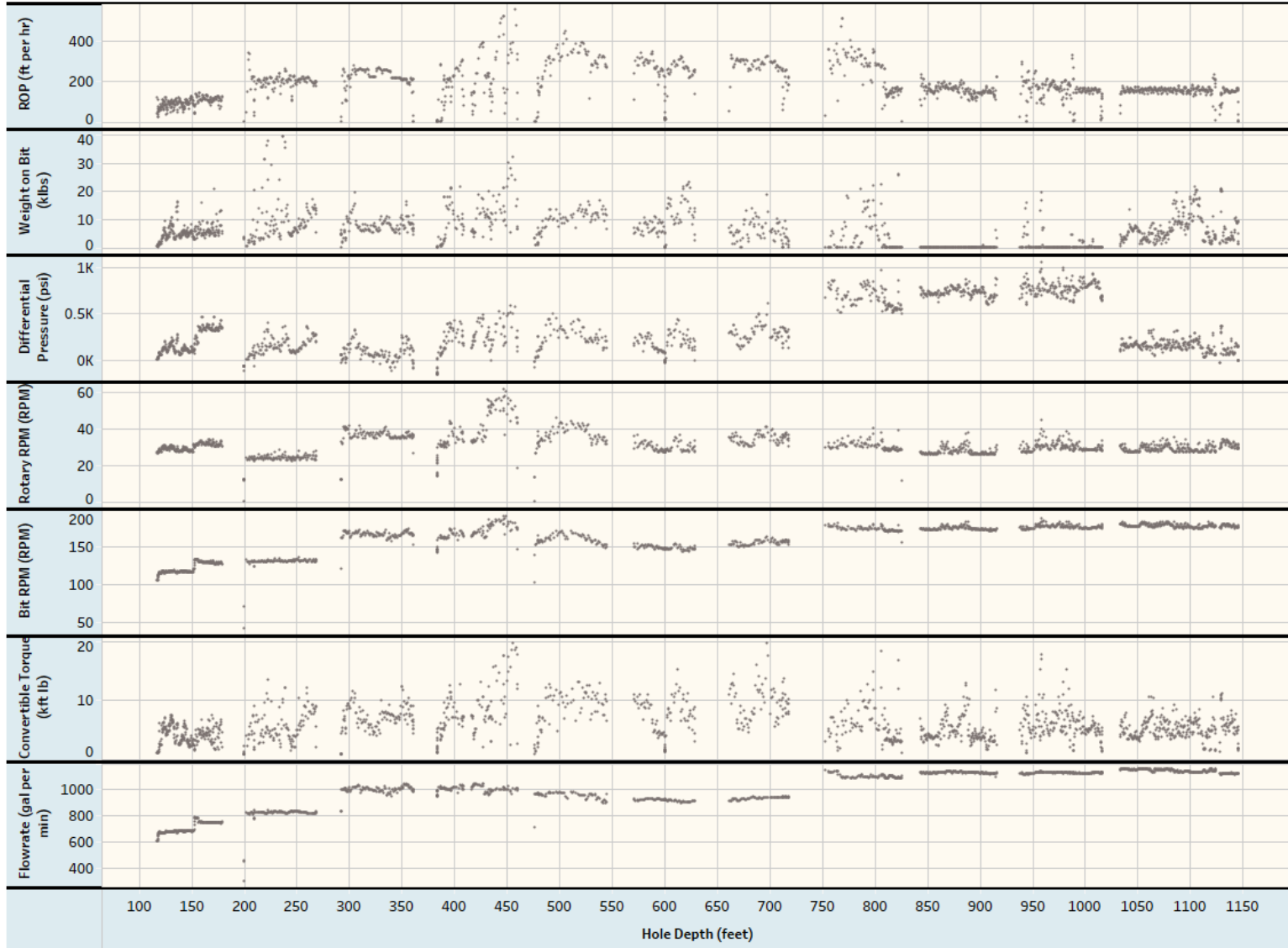


Figure 10. Surface hole drilled with TK99-A2.





Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Surface	BHA #1	1	22	TK99-A2	A297420	REEDHYCALOG	110	1146	1036	7.52	138

Figure 11. Dull photographs of the bit used for drilling the surface hole. The bit type is TK99-A2.



Figure 12. Dull photographs of the bit used for drilling the surface hole (BHA #1, TK99-A2).



Figure 13. Dull photographs of the bit used for drilling the surface hole (BHA #1, TK99-A2).

Bottom Hole Assembly																
Job#	OP:039349			Rig	Frontier 16			BHA Length (Usft)	843.58							
Operator	Utah Forge			BHA #	1			BHA Weight dry (klbs)	0.00							
Well	16B(78)-32 - 16B(78)-32			Bit #	1			BHA Weight Bouyed (klbs)	0.00							
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00			Wt. Below Jars dry (klbs)	0.00							
Date In	04/25/2023			Depth Out(Usft)	0.00			Wt. Below Jars Bouyed (klbs)	0.00							
Date Out	04/25/2023			Drilled(Usft)	0.00			Drilling / Circ Hours	0.00 / 0.00							
Sensor Offsets																
Survey Offset				71.00			Gamma Offset			N/A			Gyro Offset			N/A
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)			
1	A297420	22" PDC Bit (FN 0.5)	9.688	3.375	0.000	0.00	7 5/8 REG P		0.000	0.00	0.00	1.75	1.75			
2	915003	9.15 Mud Motor	9.500	4.625	9.688	0.50	7 5/8 REG B	7 5/8 REG B	0.000	0.00	0.00	38.10	39.85			
3	826296	21 7/8" String Stab (wrapped)	9.000	2.613	9.000	2.30	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	7.83	47.68			
4	84-611	9 1/2 NMDC	9.563	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	30.56	78.24			
5	156-017	9 1/2 NM Pony DC	9.875	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	9.00	87.24			
6	8-698	9 1/2 Hangoff Sub	9.500	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	3.01	90.25			
7	69-988	9 1/2 Hybrid Sub	9.375	3.500	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	5.40	95.65			
8	156-009	9 1/2 NM Pony DC	9.250	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	12.32	107.97			
9	DR6482	Crossover	8.000	3.000	0.000	0.00	6 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	4.31	112.28			
10		9 - 6" DC's	8.125	3.000	0.000	0.00	6 5/8 REG B	6 5/8 REG P	0.000	0.00	0.00	271.72	384.00			
11		Crossover	8.000	2.875	0.000	0.00	6 5/8 REG B	5 1/2 FH B	0.000	0.00	0.00	2.91	386.91			
12		15 Jts HWDP	7.166	3.675	0.000	0.00	5 1/2 FH B	5 1/2 FH P	0.000	0.00	0.00	456.67	843.58			

Comments						
Makeup torque 7 5/8 Reg = 60,200# 6 5/8 Reg = 38,500#						
Bit Data			Motor Data			
SN	A297420		SN	915003		
Size (in)	9.688		OD (in)	9.500		
Type	FDC		Description	9.15 Mud Motor		
Description	22" PDC Bit (FN 0.5)		Make/Model	Titan 22		
Make	NOV		Bit to Bond (Usft) / Angle	6.00 / 0.00		
Model	TK99		Stab / Kick Pad OD (in)	21.875 / 9.750		
TFA	1.32 (12x12)		Stator Vendor/Type/Fit	NBR-HR(DD) / 0.0100		
Grade In	New		Pre Run Dyno HP%			
Grade Out			Lobes	7/8		
Drilled (Usft)	0.000		Stages	5.7		
			Rev/Gal	0.130		
			Diff Press (Avg/Max)(psi)	0.0 / 1340.0		
			Press. Drop(psi)	0.0		
			Max Torque(KRlb)	25.9		
			Max RPM	160		
			Flow Range(gpm)	600-1200		
			Re-Run	NO		
			Direct Bill	NO		
Stabilizer Data						
Component Number	Description	OD (in)	Blade Length (in)	Blade Width (in)	Blade Count	Stab->Bit (Usft)
-1- 2	9.15 Mud Motor	21.875	8.50	2.50	5	3.95
3	21 7/8" String Stab (wrapped)	21.875	26.50	8.50	3	42.60

Figure 14. BHA #1, 22-inch hole.



V.3 16-inch Casing and Cementing

The procedures for cementing the surface casing were as follows.

- Pump 10 bbl of CaCl₂, pump 40 bbl of fresh water, pump 10 bbl of Zonelock, pump 10 bbl of fresh water, pump 50 bbl of MudPush Express.
- Mix and pump 478.2 bbl (1467 sacks) of 14.0 ppg cement. The surface slurry was pumped at an average of 5.5 bbl/min.
- Drop top plug and displace with 241 bbl of 8.9 ppg mud, bump plug with 1,000 psi, 500 psi over.
- Increase pressure to 1,500 psi and hold for 30 minutes.
- Bleed back 3.5 bbl and check the floats, floats holding. 144 bbl of good cement came to the surface and there was no fallback. Held 30 min casing test at 1,500 psi, casing test good.

Figure 15 shows the pressure match during cementing the intermediate casing. Figures 16 and 17 show the design parameters and the cementing records.

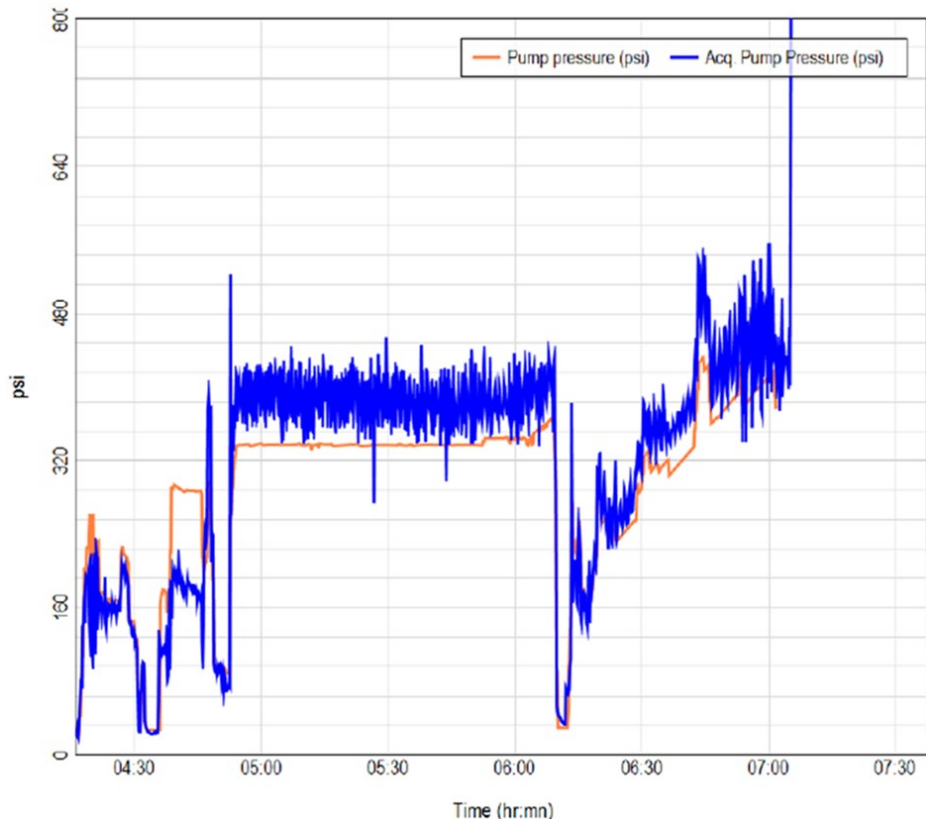
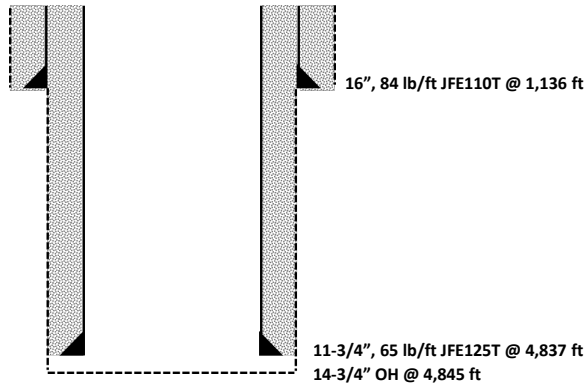


Figure 15. Design versus actual job pressure during cementing the intermediate casing.

Well 16B(78)-32 Intermediate Casing Cement Job



Cement Slurry: 65:35 G:Poz + 29.4% D066 BWOB + 0.5% D160A BWOB + 3% D020 BWOB + 1% D079 BWOB + 1.1% D800 BWOB + 0.1% D167A BWOB + 0.02 gal/sk D047

Density	14.0 ppg
Yield	1.70 cu ft/sk
Mix-water	7.729 gal/sk
SVF	37.95 %

TT	5:39 hr:min	70 Bc at 161°F
FL	140 mL	30 min at 161°F
FW	0 %	161°F
CS	1,016 psi	24 hrs at 285°F
	500 psi	04:48 hr:min at 285°F

Calculated cement volumes

Shoe track =	9.9 bbl
11-3/4" casing in 14-3/4" OH (w/ 100% excess)	571.6 bbl
11-3/4" casing in 16", 84 lb/ft surface casing	96.3 bbl

Total Cement Volume = 677.8 bbl

Displacement Volume = 526.3 bbl

Water Volume to mix cement = 411.9 bbl (2,238 sks)

Figure 16. Intermediate casing cementing specifications.

Well 16B(78)-32 Surface Casing Cement Job Execution Data

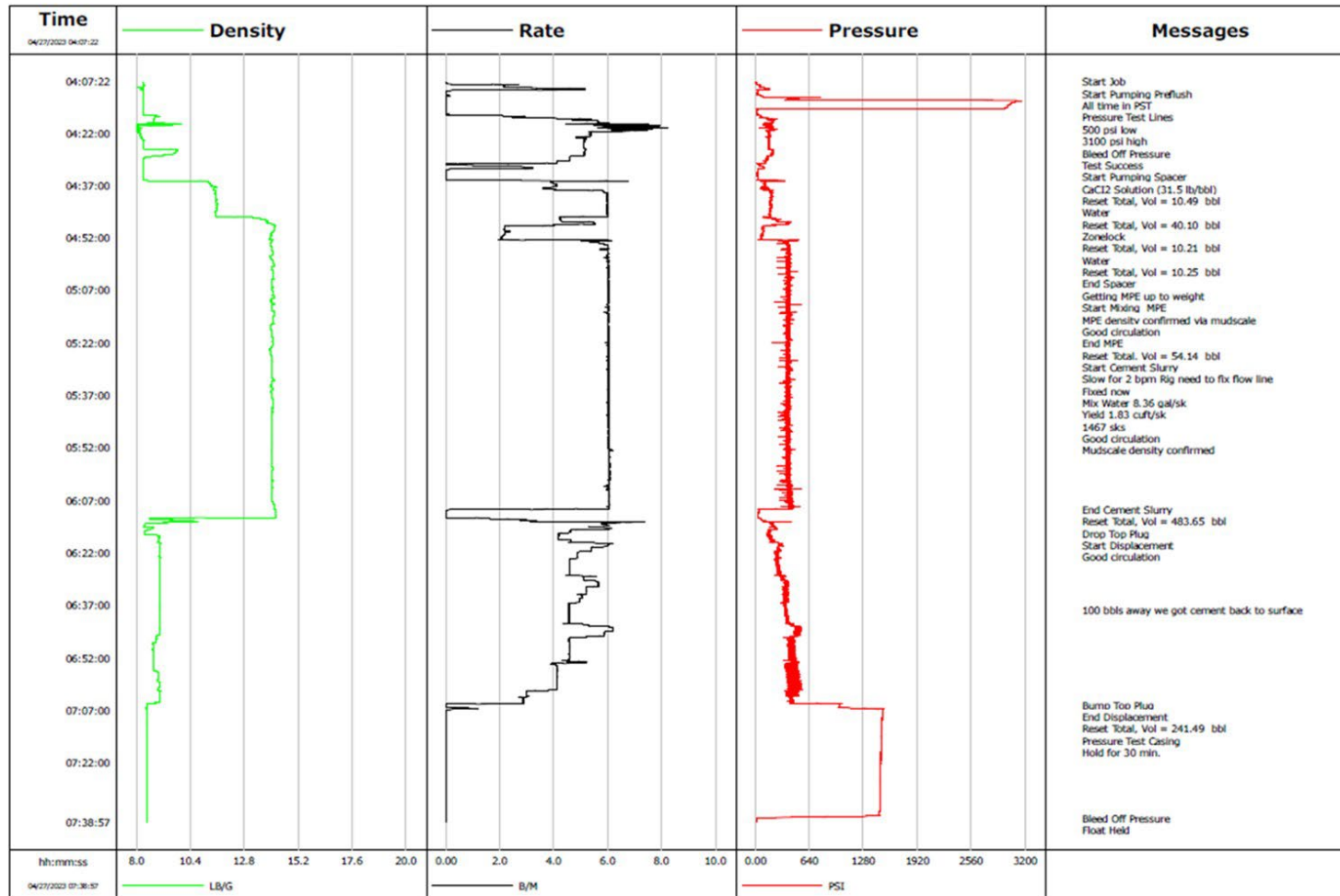


Figure 17. Cementing records for the surface casing.

In summary of the surface casing cementing, following a good pressure test of lines and equipment, more than 95% of both the MUDPUSH Express Spacer and cement slurry were pumped within 0.2 ppg of the designed density. Full circulation was maintained during the treatment. There were some issues with the pump rate during displacement that were partially due to the rig having difficulty supplying WBM to the cement pump. The actual displacement pressure (lift pressure) followed the trend of the job design simulation. The top plug bumped at the expected displacement volume. Pressure was bled off and floats held. Cement top in the annulus remained at the surface.

V.4 Wellhead

The procedures for wellhead and BOPE equipment were as follows.

Preheat and install 16-3/4" 3,000 psi wellhead as per Stream Flo procedure. Allow the wellhead to cool. Tested to 1,600 psi and held for 15 minutes. This was a good test
 Note: A Stream Flo representative was present during installation of the wellhead; all guidelines and recommendations were followed for installation. A DSM witnessed all tests.

Set in a 16-3/4-inch 3,000 psi x 21-1/4-inch 3,000 psi DSA, 21-1/4-inch 2,000 psi spacer spool, a 21-1/4-inch 2,000 psi mud cross, 21-1/4-inch 2,000 psi double gate rams, a 21 1/4-inch 2,000 psi Annular, and a 21-1/4-inch 2,000 psi riser with a rotating head assembly.

14-3/4-inch Hole to 4845 ft and 11-3/4-inch Casing

Figure 18 shows the PDC bits used to drill the surface and intermediate holes (BHA #1, BHA #3, and BHA #4). BHA #2 was a mill-toothed bit used to drill out the 16-inch casing track, and 35 feet ahead.

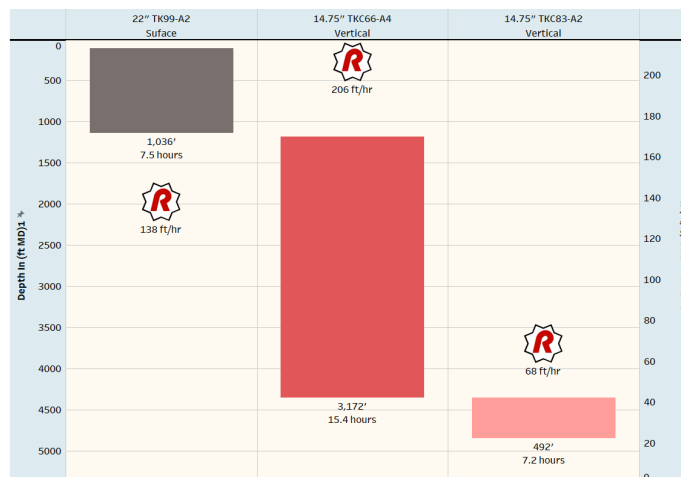


Figure 18. This shows BHAs #3 and #4 used for drilling the intermediate hole (the two right-hand columns).

VI.1 Drilling Objectives

The aim was to penetrate through the alluvium-granite/rhyolite interface by about 400 ft and run the intermediate casing.

VI.2 Summary

Table 2 is a summary of the activity while drilling and completing the intermediate hole.

Table 2. Drilling and Completing the Intermediate Hole

Report Date	Activities
April 29, 2023	Wait on cement and drilled out shoe track from 1,096 ft to 1,136 ft and clean out rathole to 1,146 ft (14 3/4-inch mill tooth bit, bit sub, and nine, 8-inch drill collars, and 15-HWDP).
April 30, 2023	Drill ahead to 1,181 ft and come out of hole to change the bit and BHA. Pick up SDI 7/8 5.7, 1.5° bent motor. Make up 14 3/4-inch intermediate BHA, RIH and drill ahead to 2,650 ft MD.
May 1, 2023	Drill ahead from 2,650 ft to 4,353 ft, 65,000 lb _f WOB, 100 rpm rotary, 18-33,000 ft-lb _f torque, 1,150-1,200 gpm, 3,300 psi standpipe pressure, differential pressure 200-400 psi. MSE steadily climbed and ROP slowed after the connection at 4,264 ft. Vibrations went from yellow-orange to orange-red. Tripped out of the hole with a tight spot from 2,241 to 2,132 ft.
May 2, 2023	After pulling out of the hole, pick up a new 7/8 5.7 stage, 0.13 rev/gal mud motor, a full gauge roller reamer, and MWD tools, picking up an additional stand of 8-inch drill collars and 5 additional stands of HWDP and drill to 4,816 ft.
May 3, 2023	Drill to casing point at 4,845 ft. Start running Run 11-3/4-inch, 65 ppf, JFE110T BTC casing.
May 4, 2023	Continue running casing. Shoe at 4,837 ft. Pumped primary cement job as follows: Dropped bottom plug with 5 bbl of water, pumped 50 bbl of 11.5 ppg spacer, 549 bbl of 14 ppg cement. Dropped top plug and displaced with 520 bbl of mud and water. Bumped plug. Checked floats (OK). CIP at 21:50. Good returns throughout job. Waited 20 minutes and attempted to drain the BOP stack. No cement. Waited on cement.
May 5, 2023	Mixed and pumped two top jobs: 1) Pump 36 bbl of 14.0 ppg surface tail cement with 2% Calcium Chloride (~413 linear feet). 2) Pump 13 bbl of 15.8 ppg tail cement with 2% calcium chloride (~153 linear feet) with cement to surface and not falling (total of 566 linear feet for both top jobs).
May 6, 2023	Install wellhead.

Report Date	Activities
May 7, 2023	Test BOPE

VI.3 14-3/4-inch Bit Program, BHAs, and Performance

As indicated, Figure 18 is an overview of the PDC bits used. Figures 19 through 31 document the intermediate hole bits and BHAs

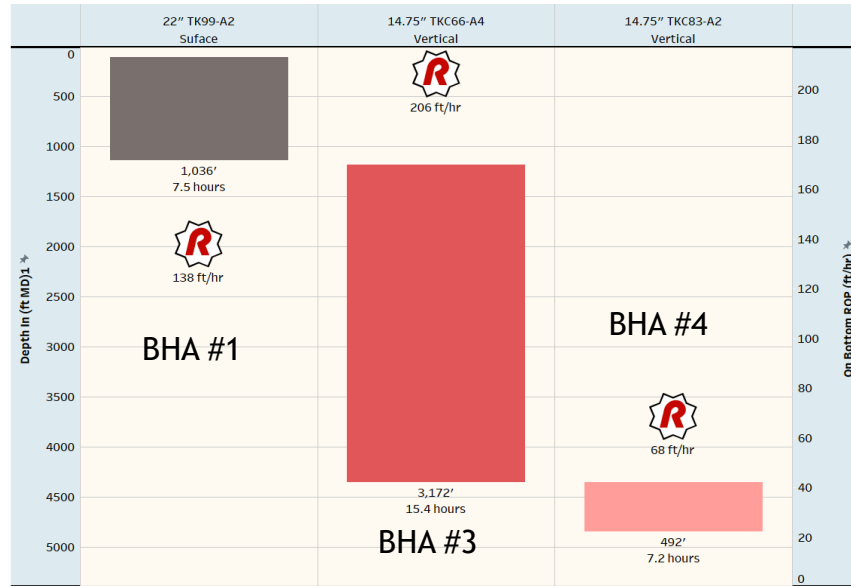


Figure 18. PDC bits for drilling and completing the surface and the intermediate holes.

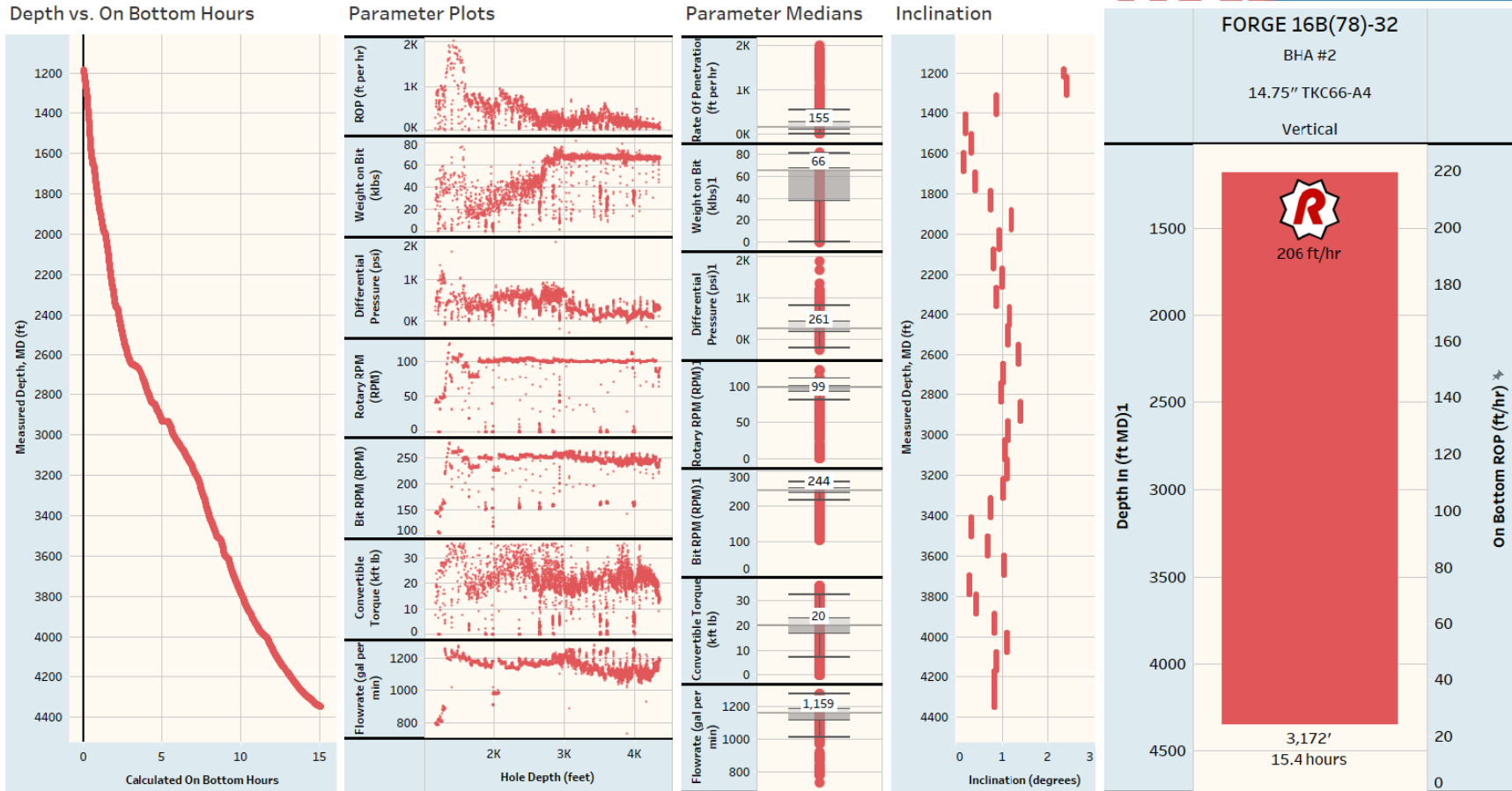


Figure 19 BHA #3. This was drilling alluvium with a TCC66-A4 bit. The average ROP was 206 ft/hr over 15.4 hours. Note - ReedHycalog refers to this as BHA #2 - it is in fact BHA #3.

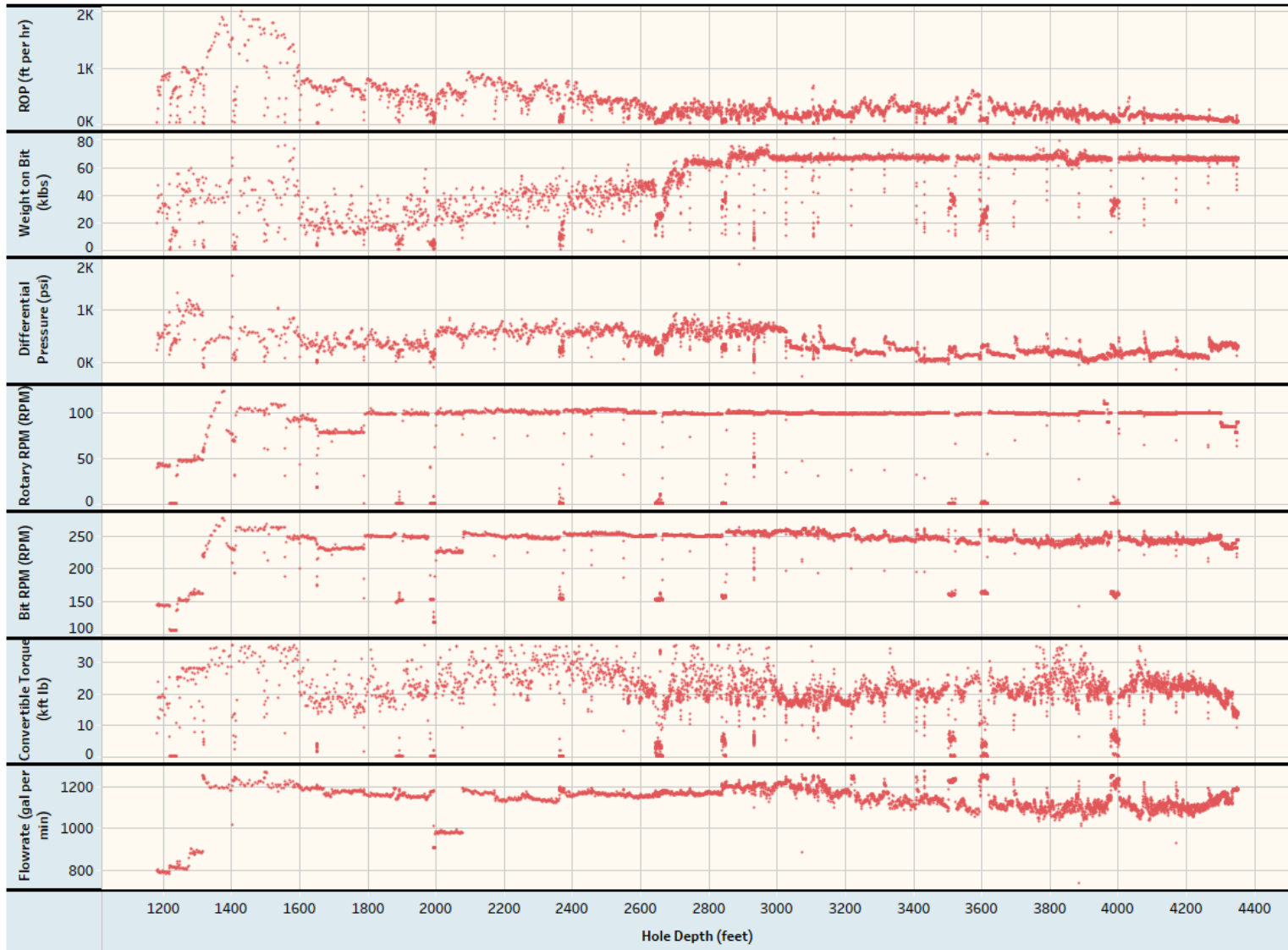


Figure 20. BHA #3. 14.75-inch TKC66-A4. Note - ReedHycalog refers to this as BHA #2 - it is in fact BHA #3.





Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Vertical	BHA #2	1	14.75	TKC66-A4	A297421	REEDHYCALOG	1181	4353	3172	15.38	206

Figure 21. Post run dull photographs after pulling BHA#3. Note - ReedHycalog refers to this as BHA #2 - it is in fact BHA #3. This was an NOV TK66 PDC bit.



Figure 22. Post run dull photographs after pulling BHA#3. Note - ReedHycalog refers to this as BHA #2 - it is in fact BHA #3. This was an NOV TK66 PDC bit.

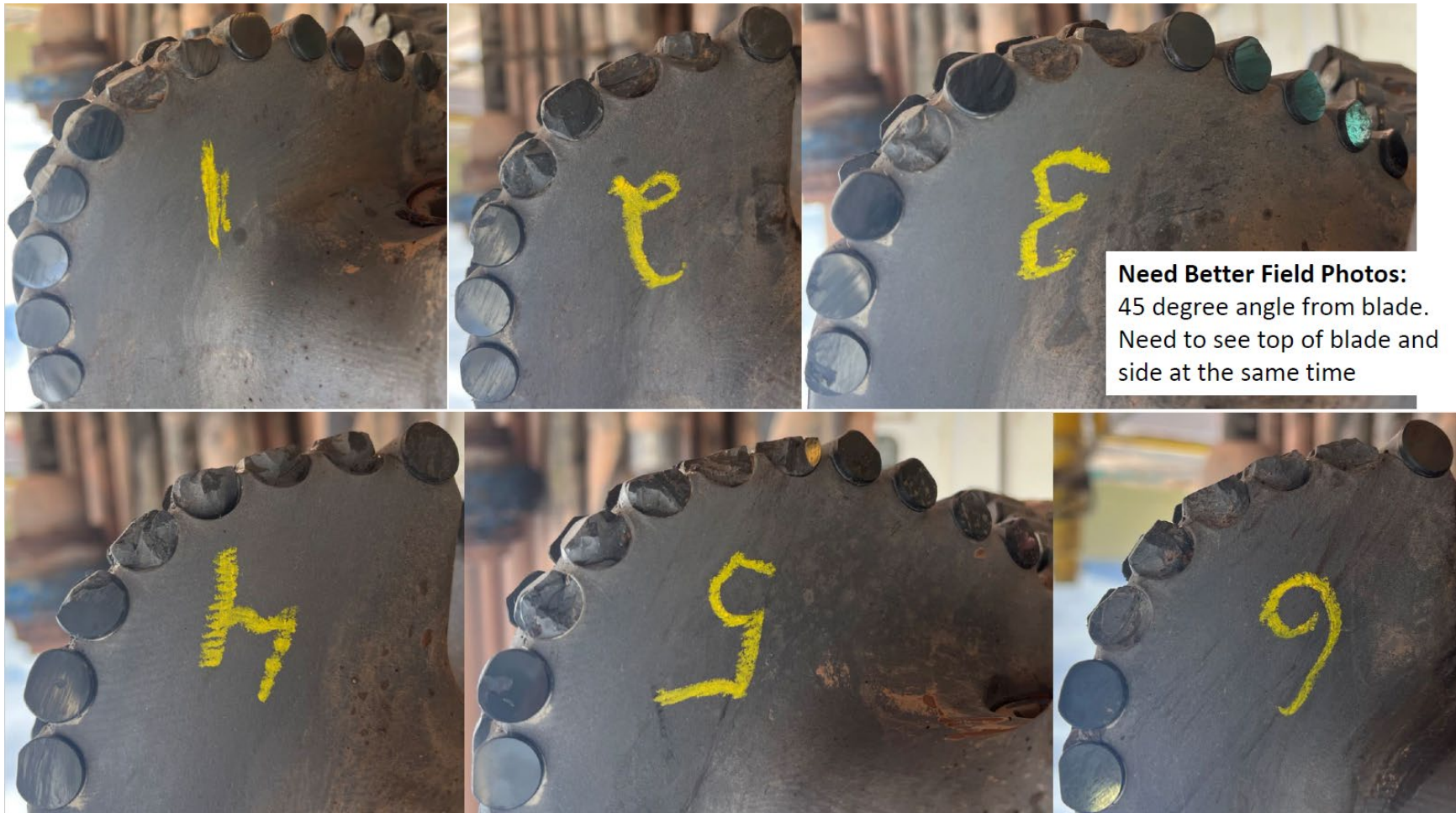


Figure 23. Post run dull photographs after pulling BHA#3. Note - ReedHycalog refers to this as BHA #2 - it is in fact BHA #3. This was an NOV TK66 PDC bit.



Figure 24. Post run dull photographs after pulling BHA#3. Note - ReedHycalog refers to this as BHA #2 - it is in fact BHA #3. This was an NOV TK66 PDC bit.

Bottom Hole Assembly													Comments					
Job#	OP.039349			Rig	Frontier 16			BHA Length (Usft)			841.42			Makeup torque 7 5/8 Reg = 60,200# 6 5/8 Reg = 38,500#				
Operator	Utah Forge			BHA #	2			BHA Weight dry (klbs)			0.00							
Well	16B(76)-32 - 16B(76)-32			Bit #	2			BHA Weight Bouyed (klbs)			0.00							
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	1180.00			Wt. Below Jars dry (klbs)			0.00							
Date In	04/23/2023			Depth Out(Usft)	4353.00			Wt. Below Jars Bouyed (klbs)			0.00							
Date Out	05/01/2023			Drilled(Usft)	3173.00			Drilling / Circ Hours			16.83 / 2.17							
Sensor Offsets																		
Survey Offset		69.00		Gamma Offset			N/A			Gyro Offset			N/A					
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)					
1	A297421	14 3/4" PDC Bit (FN)	9.688	3.376	0.000	0.00	7 5/8 REG P		0.000	0.00	0.00	1.56	1.56					
2	915002	9.15 Mud Motor	9.500	4.625	9.500	0.65	7 5/8 REG B	7 5/8 REG B	0.000	0.00	0.00	38.47	40.02					
3	100112	14 5/8" String stab (strait blade)	10.000	2.875	10.000	1.31	7 5/8 REG B	7 5/8 REG B	0.000	0.00	0.00	5.50	45.52					
4	84-611	9 1/2 NMDC	9.563	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	30.56	76.08					
5	156-017	9 1/2 NM Pony DC	9.875	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	9.00	85.08					
6	8-696	9 1/2 Hangoff Sub	9.500	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	3.01	88.09					
7	69-988	9 1/2 Hybrid Sub	9.375	3.500	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	5.40	93.49					
8	156-009	9 1/2 NM Pony DC	9.250	4.250	0.000	0.00	7 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	12.32	105.81					
9	DR6482	Crossover	8.000	3.000	0.000	0.00	6 5/8 REG B	7 5/8 REG P	0.000	0.00	0.00	4.31	110.12					
10		9 - 8" DC's	8.125	3.000	0.000	0.00	6 5/8 REG B	6 5/8 REG P	0.000	0.00	0.00	271.72	381.84					
11		Crossover	8.000	2.875	0.000	0.00	5 1/2 FH B	6 5/8 REG P	0.000	0.00	0.00	2.91	384.75					
12		15 Jts HWDP	7.188	3.875	0.000	0.00	5 1/2 FH B	5 1/2 FHP	0.000	0.00	0.00	456.67	841.42					
													Stabilizer Data					
Component Number	Description	OD (in)	Blade Length (in)	Blade Width (in)	Blade Count	Stab->Bit (Usft)												
2	9.15 Mud Motor	14.625	15.00	2.50	5	3.55												
3	14 5/8" String stab (strait blade)	14.625	13.00	2.88	4	71.02												

Figure 25. This is the configuration of BHA#3. Note - ReedHycalog and SDI refer to this as BHA #2 - it is in fact BHA #3. This was an NOV TK66 PDC bit.

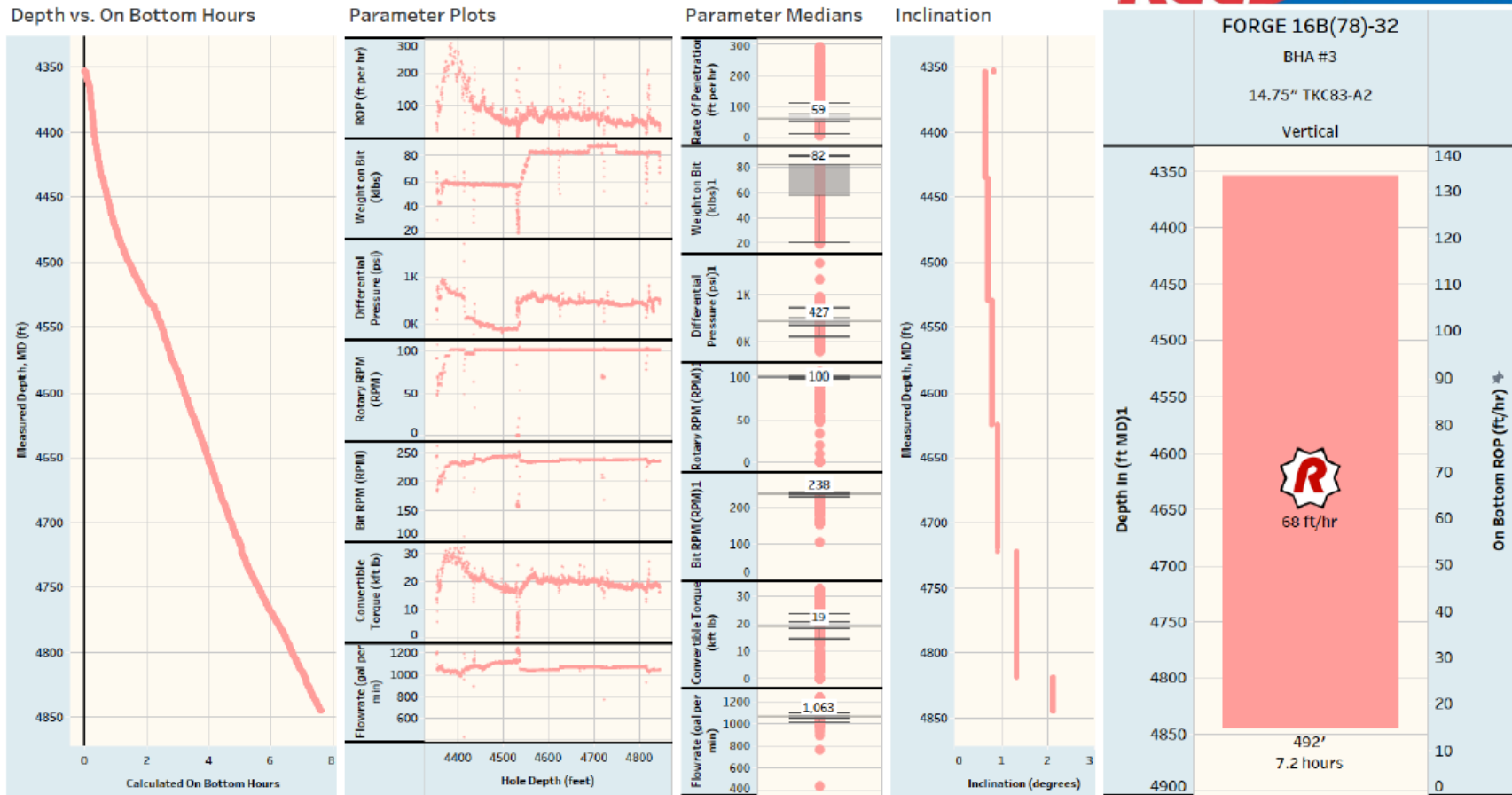


Figure 26. BHA #4 [14.75" TKC83-A2 (A298775)]. This bit drilled 492 ft in 7.2 hours at an average rate of penetration of 68 ft/hr. Note - ReedHycalog refers to this as BHA #3 - it is in fact BHA #4. This was an NOV TKC83-A2 PDC bit.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 14.75-BHA #3-(TKC83-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: Same ROP trend as granite drilling in previous wells. ROP hit a max of 290 ft/hr, but declined steadily down to a maintained level of 60 ft/hr after 100 feet of drilling.

A fresh water sweep was sent in for the last 20 feet. You can see the increase in ROP back to 200 ft/hr briefly. MSE dropped 100% during this sweep but ROP did not fully recover for the duration of the water sweep.

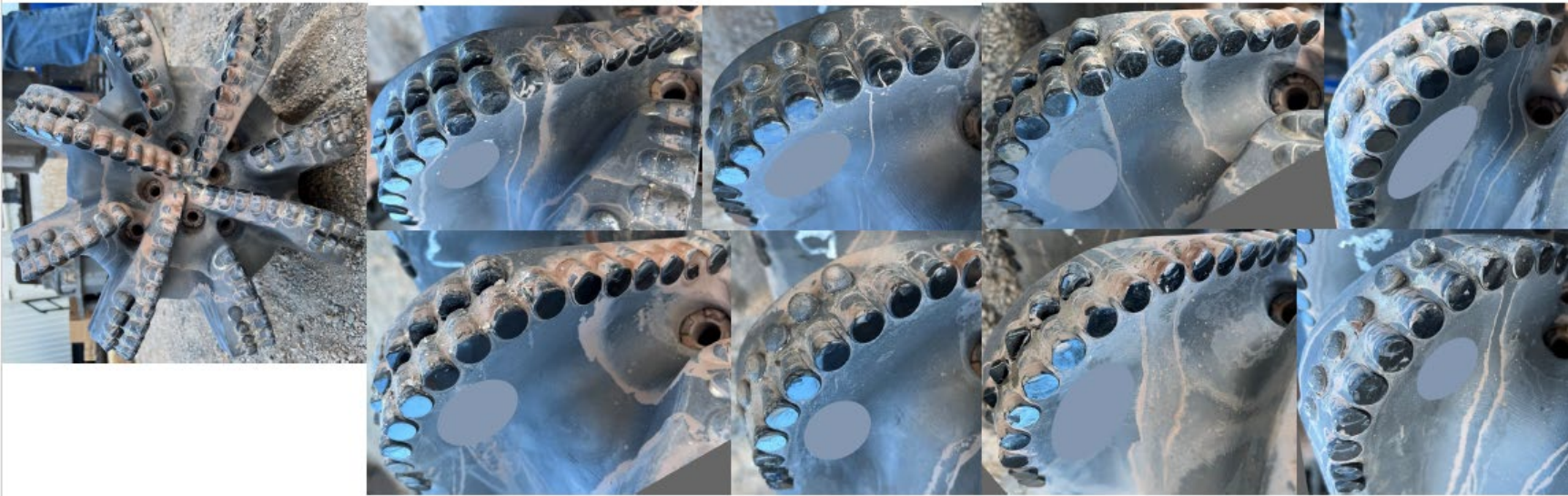
Solution: Cutter testing needs to be done to maintain cutter edge integrity.

Drilling with water improves MSE depending on economic feasibility. Need to run earlier in bit run to see if it has a greater effect on a fresh bit.



Figure 27. BHA #4 [14.75” TKC83-A2 (A298775)]. This bit drilled 492 ft in 7.2 hours at an average rate of penetration of 68 ft/hr. Note - ReedHycalog refers to this as BHA #3 - it is in fact BHA #4. This was an NOV TKC83-A2 PDC bit.





Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Vertical	BHA #3	3	14.75	TKC83-A2	A298775	REEDHYCALOG	4353	4845	492	7.19	68

Lithology: Granite
Footage: 466'
ROP: 65 ft/hr
Median WOB: 82 klbs
Median Bit RPMs: 238

Gauge Cutter Speed: 920 ft/min
Total Distance Gauge Cutter: 74.8 miles
Nose Cutter Speed: 533 ft/min
Total Distance Nose Cutter: 43.4 miles

Figure 28. BHA #4 [14.75" TKC83-A2 (A298775)]. This is a compilation of dull photographs. Note - ReedHycalog refers to this as BHA #3 - it is in fact BHA #4. This was an NOV TKC83-A2 PDC bit.

**14.75" TKC83 Dull Photos
Face View**



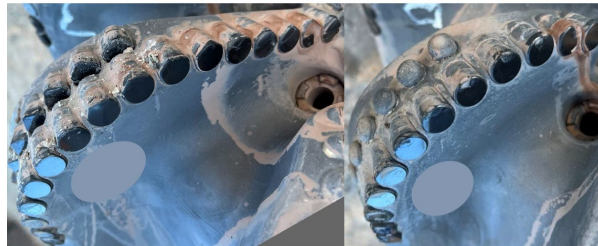
Blade 1 & 2



Blade 3 & 4



Blade 5 & 6

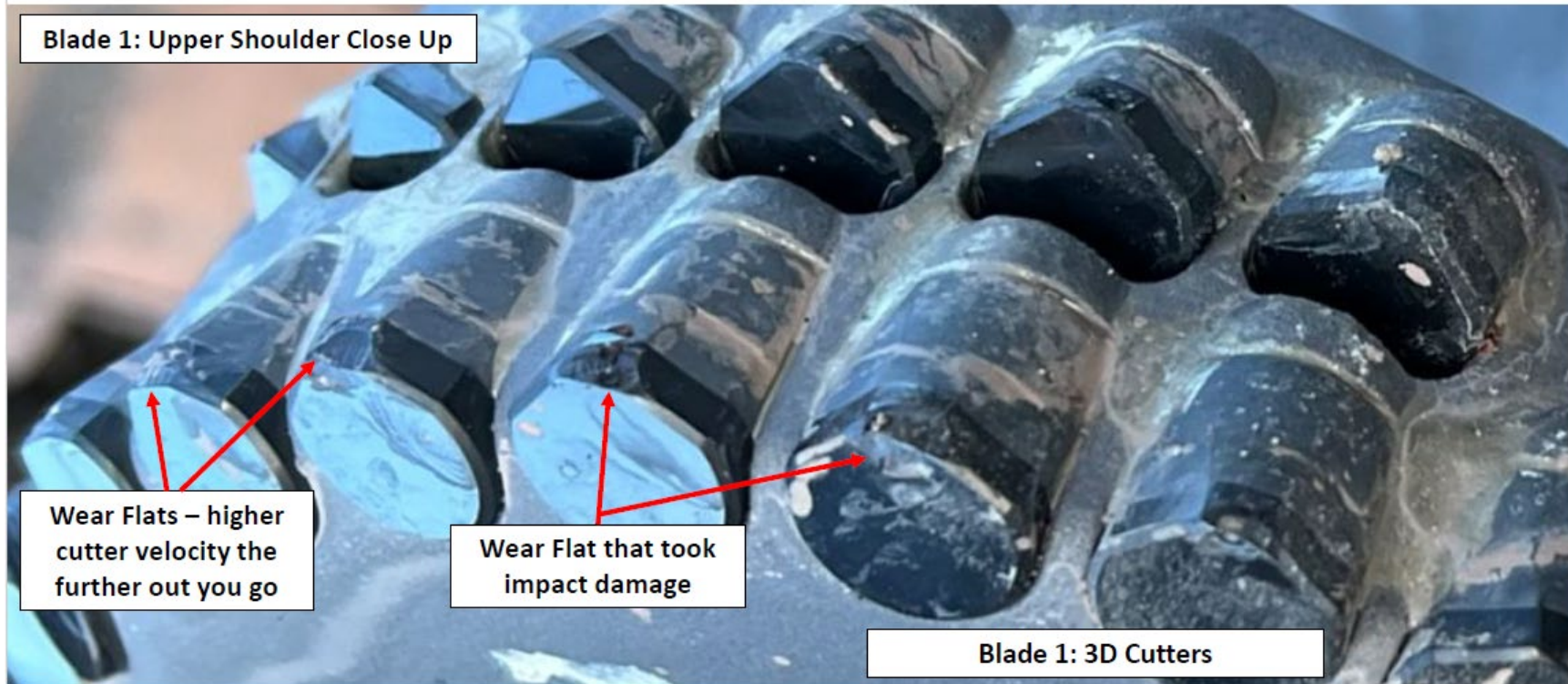


Blade 7 & 8



Figure 29. BHA #4 [14.75" TKC83-A2 (A298775)]. This is a compilation of dull photographs. Note - ReedHycalog refers to this as BHA #3 - it is in fact BHA #4. This was an NOV TKC83-A2 PDC bit.

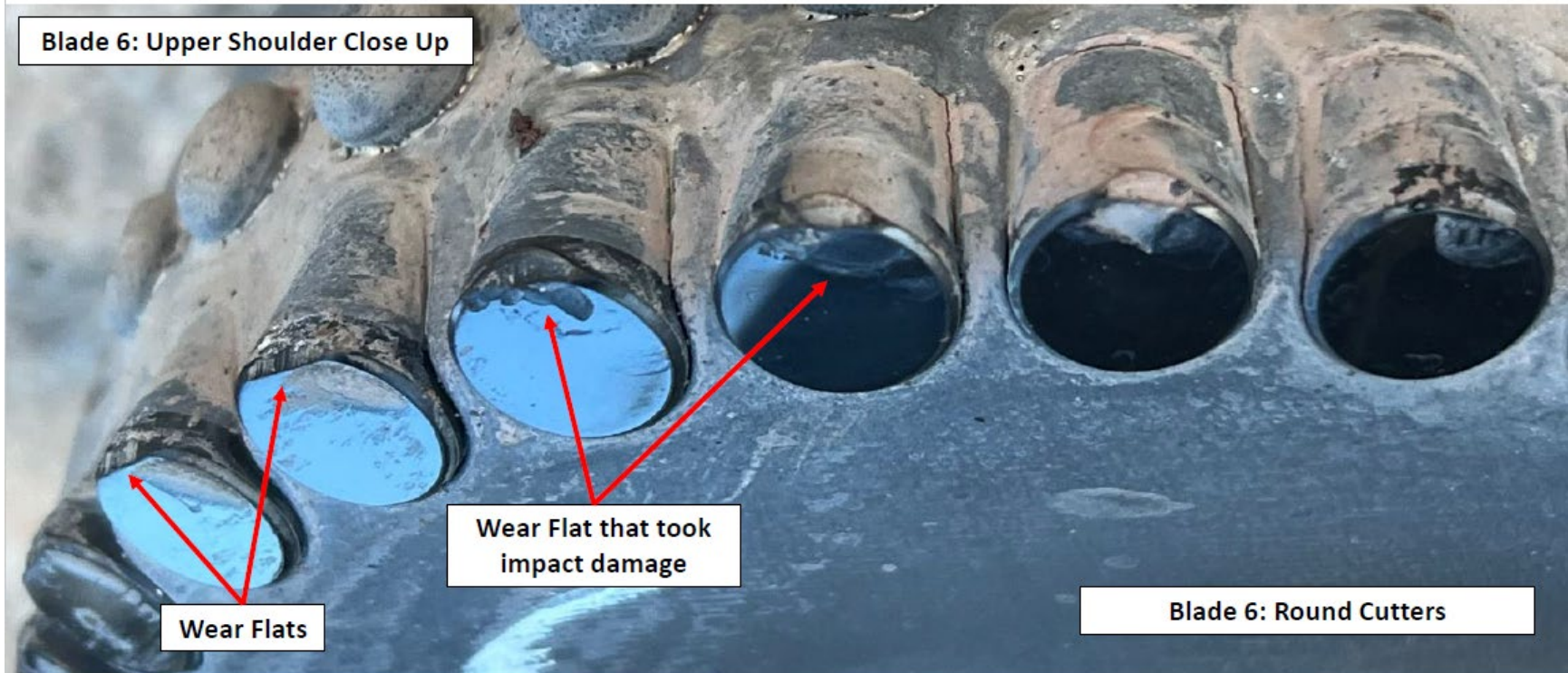
14.75" TKC83 Cutter Analysis



Notes: The main cause of wear for these cutters is abrasion (which in turn causes thermal wear). Abrasion from the formation heats the cutters, but the cutters further out developed a wear flat only. Some of the cutters took impact damage to the already created wear flat, causing diamond table flaking. We know this was late in the run due to the sharp edges on the diamond table.

Figure 30. BHA #4 [14.75" TKC83-A2 (A298775)]. This is a compilation of dull photographs. Note - ReedHycalog refers to this as BHA #3 - it is in fact BHA #4. This was an NOV TKC83-A2 PDC bit.

14.75" TKC83 Cutter Analysis



Notes: The main cause of wear for the cutters further out on the shoulder is abrasion (which in turn causes thermal wear). Abrasion from the formation heats the cutters, but these cutters survived the thermal wear put on them. The cutters on the nose took impact damage to the already created wear flat, causing spalling and beach marks. We know this was late in the run due to the sharp edges on the diamond table.

Figure 31. BHA #4 [14.75" TKC83-A2 (A298775)]. This is a compilation of dull photographs. Note - ReedHycalog refers to this as BHA #3 - it is in fact BHA #4. This was an NOV TKC83-A2 PDC bit.

VI.4 14-3/4-inch Drilling Fluids

Typical mud was 8.80 ppg (April 28, 2024) with a viscosity of 40 seconds and a yield point of 12, and a solids content of 3.5%.

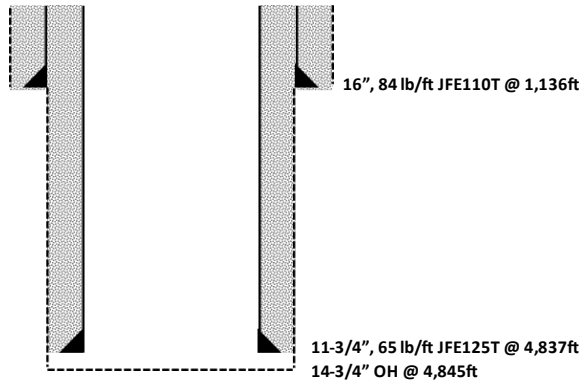
VI.5 11-3/4-inch Casing and Cementing

Figure 32 shows the logistics for the intermediate cementing. Figure 33 is a record of the parameters during the cementing. Figure 34 documents the pressure match (simulated and actual). Figure 35 shows the cementing records for two top out jobs performed (not enough cement on location for only one) that were pumped following cement fallback (Figure 36).

The chronology of cementing the intermediate casing was as follows.

- Good pressure test of treating lines and equipment.
- More than 95% of both the MUDPUSH Express Spacer and the cement slurry were pumped within 0.2 ppg of designed density.
- Pressurized mud balance confirmed mixing density from cement pump.
- Good cement circulated to surface.
- Full circulation was maintained during the treatment.
- Actual displacement pressure (lift pressure) was following the trend of the job design simulation until most of the way through the displacement when there is indication that some slight losses may have been starting to occur.
- Top plug was bumped at the expected displacement volume.
- Pressure was bled off and the floats held.
- Cement top in the annulus fell back after job was completed.
- After WOC it was determined that the TOC in the annulus was at ~578 ft.
- There was top out cement (surface casing cement system) on location but not enough to fill 578 ft of annular volume.
- It was decided to pump the volume of cement on location and ordered additional cement (Class G neat) to be delivered to location.
- Pumped top out job #1 at the designed density. Pumped volume to fill annulus up to ~153 ft. Wait on additional cement to arrive on location.
- Additional cement arrived on location. Pumped top out job #2 at the designed density and got good cement to surface. Shut down and WOC. Cement level in the annulus remained at surface.

Well 16B(78)-32 Intermediate Casing Cement Job



Cement Slurry: 65:35 G:Poz + 29.4% D066 BWOB + 0.5% D160A BWOB + 3% D020 BWOB + 1% D079 BWOB + 1.1% D800 BWOB + 0.1% D167A BWOB + 0.02 gal/sk D047

Density	14.0 ppg	
Yield	1.70 cu ft/sk	
Mix-water	7.729 gal/sk	
SVF	37.95%	
TT	5:39 hr:min	70 Bc at 161°F
FL	140 mL	30 min at 161°F
FW	0%	161°F
CS	1,016 psi	24 hrs at 285°F
	500 psi	04:48 hr:min at 285°F

Calculated cement volumes

Shoe track =	9.9 bbl
11-3/4" casing in 14-3/4" OH (w/ 100% excess)	571.6 bbl
11-3/4" casing in 16", 84 lb/ft surface casing	96.3 bbl

Total Cement Volume = 677.8 bbl

Displacement Volume = 526.3 bbl

Water Volume to mix cement = 411.9 bbl (2,238 sks)

Figure 32. Specifications for the intermediate cementing.

Well 16B(78)-32 Intermediate Casing Cement Job Execution Data

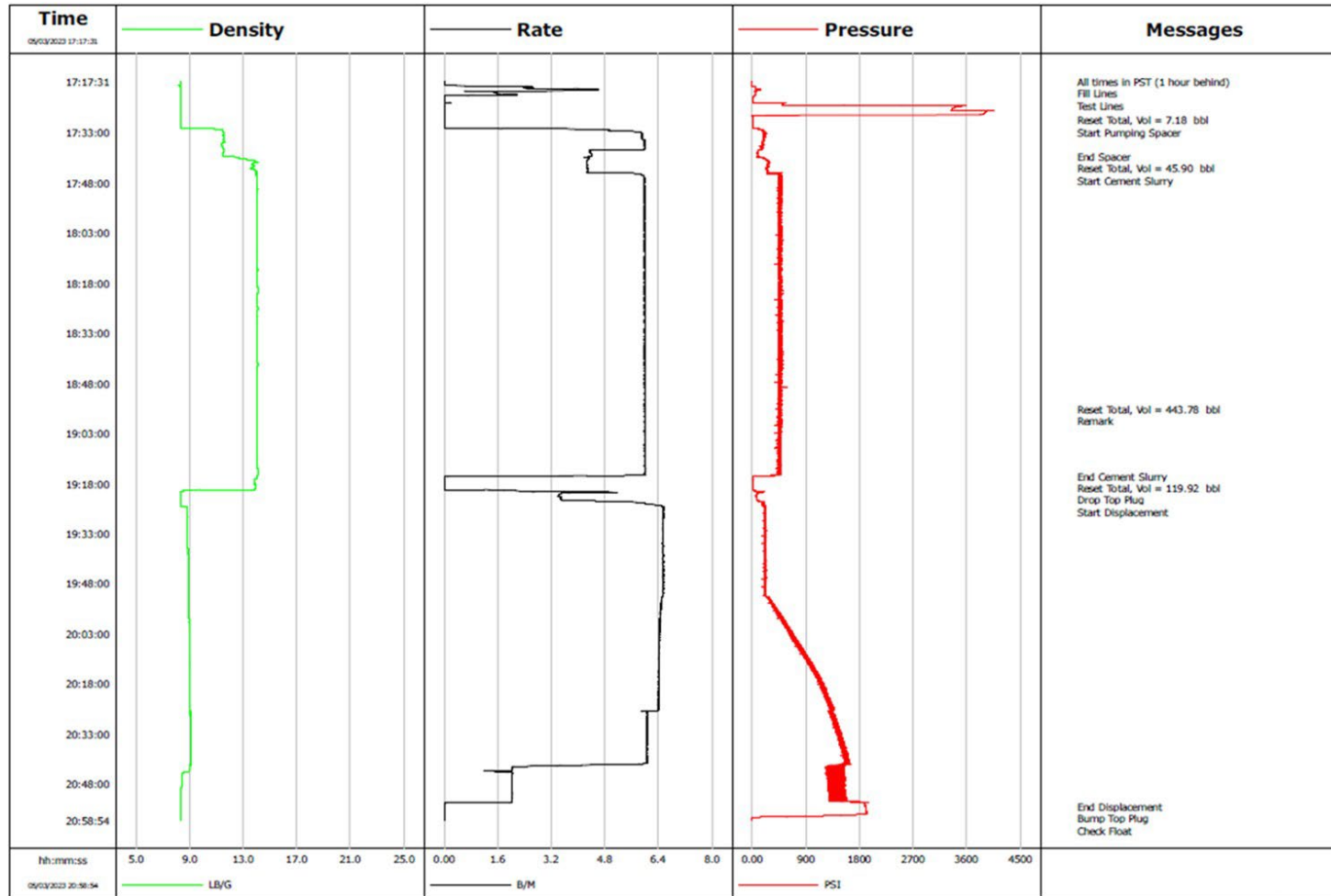


Figure 33. Density, rate, and pressure recording during the intermediate cementing.

Well 16B(78)-32 Intermediate Casing Cement Job Execution Pressure Match

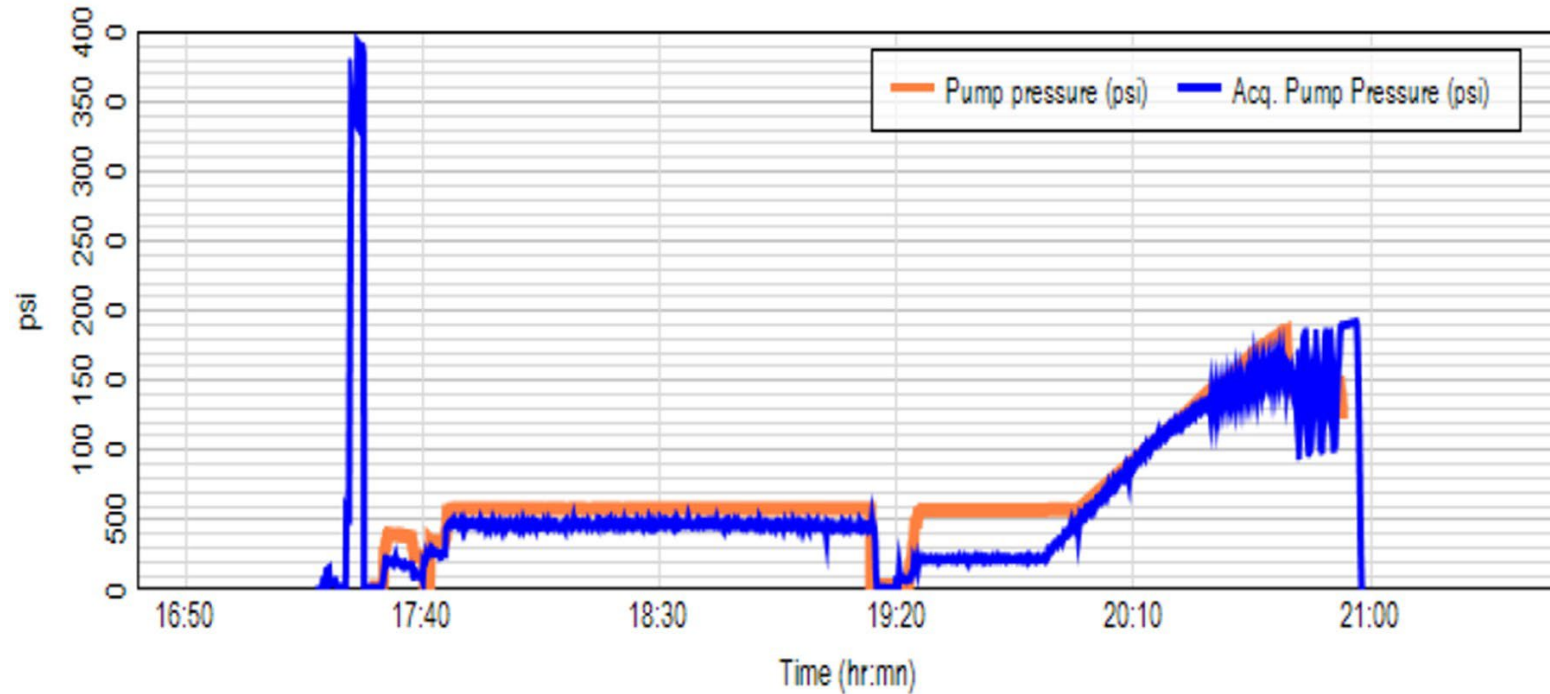
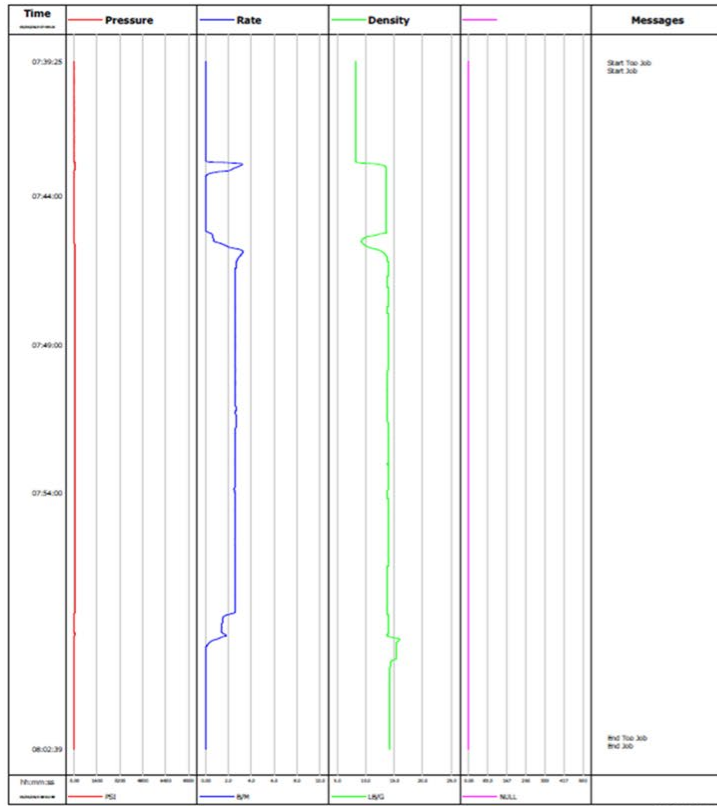


Figure 34. Simulated and actual pumping pressures during the intermediate cementing.

Well 16B(78)-32 Intermediate Casing Top Out Job #1 Execution Data



Well 16B(78)-32 Intermediate Casing Top Out Job #2 Execution Data

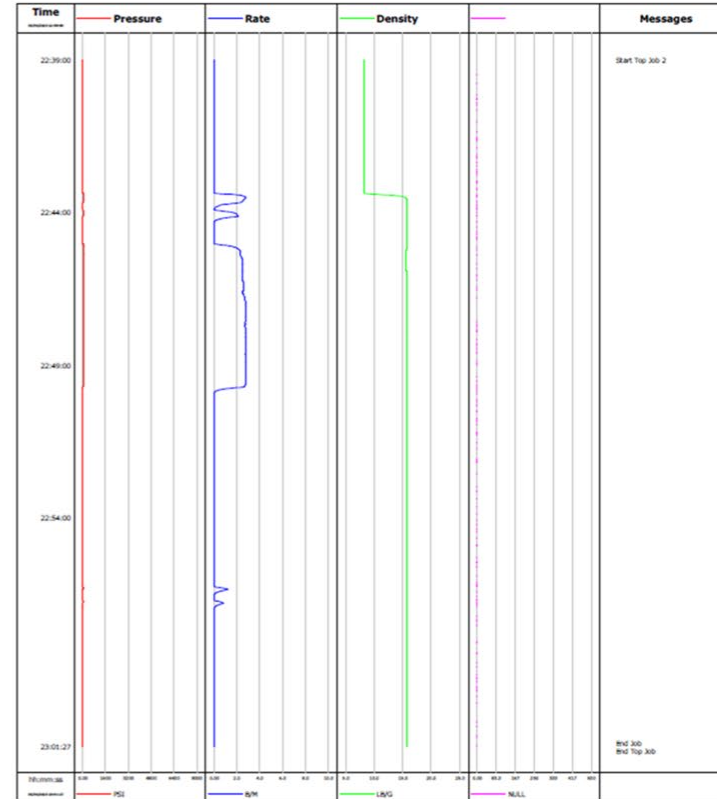


Figure 35. Records for the two top jobs performed after primary cementing.

Well 16B(78)-32 Intermediate Casing Top Out Jobs – Cement Placement Details

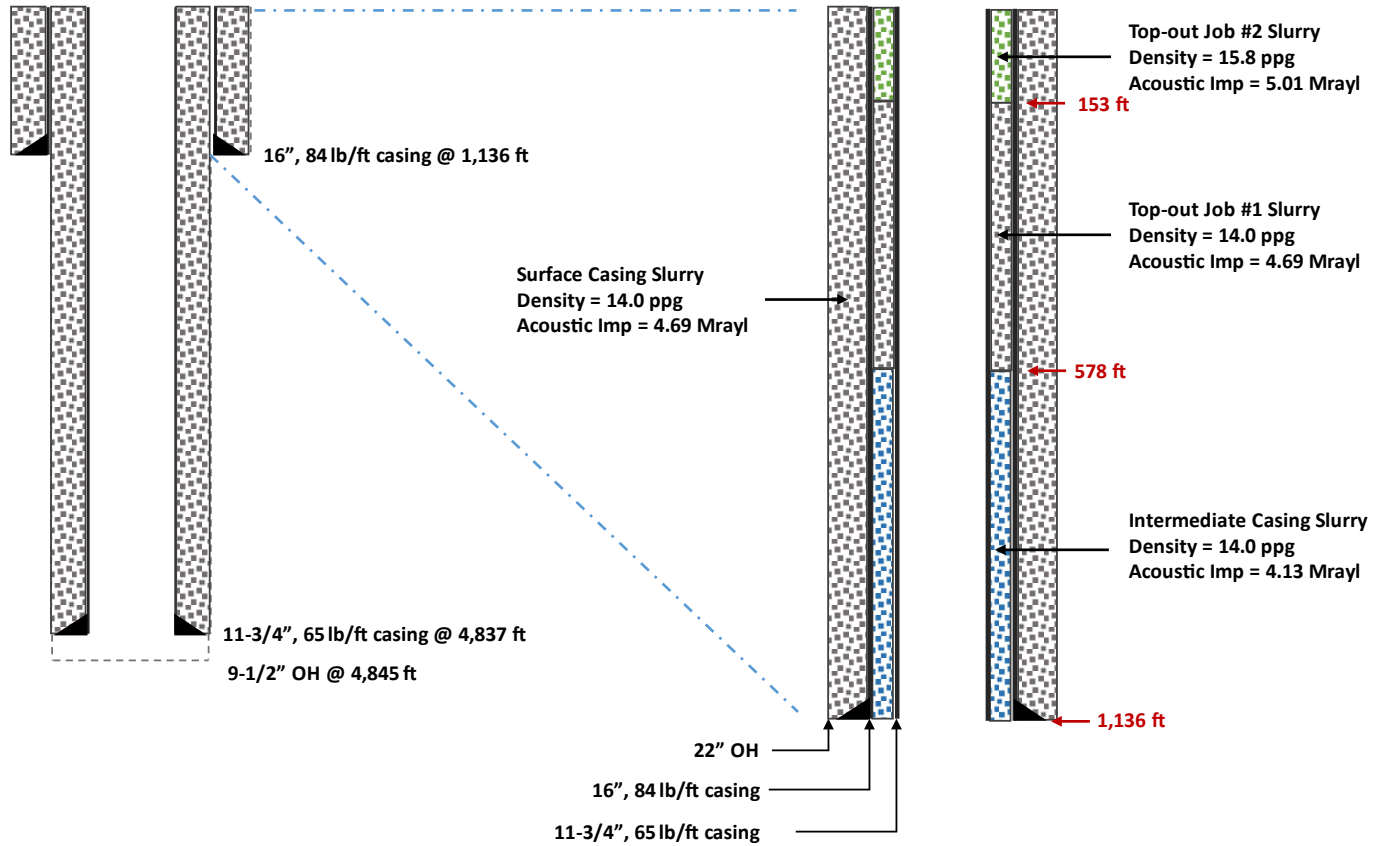


Figure 36. TOC

9-1/2-inch Hole and 8-3/4-inch Coring Runs 1, 2 to 4,878 ft

VII.1 Objectives

Drill out the intermediate shoe with a roller cone bit, drill ahead a short distance and perform an FIT. Core with two separate runs (30 ft barrels for each run).

VII.2 Summary

Report Date	Activities
May 8, 2023	Install new seals on blind rams. Drill out cement and 10 feet of new hole (to 4,855 ft) with TCI bit. FIT to 9.8 ppg and drop gyro.
May 9, 2023	Log open hole and casing from 4,845 to surface with continuous Borehole Temperature, Gamma, PFlex Cement Evaluation, Isolation Scanner, and Array Sonic. Core from 4,855 ft to 4,871 ft MD (8-3/4-inch bit). Cored 16.5' of core and recovered 15.1'.
May 10, 2023	Core from 4,871 ft to 4,878 ft. ROP dropped to less than 1 ft/hr and recovered to surface (7 feet recovered, of which 2 feet were rubblized).

VII.3 9-1/2-inch Bit Program, BHAs, and Performance

This includes coring activities for the vertical section and logging activities for the intermediate section.

Run 1: 4,855 to 4,871 ft MD (BHA 6)

Recovered core from Run 1 (May 9, 2023) is shown in Figure 37. The bit, before and after the run is shown in Figures 38 and 39, respectively, and the BHA is described in Figure 40.

Run 2: 4,871 to 4,878 ft MD (BHA 7)

Figure 41 shows the EDR for this bit run. Figures 42 and 43 show the bit post-run. The BHA is shown in Figure 44. There are bit sensors (Appendix F).

Core Run #2

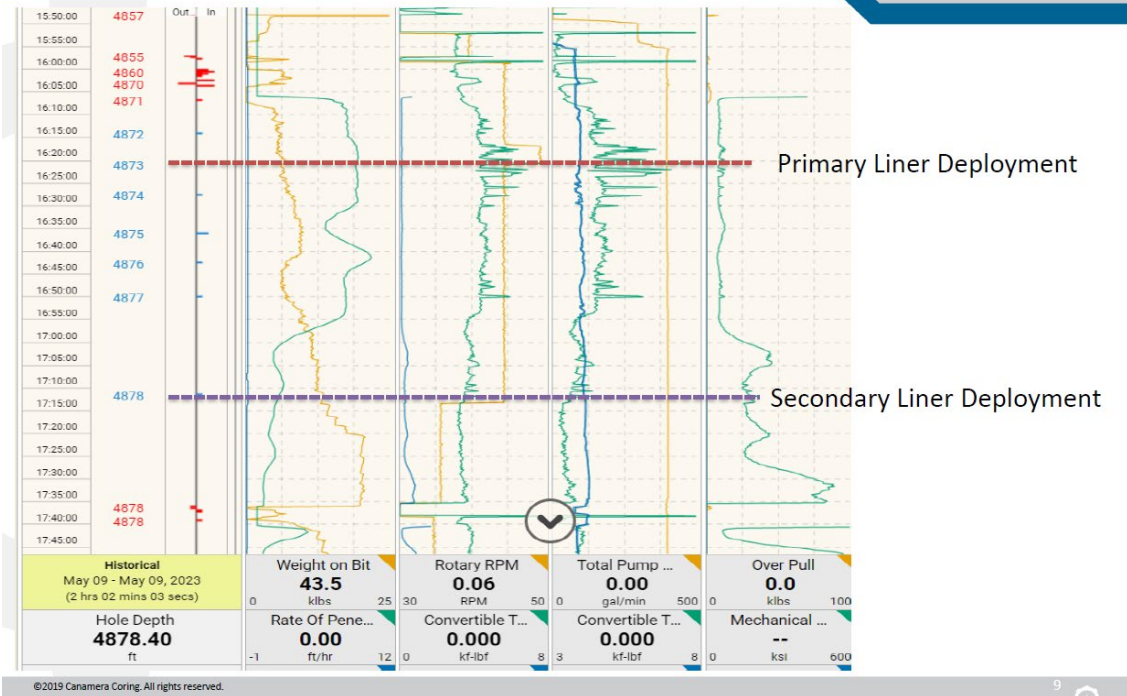


Figure 41. EDR record for coring Run 2, showing two antijamming deployments.

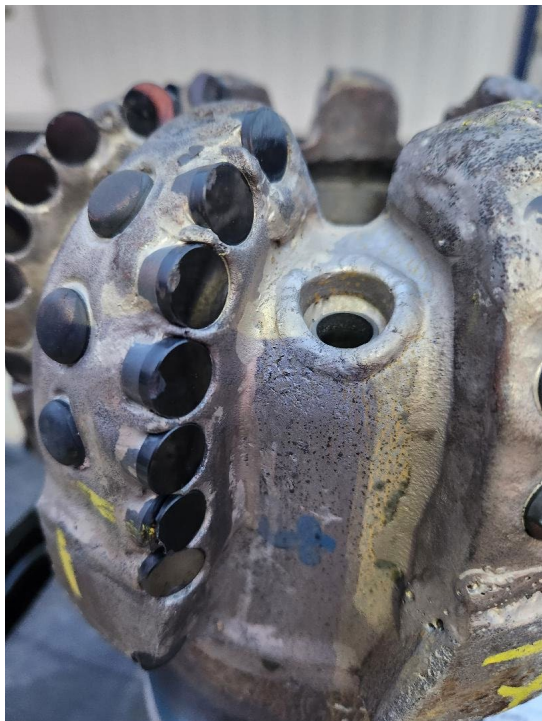
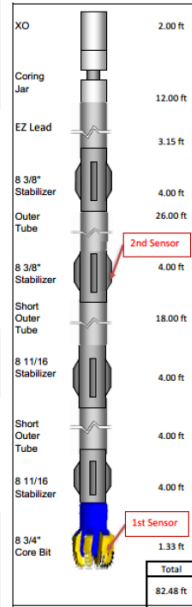


Figure 42. Partial view of bit, post-run.



Figure 43. Top view of bit, post-run.



Item	Component	Vendor	OD	ID	Top Connection	Length	Cum Length	Remarks
1	Core Bit	Canamera	8.75 in	4.00 in	6.480 HT	1.33 ft	1.33 ft	
2	8 11/16 Stabilizer	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	5.33 ft	
3	Short Outer Tube	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	9.33 ft	
4	8 11/16 Stabilizer	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	13.33 ft	
5	Short Outer Tube	Canamera	8.38 in	5.75 in	6.480 HT	18.00 ft	31.33 ft	2F-3R Ported Flapper Float 75 klbs Latch Up Only
6	8 3/8 Stabilizer	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	35.33 ft	
7	Outer Tube	Canamera	8.38 in	5.75 in	6.480 HT	26.00 ft	61.33 ft	
8	8 3/8 Stabilizer	Canamera	8.38 in	5.75 in	6.480 HT	4.00 ft	65.33 ft	
9	EZ Lead	Canamera	7.00 in	2.50 in	4 1/2 IF	3.15 ft	68.48 ft	
10	Jar	Canamera	6.88 in	2.25 in	4 1/2 IF	12.00 ft	80.48 ft	
11	XO					2.00 ft	82.48 ft	
CORING BHA:							82.48 ft	

Figure 44. BHA 7 for core run 2.

Particle Drilling

VIII.1 Drilling Objectives

Evaluate particle drilling in a granitic reservoir.

VIII.2 Summary

Table 3 is a summary of activity while particle drilling.

Table 3. Particle Drilling

Report Date	Activities
May 10, 2023	Reamed cored section of the hole from 4,855 to 4,878 ft MD with the Particle Drilling assembly. Particle drill 9-1/2-inch hole from 4,878 to 4,910 ft. ROP started to slow (from 30 to 40 ft/hr) to 5 ft/hr at ~4,900 ft. BHA 8
May 11, 2023	Particle drill with a new bit from 4,910 to 4,978 ft MD. Pump viscous sweeps to circulate out particles.

VIII.3 14-3/4-inch Bit Program, BHAs, and Performance

Figures 45 through 51 document the particle drilling pilot.

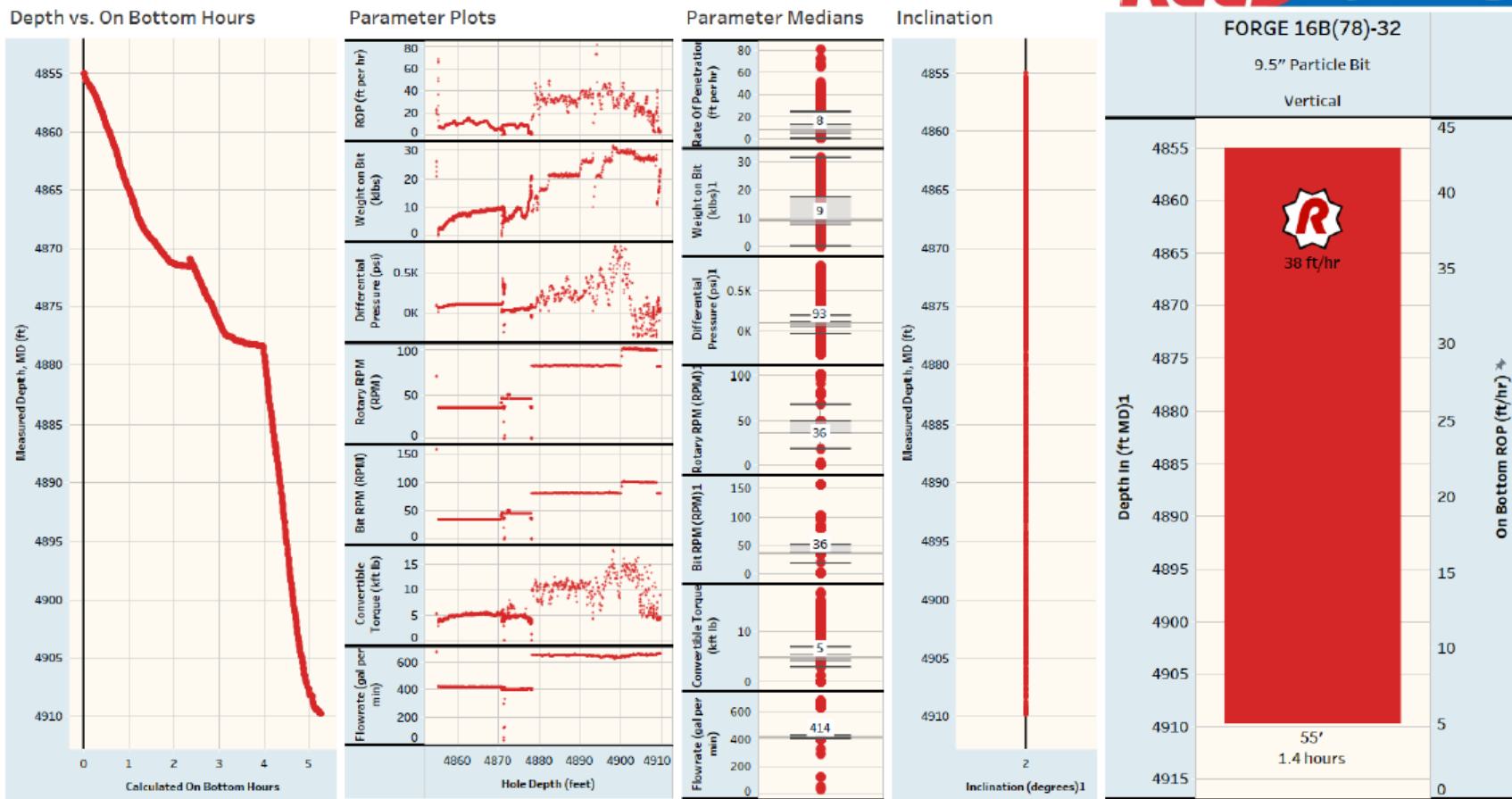
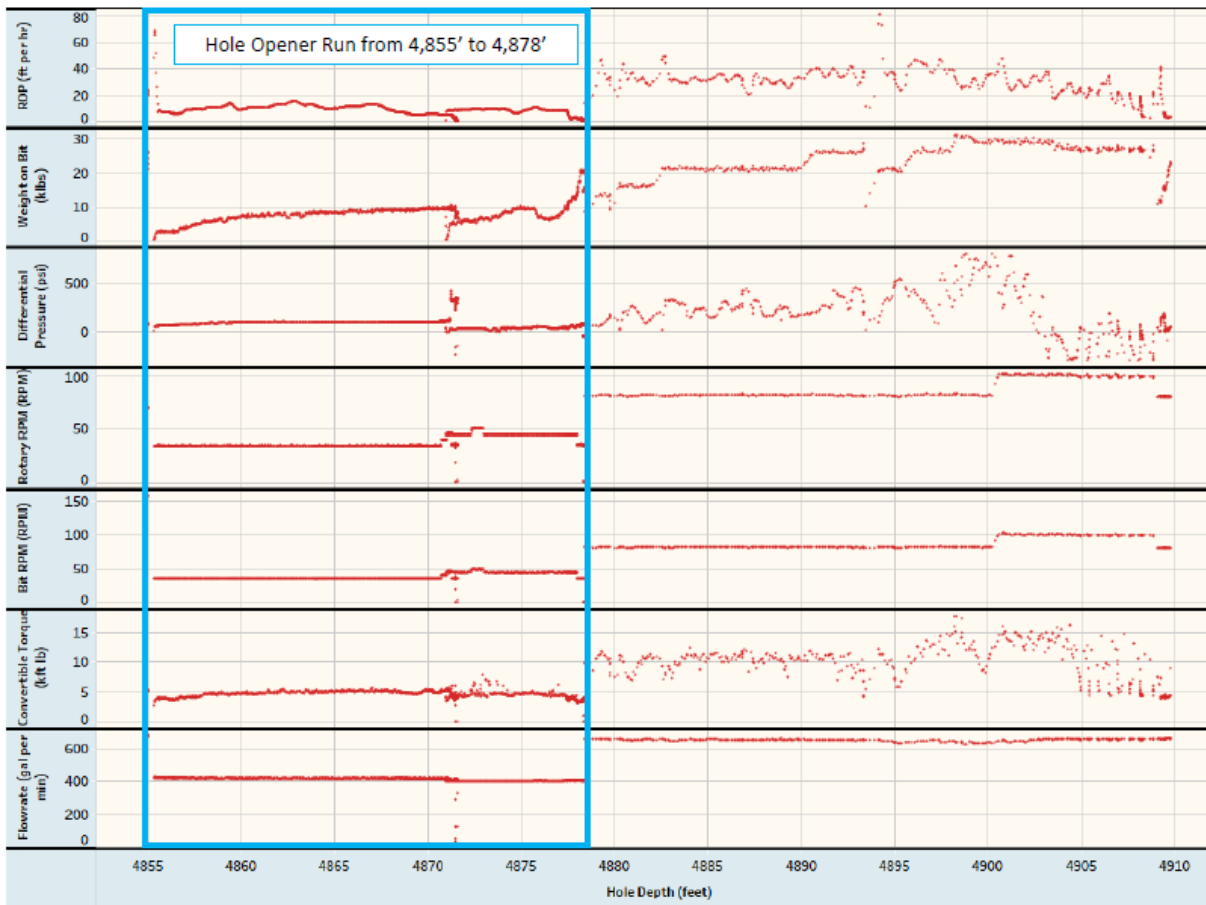


Figure 45. This is the record for the first particle drilling run, first reaming out after a coring run, and then drilling ahead. This will be officially designated as BHA 8.



Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 9.5-3-(Particle Bit)-REEDHYCALOG-FORGE 16B

ROP Limiter: When the bit is cutting rock, it is increasing in MSE (losing efficiency). Strong correlation between lower ROP when the reamer is doing work and the higher ROP when the particles are doing the work (notice the cyclical wave structure of the ROP curve).

The cutting structure could have been damaged in the reaming section of the hole (opened an 8.75" hole to 9.5" from MD 4855 to 4878).

Solution: It was decided to test a fresh bit after this run to make sure the bit was not damaged in reaming and test the concept again.



Figure 46. Performance of BHA 8 (Particle Bit Run 1).

9.5" Particle Drilling Run (A298243) Dull Photos

First Particle Drilling Run



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Vertical	Not Marked	1	9.50	Particle Bit	A298243	REEDHYCALOG	4855	4910	55	1.44	38

Figure 47. Performance of BHA 8 (Particle Bit Run 1). Bit photographs before and after.

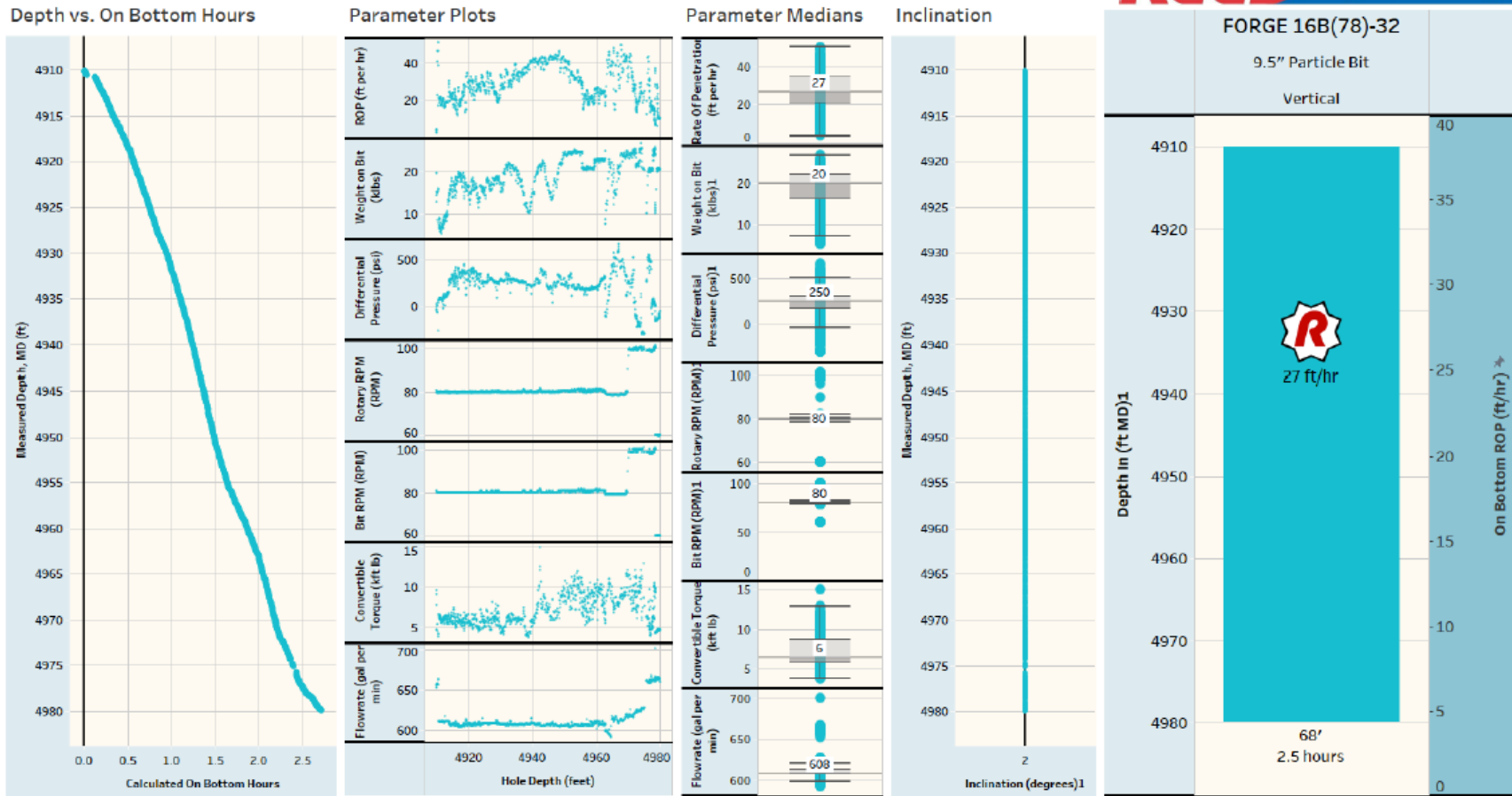


Figure 48. Performance of BHA #9 (Particle Bit Run 2) - [9.5" E1451 (A298244)].

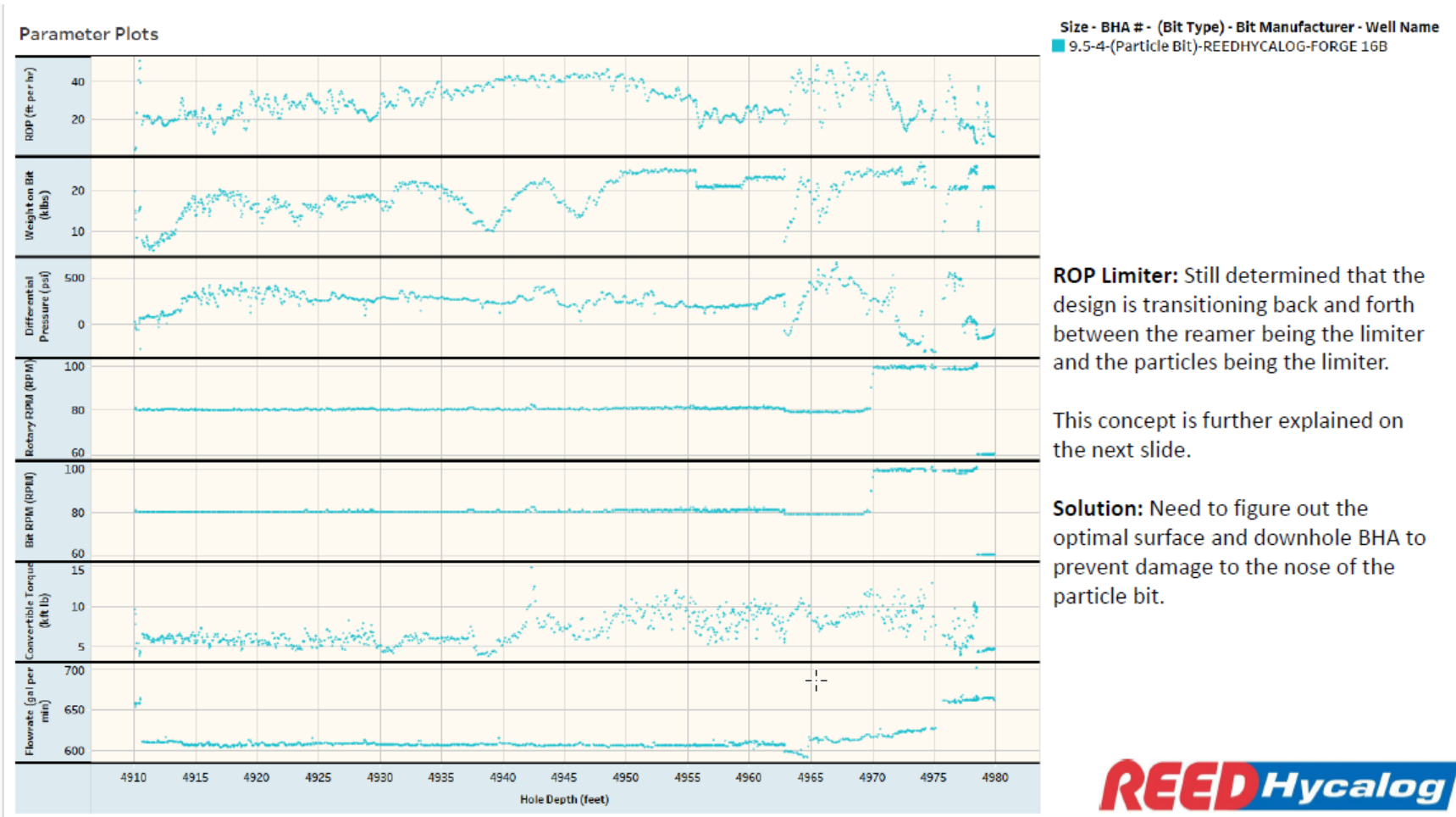


Figure 49. Performance of BHA #9 (Particle Bit Run 2) - [9.5" E1451 (A298244)].

9.5" Particle Drilling Run (A298244) Dull Photos

Second Particle Drilling Run



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Vertical	Not Marked	2	9.50	Particle Bit	A298244	REEDHYCLOG	4910	4978	68	2.5	27

Figure 50. Performance of BHA #9 (Particle Bit Run 2) - [9.5" E1451 (A298244)]. Post-run bit photographs.

9.5" Particle Drilling Run (A298243) EDR Analysis

Evaluation of the combined mechanical (reamer) and impingement work will be complicated but may yield useful insights into design or practices. Work is cycling between the reamer and impediment about every 6". May need an equivalent of MSE to surveil the impingement work.

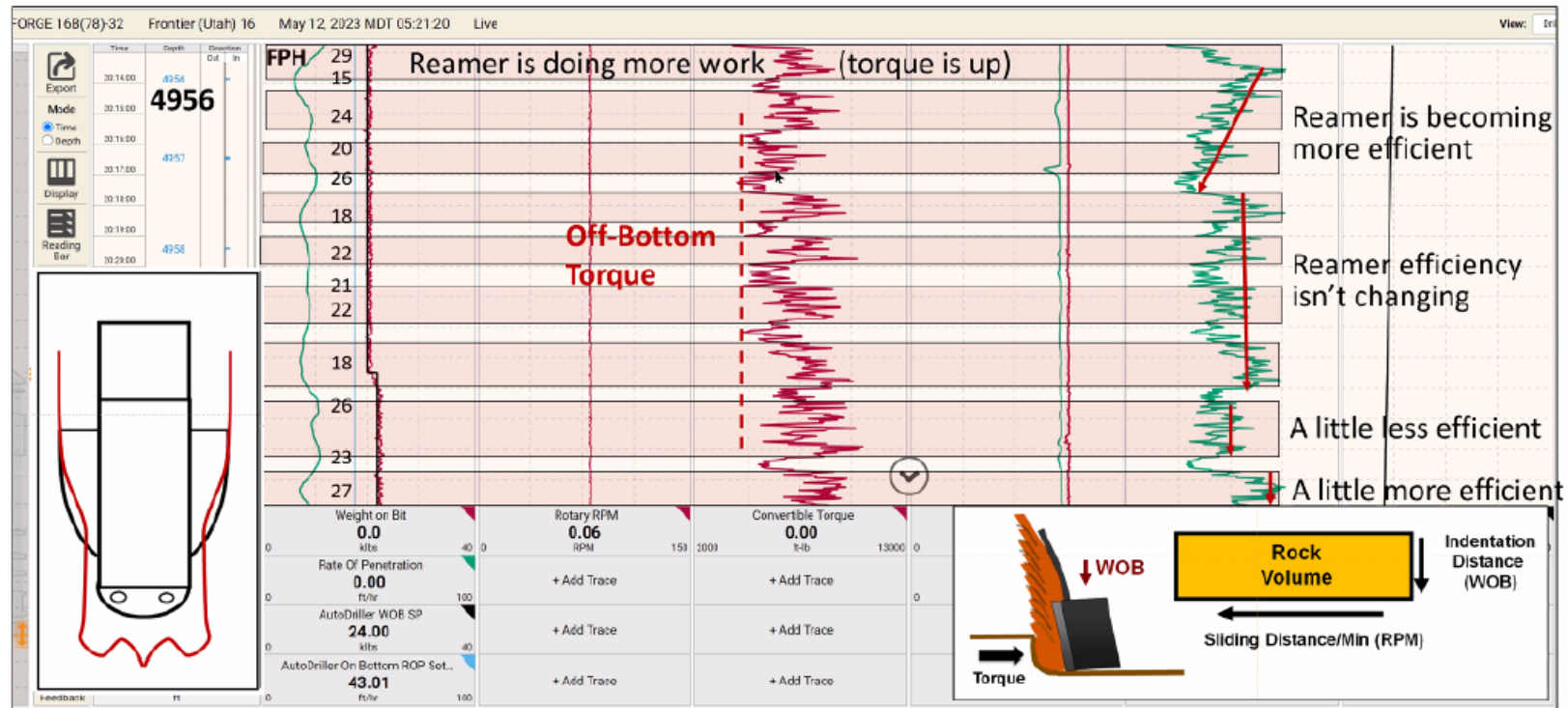


Figure 51. Performance of BHA 9 (Particle Bit Run 2) - [9.5" E1451 (A298244)]. Schematic of preliminary considerations for bit performance.

RSS Drilling

IX.1 Drilling Objectives

Evaluate a rotary steerable system in a granitic reservoir. The basis is the profile of the hole that was encountered while drilling the sister well (16A(78)-32).

IX.2 Summary

Table 4 is the summary of activity while drilling with a rotary steerable system (RSS). BHAs are shown in figures that follow and in Appendix E).

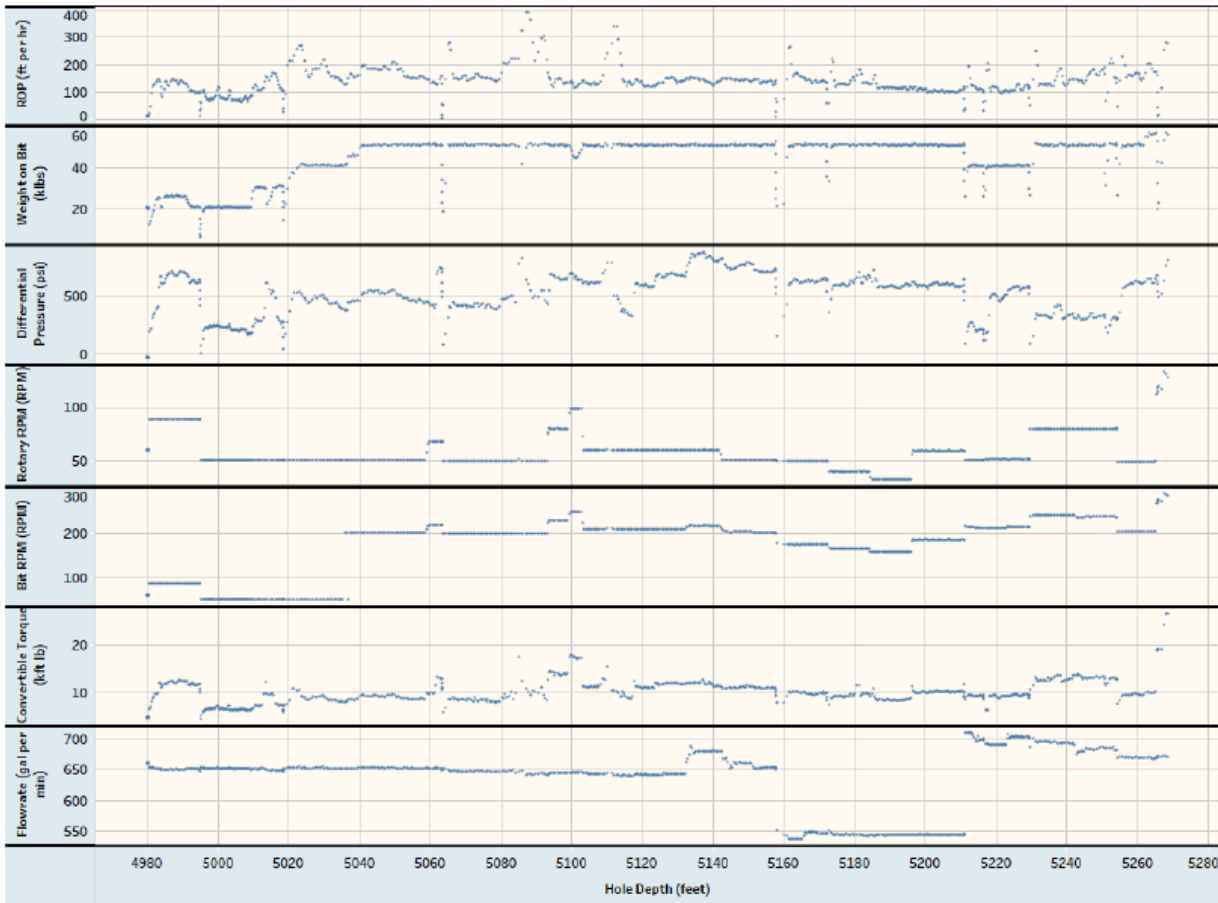
Table 4. RSS Drilling

Report Date	Activities
May 11, 2023	Drill and ream to 4,980 ft with a tricone bit. This is BHA #10 although it is a re-run of Bit 5. Clean to bottom and circulate out all Particle Drilling 2 mm steel shot plus 2 ft of new hole.
May 13, 2023	Stage in the hole with a 9-1/2-inch bit with a Sanvean sensor and the Halo directional assembly. Drill from 4,980 to 5,269 ft MD. Directional tools failed at this depth. This is BHA #11.
May 13-15, 2023	This was a re-run of BHA #12. Stage in the hole with a Sanvean sensor and the Halo assembly with no mud motor and without the RIPstick. Drill from 5,269 to 5,480 ft MD. At 5,480 ft MD, start the build ~100 ft early because of vibrations. Drill ahead to 5,537 ft MD. Drill ahead (still on build) to 5,957 ft MD.
May 16, 2023	Drill from 5,957 to 6,545 with the Halo directional assembly and no mud motor or RIPstick. POOH and run the RSS assembly (new 9-1/2-inch bit, other components, and RSS). This will be designated as BHA #13.
May 17, 2023	There were failed dropped gyro runs. On May 17, 2023, drilled from 6,545 ft MD to 6,610 ft MD and pulsar failed. This was BHA #14.
May 18, 2023	On May 17/18, ran back in the hole with a new bit and a new RSS assembly. On May 18, 2023, drill from 6,610 to 6,754 ft MD. This is designated as BHA #15. Troubleshoot encoder on top drive. Drill ahead from 6,754 to 6,773 and later to 6,777 and later to 6,950 ft MD while encoder was repaired.
May 19, 2023	Drop a gyro and log the hole on May 19, 2023, with an FMI and UBI.
May 20, 2023	Trip in the hole with a 9-1/2-inch stiff Halo assembly (BHA #16). Drill ahead from 6,950 to 7,584 ft MD. Trip out of the hole for a 1° motor.

IX.3 14-3/4-inch Bit Program, BHAs, and Performance (with RSS)

Figures 52 through 116 document bit performance and drilling with an RSS.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 9.5-BHA #4-(TKC73-A2)-REEDHYCALOG-FORGE 16B
 ROP Limiter: Bit followed Particle Drilling BHA.

Pulled for DTF. High lateral vibrations were seen from MWD tool. This limited Rotary RPM's for majority of the run.

Bit cored out due to center column of granite not being destroyed. This means we have a very smooth borehole but could be due to the RSS keeping the bit with minimal DogLegs.

Steel shot from Particle Drilling trial was still seen in the mud at a 5% concentration.

Solution: Bit modeling shows the core out occurring at a DOC higher than 7mm/rev. We can drill at the same ROP within this DOC range by increasing Bit RPM's or by setting an ROP limiter.

Potentially separate blades on the bit to remove formation column.



Figure 53. BHA #11 [9.5" TKC73-A2 (A298329)]. Compilation of drilling parameters in drilling from 4,980 to 5,269 ft. Note - ReedHycalog refers to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit.



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Vertical	BHA #4	3	9.50	TKC73-A2	A298329	REEDHYCALOG	4980	5269	289	2.264	128

Figure 54. BHA #11 [9.5” TKC73-A2 (A298329)]. Compilation of bit dull photographs after drilling from 4,980 to 5,269 ft. Note - ReedHycalog refers to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit. The BHA was pulled because of failure of the directional tools.

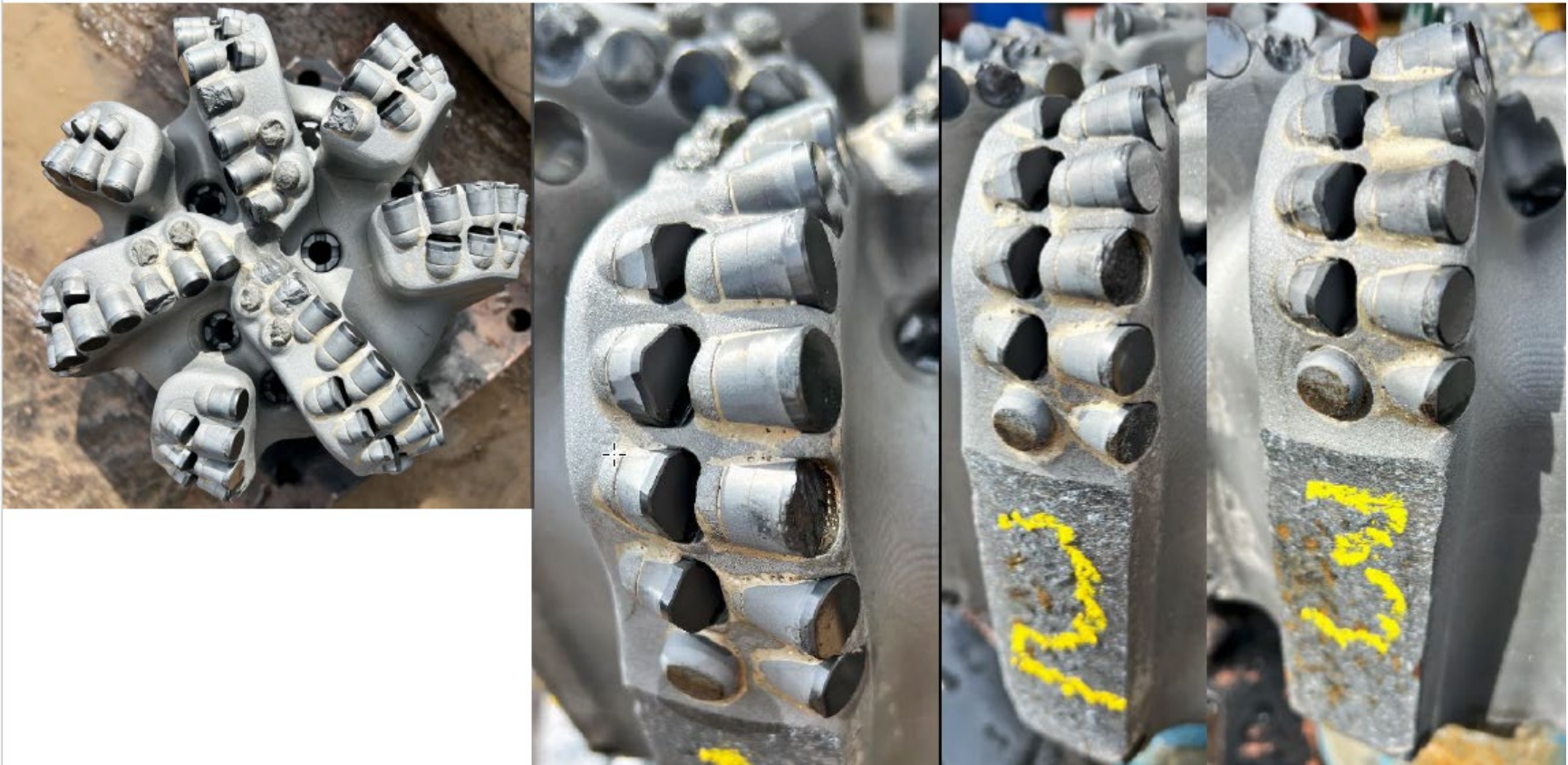


Figure 55. BHA #11 [9.5" TKC73-A2 (A298329)]. Compilation of bit dull photographs after drilling from 4,980 to 5,269 ft. Note - ReedHycalog refers to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit. The BHA was pulled because of failure of the directional tools.



Figure 56. BHA #11 [9.5" TKC73-A2 (A298329)]. Compilation of bit dull photographs after drilling from 4,980 to 5,269 ft. Note - ReedHycalog refers to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit. The BHA was pulled because of failure of the directional tools.

9.5" TKC73-A2 Dull Analysis

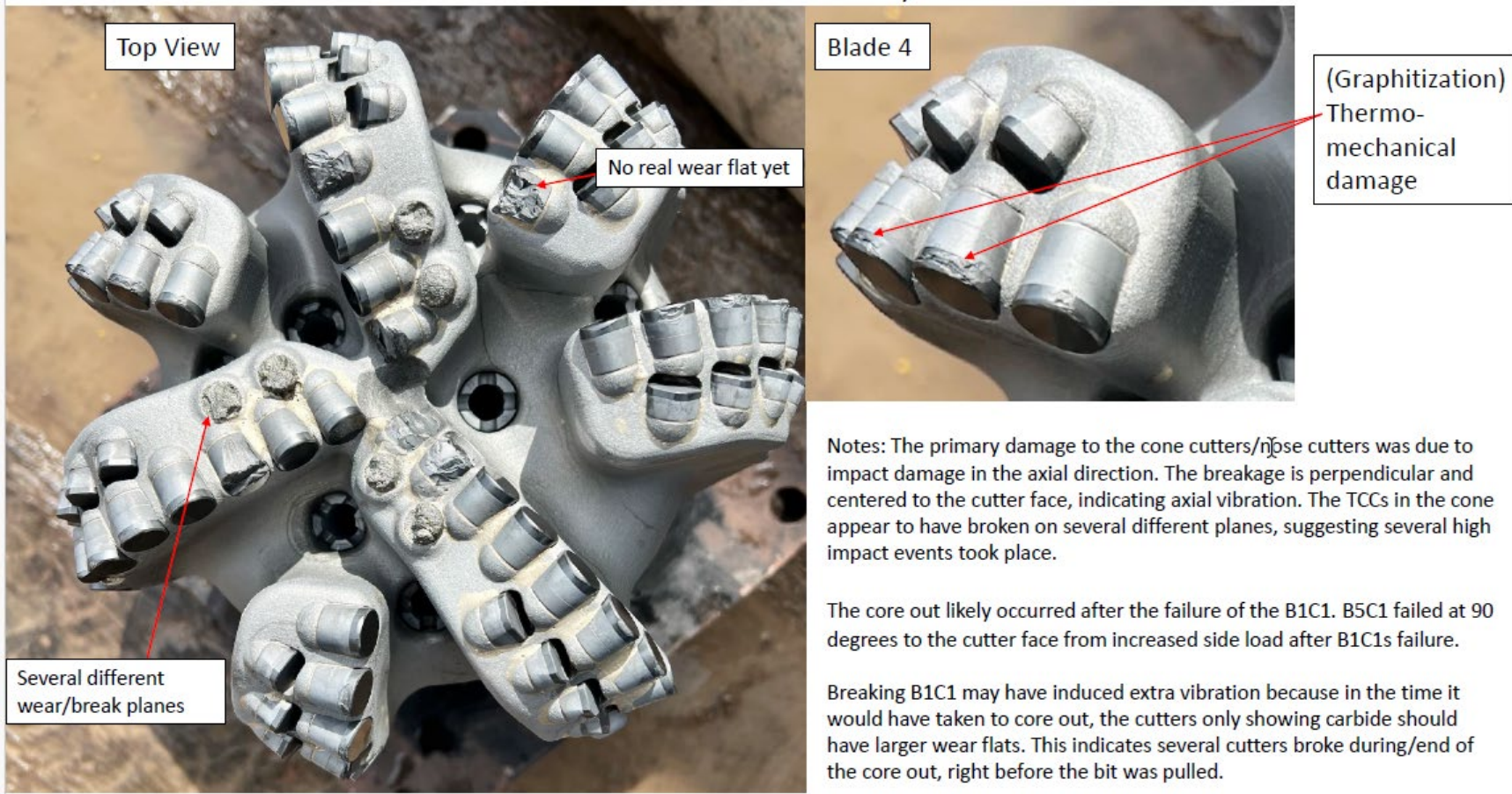
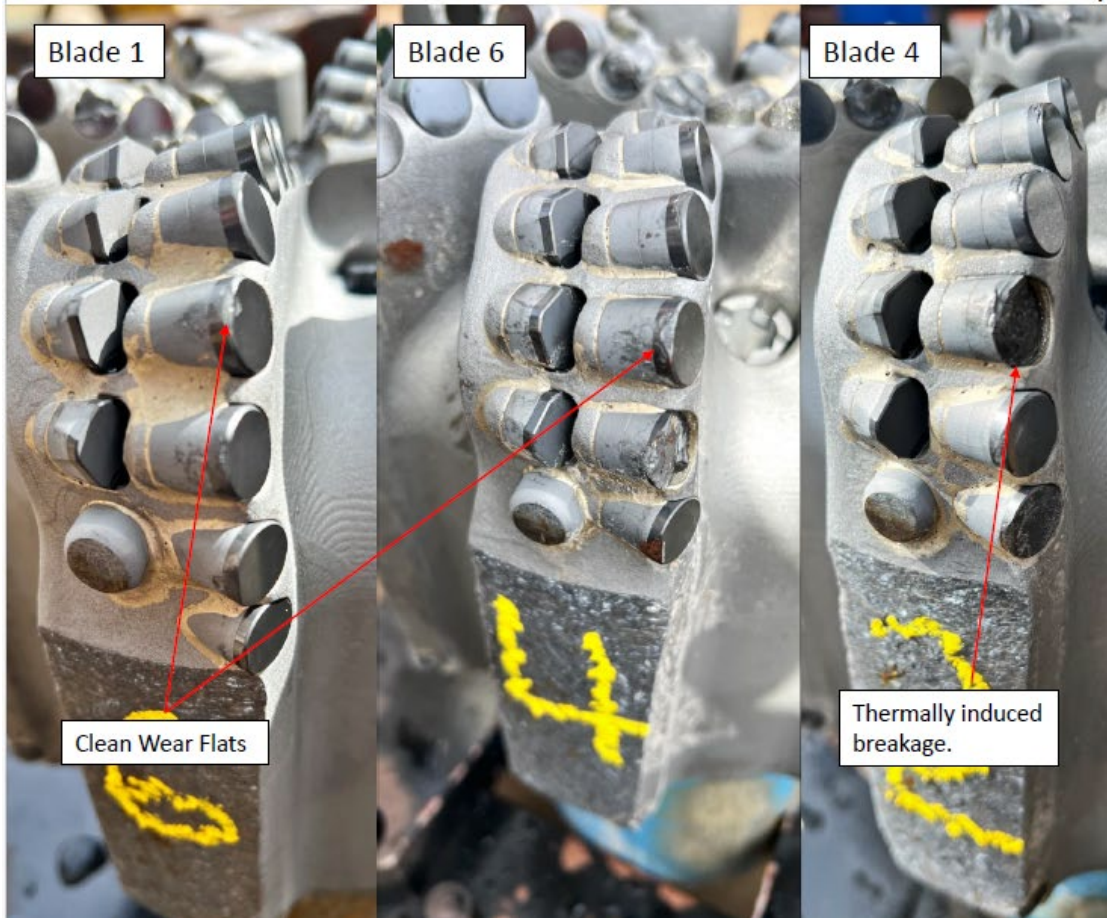


Figure 57. BHA #11 [9.5" TKC73-A2 (A298329)]. Compilation of bit dull photographs after drilling from 4,980 to 5,269 ft MD. Note - ReedHycalog refers to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit. The BHA was pulled because of failure of the directional tools.

9.5" TKC73-A2 Dull Analysis

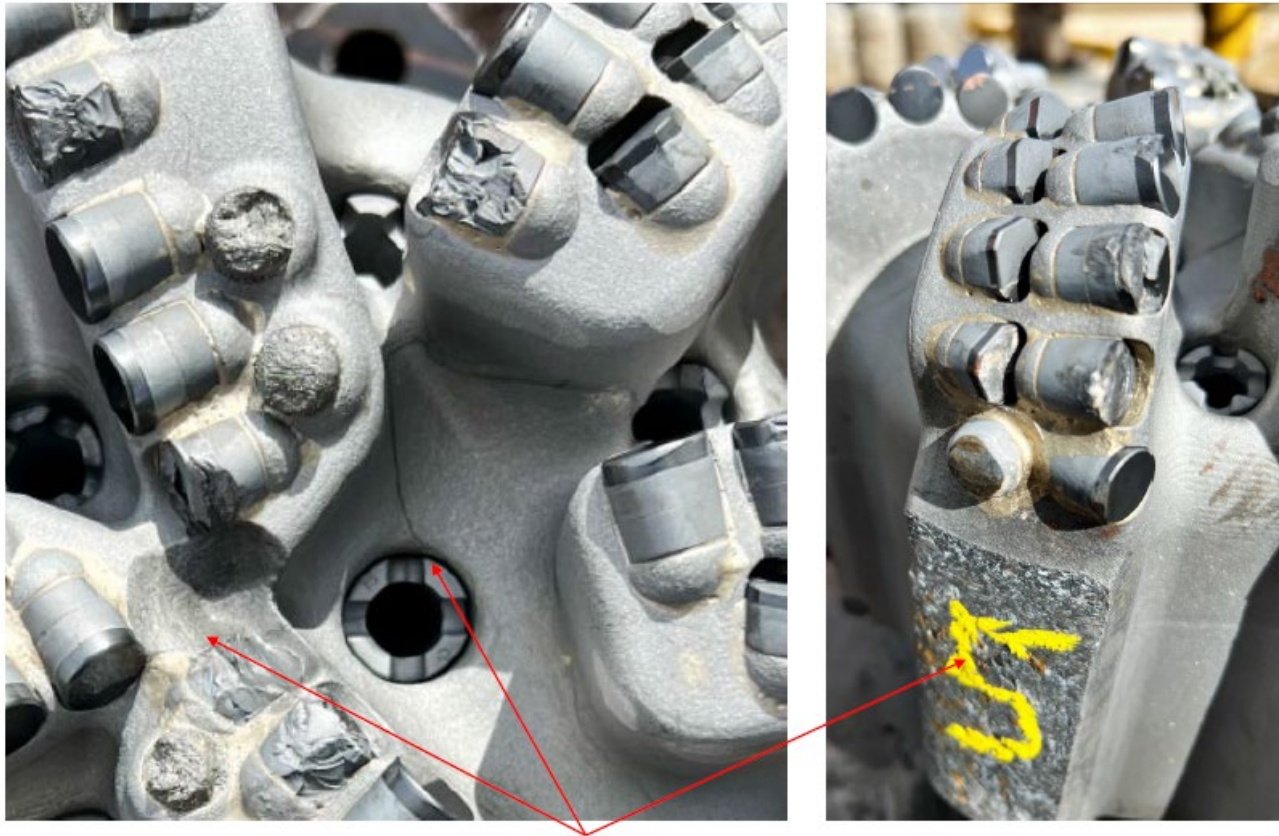


Notes: Most of the shoulder has smooth abrasive wear flats with some cutters showing an indication of impact damage. The back-up cutters look to have taken no damage, also indicating minimal whirl. The failed shoulder cutters were thermally mechanically broken.

The gauge pads and impact arrestors have much heavier wear than anticipated. Unsure to causes. Further BHA and EDR analysis required.

Figure 58. BHA #11 [9.5" TKC73-A2 (A298329)]. Compilation of bit dull photographs after drilling from 4,980 to 5,269 ft MD. Note - ReedHycalog refers to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit. The BHA was pulled because of failure of the directional tools.

9.5" TKC73-A2 Dull Analysis



DBR'd due to the Core Out, gauge pad damage, and the crack into 1 but possibly 2 nozzles. I

Figure 59. BHA #11 [9.5" TKC73-A2 (A298329)]. Compilation of bit dull photographs after drilling from 4,980 to 5,269 ft MD. Note - ReedHycalog refers to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit. The BHA was pulled because of failure of the directional tools.

Bottom Hole Assembly															
Job#	OP.039349			Rig	Frontier 16		BHA Length (Usft)		1354.08						
Operator	Utah Forge			BHA #	4		BHA Weight dry (klbs)		70.21						
Well	16B(78)-32 - 16B(78)-32			Bit #	4		BHA Weight Bouyed (klbs)		60.67						
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00		Wt. Below Jars dry (klbs)		70.21						
Date In				Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (klbs)		60.67						
Date Out				Drilled(Usft)	0.00		Drilling / Circ Hours		0.00 / 0.00						
Sensor Offsets															
Survey Offset				N/A		Gamma Offset				N/A		Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	A298329	9 1/2" 7 Blade PDC bit	6.375	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.13	1.13		
2	76000781	HALO RSS w/HFTO	6.750	2.000	0.000	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.38	36.51		
3	ASM 9006	Spiral wrapped IB Stabilizer	6.500	2.813	6.500	2.40	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.62	42.13		
4	125-573	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.22	51.35		
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	82.46		
6	GU1405	FG 9 1/2" Roller reamer	6.375	3.000	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.64	88.10		
7	7019	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	94.10		
8	RS675-0023	6 3/4 RIPstick	6.750	2.000	6.750	1.10	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	19.93	114.03		
9	7150018	7.15 Mud Motor	7.188	2.000	7.188	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	41.28	155.31		
10	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	159.24		
11	N/A	9 JTS, 6 3/4" DC's	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	437.51		
12	N/A	Crossover (DC's to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	440.66		
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1354.08		
Comments															
Halo 7600-0781; Pulser 128-481; Eye 1485; Gamma 1279; Battery 008-29SEP22AB SDI 7" Straight Fixed Lobe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1.670 Max Torque = 18.680 Rev/Gal = 0.23 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7															

Figure 60. BHA #11 for drilling from 4,980 to 5,269 ft MD. Note - ReedHycalog and SDI refer to this as BHA #4 - it is in fact BHA #11. This was an NOV TKC73-A2 PDC bit, a HALO RSS with HFTO and a 7.15 mud motor. The BHA was pulled because of failure of the directional tools.



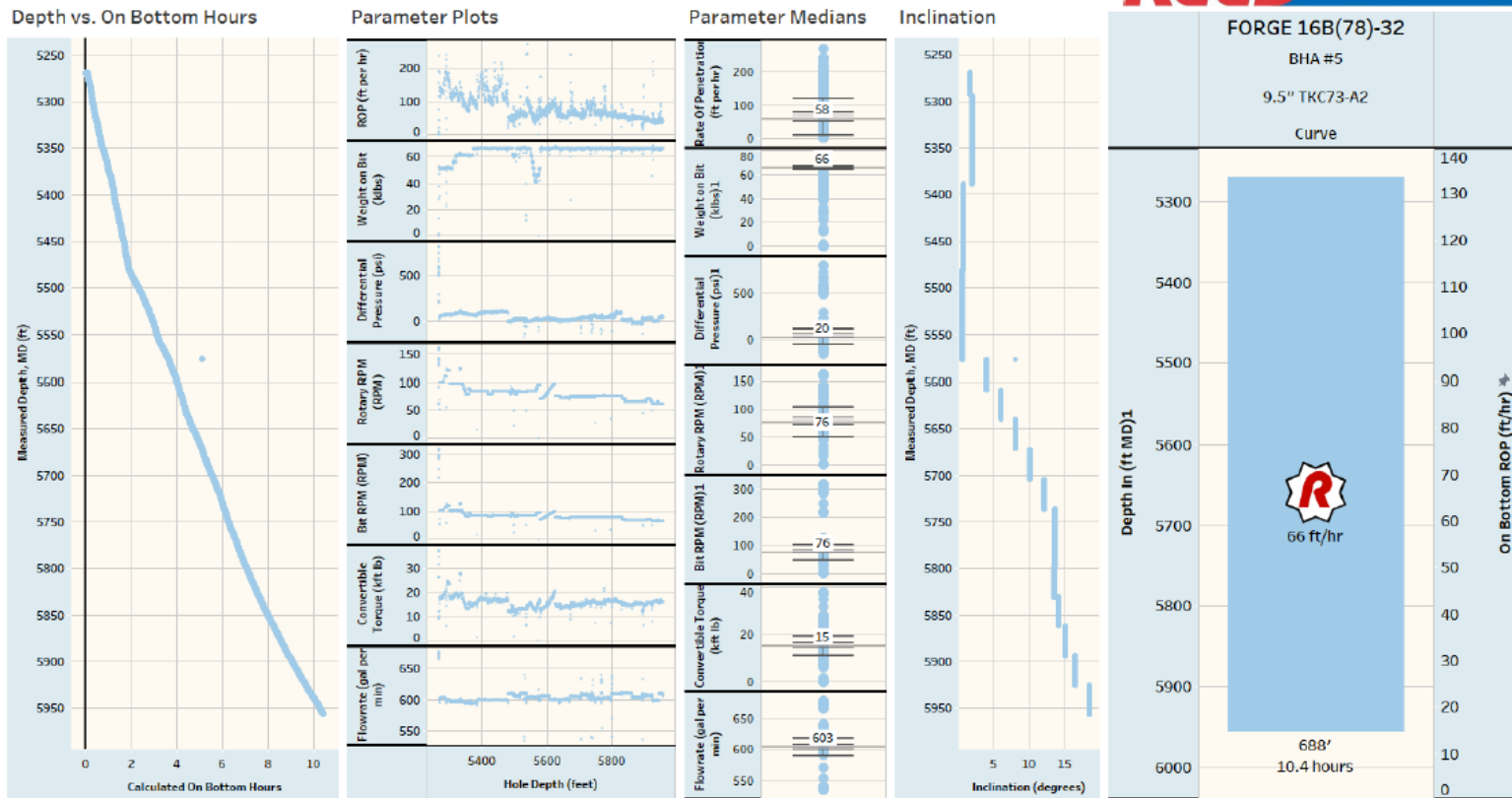
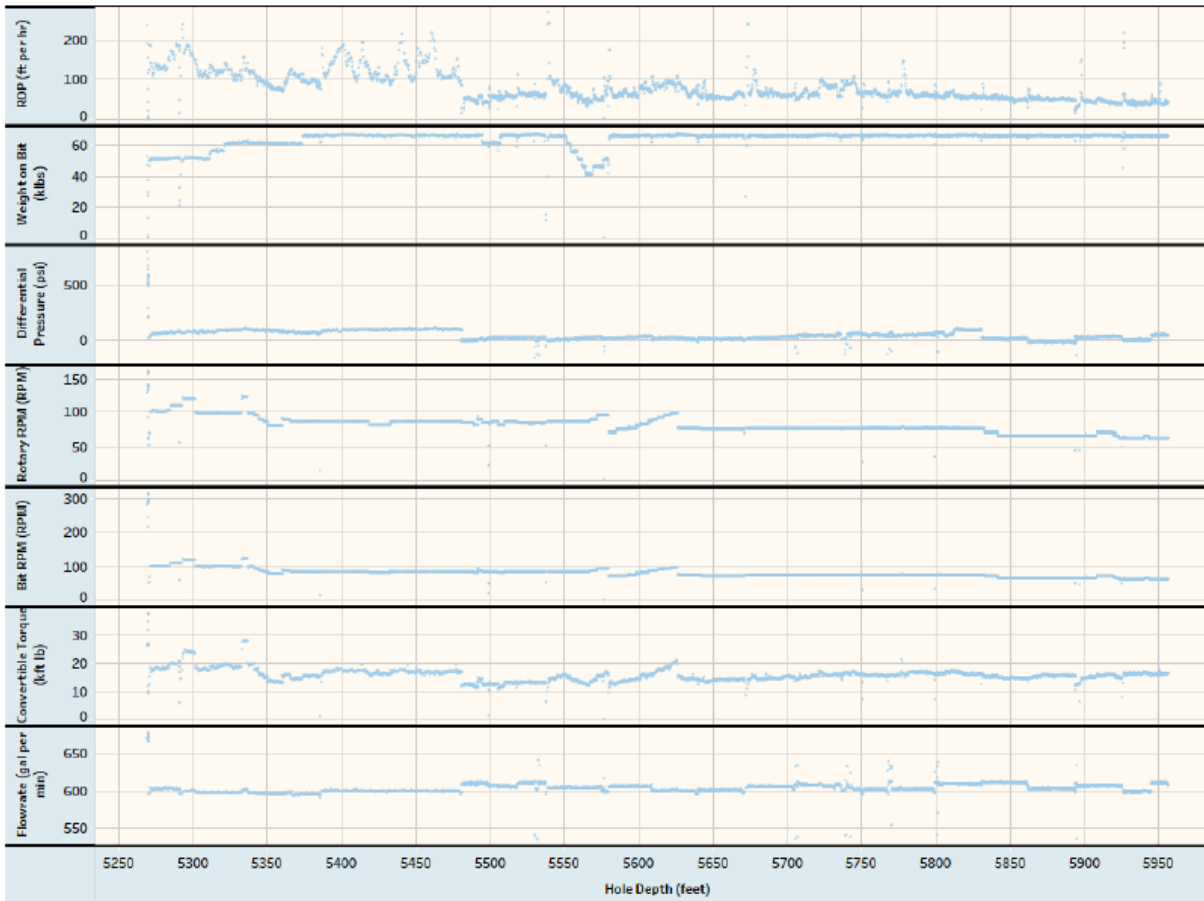


Figure 61. BHA #12 [9.5” TKC73-A2 (A298328)]. Compilation of drilling parameters in drilling from 5,269 to 5,957 ft MD. Note - ReedHycalog and SDI refer to this as BHA #5 - it is in fact BHA #12. This was an NOV TKC73-A2 PDC bit.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 9.5-BHA #5-(TKC73-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: Drilled curve from 0 degrees to 20 degrees. BHA had a Halo RSS but no mud motor.

Curve started at 5,480'

Had a short trip at 5,537' due to the Riser on the BOP stack breaking.

Maintained drilling at 65 klbs and 75 Bit RPM's

Bit tripped for Halo signal loss, increase in MSE and lower ROP on the BHA.

Solution: Figure out BHA vibration modeling to allow for mud motor to be ran.



Figure 62. BHA #12 [9.5" TKC73-A2 (A298328)]. Compilation of drilling parameters in drilling from 5,269 to 5,957 ft MD. Note - ReedHycalog and SDI refer to this as BHA #5 - it is in fact BHA #12. This was an NOV TKC73-A2 PDC bit.



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #5	4	9.50	TKC73-A2	A298328	REEDHYCALOG	5269	5957	688	10.44	66

Figure 63. BHA #12 [9.5” TKC73-A2 (A298328)]. Compilation of dull photographs after drilling from 5,269 to 5,957 ft MD. Note - ReedHycalog and SDI refer to this as BHA #5 - it is in fact BHA #12. This was an NOV TKC73-A2 PDC bit.

Bottom Hole Assembly															
Job#	OP.039349			Rig	Frontier 16			BHA Length (Usft)	1296.36						
Operator	Utah Forge			BHA #	5			BHA Weight dry (klbs)	70.21						
Well	16B(78)-32 - 16B(78)-32			Bit #	5			BHA Weight Bouyed (klbs)	60.67						
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00			Wt. Below Jars dry (klbs)	70.21						
Date In				Depth Out(Usft)	0.00			Wt. Below Jars Bouyed (klbs)	60.67						
Date Out				Drilled(Usft)	0.00			Drilling / Circ Hours	0.00 / 0.00						
Sensor Offsets															
Survey Offset				N/A				Gamma Offset				N/A			
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	A298328	9 1/2" 7 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.13	1.13		
2	76001175	HALO RSS w/HFTO (Stiff)	6.750	2.000	6.688	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.31	36.44		
3	ASM 9008	Spiral wrapped B Stabilizer	6.500	2.813	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.66	42.10		
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.22	51.32		
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	82.43		
6	GU3275	FG 9 1/2" Roller reamer	6.625	2.938	6.625	2.10	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.71	89.14		
7	7027	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	95.14		
8	AFLS603	6 3/4" Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	97.59		
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	101.52		
10	N/A	9 JTS, 6 3/4" DC's	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	379.79		
11	N/A	Crossover (DC's to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FHB	4 1/2 IF P	0.000	0.00	27.83	3.15	382.94		
12	N/A	30 JTS HWDP	5.500	3.825	0.000	0.00	5 1/2 FHB	5 1/2 FHP	48.400	42.38	70.21	913.42	1296.36		
Comments															
Halo 7600-1125; Pulsar 128-474; Eye 1733; Gamma 1182; Battery 042-29SEP22AB NO MOTOR ASSIST Flow Range = 500/750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000															

Watch these lengths

Figure 64. BHA #12 [9.5” TKC73-A2 (A298328)]. BHA for drilling from 5,269 to 5,957 ft MD. Note - ReedHycalog and SDI refer to this as BHA #5 - it is in fact BHA #12. This was an NOV TKC73-A2 PDC bit.



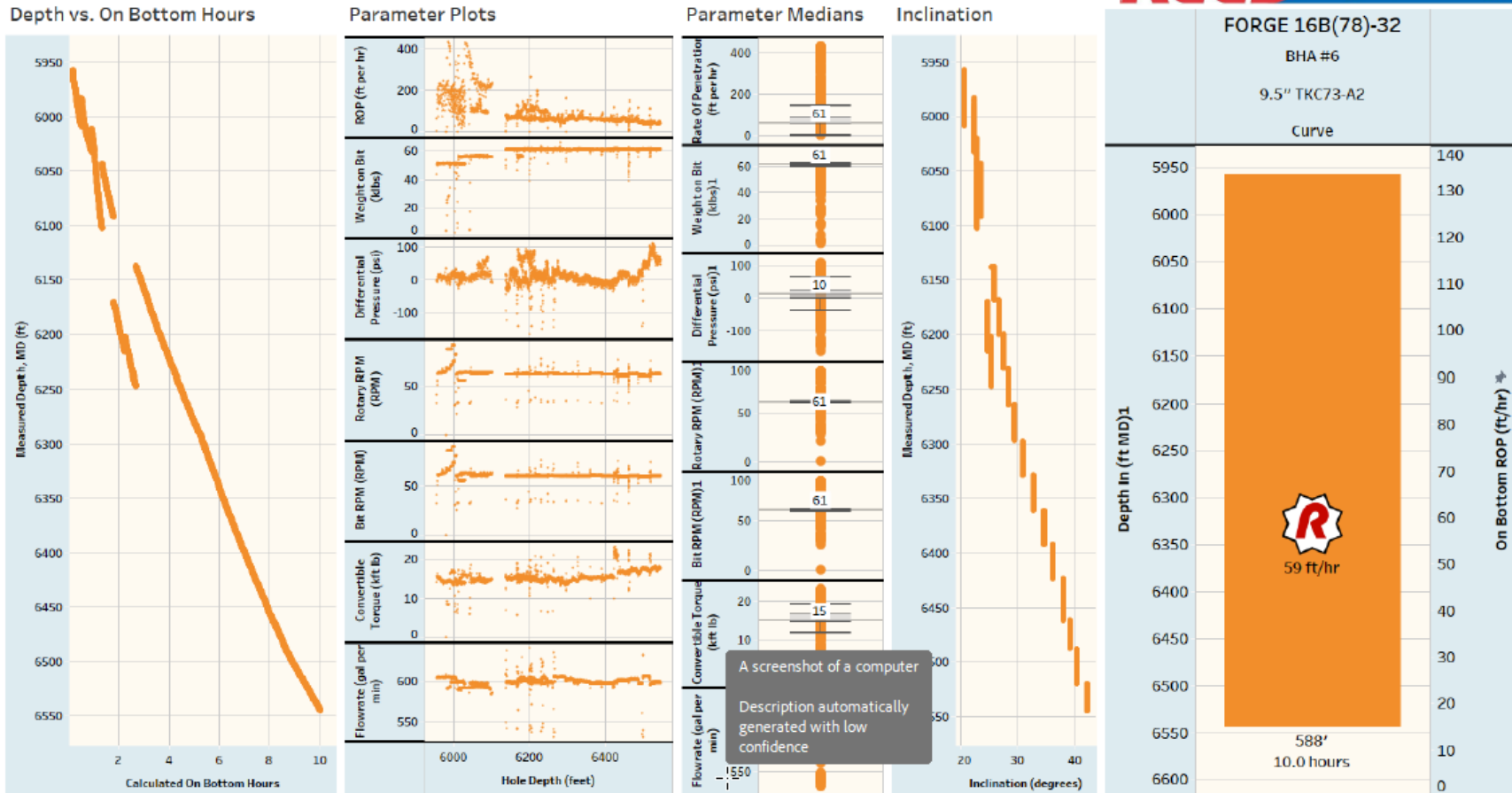


Figure 65. BHA #13 [9.5" TKC73-A2 (A298330)]. Compilation of drilling records for drilling from 5,957 to 6,545 ft MD. Note - ReedHycalog and SDI refer to this as BHA #6 - it is in fact BHA #13. This was an NOV TKC73-A2 PDC bit.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 9.5-BHA #6-(TKC73-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: Drilled curve from 20 degrees to 40.3 degrees.

Small core out on the bit. This run was with an RSS but no motor in the hole.

Drilling at high ROP but lower RPM's yielded a big DOC which put formation rubbing on the center of the bit.

Could not run higher than 66 Rotary RPM's without inducing dysfunction. Rotary Speed is the main limitation.

Steel shot from Particle Drilling is still seen on the shakers at about 5% concentration.

Solution: Figure out BHA vibration modeling to allow for mud motor to be ran.



Figure 66. BHA #13 [9.5" TKC73-A2 (A298330)]. Compilation of drilling records for drilling from 5,957 to 6,545 ft MD. Note - ReedHycalog and SDI refer to this as BHA #6 - it is in fact BHA #13. This was an NOV TKC73-A2 PDC bit.



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #6	5	9.50	TKC73-A2	A298330	REEDHYCALOG	5957	6545	588	10.04	59

Figure 67. BHA #13 [9.5" TKC73-A2 (A298330)]. Compilation of dull photographs after drilling from 5,957 to 6,545 ft MD. Note - ReedHycalog and SDI refer to this as BHA #6 - it is in fact BHA #13. This was an NOV TKC73-A2 PDC bit.



Figure 68. BHA #13 [9.5" TKC73-A2 (A298330)]. Compilation of dull photographs after drilling from 5,957 to 6,545 ft MD. Note - ReedHycalog and SDI refer to this as BHA #6 - it is in fact BHA #13. This was an NOV TKC73-A2 PDC bit.

6: Directional BHA #6 HALO, 9 1/2" Hole section

Bottom Hole Assembly																	
Job#	OP.039349		Rig	Frontier 16		BHA Length (Usft)	1286.80										
Operator	Utah Forge		BHA #	6		BHA Weight dry (klbs)	70.21										
Well	16B(78)-32 - 16B(78)-32		Bit #	6		BHA Weight Bouyed (klbs)	60.67										
Field	Beaver (University of Utah) - Utah Forge		Depth In (Usft)	5957.00		Wt. Below Jars dry (klbs)	70.21										
Date In	05/15/2023		Depth Out(Usft)	5957.00		Wt. Below Jars Bouyed (klbs)	60.67										
Date Out	05/15/2023		Drilled(Usft)	0.00		Drilling / Circ Hours	0.00 / 0.00										
Sensor Offsets																	
Survey Offset			N/A			Gamma Offset			N/A			Gyro Offset			N/A		
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)				
1	A298330	9 1/2" 7 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.13	1.13				
2	76000233	HALO RSS w/HFTO (Stif)	6.750	2.000	6.688	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.31	36.44				
3	ASM 9007	Spiral wrapped IB Stabilizer	6.500	2.813	6.500	2.20	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.42	41.86				
4	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	72.97				
5	GU3275	FG 9 1/2" Roller reamer	6.625	2.938	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.71	79.68				
6	7006	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.90	85.58				
7	AFLS603	6 3/4" Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	88.03				
8	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	91.96				
9	N/A	9 JTS, 6 3/4" DC's	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	370.23				
10	N/A	Crossover (DC's to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	373.38				
11	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1286.80				
Comments																	
Halo 7600-1125; Pulsar 128-474; Eye 1733; Gamma 1182; Battery 042-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000																	

Watch these lengths

Figure 69. BHA #13 [9.5" TKC83-A2 (A298330)]. BHA for drilling from 5,957 to 6,545 ft MD. Note - ReedHycalog and SDI refer to this as BHA #6 - it is in fact BHA #13. This was an NOV TKC73-A2 PDC bit.



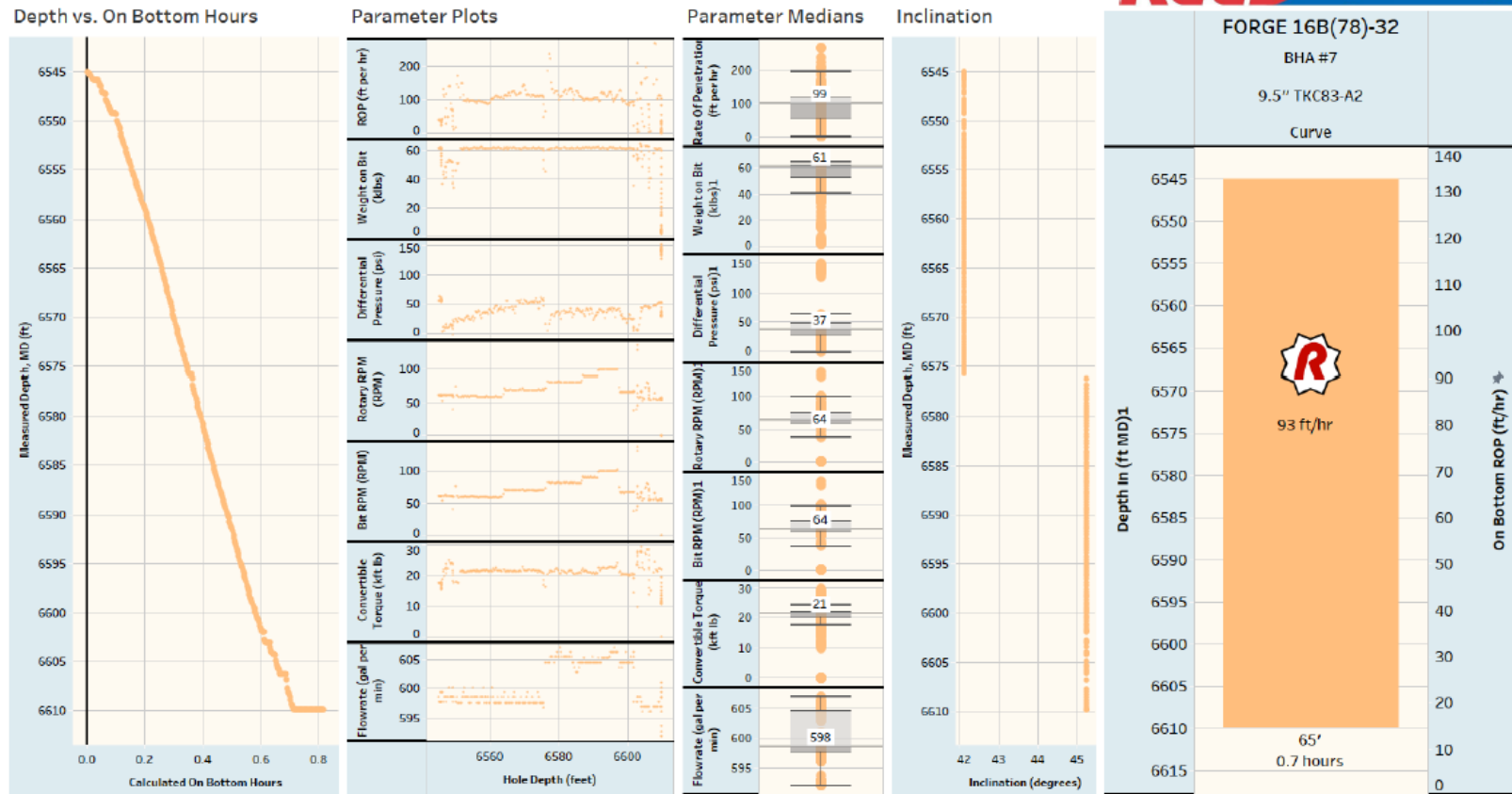
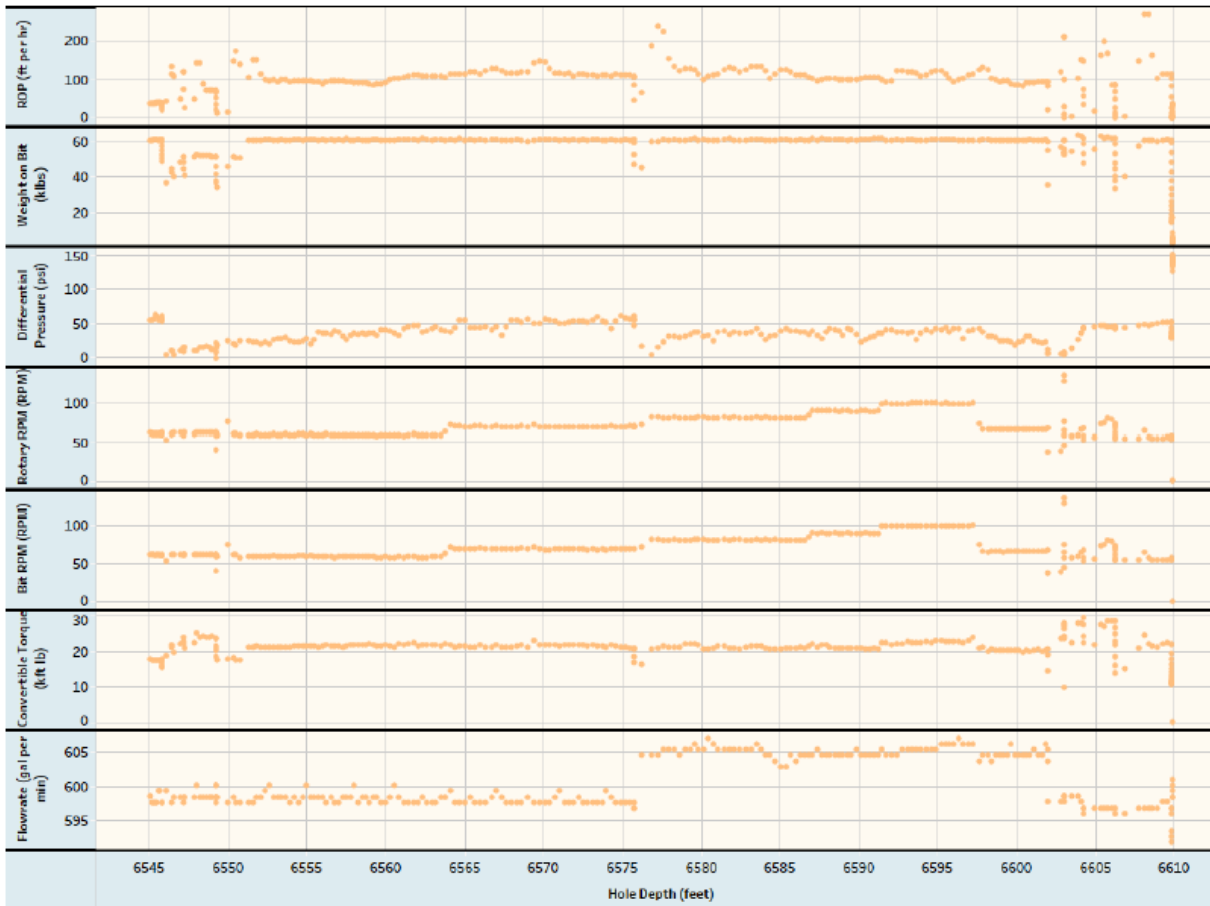


Figure 70. BHA #14 [9.5" TKC83-A2 (A298355)]. Compilation of drilling records for drilling from 6,545 to 6,610 ft MD. Note - ReedHycalog and SDI refer to this as BHA #7 - it is in fact BHA #14. This was an NOV TKC83-A2 PDC bit. Pulsar on directional tool failed.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 9.5-BHA #7-(TKC83-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: Short run. Drilled the curve from 42 to 45 degrees.

DD commented that the bit was steerable and able to get the builds needed.

Pulled for MWD failure.

Solution: Figure out BHA vibration modeling to allow for mud motor to be ran.



Figure 71. BHA #14 [9.5” TKC83-A2 (A298355)]. Compilation of drilling records for drilling from 6,545 to 6,610 ft MD. Note - ReedHycalog and SDI refer to this as BHA #7 - it is in fact BHA #14. This was an NOV TKC83-A2 PDC bit. Pulsar on directional tool failed.



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Description automatically generated with low confidence		Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #7	6	9.50	TKC83-A2	A298355	REEDHYCALOG	6545	6610	65	0.7	93

Figure 72. BHA #14 [9.5" TKC83-A2 (A298355)]. Compilation of dull photographs after drilling from 6,545 to 6,610 ft MD. Note - ReedHycalog and SDI refer to this as BHA #7 - it is in fact BHA #14. This was an NOV TKC83-A2 PDC bit. Pulsar on directional tool failed.



Figure 73. BHA #14 [9.5" TKC83-A2 (A298355)]. Compilation of dull photographs after drilling from 6,545 to 6,610 ft MD. Note - ReedHycalog and SDI refer to this as BHA #7 - it is in fact BHA #14. This was an NOV TKC83-A2 PDC bit. Pulsar on directional tool failed.

Bottom Hole Assembly																	
Job#	OP.039349			Rig	Frontier 16			BHA Length (Usft)			1306.42						
Operator	Utah Forge			BHA #	7			BHA Weight dry (klbs)			70.21						
Well	16B(78)-32 - 16B(78)-32			Bit #	7			BHA Weight Bouyed (klbs)			60.67						
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00			Wt. Below Jars dry (klbs)			70.21						
Date In				Depth Out(Usft)	0.00			Wt. Below Jars Bouyed (klbs)			60.67						
Date Out				Drilled(Usft)	0.00			Drilling / Circ Hours			0.00 / 0.00						
Sensor Offsets																	
Survey Offset				25.00				Gamma Offset				N/A		Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)				
1	A298355	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.18	1.18				
2	76000233	HALO RSS w/HFTO (Stiff)	6.750	2.000	6.688	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.31	36.49				
3	650779	9 3/8 Spiral Stabilizer	6.500	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	4.14	40.63				
4	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	52.87				
5	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	62.70				
6	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	68.09				
7	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	99.20				
8	7015	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	105.20				
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	109.13				
10	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	111.58				
11	N/A	9 JTS, 6 3/4 DCs	6.613	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	389.85				
12	N/A	Crossover (DCs to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FHB	4 1/2 IF P	0.000	0.00	27.83	3.15	393.00				
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FHB	5 1/2 FHP	46.400	42.38	70.21	913.42	1306.42				
Comments																	
Halo 7600-0233; Pulsar 213-006; Eye 1697; Gamma 1490; Battery 046-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000																	

} Watch these lengths

Figure 74. BHA #14 [9.5” TKC83-A2 (A298355)]. BHA for drilling from 6,545 to 6,610 ft MD. Note - ReedHycalog and SDI refer to this as BHA #7 - it is in fact BHA #14. This was an NOV TKC83-A2 PDC bit. Pulsar on directional tool failed.



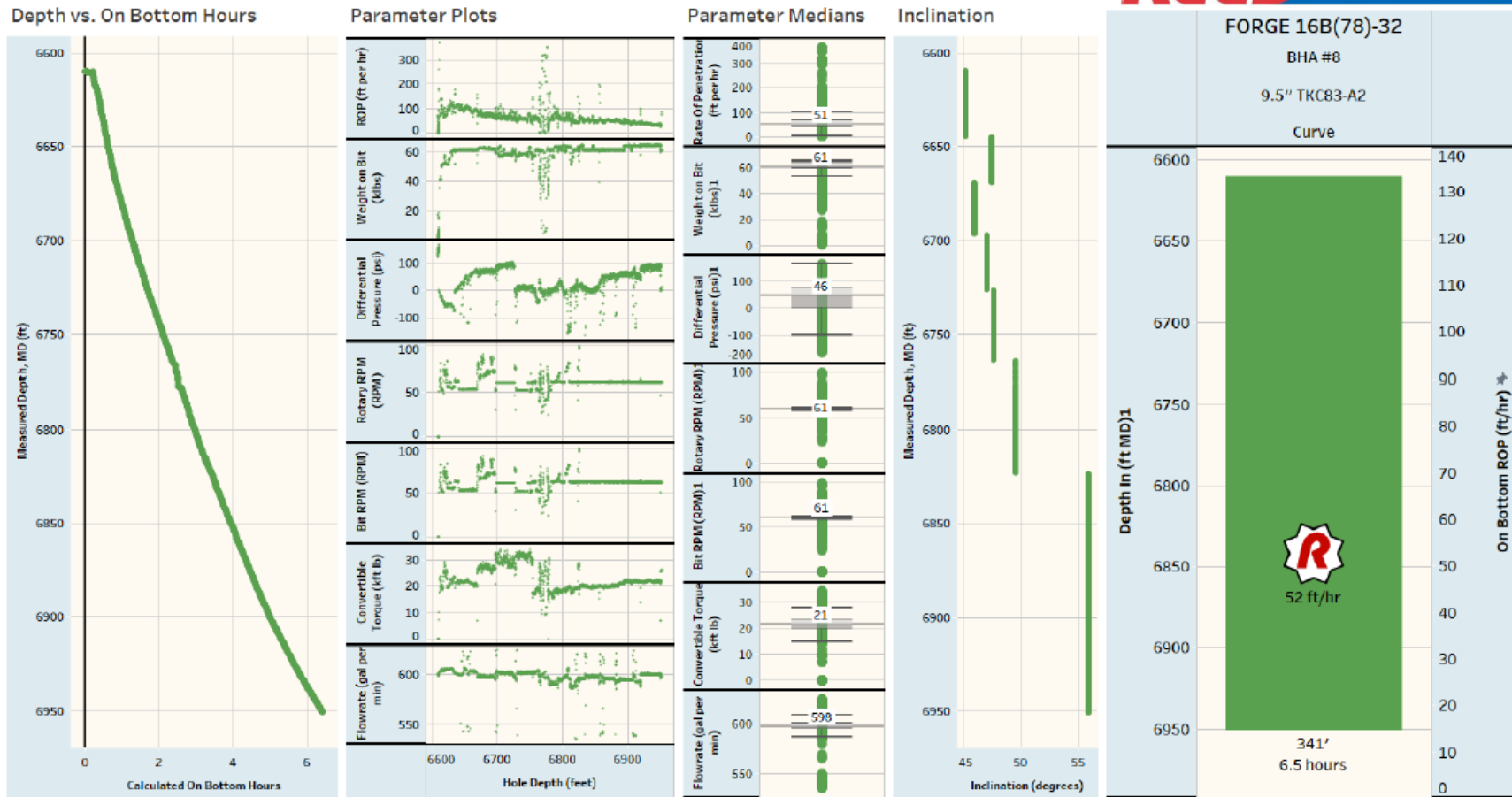
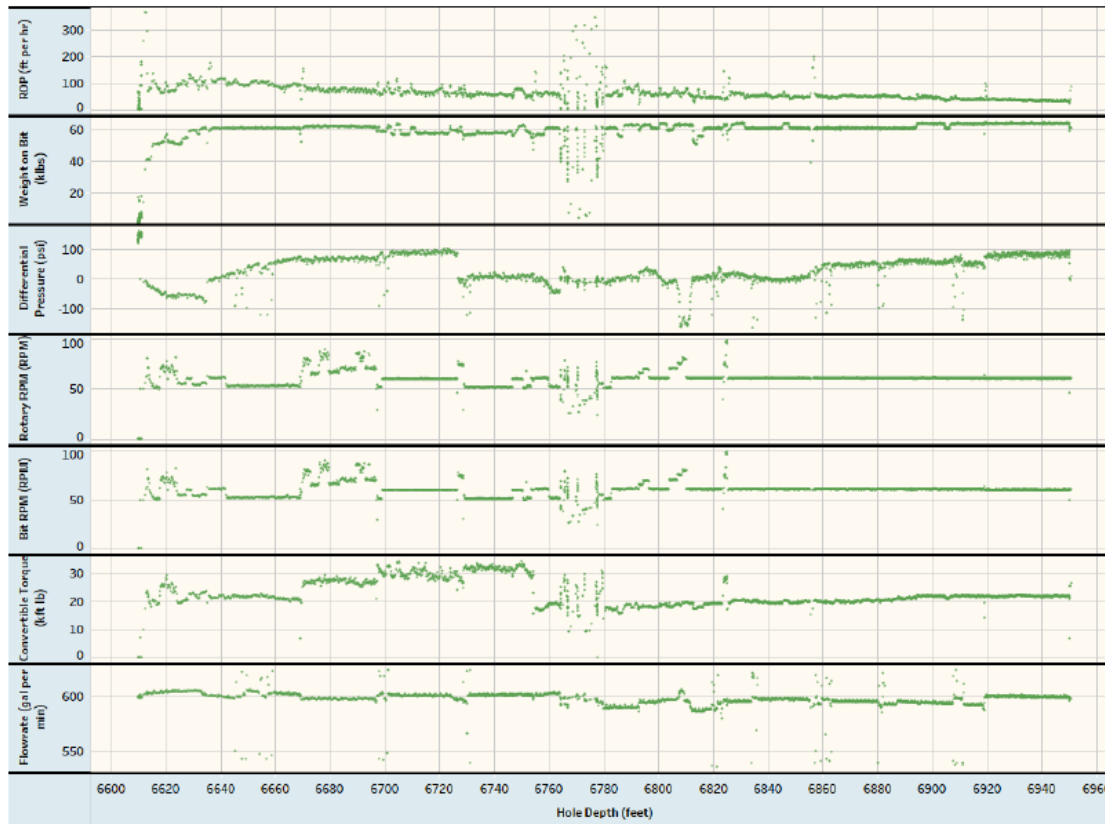


Figure 75. BHA #15 [9.5" TKC83-A2 (A298353)]. Compilation of drilling records for drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name

9.5-BHA #8-(TKC83-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: Drilled the curve from 45 degrees to end of build. Tool vibrations are high due to Revit system errors.

Halo RSS ran without a motor due to high vibrations.

Rotary RPM was at 55 for majority of the run due to vibration issues.

MWD tool stopped working at 6,799.

Revit system malfunction at 6,777 feet that caused variation in drilling plots.

Solution: Figure out BHA vibration modeling to allow for mud motor to be ran.

Curve was still drilled efficiently with RSS system.



Figure 76. BHA #15 [9.5" TKC83-A2 (A298353)]. Compilation of drilling records for drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging after the build.



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #8	7	9.50	TKC83-A2	A298353	REEDHYCALOG	6610	6951	341	6.5	52

Figure 77. BHA #15 [9.5” TKC83-A2 (A298353)]. Compilation of dull photographs after drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging after the build.



Figure 78. BHA #15 [9.5" TKC83-A2 (A298353)]. Compilation of dull photographs after drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging after the build.



Figure 79. BHA #15 [9.5" TKC83-A2 (A298353)]. Compilation of dull photographs after drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging after the build.



Figure 80. BHA #15 [9.5" TKC83-A2 (A298353)]. Compilation of dull photographs after drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging after the build.



Figure 81. BHA #15 [9.5" TKC83-A2 (A298353)]. Compilation of dull photographs after drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging after the build.

Bottom Hole Assembly																	
Job#	OP.039349		Rig	Frontier 16		BHA Length (Usft)		1306.63									
Operator	Utah Forge		BHA #	8		BHA Weight dry (klbs)		70.21									
Well	16B(78)-32 - 16B(78)-32		Bit #	8		BHA Weight Bouyed (klbs)		60.67									
Field	Beaver (University of Utah) - Utah Forge		Depth In (Usft)	0.00		Wt. Below Jars dry (klbs)		70.21									
Date In			Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (klbs)		60.67									
Date Out			Drilled(Usft)	0.00		Drilling / Circ Hours		0.00 / 0.00									
Sensor Offsets																	
Survey Offset			25.00			Gamma Offset			N/A			Gyro Offset			N/A		
#	SN	Description	OD (In)	ID (In)	FN OD (In)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)				
1	A298353	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.22	1.22				
2	76001711	HALO RSS w/HFTO (Flex)	6.750	2.000	6.500	5.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.48	36.70				
3	650779	9 3/8 Spiral Stabilizer	6.500	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	4.14	40.84				
4	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	53.08				
5	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	62.91				
6	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	68.30				
7	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	99.41				
8	7015	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	105.41				
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	109.34				
10	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	111.79				
11	N/A	9 JTS, 6 3/4 DCs	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	390.06				
12	N/A	Crossover (DCs to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	393.21				
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1306.63				
Comments																	
Halo 7600-1711; Pulsar 122-1243F; Eye 1547; Gamma 1117; Battery 025-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000																	

Watch these lengths

Figure 82. BHA #15 [9.5” TKC83-A2 (A298353)].BHA for drilling from 6,610 to 6,950 ft MD. Note - ReedHycalog and SDI refer to this as BHA #8 - it is in fact BHA #15. This was an NOV TKC83-A2 PDC bit. Pulled for logging after the build.



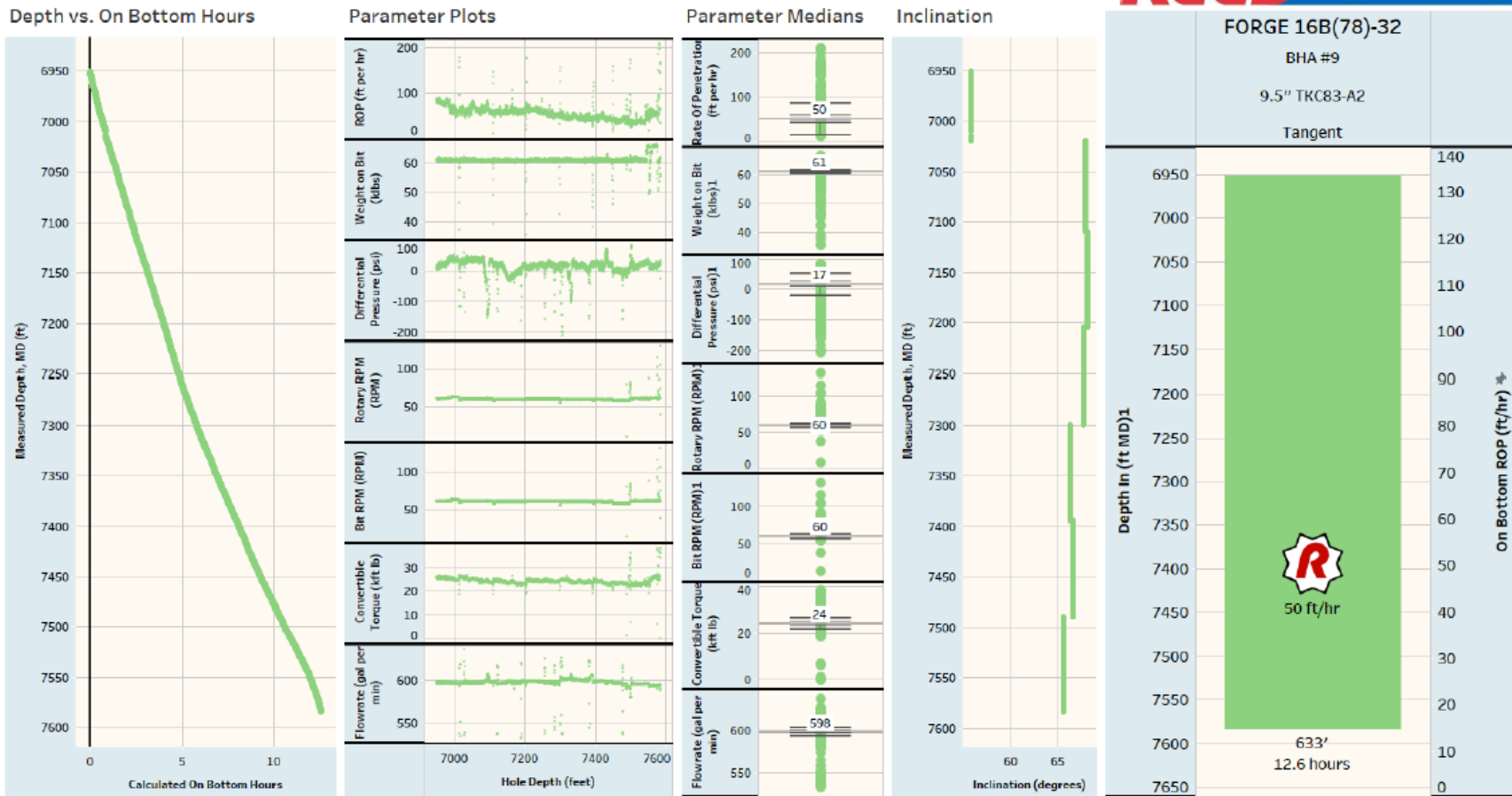
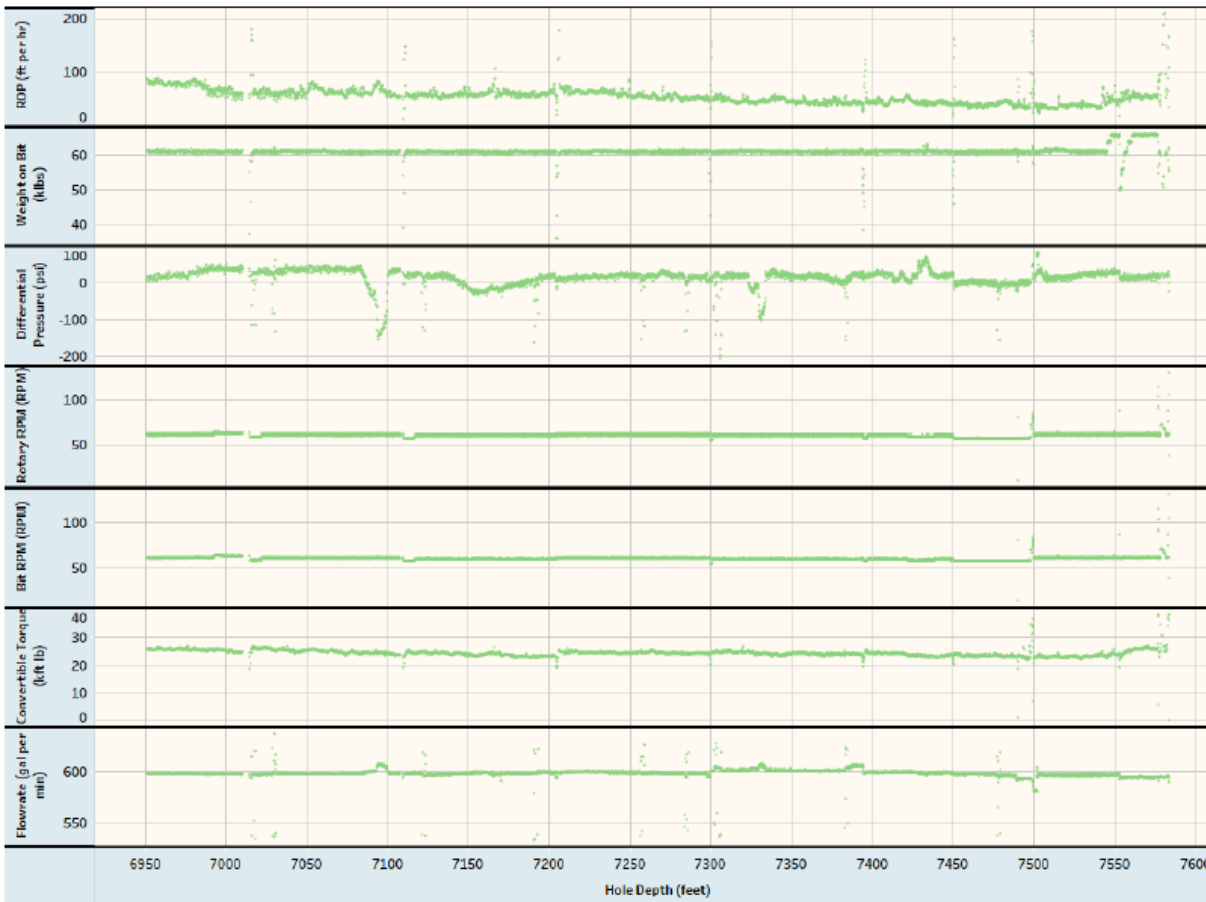


Figure 83. BHA #16 [9.5” TKC83-A2 (A298354)]. Compilation of drilling records for drilling from 6,950 to 7,584 ft MD. Note - ReedHycalog and SDI refer to this as BHA #9 - it is in fact BHA #16. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 9.5-BHA #9-(TKC83-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: WOB was not being zeroed every stand until 7,570'. You can see the ROP decline each consecutive stand until the issue was corrected. When corrected, MSE and ROP returned to baseline.

Tested 100% fresh water pill (@7,090') as well as a 50/50 fresh water/reserve pit pill (@7,420').

ROP showed that the fresh water pill was more effective than the 50/50 fresh and reserve pill.

Solution: Need to make sure WOB and Diff are zeroed consistently to yield a consistent Downhole and Total MSE.



Figure 84. BHA #16 [9.5" TKC83-A2 (A298354)]. Compilation of drilling records for drilling from 6,950 to 7,584 ft MD. Note - ReedHycalog and SDI refer to this as BHA #9 - it is in fact BHA #16. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #9	8	9.50	TKC83-A2	A298354	REEDHYCALOG	6951	7584	633	12.62	50

Figure 85. BHA #16 [9.5” TKC83-A2 (A298354)]. Compilation of dull photographs after drilling from 6,950 to 7,584 ft MD. Note - ReedHycalog and SDI refer to this as BHA #9 - it is in fact BHA #16. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.

Bottom Hole Assembly																	
Job#	OP.039349			Rig	Frontier 16			BHA Length (Usft)			1306.41						
Operator	Utah Forge			BHA #	9			BHA Weight dry (klbs)			70.21						
Well	16B(78)-32 - 16B(78)-32			Bit #	9			BHA Weight Bouyed (klbs)			60.67						
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00			Wt. Below Jars dry (klbs)			70.21						
Date In				Depth Out(Usft)	0.00			Wt. Below Jars Bouyed (klbs)			60.67						
Date Out				Drilled(Usft)	0.00			Drilling / Circ Hours			0.00 / 0.00						
Sensor Offsets																	
Survey Offset				25.00				Gamma Offset				N/A		Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)				
1	A298354	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.18	1.18				
2	76000406	HALO RSS w/HFTO (Stiff)	6.750	2.000	6.500	5.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.33	36.51				
3	650779	9 3/8 Spiral wrapped stabilizer	6.500	2.875	6.500	1.42	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	4.14	40.65				
4	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	52.89				
5	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	62.72				
6	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	2.19	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	68.11				
7	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	99.22				
8	7006	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.97	105.19				
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	109.12				
10	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	111.57				
11	N/A	9 JTS, 6 3/4 DCs	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	389.84				
12	N/A	Crossover (DCs to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FHB	4 1/2 IF P	0.000	0.00	27.83	3.15	392.99				
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FHB	5 1/2 FHP	46.400	42.38	70.21	913.42	1306.41				
Comments																	
Halo 7600-0406; Pulsar 213-004F; Eye 1754; Gamma 1311; Battery 007-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000																	

Watch these lengths

Figure 86. BHA #16 [9.5” TKC83-A2 (A298354)]. BHA for drilling from 6,950 to 7,584 ft MD. Note - ReedHycalog and SDI refer to this as BHA #9 - it is in fact BHA #16. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



IX.4 14-3/4-inch Bit Program, BHAs, and Performance (without RSS)
Below 7584 ft MD, drilling continued without the RSS, using a conventional motor.

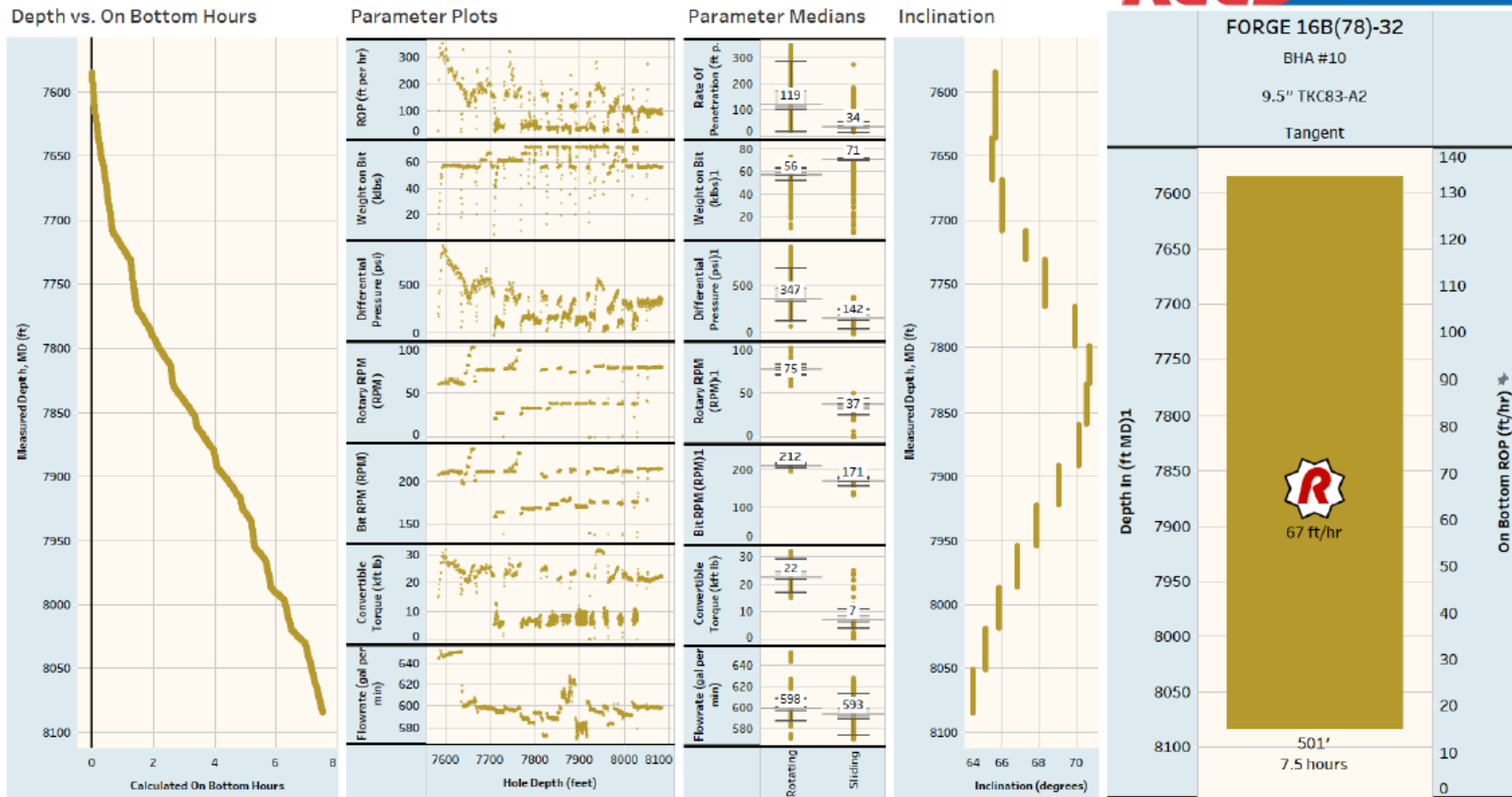
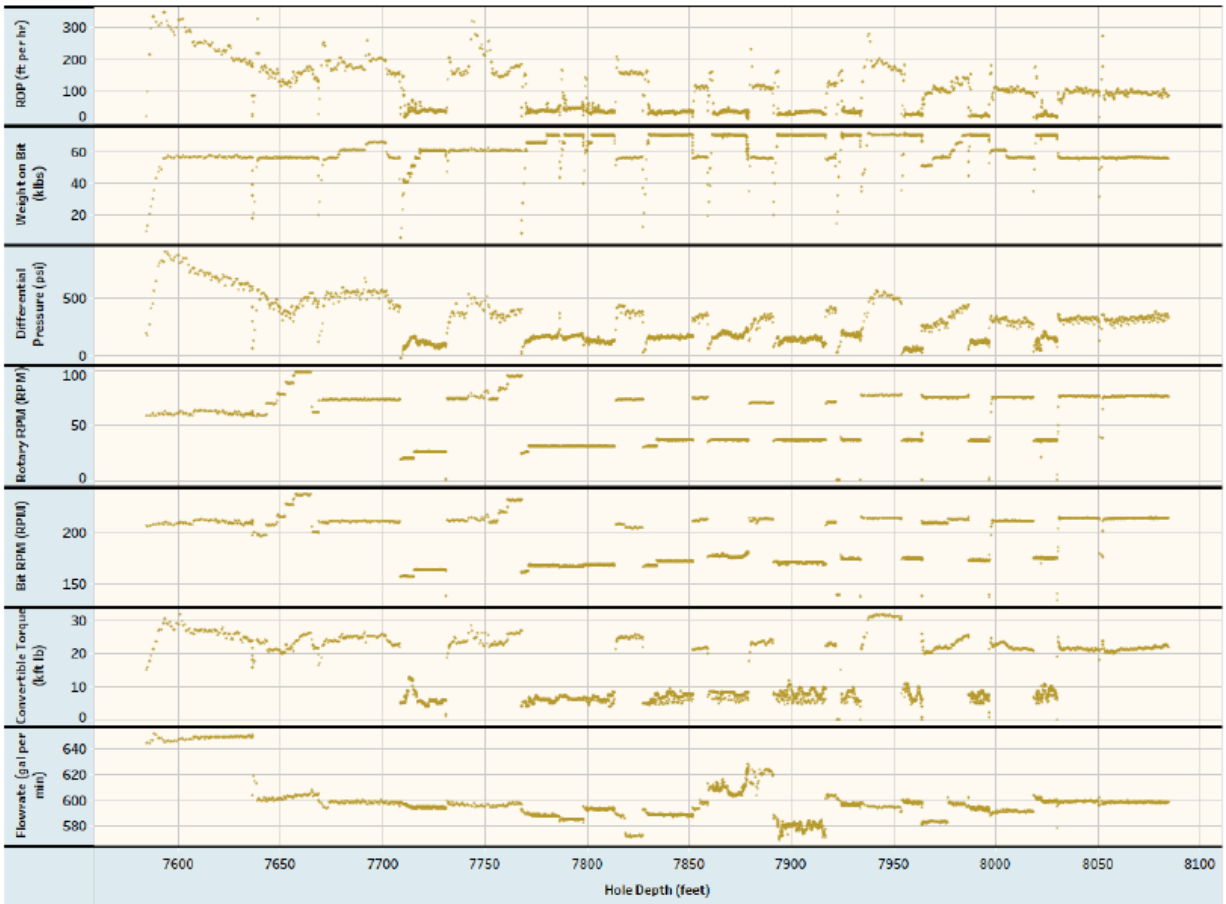


Figure 87. BHA #17 [9.5” TKC83-A2 (A298358)]. Compilation of drilling records for drilling from 7,584 to 8,085 ft MD. Note - ReedHycalog and SDI refer to this as BHA #10 - it is in fact BHA #17. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 9.5-BHA #10-(TKC83-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: BHA was ran with a 1° motor. The BHA wanted to build. Axial vibrations were high which could be due to limiting WOB and not getting enough DOC.

Step test at 7,670 did not change Downhole MSE much.

Solution: To deal with the build tendency, the next run will be ran with higher bit RPM's by increasing Flowrate and Rotary Speed.



Figure 88. BHA #17 [9.5” TKC83-A2 (A298358)]. Compilation of drilling records for drilling from 7,584 to 8,085 ft MD. Note - ReedHycalog and SDI refer to this as BHA #10 - it is in fact BHA #17. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



Cutter Trial

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #10	9	9.50	TKC83-A2	A298358	REEDHYCALOG	7584	8085	501	7.53	67

Figure 89. BHA #17 [9.5" TKC83-A2 (A298358)]. Compilation of dull photographs after drilling from 7,584 to 8,085 ft MD. Note - ReedHycalog and SDI refer to this as BHA #10 - it is in fact BHA #17. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.

10: Directional BHA #10, 9 1/2" Section

Bottom Hole Assembly															
Job#	OP 039349			Rig	Frontier 16		BHA Length (Usft)	1312.71							
Operator	Utah Forge			BHA #	10		BHA Weight dry (klbs)	70.21							
Well	16B(78)-32 - 16E(78)-32			Bit #	10		BHA Weight Bouyed (klbs)	60.67							
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00		Wt. Below Jars dry (klbs)	70.21							
Date In				Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (klbs)	60.67							
Date Out				Drilled(Usft)	0.00		Drilling / Circ Hours	0.00 / 0.00							
Sensor Offsets															
Survey Offset				N/A				N/A				Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	A298358	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.25	1.25		
2		7.15 Mud Motor	6.750	2.000	0.000	0.00	4 1/2 F B	4 1/2 REG B	0.000	0.00	0.00	35.00	36.25		
3	GU1744	FG9 1/2 Roller reamer	6.625	3.000	6.750	2.19	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	5.39	41.64		
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	9.22	50.86		
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	31.11	81.97		
6	129-076	6 3/4 Pulser Sub	6.500	3.500	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	3.93	85.90		
7	DR34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	12.24	98.14		
8	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	9.83	107.97		
9	7006	6 3/4 Black Box	6.750	2.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	5.97	113.94		
10	DR48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	3.93	117.87		
11		9 JTS, 6 3/4 DCs	6.813	2.875	0.000	0.00	4 1/2 F B	4 1/2 F P	100.000	27.83	27.83	278.27	396.14		
12		Crossover (DCs to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 F P	0.000	0.00	27.83	3.15	399.29		
13		30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1312.71		

Bit Data		Motor Data	
SN	A298358	SN	
Size (in)	9.500	OD (in)	6.750
Type	PDC	Description	7.15 Mud Motor
Description	9 1/2 8 Blade PDC bit	Make/Model	Titan 22
Make	NOV	Bit to Bend (Usft) / Angle	0.00 / 1.00
Model	TKC 83	Stab / Kick Pad OD (in)	9.375
TFA	0.00	Stator Vendor/Type/Fit	-0.0080
Grade In	New	Pre Run Dyno HP%	
Grade Out		Lobes	6/7
Drilled (Usft)	0.000	Stages	7.1
		Revi/Gal	0.230
		Diff Press (Avg/Max)(psi)	0.0 / 1670.0
		Press. Drop(psi)	0.0
		Max Torque(Kftlb)	18000.0
		Max RPM	170
		Flow Range(gpm)	500-750
		Re-Run	NO
		Direct Bit	NO

Figure 90. BHA #17 [9.5" TKC83-A2 (A298358)]. BHA for drilling from 7,584 to 8,085 ft MD. Note - ReedHycalog and SDI refer to this as BHA #10 - it is in fact BHA #17. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



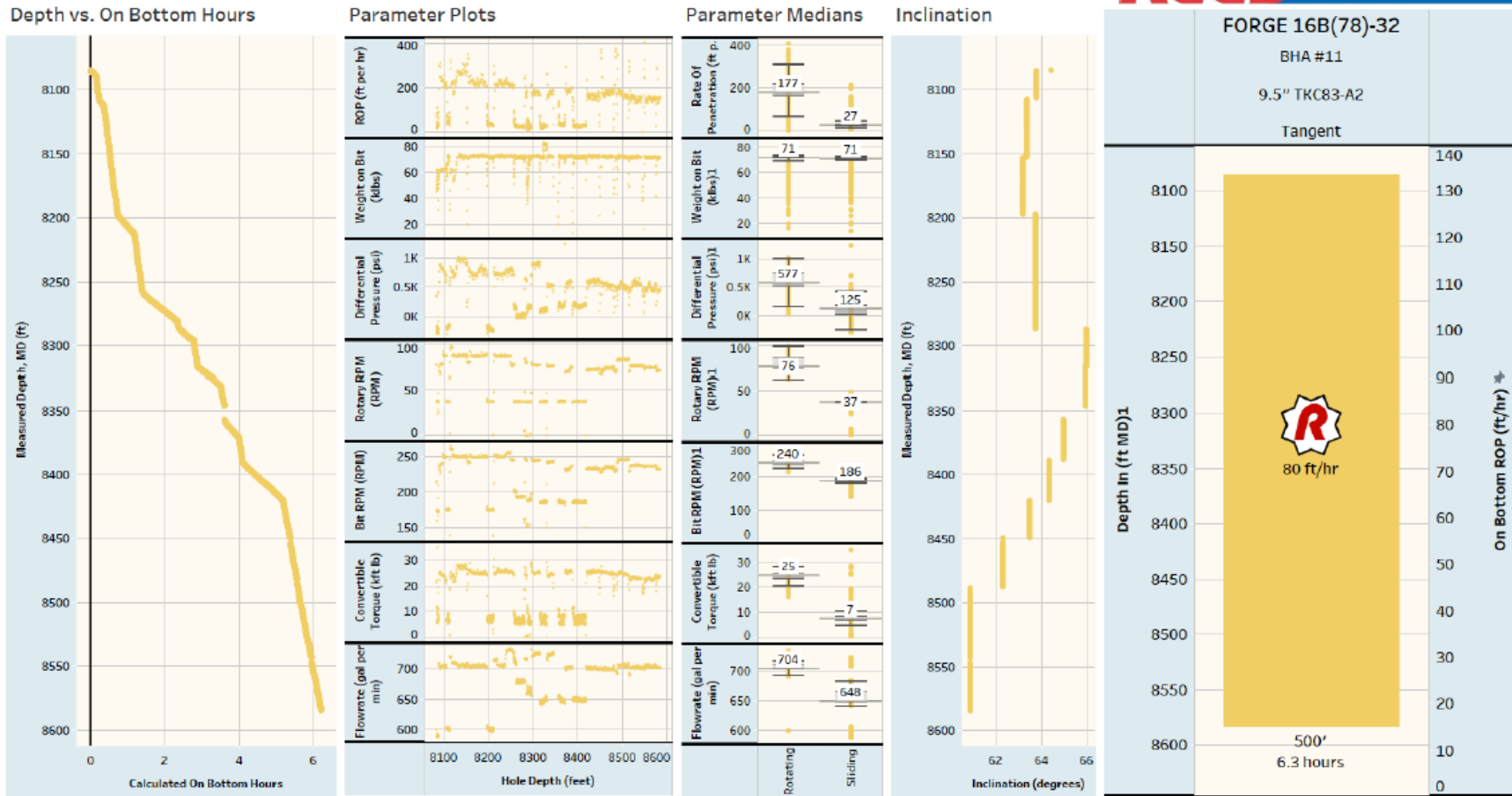
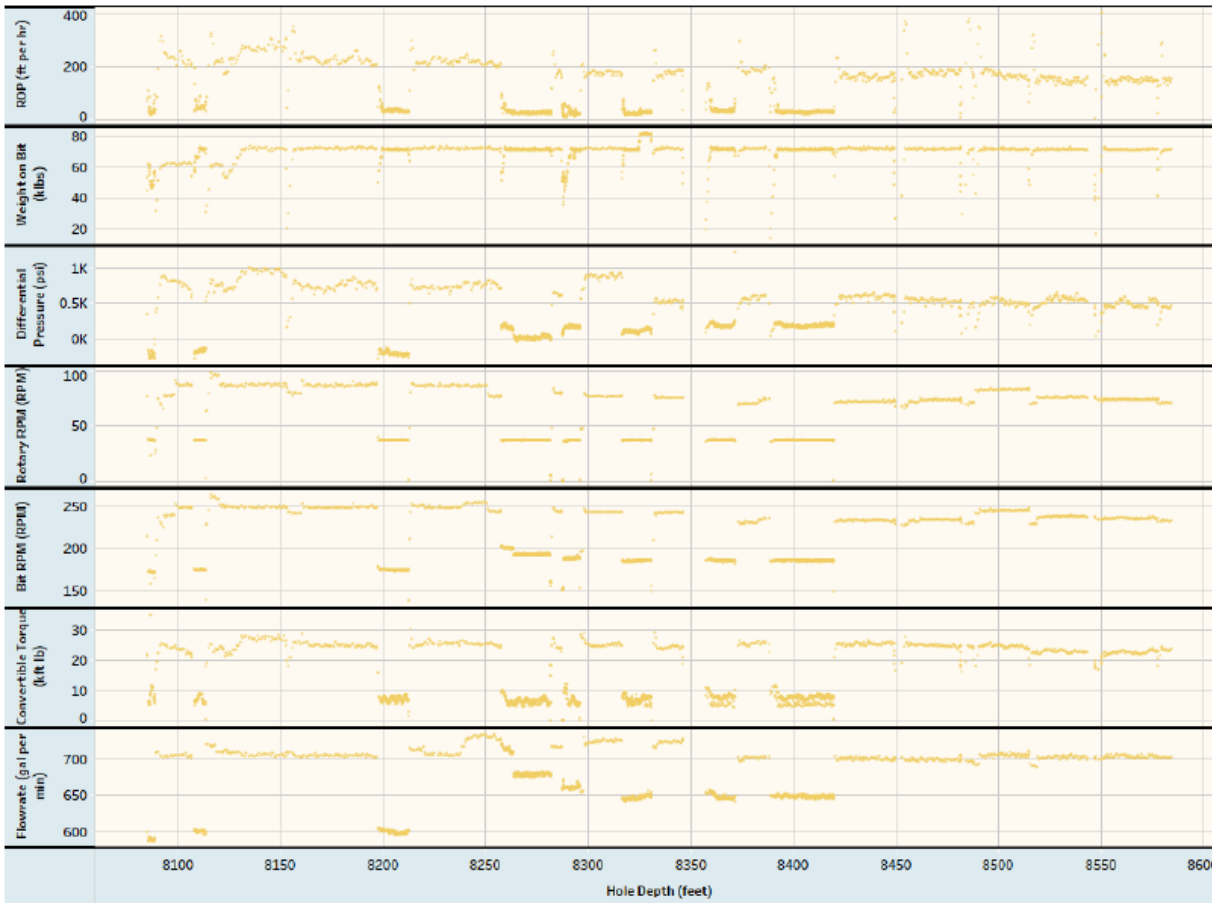


Figure 91. BHA #18 [9.5" TKC83-A2 (A298356)]. BHA for drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 9.5-BHA #11-(TKC83-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: Highest "Fast ROP" footage to date. This run was able to achieve sustainable instantaneous ROP of 180 ft/hr 400 feet into the run.

Achieved hitting the parameter limitations that we were aiming for at 70 klbs WOB and 240 Bit RPM's.

High ROP was sustained due to less sliding distance on the cutters. Traveling at a high DOC allows for more footage to be drilled before the chamfer is worn.

Bit damage could be correlated to not picking up far enough off bottom during connections. Potentially gauge damage due to 6 hours of flowing off bottom after run was TD'd.

Solution: Make sure we are off bottom on connections to keep bit from engaging. During the off bottom cooling, bit torque can be seen suggesting that the bit may have experienced dysfunction off bottom.

Drill at high DOC for best "Fast ROP" footage.



Figure 92. BHA #18 [9.5" TKC83-A2 (A298356)]. BHA for drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.

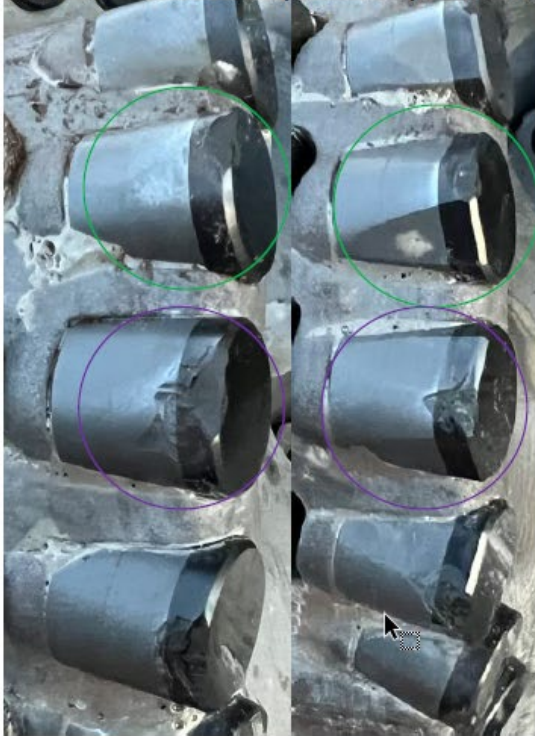


Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #11	10	9.50	TKC83-A2	A298356	REEDHYCALOG	8085	8585	500	6.26	80

Figure 93. BHA #18 [9.5" TKC83-A2 (A298356)]. Compilation of dull photographs after drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.

Cutter Trial: Looking at the shoulder of the bit and analyzing the effects of a round cutter against a shaped 3D cutter.

BHA #10 9.5" TKC83-A2 (A298358) Dull Photos



The shaped cutters higher up on the shoulder showed less diamond loss.

th shapes had wear into the substrate lower on the shoulder.

BHA #11 9.5" TKC83-A2 (A298356) Dull Photos



Standard cutters showed less wear than the test cutter. No diamond was worn into the substrate and the thermal wear did not progress into a spall down the face of the cutter. Some edges are sharp, suggesting that it may have impact damage as well as thermal mechanical damage.

Figure 94. BHA #18 [9.5" TKC83-A2 (A298356)]. Compilation of dull photographs after drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



Figure 95. BHA #18 [9.5" TKC83-A2 (A298356)]. Compilation of dull photographs after drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



Figure 96. BHA #18 [9.5" TKC83-A2 (A298356)]. Compilation of dull photographs after drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



Figure 97. BHA #18 [9.5" TKC83-A2 (A298356)]. Dull photograph after drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



Lost diamond table likely occurred after TD while flowing for 3 hours to cool the hole.

Figure 98. BHA #18 [9.5" TKC83-A2 (A298356)]. Compilation of dull photographs after drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.




Bottom Hole Assembly					
Job#	OP.039349	Rig	Frontier 16	BHA Length (Usft)	1263.09
Operator	Utah Forge	BHA #	11	BHA Weight dry (klbs)	67.39
Well	10B(78)-32 - 10B(78)-32	Bit #	11	BHA Weight Bouyed (klbs)	58.85
Field	Beaver (University of Utah) - Utah Forge	Depth In (Usft)	8085.00	Wt. Below Jars dry (klbs)	67.39
Date In	05/22/2023	Depth Out(Usft)	8085.00	Wt. Below Jars Bouyed (klbs)	58.85
Date Out	05/22/2023	Drilled(Usft)	0.00	Drilling / Circ Hours	0.00 / 0.00

Sensor Offsets													
Survey Offset				Gamma Offset				Gyro Offset				N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)
1	A298356	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.25	1.25
2	700109	7.15 Mud Motor	7.188	2.000	7.250	1.60	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	41.92	43.17
3	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	2.19	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	48.56
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.22	57.78
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	88.89
6	129-076	6 3/4 Pulser Sub	6.500	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.50	94.49
7	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	106.73
8	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	116.56
9	7015	6 3/4 Black Box	6.750	2.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	122.56
10	DR 48701	6 3/4 Filter sub	6.688	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	126.49
11	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	128.94
12		9 JTS, 6 3/4 DCs	6.813	2.875	-1.000	-1.00			100.000	27.83	27.83	278.27	407.21
13		Crossover (DCs to HWDP)	6.937	3.000	-1.000	-1.00			0.000	0.00	27.83	3.15	410.36
14		29 JTS HWDP	5.500	3.625	0.000	0.00			46.400	39.57	67.39	652.73	1263.09

Bit Data		Motor Data	
SN	A298356	SN	700109
Size (in)	9.500	OD (in)	7.188
Type	PDC	Description	7.15 Mud Motor
Description	9 1/2 8 Blade PDC bit	Make/Model	Titan 22
Make	NOV	Bit to Bond (Usft) / Angle	4.75 / 1.00
Model	TKC 83	Stab / Kick Pad OD (in)	9.375 / 7.375
TFA	1.20 (Bit14)	Stator Vendor/Type/Fill	-0.0090
Grade In	New	Pre Run Dyno HP%	
Grade Out		Lobes	6/7
Drilled (Usft)	0.000	Stages	7.1
		Rev/Gal	0.230
		Diff Press (Avg/Max)(psi)	0.0 / 1670.0
		Press. Drop(psi)	0.0
		Max Torque(Kftib)	18680.0
		Max RPM	170
		Flow Range(gpm)	
		Re-Run	NO
		Direct Bill	NO

Figure 99. BHA #18 [9.5” TKC83-A2 (A298356)]. BHA for drilling from 8,085 to 8,585 ft MD. Note - ReedHycalog and SDI refer to this as BHA #11 - it is in fact BHA #18. This was an NOV TKC83-A2 PDC bit. Pulled on schedule to test different bit performances.



		WELL NAME FORGE 16B (78) -32	
		RIG: Frontier 16	
	APPLICATION Tangent	COUNTY Beaver	
	BIT SIZE AND TYPE 9.5" D406V	SERIAL NUMBER 5341818	
	DISTANCE (ft) 670'	ROP (ft/hr) 78.8	
IN (ft) 8,585'	OUT (ft) 9,255'	HOURS 8.5	DATE 5/25/2023
		TARGET FORMATION Granite	
		BHA INFO 7.188" Titan 22 MTR 0.23 RPG 6/7 7.1 STG 1.0 Bend w/ roller reamer	
BKR DULL GRADE: 1-1-BT-S-X-00-WT-BHA			
RUN COMMENTS <ul style="list-style-type: none"> • One broken cutter in the center of the bit, and one in the gage • One cracked cutter in the shoulder with small wear flats on the rest of the shoulder cutters. • DD Comments: No issues with toolface control, but the BHA was dropping in rotation 			



Cracked shoulder cutter

Figure 100. BHA #19 [9.5" D406V (5341818)]. Bit summary for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances.






Cutter #1 got crushed. Might need a BR increase or potentially more diamond volume in the cone to take the WOB.

Effectively proved that back up cutters are not essential when the bit dysfunction is being closely monitored.

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #12	11	9.50	D406V	5341818	BAKER	8585.00	9255.00	670	5.6	120

Figure 101a. BHA #19 [9.5" D406V (5341818)]. Dull photographs for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances.

Baker Hughes  Run Recap

		WELL NAME FORGE 16B (78) - 32	
		RIG: Frontier 16	
	APPLICATION Tangent	COUNTY Beaver	
	BIT SIZE AND TYPE 9.5" D406V	SERIAL NUMBER 5341818	
	DISTANCE (ft) 670'	ROP (ft/hr) 78.8	
IN (ft) 8,585'	OUT (ft) 9,255'	HOURS 8.5	DATE 5/25/2023
		TARGET FORMATION Granite	
		BHA INFO 7.188" Titan 22 MTR 0.23 RPG 6/7 7.1 STG 1.0 Bend w/ roller reamer	
BKR DULL GRADE: 1-1-BT-S-X-00-WT-BHA			
RUN COMMENTS <ul style="list-style-type: none"> • One broken cutter in the center of the bit, and one in the gage • One cracked cutter in the shoulder with small wear flats on the rest of the shoulder cutters. • DD Comments: No issues with toolface control, but the BHA was dropping in rotation 			



Cracked shoulder cutter

Figure 101b. BHA #19 [9.5" D406V (5341818)]. Dull photographs for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances.

Bottom Hole Assembly														
Job#	OP.039349			Rig	Frontier 16		BHA Length (Usft)			3369.01				
Operator	Utah Forge			BHA #	12		BHA Weight dry (klbs)			39.57				
Well	16B(78)-32 - 16B(78)-32			Bit #	12		BHA Weight Bouyed (klbs)			34.55				
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	8585.00		Wt. Below Jars dry (klbs)			39.57				
Date In	05/24/2023			Depth Out(Usft)	8585.00		Wt. Below Jars Bouyed (klbs)			34.55				
Date Out	05/24/2023			Drilled(Usft)	0.00		Drilling / Circ Hours			0.00 / 0.00				
Sensor Offsets														
Survey Offset				94.00		Gamma Offset			N/A		Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)	
1	5341818	9 1/2 6 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.25	1.25	
2	700106	7.15 Mud Motor	7.188	2.000	7.250	1.60	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	41.87	43.12	
3	GU3274	FG 9 1/2 Roller reamer	6.563	3.000	6.750	2.19	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	6.96	50.10	
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	9.22	59.32	
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	31.11	90.43	
6	129-076	6 3/4 Pulser Sub	6.500	3.500	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	5.60	96.03	
7	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	12.24	108.27	
8	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	9.83	118.10	
9	7006	6 3/4 Black Box	6.750	2.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	5.90	124.00	
10	DR 48701	6 3/4 Filter sub	6.688	3.250	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	3.93	127.93	
11	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 F B	4 1/2 F P	0.000	0.00	0.00	2.45	130.38	
12		Crossover (BHA to HWDP)	6.937	3.000	0.000	0.00	4 1/2 F P	5 1/2 FH B	0.000	0.00	0.00	3.15	133.53	
13		28 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	39.57	39.57	852.73	986.26	
14		25 STD Drill pipe	5.500	0.000	0.000	0.00	5 1/2 FH B	5 1/2 FH P	0.000	0.00	39.57	2378.50	3364.76	
15		Crossover (HWDP to IDP)	6.937	3.000	0.000	0.00	5 1/2 Delta 544	5 1/2 FH P	0.000	0.00	39.57	4.25	3369.01	
Comments														
Lobe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1,670 Max Torque = 18,680 Rev/Gal = 0.23 9 1/2" Roller Reamer Eye = 84 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000														

Figure 102. BHA #19 [9.5" D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances.



Sliding Parameters

Recommend – 58 klbs at 200 RPM

- Test up to 65 klbs during step tests

#1 – Step tests of WOB during the first part of the slide

- Largest separation of downhole and total MSE until WOB was steady at 55,500 lbs for 5 minutes

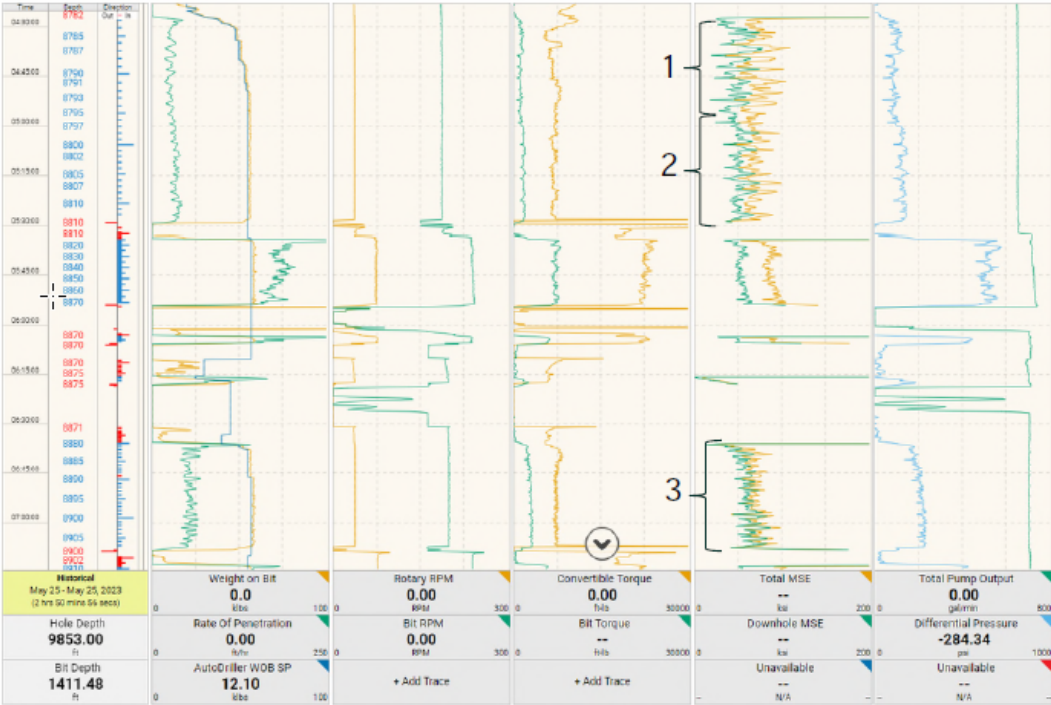
#2 – Steady WOB at 55,000-56,000 lbs

- Total MSE starts to lower to be closer to Downhole MSE
- Minor increase in ROP from the WOB step tests

Both Steps 1 and 2 used a lower flow rate (655 gpm) leading to a lower RPM (187 RPM).

#3 – Increase in ROP due to higher RPM

- Increased flow rate to 702 gpm for a total RPM of 199 RPM
- Increase in ROP from 40 ft/hr to 50 ft/hr
- Increased WOB from 56,000 lb to 58,000 with small increase in ROP



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Figure 103. BHA #19 [9.5” D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the sliding operations with this bit and this BHA, provided by Baker Hughes.



Rotating

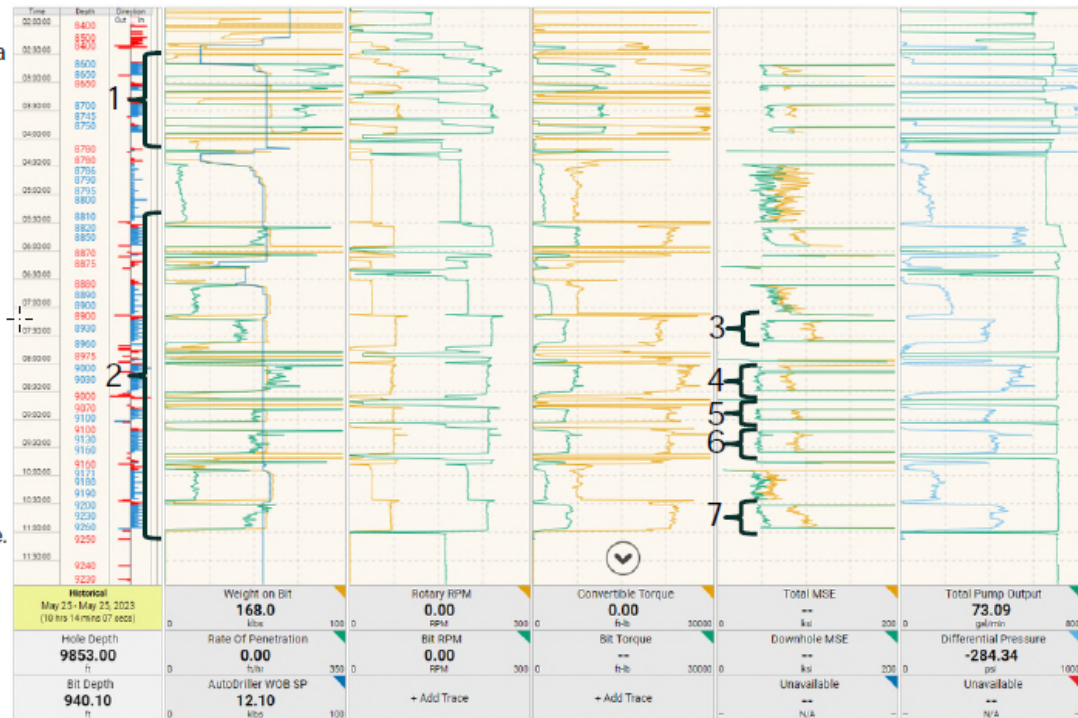
WOB Step Tests

1. The first 5 rotate sections used 60,000 klbs gaining a ROP of 200-350 ft/hr
2. After this point the rotating WOB was reduced to 56,000 lbs with an average ROP of 150-200 ft/hr
 - This section saw a larger separation in between downhole and total MSE

RPM Step Tests – Only saw changes in total MSE through these steps

3. 240 RPM – Total MSE increased to 110 ksi
4. 230 RPM – Total MSE reduced to ~70 ksi
5. 233 RPM – Total MSE increased slightly to ~80 ksi
6. 233 RPM – Small increase to 82 ksi, but saw steadier torque signature
7. 233 RPM – Saw a small increase in ROP with lower MSE, but then quickly saw total MSE linearly increase.

Step 7 was where the center cutter was likely broken correlating to the increase in total MSE.



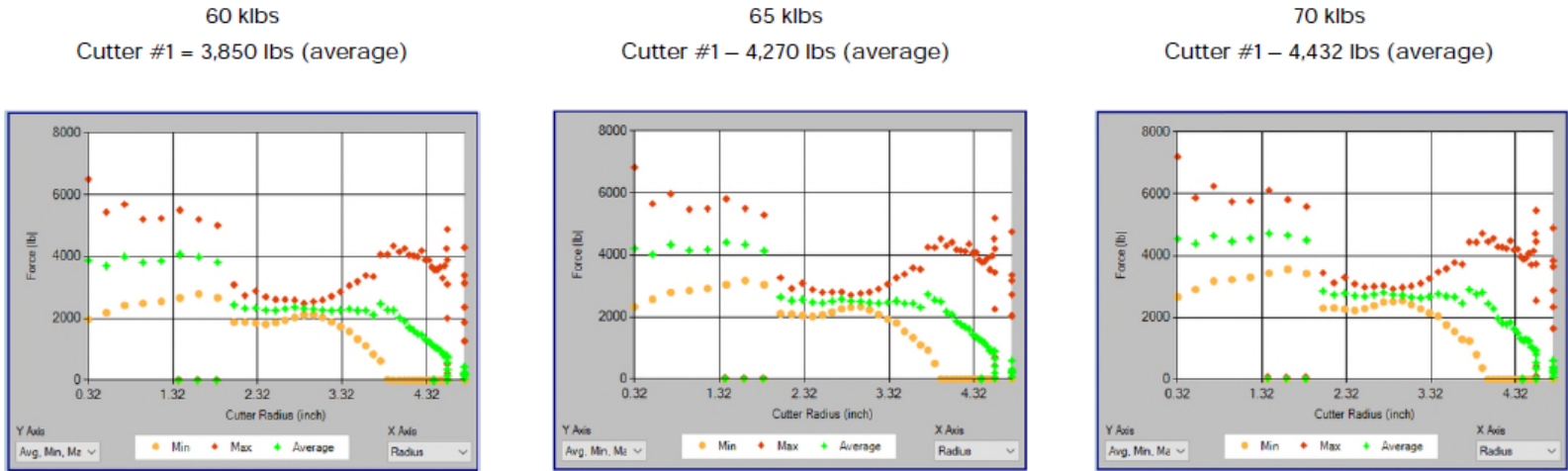
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Figure 104. BHA #19 [9.5" D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the rotating operations with this bit and this BHA, provided by Baker Hughes.

Cutter Forces

Used force models to understand the impact of WOB on cutter #1 that was broken on run #1. Lab testing showed that 4,000-4800 lbs was the WOB limit for this particular cutter/geometry before the cutter started to develop cracks in the diamond table.

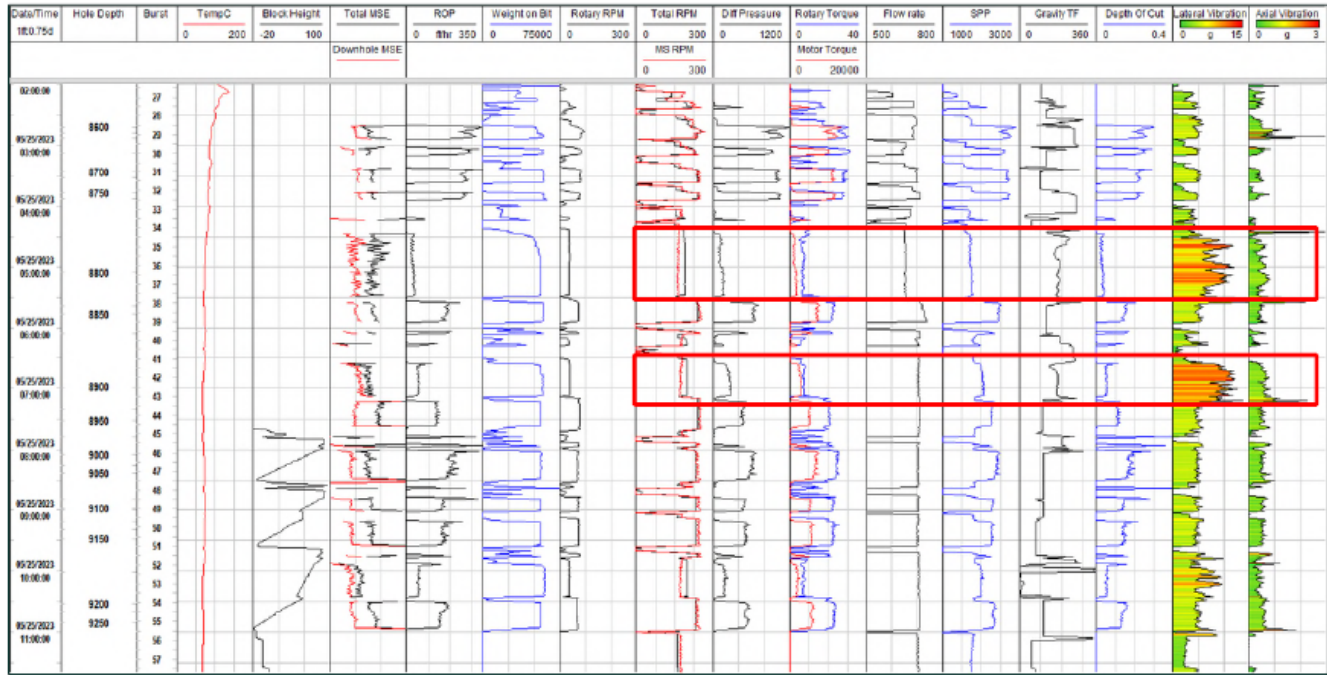


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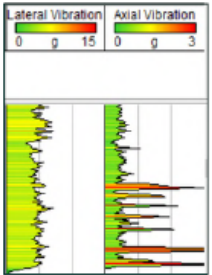


Figure 105. BHA #19 [9.5" D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the maximum load that could be applied to this bit - on a cutter by cutter basis, provided by Baker Hughes.

Run #1 – Surface + MultiSense Data



- Observations:
- Lower sliding RPM compared to calculated (~20 RPM)
 - High lateral vibs when sliding (+5-7 g)
 - Some variation in the rotating RPM that may indicate RPM oscillations or stick-slip
 - Axial vibrations that need more analysis/understanding (going to bottom/when rotating)



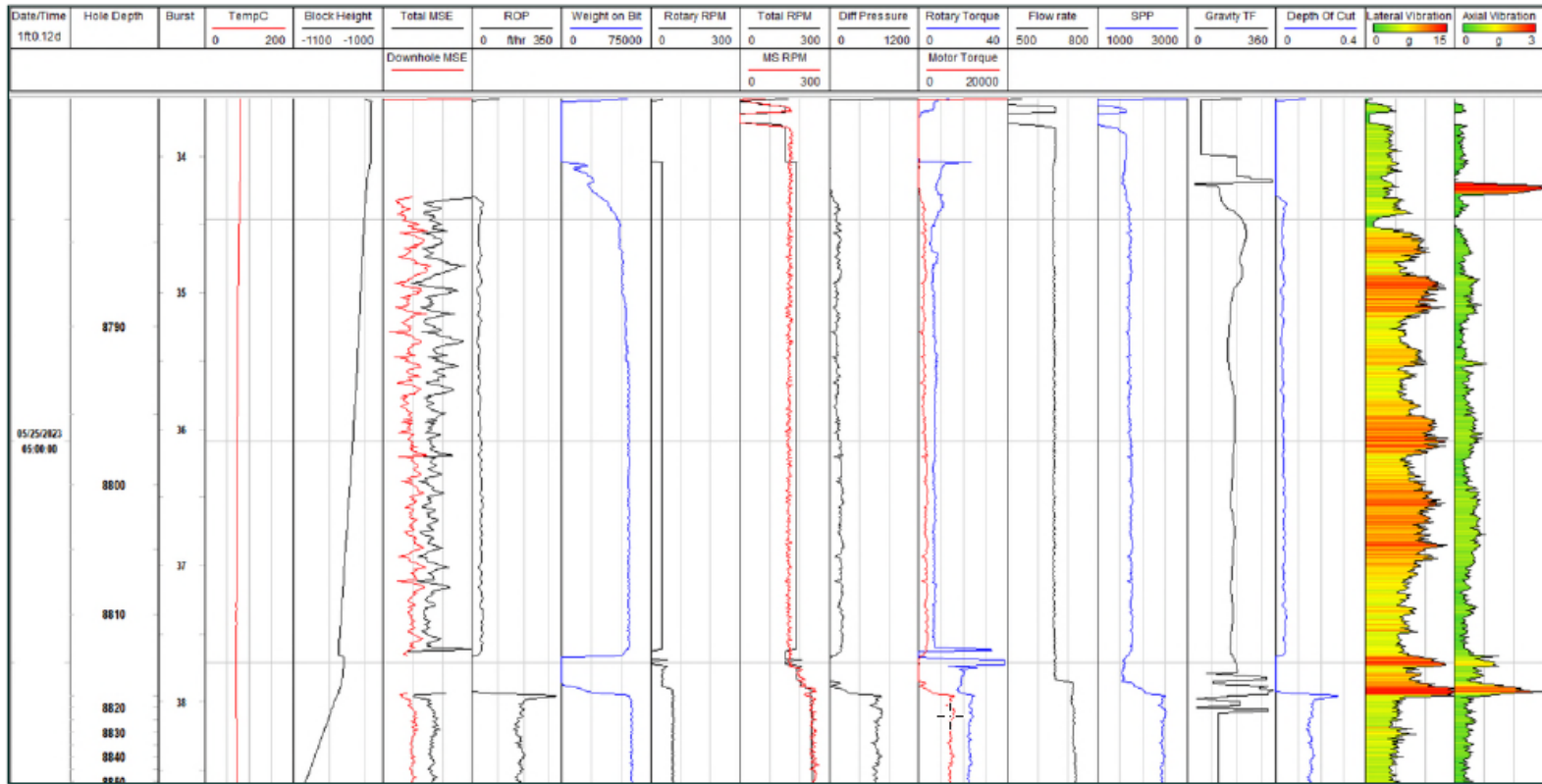
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Figure 106. BHA #19 [9.5" D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the in-bit vibrational sensing for this run, provided by Baker Hughes.



Burst #34-38



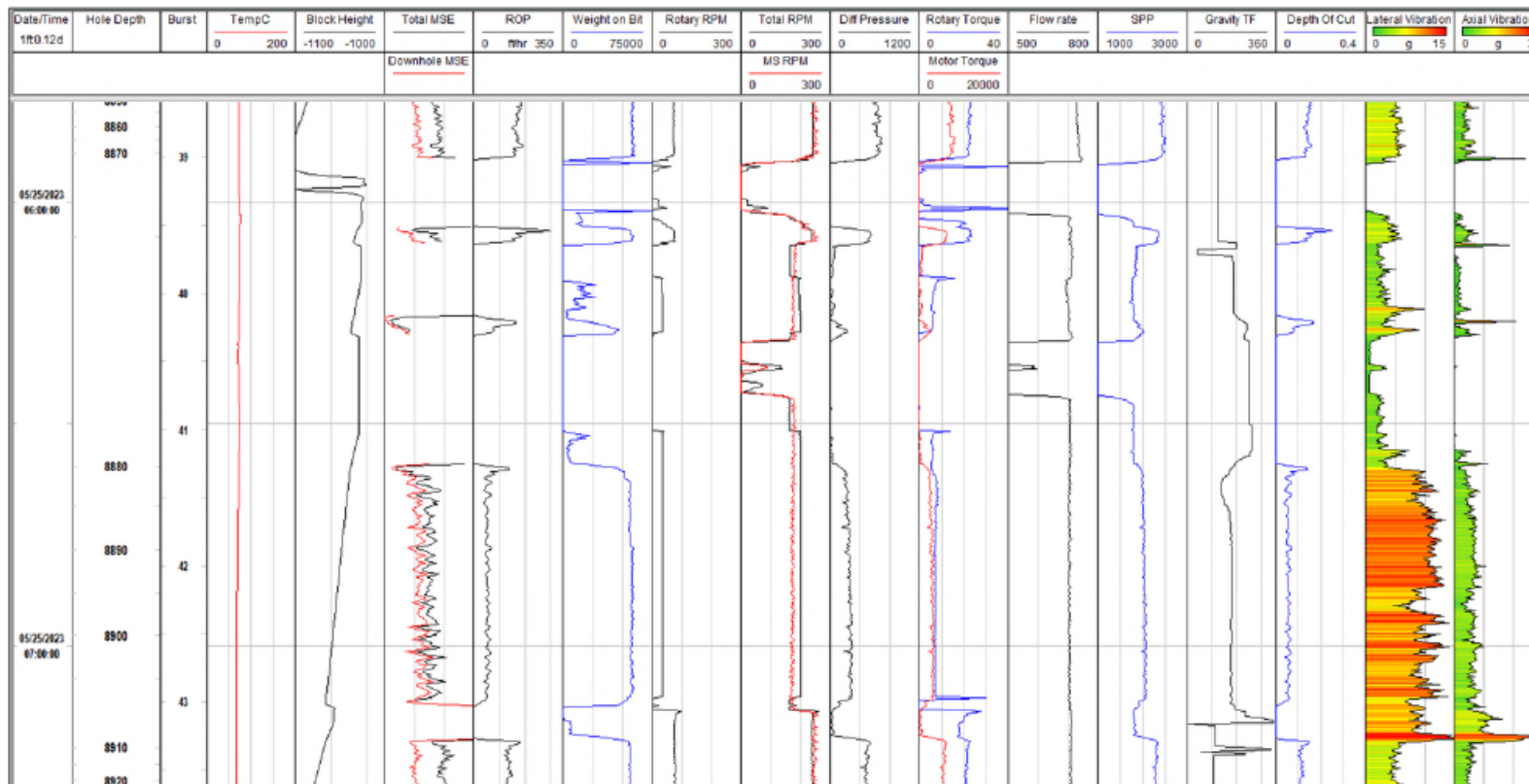
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Figure 108. BHA #19 [9.5” D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the in-bit vibrational sensing for this run, zoomed in from about 8780± (plus) ft MD, provided by Baker Hughes.



Burst #39-43

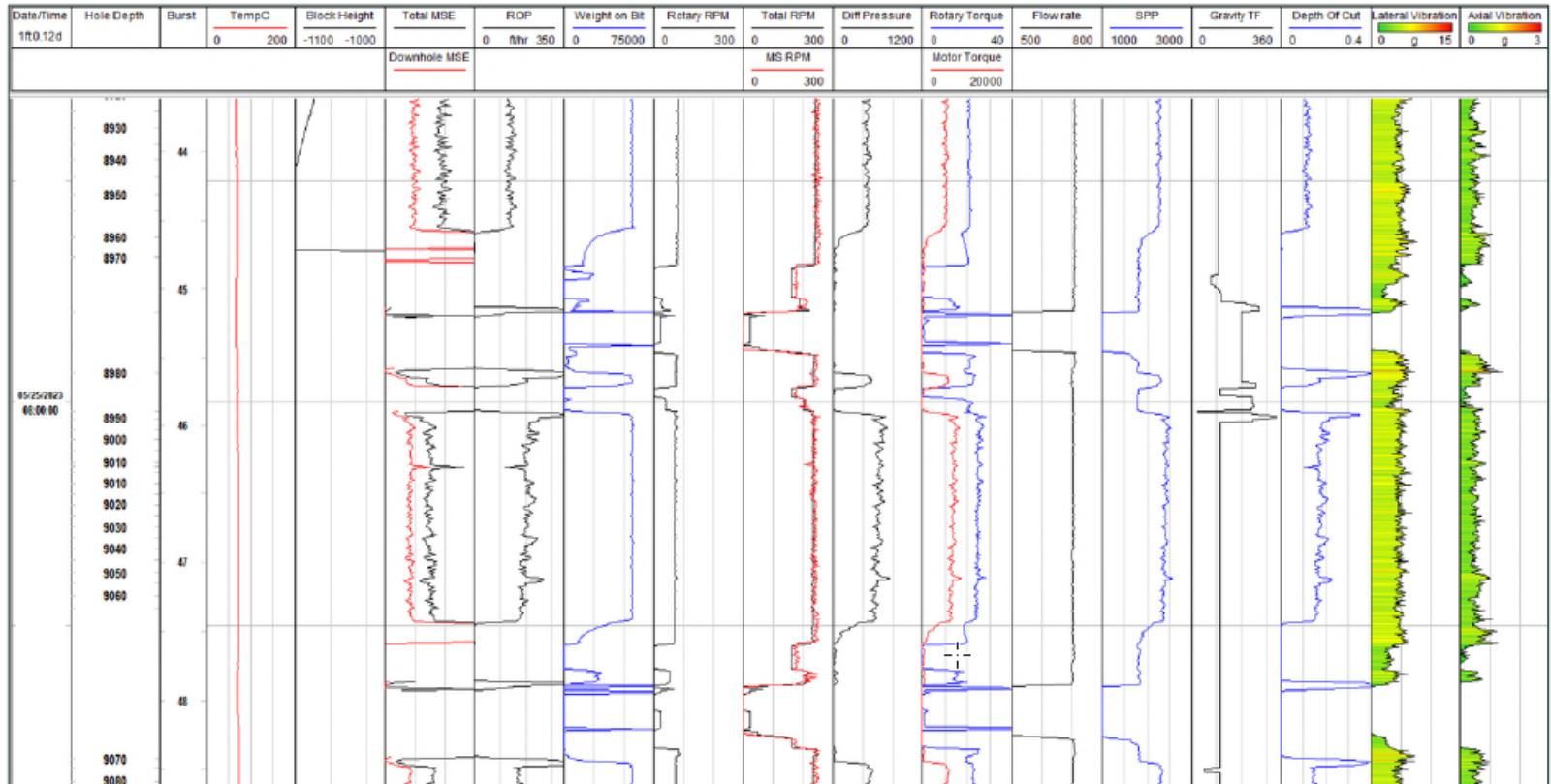


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Figure 109. BHA #19 [9.5” D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the in-bit vibrational sensing for this run, zoomed in from about 8860± (plus) ft MD, provided by Baker Hughes.

Burst #44-48

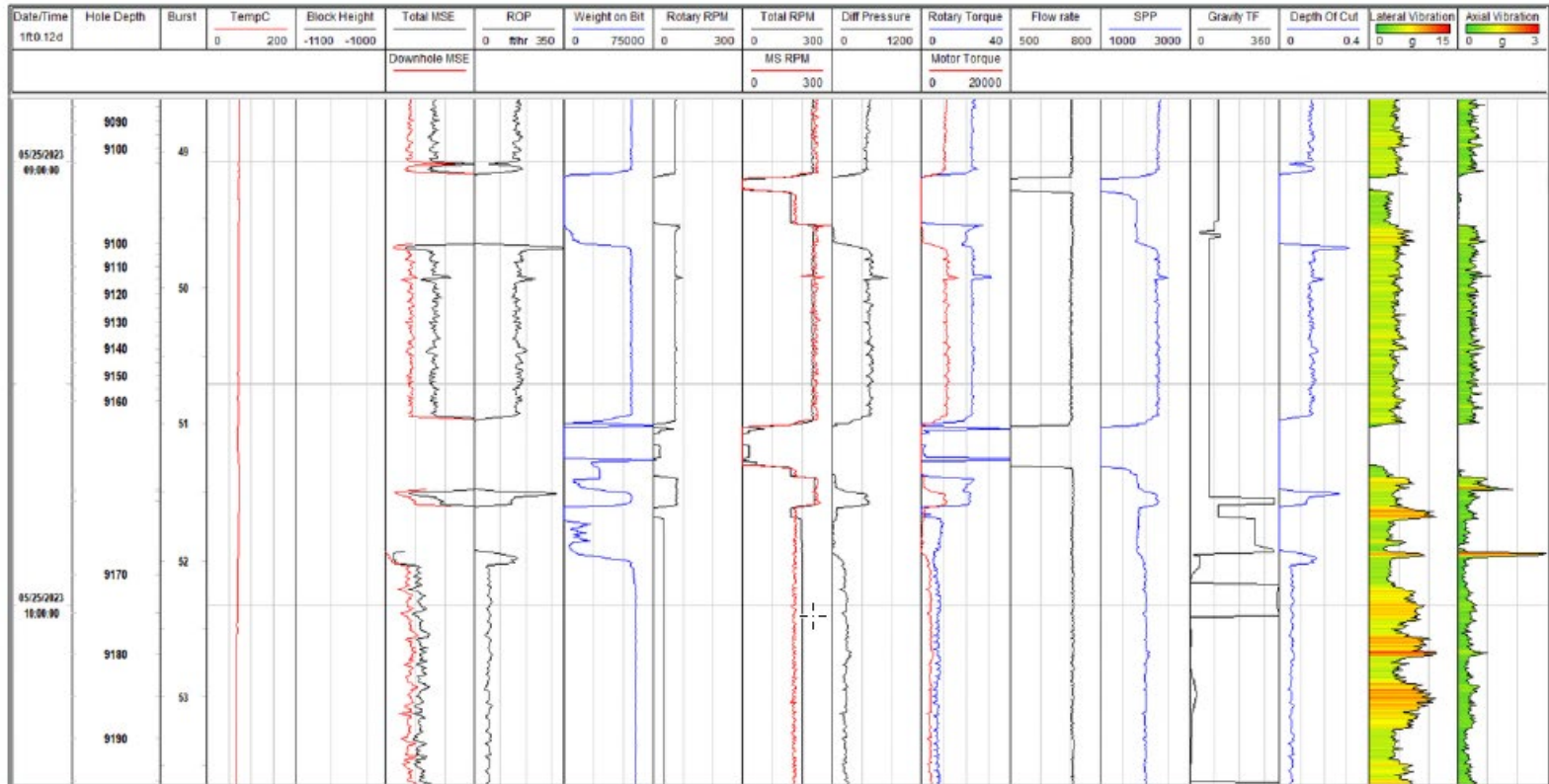


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Figure 110. BHA #19 [9.5" D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the in-bit vibrational sensing for this run, zoomed in from about 8930± (plus) ft MD, provided by Baker Hughes.

Burst #49-53



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Figure 111. BHA #19 [9.5" D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the in-bit vibrational sensing for this run, zoomed in from about 9,090± (plus) ft MD, provided by Baker Hughes.



Burst #54-55

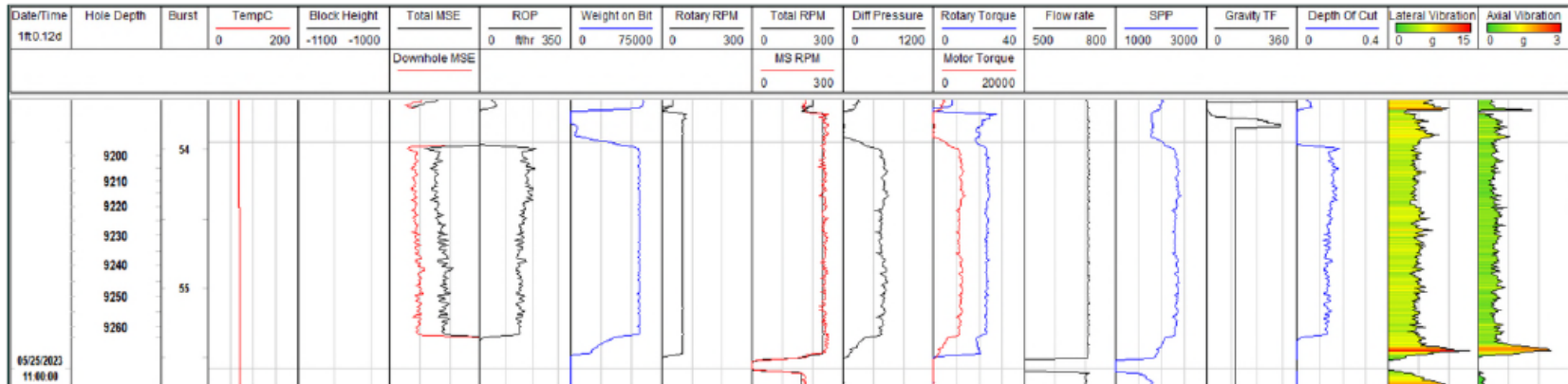


Figure 112. BHA #19 [9.5” D406V (5341818)]. BHA for drilling from 8,585 to 9,255 ft MD. Note -SDI refers to this as BHA #12 - it is in fact BHA #19. This was a Baker Hughes D406V PDC bit. Pulled on schedule to test different bit performances. This is a commentary on the in-bit vibrational sensing for this run, zoomed in from about 9,200± (plus) ft MD, provided by Baker Hughes.

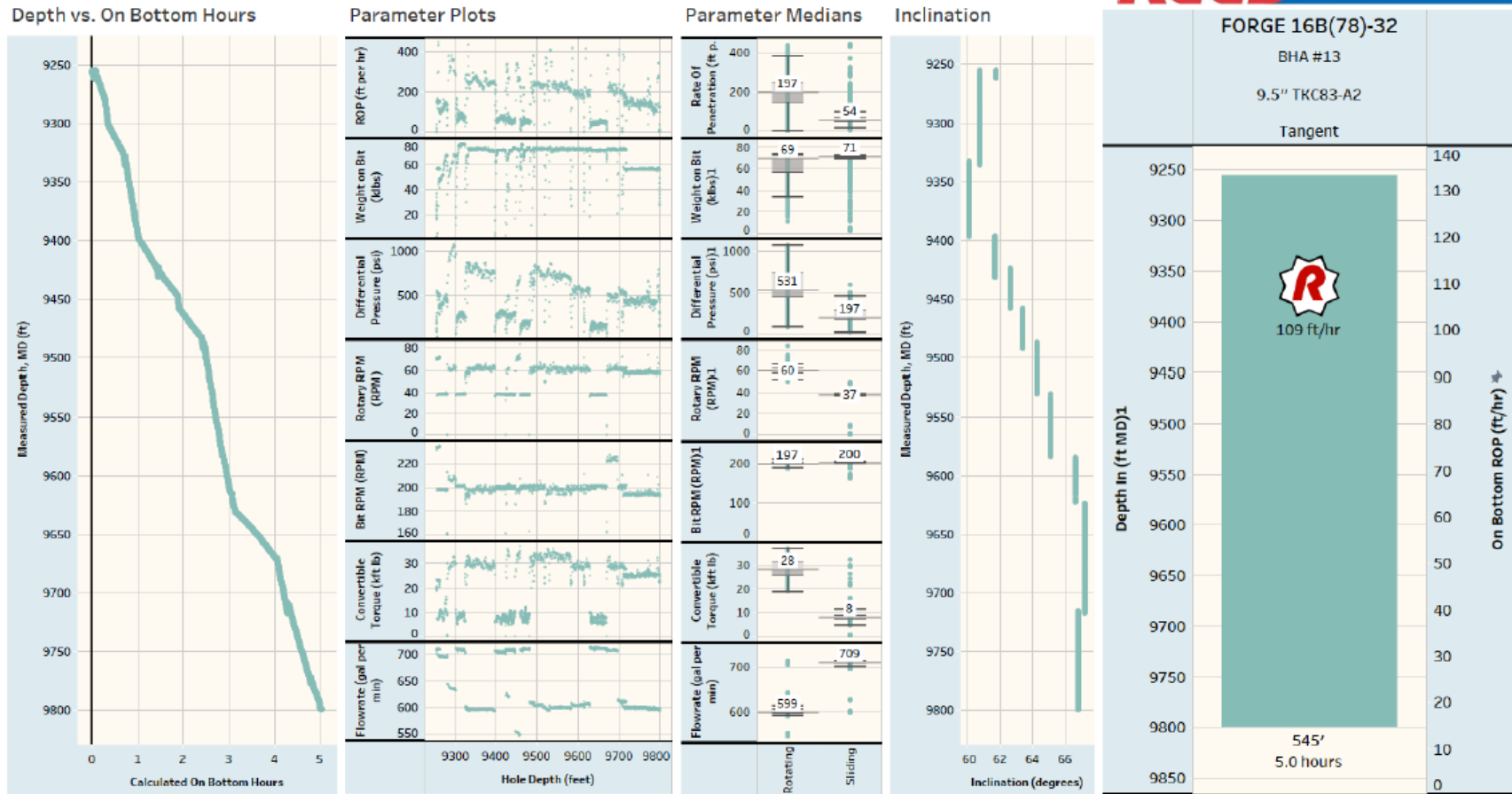
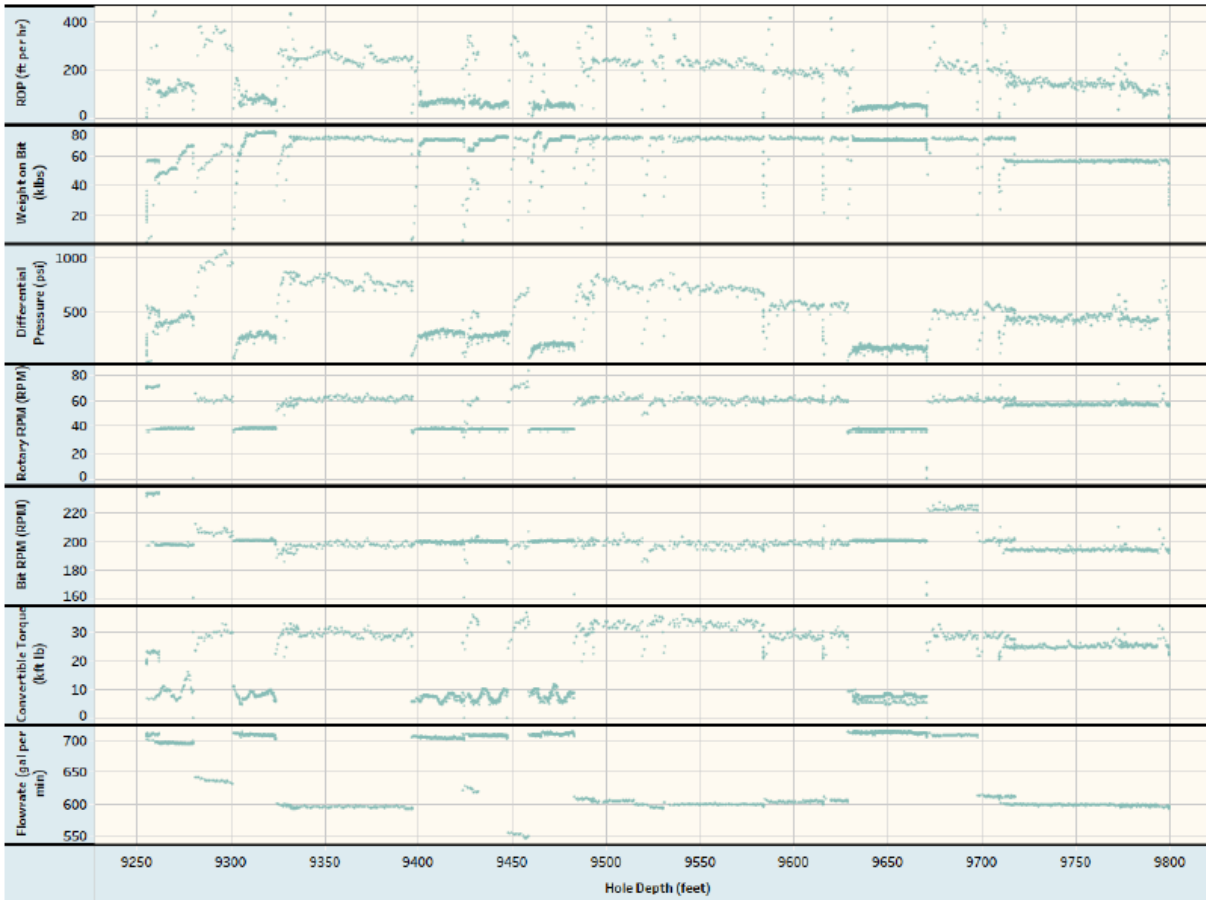


Figure 113. BHA #20 [9.5" TKC83-A2 (A298355)]. Bit and BHA performance for drilling from 9,255 to 9,800 ft MD. Note -ReedHycalog and SDI refer to this as BHA #13 - it is in fact BHA #20. This was an NOV TKC83 PDC bit. Pulled on schedule to test different bit performances.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 9.5-BHA #13-(TKC83-A2)-REEDHYCALOG-FORGE 16B

ROP Limiter: Slowing the Bit RPM's did not deter the ROP from having a similar trend but did lead to a better bit dull.

Started at 350 ft/hr with 70 klbs of WOB and dropped to a maintained ROP of 230 ft/hr in Rotation.

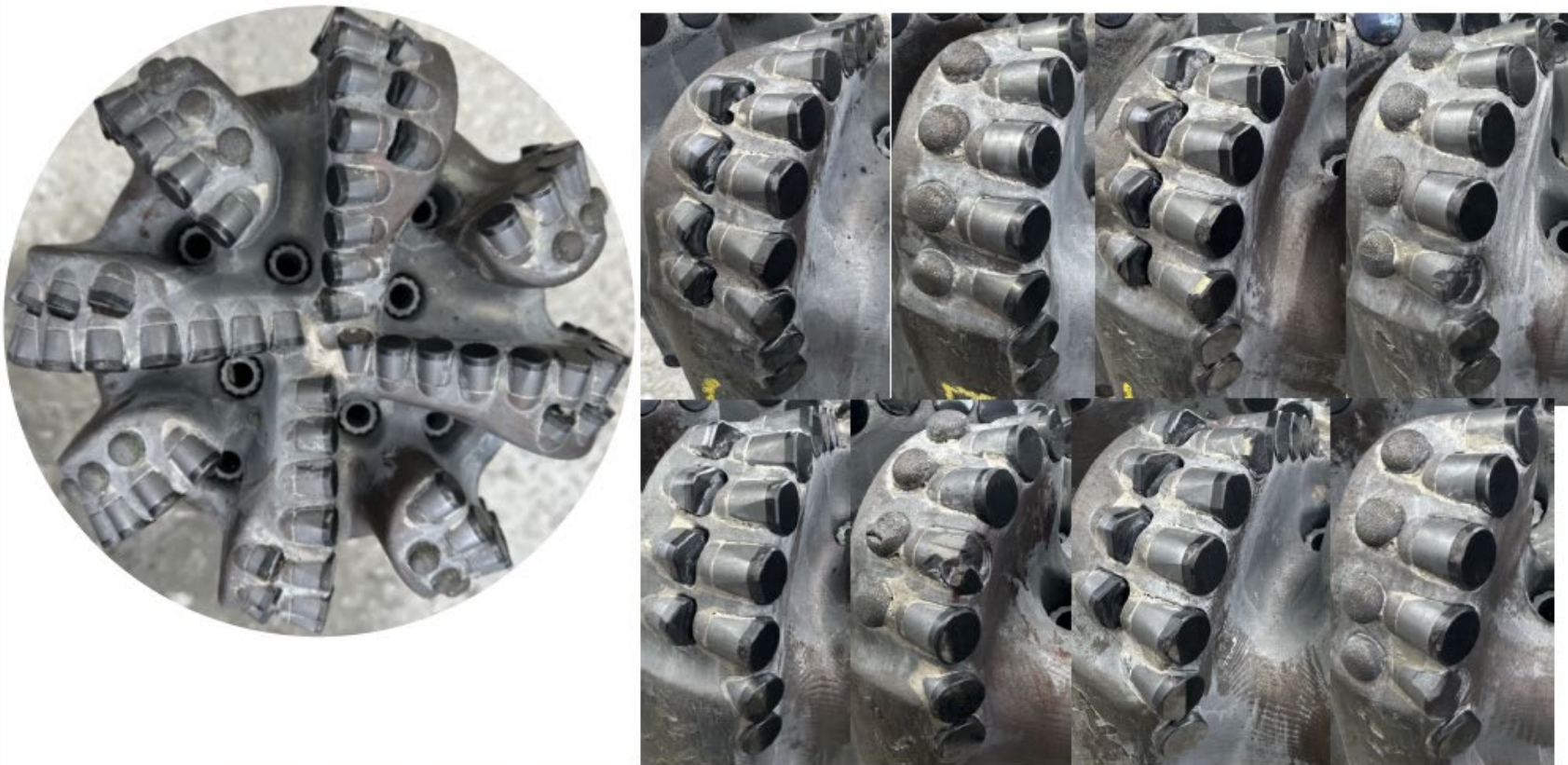
Bit RPM's were adjusted by running 60 RPM's on surface with 600 GPM's when rotating and then increasing the GPM's to 710 when sliding so that the bit RPM's would be maintained through slides. Using this method of sliding increased sliding ROP by 100% to average at 54 ft/hr.

Solution: Results from this run show that longer footages can be drilled if the cutter temperatures can be lowered through lower bit RPM's.

Sliding procedures should be noted from this run, as the slides were 100% faster than the sliding ROP from BHA #11.



Figure 114. BHA #20 [9.5" TKC83-A2 (A298355)]. Bit and BHA performance for drilling from 9,255 to 9,800 ft MD. Note -ReedHycalog and SDI refer to this as BHA #13 - it is in fact BHA #20. This was an NOV TKC83 PDC bit. Pulled on schedule to test different bit performances.



Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #13	12	9.50	TKC83-A2	A298355	REEDHYCLOG	9255.00	9800.00	545	4.98	109

Figure 115. BHA #20 [9.5" TKC83-A2 (A298355)]. Dull photographs after drilling from 9,255 to 9,800 ft MD. Note - SDI refers to this as BHA #13 - it is in fact BHA #20. This was an NOV TKC83 PDC bit. Pulled on schedule to test different bit performances.

Bottom Hole Assembly															
Job#	OP.039349			Rig	Frontier 16		BHA Length (Usft)			1051.37					
Operator	Utah Forge			BHA #	13		BHA Weight dry (klbs)			42.59					
Well	16B(78)-32 - 16B(78)-32			Bit #	13		BHA Weight Bouyed (klbs)			37.19					
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	9255.00		Wt. Below Jars dry (klbs)			42.59					
Date In	05/26/2023			Depth Out(Usft)	9255.00		Wt. Below Jars Bouyed (klbs)			37.19					
Date Out	05/26/2023			Drilled(Usft)	0.00		Drilling / Circ Hours			0.00 / 0.00					
Sensor Offsets															
Survey Offset				84.00		Gamma Offset			N/A		Gyro Offset			N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	A298355	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.25	1.25		
2	700109	7.15 Mud Motor	7.188	2.000	7.250	1.60	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	41.92	43.17		
3	GUG274	FG 9 1/2 Roller reamer	6.563	3.000	6.750	2.19	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	6.98	50.15		
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	9.22	59.37		
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	31.11	90.48		
6	129-076	6 3/4 Pulser Sub	6.500	3.500	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	5.60	96.08		
7	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	12.24	108.32		
8	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	9.83	118.15		
9	7006	6 3/4 Black Box	6.750	2.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	5.90	124.05		
10	DR 48701	6 3/4 Filter sub	6.688	3.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	3.93	127.98		
11	AFLS803	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	2.45	130.43		
12		Crossover (BHA to HWDP)	6.937	3.000	0.000	0.00	4 1/2 F P	5 1/2 FH B	0.000	0.00	0.00	3.15	133.58		
13		30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.59	42.59	917.79	1051.37		
Comments															
Lobe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1,670 Max Torque = 18,680 Rev/Gal = 0.23 9 1/2" Roller Reamer Eye = 84 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000															

Bit Data		Motor Data	
SN	A298355	SN	700109
Size (in)	9.500	OD (in)	7.188
Type	PDC	Description	7.15 Mud Motor
Description	9 1/2 8 Blade PDC bit	Make/Model	Scientific Drilling / Titan 22
Make	NOV	Bit to Bond (Usft) / Angle	4.75 / 1.00
Model	TKC83	Stab / Kick Pad OD (in)	8.750 / 7.375
TFA	1.20 (8x14)	Stator Vendor/Type/Pit	-0.0000
Grade In	New	Pre Run Dyno HP%	
Grade Out		Lobes	6/7
Drilled (Usft)	0.000	Stages	7.1
		Rev/Gal	0.230
		Diff Press (Avg/Max)(psi)	0.0 / 1670.0
		Press. Drop(psi)	0.0
		Max Torque(Klbf)	18680.0
		Max RPM	170
		Flow Range(gpm)	500-750
		Re-Run	NO
		Direct Bit	NO

Stabilizer Data						
Component Number	Description	OD (in)	Blade Length (in)	Blade Width (in)	Blade Count	Stab->Bit (Usft)
2	7.15 Mud Motor	6.750	5.50	0.00	5	2.53
3	FG 9 1/2 Roller reamer	6.625	7.25	2.50	3	46.57

Figure 116. BHA #20 [9.5" TKC83-A2 (A298355)]. BHA for drilling from 9,255 to 9,800 ft MD. Note -SDI refers to this as BHA #13 - it is in fact BHA #20. This was an NOV TKC83 PDC bit. Pulled on schedule to test different bit performances.



IX.5 Operations from 9,800 ft MD to TD

This included coring where hydraulic fractures from the April 2022 stimulation of well 16A(78)-32 would be expected if they propagated directly vertically. A summary of activities is provided in Table 5. All coring data, including bit sensor information is provided in Appendix F.

Table 5. Drilling Activities from 9800 ft MD to TD at 10,947 ft

May 29, 2023	Cut 8-3/4-inch core from 9,800 to 9,817 ft MD. Polished bottom? (six-foot discrepancy).
June 1/2, 2023	Core from 9,823 to 9,853 ft MD.
June 3, 2023	Safety ream from 9,733 to 9,853 ft MD with 9-1/2-inch insert bit. Drill 10 ft of new hole.
June 4, 2023	Drill ahead with a 9-1/2-inch PDC (bit #24 and BHA #27) from 9863 to 10,250 ft MD.
June 5, 2023	Core from 10,250 to 10,264 ft MD.
June 6, 2023	Drill 8-3/4-inch pilot hole (TCI) reaming and drilling ahead to 10,264 ft MD.
June 7, 2023	Cored from 10,264 to 10,271 ft MD.
June 8, 2023	Polish bottom of hole with 8-3/4-inch TCI and safety ream and drill ahead to 10,274 ft MD.
June 10/11, 2023	Core from 10,274 to 10,304 ft MD.
June 11, 2023	Drill with 8-3/4" PDC from 10,304 to 10,430 ft MD as pilot hole for the core assembly.
June 12/13, 2023	Core from 10,430 to 10,460 ft MD.
June 14, 2023	Drill ahead 2 ft to 10,462 with an 8-3/4-inch TCI bit.
June 15, 2023	Core from 10,462 to 10,493 ft MD.
June 16, 2023	Ream with 9-1/2-inch PDC bit from 10,250 to 10,493 ft MD and drill ahead to 10,503 ft MD with a TCI bit, motor, and roller reamers
June 17, 2023	Rotate and slide from 10,503 to 10,947 ft MD.
June 18, 2023	Run UBI from 9,400 ft to 4,837 ft MD. On June 18/19, 2023, run triple combo and FMI through the bit from 10,727 ft MD to surface (3,700 ft MD).
June 19, 2023	Run temperature log on wireline (could not get past 7,030 ft).
June 19, 2023	Ran UBI from 4,836 ft to surface.
June 20/21, 2023	Run 9-1/2-inch reaming assembly.
June 22, 2023	Circulate and cool the hole for Baker pipe-conveyed logging tools. Ran a gyro and cooled the hole.

IX.6 Coring from 9,800 to 9,817 and 9,823 to 9,853 ft MD

Two core runs were done (9,800 to 9,817 and 9,823 to 9,853 ft MD).

Report Date	Activities
May 29, 2023	Cut the 8-3/4-inch core from 9,800 to 9,817 ft MD. Polished bottom? (six-foot discrepancy)
June 1-2, 2023	Core from 9823 to 9853 ft MD.

EDR data for these core runs are shown in Figures 117 and 118.

IX.7 Coring from 10,250 to 10,304 ft MD

After coring to 9,853, the 8-3/4-inch hole was opened up to 9-1/2-inch with an insert bit and ten additional feet were drilled. The performance for this reaming run is shown in Figures 119 and 120. Drilling ahead continued with a 9-1/2-inch PDC bit to 10,250 ft MD. This bit run is shown in Figures 122 through 127. The next core run was from 10,250 to 10,264 ft MD.

Report Date	Activities
June 3, 2023	Safety ream from 9,733 to 9,853 ft MD with 9-1/2-inch insert bit. Drill 10 ft of new hole.
June 4, 2023	Drill ahead with a 9-1/2-inch PDC (bit #24 and BHA #27) from 9863 to 10,250 ft MD.
June 5, 2023	Core from 10,250 to 10,264 ft MD (Figure 128).
June 6, 2023	Drill 8-3/4-inch pilot hole (TCI) reaming and drilling ahead to 10,264 ft MD.
June 7, 2023	Core from 10,264 to 10,271 ft MD (Figure 129).
June 8, 2023	Polish bottom of hole with 8-3/4-inch TCI and safety ream and drill ahead to 10,274 ft MD.
June 10/11, 2023	Core from 10,274 to 10,304 ft MD (Figure 130).
June 11, 2023	Drill with 8-3/4" PDC from 10,304 to 10,430 ft MD as pilot hole for the core assembly (Figures 131 through 134).

IX.8 Coring from 10,430 to 10,460 ft MD and 10,462 to 10,493 ft MD

After coring to 10,304 ft MD, the 8-3/4-inch hole was extended to 10,430 for the next core run (as shown above). There were two core runs (10,430 to 10,460 ft MD and 10,462 to 10,493 ft MD).

Report Date	Activities
June 12/13, 2023	Core from 10,430 to 10,460 ft MD (Figure 135).
June 14, 2023	Drill ahead 2 ft to 10,462 with an 8-3/4-inch TCI bit.
June 15, 2023	Core from 10,462 to 10,493 ft MD (Figure 136).
June 16, 2023	Ream with 9-1/2-inch PDC bit from 10,250 to 10,493 ft MD and drill ahead to 10,503 ft MD with a TCI bit, motor, and roller reamers (Figures 137 to 140).

Zone 2 Core Run #1



- CCI 700 60' JMS BHA – 913 Bit
 - Sensored
- Cored from 9,800' – 9,817'
- ROP 1.9 ft./hr.
- Core jammed @ 9.817'
- 17' cored 16.6' Recovered
- No JMS deployments
- 8 3/4" Cleanout Run

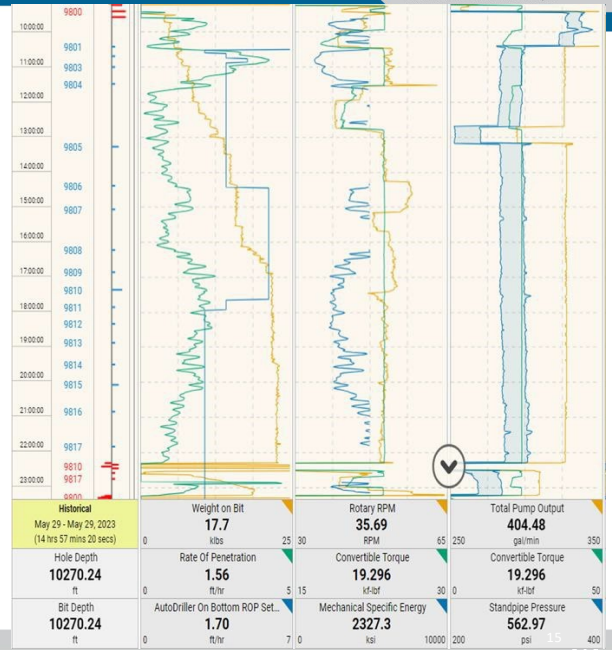


Figure 117. Coring from 9,800 to 9,817 ft MD.

Zone 2 Core Run #2



- CCI 700 60' JMS BHA – 713 Bit
 - Sensored
- Cored from 9,823' – 9,853'
- ROP 2.7 ft./hr.
- 30' cored 28.4' Recovered
- 2 JMS Deployments
 - Primary
 - ~9,828"
 - Secondary
 - ~9,832'
- 9 1/2" Drill Ahead

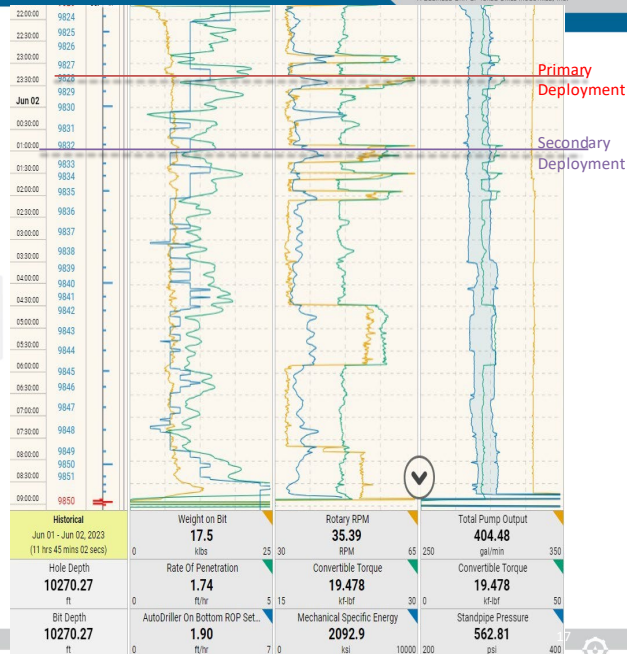


Figure 118. Coring from 9,823 to 9,853 ft MD.

BHA #14[9.5 Insert Bit (5243758) Run Analysis] (Hole Opener)

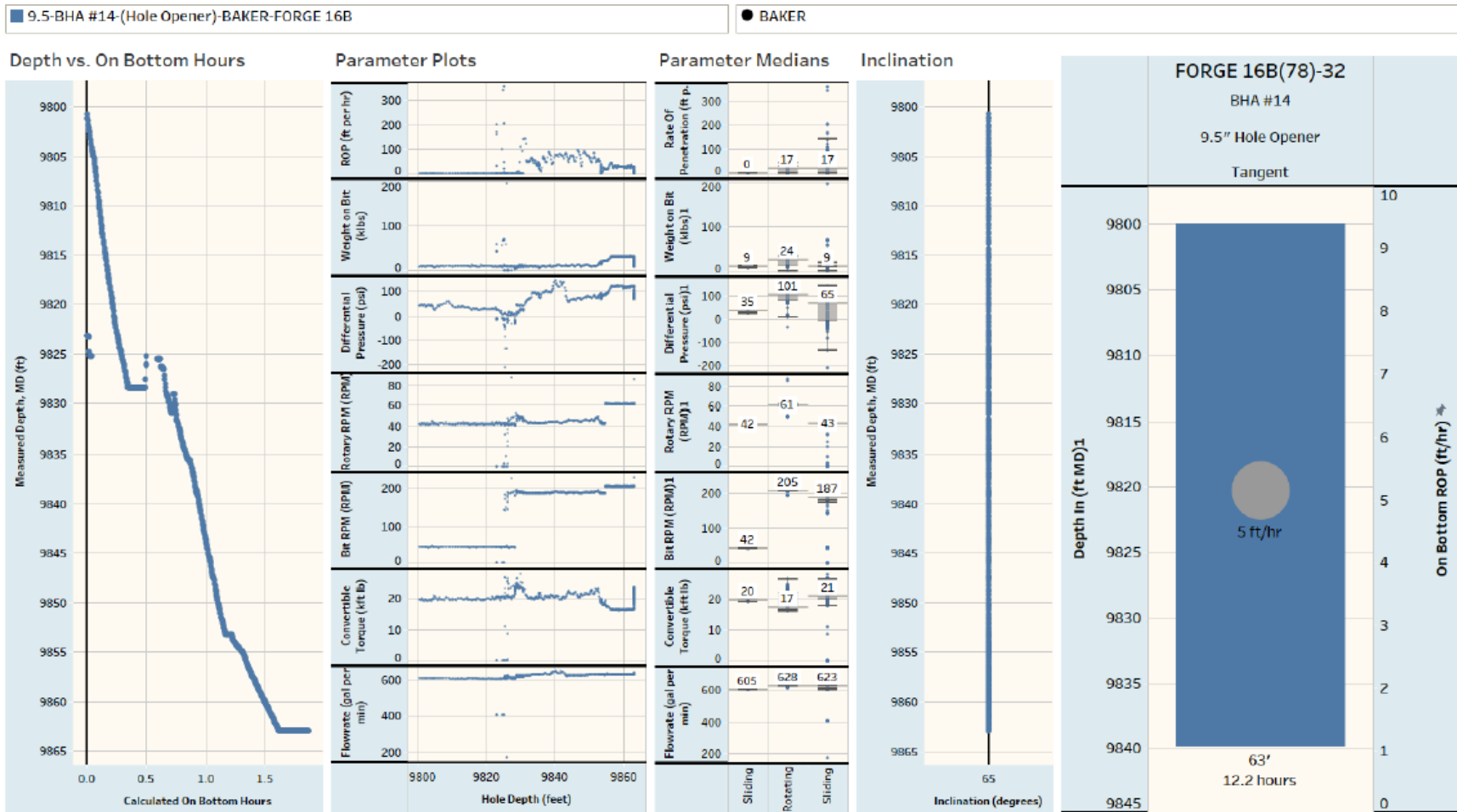
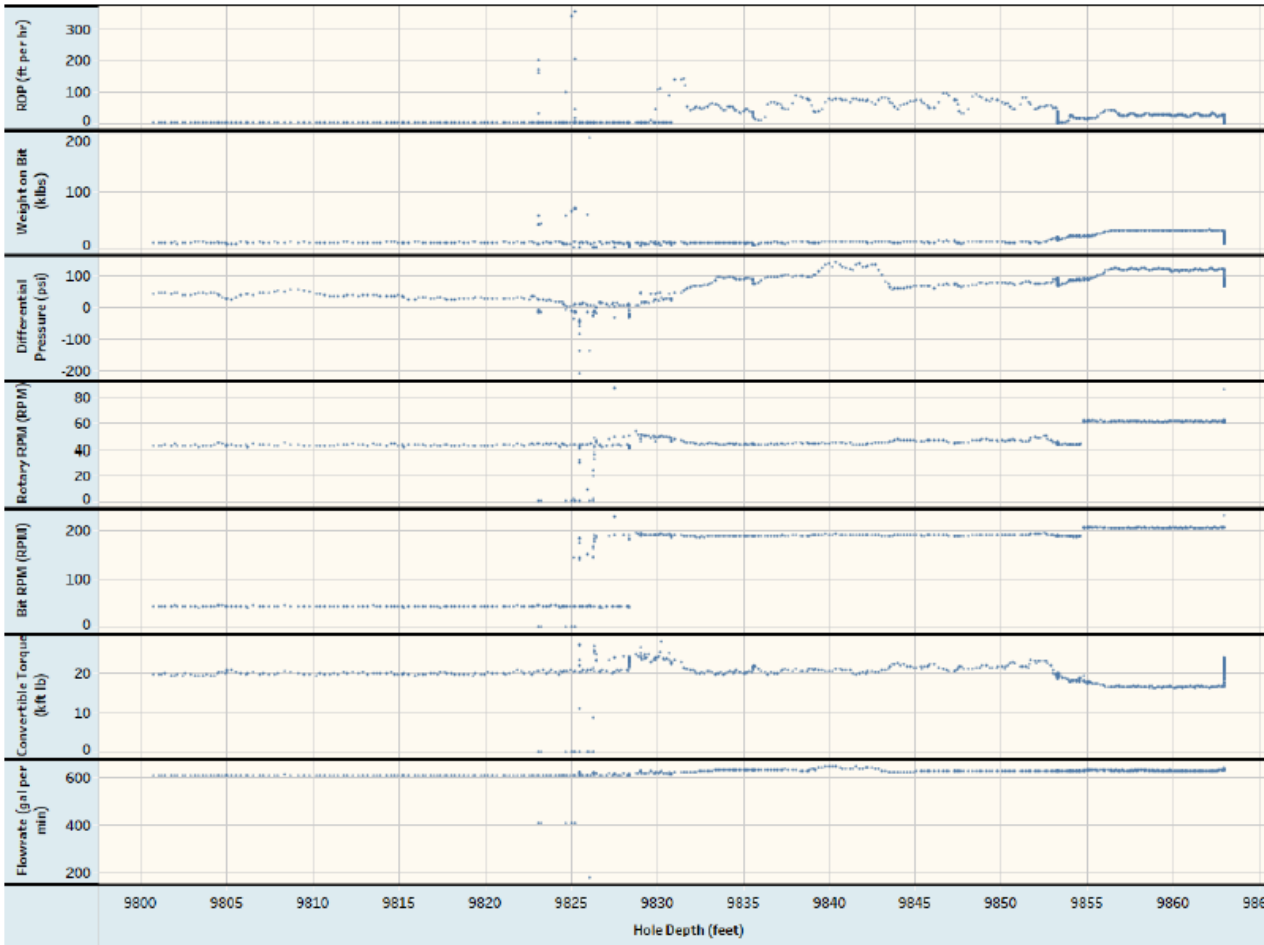


Figure 119. This is the performance of a 9-1/2-inch reaming out the previously cored hole and drilling ahead ten feet. This is BHA 26 (not BHA 14 as attributed in the heading here). The average rate was 5 ft/hr.



Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well
■ 9.5-BHA #14-(Hole Opener)-BAKER-FORGE 16B

ROP Limiter: Reaming Run, no new footage drilled.

Solution:

Figure 120. A zoomed-in view of the performance of a 9-1/2-inch reaming out the previously cored hole and drilling ahead ten feet. This is BHA 26 (not BHA 14 as attributed in the heading here). The average rate was 5 ft/hr.

14: 9 1/2 core section clean out BHA #14

Bottom Hole Assembly															
Job#	OP 039348			Rig	Frontier 16		BHA Length (Usft)		990.58						
Operator	Utah Forge			BHA #	14		BHA Weight dry (klbs)		42.62						
Well	16B(78)-32 - 16B(78)-32			Bit #	14		BHA Weight Bouyed (klbs)		37.22						
Field	Bearer (University of Utah) - Utah Forge			Depth In (Usft)	0.00		Wt. Below Jars dry (klbs)		42.62						
Date In				Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (klbs)		37.22						
Date Out				Drilled(Usft)	0.00		Drilling / Circ Hours		0.00 / 0.00						
Sensor Offsets															
Survey Offset				N/A				Gamma Offset				N/A			
								Gyro Offset				N/A			
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	5243758	9 1/2 Insert bit	9.500	3.000	0.000	0.00	6 5/8 REG P		0.000	0.00	0.00	0.85	0.85		
2		Bit Sub	6.750	2.500	0.000	0.00	4 1/2 IF B	6 5/8 REG B	0.000	0.00	0.00	3.14	3.99		
3	GU3274	FG 9 1/2 Roller reamer	6.563	3.000	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.98	10.97		
4	700077	7.15 Mud Motor	7.188	2.000	6.750	1.50	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	40.15	51.12		
5	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	56.51		
6	APLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	58.96		
7	N/A	Crossover (BHA to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	0.00	3.15	62.11		
8	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.62	42.62	918.47	980.58		

Comments
 Lobe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1,670 Max Torque = 18,680 Rev/Gal = 0.23 9 1/2" Roller Reamer Eye = 64 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000

Bit Data		Motor Data	
SN	5243758	SN	700077
Size (in)	9.500	OD (in)	7.188
Type	Insert RC	Description	7.15 Mud Motor
Description	9 1/2 Insert bit	Make/Model	Scientific Drilling / Titan 22
Make	Reed Hycalog	Bit to Bend (Usft) / Angle	0.00 / 0.00
Model	XLS30DX	Stab / Kick Pad OD (in)	
TFA	1.32 (3x24)	Stator Vendor/Type/Fit	
Grade In	New	Pre Run Dyno HP%	
Grade Out		Lobes	6/7
Drilled (Usft)	0.000	Stages	7.1
		Rev/Gal	0.230
		Diff Press (Avg/Max)(psi)	0.0 / 1670.0
		Press. Drop(psi)	0.0
		Max Torque(Kftlb)	18650.0
		Max RPM	0
		Flow Range(gpm)	500-750
		Re-Run	NO
		Direct Bill	NO

Figure 121. The BHA for the 9-1/2-inch cleanout run, reaming out the previously cored hole and drilling ahead ten feet. This is BHA 26 (not BHA 14 as attributed in the heading here). The average rate was 5 ft/hr.



BHA #15[9.5" D406V (5342357)]

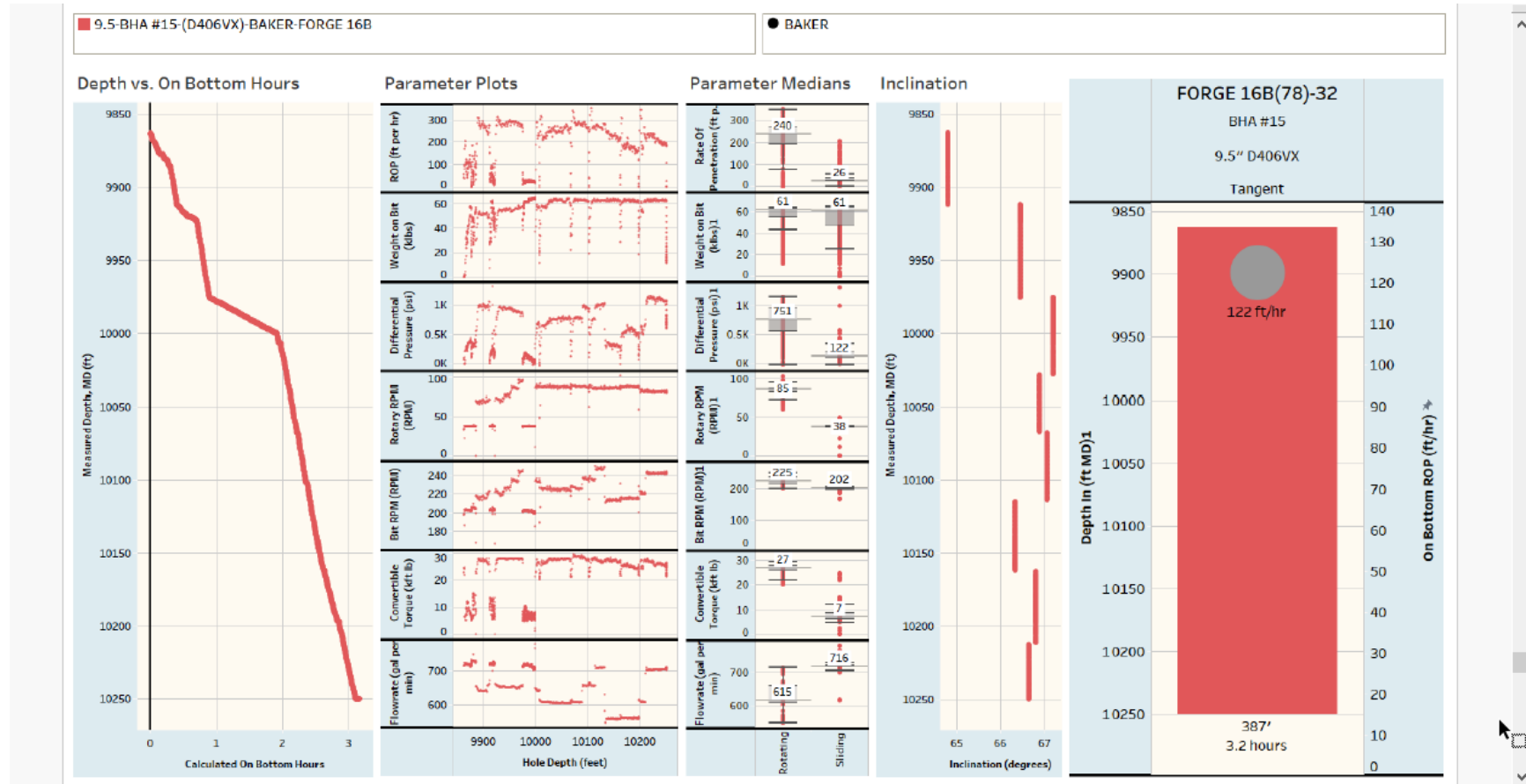
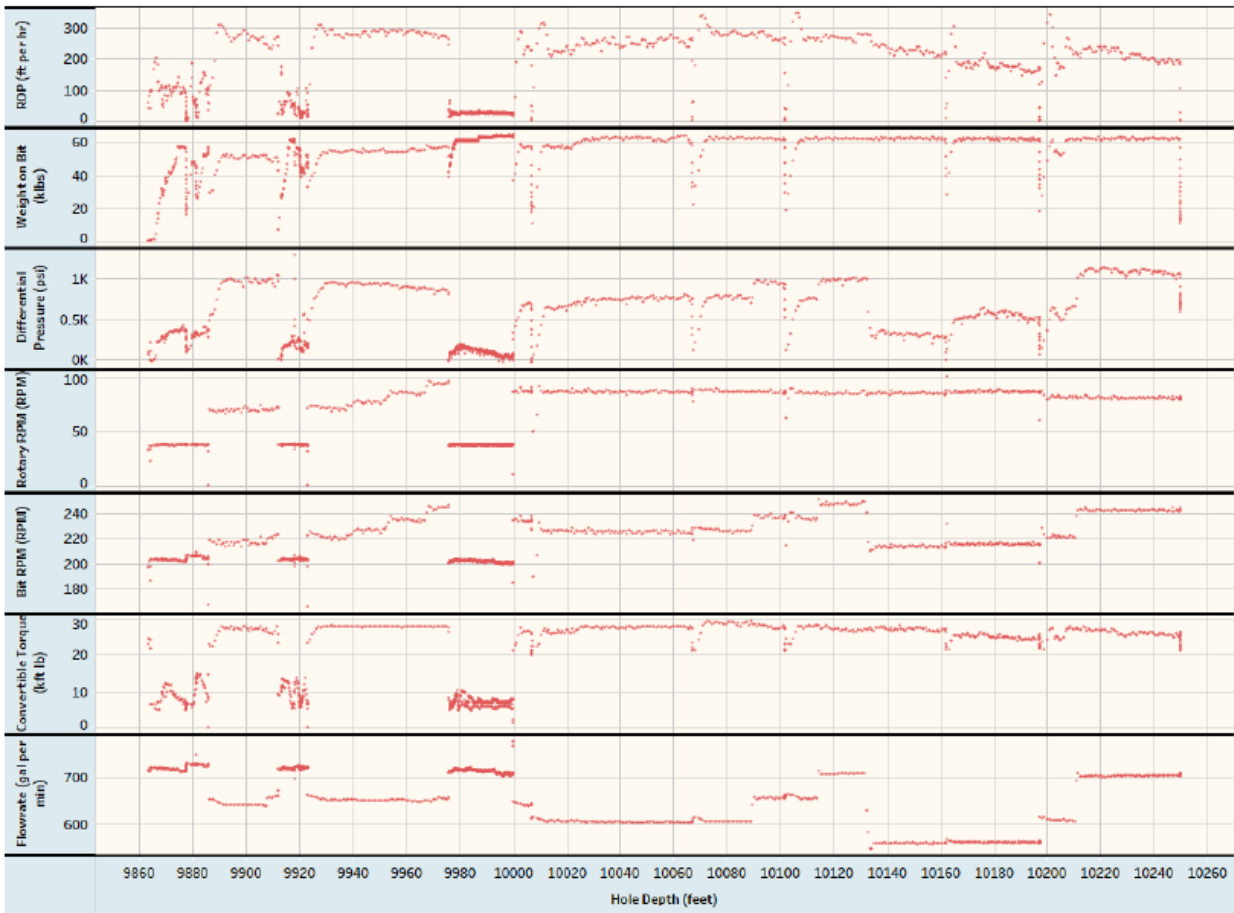


Figure 122. After cleaning out the 8-3/4-inch hole with an insert bit, a Baker Hughes PDC bit 9.5" D406V (5342357) was used to drill ahead to 10,250 ft (387 ft in 3.2 hours on bottom) in preparation for the next core run. This should be referred to as BHA 27. The BHA number shown as BHA #15 does not include all BHAs run in the hole.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 9.5-BHA #15-(D406VX)-BAKER-FORGE 16B

ROP Limiter: Started in a slide, rotated at 300 ft/hr. Able to rotate at 280 ft/hr at the end of the run.

Ended at 387 feet, the question remains of whether a lighter set bit can drill fast and still make the desirable longer footage intervals.

Solution: Continue to test light set and heavy set bits.

Figure 123. After cleaning out the 8-3/4-inch hole with an insert bit, a Baker Hughes PDC bit 9.5" D406V (5342357) was used to drill ahead to 10,250 ft (387 ft in 3.2 hours on bottom) in preparation for the next core run. This should be referred to as BHA 27. The BHA number shown as BHA #15 does not include all BHAs run in the hole. This is a zoomed in view of Figure 122.

BHA #15 9.5" D406V (5342357) Dull Photos

9863 - 10,250 (387 ft)






Motor Stab

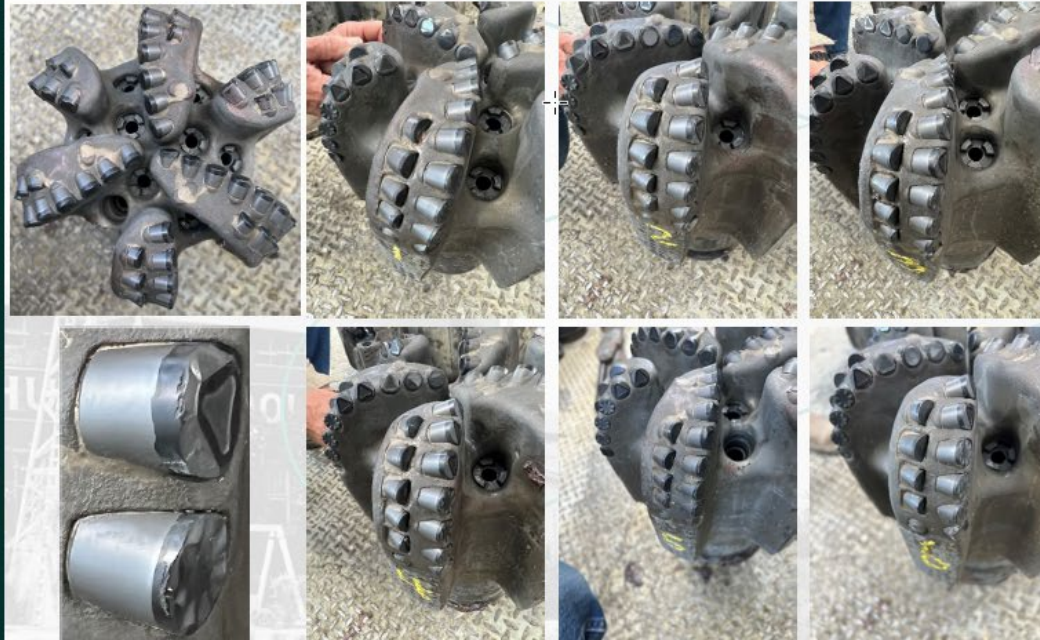


Interval	BHA #	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #15	9.5	D406V	5342357	BAKER	9863	10250	387	3.16	122

Figure 124a. After cleaning out the 8-3/4-inch hole with an insert bit, a Baker Hughes PDC bit 9.5" D406V (5342357) was used to drill ahead to 10,250 ft (387 ft in 3.2 hours on bottom) in preparation for the next core run. This should be referred to as BHA 27. The BHA number shown as BHA #15 does not include all BHAs run in the hole. These are dull photographs of the bit, a stabilizer, and the roller reamer.

Baker Hughes Run Recap

		WELL NAME FORGE 16B(78) -32	
		RIG: Frontier 16	
	APPLICATION Tangent	COUNTY Beaver	
	BIT SIZE AND TYPE 9.5" D406VX	SERIAL NUMBER 5342357	
	DISTANCE (ft) 387'	ROP (ft/hr) 96.8	
IN (ft) 9,863'	OUT (ft) 10,250'	HOURS 4.0	DATE 6/5/2023
		TARGET FORMATION Granite	
		BHA INFO 7.188" Titan 22 MTR 0.23 RPG 6/7 7.1 STG 1.0 Bend w/ roller reamer	
BKR DULL GRADE: 0-1-WT-S-X-00-BT-CP			
RUN COMMENTS <ul style="list-style-type: none"> • Pulled at core point • Increased WOB up to 63 klbs from previous run of 58 klbs • Two broken gage cutters • Wear started in the nose, and extended into the shoulder • Small wear flats on the backup cutters 			



Chipping from lateral vibs?

Figure 124b. After cleaning out the 8-3/4-inch hole with an insert bit, a Baker Hughes PDC bit 9.5" D406VX (5342357) was used to drill ahead to 10,250 ft (387 ft in 4 hours on bottom) in preparation for the next core run. This should be referred to as BHA 27. The BHA number shown as BHA #16 does not include all BHAs run in the hole. The maximum WOB was not reached at 63,000 lbf on this "406" frame. Backup cutters are not required. This frame was very efficient but can be more aggressive based on the dull. It would be desirable to decrease the forces on the center cutters and increase gage cutter durability.

Sliding Parameters

#1 –

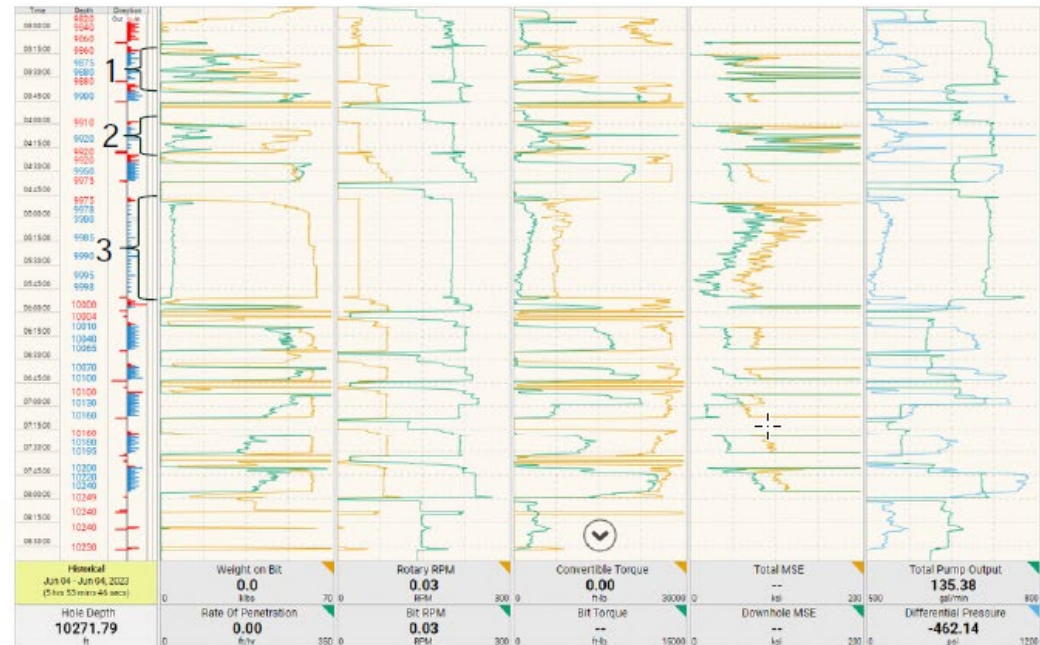
- Variable WOB during slide – 20-58 klbs
- 200 bit RPM
- Downhole, and Total MSE trended very well together

#2 –

- Variable WOB during slide – 20-58 klbs
- 200 Bit RPM
- Downhole, and Total MSE trended very well together

#3 –

- Increased WOB from 61, to 62, to 63 klbs
- Small change in gpm at the end of the slide.
- MSE decreased by ~50% as WOB was increased from 61 to 63 klbs.
- Flow was also dropped by 5-10 gpm at 63 klbs.



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Figure 125. This is a summary of drilling performance while drilling with BHA 27. These data are available from the EDR file.



Slide #3 – Step Tests

#1 –

- WOB - 60-61 klbs
- 200 bit RPM
- MSE is trending down as the slide progressed
- ROP steady around 25 ft/hr

#2 –

- WOB increased to 62.5 klbs
- 200 bit RPM
- MSE continued to trend down through slide
- Small increase in ROP to 27 ft/hr

#3 –

- Increased WOB to 63.5 klbs
- Reduced gpm by 5-10 gpm compared to #1 and #2
- MSE continued to decrease
- ROP started to trend downward as slide progressed

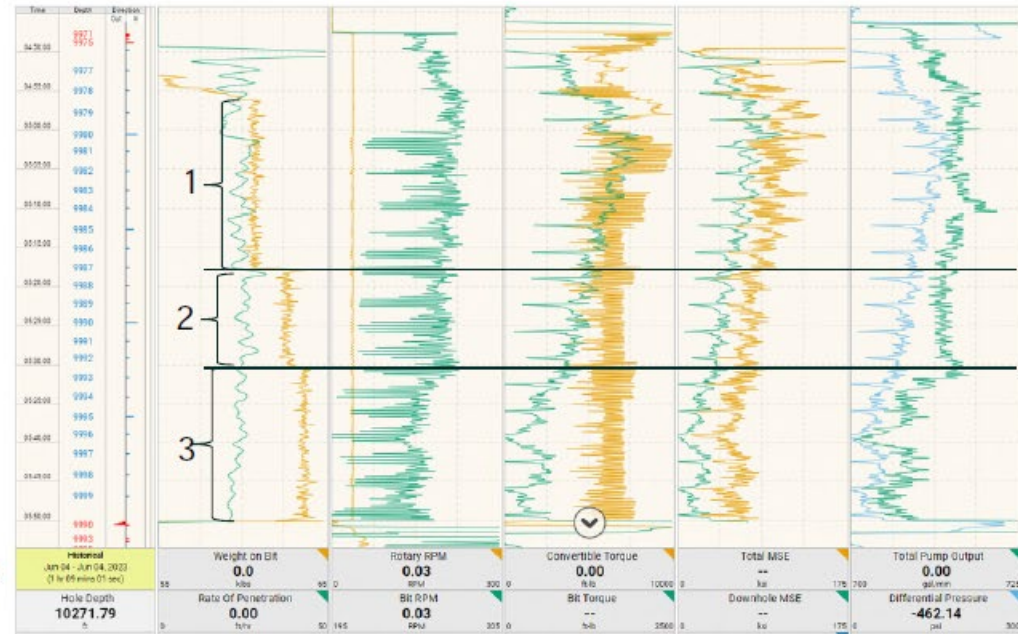
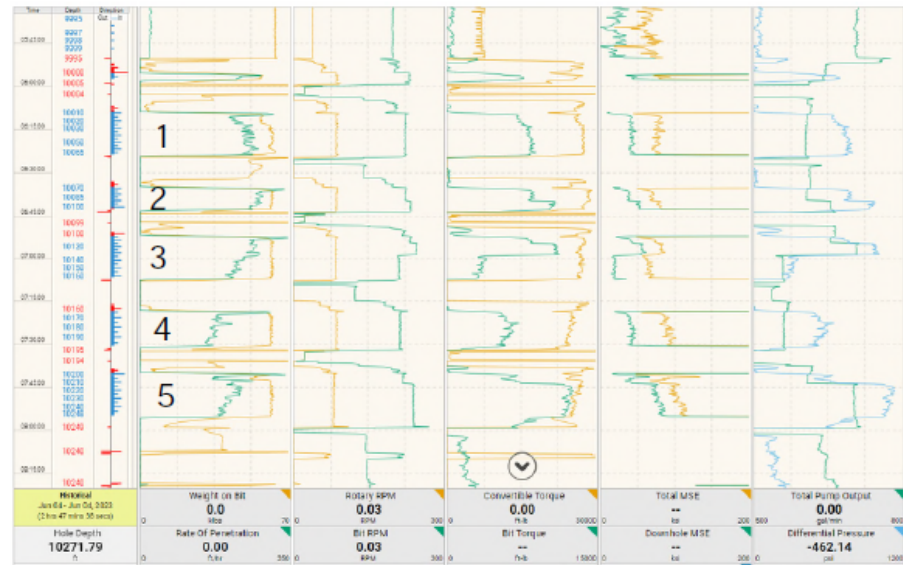


Figure 126. This is a summary of step testing while drilling with BHA 27. These data are available from the EDR file.

Rotating

- WOB was steady through the last 5 slides of this run at 61-62 klbs.
- Flow Rate was changed to understand MSE effects



Segment	Surface RPM	GPM	Total RPM	ROP	Downhole MSE	Total MSE
1	85	600	224	245	40	75
2	85	600	224	275	38	70
	85	650	233	270	50	77
3	85	650	233	260	39	72
	85	700	246	265	55	82
4	85	555	211	230	18	61
	85	560	213	175	42	90
5	80	600	219	175	40	80
	80	700	242	210	55	107

Figure 127. This is a summary of varying flow rate while drilling with BHA 27. These data are available from the EDR file.

Zone 2 Core Run #3



- CCI 700 60' JMS BHA – 713 Bit
 - Sensored
- Cored from 10,250' – 10,256'
- ROP 1.3.ft./hr.
- Core jammed @10,256'
- 6' cored 5,5' Recovered
- 1 JMS Deployment
 - Primary
 - ~10,253"
- 8 3/4" Drill Ahead

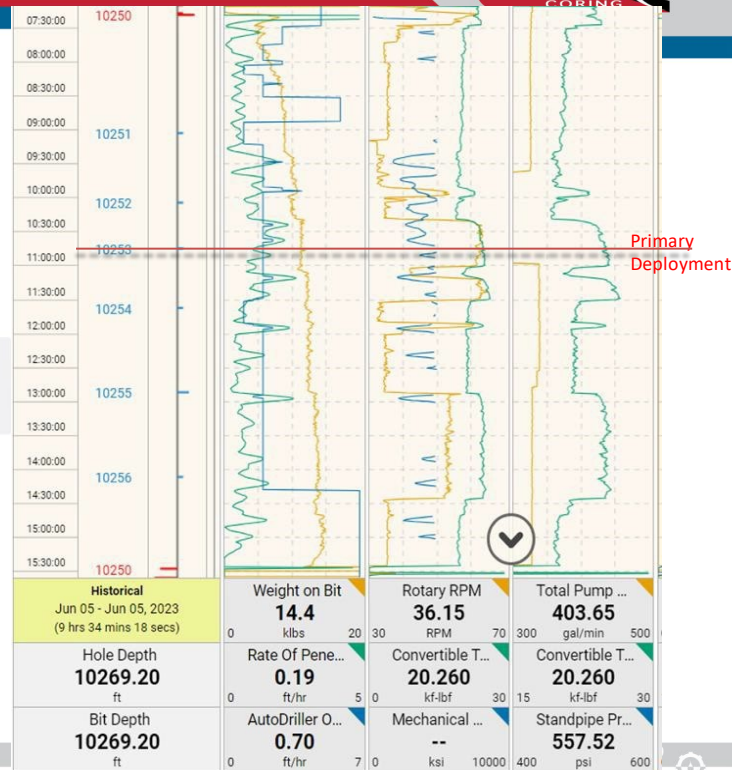


Figure 128. Data from EDR - Zone 2, Run 3 This zone was cored from 10,250 to 10,256 ft MD. Six feet were cored and 5.5 feet were recovered. There was one jam mitigation deployment. Note that after this run, the hole was drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.

Zone 2 Core Run #4



- CCI 700 60' JMS BHA – 713 Bit
 - Sensored
- Cored from 10,264' – 10,272'
- ROP 1 ft./hr.
- Core jammed @ 10,272'
- 8' cored 4,6' Recovered
- No JMS Deployments
- 8 ¾" Drill Ahead

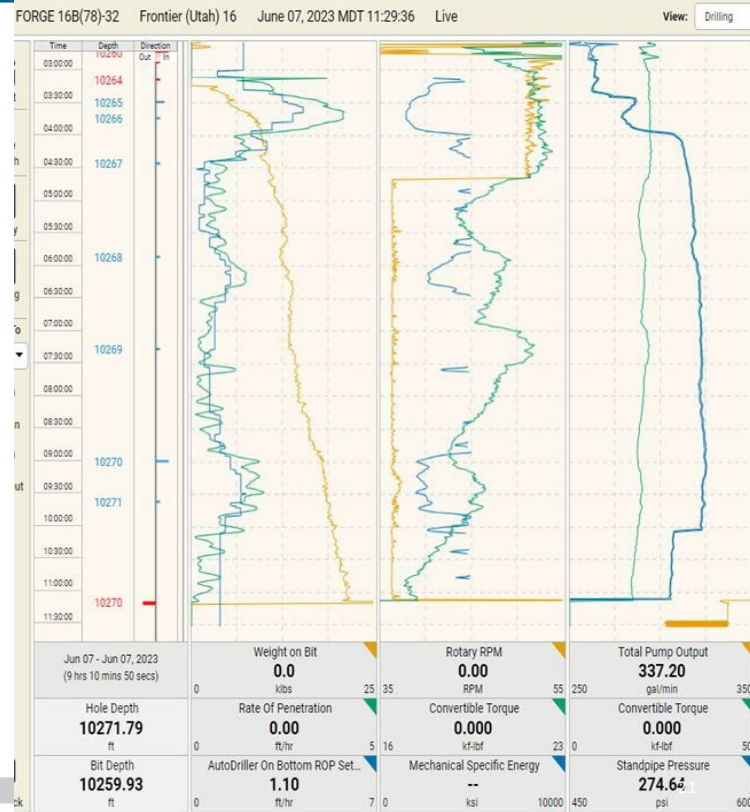
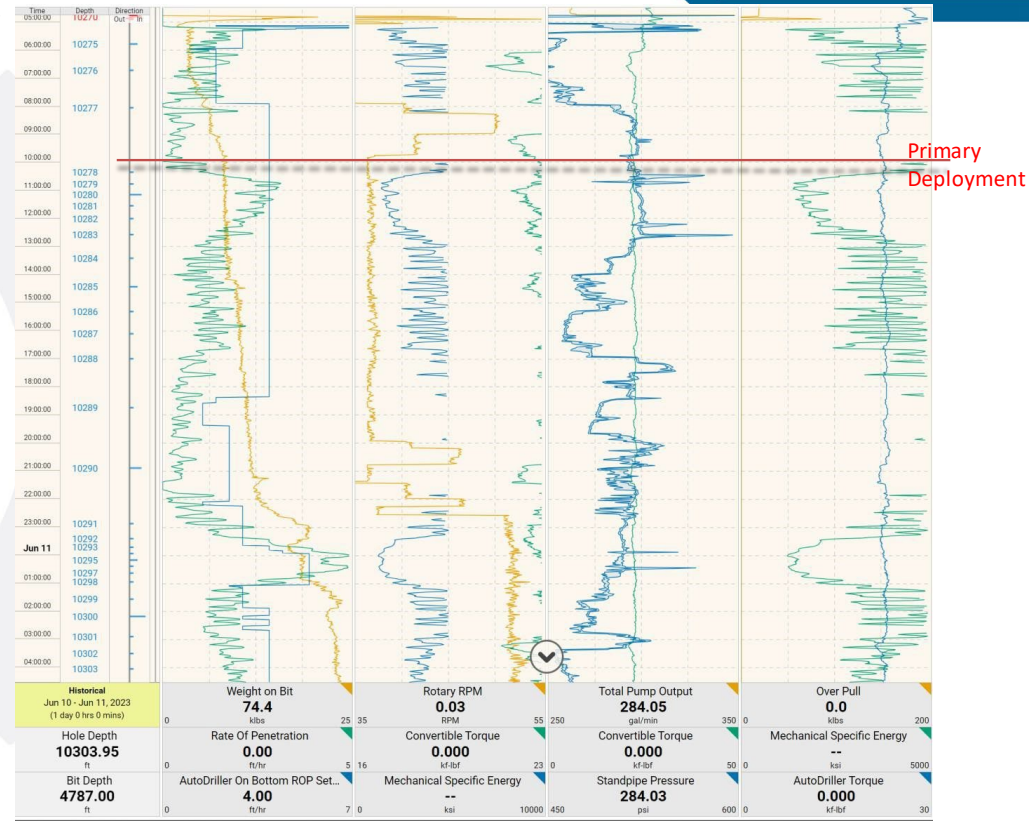


Figure 129. Data from EDR - Zone 2, Run 4 This zone was cored from 10,264 to 10,272 ft MD. Eight feet were cored and 4.6 feet were recovered. Note that after this run, the hole was drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.

Zone 2 Core Run #5



- CCI 700 60' JMS BHA – 8.44 Stabs – 713 Bit
 - Sensored
- Cored from 10,274' – 10,304'
- ROP 1 ft./hr.
- Full Run
- 30' cored 28' Recovered
- 1 JMS Deployments
 - Primary Deployed 10,278'
- 8 3/4" Drill Ahead



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Figure 130. Data from EDR - Zone 2, Run 5 This zone was cored from 10,274 to 10,304 ft MD. Thirty feet were cored and twenty-eight feet were recovered. Note that after this run, the hole was again drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.



BHA #16 [8.75 TKC63-AA1 (A299586)]

8.75-BHA #16-(TKC63-AA1)-REEDHYCALOG-FORGE 16B

REEDHYCALOG

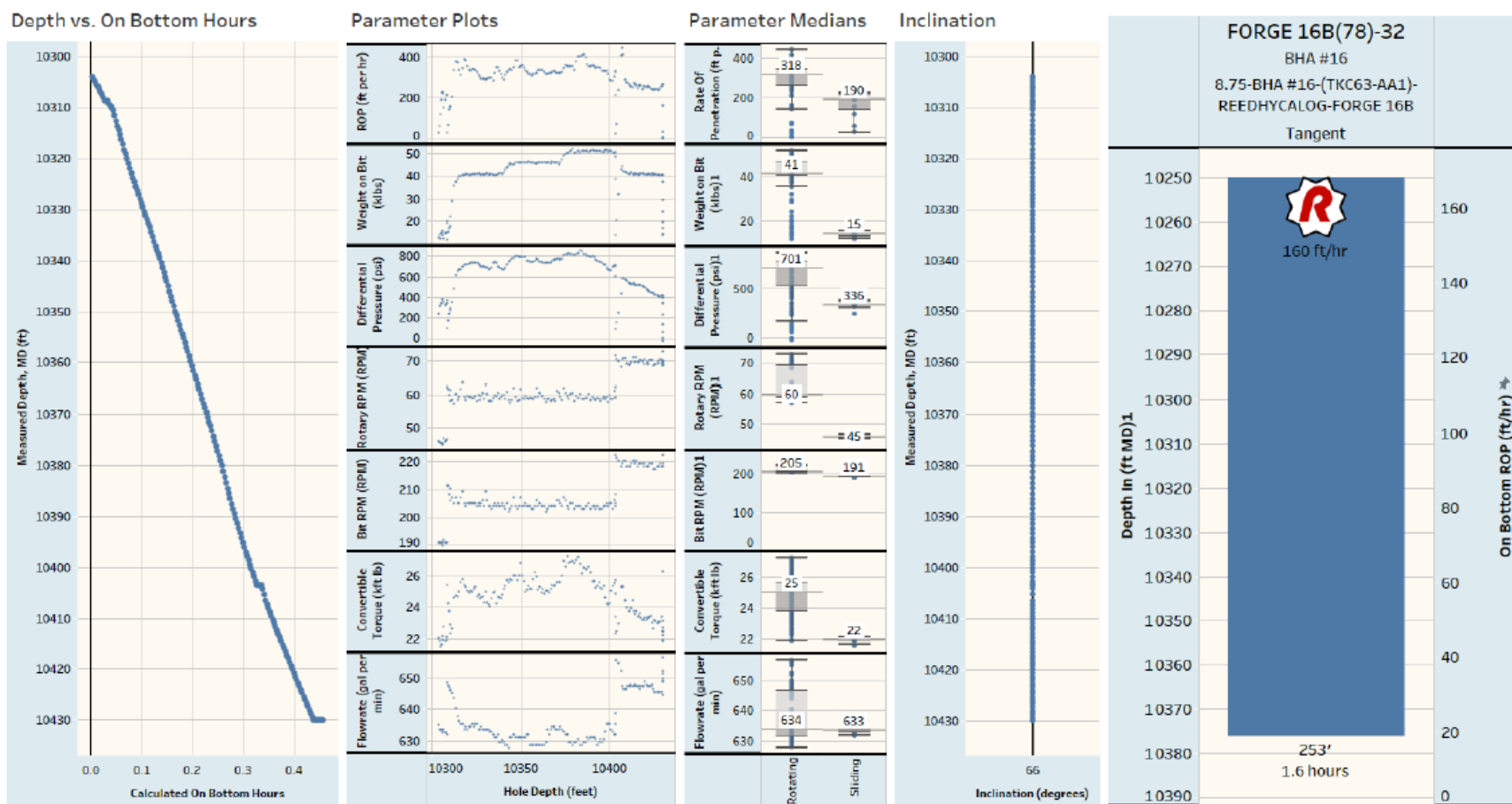
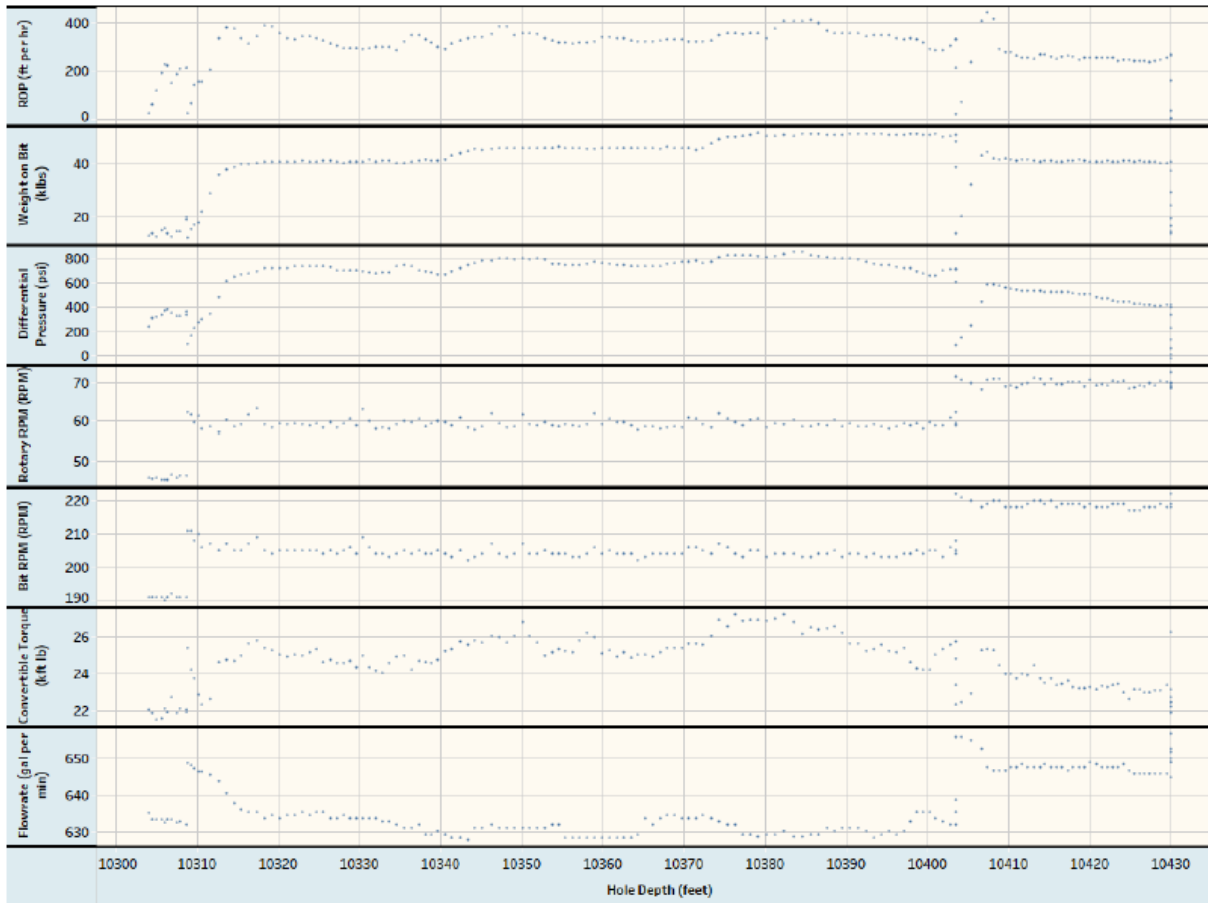


Figure 131. Drilling ahead (after coring) with an 8-3/4-inch bit. The drilling depths were 10,304 to 10,430 ft MD. This is FORGE BHA #33.



Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 ■ 8.75-BHA #16-(TKC63-AA1)-REEDHYCALOG-FORGE 16B

ROP Limiter: Run had fast ROP but cutters were damaged from only 127 feet.

Solution: Heavy set bit or better cutters needed for extended runs.

Figure 132. Drilling ahead (after coring) with an 8-3/4-inch bit. The drilling depths were 10,304 to 10,430 ft MD. This is FORGE BHA #33. This is a zoomed in view of Figure 131.

BHA #16 8.75" TKC63-AA1 (A299586) Dull Photos



Interval	BHA #	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #16	8.75	TKC63-AA1	A299586	ReedHycalog	10303	10430	127	0.46	276

Figure 133. Dull photographs. The drilling depths were 10,304 to 10,430 ft MD. This is the bit for FORGE BHA #33.

16: Directional BHA #16, 8 3/4" Section

Bottom Hole Assembly															
Job#	OP:039349			Rig	Frontier 16		BHA Length (Usft)			984.45					
Operator	Utah Forge			BHA #	16		BHA Weight dry (klbs)			42.73					
Well	10B(76)-32 - 10B(76)-32			Bit #	14		BHA Weight Bouyed (klbs)			37.32					
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00		Wt. Below Jars dry (klbs)			42.73					
Date In				Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (klbs)			37.32					
Date Out				Drilled(Usft)	0.00		Drilling / Circ Hours			0.00 / 0.00					
Sensor Offsets															
Survey Offset				N/A				Gamma Offset				N/A			
								Gyro Offset				N/A			
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	A299586	8 3/4 6 Blade PDC bit	6.500	2.250	0.000	0.00	4 1/2 REG		0.000	0.00	0.00	0.90	0.90		
2	N/A	Bit Sub	6.750	2.500	0.000	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	3.95	4.85		
3	603321	8 1/2 Spiral Stabilizer	6.750	3.188	6.750	2.40	4 1/2 IF P	4 1/2 IF P	0.000	0.00	0.00	6.27	11.12		
4	700077	7.15 Mud Motor	7.188	2.000	6.750	1.50	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	40.15	51.27		
5	GU3581	FG 8 3/4" Roller reamer	6.625	3.000	6.625	1.80	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.64	57.91		
6	AFL5603	6 3/4 Floet sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	60.36		
7	N/A	Crossover (BHA to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FHB	4 1/2 IF P	0.000	0.00	0.00	3.15	63.51		
8	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FHB	5 1/2 FHP	46.400	42.73	42.73	920.94	984.45		
Comments															
Lobe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1,670 Max Torque = 18,680 Rev/Gal = 0.23 9 1/2ⅆ Roller Reamer Eye = 84 Make up torque, 4 1/2 Reg = 16,500 4 1/2 IF = 26,000															

Bit Data		Motor Data				
SN	A299586	SN	700077			
Size (in)	6.500	OD (in)	7.188			
Type	PDC	Description	7.15 Mud Motor			
Description	8 3/4 6 Blade PDC bit	Make/Model	Scientific Drilling / Titan 22			
Make	Reed Hycalog	Bit to Bend (Usft) / Angle	0.00 / 0.00			
Model	TKC23	Stab / Kick Pad OD (in)				
TFA	0.84 (3x13, 3x14)	Stator Vendor/Type/Fit				
Grade In	New	Pre Run Dyno HP%				
Grade Out		Lobes	6/7			
Drilled (Usft)	0.000	Stages	7.1			
		Rev/Gal	0.230			
		Diff Press (Avg/Max)(psi)	0.0 / 1670.0			
		Press. Drop(psi)	0.0			
		Max Torque(Kftlb)	16650.0			
		Max RPM	0			
		Flow Range(gpm)	500-750			
		Re-Run	NO			
		Direct Bit	NO			
Stabilizer Data						
Component Number	Description	OD (in)	Blade Length (in)	Blade Width (in)	Blade Count	Stab->Bit (Usft)
3	8 1/2 Spiral Stabilizer	8.500	17.00	3.00	3	7.68
5	FG 8 3/4" Roller reamer	8.750	7.00	3.00	3	54.77

Figure 134. Dull photographs. The drilling depths were 10,304 to 10,430 ft MD. This is the bit for FORGE BHA #33.

Zone 2 Core Run #6



- CCI 700 60' JMS BHA – 8.44
- Stabs – 713 Bit
 - Sensored
- Cored from 10,430' – 10,460'
- ROP 1.3 ft./hr.
- Full Run
- 30' cored 25,7' Recovered
- 1 JMS Deployments
 - 8 3/4" Drill Ahead

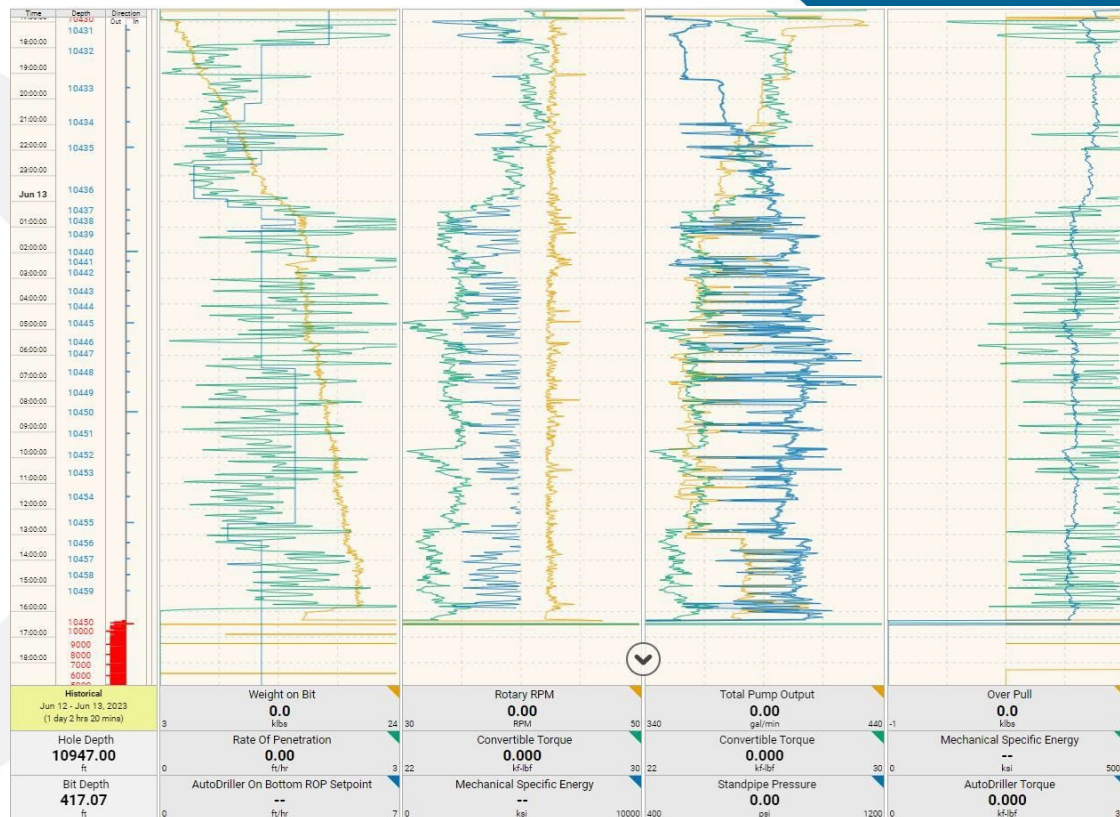


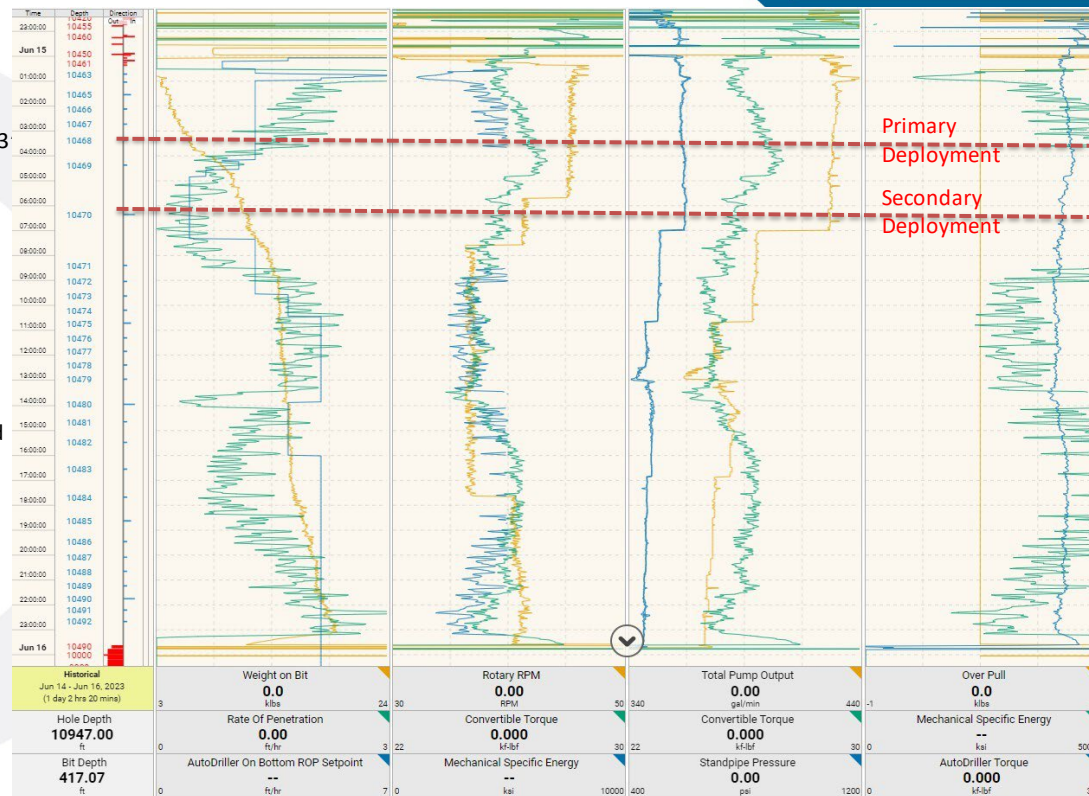
Figure 135. EDR record for the coring run from 10,430 to 10,460 ft MD.



Zone 2 Core Run #7



- CCI 700 60' JMS BHA – 8.44 Stabs – 713 Bit
 - Sensored
- Cored from 10,462' – 10,493'
- ROP 2.6 ft./hr.
- Full Run
- 31' cored 27' Recovered
- 2 JMS Deployments
 - Primary Deployed 10,468'
 - Secondary Deployed 10,470'
- 8 3/4" Drill Ahead
- Bit has damage



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Figure 136. EDR record for the coring run from 10,462 to 10,493 ft MD.

BHA #17 [9.5 Insert Bit (5243758)]

■ 9.5-BHA #17-(Hole Opener)-BAKER-FORGE 16B ● BAKER

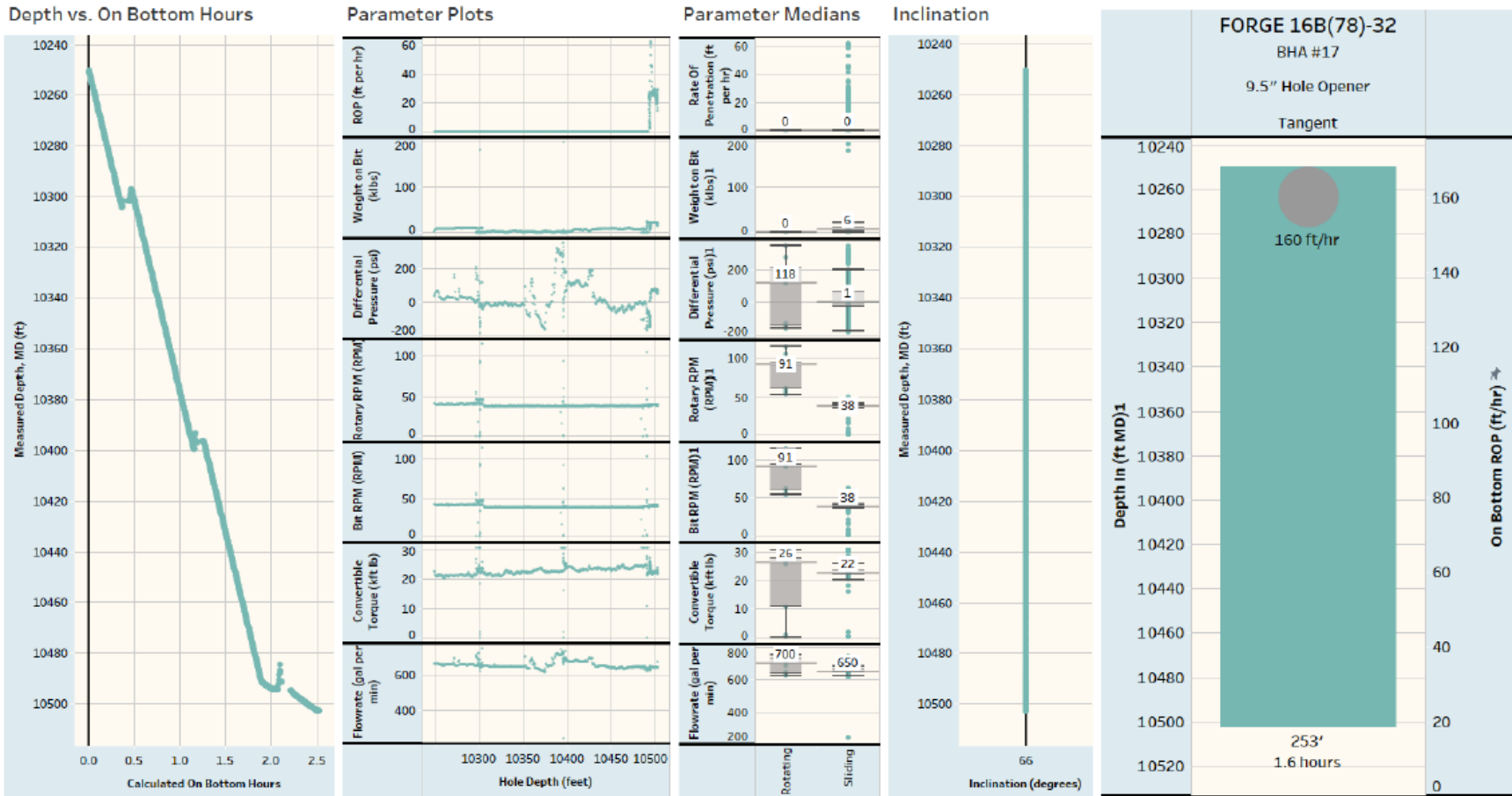
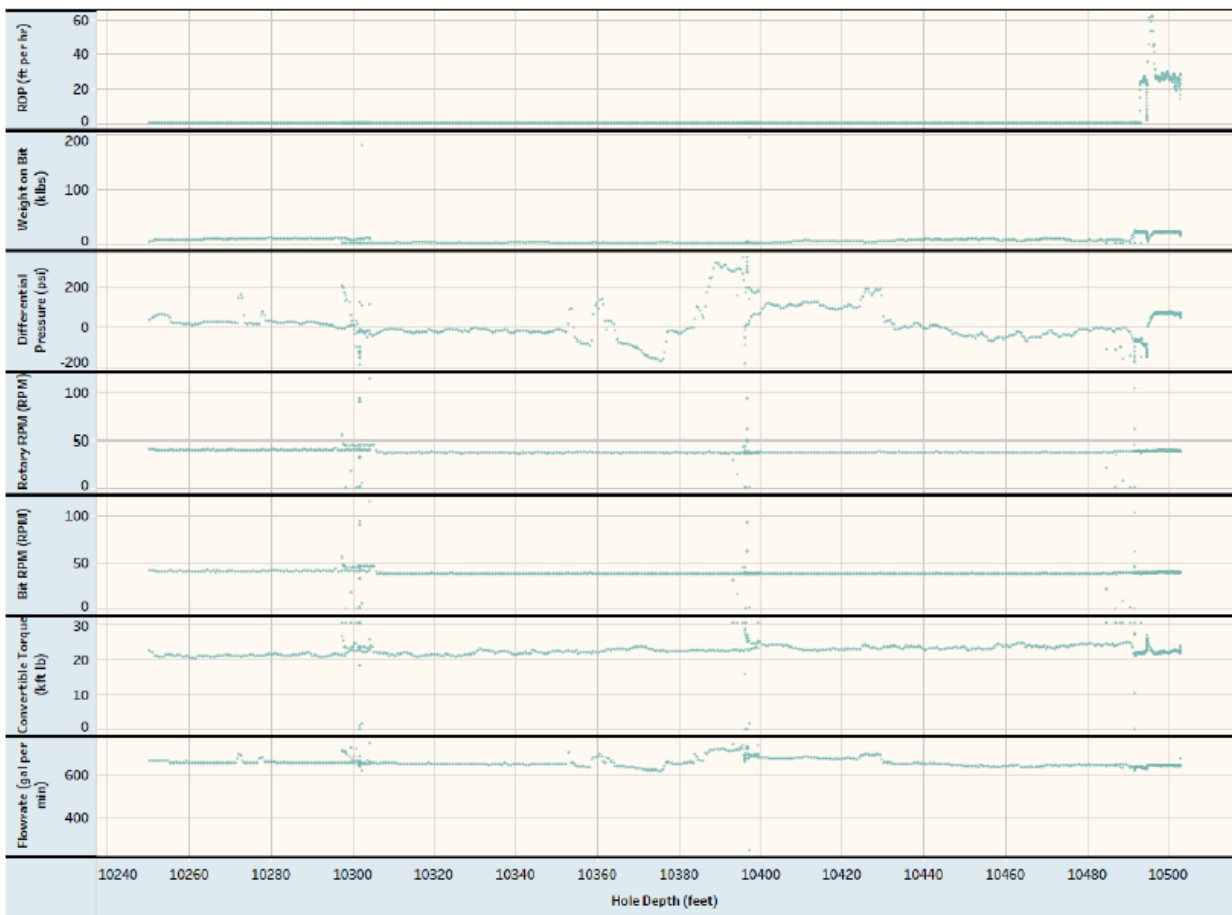


Figure 137. The hole was opened back up with this bit. It is a TCI. The 8-3/4-inch hole was reamed to 9-1/2-inches from 10,250 to 10,493 ft MD and 10 additional feet were drilled. This is FORGE BHA #37.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 9.5-BHA #17-(Hole Opener)-BAKER-FORGE 16B

ROP Limiter: This run reamed until the last 25 feet. During the reamed section it was going 160ft/hr. During the new hole it got about 25ft/hr.

Solution:

Figure 138. The hole was opened back up with this bit. It is a TCI. The 8-3/4-inch hole was reamed to 9-1/2-inches from 10,250 to 10,493 ft MD and 10 additional feet were drilled. This is FORGE BHA #37. This is a zoomed in view of Figure 135.



BHA #17 9.5” Insert Bit (5243758) Dull Photos

No Dull Photos

Interval	BHA #	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #17	9.5	Hole Opener	5243758	San Joaquin	10250	10503	253	1.58	160

Reamed Footage: 245 feet
 Drilled Footage: 9 feet

Figure 139. The hole was opened back up with this bit. It is a TCI. The 8-3/4-inch hole was reamed to 9-1/2-inches from 10,250 to 10,493 ft MD and 10 additional feet were drilled. This is FORGE BHA #37.



17: 9 1/2 core section clean out BHA #17

Bottom Hole Assembly																	
Job#	OP:039348			Rig	Frontier 16		BHA Length (Usft)							963.05			
Operator	Utah Forge			BHA #	17		BHA Weight dry (kibs)							42.73			
Well	16B(78)-32 - 16B(78)-32			Bit #	17		BHA Weight Bouyed (kibs)							37.32			
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00		Wt. Below Jars dry (kibs)							42.73			
Date In				Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (kibs)							37.32			
Date Out				Drilled(Usft)	0.00		Drilling / Circ Hours							0.00 / 0.00			
Sensor Offsets																	
Survey Offset				N/A				Gamma Offset				N/A		Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (kibs)	Total Weight (kibs)	Length (Usft)	Total Length (Usft)				
1	5243758	9 1/2 Insert bit	9.500	3.000	0.000	0.00	6 5/8 REG P		0.000	0.00	0.00	0.85	0.85				
2		Bit Sub	8.750	2.500	0.000	0.00	4 1/2 IF B	6 5/8 REG B	0.000	0.00	0.00	3.14	3.99				
3	GU3274	FG 9 1/2 Roller reamer	6.563	3.000	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.98	10.97				
4	700077	7.15 Mud Motor	7.188	2.000	6.750	1.50	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	40.15	51.12				
5	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	56.51				
6	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	58.96				
7	N/A	Crossover (BHA to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	0.00	3.15	62.11				
8	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.73	42.73	920.94	963.05				
Comments																	
Lobe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1,670 Max Torque = 18,680 Rev/Gal = 0.23 9 1/2dq; Roller Reamer Eye = 84 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000																	

Bit Data		Motor Data	
SN	5243758	SN	700077
Size (in)	9.500	OD (in)	7.188
Type	Insert RC	Description	7.15 Mud Motor
Description	9 1/2 Insert bit	Make/Model	Scientific Drilling / Titan 22
Make	Reed Hysalg	Bit to Bend (Usft) / Angle	0.00 / 0.00
Model	XLS30DX	Stab / Kick Pad OD (in)	
TFA	1.32 (3x24)	Stator Vendor/Type/Fit	
Grade In	1-1-WT-C-E-I-NO-O	Pre Run Dyno HP%	
Grade Out		Lobes	6/7
Drilled (Usft)	0.000	Stages	7.1
		Rev/Gal	0.230
		Diff Press (Avg/Max) (psi)	0.0 / 1670.0
		Press. Drop (psi)	0.0
		Max Torque (Kftlb)	18650.0
		Max RPM	0
		Flow Range (gpm)	500-750
		Re-Run	NO
		Direct Bit	NO

Figure 140. The hole was opened back up with this bit. It is a TCI. The 8-3/4-inch hole was reamed to 9-1/2-inches from 10,250 to 10,493 ft MD and 10 additional feet were drilled. This is FORGE BHA #37.

X. Drilling to TD

After coring was completed, the following drilling and logging activities occurred.

June 16, 2023	Ream with 9-1/2-inch PDC bit from 10,250 to 10,493 ft MD and drill ahead to 10,503 ft MD with a TCI bit, motor, and roller reamers (Figures 141 to
June 17, 2023	Rotate and slide from 10,503 to 10,947 ft MD.
June 18, 2023	Run UBI from 9,400 ft to 4,837 ft MD. On June 18/19, 2023, run triple combo and FMI through the bit from 10,727 ft MD to surface (3,700 ft MD).
June 19, 2023	Run temperature log on wireline (could not get past 7,030 ft).
June 19, 2023	Ran UBI from 4,836 ft to surface.
June 20/21, 2023	Run 9-1/2-inch reaming assembly.
June 22, 2023	Circulate and cool the hole for Baker pipe-conveyed logging tools. Ran a gyro and cooled the hole.

BHA #18 [9.5 D506V (5341859)]

9.5-BHA #18-(D506V)-BAKER-FORGE 16B

BAKER

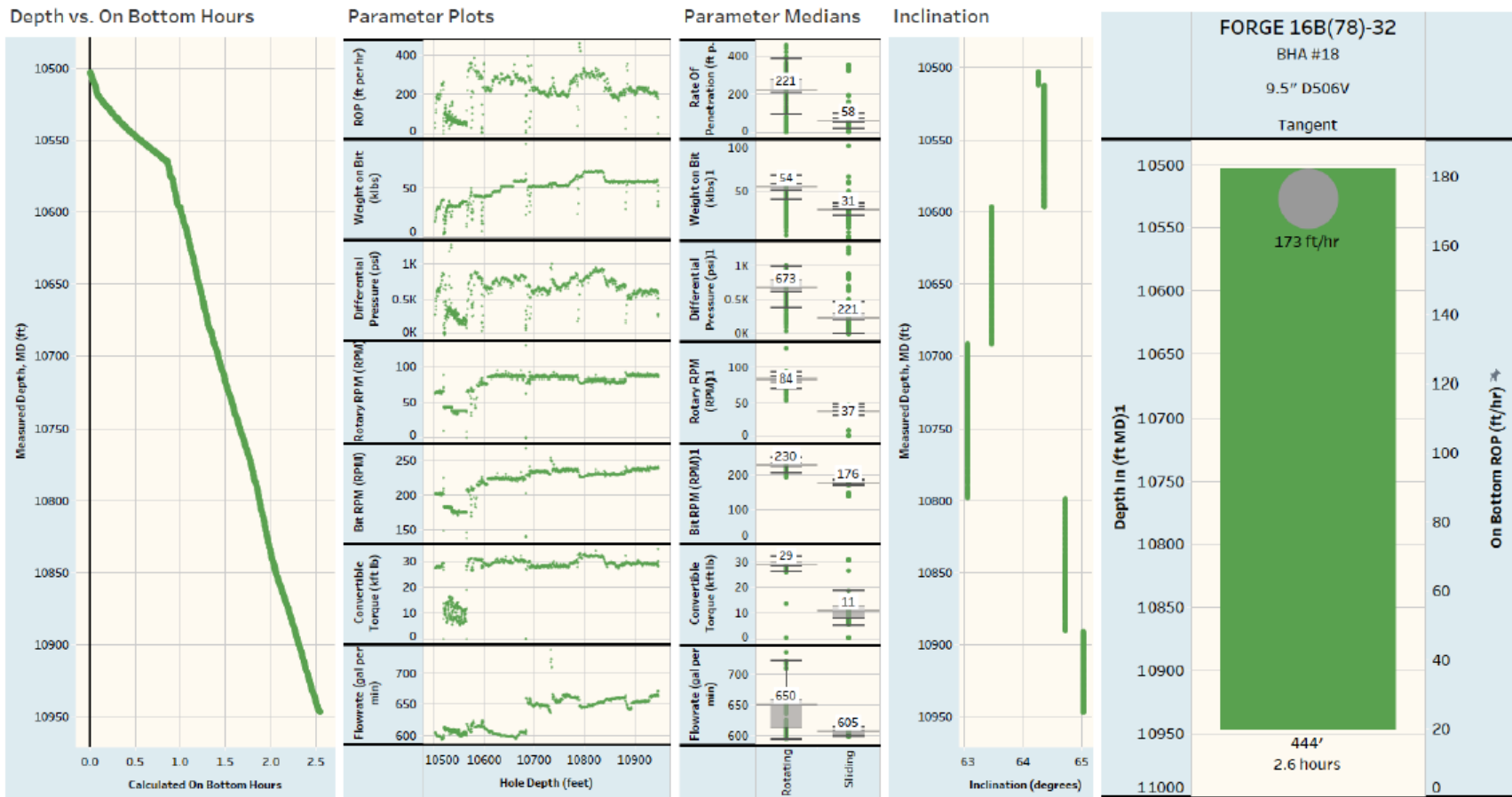
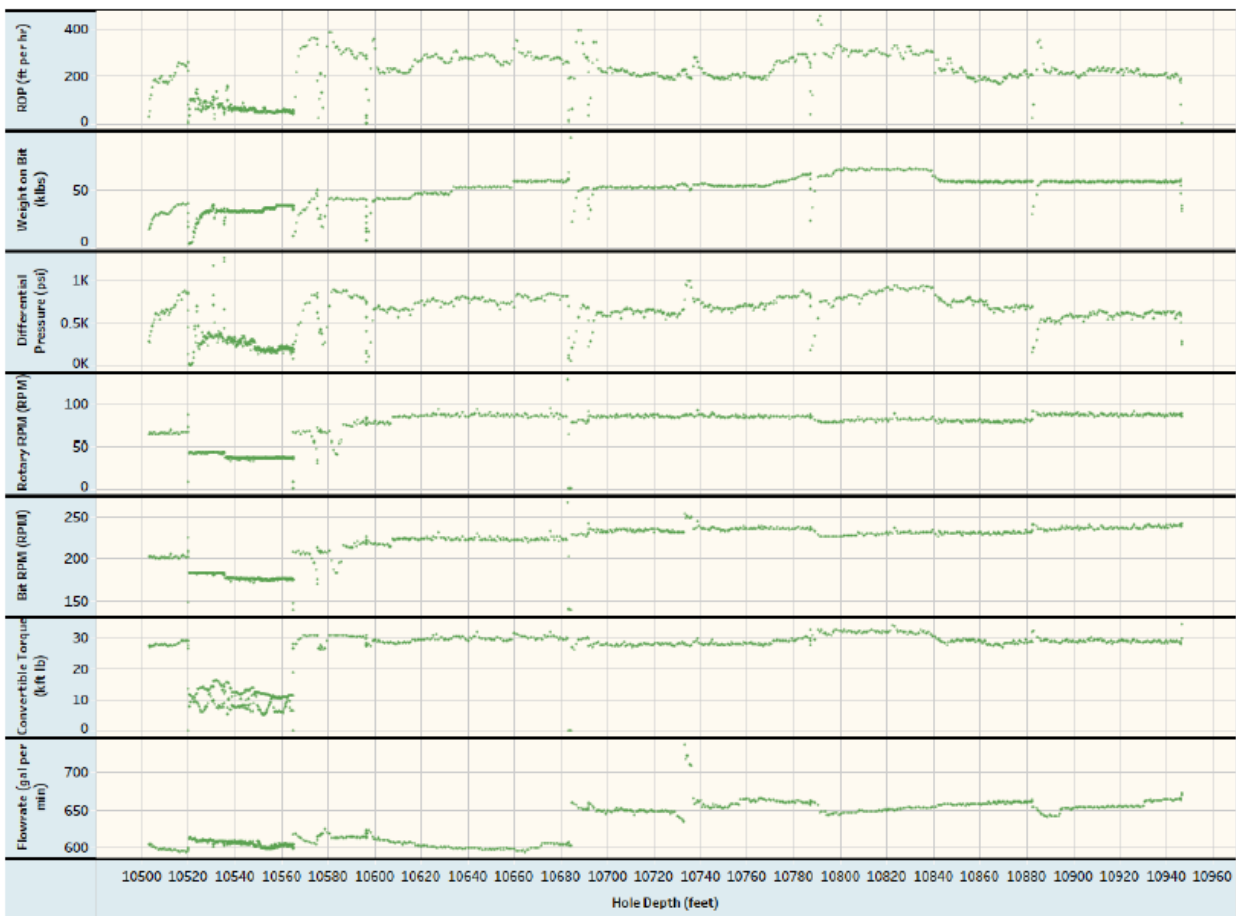


Figure 141. BHA #38. Drill to TD. This was a Baker Hughes 9.5-inch D506V.

Parameter Plots



Size - BHA # - (Bit Type) - Bit Manufacturer - Well Name
 9.5-BHA #18-(D506V)-BAKER-FORGE 16B

ROP Limiter: Baker allowed 65klbs on the bit. Max that was put on it was 55 to control the inclination and avoid sliding in the last 500 feet.

ROP was 350 to 300 ft/hr even with only 40klbs on it, showing that a less aggressive cutting structure can make it for these short 500ft interval runs. The bit was definitely more aggressive as a 16mm cutter but the only question is if it would have durability issues for longer sustained drilling intervals.

Solution: Continue to test larger cutters as well as a variety of blade counts to find the optimal amount of diamond volume on the bit to get both the high ROP at the beginning of the run and still maintain footage goals.

Figure 142. BHA #38. Drill to TD. This was a Baker Hughes 9.5-inch D506V. This is a zoomed in view of Figure 141.



BHA #18 9.5" D506V (5341859) Dull Photos



Interval	BHA #	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #18	9.5	D506V	5341859	BAKER	10503	10947	444	2.56	173

Figure 143. Bit used in BHA #38. Drill to TD. This was a Baker Hughes 9.5-inch D506V.

18: Directional BHA #18, 9 1/2" Section

Bottom Hole Assembly													
Job#	OP:038349			Rig	Frontier 16		BHA Length (Usft)			1082.98			
Operator	Utah Forge			BHA #	18		BHA Weight dry (klbs)			42.02			
Well	16B(78)-32 - 16B(78)-32			Bit #	18		BHA Weight Bouyed (klbs)			37.22			
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	10503.00		Wt. Below Jars dry (klbs)			42.62			
Date In	06/16/2023			Depth Out (Usft)	10503.00		Wt. Below Jars Bouyed (klbs)			37.22			
Date Out	06/16/2023			Drilled (Usft)	0.00		Drilling / Circ Hours			0.00 / 0.00			
Sensor Offsets													
Survey Offset				85.00		Gamma Offset		N/A		Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)
1	5341869	9 1/2 6 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.05	1.05
2	700109	7.15 Mud Motor	7.186	2.000	7.250	1.60	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	41.92	42.97
3	GU3275	FG 9 1/2 Roler reamer	6.563	3.000	6.750	2.19	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.71	49.68
4	125-373	6 3/4 NM Pony DC	6.436	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.22	58.90
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	90.01
6	129-076	8 3/4 Pulser Sub	6.500	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.60	95.61
7	84-773	6 3/4 NMDC	6.813	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.10	126.71
8	DR 34302	6 3/4 NM Pony DC	6.436	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	138.95
9	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	148.78
10	7006	6 3/4 Black Box	6.750	2.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.90	154.68
11	DR 48701	6 3/4 Filter sub	6.688	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	158.61
12	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	161.06
13		Crossover (BHA to HWDP)	6.937	3.000	0.000	0.00	4 1/2 IF P	5 1/2 FH B	0.000	0.00	0.00	3.15	164.21
14		30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.62	42.62	919.47	1062.98
Comments													
Lebe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1.670 Max Torque = 18,680 Rev/Cal = 0.23 9 1/2" Roler Reamer Eye = 85 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000													

Figure 144. BHA #38. Drill to TD.



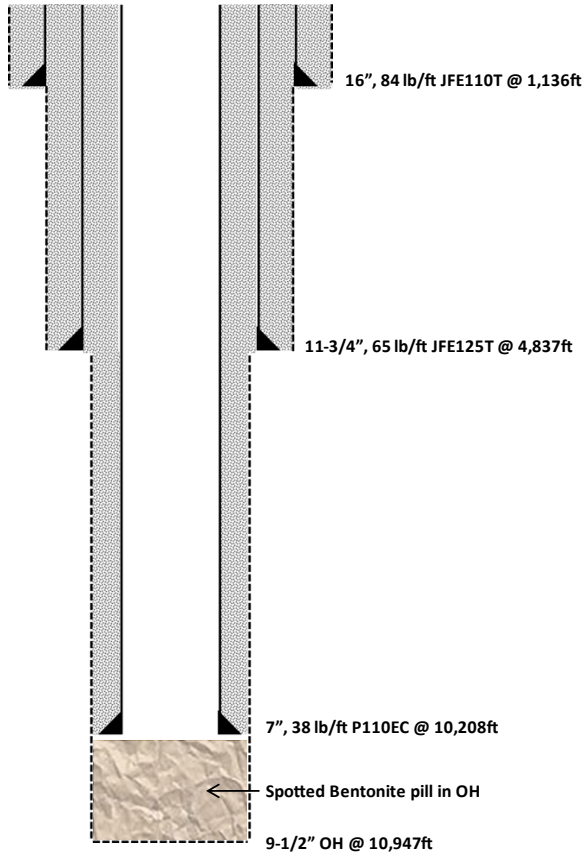
XI. Cementing 7-inch Production Casing

The chronology for cementing the production casing was as follows (see Figures 145 to 153).

- There was a good pressure test of treating lines and equipment.
- More than 95% of the MUDPUSH Express Spacer was pumped within 0.2 ppg of designed density.
- There was significant difficulty mixing the ThermaSTONE slurry. The pump rate was fluctuating between 2-5 bpm (designed mixing and pump rate of 6 bpm) with periodic shutdown to clean up mixer.
- The pressurized mud balance showed 0.3 to 0.6 ppg higher density than the mixing density from cement pump (non-radioactive densitometer, NRD).
- It was decided to mix at ~13.0 - 13.2 ppg on the cement pump (designed density is 13.8 ppg) which would give an average of ~13.6 ppg on the pressurized mud balance.
- Mixing was still very erratic and the mixing tub eventually “powered out” resulting in shutdown of the job (lasting ~30 minutes) to switch to the standby cement pump.
- Restarted pumping ThermaSTONE with the standby cement pump and had identical mixing problems for the remainder of the job.
- Fluid circulating to the surface had some appearance of cement but maximum density measured was 12.5 ppg (same as Spacer density).
- Actual displacement pressure (lift pressure) was much different from the job design simulation. Based on the appearance of the cement slurry (extremely viscous with slight phase separation) when cleaning out lines to switch pumps there are likely multiple reasons for displacement pressure results.
- Top plug was bumped at the expected displacement volume.
- Pressure was bled off and the floats held.
- When disconnecting the cement returns line from the wellhead the annulus was on a noticeable vacuum.
- Cementing equipment was rigged down pending further evaluation of cement placement in the annulus.
- Samples retained at the SLB district in Bakersfield, CA after blending were re-tested.
- It was discovered that the ThermaSTONE cement system blends were potentially being negatively affected by the amount of time being stored in the cement silos on location at the high ambient temperature before the job was pumped.
- Samples from the blending at the district that were stored in the cement laboratory (inside) were still able to be mixed to designed density of 13.8 ppg following the API mixing procedure.

- Samples from the blending at the district that were stored in the bulk plant facility (outside) were **not able** to be mixed to designed density of 13.8 ppg following the API mixing procedure.
- Dry cement samples that were taken during the cement job were retained by the University of Utah representatives. After hearing the results from the stored samples in Bakersfield, the location samples were sent to a third-party testing laboratory in Houston, TX.
- Mixing tests at the Houston laboratory were **not able** to be mixed to the designed density of 13.8 ppg following the API mixing procedure. This is consistent with the results reported by the SLB district laboratory in Bakersfield.
- QSLT CBL shows no cement from ~3,000 ft to surface inside the 11-3/4” intermediate casing string and extremely poor cement coverage throughout the build section from vertical to the 65° tangent section.

Well 16B(78)-32 Production Casing Cement Job



Cement Slurry: ThermaSTONE + 4% BWOB D176 + 2.0% BWOB D249 + 0.4% BWOB D121 + 0.3% BWOB D167A + 0.06 gal/sk D075 + 0.053 gal/sk D047

Density	13.8 ppg
Yield	1.54 cu ft/sk
Mix-water	5.923 gal/sk
SVF	45.76%

TT	6:32 hr:min	70 Bc at 355°F
FL	19 mL	30 min at 190°F
FW	0%	190°F at 65° angle
CS	1,600 psi	72 hrs at 435°F

Calculated cement volumes

Shoe track =	9.7 bbl
7" casing in 9-1/2" OH (w/ 50% excess)	322.8 bbl
7" casing in 11-3/4" intermediate casing	305.9 bbl

Total Cement Volume = 638.4 bbl

Displacement Volume = 337.8 bbl

Water Volume to mix cement = 328.3 bbl (2,328 sks)

Figure 145. Specifications for 7-inch production casing cementing.

Well 16B(78)-32 Production Casing Cement Job Execution Data

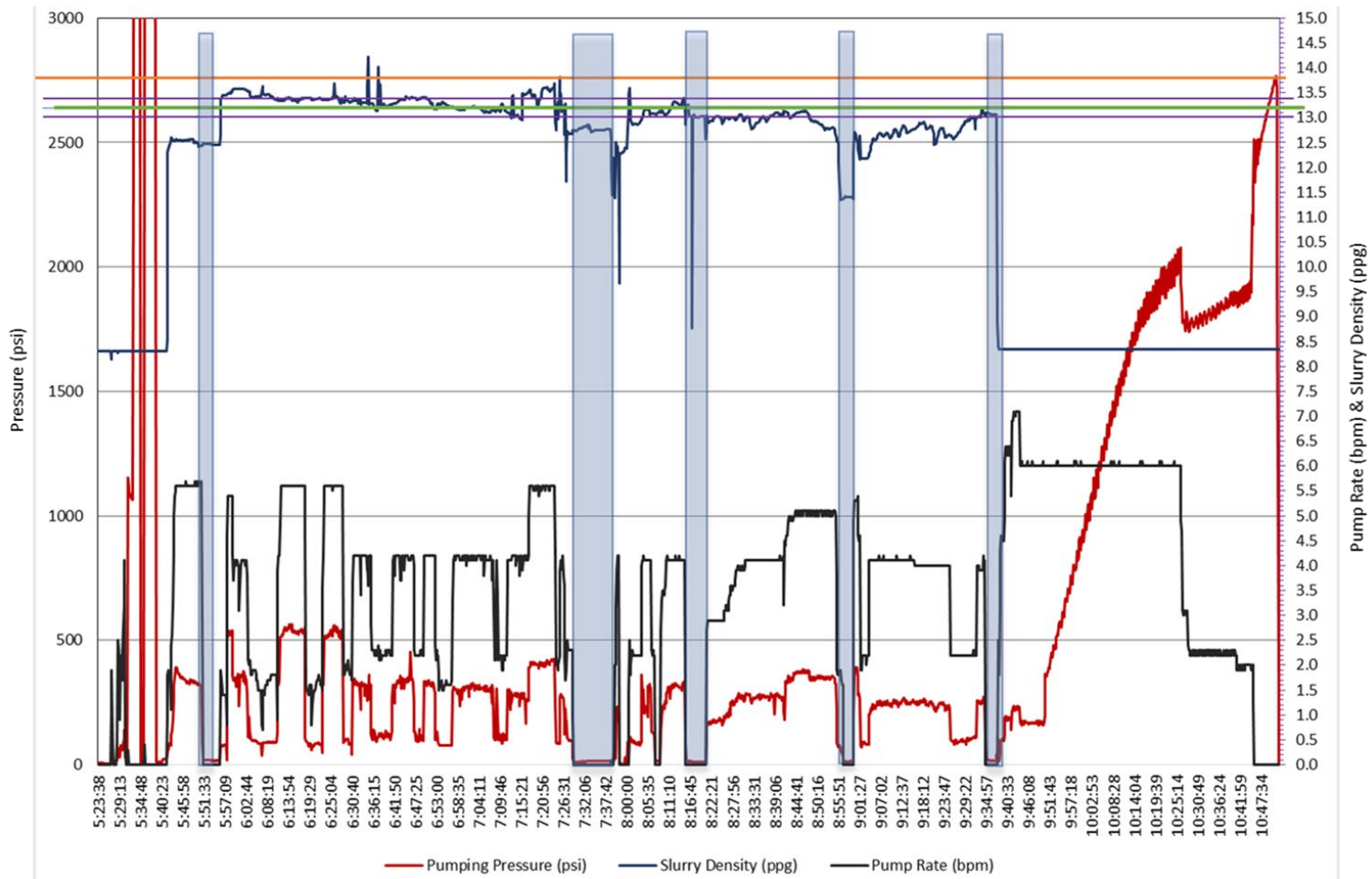


Figure 146. Pumping records for 7-inch production casing cementing.



Well 16B(78)-32 Production Casing Cement Job Execution Pressure Match

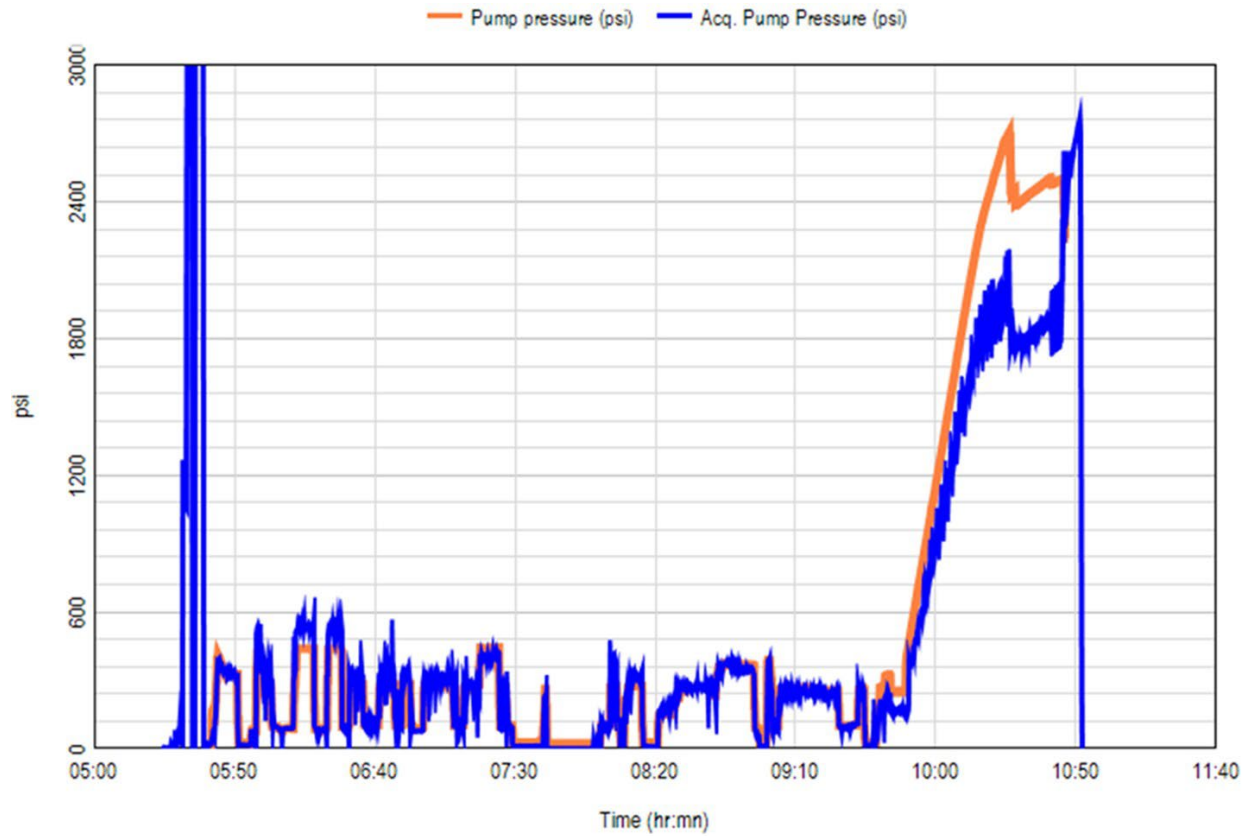


Figure 147. Pumping records for 7-inch production casing cementing.

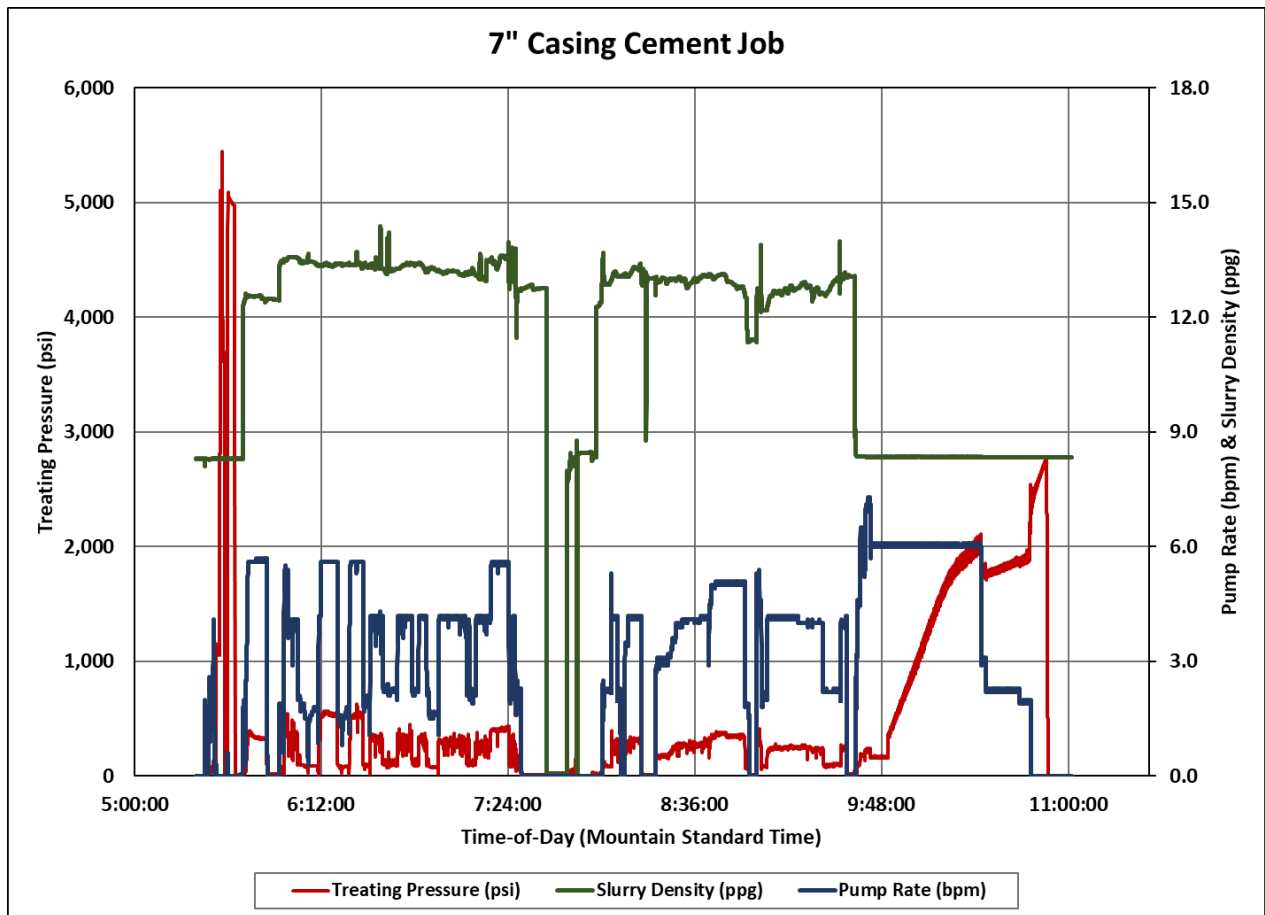


Figure 148. The digital data are in [SLB Combined Pumping Data for 7-inch Casing Cement Job.xlsx](#).

Since there were fiber optic strings in the annulus of this well, the cementing was precisely documented.

Well 16B(78)-32 – temperature change waterfall plot

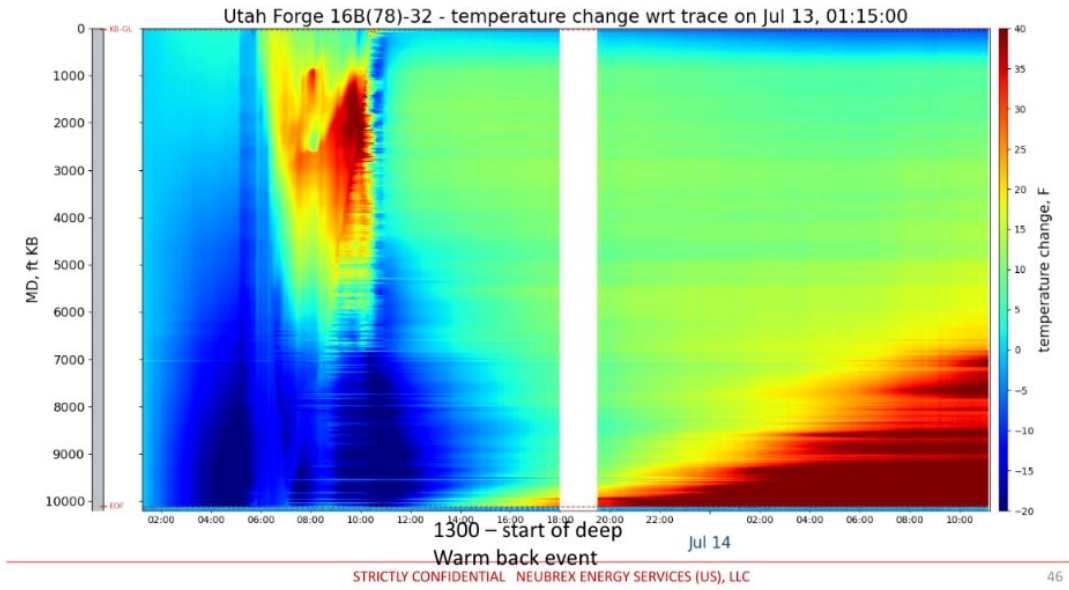


Figure 149. This shows the start of a deep warmback event on July 14, 2023.

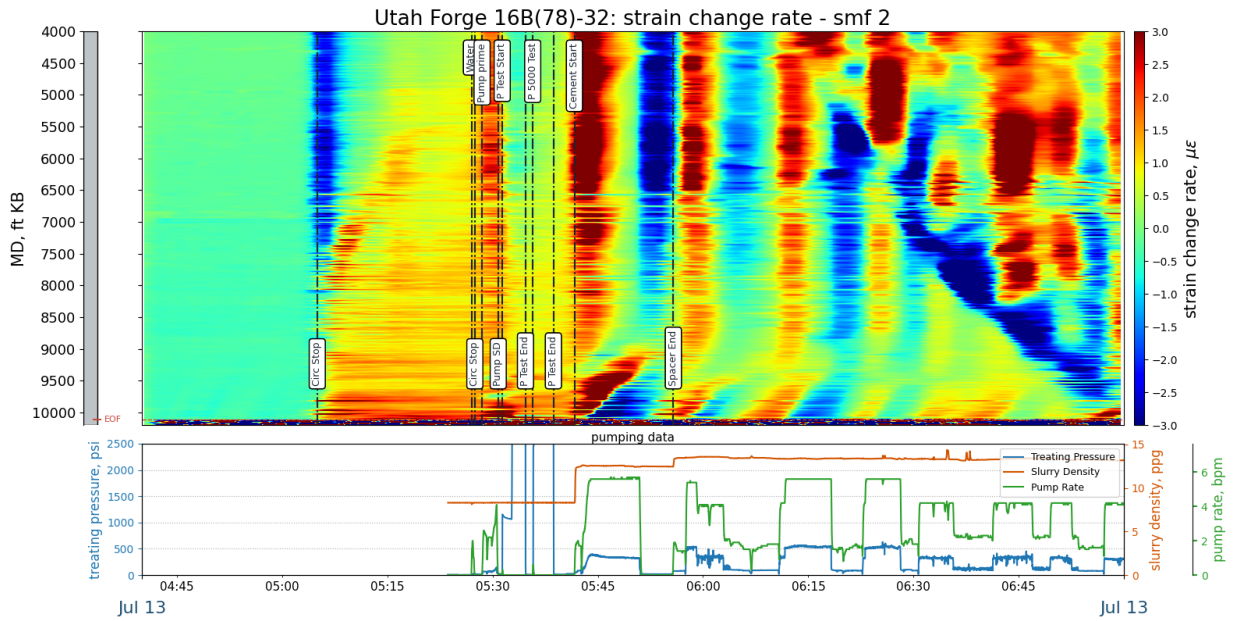


Figure 150. This shows the strain rate change during cementing.

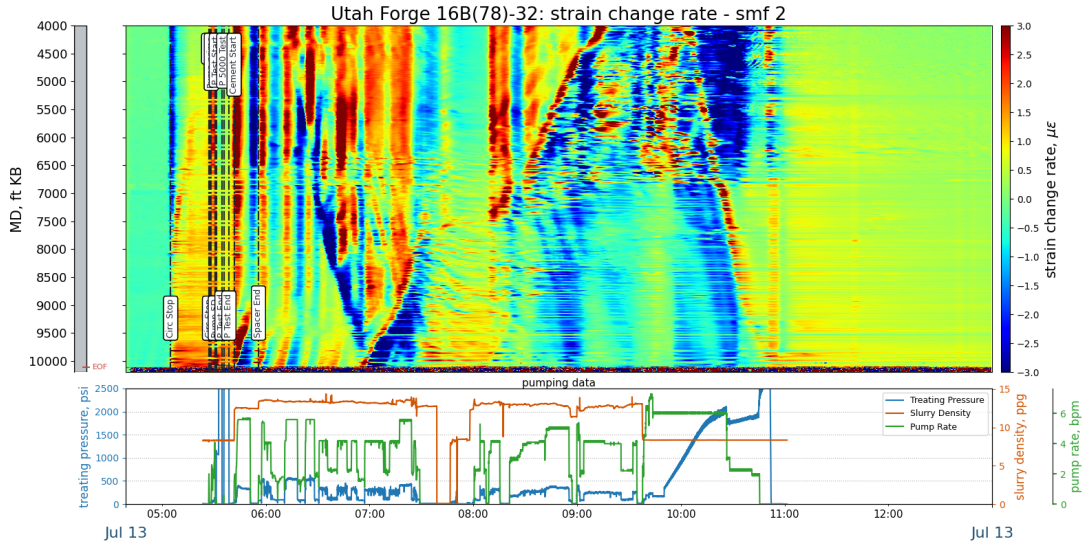


Figure 151. This is a closeup in time. The data are RfS DSS strain rate. Neubrex suggests that typically this is thermally driven strain change on the fiber during such an operation as cementing. RfS DSS may be better than DTS at detecting temperature change and it is faster than DTS so better in detecting fast changes. Positive red means warming (dilatational on glass fiber) and blue is cooling (contractual on glass fiber). Horizontal features are likely clamps or coupling or centralizes. Those hardware types affect the temperature on the fiber and can be seen in fiber data. “No reservoir features”

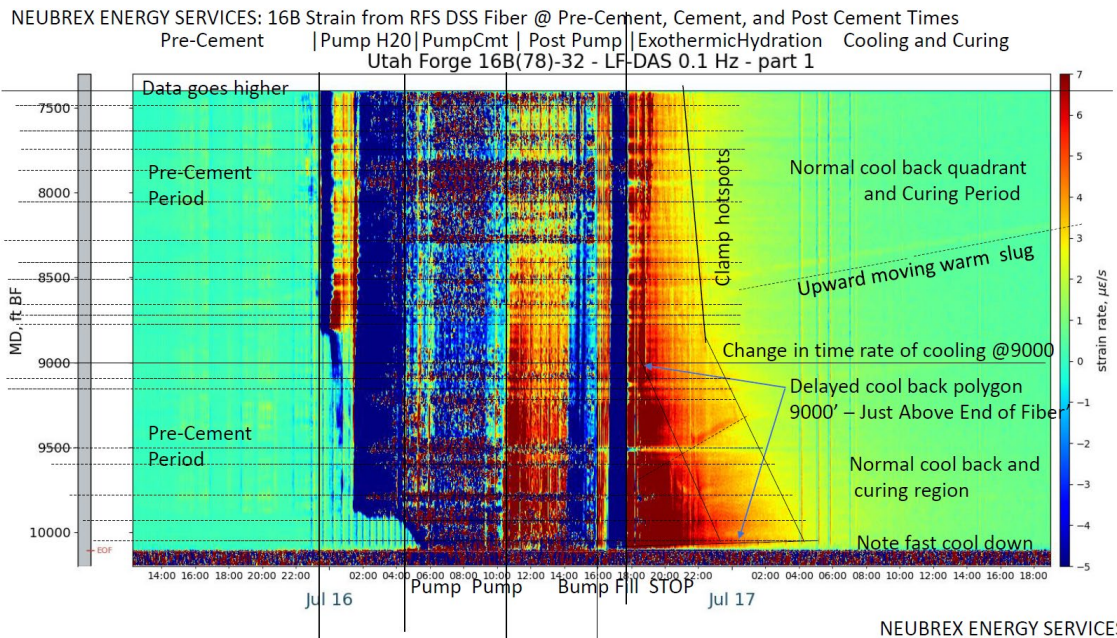


Figure 152. An annotated waterfall plot run during circulation testing on July 17, 2023.

Neubrex LF DAS 16A circulation @ 16B | LFDAS extraction from 10000 Hz DAS. Signal is assumed to be mainly driven by thermal changes

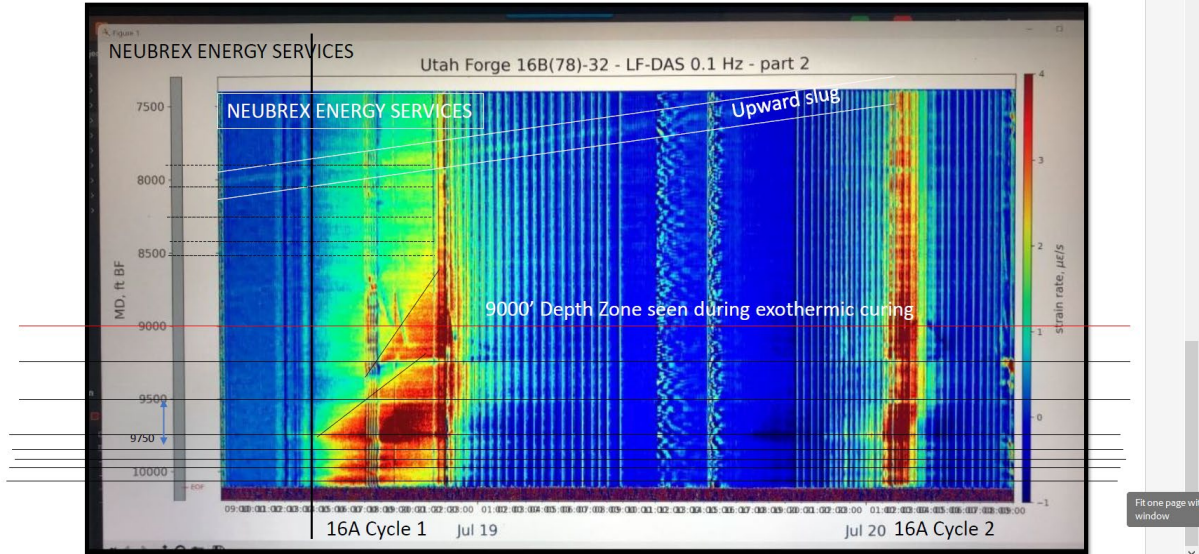


Figure 153. An annotated waterfall plot run during circulation testing on July 19 and 20, 2023 Neubrex suggests that “It is clear, that with high spatial resolution DAS measured with very high bandwidth (10,000 Hertz) it is possible to detect very clear discrete zones in the bottom of 16B.”

XII. Circulation Testing

Circulation was evaluated in July 2023, before and after the production casing was run. Refer to Appendix H.

XIII. Acronyms and Abbreviations

ACP	Annulus Casing Packer
AD	Alternative (Special) Drift
AFE	Authorization for Expenditure
ALAP	As Low as Possible
API	American Petroleum Institute
BHA	Bottom hole Assembly
BHST	Bottom hole Static Temperature
BOP	Blowout Preventer
BOPE	Blowout Prevention Equipment
BTC	Buttress Threaded and Coupled
CO ₂	Carbon dioxide
CRT	Casing Running Tool
DC	Drill Collar
DD	Directional Driller
DP	Drill Pipe
DSM	Drill Site Manager
ECD	Equivalent Circulating Density
EDR	Electronic Data Recorder (Recording)
EHS	Environmental, Health, and Safety
EMW	Equivalent Mud Weight
EOWR	End of Well Report
FC	Float Collar
FG	Fracture Gradient
FIT	Formation Integrity Test
FOSV	Full Opening Safety Valve
FS	Float Shoe
GL	Ground Level
H ₂ S	Hydrogen Sulfide
HSE	Health, Safety and Environment
HSI	Horsepower per Square Inch
HWDP	Heavyweight Drill Pipe
IADC	International Association of Drilling Contractors
ID	Inner Diameter
JSA	Job Safety Analysis
Jt	Joint
KPI	Key Performance Indicator

LCM	Lost Circulation Material
LOT	Leak off Test
MU	Make Up
MD	Measured Depth
MIRU	Move In and Rig Up
NU	Nipple Up
ND	Nipple Down
NMDC	Nonmagnetic Drill Collar
NPT	National Pipe Thread
OD	Outer Diameter
PU	Pick Up
PDC	Polycrystalline Diamond Compact
PLC	Partial Lost Circulation
POOH	Pull Out of Hole
ppb	Pounds per Barrel
ppf	Pounds per Foot
ppg	Pounds per Gallon
PT	Pressure and Temperature
PTS	Pressure, Temperature and Spinner
PU/SO	Pick Up/Slack Off
PV	Plastic Viscosity
PVT	Pit Volume Totalizer
RDMO	Rig Down and Move Out
RIH	Run in Hole
RM	Rig Manager
RSS	Rotary Steerable System
SRT	Step Rate Test
TLTM	Too Low to Measure
UBI	Ultrasonic Borehole Imager
USIT	Ultrasonic Imaging Tool
UofU	University of Utah
VRSS	Vertical Rotary Steerable System
WITSML	Well-Site Information Transfer Standard Markup Language
XLOT	Extended Leak off Test
YP	Yield Point

Appendix A: As-Drilled Trajectory

Table A-1. Header Information

COMPANY	: Utah Forge
FIELD	: Beaver (University of Utah)
SITE	: Utah Forge
WELL	: 16B(78)-32
WELLPATH	: 16B(78)-32
DESIGN	: 16B(78)-32 Final Surveys
MAP SYSTEM	: Universal Transverse Mercator (US Survey Feet)
GEODIC DATUM	: NAD83 Utah - HARN
MAP ZONE	: Zone 12N (114 W to 108 W)
CALCULATION METHOD	: Minimum Curvature
WELL EASTING	: 1097907.09ft
WELL NORTHING	: 13987765.96ft
VSECT DIREC	: 106.85deg
NORTH REF	: Grid
KB ELEV	: 5447.65ft
GL ELEV	: 5415.65ft
DATE	: 6/26/2023
SURVEY	

Table A-2. Wellbore Trajectory

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
0	0	0	0	5447.65	0	13987766	0	1097907	0	0
25	0.22	52.11	25	5422.65	0.03	13987766	0.04	1097907	0.03	0.88
50	0.45	52.11	50	5397.65	0.12	13987766	0.15	1097907	0.11	0.92
75	0.36	38.82	75	5372.65	0.24	13987766	0.28	1097907	0.2	0.52
100	0.14	58.33	100	5347.65	0.32	13987766	0.36	1097907	0.25	0.93
125	0.54	131.51	125	5322.65	0.26	13987766	0.47	1097908	0.38	2.07
150	0.64	102.12	150	5297.65	0.15	13987766	0.69	1097908	0.62	1.26
175	0.65	75.44	175	5272.65	0.15	13987766	0.97	1097908	0.88	1.19
200	0.44	58.93	199.99	5247.66	0.24	13987766	1.19	1097908	1.07	1.04
225	0.26	44.13	224.99	5222.66	0.33	13987766	1.31	1097908	1.16	0.8
250	0.19	119.27	249.99	5197.66	0.35	13987766	1.38	1097908	1.22	1.12
275	0.4	126.68	274.99	5172.66	0.28	13987766	1.49	1097909	1.35	0.85
300	0.55	112.24	299.99	5147.66	0.18	13987766	1.67	1097909	1.55	0.76
325	0.69	107.15	324.99	5122.66	0.09	13987766	1.93	1097909	1.82	0.6
350	0.84	80.36	349.99	5097.66	0.08	13987766	2.25	1097909	2.13	1.53
375	0.7	69.14	374.99	5072.66	0.16	13987766	2.57	1097910	2.42	0.82
400	0.52	73.07	399.99	5047.66	0.25	13987766	2.83	1097910	2.63	0.74
425	0.42	91.96	424.98	5022.67	0.28	13987766	3.03	1097910	2.82	0.73
450	0.42	109.31	449.98	4997.67	0.25	13987766	3.2	1097910	3	0.51
475	0.59	117.89	474.98	4972.67	0.16	13987766	3.4	1097910	3.21	0.74
500	0.88	107.57	499.98	4947.67	0.04	13987766	3.7	1097911	3.53	1.27
525	1.07	89.12	524.98	4922.67	-0.02	13987766	4.12	1097911	3.95	1.46
550	1.1	80.69	549.97	4897.68	0.03	13987766	4.59	1097912	4.38	0.65
575	0.92	68.2	574.97	4872.68	0.14	13987766	5.01	1097912	4.76	1.13
600	0.89	80.6	599.97	4847.68	0.25	13987766	5.39	1097912	5.09	0.79
625	0.88	85.61	624.96	4822.69	0.29	13987766	5.77	1097913	5.44	0.31
650	0.97	98.35	649.96	4797.69	0.28	13987766	6.17	1097913	5.83	0.9
675	1.48	95.91	674.95	4772.7	0.21	13987766	6.7	1097914	6.35	2.05
700	1.59	84.67	699.94	4747.71	0.21	13987766	7.37	1097914	6.99	1.28
725	1.44	79.09	724.94	4722.71	0.3	13987766	8.02	1097915	7.59	0.84
750	1.35	81.48	749.93	4697.72	0.41	13987766	8.62	1097916	8.14	0.43
775	1.37	85.13	774.92	4672.73	0.47	13987766	9.21	1097916	8.68	0.36
800	1.22	92.17	799.92	4647.73	0.49	13987766	9.78	1097917	9.21	0.87
825	1.37	97.63	824.91	4622.74	0.44	13987766	10.34	1097917	9.77	0.78

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
850	1.76	95.25	849.9	4597.75	0.37	13987766	11.02	1097918	10.44	1.58
875	1.78	87.92	874.89	4572.76	0.34	13987766	11.79	1097919	11.18	0.91
900	1.85	87.44	899.87	4547.78	0.38	13987766	12.58	1097920	11.93	0.29
925	1.76	80.97	924.86	4522.79	0.45	13987766	13.36	1097920	12.65	0.89
950	1.69	83.12	949.85	4497.8	0.56	13987767	14.11	1097921	13.34	0.38
975	1.64	83.53	974.84	4472.81	0.64	13987767	14.83	1097922	14	0.21
1000	1.68	86.08	999.83	4447.82	0.71	13987767	15.55	1097923	14.67	0.34
1025	1.67	88.73	1024.82	4422.83	0.74	13987767	16.28	1097923	15.36	0.31
1050	1.85	93.72	1049.81	4397.84	0.72	13987767	17.04	1097924	16.1	0.94
1075	2.24	91.88	1074.79	4372.86	0.68	13987767	17.94	1097925	16.97	1.58
1100	2.03	83.69	1099.77	4347.88	0.71	13987767	18.86	1097926	17.85	1.48
1125	1.79	83.37	1124.76	4322.89	0.81	13987767	19.69	1097927	18.61	0.96
1150	1.83	92.6	1149.75	4297.9	0.83	13987767	20.48	1097928	19.36	1.18
1175	2.07	95.76	1174.73	4272.92	0.77	13987767	21.33	1097928	20.19	1.05
1200	1.83	93.18	1199.72	4247.93	0.7	13987767	22.17	1097929	21.02	1.02
1225	1.22	85.74	1224.71	4222.94	0.7	13987767	22.84	1097930	21.65	2.56
1250	0.57	87.6	1249.71	4197.94	0.73	13987767	23.23	1097930	22.02	2.6
1275	0.39	95.12	1274.71	4172.94	0.72	13987767	23.44	1097931	22.22	0.76
1300	0.23	87.94	1299.71	4147.94	0.72	13987767	23.57	1097931	22.35	0.66
1325	0.14	152.75	1324.71	4122.94	0.69	13987767	23.64	1097931	22.42	0.85
1350	0.33	127.31	1349.71	4097.94	0.62	13987767	23.71	1097931	22.51	0.85
1375	0.46	106.77	1374.7	4072.95	0.55	13987767	23.86	1097931	22.68	0.76
1400	0.62	73.81	1399.7	4047.95	0.56	13987767	24.09	1097931	22.89	1.37
1425	0.52	59.26	1424.7	4022.95	0.65	13987767	24.31	1097931	23.08	0.7
1450	0.37	34.29	1449.7	3997.95	0.78	13987767	24.46	1097932	23.18	0.97
1475	0.15	331.37	1474.7	3972.95	0.87	13987767	24.49	1097932	23.18	1.32
1500	0.5	112.05	1499.7	3947.95	0.86	13987767	24.57	1097932	23.27	2.49
1525	0.54	64.38	1524.7	3922.95	0.87	13987767	24.78	1097932	23.46	1.69
1550	0.26	47.98	1549.7	3897.95	0.96	13987767	24.93	1097932	23.58	1.2
1575	0.26	124.6	1574.7	3872.95	0.97	13987767	25.02	1097932	23.66	1.29
1600	0.73	95.79	1599.7	3847.95	0.92	13987767	25.22	1097932	23.87	2.07
1625	0.6	74.68	1624.7	3822.95	0.94	13987767	25.51	1097933	24.14	1.1
1650	0.6	73.49	1649.7	3797.95	1.01	13987767	25.76	1097933	24.36	0.05
1675	0.44	80.68	1674.69	3772.96	1.06	13987767	25.98	1097933	24.56	0.69
1700	0.69	93.99	1699.69	3747.96	1.07	13987767	26.22	1097933	24.79	1.12
1725	0.64	108.67	1724.69	3722.96	1.01	13987767	26.51	1097934	25.07	0.71
1750	1.15	119.45	1749.69	3697.96	0.84	13987767	26.86	1097934	25.46	2.14
1775	1.09	96.52	1774.68	3672.97	0.69	13987767	27.31	1097934	25.94	1.8
1800	0.81	114.26	1799.68	3647.97	0.59	13987767	27.71	1097935	26.35	1.61

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
1825	1.24	109.58	1824.68	3622.97	0.43	13987766	28.12	1097935	26.79	1.75
1850	0.81	118.64	1849.67	3597.98	0.25	13987766	28.53	1097936	27.24	1.83
1875	1.2	124.87	1874.67	3572.98	0.02	13987766	28.9	1097936	27.66	1.62
1900	1.08	128.11	1899.66	3547.99	-0.27	13987766	29.3	1097936	28.13	0.54
1925	0.97	142.35	1924.66	3522.99	-0.59	13987765	29.62	1097937	28.52	1.11
1950	0.91	158.1	1949.66	3497.99	-0.94	13987765	29.82	1097937	28.81	1.06
1975	0.81	187.42	1974.65	3473	-1.3	13987765	29.87	1097937	28.97	1.78
2000	0.84	206.25	1999.65	3448	-1.64	13987764	29.77	1097937	28.97	1.09
2025	0.88	192.96	2024.65	3423	-1.99	13987764	29.65	1097937	28.95	0.81
2050	0.71	238.52	2049.65	3398	-2.26	13987764	29.47	1097937	28.86	2.54
2075	1.2	230.46	2074.64	3373.01	-2.51	13987763	29.14	1097936	28.61	2.03
2100	1.15	213.31	2099.64	3348.01	-2.88	13987763	28.8	1097936	28.4	1.42
2125	0.96	209.74	2124.63	3323.02	-3.27	13987763	28.56	1097936	28.28	0.8
2150	0.65	229.8	2149.63	3298.02	-3.55	13987762	28.34	1097935	28.15	1.66
2175	0.97	219.1	2174.63	3273.02	-3.8	13987762	28.1	1097935	28	1.41
2200	0.76	207.02	2199.63	3248.02	-4.11	13987762	27.89	1097935	27.89	1.11
2225	0.71	199.97	2224.62	3223.03	-4.41	13987762	27.76	1097935	27.85	0.41
2250	0.84	180.93	2249.62	3198.03	-4.74	13987761	27.71	1097935	27.89	1.15
2275	0.87	204.99	2274.62	3173.03	-5.09	13987761	27.63	1097935	27.92	1.43
2300	0.84	211.64	2299.62	3148.03	-5.42	13987761	27.45	1097935	27.84	0.41
2325	1.11	207.93	2324.61	3123.04	-5.79	13987760	27.24	1097934	27.75	1.11
2350	1.23	204.99	2349.61	3098.04	-6.25	13987760	27.01	1097934	27.66	0.54
2375	0.84	187.87	2374.6	3073.05	-6.67	13987759	26.87	1097934	27.65	1.97
2400	0.76	208.12	2399.6	3048.05	-7	13987759	26.77	1097934	27.65	1.17
2425	1.04	219.68	2424.6	3023.05	-7.32	13987759	26.55	1097934	27.53	1.33
2450	1.21	210.79	2449.59	2998.06	-7.72	13987758	26.27	1097933	27.38	0.97
2475	1.04	192.72	2474.59	2973.06	-8.17	13987758	26.08	1097933	27.33	1.56
2500	1	208.44	2499.58	2948.07	-8.58	13987757	25.93	1097933	27.3	1.13
2525	1.09	187.83	2524.58	2923.07	-9.01	13987757	25.79	1097933	27.3	1.54
2550	0.76	213.73	2549.58	2898.07	-9.38	13987757	25.67	1097933	27.29	2.1
2575	0.96	210.63	2574.57	2873.08	-9.7	13987756	25.47	1097933	27.19	0.82
2600	1.16	200.62	2599.57	2848.08	-10.12	13987756	25.27	1097932	27.12	1.09
2625	1.04	210.58	2624.56	2823.09	-10.55	13987755	25.07	1097932	27.05	0.9
2650	1.03	221.52	2649.56	2798.09	-10.91	13987755	24.8	1097932	26.9	0.79
2675	1.25	256.28	2674.56	2773.09	-11.15	13987755	24.39	1097931	26.57	2.85
2700	1.29	254.86	2699.55	2748.1	-11.29	13987755	23.85	1097931	26.1	0.2
2725	1.46	259.88	2724.54	2723.11	-11.41	13987755	23.27	1097930	25.58	0.83
2750	1.44	253.95	2749.53	2698.12	-11.56	13987754	22.65	1097930	25.03	0.61
2775	1.2	250.69	2774.53	2673.12	-11.73	13987754	22.1	1097929	24.56	1.01

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
2800	0.9	255.68	2799.52	2648.13	-11.87	13987754	21.67	1097929	24.18	1.25
2825	1.01	280.25	2824.52	2623.13	-11.88	13987754	21.26	1097928	23.79	1.68
2850	1.03	284.67	2849.52	2598.13	-11.78	13987754	20.83	1097928	23.35	0.32
2875	1.17	282.11	2874.51	2573.14	-11.67	13987754	20.36	1097927	22.87	0.59
2900	1.13	283.34	2899.51	2548.14	-11.56	13987754	19.87	1097927	22.37	0.19
2925	1.01	271.93	2924.5	2523.15	-11.49	13987754	19.41	1097927	21.91	0.98
2950	0.65	279.18	2949.5	2498.15	-11.46	13987755	19.05	1097926	21.55	1.5
2975	0.87	303.93	2974.5	2473.15	-11.34	13987755	18.75	1097926	21.23	1.56
3000	1.01	284.44	2999.49	2448.16	-11.17	13987755	18.38	1097925	20.83	1.39
3025	0.61	286.05	3024.49	2423.16	-11.08	13987755	18.04	1097925	20.48	1.6
3050	0.71	301.26	3049.49	2398.16	-10.97	13987755	17.78	1097925	20.2	0.8
3075	0.84	275.53	3074.49	2373.16	-10.87	13987755	17.46	1097925	19.87	1.47
3100	0.61	293.64	3099.49	2348.16	-10.8	13987755	17.16	1097924	19.55	1.29
3125	0.78	311.23	3124.48	2323.17	-10.63	13987755	16.91	1097924	19.27	1.08
3150	0.77	279.28	3149.48	2298.17	-10.49	13987755	16.62	1097924	18.94	1.71
3175	0.71	320.79	3174.48	2273.17	-10.35	13987756	16.35	1097923	18.65	2.11
3200	0.91	300.34	3199.48	2248.17	-10.12	13987756	16.08	1097923	18.33	1.39
3225	0.52	282.31	3224.48	2223.17	-10	13987756	15.8	1097923	18.02	1.78
3250	0.68	314.84	3249.47	2198.18	-9.87	13987756	15.59	1097923	17.78	1.48
3275	0.45	329.64	3274.47	2173.18	-9.68	13987756	15.43	1097923	17.58	1.08
3300	0.56	330	3299.47	2148.18	-9.49	13987756	15.32	1097922	17.41	0.44
3325	0.47	322.18	3324.47	2123.18	-9.3	13987757	15.2	1097922	17.24	0.46
3350	0.35	336.04	3349.47	2098.18	-9.15	13987757	15.1	1097922	17.11	0.62
3375	0.24	4.68	3374.47	2073.18	-9.03	13987757	15.08	1097922	17.05	0.72
3400	0.37	63.06	3399.47	2048.18	-8.94	13987757	15.15	1097922	17.09	1.27
3425	0.46	101.84	3424.47	2023.18	-8.93	13987757	15.32	1097922	17.25	1.15
3450	0.5	109.13	3449.47	1998.18	-8.98	13987757	15.52	1097923	17.46	0.29
3475	0.82	99.96	3474.47	1973.18	-9.05	13987757	15.8	1097923	17.75	1.34
3500	0.58	113.04	3499.46	1948.19	-9.13	13987757	16.1	1097923	18.05	1.15
3525	0.97	104.22	3524.46	1923.19	-9.23	13987757	16.42	1097924	18.39	1.63
3550	0.7	87.67	3549.46	1898.19	-9.28	13987757	16.77	1097924	18.74	1.44
3575	0.86	82.09	3574.46	1873.19	-9.25	13987757	17.11	1097924	19.06	0.71
3600	0.75	95.48	3599.46	1848.19	-9.24	13987757	17.46	1097925	19.39	0.87
3625	0.5	124.27	3624.45	1823.2	-9.31	13987757	17.71	1097925	19.65	1.58
3650	0.8	109.58	3649.45	1798.2	-9.43	13987757	17.97	1097925	19.93	1.36
3675	0.67	114.35	3674.45	1773.2	-9.55	13987756	18.27	1097925	20.25	0.57
3700	0.74	97.06	3699.45	1748.2	-9.63	13987756	18.56	1097926	20.56	0.89
3725	0.74	101.53	3724.45	1723.2	-9.68	13987756	18.88	1097926	20.88	0.23
3750	0.63	78.68	3749.44	1698.21	-9.69	13987756	19.17	1097926	21.16	1.17

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
3775	0.55	107.07	3774.44	1673.21	-9.7	13987756	19.42	1097927	21.4	1.2
3800	0.59	86.48	3799.44	1648.21	-9.72	13987756	19.66	1097927	21.64	0.83
3825	0.84	100.27	3824.44	1623.21	-9.75	13987756	19.97	1097927	21.94	1.21
3850	0.57	108.99	3849.44	1598.21	-9.82	13987756	20.27	1097927	22.25	1.16
3875	0.77	92.88	3874.44	1573.21	-9.87	13987756	20.56	1097928	22.54	1.09
3900	0.8	104.43	3899.43	1548.22	-9.92	13987756	20.89	1097928	22.87	0.64
3925	1.07	95.63	3924.43	1523.22	-9.99	13987756	21.29	1097928	23.28	1.22
3950	0.8	93.6	3949.43	1498.22	-10.02	13987756	21.7	1097929	23.67	1.09
3975	0.79	89	3974.42	1473.23	-10.03	13987756	22.05	1097929	24.01	0.26
4000	1.13	96.3	3999.42	1448.23	-10.06	13987756	22.46	1097930	24.42	1.44
4025	0.68	93	4024.42	1423.23	-10.09	13987756	22.86	1097930	24.8	1.81
4050	0.75	118.09	4049.42	1398.23	-10.18	13987756	23.15	1097930	25.11	1.27
4075	0.89	111.94	4074.41	1373.24	-10.32	13987756	23.47	1097931	25.46	0.66
4100	0.42	119.05	4099.41	1348.24	-10.44	13987756	23.74	1097931	25.74	1.9
4125	0.46	106.27	4124.41	1323.24	-10.51	13987755	23.91	1097931	25.93	0.42
4150	0.82	100.72	4149.41	1298.24	-10.58	13987755	24.18	1097931	26.21	1.46
4175	0.43	81.17	4174.41	1273.24	-10.59	13987755	24.45	1097932	26.47	1.76
4200	0.45	112.3	4199.41	1248.24	-10.62	13987755	24.64	1097932	26.66	0.95
4225	0.43	110.11	4224.41	1223.24	-10.69	13987755	24.81	1097932	26.85	0.1
4250	0.63	103.96	4249.41	1198.24	-10.75	13987755	25.04	1097932	27.08	0.83
4275	0.8	127.54	4274.4	1173.25	-10.89	13987755	25.31	1097932	27.38	1.34
4300	0.48	98.21	4299.4	1148.25	-11.01	13987755	25.55	1097933	27.65	1.79
4325	0.61	124.9	4324.4	1123.25	-11.1	13987755	25.76	1097933	27.88	1.13
4350	0.68	92.28	4349.4	1098.25	-11.19	13987755	26.02	1097933	28.15	1.47
4375	0.69	119.99	4374.4	1073.25	-11.27	13987755	26.3	1097933	28.44	1.31
4400	0.61	73.25	4399.4	1048.25	-11.3	13987755	26.56	1097934	28.69	2.08
4425	0.56	93.68	4424.4	1023.25	-11.27	13987755	26.81	1097934	28.92	0.85
4450	0.77	69.92	4449.39	998.26	-11.22	13987755	27.09	1097934	29.18	1.37
4475	1.11	81.57	4474.39	973.26	-11.13	13987755	27.48	1097935	29.53	1.55
4500	0.7	92.27	4499.39	948.26	-11.1	13987755	27.87	1097935	29.9	1.77
4525	0.95	69.37	4524.38	923.27	-11.03	13987755	28.22	1097935	30.21	1.64
4550	0.7	96.1	4549.38	898.27	-10.98	13987755	28.57	1097936	30.52	1.81
4575	1.07	104.17	4574.38	873.27	-11.05	13987755	28.95	1097936	30.91	1.56
4600	1.2	92.9	4599.37	848.28	-11.12	13987755	29.43	1097937	31.39	1.03
4625	0.98	88.69	4624.37	823.28	-11.13	13987755	29.91	1097937	31.85	0.94
4650	1.1	102.12	4649.37	798.28	-11.18	13987755	30.36	1097937	32.29	1.08
4675	1.22	115.26	4674.36	773.29	-11.34	13987755	30.83	1097938	32.8	1.16
4700	1.49	118.69	4699.35	748.3	-11.61	13987754	31.36	1097938	33.38	1.13
4725	1.85	122.18	4724.34	723.31	-11.98	13987754	31.98	1097939	34.08	1.5

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
4750	2.17	121.8	4749.33	698.32	-12.44	13987754	32.73	1097940	34.93	1.28
4775	2.44	123.54	4774.31	673.34	-12.99	13987753	33.57	1097941	35.9	1.12
4800	2.5	124.15	4799.28	648.37	-13.59	13987752	34.47	1097942	36.93	0.26
4825	2.62	125.62	4824.26	623.39	-14.23	13987752	35.38	1097942	37.99	0.55
4850	2.53	133.12	4849.23	598.42	-14.94	13987751	36.25	1097943	39.03	1.39
4875	2.88	126.33	4874.21	573.44	-15.69	13987750	37.16	1097944	40.11	1.9
4900	2.27	133.86	4899.18	548.47	-16.4	13987750	38.02	1097945	41.15	2.79
4925	1.87	158.06	4924.16	523.49	-17.12	13987749	38.53	1097946	41.84	3.81
4950	1.96	148.14	4949.15	498.5	-17.86	13987748	38.91	1097946	42.42	1.37
4975	1.61	152.88	4974.14	473.51	-18.54	13987747	39.3	1097946	42.98	1.52
5000	1.74	163.36	4999.13	448.52	-19.22	13987747	39.57	1097947	43.44	1.33
5025	0.86	165.6	5024.12	423.53	-19.76	13987746	39.72	1097947	43.74	3.53
5050	0.9	154.12	5049.12	398.53	-20.12	13987746	39.85	1097947	43.97	0.72
5075	1	174.59	5074.11	373.54	-20.51	13987745	39.96	1097947	44.19	1.41
5100	0.75	166.03	5099.11	348.54	-20.89	13987745	40.02	1097947	44.36	1.13
5125	0.71	143.03	5124.11	323.54	-21.17	13987745	40.15	1097947	44.57	1.17
5150	0.71	138.33	5149.11	298.54	-21.41	13987745	40.35	1097947	44.82	0.23
5175	1.17	131.7	5174.1	273.55	-21.7	13987744	40.64	1097948	45.19	1.89
5200	1.63	128.59	5199.1	248.55	-22.09	13987744	41.11	1097948	45.75	1.86
5225	1.63	130.3	5224.09	223.56	-22.54	13987743	41.66	1097949	46.4	0.19
5250	1.64	134.48	5249.08	198.57	-23.02	13987743	42.19	1097949	47.05	0.48
5275	2.18	141.42	5274.06	173.59	-23.64	13987742	42.74	1097950	47.76	2.35
5300	2.05	146.12	5299.05	148.6	-24.39	13987742	43.28	1097950	48.49	0.87
5325	1.61	158.24	5324.03	123.62	-25.08	13987741	43.66	1097951	49.06	2.33
5350	1.29	175.24	5349.03	98.62	-25.69	13987740	43.82	1097951	49.38	2.13
5375	0.96	199.55	5374.02	73.63	-26.17	13987740	43.77	1097951	49.48	2.29
5400	1.1	231.33	5399.02	48.63	-26.52	13987739	43.51	1097951	49.33	2.32
5425	1.39	228.65	5424.01	23.64	-26.87	13987739	43.1	1097950	49.03	1.18
5450	1.21	228.97	5449	-1.35	-27.24	13987739	42.67	1097950	48.73	0.72
5475	0.58	243.49	5474	-26.35	-27.47	13987738	42.36	1097949	48.5	2.66
5500	0.43	165.75	5499	-51.35	-27.62	13987738	42.27	1097949	48.46	2.58
5525	1.5	134.22	5524	-76.35	-27.94	13987738	42.53	1097950	48.8	4.62
5550	2.96	126.35	5548.98	-101.33	-28.55	13987737	43.28	1097950	49.7	5.95
5575	4.84	121.77	5573.92	-126.27	-29.48	13987736	44.7	1097952	51.32	7.62
5600	6.56	122.66	5598.79	-151.14	-30.81	13987735	46.8	1097954	53.72	6.89
5625	7.83	125.08	5623.6	-175.95	-32.56	13987733	49.39	1097956	56.71	5.22
5650	9.35	127.99	5648.32	-200.67	-34.79	13987731	52.39	1097959	60.22	6.32
5675	11.11	130.02	5672.92	-225.27	-37.59	13987728	55.83	1097963	64.33	7.19
5700	12.62	132.49	5697.38	-249.73	-40.98	13987725	59.69	1097967	69.01	6.37

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
5725	13.02	132.67	5721.76	-274.11	-44.74	13987721	63.77	1097971	74	1.61
5750	12.94	131.97	5746.12	-298.47	-48.52	13987717	67.93	1097975	79.07	0.71
5775	13.32	131.34	5770.47	-322.82	-52.29	13987714	72.17	1097979	84.23	1.62
5800	13.57	131.01	5794.78	-347.13	-56.12	13987710	76.55	1097984	89.53	1.05
5825	14.14	130.26	5819.05	-371.4	-60.01	13987706	81.09	1097988	95	2.39
5850	15.03	129.35	5843.25	-395.6	-64.04	13987702	85.93	1097993	100.8	3.68
5875	16.43	127.94	5867.31	-419.66	-68.27	13987698	91.22	1097998	107.09	5.8
5900	17.59	126.76	5891.22	-443.57	-72.71	13987693	97.04	1098004	113.95	4.84
5925	19.51	125.12	5914.92	-467.27	-77.37	13987689	103.48	1098011	121.46	7.96
5950	21.32	123.21	5938.35	-490.7	-82.26	13987684	110.7	1098018	129.79	7.71
5975	22.24	121.77	5961.56	-513.91	-87.24	13987679	118.52	1098026	138.72	4.26
6000	22.68	120.17	5984.67	-537.02	-92.16	13987674	126.71	1098034	147.98	3.01
6025	23.51	117.92	6007.66	-560.01	-96.91	13987669	135.28	1098042	157.57	4.85
6050	24.17	115.17	6030.53	-582.88	-101.42	13987665	144.32	1098051	167.52	5.17
6075	24.86	114.22	6053.28	-605.63	-105.76	13987660	153.75	1098061	177.8	3.18
6100	25.39	113.55	6075.91	-628.26	-110.05	13987656	163.45	1098071	188.34	2.41
6125	26	112.81	6098.44	-650.79	-114.32	13987652	173.42	1098081	199.11	2.76
6150	26.44	112.75	6120.87	-673.22	-118.6	13987647	183.6	1098091	210.09	1.76
6175	26.83	112.51	6143.21	-695.56	-122.91	13987643	193.95	1098101	221.25	1.62
6200	27.64	112.69	6165.44	-717.79	-127.31	13987639	204.51	1098112	232.63	3.26
6225	28.43	112.24	6187.51	-739.86	-131.8	13987634	215.37	1098122	244.32	3.27
6250	29.28	112.36	6209.4	-761.75	-136.37	13987630	226.53	1098134	256.33	3.41
6275	30.5	112.61	6231.08	-783.43	-141.14	13987625	238.04	1098145	268.73	4.91
6300	31.74	112.75	6252.48	-804.83	-146.12	13987620	249.96	1098157	281.58	4.97
6325	33.33	112.67	6273.56	-825.91	-151.31	13987615	262.36	1098169	294.96	6.36
6350	34.45	112.7	6294.31	-846.66	-156.69	13987609	275.22	1098182	308.83	4.48
6375	35.95	112.89	6314.74	-867.09	-162.27	13987604	288.51	1098196	323.16	6.02
6400	37.34	113.25	6334.79	-887.14	-168.12	13987598	302.24	1098209	337.99	5.63
6425	38.33	113.65	6354.54	-906.89	-174.22	13987592	316.3	1098223	353.23	4.08
6450	39.22	114.66	6374.03	-926.38	-180.63	13987585	330.59	1098238	368.75	4.37
6475	40.08	115.86	6393.28	-945.63	-187.44	13987579	345.01	1098252	384.53	4.61
6500	41.96	116.75	6412.14	-964.49	-194.71	13987571	359.72	1098267	400.72	7.87
6525	43.71	117.49	6430.47	-982.82	-202.46	13987564	374.85	1098282	417.44	7.28
6550	44.97	117.96	6448.35	-1000.7	-210.59	13987555	390.31	1098297	434.6	5.21
6575	45.99	117.69	6465.88	-1018.23	-218.91	13987547	406.08	1098313	452.1	4.15
6600	47.03	117.17	6483.09	-1035.44	-227.26	13987539	422.18	1098329	469.93	4.43
6625	47.18	116.36	6500.1	-1052.45	-235.51	13987530	438.53	1098346	487.97	2.45
6650	46.87	114.8	6517.14	-1069.49	-243.41	13987523	455.03	1098362	506.05	4.73
6675	46.72	113.29	6534.26	-1086.61	-250.83	13987515	471.67	1098379	524.12	4.44

MD	INC	AZI	TVD	SSTVD	N/S	NORTHING	E/W	EASTING	VSEC	DLS
(ft)	(deg)	(deg)	(ft)	(ft)	(ft)	(Ft)	(ft)	(Ft)	(ft)	(deg/100ft)
6700	47.29	112.19	6551.31	-1103.66	-257.9	13987508	488.53	1098396	542.31	3.94
6725	48.37	111.94	6568.09	-1120.44	-264.86	13987501	505.7	1098413	560.76	4.38
6750	49.8	112	6584.47	-1136.82	-271.93	13987494	523.22	1098430	579.58	5.72
6775	52.04	111.64	6600.22	-1152.57	-279.14	13987487	541.24	1098448	598.91	9.03
6800	54.52	109.48	6615.17	-1167.52	-286.17	13987480	560	1098467	618.91	12.1
6825	56.63	107.12	6629.31	-1181.66	-292.64	13987473	579.58	1098487	639.52	11.48
6830.94	57.38	106.66	6632.54	-1184.89	-294.09	13987472	584.34	1098491	644.5	14.18
6850	59.8	105.25	6642.47	-1194.82	-298.56	13987467	599.98	1098507	660.76	14.18
6856.49	60.29	104.83	6645.71	-1198.06	-300.01	13987466	605.41	1098513	666.38	9.45
6875	61.7	103.64	6654.69	-1207.04	-303.99	13987462	621.1	1098528	682.56	9.45
6900	62.5	102.69	6666.39	-1218.74	-309.03	13987457	642.62	1098550	704.6	4.64
6925	63.76	102.36	6677.69	-1230.04	-313.86	13987452	664.39	1098571	726.84	5.18
6950	64.35	102.72	6688.62	-1240.97	-318.74	13987447	686.33	1098593	749.26	2.69
6975	66.98	102.8	6698.92	-1251.27	-323.77	13987442	708.54	1098616	771.98	10.52
7000	67.6	102.74	6708.58	-1260.93	-328.87	13987437	731.04	1098638	794.98	2.49
7025	68.06	102.68	6718.01	-1270.36	-333.96	13987432	753.62	1098661	818.07	1.85
7050	67.92	102.56	6727.38	-1279.73	-339.03	13987427	776.24	1098683	841.18	0.72
7075	67.88	102.68	6736.78	-1289.13	-344.09	13987422	798.84	1098706	864.28	0.47
7100	68.05	102.94	6746.16	-1298.51	-349.23	13987417	821.44	1098729	887.4	1.18
7125	67.8	102.88	6755.56	-1307.91	-354.4	13987412	844.02	1098751	910.51	1.02
7150	68.12	102.52	6764.94	-1317.29	-359.5	13987406	866.63	1098774	933.63	1.85
7175	67.88	102.55	6774.31	-1326.66	-364.53	13987401	889.25	1098796	956.74	0.97
7200	67.35	102.18	6783.83	-1336.18	-369.48	13987396	911.83	1098819	979.79	2.52
7225	66.47	102.16	6793.63	-1345.98	-374.33	13987392	934.31	1098841	1002.71	3.52
7250	66.03	102.55	6803.7	-1356.05	-379.22	13987387	956.67	1098864	1025.52	2.27
7275	65.66	102.97	6813.93	-1366.28	-384.26	13987382	978.91	1098886	1048.27	2.13
7300	66.58	103.11	6824.05	-1376.4	-389.42	13987377	1001.18	1098908	1071.08	3.72
7325	66.87	102.76	6833.93	-1386.28	-394.56	13987371	1023.57	1098931	1093.99	1.73
7350	66.65	102.48	6843.79	-1396.14	-399.58	13987366	1045.98	1098953	1116.9	1.35
7375	66.57	102.48	6853.72	-1406.07	-404.54	13987361	1068.39	1098975	1139.78	0.32
7400	66.12	102.77	6863.75	-1416.1	-409.54	13987356	1090.73	1098998	1162.62	2.09
7425	66.07	103.34	6873.88	-1426.23	-414.7	13987351	1113	1099020	1185.42	2.09
7450	65.57	103.89	6884.12	-1436.47	-420.07	13987346	1135.16	1099042	1208.19	2.83
7475	65.39	104.2	6894.5	-1446.85	-425.59	13987340	1157.23	1099064	1230.91	1.34
7500	65.17	103.95	6904.95	-1457.3	-431.12	13987335	1179.26	1099086	1253.59	1.26
7525	65.49	103.5	6915.38	-1467.73	-436.51	13987329	1201.32	1099108	1276.28	2.08
7550	65.7	103.44	6925.71	-1478.06	-441.81	13987324	1223.46	1099131	1299	0.87
7575	65.58	103.96	6936.03	-1488.38	-447.2	13987319	1245.59	1099153	1321.74	1.95
7600	65.87	104.18	6946.3	-1498.65	-452.74	13987313	1267.7	1099175	1344.51	1.41

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
7625	66.57	104.35	6956.38	-1508.73	-458.38	13987308	1289.87	1099197	1367.36	2.87
7650	67.21	104.31	6966.2	-1518.55	-464.07	13987302	1312.15	1099219	1390.33	2.56
7675	67.56	104.3	6975.81	-1528.16	-469.77	13987296	1334.51	1099242	1413.39	1.4
7700	69.65	104.16	6984.93	-1537.28	-475.49	13987290	1357.07	1099264	1436.64	8.38
7725	69.76	103.84	6993.6	-1545.95	-481.17	13987285	1379.82	1099287	1460.06	1.28
7750	70.67	103.53	7002.06	-1554.41	-486.73	13987279	1402.68	1099310	1483.54	3.82
7775	71.05	103.28	7010.26	-1562.61	-492.21	13987274	1425.65	1099333	1507.12	1.79
7800	69.78	103.19	7018.64	-1570.99	-497.6	13987268	1448.58	1099356	1530.63	5.09
7825	68.87	103.32	7027.47	-1579.82	-502.96	13987263	1471.35	1099378	1553.97	3.67
7850	67.82	103.5	7036.69	-1589.04	-508.35	13987258	1493.95	1099401	1577.16	4.25
7875	67.4	103.52	7046.21	-1598.56	-513.75	13987252	1516.42	1099424	1600.24	1.68
7900	66.47	103.33	7056.01	-1608.36	-519.09	13987247	1538.8	1099446	1623.2	3.79
7925	65.25	103.06	7066.23	-1618.58	-524.3	13987242	1561.01	1099468	1645.97	4.98
7950	64.87	102.95	7076.77	-1629.12	-529.4	13987237	1583.1	1099490	1668.58	1.57
7975	64.58	102.83	7087.45	-1639.8	-534.44	13987232	1605.13	1099512	1691.14	1.24
8000	63.91	102.62	7098.31	-1650.66	-539.4	13987227	1627.1	1099534	1713.59	2.78
8025	63.76	102.48	7109.34	-1661.69	-544.28	13987222	1649	1099556	1735.97	0.78
8050	63.38	102.43	7120.46	-1672.81	-549.11	13987217	1670.86	1099578	1758.29	1.53
8075	62.78	102.54	7131.78	-1684.13	-553.93	13987212	1692.62	1099600	1780.52	2.43
8100	62.36	102.54	7143.3	-1695.65	-558.74	13987207	1714.28	1099621	1802.64	1.68
8125	64.09	102.34	7154.56	-1706.91	-563.55	13987202	1736.08	1099643	1824.9	6.96
8150	64.6	102.2	7165.38	-1717.73	-568.34	13987198	1758.1	1099665	1847.36	2.1
8175	65.84	102.3	7175.86	-1728.21	-573.16	13987193	1780.28	1099687	1869.98	4.97
8200	65.28	102.56	7186.21	-1738.56	-578.06	13987188	1802.5	1099710	1892.68	2.43
8225	66.06	103.04	7196.51	-1748.86	-583.1	13987183	1824.72	1099732	1915.4	3.58
8250	66.08	103.49	7206.65	-1759	-588.35	13987178	1846.96	1099754	1938.21	1.65
8275	65.69	103.84	7216.86	-1769.21	-593.74	13987172	1869.13	1099776	1960.99	2.02
8300	64.17	104.3	7227.45	-1779.8	-599.24	13987167	1891.1	1099798	1983.61	6.3
8325	63.76	104.85	7238.43	-1790.78	-604.89	13987161	1912.84	1099820	2006.05	2.57
8350	63.18	105.1	7249.59	-1801.94	-610.67	13987155	1934.44	1099842	2028.41	2.49
8375	62.53	105.27	7261	-1813.35	-616.5	13987149	1955.91	1099863	2050.64	2.67
8400	61.7	105.28	7272.69	-1825.04	-622.32	13987144	1977.23	1099884	2072.73	3.32
8425	60.13	105.42	7284.84	-1837.19	-628.11	13987138	1998.3	1099905	2094.57	6.3
8450	60.12	105.26	7297.3	-1849.65	-633.84	13987132	2019.2	1099926	2116.24	0.56
8475	60.1	105.09	7309.75	-1862.1	-639.51	13987126	2040.12	1099947	2137.91	0.59
8500	60.03	104.89	7322.23	-1874.58	-645.12	13987121	2061.05	1099968	2159.56	0.75
8525	60.48	104.64	7334.63	-1886.98	-650.65	13987115	2082.04	1099989	2181.25	2
8550	60.6	104.54	7346.93	-1899.28	-656.13	13987110	2103.1	1100010	2203	0.59
8575	60.56	104.6	7359.21	-1911.56	-661.61	13987104	2124.18	1100031	2224.76	0.26

MD (ft)	INC (deg)	AZI (deg)	TVD (ft)	SSTVD (ft)	N/S (ft)	NORTHING (Ft)	E/W (ft)	EASTING (Ft)	VSEC (ft)	DLS (deg/100ft)
8600	61.05	104.59	7371.4	-1923.75	-667.11	13987099	2145.3	1100052	2246.57	1.96
8625	61.72	104.51	7383.38	-1935.73	-672.62	13987093	2166.54	1100074	2268.5	2.69
8650	62.37	104.34	7395.1	-1947.45	-678.12	13987088	2187.93	1100095	2290.56	2.67
8675	62.87	104.06	7406.59	-1958.94	-683.57	13987082	2209.45	1100117	2312.74	2.23
8700	63.56	103.92	7417.86	-1970.21	-688.96	13987077	2231.1	1100138	2335.02	2.8
8725	64.43	103.66	7428.82	-1981.17	-694.32	13987072	2252.93	1100160	2357.46	3.6
8750	64.59	103.34	7439.58	-1991.93	-699.59	13987066	2274.87	1100182	2379.99	1.32
8775	63.15	103.21	7450.59	-2002.94	-704.74	13987061	2296.71	1100204	2402.39	5.78
8800	63.67	102.97	7461.78	-2014.13	-709.81	13987056	2318.49	1100226	2424.7	2.25
8825	63.64	102.82	7472.87	-2025.22	-714.8	13987051	2340.33	1100247	2447.05	0.55
8850	63.45	102.6	7484.01	-2036.36	-719.73	13987046	2362.16	1100269	2469.37	1.09
8875	63.44	102.54	7495.19	-2047.54	-724.6	13987041	2383.99	1100291	2491.67	0.22
8900	62.61	102.56	7506.53	-2058.88	-729.44	13987037	2405.73	1100313	2513.89	3.32
8925	62.31	102.67	7518.09	-2070.44	-734.28	13987032	2427.37	1100334	2536	1.26
8950	61.88	102.73	7529.79	-2082.14	-739.14	13987027	2448.92	1100356	2558.03	1.73
8975	61.85	102.92	7541.58	-2093.93	-744.03	13987022	2470.42	1100378	2580.02	0.68
9000	61.88	102.95	7553.36	-2105.71	-748.96	13987017	2491.9	1100399	2602.02	0.16
9025	61.97	102.96	7565.13	-2117.48	-753.91	13987012	2513.4	1100420	2624.02	0.36
9050	61.87	102.88	7576.9	-2129.25	-758.84	13987007	2534.9	1100442	2646.03	0.49
9075	61.94	102.89	7588.67	-2141.02	-763.76	13987002	2556.4	1100463	2668.03	0.28
9100	61.59	102.95	7600.5	-2152.85	-768.68	13986997	2577.86	1100485	2690	1.42
9125	61.4	103.16	7612.43	-2164.78	-773.65	13986992	2599.27	1100506	2711.93	1.06
9150	61.01	103.43	7624.47	-2176.82	-778.68	13986987	2620.59	1100528	2733.79	1.82
9175	60.67	103.55	7636.65	-2189	-783.78	13986982	2641.82	1100549	2755.59	1.42
9200	60.77	103.54	7648.88	-2201.23	-788.88	13986977	2663.02	1100570	2777.36	0.4
9225	60.74	103.74	7661.09	-2213.44	-794.03	13986972	2684.21	1100591	2799.14	0.71
9250	60.16	104.04	7673.42	-2225.77	-799.25	13986967	2705.33	1100612	2820.85	2.54
9275	60.11	104.28	7685.87	-2238.22	-804.55	13986961	2726.35	1100633	2842.51	0.86
9300	60.92	104.21	7698.18	-2250.53	-809.91	13986956	2747.44	1100655	2864.25	3.25
9325	61.82	104.07	7710.15	-2262.5	-815.27	13986951	2768.72	1100676	2886.17	3.63
9350	62.4	103.82	7721.85	-2274.2	-820.59	13986945	2790.16	1100697	2908.24	2.48
9375	63.03	103.63	7733.31	-2285.66	-825.86	13986940	2811.75	1100719	2930.42	2.61
9400	63.55	103.44	7744.55	-2296.9	-831.09	13986935	2833.46	1100741	2952.72	2.19
9425	64.19	103.16	7755.56	-2307.91	-836.25	13986930	2855.3	1100762	2975.12	2.75
9450	65	102.72	7766.28	-2318.63	-841.31	13986925	2877.31	1100784	2997.65	3.61
9475	65.55	102.47	7776.74	-2329.09	-846.26	13986920	2899.47	1100807	3020.29	2.38
9500	66.15	102.35	7786.97	-2339.32	-851.16	13986915	2921.75	1100829	3043.04	2.44
9525	66.7	102.36	7796.97	-2349.32	-856.07	13986910	2944.13	1100851	3065.88	2.2
9550	67.05	103.05	7806.78	-2359.13	-861.12	13986905	2966.56	1100874	3088.81	2.9

MD	INC	AZI	TVD	SSTVD	N/S	NORTHING	E/W	EASTING	VSEC	DLS
(ft)	(deg)	(deg)	(ft)	(ft)	(ft)	(Ft)	(ft)	(Ft)	(ft)	(deg/100ft)
9575	67.06	103.89	7816.53	-2368.88	-866.49	13986899	2988.95	1100896	3111.79	3.09
9600	66.91	104.58	7826.3	-2378.65	-872.14	13986894	3011.25	1100918	3134.78	2.61
9625	67.18	104.66	7836.05	-2388.4	-877.95	13986888	3033.53	1100941	3157.78	1.12
9650	66.34	104.5	7845.92	-2398.27	-883.74	13986882	3055.76	1100963	3180.73	3.41
9675	64.43	104.51	7856.33	-2408.68	-889.43	13986877	3077.76	1100985	3203.44	7.64
9700	64.34	104.42	7867.14	-2419.49	-895.06	13986871	3099.59	1101007	3225.97	0.48
9725	64.36	104.41	7877.96	-2430.31	-900.67	13986865	3121.42	1101029	3248.48	0.09
9750	64.57	104.24	7888.74	-2441.09	-906.25	13986860	3143.28	1101050	3271.02	1.04
9775	65.6	103.44	7899.27	-2451.62	-911.68	13986854	3165.29	1101072	3293.66	5.04
9800	66.22	102.9	7909.47	-2461.82	-916.88	13986849	3187.51	1101095	3316.43	3.17
9825	66.54	102.64	7919.49	-2471.84	-921.94	13986844	3209.85	1101117	3339.28	1.6
9850	66.27	102.53	7929.5	-2481.85	-926.93	13986839	3232.21	1101139	3362.13	1.15
9875	66.4	102.35	7939.53	-2491.88	-931.86	13986834	3254.57	1101162	3384.96	0.84
9900	66.63	102.61	7949.5	-2501.85	-936.82	13986829	3276.96	1101184	3407.82	1.33
9925	67.16	102.62	7959.31	-2511.66	-941.84	13986824	3299.4	1101206	3430.75	2.12
9950	67.03	102.45	7969.04	-2521.39	-946.84	13986819	3321.88	1101229	3453.72	0.81
9975	67.29	102.55	7978.74	-2531.09	-951.82	13986814	3344.37	1101251	3476.69	1.1
10000	0 67.15	102.71	7988.42	-2540.77	-956.86	13986809	3366.86	1101274	3499.68	0.81
10025	0 66.74	102.64	7998.21	-2550.56	-961.91	13986804	3389.31	1101296	3522.62	1.66
10050	0 66.27	102.67	8008.18	-2560.53	-966.93	13986799	3411.68	1101319	3545.48	1.88
10075	0 66.32	102.31	8018.23	-2570.58	-971.88	13986794	3434.02	1101341	3568.31	1.33
10100	0 66.19	101.72	8028.29	-2580.64	-976.65	13986789	3456.41	1101363	3591.11	2.22
10125	0 66.92	101.69	8038.24	-2590.59	-981.3	13986785	3478.87	1101386	3613.95	2.92
10150	0 66.97	101.68	8048.03	-2600.38	-985.96	13986780	3501.39	1101408	3636.86	0.2
10175	0 66.45	101.2	8057.92	-2610.27	-990.52	13986775	3523.9	1101431	3659.73	2.73
10200	0 66.00	101.05	8067.99	-2620.34	-994.93	13986771	3546.35	1101453	3682.49	1.88
10225	0 65.46	100.56	8078.27	-2630.62	-999.2	13986767	3568.73	1101476	3705.15	2.8
10250	0 64.76	100.36	8088.79	-2641.14	-1003.32	13986763	3591.03	1101498	3727.69	2.89
10275	0 64.50	99.98	8099.5	-2651.85	-1007.31	13986759	3613.27	1101520	3750.13	1.72
10300	0 64.14	100.05	8110.34	-2662.69	-1011.23	13986755	3635.46	1101543	3772.5	1.46
10325	0 63.60	100.1	8121.35	-2673.7	-1015.15	13986751	3657.55	1101565	3794.78	2.17
10350	0 64.38	100.13	8132.31	-2684.66	-1019.1	13986747	3679.67	1101587	3817.1	3.12
10375	0 64.42	99.9	8143.11	-2695.46	-1023.02	13986743	3701.88	1101609	3839.48	0.84
10400	0 64.85	99.61	8153.82	-2706.17	-1026.85	13986739	3724.14	1101631	3861.9	2.01
10417	0 64.36	102.52	8161.11	-2713.46	-1029.79	13986736	3739.21	1101646	3877.18	15.73
10512	0 63.47	102.65	8202.89	-2755.24	-1048.38	13986718	3822.48	1101730	3962.26	0.94
10607	0 63.06	105.22	8245.63	-2797.98	-1068.81	13986697	3904.82	1101812	4046.99	2.45
10617.1	0 63.23	105.04	8250.19	-2802.54	-1071.16	13986695	3913.52	1101821	4055.99	2.34
10638.9	5 63.61	104.66	8259.97	-2812.32	-1076.17	13986690	3932.41	1101839	4075.52	2.34

MD	INC	AZI	TVD	SSTVD	N/S	NORTHING	E/W	EASTING	VSEC	DLS
(ft)	(deg)	(deg)	(ft)	(ft)	(ft)	(Ft)	(ft)	(Ft)	(ft)	(deg/100ft)
10703	0 64.72	103.54	8287.88	-2840.23	-1090.21	13986676	3988.32	1101895	4133.1	2.34
10798	0 65.03	103.34	8328.21	-2880.56	-1110.2	13986656	4071.97	1101979	4218.96	0.38
10862	0 64.90	102.17	8355.3	-2907.65	-1123	13986643	4128.53	1102036	4276.8	1.67
10947	0 64.90	102.17	8391.36	-2943.71	-1139.23	13986627	4203.77	1102111	4353.52	0

Appendix B: BHAs

BHA #1		
Quantity	Component	Length (ft)
1	22" PDC Bit	1.75
1	Mud Motor	38.10
1	Stabilizer	7.83
1	NMDC	30.56
1	NMDC Pony	9.00
1	Hangoff Sub	3.01
1	Hybrid Sub	5.40
1	NMDC Pony	12.32
1	XO Sub	4.31
9	8" DC	271.72
1	XO Sub	2.91
15	HWDP	456.67
		843.58
BHA #3		
Quantity	Component	Length (ft)
1	14.75" PDC Bit	1.55
1	Mud Motor	38.47
1	Stabilizer	5.50
1	NMDC	30.56
1	NMDC Pony	9.00
1	Hangoff Sub	3.01
1	Hybrid Sub	5.40
1	NMDC Pony	12.32
1	XO Sub	4.31
9	8" DC	271.72
1	XO Sub	2.91
15	HWDP	456.67

BHA #2		
Quantity	Component	Length (ft)
1	14.75" Mill Tooth Bit	
1	Bit Sub	
9	8" DC	
1	XO Sub	
15	HWDP	
		0.00
BHA #4		
Quantity	Component	Length (ft)
1	14.75" PDC Bit	1.56
1	Mud Motor	37.96
1	14.75" RR	7.80
1	NMDC	30.56
1	NMDC Pony	9.00
1	Hangoff Sub	3.01
1	Hybrid Sub	5.40
1	NMDC Pony	12.32
1	XO Sub	4.31
12	8" DC	363.21
1	XO Sub	2.91
30	HWDP	913.42

		841.42
BHA #5		
Quantity	Component	Length (ft)
1	9.5" TCI Bit	1.50
1	Bit Sub	3.13
15	6.75" DC	464.48
1	XO Sub	3.15
30	HWDP	913.42
		1385.68
BHA #7		
Quantity	Component	Length (ft)
1	8.75" Core Bit	1.31
1	NB Stab	4.00
1	Outer Tube	4.00
1	Stabilizer	4.00
1	Outer Tube	18.00
1	Stabilizer	4.00
1	Outer Tube	26.00
1	Stabilizer	4.00
1	EZ Lead	2.98
1	Coring Jar	8.13
3	6.75" DC	93.42
1	XO Sub	3.00
30	HWDP	913.42

		1391.46
BHA #6		
Quantity	Component	Length (ft)
1	8.75" Core Bit	1.38
1	NB Stab	4.00
1	Outer Tube	4.00
1	Stabilizer	4.00
1	Outer Tube	18.00
1	Stabilizer	4.00
1	Outer Tube	26.00
1	Stabilizer	4.00
1	EZ Lead	2.98
1	Coring Jar	8.13
3	6.75" DC	93.42
1	XO Sub	3.00
30	HWDP	913.42
		1086.33
BHA #8		
Quantity	Component	Length (ft)
1	9.5" Particle Bit	1.24
1	Bit Sub	2.76
1	9.5" RR	7.14
1	BlackBox HF	6.00
1	9.5" RR	7.00
1	6.75" DC	30.89
1	9.5" RR	5.39
12	6.65" DC	371.69
1	XO Sub	3.15
30	HWDP	913.42

		1086.26
BHA #9		
Quantity	Component	Length (ft)
1	9.5" Particle Bit	1.24
1	Bit Sub	2.76
1	9.5" RR	7.14
1	BlackBox HF	6.00
1	9.5" RR	7.00
1	6.75" DC	30.89
1	9.5" RR	5.39
12	6.65" DC	371.69
1	XO Sub	3.15
30	HWDP	913.42
		1348.68
BHA #11		
Quantity	Component	Length (ft)
1	9.5" 7-Blade PDC Bit	1.13
1	HALO RSS w/ HFTO	35.38
1	IB Stab	5.62
1	NMDC Pony	9.22
1	NMDC	31.11
1	9.5" RR	5.64
1	RIPstick	19.93
1	BlackBox	6.00
1	Mud Motor	41.28
1	Filter Sub	3.93
9	6.75" DC	278.27
1	XO Sub	3.15
30	HWDP	913.42

		1348.68
BHA #10		
Quantity	Component	Length (ft)
1	9.5" TCI Bit	1.50
1	Bit Sub	3.13
12	6.75" DC	371.69
1	XO Sub	3.15
30	HWDP	913.42
		1292.89
BHA #12		
Quantity	Component	Length (ft)
1	9.5" 7-Blade PDC Bit	1.13
1	HALO RSS w/ HFTO	35.31
1	IB Stab	5.66
1	NMDC Pony	9.22
1	NMDC	31.11
1	9.5" RR	6.71
1	BlackBox	6.00
1	Float Sub	2.45
1	Filter Sub	3.93
9	6.75" DC	278.27
1	XO Sub	3.15
30	HWDP	913.42

		1354.08
BHA #13		
Quantity	Component	Length (ft)
1	9.5" 7-Blade PDC Bit	1.13
1	HALO RSS w/ HFTO	35.31
1	IB Stab	5.42
1	NMDC	31.11
1	9.5" RR	6.71
1	BlackBox	5.90
1	Float Sub	2.45
1	Filter Sub	3.93
9	6.75" DC	278.27
1	XO Sub	3.15
30	HWDP	913.42
		1286.80
BHA #15		
Quantity	Component	Length (ft)
1	9.5" 8-Blade PDC Bit	1.22
1	HALO RSS w/ HFTO	35.48
1	Spiral Stab	4.14
1	NMDC Pony	12.24
1	NMDC Pony	9.83
1	9.5" RR	5.39
1	NMDC	31.11
1	BlackBox	6.00
1	Filter Sub	3.93
1	Float Sub	2.45
9	6.75" DC	278.27
1	XO Sub	3.15
30	HWDP	913.42

		1296.36
BHA #14		
Quantity	Component	Length (ft)
1	9.5" 8-Blade PDC Bit	1.18
1	HALO RSS w/ HFTO	35.31
1	Spiral Stab	4.14
1	NMDC Pony	12.24
1	NMDC Pony	9.83
1	9.5" RR	5.39
1	NMDC	31.11
1	BlackBox	6.00
1	Filter Sub	3.93
1	Float Sub	2.45
9	6.75" DC	278.27
1	XO Sub	3.15
30	HWDP	913.42
		1306.42
BHA #16		
Quantity	Component	Length (ft)
1	9.5" 8-Blade PDC Bit	1.18
1	HALO RSS w/ HFTO	35.33
1	Spiral Stab	4.14
1	NMDC Pony	12.24
1	NMDC Pony	9.83
1	9.5" RR	5.39
1	NMDC	31.11
1	BlackBox	5.97
1	Filter Sub	3.93
1	Float Sub	2.45
9	6.75" DC	278.27
1	XO Sub	3.15
30	HWDP	913.42

		1306.63
BHA #17		
Quantity	Component	Length (ft)
1	9.5" 8-Blade PDC Bit	1.25
1	Mud Motor	41.87
1	9.5" RR	5.39
1	NMDC Pony	9.22
1	NMDC	31.11
1	Pulser Sub	5.60
1	NMDC Pony	12.24
1	NMDC Pony	9.83
1	BlackBox	6.00
1	Filter Sub	3.93
9	6.75" DC	278.27
1	XO Sub	3.15
28	HWDP	852.73
		1260.59
BHA #19		
Quantity	Component	Length (ft)
1	9.5" 6-Blade PDC Bit	1.25
1	Mud Motor	41.87
1	9.5" RR	6.98
1	NMDC Pony	9.22
1	NMDC	31.11
1	Pulser Sub	5.60
1	NMDC Pony	12.24
1	NMDC Pony	9.83
1	BlackBox	6.00
1	Filter Sub	3.93
1	Float Sub	2.45
1	XO Sub	3.15
28	HWDP	852.73
1	XO Sub	4.25

		1306.41
BHA #18		
Quantity	Component	Length (ft)
1	9.5" 8-Blade PDC Bit	1.25
1	Mud Motor	41.92
1	9.5" RR	5.39
1	NMDC Pony	9.22
1	NMDC	31.11
1	Pulser Sub	5.60
1	NMDC Pony	12.24
1	NMDC Pony	9.83
1	BlackBox	6.00
1	Filter Sub	3.93
1	Float Sub	2.45
9	6.75" DC	278.27
1	XO Sub	3.15
28	HWDP	852.73
1	XO Sub	4.25
		1267.34
BHA #20		
Quantity	Component	Length (ft)
1	9.5" 8-Blade PDC Bit	1.25
1	Mud Motor	41.92
1	9.5" RR	6.98
1	NMDC Pony	9.22
1	NMDC	31.11
1	Pulser Sub	5.60
1	NMDC Pony	12.24
1	NMDC Pony	9.83
1	BlackBox	5.90
1	Filter Sub	3.93
1	Float Sub	2.45
1	XO Sub	3.15
28	HWDP	917.79

		925.98
BHA #25		
Quantity	Component	Length (ft)
1	8.75" Core Bit	1.38
1	NB Stab	4.00
1	Outer Tube	4.00
1	Stabilizer	4.00
1	Outer Tube	18.00
1	Stabilizer	4.00
1	Outer Tube	26.00
1	Stabilizer	4.00
1	EZ Lead	2.98
1	Coring Jar	8.13
1	XO Sub	3.15
30	HWDP	918.47
		998.11
BHA #27		
Quantity	Component	Length (ft)
1	9.5" 6-Blade PDC Bit	1.25
1	Mud Motor	41.92
1	9.5" RR	6.71
1	NMDC Pony	9.22
1	NMDC	31.11
1	Pulser Sub	5.60
1	NMDC	31.10
1	Black Box	6.00
1	Filter Sub	3.93
1	Float Sub	2.45
1	XO Sub	3.15
30	HWDP	920.94

		926.38
BHA #26		
Quantity	Component	Length (ft)
1	9.5" TCI Bit	0.85
1	Bit Sub	3.14
1	9.5" RR	6.98
1	Mud Motor	40.15
1	9.5" RR	5.39
1	Float Sub	2.45
1	XO Sub	3.15
30	HWDP	918.47
		980.58
BHA #28		
Quantity	Component	Length (ft)
1	8.75" Core Bit	1.31
1	NB Stab	4.00
1	Outer Tube	26.00
1	Stabilizer	4.00
1	Outer Tube	26.00
1	Stabilizer	4.00
1	EZ Lead	2.98
1	Coring Jar	8.13
1	XO Sub	3.15
30	HWDP	920.94

		1081.95
BHA #41		
Quantity	Component	Length (ft)
1	8.75" TCI Bit	0.85
1	Bit Sub	3.14
1	XO Sub	3.15
30	HWDP	918.47
		925.61
BHA #43 - Fiber-Optic Dummy Run		
Quantity	Component	Length (ft)
1	Handling Assembly A	238.89
1	7" casing jt	
1	Handling Assembly C	
1	7" casing jt	
1	Handling Assembly D	
1	7" casing pup jt	
1	7" casing jt	
1	XO Sub	
33	HWDP	1009.69

		925.61
BHA #42		
Quantity	Component	Length (ft)
1	9.5" TCI Bit	1.40
1	Bit Sub	2.59
1	Stabilizer	5.12
1	DC	30.06
1	IB Stabilizer	6.22
1	Shock Sub	10.86
1	XO Sub	3.12
1	HWDP	30.21
1	XO Sub	3.08
1	Stabilizer	6.02
1	XO Sub	3.14
15	HWDP	454.55
1	Drill Jar	31.63
18	HWDP	555.14
		1143.14
BHA #44		
Quantity	Component	Length (ft)
1	9.5" Bullnose Reamer	6.87
1	Bit Sub	3.07
1	IB Stabilizer	6.77
1	DC	30.59
1	IB Stabilizer	5.79
1	Shock Sub	10.86
1	IB Stabilizer	6.41
1	DC	31.05
1	PDC Reamer	5.92
1	XO- 9 HWDP-XO	278.62
9	IB Stabilizer	6.62
1	XO Sub	3.12
12	HWDP	365.41
1	Drill Jar	31.62
12	HWDP	371.89

		748.80			
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Appendix C: Daily Reports

(see next page)



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 8 Report For 06:00 AM 24-Apr-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:		Daily Cost / Mud (\$):	---			
Measured Depth (ft):		Last Casing:		Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)		
Vertical Depth (ft):		Next Casing:		RKB Elevation (ft):	31	---	---	---		
Proposed TD (ft):		Last BOP Test:		Job Reference RKB (ft):		---	---	---		
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:		Working Interest:		Totals:	---	---	---	
Average ROP (ft/hr):						Well Cost (\$):	---			
Days (actual / plan):	Drilling 0 / 0,	Flat 0 / 0,	Complete 0 / 0,	Total 0 / 0		DOL:	8			
Pers/Hrs:	Operator: 0 / 0	Contractor: 0 / 0	Service: 0 / 0	Other: 0 / 0	Total:	0 / 0				
Current Operations:	WOD									
Planned Operations:	Physics-based Limiter Redesign Training by Fred Dupriest and Sam Noynaert, Texas A&M University									
Wellsite Supervisors:	Leroy Swearingen						Tel No.:			

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00		WOD	No activity	
8:00	17:00	9.00		OTHER	Physics-based Limiter Redesign Training by Fred Dupriest and Sam Noynaert, Texas A&M University with John McLennan, Ben Barker, Paul Stroud, Garth Larsen, FORGE DSM's Frontier Drilling Rig 16 rig managers and personnel and numerous industry participants and vendors.	
17:00	19:00	2.00		RIGU	Complete rigging up DrillCool cooler system. Install shaker slides.	
19:00	6:00	11.00		WOD	No activity	

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 9 Report For 06:00 AM 25-Apr-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:		Daily Cost / Mud (\$):	---			
Measured Depth (ft):		Last Casing:		Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)		
Vertical Depth (ft):		Next Casing:		RKB Elevation (ft):	31	---	---	---		
Proposed TD (ft):		Last BOP Test:		Job Reference RKB (ft):		---	---	---		
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:		Working Interest:		Totals:	---	---	---	
Average ROP (ft/hr):						Well Cost (\$):	---			
Days (actual / plan):	Drilling 0 / 0,	Flat 0 / 0,	Complete 0 / 0,	Total 0 / 0		DOL:	9			
Pers/Hrs:	Operator: 0 / 0	Contractor: 0 / 0	Service: 0 / 0	Other: 0 / 0	Total:	0 / 0				
Safety Summary:	No incidents or events reported.									
Current Operations:	WOD									
Planned Operations:	Complete rig up, Pre-Spud check. Pickup 22-inch BHA.									
Toolpusher:	Shawn Seddell									
Wellsite Supervisors:	Leroy Swearingen, Brian Gresham						Tel No.:			

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00		WOD	No activity	



8:00	17:00	9.00		OTHER	Physics-based Limiter Redesign Training by Fred Dupriest and Sam Noynaert, Texas A&M University with FORGE Site Manager Garth Larsen, Operations Manager Paul Stroud, FORGE DSM's Frontier Drilling Rig 16 rig managers and personnel and numerous industry participants and vendors.
17:00	21:00	4.00		RIGU	Set in 24-inch riser and weld on to conductor. Weld pad-eyes for turnbuckles on riser.
21:00	6:00	9.00		WOD	No activity

Management Summary

WOD. Attended Physics-based Limiter Redesign Training by Fred Dupriest and Sam Noynaert, Texas A&M University. Installed 24-inch riser on conductor. WOD.

Rig Information

Equipment Problems:

Location Condition:

Transport:

Safety Information

First Aid Treatments:

Medical Treatments:

Lost Time Incidents:

Days Since LTI:

BOP Test

Crownmatic Check

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 10 Report For 06:00 AM 26-Apr-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	500	Last Casing:		Wellbore:	Original Wellbore	AFE No.	AFE (\$) Actual (\$)
Vertical Depth (ft):	500	Next Casing:		RKB Elevation (ft):	31	---	---
Proposed TD (ft):		Last BOP Test:		Job Reference RKB (ft):		---	---
Hole Made (ft) / Hrs:	380 / 3.5	Next BOP Test:		Working Interest:		Totals:	---
Average ROP (ft/hr):	108.57					Well Cost (\$):	---
Days (actual / plan):	Drilling 0.15 / 0,	Flat 0 / 0,	Complete 0 / 0,	Total 0.15 / 0		DOL:	10
Pers/Hrs:	Operator: 14 / 168	Contractor: 3 / 36	Service: 7 / 84	Other: 2 / 24	Total:	26 / 312	

Safety Summary: No incidents or events reported. 10 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Drilling Surface Hole Section at 500'.

Planned Operations: Drill Surface Hole Section to casing point.

Toolpusher: Shawn Seddell

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	18:00	12.00		RIGU	Walk catwalk into place, change liner washers on mud pumps, rig up yellow dog and run hoses back to mud tanks, change elevators to 5 1/2", make up 5 1/2" saver sub and install clamps, install drill pipe, and collar ropes in board, bring bit to rig floor, stage BHA. Test mud lines from mud pumps to top drive to 1500 psi for 15 minutes. Fill conductor and check flow line and shakers, install PVC pipe for shale shaker slides. Begin mudding up system for spud. Accept rig at 18:00, 4-25-2023.	
18:00	20:30	2.50		RIGU	Install liners in open top tanks for cement returns, lay plastic around shaker area.	
20:30	22:30	2.00		BHAOP	Make up 22" surface hole section BHA #1 as followed. 22" PDC (TK99), 9.5" Motor set at 0 deg, 21.875" string stab, 9.5" NMDC, 9.5" Pony Collar, 9.5" Hangoff Sub, 9.5" Hybrid Sub, 9.5" Pony Sub, X/O.	
22:30	2:30	4.00		BHAOP	Layout Drill collars along with HWDP on racks, strap and ready for pickup. Build stand of 8" drill collars in mouse hole.	
2:30	6:00	3.50		DRIL	Drill 22" Surface hole f/120' t/500' Spud well at 02:30 4-26-2023.	

Management Summary

Walked catwalk into place. Rigged up yellow dog pump to shaker slides. Changed out Elevators along with Saver Sub. Dressed out Derrick Board. Set tools on rig floor. Tested mud lines from mud pumps to top drive to 1500 psi for 15 minutes. Filled conductor and checked surface equipment. Installed PVC pipe for shale shaker slides. Mudded up system for spud. Conducted pre-spud inspection of rig and components. Made up 22" surface hole section BHA #1. Laid out Drill collars along with HWDP on racks. Built stand of 8" drill collars in mouse hole. Drilled 22" surface hole f/120' t/500'.

Comments

Accept rig at 18:00, 4-25-2023. Spud well at 02:30 4-26-2023. Fuel on hand 18,841 gals.
 Fuel used 700 gals.
 Fuel delivered 7,500 gals.
 Total NPT to date 0 HR

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud Pump					
No	Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drop	HHP	JIF
1	1	NOV	TK99	22.000	120	380	3.5	108.6	350.0	10	30		9	1000	1650	241	457	266	1097

Jets: 12 12 12 12 12 12 12 12 12 12 21 **Out:** **Grade:** **Cutter:** / **Dull:** / **Wear:** **Brgs:** **e:** **Pull:**

Comments: Bit has a TFA of 1.32 with 12x12s

BHA - No. 1 - BIT, MMTR, STAB, DCM, PC, HSUB, OTHER, PC, XO, 9 DC, XO, HWDP = 843.58

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
120	500	100.0	350.0	10	20	20	40	4	6	650	1,000	1,500

Annular Velocity: **Drill Collars:** 45.0 **Drill Pipe:** 60.0

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 110	Pick Up: 112	Slack Off: 109	Drag Avg/Max: 2 / 3
Hours on BHA:	Since Inspection: 3.5	Total: 3.5	Jars: 0	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 265 Rng: 9W County: BEAVER State: UT

Report No: 10

Report For 06:00 AM 26-Apr-23

Rig Information

Equipment Problems:

Location Condition: Good.

Transport:

Solids Control Information

Screen Sizes: Top Middle 1 Middle 2 Bottom Equipment Usage (Hrs):

Shaker No 1: 60 60 60 60 Desander: 0 Desilter: 0 Degasser: 0

Shaker No 2: 60 60 60 60

Shaker No 3: 60 60 60 60

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	OTHER					

Safety Information

Meetings/Drills Time Description

Safety 30 Two Pre-tour safety meetings held daily with crews. Review planned operations, Picking up Dir Assembly.

First Aid Treatments: 0 Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 10

BOP Test Crownamatic Check

Weather Information

Sky Condition: Partly Cloudy Visibility: 10

Air Temperature: 38 degF Bar. Pressure: 30.09

Wind Speed/Dir: 10 / SW Wind Gusts: 15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 11

Report For 06:00 AM 27-Apr-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	1146	Last Casing:		Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	1135	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:		Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	646 / 6.0	Next BOP Test:		Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	107.67					Well Cost (\$):	---		
Days (actual / plan):	Drilling 0.4 / 0,	Flat 0 / 0,	Complete 0 / 0,	Total 0.4 / 0		DOL:	11		
Pers/Hrs:	Operator: 14 / 168	Contractor:	3 / 36	Service:	10 / 120	Other:	2 / 24	Total:	29 / 348

Safety Summary: No incidents or events reported. 11 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Cementing as per prog at report time, details to follow.

Planned Operations: Cement 16" surface casing as per prog.

Toolpusher: Shawn Seddell

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	800	DRILR	Drill Surface f/ 500' t/ 800'. WOB 10, RPM 30, TQ 7500, SPP 1660, DIFF 280, GPM 940, ROP 115	
8:00	8:30	0.50	800	DRILR	Trouble breaking out of stump.	
8:30	11:00	2.50	1,000	DRILR	Drill Surface f/ 800' t/ 1000'. WOB 20, RPM 30, TQ 12000, SPP 2165, DIFF 700, GPM 1100, ROP 105	
11:00	12:00	1.00	1,000	CIRC	Circulate to build volume. Shakers blinding off.	
12:00	13:00	1.00	1,146	DRILR	Drill Surface f/1,000' t/ 1,146'. WOB 20, RPM 30, TQ 12000, SPP 2200, DIFF 810, GPM 1120, ROP 120	
13:00	14:30	1.50	1,146	CIRC	Circulate hole clean. Pump 2 high viscosity sweeps.	
14:30	18:45	4.25	1,146	WIPE	Wipe hole f/1,146' t/Surface with no issues. Max over pull of 15k, full displacement while running back to bottom, 4' of fill.	
18:45	20:00	1.25	1,146	CIRC	Pump 50 bbl high vis sweep with nutplug caliper. Circulate surface to surface strokes, calculated 3%-hole washout. Circulate additional surface to surface strokes. Spot 50 bbl high vis sweep on bottom.	
20:00	21:30	1.50	1,146	TRPO	Trip out of the hole f/1,146 t/ BHA, hole taking proper fill.	
21:30	23:00	1.50	1,146	BHAOP	Rack back HWDP along with 8" DC's. lay down stabilizer, rack back NMDC's. drain motor and break bit. Note: Motor drained good with minimal movement in bearing assembly. Bit grade 0-1-WT-S-X-0-NO-TD. Minimal balling on stabilizer or bit.	
23:00	23:30	0.50	1,146	OTHER	Clean and clear rig floor.	
23:30	0:45	1.25	1,146	RIGU	Hold detailed safety meeting with B&L casing service along with rig crew and DSM. Rig up to run 16" surface casing.	
0:45	3:45	3.00	1,146	CASE	Make up shoe track and check floats, run 16-inch x 84 ppf, JFE110T, BTC casing t/ with full displacement. Top filling on the fly. Shoe set depth 1,136'	
3:45	5:00	1.25	1,146	CIRC	Circulate 2 bottoms up at 8 bbl per min with full returns. Note: Circulated with CRT, rigged down casing crew while circulating,	
5:00	5:30	0.50	1,146	RIGU	Hold detailed safety meeting with SLB cementing along with rig crew and DSM. Rig up cement head along with iron.	
5:30	6:00	0.50	1,146	CMTF	Surface test lines t/3000 high. Pump cement as per prog at report time, details to follow.	

Management Summary

Drilled Surface section f/ 500' t/ 800'. Rigged down grabber box on TDS to break out of stump with tongs. Drilled Surface section f/ 800' t/ 1,000'. Circulated to build volume in mud pits. Drilled Surface section f/ 1,000' t/ 1,146' (casing point). Pumped 2 high viscosity sweeps and circulated hole clean. Wiped hole f/1,146' to surface. Pumped 50 bbl high vis sweep with nutplug caliper. Circulated hole clean. Tripped out of the hole t/surface. Handled BHA. Held safety meeting, rigged up and ran 16-inch x 84 ppf, JFE110T, BTC surface casing to set depth of 1,136'. Circulated 2 bottoms up. Held safety meeting and rigged up SLB cementing. Cementing as per prog at report time, details to follow.

Comments



Fuel on hand 17,363 gals.
 Fuel used 1,478 gals.
 Total NPT to date 0 HR

	Daily Drilling Report	University of Utah
	Well ID: FORGE 16B(78)-32	Well Name: FORGE 16B(78)-32
	Field: FORGE	Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 11 **Report For 06:00 AM 27-Apr-23**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	In	This Run		R.O.P.		Mud		Pump		HHP	JIF
						Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt		

1	1	NOV	TK99	22.000	120	380	3.5								
---	---	-----	------	--------	-----	-----	-----	--	--	--	--	--	--	--	--

Jets: 12 12 12 12 12 12 12 12 12 21 **Out:** 1146 **Grade:** Cutter: 0 / 1 **Dull** WT / NO **Wear:** S **Brgs:** X **Gge:** 0 **Pull:** TD

Comments: Bit has a TFA of 1.32 with 12x12s

BHA - No. 1 - BIT, MMTR, STAB, DCM, PC, HSUB, OTHER, PC, XO, 9 DC, XO, HWDP = 843.58

Drilling Parameters

Depth (ft)	ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
	From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	

500	1,146	130.0	350.0	15	35	20	40	12	16	950	1,150	2,200
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Annular Velocity: Drill Collars: 56.0 **Drill Pipe:** 62.0

Miscellaneous Drilling Parameters

Hook Loads (lbs): Off Bottom Rotate: 125 **Pick Up:** 130 **Slack Off:** 120 **Drag Avg/Max:** 5 / 10

Hours on BHA: Since Inspection: 9 **Total:** 9 **Jars:** 0

Hours on Casing/Liner: Rotating: 0 / 0 **Tripping:** 0 / 0 **Wear Bushing Installed**

Rig Information

Equipment Problems: Replaced water pump on #4 generator, #3 generator not running properly, tech is currently troubleshooting.

Location Condition: Good.

Transport:

Solids Control Information

Screen Sizes: Top Middle 1 Middle 2 Bottom **Equipment Usage (Hrs):**

Shaker No 1: 60 60 60 60 **Desander:** 0 **Desilter:** 0 **Degasser:** 0

Shaker No 2: 60 60 60 60

Shaker No 3: 60 60 60 60

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
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5.5	365	24.7	S-135	OTHER					
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Safety Information

Meetings/Drills	Time	Description
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Safety 30 Two Pre-tour safety meetings held daily with crews. Review planned operations, Handling BHA, Making up and running casing.

First Aid Treatments: 0 **Medical Treatments:** 0 **Lost Time Incidents:** 0 **Days Since LTI:** 11

Accident Description: None.

BOP Test **Crownamatic Check**

Weather Information

Sky Condition: Partly Cloudy **Visibility:** 10

Air Temperature: 56 degF **Bar. Pressure:** 29.95

Wind Speed/Dir: 5 / SW **Wind Gusts:** 8





Report No: 12 **Report For 06:00 AM 28-Apr-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 1146	Last Casing: 16.000 at 1,136	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 1135	Next Casing:	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft):	Last BOP Test:	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Next BOP Test:	Working Interest:	Totals:	---	---
Average ROP (ft/hr):			Well Cost (\$):	---	---

Days (actual / plan): Drilling 0.4 / 0, Flat 0 / 0, Complete 0 / 0, Total 0.4 / 0 **DOL:** 12

Pers/Hrs: **Operator:** 14 / 168 **Contractor:** 3 / 36 **Service:** 12 / 144 **Other:** 2 / 24 **Total:** 31 / 372

Safety Summary: No incidents or events reported. 12 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Setting in 21 1/4-inch BOPE.

Planned Operations: Nipple up 21 1/4-inch BOPE, Test BOPE. Make up 14 3/4-inch Dir Assembly.

Toolpusher: Shawn Seddell

Wellsite Supervisors: Leroy Swearingen, Brian Gresham **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	1,146	CMTP	Fill lines and pressure test t/3,000 psi. Load bottom plug. Pump 10 bbls of CaCl solution ahead, pump 40 bbls of fresh water, pump 10 bbls of Zonelock, pump 10 bbls of fresh water, pump 50 bbls of MudPush Express. Mix and pump 478.2 bbls (1467 sks) of 14.0 ppg Surface Slurry, pumped at an average of 5.5 bbls/min. Drop top plug and displace with 241 bbls of 8.9 ppg mud, bump plug with 1,000 psi, 500 psi over. Increase pressure t/1,500 psi and hold for 30 mins. Bleed back 3.5 bbls and check floats, floats holding. Note: 144 bbls of good cement to surface. Monitored fall back for 30 mins, no fallback cement at surface. Held 30 min casing test at 1,500 psi, casing test good.	
8:00	8:30	0.50	1,146	CMTP	Rig down SLB cement equipment	
8:30	16:30	8.00	1,146	WOC	Wait on cement. Clean out sand trap on pits, Mechanic working on generators, Rig down cellar pump and hoses	
16:30	18:00	1.50	1,146	WELLHD	Cut conductor, make rough cut on surface casing, remove conductor and casing, Make final cut on casing.	
18:00	23:00	5.00	1,146	WELLHD	Preheat and install 16-3/4" 3,000 psi wellhead as per Stream Flo procedure. Allow wellhead to cool, test t/1,600 psi, hold for 15 mins, good test. Note: Stream Flo representative present during insulation of wellhead, all guidelines and recommendations followed for install. All test witnessed by DSM.	
23:00	6:00	7.00	1,146	BOPO	Set in 16 3/4-inch 3,000 psi x 21 1/4-inch 3,000 psi DSA, 21 1/4-inch 2,000 psi Spacer Spool, 21 1/4-inch 2,000 psi Mud Cross, 21 1/4-inch 2,000 psi Double Gate, 21 1/4-inch 2,000 psi Annular, 21 1/4-inch 2,000 psi riser w/Rotating Head Assembly.	

Management Summary

Cemented Surface Casing. Rigged down SLB cementers. Waited on cement. Cut conductor and dresses 16" casing. Installed 16-3/4" 3,000 psi wellhead. Installed 21 1/4-inch BOPE.

Comments

Fuel on hand 16,843 gals.
 Fuel used 520 gals.
 Total NPT to date 0 HR
 Notified SE Office on casing run and cement job on 4-27-2023 @ 08:30 hrs waiting on response.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135		SURF	22.000	84	J-55	

Mud Information

% Gels Temp Mud
 Dens. Vis PV YP Filt. Cake pH/ES Solids Oil Water Sand LGS Cl Ca CaCl 10s 10m 30m In Out Loss

27-Apr-23 15:00 at Depth 1,146 ft Mud Pits

9.00	38	9	8	8	2	8	5	0	100	0.25	4600	200	4	7	8			0
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	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 265 Rng: 9W County: BEAVER State: UT
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Report No: 12	Report For 06:00 AM 28-Apr-23
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Rig Information

Equipment Problems: Mechanic on location working on #3 generator.

Location Condition: Good.

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	120	120	120	120	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	120	120	120	120	
Shaker No 3:	120	120	120	120	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	OTHER					

Safety Information

Meetings/Drills	Time	Description
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Safety	30	Two Pre-tour safety meetings held daily with crews. Review planned operations, Cementing operations, Setting in 21 1/4-inch BOPE.
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First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	12
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Accident Description: None

BOP Test **Crownamatic Check**

Weather Information

Sky Condition: Clear	Visibility: 10	
Air Temperature: 60 degF	Bar. Pressure: 29.95	
Wind Speed/Dir: 5 / SW	Wind Gusts: 8	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 13 Report For 06:00 AM 29-Apr-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	1146	Last Casing:	16.000 at 1,136	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	1135	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 0.4 / 0, Flat 0 / 0, Complete 0 / 0, Total 0.4 / 0 DOL: 13

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 4 / 48 Other: 2 / 24 Total: 23 / 276

Safety Summary: No incidents or events reported. 13 days since LTI. Conducted BOP Test, Crown Check, Safety Meeting.

Current Operations: Drilling out shoe track at 1,136'.

Planned Operations: Drill t/1,156', circulate hole clean, FIT test, trip out of the hole, pick up dir assembly, trip in the hole t/1,156', drill intermediate section.

Toolpusher: Shawn Seddell

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	14:00	8.00	1,146	BOPO	Nipple up 21 1/4" BOPE, Rotating head, Choke Manifold. Reset catwalk, pick up joint of pipe to test.	
14:00	22:00	8.00	1,146	BOPT	Test rams 250 psi low, 3000 psi high, Test annular 250 psi low, 1,500 psi high. Test all valves and lines on choke manifold 250 psi low, 3000 psi high. Test inner and outer valves on mud cross 250 psi low, 3000 psi high. Test lower Kelly valve 250 psi low, 3000 psi high. Test floor valve 250 psi low, 3000 psi high. Test witnessed by DSM. Note: extended time testing due to multiple leaks and having to retighten flanges.	
22:00	22:30	0.50	1,146	WELLHD	Remove test plug and close casing valve. Install wear bushing, verified by DSM.	
22:30	23:00	0.50	1,146	SERV	Service rig, change out grabber dies on TDS.	
23:00	2:00	3.00	1,146	BHAOP	Make up 14 3/4-inch clean out assembly as follows, 14 3/4-inch Mill tooth bit, BS, 9-8-inch drill collars, 15-HWDP.	
2:00	6:00	4.00	1,146	CMTD	Drilled out shoe track f/1,096' t/1,136', clean out rathole t/1,146'.	

Management Summary

Nipped up 21 1/4-inch BOPE. Tested BOPE. Removed test plug and installed wear bushing. Serviced rig. Made up 14 3/4-inch clean out assembly. Tripped in the hole to 1,094'. Drilled out shoe track t/1,136'. Cleaned out rathole t/1,146'.

Comments

Fuel on hand 16,394 gals.
Fuel used 447 gals.
Total NPT to date 0 HR
Notified SE Office on upcoming BOP test on 4-28-2023. Ditch magnets installed.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	J-55	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
28-Apr-23 15:00 at Depth 1,146 ft Mud Pits																				
9.00	38	9	8	82	8	5	0	100	0.25	4600	200		4	7	8					



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 13 Report For 06:00 AM 29-Apr-23



Mud Consumables																							
Item Description			Qty.	Cost	Item Description			Qty.	Cost														
API Gel - 100#SK			40	---	Bicarb - 50#SK			0	---														
Cotton Seed - 50#SK			0	---	Defoam 14 - GALS			0	---														
De-MOB - OTHER			1	---	Desco - 25#SK			0	---														
DMA/SPA - 50#SK			15	---	Engineering - OTHER			2	---														
Lime - 50#SK			0	---	Micro C - 50#SK			0	---														
PAC LV - 50#SK			6	---	Pallets/Wraps - OTHER			6	---														
PrimeSeal/MaxiSea1117 - 50#SK			0	---	SAPP - 50#SK			0	---														
Sawdust - 50#SK			0	---	Soda Ash - 50#SK			3	---														
TORKease - GALS			0	---	TORKease Concentrate - GALS			0	---														
Walnut - 50#SK			0	---																			
Bit/BHA/Workstring Information																							
Depth		This Run						R.O.P.			Mud Pump												
No	Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF				
2	1	OTHER	XR+C	14.750	1146																		
Jets: 24 24 24 14			Out:			Grade: Cutter: /			Dull /			Wear:			Brgs:			Gge:			Pull:		
BHA - No. 2 - BIT, BS, 9 DC, XO, 15 HWDP = 737.36																							
Rig Information																							
Equipment Problems:																							
Location Condition: Good.																							
Transport:																							
Solids Control Information																							
Screen Sizes:		Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):																	
Shaker No 1:		120	120	120	120	Desander: 0			Desilter: 0			Degasser: 0											
Shaker No 2:		120	120	120	120																		
Shaker No 3:		120	120	120	120																		
Drill Pipe Inventory																							
DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread														
5.5	365	24.7	S-135	OTHER																			
Safety Information																							
Meetings/Drills	Time	Description																					
Safety	30	Two Pre-tour safety meetings held daily with crews. Review planned operations, Slips, trips, and falls. Overhead objects.																					
First Aid Treatments: 0		Medical Treatments: 0			Lost Time Incidents: 0			Days Since LTI: 13															
Accident Description: None.																							
<input checked="" type="checkbox"/> BOP Test		<input checked="" type="checkbox"/> Crownamatic Check																					
Weather Information																							
Sky Condition: Sunny		Visibility: 31																					
Air Temperature: 66 degF		Bar. Pressure: 30.06																					
Wind Speed/Dir: 10 / S		Wind Gusts: 10																					



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 14 Report For 06:00 AM 30-Apr-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	2650	Last Casing:	16.000 at 1,136	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	2579	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	1,504 / 8.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	188.0					Well Cost (\$):	---		

Days (actual / plan): Drilling 0.73 / 0, Flat 0 / 0, Complete 0 / 0, Total 0.73 / 0 DOL: 14

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 4 / 48 Other: 3 / 36 Total: 24 / 288

Safety Summary: No incidents or events reported. 14 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Drilling Intermediate section @ 2,650' MD

Planned Operations: Drill Intermediate section f/ 2,650'

Toolpusher: Shawn Seddell

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:15	1.25	1,136	CMTD	Drill out shoe track f/1,096' t/1,136'.	
7:15	8:00	0.75	1,156	DRIL	Clean out rathole t/1,146'. Drill 10' new formation t/1,156'.	
8:00	9:00	1.00	1,156	CIRC	Circulate hole clean for trip for directional tools.	
9:00	11:30	2.50	1,156	REPR	Replace dies in clamp on IBOP/Saver sub.	X
11:30	12:00	0.50	1,181	DRIL	Drill ahead f/ 1,156' t/ 1,181', 20K WOB, 60 rpm ROT, 2.5K ft-lb TORQ, 1,012 gpm, 1,550 psi SPP	
12:00	15:30	3.50	1,181	REPR	Work on clamps on top drive. Replace hydraulic hose on ST-80.	X
15:30	17:30	2.00	1,181	TRPO	Trip out of hole f/ 981' t/surface. Break off bit and bit sub.	
17:30	18:00	0.50	1,181	BHAOP	Pick up SDI 7/8 5.7, 1/5° bent motor. Make up 14 3/4-inch Intermediate BHA.	
18:00	21:00	3.00	1,181	TRPI	Trip in the hole t/1,036' hole giving proper displacement.	
21:00	21:30	0.50	1,181	OTHER	Install rotating rubber.	X
21:30	22:30	1.00	1,410	DRIL	Drill 14 3/4-inch intermediate section f/1,181' t/1,410', 10-60K WOB, 60-120 rpm ROT, 15-35 K ft-lb TORQ, 1,200 gpm, 2,450 psi SPP, Diff 650-800. ROP Limiter, making up stands in the mouse hole.	
22:30	23:30	1.00	1,410	OTHER	Remove clamp on TDS, raise grabber assembly and break out of connection w/tongs. Note: circulate at reduced pump rate while rigging down grabber box.	
23:30	0:30	1.00	1,597	DRIL	Drill 14 3/4-inch intermediate section f/1,410' t/1,597', 10-60K WOB, 100 rpm ROT, 15-25 K ft-lb TORQ, 1,200 gpm, 2,450 psi SPP, Diff 650-800. ROP Limiter, making up stands in the mouse hole.	
0:30	1:15	0.75	1,597	OTHER	Retighten clamps on TDS.	X
1:15	6:00	4.75	2,500	DRIL	Drill 14 3/4-inch intermediate section f/1,597' t/2,650', 20-60K WOB, 100 rpm ROT, 18-27 K ft-lb TORQ, 1,200 gpm, 2,450 psi SPP, Diff 650-800. ROP Limiter, making up stands in the mouse hole.	

Management Summary

Drilled out shoe track t/1,136'. Cleaned out rathole t/1,146'. Drilled 10' of new formation t/1,156'. Circulated hole clean. Replaced dies on Saver Sub clamp. Drilled f/1,156' t/1,181'. Retighten clamps on TDS. Tripped out of the hole with clean out assembly. Picked up 14 3/4-inch Dir assembly. Tripped in the hole t/1,036'. Installed rotating rubber. Drilled intermediate section f/1,181' t/1,410'. Removed Saver Sub clamp and break out of connection with tongs. Drilled intermediate section f/1,410' t/1,597'. Retighten clamp on TDS. Drilled intermediate section f/1,597' t/2,650'.

Comments

Fuel on hand 16,394 gals.
Fuel used 447 gals.
Total NPT to date 7.75 HR

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	J-55	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 14

Report For 06:00 AM 30-Apr-23

Mud Information

															Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
29-Apr-23 16:00 at Depth 1,181 ft Mud Pits																				
8.80	40	12	9	5	1	9	3.5	0	100	0.1		3100	20		2	14	22			0

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	2	---	SAPP - 50#SK	6	---

Bit/BHA/Workstring Information

Depth		This Run		R.O.P.		Mud		Pump												
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF		
3	1	NOV	TKC66-A4	9.688	1181															
Jets: 18 18 18 18 18 18		Out:		Grade: Cutter: /		Dull: /		Wear:		gs:		Gge:		Pull:						
BHA - No. 3 - BIT, MMTR, STAB, DCM, PC, HSUB, OTHER, PC, XO, DC, XO, HWDP = 841.42																				

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
1,146	2,650	300.0	1,800.0	20	60	100	120	18	31	1,150	1,200	

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	140	Pick Up:	150	Slack Off:	135	Drag Avg/Max:	5 / 10
Hours on BHA:	Since Inspection:	7.25	Total:	7.25	Jars:	0		
Hours on Casing/Liner:	Rotating:	7.25 / 0	Tripping:	2 /	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems:	
Location Condition:	Good.
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	120	120	120	120	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	120	120	120	120	Centrifuge 1: 6 (Solids Removal)		Centrifuge 2: 6 (Solids Removal)			
Shaker No 3:	120	120	120	120						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	OTHER					

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crews. Review planned operations. Making up BHA.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	14
<input type="checkbox"/> BOP Test		<input checked="" type="checkbox"/> Crownamatic Check					

Weather Information

Sky Condition:	Sunny	Visibility:	10
Air Temperature:	44 degF	Bar. Pressure:	1021
Wind Speed/Dir:	8 / SSW	Wind Gusts:	3





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 15 Report For 06:00 AM 01-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	4353	Last Casing:	16.000 at 1,136	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	4352	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	1,703 / 14.42	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	118.12					Well Cost (\$):	---		
Days (actual / plan):	Drilling 1.33 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.33 / 0				DOL:	15			
Pers/Hrs:	Operator: 3 / 36	Contractor:	14 / 168	Service:	4 / 48	Other:	3 / 36	Total:	24 / 288

Safety Summary: No incidents or events reported. 15 days since LTI. Conducted Safety Meeting.

Current Operations: Working tight hole at 2,132'.

Planned Operations: Finish pulling out of the hole. Change out 14-3/4" bit and MWD batteries. Run in hole and drill 14-3/4" to +/- 4,960'. TD for this section.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:15	2.25	2,932	DRIL	Drill 14 3/4-inch intermediate section f/2,650' t/2,932', 20-70K WOB, 100 rpm ROT, 18-27 K ft-lb TORQ, 1,200 gpm, 2,450 psi SPP, Diff 650-800.	
8:15	8:35	0.33	2,932	REPR	Lost air pressure to drawworks, clutch would not function.	X
8:35	10:00	1.42	3,075	DRIL	Drill 14 3/4-inch intermediate section f/2,932' t/3,075', 40-70K WOB, 100 rpm ROT, 18-33 K ft-lb TORQ, 1,200 gpm, 3,300 psi SPP, Diff 650-800. ROP Limiter is available weight on bit.	
10:00	11:30	1.50	3,075	OTHER	No. 1 generator down on high temperature, 2 of 4 generators operational.	X
11:30	12:00	0.50	3,122	DRIL	Drill 14 3/4-inch intermediate section f/3,075' t/3,122', 65K WOB, 100 rpm ROT, 18-33 K ft-lb TORQ, 1,200 gpm, 3,300 psi SPP, Diff 650-800. ROP Limiter is available weight on bit.	
12:00	13:30	1.50	3,122	OTHER	No. 2 and 4 generator down on high temperature, 1 of 4 generators operational.	X
13:30	14:15	0.75	3,207	DRIL	Drill 14 3/4-inch intermediate section f/3,122' t/3,207', 65K WOB, 100 rpm ROT, 18-33 K ft-lb TORQ, 1,200 gpm, 3,300 psi SPP, Diff 650-800. ROP Limiter is available weight on bit, generators.	
14:15	15:00	0.75	3,207	OTHER	Cool down generators. 3 of 4 generators operational. Change swab on #2 mud pump.	X
15:00	20:00	5.00	3,960	DRIL	Drill 14 3/4-inch intermediate section f/3,207' t/3,960', 65K WOB, 100 rpm ROT, 18-33 K ft-lb TORQ, 1,200 gpm, 3,300 psi SPP, Diff 200-400. ROP Limiter is available weight on bit, generators.	
20:00	0:00	4.00	4,316	DRIL	Drill 14 3/4-inch intermediate section f/3,960' t/4316', 65K WOB, 100 rpm ROT, 18-33 K ft-lb TORQ, 1,100-1200 gpm, 3,300 psi SPP, Diff 200-400. ROP Limiter is available weight on bit, generators. NOTE: Vibrations went to orange around 3,960'. At 20:00. Adjusted rotary to 110 rpm and 90 rpm. Vibrations stayed at orange. Continued at 100 rpm.	
0:00	0:30	0.50	4,316	DRIL	Drill 14 3/4-inch intermediate section f/4,316' t/4,353', 65K WOB, 100 rpm ROT, 18-33 K ft-lb TORQ, 1,150-1,200 gpm, 3,300 psi SPP, Diff 200-400. ROP Limiter is available weight on bit, generators. NOTE: MSE steadily climbed and ROP slowed after connection at 4,264'. Vibrations went from yellow orange to orange red. Adjusted rotary to 90 rpm and then 85 rpm. Vibrations stayed at orange with MSE still climbing.	
0:30	1:40	1.17	4,353	CIRC	Circulated hole clean with 1-1/2 hole volumes.	
1:40	4:15	2.58	4,353	TRPO	Tripped out of the hole from 4,353' to 2,241'. Hole giving proper displacement.	
4:15	6:00	1.75	4,353	STUCK	Worked tight hole from 2,241' to 2,132' with 70 - 100 K overpull with pumps.	X

Management Summary

Drill 14 3/4-inch intermediate section f/2,650' t/4,353', 65K WOB, 100 rpm ROT, 18-33 K ft-lb TORQ, 1,150-1,200 gpm, 3,300 psi SPP, Diff 200-400. ROP Limiter is available weight on bit and generators overheating. NOTE: MSE steadily climbed and ROP slowed after connection at 4,264'. Vibrations increased from yellow orange to orange red. Formation changed to granite wash around 4,330'. Circulated hole cleaned and tripped out of the hole with proper hole fill. Pulled tight at 2,241'. Worked tight hole from 2,241' to 2,132' with pumps.

Comments



Fuel on hand 11,846 gals.
 Fuel used 3,466 gals.
 Total NPT to date 11.75 HR

	Daily Drilling Report	University of Utah
	Well ID: FORGE 16B(78)-32	Well Name: FORGE 16B(78)-32
	Field: FORGE	Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 15 **Report For 06:00 AM 01-May-23**

Casing/Tubular Information										
Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	J-55	

Mud Information																					
											Gels			Temp		Mud					
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss	
30-Apr-23 17:00 at Depth 3,599 ft Mud Pits, Type: Low Solids Non-Dispersed																					
9.00	38	11	8	5	1	8.2	3.5	0	96.5	0.3		2900	72		22			6	129	140	

Mud Consumables										
Item Description		Qty.	Cost	Item Description		Qty.	Cost			
API Gel - 100#SK		136	---	Desco - 25#SK		3	---			
DMA/SPA - 50#SK		24	---	Micro C - 50#SK		14	---			
PAC LV - 50#SK		19	---	Pallets/Wraps - OTHER		5	---			
SAPP - 50#SK		4	---	Sawdust - 50#SK		17	---			
Soda Ash - 50#SK		2	---							

Bit/BHA/Workstring Information																				
Depth		This Run				R.O.P.				Mud Pump										
No	Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
3	1	NOV	TKC66-A4	9.688	1181	3170	16	198.1	300.0	65	350	18000	9	1200	3300	258	537	376	1443	
Jets: 18 18 18 18 18 18		Out:		Grade: Cutter: /		Dull /		Wear:		Brgs: e:		Pull:								
BHA - No. 3 - BIT, MMTR, STAB, DCM, PC, HSUB, OTHER, PC, XO, DC, XO, HWDP = 841.42																				

Drilling Parameters												
Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
2,650	4,351	200.0	300.0	65	65	350	350	18,000	22,000	1,160	1,220	3,300
Annular Velocity: Drill Collars: 1,021.2				Drill Pipe: 151.8								
Comments: No Losses.												

Miscellaneous Drilling Parameters										
Hook Loads (lbs):		Off Bottom Rotate: 200		Pick Up: 204		Slack Off: 192		Drag Avg/Max: 4000 / 8000		
Slow Circulation Data:										
Pump 1:		40 spm 150 psi		50 spm 200 psi		60 spm 250 psi				
Pump 2:		40 spm 150 psi		50 spm 200 psi		60 spm 250 psi				
Hours on BHA:		Since Inspection: 23.25		Total: 23.25		Jars:				
Hours on Casing/Liner:		Rotating: 23.25 / 16		Tripping: 6 /		Wear Bushing Installed				

Rig Information										
Equipment Problems: Generators overheating. Gen #3 down for repairs.										
Location Condition: Good.										
Transport:										

Solids Control Information										
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	120	120	120	120						
Shaker No 2:	120	120	120	120	Centrifuge 1: 20 (Solids Removal)			Centrifuge 2: 20 (Solids Removal)		
Shaker No 3:	120	120	120	120						

Drill Pipe Inventory										



DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	OTHER					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews. Review planned operations. Drilling ahead.
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:
BOP Test	Crownamatic Check	Days Since LTI: 15

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 15 **Report For 06:00 AM 01-May-23**

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 73 degF	Bar. Pressure:
Wind Speed/Dir: 11 / SSW	Wind Gusts: 14



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 16 Report For 06:00 AM 02-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	4816	Last Casing:	16.000 at 1,136	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	4815	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	463 / 8.83	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	52.42					Well Cost (\$):	---		

Days (actual / plan): Drilling 1.7 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.7 / 0 DOL: 16

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 5 / 0 Other: 3 / 6 Total: 25 / 210

Safety Summary: No incidents or events reported. 16 days since LTI. Conducted Safety Meeting.

Current Operations: Drilling 14-3/4" hole at 4,816'.

Planned Operations: Drill to casing point. Make wiper trip. Strap out of the hole. Rig up and run 11-3/4" 65# casing.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	4,353	TRPO	TOOH f/ 2,153' t/ 1,957'. Pulling tight, 50K - 100K over string weight. Kelly up on each stand and washing out of hole.	
7:00	10:30	3.50	4,353	TRPO	TOOH on elevators f/ 1,957' t/ 166'.	
10:30	13:00	2.50	4,353	DIR	Lay down directional tools, mud motor and bit.	
13:00	16:00	3.00	4,353	DIR	Pick up new 7/8 5.7 stage, 0.13 rev/gal mud motor, full gauge roller reamer and MWD tools.	
16:00	20:50	4.83	4,353	TRPI	TIH t/4,339' picking up an additional std of 8" drill collars and 5 additional stds weight pipe.	
20:50	21:00	0.17	4,353	CIRC	Filled drill pipe.	
21:00	21:10	0.17	4,353	TRPI	TIH f/4,339' t/4,350'. Ran survey. TIH t/4,353'.	
21:10	21:30	0.33	4,353	DRIL	Perform RPM step test with 55K WOB. Excessive surface chatter until 100 rpm was reached.	
21:30	23:30	2.00	4,527	DRIL	Drill 14 3/4-inch intermediate section f/4,353' t/4,527', 55K WOB, 100 rpm ROT, 20-33 K ft-lb TORQ, 1,050-1,150 gpm, 3,450 psi SPP, Diff 100-500. 50-150 ROP.	
23:30	0:30	1.00	4,535	DRIL	Attempt to get MWD signal to slide. Drilled f/4,527' t/4,535' while attempting to slide.	X
0:30	3:00	2.50	4,690	DRIL	Perform WOB step test. Drill 14 3/4-inch intermediate section f/4,535' t/4,690', 80K WOB, 100 rpm ROT, 19-23 K ft-lb TORQ, 1,050 gpm, 3,200 psi SPP, Diff 400-650. 50-100 ROP.	
3:00	4:20	1.33	4,750	DRIL	Drill 14 3/4-inch intermediate section f/4,690' t/4,750', 85K WOB, 100 rpm ROT, 19-23 K ft-lb TORQ, 1,060 gpm, 3,280 psi SPP, Diff 400-500. 60-100 ROP.	
4:20	6:00	1.67	4,816	DRIL	Drill 14 3/4-inch intermediate section f/4,750' t/4,816', 80K WOB, 100 rpm ROT, 17-20 K ft-lb TORQ, 1,060 gpm, 3,270 psi SPP, Diff 400-500. 60-100 ROP.	

Management Summary

TOOH f/ 2,153' t/ 1,957'. Pulling tight, 50K - 100K over string weight. Kelly up on each stand and washing out of hole. TOOH on elevators f/ 1,957' t/ 166'. Lay down directional tools, mud motor and bit. TIH t/4.353' with new bit and directional tools picking up an additional stand of 8" drill collars and 5 additional stands weight pipe. Perform RPM step test. Excessive surface chatter until 100 rpm was reached. Continue drilling 14 3/4-inch intermediate section f/4,353' t/4,527', Perform WOB step test f/ 55K-80K. Continue drilling 14 3/4-inch intermediate section f/4,527' t/4,816', 80K-85K WOB, 100 rpm ROT, 19-23 K ft-lb TORQ, 1,060 gpm, 3,280 psi SPP, Diff 400-500. 60-100 ROP.

Comments

Fuel on hand 10,157 gals.
Fuel used 1,689 gals.
Total NPT to date 11.75 HR

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section (ft)	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	J-55	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 16

Report For 06:00 AM 02-May-23

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
01-May-23 16:00 at Depth 4,353 ft Mud Pits, Type: Low Solids Non-Dispersed																				
9.10	38	13	7	4.8	1	8	5.7		94.3	0.1		3100	80		33	10	127			0

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	54	---	DMA/SPA - 50#SK	11	---
Micro C - 50#SK	6	---	PAC LV - 50#SK	10	---
Pallets/Wraps - OTHER	2	---	Poly Vis - 50#SK	4	---
Soda Ash - 50#SK	2	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump								
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
3	1NOV	TKC66-A4	14.750	1181	3170	16	0.0	0.0	0	0	0	0	0	0	258	537	376	1443
Jets: 18 18 18 18 18 18				Out: 4353	Grade: Cutter: / Dull: /				Wear: /		Brgs: /		Gge: /		Pull: /			
4	1SANJOAQ	TKC83	14.750	4353	433	9	48.1	90.0	80	335	19	9	1050	320	228	424	260	1129
Jets: 15 15 15 15 16 16 16 16				Out:	Grade: Cutter: / Dull: /				Wear: /		Brgs: /		Gge: /		Pull: /			

BHA - No. 4 - BIT, MMTR, RR, DCM, PC, HSUB, OTHER, PC, XO, 12 DC, XO, 30 HWDP = 1391.45

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)	
4,353	4,816	60.0	100.0	80	85	100	100	19	21	1,050	1,050	3,200	
Annular Velocity: Drill Collars:				169.8		Drill Pipe:				137.4			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 235,000	Pick Up: 250,000	Slack Off: 220,000	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 32.25	Total: 32.25	Jars:	
Hours on Casing/Liner:	Rotating: 32.25 / 25	Tripping: 16 /	Wear Bushing Installed	

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	120	120	120	120	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	120	120	120	120	Centrifuge 1: 18 (Solids Removal)		Centrifuge 2: 18 (Solids Removal)
Shaker No 3:	120	120	120	120			

Drill Pipe Inventory

DP Size	Joists	Weight	Grade	Thread	DP Size	Joists	Weight	Grade	Thread
5.5	365	24.7	S-135	OTHER					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews. Review planned operations. Drilling ahead.
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:
		Days Since LTI: 16
BOP Test	Crownamatic Check	

Weather Information

Sky Condition: Partly Cloudy	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 998
Wind Speed/Dir: 23 / S	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 17 Report For 06:00 AM 03-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	4845	Last Casing:	16.000 at 1,136	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	4844	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	29 / 1.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):	29.0					Well Cost (\$):	---

Days (actual / plan): Drilling 1.74 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.74 / 0 DOL: 17

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 5 / 60 Other: 3 / 0 Total: 25 / 264

Safety Summary: No incidents or events reported. 17 days since LTI. Conducted Safety Meeting.

Current Operations: Running 11-3/4" 65# BTC casing.

Planned Operations: Finish running 11-3/4" 65# casing to 4,837'. Cement same.

Toolpusher: Shawn Seddell, Jason

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	4,816	CIRC	Circulate hole clean for running 11 3/4" intermediate casing. Fill pill tank with fresh water.	
8:00	8:30	0.50	4,816	REPR	Change swab in No. 3 mud pump.	X
8:30	9:30	1.00	4,845	DRIL	Drill 14 3/4" hole to casing point f/4,818' t/4,845' to obtain proper stick up. 80K WOB, 100 rpm ROT, 17-20 K ft-lb TORQ, 1,060 gpm, 3,270 psi SPP, Diff 400-500. 50-100 ROP.	
9:30	10:00	0.50	4,845	CIRC	Circulate bottoms up.	
10:00	16:00	6.00	4,845	WIPE	Wiper trip to 16" casing shoe and back in. No tight spots.	
16:00	16:45	0.75	4,845	CIRC	Circulate bottoms up.	
16:45	2:30	9.75	4,845	TRPO	Trip out of hole f/4,845' t/485'. Strap out was 3 tenths of a foot difference. Lay down 8" DC's, directional tools, mud motor and bit. Some of the drill pipe and HWDP and all the 8" drill collars were torqued up. Use rig tongs instead of ST 80 to break out.	
2:30	3:00	0.50	4,845	OTHER	Pulled wear bushing.	
3:00	3:30	0.50	4,845	OTHER	Cleared and cleaned rig floor.	
3:30	4:30	1.00	4,845	CASE	Hold detailed safety meeting with B&L Casing Service along with rig crew and DSM. Rig up to run 11-3/4" 65# casing.	
4:30	6:00	1.50	4,845	CASE	Make up shoe track. Run 11-3/4" 65 ppf, JFE110T BTC casing t/150 ft. Rig up CRT.	

Management Summary

Circulated and cleaned hole @ 4,816' to running casing. Drill 14 3/4" hole f/4,816' t/4,845' to obtain proper stick up. 80K WOB, 100 rpm ROT, 17-20 K ft-lb TORQ, 1,060 gpm, 3,270 psi SPP, Diff 400-500. 50-100 ROP. Circulate bottoms up. Wiper trip to 16" casing shoe and back in. No tight spots. Trip out of hole f/4,845' t/485'. Strap out was 3 tenths of a foot difference. Lay down 8" DC's, directional tools, mud motor and bit. Pulled wear bushing. Held Safety meeting for running casing. Made up shoe track, Run 11-3/4" 65 ppf, JFE110T BTC casing t/150 ft. Rig up CRT.

Comments

Fuel on hand 16,413 gals.
Fuel used 1,244 gals.
Total NPT to date 12.25 HR

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section (ft)	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	J-55	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
02-May-23 15:00 at Depth 4,845 ft Mud Pits, Type: Low Solids Non-Dispersed																				
9.10	40	14	6	5.2	1	8	5.7		94.3	0.25		30000	80		3	4	11	127	148	0





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 17

Report For 06:00 AM 03-May-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	80	---	DMA/SPA - 50#SK	10	---
Engineering - OTHER	1	---	Micro C - 50#SK	3	---
PAC LV - 50#SK	8	---	Pallets/Wraps - OTHER	2	---
Soda Ash - 50#SK	2	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
4	1	SANJOAQ	TKC83	14.750	4353	462	10	46.2	100.0	80	335	2	91050	3200	228	424	260	1129	
Jets: 15 15 15 15 16 16 16 16					Out: 4845	Grade: Cutter: /		Dull: /		Wear:	Brgs:	Gge:	Pull:						
BHA - No. 4 - BIT, MMTR, RR, DCM, PC, HSUB, OTHER, PC, XO, 12 DC, XO, 30 HWDP = 1391.45																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max		
4,818	4,845	60.0	100.0	80	80	100	100	19	22	1,050	1,050	3,200	
Annular Velocity: Drill Collars:				169.8		Drill Pipe:				137.4			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 33.25	Total: 33.25	Jars:		
Hours on Casing/Liner:	Rotating: 33.25 / 26	Tripping:	/	Wear Bushing Installed	

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	120	120	120	120	
Shaker No 2:	120	120	120	120	Centrifuge 1: 14
Shaker No 3:	120	120	120	120	Centrifuge 2: 14

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	OTHER					

Safety Information

Meetings/Drills	Time	Description
Safety	45	Two Pre-tour safety meetings held daily with crews. PJSM for running casing.
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:
		Days Since LTI: 17
BOP Test	Crownamatic Check	

Weather Information

Sky Condition: Partly Cloudy	Visibility: 8
Air Temperature: 68 degF	Bar. Pressure:
Wind Speed/Dir: 13 / SSW	Wind Gusts: 20





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 18 Report For 06:00 AM 04-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	4845	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	4844	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 1.74 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.74 / 0 DOL: 18

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 128 Service: 22 / 220 Other: 3 / 36 Total: 42 / 420

Safety Summary: No incidents or events reported. 18 days since LTI. Conducted Safety Meeting.

Current Operations: Measuring cement fallback for possible cement top job.

Planned Operations: Nipple down 21-1/4" BOPs and nipple up 13-5/8" 3M BOPs.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	14:45	8.75	4,845	CASE	Run in hole with 11 3/4", 65 #/ft, JFE 110 and JFE 125 casing from 150' to 4,837' shoe depth.	
14:45	15:45	1.00	4,845	CIRC	Rig down B&L casing crew while circulating casing prior to cement job.	
15:45	17:30	1.75	4,845	CASE	Rig down CRT tool.	
17:30	17:45	0.25	4,845	CMTP	Rig up SLB to cement 11 3/4" Intermediate string.	
17:45	18:15	0.50	4,845	SAFETY	Held safety meeting with SLB cementers, FORGE DSM's, Rig Managers, and crew.	
18:15	22:30	4.25	4,845	CMTP	Run in hole with 11 3/4", 65 #/ft, JFE 110 and JFE 125 casing from 150' to 4,837' shoe depth. Circulated with CRT. Rigged down casing running equipment and CRT. Rigged up cement pumping equipment. Pumped primary cement job as follows. Dropped bottom plug with 5 bbls of water, Test lines to 3500 psi. Pumped 50 bbls of 11.5 ppg spacer, 549 bbls of 14 ppg cement. Dropped top plug and displaced with 520 bbls of mud and water. Bumped plug. Checked floats (OK). CIP at 21:50. Good returns throughout job. Waited 20 minutes and attempted to drain BOP stack. No cement. Waited on cement.	
22:30	6:00	7.50	4,845	WOC	Waited on cement. Removed and cleaned out flow line. 4 bolted stack. Changed out pump liners from 6" to 5.5".	

Management Summary

Run in hole with 11 3/4", 65 #/ft, JFE 110 and JFE 125 casing from 150' to 4,837' shoe depth. Circulated with CRT. Rigged down casing running equipment and CRT. Rigged up cement pumping equipment. PJSM. Pumped primary cement job as follows. Dropped bottom plug with 5 bbls of water, Test lines to 3500 psi. Pumped 50 bbls of 11.5 ppg spacer, 549 bbls of 14 ppg cement. Dropped top plug and displaced with 10 bbls of water, 496 bbls of mud and 14 bbls of water. Bumped plug. Checked floats (OK). CIP at 21:50. 67 bbls of good cement back. Waited 20 minutes and attempted to drain BOP stack. No cement. Waited on cement.

Comments

Fuel on hand 15050 gals.
 Fuel used 1,363 gals.
 Total NPT to date 12.25 HR No
 H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	


Mud Information

%
 Gels Temp Mud
 Dens. Vis PV YP Filt. Cake pH/ES Solids Oil Water Sand LGS Cl Ca CaCl 10s 10m 30m In Out Loss

03-May-23 15:00 at Depth 4,845 ft Mud Pits, Type: Low Solids Non-Dispersed

9.00	38	13	7	4.8	1	8	5	95			3000	80		3	3	9		125	
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Mud Consumables					
Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			
		Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE		University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	
Report No: 18			Report For 06:00 AM 04-May-23		
Miscellaneous Drilling Parameters					
Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 33.25	Total: 33.25	Jars:		
Hours on Casing/Liner:	Rotating: 33.25 / 26	Tripping: /	Wear Bushing Installed		
Rig Information					
Equipment Problems:					
Location Condition:					
Transport:					
Solids Control Information					
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	
Shaker No 1:	120	120	120	120	
Shaker No 2:	120	120	120	120	
Shaker No 3:	120	120	120	120	
Drill Pipe Inventory					
DP Size	Joints	Weight	Grade	Thread	
5.5	365	24.7	S-135	OTHER	
Safety Information					
Meetings/Drills	Time	Description			
Safety	60	Two Pre-tour safety meetings held daily with crews. Casing running procedures. Cementing procedures.			
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:	18	
BOP Test	Crownamatic Check				
Weather Information					
Sky Condition:	Mostly Sunny	Visibility:	10		
Air Temperature:	67 degF	Bar. Pressure:	1002		
Wind Speed/Dir:	16 / SSW	Wind Gusts:			



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 19 Report For 06:00 AM 05-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	4845	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	4844	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 1.74 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.74 / 0 DOL: 19

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 128 Service: 5 / 60 Other: 3 / 36 Total: 25 / 260

Safety Summary: No incidents or events reported. 19 days since LTI. Conducted Safety Meeting.

Current Operations: Test pack-off.

Planned Operations: Nipple up 13-5/8" 3M BOPE.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	4,845	WOC	Wait on cement. Finish changing mud pump liners to 5-1/2".	
8:30	9:00	0.50	4,845	CMTS	PJSM. Mix and pump Top Job #1. Flush lines with cement. Rig up to annulus. Pump 36 bbls of 14.0 ppg surface tail cement with 2% Calcium Chloride. Approx 413 linear feet. No returns.	
9:00	20:30	11.50	4,845	WOC	Wait on additional cement from Bakersfield. Work with welder on next BOP stack. Work on generators.	
20:30	23:15	2.75	4,845	BOPO	Slack off 11-3/4" casing. No movement. Rig down choke and kill lines. Rig down turnbuckles. Rig up bridle lines and lift BOP stacked approx 24". Install casing slips. Remove mousehole and catwalk.	
23:15	0:15	1.00	4,845	CMTS	PJSM. Mix and pump Top Job #2. Flush lines with cement. Rig up to annulus. Pump 13 bbls of 15.8 ppg tail cement with 2% Calcium Chloride. Approx 153 linear feet. Cement to surface. Cement not falling. Top job #1 and #2 combined for approx 566 ft.	
0:15	6:00	5.75	4,845	BOPO	Make rough cut on 11-3/4" casing and remove same. Set out 21-1/4" riser, annular, doublegate and mudcross. Make final cut on casing. Install pack-off and flange.	

Management Summary

Waited on cement before pumping top job. Pumped Top Job #1: Flushed lines with cement. Rigged up to annulus. Pumped 36 bbls of 14.0 ppg surface tail cement with 2% Calcium Chloride. Approx 413 linear feet. No returns. Waited on additional cement from Bakersfield. Slacked off 11-3/4" casing. No movement. Rigged down turnbuckles, choke and kill lines. Rigged up bridle lines and lifted BOP stacked approx 24". Installed casing slips. Removed mousehole and catwalk. Pumped Top Job #2: Flushed lines with cement. Rigged up to annulus. Pumped 13 bbls of 15.8 ppg tail cement with 2% Calcium Chloride. Approx 153 linear feet. Cement to surface. Made rough cut on 11-3/4" casing and removed same. Set out 21-1/4" riser, annular, doublegate and mudcross. Made final cut on casing. Installed pack-off and flange.

Comments

Fuel on hand 19866 gals.
 Fuel used 400 gals.
 Total NPT to date 12.25 HR No
 H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	


Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
04-May-23 15:00 at Depth 4,845 ft Mud Pits, Type: Low Solids Non-Dispersed																				
	27								100									70		

Mud Consumables



Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE			University of Utah Well Name: FORGE 16B(78)-32 26S Rng: 9W County: BEAVER State: UT		
	Report No: 19			Report For 06:00 AM 05-May-23		
Miscellaneous Drilling Parameters						
Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/	
Hours on BHA:	Since Inspection:	0	Total:	0	Jars:	
Hours on Casing/Liner:	Rotating:	0 / 0	Tripping:	/	Wear Bushing Installed	
Rig Information						
Equipment Problems:						
Location Condition:						
Transport:						
Solids Control Information						
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):	
Shaker No 1:	120	120	120	120		
Shaker No 2:	120	120	120	120	Centrifuge 1: 3 (Solids Removal)	
Shaker No 3:	120	120	120	120		
Drill Pipe Inventory						
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints Weight Grade Thread
5.5	365	24.7	S-135	OTHER		
Safety Information						
Meetings/Drills	Time	Description				
Safety	60	Two Pre-tour safety meetings held daily with crews. Two PJSM for Cementing procedures.				
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:	19		
BOP Test	Crownamatic Check					
Weather Information						
Sky Condition:	Light rain	Visibility:	3			
Air Temperature:	49 degF	Bar. Pressure:				
Wind Speed/Dir:	27 / SSW	Wind Gusts:	35			



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 20 Report For 06:00 AM 06-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	4845	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	4844	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 1.74 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.74 / 0 DOL: 20

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 128 Service: 6 / 72 Other: 3 / 36 Total: 26 / 272

Safety Summary: No incidents or events reported. 20 days since LTI. Conducted Safety Meeting.

Current Operations: Loading 6-3/4" drill collars.

Planned Operations: Test 13-5/8" 5M BOPE. Pick up drill collars and trip in hole. Drill out shoe track plus 10' of new hole. Perform FIT test. Drop gyro.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	4,845	WELLHD	Install and test packoff on 11 3/4" casing. 5,000 psi for 15 minutes. Test good.	
8:00	9:00	1.00	4,845	WELLHD	Test upper and lower wellhead flanges. 5,000 psi for 15 minutes. Test good.	
9:00	10:00	1.00	4,845	BOPO	Move BOP into cellar on forks to begin nipping up. While installing bridle lines to lift, BOP slipped off forks onto ground hitting one of the lock down pins for the 7" casing packoff, damaging the lock down pin.	
10:00	22:00	12.00	4,845	BOPO	Continue nipping up while waiting on new lock down pin. Stack up 13 5/8" X 5,000 psi mud cross, double gate, annular, and Pruitt rotating head. Function test BOP's. Install turnbuckles, sub walkway, and sub cross beams. Move catwalk into position.	
22:00	23:00	1.00	4,845	BOPT	Pressure test valves on choke manifold to 250 psi low, 5000 psi high for 5 minutes each.	
23:00	5:00	6.00	4,845	REPR	Attempt to move mousehole to rig floor. Catwalk broke. Work on catwalk. Clear and clean rig floor.	X
5:00	6:00	1.00	4,845	REPR	Work on catwalk. Load and strap 6-3/4" drill collars.	X

Management Summary

Installed and tested packoff on the 11 3/4" casing. Tested upper and lower wellhead flanges. Moved BOP into cellar on forks to begin nipping up. While installing bridle lines to lift, BOP slipped off forks onto ground hitting one of the lock down pins for the 7" casing packoff, damaging the lock down pin. Continued nipping up while waiting on new lock down pin. Stacked up 13 5/8" X 5,000 psi mud cross, double gate, annular, and Pruitt rotating head. Function tested BOPs. Installed turnbuckles, sub walkway and sub cross beams. Installed catwalk and mousehole. Pressure tested valves on choke manifold to 250 psi low and 5000 psi high for minutes each. Attempted to move mousehole to rig floor. Catwalk broke. Worked on catwalk. Cleared and cleaned rig floor. Loaded and strapped 6-3/4" drill collars.

Comments

Fuel on hand 19306 gals.
Fuel used 306gals.
Total NPT to date 21.58 HR No
H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER

Mud Information


%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	Temp In	Mud Out	Loss
	8.35	27	2	1	100		7			100			300								

05-May-23 15:00 at Depth 4,845 ft Mud Pits, Type: Low Solids Non-Dispersed

Mud Consumables



Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE			University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT					
	Report No: 20			Report For 06:00 AM 06-May-23					
Miscellaneous Drilling Parameters									
Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/				
Hours on BHA:	Since Inspection:	0	Total:	0	Jars:				
Hours on Casing/Liner:	Rotating:	0 / 0	Tripping:	/	Wear Bushing Installed				
Rig Information									
Equipment Problems:									
Location Condition:									
Transport:									
Solids Control Information									
Screen Sizes:	Top	Middle 1	Middle 2	Bottom					
Shaker No 1:	120	120	120	120	Wet Pan / Fine				
Shaker No 2:	120	120	120	120					
Shaker No 3:	170	170	170	170					
Drill Pipe Inventory									
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					
Safety Information									
Meetings/Drills	Time	Description							
Safety	30	Two Pre-tour safety meetings held daily with crews. BOPE handling procedures.							
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	20		
BOP Test		Crownamatic Check							
Weather Information									
Sky Condition:	Mostly Cloudy			Visibility:	10				
Air Temperature:	55 degF			Bar. Pressure:	1010				
Wind Speed/Dir:	18 / SW			Wind Gusts:					



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 21 Report For 06:00 AM 07-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	4845	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	4844	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 1.74 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.74 / 0 DOL: 21

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 128 Service: 6 / 72 Other: 3 / 36 Total: 26 / 272

Safety Summary: No incidents or events reported. 21 days since LTI. Conducted Safety Meeting.

Current Operations: Finish BOPE testing, blinds, kill valves, TIW valve.

Planned Operations: Run in hole with 9.5 RC bit and BHA. Drill out shoe track and 10' of new hole. Perform FIT test. Drop Gyro. Trip out of hole. Run wireline Isolation Scanner.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	18:00	12.00	4,845	REPR	Work on catwalk, assist with Particle Drilling Technologies rig up, unload 90 jts of insulated drill pipe.	X
18:00	0:15	6.25	4,845	REPR	Pick up and make up 21 joints of 6-3/4" drill collars. Stand back in derrick. Make up and ran in hole with test plug.	X
0:15	1:00	0.75	4,845	REPR	New lock down pin arrive. Install same.	X
1:00	6:00	5.00	4,845	BOPT	PJSM. Rig up testers. Make up TIW valve. Fill stack with water. Close pipe rams. Attempt to test pipe rams. Rams leaking. Pipe rams closing partially on x-over tool joint. Change out to shorter x-over. Test pipe rams 250 psi low, 5000 psi high, Test annular 250 psi low, 2,500 psi high. Test inner valves on mud cross 250 psi low, 5000 psi high. Test witnessed by DSM. Note: all choke valves on manifold were tested to 250 psi low and 5000 psi high on Report #20.	

Management Summary

Worked on catwalk. Assisted with Particle Drilling Technologies rigging up. Unloaded 90 jts of insulated drill pipe. Picked up and made up 21 joints of 6-3/4" drill collars and stood back in derrick. Made up and ran in hole with test plug. New lock down pin arrived. Installed same. Rigged up testers. Made up TIW valve. Filled stack with water. Closed pipe rams. Tested pipe rams 250 psi low, 5000 psi high, Tested annular 250 psi low, 2,500 psi high. Tested inner valves on mud cross 250 psi low, 5000 psi high. Test witnessed by DSM. Note: All choke valves on manifold were tested to 250 psi low and 5000 psi high on Report #20.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
06-May-23 15:00 at Depth 4,845 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.35	27	2	1	100					100			300								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
DC-310/CI-100 - SACK	30	---	Engineering - OTHER	1	---

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	0 Total:	0 Jars:		
Hours on Casing/Liner:	Rotating:	0 / 0	Tripping:	/	Wear Bushing Installed

Rig Information



Equipment Problems:
Location Condition:
Transport:

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 21	Report For 06:00 AM 07-May-23
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Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	120	120	120	120
Shaker No 2:	120	120	120	120
Shaker No 3:	170	170	170	170

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	45	Two Pre-tour safety meetings held daily with crews. BOPE testing procedures.

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:	21
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BOP Test	Flowdynamic Check
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Weather Information

Sky Condition: Mostly cloudy	Visibility: 5
Air Temperature: 40 degF	Bar. Pressure:
Wind Speed/Dir: 5 / SSW	Wind Gusts: 10



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 22 Report For 06:00 AM 08-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	4855	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	4854	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	10 / 1.5	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):	6.67					Well Cost (\$):	---

Days (actual / plan): Drilling 1.8 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.8 / 0 DOL: 22

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 10 / 120 Other: 3 / 36 Total: 30 / 360

Safety Summary: No incidents or events reported. 22 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping out of the hole at 1,607'.

Planned Operations: Finish tripping out of the hole. Remove bit, bit sub and Gyro. Run Isolation Scanner. Pick up core tools.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:30	3.50	4,845	BOPT	Test lower manual valve and pipe rams, 250 psi low, 5,000 psi high for 5 minutes. Test good. Attempt to test blind rams. Test failed.	
9:30	17:30	8.00	4,845	REPR	Open ram doors and remove blind rams. Remove seals. Wait on new seals. While waiting on repairs, crew changing grabber box dies and change oil in top drive. Unload 90 jts of insulated drill pipe. Install new seals on blind rams.	X
17:30	19:30	2.00	4,845	BOPT	Test blind rams to 250 psi low and 5,000 psi high for 5 minutes. Good test. Remove test plug. Install wear bushing.	
19:30	1:00	5.50	4,845	TRPI	Make up 9-1/2" insert bit. Trip in the hole. Tag top of cement at 4,744'.	
1:00	2:00	1.00	4,845	DRILR	Drill out cement f/4,744' t/4,748', top of float collar. Drill out float collar and good cement to float shoe at 4,839'. Drill out good cement t/4,843' and contaminated cement t/4,845'.	
2:00	2:30	0.50	4,855	DRILR	Drill 10' new hole f/4,845' t/4,855'. 20 WOB, RPM 50, 60, 65, &70. Brought WOB to 25. Max temperature out 120 deg F.	
2:30	3:30	1.00	4,855	CIRC	Circulate hole clean. 8.5 ppg in and out.	
3:30	4:00	0.50	4,855	FIT	Perform FIT test to 330 psi. Mud Weight Equivalent 9.8 ppg.	
4:00	4:30	0.50	4,855	SURV	PJSM. Drop Gyro. Totco Ring at 4,850'.	
4:30	6:00	1.50	4,855	TRPO	Trip out of the hole f/4,852' t/1,607'.	

Management Summary

Tested lower manual valve and pipe rams, 250 psi low, 5,000 psi high for 5 minutes. Test good. Attempted to test blind rams. Test failed. Changed out blind ram seals. Tested blind rams to 250 psi low and 5,000 psi high for 5 minutes. Test good. Removed test plug. Installed wear bushing. Made up 9-1/2" insert bit and tripped in the hole. Tagged top of cement at 4,744'. Drilled out cement f/4,744' t/4,748', top of float collar. Drilled out float collar and good cement to shoe at 4,839'. Drilled out good cement t/4,843' and contaminated cement t/4,845'. Drilled 10' new hole f/4,845' t/4,855'. Circulated hole clean. 8.5 ppg in and out. Performed FIT test to 330 psi. Mud Weight Equivalent 9.8 ppg. Dropped Gyro with Totco Ring at 4,850'. Trip out of the hole f/4,852' t/1,607'.

Comments

Fuel on hand 17,978 gals.
Fuel used 824 gals.
Total NPT to date 48.5 HR No
H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%										Gels			Temp		Mud					
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss



07-May-23 15:00 at Depth 4,845 ft Mud Pits, Type: Low Solids Non-Dispersed														
8.35	2	1			7.8			100			300			

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 22 **Report For 06:00 AM 08-May-23**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud Pump				
No Run	Make	Model	Diam In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
5	1	SANJOAQ	MX-S50R	9.500	4845	111	1.5	74.0	120.0	25	70	4700	8680	1080	165	204	81	487
Jets: 24 24 24				Out:	Grade:	Cutter: /	Dull: /	Wear:	Brgs:	Gge:	Pull:							

Comments: Drill out shoe track and 10 ft of new hole.

BHA - No. 5 - BIT, BS, 5 DC, XO, 30 HWDP = 1385.26

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
4,744	4,855	11.0	15.0	25	25	70	70	4,500	5,300	680	690	1,080	
Annular Velocity: Drill Collars: 373.0				Drill Pipe: 277.8									

Comments: 10 ft of new hole.

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 1.5	Total: 1.5	Jars:	

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	120	120	120	120
Shaker No 2:	120	120	120	120
Shaker No 3:	170	170	170	170

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews. BOPE testing procedures. Making up BHA
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 22
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Mostly clear	Visibility: 10
Air Temperature: 62 degF	Bar. Pressure: 1013
Wind Speed/Dir: 11 / ENE	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 23 Report For 06:00 AM 09-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	4871	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	4870	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	16 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 1.8 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.8 / 0 DOL: 23

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 10 / 120 Other: 3 / 36 Total: 30 / 360

Safety Summary: No incidents or events reported. 23 days since LTI. Conducted Safety Meeting.

Current Operations: Laying down Core BHA 1

Planned Operations: Pick up Core BHA 2 and trip in hole for 2nd core run

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	4,855	TRPO	Trip out of hole with Gyro tool f/1,700' t/surface.	
8:00	8:30	0.50	4,855	TRPO	Lay down Gyro tool. Break off bit and bit sub.	
8:30	10:30	2.00	4,855	LOG	Clean floor, PJSM with SLB and Frontier personnel, rig up logging truck and tools.	
10:30	14:00	3.50	4,855	LOG	Log open hole and casing f/4,845' t/ surface with continuous Borehole Temperature, Gamma, PFlex Cement Evaluation, Isolation Scanner, Array Sonic	
14:00	14:30	0.50	4,855	LOG	Rig down SLB and SureFire wireline.	
14:30	15:30	1.00	4,855	SERV	Clean rig floor. Rig Service, grease crown, top drive, drawworks and ST-80. Test tattoo and crown save. Grease swivel packing.	
15:30	18:00	2.50	4,855	CORE	Load catwalk with coring assembly.	
18:00	19:00	1.00	4,855	BHAOP	Make up 8-3/4" core bit and core barrels. Make up jars.	
19:00	22:00	3.00	4,855	TRPI	Trip in hole f/76' to 4,855'. Wash down last 2 stands.	
22:00	23:45	1.75	4,855	CIRC	Circulate bottoms up. Drop ball and pump down.	
23:45	2:15	2.50	4,871	CORE	Core f/4,855' t/4,871'. ROP slowed and pressure increased by 220 psi.	
2:15	3:00	0.75	4,871	CIRC	Pick up and circulate hole clean.	
3:00	6:00	3.00	4,871	TRPO	Trip out of the hole f/4,871' t/BHA.	

Management Summary

Tripped out of hole with Gyro survey tool. Break off bit and bit sub. Held pre job safety meeting with SLB Wireline personnel, Frontier Drilling personnel and DSM. Rig up and log well with Borehole Temperature, Gamma, PFlex Cement Evaluation, Isolation Scanner, and Sonic Array from 4,845' to surface. Rig down logging tools. Load catwalk, make up core bit 1 and pick up core BHA 1 and jars. Trip in hole, washing last 2 stands to bottom at 4,855'. Circulate bottoms up, dropped ball, pumped down and begin coring f/ 4,855' t/4,871'. ROP slowed and pressure increased to 220 psi. Picked up, circulated hole clean and tripped out of hole f/4,871' t/BHA.

Comments

Fuel on hand 17,093 gals.
Fuel used 885 gals.
Total NPT to date 48.5 HR No
H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

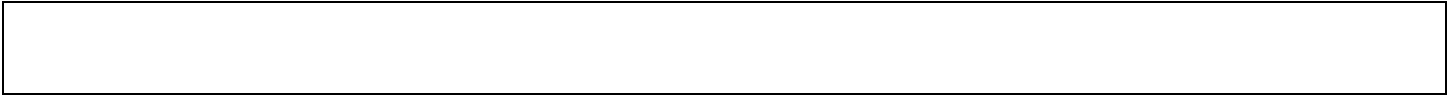
Mud Information

													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss

08-May-23 15:00 at Depth 4,855 ft Mud Pits, Type: Low Solids Non-Dispersed

8.40		2	1	100		9.7			100			600								
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	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 23 **Report For 06:00 AM 09-May-23**

Mud Consumables					
Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Bit/BHA/Workstring Information																			
Depth					This Run					R.O.P.				Mud Pump					
No	Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
5	1	SANJOAQ	MX-S50R	9.500	4845	0	0	0.0	0.0	0	0	0	0	0	0				
Jets: 24 24 24					Out: 4855		Grade: Cutter: /		Dull: /		Wear:		Brgs:		Gge:		Pull:		
Comments: Drill out shoe track and 10 ft of new hole.																			
6	1	CANAMER	CCI-913	8.750	4855	16	2.5	6.4	11.0	8	35	4500	8400	33	116	102	24	202	
Jets: 12 12 12 12 12 12 12 12 12 12					Out: 4871		Grade: Cutter: /		Dull: /		Wear:		Brgs:		Gge:		Pull:		
BHA - No. 6 - BIT, NBS, PC, STAB, CORE, STAB, CORE, STAB, OTHER, JAR, DC, XO, 30 HWDP = 1085.84																			

Drilling Parameters													
Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
4,855	4,871	6.7	10.0	8,000	9,000								

Miscellaneous Drilling Parameters										
Hook Loads (lbs):		Off Bottom Rotate:			Pick Up: 200,000		Slack Off:		Drag Avg/Max: /	
Hours on BHA:		Since Inspection: 4			Total: 4		Jars:			
Hours on Casing/Liner:		Rotating: 4 / 2.5			Tripping: /		Wear Bushing Installed			

Rig Information									
Equipment Problems:									
Location Condition:									
Transport:									

Solids Control Information									
Screen Sizes:	Top	Middle 1	Middle 2	Bottom					
Shaker No 1:	120	120	120	120					
Shaker No 2:	120	120	120	120					
Shaker No 3:	170	170	170	170					

Drill Pipe Inventory									
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information									
Meetings/Drills	Time	Description							
Safety	30	Two Pre-tour safety meetings held daily with crews.							
First Aid Treatments: 0		Medical Treatments: 0		Lost Time Incidents: 0		Days Since LTI: 23			
BOP Test		Dynamic Check							

Weather Information									
Sky Condition: Clear					Visibility: 9				
Air Temperature: 56 degF					Bar. Pressure: 1012				
Wind Speed/Dir: 7 / ENE					Wind Gusts:				





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 24 Report For 06:00 AM 10-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	4878	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	4877	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	7 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 1.8 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.8 / 0 DOL: 24

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 10 / 120 Other: 3 / 36 Total: 30 / 360

Safety Summary: No incidents or events reported. 24 days since LTI. Conducted Safety Meeting.

Current Operations: Mixing mud for Particle Drilling.

Planned Operations: Finish mixing mud. Trip in hole to 4,855'. Open 8-3/4" to 9-1/2" hole f/4,855' t/4,878'. Drill 9-1/2" hole with particle drilling.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	4,871	CORE	Lay down coring BHA 1, break off bit.	
8:30	11:00	2.50	4,871	CORE	Cut 16.5' of core and recovered 15.1'. Cut up core. Discussed coring BHA 2.	
11:00	12:30	1.50	4,871	CORE	Pick up coring BHA 2. Make up bit.	
12:30	15:30	3.00	4,871	TRPI	TIH with coring BHA 2.	
15:30	18:00	2.50	4,878	CORE	Drop ball, pump to seat. Core f/4,871' t/4,878'. ROP dropped to less than 1 ft/hr. No increase in pump pressure or torque. Pick up 1 ft and attempt to restart coring.	
18:00	21:00	3.00	4,878	TRPO	Trip out of the hole f/4,878' t/ BHA.	
21:00	23:00	2.00	4,878	CORE	Laid down bit and coring assembly. Cut 7' of core and recovered 5' good core and 2' of rubble.	
23:00	1:00	2.00	4,878	DRILPA	Stage Particle drilling BHA. Rig up high pressure lines from Particle drilling unit to mud pumps. Mix mud. Turn on sensor at 23:50. Remove ditch magnets in possum belly, replace with magnets under the shaker screens.	
1:00	2:30	1.50	4,878	BHAOP	PJSM. Make up 9-1/2" Particle drilling BHA.	
2:30	4:30	2.00	4,878	TRPI	Trip in hole t/1,436'.	
4:30	5:00	0.50	4,878	TEST	Pressure test lines to Particle Drilling Unit to 2,400 psi.	
5:00	5:30	0.50	4,878	TRPI	Trip in the hole f/1,436' t/2,475'.	
5:30	6:00	0.50	4,878	CIRC	Circulate water out of hole. Mix mud.	

Management Summary

Laid down Run 1 coring assembly. Cut 16.5' of core and recovered 15.1'. Ran in hole with Run 2 coring assembly. Dropped ball, Cored f/4,871' t/4,878'. ROP dropped to less than 1 ft/hr. No increase in pump pressure or torque. Picked up 1 ft and attempted to restart coring. Tripped out of the hole. Laid down bit and coring assembly. Cut 7' of core and recovered 5' of good core and 2' of rubble. Made up and tripped in the hole with Particle Drilling bit and BHA t/1,436'. Pressure tested the lines to Particle Drilling Unit to 2,400 psi. Tripped in the hole f/1,436' t/2,475'. Circulated water out of the hole and mixed mud.

Comments

Fuel on hand 16,167 gals.
Fuel used 926 gals.
Total NPT to date 48.5 HR No
H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss



09-May-23 15:00 at Depth 4,871 ft Mud Pits, Type: Low Solids Non-Dispersed																			
8.45	30	2	1	100		10.8			100			1000							

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 24 **Report For 06:00 AM 10-May-23**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
DC-310/CI-100 - SACK	10	---	Engineering - OTHER	1	---
Poly Vis - 50#SK	3	---	TORKease - GALS	4	---

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
6	1	CANAMER	CCI-913	8.750	4855	0	0	0.0	0.0	0	0	0	0	0	0	116	102	24	203
Jets: 12 12 12 12 12 12 12 12 12 12					Out: 4871	Grade: Cutter: /		Dull: /		Wear:		Brgs:	Gge:		Pull:				
7	1	CANAMER	CCI-713	8.750	4871	7	2.5	2.8	10.0	10	35	4000	8	400	360	93	66	15	163
Jets: 16 16 16 16 16 16 16					Out: 4878	Grade: Cutter: /		Dull: /		Wear:		Brgs:	Gge:		Pull:				

Comments: New core bit for run #2.

8	1	NOV	Particle Drilli	9.500	4878	0	0	0.0	0.0	0	0	0	8	0	0				
Jets: 11 11 12 12					Out:	Grade: Cutter: /		Dull: /		Wear:		Brgs:	Gge:		Pull:				

BHA - No. 8 - BIT, BS, RR, OTHER, RR, DC, RR, 12 DC, XO, 30 HWDP = 1348.68

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure	
from	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)	
4,871	4,878	4.0	10.0	10	18	35	40	4,000	4,500	400	400	360	
Annular Velocity: Drill Collars: 355.7				Drill Pipe: 204.5									

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 6.5	Total: 6.5	Jars:	
Hours on Casing/Liner:	Rotating: 6.5 / 0	Tripping: /	Wear Bushing Installed	

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	120	120	120	120
Shaker No 2:	120	120	120	120
Shaker No 3:	170	170	170	170

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	45	Two Pre-tour safety meetings are held daily with crews. Pinch points, overhead loads, coring operations. PJSM for Particle Drilling BHA.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 24
<input type="checkbox"/> BOP Test		<input type="checkbox"/> Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 69 degF	Bar. Pressure: 1011
Wind Speed/Dir: 7 / E	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 25 Report For 06:00 AM 11-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):			---
Measured Depth (ft):	4910	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	4909	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	32 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):						Well Cost (\$):	---	---	

Days (actual / plan): Drilling 1.8 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.8 / 0 DOL: 25

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 12 / 144 Other: 5 / 60 Total: 34 / 408

Safety Summary: No incidents or events reported. 25 days since LTI. Conducted Safety Meeting.

Current Operations: Circulating hole clean for trip out to look at bit and possible wash out.

Planned Operations: Trip out of the hole. Change out bit. Trip in hole and particle drill ahead.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	4,878	CIRC	Displace top of hole at 2,486' with mud.	
8:00	9:00	1.00	4,878	TRPI	Trip in hole on elevators to 4,764'.	
9:00	9:30	0.50	4,878	CIRC	Displace bottom of hole at 4,774' with mud.	
9:30	10:30	1.00	4,878	REAM	Ream cored section of hole with particle drilling bit, from 4,855' to 4,878'.	
10:30	10:40	0.17	4,878	SAFETY	PJSM with Particle Drilling Technologies, NOV, FORGE DSM, and Frontier Drilling personnel.	
10:40	11:00	0.33	4,878	SERV	Service top drive and check out electrical issue.	
11:00	11:15	0.25	4,878	DRILPA	Pump shot down to begin particle drilling. Top drive rotary stopped.	
11:15	22:30	11.25	4,878	REPR	Work on top drive. Pull back into casing and continue to work on top drive. Remove blower motor on top drive. Waited on new blower motor.	X
22:30	2:30	4.00	4,878	REPR	Blower motor arrive at 22:30. Install blower motor.	X
2:30	2:45	0.25	4,878	SAFETY	PJSM with Particle Drilling Technologies, NOV, FORGE DSM, and Frontier Drilling night personnel.	
2:45	3:30	0.75	4,878	TRPI	Trip in the hole from 4,773' to 4,878'.	
3:30	5:30	2.00	4,910	DRILPA	Particle drill 9-1/2" hole from 4,878' to 4,910'. Increase WOB in steps from 15k to 30 k. Increase RPM from 80 to 100. Only slight changes in ROP. 30 to 40 ROP. ROP started to slow at around 4900' to 5 ft/hr.	
5:30	6:00	0.50	4,910	CIRC	Circulate hole clean.	

Management Summary

Displaced top of hole at 2,486' with mud. Tripped in hole to 4,764'. Displaced bottom of hole with mud. Reamed cored section of hole with particle drilling bit from 4,855' to 4,878'. Trouble shoot top drive blower motor. Pulled up to the shoe. Waited on new blower motor. Installed same. Tripped back to bottom. Particle drilled 9-1/2" hole from 4,878' to 4,910'. Increased WOB in steps from 15k to 30 k. Increased RPM from 80 to 100 with 30-40 ROP. ROP started to slow to 5 ft/hr and some pump pressure loss. Circulated hole clean for trip out.

Comments

Fuel on hand 14,783 gals.
 Fuel used 1,384 gals.
 Total NPT to date 63.75 HR
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%										Gels			Temp		Mud					
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss



10-May-23 12:00 at Depth 4,878 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.60	52	12	17	11	1	10.8			100	0.1		1300			8	24	38		127	

	Daily Drilling Report										University of Utah									
	Well ID: FORGE 16B(78)-32										Well Name: FORGE 16B(78)-32									
	Field: FORGE										Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT									

Report No: 25 **Report For 06:00 AM 11-May-23**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	200	---	Bicarb - 50#SK	5	---
Caustic Soda - 50#SK	1	---	DC-310/CI-100 - SACK	10	---
Defoam 14 - GALS	1	---	Desco - 25#SK	3	---
Engineering - OTHER	1	---	MDC -	1	---
Pallets/Wraps - OTHER	4	---	TORKease - GALS	5	---
Trucking -	1	---	Xanthan Gum - 50#SK	8	---

Bit/BHA/Workstring Information

Depth										This Run				R.O.P.				Mud Pump			
No Run	Make	Model	Diam	in	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF			
8	1	NOV	Particle Drilli	9.500	4878	32	2	16.0	40.0	30	80	9000	9	650	3000	513	2025	768	1484		

Jets: 11 11 12 12 Out: Grade: Cutter: / Dull / Wear: Brgs: Gge: Pull:

BHA - No. 8 - BIT, BS, RR, OTHER, RR, DC, RR, 12 DC, XO, 30 HWDP = 1348.68

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
from	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
4,878	4,910	30.0	40.0	30	40	80	100	9,000	13,000	650	650	3,000	

Annular Velocity: Drill Collars: 356.5 Drill Pipe: 265.5

Comments: Particle drilling.

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	8.5	Total:	8.5	Jars:
Hours on Casing/Liner:	Rotating:	8.5 / 0	Tripping:	/	Wear Bushing Installed

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	120	120	120	120
Shaker No 2:	120	120	120	120
Shaker No 3:	170	170	170	170

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews. Last day of shift, particle drilling.

First Aid Treatments: Medical Treatments: Lost Time Incidents: Days Since LTI: 25

BOP Test Crownamatic Check

Weather Information

Sky Condition: Overcast	Visibility: 10
Air Temperature: 75 degF	Bar. Pressure: 1011
Wind Speed/Dir: 8 / NW	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 26 Report For 06:00 AM 12-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	4978	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	4977	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	68 / 0.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 1.8 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.8 / 0 DOL: 26

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 12 / 144 Other: 5 / 60 Total: 34 / 408

Safety Summary: No incidents or events reported. 26 days since LTI. Conducted Safety Meeting.

Current Operations: Picking up wash tool to clean Particle Drilling shot from BOPE.

Planned Operations: Rig down Particle Drilling equipment. Clean mud pits. Trip in hole with 9-1/2" HALO assembly and drill ahead.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	4,910	CIRC	Circulate to remove Particle Drilling shot from hole.	
7:00	9:30	2.50	4,910	TRPO	Trip out of hole from 4,910' to BHA.	
9:30	11:00	1.50	4,910	TRPO	Lay down top reamer and pull up to bit. Break off NOV Black Box and bit.	
11:00	15:00	4.00	4,910	TRPI	Pick up new NOV Black Box and bit. Trip in hole to 4,808'. Fill pipe.	
15:00	16:30	1.50	4,910	CUTDL	Slip and cut 100' of drill line.	
16:30	17:00	0.50	4,910	SERV	Service rig.	
17:00	17:30	0.50	4,910	TRPI	Trip in hole from, 4,808' to 4,900'.	
17:30	18:15	0.75	4,910	CIRC	Pump sweep and clean hole.	
18:15	18:30	0.25	4,910	REAM	Safety ream from 4,900' to 4,910'.	
18:30	22:00	3.50	4,978	DRILPA	Particle drill 9-1/2" hole from 4,910' to 4,978'. ROP slowing down. Loss of pump pressure.	
22:00	1:30	3.50	4,978	CIRC	Pump 4 each, 80 bbl high viscosity sweeps and clean hole.	
1:30	4:30	3.00	4,978	TRPO	Trip out of the hole from 4,978' to BHA.	
4:30	6:00	1.50	4,978	BHAOP	Lay down roller reamers, NOV Black Box, bit sub and bit.	

Management Summary

Circulated and removed Particle Drilling shot from hole. Tripped out of the hole. Changed out bit and NOV Black Box. Tripped in hole to 4,900'. Safety reamed from 4,900' to 4,910'. Particle drilled 9-1/2" hole from 4,910' to 4,978'. ROP slowed and loss of pump pressure. Pumped high viscosity sweeps and cleaned shot from hole. Tripped out of the hole from 4,978' to BHA. Laid down roller reamers, Nov Black Box, bit sub and bit.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section (ft)	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER

Mud Information

% Gels Temp Mud

Dens. Vis PV YP Filt. Cake pH/ES Solids Oil Water Sand LGS Cl Ca CaCl 10s 10m 30m In Out Loss

11-May-23 09:00 at Depth 4,910 ft Mud Pits, Type: Low Solids Non-Dispersed

8.60	48	13	17	11	1	10.6	1.2		98.8		1600			5	23		110	120	0
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Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Defoam 14 - GALS	1	---	Engineering - OTHER	1	---
Trucking -	1	---	Xanthan Gum - 50#SK	2	---





Report No: 26 **Report For 06:00 AM 12-May-23**

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump								
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
8	1 NOV	Particle Drill	9.500	4878	0	0	0.0	0.0	0	0		9	0	513	2025	768	1484	
Jets: 11 11 12 12					Out: 4910		Grade: Cutter: / Dull /				Wear:		Brgs:		Gge:		Pull:	
Comments: Nose of bit gone. 1 nozzle gone. Bottom cutters gone.																		
9	1 NOV	Particle	9.500	4910	68	3	22.7	44.0	20	80	6000	9600	2500	474	1705	597	1250	
Jets: 11 11 12 12					Out: 4978		Grade: Cutter: / Dull /				Wear:		Brgs:		Gge:		Pull:	
Comments: Nose was gone. Cutters OK.																		
BHA - No. 9 - BIT, BS, RR, OTHER, RR, DC, RR, 12 DC, XO, 30 HWDP = 1348.68																		

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
4,910	4,978	22.0	44.0	20,000	25,000	80	100	4,500	12,000	600	650	2,500
Annular Velocity: Drill Collars:				329.1		Drill Pipe:				245.1		
Comments: Particle Drilling												

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	12	Total:	12	Jars:
Hours on Casing/Liner:	Rotating:	12 / 0	Tripping:	/	Wear Bushing Installed

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	120	120	120	120	
Shaker No 2:	120	120	120	120	Centrifuge 1: 1 (Solids Removal)
Shaker No 3:	170	170	170	170	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	45	Two Pre-tour safety meetings held daily with crews. Particle drilling. New rig crews.
First Aid Treatments:		Medical Treatments:
Lost Time Incidents:		Days Since LTI: 26
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Partly sunny.	Visibility: 10
Air Temperature: 67 degF	Bar. Pressure:
Wind Speed/Dir: 8 / NW	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 27 Report For 06:00 AM 13-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	4980	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	4979	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	2 / 1.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):	2.0					Well Cost (\$):	---

Days (actual / plan): Drilling 1.84 / 0, Flat 0 / 0, Complete 0 / 0, Total 1.84 / 0 DOL: 27

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 144 Service: 10 / 120 Other: 5 / 60 Total: 32 / 360

Safety Summary: No incidents or events reported. 27 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping in the hole with 9-1/2" directional tools at 4,076'.

Planned Operations: Finish tripping to bottom. Drill ahead with 9 1/2" HALO assembly.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	4,978	BHAOP	Lay down Particle Drilling BHA.	
7:00	11:00	4.00	4,978	WASH	Rig up wash down tool for BOPE. Hold PJSM with Frontier crew and Particle Drilling. Wash out BOP stack and flow line.	
11:00	15:30	4.50	4,978	DRILPA	Rig down Particle Drilling equipment including hoses, mud lines and hoppers. Reconnect rig mud line. Drain and clean mud pits. Repair flow line sensor.	
15:30	16:30	1.00	4,978	BHAOP	Make up clean out BHA consisting of tri-cone bit, bit sub, 4 stands of drill collars.	
16:30	18:00	1.50	4,978	TRPI	Trip in hole with clean out assembly to 3,712'.	
18:00	18:30	0.50	4,978	REPR	Change out grabber dies on top drive.	X
18:30	20:00	1.50	4,978	TRPI	Trip in the hole from 3,712' to 4,968'. Fill pipe.	
20:00	20:30	0.50	4,978	OTHER	Mix high visc LCM sweep for cleaning hole.	
20:30	21:00	0.50	4,978	CIRC	Pump 80 bbl sweep.	
21:00	22:00	1.00	4,980	DRILR	Ream 9-1/2" hole from 4,968' to 4,978'. Drilled to 4,980' and displaced hole clean.	
22:00	0:30	2.50	4,980	TRPO	Trip out of the hole from 4,980' to 372'. Laid down 12 each 6-3/4" collars. Laid down bit and bit sub.	
0:30	4:30	4.00	4,980	BHAOP	Stage in hole with 9-1/2" bit with Sanvean sensor #5105 and Halo directional assembly to 1,354'. Test same at 114'. OK. Corrosion ring in top of HWDP.	
4:30	6:00	1.50	4,980	TRPI	Trip in the hole from 1,354' to 4,076'. Fill pipe. Test tools.	

Management Summary

Laid down Particle Drilling BHA. Washed out BOP stack and flow line. Rigged down Particle Drilling equipment. Reconnected rig mud line. Drained and cleaned mud pits. Tripped in hole with 9-1/2" clean out assembly to 4,968'. Safety reamed to 4,978'. Drilled new hole to 4,980'. Cleaned hole. Tripped out of the hole. Laid down 12 drill collars, bit sub and bit. Tripped in hole with 9-1/2" bit and HALO directional assembly to 4,076'. Fill pipe. Test tools.

Comments

Fuel on hand 12,235 gals.
Fuel used 1,226 gals.
Total NPT to date 63.75 HR
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss

12-May-23 15:00 at Depth 4,978 ft Mud Pits, Type: Low Solids Non-Dispersed



Sky Condition: Overcast	Visibility: 8	
Air Temperature: 54 degF	Bar. Pressure: 1021	
Wind Speed/Dir: 8 / NNE	Wind Gusts:	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 28 Report For 06:00 AM 14-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---	
Measured Depth (ft):	5537	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft):	5536	Next Casing:		RKB Elevation (ft):	31	---	---	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---
Hole Made (ft) / Hrs:	557 / 8.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---
Average ROP (ft/hr):	69.63					Well Cost (\$):	---	---

Days (actual / plan): Drilling 2.18 / 0, Flat 0 / 0, Complete 0 / 0, Total 2.18 / 0 DOL: 28

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 4 / 48 Total: 27 / 324

Safety Summary: No incidents or events reported. 28 days since LTI. Conducted BOP Drill, Safety Meeting.

Current Operations: Waiting on welder to weld crack in rotating head riser.

Planned Operations: Drill ahead building curve with 9 1/2" HALO assembly.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	4,980	TRPI	Trip in hole from 4,076' to 4,970'. Install rotating head.	
7:00	7:30	0.50	4,980	DIR	Test directional tools and pump up survey.	
7:30	11:30	4.00	5,269	DRILR	Drill 9 1/2" hole from 4,980' to 5,269', varying WOB 20K - 55K, Rotary 30 rpm - 150 rpm, Flow 550gpm - 700gpm. Directional tools flatlined. Try to restart.	
11:30	12:00	0.50	5,269	CIRC	Circulate bottoms up.	
12:00	15:00	3.00	5,269	TRPO	Trip out of hole from 5,269' to 188'.	
15:00	18:00	3.00	5,269	BHAOP	Rack back collars. Lay down motor, Black Box, Ripstick, and roller reamer. Pull up to bit and break off. Lay down HALO RSS.	
18:00	19:30	1.50	5,269	BHAOP	Stage in hole with 9-1/2" bit with Sanvean sensor #5104 and Halo directional BHA to 1,296' (No Ripstick or motor). Test same at 309'. OK. Corrosion ring in top of HWDP.	
19:30	22:00	2.50	5,269	TRPI	Trip in hole from 1,296' to 5,269'.	
22:00	22:30	0.50	5,269	OTHER	Down link RSS.	
22:30	1:00	2.50	5,480	DRILR	Drill 9-1/2" hole from 5,269' to 5,480' with Halo directional assembly with no mud motor. Step test: WOB from 50K to 65K. RPM from 80 to 125. Maintain drilling at RPM 85 and WOB 65K.	
1:00	2:30	1.50	5,537	DRIL	Start building curve. Drill from 5,480' to 5,537. Started curve approx 100 ft early to try to help with downhole vibrations. ROP slowing down.	
2:30	2:45	0.25	5,537	REPR	Pick up to 5,383'.	X
2:45	6:00	3.25	5,537	REPR	Wait on welder to weld riser. Old weld on riser broke. Riser almost broke in half.	X

Management Summary

Tripped in hole from 4,076' to 4,970'. Tested directional tools and pumped up survey. Drilled 9 1/2" hole from 4,980' to 5,269'. Directional tools flatlined. Tried to restart. Tripped out of the hole. Changed out RSS, stabilizer, and roller reamer. Did not pick up mud motor and Ripstick. Tripped in the hole. Drilled 9-1/2" hole from 5,269' to 5,480' with Halo directional assembly. Started building the curve at 5,480'. Drilled to 5,537'. Riser on BOP stack broke. Waiting on welder.

Comments

Fuel on hand 18,156 gals.
Fuel used 1,472 gals.
Total NPT to date 63.75 HR
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information



%															Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
13-May-23 11:00 at Depth 5,246 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					8.8	0.5		99.5			800								

	Daily Drilling Report										University of Utah									
	Well ID: FORGE 16B(78)-32										Well Name: FORGE 16B(78)-32									
	Field: FORGE										Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT									

Report No: 28 **Report For 06:00 AM 14-May-23**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
AltaVert 102 - GALS	2	---	Caustic Soda - 50#SK	1	---
DC-310/CI-100 - SACK	10	---	Engineering - OTHER	1	---
Lime - 50#SK	3	---	MDC -	3	---
Poly Vis - GALS	1	---	PrimeSeal/MaxiSea1117 - 50#SK	10	---
TORKease - GALS	2	---	Xanthan Gum - 50#SK	4	---

Bit/BHA/Workstring Information

Depth										This Run				R.O.P.				Mud Pump			
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF			
10	1 NOV	TKC73 A1	9.500	4980	290	4	72.5	220.0	55	120	9000	8	650	2450	173	224	85	488			
Jets: 15 15 15 15 15 15 15					Out: 5269		Grade: Cutter: /		Dull: /		Wear:		Brgs:		Gge:		Pull:				
Comments: Some chip cutters.																					
11	1 NOV	TKC73 A1	9.500	5269	268	4	67.0	135.0	65	85	12000	8	600	1150	159	191	67	416			
Jets: 15 15 15 15 15 15 15					Out:		Grade: Cutter: /		Dull: /		Wear:		Brgs:		Gge:		Pull:				
Comments: New PDC bit.																					

BHA -No. 12 - BIT, OTHER, STAB, PC, DCM, RR, 3 OTHER, 9 DC, XO, 30 HWDP = 1296.36

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
4,980	5,269	150.0	220.0	50	55	55	150	9,000	12,300	650	700	2,437	
Annular Velocity: Drill Collars:				363.5		Drill Pipe:				265.5			
Comments: Lost down hole tool signal. With mud motor.													
5,269	5,480	100.0	185.0	65	65	85	125	15,000	17,000	600	600	1,150	
Annular Velocity: Drill Collars:				335.5		Drill Pipe:				245.1			
Comments: Without mud motor.													
5,480	5,537	60.0	88.0	65	65	85	85	12,000	14,000	600	600	1,180	
Annular Velocity: Drill Collars:				335.5		Drill Pipe:				245.1			
Comments: Started the curve.													

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 200,000	Pick Up: 240,000	Slack Off: 190,000	Drag Avg/Max: /
Slow Circulation Data:				
Pump 1:	30 spm	80 psi	30 spm	75 psi
Pump 2:	60 spm	200 psi	60 spm	205 psi
Hours on BHA:	Since Inspection: 2	Total: 21	Jars:	
Hours on Casing/Liner:	Rotating: 21 / 0	Tripping: 52.25 /	Wear Bushing Installed	

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	170	170	170	172	
Shaker No 2:	170	170	170	170	Centrifuge 1: 24 (Solids Removal) Centrifuge 2: 24 (Solids Removal)



Shaker No 3:					170	170	170	170	
Drill Pipe Inventory									
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 28 **Report For 06:00 AM 14-May-23**

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
BOP	3	BOP drill with Day crew.
First Aid Treatments:		Medical Treatments:
Lost Time Incidents:		Days Since LTI: 28
BOP Test	Crownamatic Check	

Weather Information

Sky Condition: Partly cloudy	Visibility: 7
Air Temperature: 51 degF	Bar. Pressure: 1029
Wind Speed/Dir: 20 / NE	Wind Gusts:



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 29 **Report For 06:00 AM 15-May-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 5957	Last Casing: 11.750 at 4,837	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 5945	Next Casing:	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft):	Last BOP Test: 29-Apr-23	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 420 / 10.5	Next BOP Test: 20-May-23	Working Interest:	Totals: ---		
Average ROP (ft/hr): 40.0			Well Cost (\$): ---		

Days (actual / plan): Drilling 2.61 / 0, Flat 0 / 0, Complete 0 / 0, Total 2.61 / 0 **DOL:** 29

Pers/Hrs: **Operator:** 3 / 36 **Contractor:** 14 / 168 **Service:** 6 / 72 **Other:** 6 / 72 **Total:** 29 / 348

Safety Summary: No incidents or events reported. 29 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping out of the hole at 3,920'.

Planned Operations: Continue tripping out of the hole to BHA. Change out BHA and bit. Trip in the hole and drill curve to 65°.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	16:00	10.00	5,537	WELD	Wait on welder. Cut off flow nipple and dress. Weld flow nipple back on stack.	X
16:00	16:30	0.50	5,537	OTHER	Install and tighten turnbuckles on flow nipple. Pick up and install mouse hole. Prepare to trip in hole.	X
16:30	17:00	0.50	5,537	TRPI	Trip in hole from 4,753' to 5,350'.	X
17:00	17:30	0.50	5,537	WOW	High wind and rain. Tie service loop in derrick.	
17:30	18:00	0.50	5,537	TRPI	Trip in hole from 5,350' to 5,537'. Break circulation. Sync tool.	X
18:00	1:00	7.00	5,831	DRIL	Drill 9-1/2" hole from 5,537' to 5,831' with Halo directional assembly with no mud motor or Ripstick. Step test: WOB from 65K to 40K. RPM from 70 to 97. Maintain drilling at WOB 65K and RPM 75 to 5,831'.	
1:00	4:30	3.50	5,957	DRIL	Drill 9-1/2" hole from 5,831' to 5,957' with Halo directional assembly with lower RPM from 70 to 62 due to signal loss.	
4:30	5:15	0.75	5,957	CIRC	Circulate hole clean for trip out due to signal loss, high MSE and low ROP.	
5:15	6:00	0.75	5,957	TRPO	Trip out of the hole from 5,956' to 3,920'.	

Management Summary

Repaired flow nipple on BOP stack. Tripped in hole from 4,753' to 5,537'. Sync tool. Drilled 9-1/2" hole from 5,537' to 5,831' with Halo directional assembly. Step test: WOB from 65K to 40K. RPM from 70 to 97. Maintained drilling at WOB 65K and RPM 75 to 5831'. Started receiving Halo communication errors. Slowed RPM from 75 to 62. Drilled to 5,957'. Communications errors worsened. High MSE and low ROP. Circulated hole clean. Tripped out of the hole to 3,920'.

Comments

Received word at 04:00, back up Halo will be here at 05:00.
 Fuel on hand 17,015 gals.
 Fuel used 1,277 gals.
 Total NPT to date 63.75 HR
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
14-May-23 13:00 at Depth 5,537 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.35	27					9	0.1		99.9			600								

Mud Consumables



Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	Engineering - OTHER	2	---
MDC -	3	---	Soda Ash - 50#SK	1	---

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 29 Report For 06:00 AM 15-May-23

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	In	This Run			R.O.P.			Mud		Pump		J. Vel	P. Drp	HHP	JIF
						Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press				
11	1	NOV	TKC73A1	9.500	5269	688	14.5	47.4	140.0	65000	75	15000	8	600	1170	159	191	67	416

Jets: 15 15 15 15 15 15 15 Out: 5956 Grade: Cutter: / Dull: / Wear: Brgs: Gge: Pull:

Comments: New PDC bit.

BHA - No. 12 - BIT, OTHER, STAB, PC, DCM, RR, 3 OTHER, 9 DC, XO, 30 HWDP = 1296.36

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
5,537	5,957	48.0	140.0	65,000	65,000	75	75	15,000	16,400	600	6,020	1,150

Annular Velocity: Drill Collars: 335.5 Drill Pipe: 245.1

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 31.5	Total: 31.5	Jars:		
Hours on Casing/Liner:	Rotating: 31.5 / 0	Tripping: 54.25 /	Wear Bushing Installed		

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	170	170	170	172	
Shaker No 2:	170	170	170	170	Centrifuge 1: 24 Centrifuge 2: 24
Shaker No 3:	170	170	170	170	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 29
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Rain	Visibility: 10
Air Temperature: 73 degF	Bar. Pressure: 1032
Wind Speed/Dir: 9 / ENE	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 30 Report For 06:00 AM 16-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	6423	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	6361	Next Casing:		RKB Elevation (ft):	31				
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	466 / 11.0	Next BOP Test:	20-May-23	Working Interest:		Totals:			
Average ROP (ft/hr):	42.36					Well Cost (\$):			

Days (actual / plan): Drilling 3.07 / 0, Flat 0 / 0, Complete 0 / 0, Total 3.07 / 0 DOL: 30

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 3 / 36 Total: 26 / 312

Safety Summary: No incidents or events reported. 30 days since LTI. Conducted BOP Drill, Safety Meeting.

Current Operations: Drilling 9-1/2" hole at 6,424'.

Planned Operations: Continue drilling ahead building curve to 65*.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	5,957	TRPO	Trip out of hole from 5,957' to 106'.	
8:30	11:00	2.50	5,957	BHAOP	Lay down Black box, roller reamer and RSS tool. Break off bit.	
11:00	12:00	1.00	5,957	SERV	Service rig and top drive.	
12:00	14:00	2.00	5,957	BHAOP	Lay down 9.22'x6 3/4" non-mag pony collar. Pick up RSS tool, make up bit and new Black box and trip in hole making up BHA. Pick up rebuilt roller reamer. Trip in hole with drill collars.	
14:00	15:30	1.50	5,957	TRPI	Trip in hole with drill pipe on elevators to 3,756'.	
15:30	17:30	2.00	5,957	REPR	Work on Pason Depth tracking.	X
17:30	19:00	1.50	5,957	TRPI	Trip in hole from 3,756' to 5,957'.	
19:00	6:00	11.00	6,423	DRIL	Drill 9-1/2" hole from 5,957' to 6,423' with Halo directional assembly with no mud motor or Ripstick. Step test: WOB from 50K to 60K. RPM from 60 to 80. Maintain drilling at WOB 60K and RPM 60. Last survey @ 6,462'MD, 6,379' TVD, 40.3 Inc, 117.09 Azi, 4.03 DLS.	

Management Summary

Tripped out of hole from 5,957' to 106'. Laid down Black box, roller reamer, non mag- pony collar and RSS tool. Broke off bit. Picked up new RSS tool, bit, Black box, and re-built roller reamer. Left pony collar out. Tripped in the hole to 5957'. Drilled 9-1/2" hole from 5,957' to 6,423' with Halo directional assembly.

Comments

Surveys getting magnetic interference.

Fuel on hand 16,332 gals.
 Fuel used 1,383 gals.
 Total NPT to date 80.75 HR
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
15-May-23 13:30 at Depth 5,957 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.35	27				0.1	8.9	0.1		99.9			900								
16-May-23 01:00 at Depth 5,832 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.35	27	2			0.1	9.4	0.1		99.9			800								





Report No: 30 Report For 06:00 AM 16-May-23

Mud Consumables					
Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	Engineering - OTHER	2	---
TORKease - GALS	2	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
11	1 NOV	TKC73A1	9.500	5269	688	14.5	47.4	47.4	0	0	0	0	0	0	0	0	0	0	
Jets: 15 15 15 15 15 15 15					Out: 5957	Grade: Cutter: / Dull /			Wear:	Brgs:	Gge:	Pull:							
Comments: New PDC bit.																			
12	1 NOV	TKC73A1	9.500	5957	466	11	42.4	200.0	60000	60	15100	600	120	159	190	6	413		
Jets: 15 15 15 15 15 15 15					Out:	Grade: Cutter: / Dull /			Wear:	Brgs:	Gge:	Pull:							
BHA - No. 13 - BIT, OTHER, STAB, DCM, RR, 3 OTHER, 9 DC, XO, 30 HWDP = 1286.80																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
5,957	6,423	55.0	200.0	60,000	60,000	60	85	14,800	17,300	60	600	1,200
Annular Velocity: Drill Collars:				335.5		Drill Pipe:		245.1				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 230,000	Pick Up: 280,000	Slack Off: 210,000	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 42.5	Total: 42.5	Jars:	
Hours on Casing/Liner:	Rotating: 42.5 / 0	Tripping: 60.25 /	Wear Bushing Installed	

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	170	170	170	172	
Shaker No 2:	170	170	170	170	Centrifuge 1: 24 (Solids Removal) Centrifuge 2: 24 (Solids Removal)
Shaker No 3:	170	170	170	170	

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
BOP	3	Function tested blind and pipe rams.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 30
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Partly Cloudy	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 1021
Wind Speed/Dir: 7 / S	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 31 Report For 06:00 AM 17-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	6548	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	6430	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	125 / 3.0	Next BOP Test:	20-May-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	41.67					Well Cost (\$):	---		

Days (actual / plan): Drilling 3.2 / 0, Flat 0 / 0, Complete 0 / 0, Total 3.2 / 0 DOL: 31

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 5 / 60 Other: 3 / 36 Total: 25 / 300

Safety Summary: No incidents or events reported. 31 days since LTI. Conducted Safety Meeting.

Current Operations: Running Gyro on wireline.

Planned Operations: Continue drilling ahead building curve to 65*.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:00	3.00	6,545	DRIL	Drill 9 1/2" curve from 6,423' to 6,545' with RSS. 60K WOB, 60 rpm ROT, 600 gpm. ROP dropped to 36 fph and MSE was steadily climbing. Last survey at 6462' MD, 6379' TVD, 40.3° INC, 117.09° AZI, 4.03° DLS.	
9:00	12:30	3.50	6,545	CIRC	Circulate hole to clean out steel shavings and particle drilling beads. Pump a cedar fiber sweep to clean hole. Discuss options for hole cleaning procedures.	
12:30	13:30	1.00	6,545	TRPO	Trip out of the hole from 6,545' to 4,850' for slowed ROP and rising MSE.	
13:30	16:00	2.50	6,545	CIRC	Pump 2X 20 bbl sweeps, 6 minutes apart at the bottom of the intermediate rathole. Circulate to clear bit. Pull up to 4,845' and pump 2X 20 bbl sweeps 6 minutes apart. Circulate sweeps out of hole. Shavings from sweep 1 were light, sweep 2 medium, sweep 3 heaviest, and sweep 4 lighter.	
16:00	18:30	2.50	6,545	TRPO	Trip out of hole from 4,845' to 92'.	
18:30	21:30	3.00	6,545	BHAOP	Laid down NMDC, Black Box, roller reamer and bit. Download RSS. Made up new 9-1/2" bit with sensor #2232, 2 ea non-mag pony collars, rebuilt roller reamer, NMDC, Black new Box, filter sub and float sub. Test RSS. .	
21:30	23:00	1.50	6,545	WOE	Waited on non-mag stabilizer. Mix mud sweep in pill pit. Put 2 each Scientific ditch magnets in troughs between shakers.	X
23:00	23:30	0.50	6,545	BHAOP	Install non-mag stabilizer.	
23:30	1:30	2.00	6,545	TRPI	Trip in the hole from 111' to 2247'. Fill pipe. Corrosion ring on top of HWDP. Trip in hole to 4,850'. Tool Temp=143*	
1:30	3:00	1.50	6,545	CIRC	Pump 2X40 bbl high-visc cedar fiber sweeps to clean intermediate rathole. Work pipe from 4,850' to 4,840' while pumping and displacing. Less than a cup full of magnetic fines on first circ with 3 to 4 beads on each magnet. Tablespoon full on each magnet on 2nd sweep. No beads.	
3:00	4:00	1.00	6,545	TRPI	Trip in the hole from 4,850' to 5,697'. Tool Temp= 165*. Circulate and cool hole. Trip in to 6,536'. Tool Temp= 205*.	
4:00	4:45	0.75	6,545	CIRC	Circulate and cool hole for Gyro. PJSM.	
4:45	6:00	1.25	6,545	LOG	Rigged up and ran Gyro down drill pipe to 4,600'.	

Management Summary

Drilled 9 1/2" curve from 6,423' to 6,545' with RSS. ROP dropped to 36 fph and MSE was steadily climbing. Circulated hole clean. Some steel shavings and particle drilling beads back. Tripped out of the hole from 6,545' to 4,850'. Pumped four 20 bbl sweeps at the bottom of the intermediate rathole. Tripped out of hole. Changed out bit, roller reamer, Black Box, non-mag spiral stabilizer. Picked up two non-mag pony collars to shorten distance between stabilizer and roller reamer. Test RSS. Tripped in the hole to 4,850'. Pumped two 40 bbl sweeps to clean intermediate rathole. Staged in hole to 6,536'. Tool temperature - 205*. Circulated and cooled hole for gyro survey. Rigged up and ran Gyro to 4,600'.

Comments



Fuel on hand 14,560 gals.
 Fuel used 1,187 gals.
 Total NPT to date 80.75 HR
 No H2S today.



Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 31

Report For 06:00 AM 17-May-23

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
17-May-23 01:00 at Depth 6,200 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.30	28					8.3	0.1		99.9			800								
16-May-23 13:00 at Depth 6,545 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.30	28					8.5	0.1		99.9			850								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	21	---	Caustic Soda - 50#SK	2	---
DC-310/CI-100 - SACK	20	---	Defoam 14 - GALS	1	---
PrimeSeal/MaxiSea1117 - 50#SK	10	---	Sawdust - 50#SK	14	---
Soda Ash - 50#SK	1	---	Walnut - 50#SK	10	---
Xanthan Gum - 50#SK	2	---			

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud Pump					
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
12	1NOV	TKC73A1	9.500	5957	591	14	42.2	65.0	60000	60	18000	8	600	1200	159	190	66	413	
Jets: 15 15 15 15		15 15 15		Out: 6545		Grade: Cutter: /		Dull: /		Wear: /		Brgs: /		Ge: /		Pull: /			
13	1NOV	TKC 83	9.500	6545	0	0	0.0	0.0	0	0	0	8	600	0	160	191	67	415	
Jets: 14 14 14 14		14 14 14 14		Out: /		Grade: Cutter: /		Dull: /		Wear: /		Brgs: /		Ge: /		Pull: /			

BHA - No. 14 - BIT, OTHER, STAB, 2 PC, RR, DCM, 3 OTHER, 9 DC, XO, 30 HWDP = 1306.42

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
6,423	6,545	45.0	71.0	60	60	60	60	22,000	16,000	600	600	1,200
Annular Velocity:		Drill Collars:		335.5		Drill Pipe:		245.1				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 240,000	Pick Up: 300,000	Slack Off: 210,000	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 45.5	Total: 45.5	Jars:	
Hours on Casing/Liner:	Rotating: 45.5 / 0	Tripping: 67.25 /	Wear Bushing Installed	

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
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Shaker No 1:	170	170	170	172					
Shaker No 2:	170	170	170	170	Centrifuge 1: 24	Centrifuge 2: 24			
Shaker No 3:	170	170	170	170					
Drill Pipe Inventory									
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.	S-135	5.5FH					

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
	Report No: 31	
	Report For 06:00 AM 17-May-23	

Safety Information			
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Meetings/Drills	Time	Description	
Safety	45	Two Pre-tour safety meetings held daily with crews. PJSM for Gyro.	
First Aid Treatments:	0	Medical Treatments:	0
Lost Time Incidents:	0	Days Since LTI:	31
BOP Test	Crownamatic Check		

Weather Information			
Sky Condition:	Mostly sunny	Visibility:	10
Air Temperature:	80 degF	Bar. Pressure:	1011
Wind Speed/Dir:	6 / S	Wind Gusts:	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 32 Report For 06:00 AM 18-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	6754	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	6602	Next Casing:		RKB Elevation (ft):	31				
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	206 / 1.0	Next BOP Test:	20-May-23	Working Interest:		Totals:			
Average ROP (ft/hr):	206.0					Well Cost (\$):			

Days (actual / plan): Drilling 3.24 / 0, Flat 0 / 0, Complete 0 / 0, Total 3.24 / 0 DOL: 32

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 5 / 60 Other: 3 / 36 Total: 25 / 300

Safety Summary: No incidents or events reported. 32 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Troubleshooting encoder on TDS.

Planned Operations: Repair encoder. Drill 9 1/2" curve from 6,754'.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	6,545	SURV	Wireline SDI gyro tool from surface to 6,148', hole angle 26°. Would not pass through x-over sub to drill collars.	
8:30	10:00	1.50	6,545	SURV	Pull gyro tool to surface and change configuration. Was decided to make a second run to attempt to reach TD.	
10:00	13:00	3.00	6,545	SURV	Make 2nd attempt to run wireline. Run gyro to 6,409', top of float sub. Pull tool and rig down SDI.	
13:00	14:00	1.00	6,610	DRIL	Drill 9 1/2" curve from 6,545' to 6,610' with RSS. 60K WOB, Step test rotary from 60 - 100 rpm ROT, 600 gpm. Last survey at 6,545' MD, 6,442' TVD, 45.24° INC, 119.7° AZI, 8.02° DLS.	
14:00	15:00	1.00	6,610	DIR	Pulsar quit on directional tools. Pump fresh water and work pipe attempting to restart.	
15:00	15:30	0.50	6,610	CIRC	Circulate bottoms up.	
15:30	18:00	2.50	6,610	TRPO	Trip out of hole for directional tools from 6,610' to BHA.	
18:00	20:30	2.50	6,610	BHAOP	Rack back Drill collars, laid down NMDC, Black Box, roller reamer and bit, laid out RSS. Pick up new RSS. Made up new 9-1/2" bit with sensor #2232. Pick up BHA. Shallow test RSS. Good test.	
20:30	22:30	2.00	6,610	TRPI	Trip in the hole from 913' to 6,610'. Fill pipe every 3,000'. Corrosion ring on top of HWDP.	
22:30	0:30	2.00	6,610	CIRC	Pump 80 bbl high vis sweep to remove any residual steel shot. Circulate surface to surface strokes.	
0:30	4:00	3.50	6,754	DIR	Drill 9 1/2" curve from 6,610' to 6,754' with RSS. 60K WOB, 600 gpm. Last survey at 6,729' MD, 6,552' TVD, 47.61° INC, 113.68° AZI, 1.76° DLS.	
4:00	6:00	2.00	6,754	CIRC	Pull to 6,725' troubleshoot encoder on TDS.	

Management Summary

Wireline SDI gyro tool from surface to 6,148', hole angle 26°. Tool would not pass-through x-over sub to drill collars. Pulled gyro tool to surface and change tool configuration. Ran gyro to 6,409', top of float sub. Pulled tool and rigged down SDI. Drilled 9 1/2" curve from 6,545' to 6,610' with RSS. Pulsar quit on directional tools. Pumped fresh water and work pipe attempting to restart. Circulated bottoms up. Tripped out of hole for directional tools from 6,610' to BHA. Laid out RSS, picked up new RSS and bit. Tripped in the hole to 6,610'. Pumped 80 bbl high vis sweep to remove any residual steel shot. Circulate surface to surface strokes. Drilled 9 1/2" curve from 6,610' to 6,754' with RSS. Pulled to 6,725' troubleshoot encoder on TDS.

Comments

Fuel on hand 9,464 gals.
 Fuel used 5,096 gals.
 Total NPT to date 80.75 HR
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	



FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER
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	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 32 Report For 06:00 AM 18-May-23

Mud Information

															Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
18-May-23 02:00 at Depth 6,545 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.30	27					8.5	0.2		99.8			800								
17-May-23 14:00 at Depth 6,559 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.30	28					8.8	0.2		99.8			850								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	12	---	Engineering - OTHER	2	---
Pallets/Wraps - OTHER	2	---	PrimeSeal/MaxiSea1117 - 50#SK	7	---
Sawdust - 50#SK	3	---	TORKease - GALS	4	---
Xanthan Gum - 50#SK	3	---			

Bit/BHA/Workstring Information

Depth		This Run		R.O.P.		Mud		Pump											
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
13	NOV	TKC 83	9.500	6545	65	1	65.0	65.0	50	60	23	8	600	115	160	190	67	413	
Jets: 14 14 14 14 14 14 14 14		Out: 6610		Grade: Cutter: 1 / 0		Dull ER / NO		Wear: N		Egs: X		Gge: 0		Pull: DTF					
Comments: Bit had a small area in the center that showed signs of washing out around one of the cutter pockets.																			
14	NOV	TKC 83	9.500	6610	144	3.5	41.1	85.0	55	50	23	8	600	120	160	190	67	413	
Jets: 14 14 14 14 14 14 14 14		Out:		Grade: Cutter: /		Dull /		Wear:		Egs:		Gge:		Pull:					
BHA - No. 15 - BIT, OTHER, STAB, 2 PC, RR, DCM, 3 OTHER, 9 DC, XO, 30 HWDP = 1306.42																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
6,545	6,610	85.0	128.0	60	60	60	100	20,000	24,000	600	600	1,150
Annular Velocity:		Drill Collars: 335.5		Drill Pipe: 245.1								
6,610	6,754	65.0	125.0	55	62	50	65	25,000	32,000	600	600	1,205
Annular Velocity:		Drill Collars: 335.5		Drill Pipe: 245.1								

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 240,000	Pick Up: 300,000	Slack Off: 210,000	Drag Avg/Max: 5 / 10
Hours on BHA:	Since Inspection: 50	Total: 50	Jars:	
Hours on Casing/Liner:	Rotating: 50 / 0	Tripping: 75.25 /	<input checked="" type="checkbox"/> Wear Bushing Installed	

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information


Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	170	170	170	172	
Shaker No 2:	170	170	170	170	Centrifuge 1: 8 (Solids Removal) Centrifuge 2: 8 (Solids Removal)
Shaker No 3:	170	170	170	170	

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					



Safety Information			
Meetings/Drills	Time	Description	
Safety	30	Two Pre-tour safety meetings held daily with crews.	
First Aid Treatments:	0	Medical Treatments:	0
Lost Time Incidents:	0	Days Since LTI:	32
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check	

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 32 Report For 06:00 AM 18-May-23

Weather Information			
Sky Condition:	Mostly clear	Visibility:	10
Air Temperature:	77 degF	Bar. Pressure:	1010
Wind Speed/Dir:	6 / NNW	Wind Gusts:	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 33 Report For 06:00 AM 19-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	6950	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	6680	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	196 / 6.0	Next BOP Test:	28-May-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):	32.67					Well Cost (\$):	---		

Days (actual / plan): Drilling 3.49 / 0, Flat 0 / 0, Complete 0 / 0, Total 3.49 / 0 DOL: 33

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 2 / 24 Total: 25 / 300

Safety Summary: No incidents or events reported. 33 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Handling BHA.

Planned Operations: lay out BHA, rig up SLB Wireline unit, log as per prog.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	6:15	0.25	6,754	REPR	Troubleshoot TDS electrical problems. Bad encoder. Clean and reinstall.	X
6:15	6:30	0.25	6,773	DRIL	Drill from 6,754' to 6,773' to test top drive. 60 rpm, 60K WOB, 600 gpm. System was fine until picking up for a survey. Attempted several times to get encoder to work.	
6:30	13:15	6.75	6,773	REPR	Wait for new encoder to arrive from Vernal, UT. Install same.	X
13:15	13:30	0.25	6,777	DRIL	Drill from 6,773' to 6,777'. 60 rpm, 60K WOB, 600 gpm testing new encoder. TDS still not communicating.	
13:30	18:00	4.50	6,777	REPR	Wait for electrician and additional parts to repair TDS.	X
18:00	18:30	0.50	6,777	REPR	Replace pigtail to encoder. Function test TDS.	X
18:30	0:00	5.50	6,950	DRIL	Drill 9 1/2" curve from 6,777' to 6,950' with RSS. 60-63K WOB, 600 gpm. EOB at 6,943' MD, 6,680' TVD, 65.9 INC, 103.47 AZI, 25' low, 1.65' right of plan.	
0:00	2:15	2.25	6,950	CIRC	Pump 70 bbl high vis sweep. Circulate sweep to surface, dump overboard, Circulate additional strokes while setting up gyro.	
2:15	2:45	0.50	6,950	OTHER	Drop gyro in drill string. Pump gyro down to top of float sub at 6,839'.	
2:45	5:30	2.75	6,950	TRPO	Trip out of the hole for logs from 6,950' to BHA.	
5:30	6:00	0.50	6,950	BHAOP	Rack back HWDP and Collars.	

Management Summary

Troubleshooted encoder issues on TDS. Drilled from 6,754' to 6,773' to test top drive. System still not functioning properly. Attempted several times to get encoder working with no success. Waited for new encoder to arrive from Vernal, UT. Install same. Drilled from 6,773' to 6,777' testing new encoder. TDS still not functioning properly. Replaced pigtail to encoder. Function tested TDS, system working properly. Drilled 9 1/2" curve from 6,777' to 6,950' with RSS. EOB at 6,943' MD, 6,680' TVD, 65.9 INC, 103.47 AZI, 25' low, 1.65' right of plan. Pumped 70 bbl high vis sweep. Circulated surface to surface strokes and condition hole for logs. Installed gyro in drill string, Pumped gyro down to top of float sub at 6,839'. Tripped out of the hole for logs from 6,950' to BHA.

Comments

Fuel on hand 18,672 gals.
 Fuel used 1,409 gals.
 Fuel delivered 7,352 gals.
 Total NPT to date 92.75 HR
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 33

Report For 06:00 AM 19-May-23

Mud Information

															Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
19-May-23 01:00 at Depth 6,685 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	28					10	1		99			800						80	93	
18-May-23 14:00 Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	28					9.5	1		99			800						80	93	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
DC-310/CI-100 - OTHER	10	---	Engineering - OTHER	2	---
Poly Vis - 50#SK	5	---	TORKease - GALS	3	---
TORKease L - GALS	3	---	Walnut - 50#SK	13	---
Xanthan Gum - 50#SK	5	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
14	NOV	TKC 83	9.500	6610	144	9.5	15.2	75.0	60	60	2	600	1205		16	190		6	413
Jets: 14 14 14 14 14 14 14 14				Out:		Grade:		Cutter: /		Dull: /		Wear:		gs:		Gge:		Pull:	
BHA - No. 15 - BIT, OTHER, STAB, 2 PC, RR, DCM, 3 OTHER, 9 DC, XO, 30 HWDP = 1306.42																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
6,754	6,950	55.0	75.0	60	60	60	60	15,000	27,000	60	600	1,220
Annular Velocity: Drill Collars:				335.5		Drill Pipe:				245.1		

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	240,000	Pick Up:	300,000	Slack Off:	210,000	Drag Avg/Max:	5 / 10
Hours on BHA:	Since Inspection:	56	Total:	56	Jars:			
Hours on Casing/Liner:	Rotating:	56 / 0	Tripping:	80.25 /	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems: Encoder on TDS, not functioning properly. Encoder was changed out along with pigtail. issues resolved.

Location Condition: Good.

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	170	170	Centrifuge 1: 6 (Solids Removal)		Centrifuge 2: 6 (Solids Removal)			
Shaker No 3:	170	170	170	170						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crews.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	33
<input type="checkbox"/> BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check					

Weather Information

Sky Condition:	Mostly clear	Visibility:	10
Air Temperature:	77 degF	Bar. Pressure:	1009
Wind Speed/Dir:	10 / NNW	Wind Gusts:	3





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 34 Report For 06:00 AM 20-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	6950	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	6680	Next Casing:		RKB Elevation (ft):	31				
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	28-May-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 3.49 / 0, Flat 0 / 0, Complete 0 / 0, Total 3.49 / 0 DOL: 34

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 4 / 48 Total: 27 / 324

Safety Summary: No incidents or events reported. 34 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Tripping in the hole with RSS assembly at 6,950'.

Planned Operations: Drill 9 1/2" hole section from 6,950'.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	6,950	DIR	Break down BHA including NOV black box, roller reamer, string stabilizer, Halo RSS and bit. Remove dart sensor #2232 from bit.	
8:30	0:00	15.50	6,950	LOG	Rig up SLB Wireline to log well with FMI and UBI. 1st run of Formation Micro Imager log @ 10:00 from 6,947' to 4,852'. Lay down tool and rig up for UBI. 2nd run of UltraSonic Borehole Imager @ 16:30 from 6,930' to 4,836'. Switch mode at 4,810' to UltraSonic casing Imager, logs casing to surface.	
0:00	0:30	0.50	6,950	RIGD	Rig down SLB Wireline.	
0:30	1:30	1.00	6,950	BHAOP	Pick up 9 1/2" Halo stiff assembly, BHA # 16, RSS # 6, bit # 15, sensor #2232.	
1:30	4:00	2.50	6,950	TRPI	Trip in the hole from 913' to 4,800'. Fill pipe every 3,000'.	
4:00	5:00	1.00	6,950	CUTDL	Slip and cut drill line.	
5:00	6:00	1.00	6,950	TRPI	Trip in the hole from 4,800' to 6,950'. Break circulation at 6,000'.	

Management Summary

Broke down BHA including NOV black box, roller reamer, string stabilizer, Halo RSS and bit. Removed dart sensor #2232 from bit. Rigged up SLB Wireline. Log well with FMI and UBI. Rigged down SLB Wireline. Picked up 9 1/2" Halo stiff assembly. Tripped in the hole from 1,036' to 4,800', Slipped and cut drill line. Tripped in the hole from 4,800' to 6,950'.

Comments

Fuel on hand 17,362 gals.
 Fuel used 1,049 gals.
 Total NPT to date 92.75 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
20-May-23 02:00 at Depth 6,943 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.30	27				0.25	10	0.2		99.8			850								
19-May-23 11:00 at Depth 6,950 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.30	27				0.25	10	0.2		99.8			850								





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 34

Report For 06:00 AM 20-May-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	6	---	Bicarb - 50#SK	3	---
Caustic Soda - 50#SK	5	---	DC-310/CI-100 - OTHER	50	---
Defoam 14 - GALS	2	---	De-MOB - OTHER	1	---
Desco - 25#SK	3	---	Engineering - OTHER	2	---
Lodging - OTHER	1	---	Poly Vis - 50#SK	2	---
Soda Ash - 50#SK	5	---	Walnut - SACK	2	---
Xanthan Gum - 50#SK	4	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump								
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
14	1	NOV	TKC 83	9.500	6610	144	9.5	45.0	60.0	60	60	19000	8600	1250	160	193	67	418
Jets: 14 14 14 14 14 14 14 14					Out: 6950	Grade: Cutter: 1/2		Dull CT/WT		Wear: S	Brgs: X	Gge: 1	Pull: PR					

Comments: Second cutter from center diamond plate missing. Chipped cutters on nose and shoulder.

BHA - No. 16 - BIT, OTHER, STAB, 2 PC, RR, DCM, 3 OTHER, 9 DC, XO, 30 HWDP = 1306.42

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on Casing/Liner:	Rotating:	/	Tripping:	/	<input checked="" type="checkbox"/> Wear Bushing Installed

Rig Information

Equipment Problems: None.
 Location Condition: Good.
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	170	170	170	170	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	170	170	170	170			
Shaker No 3:	170	170	170	170			

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	365	24.7	S-135						

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 34
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check

Weather Information

Sky Condition: Partly Cloudy	Visibility: 10
Air Temperature: 75 degF	Bar. Pressure: 1017
Wind Speed/Dir: 11 / NNW	Wind Gusts: 3





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 35 Report For 06:00 AM 21-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	7584	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	6945	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	634 / 14.0	Next BOP Test:	28-May-23	Working Interest:		Totals:	---
Average ROP (ft/hr):	45.29					Well Cost (\$):	---

Days (actual / plan): Drilling 4.07 / 0, Flat 0 / 0, Complete 0 / 0, Total 4.07 / 0 DOL: 35

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 5 / 60 Total: 28 / 336

Safety Summary: No incidents or events reported. 35 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Tripping in the hole with 1° motor assembly at 2,810'.

Planned Operations: Trip in the hole to 7,584'. Drill 9 1/2" tangent section from 7,584'.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	6,950	TRPI	Trip in the hole from 6,000' to 6,950'. Circ. Temp@6,000' - 210°, Circ. Temp@6,950' - 290°.	
7:00	21:00	14.00	7,584	DRIL	Drill 9 1/2" hole w/ HALO RSS from 6,950' to 7,584'. 60K wob, 60 rpm, 600 gpm, 25K torq, 45-80 fph. Last survey depth 7,506' MD, 65.67° inc., 105.15° azi, Picking up insulated drill pipe with tugger and racking in derrick. Pump 80 bbl fresh water sweep at 7,083', 35% increase in ROP once sweep hit the bit. Pump 80 bbl sweep 50% fresh water, 50% reserve pit at 7,322', 13% increase in ROP once sweep hit the bit. Pump 80 bbl fresh water sweep at 7,411', 25% increase in ROP once sweep hit the bit.	
21:00	21:45	0.75	7,584	CIRC	Circulate bottoms up strokes at 600 GPM.	
21:45	22:30	0.75	7,584	OTHER	Drop gyro in drill string, let fall for 15 mins, pump gyro down at 200 GPM to top of float sub at 7,472', kill pump and let sit for 10 mins.	
22:30	2:30	4.00	7,584	TRPO	Trip out of the hole for 1° motor from 7,584' to BHA.	
2:30	3:00	0.50	7,584	BHAOP	Rack back HWDP and Collars. Note: Found one joint of HWDP washed out on the face.	
3:00	3:30	0.50	7,584	BHAOP	Break down BHA including NOV black box, roller reamer, string stabilizer, Halo RSS and bit. Remove dart sensor #2232 from bit.	
3:30	4:30	1.00	7,584	BOPO	Make up 9 1/2", 1° tangent motor assembly, BHA #17, bit sensor #2232. Shallow test tools (good test).	
4:30	6:00	1.50	7,584	TRPI	Trip in the hole from 128' to 2,810'.	

Management Summary

Tripped in the hole from 6,000' to 6,950'. Drilled 9 1/2" hole from 6,950' to 7,584'. Circulated bottoms up. Dropped gyro at 7,584'. Tripped out of the hole for 1° motor assembly from 7,584' to BHA. Laid out RSS assembly. Picked up 1° motor assembly, BHA # 17 and tripped in the hole to 2,810'.

Comments


Fuel on hand 15,616 gals.
Fuel used 2,007 gals.
Total NPT to date 92.75 HR.
No H2S today.
Pumped 80 bbl fresh water sweep at 7,083', 35% increase in ROP once sweep hit the bit.
Pumped 80 bbl sweep 50% fresh water, 50% reserve pit at 7,322', 13% increase in ROP once sweep hit the bit. Pumped 80 bbl fresh water sweep at 7,411', 25% increase in ROP once sweep hit the bit.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	





	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 35	Report For 06:00 AM 21-May-23
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Mud Information

														Gels			Temp		Mud			
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss	
21-May-23 01:00 at Depth 6,950 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.35	28					11.5	0.2			99.8			850									
20-May-23 13:30 at Depth 7,330 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.40	27					10.5	0.5			99.5			800									

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	DC-310/CI-100 - OTHER	10	---
Defoam 14 - GALS	1	---	Engineering - OTHER	2	---
Lodging - OTHER	1	---	Walnut - 50#SK	6	---

Bit/BHA/Workstring Information

										This Run		R.O.P.		Mud Pump							
Depth	No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF		
15		NOV	TKC 83	9.500	6950	634		14	45.3	87.0	60	60	23800	600	1250	16	190		6	413	
Jets: 14 14 14 14 14 14 14 14					Out: 7584		Grade: Cutter: 1 / 1		Dull WT / NO		Wear: A		gs: X		Gge: 1		Pull: BHA				
BHA - No. 17 - BIT, MMTR, RR, PC, DCM, MWD, 2 PC, 3 OTHER, 9 DC, XO, 30 HWDP = 1323.66																					

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
6,950	7,584	50.0	87.0	60	60	60	60	23,700	24,800	60	60	1,250
Annular Velocity:		Drill Collars:		335.5		Drill Pipe:		245.1				

Miscellaneous Drilling Parameters
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Hook Loads (lbs):	Off Bottom Rotate: 230	Pick Up: 325	Slack Off: 230	Drag Avg/Max: 5 / 15
Hours on BHA:	Since Inspection: 14	Total: 14	Jars: 14	
Hours on Casing/Liner:	Rotating: 14 / 0	Tripping: 6 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed	

Rig Information

Equipment Problems: None.
Location Condition: Good.
Transport: Received 2 savor subs, Received 2 motors at 02:15 hrs.

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	170	170	170	170	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	170	170	170	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	170	170	170	170			

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	365	24.7	S-135						

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 35
<input type="checkbox"/> BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check

Weather Information



Sky Condition: Mostly clear	Visibility: 10	
Air Temperature: 79 degF	Bar. Pressure: 1014	
Wind Speed/Dir: 6 / WNW	Wind Gusts:	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 36 Report For 06:00 AM 22-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	8085	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7087	Next Casing:		RKB Elevation (ft):	31				
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	501 / 11.5	Next BOP Test:	28-May-23	Working Interest:		Totals:			
Average ROP (ft/hr):	43.57					Well Cost (\$):			

Days (actual / plan): Drilling 4.55 / 0, Flat 0 / 0, Complete 0 / 0, Total 4.55 / 0 DOL: 36

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 5 / 60 Total: 28 / 336

Safety Summary: No incidents or events reported. 36 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Changing out saver sub.

Planned Operations: Pick up insulated drill pipe and rack back in the derrick, make up BHA #17, trip in the hole to 8,085', drill 9 1/2" hole section.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	10:30	4.50	7,584	TRPI	Trip in hole from 2,810 to 7,584'. Fill pipe at 3,000'. Test tools at 4,866'. test good. Stage in from 6,000' to 7,584' in 500' increments. High temperature seen was 210°.	
10:30	22:00	11.50	8,085	DRILR	Drilling 9 1/2" hole from 7,584' to 8,085'. 60-100 rpm step test, 55-65 wob step test. 121-286 fph, 13.3K-26.5K torque, 600 gpm. Turn off cooler 1 for temperature test at 7584'. Beginning temperature 185° on MWD tool. Slide f/7,708 t/7,727, Slide f/7,764' t/7,798, Slide f/7,827' t/7,851', Slide f/7,859' t/7,879', Slide f/7,891' t/7,916'. Slide f/7,923' t/7,934'. Slide f/7,954' t/7,964'. Slide f/7,986' Slide f/8,014' t/8,030'. Note: Turn off cooler 2 at 7867'. Reduced weight on bit at 7,990' to 55k to see if assembly would hold or drop in rotation.	
22:00	22:45	0.75	8,085	CIRC	Circulate bottoms up strokes at 600 GPM.	
22:45	23:15	0.50	8,085	OTHER	Drop gyro in drill string, let fall for 15 mins, pump gyro down at 200 GPM to top of float sub at 7,956', kill pump and let sit for 10 mins.	
23:15	4:00	4.75	8,085	TRPO	Trip out of the hole from 8,085' to BHA.	
4:00	4:30	0.50	8,085	BHAOP	Rack back HWDP and Collars.	
4:30	5:30	1.00	8,085	BHAOP	Break bit, rack back BHA #16, retrieve gyro, remove sensor #2232 from bit	
5:30	6:00	0.50	8,085	OTHER	Change out saver sub.	

Management Summary

Tripped in the hole from 2,810 to 6,000', staged in the hole from 6,000' to 7,584' highest temperature observed was 210 deg f. Drilled 9 1/2" hole from 7,584' to 8,085' slide approximately 66%. Circulated bottoms up. Dropped gyro. Tripped out of the hole from 8,085' to BHA. Break bit out and rack BHA #16.

Comments

Fuel on hand 13,685 gals.
 Fuel used 1,751 gals.
 Total NPT to date 92.75 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud		
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
21-May-23 23:30 at Depth 7,589 ft Mud Pits, Type: Low Solids Non-Dispersed																					
8.40	27					11	0.5		99.5				750								
21-May-23 14:00 at Depth 7,780 ft Mud Pits, Type: Low Solids Non-Dispersed																					
8.40	27					11	0.5		99.5				800								





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 36

Report For 06:00 AM 22-May-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	DC-310/CI-100 - OTHER	10	---
Engineering - OTHER	2	---	Lodging - OTHER	1	---
Walnut - 50#SK	4	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
16	1	NOV	TCK 83	9.500	7584	501	11.5	43.6	175.0	60	75	2	8600	1250	160	193	67	418	
Jets: 14 14 14 14 14 14 14 14					Out: 7584	Grade: Cutter: /		Dull: /		Wear:	Brgs:	Gge:	Pull:						
BHA - No. 17 - BIT, MMTR, RR, PC, DCM, MWD, 2 PC, 3 OTHER, 9 DC, XO, 30 HWDP = 1323.66																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
7,584	8,085	50.0	235.0	60	65	70	100	20	25	600	600	1,250
Annular Velocity: Drill Collars:				335.5		Drill Pipe:		245.1				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	220	Pick Up:	300	Slack Off:	210	Drag Avg/Max:	5 / 15
Hours on BHA:	Since Inspection:	25.5	Total:	25.5	Jars:	0		
Hours on Casing/Liner:	Rotating:	28 / 14	Tripping:	12 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems:	None.
Location Condition:	Good.
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	170	170	Centrifuge 1:	5.5 (Solids Removal)		Centrifuge 2:	5.5 (Solids Removal)	
Shaker No 3:	170	170	170	170						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5	365	24.7	S-135						

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crews.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	36
BOP Test	<input checked="" type="checkbox"/>	Crownmatic Check					

Weather Information

Sky Condition:	Partly cloudy	Visibility:	10
Air Temperature:	78 degF	Bar. Pressure:	1012
Wind Speed/Dir:	6 / WSW	Wind Gusts:	5





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 37 Report For 06:00 AM 23-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	8360	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7189	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	275 / 6.0	Next BOP Test:	28-May-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	45.83					Well Cost (\$):	---		

Days (actual / plan): Drilling 4.8 / 0, Flat 0 / 0, Complete 0 / 0, Total 4.8 / 0 DOL: 37

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 3 / 36 Total: 26 / 312

Safety Summary: No incidents or events reported. 37 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Drilling 9 1/2" hole section at 8,360'.

Planned Operations: Drill 9 1/2" hole section to 8,585'. Circulate hole clean, trip out of the hole from 8,585' to surface, handle BHA, rig up SLB, log well.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	11:30	5.50	8,085	TRPI	Rebuild roller reamer in BHA. Change pulsar speed from 300ms to 760ms. Pick up 6 stands S-135 insulated drill pipe and rack in derrick.	
11:30	13:00	1.50	8,085	TRPI	Pick up 10 stands S-135 insulated drill pipe and rack in derrick.	
13:00	15:00	2.00	8,085	BHAOP	Make up BHA #17 with new 7.15 mud motor, 1° fixed. Surface test MWD. Good test. Make up TKC 83 bit w/ dart sensor #2232.	
15:00	15:45	0.75	8,085	TRPI	Trip in hole from 129' to 1,979' with collars and HWDP.	
15:45	16:30	0.75	8,085	TRPI	Change out saver sub on top drive for insulated drill pipe.	
16:30	18:00	1.50	8,085	TRPI	Trip in stands out of the derrick from 1,979' to 3,000' with insulated drill pipe, 81 joints of S-135 on bottom of string, remaining joints to surface V-150.	
18:00	23:30	5.50	8,085	TRPI	Pick up singles of insulated drill pipe from 3,000' to 8,085', 81 joints of S-135 on bottom of string, remaining joints to surface V-150. Stage in from 6,000' to 8,085' in 500' increments. High temperature observed was 325° at 8,085'.	
23:30	2:00	2.50	8,257	DRIL	Drilling 9 1/2" hole from 8,085' to 8,257'. 60-95 rpm step test, 50-70 wob step test. 225-325 fph, 18K-25.2K torque, 600-700 gpm. Running one mud cooler. Beginning temperature 163° on MWD tool. Pump 80 bbls fresh water sweep at 8,175'. Slide from 8,085' to 8,089'. Slide from 8,107' to 8,113'. Slide from 8,197' to 8,212'.	
2:00	2:30	0.50	8,257	OPEN	Reboot Pason system due to MSE not working while sliding.	
2:30	6:00	3.50	8,360	DRIL	Drilling 9 1/2" hole from 8,257' to 8,360'. 60-95 rpm step test, 50-70 wob step test. 225-325 fph, 18K-25.2K torque, 600-700 gpm. Turned on second mud cooler at 8,346'. Beginning temperature 163° on MWD tool. Slide from 8,256' to 8,281'. Slide from 8,288' to 8,296'. Slide from 8,316 to 8,330'.	

Management Summary

Rebuilt roller reamer in BHA. Changed pulsar speed from 300ms to 760ms. Picked up 16 stands S-135 insulated drill pipe and rack in derrick. Make up BHA #17 with new 7.15 mud motor, fixed at 1°. Surface test MWD. Good test. Tripped in the hole from 129' to 1,979' with collars and HWDP. Changed out saver sub on top drive for insulated drill pipe. Tripped in stands out of the derrick from 1,979' to 3,000' with insulated drill pipe. Picked up singles of insulated drill pipe from 3,000' to 6,000'. Staged in from 6,000' to 8,085' in 500' increments. Highest temperature observed was 325° at 8,085'. Drilled 9 1/2" hole from 8,085' to 8,257'. Rebooted Pason system due to MSE not working while sliding. Drilled 9 1/2" hole from 8,257' to 8,360'.

Comments



Fuel on hand 20,368 gals.
 Fuel used 997 gals.
 Fuel delivered 7,500 gals.
 Total NPT to date 92.75 HR.
 No H2S today.

	Daily Drilling Report	University of Utah
	Well ID: FORGE 16B(78)-32	Well Name: FORGE 16B(78)-32
	Field: FORGE	Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 37 **Report For 06:00 AM 23-May-23**

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	34,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
22-May-23 14:30 at Depth 8,085 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					8.5	0.5		99.5			600								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Corrosion rings - OTHER	2	---	DC-310/CI-100 - OTHER	10	---
Engineering - OTHER	2	---	Lodging - OTHER	1	---

Bit/BHA/Workstring Information

This Run										R.O.P.										Mud				Pump	
Depth	No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF						
16	1	NOV	TCK 83	9.500	7584	501	11.5						8600	1250	160	190		67	413						
Jets: 14 14 14 14 14 14 14 14 14 14										Out: 8085		Grade: Cutter: 1/3		Dull WT/CT		Wear: S		Brgs: X		e: 1		Pull: BHA			
Comments: This bit had test cutters on it.																									
17	1	NOV	TKC 83	9.500	8085	275	645.8	275.0	70	85	24	8700	1450	187	259	106			562						
Jets: 14 14 14 14 14 14 14 14 14 14										Out:		Grade: Cutter: /		Dull /		Wear:		Brgs:		e:		Pull:			
Comments: Insulated drill pipe																									
BHA - No. 18 - BIT, MMTR, RR, PC, DCM, MWD, 2 PC, 3 OTHER, 9 DC, XO, 30 HWDP = 1323.71																									

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
8,085	8,360	40.0	280.0	70	70	85	100	24	24	60	700	1,850	
Annular Velocity:		Drill Collars:		391.4		Drill Pipe:		286.0					

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	320	Pick Up:	345	Slack Off:	310	Drag Avg/Max:	10 / 15
Hours on BHA:	Since Inspection:	31.5	Total:	31.5	Jars:	0		
Hours on Casing/Liner:	Rotating:	34 / 20	Tripping:	20 / 8	<input checked="" type="checkbox"/> Wear Bushing Installed			




Rig Information

Equipment Problems: None.
 Location Condition: Good.
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	170	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)			
Shaker No 3:	170	170	170	170						



Drill Pipe Inventory																													
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread																				
5.5	81	21.3	S-135	OTHER	5.5	250	24.7	V-150	OTHER																				
Safety Information																													
Meetings/Drills	Time	Description																											
Safety	30	Two Pre-tour safety meetings held daily with crews.																											
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	37																						
Accident Description: None to report.																													
<input type="checkbox"/> BOP Test	<input checked="" type="checkbox"/> Crownamatic Check																												
<table border="0"> <tr> <td rowspan="2">  </td> <td colspan="4"> Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE </td> <td colspan="5" style="text-align: right;"> University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT </td> </tr> <tr> <td colspan="5"> Report No: 37 </td> <td colspan="5" style="text-align: right;"> Report For 06:00 AM 23-May-23 </td> </tr> </table>											Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE				University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT					Report No: 37					Report For 06:00 AM 23-May-23				
	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE				University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT																								
	Report No: 37					Report For 06:00 AM 23-May-23																							
Weather Information																													
Sky Condition:	Mostly clear			Visibility:	10																								
Air Temperature:	75 degF			Bar. Pressure:	1010																								
Wind Speed/Dir:	12 / S			Wind Gusts:	3																								



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 38 Report For 06:00 AM 24-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	8585	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7350	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	225 / 4.5	Next BOP Test:	28-May-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):	50.0					Well Cost (\$):	---		

Days (actual / plan): Drilling 4.99 / 0, Flat 0 / 0, Complete 0 / 0, Total 4.99 / 0 DOL: 38

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 4 / 48 Total: 27 / 324

Safety Summary: No incidents or events reported. 38 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Logging well with UBI at report time.

Planned Operations: Log well, lay out drill collars, pick up BHA #19, trip in the hole to 8,585', drill 9 1/2" hole from 8,585'.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	10:30	4.50	8,585	DRILS	Rotate/Slide drill 9 1/2" hole from 8,360' to 8,585'. Rotating at 70K wob, 70 rpm, 700 gpm, 120-160 fph. Rotating Sliding at 60K-80K wob, 600-700 gpm, 30-70 fph. Rotation 85%, Sliding 15%. Slide 8,360' to 8,362'. Slide 8,388' to 8,420'. Note: Lost pluses with MWD at 8,460' while drilling.	
10:30	16:00	5.50	8,585	CIRC	Circulate to clean and cool hole for open hole logs.	
16:00	18:00	2.00	8,585	TRPO	Break off top drive, drop gyro survey tool, and pump down. Trip out of hole from 8,585' to 7,027' with insulated drill pipe.	
18:00	20:30	2.50	8,585	TRPO	Trip out of the hole with insulated drill pipe from 7,027' to BHA.	
20:30	21:00	0.50	8,585	BHAOP	Rack back HWDP and Collars.	
21:00	22:00	1.00	8,585	BHAOP	Break bit, rack back BHA #18, retrieve gyro, remove sensor #2232 from bit. Lay out motor. Note: found a small amount of coating from insulated drill pipe in filter sub.	
22:00	6:00	8.00	8,585	LOG	Rig up SLB Wireline to log well with UBI and FMI. 1st run, UltraSonic Borehole Imager @ 23:00 hrs, from 8,508' to 6,700', logged at 800 ft/hr. Switch mode to borehole dip mode and log from 8,508' to 6,700', logged at 800 ft/hr. Stop at 4,810' switch mode to UltraSonic casing Imager, log casing. Max temperature on first run 247 deg f. Max temp on second run 272 deg f.	

Management Summary

Drilled 9 1/2" hole from 8,360' to 8,585'. Circulated hole clean for logs, dropped gyro, tripped out of the hole from 8,585' to BHA, racked back BHA #18, Laid out motor and bit. Rigged up SLB Wireline. Log well with UBI.

Comments

Fuel on hand 18,740 gals.
 Fuel used 1,628 gals.
 Fuel delivered 7,500 gals.
 Total NPT to date 92.75 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136		22.000	84	OTHER	
FULL	11.750	-3	3	4,837	INT1	14.750	65	OTHER	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 38

Report For 06:00 AM 24-May-23

Mud Information

																	Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss		
24-May-23 00:30 at Depth 8,145 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.40	27				0.2	11	0.6		99.4			750										
23-May-23 13:00 Mud Pits, Type: Low Solids Non-Dispersed																						
8.40	27				0.2	10.5	0.4		99.6			700										

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	5	---	DC-310/Cl-100 - OTHER	10	---
Engineering - OTHER	2	---	Lodging - OTHER	1	---

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump										
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF		
17	NOV	TKC 83	9.500	8085	550	10.5	52.4	175.0	70	88	2	700	2150	18	262	107	568			
Jets: 14 14 14 14 14 14 14 14				Out: 8585	Grade: Cutter: 2 / 3		Dull	BT / WT	Wear: S	gs: X	Gge: 1	Pull: LOG								
Comments: ran on Insulated drill pipe																				
BHA - No. 18 - BIT, MMTR, RR, PC, DCM, MWD, 2 PC, 3 OTHER, 9 DC, XO, 30 HWDP = 1323.71																				

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
8,360	8,585	70.0	165.0	70	70	70	7	24	2	70	700	2,350
Annular Velocity:		Drill Collars:		391.4		Drill Pipe:		286.0				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	320	Pick Up:	345	Slack Off:	320	Drag Avg/Max:	10 / 20
Hours on BHA:	Since Inspection:	36	Total:	36	Jars:			
Hours on Casing/Liner:	Rotating:	38.5 / 24.5	Tripping:	22 / 10	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems:	None to report.
Location Condition:	Good.
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	170	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	170	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	81	21.9	S-135	OTHER	5.5	25	24.1	V-150	OTHER

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crews.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	38
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check					

Weather Information

Sky Condition:	Mostly clear	Visibility:	10
Air Temperature:	72 degF	Bar. Pressure:	1011
Wind Speed/Dir:	11 / SSW	Wind Gusts:	10





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 39 Report For 06:00 AM 25-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	8852	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8715	Next Casing:		RKB Elevation (ft):	31				
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	267 / 3.5	Next BOP Test:	28-May-23	Working Interest:		Totals:			
Average ROP (ft/hr):	76.29					Well Cost (\$):			

Days (actual / plan): Drilling 5.14 / 0, Flat 0 / 0, Complete 0 / 0, Total 5.14 / 0 DOL: 39

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 8 / 96 Total: 31 / 372

Safety Summary: No incidents or events reported. 39 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Drilling 9 1/2" hole section at 8,852'.

Planned Operations: Drill 9 1/2" hole section to 9,085', circulate bottoms up, trip out of the hole from 9,085', lay out insulated drill pipe, make up BHA #20.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	15:30	9.50	8,585	LOG	Logging with Ultrasonic Borehole Imager UBI. Rig down UBI. Rig up FMI. Logging with Formation Micro Imager. Maximum temperature on tools was 292° F. Rig down SLB Wireline tools.	
15:30	16:30	1.00	8,585	BHAOP	Stage Baker Hughes 406 bit with puck sensor and directional tools.	
16:30	18:30	2.00	8,585	BHAOP	Make up BHA #19 with 1° fixed motor, Baker 406 bit, trip in the hole to 930'.	
18:30	19:30	1.00	8,585	BHAOP	Run in with 3 stands of 6.75" drill collars from derrick. Lay down same.	
19:30	2:30	7.00	8,585	TRPI	Trip in the hole from 930' to 8,585'. Stage in from 6,000' to 8,585' in 500' increments. Highest temperature observed was 284° at 8,371'. Note: Ran 25 stands 2,378' of non-insulated S-135 drill pipe on top of BHA, crossed over to insulated drill pipe at 3,369'. Visually inspected inner coating on insulated drill pipe on trip in the hole. laid out 3 joints due to inner coating peeling.	
2:30	6:00	3.50	8,852	DRIL	Drilling 9 1/2" hole from 8,585' to 8,852'. 60-95 rpm step test 60-100 rpm, 50-57 wob step test. 225-345 fph, 18K-25.2K torque, 600-700 gpm. Running 3 mud coolers. Beginning temperature 196° on MWD tool. Slide from 8,782' to 8,817'.	

Management Summary

Logged well with FMI and UBI, rigged down SLB wireline unit, staged out BHA, made up BHA #19 with 1° fixed motor, ran in the hole with 3 stands of 6 3/4" drill collars from the derrick. Laid out same, tripped in the hole from 930' to 6,000', staged in the hole from 6,000' to 8,585', max temperature observed was 284° at 8,371'. Drilled 9 1/2" hole from 8,585' to 8,852'.

Comments

Fuel on hand 17,561 gals.

Fuel used 1,179 gals.

Total NPT to date 92.75 HR.

No H2S today.

Visually inspected inner coating on insulated drill pipe on trip in the hole. laid out 3 joints due to inner coating peeling.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

													Gels			Temp		Mud			
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
24-May-23 14:30 at Depth 8,585 ft Mud Pits, Type: Low Solids Non-Dispersed																					
8.40	27	1	1	100	0.2	11.1	0.5	0	100				700								





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 39

Report For 06:00 AM 25-May-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
DC-310/CI-100 - OTHER	20	---	Engineering - OTHER	2	---
Lodging - OTHER	1	---	Trucking - OTHER	5	---

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
18	1	BAKER	D406V	9.500	8585	267	3.5	76.3	375.0	57	75	2	700	1650	216	346	141	649	
Jets: 14 14 14 16 16 16					Out:		Grade: Cutter: /			Dull: /		Wear:		Brgs:		Gge:		Pull:	
BHA - No. 19 - BIT, MMTR, RR, PC, DCM, MWD, 2 PC, 3 OTHER, XO, 28 HWDP = 986.19																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
8,585	8,852	65.0	355.0	57	57	75	100	25	28	650	700	1,650	
Annular Velocity: Drill Collars:				176.5		Drill Pipe:				265.5			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	225	Pick Up:	342	Slack Off:	216	Drag Avg/Max:	5 / 10
Hours on BHA:	Since Inspection:	39.5	Total:	39.5	Jars:			
Hours on Casing/Liner:	Rotating:	42 / 28	Tripping:	30 / 18	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems:	None to report.
Location Condition:	Good
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	170	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	170	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	81	21.9	S-135	OTHER	5.5	25	24.7	V-150	OTHER

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crews.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	39
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check					

Weather Information

Sky Condition:	Partly Cloudy	Visibility:	10
Air Temperature:	74 degF	Bar. Pressure:	1009
Wind Speed/Dir:	5 / WSW	Wind Gusts:	15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 40 Report For 06:00 AM 26-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	9255	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7623	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	29-Apr-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	403 / 5.0	Next BOP Test:	28-May-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):	80.6					Well Cost (\$):	---		

Days (actual / plan): Drilling 5.34 / 0, Flat 0 / 0, Complete 0 / 0, Total 5.34 / 0 DOL: 40

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 3 / 36 Total: 26 / 312

Safety Summary: No incidents or events reported. 40 days since LTI. Conducted Safety Meeting.

Current Operations: Testing BOPE.

Planned Operations: Test BOPE, Make up BHA #20, trip in the hole to 9,255', drill 9 1/2" hole section from 9,255'.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	11:00	5.00	9,255	DRIL	Drill 9 1/2" hole from 8,817' to 9,255', 18K-25.2K torque, 600-700 gpm. Running 3 mud coolers. Slide from 8,879' to 8,907'. Slide from 9,165' to 9,196'. Survey at 9,255' MD, 9,171' SD, 60.75° INC, 105.87° AZI, 24.36' low and 8.76' right.	
11:00	12:00	1.00	9,255	CIRC	Circulate 2X bottoms up.	
12:00	21:30	9.50	9,255	TRPO	Trip out 10 stands of insulated drill pipe from 9,255' to 8,065'. Pick up 410K, slack off 180K, string wt 245K. Trip out laying down singles from 8,065' to 3,364'. Trip in hole with 24 stands of insulated drill pipe from derrick. Trip out laying down singles to 3,364'.	
21:30	23:30	2.00	9,255	TRPO	Trip out of the hole from 3,364' to BHA.	
23:30	0:00	0.50	9,255	BHAOP	Rack back HWDP.	
0:00	1:00	1.00	9,255	BHAOP	Break bit, rack back BHA #19, lay out motor and bit. Note: Motor drained good with minimal movement in bearing assembly.	
1:00	2:30	1.50	9,255	WELLHD	Attempt to remove wear bushing, pulled 18k over with no movement in wear bushing, slack off and verify all lock screws backed out at intermediate casing head, attempt to work torque down to wear bushing with no success. Contact Stream-flo for max overpull on puller, Pull 22k over and work link tilts on TDS. Pull wear bushing. Note: Observed outer area of wear bushing coated with cuttings.	
2:30	6:00	3.50	9,255	BOPT	PJSM. Rig up testers. Make up TIW valve, install test plug. Close pipe rams. Test pipe rams 250 psi low, 5000 psi high, Test annular 250 psi low, 2,500 psi high. Test pipe rams 250 psi low, 5,000 psi high. Test inner and outer valves on mud cross 250 psi low, 5000 psi high. Test inner and outer valves on kill side 250 psi low, 5,000 psi high. Test witnessed by DSM. Note: All choke valves on manifold were tested to 250 psi low and 5000 psi high while tripping out of the hole. All test good and witnessed by DSM.	

Management Summary

Drilled 9 1/2" hole section from 8,817' to 9,255', circulated two bottoms up, tripped out of the hole from 9,255' to 8,065', laid out insulated drill pipe from 8,065' to 3,364', tripped in remaining stands of insulated drill pipe from derrick and laid out same, pulled out of the hole from 3,364' to BHA, racked back BHA # 19, laid out motor and bit, worked wear bushing from wellhead, tested BOPE.

Comments

Fuel on hand 16,120 gals.
Fuel used 1,441 gals.
Total NPT to date 92.75 HR.
No H2S today.

Survey at 9,255' MD, 9,171' SD, 60.75° INC, 105.87° AZI, 24.36' low and 8.76' right.

Casing/Tubular Information



Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 40 Report For 06:00 AM 26-May-23

Mud Information

%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	Gels			Temp		Mud Loss	
																10s	10m	30m	In	Out		
26-May-23 04:00 at Depth 8,780 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.40	27	1	1		0.2	10.8	0.5		99.5			700										
25-May-23 15:00 at Depth 9,255 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.50	27	1	1		0.25	11.1	1.25		98.75			700										

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	Corrosion rings - OTHER	1	---
Defoam 14 - GALS	1	---	Engineering - OTHER	2	---
Lodging - OTHER	1	---	MDC -	41	---

Bit/BHA/Workstring Information

Depth	No Run	Make	Model	Diam	In	This Run			R.O.P.			Mud		Pump		J. Vel	P. Drp	HHP	JIF
						Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press				
18	1	BAKER	D406V	9.500	8585	705	8.5	82.9	300.0	57	70	2	600	2330	18	261	9	489	
Jets: 14 14 14 16 16 16						Out: 9255	Grade: Cutter: 1 / 1		Dull	BT / WT	Wear: S	gs: X	Gge: 1	Pull: BHA					
BHA - No. 19 - BIT, MMTR, RR, PC, DCM, MWD, 2 PC, 3 OTHER, XO, 28 HWDP = 986.19																			

Drilling Parameters

Depth (ft)	ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)		
	From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max			
8,817	9,255		87.6	185.0	57	57	70	70	22	2	70	700	2,330
Annular Velocity:		Drill Collars:	190.1		Drill Pipe:		286.0						

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	230	Pick Up:	36	Slack Off:	21	Drag Avg/Max:	10 / 20
Hours on BHA:	Since Inspection:	44.5	Total:	44.5	Jars:			
Hours on Casing/Liner:	Rotating:	47 / 33	Tripping:	36 / 24	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems: Wear bushing sticking in in intermediate wellhead bowl.
Location Condition: Good.
Transport: Received core bit.

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	170	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)			
Shaker No 3:	170	170	170	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	365	24.7	S-135						

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crews.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	40
<input type="checkbox"/> BOP Test		<input type="checkbox"/> Crownmatic Check					



Weather Information			
Sky Condition:	Cloudy	Visibility:	10
Air Temperature:	75 degF	Bar. Pressure:	1004
Wind Speed/Dir:	23 / SW	Wind Gusts:	15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 41 Report For 06:00 AM 27-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	9524	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7623	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):		Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	269 / 5.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	53.8					Well Cost (\$):	---		

Days (actual / plan): Drilling 5.55 / 0, Flat 0 / 0, Complete 0 / 0, Total 5.55 / 0 DOL: 41

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 3 / 36 Total: 26 / 312

Safety Summary: No incidents or events reported. 41 days since LTI. Conducted BOP Test, Crown Check, Safety Meeting.

Current Operations: Drilling 9 1/2" hole at 9,524'.

Planned Operations: Drill 9 1/2" hole to 9,800', circulate hole clean, trip out of the hole to surface, make up BHA #21, trip in the hole to 9,800', change hole over to mud, rig up wireline and run gyro, trip out of the hole for core run.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	9,255	BOPT	Complete BOPE test. Test accumulator. Pull test plug and rig down tester. Install wear bushing.	
8:00	9:00	1.00	9,255	TRPI	Pick up singles of drill pipe from rack and make up 4 stands in mouse hole, rack back in derrick.	
9:00	11:00	2.00	9,255	BHAOP	Make up BHA #20. Pick up 7.15 motor and scribe, make up TKC83 bit, install MWD, and trip in hole with BHA. Check all torques. Installed dart sensor #2232 in bit.	
11:00	15:45	4.75	9,255	TRPI	Lay down 6 joints of weight pipe for bad hardbanding. Pick up 8 joints of weight pipe to replace and make even stands. Pick up 30 joints of regular drill pipe. Trip in hole from 130' to 4,978'.	
15:45	16:00	0.25	9,255	DIR	Test MWD tool.	
16:00	18:00	2.00	9,255	CUTDL	Slip and cut drilling line.	
18:00	19:30	1.50	9,255	REPR	Remove brake turnbuckles and adjust brakes.	X
19:30	20:30	1.00	9,255	TRPI	Trip in the hole from 4,978' to 6,000'.	
20:30	21:00	0.50	9,255	CIRC	Circulate and check tool temperature, beginning temperature 225 deg f, ending temp 218 deg f.	
21:00	21:15	0.25	9,255	TRPI	Trip in the hole from 6,000' to 6,500'.	
21:15	21:30	0.25	9,255	CIRC	Circulate and check tool temperature, beginning temperature 238 deg f, ending temp 230 deg f.	
21:30	21:45	0.25	9,255	TRPI	Trip in the hole from 6,500' to 7,000'.	
21:45	22:00	0.25	9,255	CIRC	Circulate and check tool temperature, beginning temperature 243 deg f, ending temp 230 deg f.	
22:00	22:15	0.25	9,255	TRPI	Trip in the hole from 7,000' to 7,500'.	
22:15	22:30	0.25	9,255	CIRC	Circulate and check tool temperature, beginning temperature 255 deg f, ending temp 233 deg f.	
22:30	22:45	0.25	9,255	TRPI	Trip in the hole from 7,500' to 8,000'.	
22:45	23:15	0.50	9,255	CIRC	Circulate and check tool temperature, beginning temperature 260 deg f, ending temp 228 deg f.	
23:15	23:30	0.25	9,255	TRPI	Trip in the hole from 8,000' to 8,500'.	
23:30	23:45	0.25	9,255	CIRC	Circulate and check tool temperature, beginning temperature 268 deg f, ending temp 238 deg f.	
23:45	0:00	0.25	9,255	TRPI	Trip in the hole from 8,500' to 8,900'.	
0:00	0:45	0.75	9,255	CIRC	Circulate and check tool temperature, beginning temperature 300 deg f, ending temp 238 deg f.	
0:45	1:00	0.25	9,255	TRPI	Trip in the hole from 8,900' to 9,255'.	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 41

Report For 06:00 AM 27-May-23

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
1:00	6:00	5:00	9,524	DRIL	Drill 9 1/2" hole from 9,255' to 9,524', 23K-28K torque, 600-700 gpm. Running 3 mud coolers. Slide from 9,255' to 9,280'. Slide from 9,301' to 9,324'. Slide from 9,396' to 9,424'. Slide from 9,430' to 9,447'. Slide from 9,458' to 9,482'. Note: Pumped 80 bbl surfactant pill at 9,238', observed 15% decrease in ROP along with increase in lateral and axial vibrations. Pumped 70 bbl freshwater pill at 9,487'. Survey at 9,487' MD, 9,402' SD, 64.28° INC, 106.89° AZI, 37.6' low and 14.7' right.	

Management Summary

Completed BOPE test, picked up 4 stands of drill pipe and racked back in the derrick, made up BHA #20, Tripped in the hole 4,978', tested MWD tool, slipped and cut drill line, removed brake turnbuckles and adjusted brakes, tripped in the hole to 6,000', stagged in the hole from 6,000' to 9,255' cooling MWD every 500', max temperature observed was 300° at 8,900', drilled 9 1/2" hole section from 9,255' to 9,524'.

Comments

Fuel on hand 14,997 gals.
Fuel used 1,123 gals.
Total NPT to date 94.25 HR.
No H2S today.
Survey at 9,487' MD, 9,402' SD, 64.28° INC, 106.89° AZI, 37.6' low and 14.7' right.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-	3,4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
27-May-23 01:30 at Depth 9,255 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.47	27			0.3		10.5	1.1		98.9			650								
26-May-23 14:00 at Depth 9,255 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.42	27			0.25		10	0.7		99.3			600								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
DC-310/CI-100 - OTHER	20	---	Defoam 14 - GALS	1	---
Engineering - OTHER	2	---	Lodging - OTHER	1	---

Bit/BHA/Workstring Information

Depth	No Run	Make	Model	Diam	In	This Run		R.O.P.		WOB	RPM	Torque	Wt	Mud			Pump			
						Dist	Hrs	Avg	Max					Flow	Press	J. Vel	P. Drp	HHP	JIF	
19		NOV	TKC83	9.500	9255	269	5	53.8	325.0	70	56	23	8600	1560	160	193	67	418		
Jets: 14 14 14 14 14 14 14 14						Out:		Grade: Cutter: /		Dull: /		Wear:		Brgs: e:		Pull:				
BHA - No. 20 - BIT, MMTR, RR, PC, DCM, MWD, 2 PC, 3 OTHER, XO, 30 HWDP = 1051.37																				

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
9,255	9,524	250.0	325.0	70	70	56	65	23	26	6	700	1,565
Annular Velocity:		Drill Collars:		162.9		Drill Pipe:		245.1				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	265	Pick Up:	375	Slack Off:	233	Drag Avg/Max:	25 / 45
Hours on BHA:	Since Inspection:	49.5	Total:	49.5	Jars:			



Hours on Casing/Liner:	Rotating:	52 / 38	Tripping:	44 / 32	<input checked="" type="checkbox"/> Wear Bushing Installed
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	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26E Rng: 9W County: BEAVER State: UT
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Report No: 41 Report For 06:00 AM 27-May-23

Rig Information

Equipment Problems: None to report.
 Location Condition: Good.
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Water Filtrate	Equipment Usage (Hrs):
Shaker No 1:	170	170	170	170	Desander: 0	Desilter: 0
Shaker No 2:	170	170	170	170	Centrifuge 1: 12 (Solids Removal)	Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	170	170	170	170		

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135						

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 41
<input checked="" type="checkbox"/> BOP Test	<input checked="" type="checkbox"/> Crownamatic Check	

Weather Information

Sky Condition: Partly Cloudy	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 1004
Wind Speed/Dir: 19 / SSW	Wind Gusts: 12



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 42 Report For 06:00 AM 28-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	9800	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7623	Next Casing:		RKB Elevation (ft):	31				
Proposed TD (ft):		Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	276 / 3.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):	92.0					Well Cost (\$):			

Days (actual / plan): Drilling 5.68 / 0, Flat 0 / 0, Complete 0 / 0, Total 5.68 / 0 DOL: 42

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 6 / 72 Total: 29 / 348

Safety Summary: No incidents or events reported. 42 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Running Gyro on wireline.

Planned Operations: Run gyro, rig down wireline unit, trip out of the hole from 9,773' to surface, make up BHA #22 core assembly, trip in the hole to 9,800', change hole over, cut core from 9,800'.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:00	3.00	9,800	DRIL	Rotate/Slide from 9,524' to 9,800'. Rotating 57K wob, 53 rpm, 600 gpm, 380-540 psi diff, 120-240 fpm. Sliding 71K wob, 700 gpm, 130-240 fpm. Slide 9,629' to 9,670'. 276' drilled, 235' rotating (85.2%), 41' sliding (14.8%). Last survey depth 9,709 MD, 7,857' TVD, 64.81° INC, 107.35° AZI. We are 31.75' low and 22.39' right of the plan.	
9:00	9:30	0.50	9,800	CIRC	Circulate bottoms up. Prepare to trip out of the hole for gyro survey and core.	
9:30	16:00	6.50	9,800	TRPO	Trip out of the hole on elevators from 9,800' to 130'. 500K up, 180K down coming off bottom.	
16:00	17:30	1.50	9,800	BHAOP	Trip out with BHA #20. Lay down same.	
17:30	18:00	0.50	9,800	OTHER	Clean and clear rig floor.	
18:00	18:30	0.50	9,800	BHAOP	Make up BHA #21 with TCI bit.	
18:30	23:00	4.50	9,800	TRPI	Trip in the hole with BHA #21 to 9,773', fill pipe every 30 stands, break circulation at 8,000'.	
23:00	0:00	1.00	9,800	CIRC	Circulate bottoms up at 800 gpm. PJSM with SDI.	
0:00	6:00	6.00	9,800	DIR	Wireline SDI gyro tool from surface to 9,723', pump gyro down from 6,800' to 9,723'.	

Management Summary

Drilled 9 1/2" hole section from 9,524' to 9,800', circulated bottoms up, tripped out of the hole from 9,800' to surface, laid out BHA #20, Make up BHA #21 with TCI, tripped in the hole to 9,773', circulated bottoms up at 9,773, rigged up SDI wireline unit, ran gyro from surface to 9,723'.

Comments

Fuel on hand 13,628 gals.
 Fuel used 1,369 gals.
 Total NPT to date 94.25 HR.
 No H2S today.
 Survey at 9,800' MD, 9,709' SD, 64.81° INC, 107.35° AZI, 31.75' low and 22.39' right.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
27-May-23 14:00 at Depth 9,801 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.53	27	1	1		0.5	10.5	1.5	0	98.5	0		600	60					90	101	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 42

Report For 06:00 AM 28-May-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	DC-310/CI-100 - OTHER	40	---
Defoam 14 - GALS	4	---	Engineering - OTHER	2	---
Lodging - OTHER	1	---	MDC -	33	---

Bit/BHA/Workstring Information

Depth		This Run		R.O.P.		Mud Pump												
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
5	3	SANJOAQ	MX-S50R	9.500	9800													
Jets: 24 24 24		Out: 9800		Grade: Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:				
19	1	NOV	TKC83	9.500	9255	545	868.1	300.0	70	60	2	8650	2300	173	226			8490
Jets: 14 14 14 14 14 14 14 14		Out: 9800		Grade: Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:				

BHA - No. 21 - BIT, BS, XO, 30 HWDP = 924.64

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
9,524	9,800	180.0	240.0	70	70	56	64	23	26	60	700	2,250
Annular Velocity:		Drill Collars:		162.9		Drill Pipe:		245.1				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	280	Pick Up:	420	Slack Off:	230	Drag Avg/Max:	30 / 45
Hours on BHA:	Since Inspection:	52.5	Total:	52.5	Jars:			
Hours on Casing/Liner:	Rotating:	55 / 41	Tripping:	52 / 40	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems:	None to report
Location Condition:	Good.
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	170	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	170	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135						

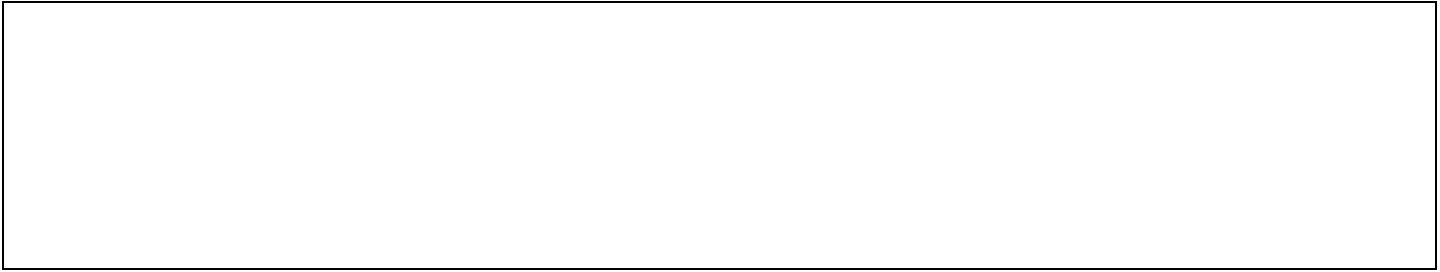
Safety Information


Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crews.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	42
Accident Description:		None to report.					
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check					

Weather Information

Sky Condition:	Mostly clear	Visibility:	10
Air Temperature:	71 degF	Bar. Pressure:	1008
Wind Speed/Dir:	12 / SSW	Wind Gusts:	5





	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 43 **Report For 06:00 AM 29-May-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 9800	Last Casing: 11.750 at 4,837	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 7623	Next Casing:	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft):	Last BOP Test: 27-May-23	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Next BOP Test: 19-Jun-23	Working Interest:	Totals:	---	---
Average ROP (ft/hr):			Well Cost (\$):	---	---

Days (actual / plan): Drilling 5.68 / 0, Flat 0 / 0, Complete 0 / 0, Total 5.68 / 0 **DOL:** 43

Pers/Hrs: **Operator:** 3 / 36 **Contractor:** 14 / 168 **Service:** 6 / 72 **Other:** 2 / 24 **Total:** 25 / 300

Safety Summary: No incidents or events reported. 43 days since LTI. Conducted Safety Meeting.

Current Operations: Staging in the hole with Core tools at 8,039'.

Planned Operations: Finish staging in the hole with Core tools to bottom. Core from 9,800' to 9,830'.

Toolpusher: Shawn Seddell, Clay

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	6:30	0.50	9,800	LOG	Running gyro survey tool to surface. Retrieve data while circulating hole. Data was bad. Decision to rerun gyro.	
6:30	7:30	1.00	9,800	CIRC	Circulate hole to cool while rebuilding new gyro tool.	
7:30	15:30	8.00	9,800	LOG	Run gyro on wireline from surface to 6,800'. Tool not functioning. Pull out of hole and rebuild gyro. Run in hole to 6,800' and pump down from 6,800' to 9,720'. Surveying from 9,720' to 6,409'. Lay down gyro tools.	
15:30	16:30	1.00	9,800	CIRC	Circulate to cool hole prior to trip out for core tools. Analyze gyro data. Swap mud system to water and lube system.	
16:30	22:30	6.00	9,800	TRPO	Trip out of hole from 9,725' to surface. Break off bit, bit sub and crossover.	
22:30	23:30	1.00	9,800	BHAOP	Make up BHA #22, Core BHA #3 consisting of 8-3/4" Core bit, core barrels, stabs, and jars.	
23:30	0:30	1.00	9,800	BHAOP	Change out 7 joints of slick HWDP.	
0:30	6:00	5.50	9,800	TRPI	Trip in the hole to 3,044'. Fill drill pipe. Trip in hole to 6,043'. Circulate bottoms up. Trip in hole to 6,519'. Cool tools. Wash down to 6,993'. Trip in hole to 7,469'. Cool tools. Wash down to 8,039'.	

Management Summary

Ran gyro survey tool. Data was bad. Re-ran gyro. Circulated and cooled hole prior to trip out for core tools. Changed water in hole to a lube system. Tripped out of hole. Laid down bit, bit sub and crossover. Made up BHA #22, Core BHA #3 consisting of 8-3/4" Core bit, core barrels, stabs, and jars. Changed out 7 joints of slick HWDP. Staged in the hole cooling tools to 8,000'.

Comments

Fuel on hand 12582 gals.
 Fuel used 1,046 gals.
 Total NPT to date 94.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section (ft)	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	



FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER											
Mud Information																				
%																				
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Mud Loss
29-May-23 02:00 at Depth 9,800 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.48	27					10.5	1.1		98.9			600								
28-May-23 14:30 at Depth 9,800 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.41	27					8.7	0.5		99.5			550								

	Daily Drilling Report										University of Utah									
	Well ID: FORGE 16B(78)-32										Well Name: FORGE 16B(78)-32									
	Field: FORGE										Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT									

Report No: 43 Report For 06:00 AM 29-May-23

Mud Consumables										
Item Description	Qty.	Cost	Item Description	Qty.	Cost					
Citric Acid - OTHER	3	---	Engineering - OTHER	2	---					
HIB 19 - GALS	4	---	Lodging - OTHER	1	---					
Pallets/Wraps - OTHER	1	---	ProOne - GALS	30	---					
TORKease Concentrate - GALS	12	---								

Bit/BHA/Workstring Information																		
Depth																		
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
5	3	SANJOAQ	MX-S50R	9.500	9800	0	0.0	0.0	0	0		8	0					
Jets: 24 24 24				Out: 9800		Grade: Cutter: 3 / 3		Dull CT / WT		Wear: A		Brgs: E		Gge: 0		Pull: TD		
Comments: Ran with dumb iron to run Gyro																		
20	1	CANAMER	CCI	8.750	9800	0	0.0	0.0	0	0		400	408	129	126			226
Jets: 12 12 12 12 12 12 12 12				Out:		Grade: Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:		
Comments: New core bit.																		
BHA - No. 22 - BIT, NBS, CORE, STAB, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.84																		

Miscellaneous Drilling Parameters										
Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/					
Hours on BHA:	Since Inspection: 52.5	Total: 52.5	Jars:							
Hours on Casing/Liner:	Rotating: 55 / 0	Tripping: 64 / 0	Wear Bushing Installed							

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information											
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):						
Shaker No 1:	170	170	170	170	Desander:	0	Desilter:	0	Degasser:	0	
Shaker No 2:	170	170	170	170	Centrifuge 1:	6 (Solids Removal)			Centrifuge 2:	6 (Solids Removal)	
Shaker No 3:	170	170	170	170							

Drill Pipe Inventory										
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread	
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH	
5.5	20	54.0	S-135	5.5FH						

Safety Information										
Meetings/Drills	Time	Description								
Safety	45	Two Pre-tour safety meetings held daily with crews. PJSM for making up core BHA.								



First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	43
BOP Test		Crowdynamic Check					
Weather Information							
Sky Condition:	Mostly Clear			Visibility:	10		
Air Temperature:	75 degF			Bar. Pressure:	1009		
Wind Speed/Dir:	3 / SW			Wind Gusts:			



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 44 Report For 06:00 AM 30-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	9817	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7640	Next Casing:		RKB Elevation (ft):	31				
Proposed TD (ft):		Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	17 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 5.68 / 0, Flat 0 / 0, Complete 0 / 0, Total 5.68 / 0 DOL: 44

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 4 / 48 Total: 27 / 324

Safety Summary: No incidents or events reported. 44 days since LTI. Conducted Safety Meeting.

Current Operations: Picking up Core BHA #4.

Planned Operations: Run in hole with BHA #23. Core BHA #4. Core from 9,817' to 9,847'.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	9,800	TRPI	Stage in hole from 8,039' to 9,800' keeping tools cool. Tag bottom at 9,800'. get rotating weight 250K, up weight 380K, down 200K.	
8:00	9:30	1.50	9,800	CIRC	Circulate bottoms up at 9,710'. Drop ball and circulate down.	
9:30	22:15	12.75	9,817	CORE	Cut 8 3/4" core from 9,800' to 9,817'. Pason weight on bit reading 8-9K high. Using Totco with 12-13K wob, 40-50 rpm, 15-23K torque, 300 gpm.	
22:15	23:15	1.00	9,817	CORE	ROP slowing. Perform Pull Test to 425K. Holding. Slack off to neutral point. Zero weight and restart. Pason weight on bit reading right. ROP still slow. Pull up to 430K and broke core.	
23:15	3:00	3.75	9,817	TRPO	Trip out of the hole to 913'. 415K max up weight.	
3:00	4:15	1.25	9,817	BHAOP	Broke out and laid down jars, core barrels and core. Broke out bit.	
4:15	6:00	1.75	9,817	OTHER	Cut 17.5' of core and recovered 15.5'. Cut up core. Discussed coring BHA #4, BHA #23.	

Management Summary

Staged in hole cooling tools from 8,039' to 9,800'. Circulated bottoms up at 9,710'. Dropped ball and circulated down. Cut 8 3/4" core from 9,800' to 9,817'. ROP slowed. Performed Pull test to 425K. OK. Slack off to neutral point. Zero weight and restarted. ROP still slow. Pulled up to 430K and broke core. Tripped out of the hole. Broke out and laid down jars, core barrels and bit. Cut 17.5' of core and recovered 15.5'. Cut up core.

Comments

Fuel on hand 18713 gals.
 Fuel used 1,369 gals.
 Total NPT to date 94.25 HR.
 No H2S today.
 Pason WOB not working correctly during coring.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000		4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750		-3	3,4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%	Dens. Vis PV YP Filt. Cake pH/ES Solids Oil Water Sand LGS Cl Ca CaCl										Gels			Temp		Mud Loss	
	10s	10m	30m	In	Out												
30-May-23 00:30 at Depth 9,800 ft Mud Pits, Type: Low Solids Non-Dispersed																	
8.41	27					8.5			99		500						
29-May-23 14:00 at Depth 9,806 ft Mud Pits, Type: Low Solids Non-Dispersed																	
8.41	27					8.3			99		500						





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 44

Report For 06:00 AM 30-May-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Defoam 14 - GALS	1	---	Engineering - OTHER	2	---
HIB 19 - GALS	4	---	Lodging - OTHER	1	---
ProOne - GALS	245	---	TORKease - GALS	16	---
TORKease Concentrate - GALS	1	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
20	1	CANAMER	CCI	8.750	9800	17	13.75	1.2	4.3	10	40	2	300	285	97	7	12	126	
Jets: 12 12 12 12 12 12 12 12 12					Out: 9817		Grade: Cutter: /		Dull: /		Wear: /		Brgs: /		Gge: /		Pull: PR		
Comments: All bottom cutters missing 9 completely gone																			

BHA - No. 22 - BIT, NBS, CORE, STAB, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.84

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max		
9,800	9,817	1.3	2.5	10	13	39	50	15	23	32	326	300	
Annular Velocity: Drill Collars: 102.4				Drill Pipe: 315.0									

Comments: Core Run from 9,800'

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 250	Pick Up: 380	Slack Off: 200	Drag Avg/Max: 200 / 200
Hours on BHA:	Since Inspection: 66.25	Total: 66.25	Jars: 13.75	
Hours on Casing/Liner:	Rotating: 68.75 / 0	Tripping: 69.75 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed	

Rig Information

Equipment Problems: Pason WOB reading 8-9K high. Attempt to calibrate 3 times. Calling out Pason tech.

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	170	170	200	170	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	170	170	200	170	Centrifuge 1: 8.5 (Solids Removal)		Centrifuge 2: 8.5 (Solids Removal)
Shaker No 3:	170	170	200	170			

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	3	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews. PJSM for making up core BHA.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 44
<input type="checkbox"/> BOP Test	<input type="checkbox"/> Crownamatic Check	

Weather Information

Sky Condition: Mostly sunny	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 1008
Wind Speed/Dir: 12 / SSW	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 45 Report For 06:00 AM 31-May-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	9817	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	7640	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):		Last BOP Test:	27-May-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 5.68 / 0, Flat 0 / 0, Complete 0 / 0, Total 5.68 / 0 DOL: 45

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 4 / 48 Total: 27 / 324

Safety Summary: No incidents or events reported. 45 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping out of the hole with 9-1/2" bit and BHA at 584'.

Planned Operations: Finish tripping out of the hole. Break out and lay down 9-1/2" bit, bit sub and x-over. Make up and trip in hole with 8-3/4" insert bit and BHA. Clean out coring stub. Trip out of the hole.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	9,817	CORE	Break out and lay down core tools.	
8:30	10:00	1.50	9,817	SERV	Service rig and top drive. Work on ST-80.	
10:00	12:00	2.00	9,817	REPR	Make up bit sub and bit. Driller stacked out on pipe rams. Break off bit and bit sub. Lay down 2 bent joints of HWDP.	X
12:00	17:00	5.00	9,817	TRPI	Make up bit sub and 9 1/2" re-run bit. Trip in hole to 9,793' for gyro survey run.	
17:00	18:45	1.75	9,817	CIRC	Circulate to cool hole for gyro run on wireline.	
18:45	1:30	6.75	9,817	SURV	PJSM for running Gyro. Pull up to 9,772'. Rig up wireline unit. Ran Gyro to 7,763'. Pump down to 9,767'. Survey up to 50'. Ran back down to 5,500'. Survey up.	
1:30	2:00	0.50	9,817	CIRC	Circulate and clear floor.	
2:00	6:00	4.00	9,817	TRPO	Trip out of the hole from 9,772' to 584'.	

Management Summary

Broke out and laid down core tools. Made up and tripped in the hole with 9 1/2" bit and BHA to 9,793'. Circulated and cooled hole. Pulled up to 9,772'. Rigged up wireline and ran Gyro to 7,663'. Pumped down to 9,767'. Surveyed up to 50' KB. Rigged down wireline. Circulated and tripped out of the hole to 584'.

Comments

Fuel on hand 18285 gals.
Fuel used 569 gals.
Total NPT to date 96.25 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
30-May-23 20:30 at Depth 9,815 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					8.9	0.5		99.1			500								
30-May-23 14:00 at Depth 9,817 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					8.8	0.6		99.1			500								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Corrosion rings - OTHER	1	---	Engineering - OTHER	2	---



Lime - 50#SK	2	---	Lodging - OTHER	1	---
TORKease - GALS	10	---	Trucking - OTHER	1	---

	Daily Drilling Report		University of Utah		
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32		
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT		

Report No: 45 **Report For 06:00 AM 31-May-23**

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud				Pump	
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
5	4	SANJOAQ	MX-S50R	9.500	9817	0	0.0	0.0	0	0	0	8	600	995	145	159	56	381	
Jets: 24 24 24				Out: 9817		Grade: Cutter: 3 / 3			Dull CT / WT		Wear: A	Brgs: E	Gge: 0	Pull: BHA					
Comments: Used for running wireline Gyro																			
BHA - No. 23 - BIT, BS, XO, 30 HWDP = 924.64																			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 250	Pick Up: 390	Slack Off: 190	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 67.25	Total: 67.25	Jars: 13.75	
Hours on Casing/Liner:	Rotating: 69.75 / 0	Tripping: 78.75 / 0	Wear Bushing Installed	

Rig Information

Equipment Problems: Stacked out top drive on stand of rental heavy weight drill pipe. Laid down 2 bent joints and changed out saver sub.

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):	
Shaker No 1:	170	170	200	170		
Shaker No 2:	170	170	200	170	Centrifuge 1: 24 (Solids Removal)	Centrifuge 2: 24 (Solids Removal)
Shaker No 3:	170	170	200	170		

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	45	Two Pre-tour safety meetings held daily with crews. PJSM for running Gyro
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 45
Accident Description: None reported		
BOP Test	Crownamatic Check	

Weather Information

Sky Condition: Partly cloudy	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 1007
Wind Speed/Dir: 11 / S	Wind Gusts:



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 46 Report For 06:00 AM 01-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	9822	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7647	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	5 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 5.68 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.68 / 74 DOL: 46

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 4 / 48 Total: 27 / 324

Safety Summary: No incidents or events reported. 46 days since LTI. Conducted Safety Meeting.

Current Operations: Picking up BHA #25. Core #4 assembly.

Planned Operations: Strap in hole with Core assembly #4 to verify initial SLM. Core from 9,823' to 9,853'.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	6:30	0.50	9,817	BHAOP	Break off BHA #23 bit sub and bit.	
6:30	7:00	0.50	9,817	BHAOP	Make up BHA #24 consisting of BH 8 3/4" TCI bit and bit sub with float and crow's foot.	
7:00	9:30	2.50	9,817	TRPI	Trip in hole from surface to 4,823'.	
9:30	11:00	1.50	9,817	CUTDL	Cut and slip drilling line.	
11:00	11:30	0.50	9,817	SERV	Check top drive connections.	
11:30	15:00	3.50	9,817	TRPI	Trip in hole from 4,823' to 9,780', performing torque and drag readings every 5 stands.	
15:00	22:00	7.00	9,823	REAM	Wash and ream from 9,780' to 9,823'. Note: Could not see any changes in ROP or torque at bottom. Decision was made to make additional hole to make sure core stub was gone. More cuttings over shakers around 9,817'.	
22:00	23:30	1.50	9,823	CIRC	Pump 50 bbl high visc sweep and clean hole.	
23:30	5:00	5.50	9,823	TRPO	Strap out of the hole from 9,823' to surface. Break out and lay down bit and bit sub.	
5:00	6:00	1.00	9,823	OTHER	Clear floor. Gather coring assembly. Add pipe tally straps. Discrepancy in SLM vs. driller's tally.	

Management Summary

Broke off BHA #23 bit sub and bit. Made up BHA #24 consisting of 8 3/4" TCI bit and bit sub with float and crow's foot. Tripped in hole. Reamed from 9,780' to 9,823'. Pumped 50 bbl high visc sweep and clean hole. Strapped out of the hole from 9,823' to surface. Broke out and laid down bit and bit sub. Discrepancy in SLM vs. driller's tally.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
31-May-23 20:00 at Depth 9,817 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					8.8	0.5		99			500								
31-May-23 14:00 at Depth 9,817 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					8.7	0.5		99			500								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	2	---	HIB 19 - GALS	4	---
Lime - 50#SK	2	---	Lodging - OTHER	1	---





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 46

Report For 06:00 AM 01-Jun-23

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump								
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF

5	4	SANJOAQ	MX-S50R	9.500	9817	0	-20.0	0.0	0	0	0	0	0	0					
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Jets: 24 24 24 Out: 9817 Grade: Cutter: 3 / 3 Dull CT / WT Wear: A Brgs: E Gge: 0 Pull: BHA

Comments: Used for running wireline Gyro

21	1	BAKER	VGD-38CH	8.750	9817	23	73.3	4.0	12	75	19000	8400	600	172	223	52	299	
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Jets: 18 18 18 Out: 9823 Grade: Cutter: 2 / 3 Dull WT / NO Wear: A Brgs: E Gge: 0 Pull: BHA

BHA - No. 24 - BIT, BS, XO, 30 HWDP = 924.64

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	

9,800	9,823	3.0	4.0	12	15	55	90	19,000	21,000	400	400	600
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Annular Velocity: Drill Collars: 128.1 Drill Pipe: 211.7

Comments: Reaming 8-3/4" hole.

Miscellaneous Drilling Parameters

Hook Loads (lbs): Off Bottom Rotate: Pick Up: 389 Slack Off: Drag Avg/Max: /

Hours on BHA: Since Inspection: 74.25 Total: 74.25 Jars: 13.75

Hours on Casing/Liner: Rotating: 76.75 / 0 Tripping: 90.25 / 0 Wear Bushing Installed

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	170	170	200	170	
Shaker No 2:	170	170	200	170	Centrifuge 1: 24 (Solids Removal) Centrifuge 2: 24 (Solids Removal)
Shaker No 3:	170	170	200	170	

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
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Safety 30 Two Pre-tour safety meetings held daily with crews.

First Aid Treatments: 0 Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 46

BOP Test Crownamatic Check

Weather Information

Sky Condition: Mostly clear	Visibility: 10
Air Temperature: 72 degF	Bar. Pressure: 1005
Wind Speed/Dir: 8 / S	Wind Gusts:





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 47 **Report For 06:00 AM 02-Jun-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 9845	Last Casing: 11.750 at 4,837	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 7670	Next Casing: 7.000 at 10,159	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft): 10658	Last BOP Test: 27-May-23	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 22 / 0.0	Next BOP Test: 19-Jun-23	Working Interest:	Totals:		
Average ROP (ft/hr):			Well Cost (\$): ---		

Days (actual / plan): Drilling 5.68 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.68 / 74 **DOL:** 47

Pers/Hrs: **Operator:** 3 / 36 **Contractor:** 14 / 168 **Service:** 6 / 72 **Other:** 4 / 48 **Total:** 27 / 324

Safety Summary: No incidents or events reported. 47 days since LTI. Conducted Safety Meeting.

Current Operations: Cutting 8-3/4" core at 9,845'.

Planned Operations: Core from 9,845' to 9,853'. Pull out of the hole.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:30	1.50	9,823	BHAOP	Pick up coring assembly #4, BHA #25.	
7:30	8:00	0.50	9,823	SERV	Change out dies on ST-80	X
8:00	18:00	10.00	9,823	TRPI	Trip in hole from 76' to 9,814'. SLM while tripping in. Strap OK. 0.58' difference from Pason tally. Lay down 4 bad joints of drill pipe. Pick up new joints. Fill pipe at 3.843'. Stage in hole from 6.000' to core point to cool tools.	
18:00	19:00	1.00	9,823	REAM	Safety ream from 9,814' to 9,823'. Tag bottom.	
19:00	21:30	2.50	9,823	CIRC	Circulate bottoms up. Drop ball and pump down.	
21:30	6:00	8.50	9,833	CORE	Cut 8-3/4" core from 9,823' to 9,845'. ROP 2-3', WOB 7K, RPM 30, TORQ 22K, GPM 300, PSI 300	

Management Summary

Picked up coring assembly #4, BHA #25. Tripped in hole from 76' to 9,814'. SLM while tripping in. Laid down 4 joints of drill pipe with worn hardband. Picked up new joints. Filled pipe at 3.843'. Staged in hole from 6.000' to core point to cool tools. Safety reamed from 9,814' to 9,823'. Tagged bottom. Circulated bottoms up. Dropped ball and pumped down. Cut 8-3/4" core from 9,823' to 9,845'.

Comments

Fuel on hand 16242 gals.
 Fuel used 1077 gals.
 Total NPT to date 96.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss

01-Jun-23 14:00 at Depth 9,823 ft Mud Pits, Type: Low Solids Non-Dispersed

8.40	27			100	0.2	9.2	0.5	0.15	99.35			500	80					74	89	0
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Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	Engineering - OTHER	2	---
HIB 19 - GALS	4	---	Lodging - OTHER	2	---
Poly Vis - 50#SK	1	---	TORKease L - GALS	12	---
Trucking - OTHER	1	---			





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 47

Report For 06:00 AM 02-Jun-23

Bit/BHA/Workstring Information

Depth		This Run		R.O.P.		Mud		Pump												
No Run	Make	Model	Diam In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF			
22	1	CANAMER	CCI-713	8.750	9823	22	8.5	2.6	3.2	30	7	35	21	8	300	290	92	63	11	119
Jets: 14 14 14 14 14 14 14 0				Out:		Grade: Cutter: /		Dull: /		Wear:		Brgs:		Gge:		Pull:				
BHA - No. 25 - BIT, NBS, CORE, STAB, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.84																				

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
9,823	9,845	2.4	3.2	7	8	30	35	21	26	300	300	300	300
Annular Velocity:		Drill Collars:		158.8		Drill Pipe:		158.8					

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 82.75	Total: 82.75	Jars: 22.25		
Hours on Casing/Liner:	Rotating: 87.25 / 0	Tripping: 100.25 / 0	Wear Bushing Installed		

Rig Information

Equipment Problems:
 Location Condition:
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	170	170	200	170	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	170	170	200	170	Centrifuge 1: 24 (Solids Removal)		Centrifuge 2: 24 (Solids Removal)
Shaker No 3:	170	170	200	170			

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 47
BOP Test <input type="checkbox"/> Crownamatic Check <input type="checkbox"/>		

Weather Information

Sky Condition: Partly Cloudy	Visibility: 10
Air Temperature: 74 degF	Bar. Pressure: 1004
Wind Speed/Dir: 9 / S	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 48 Report For 06:00 AM 03-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	9853	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	7670	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	8 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 5.68 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.68 / 74 DOL: 48

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 4 / 48 Other: 3 / 36 Total: 24 / 288

Safety Summary: No incidents or events reported. 48 days since LTI. Conducted Safety Meeting.

Current Operations: Reaming 8-3/4" hole to 9-1/2" hole at 9,828'.

Planned Operations: Finish reaming to 9,853' plus 10 ft of new hole. Pull out of the hole. Trip in hole with 9-1/2" PDC bit and assembly. Drill 9-1/2" hole ahead.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:45	2.75	9,853	CORE	Cut 8-3/4" core from 9,845' to 9,853'. ROP 5-7 fph, WOB 12K, RPM 30-40, TORQ 22K, GPM 300, PSI 300. Performed WOB and Rot step test from 9,848' to 9,853'.	
8:45	9:00	0.25	9,853	CIRC	Circulate partial bottoms up. Break off core. Verify core had broken off.	
9:00	10:00	1.00	9,853	CIRC	Set back on bottom and circulate full bottoms up.	
10:00	16:30	6.50	9,853	TRPO	Trip out of hole from 9,853' to 79'. Lay down a single that was picked up at start of coring.	
16:30	17:00	0.50	9,853	SERV	Repair hydraulic hose on ST-80	
17:00	19:00	2.00	9,853	CORE	Broke out and laid down coring assembly. Cut 30'. Recovered 28.4'.	
19:00	20:00	1.00	9,853	OTHER	Pull wear bushing, grease, and re-install.	
20:00	21:00	1.00	9,853	BHAOP	Made up 9-1/2" insert bit, bit #23 and BHA #26.	
21:00	21:30	0.50	9,853	OTHER	Install turnbuckles on BOP stack.	
21:30	5:00	7.50	9,853	TRPI	Trip in hole from 62' to 9,733'. Performing torque and drag readings every 5 stands.	
5:00	6:00	1.00	9,853	REAM	Safety ream from 9,733' to 9,800'. Ream 8-3/4" hole to 9-1/2" hole from 9,800' to 9,828'.	

Management Summary

Cut 8-3/4" core from 9,845' to 9,853'. Circulated. Broke off core. Verified core had broken off. Circulated bottoms up. Broke out and laid down coring assembly. Cut 30'. Recovered 28.4'. Made up 9-1/2" insert bit, bit #23 and BHA #26. Tripped in hole to 9,733'. Safety reamed from 9,733' to 9,800'. Ream 8-3/4" hole to 9-1/2" hole from 9,800' to 9,828'.

Comments

Fuel on hand 14349 gals.
Fuel used 1119 gals.
Total NPT to date 96.25 HR.
No H2S today.

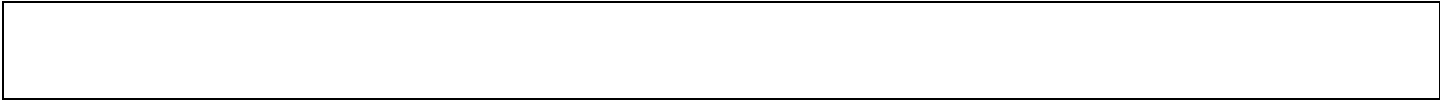
Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%															Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
03-Jun-23 00:30 at Depth 9,830 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27	1	1	100	0.2	8.8	0.6	0.6	98.8			500								
02-Jun-23 14:00 at Depth 9,853 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27	1	1	100	0.2	9.1	0.6	0.6	98.8			500								





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 48

Report For 06:00 AM 03-Jun-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	2	---	HIB 19 - GALS	2	---
Lime - 50#SK	3	---	Lodging - OTHER	1	---
TORKease - GALS	28	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HP	JIF	
22	1	CANAMER	CCI-713	8.750	9823	30	11.25	2.7	7.4	835	2	8300	300	92	63	11	119		
Jets: 14 14 14 14 14 14 0					Out: 9853	Grade: Cutter: /			Dull: /		Wear:	Brgs:	Gge:	Pull:					
Comments: Few chip cutters.																			
23	1	SANJOAQ	XLS30DX	9.500	9853	25	1	25.0	25.0	10	178	19	600	1523	145	159	55	379	
Jets: 24 24 24					Out:	Grade: Cutter: /			Dull: /		Wear:	Brgs:	Gge:	Pull:					
BHA -No. 26 - BIT, BS, RR, MMTR, RR, OTHER, XO, 30 HWDP = 975.53																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
9,845	9,853	5.0	7.4	8	12	30	50	21	23	300	300	300
Annular Velocity:		Drill Collars:		158.8		Drill Pipe:		158.8				
9,800	9,828	25.0	25.0	10	10	40	178	19	21	600	600	1,510
Annular Velocity:		Drill Collars:		245.1		Drill Pipe:		245.1				
Comments: With mud motor.												

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	85.5	Total:	85.5	Jars: 25
Hours on Casing/Liner:	Rotating:	90 / 0	Tripping:	114.25 / 0	Wear Bushing Installed

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	170	170	200	170	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	170	170	200	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	170	170	200	170			

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	3	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:
Days Since LTI:	48	
BOP Test	Crownmatic Check	

Weather Information



Sky Condition: Overcast	Visibility: 10	
Air Temperature: 71 degF	Bar. Pressure: 1008	
Wind Speed/Dir: 6 / SSW	Wind Gusts:	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 49 Report For 06:00 AM 04-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10007	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	7958	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	154 / 3.5	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---	---	
Average ROP (ft/hr):	44.0					Well Cost (\$):	---		

Days (actual / plan): Drilling 5.82 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.82 / 74 DOL: 49

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 4 / 48 Other: 4 / 48 Total: 25 / 300

Safety Summary: No incidents or events reported. 49 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Drilling 9-1/2" hole at 10,007'.

Planned Operations: Drill 9-1/2" hole to 10,250'. Trip out of the hole with directional tools. Trip in the hole with 8-3/4" core assembly.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:


Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	6:30	0.50	9,853	REAM	Ream 8, 3/4" core section from 9,828' to 9,853'. ROP 1-75 fph, WOB 8K-11K, RPM 30, TORQ 22K, GPM 630, PSI 1525.	
6:30	7:00	0.50	9,863	DRIL	Drill 10' of new hole from 9,853' to 9,863'. ROP 25-95 fph, WOB 20K-30K, RPM 40, TORQ 22K, GPM 630, PSI 1525.	
7:00	7:30	0.50	9,863	CIRC	Circulate partial bottoms up and prepare to trip out of hole.	
7:30	16:00	8.50	9,863	TRPO	Trip out of hole from 9,863' to 59'. Lay down 19 joints of drill pipe and 2 joints of HWDP for hardbanding. Pick up new joints.	
16:00	17:00	1.00	9,863	BHAOP	Break out and lay down 9-1/2" insert bit, roller reamer, mud motor, roller reamer and float sub.	
17:00	19:00	2.00	9,863	BHAOP	Make up new 9-1/2" 6 blade PDC bit, bit #24 and BHA #27 consisting of: Mud motor, roller reamer, NM pony collar, NM drill collar, pulse sub, NM drill collar, Black Box, filter sub and float sub. BH 5342357. Test MWD.	
19:00	19:30	0.50	9,863	TRPI	Trip in hole from 142' to 1,169'.	
19:30	20:00	0.50	9,863	SERV	Rig service.	
20:00	21:00	1.00	9,863	TRPI	Trip in hole from 1,169' to 3,059'. Fill pipe.	
21:00	22:40	1.67	9,863	TRPI	Trip in hole from 3,059' to 6,009'.	
22:40	22:50	0.17	9,863	CIRC	Circulate and check tool temperature. Start temperature 238 deg F. End 230 deg F.	
22:50	23:00	0.17	9,863	TRPI	Trip in hole from 6,009' to 6,579'.	
23:00	23:15	0.25	9,863	CIRC	Circulate and check tool temperature. Start temperature 250 deg F. End 245 deg F.	
23:15	23:30	0.25	9,863	TRPI	Trip in hole from 6,579' to 7,054'.	
23:30	23:45	0.25	9,863	CIRC	Circulate and check tool temperature. Start temperature 260 deg F. End 255 deg F.	
23:45	0:00	0.25	9,863	TRPI	Trip in hole from 7,054' to 7,530'.	
0:00	0:15	0.25	9,863	CIRC	Circulate and check tool temperature. Start temperature 270 deg F. End 260 deg F.	
0:15	0:30	0.25	9,863	TRPI	Trip in hole from 7,530' to 8,005'.	
0:30	0:40	0.17	9,863	CIRC	Circulate and check tool temperature. Start temperature 278 deg F. End 275 deg F.	
0:40	0:55	0.25	9,863	TRPI	Trip in hole from 8,005' to 8,575'.	
0:55	1:15	0.33	9,863	CIRC	Circulate and check tool temperature. Start temperature 287 deg F. End 268 deg F.	
1:15	1:30	0.25	9,863	TRPI	Trip in hole from 8,575' to 9,051'.	
1:30	2:00	0.50	9,863	CIRC	Circulate and check tool temperature. Start temperature 292 deg F. End 265 deg F.	
2:00	2:15	0.25	9,863	TRPI	Trip in hole from 9,051' to 9,526'.	
2:15	2:30	0.25	9,863	CIRC	Circulate and check tool temperature. Start temperature 292 deg F. End 275 deg F.	
2:30	3:00	0.50	9,863	TRPI	Trip in hole from 9,526' to 9,863'.	
3:00	6:00	3.00	9,863	DRIL	Drill 9-1/2" hole from 9,863' to 10,007', rotating and sliding. WOB 50K to 55K, RPM 65 to 95, GPM, 650 to 700, Torque 22K to 28K, ROP 25 to 300.	

Management Summary



Reamed 8, 3/4" core section to 9-1/2" from 9,800' to 9,853'. Drilled 10' of new hole to 9,863'. Tripped out of the hole. Laid down 9-1/2" bit and reaming assembly. Made up bit #24 and BHA #27 directional assembly. Test MWD. Tripped in the hole to 6,009'. Staged in hole from 6,009' to 9,863' cooling tools and recording torque and drag every 5 stands. Drilled 9-1/2" hole from 9,863' to 10,007', rotating and sliding. WOB 50K to 55K, RPM 65 to 95, GPM, 650 to 700, Torque 22K to 28K, ROP 25 to 300 fph.

	Daily Drilling Report										University of Utah												
	Well ID: FORGE 16B(78)-32										Well Name: FORGE 16B(78)-32												
	Field: FORGE										Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT												
Report No: 49										Report For 06:00 AM 04-Jun-23													
Comments																							
Fuel on hand 13123 gals. Fuel used 1226 gals. Total NPT to date 96.25 HR. No H2S today.																							
Casing/Tubular Information																							
Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)														
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER															
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER															
Mud Information																							
												Gels			Temp		Mud						
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss			
04-Jun-23 03:00 at Depth 9,853 ft Mud Pits, Type: Low Solids Non-Dispersed																							
8.40	27	1	1	100	0.2	9	0.5	0.05	99			500	120										
03-Jun-23 12:00 at Depth 9,863 ft Mud Pits, Type: Low Solids Non-Dispersed																							
8.40	27	1	1	100	0.2	8.3	0.5	0.39	99.11			500	100						102				
Mud Consumables																							
Item Description						Qty.			Cost			Item Description						Qty.			Cost		
Engineering - OTHER						2			---			HIB 19 - GALS						4			---		
Lodging - OTHER						1			---														
Bit/BHA/Workstring Information																							
Depth						This Run						R.O.P.						Mud Pump					
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF					
23	1SANJOAQ	XLS30DX	9.500	9853	35	2	17.5	95.0	20	35	22	8	630	1550	153	175	64	418					
Jets: 24 24 24					Out: 9863	Grade: Cutter: 1/3			Dull FC/WT	Wear: G	Bgs: E	Gge: 1	Pull: BHA										
Comments: 1/16 under.																							
24	1BAKER	D406VX	9.500	9863	10007	3	50.0	300.0	60	270	22	8	650	2400	170	217	82	480					
Jets: 14 14 14 13 13 13 13 13					Out:	Grade: Cutter: /			Dull /	Wear:	Egs:	Ge:	Pull:										
BHA - No. 27 - BIT, MMTR, RR, PC, DCM, MWD, DCM, 3 OTHER, XO, 30 HWDP = 1060.91																							
Drilling Parameters																							
Depth (ft)		ROP (ft/hr)				WOB (lbs)				RPM				Torque (ft lbs)				Flow (gals/min)		Pressure (psi)			
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max						
9,853	9,863	35.0	95.0	12	30	35	40	16	22	630	630	1,525											
Annular Velocity: Drill Collars: 257.4				Drill Pipe: 257.4																			
Comments: Ream 8-3/4" to 9.5" plus 10' of new hole.																							
9,863	10,007	50.0	300.0	55	65	270	275	24	29	650	700	2,900											
Annular Velocity: Drill Collars: 265.5				Drill Pipe: 265.5																			
Comments: Rotate and sliding.																							
Miscellaneous Drilling Parameters																							
Hook Loads (lbs):				Off Bottom Rotate: 250				Pick Up: 380				Slack Off: 190				Drag Avg/Max: 75 / 180							
Hours on BHA:				Since Inspection: 90.5				Total: 90.5				Jars:											
Hours on Casing/Liner:				Rotating: 95 / 0				Tripping: 126.25 / 0				<input checked="" type="checkbox"/> Wear Bushing Installed											
Rig Information																							
Equipment Problems:																							
Location Condition:																							



Transport:							
Solids Control Information							
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	170	170	200	170	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	170	170	200	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	170	170	200	170			

	Daily Drilling Report		University of Utah
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 49	Report For 06:00 AM 04-Jun-23
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Drill Pipe Inventory									
DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information			
Meetings/Drills	Time	Description	
Safety	30	Two Pre-tour safety meetings held daily with crew	
First Aid Treatments:		Medical Treatments:	Lost Time Incidents:
			Days Since LTI: 49
<input type="checkbox"/> BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check	

Weather Information			
Sky Condition: Overcast	Visibility: 10		
Air Temperature: 72 degF	Bar. Pressure: 1008		
Wind Speed/Dir: 14 / SW	Wind Gusts:		



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 50 Report For 06:00 AM 05-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10250	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8089	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	243 / 2.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):	121.5					Well Cost (\$):	---		

Days (actual / plan): Drilling 5.91 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.91 / 74 DOL: 50

Pers/Hrs: Operator: 3 / 12 Contractor: 14 / 168 Service: 4 / 48 Other: 6 / 72 Total: 27 / 300

Safety Summary: No incidents or events reported. 50 days since LTI. Conducted Safety Meeting.

Current Operations: Circulating bottoms up.

Planned Operations: Drop ball and pump down. Core to 10,280'. Break off core and TOO. Pick up new core barrels and bit and TIH.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	10,250	DRIL	Rotate/Slide from 10,007' to 10,250' performing step tests in rotation for ROT 30-90 rpm, WOB 45K-62K, GPM 550-700. Slide f/ 9,863' t/ 9,885' Slide f/ 9,912' t/ 9,922' Slide f/ 9,975' t/ 10,000' 57' of 387' or 14.7%.	
8:00	9:00	1.00	10,250	CIRC	Circulate bottoms up before trip out of hole @10,250' for core run.	
9:00	15:00	6.00	10,250	TRPO	Trip out of the hole from 10,250' to 142'. Racking drill pipe to swap top half with bottom for wear. P/U 460K S/O 175K ROT 255K.	
15:00	16:00	1.00	10,250	BHAOP	Lay down directional BHA and bit.	
16:00	16:30	0.50	10,250	SERV	Service rig and top drive. Held PJSM with Canamera.	
16:30	18:00	1.50	10,250	BHAOP	Make up 8-3/4" core bit #5, bit #25 and BHA # 28.	
18:00	20:30	2.50	10,250	TRPI	Trip in hole from 77' to 4,804'. Fill pipe at 3,000'.	
20:30	23:00	2.50	10,250	CUTDL	Slip and cut 100' of drill line. Adjusted brakes.	
23:00	4:30	5.50	10,250	TRPI	Trip in hole from 4,804 to 9,554'. Cool tools every 5 stands. Wash down from 9,554' to 10,230'.	
4:30	5:30	1.00	10,250	REAM	Safety ream from 10,230' to 10,250'. Tag bottom.	
5:30	6:00	0.50	10,250	CIRC	Start circulating bottoms up.	

Management Summary

Drilled 9 1/2" hole from 10,007 to 10,250'. Circulated bottoms up and TOO from 10,250' to 142'. Laid down directional BHA and bit. Made up 8-3/4" core bit #5, bit #25 and BHA # 28. Tripped in hole to 4,804'. Slipped and cut line. Tripped in hole to 9,554' circulating every 5 stands to cool tools. Washed down from 9,554' to 10,230'. Safety reamed from 10,230' to 10,250'. Tagged bottom at 10,250'. Circulated.

Comments

Fuel on hand 11766 gals.
Fuel used 1357 gals.
Total NPT to date 96.25 HR.
No H2S today.
Last survey: 10,165' MD, 8,054 TVD, 65.97° INC, 103.6° AZI, 37' low and 72' left of the plan.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section (ft)	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 50

Report For 06:00 AM 05-Jun-23

Mud Information

%																	Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss		
05-Jun-23 05:00 at Depth 9,880 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.40	27	1	1	100	0.2	8.8	0.5	0.25	99.25			500	120					80	121			
04-Jun-23 11:00 at Depth 10,250 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.41	27	1	1	100	0.2	9.2	0.55	0.2	99.25			550	100									

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	Engineering - OTHER	2	---
HIB 19 - GALS	5	---	Lodging - OTHER	1	---

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump								
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
24	BAKER	D406VX	9.500	9863	387		496.8	320.0	60	35	2	8600	1880	157	185		6	409
Jets: 14 14 14 13 13 13 13 13 13		Out: 10250		Grade: Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:				
25	CANAMER	CCI-713	8.750	10250	0	0	0.0	0.0	0	30	2	8330	290	101	76		13	144
Jets: 14 14 14 14 14 14 14		Out:		Grade: Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:				

Comments: Core from 10,250'

BHA - No. 28 - BIT, NBS, CORE, STAB, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
10,007	10,250	175.0	250.0	60	62	85	90	25	2	600	700	2,880

Annular Velocity: Drill Collars: 245.1 Drill Pipe: 245.1

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	255	Pick Up:	460	Slack Off:	175	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	93.5	Total:	93.5	Jars:			
Hours on Casing/Liner:	Rotating:	98 / 0	Tripping:	138.25 / 0	Wear Bushing Installed			

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5'	365	24.7	S-135	5.5FH	5.5'	3	71.0	S-135	5.5FH
5.5'	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crew					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	50
BOP Test		Crownamatic Check					

Weather Information

Sky Condition:	Mostly clear	Visibility:	10
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Air Temperature: 75 degF	Bar. Pressure: 1013	
Wind Speed/Dir: 0 / WNW	Wind Gusts: 5	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 51 **Report For 06:00 AM 06-Jun-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 10256	Last Casing: 11.750 at 4,837	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 8094	Next Casing: 7.000 at 10,159	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft): 10658	Last BOP Test: 27-May-23	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 6 / 0.0	Next BOP Test: 19-Jun-23	Working Interest:	Totals:		
Average ROP (ft/hr):			Well Cost (\$): ---		

Days (actual / plan): Drilling 5.91 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.91 / 74 **DOL:** 51

Pers/Hrs: **Operator:** 3 / 36 **Contractor:** 14 / 168 **Service:** 6 / 72 **Other:** 4 / 48 **Total:** 27 / 324

Safety Summary: No incidents or events reported. 51 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping in the hole with 8-3/4" Tricone bit at 8,527'.

Planned Operations: Ream 8-3/4" hole from 10,250' to 10,256'. Drill core stub. Drill 7' of new hole to 10,263'. Trip out of the hole. Pick up core bit #6. TIH. Core from 10,263' to 10,293'.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	10,250	CORE	Circulate hole. Drop ball and pump to bottom.	
7:00	15:30	8.50	10,256	CORE	Coring 8 3/4" from 10,250' to 10,256'. 8K-13K WOB, 35 RPM, 300 GPM, 23K TORQ, 0.7 FPH. P-rate dropped off.	
15:30	20:30	5.00	10,256	TRPO	Trip out of the hole from 10,256' to 76'. Pulled 410K coming off bottom.	
20:30	22:00	1.50	10,256	BHAOP	Lay down core barrels. NOTE: Top swivel connection above core barrel was unscrewed. Break off bit. Lay down coring bit # 5, BHA #28. Cut 6.6'. Re-cover 5.5'.	
22:00	0:00	2.00	10,256	REPR	Change out 2 transmissions and 1 hydraulic ram on ST-80.	X
0:00	0:30	0.50	10,256	BHAOP	Make up 8-3/4" TCI bit #26 and BHA #29.	
0:30	6:00	5.50	10,256	TRPI	Trip in the hole 8,527'. Performing torque and drag readings every 5 stands.	

Management Summary

Circulated hole. Dropped ball and pumped down. Cored 8 3/4" from 10,250' to 10,256'. ROP slowed. Tripped out of the hole. Laid down core barrels. NOTE: Top swivel connection above core barrel was unscrewed. Broke off bit. Laid down core bit # 5, BHA #28. Cut 6.6'. Recovered 5.5'. Made up 8-3/4" TCI bit #26 and BHA #29. Tripped in the hole to 8,527' recording torque and drag values every 5 stands.

Comments

Fuel on hand 18337 gals.
 Fuel used 1064 gals.
 Total NPT to date 98.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
05-Jun-23 14:00 at Depth 10,255 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.45	27	1	1	100	0.25	9.3	0.55		99.3			500						71	81	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	Corrosion rings - OTHER	1	---
Engineering - OTHER	2	---	Lodging - OTHER	1	---
TORKease - GALS	1	---	TORKease Concentrate - GALS	12	---





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 51

Report For 06:00 AM 06-Jun-23

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud		Pump							
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
25	1	CANAMER	CCI-713	8.750	10250	6	8.5	0.7	2.6	13	30	23	8	300	300	92	63	11	119

Jets: 14 14 14 14 14 14 14 Out: 10256 Grade: Cutter: / Dull: / Wear: Brgs: Gge: Pull:

Comments: Core from 10,250'

Missing 4 out of the 7 gauge cutters.

26	1	SANJOAQ	EP4900	8.750	10256	0	0.0	0.0	0	0	0	8	600	344	145	159	55	379
----	---	---------	--------	-------	-------	---	-----	-----	---	---	---	---	-----	-----	-----	-----	----	-----

Jets: 24 24 24 Out: Grade: Cutter: / Dull: / Wear: Brgs: Gge: Pull:

BHA - No. 28 - BIT, NBS, CORE, STAB, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
10,250	10,280	0.7	2.6	10	12	33	60	19	25	300	338	300

Annular Velocity: Drill Collars: Drill Pipe: 158.8

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	258	Pick Up:	410	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	102	Total:	102	Jars:		
Hours on Casing/Liner:	Rotating:	106.5 / 0	Tripping:	144.25 / 0	Wear Bushing Installed		

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	3	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crew					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	51
<input type="checkbox"/> BOP Test		<input type="checkbox"/> Crownamatic Check					

Weather Information

Sky Condition:	Partly cloudy	Visibility:	10
Air Temperature:	77 degF	Bar. Pressure:	1011
Wind Speed/Dir:	8 / N	Wind Gusts:	



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 52 Report For 06:00 AM 07-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10268	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8098	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	12 / 0.5	Next BOP Test:	19-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):	24.0					Well Cost (\$):			

Days (actual / plan): Drilling 5.93 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.93 / 74 DOL: 52

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 6 / 72 Total: 29 / 348

Safety Summary: No incidents or events reported. 52 days since LTI. Conducted Safety Meeting.

Current Operations: Coring at 10,268'.

Planned Operations: Continue coring 8-3/4" hole.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	10,256	TRPI	Trip in hole from 8,527' to 10,250', recording torque and drag every 5 stands.	
7:00	7:30	0.50	10,256	REAM	Ream 8 3/4" core hole from 10,250' to 10,256'.	
7:30	8:00	0.50	10,264	DRIL	Drill 8' of new 8 3/4" hole from 10,256' to 10,264' to clean bottom and create a pilot hole for next core run.	
8:00	9:00	1.00	10,264	CIRC	Circulate, build, and pump sweep to clean bottom of hole. Circulate bottoms up.	
9:00	14:30	5.50	10,264	TRPO	Trip out of hole from 10,264' to BHA. Lay down bit, bit sub and crossover.	
14:30	16:00	1.50	10,264	CORE	Make up 9 blade core bit CCI 3409-05, bit #27 and 4 stabilizer core assembly, BHA #30.	
16:00	0:00	8.00	10,264	TRPI	Trip in the hole to 10,234' with core assembly. Fill pipe at 3,091'. Cool tools every 5 stands after 5,000'. Wash down from 9,074' to 10,234'. Safety ream from 10,234' to 10,264'. Tag bottom.	
0:00	1:45	1.75	10,264	CIRC	Circulate bottoms up. Drop ball and pump down.	
1:45	3:00	1.25	10,264	OTHER	Performed RPM step test of bottom. RPM: 40,45,50,55,60 and back to 30.	
3:00	6:00	3.00	10,268	CORE	Coring 8 3/4" from 10,264' to 10,268'. 8K-13K WOB, 50 RPM, 400 GPM, 22K TORQ, 1.3 ROP. 500 SPP.	

Management Summary

Tripped in hole from 8,527' to 10,250', Reamed 8 3/4" core hole from 10,250' to 10,256'. Drilled 8' of new 8 3/4" hole from 10,256' to 10,264' for coring assembly. Pumped high viscosity sweep to clean hole. Tripped out of the hole. Made up 9 blade core bit. Bit #27 and BHA #30. Trip in the hole to 10,234' with core assembly cooling tools. Safety reamed from 10,234' to 10,264'. Tagged bottom. Circulated bottoms up. Dropped ball and pumped down. Performed RPM step test. Cored 8 3/4" hole from 10,264' to 10,268'.

Comments

Fuel on hand 17158 gals.
 Fuel used 1179 gals.
 Total NPT to date 98.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
06-Jun-23 14:00 at Depth 10,264 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27				0.2	9	0.7		99.2			500						88	112	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 52

Report For 06:00 AM 07-Jun-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	2	---	HIB 19 - GALS	4	---
Lodging - OTHER	1	---	Poly Vis - 50#SK	2	---
Xanthan Gum - 50#SK	2	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump								
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
26	1	SANJOAQ	EP4900	8.750	10256	8	1	8.0	25.0	30	85	14	8508	1050	123	114	34	272
Jets: 24 24 24		Out: 10256			Grade: Cutter: 0 / 0		Dull NO / NO		Wear: A		Brgs: 0		Gge: 0		Pull: TD			
27	1	CANAMER	CCI913	8.750	10264	4	3	1.3	4.0	10	35	20	8400	550	129	125	29	225
Jets: 12 12 12 12 12 12 12 12 12		Out:			Grade: Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:			

Comments: Core bit

BHA - No. 30 - BIT, NBS, CORE, STAB, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
10,256	10,264	20.0	26.0	30	32	86	90	16	18	615	615	1,050
Annular Velocity:		Drill Collars:		325.5		Drill Pipe:		325.5				
Comments: 8' of new hole fore core pilot hole.												
10,264	10,268	1.0	4.0	10	12	35	50	20	21	400	400	550
Annular Velocity:		Drill Collars:		211.7		Drill Pipe:		211.7				
Comments: Core												

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	250	Pick Up:	410	Slack Off:	200	Drag Avg/Max:	75 / 160
Hours on BHA:	Since Inspection:	103	Total:	103	Jars:			
Hours on Casing/Liner:	Rotating:	107.5 / 1	Tripping:	156.25 / 12	<input checked="" type="checkbox"/>	Wear Bushing Installed		

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crew					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	52
<input type="checkbox"/> BOP Test	<input type="checkbox"/> Crownamatic Check						

Weather Information

Sky Condition:	Overcast	Visibility:	10
Air Temperature:	83 degF	Bar. Pressure:	1001
Wind Speed/Dir:	22 / SSW	Wind Gusts:	25





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 53 Report For 06:00 AM 08-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10274	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8102	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	6 / 0.5	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):	12.0					Well Cost (\$):	---		

Days (actual / plan): Drilling 5.95 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.95 / 74 DOL: 53

Pers/Hrs: Operator: 3 / 36 Contractor: 18 / 216 Service: 6 / 72 Other: 10 / 120 Total: 37 / 444

Safety Summary: No incidents or events reported. 53 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping out of the hole at 5,074'.

Planned Operations: Finish tripping out of the hole. Make up and trip in the hole with 8-3/4" coring assembly. Core from 10,274' to 10,304'.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	11:30	5.50	10,271	CORE	Core 8 3/4" hole from 10,268' to 10,271'. 12K-21K WOB, 35 RPM, 17K-22K TORQ, 400 GPM, 0.2-1.9 fph. Core stopped advancing.	
11:30	16:30	5.00	10,271	TRPO	Trip out of the hole from 10,271' to 76'.	
16:30	18:30	2.00	10,271	BHAOP	Lay down core assembly. 7.8' of core cut, 4.5' of core recovered.	
18:30	19:00	0.50	10,271	BHAOP	Make up 8-3/4" re-run TCI bit #26 and BHA #31.	
19:00	21:00	2.00	10,271	TRPI	Trip in hole from 77' to 4,830'. Fill pipe at 3,019'	
21:00	22:30	1.50	10,271	CUTDL	Slip and cut 110' of drill line.	
22:30	1:30	3.00	10,271	TRPI	Trip in the hole to 10,246' Fill pipe at 6,059', 9,013' & 10,246'.	
1:30	2:00	0.50	10,271	DRIL	Safety ream from 10,246' to 10,269'. Drill out stump from 10,269' to 10,272' and 2' of new hole to 10,274'.	
2:00	3:00	1.00	10,271	CIRC	Pump 50 bbl high visc sweep and circulate bottoms up.	
3:00	6:00	3.00	10,271	TRPO	Trip out of the hole from 10,274' to 5,074'. Coming out on different break.	

Management Summary

Core 8 3/4" hole from 10,268' to 10,271'. ROP stopped. Tripped out of the hole. Laid down core assembly. 7.8' of core cut, 4.5' of core recovered. Made up 8-3/4" re-run TCI bit #26 and BHA #31. Tripped in hole from 77' to 4,830'. Slipped and cut 110' of drill line. Tripped in the hole to 10,246'. Safety reamed from 10,246' to 10,269'. Drilled out stump from 10,269' to 10,272' and 2' of new hole to 10,274'. Pumped 50 bbl high viscosity sweep and circulated bottoms up. Tripped out of the hole from 10,274' to 5,074'.

Comments

Fuel on hand 15752 gals.
 Fuel used 1406 gals.
 Total NPT to date 98.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
07-Jun-23 12:30 at Depth 10,271 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					9.3	0.65		99.2			550								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	Engineering - OTHER	2	---



HIB 19 - GALS	8	---	Lodging - OTHER	1	---
Pallets/Wraps - OTHER	1	---	Poly Vis - 50#SK	1	---
TORKease - GALS	6	---	TORKease L - GALS	12	---

	Daily Drilling Report		University of Utah		
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32		
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT		

Report No: 53 **Report For 06:00 AM 08-Jun-23**

Bit/BHA/Workstring Information

Depth	No Run	Make	Model	Diam In	This Run			R.O.P.			Mud Pump								
					Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
26	2	SANJOAQ	EP4900	8.750	10271	2	0.5	10.0	14.0	30	85	17	8	600	1000	145	159	55	379
Jets: 24 24 24					Out:	Grade: Cutter: /			Dull: /			Wear:	Brgs:	Gge:	Pull:				
27	1	CANAMER	CCI 913	8.750	10264	11	8.5	1.3	1.9	16	35	21	8	400	575	129	125	29	225
Jets: 12 12 12 12 12 12 12 12 12					Out: 10271	Grade: Cutter: /			Dull: /			Wear: N	Brgs:	Gge:	Pull: PR				

Comments: Core bit. Wear on nose cutters.

BHA -No. 31 - BIT, BS, XO, 30 HWDP = 924.24

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
10,268	10,271	0.5	1.9	13	21	35	35	17	21	400	400	600
Annular Velocity: Drill Collars:				355.7		Drill Pipe:						211.7
Comments: Core 8-3/4"												
10,271	10,274	10.0	15.0	25	30	80	85	16	17	600	600	1,000
Annular Velocity: Drill Collars:				317.5		Drill Pipe:						317.5
Comments: Drill out core stump and 2' of new hole.												

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	255	Pick Up:	430	Slack Off:	185	Drag Avg/Max:	75 / 175
Hours on BHA:	Since Inspection:	107	Total:	107	Jars:			
Hours on Casing/Liner:	Rotating:	111.5 / 1	Tripping:	166.25 / 12	Wear Bushing Installed			

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1: 12 (Solids Removal)			Centrifuge 2: 12 (Solids Removal)		
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 53
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Partly cloudy	Visibility: 10
Air Temperature: 78 degF	Bar. Pressure: 1005
Wind Speed/Dir: 20 / SW	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 54 Report For 06:00 AM 09-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10274	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8102	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):	---					Well Cost (\$):	---

Days (actual / plan): Drilling 5.95 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.95 / 74 DOL: 54

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 4 / 48 Other: 4 / 48 Total: 25 / 300

Safety Summary: No incidents or events reported. 54 days since LTI. Conducted Safety Meeting.

Current Operations: Waiting on dynamatic from Vernal.

Planned Operations: Replace dynamatic. Trip in the hole from 4,808' to bottom with 8-3/4" coring assembly. Core from 10,274' to 10,304'.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:30	3.50	10,274	TRPO	Trip out of the hole from 5,074' with BHA #31, cleanout run for coring. Break off bit and bit sub.	
9:30	11:00	1.50	10,274	CORE	Make up core assembly BHA #32.	
11:00	13:30	2.50	10,274	TRPI	Trip in the hole to 2,799' and fill pipe, trip in the hole to 4,985' and install rotating head.	
13:30	14:00	0.50	10,274	SERV	Service rig and top drive.	
14:00	14:30	0.50	10,274	TRPI	Trip in the hole to 5,534'.	
14:30	16:00	1.50	10,274	REPR	Bearing housing on dynamatic split apart. Wait on Frontier Drilling decision on how to proceed.	X
16:00	17:00	1.00	10,274	TRPO	Trip out of the hole to 4,808'. Inside the shoe.	
17:00	6:00	13.00	10,274	REPR	Waiting on dynamatic from Vernal. Rig down and prep dynamatic for removal. Rig down gas buster. Clean rig. Unload separator for flow testing.	X

Management Summary

Tripped out of the hole from 5,074' with BHA #31. Laid down bit and bit sub. Made up core assembly BHA #32. Tripped in the hole to 2,799' and filled pipe. Tripped in the hole to 5,534'. Bearing housing on dynamatic split apart. Tripped out of the hole to 4,808'. Waited on dynamatic from Vernal.

Comments

Fuel on hand 14690 gals.
 Fuel used 1006 gals.
 Total NPT to date 106.75 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
09-Jun-23 02:00 at Depth 10,270 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					9.1	0.65		99.3			550								
08-Jun-23 14:00 Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27					9	0.65		99.3			550								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	2	---	HIB 19 - GALS	2	---



Lodging - OTHER	1	---	Poly Vis - 50#SK	2	---
-----------------	---	-----	------------------	---	-----

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 54 **Report For 06:00 AM 09-Jun-23**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam In	This Run			R.O.P.			Mud		Pump		J. Vel	P. Drp	HHP	JIF
					Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press				
26	2	SANJOAQ	EP4900	8.750	10271	20.5	0.0	0.0	30	85	14	0	0					
Jets: 24 24 24					Out: 10274	Grade: Cutter: 1 / 1			Dull: NO / NO	Wear:	Brgs: 1	Gge: 0	Pull: TD					
28	1	CANAMER	CCI-713	8.750	10274	0	0.0	0.0	0	0		8270	100	82	51			97
Jets: 14 14 14 14 14 14 14					Out:	Grade: Cutter: /			Dull: /	Wear:	Brgs:	Gge:	Pull:					

Comments: Core bit CCI-713, BHA

BHA - No. 32 - BIT, NBS, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 107	Total: 107	Jars:	
Hours on Casing/Liner:	Rotating: 111.5 / 1	Tripping: 172.75 / 12	Wear Bushing Installed	

Rig Information

Equipment Problems: Bearing housing on Dynamatic is cracked. Bearing is making noise.

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top				Middle 1				Middle 2				Bottom				Equipment Usage (Hrs):		
	Shaker No 1:	Shaker No 2:	Shaker No 3:		Shaker No 1:	Shaker No 2:	Shaker No 3:		Shaker No 1:	Shaker No 2:	Shaker No 3:		Shaker No 1:	Shaker No 2:	Shaker No 3:	Desander:	Desilter:	Degasser:	
	170	170	200	170	170	170	200	170	170	170	200	170	170	170	200	0	0	0	
													Centrifuge 1: 12 (Solids Removal)	Centrifuge 2: 12 (Solids Removal)					

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 54
BOP Test		Dynamatic Check

Weather Information

Sky Condition: Partly Cloudy	Visibility: 10
Air Temperature: 77 degF	Bar. Pressure: 1008
Wind Speed/Dir: 15 / SSW	Wind Gusts: 20





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 55 Report For 06:00 AM 10-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10275	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8103	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	1 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 5.95 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.95 / 74 DOL: 55

Pers/Hrs: Operator: 3 / 36 Contractor: 16 / 168 Service: 6 / 72 Other: 4 / 48 Total: 29 / 324

Safety Summary: No incidents or events reported. 55 days since LTI. Conducted Safety Meeting.

Current Operations: Coring 8-3/4" hole at 10,275'.

Planned Operations: Core 8-3/4" hole to 10,304'. Trip out of the hole.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	16:30	10.50	10,274	REPR	Wait on Dynamatic from Vernal, UT. Service and inspect drawworks.	X
16:30	21:30	5.00	10,274	REPR	Change out Dynamatic with Frontier Drilling and R.W. Jones Trucking crane.	X
21:30	3:15	5.75	10,274	TRPI	Trip in the hole with 8-3/4" coring assembly from 4,808' to 8,989'. Cool tools every 5 stands. Wash down from 8,989' to 10,230'. Safety ream from 10,230' to 10,274'. Tag bottom. Pick up 10' and tag bottom again.	
3:15	5:00	1.75	10,274	CIRC	Circulate bottoms up. Drop ball and pump down.	
5:00	6:00	1.00	10,274	CORE	Core 8-3/4" hole from 10,274' to 10,275'.	

Management Summary

Waited on Dynamatic. Changed out Dynamatic. Tripped in the hole with 8-3/4" coring assembly from 4,808' to 8,989'. Cooled tools every 5 stands. Washed down from 8,989' to 10,230'. Safety reamed from 10,230' to 10,274'. Tagged bottom. Circulated bottoms up. Dropped ball and pumped down.

Comments

Fuel on hand 13709 gals.
 Fuel used 670 gals.
 Total NPT to date 120.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000		4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750		3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	Gels			Temp		Mud Loss	
																10s	10m	30m	In	Out		
	10-Jun-23 02:00 at Depth 10,274 ft Mud Pits, Type: Low Solids Non-Dispersed																					
	8.40	27					9.1	0.6		99.35			550									
	09-Jun-23 11:30 Mud Pits, Type: Low Solids Non-Dispersed																					
	8.40	27					9.4	0.6		99.35			550									

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	Engineering - OTHER	2	---
HIB 19 - GALS	4	---	Lodging - OTHER	1	---





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 55

Report For 06:00 AM 10-Jun-23

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud		Pump			
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
28	1	CANAMER	CCI-713	8.750	10274	1	1	1.0	1.5	3	22	2	8	400	458	122	112	26	212
Jets: 14 14 14 14 14 14 14				Out:		Grade: Cutter: /		Dull: /		Wear:		Brgs:		Gge:		Pull:			
Comments: Core bit CCI-713, BHA																			
BHA - No. 32 - BIT, NBS, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
10,274	10,275	1.0	1.0	3	5	20	25	25	26	400	400	458
Annular Velocity: Drill Collars:				355.7		Drill Pipe:		211.7				
Comments: Coring												

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	255	Pick Up:	450	Slack Off:	248	Drag Avg/Max:	/ 195
Hours on BHA:	Since Inspection:	108	Total:	108	Jars:			
Hours on Casing/Liner:	Rotating:	112.5 / 1	Tripping:	178.75 / 12	Wear Bushing Installed			

Rig Information

Equipment Problems:	Waiting on replacement Dynamatic from Vernal, UT.		
Location Condition:			
Transport:			

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	3	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crew					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	55
BOP Test	Crownamatic Check						

Weather Information

Sky Condition:	Mostly Clear	Visibility:	10
Air Temperature:	75 degF	Bar. Pressure:	1010
Wind Speed/Dir:	5 / SSW	Wind Gusts:	8





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 56 Report For 06:00 AM 11-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10304	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8123	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	29 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):	---					Well Cost (\$):	---

Days (actual / plan): Drilling 5.95 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.95 / 74 DOL: 56

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 4 / 48 Other: 1 / 12 Total: 22 / 264

Safety Summary: No incidents or events reported. 56 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping out of the hole at 8,330' with coring assembly # 7.

Planned Operations: Finish tripping out of the hole. Lay down core and coring assembly. Make up and trip in hole with 8-3/4" directional assembly. Drill ahead to next core point.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	22:00	16.00	10,290	CORE	Coring 8 3/4" hole from 10275' to 10290'. 5K-10K WOB, 30-50 RPM, 20k-23K TORQ, 365-380 GPM, 1.2 FPH	
22:00	4:30	6.50	10,304	CORE	Coring 8 3/4" hole from 10290' to 10304'. 16K-19K WOB, 50 RPM, 20k-23K TORQ, 380 GPM, 2.3 FPH.	
4:30	5:00	0.50	10,304	CIRC	Circulate partial bottoms up. Break off core. Verify core had broken off. Note: No overpull when breaking off core. 420K max over pull.	
5:00	6:00	1.00	10,304	TRPO	Trip out of the hole from 10,304' to 8,330'.	

Management Summary

Cored 8 3/4" hole from 10275' to 10304'. Cored 30' total. Circulated partial bottoms up. Broke off core. Verify core had broken off by slacking off to bottom and tagging no stump. Note: No over pull when breaking off core. Tripped out of the hole from 10,304' to 8,330'.

Comments

Fuel on hand 15229 gals.
Fuel used 1533 gals.
Total NPT to date 120.25 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
11-Jun-23 02:00 at Depth 10,274 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27				0.25	9.4	0.6		99.4			550								
10-Jun-23 13:00 at Depth 10,283 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27				0.2	9.5	0.55		99.4			500								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	Engineering - OTHER	2	---
HIB 19 - GALS	4	---	Lodging - OTHER	1	---
TORKease - GALS	3	---	TORKease Concentrate - GALS	16	---





	Daily Drilling Report										University of Utah									
	Well ID: FORGE 16B(78)-32										Well Name: FORGE 16B(78)-32									
	Field: FORGE										Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT									

Report No: 56 **Report For 06:00 AM 11-Jun-23**

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud Pump					
No	Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
28	1	CANAMER	CCI-713	8.750	10274	30	24	1.2	5.0	15	40	22	8	380	470	116	101	22	192
Jets: 14 14 14 14 14 14 14					Out:	Grade: Cutter: /			Dull: /			Wear:	Brgs:	Gge:	Pull:				
Comments: Core bit CCI-713, BHA																			
BHA - No. 32 - BIT, NBS, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
10,275	10,290	1.5	2.8	8	10	35	50	21	23	365	385	520	
Annular Velocity: Drill Collars:				346.8		Drill Pipe:				201.1			
Comments: Coring													
10,290	10,304	1.5	5.0	19	23	50	50	22	23	380	380	512	
Annular Velocity: Drill Collars:				361.0		Drill Pipe:				201.1			
Comments: Coring													

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	255	Pick Up:	420	Slack Off:	185	Drag Avg/Max:	/ 165	
Hours on BHA:	Since Inspection:	131	Total:	131	Jars:				
Hours on Casing/Liner:	Rotating:	135.5 / 1		Tripping:	179.75 / 12		<input checked="" type="checkbox"/> Wear Bushing Installed		

Rig Information

Equipment Problems:			
Location Condition:			
Transport:	W/B / F/F / W/C		

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1: 24 (Solids Removal)			Centrifuge 2: 24 (Solids Removal)		
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew. Securing loads.
First Aid Treatments:	0	Medical Treatments:
		0
Lost Time Incidents:	0	Days Since LTI:
		56
BOP Test	Crownamatic Check	

Weather Information

Sky Condition:	Visibility:	10
Air Temperature:	Bar. Pressure:	1007
Wind Speed/Dir:	Wind Gusts:	
6 / SW		





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 57

Report For 06:00 AM 12-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10430	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8162	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	---
Hole Made (ft) / Hrs:	126 / 0.75	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):	168.0					Well Cost (\$):	---		

Days (actual / plan):	Drilling 5.98 / 22,	Flat 0 / 0,	Complete 0 / 52,	Total 5.98 / 74	DOL:	57
Pers/Hrs:	Operator: 3 / 36	Contractor: 14 / 168	Service: 4 / 48	Other: 2 / 24	Total:	23 / 276

Safety Summary: No incidents or events reported. 57 days since LTI. Conducted Safety Meeting.

Current Operations: Picking up core barrels.

Planned Operations: Trip in the hole with core assembly #8, BHA #34, 9 blade and core from 10,430' to 10,460'.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	10:30	4.50	10,304	TRPO	Trip out of the hole with core assembly, BHA #32 from 8,330' to 76'.	
10:30	12:00	1.50	10,304	BHAOP	Lay down core assembly, break off bit. All three stabilizers measured 8 1/4" diameter. 30' of core cut, 27.91' of core recovered.	
12:00	13:30	1.50	10,304	BHAOP	Pick up BHA #33 consisting of new TKC 63, 8-3/4" bit, 8 1/2" NB spiral stabilizer, motor, and FG roller reamer.	
13:30	15:00	1.50	10,304	TRPI	Trip in the hole from 63' to 4,800'.	
15:00	15:30	0.50	10,304	SERV	Service rig and top drive.	
15:30	16:00	0.50	10,304	TRPI	Trip in the hole from 4,800' to 6,026'.	
16:00	16:30	0.50	10,304	CIRC	Circulate to cool motor at 6,026'.	
16:30	20:45	4.25	10,304	TRPI	Trip in hole from 6,026' to 10,304', staging in to cool motor and performing torque and drag values.	
20:45	21:30	0.75	10,430	DRIL	Drill 8-3/4" hole from 10,304' to 10,430'. WOB test at 40K, 45K and 50K with 60 RPM. RPM test at 60 and 70. GPM 650. TORQ 23-27K. ROP 250-400 FT/HR	
21:30	22:30	1.00	10,430	CIRC	Pump high visc sweep and circulate bottoms up.	
22:30	4:00	5.50	10,430	TRPO	Trip out of the hole from 10,430' to 64' performing torque and drag values.	
4:00	5:00	1.00	10,430	BHAOP	Lay down 8-3/4" PDC bit and BHA.	
5:00	6:00	1.00	10,430	BHAOP	PJSM with Canamera and rig personnel. Make up 8-3/4" core bit. Core bit #8 and BHA #34.	

Management Summary

Tripped out of the hole. Laid down core and coring assembly. 30' of core cut, 27.91' of core recovered. Picked up BHA #33 consisting of new TKC 63, 8-3/4" bit and BHA. Trip in the hole from 64' to 6,026'. Staged in the hole from 6,026' to 10,304' to cool mud motor. Drilled 8-3/4" hole from 10,304' to 10,430'. Circulated bottoms up. Tripped out of the hole from 10,430'. Laid down bit and BHA. Made up 8-3/4" 9 blade core bit w/ sensor and BHA #34. Last survey at 10,165 MD, 8,054' TVD, 65.97° AZI, 103.6° AZI.

Comments

Fuel on hand 10843 gals.
Fuel used 1333 gals.
Total NPT to date 120.25 HR.
No H2S today.
Last survey at 10,165 MD, 8,054' TVD, 65.97° AZI, 103.6° AZI.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 57

Report For 06:00 AM 12-Jun-23

Mud Information

																	Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss		
11-Jun-23 12:30 at Depth 10,296 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.41	27				0.2	9.5	0.55		99.45			500										
11-Jun-23 14:00 at Depth 10,304 ft Mud Pits, Type: Low Solids Non-Dispersed																						
8.42	27				0.25	9.4	0.6		99.4			500										

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Corrosion rings - OTHER	1	---	Defoam 14 - GALS	3	---
Engineering - OTHER	2	---	HIB 19 - GALS	4	---
Lodging - OTHER	1	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump										
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF		
28	CANAMER	CCI-713	8.750	10274	3024	0.0	0.0	0	0	0	0	8	0							
Jets: 14 14 14 14 14 14 14				Out: 10304		Grade: Cutter: /		Dull CT / WT		Wear: A		Brgs: Gge:		Pull: TD						
Comments: Core bit CCI-713, BHA. Some chip cutters.																				
29	NOV	TKC 63	8.750	10304	126	0.5	252.0	400.0	45	200	2	8650	2700	248	463	176	702			
Jets: 13 13 13 14 14 14				Out: 10430		Grade: Cutter: 1 / 1		Dull BT / CT		Wear: A		Brgs: Gge: 0		Pull: TD						
Comments: New bit technology 3 chip cutters and 1 broken cutter.																				
BHA - No. 33 - BIT, BS, NBS, MMTR, RR, OTHER, XO, 30 HWDP = 976.88																				

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
10,304	10,430	330.0	400.0	45	50	200	210	25	2	650	650	2,700
Annular Velocity: Drill Collars: 617.6				Drill Pipe: 344.0								
Comments: With mud motor.												

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate: 255	Pick Up: 430	Slack Off: 170	Drag Avg/Max: / 175
Hours on BHA:	Since Inspection: 131.5	Total: 131.5	Jars:	
Hours on Casing/Liner:	Rotating: 136 / 1	Tripping: /	Wear Bushing Installed	

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	170	170	200	170	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	170	170	200	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	170	170	200	170			

Drill Pipe Inventory


DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH	5.5	3	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	45	Two Pre-tour safety meetings held daily with crew. PJSM with Canamera and rig personnel.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 57



BOP Test	Dynamic Check

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
	Report No: 57 Report For 06:00 AM 12-Jun-23	

Weather Information	
Sky Condition: Mostly cloudy	Visibility: 10
Air Temperature: 77 degF	Bar. Pressure: 1009
Wind Speed/Dir: 5 / S	Wind Gusts:



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 58 Report For 06:00 AM 13-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10447	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8170	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	17 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 5.98 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.98 / 74 DOL: 58

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 2 / 24 Total: 25 / 300

Safety Summary: No incidents or events reported. 58 days since LTI. Conducted Safety Meeting.

Current Operations: Coring 8-3/4" hole at 10,447'.

Planned Operations: Finish coring 8-3/4" hole to 10,460'. Trip out of the hole.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	10,430	BHAOP	Finish making up Coring BHA #34.	
7:00	9:00	2.00	10,430	TRPI	Trip in the hole from 76' to 4,800'.	
9:00	9:30	0.50	10,430	SERV	Service rig and top drive while circulating hole.	
9:30	14:30	5.00	10,430	TRPI	Trip in the hole from 4,800' to 10,407', circulating and washing down as per staging in procedure to cool core barrels. Pick up 460K, Slack off 170K.	
14:30	15:00	0.50	10,430	WASH	Wash down last stand. Tag bottom at 10,430'.	
15:00	16:30	1.50	10,430	CIRC	Circulate bottoms up at 10,427'.	
16:30	17:00	0.50	10,430	CIRC	Drop ball and circulate down to seat at 250 gpm.	
17:00	18:00	1.00	10,432	CORE	Coring 8 3/4" hole from 10,430' to 10432'. 4K-5.5K WOB, 40 RPM, 25K-26K TORQ, 400 GPM, 2 FPH.	
18:00	21:00	3.00	10,434	CORE	Coring 8 3/4" hole from 10,432' to 10434'. 6K-9K WOB, 40 RPM, 25K-26K TORQ, 400 GPM, .6 FPH.	
21:00	6:00	9.00	10,447	CORE	Coring 8 3/4" hole from 10,434' to 10,447'. 14K-16K WOB, 40 RPM, 22K-24K TORQ, 400 GPM, 1.5 FPH.	

Management Summary

Finished making up Coring BHA #34. Tripped in the hole to 4,800'. Staged in hole to 10,430', circulating and washing down to cool core barrels. Tagged bottom at 10,430'. Circulated bottoms up. Dropped ball and pumped down. Coring 8 3/4" hole from 10,430' to 10,447'.

Comments

Fuel on hand 17409 gals.
 Fuel used 968 gals.
 Total NPT to date 120.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

% Mud													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
12-Jun-23 22:00 at Depth 10,427 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.42	27				0.25	9.4	0.65					500								
12-Jun-23 14:00 at Depth 10,430 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.42	27				0.25	9.25	0.65					550								





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 58

Report For 06:00 AM 13-Jun-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	4	---	HIB 19 - GALS	4	---
Lodging - OTHER	1	---	Poly Vis - 50#SK	2	---
TORKease Concentrate - GALS	1	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
30	1	CANAMER	CCI-911	8.750	10430	17	13	1.3	4.0	15	40	24	8	400	800	129	125	29	225
Jets: 12 12 12 12 12 12 12 12 12					Out:	Grade: Cutter: /				Dull: /		Wear:	Brgs:	Gge:	Pull:				
BHA - No. 34 - BIT, NBS, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
10,430	10,432	2.0	4.0	4	6	40	40	25	26	400	400	650
Annular Velocity:		Drill Collars:		355.7		Drill Pipe:		211.7		Comments: Formation changing from (clay ?) to granodiorite and back.		
10,432	10,447	0.5	3.5	15	16	40	40	22	24	380	385	755
Annular Velocity:		Drill Collars:		337.9		Drill Pipe:		201.1		Comments: Mostly clay		

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	260	Pick Up:	460	Slack Off:	170	Drag Avg/Max:	/ 200
Hours on BHA:	Since Inspection:	144.5	Total:	144.5	Jars:	0		
Hours on Casing/Liner:	Rotating:	149 / 0	Tripping:	202.75 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description					
Safety	45	Two Pre-tour safety meetings held daily with crew. PJSM with Canamera					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	58
BOP Test	Crownamatic Check						

Weather Information

Sky Condition:	Mostly clear	Visibility:	10
Air Temperature:	67 degF	Bar. Pressure:	1010
Wind Speed/Dir:	8 / WSW	Wind Gusts:	10





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 59 Report For 06:00 AM 14-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10460	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8180	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	13 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 5.98 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.98 / 74 DOL: 59

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 5 / 60 Other: 2 / 24 Total: 24 / 288

Safety Summary: No incidents or events reported. 59 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping in the hole with 8-3/4" clean out assembly at 10,343'.

Planned Operations: Trip in hole from 10,343' to bottom. Drill out core stump and 2' of new hole to 10,462'. Pump sweep and clean hole. Trip out of the hole for coring assembly.

Toolpusher: Steve King, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	12:00	6.00	10,454	CORE	Coring 8 3/4" hole from 10,447' to 10,454'. 16K-20K WOB, 40 RPM, 22K-24K TORQ, 360 GPM, 1.3 FPH.	
12:00	15:45	3.75	10,460	CORE	Coring 8 3/4" hole from 10,454' TO 10,460'. 16-20K 20-21k WOB, 40 RPM 22-24K TORQ, 360 GPM, 1 TO 1.6 FPH	
15:45	16:30	0.75	10,460	CORE	Circulate bottom of hole and let weight drill off. Pick up to break off core.	
16:30	22:00	5.50	10,460	TRPO	Trip out of the hole from 10,460' to 77' with coring BHA #34.	
22:00	23:30	1.50	10,460	BHAOP	Lay down core assembly. Break off bit. All 9 nozzles partially plugged. Top stabilizers measured 8 - 1/8" diameter, middle and near bit stabilizers measured 8-1/4". 30' of core cut, 25.7' of core recovered.	
23:30	0:00	0.50	10,460	BHAOP	Made up 8-3/4" re-run TCI bit #26 and BHA #35 for cleanout.	
0:00	1:30	1.50	10,460	TRPI	Trip in the hole to 4,933'. Fill pipe.	
1:30	2:30	1.00	10,460	CUTDL	Slip and cut 110' of drill line.	
2:30	6:00	3.50	10,460	TRPI	Trip in the hole from 4,933' to 10,343'. performing torque and drag values.	

Management Summary

Cored 8-3/4" hole from 10,447 to 10,460 FT. Circulated. Broke off core. Tripped out of the hole. Laid down core and core assembly. Broke off bit. All 9 nozzles partially plugged. 30' of core cut, 25.7' of core recovered. Made up 8-3/4" re-run TCI bit #26 and BHA #35. Tripped in the hole to 10,343'.

Comments

Fuel on hand 16016 gals.
 Fuel used 1399 gals.
 Total NPT to date 120.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information


%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
13-Jun-23 22:00 at Depth 10,435 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.42	27				0.25	9.3	0.65					500								
13-Jun-23 14:00 at Depth 10,457 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.42	27				0.25	9.1	0.65					450								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
------------------	------	------	------------------	------	------



Engineering - OTHER	3	---	Lodging - OTHER	1	---
TORKease Concentrate - GALS	6	---			

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE										University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT										
	Report No: 59													Report For 06:00 AM 14-Jun-23							
Bit/BHA/Workstring Information																					
Depth		This Run										R.O.P.		Mud Pump							
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF			
26	3	SANJOAQ	EP4900	8.750	10460	0	0.0	0.0	0	0	0	8350	325	85	54	1	129				
Jets: 24 24 24				Out:		Grade:		Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:			
30	1	CANAMER	CCI-911	8.750	10430	30	22.75	1.3	2.4	18	40	2	8375	950	121	110	2	197			
Jets: 12 12 12 12 12 12 12 12 12				Out: 10460		Grade:		Cutter: 8 / 2		Dull BT / WT		Wear:		Brgs:		Gge: 0		Pull: TD			
Comments: Inside cutters damaged. All nozzles plugged. BHA - No. 35 - BIT, BS, XO, 30 HWDP = 924.24																					
Drilling Parameters																					
Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure									
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	psi									
10,447	10,460	1.4	2.4	18	21	40	40	23	24	375	400	890									
Annular Velocity: Drill Collars:				333.5		Drill Pipe:				198.5											
Miscellaneous Drilling Parameters																					
Hook Loads (lbs):		Off Bottom Rotate:		260		Pick Up:		460		Slack Off:		170		Drag Avg/Max:		/					
Hours on BHA:		Since Inspection:		154.25		Total:		154.25		Jars:		0									
Hours on Casing/Liner:		Rotating:		158.75 / 0		Tripping:		213.25 / 0		<input checked="" type="checkbox"/>		Wear Bushing Installed									
Rig Information																					
Equipment Problems:																					
Location Condition:																					
Transport:																					
Solids Control Information																					
Screen Sizes:		Top		Middle 1		Middle 2		Bottom		Equipment Usage (Hrs):											
Shaker No 1:		170		170		200		170		Desander:		0		Desilter:		0		Degasser:		0	
Shaker No 2:		170		170		200		170		Centrifuge 1: 12 (Solids Removal)						Centrifuge 2: 12 (Solids Removal)					
Shaker No 3:		170		170		200		170													
Drill Pipe Inventory																					
DP Size		Joints		Weight		Grade		Thread		DP Size		Joints		Weight		Grade		Thread			
5.5"		365		24.7		S-135		5.5FH		5.5		30		71.0		S-135		5.5FH			
5.5		20		54.0		S-135		5.5FH													
Safety Information																					
Meetings/Drills		Time		Description																	
Safety		30		Two Pre-tour safety meetings held daily with crew. PJSM with Canamera																	
First Aid Treatments:		0		Medical Treatments:		0		Lost Time Incidents:		0		Days Since LTI:		59							
BOP Test		Crownamatic Check																			
Weather Information																					
Sky Condition:		mostly clear								Visibility:		10									
Air Temperature:		74 degF								Bar. Pressure:		1006									
Wind Speed/Dir:		8 / SSW								Wind Gusts:		10									



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 60 Report For 06:00 AM 15-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10470	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8180	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	10 / 0.25	Next BOP Test:	19-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):	40.0					Well Cost (\$):			

Days (actual / plan): Drilling 5.99 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.99 / 74 DOL: 60

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 5 / 60 Other: 2 / 24 Total: 24 / 288

Safety Summary: No incidents or events reported. 60 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Coring 8-3/4" hole at 10,470'.

Planned Operations: Core 8-3/4" hole, trip out of the hole.

Toolpusher: Steve King, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	6:45	0.75	10,460	TRPI	Trip in the hole from 10,343' to 10,460'.	
6:45	7:00	0.25	10,462	DRIL	Drill 2' of new hole from 10,460' to 10,462'.	
7:00	8:30	1.50	10,462	CIRC	Pump 70 bbl high viscosity sweep and circulate out of hole.	
8:30	13:30	5.00	10,462	TRPO	Trip out of the hole from 10,430' to 64' performing torque and drag values.	
13:30	14:30	1.00	10,462	BHAOP	Lay down 8-3/4" TCI bit and BHA, BHA #35.	
14:30	16:00	1.50	10,462	BHAOP	PJSM with Canamera and rig personnel. Make up 8-3/4" core assembly. Core bit #9 and BHA #36.	
16:00	17:30	1.50	10,462	TRPI	Trip in the hole from 76' to 4,800'.	
17:30	18:00	0.50	10,462	SERV	Service rig and top drive while circulating hole.	
18:00	22:45	4.75	10,462	TRPI	Trip in the hole from 4,800' to 10,462', circulating and washing down as per staging in procedure to cool core barrels. Pick up 460K, Slack off 170K.	
22:45	23:30	0.75	10,462	CIRC	Circulate bottoms up at 10,462'.	
23:30	0:30	1.00	10,462	CIRC	Drop ball and circulate down to seat at 250 gpm.	
0:30	6:00	5.50	10,470	CORE	Coring 8 3/4" hole from 10,462' to 10,470'. 3K-9K WOB, 45 RPM, 25K-26K TORQ, 430 GPM, 2 FPH.	

Management Summary

Tripped in the hole from 10,343' to 10,460'. Drilled 2' of new hole from 10,460' to 10,462'. Pumped 70 bbl high viscosity sweep and circulated out of the hole. Tripped out of the hole from 10,430' to 64' performing torque and drag values. Laid down 8-3/4" TCI bit and BHA, BHA #35. Held safety meeting with Canamera and rig personnel. Made up 8-3/4" core assembly, BHA #36. Tripped in the hole from 76' to 4,800'. Serviced rig and top drive while circulating hole. Tripped in the hole from 4,800' to 10,462', circulating and washing down as per staging in procedure to cool core barrels. Circulated bottoms up at 10,462'. Dropped ball and circulated down to seat at 250 gpm. Core 8 3/4" hole from 10,462' to 10,470'.

Comments

Fuel on hand 14,584 gals.
 Fuel used 1,432 gals.
 Total NPT to date 120.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
15-Jun-23 03:00 at Depth 10,460 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27				0.25	9	0.65					450								



14-Jun-23 12:00 at Depth 10,462 ft Mud Pits, Type: Low Solids Non-Dispersed														
8.40	27				0.25	8.9	0.65					450		

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 60 Report For 06:00 AM 15-Jun-23

Mud Consumables				
Item Description	Qty.	Cost	Item Description	Qty. Cost
Engineering - OTHER	2	---	HIB 19 - GALS	2 ---
Lodging - OTHER	1	---		

Bit/BHA/Workstring Information																		
Depth		This Run				R.O.P.				Mud Pump								
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
26	3	SANJOAQ	EP4900	8.750	10460	2	0.25	8.0	10.0	10	80	2	8400	550	97	71	16	168
Jets: 24 24 24					Out: 10462	Grade: Cutter: 1 / 1		Dull NO / NO		Wear:	Brgs: 1	Gge: 0	Pull: TD					
31	1	CANAMER	CCI	8.750	10462	8	5.5	1.5	2.5	3	45	2	8430	585	131	129	32	245
Jets: 14 14 14 14 14 14 14					Out:	Grade: Cutter: /		Dull /		Wear:	Brgs:	Gge:	Pull:					

BHA - No. 36 - BIT, NBS, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79

Drilling Parameters													
Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
10,460	10,462	15.0		27		78		19		400		450	
Annular Velocity:		Drill Collars:		128.1		Drill Pipe:							
10,462	10,470	1.0	2.4	4	6	45	45	25	26	430	430	584	
Annular Velocity:		Drill Collars:		137.7		Drill Pipe:		423.3					

Miscellaneous Drilling Parameters									
Hook Loads (lbs):	Off Bottom Rotate:	265	Pick Up:	460	Slack Off:	170	Drag Avg/Max:	/	
Hours on BHA:	Since Inspection:	159.75	Total:	159.75	Jars:	5.5			
Hours on Casing/Liner:	Rotating:	164.25 / 5.5	Tripping:	221.25 / 8	<input checked="" type="checkbox"/> Wear Bushing Installed				

Rig Information

Equipment Problems: None to report.

Location Condition: Good.

Transport:

Solids Control Information										
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory									
DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information							
Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crew.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	60
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check					

Weather Information			
Sky Condition:	Mostly cloudy	Visibility:	10
Air Temperature:	76 degF	Bar. Pressure:	1007
Wind Speed/Dir:	11 / SW	Wind Gusts:	15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 61 Report For 06:00 AM 16-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10493	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8180	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	23 / 0.0	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 5.99 / 22, Flat 0 / 0, Complete 0 / 52, Total 5.99 / 74 DOL: 61

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 2 / 24 Total: 25 / 300

Safety Summary: No incidents or events reported. 61 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Laying out reaming assembly.

Planned Operations: Make up 9 1/2" reaming assembly, trip in the hole to 10,250', Open hole from 10,250' to 10,493'. Drill 10' of new formation. Trip out of the hole from 10,503'.

Toolpusher: Steve King, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	23:00	17.00	10,493	CORE	Coring 8 3/4" hole from 10,470' to 10,493'. 9K-14K WOB, 35 RPM, 23K-25K TORQ, 380 GPM, 1.7 FPH.	
23:00	23:45	0.75	10,493	CIRC	Circulate partial bottoms up. Break off core. Verify core had broken off. Note: 450K overpull when breaking off core. 500K max overpull.	
23:45	4:00	4.25	10,493	TRPO	Trip out of the hole from 10,493' to BHA.	
4:00	5:30	1.50	10,493	BHAOP	Lay down core assembly. Break off bit. Top stabilizers measured 8 -1/8" diameter, middle and near bit stabilizers measured 8-1/4". 31' of core cut, 27' of core recovered.	
5:30	6:00	0.50	10,493	SERV	Lay out reaming assembly and prep to pick up.	

Management Summary

Cored 8 3/4" hole from 10,470' to 10,493'. Circulated. Broke off core. Tripped out of the hole. Laid down core and core assembly, 31' of core cut, 27' of core recovered. Serviced rig.

Comments

Fuel on hand 12,701 gals.
Fuel used 1,883 gals.
Total NPT to date 120.25 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
15-Jun-23 13:00 at Depth 10,479 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.42	27			100	0.25	9.3	0.65					400								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	1	---	Engineering - OTHER	2	---
HIB 19 - GALS	1	---	Lodging - OTHER	1	---
TORKease Concentrate - GALS	5	---			

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud Pump					
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
31	1	CANAMER	CCI	8.750	10462	31	22.5	1.4	2.2	18	35	26	8 375	450	114	98	21	186	



Jets: 14 14 14 14 14 14 14	Out:	Grade: Cutter: /	Dull /	Wear:	Brgs: Ge:	Pull:
BHA - No. 36 - BIT, NBS, CORE, STAB, CORE, STAB, OTHER, JAR, XO, 30 HWDP = 992.79						

	Daily Drilling Report		University of Utah
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 61 Report For 06:00 AM 16-Jun-23

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
10,470	10,493	1.7	2.5	14	14	35	45	24	26	380	425	480
Annular Velocity:		Drill Collars:		121.6		Drill Pipe:		374.1				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	265	Pick Up:	470	Slack Off:	170	Drag Avg/Max:	125 / 160
Hours on BHA:	Since Inspection:	176.75	Total:	176.75	Jars:	22.5		
Hours on Casing/Liner:	Rotating:	181.25 / 0	Tripping:	228.25 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems: None to report.
 Location Condition: Good.
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	170	170	200	170	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	170	170	200	170	Centrifuge 1: 12 (Solids Removal) Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	170	170	200	170	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 61
Accident Description: None to report.		
BOP Test	<input checked="" type="checkbox"/> Crownamatic Check	

Weather Information

Sky Condition: Cloudy	Visibility: 10
Air Temperature: 65 degF	Bar. Pressure: 1014
Wind Speed/Dir: 14 / SW	Wind Gusts: 20





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 62 **Report For 06:00 AM 17-Jun-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 10503	Last Casing: 11.750 at 4,837	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 8180	Next Casing: 7.000 at 10,159	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft): 10658	Last BOP Test: 27-May-23	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 10 / 0.75	Next BOP Test: 19-Jun-23	Working Interest:	Totals:	---	---
Average ROP (ft/hr): 13.33			Well Cost (\$):	---	---

Days (actual / plan): Drilling 6.02 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.02 / 74 **DOL:** 62

Pers/Hrs: **Operator:** 3 / 36 **Contractor:** 14 / 168 **Service:** 6 / 72 **Other:** 4 / 48 **Total:** 27 / 324

Safety Summary: No incidents or events reported. 62 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping in the hole with 9 1/2" assembly at 9,000'.

Planned Operations: Trip in the hole to 10,503', drill 9 1/2" hole from 10,503' to 10,947', pump high vis sweep, circulate hole clean, trip out of the hole from 10,947' to surface, rig up SLB logging.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	10,493	BHAOP	Make up 9 1/2" TCI bit with motor and roller reamers.	
7:00	14:30	7.50	10,493	TRPI	Trip in hole from 62' to 10,250' staging in to cool motor. Wash last 6 stands to bottom.	
14:30	16:30	2.00	10,493	REAM	Ream 8 3/4" hole to 9 1/2" hole from 10,250' to 10,493'. 10K WOB, 35 RPM, 650 GPM.	
16:30	17:15	0.75	10,503	DRIL	Drill 9 1/2" hole from 10,493' to 10,503'.	
17:15	17:30	0.25	10,503	CIRC	Circulate and prep for trip.	
17:30	22:00	4.50	10,503	TRPO	Trip out of the hole from 10,503' to BHA.	
22:00	23:00	1.00	10,503	BHAOP	Lay out 9 1/2" reaming assembly.	
23:00	0:30	1.50	10,503	BHAOP	Make up 9 1/2" drilling assembly with Baker 506 bit. Shallow test tools, good test.	
0:30	6:00	5.50	10,503	TRPI	Trip in the hole from 164' to 9,000' staging in to cool motor and tools as needed.	

Management Summary

Made up 9 1/2" clean out assembly, tripped in the hole from 62' to 10,250' staging in as needed to cool motor, opened 8 3/4" hole to 9 1/2" hole from 10,250' to 10,493', Drilled 9 1/2" hole from 10,493' to 10,503', Circulated and prepared to trip out of the hole, tripped out of the hole from 10,503' to BHA, laid out 9 1/2" reaming assembly, made up 9 1/2" drilling assembly with Baker 506 bit, Tripped in the hole from 164' to 10,503' staging in as needed to cool motor and tools.

Comments

Fuel on hand 11,418 gals.
 Fuel used 1,283 gals.
 Total NPT to date 120.25 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
16-Jun-23 22:00 at Depth 10,490 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27				9.5	0.65			99			400								
16-Jun-23 14:00 at Depth 10,503 ft Mud Pits, Type: Low Solids Non-Dispersed																				
8.40	27				9.4	0.65			99			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
------------------	------	------	------------------	------	------



Caustic Soda - 50#SK	1	---	Engineering - OTHER	2	---
Lodging - OTHER	1	---	TORKease Concentrate - GALS	2	---

	Daily Drilling Report		University of Utah		
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32		
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT		

Report No: 62 **Report For 06:00 AM 17-Jun-23**

Bit/BHA/Workstring Information

Depth	This Run										R.O.P.								Mud		Pump	
	No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF			
23	2	SANJOAQ	XLS30DX	9.500	10493	10	0.75	13.3	20.0	20	40	25	8	650	1750	157	186	71	445			
Jets: 24 24 24				Out: 10503		Grade: Cutter:		1 / 1		Dull WT / NO		Wear: A		Brgs: 1		Gge: 0		Pull: BHA				
31	1	CANAMER	CCI	8.750	10462	31	22.5	1.4		14	35		8	375	450	114	98	21	186			
Jets: 14 14 14 14 14 14 14				Out: 10493		Grade: Cutter:		5 / 2		Dull WT / BT		Wear: N		Brgs: X		Gge: 0		Pull: TD				
32	1	BAKER	DD506V	9.500	10503																	
Jets: 15 15 15 18 18 18				Out:		Grade: Cutter:		/		Dull /		Wear:		Brgs:		Gge:		Pull:				

BHA - No. 38 - BIT, MMTR, RR, PC, DCM, MWD, DCM, 4 OTHER, XO, 30 HWDP = 1068.15

Drilling Parameters

Depth (ft)	ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)
	From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
10,493	10,503	25.0	35.0	15	20	35	40	22	23	655	1,706

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max: /
Hours on BHA:	Since Inspection: 179.5	Total: 179.5	Jars: 22.5	
Hours on Casing/Liner:	Rotating: 184 / 2.75	Tripping: 236.25 / 8	<input checked="" type="checkbox"/> Wear Bushing Installed	

Rig Information

Equipment Problems: None to report.
Location Condition: Good.
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Wet Pan / Filter
Shaker No 1:	170	170	200	170	
Shaker No 2:	170	170	200	170	
Shaker No 3:	170	170	200	170	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 62
Accident Description: None to report.		
<input type="checkbox"/> BOP Test	<input type="checkbox"/> Crownamatic Check	

Weather Information

Sky Condition: Overcast	Visibility: 10
Air Temperature: 57 degF	Bar. Pressure: 1017
Wind Speed/Dir: 5 / NNW	Wind Gusts:





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 63 Report For 06:00 AM 18-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	444 / 3.75	Next BOP Test:	19-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):	118.4					Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 63

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 6 / 72 Total: 29 / 348

Safety Summary: No incidents or events reported. 63 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Logging out of the hole with UBI at 5,800'.

Planned Operations: Continue logging with UBI to 4,836', pull out of the hole to surface, rig down SLB, make up ThruBit and trip in the hole, log well.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:00	3.00	10,503	TRPI	Trip in the hole from 9,000' to 10,503' staging in to cool motor and tools and acquire surveys as needed.	
9:00	11:00	2.00	10,680	DRIL	Rotate/slide from 10,503' to 10,680' performing step tests, 55-80 RPM, 40-65 WOB, 600-650 GPM. Slide 40' - 23%, Rotate 137' - 77%	
11:00	12:15	1.25	10,680	REPR	Pick up to make connection and rig blacked out. All generators went down. Restart generators and get rig back on line. Drill 10' to 10,690' and drawworks and pumps went offline.	X
12:15	14:00	1.75	10,947	DRIL	Rotate from 10,690' to 10,947'. 55K WOB, 80 RPM, 28,5K TORQ, 650 GPM, 200 FPH. Pump mud sweep at 10,787'. ROP decreased from 280 FPH to 180 FPH while sweep was going across the bit, then picked back up. Last survey @ 10,947" MD, 10,862' Survey Depth, 64.9° INC, 102.17° AZI, 8,356.66' TVD.	
14:00	18:30	4.50	10,947	CIRC	Build and pump a high viscosity sweep to clean hole. Circulate out of hole. Continue circulating to cool hole prior to logs.	
18:30	19:30	1.00	10,947	REAM	Backream out of the hole from 10,947' to 10,435' max overpull 525k.	
19:30	23:30	4.00	10,947	TRPO	Trip out of the hole from 10,435' to BHA.	
23:30	0:30	1.00	10,947	BHAOP	Lay out 9 1/2" dir assembly.	
0:30	1:30	1.00	10,947	RIGU	Hold safety meeting, rig up SLB Wireline	
1:30	6:00	4.50	10,947	LOG	Make up tools, run in hole with UBI, took weight at 9,400', unable to work tool past 9,400'. log well with UBI from 9,400' to 5,800', logged at 1,000 ft/hr. Max temperature on first run 280 deg f.	

Management Summary

Tripped in the hole from 9,000' to 10,503', staging in to cool tools as needed, drilled 9 1/2" hole section from 10,503' to 10,680', rig blacked out while picking up off bottom, restarted generators to get rig back online, drilled 9 1/2" hole section from 10,680' to 10,947', pumped high viscosity sweeps and circulated to cool wellbore prior to logs, Backreamed out of the hole from 10,947' to 10,435', Tripped out of the hole from 10,435' to BHA, Laid out 9 1/2" dir assembly, Held safety meeting and rigged up SLB Wireline, Made up tools and ran in the hole with UBI, took weight at 9,400', logged well with UBI from 9,400' to 5,800'.

Comments

Fuel on hand 9,796 gals.
 Fuel used 1,622 gals.
 Total NPT to date 121.50 HR.
 No H2S today.
 Last survey @ 10,947" MD, 10,862' Survey Depth, 64.9° INC, 102.17° AZI, 8,356.66' TVD.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	



FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER
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	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 63 **Report For 06:00 AM 18-Jun-23**

Mud Information

														Gels			Temp		Mud		
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
17-Jun-23 10:00 at Depth 10,657 ft Mud Pits, Type: Low Solids Non-Dispersed																					
8.40						9.6							400								
18-Jun-23 05:00 at Depth 10,503 ft Other Location, Type: Low Solids Non-Dispersed																					
8.60	38	15	8	8.8		1	92.5		97.5				400				5	110	125		

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	7	---	Caustic Soda - 50#SK	1	---
DMA/SPA - 50#SK	2	---	Engineering - OTHER	2	---
HIB 19 - GALS	2	---	Lodging - OTHER	1	---
Poly Vis - 50#SK	2	---	TORKease Concentrate - GALS	2	---

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud				Pump	
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
32	BAKER	DD506V	9.500	10503	444	3.12	142.3	306.0	5	7	2	650	2850	16	205		7	467	
Jets: 15 15 15 18 18 18				Out: 10947		Grade: Cutter: 2 / 1		Dull BT / WT		Wear: S		gs: X		Gge: 1		Pull: TD			
BHA - No. 38 - BIT, MMTR, RR, PC, DCM, MWD, DCM, 4 OTHER, XO, 30 HWDP = 1068.15																			

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
10,503	10,947	142.0	306.0	55	65	7	8	27	3	65	700	2,850
Annular Velocity:		Drill Collars:		176.5		Drill Pipe:		265.5				

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	278	Pick Up:	500	Slack Off:	190	Drag Avg/Max:	100 / 125
Hours on BHA:	Since Inspection:	183.25	Total:	183.25	Jars:	22.5		
Hours on Casing/Liner:	Rotating:	187.75 / 6.5	Tripping:	244.25 / 16	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems: None to report.
 Location Condition: Good.
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)			
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5	365	24.7	S-135	5.5FH	5.5	3	71.1	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew.
First Aid Treatments:	0	Medical Treatments:
		0
Lost Time Incidents:	0	Days Since LTI:
		63



BOP Test		<input checked="" type="checkbox"/> Crownamatic Check	
Weather Information			
Sky Condition:	Clear	Visibility:	10
Air Temperature:	78 degF	Bar. Pressure:	1009
Wind Speed/Dir:	15 / S	Wind Gusts:	20

Weather / Field



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 64 Report For 06:00 AM 19-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 64

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 6 / 72 Total: 29 / 348

Safety Summary: No incidents or events reported. 64 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Pulling out of the hole with ThruBit tools at 8,200'.

Planned Operations: Continue pulling out of the hole with ThruBit tools to surface. Rig up and run baseline temperature tool, rig down same, rig up and run UBI from casing shoe to surface.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	10:00	4.00	10,947	LOG	Logging w/ SLB - running UBI log from 5,200' to intermediate casing shoe at 4,837'. Pull tool to surface. Break down UBI. Stage and make up bit, bit sub, and hangoff sub for thru bit logging.	
10:00	11:15	1.25	10,947	TRPI	Trip in hole to 3,677'.	
11:15	12:00	0.75	10,947	SUSOPS	Shut down to reroute service loop in derrick due to high winds.	
12:00	16:30	4.50	10,947	TRPI	Fill pipe, TIH to 5,981', fill pipe, TIH to 9,042', fill pipe, TIH to 10,940'.	
16:30	22:15	5.75	10,947	CIRC	Circulate and cool wellbore prior to running in logging tools. Hold safety meeting with SLB on rigging up and operations while circulating.	
22:15	22:30	0.25	10,947	TRPO	Pump out of the hole from 10,940' to 10,727'.	
22:30	3:00	4.50	10,947	LOG	Make up surface pressure equipment to drill string, pick up logging tools (Triple-Combo, Dipole sonic, Electronic imager) on wireline and run in drill string to 5,632', pump down tools from 5,632' to 10,727' (bottom of tools at 10,905') 100-650 gpm, disconnect from the logging tool at Hangoff sub, pull out of hole with wireline. Max temperature observed 260 deg f.	
3:00	4:30	1.50	10,947	LOG	Pump out of the hole from 10,727' to 9,500', 450-500 gpm, 1800 ft/hr.	
4:30	5:00	0.50	10,947	LOG	Pull out on elevators from 9,500' to 9,000' at 1,800 ft/hr.	
5:00	5:30	0.50	10,947	LOG	Pump out of the hole from 9,000' to 8,700' 450-500 gpm, 1800 ft/hr.	
5:30	6:00	0.50	10,947	LOG	Pull out on elevators from 8,700' to 8,200' at 1,800 ft/hr.	

Management Summary

Ran UBI log from 5,200' to intermediate casing shoe at 4,837'. Pulled tool to surface. Broke down UBI and laid out same. Staged out and picked up bit, bit sub, and hangoff sub for ThruBit logging. Tripped in hole to 3,677'. Shut down to reroute service loop in derrick due to high winds. Tripped in the hole from 3,677' to 10,940'. Circulated and cooled wellbore prior to running in logging tools. Pumped out of the hole from 10,940' to 10,727'. Made up surface pressure equipment to drill string. Picked up logging tools. Ran in the hole with ThruBit tools to hangoff sub. Released from logging tools and pulled wireline out of the hole to surface. Pumped out of the hole with ThruBit tools from 10,727' to 9,500' at 1800 ft/hr. Pulled out on elevators from 9,500' to 9,000' at 1,800 ft/hr. Pumped out of the hole from 9,000' to 8,700' at 1,800 ft/hr. Pulled out on elevators from 8,700' to 8,200' at 1,800 ft/hr.

Comments

Fuel on hand 16,040 gals.
Fuel used 1,256 gals.
Fuel delivered 7,500 gals Total
NPT to date 121.50 HR. No
H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 64

Report For 06:00 AM 19-Jun-23

Mud Information

													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
19-Jun-23 05:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.42	27				0.25	9.4	0.65					350								
18-Jun-23 14:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.42	27				0.25	9.3	0.65					350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	3	---	Engineering - OTHER	2	---
Lodging - OTHER	1	---	Poly Vis - 50#SK	4	---
PrimeSeal/MaxiSea1117 - 50#SK	5	---			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	278	Pick Up:	500	Slack Off:	190	Drag Avg/Max:	100 / 125
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Rig Information

Equipment Problems: Service loop getting tangled in derrick due to high winds.
 Location Condition: Good.
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	170	170	200	170	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	170	170	200	170	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings held daily with crew.					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	64
Accident Description: None to report.							
BOP Test		<input checked="" type="checkbox"/> Crownamatic Check					

Weather Information

Sky Condition:	Clear	Visibility:	10
Air Temperature:	81 degF	Bar. Pressure:	1005
Wind Speed/Dir:	31 / SSW	Wind Gusts:	55





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 65 Report For 06:00 AM 20-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 65

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 8 / 96 Total: 31 / 372

Safety Summary: No incidents or events reported. 65 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Making up 9 1/2" reaming assembly.

Planned Operations: Trip in the hole to 4,836', ream to 10,947' as needed.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	14:00	8.00	10,947	LOG	Pulled out of the hole with FMI log and Thru Bit tools from 8,200' to 3,700' at 3 minutes/stand. Trip out of the hole from 3,700' to bit at normal trip speed. Break down tools. Download data. Data looked good.	
14:00	16:30	2.50	10,947	LOG	Rig up and run Temperature log on wireline. Tool stopped at 7,030'. Made several attempts to get past. Continued to 9,580' and tool stopped. After several attempts with no progress. Pull out of the hole. with Temperature log. Rig down and lay out same.	
16:30	20:00	3.50	10,947	LOG	Rig up and run UBI to 4,836', log from 4,836' to surface. Rig down UBI tools. Rig down SLB wireline unit.	
20:00	3:00	7.00	10,947	OTHER	Hold pre job safety meeting with rig crew and Colorado string up crew, unstring blocks and restring to twelve lines.	
3:00	6:00	3.00	10,947	BHAOP	Make up 9 1/2" reaming assembly, BHA #39. Lay out 5 joints of HWDP due to hard banding needing to be replaced.	

Management Summary

Pulled out of the hole with FMI log and Thru Bit tools from 8,200' to 3,700' at 3 minutes/stand. Tripped out of the hole from 3,700' to bit at normal trip speed. Broke down tools. Downloaded data. Rigged up and ran Temperature log on wireline, worked tool past 7,030'. Continued to 9,580' unable to work past. Pulled out of the hole with Temperature log. Rigged down and laid out same. Rigged up and run UBI, logged from 4,836' to surface, rigged down UBI tools, rigged down SLB wireline unit. Held pre job safety meeting with rig crew and Colorado string up crew, unstrung blocks and restrung to twelve lines. Made up 9 1/2" reaming assembly, BHA #39. Laid out 5 joints of HWDP due to hard banding needing to be replaced.

Comments

Fuel on hand 14,870 gals.
 Fuel used 1,170 gals.
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
19-Jun-23 19:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27				0.25	9.7	0.65		99.4			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	Engineering - OTHER	2	---



HIB 19 - GALS	1	---	Lodging - OTHER	1	---
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Bit/BHA/Workstring Information

BHA - No. 39 - OTHER, BS, STAB, DC, STAB, OTHER, STAB, XO, HWDP, XO, STAB, XO, 9 HWDP, XO, STAB, XO, 15 HWDP, JAR, 9 HWDP =

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 265 Rng: 9W County: BEAVER State: UT	

Report No: 65 **Report For 06:00 AM 20-Jun-23**
 1157.13

Rig Information

Equipment Problems: None to report.
Location Condition: Good.
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Max. Equipment Usage (Hrs):			
Shaker No 1:	170	170	200	170	Desander: 0	Desilter: 0	Degasser: 0	
Shaker No 2:	170	170	200	170	Centrifuge 1: 10 (Solids Removal)		Centrifuge 2: 10 (Solids Removal)	
Shaker No 3:	170	170	200	170				

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5"	30	71.0	S-135	5.5FH
5.5"	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 65
Accident Description: None to report.		
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 1003
Wind Speed/Dir: 28 / S	Wind Gusts: 35
Comments: High wind throughout out the day.	





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 66 Report For 06:00 AM 21-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 66

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 2 / 24 Total: 25 / 300

Safety Summary: No incidents or events reported. 66 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Reaming 9 1/2" hole at 9,465'.

Planned Operations: Ream 9 1/2" hole to 10,947'. Circulate hole clean. Trip out of the hole, lay out reaming assembly.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	10,947	BHAOP	Finish making up BHA #39, Reaming Assembly. Pick up 10 newly hardbanded heviweight drill pipe.	
8:30	10:30	2.00	10,947	TRPI	Trip in hole to 5,337'.	
10:30	17:00	6.50	10,947	REAM	Reaming 9 1/2" hole from 5,337' to 6,780', 2-6K WOB, 80 RPM, 8-12K TORQ, 1000 GPM, 300 FPH.	
17:00	17:30	0.50	10,947	SERV	Service rig.	
17:30	6:00	12.50	10,947	REAM	Reaming 9 1/2" hole from 6,780' to 9,465', 2-4K WOB, 80 RPM, 18-23K TORQ, 1000 GPM, 300 FPH.	

Management Summary

Made up 9 1/2" reaming assembly. Tripped in the hole to 5,337'. Reamed 9 1/2" hole from 5,337' to 6,780'. Serviced rig. Reamed 9 1/2" hole from 6,780' to 9,465'.

Comments

Fuel on hand 12,458 gals.
 Fuel used 2,412 gals.
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
20-Jun-23 13:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.8	0.65		99.5			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	Engineering - OTHER	1	---
HIB 19 - GALS	1	---	Lodging - OTHER	1	---
Poly Vis - 50#SK	2	---	Xanthan Gum - 50#SK	2	---


Bit/BHA/Workstring Information

BHA - No. 39 - OTHER, BS, STAB, DC, STAB, OTHER, STAB, XO, HWDP, XO, STAB, XO, 9 HWDP, XO, STAB, XO, 15 HWDP, JAR, 9 HWDP = 1157.13

Miscellaneous Drilling Parameters



Hook Loads (lbs):	Off Bottom Rotate:	240	Pick Up:	325	Slack Off:	230	Drag Avg/Max:	50 / 65
Hours on Casing/Liner:	Rotating:	19 / 0	Tripping:	5 / 0	Wear Bushing Installed			

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 265 Rng: 9W County: BEAVER State: UT	

Report No: 66 Report For 06:00 AM 21-Jun-23

Rig Information

Equipment Problems: None to report.
 Location Condition: Good.
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Wear Bushing Installed					
Equipment Usage (Hrs):					Desander:	0	Desilter:	0	Degasser:	0
Shaker No 1:	170	170	200	170	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)			
Shaker No 2:	170	170	200	170						
Shaker No 3:	170	170	200	170						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crew.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 66
Accident Description: None to report.		
BOP Test	<input checked="" type="checkbox"/>	Crownamatic Check

Weather Information

Sky Condition:	Clear	Visibility:	10
Air Temperature:	80 degF	Bar. Pressure:	1007
Wind Speed/Dir:	22 / W	Wind Gusts:	30





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 67 Report For 06:00 AM 22-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 67

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 3 / 36 Total: 26 / 312

Safety Summary: No incidents or events reported. 67 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Circulating at 10,442' to cool wellbore.

Planned Operations: Circulate to cool wellbore prior to running Baker pipe conveyed tools, rig up and run gyro, rig down same, pull out of the hole, rig up to run baker conveyed tools.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	16:30	10.50	10,947	REAM	Reaming 9 1/2" hole from 9,465' to 10,308', 2-5K WOB, 80 RPM, 23K-30K TORQ, 1000 GPM, 200-300 FPH.	
16:30	17:00	0.50	10,947	SERV	Service rig.	
17:00	19:15	2.25	10,947	REAM	Reaming 9 1/2" hole from 10,308' to 10,536', 2-5K WOB, 80 RPM, 30K-34K TORQ, 1000 GPM, 200-300 FPH. Note: Decision was made to stop reaming at 10,536' due to high torque.	
19:15	19:45	0.50	10,947	WASH	Wash in the hole from 10,535' to 10,715', 1,000 gpm. Pick up every 30' while washing down to check overpull.	
19:45	20:30	0.75	10,947	WASH	Pump out of the hole from 10,715' to 10,535', max overpull 550k,	
20:30	21:30	1.00	10,947	CIRC	Pump 65 bbl high vis poly sweep, circulate to surface with no noticeable increase in cuttings at the shakers.	
21:30	0:00	2.50	10,947	CIRC	Circulate to cool wellbore at 10,535' prior to running Baker pipe conveyed logging tools.	
0:00	0:15	0.25	10,947	WASH	Pump out of the hole from 10,535' to 10,442', max overpull 550k,	
0:15	6:00	5.75	10,947	CIRC	Circulate to cool wellbore at 10,442' prior to running Baker pipe conveyed logging tools.	

Management Summary

Reamed 9 1/2" hole from 9,465' to 10,308'. Serviced rig. Reamed 9 1/2" hole from 10,308' to 10,536'. Washed in the hole from 10,535' to 10,715', checking overpull every 30'. Pumped out of the hole from 10,715' to 10,535', max overpull 550k. Pumped 65 bbl high vis Polly sweep, circulated sweep to surface with no noticeable increase in cuttings at the shakers. Circulated to cool wellbore prior to running Baker pipe conveyed tools. Pumped out of the hole from 10,535' to 10,442', max overpull 550k. Circulated to cool wellbore prior to running Baker pipe conveyed tools.

Comments

Fuel on hand 15,959 gals.
Fuel used 3,999 gals.
Fuel delivered 7,500 gals.
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud		
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
21-Jun-23 10:00 at Depth 9,639 ft Other Location, Type: Low Solids Non-Dispersed																					



8.40	27					10.1	0.65		99			350						
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	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 67 **Report For 06:00 AM 22-Jun-23**

Mud Consumables				
Item Description	Qty.	Cost	Item Description	Qty.
Caustic Soda - 50#SK	2	---	Engineering - OTHER	1
HIB 19 - GALS	1	---	Pallets/Wraps - OTHER	2

Bit/BHA/Workstring Information

BHA - No. 39 - OTHER, BS, STAB, DC, STAB, OTHER, STAB, XO, HWDP, XO, STAB, XO, 9 HWDP, XO, STAB, XO, 15 HWDP, JAR, 9 HWDP = 1157.13

Miscellaneous Drilling Parameters				
Hook Loads (lbs):	Off Bottom Rotate:	290	Pick Up:	500
Slack Off:	150	Drag Avg/Max:	100 / 150	
Hours on BHA:	Since Inspection:	Total:	Jars:	24
Hours on Casing/Liner:	Rotating:	33 / 14	Tripping:	5 / 0
Wear Bushing Installed				

Rig Information

Equipment Problems: Water pump out on one mud coolers, DrillCool arrived at 23:45 hrs and replaced coupler.

Location Condition: Good.

Transport:

Solids Control Information				
Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	170	170	200	170
Shaker No 2:	170	170	200	170
Shaker No 3:	170	170	200	170

Mud Equipment Usage (Hrs):			
Desander:	0	Desilter:	0
Centrifuge 1:	12 (Solids Removal)	Centrifuge 2:	12 (Solids Removal)

Drill Pipe Inventory									
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information			
Meetings/Drills	Time	Description	
Safety	30	Two Pre-tour safety meetings held daily with crew.	
First Aid Treatments:	0	Medical Treatments:	0
Lost Time Incidents:	0	Days Since LTI:	67
Accident Description: None to report.			
<input type="checkbox"/> BOP Test	<input checked="" type="checkbox"/> Crownamatic Check		

Weather Information	
Sky Condition: Clear	Visibility: 10
Air Temperature: 69 degF	Bar. Pressure: 1016
Wind Speed/Dir: 8 / N	Wind Gusts: 10





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 68 Report For 06:00 AM 23-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 68

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 3 / 36 Total: 26 / 312

Safety Summary: No incidents or events reported. 68 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Circulating at 9,143' to cool wellbore.

Planned Operations: Circulate to cool wellbore, pull out of the hole, rig up to run baker conveyed tools.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:30	3.50	10,947	CIRC	Circulate to cool hole for gyro survey and Baker/Battelle tools at 10,494' MD.	
9:30	11:30	2.00	10,947	LOG	Rig up SDI for gyro. HSM with SDI, Frontier Drilling and FORGE personnel.	
11:30	19:00	7.50	10,947	LOG	RIH with gyro to 10,415'. Survey out of hole from 10,415' to 5,555'. Pull gyro to surface, rig down same.	
19:00	20:30	1.50	10,947	TRPO	Pull out of the hole from 10,442' to 9,143', max overpull 230k,	
20:30	6:00	9.50	10,947	CIRC	Circulate to cool wellbore at 9,143' prior to running Baker pipe conveyed logging tools.	

Management Summary

Circulated to cool hole for gyro survey and Baker/Battelle tools at 10,494' MD. Rugged up SDI for gyro. Ran in the hole with gyro to 10,415'. Surveyed out of the hole from 10,415' to 5,555'. Pulled gyro to surface, rigged down same. Pulled out of the hole from 10,442' to 9,143'. Circulated to cool wellbore at 9,143' prior to running Baker pipe conveyed logging tools.

Comments

Fuel on hand 12,764 gals.
Fuel used 3,195 gals.
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
22-Jun-23 08:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.9	0.65		99.5			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Bit/BHA/Workstring Information

BHA - No. 39 - OTHER, BS, STAB, DC, STAB, OTHER, STAB, XO, HWDP, XO, STAB, XO, 9 HWDP, XO, STAB, XO, 15 HWDP, JAR, 9 HWDP = 1157.13

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	320	Pick Up:	550	Slack Off:	175	Drag Avg/Max:	175 / 225
Hours on Casing/Liner:	Rotating:	35 / 16	Tripping:	7 / 2	Wear Bushing Installed			





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 69 Report For 06:00 AM 24-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):	---					Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 69

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 6 / 72 Other: 8 / 96 Total: 31 / 372

Safety Summary: No incidents or events reported. 69 days since LTI. Conducted Crown Check, Safety Meeting.

Current Operations: Performing pull test on cable clamp.

Planned Operations: Trip in the hole with pipe conveyed logging tools to 9,200'. Log interval as per program:

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	12:30	6.50	10,947	CIRC	Circulate to cool wellbore at 9,143' prior to running Baker pipe conveyed logging tools.	
12:30	18:00	5.50	10,947	TRPO	Trip out of the hole for Baker PCL from 9,169' to 895'. Lay down jars. Trip out to BHA. Lay down reaming assembly.	
18:00	19:00	1.00	10,947	RIGD	Hold detailed safety with baker and rig crew on rigging up to run pipe conveyed logging tools. Hang sheave from derrick board. gather all tools and place on rig floor.	
19:00	22:00	3.00	10,947	LOG	Pick up tools, CBIL, XMAC, STAR, GR, surface test tools.	
22:00	3:30	5.50	10,947	TRPI	Trip in the hole with pipe conveyed logging tools from surface to 4,536'. All the stands drifted prior to running in the hole. Fill pipe at 2,347' at 200 gpm.	
3:30	4:45	1.25	10,947	RIGU	Pick up x/o, stabilizer, x/o, install wireline in string, make up SES to lower drill pipe assembly.	
4:45	6:00	1.25	10,947	LOG	Run in hole with sinker bar, latch tool and establish good communication with tool string. Raise SES above rotary and install cable clamps (8000 lbs. shear screws) and perform pull test.	

Management Summary

Circulated to cool wellbore at 9,143'. Tripped out of the hole for Baker PCL from 9,169' to 895'. Laid down jars. Tripped out to BHA. Laid down reaming assembly. Held detailed safety with Baker and rig crew on rigging up to run pipe conveyed logging tools. Hung sheave from derrick board. gather all tools and placed on rig floor. Picked up logging tools. Tripped in the hole with pipe conveyed logging tools from surface to 4,536'. Picked up crossovers, stabilizer along with SES, made up SES to lower drill pipe assembly. Ran in hole with sinker bar, latched tool and establish good communication with tool string. Raised SES above rotary and install cable clamps with 8000 lbs. shear screws. Performed pull test.

Comments

Fuel on hand 10,521 gals.
 Fuel used 2,243 gals.
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information


Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
23-Jun-23 09:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.6	0.65		99.5			350								





	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE				University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT					
	Report No: 69				Report For 06:00 AM 24-Jun-23					
Mud Consumables										
Item Description		Qty.	Cost	Item Description		Qty.	Cost			
Caustic Soda - 50#SK		3	---	Engineering - OTHER		1	---			
HIB 19 - GALS		1	---							
Bit/BHA/Workstring Information										
BHA - No. 39 - OTHER, BS, STAB, DC, STAB, OTHER, STAB, XO, HWDP, XO, STAB, XO, 9 HWDP, XO, STAB, XO, 15 HWDP, JAR, 9 HWDP = 1157.13										
Rig Information										
Equipment Problems: None to report. Location Condition: Good. Transport:										
Solids Control Information										
Screen Sizes:				Equipment Usage (Hrs):						
	Top	Middle 1	Middle 2	Bottom						
Shaker No 1:	200	200	200	200	Desander: 0	Desilter: 0	Degasser: 0			
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)			
Shaker No 3:	200	200	200	200						
Drill Pipe Inventory										
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread	
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH	
5.5	20	54.0	S-135	5.5FH						
Safety Information										
Meetings/Drills		Time	Description							
Safety		30	Two Pre-tour safety meetings held daily with crew.							
First Aid Treatments:		0	Medical Treatments:		0	Lost Time Incidents:		0	Days Since LTI:	69
Accident Description: None to report.										
BOP Test		<input checked="" type="checkbox"/>	Crownamatic Check							
Weather Information										
Sky Condition: Clear					Visibility: 10					
Air Temperature: 65 degF					Bar. Pressure: 1008					
Wind Speed/Dir: 19 / SSW					Wind Gusts: 25					



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 70 Report For 06:00 AM 25-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 70

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 7 / 84 Other: 8 / 96 Total: 32 / 384

Safety Summary: No incidents or events reported. 70 days since LTI. Conducted Safety Meeting.

Current Operations: Working on unraveling wireline from drill pipe.

Planned Operations: Unravel wireline from drill pipe. Trip out of the hole with PCL tools.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	10,947	LOG	Ran in hole with sinker bar, latched tool and establish good communication with tool string. Raised SES above rotary and install cable clamps with 8000 lbs. shear screws. Performed pull test.	
7:00	10:00	3.00	10,947	LOG	Run in hole with PCL tools from 4,645' to 9,169' drill pipe measurement (9,173' wireline measurement).	
10:00	19:00	9.00	10,947	LOG	Start tool and begin logging from 9,173' to 5,834'. Temperature at tool on bottom was 281° F.	
19:00	21:00	2.00	10,947	OTHER	Wireline counter is 700' different from drill pipe measurement. Correlate logs to Schlumberger gamma ray logs.	
21:00	2:30	5.50	10,947	LOG	Log from 5,834' to 4,554'. Top of side entry port.	
2:30	6:00	3.50	10,947	OTHER	Wireline wrapped around drill pipe below side entry port. Work on unraveling wireline from drill pipe.	

Management Summary

Ran in hole with sinker bar. Latched tool and established good communication with tool string. Raised SES above rotary and installed cable clamps with 8000 lbs. Sheared screws. Performed pull test. Ran in hole with PCL tools from 4,645' to 9,169' drill pipe measurement. (9,173' wireline measurement). Logged from 9,173' to 5,834'. Wireline counter is 700' different from drill pipe measurement. Correlate logs to Schlumberger gamma ray logs and continued logging up to side entry port at 4,554'. Wireline wrapped around drill pipe below side entry port. Worked on unraveling wireline from drill pipe.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000		4	1,136	1,135	SURF	22.000	84	OTHER
FULL	11.750		-3	4,837	4,837	INT1	14.750	65	OTHER

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
24-Jun-23 09:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.8	0.65		99.5			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Rig Information

Equipment Problems:

Location Condition:

Transport:





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32
 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 70

Report For 06:00 AM 25-Jun-23

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	200	200	200	200
Shaker No 2:	200	200	200	200
Shaker No 3:	200	200	200	200

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews. Baker and Battelle were invited to participate to review operations.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 70
BOP Test		Crowmamic Check

Weather Information

Sky Condition:	Clear	Visibility:	10
Air Temperature:	81 degF	Bar. Pressure:	1010
Wind Speed/Dir:	11 / S	Wind Gusts:	15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 71 Report For 06:00 AM 26-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 71

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 7 / 84 Other: 8 / 96 Total: 32 / 384

Safety Summary: No incidents or events reported. 71 days since LTI. Conducted Safety Meeting.

Current Operations: Circulating and cooling hole.

Planned Operations: Pull out of the hole. Rig up replacement wireline unit. Run in hole with RCX assembly and perform microfrac testing.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Brian Gresham Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	10:00	4.00	10,947	LOG	Unwind wireline from above and below SES. Meeting with Baker/Battelle to agree on plan forward. Install lift sub into SES, cut wireline and let fall into drillpipe.	
10:00	13:30	3.50	10,947	LOG	Trip out of hole from 4,554' to top of tools removing wireline from inside and outside of drillpipe.	
13:30	14:30	1.00	10,947	LOG	Lay down all logging tools from hole.	
14:30	18:00	3.50	10,947	EVAL	Make up 9 1/2" TCI bit, bit sub and X-over. Trip in the hole to 5,870' to cool as per Battelle.	
18:00	19:30	1.50	10,947	CUTDL	Slip and cut 80' of drilling line. Circulate and cool hole at 400 GPM.	
19:30	6:00	10.50	10,947	WOE	Circulate and cool hole while waiting on replacement wireline truck.	X

Management Summary

Unwind wireline from above and below SES. Installed lift sub into SES. Cut wireline and let fall into drillpipe. Tripped out of hole from 4,554' to top of tools removing wireline from inside and outside of drillpipe. Laid down logging tools. Made up 9-1/2" TCI bit, bit sub and X-over. Tripped in the hole to 5,870'. Circulated and cooled hole while waiting on wireline replacement truck.

Comments

Fuel on hand 19,1115 gals.
Fuel used 1006 gals.
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
25-Jun-23 09:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.6	0.65		95			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Rig Information

Equipment Problems:
Location Condition:
Transport:





Daily Drilling Report **University of Utah**
 Well ID: FORGE 16B(78)-32 Well Name: FORGE 16B(78)-32
 Field: FORGE Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 71 **Report For 06:00 AM 26-Jun-23**

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	W.P./P.F. (Hrs)	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Desander: 0	Desilter: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal)	Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	200	200	200	200		

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 71
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 84 degF	Bar. Pressure: 1007
Wind Speed/Dir: 17 / SSW	Wind Gusts: 25



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 72 Report For 06:00 AM 27-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 72

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 6 / 0 Other: 6 / 0 Total: 29 / 0

Safety Summary: No incidents or events reported. 72 days since LTI. Conducted Safety Meeting.

Current Operations: Circulate to cool hole for Battelle stress testing, while waiting on Baker wireline truck.

Planned Operations: Pull out of the hole from 6.055'. Rig up Baker replacement wireline unit. Run in hole with RCX assembly and perform microfrac testing.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	10,947	CIRC	Wash down 2 stands from 5,864' to 6,055'. Continue to circulate as per Battelle to cool hole.	
8:30	9:30	1.00	10,947	TRPI	Trip in hole from 6.055' to 9,005' to clean and cool hole.	
9:30	10:30	1.00	10,947	CIRC	Circulate to cool hole.	
10:30	12:00	1.50	10,947	TRPO	Trip out of hole from 9,005' to 6,055'.	
12:00	6:00	18.00	10,947	CIRC	Circulate to clean and cool hole for Battelle stress testing, while waiting on Baker wireline truck.	

Management Summary

Washed down 2 stands from 5,864' to 6,055'. Continued to circulate as per Battelle to cool hole. Tripped in hole from 6.055' to 9,005'. Circulated and cooled hole. Tripped out of hole from 9,005' to 6,055'. Circulated and cool hole for Battelle stress testing while waiting on Baker wireline truck. Baker wireline truck waiting on Over Weight Road Permits.

Comments

Fuel on hand 17,819 gals.
Temp in 80* F
Temp out 82* F
Fuel used 1299 gals.
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
26-Jun-23 08:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.5	0.65		0.95			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---	HIB 19 - GALS	1	---

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.					Mud Pump				
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF			
23	3	SANJOAQ	XLS30DX	9.500	10947																



Jets: 24 24 24	Out:	Grade: Cutter: /	Dull /	Wear:	Brgs: Ge:	Pull:
BHA - No. 40 - BIT, BS, XO, 30 HWDP = 920.51						

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 72 Report For 06:00 AM 27-Jun-23

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on Casing/Liner:	Rotating: 35 / 0	Tripping:	31.5 / 0	Wear Bushing Installed	

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal) Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5"	30	71.0	S-135	5.5FH
5.5"	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 72
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 84 degF	Bar. Pressure: 1007
Wind Speed/Dir: 21 / SW	Wind Gusts: 30





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 73 **Report For 06:00 AM 28-Jun-23**

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 **DOL:** 73

Pers/Hrs: **Operator:** 3 / 36 **Contractor:** 14 / 168 **Service:** 8 / 96 **Other:** 4 / 48 **Total:** 29 / 348

Safety Summary: No incidents or events reported. 73 days since LTI. Conducted Safety Meeting.

Current Operations: Deflating packers to move to next test zone.

Planned Operations: Continue microfrac testing.

Toolpusher: Shawn Seddell, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	10,947	TRPI	Trip in the hole from 6,055' to 9,006'.	
7:00	10:00	3.00	10,947	CIRC	Circulate to cool hole while waiting on Baker Wireline truck. 400 gpm.	
10:00	13:30	3.50	10,947	TRPO	Trip out of the hole from 9,006' to surface. Break off bit, bit sub and crossover.	
13:30	15:00	1.50	10,947	LOG	Stage Baker tools onto catwalk.	
15:00	15:30	0.50	10,947	SAFETY	Held procedural and safety meeting with rig crew, Baker Wireline and Battelle.	
15:30	17:15	1.75	10,947	LOG	Finish making up Baker Wireline line RCX tools, consisting of logging tools and upper and lower set of straddle packers. Surface test same.	
17:15	20:45	3.50	10,947	TRPI	Trip in hole from 137' to 4,766'.	
20:45	0:00	3.25	10,947	OTHER	Circulate 2 drill pipe volumes. PJSM. Install stabilizer and side entry sub. Run in hole with sinker bar with wireline latch. Latch up and test tools.	
0:00	1:20	1.33	10,947	TRPI	Trip in the hole from 4,766' to 5,735'.	
1:20	2:20	1.00	10,947	OTHER	Correlate depths to Schlumberger gamma logs by logging up to from 5,735' to 5,640' and back down 2 times. Install drill pipe screen and screw in top drive.	
2:20	3:15	0.92	10,947	OTHER	Set packers with center of packers at 5,657' wireline depth. 5,646' drill pipe depth. Note: approx 4' between packers.	
3:15	6:00	2.75	10,947	CIRC	Inflate packers. Communication problem with tools. Re-start unit. Re-inflate packers. Start Microfrac testing.	

Management Summary

Tripped in the hole from 6,055' to 9,006'. Circulated and cooled hole. Tripped out of the hole from 9,006' to surface. Broke out bit, bit sub and crossover. Made up Baker RCX tools, consisting of logging tools and upper and lower set of straddle packers. Surface tested same. Tripped in hole from 137' to 4,766'. Circulated. Installed stabilizer and side entry sub. Ran in hole with sinker bar with wireline latch. Latched up and tested tools. Tripped in the hole from 4,766' to 5,735'. Correlate depths to gamma logs. Set packers with center of packers at 5,657' wireline depth and 5,646' drill pipe depth. Inflated packers start testing.

Comments

Fuel on hand 16,888 gals.
 Fuel used 928 gals.
 Temp in 82* F
 Temp out 93* F
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information



													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
27-Jun-23 15:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.42	27	1	1	100	0.25	9.5	0.65					350	120						80	

	Daily Drilling Report										University of Utah									
	Well ID: FORGE 16B(78)-32										Well Name: FORGE 16B(78)-32									
	Field: FORGE										Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT									

Report No: 73 Report For 06:00 AM 28-Jun-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering 1 -	1	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
23	β	SANJOAQ	XLS30DX	9.500	10947	0	0.0	0.0	0	0	0	8400	480		97	71	16	168	
Jets: 24 24 24				Out: 10947		Grade: Cutter:		1 / 3		Dull FC / BT		Wear: S		Brgs: E		Gge: 0		Pull: BHA	

Comments: Used for circulating.

BHA - No. 40 - BIT, BS, XO, 30 HWDP = 920.51

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on Casing/Liner:	Rotating: 35 / 0	Tripping:	39.5 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed	

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	200	200	200	200
Shaker No 2:	200	200	200	200
Shaker No 3:	200	200	200	200

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.

First Aid Treatments: 0 Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 73

BOP Test Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 1008
Wind Speed/Dir: 7 / SSE	Wind Gusts: 10



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 74 Report For 06:00 AM 29-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 74

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 8 / 0 Other: 3 / 0 Total: 28 / 0

Safety Summary: No incidents or events reported. 74 days since LTI. Conducted Safety Meeting.

Current Operations: Circulating and cooling hole at 9,122' for mini-frac testing.

Planned Operations: Finish cooling hole. Trip out of the hole with bit and BHA. Trip in the hole with straddle packers and logging tools. Perform mini-frac testing.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	18:00	12.00	10,947	Eval	Running Baker/Battelle mini-frac testing. Completed Test #1. Deflate packers, move up to second test depth of 5,494.6' wireline depth, 5,520' drill pipe depth, Test #2. Inflate packers and test. Deflate packers, move to third test depth of 5,201.6' wireline depth, 5,227' drill pipe depth, Test #3. Inflate packers and test. Deflate packers.	
18:00	18:30	0.50	10,947	TRPO	Trip out of the hole from 5,227' to 4,766'.	
18:30	19:30	1.00	10,947	OTHER	Un-seat latch and sinker bar and pull to surface. Laid down SES and stabilizer. Rig down wireline.	
19:30	22:00	2.50	10,947	TRPO	Trip out of the hole from 4,766' to 135'.	
22:00	23:00	1.00	10,947	BHAOP	Lay down logging tools.	
23:00	23:30	0.50	10,947	BHAOP	Make up 9-1/2" re-run bit, bit sub and x-over.	
23:30	3:45	4.25	10,947	TRPI	Trip in the hole to 9,122'. Fill pipe at 2,918' and 5,765'.	
3:45	6:00	2.25	10,947	CIRC	Circulate and cool hole at 400 GPM.	

Management Summary

Ran Baker/Battelle mini-frac testing. Completed Test #1. Moved up to second test depth of 5,494' wireline depth, 5,520' drill pipe depth, Test #2. Inflated packers and tested. Deflated packers, moved to third test depth of 5,201' wireline depth, 5,227' drill pipe depth, Test #3. Inflated packers and tested. Deflated packers and tripped out of the hole to 4,766'. Un-seated latch and sinker bar and pulled wireline to surface. Laid down SES and stabilizer. Tripped out of the hole to 135'. Laid down logging tools. Tripped in the hole with 9-1/2" bit and BHA to 9,122'. Circulated and cooled hole.

Comments

Fuel on hand 15,995 gals.
Fuel used 893 gals.
Temp in 80° F
Temp out 86° F
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
28-Jun-23 08:00 at Depth 10,497 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.4	0.65		95			350								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
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Engineering - OTHER	1	---
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Bit/BHA/Workstring Information

	Daily Drilling Report		University of Utah
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 74 **Report For 06:00 AM 29-Jun-23**

BHA -No. 41 - BIT, BS, XO, 30 HWDP = 920.51

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on Casing/Liner:	Rotating: 35 / 0	Tripping:	47.5 / 0	Wear Bushing Installed	

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Washer: 0 Desilter: 0 Degasser: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal) Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 74
BOP Test		Dynamic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 81 degF	Bar. Pressure: 1007
Wind Speed/Dir: 12 / NW	Wind Gusts: 15



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 75 Report For 06:00 AM 30-Jun-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 75

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 8 / 0 Other: 3 / 0 Total: 28 / 0

Safety Summary: No incidents or events reported. 75 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping in the hole at 3,806'.

Planned Operations: Trip in the hole to 4,766'. Install SES and stabilizer. Trip in the hole to 8,263' with straddle packers and logging tools. Perform mini-frac testing.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	19:45	13.75	10,947	CIRC	Perform 16 hr. circulation to cool hole for Baker/Battelle mini-frac testing. 390 gpm. Temp In 94°, Temp Out 104°.	
19:45	0:00	4.25	10,947	TRPO	Trip out of the hole from 9,122'. Break off bit, bit sub and x-over.	
0:00	3:00	3.00	10,947	LOG	PJSM. Make up Baker Wireline line RCX tools, consisting of logging tools and upper and lower set of straddle packers. Surface test same. Change out cable head connection on sinker bar. Re-test. OK.	
3:00	6:00	3.00	10,947	TRPI	Trip in the hole from 137' to 3,806'.	

Management Summary

Performed 16 hr. circulation to cool hole for Baker/Battelle mini-frac testing. Tripped out of the hole from 9,122'. Made up Baker Wireline line RCX tools, consisting of logging tools and upper and lower set of straddle packers. Surface tested same. Tripped in the hole from 137' to 3,806'.

Comments

Fuel on hand 19,643 gals.
Fuel used 643 gals.
Temp in 94° F Temp out 104° F
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
29-Jun-23 13:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40						10	0.65		0.95			350						94	103	

Mud Consumables


Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	2	---	Engineering - OTHER	1	---
HIB 19 - GALS	1	---			

Bit/BHA/Workstring Information

Depth					This Run							R.O.P.								Mud				Pump	
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF							
23	4	SANJOAQ	XLS30DX	9.500	10947	0	0	0.0	0.0	0	0	0	8	400	390	97	71	16	169						



Jets: 24 24 24	Out: 10947	Grade: Cutter: 1 / 3	Dull BT / FC	Wear: S	Brgs: E	Ge: 0	Pull: BHA
Comments: RIH to 9122'. Cool hole for minifrac.							
BHA - No. 41 - BIT, BS, XO, 30 HWDP = 920.51							

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE			University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT		
	Report No: 75		Report For 06:00 AM 30-Jun-23			
Miscellaneous Drilling Parameters						
Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max: /		
Hours on Casing/Liner:	Rotating: 35 / 0	Tripping: 51.5 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed			
Rig Information						
Equipment Problems:						
Location Condition:						
Transport:						
Solids Control Information						
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):	
Shaker No 1:	200	200	200	200	Desander: 0	Desilter: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal)	
Shaker No 3:	200	200	200	200	Centrifuge 2: 12 (Solids Removal)	
Drill Pipe Inventory						
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints
5.5"	365	24.7	S-135	5.5FH	5.5	30
5.5	20	54.0	S-135	5.5FH	71.0	
Safety Information						
Meetings/Drills	Time	Description				
Safety	45	Two Pre-tour safety meetings held daily with crews. PJSM with Baker				
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI: 75			
BOP Test	Dynamic Check					
Weather Information						
Sky Condition:	Clear	Visibility:	10			
Air Temperature:	82 degF	Bar. Pressure:	1008			
Wind Speed/Dir:	14 / N	Wind Gusts:				



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 76 Report For 06:00 AM 01-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 76

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 8 / 0 Other: 4 / 0 Total: 29 / 0

Safety Summary: No incidents or events reported. 76 days since LTI. Conducted Safety Meeting.

Current Operations: Running in the hole with RCX and logging tools on wireline.

Planned Operations: Perform mini-frac testing on wireline.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	6:30	0.50	10,947	TRPI	Trip in hole from 3,806' to 4,766'.	
6:30	7:00	0.50	10,947	CIRC	Circulate 2 pipe capacities	
7:00	9:30	2.50	10,947	LOG	Break off and make up stabilizer and SES. Ran in hole with sinker bar with wireline latch. Latched up and tested tools. Temp at tool was 212°F.	
9:30	13:15	3.75	10,947	TRPI	Trip in the hole from 4,766' to test depth of 8,473' wireline depth, 8,500' drill pipe depth. Temperature at tool is 293°F. Shut down 25 minutes on trip in, logging truck died.	
13:15	15:00	1.75	10,947	LOG	Running Baker/Battelle mini-frac testing. Test #1, Test depth 8,473' wireline depth, 8,500' drill pipe depth, Logging truck died. Tool quit working.	
15:00	16:30	1.50	10,947	LOG	Pull up to test depth 7,917' wireline depth, 7,946' drill pipe depth attempting to get tool to work. No luck.	
16:30	18:00	1.50	10,947	TRPO	Trip out of the hole to 7,072' to pick up new tools.	
18:00	18:30	0.50	10,947	CIRC	Circulate.	
18:30	20:00	1.50	10,947	TRPO	Trip out of the hole from 7,072' to 4,766'.	
20:00	21:00	1.00	10,947	OTHER	Rig down wireline. Lay down SES, stabilizer and x-over.	
21:00	23:00	2.00	10,947	TRPO	Trip out of the hole from 4,766' to 135'.	
23:00	3:00	4.00	10,947	OTHER	Lay down Baker Wireline line RCX tools and logging tools. Made up new RCX tools and logging tools except the sleeve packers (no back up on location). Surface test tools.	
3:00	6:00	3.00	10,947	LOG	Run in hole with RCX and logging tools on wireline to 300'. Pull out of the hole. Removed sleeve packer. Run in hole with tools.	

Management Summary

Tripped in hole from 3,806' to 4,766'. Made up stabilizer and SES. Ran in hole with sinker bar with wireline latch. Latched up and tested tools. Tripped in the hole from 4,766' to 8,500' drill pipe depth. Temperature at tool is 293°F. Ran Baker/Battelle mini-frac test. Test depth 8,473' wireline depth, 8,500' drill pipe depth, Logging truck died. Tool quit working. Pulled up to 7,917' wireline depth, 7,946' drill pipe depth and attempted to test. Tripped out of the hole to 4,766'. Laid down wireline, SES, stabilizer and x-over. Laid down RCX tools and logging tools. Made up new RCX tools and logging tools. Surface tested same. Ran in hole with tools on wireline to 300'. Packers not working. Pulled out of the hole. Removed sleeve packer. Ran in hole with tools.

Comments

Fuel on hand 18,663 gals.
Fuel used 662 gals.
Temp in * F Temp
out * F
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information



Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

	Daily Drilling Report		University of Utah
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 76 **Report For 06:00 AM 01-Jul-23**

Mud Information

%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	Gels			Temp		Mud Loss
																	10m	30m	In	Out		
30-Jun-23 08:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																						
8.40	27						9.9	0.65		95			350									

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max: /
Hours on Casing/Liner:	Rotating: 35 / 0	Tripping: 62.5 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed	

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Water (Gals)	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 1:	200	200	200	200		Centrifuge 1: 12 (Solids Removal)	Centrifuge 2: 12 (Solids Removal)	
Shaker No 2:	200	200	200	200				
Shaker No 3:	200	200	200	200				

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 76
<input type="checkbox"/> BOP Test		<input type="checkbox"/> Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 76 degF	Bar. Pressure: 1014
Wind Speed/Dir: 8 / N	Wind Gusts: 10





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 77 Report For 06:00 AM 02-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 77

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 6 / 0 Other: 4 / 0 Total: 27 / 0

Safety Summary: No incidents or events reported. 77 days since LTI. Conducted Safety Meeting.

Current Operations: Performing mini-frac testing.

Planned Operations: Finish Mini-frac testing. Pull out of the hole. Lay down RCX tools. Run in hole with logging tools and log.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	20:30	14.50	10,947	LOG	Running RCX tool on wireline. Perform mini-frac testing at 5,201', 5,495' & 5,658'.	
20:30	4:30	8.00	10,947	OTHER	Straddle packers quit working. Pull out of the hole. Change out straddle packers and some of the logging tools. Test. No signal Troubleshoot tools. Change out flow back pump and test. No signal. Remove flow back pump. Test good. Ran in hole with RCX tools on wireline.	X
4:30	6:00	1.50	10,947	LOG	Perform mini-frac testing.	

Management Summary

Ran RCX tool on wireline. Performed mini-frac testing. Straddle packers quit working. Pulled out of the hole. Changed out straddle packers and some of the logging tools. Tested. Troubleshoot tools. Changed out flow back pump and tested. No signal. Removed flow back pump. Tested good. Ran in hole with RCX tools on wireline. Perform mini-frac testing. NOTE: No losses. (.75 bbls in 12 hours).

Comments

Fuel on hand 17,963 gals.
Fuel used 748 gals.
Temp in * F Temp out * F
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

														Gels			Temp		Mud		
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
01-Jul-23 11:30 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																					
8.40	27					9.3	0.65		95			350									

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on Casing/Liner:	Rotating: 35 / 0	Tripping: 62.5 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed		

Rig Information

Equipment Problems:

Location Condition:



Transport:

	Daily Drilling Report	University of Utah
	Well ID: FORGE 16B(78)-32	Well Name: FORGE 16B(78)-32
	Field: FORGE	Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 77 **Report For 06:00 AM 02-Jul-23**

Solids Control Information									
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):				
Shaker No 1:	200	200	200	200	Desander: 0	Desilter: 0	Degasser: 0		
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal)		Centrifuge 2: 12 (Solids Removal)		
Shaker No 3:	200	200	200	200					

Drill Pipe Inventory									
DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information		
Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 77
BOP Test	Crownamatic Check	

Weather Information		
Sky Condition:	Clear	Visibility:
Air Temperature:	88 degF	Bar. Pressure:
Wind Speed/Dir:	3 / NNE	Wind Gusts:



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 78 Report For 06:00 AM 03-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 78

Pers/Hrs: Operator: 1 / 0 Contractor: 14 / 0 Service: 8 / 0 Other: 4 / 0 Total: 27 / 0

Safety Summary: No incidents or events reported. 78 days since LTI. Conducted Safety Meeting.

Current Operations: Slip and cutting drill line.

Planned Operations: Continue tripping in the hole to +/- 9,000'. Ream 9-1/2" hole from 9,000' to 10,300'. Pull out of the hole for Circulation Test.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	13:00	7.00	10,947	LOG	Running RCX tool on wireline. Perform mini-frac testing. 5,201', 5,495', 5,658', 5,980', 5,918', 5,639', 5,617'.	
13:00	15:30	2.50	10,947	LOG	Troubleshoot tool. Cannot inflate packers on new test depth. Pull out of hole, break down RCX tools. Packer rubber was torn.	
15:30	1:00	9.50	10,947	LOG	Make up CBIL/XMAC/STAR/GR tool. Run in on wireline. Log from 4,836' down to 6,120' and log up to 4,836'. Repeat 200'. Lay down logging tools.	
1:00	3:00	2.00	10,947	BHAOP	Make up and run in hole with new 9-1/2" insert bit and clean out BHA.	
3:00	5:00	2.00	10,947	TRPI	Trip in the hole from 1,147' to 4,843'.	
5:00	6:00	1.00	10,947	CUTDL	Slip and cut 70' of drill line.	

Management Summary

Ran RCX tool on wireline. Performed mini-frac testing. Troubleshoot tool. Could not inflate packers on new test depth. Pulled out of hole. Laid down RCX tools. Packer rubber torn. Made up CBIL/XMAC/STAR/GR tool. Ran in hole on wireline. Logged from 4,836' to 6,120' and back up to 4,836'. Pulled out of the hole. Laid down logging tools. Made up and ran in hole with 9-1/2" insert bit and clean out BHA #42 to 4,843'. Slipped and cut drill line.

Comments

Fuel on hand 17,296 gals.
 Fuel used 618 gals.
 Temp in * F Temp out * F
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135		SURF	22.000	84	OTHER	
FULL	11.750	-3	3,4837	4,837		INT1	14.750	65	OTHER	

Mud Information

%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	Temp In	Temp Out	Mud Loss	
	8.40	27				9.2	0.65	95				350										

02-Jul-23 11:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 78

Report For 06:00 AM 03-Jul-23

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud		Pump		
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
33	1	SANJOAQ	SS617PS	9.500	10947	0	0.0	0.0	0	0	0	8	400	300	97	71	16	168

Jets: 24 24 24 Out: Grade: Cutter: / Dull: / Wear: Brgs: Gge: Pull:

Comments: Ream and clean out

BHA - No. 42 - BIT, BS, STAB, DC, STAB, OTHER, XO, HWDP, XO, STAB, XO, 15 HWDP, JAR, 18 HWDP = 1147.15

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on Casing/Liner:	Rotating: 35 / 0	Tripping: 64.5 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed		

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom
Shaker No 1:	200	200	200	200
Shaker No 2:	200	200	200	200
Shaker No 3:	200	200	200	200

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.

First Aid Treatments: 0 Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 78

BOP Test Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 91 degF	Bar. Pressure: 1014
Wind Speed/Dir: 3 / SW	Wind Gusts: 5





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 79 Report For 06:00 AM 04-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 **DOL:** 79

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 3 / 0 Other: 1 / 0 Total: 21 / 0

Safety Summary: No incidents or events reported. 79 days since LTI. Conducted Safety Meeting.

Current Operations: Installing blind rams in BOPs.

Planned Operations: Perform Open Hole Circulation Evaluation.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:00	3.00	10,947	TRPI	Trip in the hole with reaming assembly BHA #42 from 4,843' to 8,000'.	
9:00	16:00	7.00	10,947	REAM	Ream 9 1/2" hole from 8,000' to 9,418'. 980 GPM, 80 RPM, 18K - 25K torque,	
16:00	16:30	0.50	10,947	SERV	Service rig and top drive.	
16:30	22:00	5.50	10,947	REAM	Ream 9 1/2" hole from 9,418' to 10,182'. 980 GPM, 80 RPM, 18K - 27K torque,	
22:00	23:00	1.00	10,947	CIRC	Pump 2 ea 70 bbl hi-visc sweeps and clean hole. Small amount of increase in cuttings.	
23:00	3:00	4.00	10,947	TRPO	Trip out of the hole from 10,182' to 1,187'.	
3:00	4:15	1.25	10,947	BHAOP	Trip out with BHA. Lay down jars, shock sub, stabilizers, and bit. Top stab in gauge, middle stab 1/4" under, bottom stab in gauge. Bit 1/16 under.	
4:15	6:00	1.75	10,947	BOPO	Remove pipe rams and install blind rams.	

Management Summary

Tripped in the hole with reaming assembly BHA #42 from 4,843' to 8,000'. Reamed 9-1/2" hole from 8,000' to 10,182'. Pumped hi-visc sweeps and cleaned hole. Tripped out of the hole. Laid down jars, shock sub, stabilizers, and bit. Started removing pipe rams and installing blind rams.

Comments

Fuel on hand 14,759 gals.
 Fuel used 2537 gals.
 Temp in 121 F
 Temp out 133 F
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
03-Jul-23 13:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27				9.8	0.65		95			500							127	138	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	4	---	Engineering - OTHER	1	---
HIB 19 - GALS	1	---			





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 79

Report For 06:00 AM 04-Jul-23

Bit/BHA/Workstring Information

Depth		This Run										R.O.P.		Mud				Pump		
No	Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
33	1	SANJOAQ	SS617PS	9.500	8000	2182	12.5	174.6	300.0		980	2	8980	2650	237	423	242	1011		
Jets: 24 24 24					Out: 10182		Grade: Cutter: 1 / 3		Dull WT / NO		Wear: G		Brgs: E		Gge: 1		Pull: BHA			

Comments: Ream and clean out.

BHA - No. 42 - BIT, BS, STAB, DC, STAB, OTHER, XO, HWDP, XO, STAB, XO, 15 HWDP, JAR, 18 HWDP = 1147.15

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
8,000	10,182	175.0	300.0	8	10	70	80	27	29	900	980	2,600	

Annular Velocity: Drill Collars: 475.8 Drill Pipe: 367.7

Comments: Reaming.

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	250	Pick Up:	530	Slack Off:	150	Drag Avg/Max:	180 / 280
Hours on BHA:	Since Inspection:	12.5	Total:	12.5	Jars:	12.5		
Hours on Casing/Liner:	Rotating:	47.5 / 0	Tripping:	73.5 / 0	<input checked="" type="checkbox"/> Wear Bushing Installed			

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	200	200	200	200	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	200	200	200	200	Centrifuge 1:	12 (Solids Removal)		Centrifuge 2:	12 (Solids Removal)	
Shaker No 3:	200	200	200	200						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description	
Safety	30	Two Pre-tour safety meetings held daily with crews.	
First Aid Treatments:	0	Medical Treatments:	0
Lost Time Incidents:	0	Days Since LTI:	79
<input type="checkbox"/> BOP Test	<input type="checkbox"/> Crownamatic Check		

Weather Information

Sky Condition:	Clear	Visibility:	
Air Temperature:	98 degF	Bar. Pressure:	1007
Wind Speed/Dir:	15 / WSW	Wind Gusts:	20





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 80 Report For 06:00 AM 05-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 80

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 6 / 0 Other: 1 / 0 Total: 23 / 0

Safety Summary: No incidents or events reported. 80 days since LTI. Conducted Safety Meeting.

Current Operations: Well shut in for pressure build up.

Planned Operations: Perform 2nd stage of Open Hole Circulation Test.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	12:00	6:00	10,947	EVAL	Rigging up to perform open hole circulation test. Move separator out and flange up lines directly to reserve pit. PJSM. Work on tracer injection pump.	
12:00	21:00	9:00	10,947	EVAL	Perform Open Hole Circulation Test as per program, pumping down 16A and observe pressure, temperature, and flow on 16B.	
21:00	6:00	9:00	10,947	EVAL	Shut wells 16A and 16B in @ 21:10 to observe pressure build up.	

Management Summary

Rigged up to perform open hole circulation test. Moved separator out and flanged up lines directly to reserve pit. Worked on tracer injection pump. Performed 1st stage of Open Hole Circulation Test as per program pumping down well 16A and observing pressure temperature and flow on well 16B. Shut wells 16A and 16B in to observe pressure build up.

Comments

Fuel on hand 13,993 gals.
Fuel used 766 gals.
Temp in 121 F Temp out 133 F
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
04-Jul-23 13:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.42	27	1	1	100	0.25	9.7	0.65					500	40							

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering 1 -	1	---			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	12.5	Total:	12.5	Jars: 12.5
Hours on Casing/Liner:	Rotating:	47.5 / 0	Tripping:	73.5 / 0	Wear Bushing Installed

Rig Information

Equipment Problems:



Location Condition:
Transport:

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 80	Report For 06:00 AM 05-Jul-23
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Solids Control Information					
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Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Weight / Filtrate
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory									
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DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information		
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Meetings/Drills	Time	Description
Safety	45	Two Pre-tour safety meetings held daily with crews. PJSM for Open hole Evaluation testing.
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:
BOP Test	Crowmamic Check	Days Since LTI: 80

Weather Information			
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Sky Condition:	Clear	Visibility:	12
Air Temperature:	94 degF	Bar. Pressure:	
Wind Speed/Dir:	10 / ENE	Wind Gusts:	15



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 81 Report For 06:00 AM 06-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 81

Pers/Hrs: Operator: 3 / 36 Contractor: 14 / 168 Service: 8 / 96 Other: 2 / 24 Total: 27 / 324

Safety Summary: No incidents or events reported. 81 days since LTI. Conducted Safety Meeting.

Current Operations: Making up 7" casing dummy run.

Planned Operations: Finish making up 7" casing dummy run. Run in the hole to 10,215'. Circulate bottoms up. Pull out of the hole. Lay down casing.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	10,947	EVAL	Monitoring wells 16A and 16B.	
8:30	9:30	1.00	10,947	EVAL	Bled off pressure and repair leak on 16B flow meter. Troubleshoot and acquire pressure readings on 16A well.	
9:30	10:30	1.00	10,947	SAFETY	Held safety meeting with SLB, FORGE, and EGI personnel prior to pumping	
10:30	16:30	6.00	10,947	EVAL	Pumping into 16A well at 5 bpm while monitoring pressure, temperature, and flow from 16B well.	
16:30	1:00	8.50	10,947	EVAL	Shut in on wells 16A and 16B for monitoring. Rig down SLB pumping units. Change out top rams on BOP. Stage and dummy casing run on catwalk. Strap and prepare to run on drill pipe.	
1:00	4:00	3.00	10,947	RIGU	Bled off 16B well. Rig up casing running equipment.	
4:00	5:30	1.50	10,947	REPS	Troubleshoot and repair hydraulic fittings on hydraulic slips. Pull wear bushings. PJSJ with B&L and rig crew.	X
5:30	6:00	0.50	10,947	CASE	Start making up and run in hole with 7" 38# Vam HT casing as a dummy run. Consist of float shoe, 2 csg joints, pup joint, float collar, pup joint, 1 csg joint, pup joint, PetroQuip sub, pup joint, 1 csg joint, and x-over. 9 straight vane centralizers total.	

Management Summary

Monitoring wells 16A and 16B for pressure and temperature. Bled off. Performed 2nd stage of Open Hole Circulation Test by pumping into 16A well at 5 bpm while monitoring pressure, temperature, and flow from 16B well. Shut in on both wells for monitoring. Installed pipe rams. Bled of 16B well. Rigged up casing running equipment. Start making up and running in hole with 7" 38# Vam HT casing dummy run assembly, consisting of float shoe, 2 pup joints, float collar, 1 pup joint, 1 csg joint, 1 pup joint, PetroQuip sub, 1 pup joint, 1 csg joint, and x-over. Also includes 9 straight vane centralizers.

Comments

Fuel on hand 13,385 gals.
Fuel used 608 gals.
Temp in 121 F
Temp out 133 F
Total NPT to date 121.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135		SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837		INT1	14.750	65	OTHER	

Mud Information

%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	Gels 10s	10m	30m	Temp In	Out	Mud Loss
---	-------	-----	----	----	-------	------	-------	--------	-----	-------	------	-----	----	----	------	----------	-----	-----	---------	-----	----------

05-Jul-23 08:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed



8.40	27					9.6	0.65		95			500					99		
------	----	--	--	--	--	-----	------	--	----	--	--	-----	--	--	--	--	----	--	--

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 81 **Report For 06:00 AM 06-Jul-23**

Mud Consumables					
Item Description	Qty.	Cost	Item Description	Qty.	Cost
Defoam 14 - GALS	1	---	Engineering - OTHER	1	---
Poly Vis - 50#SK	4	---	Xanthan Gum - 50#SK	4	---

Bit/BHA/Workstring Information
 BHA - No. 43 - , XO, 33 HWDP = 1248.37

Miscellaneous Drilling Parameters					
Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 12.5	Total: 12.5	Jars: 12.5		
Hours on Casing/Liner:	Rotating: 47.5 / 0	Tripping: 73.5 / 0	Wear Bushing Installed		

Rig Information
 Equipment Problems:
 Location Condition:
 Transport:

Solids Control Information					
Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal) Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory									
DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information			
Meetings/Drills	Time	Description	
Safety	30	Two Pre-tour safety meetings held daily with crews. PJSM for Open hole Evaluation testing.	
First Aid Treatments:	0	Medical Treatments:	0
Lost Time Incidents:	0	Days Since LTI:	81
BOP Test		Crowmatic Check	

Weather Information			
Sky Condition:	Clear	Visibility:	10
Air Temperature:	92 degF	Bar. Pressure:	1005
Wind Speed/Dir:	11 / S	Wind Gusts:	15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 82 Report For 06:00 AM 07-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 82

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 4 / 0 Other: 4 / 0 Total: 25 / 0

Safety Summary: No incidents or events reported. 82 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping in the hole with 9-1/2" reaming assembly.

Planned Operations: Ream 9-1/2" hole from 6,500' to 7,500'. Run in hole to 10,000 and ream to 10,300'.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:30	2.50	10,947	CASE	Make up cross over sub to drill pipe onto 7" 38# Vam HT casing for dummy run. Remove hydraulic slips.	
8:30	9:00	0.50	10,947	CASE	Trip in hole with dummy casing assembly on drill pipe.	
9:00	10:00	1.00	10,947	BOPO	Door seal leaking on upper ram door. Open ram door and install new seal.	
10:00	14:00	4.00	10,947	CASE	Continue running dummy casing assembly on drill pipe to 10,215' MD. No tight spots. This will be setting depth for final casing shoe.	
14:00	18:30	4.50	10,947	CIRC	Circulating 2X bottom up for samples. Pump high viscosity sweep to clean hole.	
18:30	1:00	6.50	10,947	CASE	Trip out of the hole with dummy casing assembly on drill pipe. No tight spots. Casing assembly in good shape.	
1:00	2:00	1.00	10,947	RIGD	Rig down casing running equipment.	
2:00	3:00	1.00	10,947	OTHER	Install wear bushing.	
3:00	6:00	3.00	10,947	BHAOP	Make up BHA #44 with 9-1/2" bull nose PDC reamer and reaming assembly.	

Management Summary

Made up cross over sub to drill pipe onto 7" 38# Vam HT casing. Tripped in the hole with casing and drill pipe to 10,215'. No tight spots. Pumped sweeps and cleaned hole. Pulled out of the hole. No tight spots. Casing assembly in good shape. Installed wear bushing. Made up and tripped in the hole with BHA #44 with 9-1/2" bull nose PDC reamer and reaming assembly to 3,186'.

Comments

Fuel on hand 13,123 gals.
 Fuel used 775 gals.
 Temp in 110 F
 Temp out 126 F
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135		SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837		INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
06-Jul-23 12:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.8	0.65		95			500						86	105	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			



Bit/BHA/Workstring Information

BHA - No. 44 - OTHER, BS, STAB, DC, STAB, OTHER, STAB, DC, STAB, XO, 9 HWDP, XO, STAB, XO, 12 HWDP, JAR, 12 HWDP = 1163.75



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 82

Report For 06:00 AM 07-Jul-23

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 12.5	Total: 12.5	Jars: 12.5		
Hours on Casing/Liner:	Rotating: 47.5 / 0	Tripping: 84.5 / 0		Wear Bushing Installed	

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal) Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews. PJSM for running casing dummy run.
First Aid Treatments:		Medical Treatments:
Lost Time Incidents:		Days Since LTI: 82
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 91 degF	Bar. Pressure: 1003
Wind Speed/Dir: 17 / SSW	Wind Gusts: 20





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 83 Report For 06:00 AM 08-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 83

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 3 / 0 Other: 4 / 0 Total: 23 / 0

Safety Summary: No incidents or events reported. 83 days since LTI. Conducted Safety Meeting.

Current Operations: Tripping out of the hole at 5,100'.

Planned Operations: Finish tripping out of the hole. Lay down BHA. Run in hole with 8-3/4" bit to bottom. Spot bentonite pill. Pull out of the hole laying down drill pipe.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	10,947	TRPI	Trip in the hole with reaming assembly, BHA #44.	
8:00	12:00	4.00	10,947	REAM	Ream hole from 6,500' to 7,431'. 800 gpm, 80 rpm, 4K - 13K wob, 10K - 15K torq.	
12:00	13:00	1.00	10,947	TRPI	Trip in hole from 7,431' to 9,951'.	
13:00	14:30	1.50	10,947	REAM	Begin reaming from 9,951' to 10,300'.	
14:30	16:00	1.50	10,947	CIRC	Circulate at 10,300' for samples and to clean hole for casing run.	
16:00	16:30	0.50	10,947	SERV	Service rig and top drive.	
16:30	18:30	2.00	10,947	CIRC	Pump high viscosity sweep to clean hole.	
18:30	21:00	2.50	10,947	TRPO	Trip out of the hole from 10,300' to 5500'.	
21:00	5:00	8.00	10,947	REAM	Ream hole from 5,500' to 7,300'. 800 gpm, 80 rpm, 5K - 15K wob, 5K - 10 torq,	
5:00	6:00	1.00	10,947	TRPO	Trip out of the hole from 7,300' to 5,100'.	

Management Summary

Tripped in the hole with reaming assembly, BHA #44. Reamed hole from 6,500' to 7,431'. Tripped in hole from 7,431' to 9,951'. Reamed from 9,951' to 10,300'. Pumped high viscosity sweep and cleaned hole. Tripped out of the hole from 10,300' to 5500'. Reamed hole from 5,500' to 7,300'. Tripped out of the hole from 7,300' to 5,100'.

Comments

Fuel on hand 13,123 gals.
 Fuel used 775 gals.
 Temp in 115 F Temp
 out 130 F
 Total NPT to date 121.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
07-Jul-23 12:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.7	0.65		95			1200								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Caustic Soda - 50#SK	3	---	Engineering - OTHER	1	---



HIB 19 - GALS	1	---	Poly Vis - 50#SK	4	---
Xanthan Gum - 50#SK	4	---			

Bit/BHA/Workstring Information

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 83 **Report For 06:00 AM 08-Jul-23**

BHA - No. 44 - OTHER, BS, STAB, DC, STAB, OTHER, STAB, DC, STAB, XO, 9 HWDP, XO, STAB, XO, 12 HWDP, JAR, 12 HWDP = 1163.75

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
6,500	7,431	300.0	300.0	10	18	80	80	10	18	800	800	1,520
Annular Velocity:		Drill Collars:		423.0		Drill Pipe:		326.8				
Comments: Reaming												
5,500	7,500	300.0	300.0	10	13	80	80	10	15	800	800	1,470
Annular Velocity:		Drill Collars:		423.0		Drill Pipe:		326.8				
Comments: Reaming												

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	240	Pick Up:	460	Slack Off:		Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	27	Total:	27	Jars:	27		
Hours on Casing/Liner:	Rotating:	62 / 0	Tripping:	90 / 0	<input checked="" type="checkbox"/>	Wear Bushing Installed		

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal) Centrifuge 2: 12
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 83
<input type="checkbox"/> BOP Test	<input type="checkbox"/> Crownamatic Check	

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 86 degF	Bar. Pressure: 1005
Wind Speed/Dir: 13 / S	Wind Gusts: 18



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 84 Report For 06:00 AM 09-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31				
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):					
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:			
Average ROP (ft/hr):						Well Cost (\$):			

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 84

Pers/Hrs: Operator: 3 / 0 Contractor: 14 / 0 Service: 5 / 0 Other: 4 / 0 Total: 26 / 0

Safety Summary: No incidents or events reported. 84 days since LTI. Conducted Safety Meeting.

Current Operations: Laying down 5-1/2" subs, lifters, and x-overs.

Planned Operations: Finish putting 7" casing on pipe racks. Pick up and stand back 3-1/2" drill pipe.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	8:00	2.00	10,947	TRPO	Trip out of the hole from 5,100' to BHA #44.	
8:00	9:00	1.00	10,947	REPR	Change 2 hoses on ST-80.	X
9:00	10:00	1.00	10,947	BHAOP	Lay down jars, shock sub, reamers, bit sub and bull nose reamer.	
10:00	11:00	1.00	10,947	BHAOP	Remove jets from bit and make up BHA #45 consisting of 8 3/4" TCI bit, bit sub with float and X-over.	
11:00	13:00	2.00	10,947	TRPI	Trip in the hole with BHA #45 to 4,943'. SLM.	
13:00	14:30	1.50	10,947	CUTDL	Cut and slip drilling line.	
14:30	15:00	0.50	10,947	SERV	Service rig and adjust brakes.	
15:00	16:30	1.50	10,947	TRPI	Trip in the hole from 4,943' to 10,150'. SLM.	
16:30	17:30	1.00	10,947	WASH	Wash to bottom from 10,150' to 10,947'. Tag bottom.	
17:30	19:30	2.00	10,947	CIRC	Lay down 2 jts. of drill pipe. Circulate for samples and to clean hole.	
19:30	20:00	0.50	10,947	PUMP	Pump and spot 64 bbls of 25 pound per barrel bentonite pill on bottom.	
20:00	20:30	0.50	10,947	TRPO	Pull up to 10,228', laying down drill pipe.	
20:30	21:15	0.75	10,947	CIRC	Circulate out excess pill.	
21:15	6:00	8.75	10,947	TRPO	Trip out of the hole laying down drill pipe and HWDP from 10,228' to surface.	

Management Summary

Tripped out of the hole from 5,100' to BHA. Laid down BHA. Made up and tripped in the hole with BHA #45 consisting of 8- 3/4" TCI bit, bit sub with float and X-over to 10,150'. Washed to bottom from 10,150' to 10,947'. Tagged bottom. Circulated for samples and to clean hole. Spotted a 64 bbl bentonite pill on bottom. Pulled up to 10,228', Circulated out excess pill. Tripped out of the hole laying down drill pipe and HWDP from 10,228' to surface.

Comments

Fuel on hand 13,659 gals.
 Fuel used 1675 gals.
 Temp in 95 F Temp
 out 125 F
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

											Gels			Temp		Mud					
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss



08-Jul-23 12:30 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed														
8.40	27					9.7	0.65		95			1200		

	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 84 Report For 06:00 AM 09-Jul-23

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---	Xanthan Gum - 50#SK	1	---

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump							
No Run	Make	Model	Diam In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF
26	4	SANJOAQ	EP4900	8.750	10947												
Jets: 28 28 28					Out: 10947		Grade: Cutter: 1/1		Dull WT/NO		Wear: A		Brgs: E		Gge: 0		Pull: TD
Comments: Wash to bottom f 10,800' t 10,947'																	
BHA - No. 45 - BIT, BS, XO, 33 HWDP = 1016.45																	

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	208	Pick Up:	420	Slack Off:	170	Drag Avg/Max:	/ 212
Hours on BHA:	Since Inspection:	27	Total:	27	Jars:	27		
Hours on Casing/Liner:	Rotating:	64 / 0	Tripping:	105.75 / 0	Wear Bushing Installed			

Rig Information

Equipment Problems:
 Location Condition:
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 12 (Solids Removal) Centrifuge 2: 12 (Solids Removal)
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 84
BOP Test		Crowmamic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 89 degF	Bar. Pressure: 1008
Wind Speed/Dir: 6 / S	Wind Gusts: 10





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 85 Report For 06:00 AM 10-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 85

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 4 / 0 Other: 2 / 0 Total: 22 / 0

Safety Summary: No incidents or events reported. 85 days since LTI. Conducted Safety Meeting.

Current Operations: Rigging up to run 7" 38# casing.

Planned Operations: Finish rigging up. Run 7" casing with 3 fiber optics lines.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:00	1.00	10,947	TRPO	Pull wear bushing. Clean floor and lay down all handling subs, x-overs, and related tools for 5 1/2" drill pipe.	
7:00	10:00	3.00	10,947	OTHER	Load 7" casing back on rack after installing centralizers.	
10:00	14:00	4.00	10,947	OTHER	Strap 3 1/2" drill pipe. Pick up 30 stands and rack in derrick.	
14:00	16:00	2.00	10,947	OTHER	Clean floor, stage fiber optics cable protectors and move to floor,	
16:00	18:00	2.00	10,947	OTHER	Removing saver sub from top drive. Change out grabber dies. Rig down ST-80 and take off floor.	
18:00	6:00	12.00	10,947	OTHER	Made up new saver sub. (6-5/8 Reg to 5-1/2 FH) Clean rig and location. Change oil in generator #2. Repaired power washer.	

Management Summary

Pulled wear bushing. Laid down all handling subs, x-overs, and related tools for 5 1/2" drill pipe. Finished loading 7" casing on rack. Made up 30 stands of 3-1/2" drill pipe. Stood back in derrick. Staged fiber optics cable protectors on rig floor and the spools by the rig., Laid down ST-80. Changed out saver sub. Cleaned rig and location.

Comments

Fuel on hand 12,315 gals.
 Fuel used 1344 gals.
 Temp in F Temp out F
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
09-Jul-23 13:30 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.6	0.65		99			1300								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
API Gel - 100#SK	19	---	Engineering - OTHER	1	---
Pallets/Wraps - OTHER	2	---			





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 85

Report For 06:00 AM 10-Jul-23

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud				Pump					
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
26	4	SANJOAQ	EP4900	8.750	10947	0	0.0	0.0	0	0	0	8	0	0					
Jets: 28 28 28					Out: 10947		Grade: Cutter: 1 / 1			Dull WT / NO		Wear: A	Brgs: E	Gge: 0		Pull: TD			
Comments: Wash to bottom f 10,800' t 10,947'																			
BHA - No. 45 - BIT, BS, XO, 33 HWDP = 1016.45																			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 27	Total: 27	Jars: 27		
Hours on Casing/Liner:	Rotating: 64 / 0	Tripping: 109.25 / 0	Wear Bushing Installed		

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):		
Shaker No 1:	200	200	200	200	Desander: 0	Desilter: 0	Degasser: 0
Shaker No 2:	200	200	200	200	Centrifuge 1: 8 (Solids Removal)		Centrifuge 2: 8 (Solids Removal)
Shaker No 3:	200	200	200	200			

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings held daily with crews.
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 85
BOP Test	Crownamatic Check	

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 93 degF	Bar. Pressure: 1009
Wind Speed/Dir: 25 / SW	Wind Gusts: 25





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 86 Report For 06:00 AM 11-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---				
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---	AFE (\$)	---	Actual (\$)	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31						
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):							
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:				Totals:			
Average ROP (ft/hr):								Well Cost (\$):			---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 86

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 4 / 0 Other: 8 / 0 Total: 28 / 0

Safety Summary: No incidents or events reported. 86 days since LTI. Conducted Safety Meeting.

Current Operations: Running 7" casing at 2,202'.

Planned Operations: Continue running 7" casing. Install gauge carrier and third fiber line.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	11:30	5.50	10,947	CASE	Rig up B&L Casing to run 7" casing. Rig up Baker, Silixa and Shell for fiber optics. Pick up Shoe joint set in table. Hang Baker sheaves from derrick board with 3 fiber optics cables. Pump through float shoe to verify working. Adjust B&L casing tongs. Work on tongs. Tie service loop in derrick due to high winds.	
11:30	15:30	4.00	10,947	CASE	Pick up and run in hole with Shell Termination Sub, Silixa Termination Sub, Float Collar and PetroQuip Landing Profile.	
15:30	16:30	1.00	10,947	CASE	Test fiber optics communication lines. Fill pipe and test float collar.	
16:30	6:00	13.50	10,947	CASE	Run 7" 38# Vam HT casing from 455' to 2,202' as per program. Fill casing and test fiber optics every 10 joints. Used Bestolife casing dope.	

Management Summary

Rigged up B&L Casing to run 7" casing. Rigged up Baker, Silixa and Shell for fiber optics. Picked up Shoe joint and pumped through float shoe to verify working. Picked up and ran in with Shell Termination Sub, Silixa Termination Sub, Float Collar and PetroQuip Landing Profile. Filled pipe and tested float collar and fiber optics communication lines. Ran 7" 38# Vam HT casing from 455' to 2,202' as per program. Filled casing and tested fiber optics every 10 joints.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
10-Jul-23 15:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.43	27	1	1	100	0.25	9	0.65					1300	60							

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering 1 -	1	---	MDC -	2	---

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/	
Hours on BHA:	Since Inspection:	27	Total:	27	Jars:	27
Hours on Casing/Liner:	Rotating:	64 / 0	Tripping:	126.25 / 0	Wear Bushing Installed	

Rig Information

Equipment Problems:

Location Condition:

Transport:





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32
 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 86

Report For 06:00 AM 11-Jul-23

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Wash / Filter
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5.5"	365	24.7	S-135	5.5FH	5.5	30	71.0	S-135	5.5FH
5.5	20	54.0	S-135	5.5FH					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews, Shell, Baker, Silixa and FORGE representatives prior to rigging up. 10 minute safety meeting with Frontier crew, Baker, Shell and Silixa prior to picking up casing.
First Aid Treatments:	0	Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 86
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 90 degF	Bar. Pressure: 1007
Wind Speed/Dir: 21 / SSW	Wind Gusts: 30





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 87 Report For 06:00 AM 12-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	11.750 at 4,837	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:	7.000 at 10,159	RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):	---	Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:	---	Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 87

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 4 / 0 Other: 8 / 0 Total: 28 / 0

Safety Summary: No incidents or events reported. 87 days since LTI. Conducted Safety Meeting.

Current Operations: Running 7" casing at 7,453'.

Planned Operations: Finish running 7" casing. Install liner hanger and landing joint. Land casing. Circulate and cement.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	12:45	6.75	10,947	CASE	Run 7" 38# Vam HT casing from 2,202' to 3,148' as per program. Fill casing and test fiber optics every 10 joints.	
12:45	15:30	2.75	10,947	CASE	Make up gauge carrier sub, install fiber optics line and test. Test failed. Tighten all fittings and test again. Test failed. Change fitting on bottom of fiber line and retest. Test passed.	
15:30	18:00	2.50	10,947	CASE	Run 7" 38# Vam HT casing from 3,148' to 3,770' as per program (77 total joints run). Fill casing and test fiber optics every 10 joints.	
18:00	1:00	7.00	10,947	CASE	Run 7" 38# Vam HT casing from 3,770' to 6,095' as per program (127 total joints run). Fill casing and test fiber optics every 10 joints.	
1:00	2:00	1.00	10,947	CASE	Troubleshoot jumper wire on Baker reel. Replace jumper wire.	
2:00	5:00	3.00	10,947	CASE	Run 7" 38# Vam HT casing from 6,095' to 7,033' as per program (147 total joints run). Fill casing and test fiber optics every 10 joints.	
5:00	6:00	1.00	10,947	CASE	Run 7" 38# Vam HT casing from 7,033' to 7,453' as per program (156 total joints run). Fill casing every 20 joints. No fiber optics testing.	

Management Summary

Ran 7" 38# Vam HT casing from 2,202' to 3,148' as per program. Made up gauge carrier sub, install fiber optics line and tested. Continued running 7" from 3,148' to 7,453 as per program. Filled casing and tested fiber optics every 10 joints. 156 total joints run.

Comments

Fuel on hand 10,261 gals.
Fuel used 955 gals.
Temp in F Temp out F
Total NPT to date 122.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	

Mud Information

														Gels			Temp		Mud		
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
11-Jul-23 15:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																					
8.43	27	1	1	100	0.25	8.7	0.65						1450	50							

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering 1 -	1	---			





Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 87 **Report For 06:00 AM 12-Jul-23**

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection: 0	Total: 0	Jars: 0		
Hours on Casing/Liner:	Rotating: 0 / 0	Tripping: 144.25 / 0	Wear Bushing Installed		

Rig Information

Equipment Problems:
 Location Condition:
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Wash / Filter
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
3.5	30	15.5	S-135	3.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews,
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 87
BOP Test	Crownamatic Check	

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 90 degF	Bar. Pressure: 1012
Wind Speed/Dir: 14 / SSW	Wind Gusts: 20





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 88 Report For 06:00 AM 13-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 88

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 6 / 0 Other: 9 / 0 Total: 31 / 0

Safety Summary: No incidents or events reported. 88 days since LTI. Conducted Safety Meeting.

Current Operations: Pumping 7" primary cement job.

Planned Operations: Finish pumping 7" cement job. Wait on cement.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	14:00	8.00	10,947	CASE	Run 7" 38# Vam HT casing from 7,453' to 10,173' as per program (214 total joints run). Fill casing every 20 joints.	
14:00	14:30	0.50	10,947	CASE	Make up hanger and landing joint in mouse hole. Make up to stump.	
14:30	15:00	0.50	10,947	CASE	Rig down B&L equipment except for tongs to soft break landing joint.	
15:00	18:00	3.00	10,947	CASE	Remove sheaves from derrick. Baker stripping coating from fiber lines running through hanger and wrapping. SLB on location rigging up pump trucks for cement job.	
18:00	20:00	2.00	10,947	CASE	Finish feeding fiber optics through hanger. Wrap line around hanger neck.	
20:00	22:00	2.00	10,947	CASE	Open 3" casing valves. Lower casing and land hanger. Test seals to 5,000 psi for 10 minutes. Lock down hanger. Break out and lay down CRT. Soft break landing joint. Lay down tongs.	
22:00	5:00	7.00	10,947	CIRC	Install circulating swage on casing and circulate 400 gpm at 400 psi. 3 mud coolers on and working. Start Mud temp in 71°F. Out 94°F. DH Temp at Gauge at 7,033' 309°F. 04:45 Mud temp in 86°F, Out 110°F, DH Gauge 279°F	
5:00	6:00	1.00	10,947	CMTP	PJSM with Schlumberger and rig crews. Install cement head. Swap return hoses from mud tanks to reserve pit. Test lines to 5,000 psi. Begin pumping 50 bbl. spacer.	

Management Summary

Ran 7" 38# Vam HT casing from 7,453' to 10,173' as per program. (214 total joints run). Made up hanger and landing joint. Removed sheaves from derrick. Baker stripped coating from fiber lines. Ran through hanger and wrapped around hanger neck. Opened 3" casing valves. Lowered casing and landed hanger. Tested seals to 5,000 psi for 10 minutes. Locked down hanger. Installed circulating swage on casing and circulated at 400 gpm. PJSM with Schlumberger and rig crews. Install cement head. Swap return hoses from mud tanks to reserve pit. Test lines to 5,000 psi. Begin pumping 50 bbl. spacer.

Comments

Fuel on hand 9,309 gals.
Fuel used 952 gals.
Temp in F Temp
out F
Total NPT to date 122.50 HR.
No H2S today.


Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	
LINER	7.000	7	0	10,208	8,061	INT2	9.500	38	VSTP110M	

Mud Information



%														Gels			Temp			Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
12-Jul-23 12:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					8.7			99			1400								

	Daily Drilling Report										University of Utah												
	Well ID: FORGE 16B(78)-32										Well Name: FORGE 16B(78)-32												
Field: FORGE										Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT													
Report No: 88										Report For 06:00 AM 13-Jul-23													
Mud Consumables																							
Item Description		Qty.		Cost		Item Description		Qty.		Cost													
Engineering - OTHER		1		---																			
Miscellaneous Drilling Parameters																							
Hook Loads (lbs):			Off Bottom Rotate:			Pick Up:			Slack Off: 200			Drag Avg/Max: /											
Hours on BHA:			Since Inspection: 0			Total: 0			Jars: 0														
Hours on Casing/Liner:			Rotating: 0 / 0			Tripping: 152.25 / 0			Wear Bushing Installed														
Rig Information																							
Equipment Problems:																							
Location Condition:																							
Transport:																							
Solids Control Information																							
Screen Sizes:		Top		Middle 1		Middle 2		Bottom															
Shaker No 1:		200		200		200		200															
Shaker No 2:		200		200		200		200															
Shaker No 3:		200		200		200		200															
Drill Pipe Inventory																							
DP Size		Joints		Weight		Grade		Thread		DP Size		Joints		Weight		Grade		Thread					
3.5		30		15.5		S-135		3.51F															
Safety Information																							
Meetings/Drills		Time		Description																			
Safety		30		Two Pre-tour safety meetings with crews,																			
First Aid Treatments:			0			Medical Treatments:			0			Lost Time Incidents:			0			Days Since LTI:			88		
BOP Test		Crownamatic Check																					
Weather Information																							
Sky Condition:						Clear						Visibility:						10					
Air Temperature:						92 degF						Bar. Pressure:						1006					
Wind Speed/Dir:						20 / SW						Wind Gusts:						25					



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 89 Report For 06:00 AM 14-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 89

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 9 / 0 Other: 6 / 0 Total: 31 / 0

Safety Summary: No incidents or events reported. 89 days since LTI. Conducted Safety Meeting.

Current Operations: Waiting on cement to set.

Planned Operations: Lift BOP stack. Secure fiber optics. Nipple down and remove 13 5/8" X 5,000 BOPEs. Install 7-1/16" 10,000 BOPEs with fiber optics.

Toolpusher: Steve King, Jason Postma

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	11:00	5.00	10,947	CMTP	Finish pumping 50 bbl 12.5 ppg spacer. Mix and pump 318 bbls of plan 13.8 ppg cement. Actual density was between 12.5 -13.6 ppg cement due to the thickness of the cement being mixed. Pump rates are between 2-4 bpm. At 318 bbls of cement pumped, cement mixer became plugged. Attempt to unplug. Switch out pump trucks. Pump an additional 336 bbls of 12.9 to 13.6 ppg cement at 3 to 5 bpm. Drop plug and displace with 328 bbls of water. Bump plug. Check floats. Floats held. Returned 2.5 bbls. CIP at 10:56. Approx 80 bbls of light cement returns. (11.2 ppg start to 12.1 ppg at the end). Closed casing valves. Open casing valve, well on a vacuum. Close casing valve.	
11:00	6:00	19.00	10,947	WOC	Wait on cement. Install valves on 7-1/16" mudcross. Clean radiators on generators. Identify leaks on separator.	

Management Summary

Finished pumping 50 bbl of 12.5 ppg spacer. Mixed and pumped 318 bbls of the plan 13.8 ppg cement. Actual density was between 12.5 -13.6 ppg cement due to the thickness of the cement being mixed. Pump rates were between 2-4 bpm. At 318 bbls of cement pumped, cement mixer became plugged. Attempted to unplug. Switched out cement pump trucks. Pumped an additional 336 bbls of 12.9 to 13.5 ppg cement at 3 to 5 bpm. Dropped plug and displaced with 328 bbls of water. Bumped plug. Checked floats. Floats held. 2.5 bbls back. CIP at 10:56. Approx 80 bbls of light cement returns. (11.4 ppg start. 12.1 ppg end). Closed casing valves. Opened casing valve. Well on a vacuum. Closed casing valve.

Comments

Fuel on hand 8,670 gals.
 Fuel used 636 gals.
 Temp in F Temp out F
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84 OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65 OTHER	
LINER	7.000	7	0	10,208	8,061	INT2	9.500	38 VSTP110M	

Mud Information

%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	Temp		Mud Loss
																			In	Out	
13-Jul-23 14:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																					
8.40	27							0.65		99			2000								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
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Engineering - OTHER	1	---
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	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
	Report No: 89	
	Report For 06:00 AM 14-Jul-23	

Miscellaneous Drilling Parameters					
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Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/	
Hours on BHA:	Since Inspection:	0	Total:	0	Jars:	0
Hours on Casing/Liner:	Rotating:	0 / 0	Tripping:	0 / 0	Wear Bushing Installed	

Rig Information					
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Equipment Problems:
Location Condition:
Transport:

Solids Control Information					
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Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Wash / Filter
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory									
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DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
3.5	30	15.5	S-135	3.5IF					

Safety Information		
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Meetings/Drills	Time	Description					
Safety	30	Two Pre-tour safety meetings with crews,					
First Aid Treatments:	0	Medical Treatments:	0	Lost Time Incidents:	0	Days Since LTI:	89
BOP Test	Crownamatic Check						

Weather Information			
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Sky Condition:	Clear	Visibility:	10
Air Temperature:	96 degF	Bar. Pressure:	1004
Wind Speed/Dir:	9 / SSW	Wind Gusts:	12



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 90 Report For 06:00 AM 15-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 90

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 4 / 0 Other: 8 / 0 Total: 28 / 0

Safety Summary: No incidents or events reported. 90 days since LTI. Conducted Safety Meeting.

Current Operations: Rigging up to test 7-1/16" BOPs.

Planned Operations: Test BOPs. Pick up 5-1/2" bit and BHA. Trip in hole, picking up drill pipe. Drill out shoe track and bentonite plug.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	10:00	4.00	10,947	WOC	Move Shell Connex in place. Gather rental equipment for return. Clean floor.	
10:00	11:00	1.00	10,947	WOC	Rig down SLB cement equipment, remove cement head. Load on trucks.	
11:00	11:30	0.50	10,947	BOPO	Lay down landing joint. Remove mousehole, unflange flowline, remove turnbuckles.	
11:30	12:00	0.50	10,947	WELLHD	Install Streamflo back pressure valve.	
12:00	15:00	3.00	10,947	BOPO	Unbolt rotating head and raise. Pull fiber lines through and remove. Unbolt annular preventer and raise. Pull fiber lines through and remove. Unbolt double gate and raise. Pull fiber lines through and remove. Unbolt mud cross and raise. Pull fiber lines through and remove.	
15:00	18:00	3.00	10,947	BOPO	Pull fiber lines through ports on packoff flange and set down on lower wellhead. Insert packoff and set master valve onto packoff flange. Tighten down master valve onto packoff flange.	
18:00	21:30	3.50	10,947	BOPO	Terminate fiber optics. Test seal on hanger neck to 5,000 psi 15 mins. Test packoff body to 5,000 psi 15 mins.	
21:30	4:00	6.50	10,947	BOPO	Install 7-1/16" 10,000 psi BOPs consisting of mud cross, doublegate, spacer spools, rotating head, and accumulator hoses. Function test BOPs. Install flowline, kill line, fill up line and turnbuckles.	
4:00	5:30	1.50	10,947	OTHER	Set in catwalk. Install mousehole. Lay down pick up lines. Install ST-80.	
5:30	6:00	0.50	10,947	BOPT	Remove back pressure valve. Install 2 way check.	

Management Summary

Rigged down SLB cement head and equipment. Laid down landing joint. Removed mousehole and turnbuckles. Disconnected flowline. Installed Streamflo back pressure valve. Remove rotating head, annular, doublegate and mudcross pulling fiber optics lines through each piece. Pulled fiber optic lines through ports on packoff flange and sat down on lower wellhead. Inserted packoff and installed master valve. Terminated fiber optics and tested packoff. Installed 7-1/16" 10,000 psi mud cross, doublegate, spacer spools, rotating head, and accumulator hoses. Function test BOPs. Install flowline, kill line, fill up line and turnbuckles. Removed back pressure valve. Installed 2 way check.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	
LINER	7.000	7	10,208	8,061	INT2	9.500	38	VSTP110M	

Mud Information

														Gels			Temp		Mud		
%	Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
14-Jul-23 10:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																					
8.40	27					8.5	0.65		99			2000									

Mud Consumables



Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE		University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	
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Report No: 90 Report For 06:00 AM 15-Jul-23

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Wash Water / Filtrate
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
3.5	30	15.5	S-135	3.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews,
First Aid Treatments:	0	Medical Treatments: 0
Lost Time Incidents:	0	Days Since LTI: 90
BOP Test		Dynamic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 78 degF	Bar. Pressure: 1010
Wind Speed/Dir: 17 / WNW	Wind Gusts: 20



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 91 Report For 06:00 AM 16-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	---
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	AFE (\$)	---
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		Actual (\$)	---
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---
Average ROP (ft/hr):						Well Cost (\$):	---

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 91

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 2 / 0 Other: 4 / 0 Total: 22 / 0

Safety Summary: No incidents or events reported. 91 days since LTI. Conducted Safety Meeting.

Current Operations: Drilling out shoe track at 10,181'.

Planned Operations: Finish drilling out shoe track. Clean out bentonite plug from 10,208' to 10,947'. Pump sweeps and clean hole. Trip out of the hole.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	10:00	4.00	10,947	BOPT	Test pipe rams to 250 psi low, 6,000 psi high (limited by top drive weight). Test inside and outside kill valves, inside choke valve, HCR, IBOP, TIW valves to 250 psi low, 6,000 psi high. Test blind rams and all 7" flanges below blind rams to 250 psi low, 8,500 psi high. The top seal of three on the CSBS metal seal inside the adapter flange was leaking. Could not get a good test of top seal. Was able to get a test on the bottom two seals.	
10:00	13:30	3.50	10,947	OTHER	Pick up rotating head clamp and bearing pack and install. Loading pipe racks with collars and drill pipe. Move Baker fiber optic unit. Waiting on Silixa to run testing on fiber.	
13:30	1:30	12.00	10,947	TRPI	Make up 5 1/2" bit, 5 1/4" near bit stabilizer w/ float, 1 joint of drill collars, 5 1/4" stabilizer and 23 joints of drill collars. Run in hole on drill pipe picking up singles to 9,903'.	
1:30	4:00	2.50	10,947	CMTD	Tag top of cement at 9,903'. Drill out cement to float collar at 9,934'. Drill out float collar.	
4:00	6:00	2.00	10,947	CMTD	Drill out shoe track from 9,936' to 10,181'. No cement below float collar.	

Management Summary

Tested BOPE to 8,500 psi. Tested good. Tested hanger packoff. The top seal of three on the CSBS metal seal inside the adapter flange leaked. Bottom two seals tested good. Ran in hole with 5-1/2" bit and BHA picking up singles to 9,903'. Tagged top of cement at 9,903'. Drilled out cement to float collar at 9,934'. Drilled out float collar.

Comments

Fuel on hand 15,150 gals.
 Fuel used 782 gals.
 Temp in 80 F
 Temp out 94 F
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3 4,837	4,837	INT1	14.750	65	OTHER	
LINER	7.000	7	0 10,208	8,061	INT2	9.500	38	VSTP110M	

Mud Information

%
 Dens. Vis PV YP Filtr. Cake pH/ES Solids Oil Water Sand LGS Cl Ca CaCl 10s 10m 30m Gels Temp Mud In Out Loss

15-Jul-23 12:00 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																	
8.40	27					8.4	0.65			99.5			2000				



Mud Consumables					
Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

	Daily Drilling Report		University of Utah		
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32		
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT		

Report No: 91 Report For 06:00 AM 16-Jul-23

Bit/BHA/Workstring Information

Depth No Run	Make	Model	Diam In	This Run			R.O.P.			Mud Pump											
				Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF				
34	1	SANJOAQ	tricone	5.500	10947	278	4.5	61.8	200.0		3	70		8	250	2100	61	28		4	66
Jets: 24 24 24				Out:		Grade: Cutter: /		Dull /		Wear:		Brgs:		Gge:		Pull:					
BHA - No. 46 - BIT, NBS, DC, STAB, 23 DC = 748.80																					

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
9,803	10,208	75.0	200.0	1	17	70	70	8	9	250	250	2,100	
Annular Velocity:		Drill Collars:		490.8		Drill Pipe:		268.8					
Comments: Drill out shoe track.													

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	152	Pick Up:	190	Slack Off:	120	Drag Avg/Max:	38 / 50
Hours on BHA:	Since Inspection:	4.5	Total:	4.5	Jars:	0		
Hours on Casing/Liner:	Rotating:	/ 4.5	Tripping:	/ 12	Wear Bushing Installed			

Rig Information

Equipment Problems:
 Location Condition:
 Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):
Shaker No 1:	200	200	200	200	Desander: 0 Desilter: 0 Degasser: 0
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joins	Weight	Grade	Thread	DP Size	Joins	Weight	Grade	Thread
3.5"	362	15.5	S-135	3.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews,
First Aid Treatments:	0	Medical Treatments:
Lost Time Incidents:	0	Days Since LTI:
91		
BOP Test		Crownamatic Check

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 94 degF	Bar. Pressure: 1011
Wind Speed/Dir: 10 / NNW	Wind Gusts: 15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 92 Report For 06:00 AM 17-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 92

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 4 / 0 Other: 1 / 0 Total: 21 / 0

Safety Summary: No incidents or events reported. 92 days since LTI. Conducted Safety Meeting.

Current Operations: Finishing rig service.

Planned Operations: Run logs. Rig up for circulation test.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	9:00	3.00	10,947	CMTD	Drill out cement in shoe track f/ 10,181' t/ 10,218'. Drill shoe f/ 10,218' t/10,220'. Very light cement in shoe track and after drilling out.	
9:00	14:30	5.50	10,947	CMTD	Drill cement f/ 10,220' t/ 10,310'. Wash and circulate from 10,310' to 10947'.	
14:30	16:00	1.50	10,947	CIRC	Pump 2 high viscosity sweeps and circulate 2 bottoms up to clean hole and to catch samples.	
16:00	16:30	0.50	10,947	TRPO	Back ream out of the hole to 10,204' to clean hole on the way out. SLM.	
16:30	18:00	1.50	10,947	CIRC	Pump high viscosity sweep and clean hole.	
18:00	23:00	5.00	10,947	TRPO	Trip out of the hole from 10,204' to surface. SLM. Break out bit and near bit. Stand back drill collars and string stab.	
23:00	4:00	5.00	10,947	OTHER	Move choke house and trip tank. Rig up flex hose to separator lines Spot separator and rig up.	
4:00	5:30	1.50	10,947	OTHER	Fix leaks on ST-80. Remove ditch magnets. General housekeeping on rig and location.	
5:30	6:00	0.50	10,947	SERV	Serviced rig.	

Management Summary

Drilled out cement in shoe track f/ 10,181' t/ 10,218'. Drilled shoe f/ 10,218' t/10,220'. Very light cement in shoe track. Drill cement from 10,220' to 10,310'. Washed and circulated from 10,310' to 10947'. Pumped 2 high viscosity sweeps and cleaned hole. Back reamed out of the hole to 10,204'. SLM. Pumped high viscosity sweep and cleaned hole. Tripped out of the hole from 10,204' to surface. SLM .5 ft difference. Rigged up separator.

Comments

Fuel on hand 13,634 gals.
 Fuel used 1272 gals.
 Temp in 97 F Temp
 out 113 F
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	
LINER	7.000	7	10,208	8,061	INT2	9.500	38	VSTP110M	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
16-Jul-23 13:45 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27			80	0.25	9.5	0.65		99			1900								



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	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 92	Report For 06:00 AM 17-Jul-23
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Mud Consumables					
Item Description	Qty.	Cost	Item Description	Qty.	Cost
Bicarb - 50#SK	2	---	Desco - 25#SK	5	---
Engineering - OTHER	1	---	Polythin - OTHER	4	---

Bit/BHA/Workstring Information																						
Depth		This Run								R.O.P.								Mud		Pump		
No	Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF			
34	1	SANJOAQ	tricone	5.500	10947	280	7.5	37.3	200.0	8	68		8250	2000		61	28	466				
Jets: 24 24 24					Out: 10947		Grade: Cutter:		5 / 4		Dull		BT / WT		Wear: N		Brgs: F		Gge: 1		Pull: TD	
Comments: 2 cones loose.																						
BHA - No. 46 - BIT, NBS, DC, STAB, 23 DC = 748.80																						

Drilling Parameters													
Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure (psi)	
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
10,206	10,208	0.1	0.1	8	12	68	70	8	9	250	250	2,150	
Annular Velocity: Drill Collars:				490.8		Drill Pipe:		268.8					
Comments: Drill out float shoe.													

Miscellaneous Drilling Parameters													
Hook Loads (lbs):		Off Bottom Rotate:			Pick Up:		Slack Off:		Drag Avg/Max: /				
Hours on BHA:		Since Inspection:			7.5 Total:		7.5		Jars: 0				
Hours on Casing/Liner:		Rotating:			/ 7.5		Tripping:		/ 23			Wear Bushing Installed	

Rig Information
Equipment Problems:
Location Condition:
Transport:

Solids Control Information									
Screen Sizes:					Equipment Usage (Hrs):				
Shaker No 1:	Top	Middle 1	Middle 2	Bottom	Desander:	Desilter:	Degasser:	Centrifuge 1:	Centrifuge 2:
200	200	200	200	200	0	0	0	12 (Solids Removal)	12 (Solids Removal)
200	200	200	200	200					
200	200	200	200	200					

Drill Pipe Inventory									
DP Size		Joints		Weight		Grade		Thread	
3.5"	362	15.5	S-135	3.5IF					

Safety Information															
Meetings/Drills		Time		Description											
Safety	30	Two Pre-tour safety meetings with crews,													
First Aid Treatments:		0		Medical Treatments:		0		Lost Time Incidents:		0		Days Since LTI:		92	
BOP Test		Crownamatic Check													

Weather Information									
Sky Condition: Clear					Visibility: 10				
Air Temperature: 101 degF					Bar. Pressure: 1007				
Wind Speed/Dir: 9 / S					Wind Gusts: 15				





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 93 Report For 06:00 AM 18-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 93

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 2 / 0 Other: 2 / 0 Total: 20 / 0

Safety Summary: 1 First Aid Treatment reported. 93 days since LTI. Conducted Safety Meeting.

Current Operations: Waiting for pump trucks for Circulation Test.

Planned Operations: Perform Circulation Test #2.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	13:00	7:00	10,947	OTHER	Gel separator to prevent leakage, install throttle valve on 16A, rig up line to pit, install gauges on kill side of BOP on 16B, locating rental equipment, move remaining 7" casing to 58-32 location.	
13:00	0:00	11:00	10,947	LOG	Rig up SLB Logging and log well with isolation scanner and cement bond log. Log well from 5,500' to surface. Trouble with logging tools. Rig down wireline tools.	
0:00	0:30	0:50	10,947	TRPI	Trip in hole with 5-1/2" bit, bit sub with float, stand drill collars and 10 stands of drill pipe to 1,109' to displace water from top of well.	
0:30	1:00	0:50	10,947	TRPO	Trip out of the hole.	
1:00	6:00	5:00	10,947	WOE	Wait on pump trucks for circulation test. Rig up yellow dog water pump. Turn off mud coolers. Inventory subs and x-overs to go back. Clean up back yard.	X

Management Summary

Installed throttle valve. Rigged up line to pit, install gauges on kill side of BOP on 16A well. Rigged up SLB Logging and logged well with isolation scanner and cement bond log from 5,500' to surface. Trouble with logging tools. Rigged down wireline tools. Tripped in hole with 5-1/2" bit, bit sub with float, stand drill collars and 10 stands of drill pipe to 1,109' to displace water from top of well. Tripped out of the hole.

Comments

Fuel on hand 13,157 gals.
 Fuel used 477 gals.
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER
LINER	7.000	7	0	10,208	8,061	INT2	9.500	38	VSTP110M

Mud Information

%													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
17-Jul-23 13:45 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27			80	0.25	9.5	0.65		99.5			1900								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Bicarb - 50#SK	2	---	Desco - 25#SK	5	---
Engineering - OTHER	1	---	Polythin - OTHER	4	---

Miscellaneous Drilling Parameters

Hook Loads (lbs): Off Bottom Rotate: Pick Up: Slack Off: Drag Avg/Max: /



Hours on BHA:	Since Inspection:	7.5	Total:	7.5	Jars:	0
Hours on Casing/Liner:	Rotating:	17.5	Tripping:	125	Wear Bushing Installed	

	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE		University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	
	Report No: 93		Report For 06:00 AM 18-Jul-23	

Rig Information				
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Equipment Problems:
 Location Condition:
 Transport:

Solids Control Information				
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Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Wet Pan / Fluids
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory									
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DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
3.5"	362	15.5	S-135	3.5IF					

Safety Information		
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Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews.

First Aid Treatments: 1 Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 93

Accident Description: SLB Logging employee was picking up SLB tools and placed his finger in one of the spring sections of the tool and pinched it.

BOP Test Crownamatic Check

Weather Information		
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Sky Condition: Cloudy	Visibility: 10
Air Temperature: 98 degF	Bar. Pressure: 1006
Wind Speed/Dir: 25 / SW	Wind Gusts: 30



Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 94 Report For 06:00 AM 19-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 94

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 3 / 0 Other: 5 / 0 Total: 24 / 0

Safety Summary: No incidents or events reported. 94 days since LTI. Conducted Safety Meeting.

Current Operations: Monitoring wells 16A and 16B.

Planned Operations: Perform final Circulation Test including PLT logs on 16A.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	11:00	5.00	10,947	PUMP	Rig up 16A well for circulation test #2. Rig up SLB. Fill hole and all lines to separator. Close blind rams. HSM with all personnel. Pressure test SLB lines to 5,000 psi.	
11:00	21:50	10.83	10,947	PUMP	Perform circulation test #2 pumping down well 16A and recording pressure, temperature, and flow on well 16B. Pumped 2.5 bpm for 60 minutes holding 200 psi on 16B for 15 minutes, then decreased pressure to 100 psi for 15 minutes, then opened well upholding 0 psi for 30 minutes. Increased rate on 16A to 5bpm and held 200 psi on 16B for 15 minutes, decreased pressure to 100 psi for 15 minutes, then 0 psi for remainder of test. Increase rate to SLB max of 7.4 bpm.	
21:50	6:00	8.17	10,947	EVAL	Shut down pumping. Close both 16A and 16B wells in keeping 16B wellhead pressure between 400 and 500 psi. remove 5.5" rams and install 5" on 13-3/8" doublegate. Load out some of the 5.5" drill pipe.	

Management Summary

Rigged up 16A well for circulation test #2. Rigged up SLB. Filled hole and all lines to separator. Closed blind rams. Pressure tested SLB lines to 5,000 psi. Performed circulation test pumping down well 16A and recording pressure, temperature, and flow on well 16B. Pumped 2.5 bpm, 5 bpm and 7.4 bpm stages. Shut down pumping. Closed both wells in keeping 16B wellhead pressure between 400 and 500 psi.

Comments

Fuel on hand 13,195 gals.
 Fuel used 563 gals.
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER	
LINER	7.000	7	0	10,208	8,061	INT2	9.500	38	VSTP110M	

Mud Information

%														Gels			Temp		Mud	
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
18-Jul-23 11:45 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed																				
8.40	27					9.1	0.65		99.5			1800								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	7.5	Total:	7.5	Jars: 0



Hours on Casing/Liner:	Rotating:	17.5	Tripping:	125	Wear Bushing Installed
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	Daily Drilling Report		University of Utah	
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32	
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT	

Report No: 94 Report For 06:00 AM 19-Jul-23

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Water/Fine
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
3.5"	362	15.5	S-135	3.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Two Pre-tour safety meetings with crews, 30 minute safety meeting with all personnel on location to review circulation test #2.

First Aid Treatments: 0 Medical Treatments: 0 Lost Time Incidents: 0 Days Since LTI: 94

BOP Test Crownamatic Check

Weather Information

Sky Condition: Partly cloudy	Visibility: 10
Air Temperature: 93 degF	Bar. Pressure: 1007
Wind Speed/Dir: 17 / SSW	Wind Gusts: 20



Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 95 **Report For 06:00 AM 20-Jul-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 10947	Last Casing: 7.000 at 10,208	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 8357	Next Casing:	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft): 10658	Last BOP Test: 27-May-23	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Next BOP Test: 26-Jun-23	Working Interest:	Totals: ---		
Average ROP (ft/hr):			Well Cost (\$): ---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 **DOL:** 95

Pers/Hrs: **Operator:** 2 / 0 **Contractor:** 14 / 0 **Service:** 3 / 0 **Other:** 6 / 0 **Total:** 25 / 0

Safety Summary: 1 Medical Treatment reported. 95 days since LTI. Conducted Safety Meeting.

Current Operations: Filling mud pits with clean water.

Planned Operations: Run in hole with 5-1/2" bit and BHA. Change hole over to clean water. Trip out of the hole laying down drill pipe.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	15:00	9:00	10,947	WOE	Remove top valve on 16A and install flange for lubricator. Put lubricator and PLT tools together on stands and get ready to pick up. Wait on crane to arrive until 13:30, wait on forklift to return with SLB logging tools needed to rig up until 15:00. Trucking company van carrying SLB tools broke down on road.	X
15:00	21:00	6:00	10,947	SLWL	Determined that crane was not big enough to run lubricator on top of well 16A. Broke down tool and made up in wellhead w/o lubricator. Pick up grease head and land to seal off well. Run in the hole with spinner tool on wireline. Well was always flowing. 230* F coming back. Clean mud pits with super sucker and pressure washer.	
21:00	6:00	9:00	10,947	PUMP	Close annulus valve. Perform circulation test #2, Stage 2, pumping down well 16A and recording pressure, temperature, and flow on well 16B. Pumped 2.5 bpm for 45 minutes holding 200 psi on 16B for 15 minutes, then decreased pressure to 100 psi for 15 minutes, then opened well up, holding 0 psi for 15 minutes. Increased rate on 16A to 5 bpm and held 200 psi on 16B for 15 minutes, decreased pressure to 100 psi for 15 minutes, then 0 psi for remainder of test. Increase rate to SLB max of 7.5 bpm. Shut down pumping. Shut in for 40 mins. Bleed down 16B. 130* F coming back. Lay down wireline tools. Closed well in. Rig down SLB.	

Management Summary

Rigged up SLB lubricator. Determined that crane was not big enough to run lubricator on top of well 16A. Broke down tools and made up in wellhead w/o lubricator with well flowing. Rigged up grease head and landed to seal off well. Ran in the hole with spinner tool on wireline. Performed circulation test pumping down well 16A and recording pressure, temperature, and flow on well 16B. Pumped 2.5 bpm, 5 bpm and 7.5 bpm stages. Shut down pumping. Bled off well. Pulled out of the hole with wireline. Closed well in. Rig down SLB. Cleaned mud pits.

Comments

Fuel on hand 13,195 gals.
 Fuel used 563 gals.
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750	-3	4,837	4,837	INT1	14.750	65	OTHER	
LINER	7.000	7	10,208	8,061	INT2	9.500	38	VSTP110M	

Mud Information

													Gels			Temp		Mud		
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss

19-Jul-23 11:15 at Depth 10,947 ft Other Location, Type: Low Solids Non-Dispersed

8.40	27					8.8			99.5			1750									
------	----	--	--	--	--	-----	--	--	------	--	--	------	--	--	--	--	--	--	--	--	--

Mud Consumables



Item Description	Qty.	Cost	Item Description	Qty.	Cost
Engineering - OTHER	1	---			

	Daily Drilling Report		University of Utah		
	Well ID: FORGE 16B(78)-32		Well Name: FORGE 16B(78)-32		
	Field: FORGE		Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT		

Report No: 95 **Report For 06:00 AM 20-Jul-23**

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	Pick Up:	Slack Off:	Drag Avg/Max:	/
Hours on BHA:	Since Inspection:	7.5	Total:	7.5	Jars:
Hours on Casing/Liner:	Rotating:	/ 7.5	Tripping:	/ 25	Wear Bushing Installed

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Equipment Usage (Hrs):					
Shaker No 1:	200	200	200	200	Desander:	0	Desilter:	0	Degasser:	0
Shaker No 2:	200	200	200	200	Water/Fine					
Shaker No 3:	200	200	200	200						

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
3.5"	362	15.5	S-135	3.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews,
First Aid Treatments:	0	Medical Treatments:
		1
Lost Time Incidents:	0	Days Since LTI:
		95

Accident Description: Recordable injury. Rig hand went to close wellhead valve on 16A. Cellar was full of hot water. Cellar is mostly covered by 2X8 boards. There was a board floating on top of the water that he thought was part of the cover. He stepped on it and went up to his knee with his left leg. pulled his boot off and help poured bottled water on it until the burn gel wraps got there. Maybe 3 mins. Wrapped his leg from mid-calf to toes. Took him to Beaver hospital. Gave him pain meds and cleaned and wrapped injury. Came back to work a few hours later.

BOP Test Crownamatic Check

Weather Information

Sky Condition:	Partly cloudy	Visibility:	10
Air Temperature:	94 degF	Bar. Pressure:	1010
Wind Speed/Dir:	13 / SSW	Wind Gusts:	15





Daily Drilling Report

Well ID: FORGE 16B(78)-32

Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 96 Report For 06:00 AM 21-Jul-23

Operator:	UNIVERSITY OF UTAH	Rig:	Frontier 16	Spud Date:	26-Apr-23	Daily Cost / Mud (\$):	---		
Measured Depth (ft):	10947	Last Casing:	7.000 at 10,208	Wellbore:	Original Wellbore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	8357	Next Casing:		RKB Elevation (ft):	31	---	---	---	
Proposed TD (ft):	10658	Last BOP Test:	27-May-23	Job Reference RKB (ft):		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Next BOP Test:	26-Jun-23	Working Interest:		Totals:	---	---	---
Average ROP (ft/hr):						Well Cost (\$):	---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 DOL: 96

Pers/Hrs: Operator: 2 / 0 Contractor: 14 / 0 Service: 3 / 0 Other: 2 / 0 Total: 21 / 0

Safety Summary: No incidents or events reported. 96 days since LTI. Conducted Safety Meeting.

Current Operations: Removing saver sub. Emptying mud pits.

Planned Operations: Work on BOPs. Organize rental tools. Release rig and rig down.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	7:30	1.50	10,947	OTHER	Rig down SLB wireline tools, break off flowline and 1502 flange and replace on 16A well.	
7:30	12:30	5.00	10,947	TRPI	Make up bit and trip in hole to 10,854' to circulate completion fluid and lay down drill pipe.	
12:30	13:30	1.00	10,947	OTHER	Wait on Silixa to complete work on fiber around wellhead.	
13:30	15:00	1.50	10,947	CIRC	Circulate completion fluid into 7" casing.	
15:00	1:00	10.00	10,947	LAYD	Trip out of the hole laying down 3 1/2" drill pipe and BHA.	
1:00	2:30	1.50	10,947	OTHER	Rig down Separator and all lines.	
2:30	6:00	3.50	10,947	BOPO	Nipple down and remove 7-1/16", 10,000 psi BOPEs. Install tree cap on master valve.	

Management Summary

Rigged down SLB wireline tools. Made up 5-1/2" bit and BHA. Tripped in hole to 10,854'. Circulated completion fluid into 7" casing. Tripped out of the hole laying down 3 1/2" drill pipe and BHA. Rigged down separator. Nipped down and removed 7-1/16", 10,000 psi BOPEs. Installed tree cap on master valve.

Comments

Fuel on hand 11,195 gals.
Fuel used 2539 gals.
Total NPT to date 122.50 HR.
No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000	4		1,136	1,135	SURF	22.000	84	OTHER
FULL	11.750	-3	3	4,837	4,837	INT1	14.750	65	OTHER
LINER	7.000	7	0	10,208	8,061	INT2	9.500	38	VSTP110M

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Amberguard 215 - GALS	4	---	Engineering - OTHER	2	---
HIB 19 - GALS	8	---			

Bit/BHA/Workstring Information

Depth		This Run				R.O.P.				Mud Pump									
No Run	Make	Model	Diam	In	Dist	Hrs	Avg	Max	WOB	RPM	Torque	Wt	Flow	Press	J. Vel	P. Drp	HHP	JIF	
34	2	SANJOAQ	Tricone	5.500	10947														
Jets: 24 24 24		Out: 10947		Grade: Cutter:		5 / 4		Dull		BT / WT		Wear: N		Brgs: F		Ge: 1		Pull: TD	

Comments: Trip in. Change hole to water. Trip out laying down drill pipe and BHA.



	Daily Drilling Report Well ID: FORGE 16B(78)-32 Field: FORGE	University of Utah Well Name: FORGE 16B(78)-32 Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT
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Report No: 96 **Report For 06:00 AM 21-Jul-23**

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Middle 1	Middle 2	Bottom	Water / Filtrate
Shaker No 1:	200	200	200	200	
Shaker No 2:	200	200	200	200	
Shaker No 3:	200	200	200	200	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
3.5"	362	15.5	S-135	3.5IF					

Safety Information

Meetings/Drills

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews,

First Aid Treatments: 0 **Medical Treatments:** 0 **Lost Time Incidents:** 0 **Days Since LTI:** 96

BOP Test **Crownamatic Check**

Weather Information

Sky Condition: clear	Visibility:
Air Temperature: 89 degF	Bar. Pressure: 1012
Wind Speed/Dir: 11 / N	Wind Gusts: 13



Daily Drilling Report
 Well ID: FORGE 16B(78)-32
 Field: FORGE

University of Utah

Well Name: FORGE 16B(78)-32

Sect: 32 Town: 26S Rng: 9W County: BEAVER State: UT

Report No: 97 **Report For 06:00 AM 22-Jul-23**

Operator: UNIVERSITY OF UTAH	Rig: Frontier 16	Spud Date: 26-Apr-23	Daily Cost / Mud (\$): ---		
Measured Depth (ft): 10947	Last Casing: 7.000 at 10,208	Wellbore: Original Wellbore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 8357	Next Casing:	RKB Elevation (ft): 31	---	---	---
Proposed TD (ft): 10658	Last BOP Test: 27-May-23	Job Reference RKB (ft):	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Next BOP Test: 26-Jun-23	Working Interest:	Totals: ---		
Average ROP (ft/hr):			Well Cost (\$): ---		

Days (actual / plan): Drilling 6.18 / 22, Flat 0 / 0, Complete 0 / 52, Total 6.18 / 74 **DOL:** 97

Pers/Hrs: **Operator:** 2 / 0 **Contractor:** 14 / 0 **Service:** 0 / 0 **Other:** 0 / 0 **Total:** 16 / 0

Safety Summary: No incidents or events reported. 97 days since LTI. Conducted Safety Meeting.

Current Operations: Rigging down.

Planned Operations: Continue rigging down.

Toolpusher: Shawn Seddell, Clay Nielson

Wellsite Supervisors: Leroy Swearingen, Randy Baldwin

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
6:00	18:00	12.00	10,947	OTHER	Removed saver sub. Emptied water from mud pits. Installed flanged caps on 16B. Changed out wing valves on 7-1/16" mud cross. Organized all rental subs and x- overs. Loaded out 2 mud coolers. 2 cement silos and 6 trucks of drill pipe and BHA.	
18:00	6:00	12.00	10,947	RIGD	Released rig at 18:00. Rigged down floor and ST-80. Rigged down mud pumps, mud pits, accumulator, HPU and parts house.	

Management Summary

Removed saver sub. Emptied water from mud pits. Installed flanged caps on 16B. Changed out wing valves on 7-1/16" mud cross. Organized all rental subs and x-overs. Loaded out 2 mud coolers. 2 cement silos and 6 truckloads of drill pipe and BHA. Released rig at 18:00. Rigged down floor and ST-80. Rigged down mud pumps, mud pits, accumulator, HPU and parts house.

Comments

RELEASED RIG AT 18:00.
 Fuel on hand 10,176 gals.
 Fuel used 1,055 gals.
 Total NPT to date 122.50 HR.
 No H2S today.

Casing/Tubular Information

Size Type	Top MD (ins)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	(ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	16.000		4	1,136	1,135	SURF	22.000	84	OTHER	
FULL	11.750		-3	4,837	4,837	INT1	14.750	65	OTHER	
LINER	7.000		7	10,208	8,061	INT2	9.500	38	VSTP110M	

Rig Information

Equipment Problems:

Location Condition: ~~Wellbore / HPU~~

Transport:

Safety Information

Meetings/Drills	Time	Description
Safety	30	Two Pre-tour safety meetings with crews,
First Aid Treatments:	Medical Treatments:	Lost Time Incidents:
BOP Test	Crownamatic Check	Days Since LTI: 97

Weather Information

Sky Condition: Clear	Visibility: 10
Air Temperature: 101 degF	Bar. Pressure:
Wind Speed/Dir: 5 / SW	Wind Gusts: 10



Appendix D: Insulated Drillpipe²

Eavor Technologies Inc. Insulated Drill Pipe Trial Results

FORGE Project
June 2023

D.1 Executive Summary

Insulated drill pipe (IDP) restricts counter-current heat transfer between drilling fluid inside the drill string and hotter returning fluid in the annulus, thereby ensuring the bottomhole assembly (BHA) remains submerged in cool fluid. Eavor has several versions of the IDP in operation, testing, and development. The performance of the IDP in high temperature geothermal settings was successfully tested at Eavor's Eavor-Deep project in New Mexico in Q3/Q4 2022.

FORGE rented 350 joints of IDP which was run in two consecutive BHAs at the FORGE 16B (78)-32 well in May 2023. The objective of the pilot was to demonstrate the IDP's capacity to reduce the BHA temperatures, reduce temperature related equipment failures and observe any potential drilling performance improvement with the IDP.

In the first run, a full string of the IDP was utilized. In the subsequent run, a partial IDP string (~70% IDP) was utilized, with the remaining ~30% comprised of regular non-insulated drill pipe. The benefit of the IDP was empirically estimated (against prior and subsequent bit runs) to be 47-75° F for the full IDP string and 30-55° F for the partial IDP string. This range was validated by thermodynamic modelling.

Eavor regards the FORGE IDP trial as a success, with predicted bottomhole circulating temperatures in-line with expectations and matching the results observed at Eavor-Deep, providing additional empirical validation of the performance of the IDP.

D.2 Background

Eavor Technologies Inc. has developed insulated drill pipe (IDP) technology to reach depths and temperatures previously seen as impossible while using conventional downhole drilling components. Previously, the limiting factor for drilling in high temperature geothermal geologies was the temperature rating of different bottomhole assembly (BHA) components such as measurement while drilling (MWD) and rotary

² This report is courtesy of Eavor Technologies, Inc.

steerable systems (RSS), typically limited to 300-350°F. By insulating the drill pipe, the heat transfer between the cool mud travelling down the drill pipe and the hot fluid travelling up the annulus is reduced, resulting in cooler fluid being delivered to the BHA.

Eavor has several versions of the IDP in operation, testing, and development. The performance of the IDP in high temperature geothermal settings was successfully tested at Eavor's Eavor-Deep project in New Mexico in Q3/Q4 2022. A full string of the IDP used at Eavor-Deep is capable of drilling through >750°F resources with downhole equipment rated to 300°F.

FORGE is a US Department of Energy (DOE) funded geothermal research project run by the University of Utah. The DOE hired Eavor to run the IDP for two bit runs in May 2023 as a pilot to test the technology. 350 joints of the internally and externally coated IDP were provided to FORGE for this trial which consisted of different versions, grades, and coating types. The pilot's objectives were to demonstrate the IDP capacity to reduce the BHA temperatures, reduce temperature related equipment failures, and observe any potential drilling performance improvement with the IDP.

D.3 IDP Trial Operational Summary

Eavor's IDP was deployed in BHA 11 and 12 which consisted of 100% and ~70% of the total drill string length, respectively. For the BHA 12, regular drill pipe was run below the IDP string.

Prior to Runs with the IDP

- Eavor understands that while tripping in hole at ~4700ft in a previous run to the IDP deployment, one of the MWD batteries failed under temperature recording of 327°F.
- To avoid damaging external coating of the IDP while pipe handling, the forklift on the drilling rig was outfitted with plastic socks for the forks.

BHA 11 - Full IDP String

- For the first BHA run of the IDP trial, the same BHA as the previous run (BHA10) was used (with a new motor), however the flow rate was increased from 600GPM to 700GPM and mud chillers were initially shut off, providing a change in the wellbore hydraulics and therefore cooling efficiency.
- Towards the end of the BHA 11 run, one mud chiller was brought online, decreasing the inlet temperatures from approximately 130°F to 110°F.
- At 8400ft, mud loggers were reporting that an internal coating of the drill pipe was caught in shakers, with noticeable amount of coating parts in the mud samples.

- Depth in for the BHA11 was 8085ft, depth out was 8585ft.

D.4 BHA 12 - Partial IDP String

- After the BHA 11 was pulled out of hole, wireline logs were run, resulting in more time for wellbore thermal recovery (vs. the BHA 10 and 11).
- The BHA performed within expectations, it achieved higher penetration rates and showed a lower building tendency requiring less sliding, even with lower weight on the bit than the previous BHAs, limited by the bit manufacturer to 57 klbs WOB (weight on bit) (vs. 70klbs WOB for the BHAs 10 and 11).
- Depth in for the BHA12 was 8585ft, depth out was 9255ft.
- A different BHA was used for the BHA 12 (vs the BHA 11); the table below highlights the differences between the BHA and drill string.

Table 1: the BHA and Drill String Comparison

	BHA-10	BHA-11 - Full IDP	BHA-12 - Partial IDP	BHA-13
Bit	9 ½” PDC -TKC83	9 ½” PDC -TKC83	9 ½” PDC - D406V	9 ½” PDC -TKC83
BHA + NMDC (ft)	130.84	130.84	132.28	132.33
Drill Collars (DC), (ft)	278.27	278.27	0	0
HWDP (joints)	28	28	28	30
Non-IDP (ft, end of run)	6821.91	0	2378.5	8748.63
IDP (ft, end of run)	0	7317.66	8264.49	0
End of run depth (ft)	8085	8585	9255	9800

D.5 Thermal Performance of the IDP

Empirical Results

Figure I-1 below shows the measured MWD temperatures plotted against the circulation rate and inlet temperature (Manifold temperature). Other than the level of drill pipe insulation, these two parameters are the primary drivers of MWD temperature variation. The BHAs 8, 9, 10 and 13 used regular non- insulated drill pipe, while the BHAs 11 and 12 used 100% and ~70% of the IDP, respectively.³

³ FORGE BHA numbers are shown in Table 1.

BHA 10 (non-insulated regular drill pipe)

- Average MWD temperature of 180°F while drilling.
- Baseline run to gauge MWD temperatures without the IDP.
- By maintaining a constant flowrate and considering the gradual increase in inlet temperatures, the specific impact of inlet temperatures on MWD temperatures could be isolated for regular drill-pipe. It is estimated that a 1°F change in inlet temperature has an approximately 1°F impact on MWD temperatures.

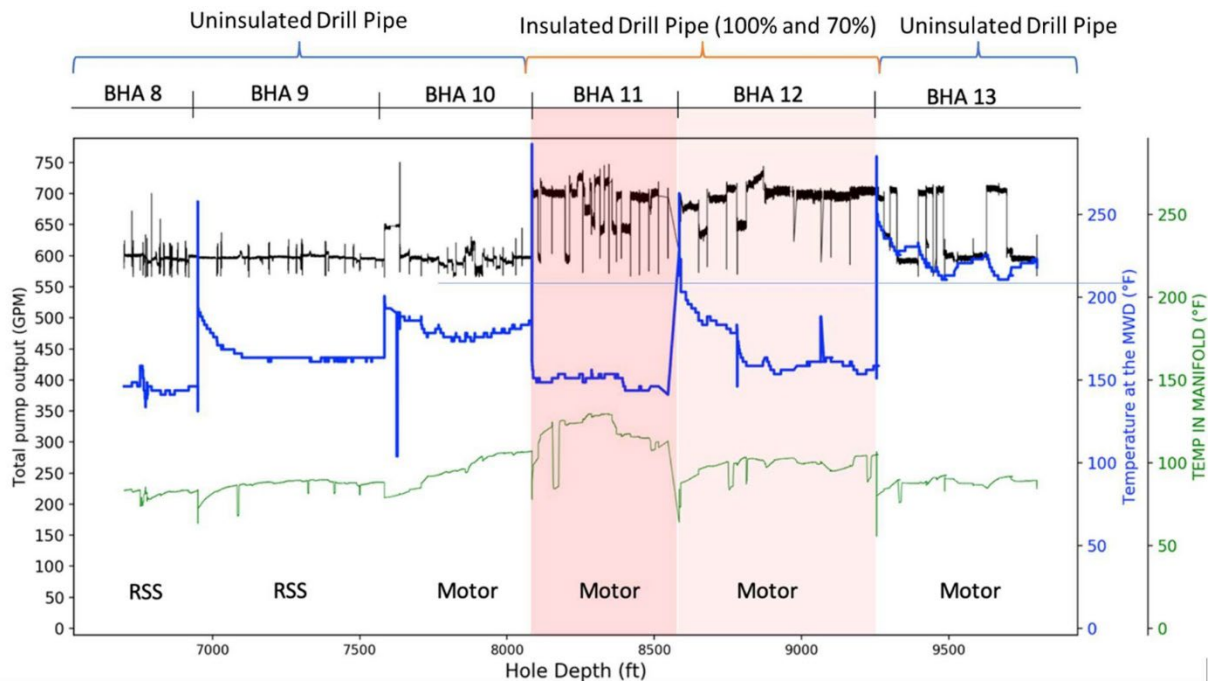


Figure D-1: Pump output, Inlet Temperature and MWD Temperature vs Depth.

The following sections provide commentary on the measured data outlined in the above chart:

BHA 11 (Full string of the IDP)

- Average MWD temperature of 149°F while drilling (a reduction of 31°F relative to the BHA 10 without the IDP).
- The same BHA 11 was used as the BHA 10.
- Throughout the entire run, the temperature profile of the MWD measurements remained relatively uniform when employing the full string of the IDP.
- The circulation rates were increased from 600GPM to 700GPM (vs the BHA 10), which does provide an additional cooling effect. However, the BHA 13 run managed to attain nearly identical circulation rates with regular drill pipe, establishing a benchmark for empirically estimating the impact of circulation rate on MWD temperature.
- The data suggests that 12-14°F of cooling was attributable to the higher flowrate in the BHA 11 vs the BHA 10. See the BHA 13 section below for more detail on the empirical estimation of the impact of circulation rate.

- The inlet temperature was increased from an average of 98°F in the previous run without the IDP to an average of 121°F. Based on the data collected during the BHA 10 which suggests that a 1°F change in inlet temperature corresponds to a 1°F change in MWD temperature, it is estimated that the change in inlet temperature increased MWD temperatures by ~23°F.
- Correcting for different inlet temperatures and flowrates, empirical estimates (from the BHAs 10 and 13) suggest that for every 500 feet of increased vertical depth, MWD temperatures at FORGE rose by approximately 7°F owing to the elevated temperature of the rock (~16°F/500ft geothermal gradient).
- The empirically estimated impact of the IDP alone is 47-49°F for the BHA11 vs the BHA 10, normalized for all variables below, calculated as follows:
 - 31°F observed reduction in MWD temperature.
 - Minus 12-14°F reduction in MWD temperature attributable to increasing circulation rate.
 - Plus 23°F increase in MWD temperature attributable to increased inlet temperature
 - Plus 7°F attributable to drilling through higher temperature rock.
 - Note this empirical estimate neglects the transient MWD temperature profile during initial drilling; thus this factor will increase the relative benefit of the IDP. Therefore, this empirical estimate is deemed to be conservative.
- See *Temperature modeling by Eavor* Temperature modeling by Eavor which incorporates calibrated simulation results accounting for transient effects.

BHA 12 (Partial string of the IDP)

- Average MWD temperature of 164°F while drilling, with high temperatures observed initially but ultimately leveling off at ~150-160°F.
- A different BHA design to the BHA 11
- Wireline logs were run between BHAs 11 and 12, providing more time for thermal recharge of the near wellbore rock temperatures, a contributing factor towards the higher observed MWD temperatures during initial drilling.
- Higher MWD temperatures during initial drilling were observed with the partial IDP string (70 % in the BHA 12) than with a full string of the IDP (100% of the IDP in the BHA 11). This transient effect can be attributed to the positioning of regular non-insulated drill pipe near the BHA.
- Initially, the hot fluid from the drill pipe is displaced with cooler fluid from the upper sections. However, the section of regular non-insulated drill pipe near the BHA facilitates high heat transfer between the hot annulus fluid and colder drill pipe fluid, resulting in prolonged higher BHA temperatures.
- A sharp decline in temperature occurs at approximately 8,700ft when sufficient circulation has occurred to displace the hot fluid from both the drill pipe and annular side of the regular non-insulated drill pipe section.
- This transient effect is minimized when drilling with a full string of the IDP evidenced by the flat measured MWD temperature profile in BHA 11.
- The sharp MWD temperature increase between the BHAs 12 and 13 highlights the cooling impact of the partial IDP string, estimated to be 30-55°F.

BHA 13 (non-insulated regular drill pipe)

- Average MWD temperature of 220 °F while drilling.
- Baseline run to gauge MWD temperatures without the IDP.
- Inlet temperature was relatively consistent throughout the run, providing a good baseline for estimating the impact of circulation rate.
- The figure below shows a zoom-in of the temperature profile for the BHA 13. The two blue arrows indicate steady state MWD temperatures at 700GPM (both 211 °F), while the two red arrows indicate steady state MWD temperatures at 600GPM (225 °F and 223 °F). This data suggests that an increase in circulation rate from 600 to 700 GPM results in an MWD temperature reduction of 12-14 °F.
- The configuration of the BHAs 12 and 13 are very similar, with only 2 extra joints of HWDP (heavy weight drill pipe) in the BHA 13, and an identical PDC bit to the BHA 10.

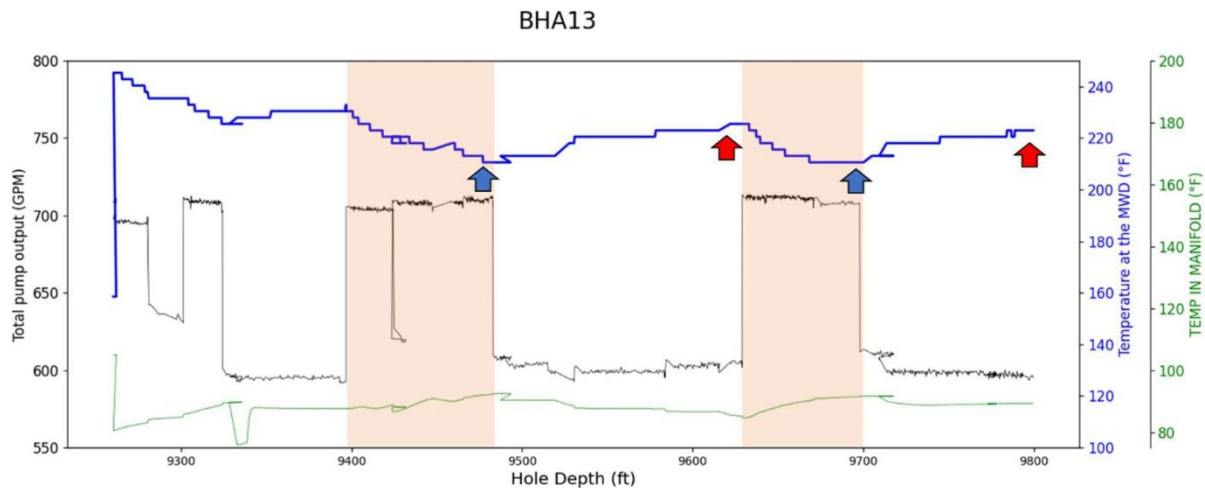


Figure D-2: Impact of flow rate on MWD temperature

D.6 Temperature Modeling by Eavor

Eavor has developed a proprietary transient drilling model to evaluate the effectiveness of IDP and predict the temperature profile along the wellbore, both inside the drill pipe and in the annulus. Inputs to the model include:

- Inlet temperatures, flow rates and pressures were exported from Pason.
- Temperature gradient and geology were estimated from the offset wells.
- Drill pipe thermodynamic properties were measured in the lab (insulated or regular drill pipe).
- Assumptions for mud properties and the BHA as detailed data for each BHA were not available.
 - A water-based drilling mud was used to drill the FORGE well - solids content was minimal (<1%). Modelled as pure water.
 - If provided to Eavor, detailed mud reports and the BHA spec sheets can further improve the match presented below.

The transient model used for this analysis is covered in detail in the “[Enabling of High-Temperature Well Drilling for Multilateral Closed-Loop Geothermal Systems](#),” presented at 2023 Stanford Geothermal Workshop.

Figure D-3 below summarizes the history match simulation using Eavor’s transient model (blue line) plotted alongside the measured MWD temperatures, both with the IDP (green points) and without the IDP (orange points).

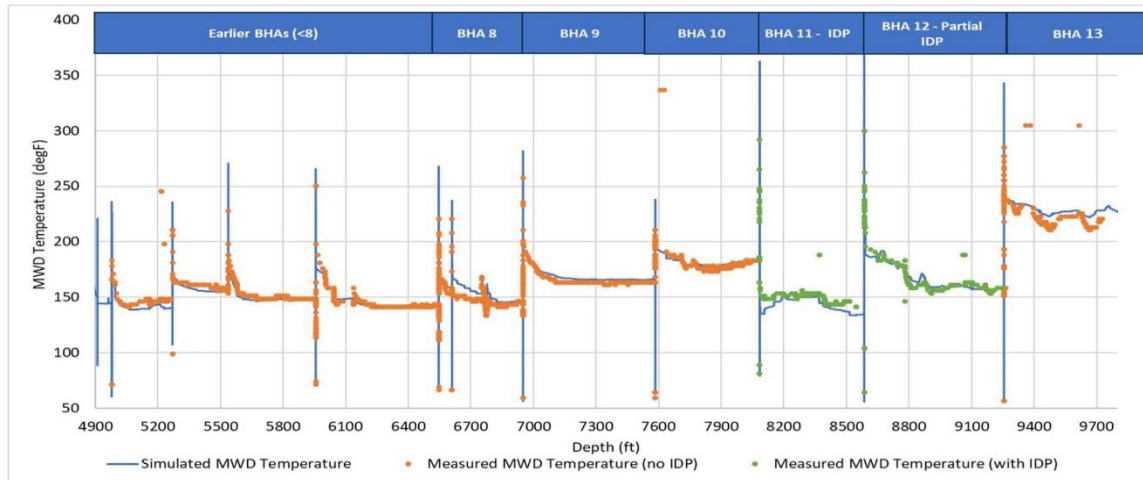


Figure D-3: the BHA temperature prediction using Eavor’s Transient Drilling Model

The overall match was considered satisfactory, as the predicted BHA temperatures for both insulated and non-insulated drill pipe scenarios closely aligned with the measured values. To assess the impact of the IDP, simulation of the BHA 11 and 12 runs were repeated assuming regular drill pipe properties instead of the IDP. All other parameters were held constant between the simulations. The impact of the IDP is apparent, with the simulation drastically overestimating the observed MWD temperatures when using non-insulated regular drill pipe (blue line vs. green points in the BHAs 11 and 12).

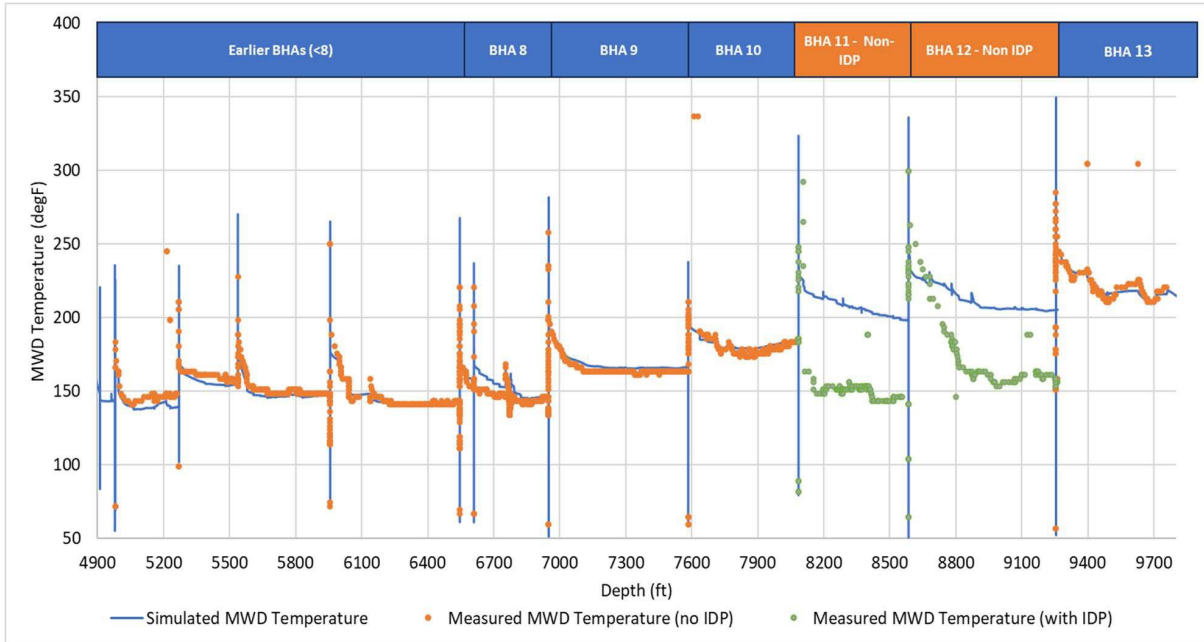


Figure D-4: the BHA temperature prediction, assuming non-insulated Drill Pipe

Zooming into the BHA 11 and 12 sections (simulation assumes the non-IDP is used):

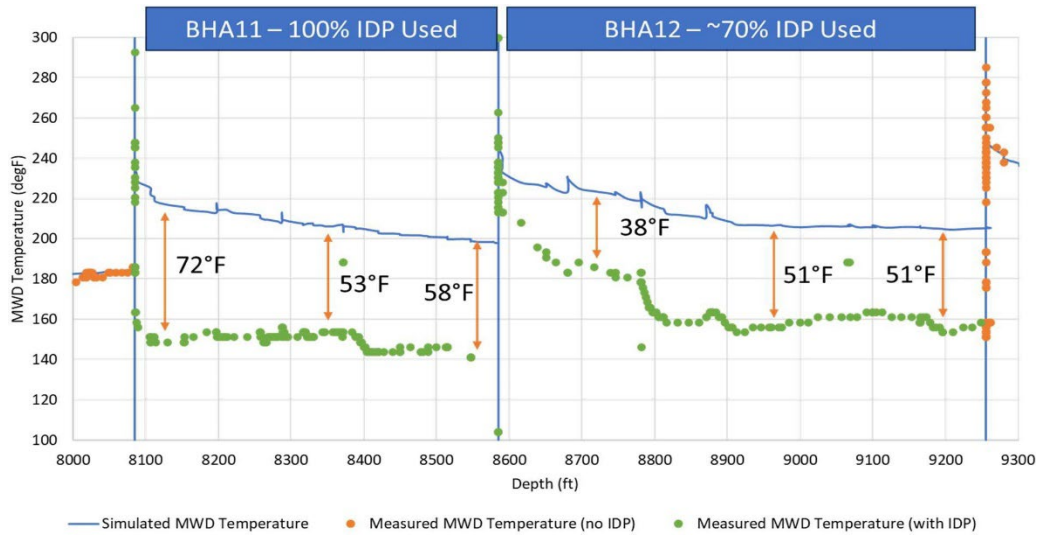


Figure D-5: BHA temperature prediction, assuming non-insulated Drill Pipe (zoom into the BHA 11 and 12).

The benefit of the IDP can be quantified by the difference between the measured and simulated curves. The thermodynamic results align with the empirical measurements from the trial, showing the bottomhole circulating temperature impact of a full IDP string to be 50-75°F, and a partial IDP string to be 30-55°F.

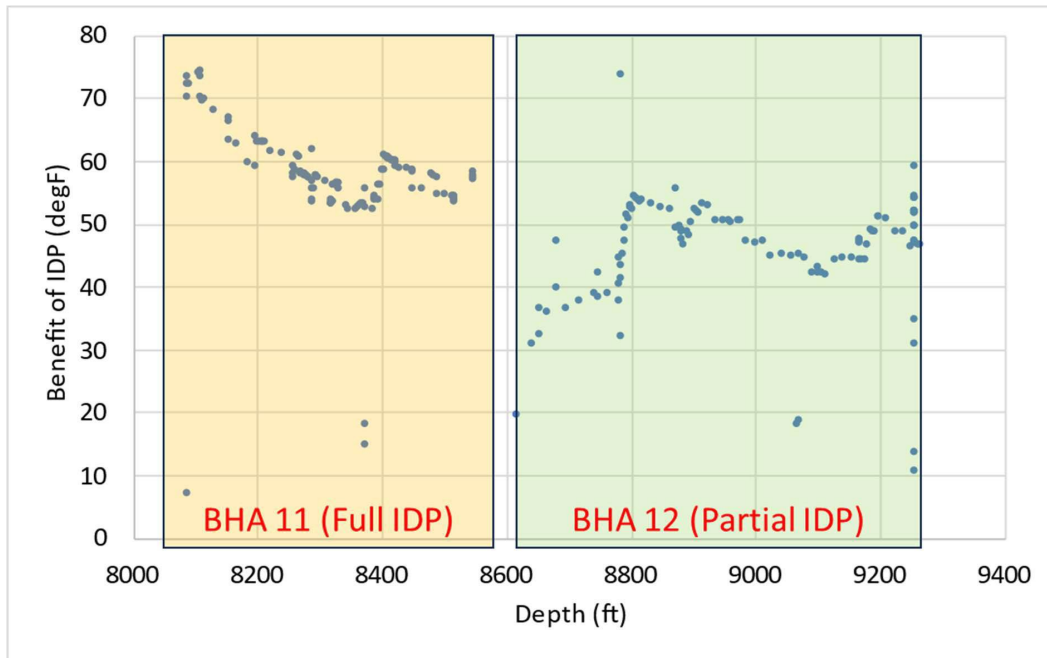


Figure D-6: Benefit of the IDP (modeled bottomhole circulating temperature without the IDP minus measured bottomhole circulating temperature with the IDP).

D.7 IDP Mechanical Wear

The external coating of the IDP was inspected by Eavor on-site and showed negligible wear from the trial, however, there was minor damage to the internal coating of the IDP on a small number of joints; Small portions of the internal coating delaminated from the steel tubular, but no coating peels were found on the MWD tool or the drill bit nozzles. A subsequent inspection of the internal coating indicated that only few joints were affected by this damage, where applications of a thicker coating were trialed, and accounts for less than 0.01% of the uncoated coverage of the IDP. Eavor is working on solutions to this and improve the reliability of the insulative coating.



Figure D-7: Coating pieces caught by the mud loggers



Figure D-8: Drill pipe joints laid down with ID coating defects

D.8 Additional Benefits of the IDP

During the process of tripping in the hole and at the beginning of drilling a new section, the BHAs face heightened vulnerability due to the lack of circulation, resulting in the column warming up close to the temperature of the surrounding formation. While running in hole, the BHA encounters hot fluid, and without adequate circulation it will warm up very quickly, requiring frequent pauses to circulate and cool down the BHA. If the cool downs are not performed in time, the BHA is at risk of exceeding the maximum design temperatures. Eavor understands that an example of this operational concern occurred at the FORGE well, where while tripping in hole in a run prior to the IDP deployment, one of the MWD batteries failed with a recorded temperature of 327°F. With the IDP, heat transfer between the hot annulus fluid and cold fluid in the drill-pipe is reduced. This improves the effectiveness of a bypass sub (if used) and allows less time to spend on washing-in, thus eliminating the risk of exceeding the BHA maximum temperatures and reducing the time required to trip into the well.

Eavor believes that the IDP technology can lead to improvements in hard-rock drilling performance in high temperature formations through a thermal shock cooling effect. This effect is attributed to the introduction of cold fluid (enabled by the IDP) at the rock face, resulting in differential thermal contraction within the rock volume. Consequently, the rock weakens, leading to a significant increase in the rate of penetration and extended bit life. Due to the influence of numerous variables on drilling performance and the absence of a solid baseline run, the data obtained from the two conducted IDP runs do not offer conclusive evidence to either validate or refute the effectiveness of the shock cooling effect while drilling brittle rock. Despite the lack of conclusive evidence from this trial data, Eavor remains confident in the occurrence of this phenomenon, grounded in the fundamental principles to govern it as well as empirically from bench-level testing.

D.9 Conclusions

Eavor regards the trial demonstration of IDP technology at FORGE a success. The IDP was empirically proven to reduce the BHA temperature by 47-75°F for a full IDP string and by 30-55°F for a partial IDP string. Eavor's proprietary drilling model integrated measured data from the FORGE trial, along with other drilling and geology data, to accurately estimate the MWD temperatures both with and without the IDP and provide further validation to the empirical data from the trial.

The IDP trial at FORGE has shown that the BHA can be maintained at cool temperatures with the use of mud coolers and IDP alone. The delay in using mud chillers until later (and hotter) parts of the well allows for significant savings due to reduced fuel consumption.

Appendix E: SDI Review

Figure E-1 summarizes run data while drilling with brine in high strength, high modulus granite. RSS technology was tried for a smoother well path. Overall, the drilling targeted high WOB to help reduce whirl/damage and improve ROP.

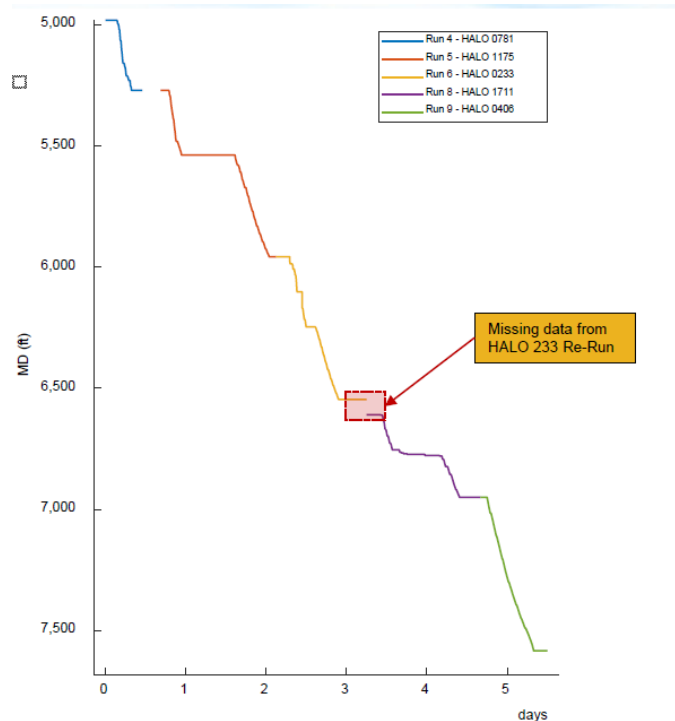


Figure E-1. Depth versus days drilling.

There were lessons learned and BHA changes were made along the way.

BHA 1: This was a motor assist with a RIP Stick. This BHA was bit, stiff HALO, a 0.25-inch undergauge stabilizer, NMPC, NMDC, an in-gauge roller reamer, an NOV Black Box, a RIP Stick, and a 7-inch motor. There was constant, excessive vibration (whirl). Lateral vibration was 30 to 40 g RMS and there was high axial vibration.

BHA 2: For this run, the motor and the Rip Stick were removed. Vibration remained but it was lower amplitude (15 g RMS - whirl). Build rates of 5 to 6° / 100 ft were developed at 50% pad force.

BHA 3: For this run, the motor, the Rip Stick, and the pony collar were removed. Removal of the pony collar changed the stabilizer placement. The build rates were maintained, and the vibrations were 8 g RMS (whirl).

SDI observed that:

- Very hard formations (granite) are prone to bit whirl. There was some bit whirl on run 1. There was little or no bit whirl on subsequent runs without the motor (vibration related to general BHA whirl).
- Reduction of bit RPM helps greatly reduced the amplitude of vibrations, regardless of the origin (i.e., either bit or BHA whirl).
- RIPSTICK, and other HFTO/stick-slip mitigation tools with axial “springy-ness” can lead to elevated axial vibration
- HFTO was not present, likely due to:
 - Run 1: Bit whirl was present (one cannot occur with the other)
 - Other runs: RPM was very low (no motor)
- The low plastic viscosity of the fluid makes the BHA very prone to lateral vibration (little damping).

Figure E-2 shows a chronology of the drilling activity with an RSS. Figure E-3 shows the vibration profiles (whirl was dominant) and Figure E-4 shows the magnitude of the whirl. Specific BHA runs are summarized below.

MWD Run 4 -HALO 781

The BHA is shown in Figure E-5. 289 ft were drilled over 4.75 hr of circulation, with a maximum temperature of 189°F. The motor was 0.23 rev/gal (7” 6/7-7.1). Larger lateral vibration was seen throughout the run. Figure E-6 is a collage of post-run bit photographs.⁴ The run was dominated by BHA whirl with lateral vibration up to 40 gRMS (refer to Table E-1 for Halo 781 and Figure E-7). All recorded data are shown in Figures J-8 through J-10.

Table E-1. Vibration for BHA-4

HALO SN	Footage	Circulating Hours	ROP avg, on-bottom (ft/hr)	Hr HFTO Total	Whirl Hr Total
0781	289.40	5.36	128.43	0.00	2.19
1175	686.84	16.70	66.16	0.00	10.36
0233	589.02	21.30	59.09	0.03	9.64
1711	340.27	26.04	53.55	0.29	5.16
0406	633.84	16.44	50.15	0.00	11.40

⁴ Per the daily reports, the assembly was pulled for an MWD flat line after several communication errors and the vibrations.

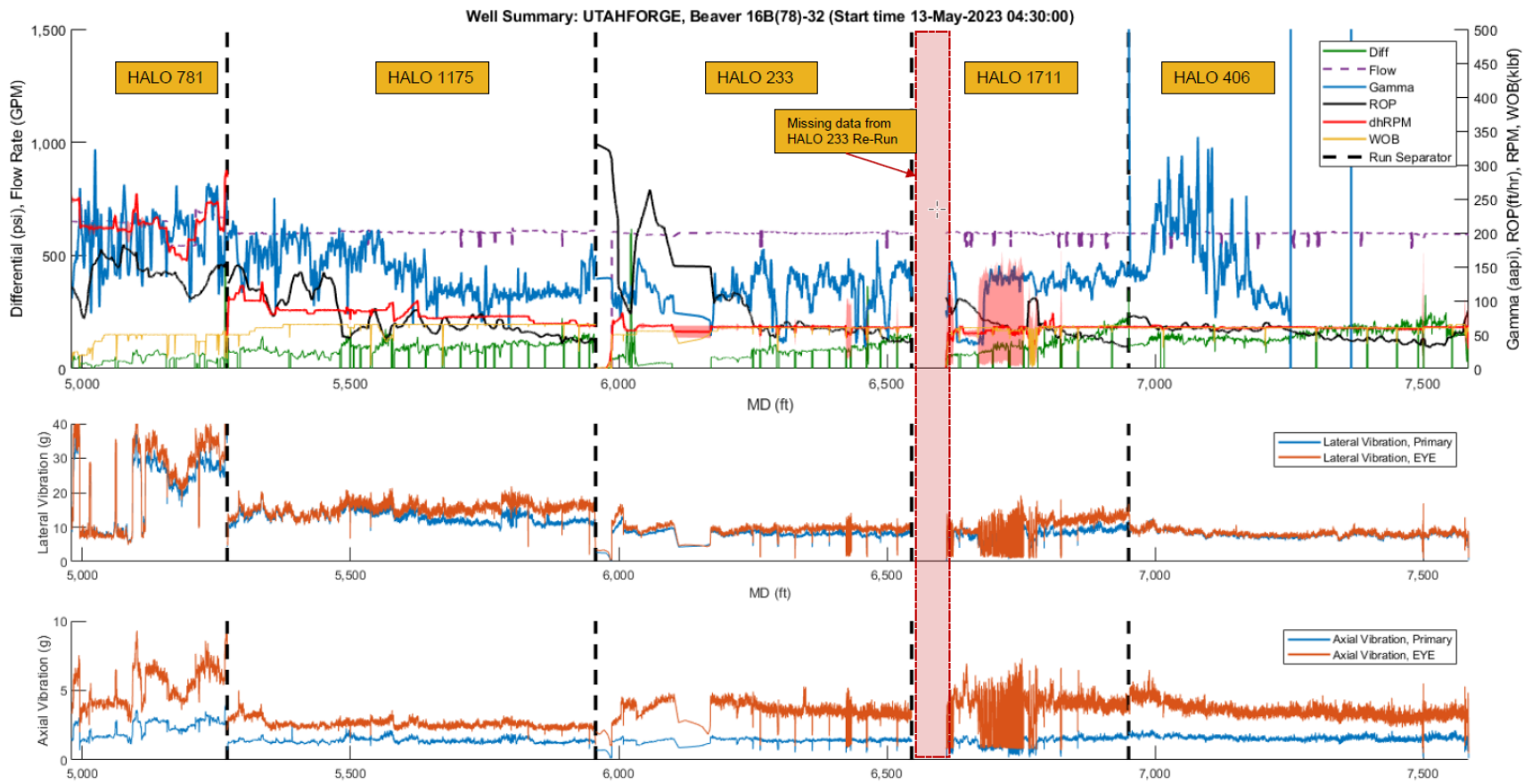


Figure E-2. Summary of drilling activity. The lateral and axial vibrations are shown in the lower two rows.

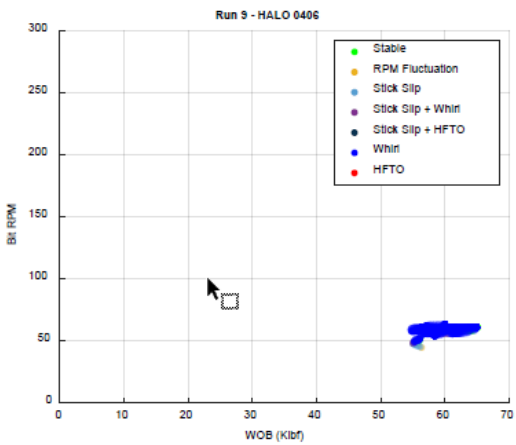
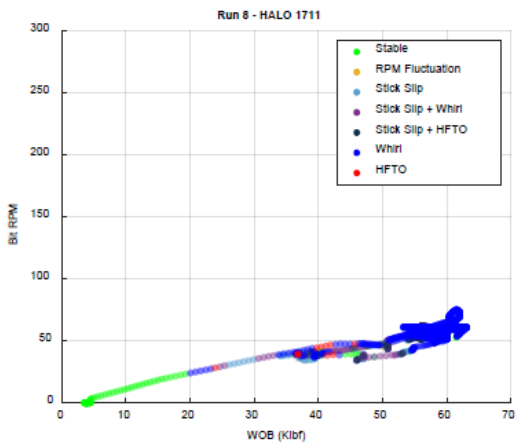
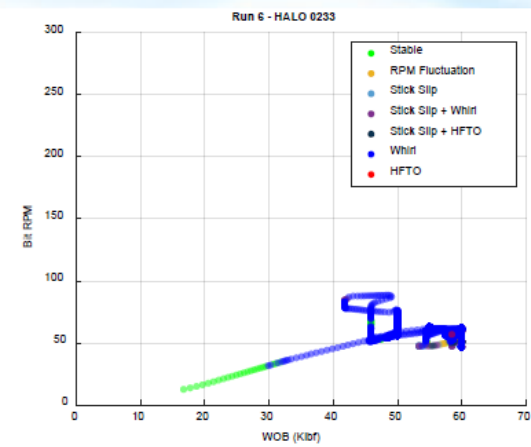
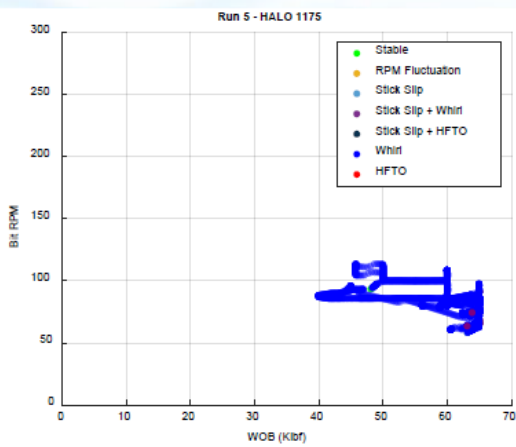
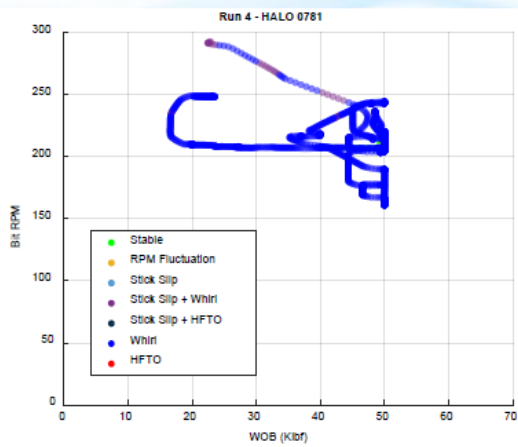


Figure E-3. Summary of vibration profiles for various RSS BHAs.

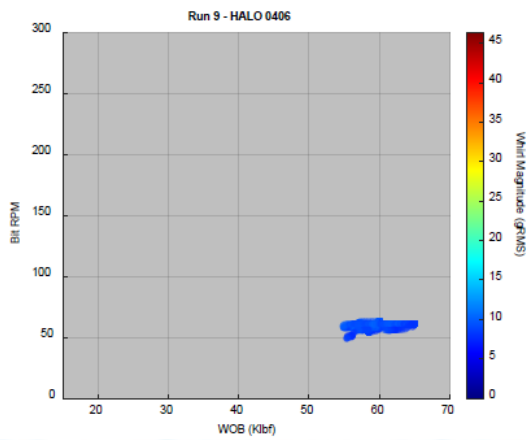
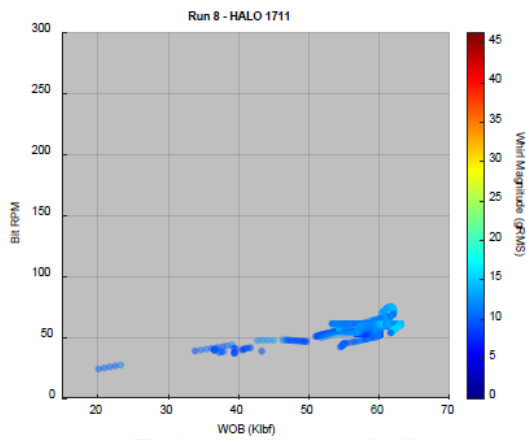
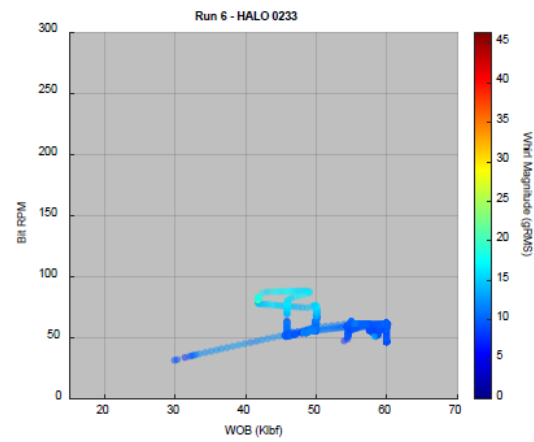
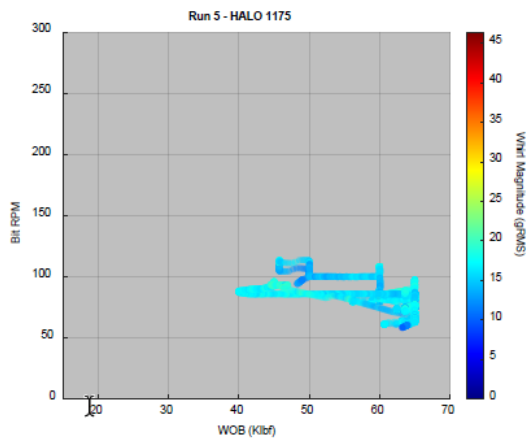
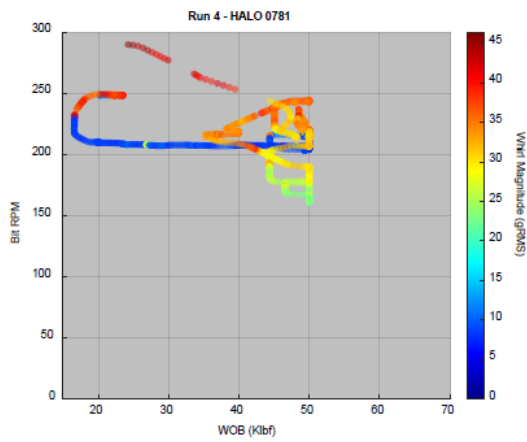


Figure E-4. Magnitude of the whirl.

Proposed BHA	#	SN	Description	OD [in]	ID [in]	FN OD [in] / FN Len [Usft]	Cnx Up / Cnx Dn	Wt[lb/ft] / Comp Wt[klbs] / Tot Wt[klbs]	Length [Usft]	Total Length [Usft]
	1	A298329	9 1/2" 7 Blade PDC bit	9.5	2.75		4 1/2 REG P		1.13	1.13
	2	76000781	HALO RSS w/HFTO	6.75	2		4 1/2 IF B / 4 1/2 REG B		35.38	36.51
	3	ASM 9006	Spiral wrapped IB Stabilizer	6.5	2.813	6.500 / 2.40	4 1/2 IF B / 4 1/2 IF P		5.62	42.13
	4	125-373	6 3/4 NM Pony DC	6.438	3.25		4 1/2 IF B / 4 1/2 IF P		9.22	51.35
	5	84-772	6 3/4 NMDC	6.813	3.25		4 1/2 IF B / 4 1/2 IF P		31.11	82.46
	6	GU1405	FG 9 1/2" Roller reamer	6.375	3		4 1/2 IF B / 4 1/2 IF P		5.64	88.1
	7	RS675-0023	6 3/4 RIPstick	6.75	2	6.750 / 1.10	4 1/2 IF B / 4 1/2 IF P		19.93	108.03
	8	7019	6 3/4 Black Box	6.75	2.25	6.750	4 1/2 IF B / 4 1/2 IF P		6	114.03
	9	7150018	7.15 Mud Motor	7.188	2	7.188	4 1/2 IF B / 4 1/2 IF P		41.28	155.31
	10	DR 48701	6 3/4 Filter sub	6.688	3.25	6.688	4 1/2 IF B / 4 1/2 IF P		3.93	159.24
	11	N/A	9 JTS, 6 3/4" DC's	6.813	2.875		4 1/2 IF B / 4 1/2 IF P	100.00 / 27.83 / 27.83	278.27	437.51
	12	N/A	Crossover (DC's to HWDP)	6.937	3		5 1/2 FH B / 4 1/2 IF P		3.15	440.66
	13	N/A	30 JTS HWDP	5.5	3.625		5 1/2 FH B / 5 1/2 FH P	46.40 / 42.38 / 70.21	913.42	1354.08

Figure E-5. BHA-4.

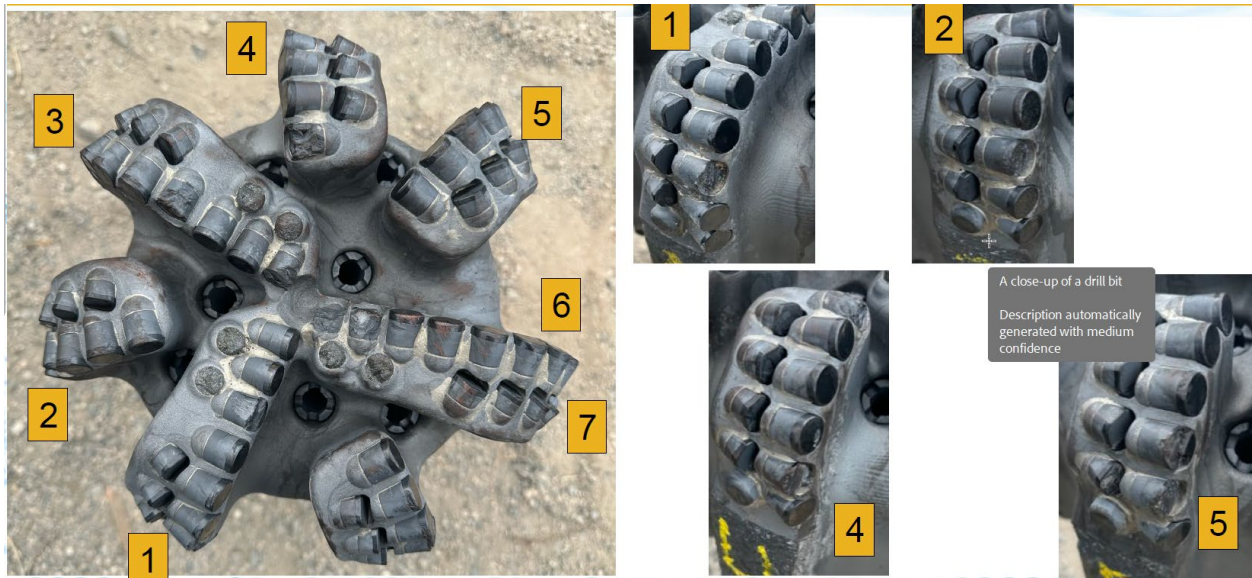


Figure E-6. Post-run bit photographs (after pulling BHA-4).

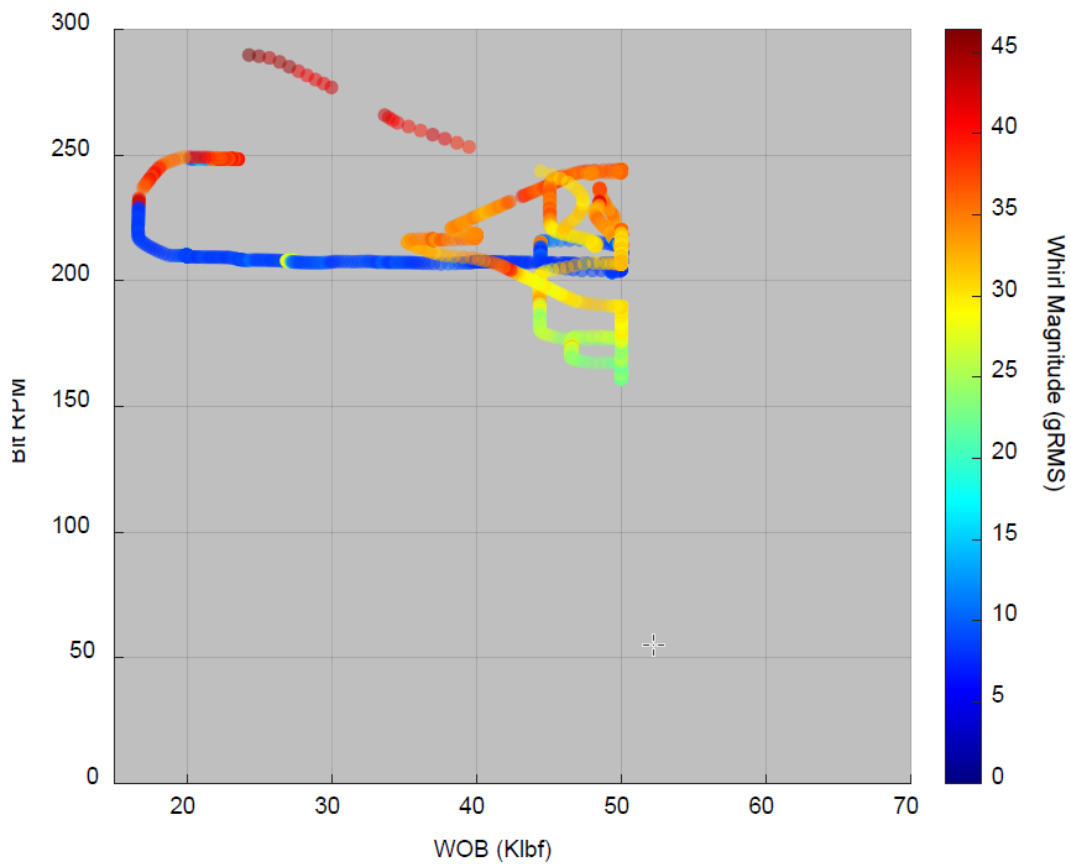


Figure E-7. Vibration magnitudes for BHA-4. Bit RPM is plotted against WOB and the whirl magnitude is indicated by the color bar.

MWD Run 4 – HALO 781

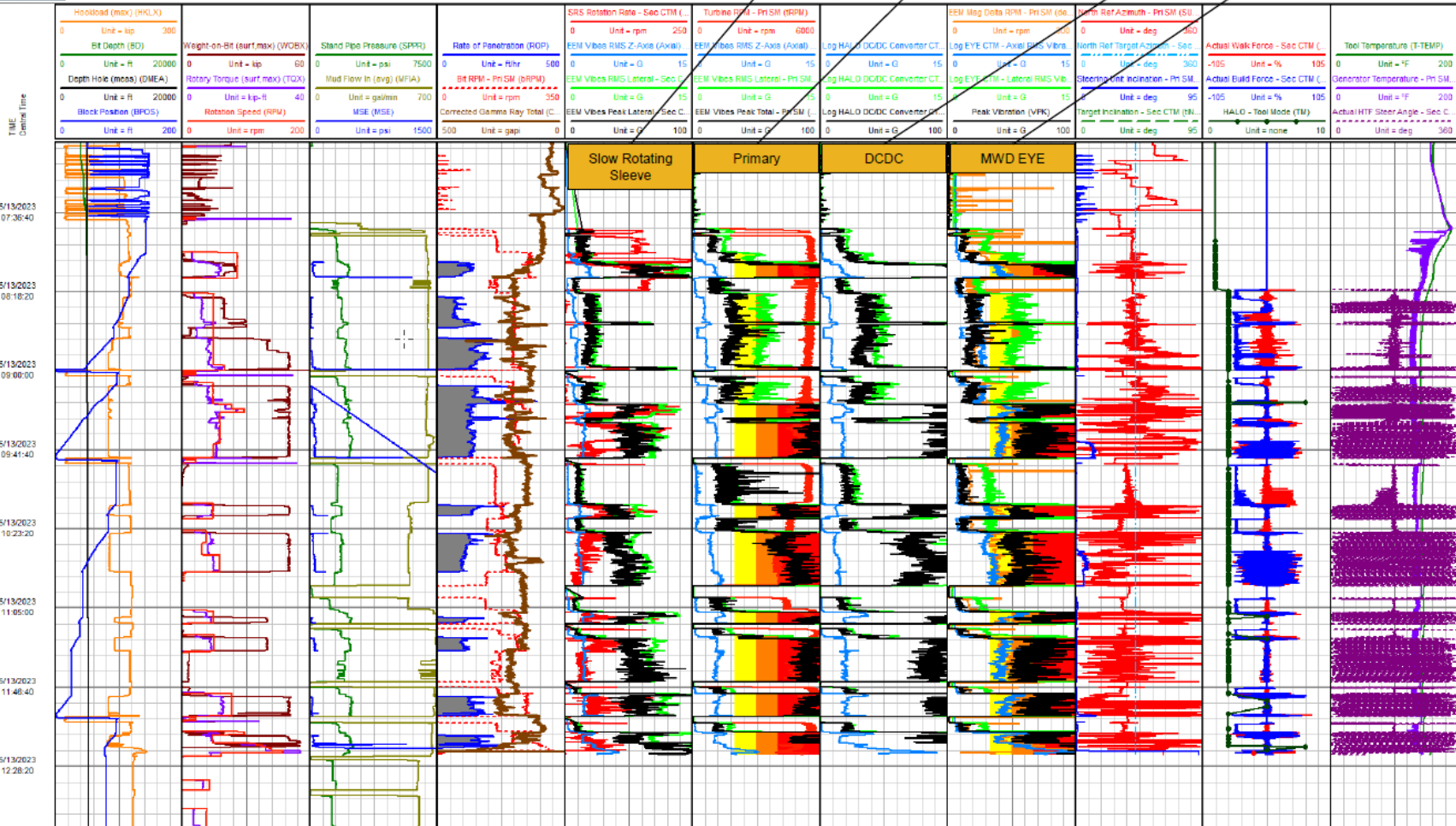


Figure E-9. MWD data, by date and time.

CONFIRMATION OF VIBRATION MODE (WHIRL)

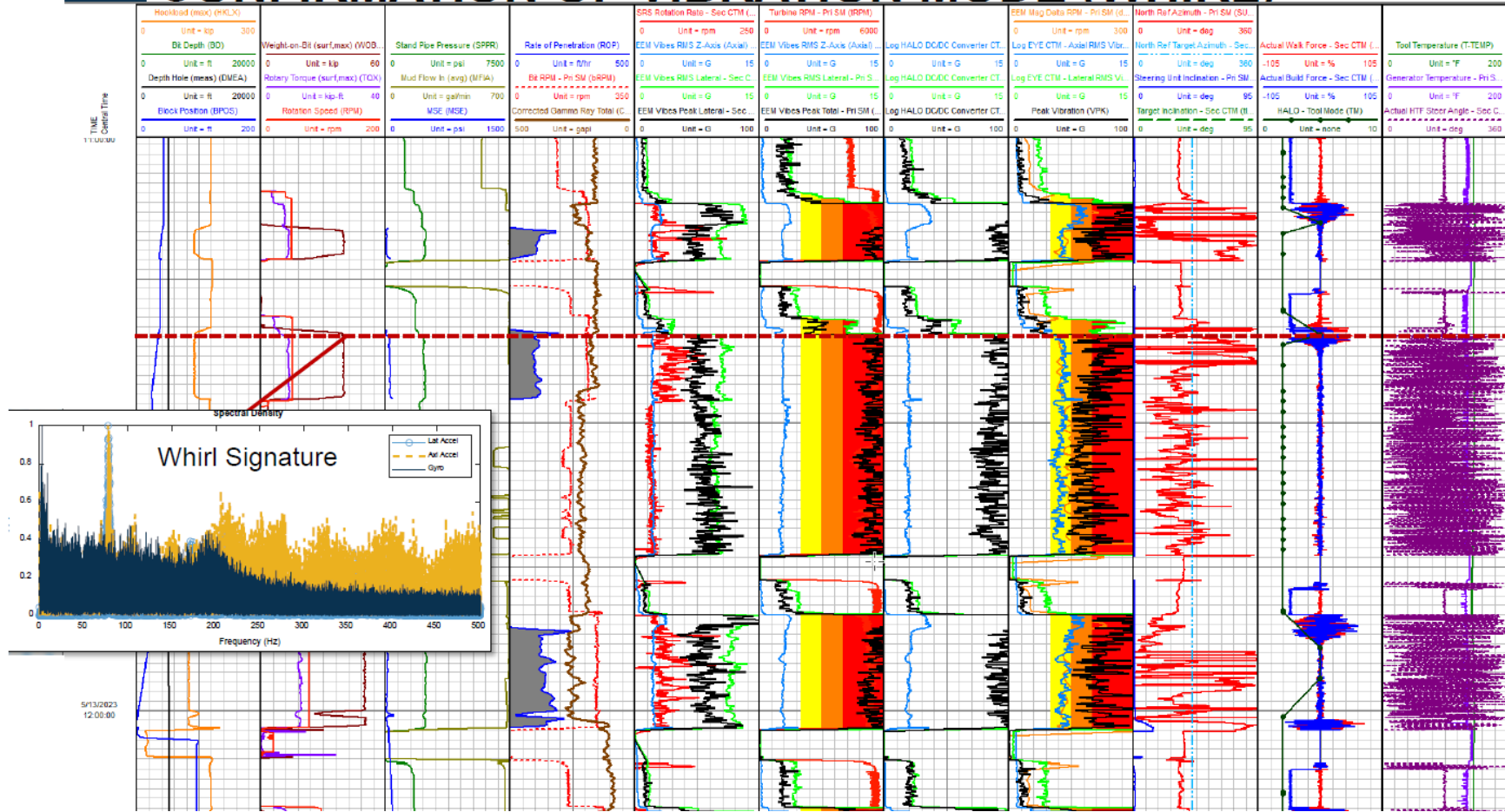


Figure E-10. MWD data, confirmation of whirl.

MWD Run 5 -HALO 1175

The BHA is shown in Figure E-11. 688 ft were drilled over 14.25 hr of circulation, with a maximum temperature of 260°F. No motor was run. Lateral vibration was seen throughout the run. Figure E-12 is a collage of post-run bit photographs.⁵ The run is dominated by BHA whirl. Lateral Vibration was up to 20 gRMS. There was a 50% reduction in vibration magnitude (from the previous run) (refer to Table E-2 for Halo 1175 and Figure E-13). All recorded data are shown in Figures E-14 and E-15.

Table E-2. Vibration for BHA-5

HALO SN	Footage	Circulating Hours	ROP avg, on-bottom (ft/hr)	Hr HFTO Total	Whirl Hr Total
0781	289.40	5.36	128.43	0.00	2.19
1175	686.84	16.70	66.16	0.00	10.36
0233	589.02	21.30	59.09	0.03	9.64
1711	340.27	26.04	53.55	0.29	5.16
0406	633.84	16.44	50.15	0.00	11.40

⁵ Per the daily reports, the assembly was pulled for secondary communication errors while building the curve.


Proposed BHA	#	SN	Description	OD [in]	ID [in]	FN OD [in] / FN Len [Usft]	Cnx Up / Cnx Dn	Wt[lb/ft] / Comp Wt[klbs] / Tot Wt[klbs]	Length [Usft]	Total Length [Usft]
	1	A298328	9 1/2" 7 Blade PDC bit	9.5	2.75		4 1/2 REG P		1.13	1.13
	2	76001175	HALO RSS w/HFTO (Stiff)	6.75	2	6.688	4 1/2 IF B / 4 1/2 REG B		35.31	36.44
	3	ASM 9008	Spiral wrapped IB Stabilizer	6.5	2.813		4 1/2 IF B / 4 1/2 IF P		5.66	42.1
	4	125-373	6 3/4 NM Pony DC	6.438	3.25		4 1/2 IF B / 4 1/2 IF P		9.22	51.32
	5	84-772	6 3/4 NMDC	6.813	3.25		4 1/2 IF B / 4 1/2 IF P		31.11	82.43
	6	GU3275	FG 9 1/2" Roller reamer	6.625	2.938	6.625 / 2.10	4 1/2 IF B / 4 1/2 IF P		6.71	89.14
	7	7027	6 3/4 Black Box	6.75	2.25	6.750	4 1/2 IF B / 4 1/2 IF P		6	95.14
	8	AFLS603	6 3/4" Float sub	6.375	2.875		4 1/2 IF B / 4 1/2 IF P		2.45	97.59
	9	DR 48701	6 3/4 Filter sub	6.688	3.25	6.688	4 1/2 IF B / 4 1/2 IF P		3.93	101.52
	10	N/A	9 JTS, 6 3/4" DC's	6.813	2.875		4 1/2 IF B / 4 1/2 IF P	100.00 / 27.83 / 27.83	278.27	379.79
	11	N/A	Crossover (DC's to HWDP)	6.937	3		5 1/2 FH B / 4 1/2 IF P		3.15	382.94
	12	N/A	30 JTS HWDP	5.5	3.625		5 1/2 FH B / 5 1/2 FH P	46.40 / 42.38 / 70.21	913.42	1296.36

Figure E-11. Run 5.



Figure E-12. Post-run bit photograph (after pulling BHA-5).

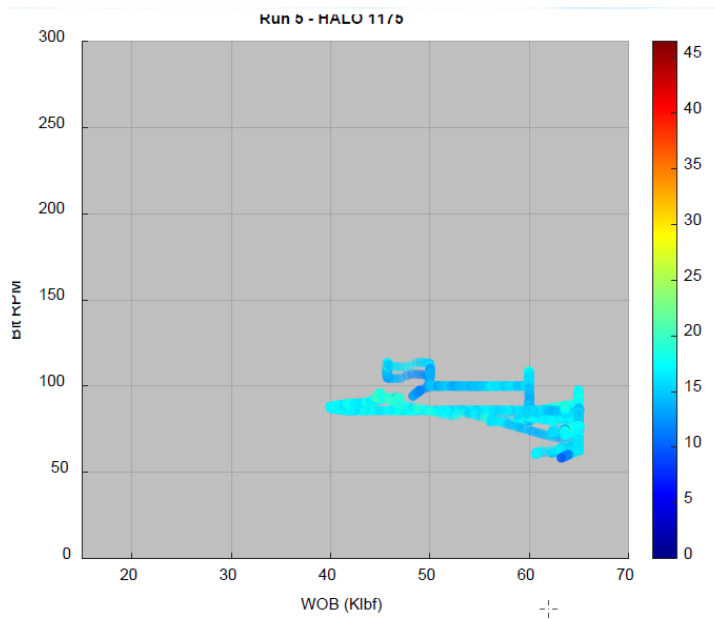


Figure E-13. Vibration magnitudes for BHA-5. Bit RPM is plotted against WOB and the whirl magnitude is indicated by the color bar.

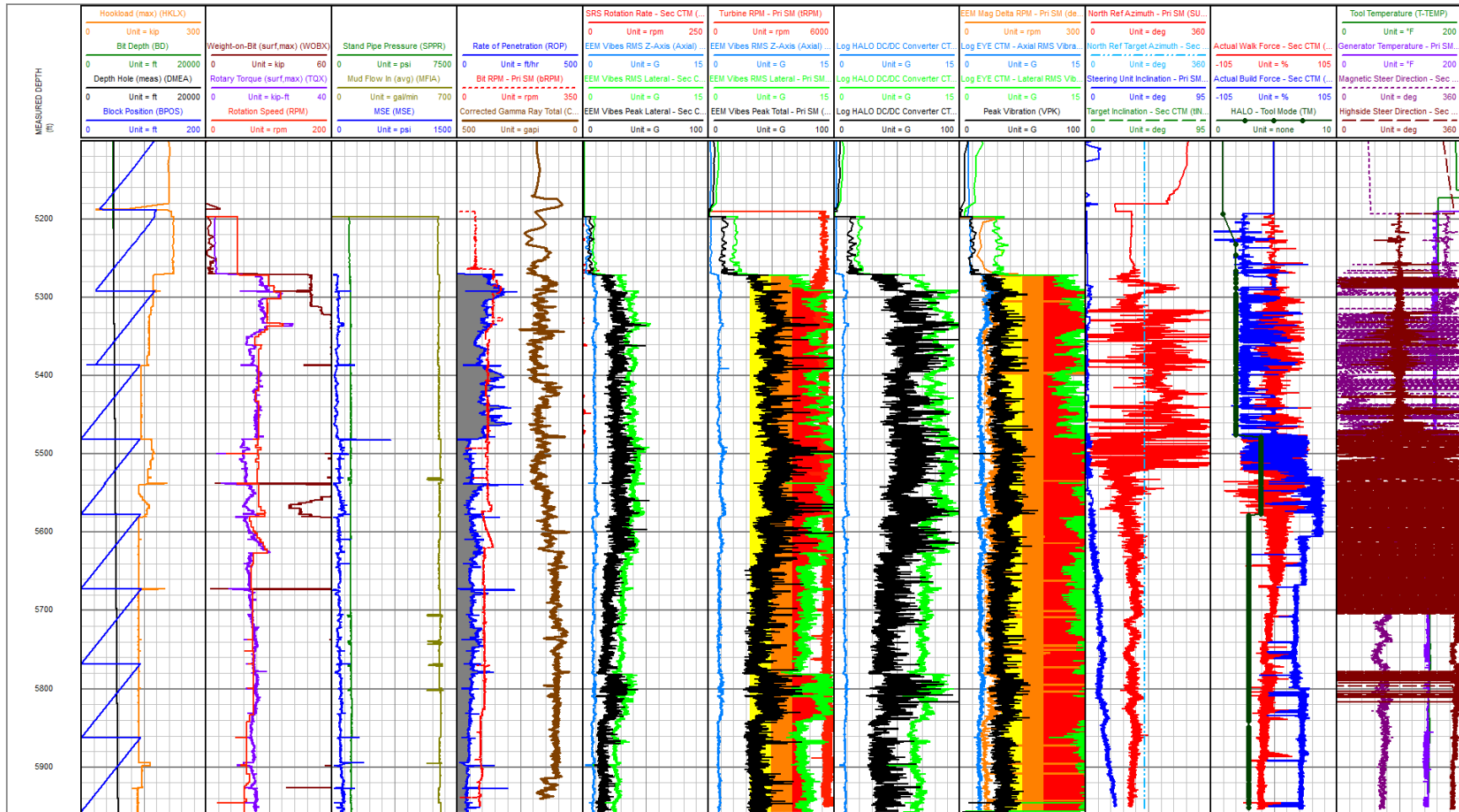


Figure E-14. MWD data, by depth.

MWD Run 6 -HALO 0233

The BHA is shown in Figure E-16. 588 ft were drilled over 17.81 hr of circulation, with a maximum temperature of 260°F. No motor was run. T Lateral vibration was seen throughout the run. Figure E-17 is a post-run bit photograph.⁶ There was a 50% reduction in vibration magnitude (from the previous run) (refer to Table E-3 for Halo 0233 and Figure E-18). All recorded data are shown in Figures J-19 and J-20.

On re-run, 65 feet were drilled with a circulation time of 12 hours. The assembly was pulled because the MWD flat-lined. Figure E-17 has a photograph of the pulled bit.

Table E-3. Vibration for BHA-6

HALO SN	Footage	Circulating Hours	ROP avg, on-bottom (ft/hr)	Hr HFTO Total	Whirl Hr Total
0781	289.40	5.36	128.43	0.00	2.19
1175	686.84	16.70	66.16	0.00	10.36
0233	589.02	21.30	59.09	0.03	9.64
1711	340.27	26.04	53.55	0.29	5.16
0406	633.84	16.44	50.15	0.00	11.40

⁶ Per the daily reports, the assembly was pulled for low ROP, inspected and re-run.


Proposed BHA	#	SN	Description	OD [in]	ID [in]	FN OD [in] / FN Len [Usft]	Cnx Up / Cnx Dn	Wt[lb/ft] / Comp Wt[klbs] / Tot Wt[klbs]	Length [Usft]	Total Length [Usft]
	1	A298330	9 1/2" 7 Blade PDC bit	9.5	2.75		4 1/2 REG P		1.13	1.13
	2	76000233	HALO RSS w/HFTO (Stiff)	6.75	2	6.688 / 5.00	4 1/2 IF B / 4 1/2 REG B		35.31	36.44
	3	ASM 9007	Spiral wrapped IB Stabilizer	6.5	2.813	6.500 / 2.20	4 1/2 IF B / 4 1/2 IF P		5.42	41.86
	4	84-772	6 3/4 NMDC	6.813	3.25		4 1/2 IF B / 4 1/2 IF P		31.11	72.97
	5	GU3275	FG 9 1/2" Roller reamer	6.625	2.938	6.625 / 2.10	4 1/2 IF B / 4 1/2 IF P		6.71	79.68
	6	7006	6 3/4 Black Box	6.75	2.25	6.750	4 1/2 IF B / 4 1/2 IF P		5.9	85.58
	7	AFLS603	6 3/4" Float sub	6.375	2.875		4 1/2 IF B / 4 1/2 IF P		2.45	88.03
	8	DR 48701	6 3/4 Filter sub	6.688	3.25	6.688	4 1/2 IF B / 4 1/2 IF P		3.93	91.96
	9	N/A	9 JTS, 6 3/4" DC's	6.813	2.875		4 1/2 IF B / 4 1/2 IF P	100.00 / 27.83 / 27.83	278.27	370.23
	10	N/A	Crossover (DC's to HWDP)	6.937	3		5 1/2 FH B / 4 1/2 IF P		3.15	373.38
	11	N/A	30 JTS HWDP	5.5	3.625		5 1/2 FH B / 5 1/2 FH P	46.40 / 42.38 / 70.21	913.42	1286.8

Figure E-16. BHA-6.



Figure E-17. Post-run bit photograph (after pulling BHA-6). At left is the original run, at right is a bit after the re-run.

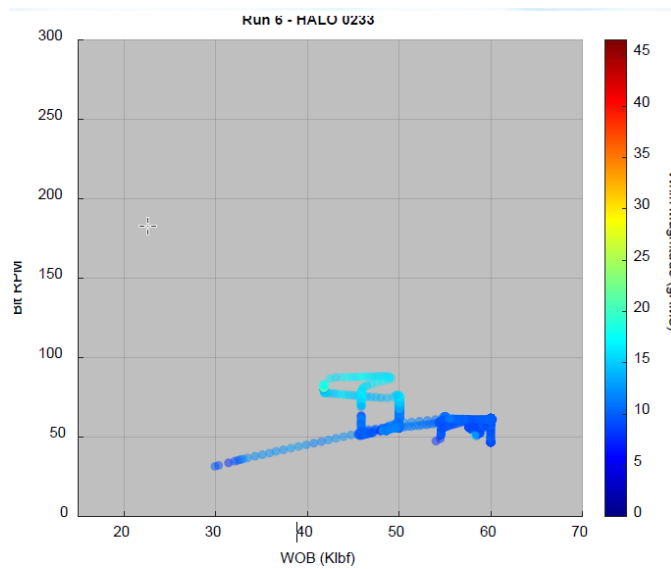


Figure E-18. Vibration magnitudes for BHA-6. Bit RPM is plotted against WOB and the whirl magnitude is indicated by the color bar.

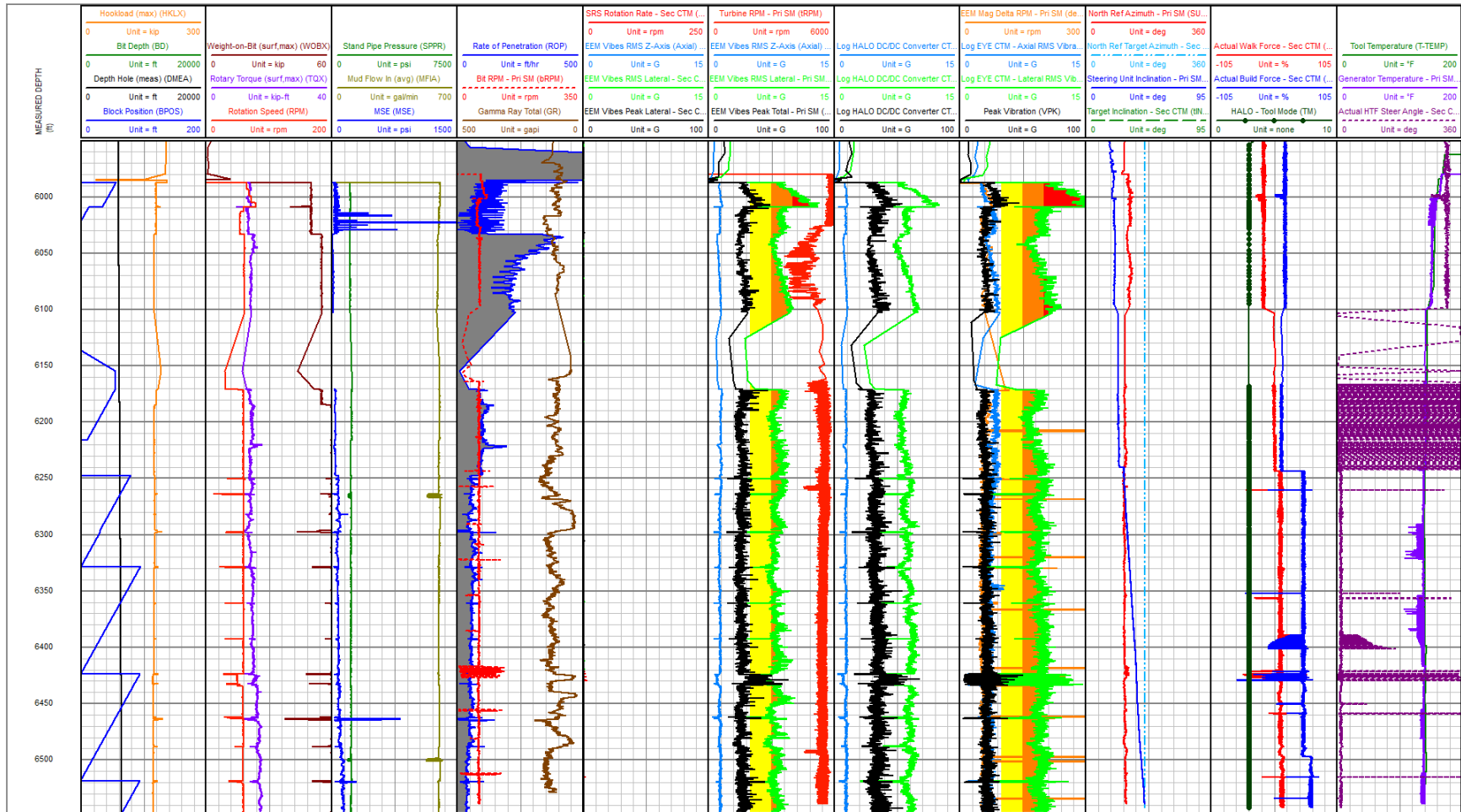


Figure E-19. MWD data, by depth.

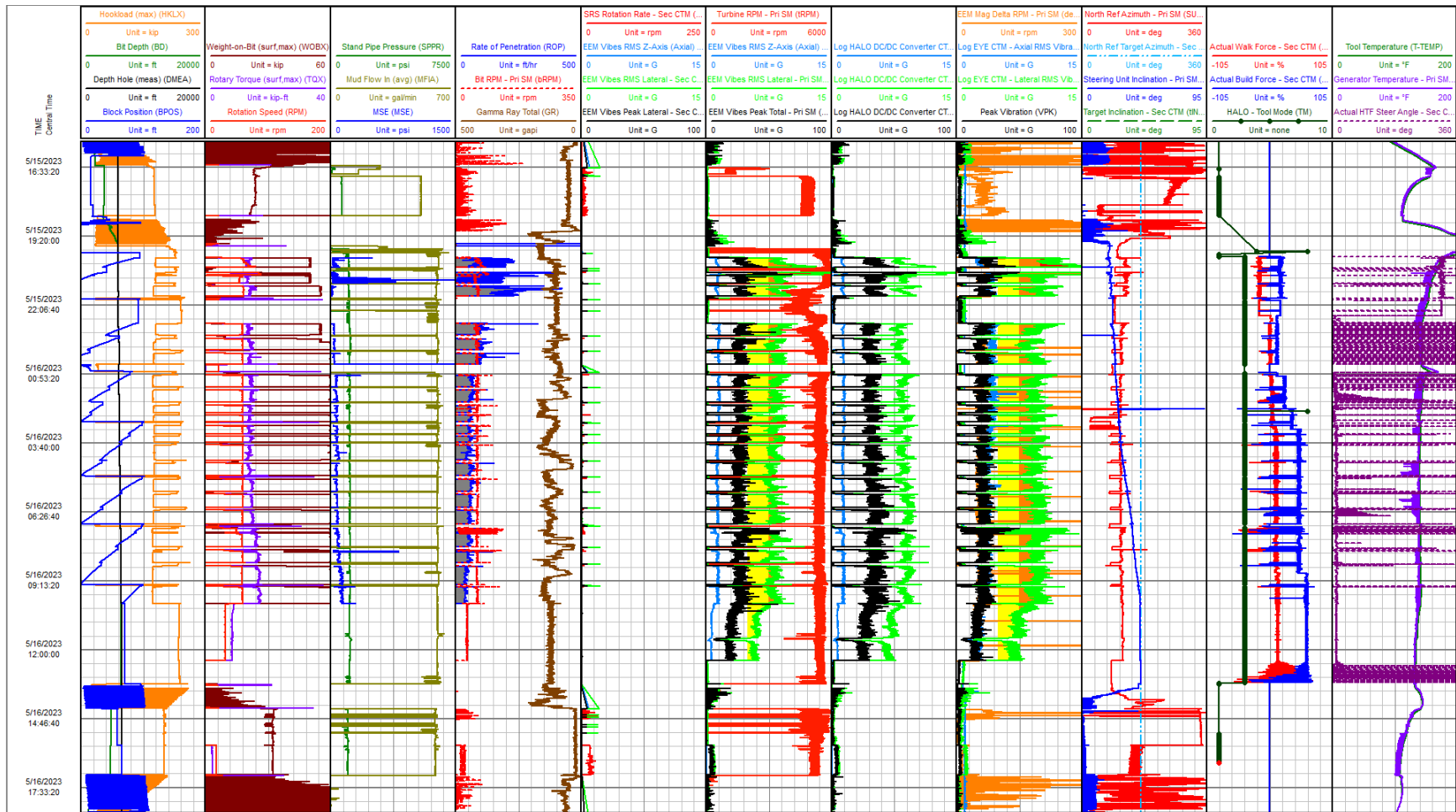


Figure E-20. MWD data, by date and time.

MWD Run 7 -HALO 1711

The BHA is shown in Figure E-21. 340 ft were drilled over 16.76 hr of circulation, with a maximum temperature of 241°F. No motor was run. Figure E-22 is a post-run bit photograph.⁷ Refer to Table E-4 for Halo 1711 and Figure E-23. All recorded data are shown in Figures J-24 and J-25.

Table E-4. Vibration for BHA-7

HALO SN	Footage	Circulating Hours	ROP avg, on-bottom (ft/hr)	Hr HFTO Total	Whirl Hr Total
0781	289.40	5.36	128.43	0.00	2.19
1175	686.84	16.70	66.16	0.00	10.36
0233	589.02	21.30	59.09	0.03	9.64
1711	340.27	26.04	53.55	0.29	5.16
0406	633.84	16.44	50.15	0.00	11.40

⁷ Per the daily reports, the assembly was pulled when the MWD flat-lined.


Proposed BHA	#	SN	Description	OD [in]	ID [in]	FN OD [in] / FN Len [Usft]	Cnx Up / Cnx Dn	Wt[lb/ft] / Comp Wt[klbs] / Tot Wt[klbs]	Length [Usft]	Total Length [Usft]
	1	A298353	9 1/2 8 Blade PDC bit	9.5	2.75		4 1/2 REG P		1.22	1.22
	2	76001711	HALO RSS w/HFTO (Flex)	6.75	2	6.500 / 5.00	4 1/2 IF B / 4 1/2 REG B		35.48	36.7
	3	650779	9 3/8 Spiral wrapped stabilizer	6.5	2.875	6.500 / 1.42	4 1/2 IF B / 4 1/2 IF P		4.14	40.84
	4	DR 34302	6 3/4 NM Pony DC	6.438	3.5		4 1/2 IF B / 4 1/2 IF P		12.24	53.08
	5	153-022	6 3/4 NM Pony DC	6.813	3.25		4 1/2 IF B / 4 1/2 IF P		9.83	62.91
	6	GU1744	FG 9 1/2 Roller reamer	6.625	3	6.750 / 2.19	4 1/2 IF B / 4 1/2 IF P		5.39	68.3
	7	84-772	6 3/4 NMDC	6.813	3.25		4 1/2 IF B / 4 1/2 IF P		31.11	99.41
	8	7015	6 3/4 Black Box	6.75	2.25	6.750	4 1/2 IF B / 4 1/2 IF P		6	105.41
	9	DR 48701	6 3/4 Filter sub	6.688	3.25	6.688	4 1/2 IF B / 4 1/2 IF P		3.93	109.34
	10	AFLS603	6 3/4 Float sub	6.375	2.875		4 1/2 IF B / 4 1/2 IF P		2.45	111.79
	11	N/A	9 JTS, 6 3/4 DCs	6.813	2.875		4 1/2 IF B / 4 1/2 IF P	100.00 / 27.83 / 27.83	278.27	390.06
	12	N/A	Crossover (DCs to HWDP)	6.937	3		5 1/2 FH B / 4 1/2 IF P		3.15	393.21
	13	N/A	30 JTS HWDP	5.5	3.625		5 1/2 FH B / 5 1/2 FH P	46.40 / 42.38 / 70.21	913.42	1306.63

Figure E-21. BHA-7.



Figure E-22. Post-run bit photograph (after pulling BHA-7).

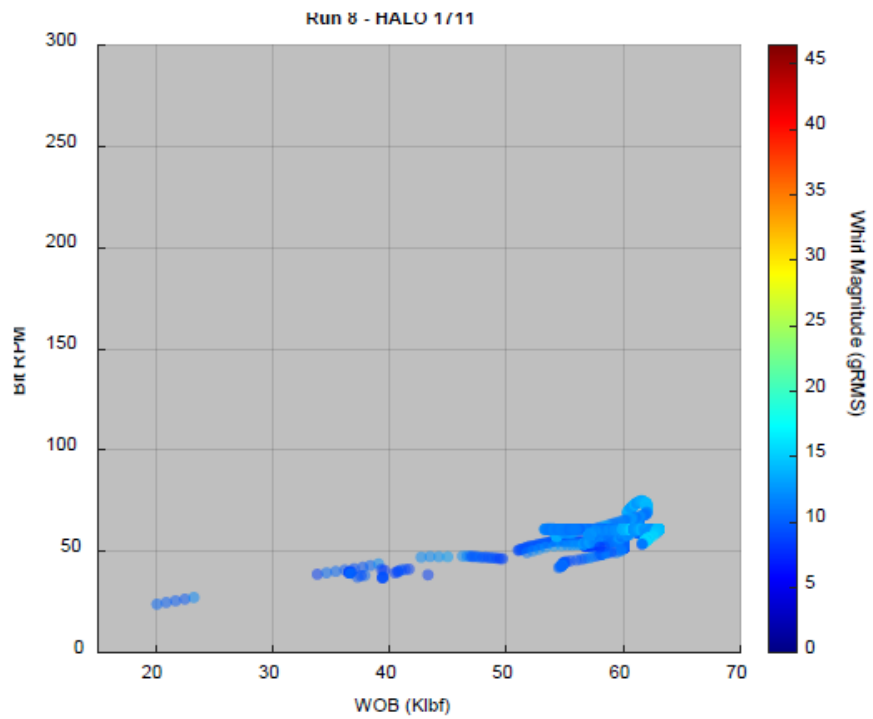


Figure E-23. Vibration magnitudes for BHA-7. Bit RPM is plotted against WOB and the whirl magnitude is indicated by the color bar.

Slow Rotating Sleeve Primary DCDC MWD EYE

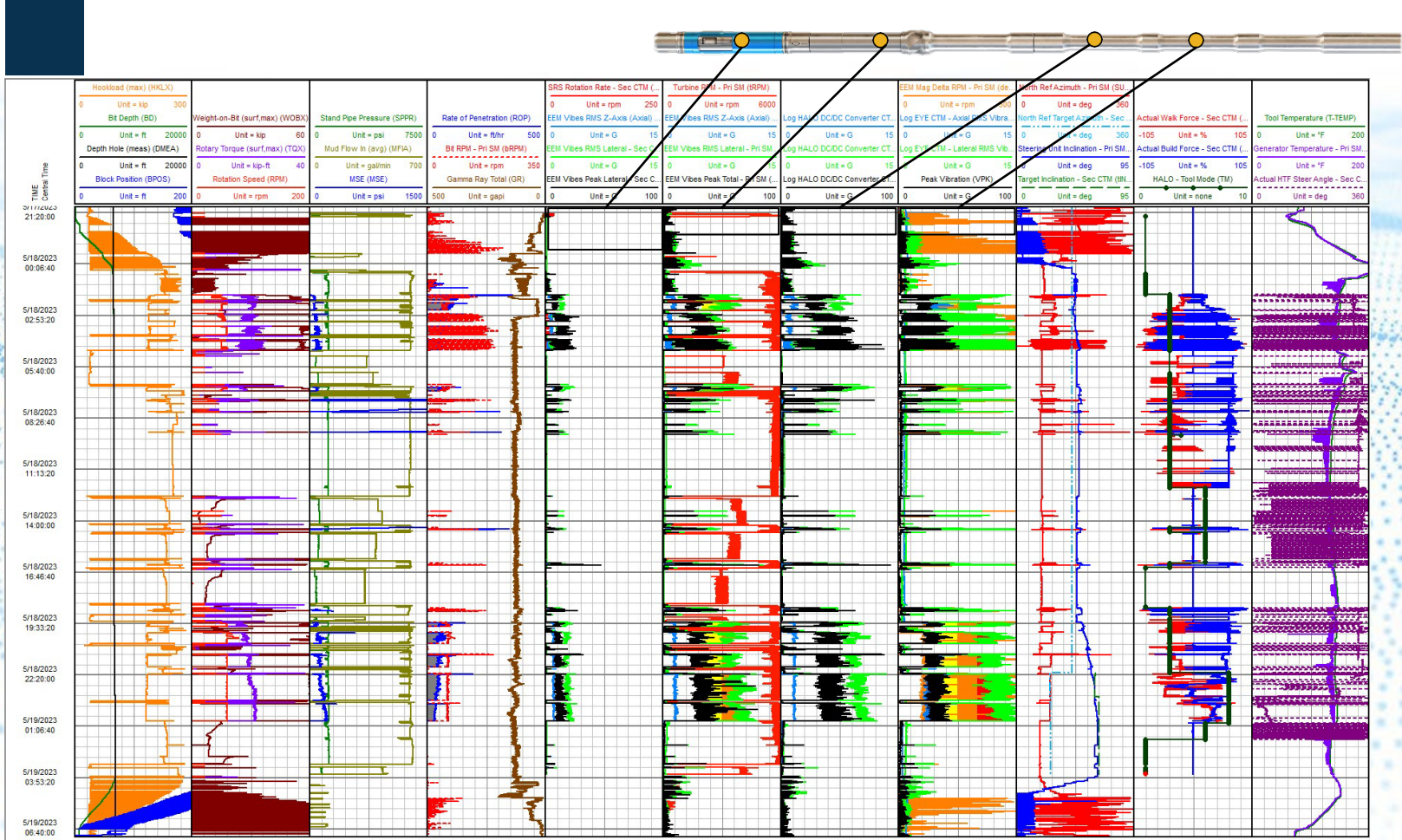


Figure E-25. MWD data, by date and time.

MWD Run 8 -HALO 0406

The BHA is shown in Figure E-26. 634 ft were drilled over 16.4 hr of circulation, with a maximum temperature of 299° F. No motor was run. The assembly was pulled when the hole was landed at 65°. Figure E-27 is a post-run bit photograph. Refer to Table E-5 for Halo 0406 and Figure E-28. All recorded data are shown in Figures J-29 and J-30.

Table E-5. Vibration for BHA-8

HALO SN	Footage	Circulating Hours	ROP avg, on-bottom (ft/hr)	Hr HFTO Total	Whirl Hr Total
0781	289.40	5.36	128.43	0.00	2.19
1175	686.84	16.70	66.16	0.00	10.36
0233	589.02	21.30	59.09	0.03	9.64
1711	340.27	26.04	53.55	0.29	5.16
0406	633.84	16.44	50.15	0.00	11.40


Proposed BHA	#	SN	Description	OD [in]	ID [in]	FN OD [in] / FN Len [Usft]	Cnx Up / Cnx Dn	Wt[lb/ft] / Comp Wt[klbs] / Tot Wt[klbs]	Length [Usft]	Total Length [Usft]
	1	A298354	9 1/2 8 Blade PDC bit	9.5	2.75		4 1/2 REG P		1.18	1.18
	2	76000406	HALO RSS w/HFTO (Stiff)	6.75	2	6.500 / 5.00	4 1/2 IF B / 4 1/2 REG B		35.33	36.51
	3	650779	9 3/8 Spiral wrapped stabilizer	6.5	2.875	6.500 / 1.42	4 1/2 IF B / 4 1/2 IF P		4.14	40.65
	4	DR 34302	6 3/4 NM Pony DC	6.438	3.5		4 1/2 IF B / 4 1/2 IF P		12.24	52.89
	5	153-022	6 3/4 NM Pony DC	6.813	3.25		4 1/2 IF B / 4 1/2 IF P		9.83	62.72
	6	GU1744	FG 9 1/2 Roller reamer	6.625	3	6.750 / 2.19	4 1/2 IF B / 4 1/2 IF P		5.39	68.11
	7	84-772	6 3/4 NMDC	6.813	3.25		4 1/2 IF B / 4 1/2 IF P		31.11	99.22
	8	7006	6 3/4 Black Box	6.75	2.25	6.750	4 1/2 IF B / 4 1/2 IF P		5.97	105.19
	9	DR 48701	6 3/4 Filter sub	6.688	3.25	6.688	4 1/2 IF B / 4 1/2 IF P		3.93	109.12
	10	AFLS603	6 3/4 Float sub	6.375	2.875		4 1/2 IF B / 4 1/2 IF P		2.45	111.57
	11	N/A	9 JTS, 6 3/4 DCs	6.813	2.875		4 1/2 IF B / 4 1/2 IF P	100.00 / 27.83 / 27.83	278.27	389.84
	12	N/A	Crossover (DCs to HWDP)	6.937	3		5 1/2 FH B / 4 1/2 IF P		3.15	392.99
	13	N/A	30 JTS HWDP	5.5	3.625		5 1/2 FH B / 5 1/2 FH P	46.40 / 42.38 / 70.21	913.42	1306.41

Figure E-26. BHA-8.



Figure E-27. Post-run bit photograph (after pulling BHA-8).

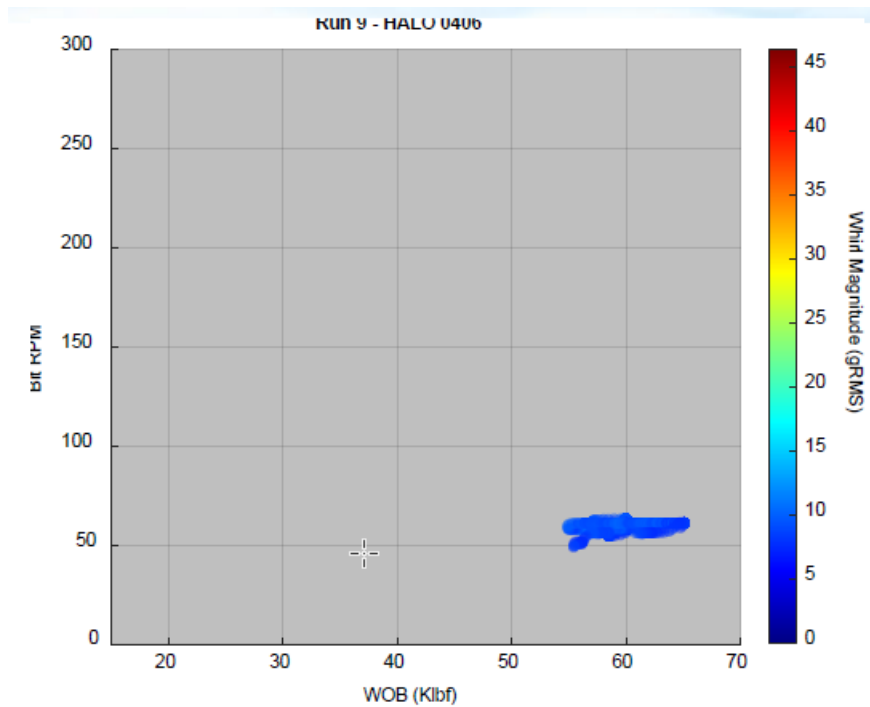


Figure E-28. Vibration magnitudes for BHA-8. Bit RPM is plotted against WOB and the whirl magnitude is indicated by the color bar.

MWD Run 9 – HALO 406

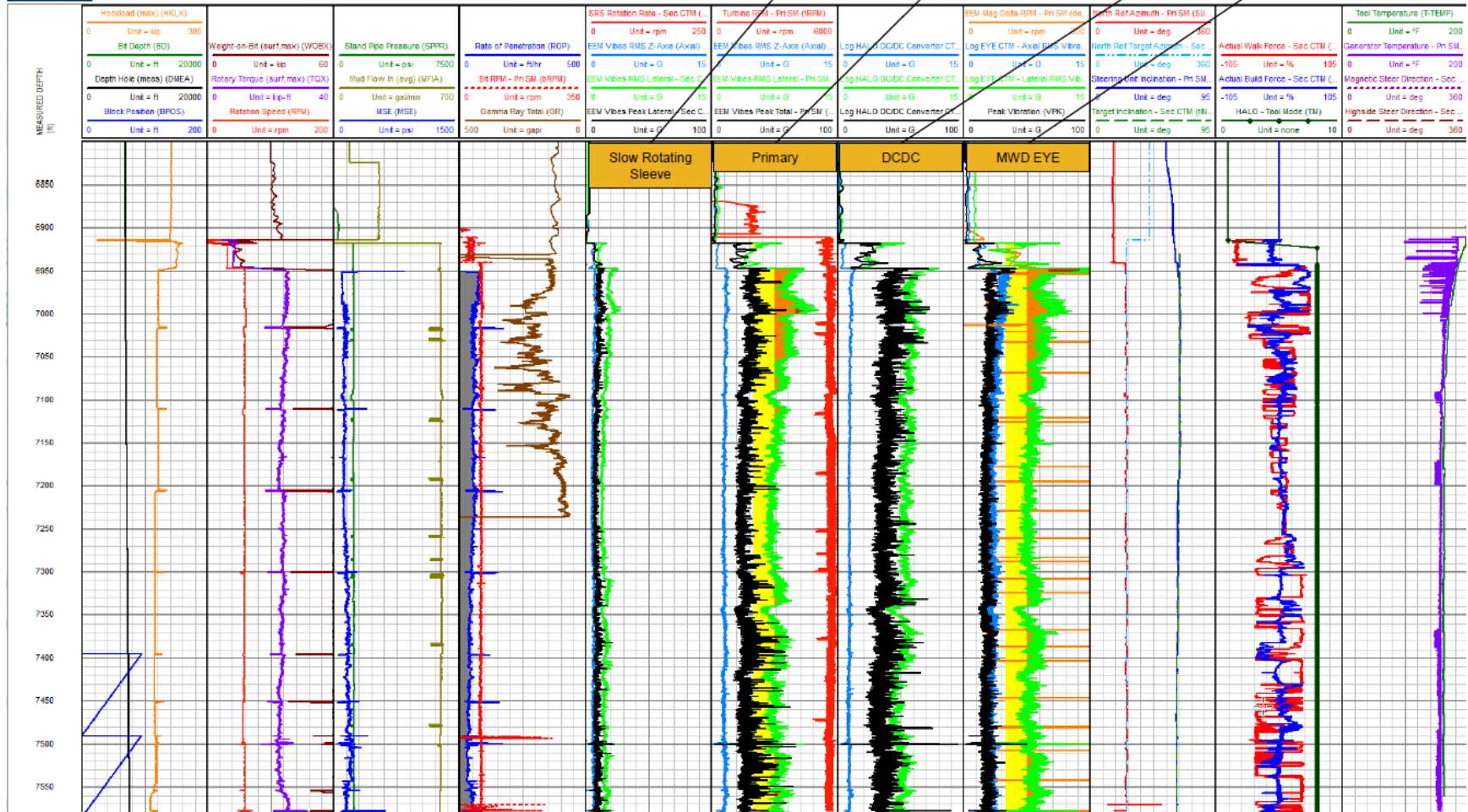


Figure E-29. MWD data, by depth.

MWD Run 9 – HALO 406

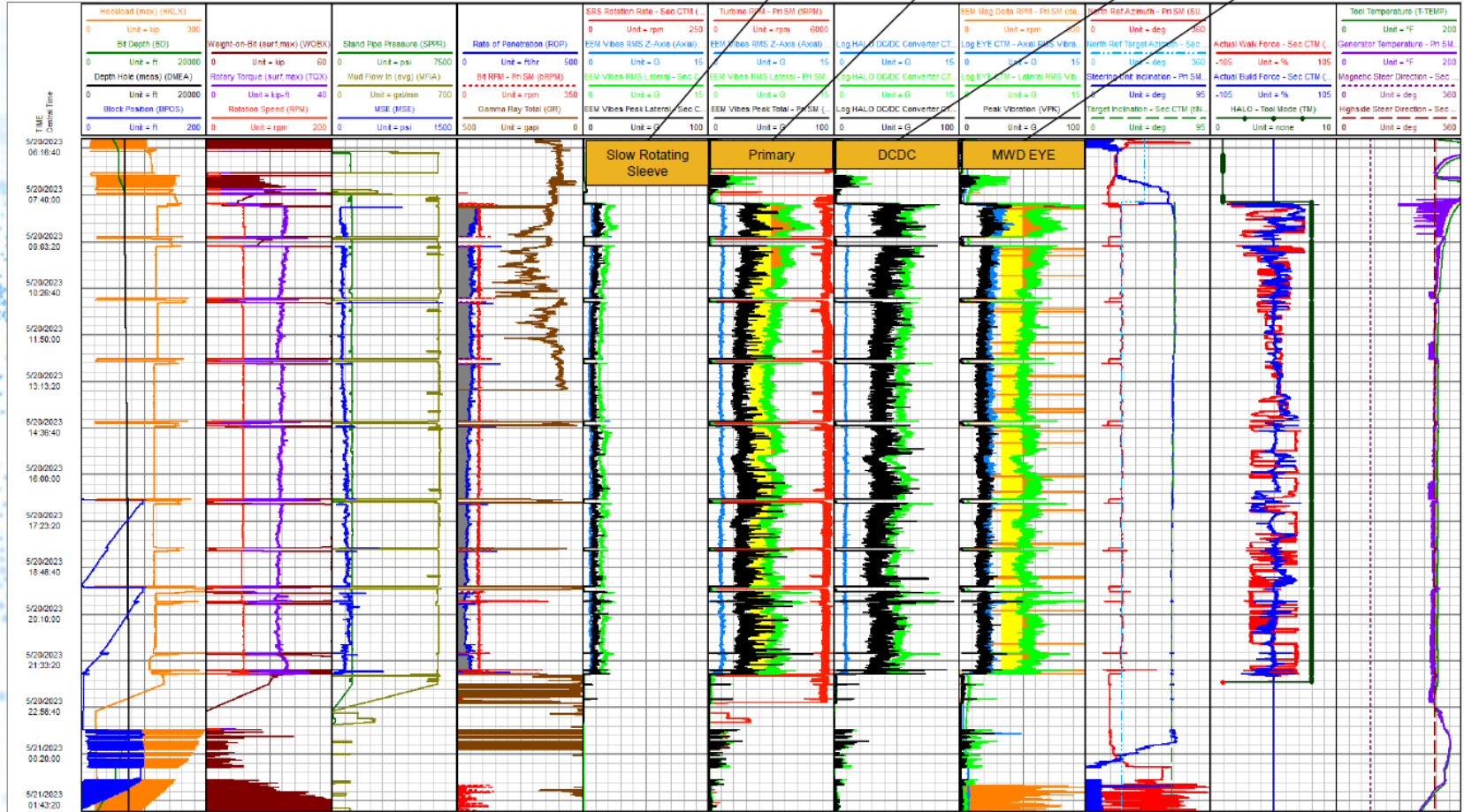


Figure E-30. MWD data, by date and time.

Appendix F: Sanvean Sensor Data

This covers 9.5-inch diameter hole (BHAs 11 to 17).

F-1. BHA 11 Drilled from 4980 to 5269 ft MD

The first BHA described is labeled BHA #4 by SDI. It is shown in Figure F-1 and includes the Halo RSS, a motor, and a RIP Stick.

BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
BHA #4	3	9.50	TKC73-A2	A298329	REEDHYCALOG	4980	5269	289	2.264	128

4: Directional BHA #4 HALO, 9 1/2" Hole section

Bottom Hole Assembly													
Job#	OP.039349		Rig	Frontier 16		BHA Length (Usft)	1354.08						
Operator	Utah Forge		BHA #	4		BHA Weight dry (kibs)	70.21						
Well	16B(78)-32 - 16B(78)-32		Bit #	4		BHA Weight Bouyed (kibs)	60.57						
Field	Beaver (University of Utah) - Utah Forge		Depth in (Usft)	0.00		Wt. Below Jars dry (kibs)	70.21						
Date In			Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (kibs)	60.57						
Date Out			Drilled(Usft)	0.00		Drilling / Circ Hours	0.00 / 0.00						
Sensor Offsets													
Survey Offset	N/A		Gamma Offset	N/A		Gyro Offset	N/A						
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (kibs)	Total Weight (kibs)	Length (Usft)	Total Length (Usft)
1	A298329	9 1/2" 7 Blade PDC bit	6.375	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.13	1.13
2	76000781	HALO RSS w/HFTO	6.750	2.000	0.000	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.38	36.51
3	ASM 9006	Spiral wrapped IB Stabilizer	6.500	2.813	6.500	2.40	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.62	42.13
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.22	51.35
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	82.46
6	GU1405	FG 9 1/2" Roller reamer	6.375	3.000	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.64	88.10
7	7019	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	94.10
8	RS675-0023	6 3/4 RIPstick	6.750	2.000	6.750	1.10	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	19.93	114.03
9	7150018	7.15 Mud Motor	7.188	2.000	7.188	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	41.28	155.31
10	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	159.24
11	N/A	9 JTS, 6 3/4" DC's	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	437.51
12	N/A	Crossover (DC's to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	440.66
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1354.08
Comments													
Halo 7600-0781; Pulsar 128-481; Eye 1485; Gamma 1279; Battery 008-29SEP22AB SDI 7" Straight Fixed Lobe 6/7, Stage 7.1 Flow Range = 500-750 Max Diff = 1,570 Max Torque = 18,680 Rev/Gal = 0.23 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7													

HALO
STAB

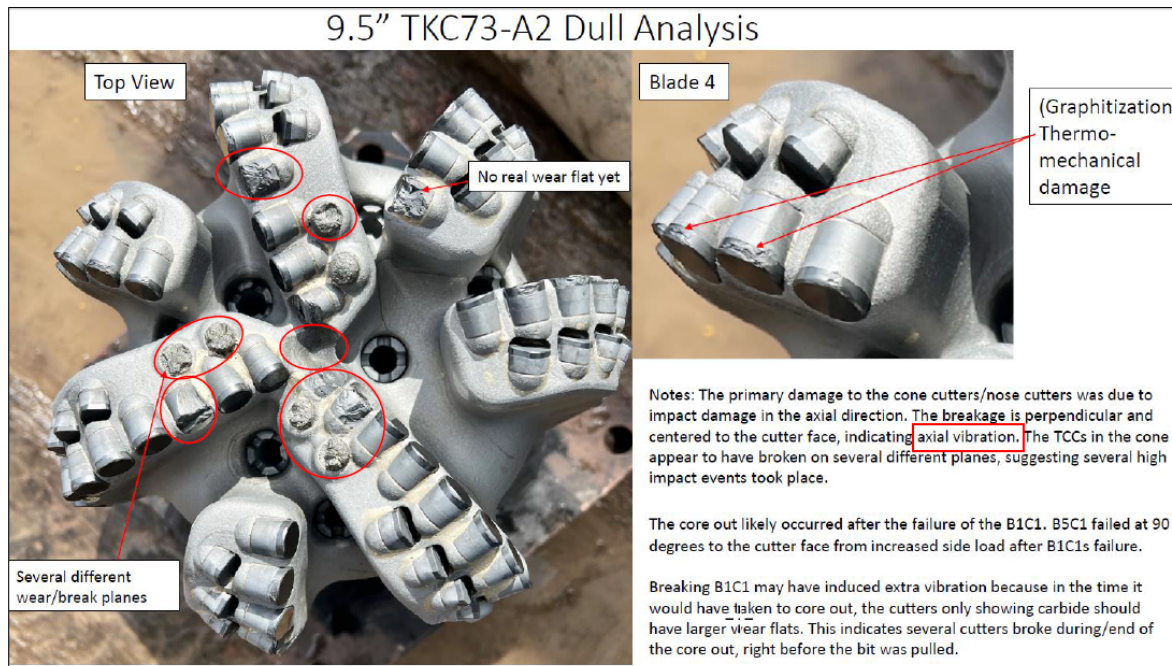
RR
Black Box
RIPstick
Mud Motor (6/7 7.1)

9 x 6 3/4" DC

30 x HWDP

Figure F-1. BHA #11.

Figure F-2 shows the pulled bit with a forensic evaluation. Figure F-3 shows significant damage to the stabilizer and the roller reamer. Figure F-4 through K-10 show data recorded at the bit.



Comments from NOV Report

Pulled for DTF. High lateral vibrations were seen from MWD tool. This limited Rotary RPM's for majority of the run.

Bit cored out due to center column of granite not being destroyed. This means we have a very smooth borehole but could be due to the RSS keeping the bit with minimal DogLegs.

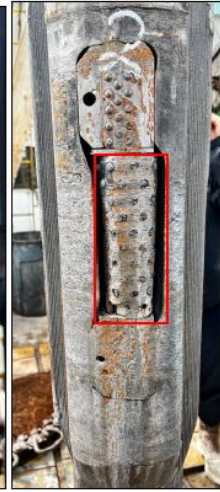
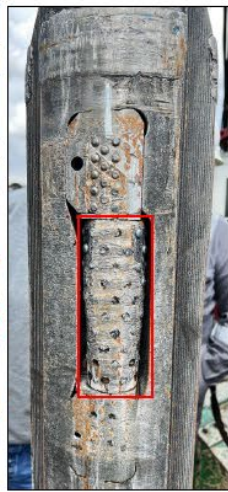
Steel shot from Particle Drilling trial was still seen in the mud at a 5% concentration.

Solution: Bit modeling shows the core out occurring at a DOC higher than 7mm/rev. We can drill at the same ROP within this DOC range by increasing Bit RPM's or by setting an ROP limiter.

Potentially separate blades on the bit to remove formation column.

Figure F-2. This shows damage associated with axial vibration. The torque control cutters reflect high impact events. High lateral vibrations were shown by the MWD (Section J). There was a core out potentially occurring because the DOC was more than 7 mm/rev. Set an ROP limiter or increase the bit RPMs (NOV recommendation).

Roller Element & Button Wear



Leading Edge Wear



Figure F-3. Severe damage to the stabilizer and roller reamer.

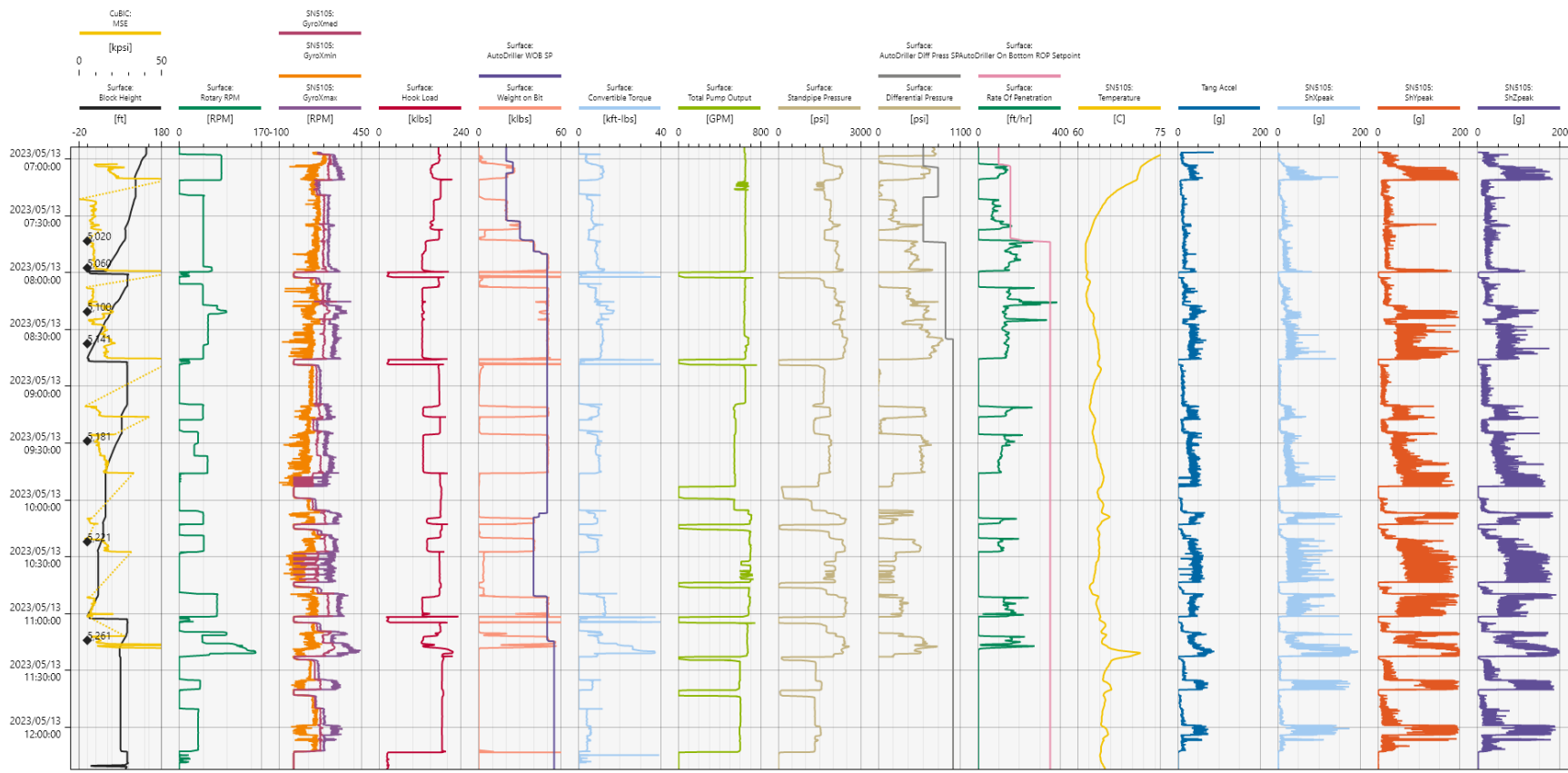


Figure F-4. The entire run (Halo, motor, RIP Stick).

BHA #11 (4) – Stand Zoom

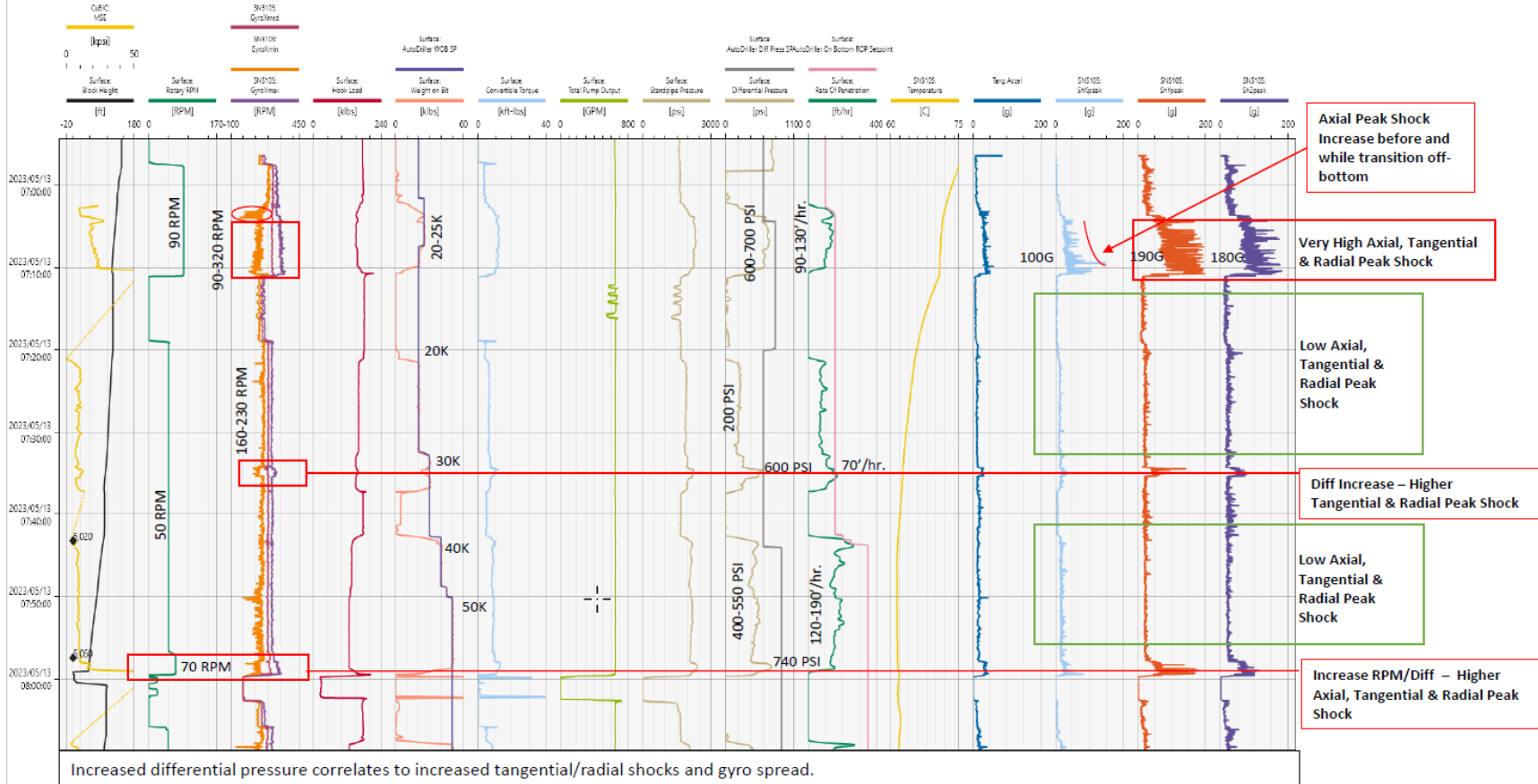


Figure F-5. This is zooming in on one stand. There are very high axial, tangential and radial peak shocks before and while transitioning off bottom. An increase in RPM (or differential pressure) led to increases in axial, tangential and radial peak shocks.

BHA #11 (4) – Stand Zoom

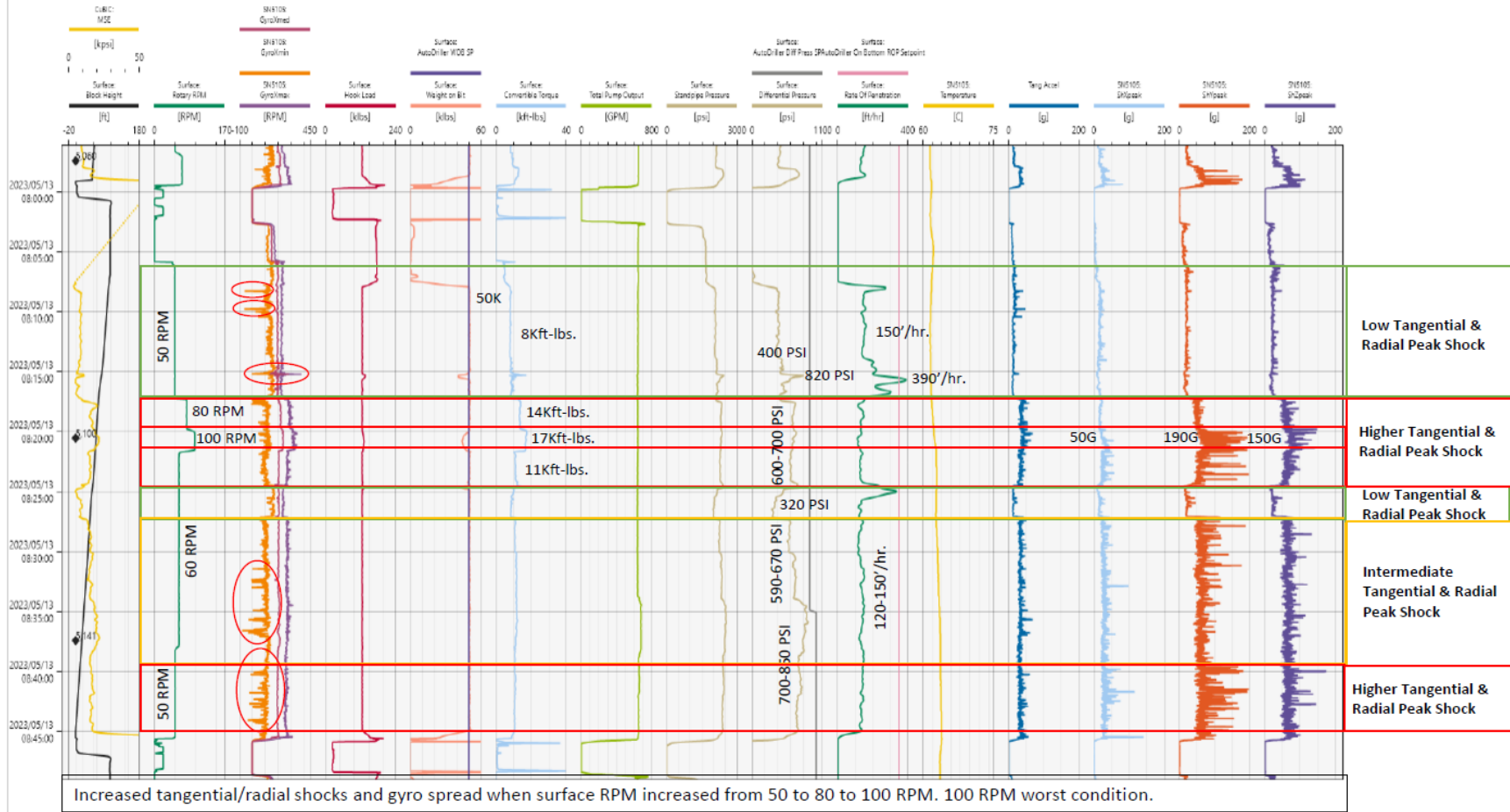


Figure F-6. This is another zoomed in view of a stand, showing a surface RPM step test - 100 RPM was the worst scenario.

BHA #11 (4) – Stand Zoom

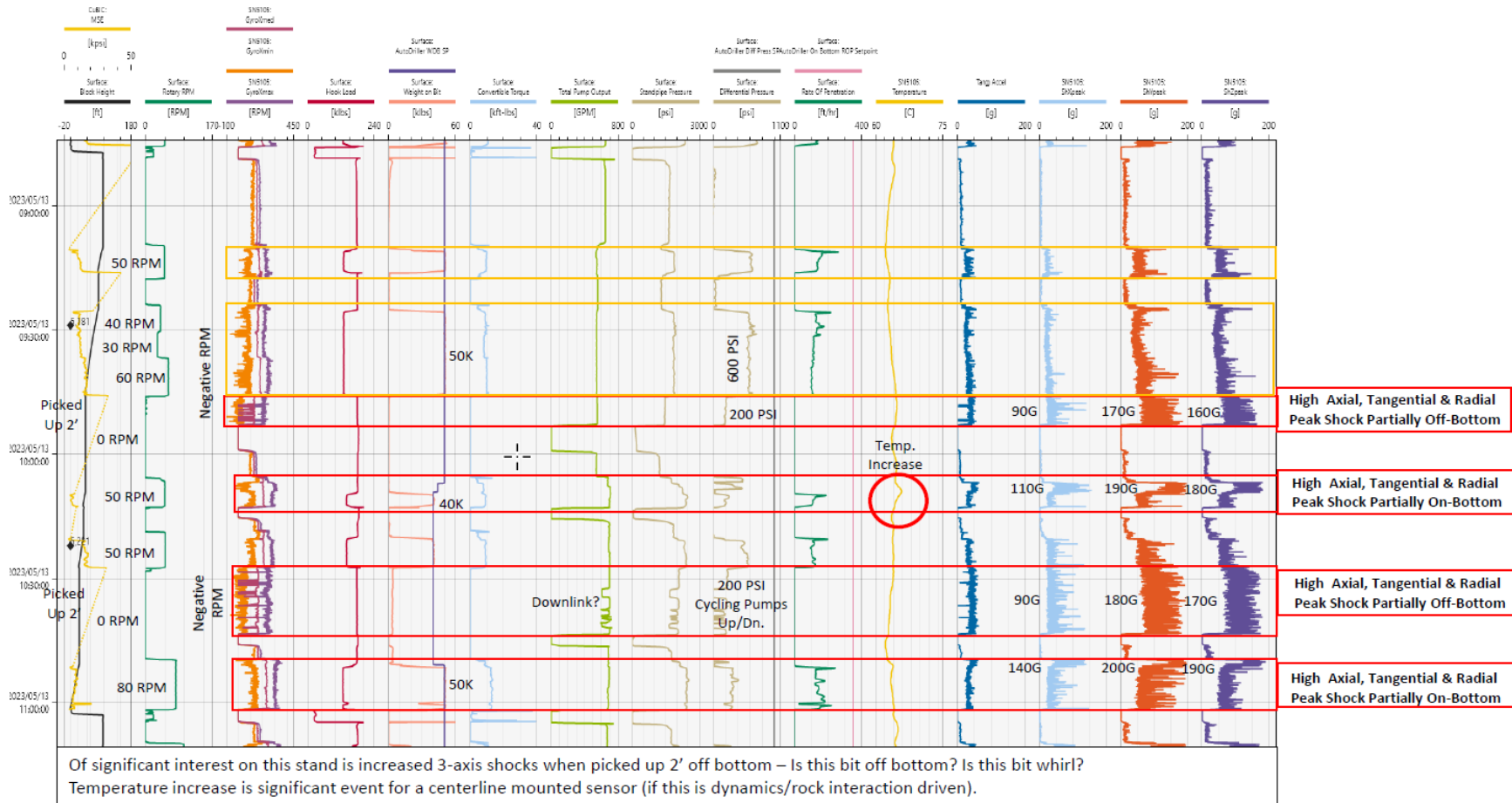


Figure F-7. This is another zoomed in view of a stand, showing a surface RPM step test. Notice the increased shocks when picked up only two-ft off bottom. The temperature increase is also of interest for a centerline mounted sensor.

BHA #11 (4) – Stand Zoom

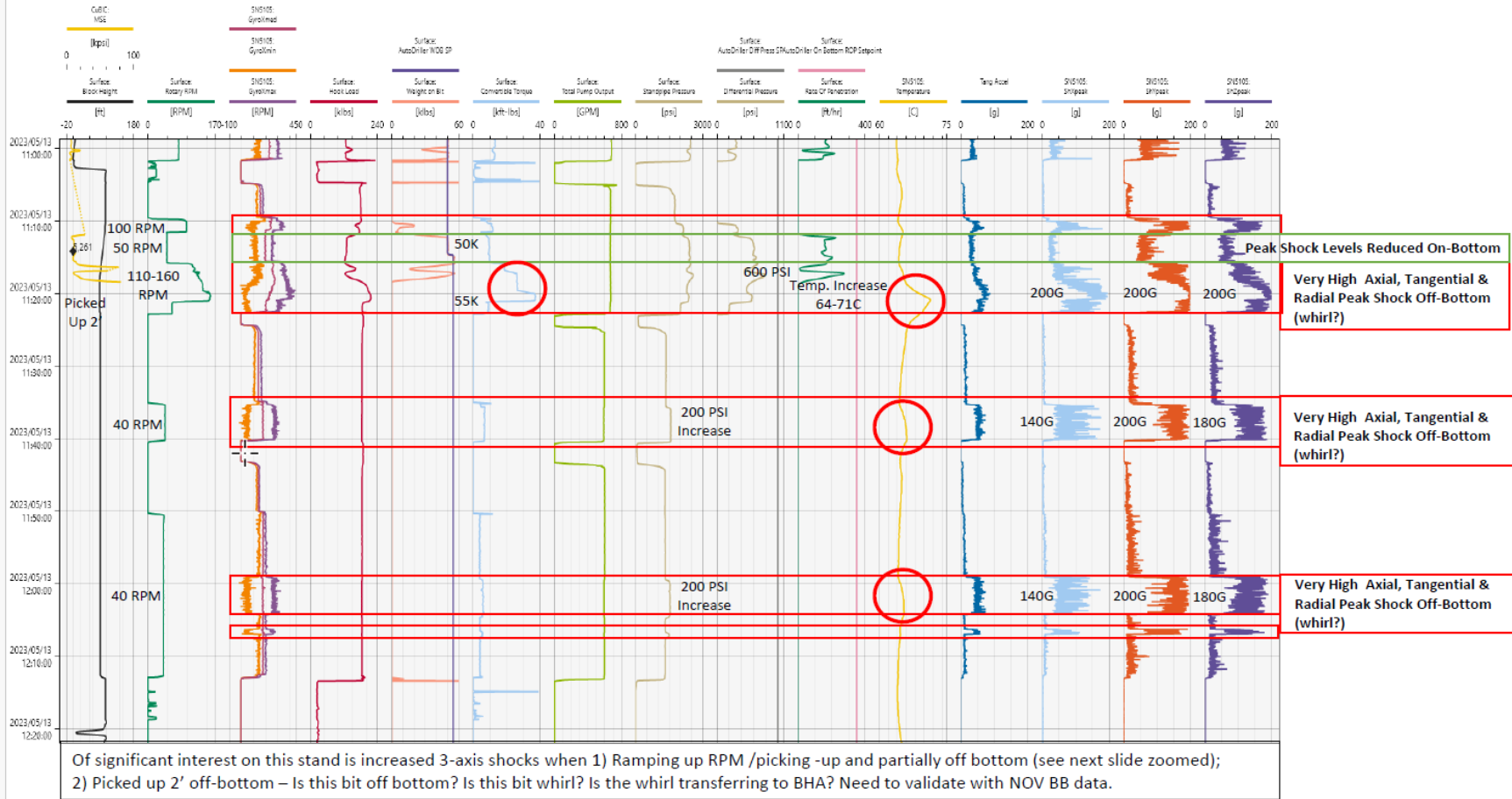


Figure F-8. This is another zoomed in view of a stand, showing a surface RPM step test. There are increased shocks when ramping up the RPM/picking up and partially off bottom (see Figure F-7).

BHA #11 (4) – Stand Zoom

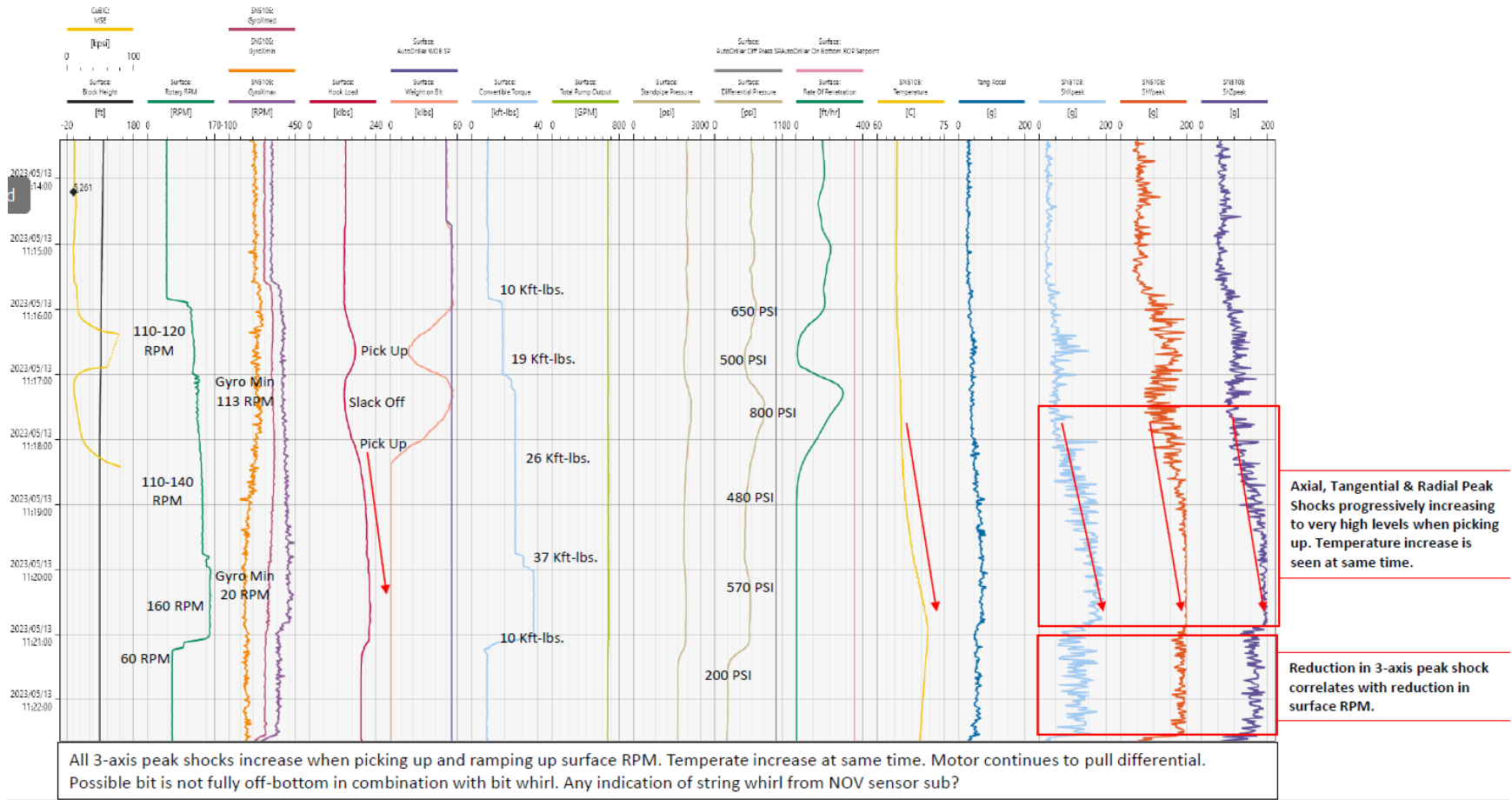


Figure F-9. This is another zoomed in view of a stand. All 3-axis shocks increase when picking up and when ramping up the surface RPM.

F-1.1 Sanvean's Observations for BHA #11

- Post run comments stated high lateral vibrations at MWD.
- Temperature increase during high levels of 3-axis peak shock is significant. This is a condition that will cause thermal damage to bit/cutters.
- Very high 3-axis Peak Shocks (up to 200G) experienced during run (HFTO 105Hz).
- Negative bit RPM events experienced through run.
- Clear correlation between higher differential pressure and increased 3-axis peak shocks while on-bottom.
- Clear correlation between higher surface RPM and increased 3-axis peak shocks while on-bottom.
- Off-bottom events are significant (transitioning off-bottom) shows very high 3-axis peak shocks and still pulling torque and differential pressure. Looks very much like bit whirl.
- Should use NOV Black Box data to evaluate magnitude of mud motor back-drive throughout the run.
- Bit cutter damages (and wear pattern on DOC limiters) likely due to negative RPM events.
- Roller reamer roller element/button and stabilizer wear likely due to BHA whirl which was more severe while off bottom. Need to verify with NOV Black Box data.

F-2 BHA #12 (SDI BHA #5)

Figure F-11 shows this BHA. The motor and the RIP Stick were removed. Figure F-12 is the post run bit (the curve was drilled from 0 to 20°). The curve started at 5,480 ft MD but there was a short trip at 5,537 ft due to a failure of the riser on the BOP stack. Drilling was maintained at 65,000 lbf and 75 rpm. The BHA was tripped due to Halo signal loss, increase in MSE and lower ROP. Ultimately it would be desirable to model how to reduce vibrations so a mud motor could be run. The pulled stabilizer and roller reamer were in good condition (Figure F-13). Figures K-14 through K-18 show recorded data during this run.

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #5	4	9.50	TKC73-A2	A298328	REEDHYCALOG	5269	5957	688	10.44	66

Bottom Hole Assembly																
Job#	OP.039349			Rig	Frontier 16			BHA Length (Usft)		1296.36						
Operator	Utah Forge			BHA #	5			BHA Weight dry (klbs)		70.21						
Well	16B(78)-32 - 16B(78)-32			Bit #	5			BHA Weight Bouyed (klbs)		60.67						
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00			Wt. Below Jars dry (klbs)		70.21						
Date In				Depth Out(Usft)	0.00			Wt. Below Jars Bouyed (klbs)		60.67						
Date Out				Drilled(Usft)	0.00			Drilling / Circ Hours		0.00 / 0.00						
Sensor Offsets																
Survey Offset			N/A			Gamma Offset			N/A			Gyro Offset			N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)			
1	A298328	9 1/2" 7 Blade PDC bit	9.600	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.13	1.13			
2	76001175	HALO RSS w/HFTO (Stiff)	6.750	2.000	6.688	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.31	36.44			
3	ASM 9006	Spiral wrapped IB Stabilizer	6.500	2.813	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.66	42.10			
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.22	51.32			
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	82.43			
6	GU3275	FG 9 1/2" Roller reamer	6.625	2.938	6.625	2.10	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.71	89.14			
7	7027	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	95.14			
8	AFLS603	6 3/4" Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	97.59			
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	101.52			
10	N/A	9 JTS, 6 3/4" DC's	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.63	27.63	278.27	379.79			
11	N/A	Crossover (DC's to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.63	3.15	382.94			
12	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1296.36			
Comments																
Halo 7600-1125; Pulser 128-474; Eye 1733; Gamma 1182; Battery 042-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Meke up torque, 4 1/2 Reg = 19,500 4 1/2 F = 29,000																

HALO STIFF
STAB
RR
Black Box
9 x 6 3/4" DC
30 x HWDP

Figure F-11. BHA #12 (motor and HFTO suppression removed).



Figure F-12. Pulled bit.



Figure F-13. The stabilizer and roller reamer were in good condition.

BHA #12 (5) – Entire Run

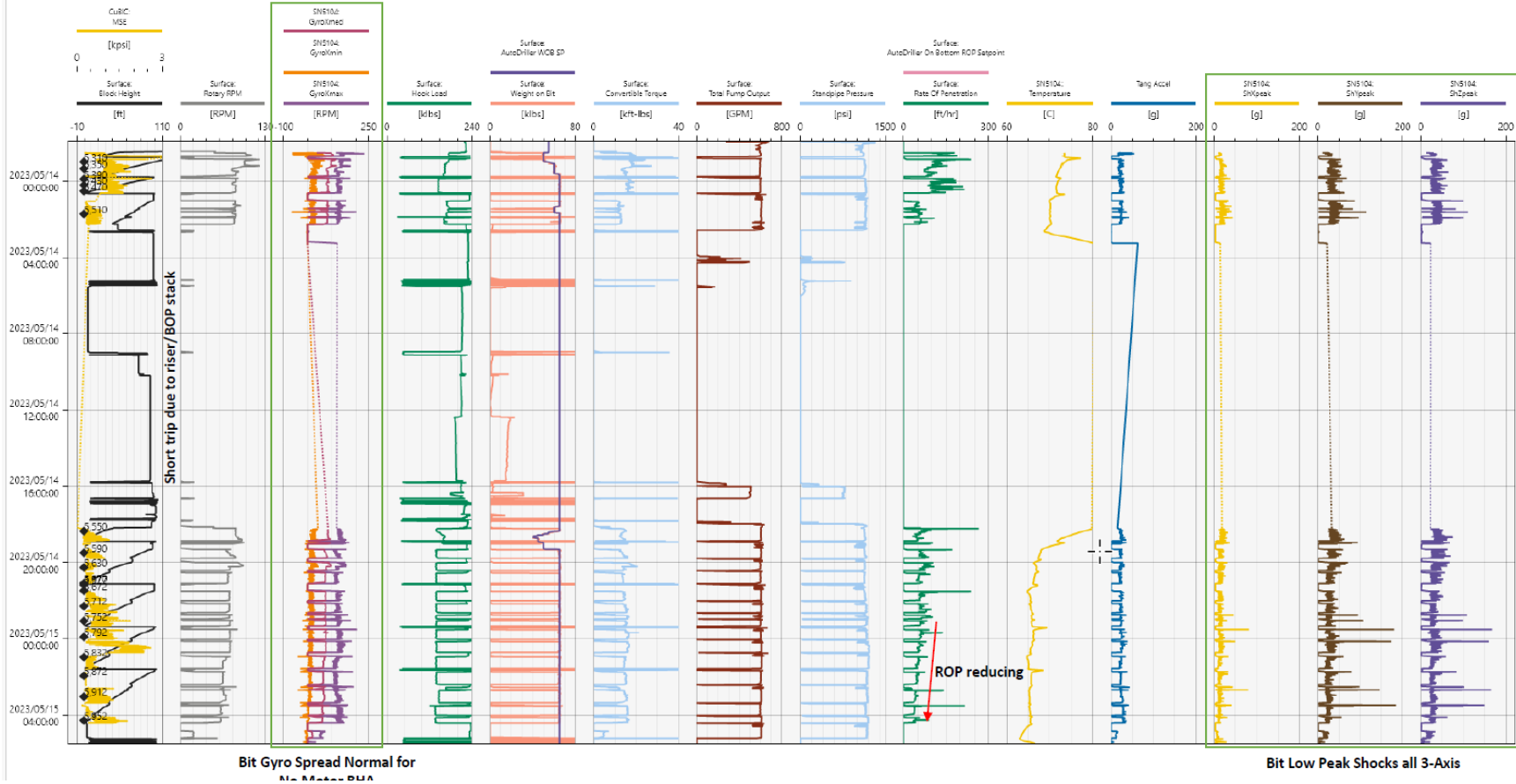


Figure F-14. This is the complete run. The bit gyro spread was normal for a BHA without a motor.

BHA #12 (5) – Stand Zoom

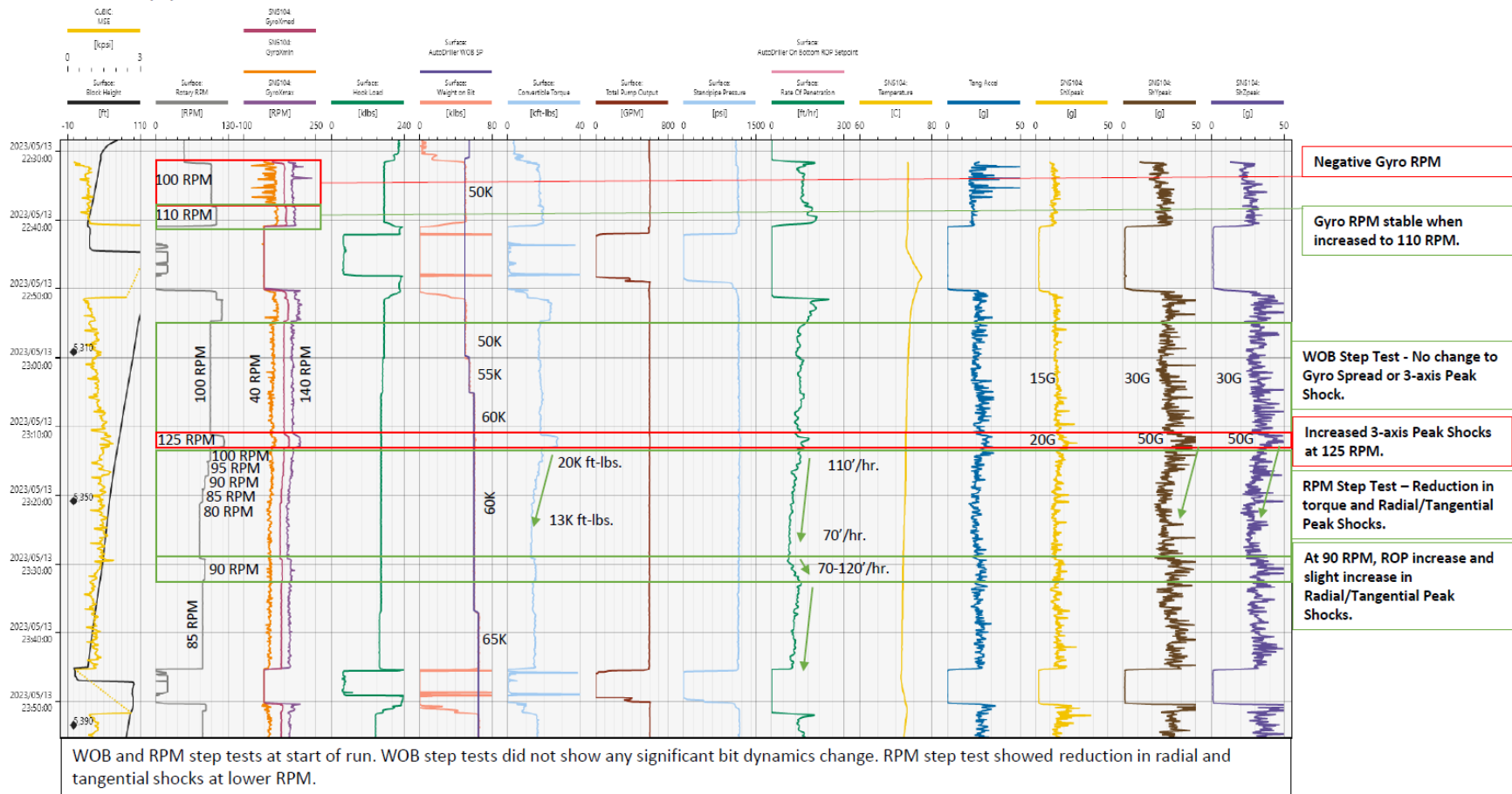


Figure F-15. WOB and RPM step tests were run. The WOB step tests did not show any significant bit dynamics changes while the RPM step test showed a reduction in radial and tangential shocks at lower RPM.

BHA #12 (5) – Stand Zoom

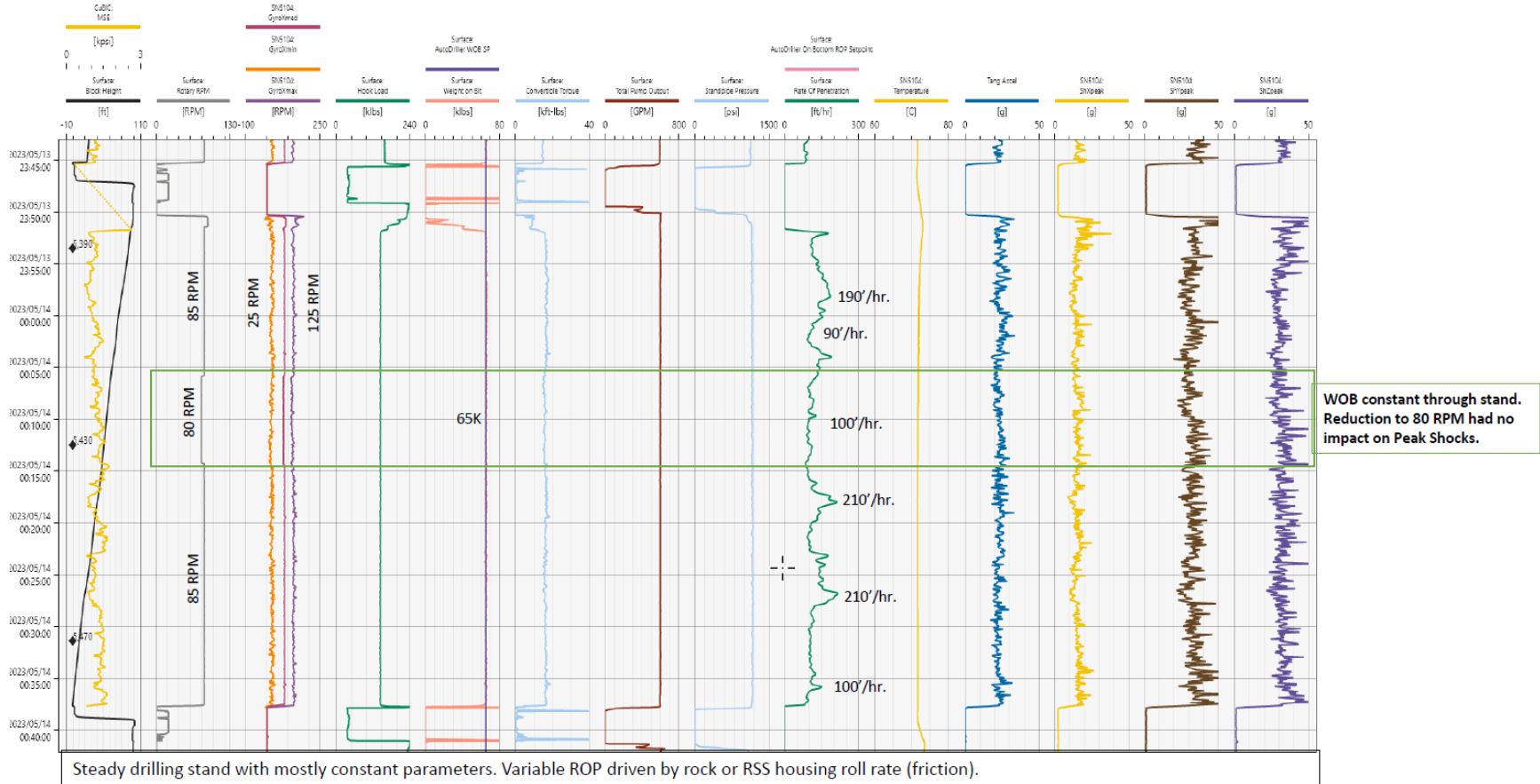


Figure F-16. This stand showed steady drilling with mostly constant parameters. The ROP variations are driven by lithology or RSS friction.

BHA #12 (5) – Stand Zoom

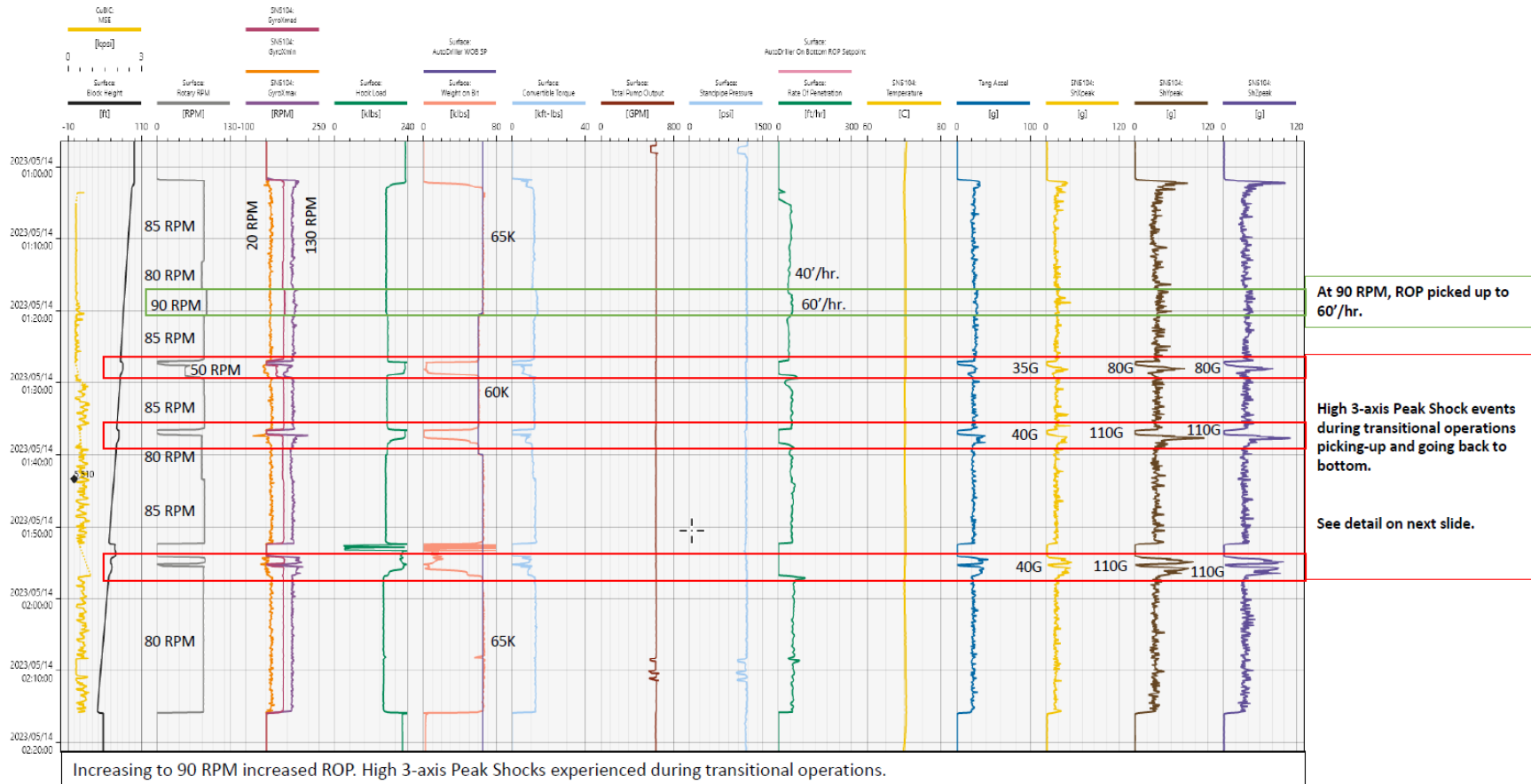


Figure F-17. While increased RPM showed increased ROP, there were high 3-axis peak shocks during transitions.

BHA #12 (5) – Event Zoom

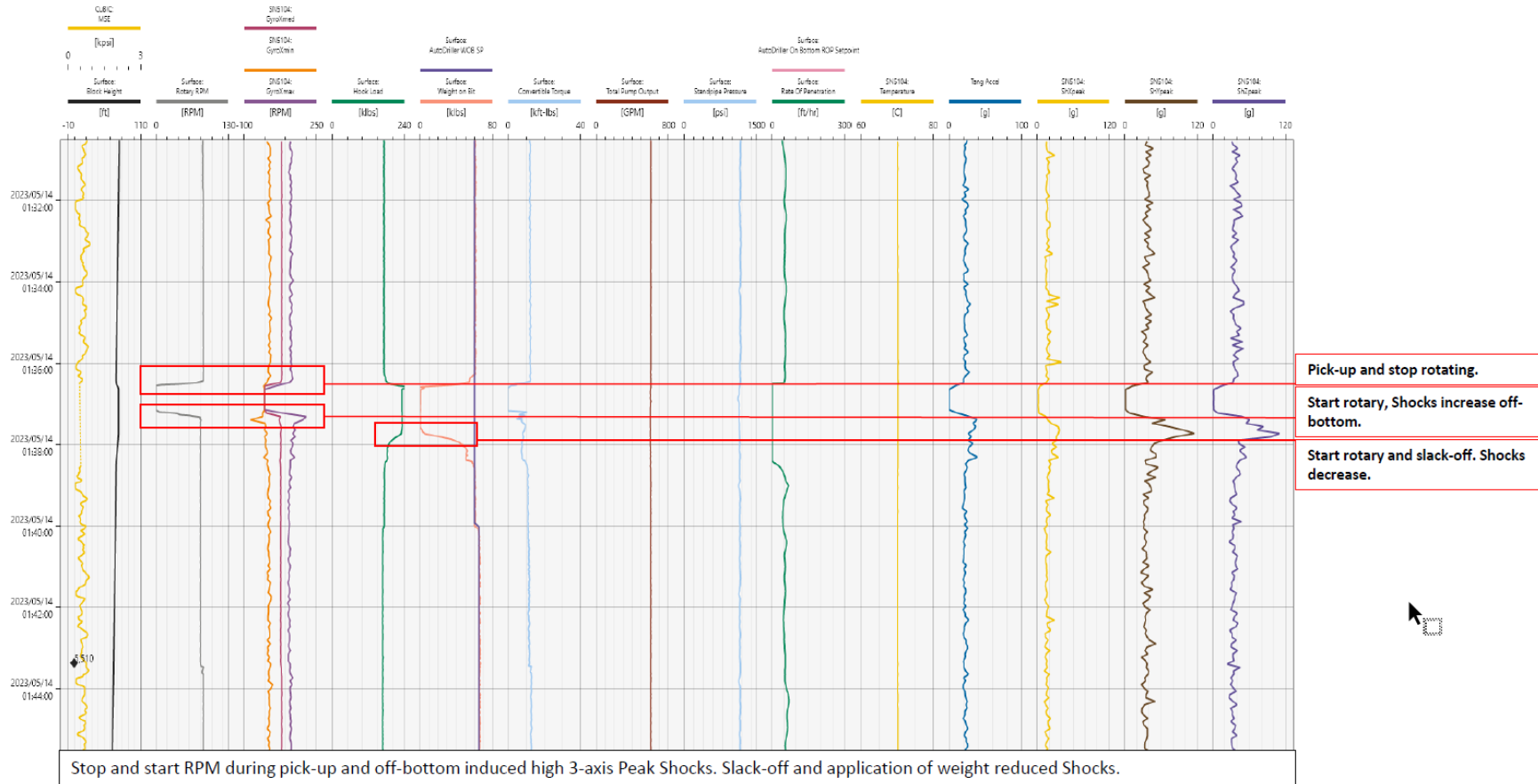


Figure F-18. This zooms in on off-bottom RPM testing.

F-2.1 Sanvean Observations (BHA #12)

- Torsional and 3 axis Peak Shock dynamics are significantly improved with removal of the mud motor from the BHA (200g to below 50g).
- WOB step tests from 50 60K lbf showed no change in gyro spread or 3 axis peak shocks.
- 120 RPM showed a slight increase in 3 axis Peak Shocks.
- RPM step test from 100 80 RPM showed reduction in torque (20 13K ft lbf.) and reduction in Tangential/Radial Peak Shocks.
- Higher RPM delivered higher ROP.
- Bit, stabilizers, and roller reamer in good condition.

F-3 BHA 13

This BHA is like the previous but stabilizer spacing is changed (refer to Figure F-19).

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #6	5	9.50	TKC73-A2	A298330	REEDHYCALOG	5957	6545	588	10.04	59

Bottom Hole Assembly															
Job#	OP.039349				Rig	Frontier 16				BHA Length (Usft)		1286.80			
Operator	Utah Forge				BHA #	6				BHA Weight dry (klbs)		70.21			
Well	16B(78)-32 - 16B(78)-32				BIT #	6				BHA Weight Bouyed (klbs)		60.67			
Field	Beaver (University of Utah) - Utah Forge				Depth In (Usft)	5957.00				Wt. Below Jars dry (klbs)		70.21			
Date In	05/15/2023				Depth Out(Usft)	5957.00				Wt. Below Jars Bouyed (klbs)		60.67			
Date Out	05/15/2023				Drilled(Usft)	0.00				Drilling / Circ Hours		0.00 / 0.00			
Sensor Offsets															
Survey Offset				N/A				Gamma Offset				N/A			
Gyro Offset				N/A				Gyro Offset				N/A			
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	A298330	9 1/2" 7 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG	P	0.000	0.00	0.00	1.13	1.13		
2	76000233	HALO RSS w/HFTO (Stiff)	6.750	2.000	6.688	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.31	36.44		
3	ASM 9007	Spiral wrapped IB Stabilizer	6.500	2.813	6.500	2.20	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.42	41.86		
4	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	72.97		
5	GU3275	FG 9 1/2" Roller reamer	6.625	2.938	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.71	79.68		
6	7006	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.90	85.58		
7	AFLS603	6 3/4" Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	88.03		
8	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	91.96		
9	N/A	9 JTS, 6 3/4" DC's	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	370.23		
10	N/A	Crossover (DC's to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	373.38		
11	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1286.80		
Comments															
Halo 7600-1125; Pulsar 128-474; Eye 1733; Gamma 1182; Battery 042-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque. 4 1/2 Reg = 19,500 4 1/2 IF = 29,000															

HALO STIFF
STAB
RR
Black Box
9 x 6 3/4" DC
30 x HWDP

Figure F-19. BHA 13.



The recovered bit is shown in Figure F-20. NOV observed that:

- This bit drilled the curve from 20 to 40.3°.
- There was a small core out in the bit. The rationale is that drilling at a high ROP but lower RPMs yielded a large depth of cut which put formation abrading on the center of the bit.
- Could not run higher than 66 rotary rpm without inducing dysfunction. Rotary speed is the main limiter. In addition, residual steel shot from the particle drilling was seen on the shakes at about 5% concentration.



Figure F-20. Recovered bit from BHA-13.

The stabilizer and roller reamer are in good condition (Figure F-21).



Figure F-21. Stabilizer and roller reamer were recovered in good condition.

Recorded data are shown in Figures K-22 through K-29.

BHA #13 (6) – Entire Run

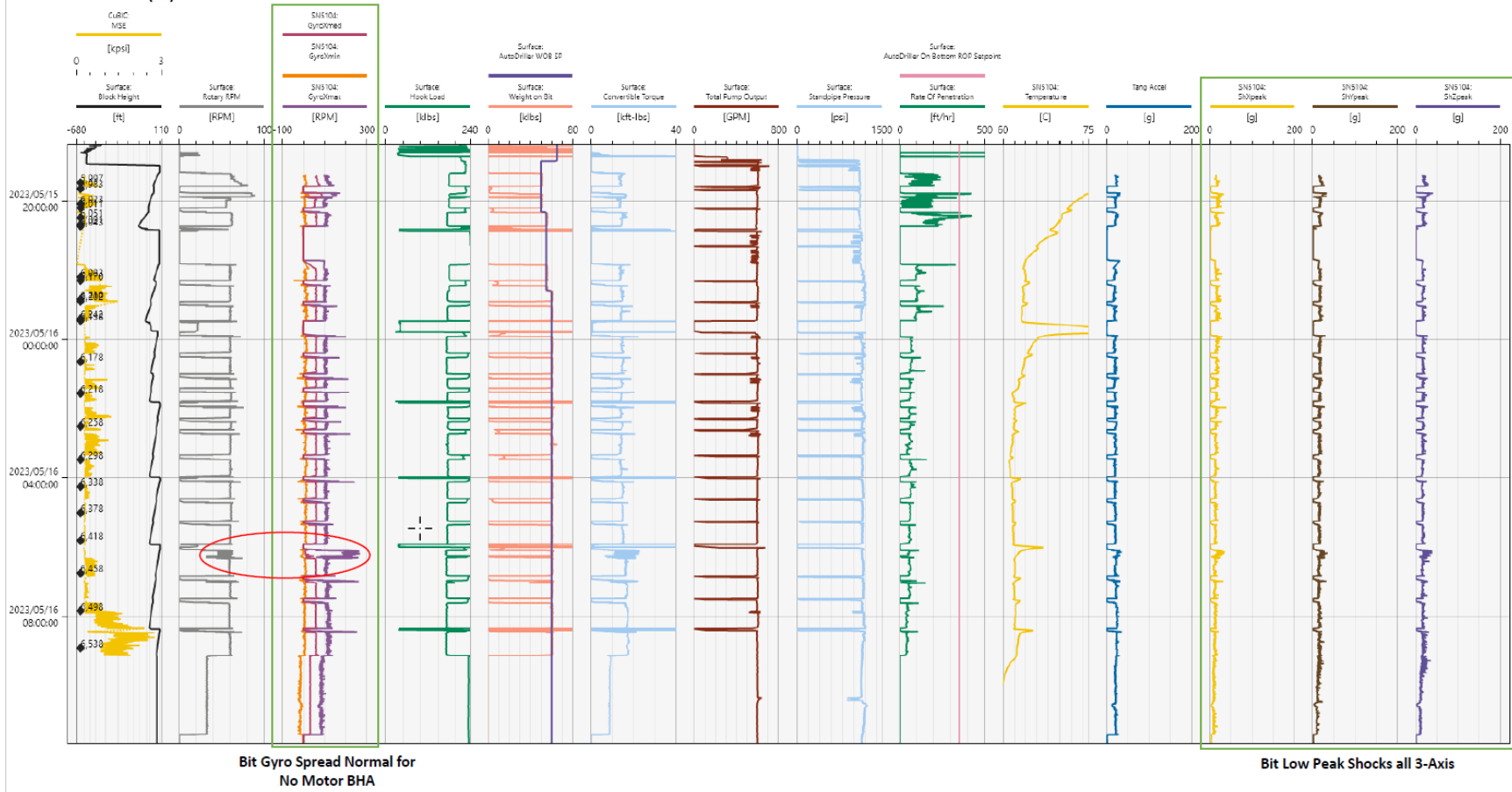


Figure F-22. Data for the entire run shows low peak shocks at the bit (all three axes).

BHA #13 (6) – Stand Zoom

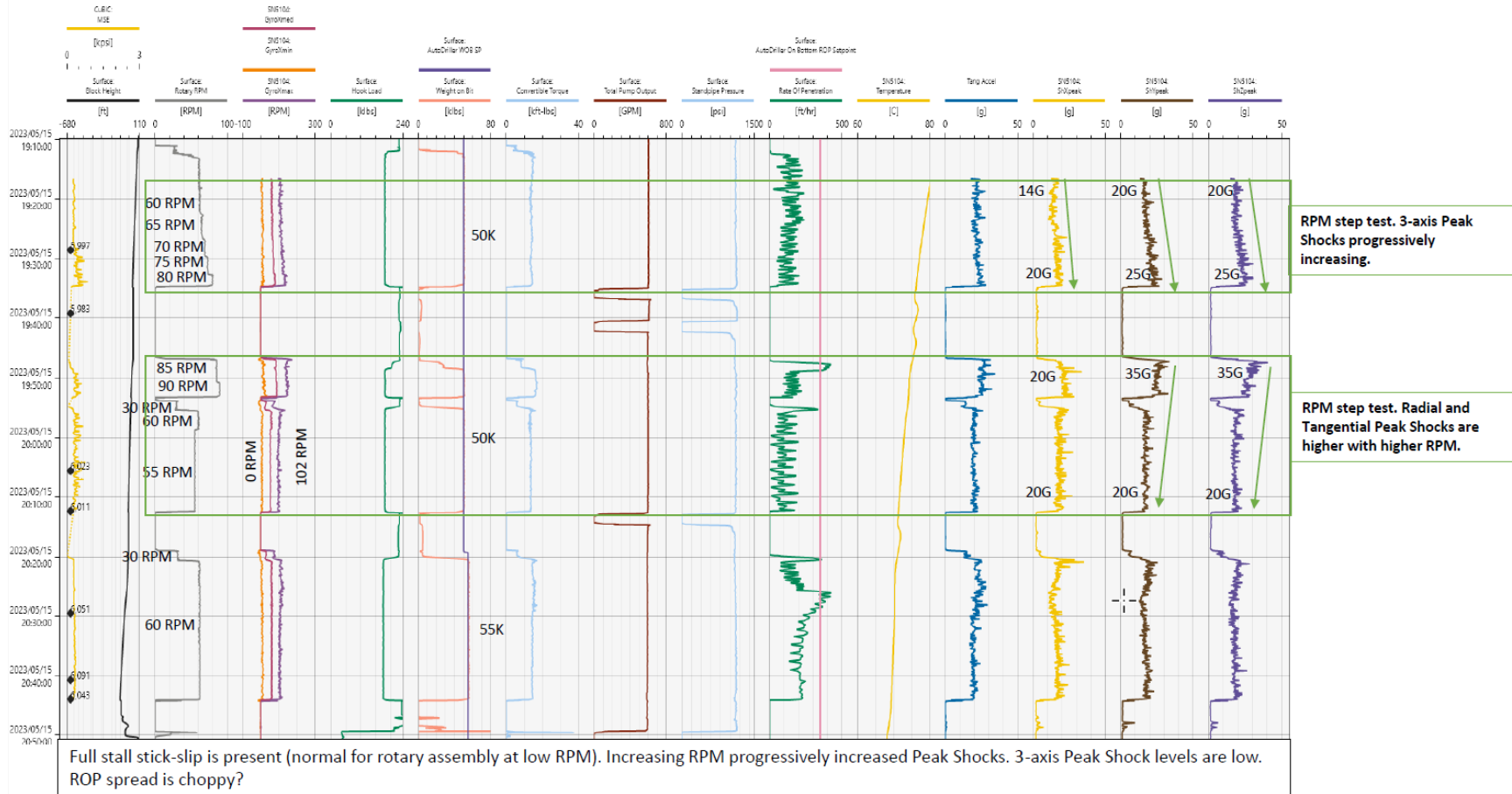


Figure F-23. Zooming in on one stand. Full stall stick slip is present as is normal for a rotary assembly at low RPM. Increasing RPM progressively increased the peak shocks although the levels are low. ROP appears to be choppy.

BHA #13 (6) – Stand Zoom

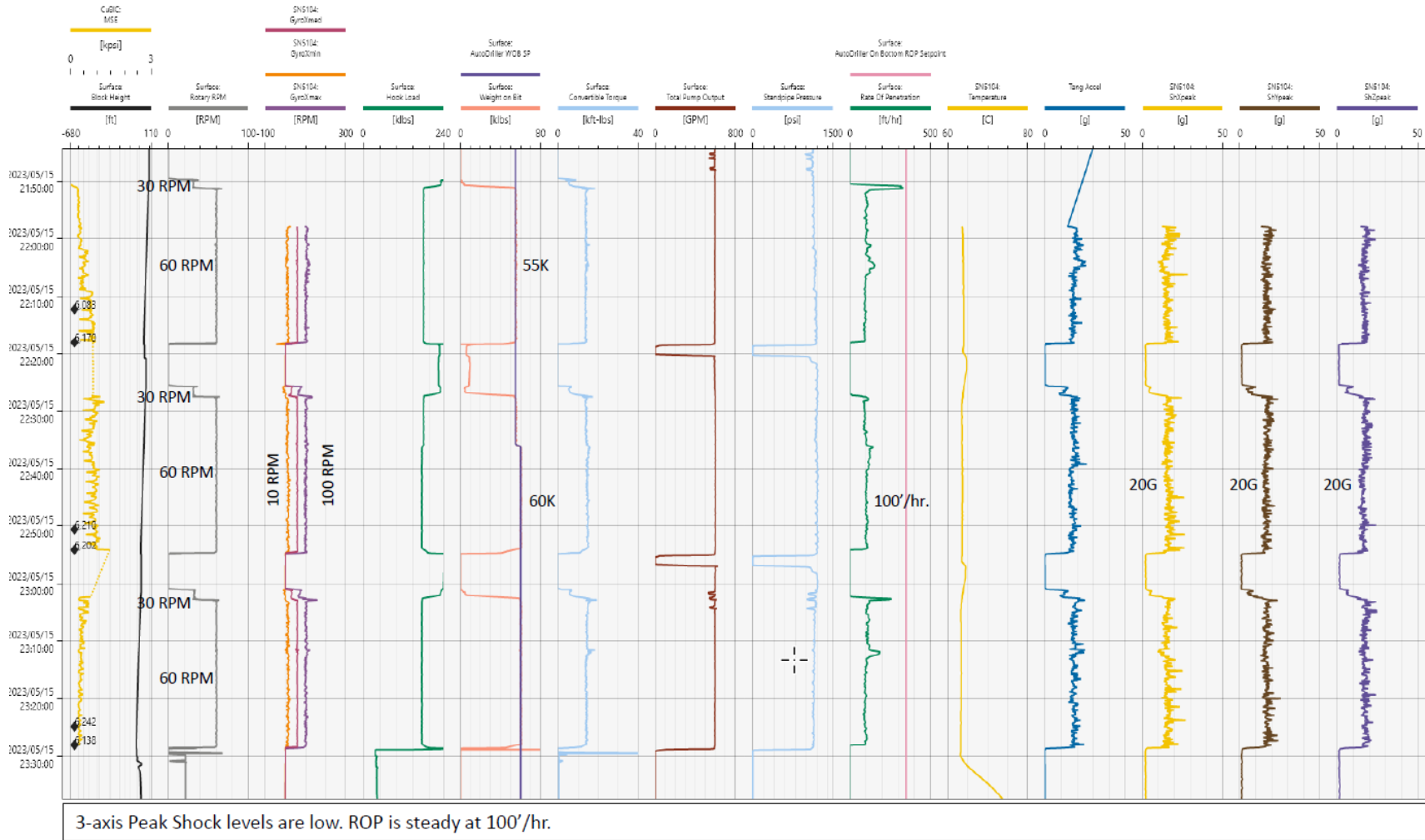


Figure F-24. Zoomed in on another stand. Shock levels are low and ROP is steady at 100 ft /hr.

BHA #13 (6) – Stand Zoom

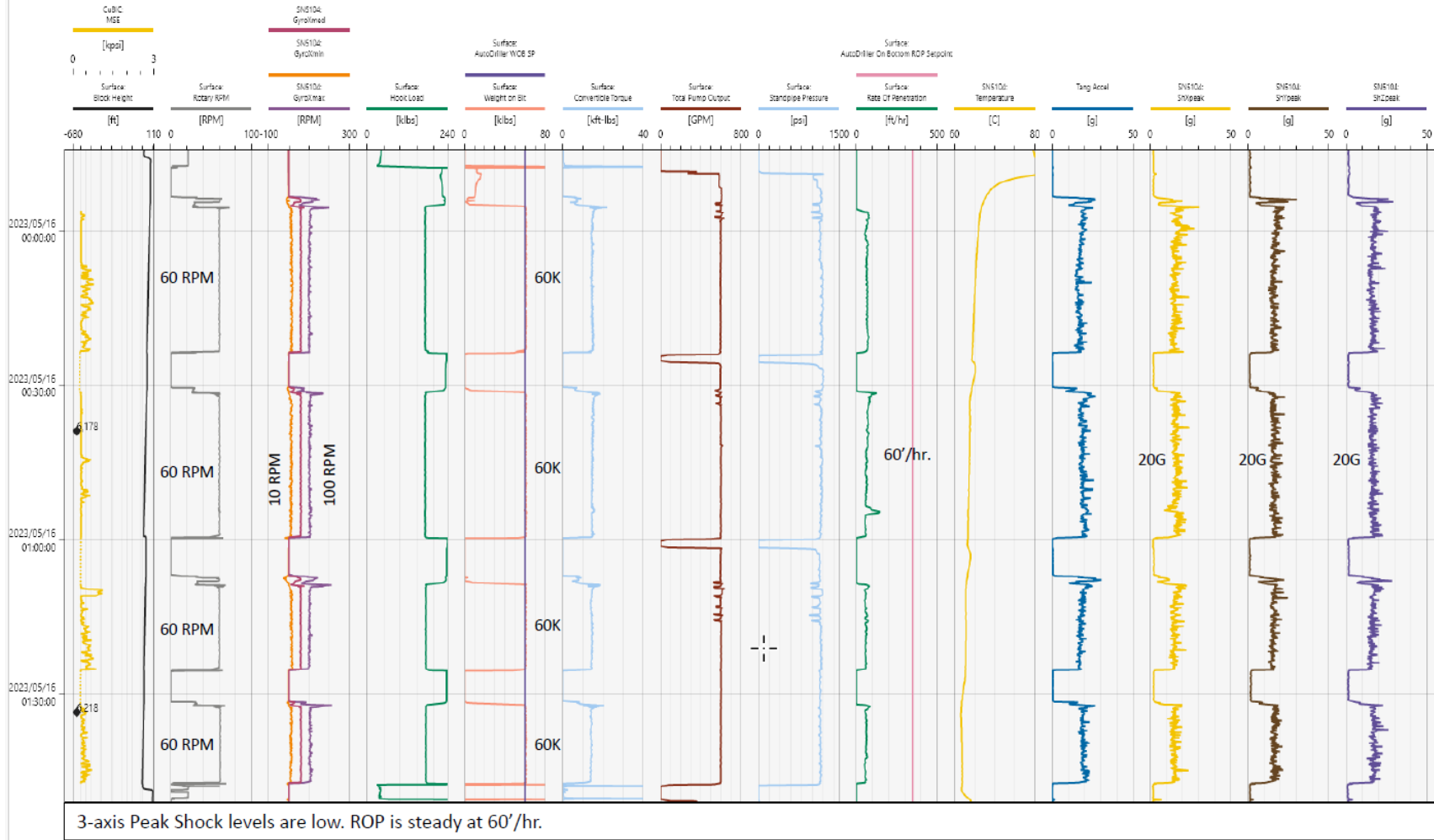


Figure F-25. Zoomed in on another stand. Shock levels are low, and ROP is steady at 60 ft /hr.

BHA #13 (6) – Stand Zoom

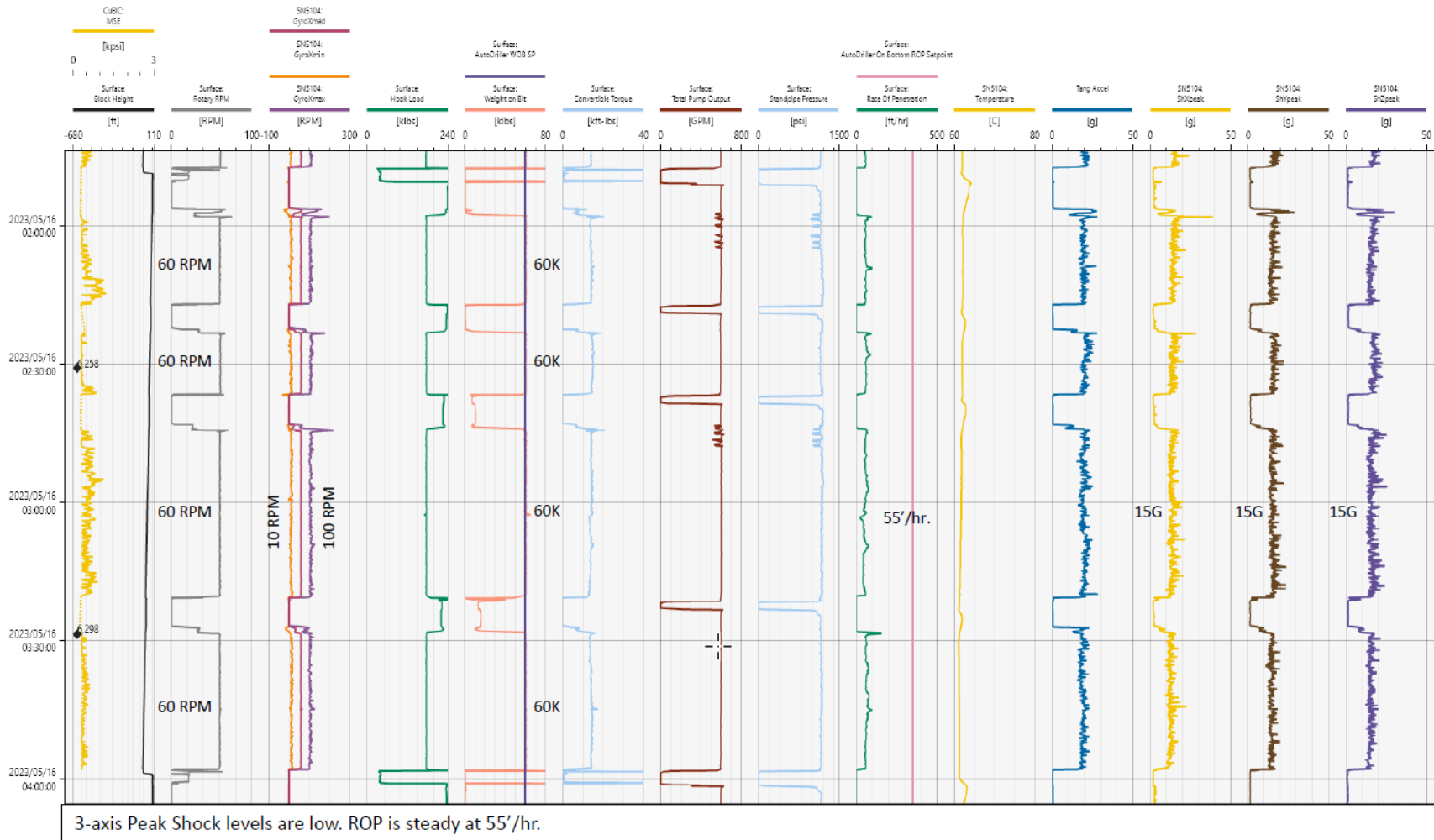


Figure F-26. Zoomed in on another stand. Shock levels are low and ROP is steady at 55 ft /hr.

BHA #13 (6) – Stand Zoom

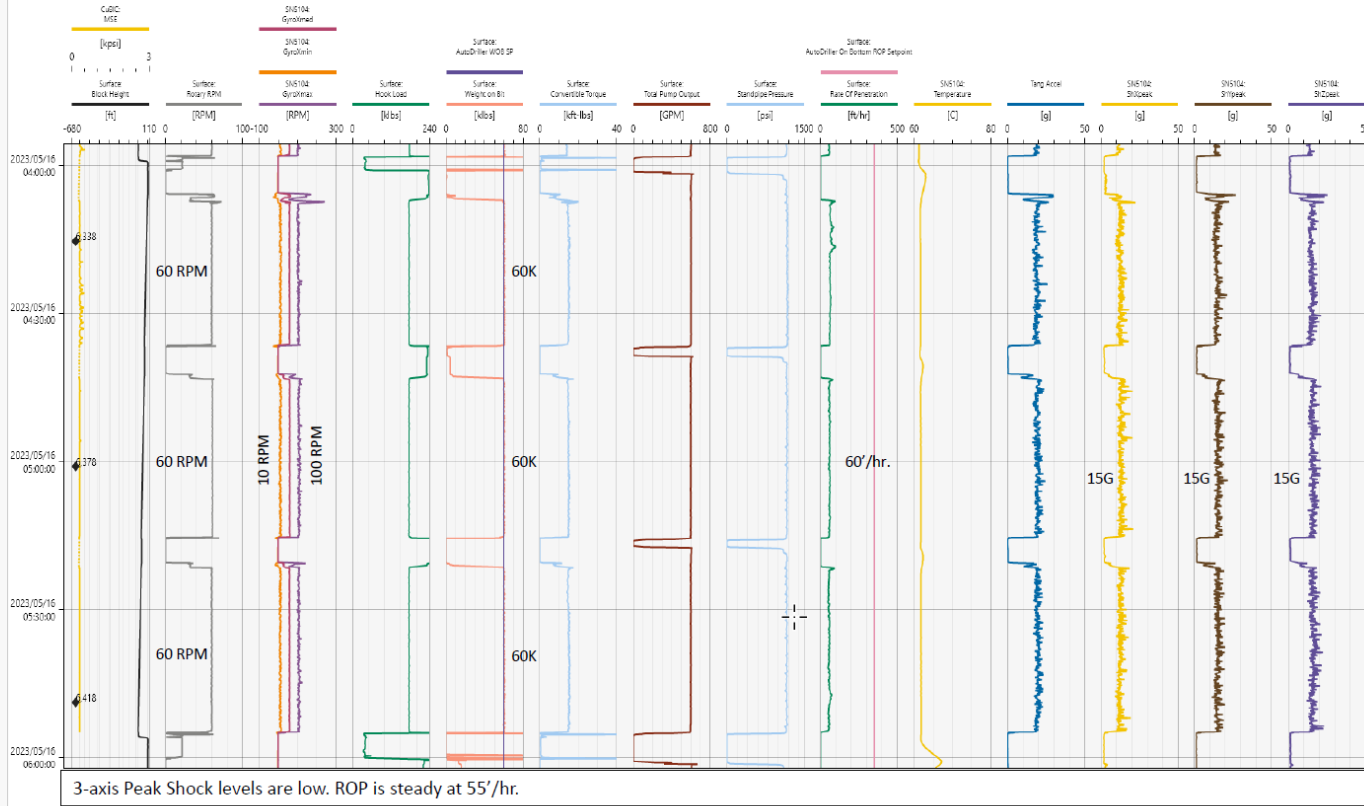


Figure F-27. Zoomed in on another stand. Shock levels are low and ROP is steady at 55 ft /hr.

BHA #13 (6) – Stand Zoom

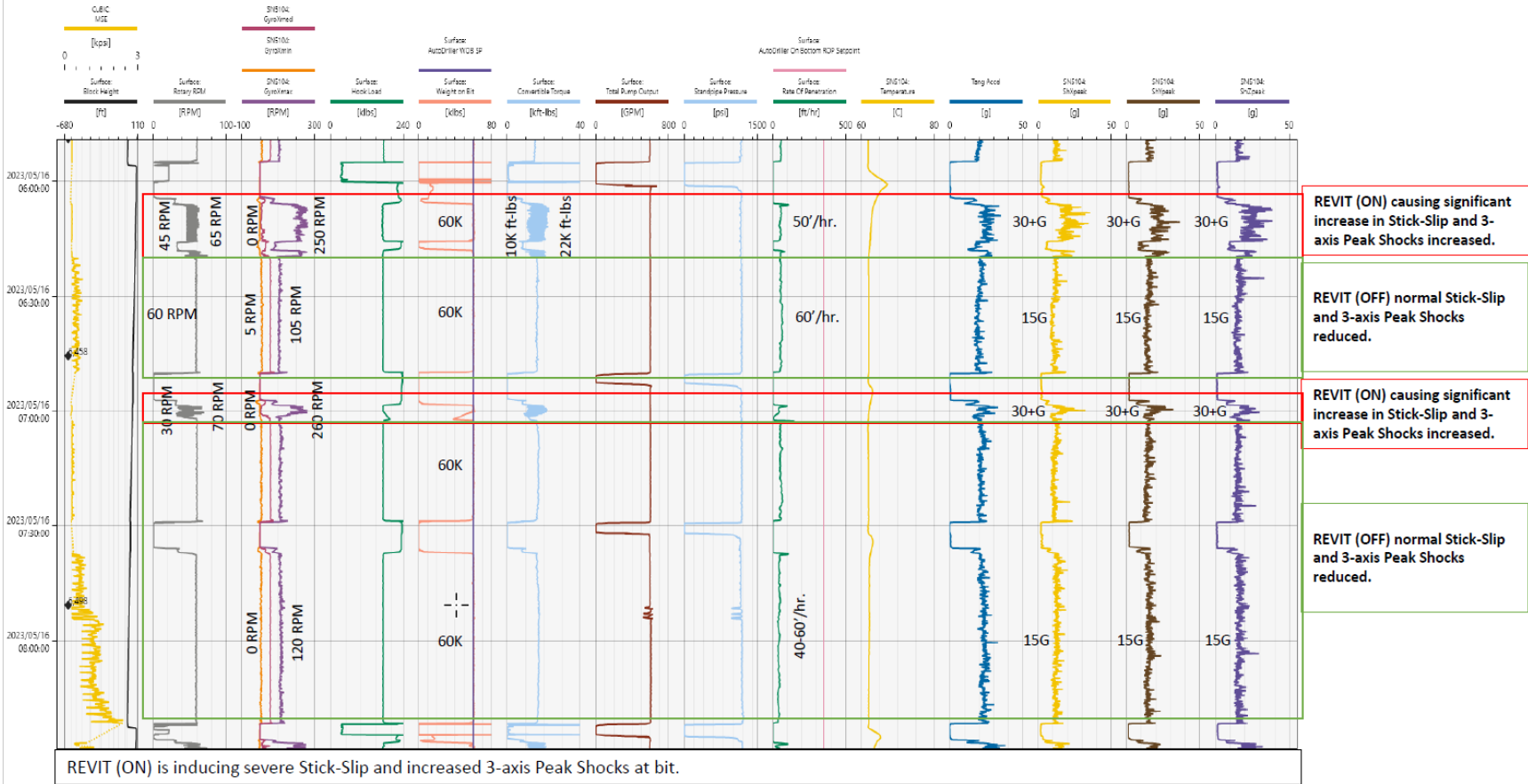


Figure F-28. With REVIT on (confirm) severe stick slip is encountered at this increased 3-axis peak shocks at the bit.

BHA #13 (6) – Stand Zoom

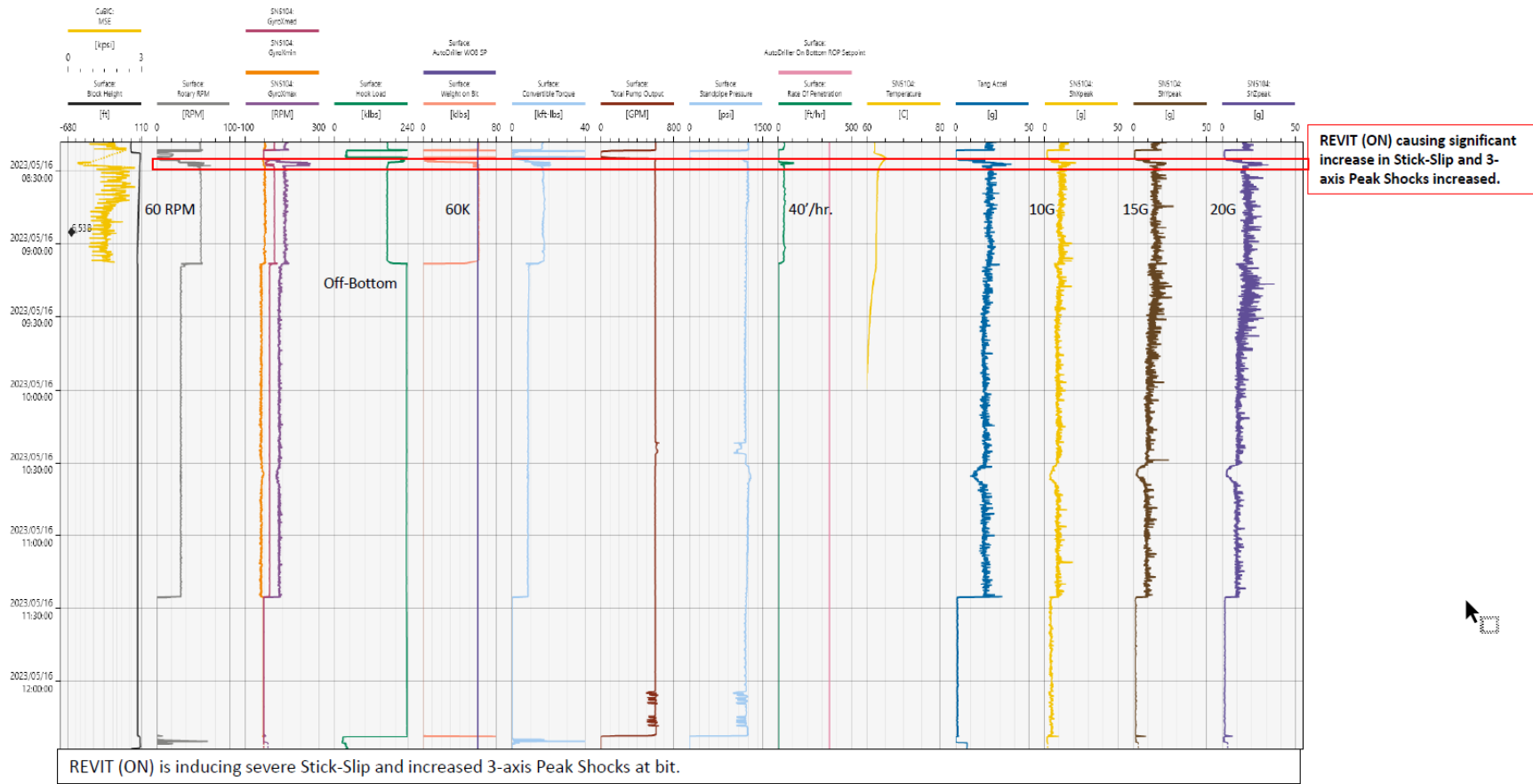


Figure F-29. With REVIT on (confirm) severe stick slip is encountered at this increased 3-axis peak shocks at the bit.

F-3.1 Sanvean Observations (BHA #13)

- Post run comments stated could not run higher than 66 RPM without inducing dysfunction. The type of dysfunction is not stated.
- 3-axis peak shocks are low throughout run (typically 15 to 20g).
- Increasing RPM correlates with increasing tangential and radial peak shocks.
- Stick slip and torsional oscillation response is normal for a rotary assembly.
- 5/16 @ 06:06 06:20, 06:58 07.01, 08:26 08:27 appears REVIT enabled and induces severe stick slip (0 to 260 RPM).
- Bit was in good condition but starting to core (high WOB).
- The stabilizer and roller reamer came out in good condition.

F-4 BHA #14

This BHA is shown in Figure F-30.

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #7	6	9.50	TKC83-A2	A298355	REEDHYCALOG	6545	6610	65	0.7	93

Bottom Hole Assembly													
Job#	OP.039049			Rig	Frontier 16			BHA Length (Usft)			1306.42		
Operator	Utah Forge			BHA #	7			BHA Weight dry (klbs)			70.21		
Well	168(78)-32 - 16B(78)-32			Bit #	7			BHA Weight Bouyed (klbs)			60.67		
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00			Wt. Below Jars dry (klbs)			70.21		
Date In				Depth Out(Usft)	0.00			Wt. Below Jars Bouyed (klbs)			60.67		
Date Out				Drilled(Usft)	0.00			Drilling / Circ Hours			0.00 / 0.00		
Sensor Offsets													
Survey Offset				25.00				Gamma Offset				N/A	
								Gyro Offset				N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)
1	A298355	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.18	1.18
2	76000233	HALO RSS w/HFTD (Stiff)	6.750	2.000	6.688	0.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.31	36.49
3	650779	9 3/8 Spiral Stabilizer	6.500	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	4.14	40.63
4	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	52.87
5	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	62.70
6	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	68.09
7	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	99.20
8	7015	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	105.20
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	109.13
10	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	111.58
11	N/A	9 JTS, 6 3/4 DCs	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	389.85
12	N/A	Crossover (DCs to HWDP)	6.537	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	393.00
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1306.42
Comments													
Halo 7600-0233, Pulsar 213-006, Eye 1697, Gamma 1490, Battery 048-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000													

HALO STIFF
 STAB
 REDUCED LENGTH 10'
 RR
 Black Box
 9 x 6 3/4" DC
 30 x HWDP

Figure F-30. BHA #14. The distance between the roller reamer and the stabilizer was reduced by 10 ft.

The pulled bit is shown in Figure F-31.



ROP Limiter: Short run. Drilled the curve from 42 to 45 degrees.

DD commented that the bit was steerable and able to get the builds needed.

Pulled for MWD failure.

Solution: Figure out BHA vibration modeling to allow for mud motor to be ran.

Figure F-31. Recovered bit was in good condition. This was a short run.

The stabilizer and the roller reamer (as pulled, shown in Figure F-32) were in good condition. The run was short because of an MWD failure.



Good condition.

Figure F-32. The stabilizer and the roller reamer were pulled in good condition.

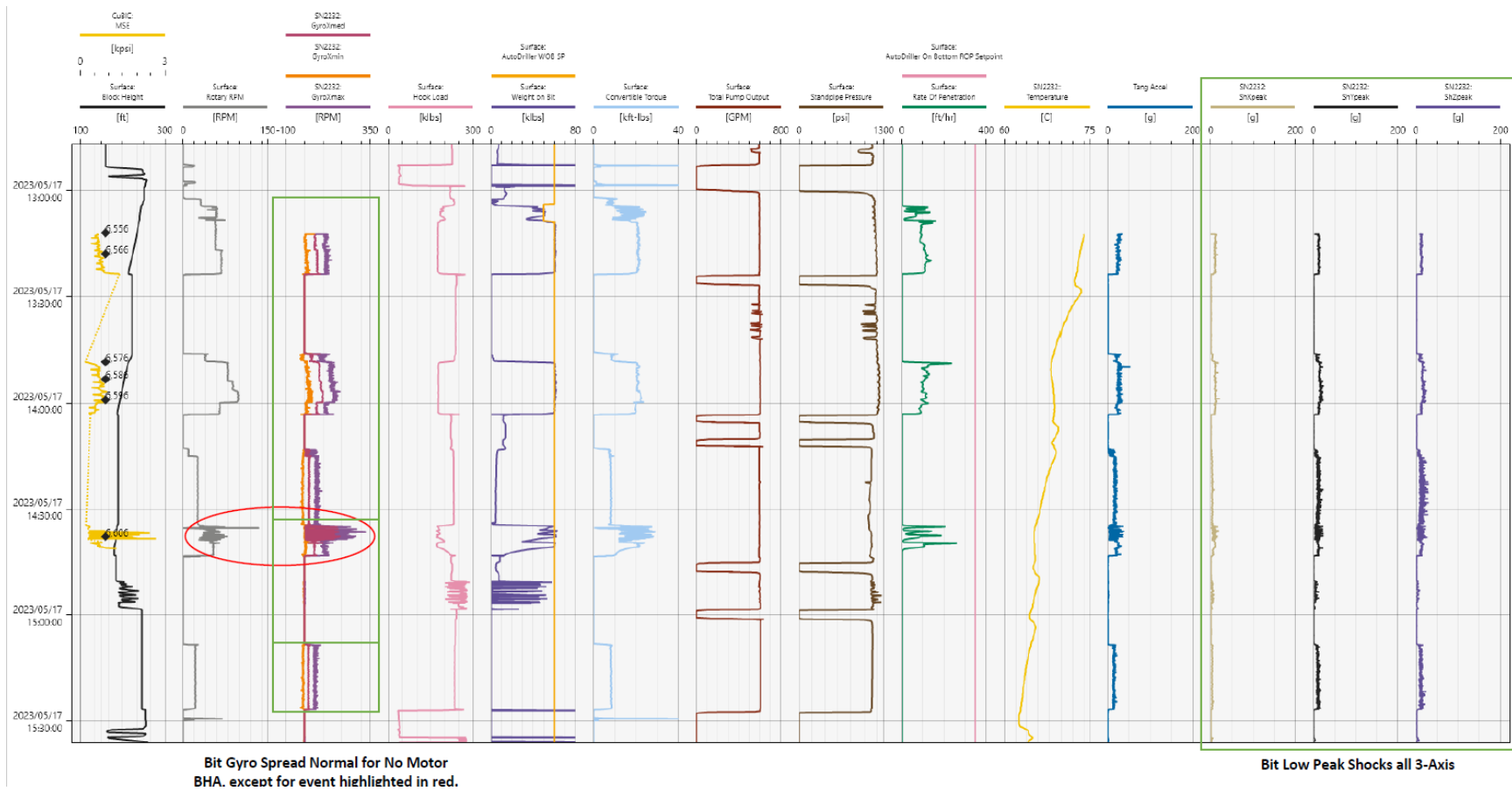


Figure F-33. These are data from the entire BHA run. Anomalous behavior is circled.

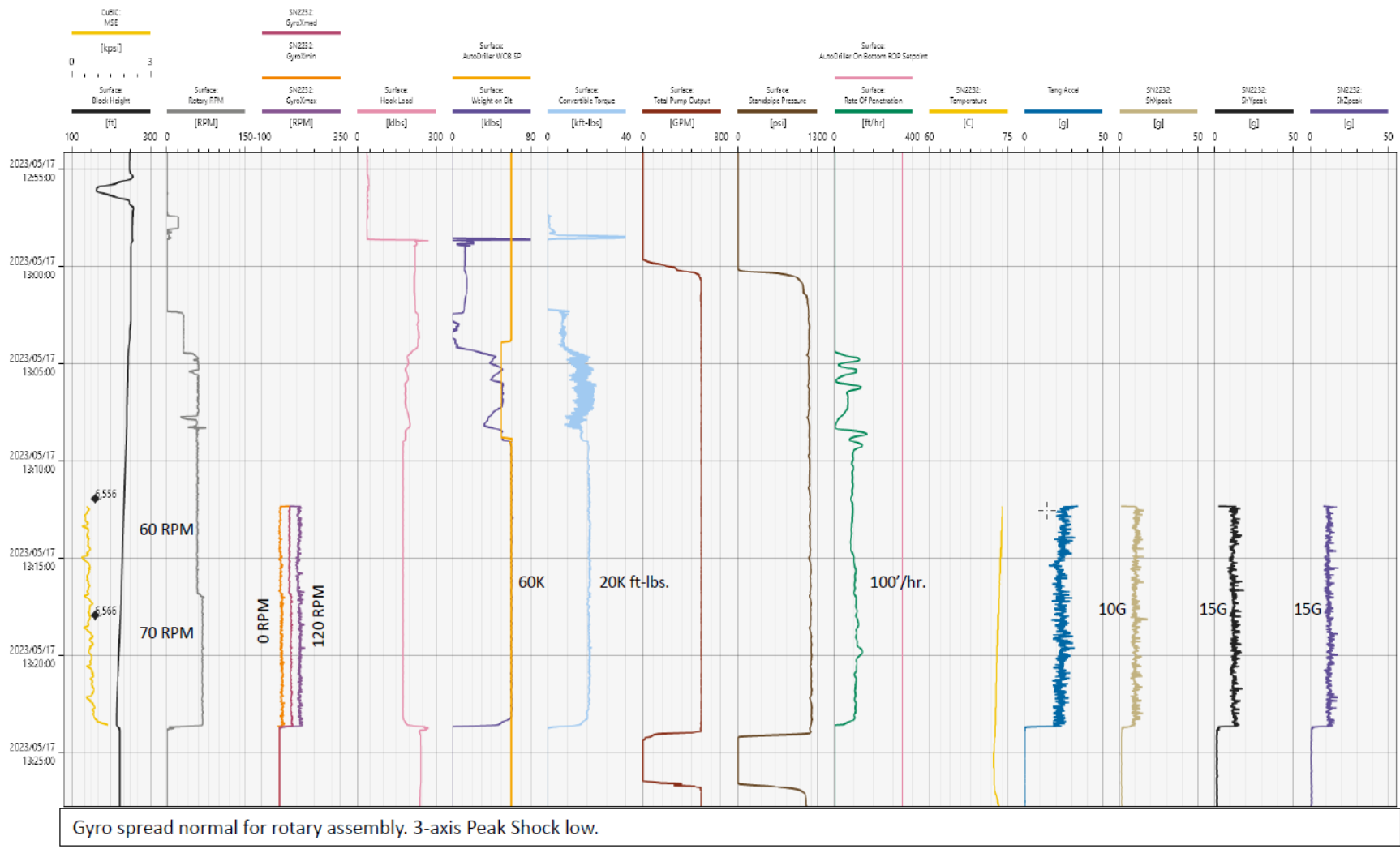


Figure F-34. These data are zoomed in on one stand, showing normal behavior.

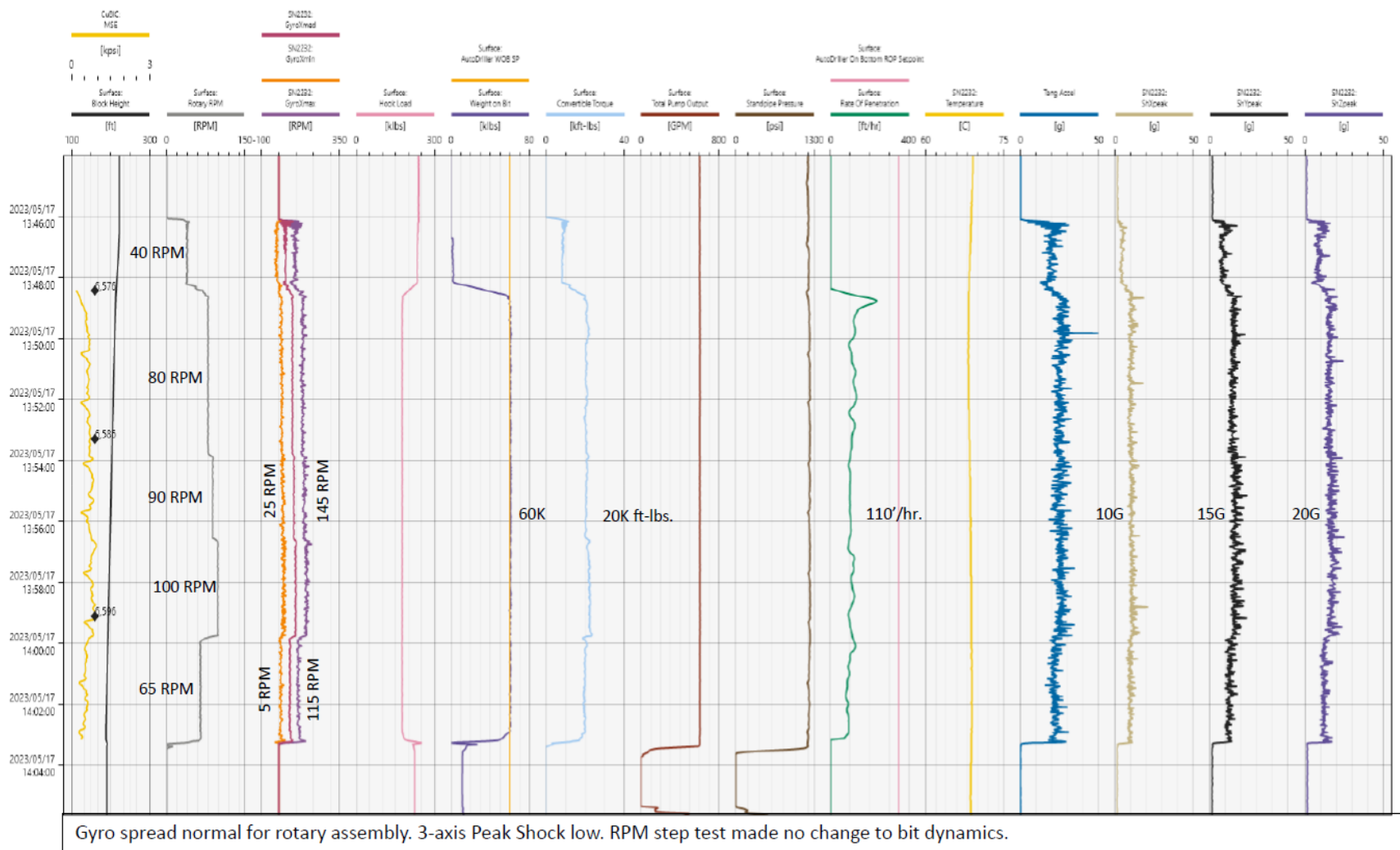


Figure F-35. These data are zoomed in on an rpm test, showing normal behavior.

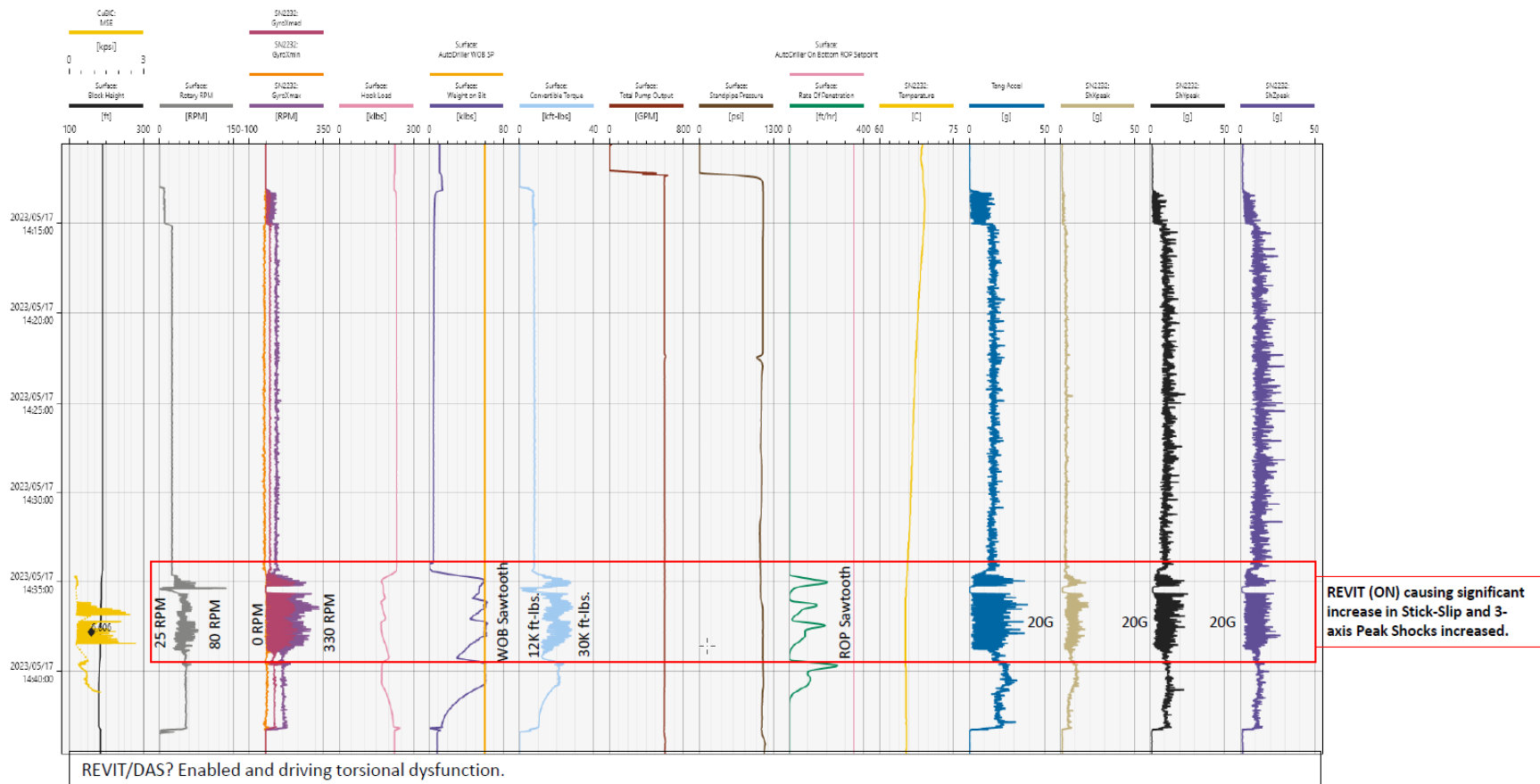


Figure F-36. These data are zoomed in on a dysfunction.

BHA #14 (7) – Event Zoom REVIT/DAS?

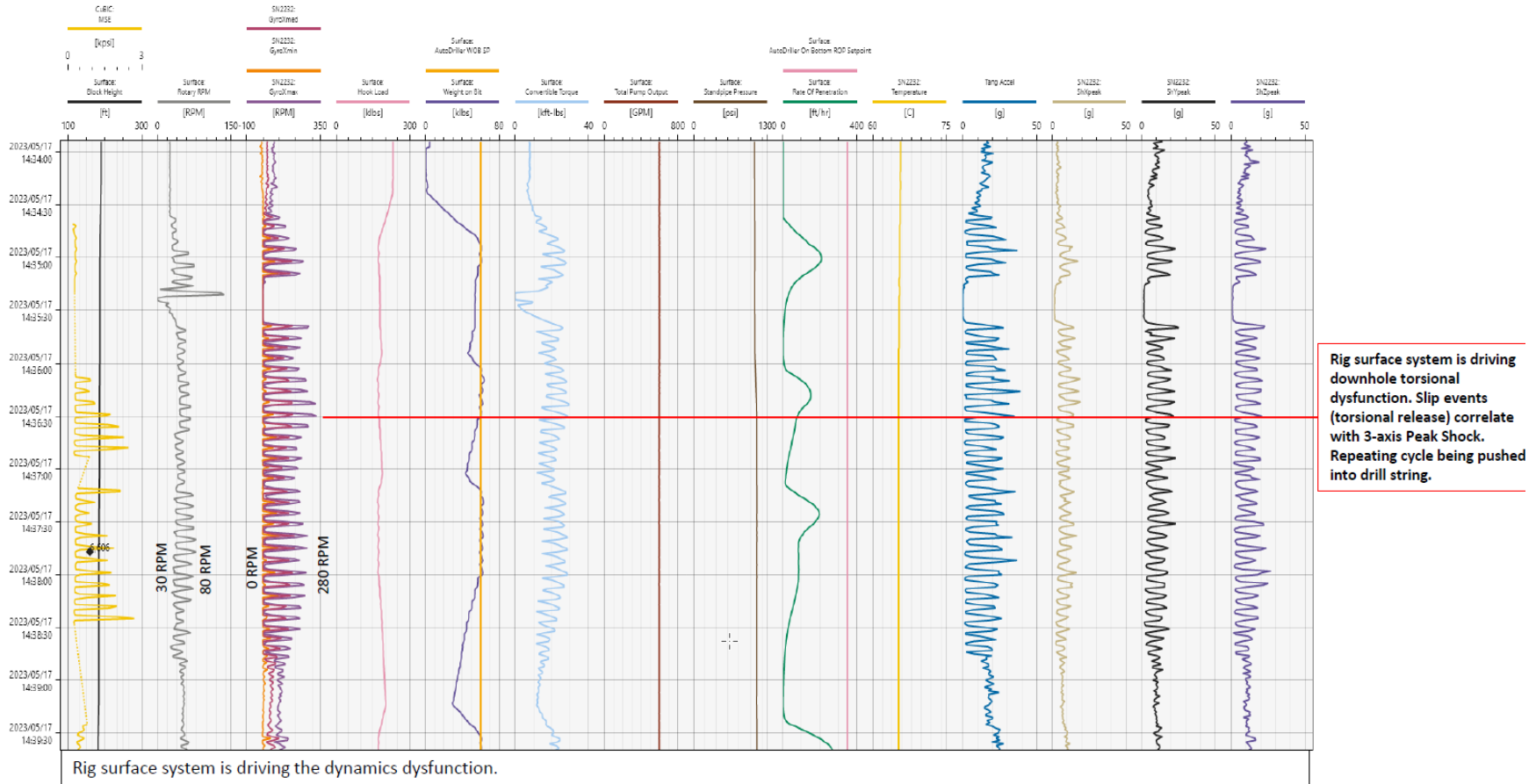


Figure F-37. These data are zoomed in on a dysfunction.

F-4.1 Sanvean Observations for BHA 14

- Bit dynamics were normal for rotary assembly until rig surface control system enabled.
- Rig surface control system inducing torsional dynamics into drill string.
- Bit, stabilizer, and roller reamer were pulled in good condition.
- POOH for MWD failure.

F-5 BHA 15

BHA 15 is shown in Figure F-38.

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Curve	BHA #8	7	9.50	TKC83-A2	A298353	REEDHYCALOG	6610	6951	341	6.5	52

Bottom Hole Assembly													
Job#	OP.039349			Rig	Frontier 16			BHA Length (Usft)	1306.63				
Operator	Utah Forge			BHA #	8			BHA Weight dry (klbs)	70.21				
Well	16B(78)-32 - 16B(78)-32			Bit #	8			BHA Weight Bouyed (klbs)	60.67				
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00			Wt. Below Jars dry (klbs)	70.21				
Date In				Depth Out(Usft)	0.00			Wt. Below Jars Bouyed (klbs)	60.67				
Date Out				Drilled(Usft)	0.00			Drilling / Circ Hours	0.00 / 0.00				
Sensor Offsets													
Survey Offset	25.00			Gamma Offset	N/A			Gyro Offset	N/A				
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)
1	A298353	9 1/2 8 Blade PDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.22	1.22
2	76001711	HALO RSS w/HFTO (Flex)	6.750	2.000	6.500	5.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.48	36.70
3	650779	9 3/8 Spiral Stabilizer	6.500	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	4.14	40.84
4	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	53.08
5	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	62.91
6	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	68.30
7	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	99.41
8	7015	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	6.00	105.41
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	109.34
10	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	111.79
11	N/A	9 JTS, 6 3/4 DCs	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	390.06
12	N/A	Crossover (DCs to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	393.21
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1306.63
Comments													
Halo 7600-1711; Pulsar 122-1243F; Eye 1547; Gamma 1117; Battery 025-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Inc/Az = 7 Make up torque. 4 1/2 Reg = 19,500 4 1/2 IF = 29,000													

HALO FLEX
STAB
REDUCED LENGTH 10'
RR
Black Box
9 x 6 3/4" DC
30 x HWDP

Figure F-38. Configuration of BHA 15.

The recovered bit is shown in Figure F-39.



ROP Limiter: Drilled the curve from 45 degrees to end of build. Tool vibrations are high due to Revit system errors.

Halo RSS ran without a motor due to high vibrations.

Rotary RPM was at 55 for majority of the run due to vibration issues.

MWD tool stopped working at 6,799.

Revit system malfunction at 6,777 feet that caused variation in drilling plots.

Solution: Figure out BHA vibration modeling to allow for mud motor to be ran.

Curve was still drilled efficiently with RSS system.

Figure F-39. Recovered bit. Pulled for logging.

The roller reamer and stabilizer were pulled in good condition (Figure F-40).

NO POST RUN RR PHOTOS AVAILABLE



Figure F-40. Photographs of stabilizer (post-run).

BHA #15 (8) – Entire Run

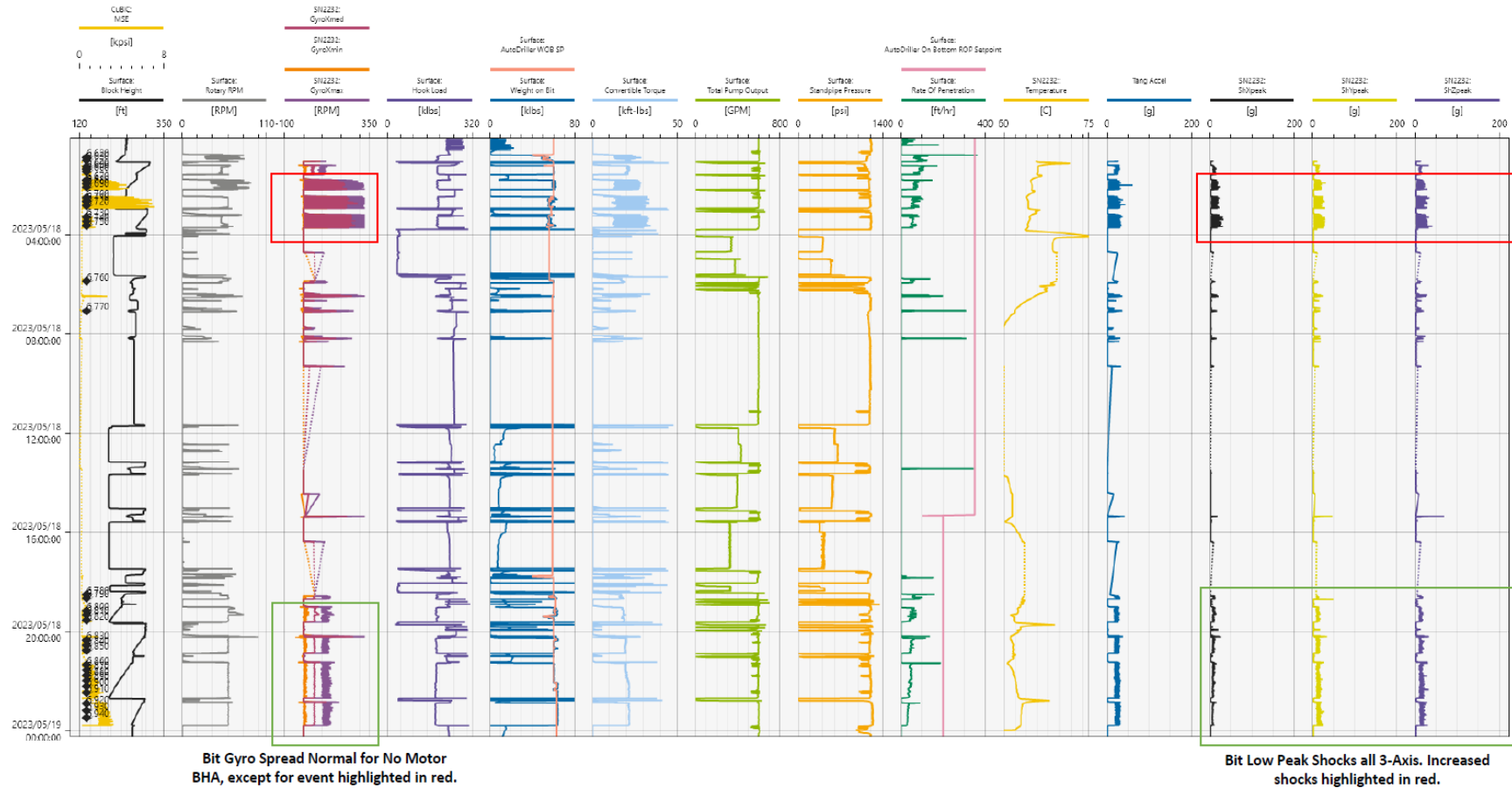


Figure F-41. Data from the entire BHA run.

BHA #15 (8) – Stand Zoom

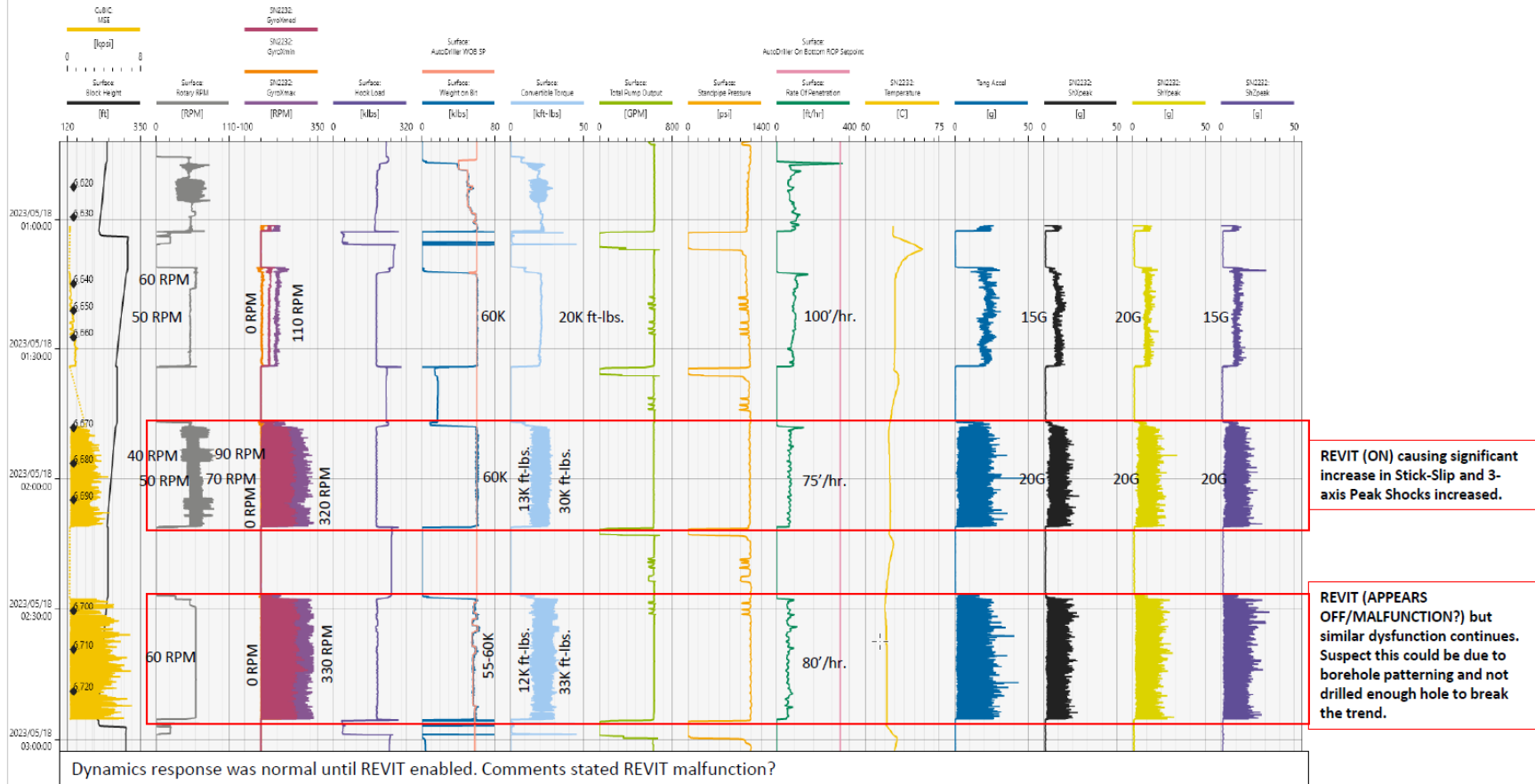


Figure F-42. Data from a single stand showing dysfunction.

BHA #15 (8) – Stand Zoom

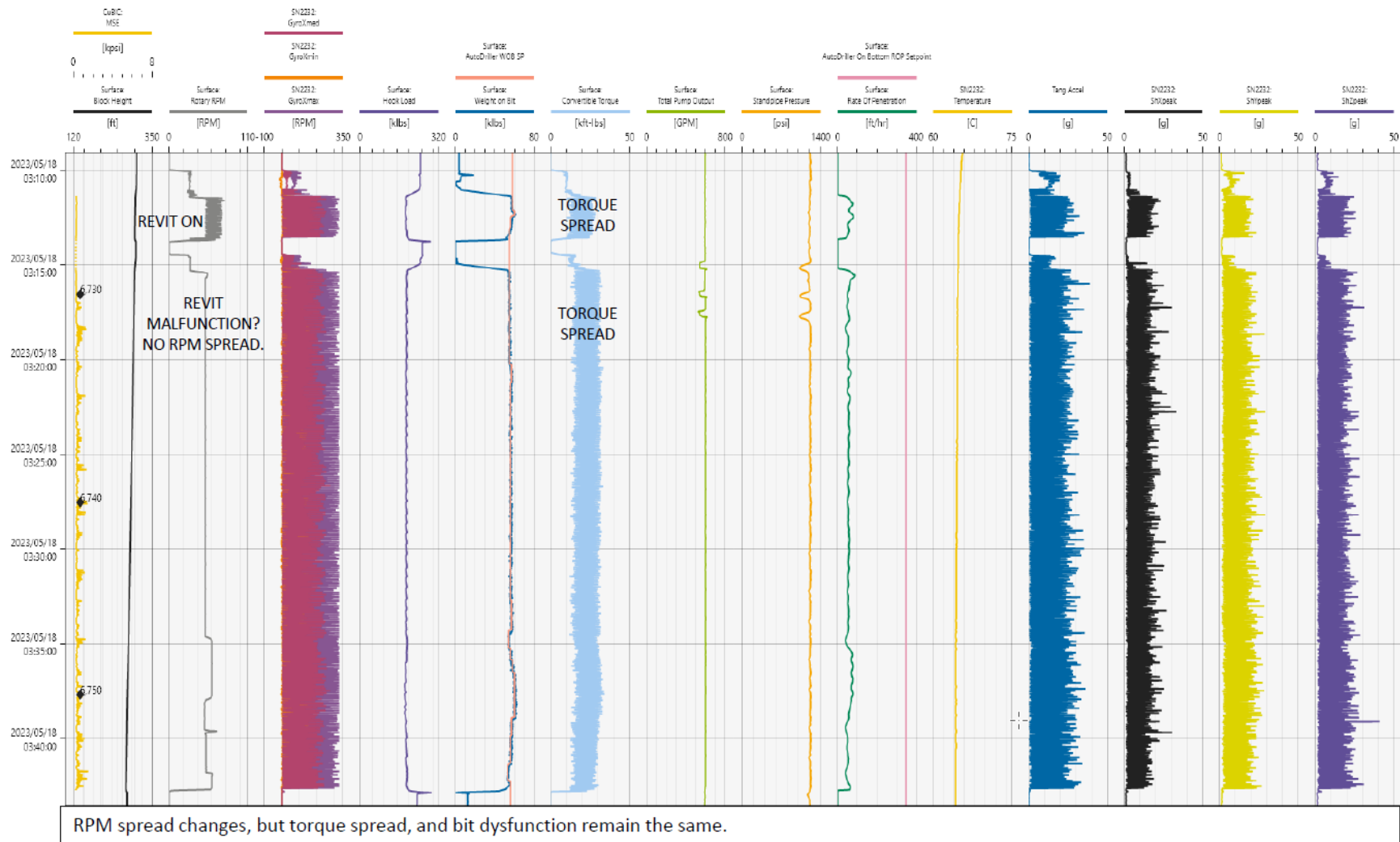


Figure F-43. Data from a single stand showing dysfunction.

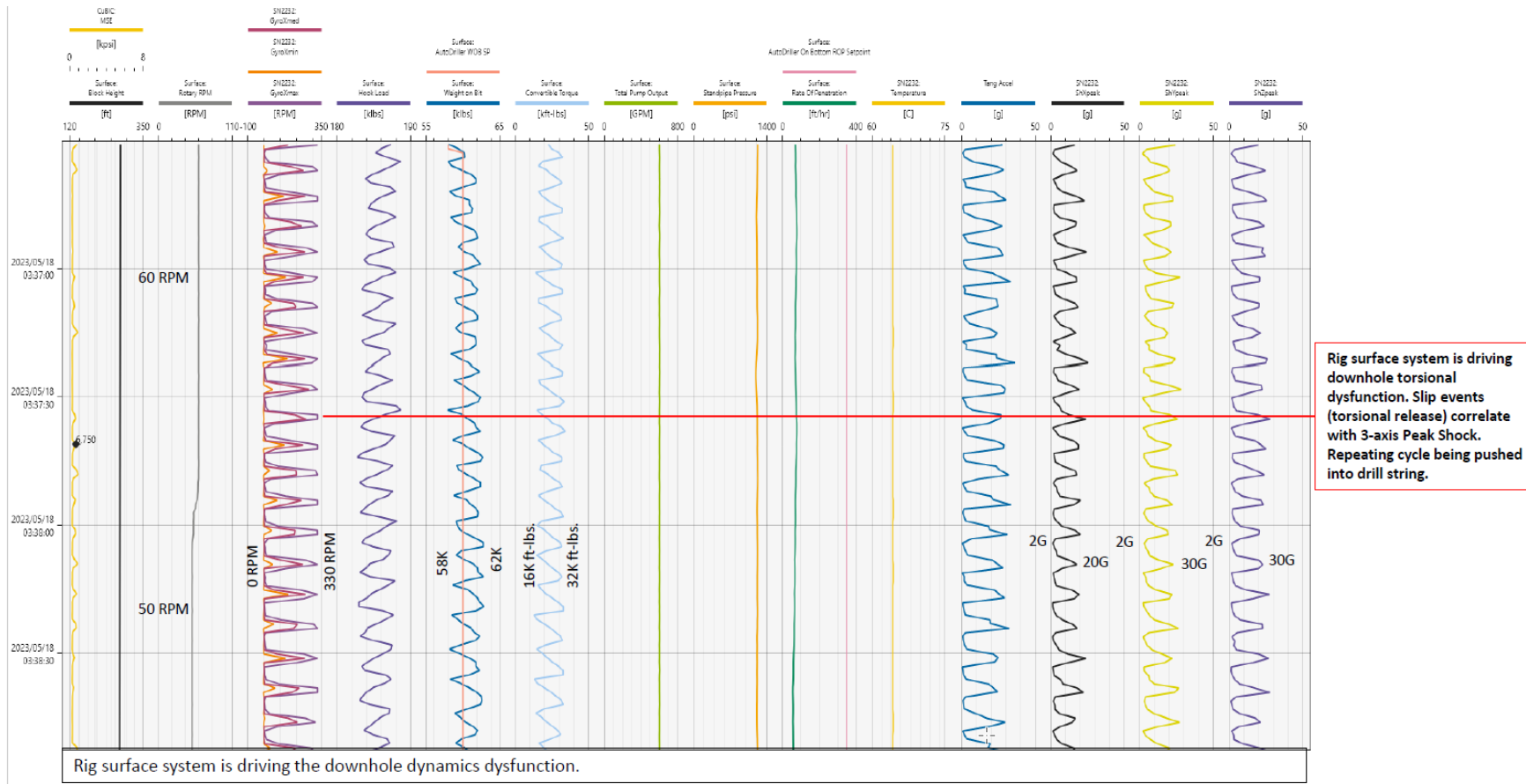


Figure F-44. Data from a single stand showing dysfunction.

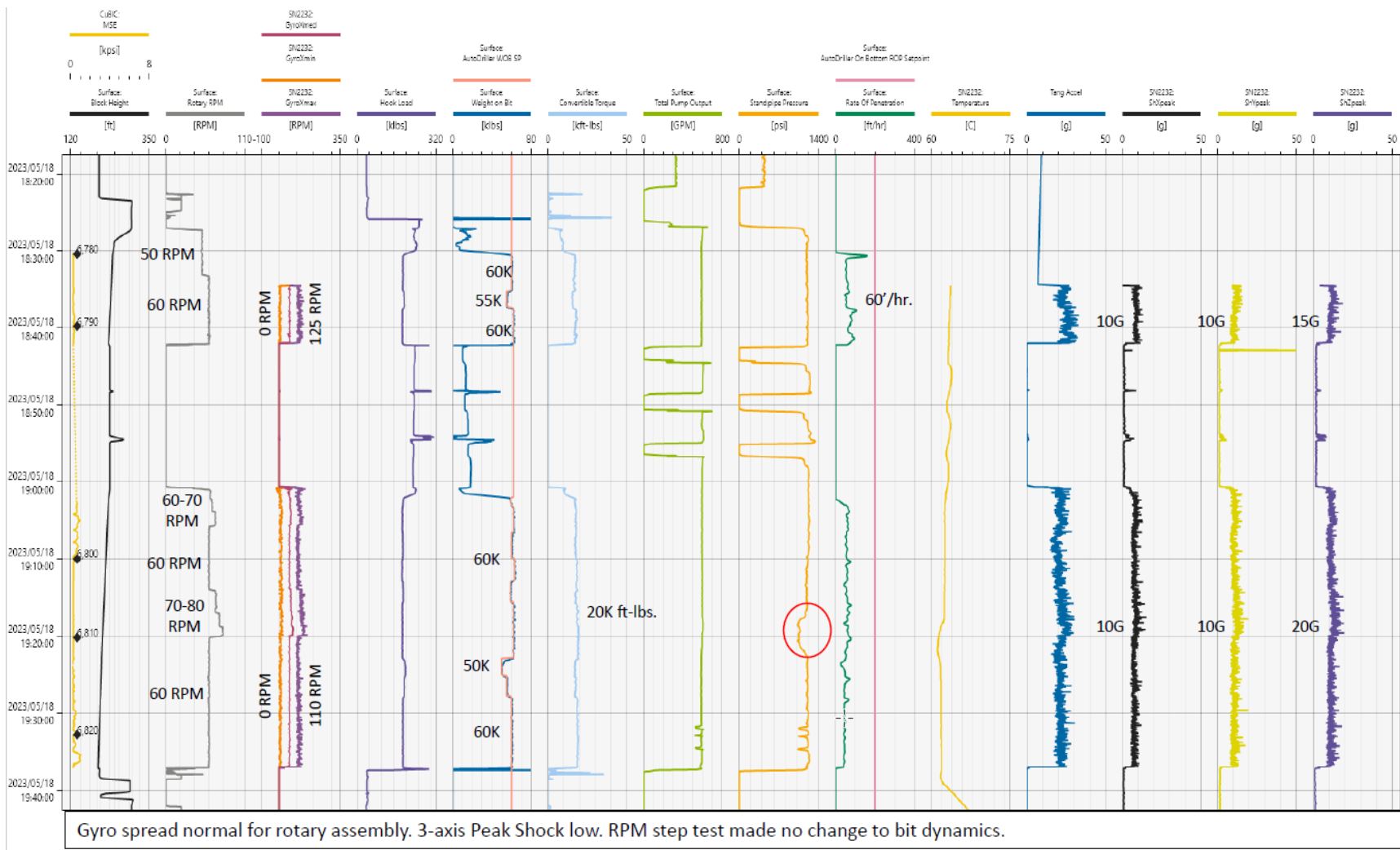


Figure F-45. Data from a single stand showing dysfunction.

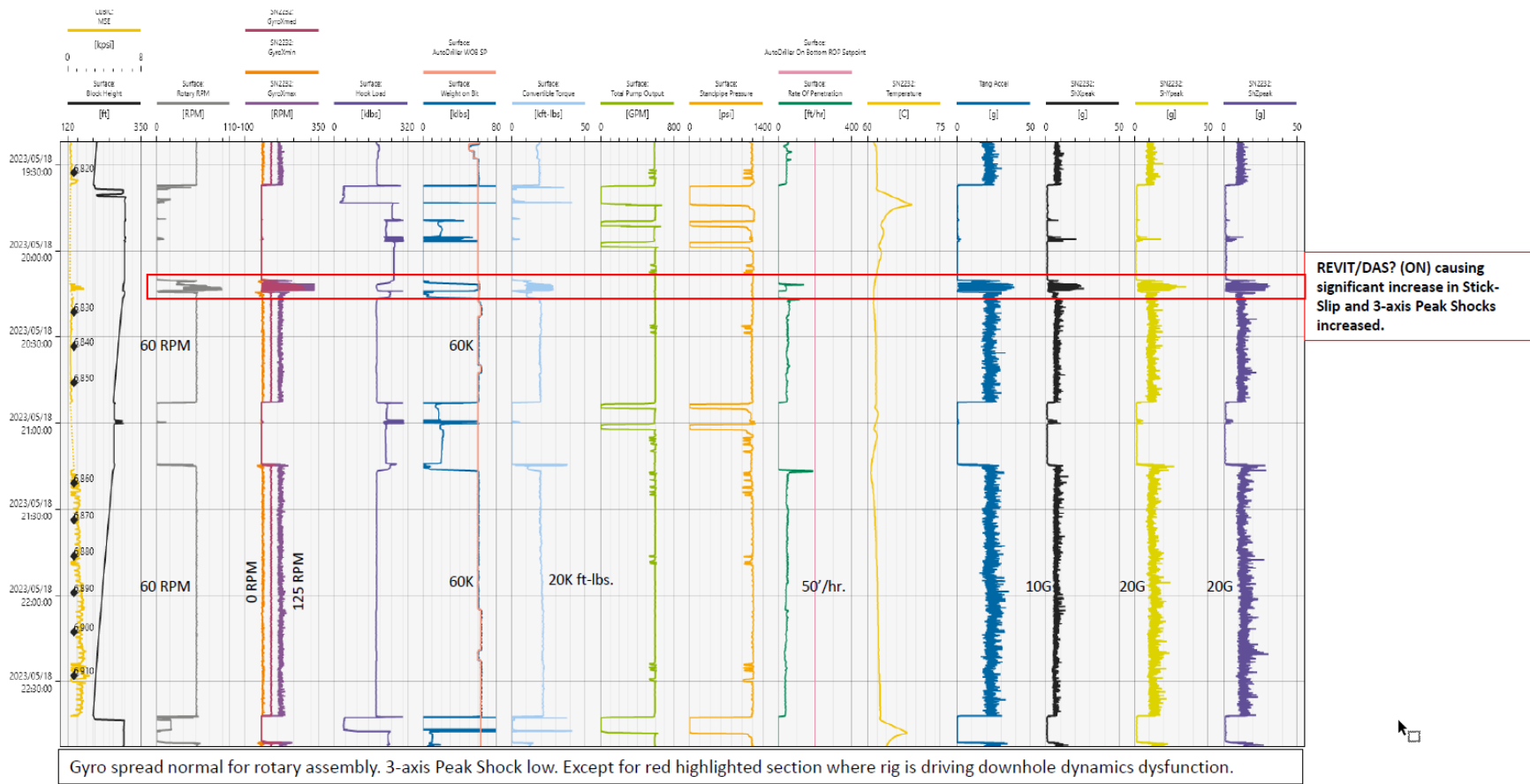


Figure F-46. Data from a single stand showing dysfunction.

BHA #15 (8) – Stand Zoom

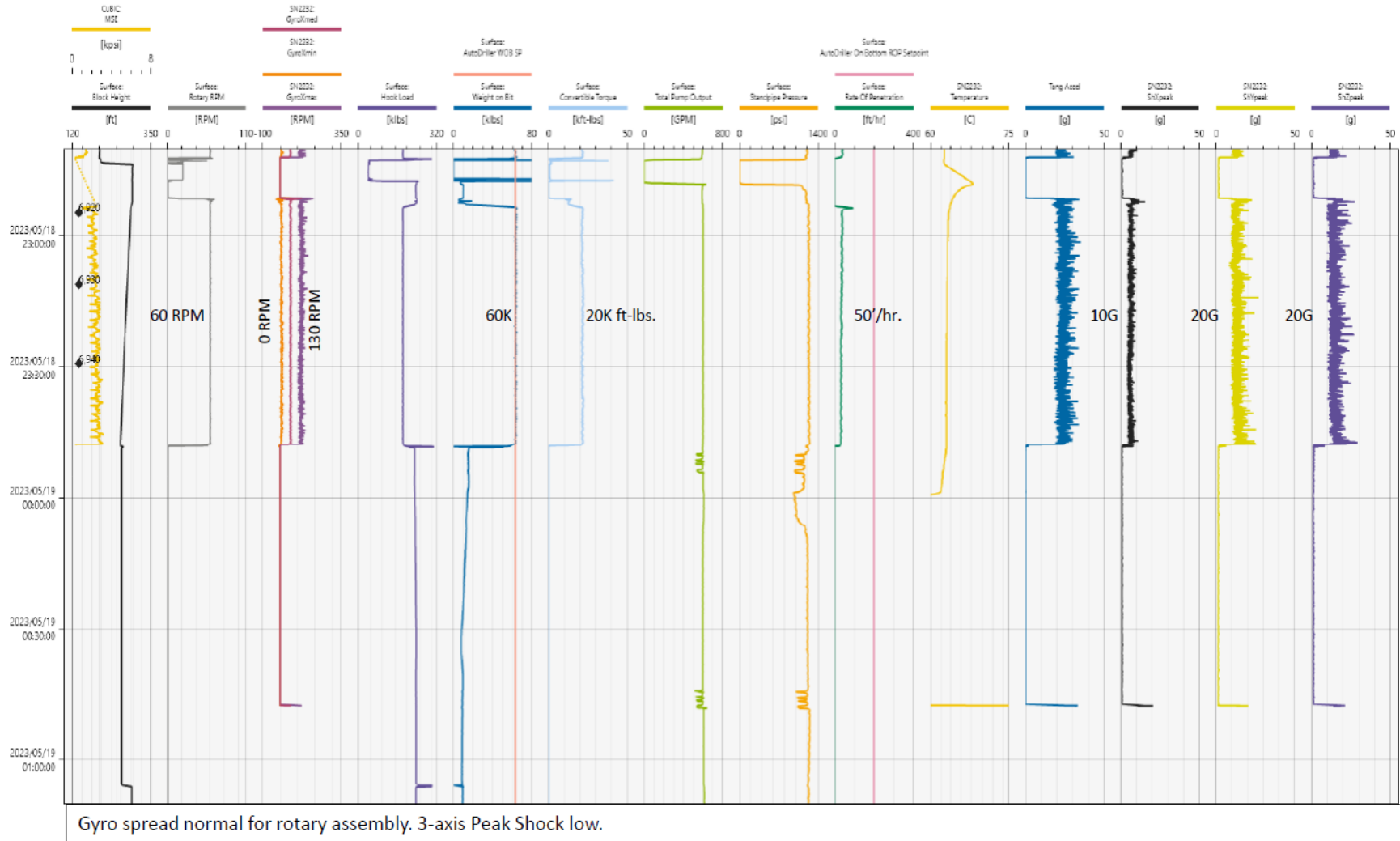


Figure F-47. Data from a single stand - low shocks.



F-5.1 Sanvean Observations on BHA 15 Performance

- Bit dynamics were normal for rotary assembly until rig surface control system enabled.
- Rig surface control system inducing torsional dynamics into drillstring.
- Bit, HALO stab in good condition. No other photos available.
- POOH for MWD failure.

F-6 BHA 16

The BHA configuration is shown in Figure F-48.

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #9	8	9.50	TKC83-A2	A298354	REEDHYCALOG	6951	7584	633	12.62	50

Bottom Hole Assembly															
Job#	OP.039349			Rig	Frontier 16		BHA Length (Usft)	1306.41							
Operator	Utah Forge			BHA #	9		BHA Weight dry (kbs)	70.21							
Well	16B(78)-32 - 16B(78)-32			Bit #	9		BHA Weight Bouyed (kbs)	60.67							
Field	Beaver (University of Utah) - Utah Forge			Depth In (Usft)	0.00		Wt. Below Jars dry (kbs)	70.21							
Date In				Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (kbs)	60.67							
Date Out				Drilled(Usft)	0.00		Drilling / Circ Hours	0.00 / 0.00							
Sensor Offsets															
Survey Offset				25.00		Gamma Offset				N/A		Gyro Offset		N/A	
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (kbs)	Total Weight (kbs)	Length (Usft)	Total Length (Usft)		
1	A298354	9 1/2 8 Blade FDC bit	9.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.18	1.18		
2	76000406	HALO RSS w/HFTO (Stiff)	6.750	2.000	6.500	5.00	4 1/2 IF B	4 1/2 REG B	0.000	0.00	0.00	35.33	36.51		
3	650779	9 3/8 Spiral wrapped stabilizer	6.500	2.875	6.500	1.42	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	4.14	40.65		
4	DR 34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	12.24	52.89		
5	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	9.83	62.72		
6	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	2.10	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.39	68.11		
7	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	31.11	99.22		
8	7006	6 3/4 Black Box	6.750	2.250	6.750	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	5.97	105.19		
9	DR 48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	3.93	109.12		
10	AFLS603	6 3/4 Float sub	6.375	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	0.000	0.00	0.00	2.45	111.57		
11	N/A	9 JTS, 6 3/4 DCs	6.813	2.875	0.000	0.00	4 1/2 IF B	4 1/2 IF P	100.000	27.83	27.83	278.27	389.84		
12	N/A	Crossover (DCs to HWDP)	6.937	3.000	0.000	0.00	5 1/2 FH B	4 1/2 IF P	0.000	0.00	27.83	3.15	392.99		
13	N/A	30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FH B	5 1/2 FH P	46.400	42.38	70.21	913.42	1306.41		
Comments															
Halo 7600-0406; Pulsar 213-004F; Eye 1754; Gamma 1311; Battery 007-29SEP22AB NO MOTOR ASSIST Flow Range = 500-750 9 3/8 Spiral 3 blade stabilizer Eye = 22 Gamma = 17 NB Incl/Az = 7 Make up torque, 4 1/2 Reg = 19,500 4 1/2 IF = 29,000															

HALO STIFF STAB

SHORT

RR

Black Box

9 x 6 3/4" DC

30 x HWDP

Figure F-48. Configuration for BHA 16.

The pulled bit, with an NOV commentary is shown in Figure F-49. WOB was not being zeroed every stand until 7,570 ft MD. There is an ROP decline each consecutive stand until the issue was corrected. When corrected, the MSE and ROP returned to baseline. During this BHA, a test was performed using a 100% freshwater pill, at 7,090 ft MD, as well as a 50/50 freshwater/reserve pit pill, at 7,420 ft MD. The ROP showed that the freshwater pill was more effective than the 50/50 pill.



Figure F-49. Pulled bit (BHA 16).

Figures K-50 through K-59 show the recorded data.

F-6.1 Sanvean's Observations on the Performance of BHA 16

- Bit dynamics were normal for rotary assembly until rig surface control system enabled.
- Rig surface control system inducing torsional dynamics into drill string.
- Bit in good condition.
- POOH for ?

BHA #16 (9) – Entire Run

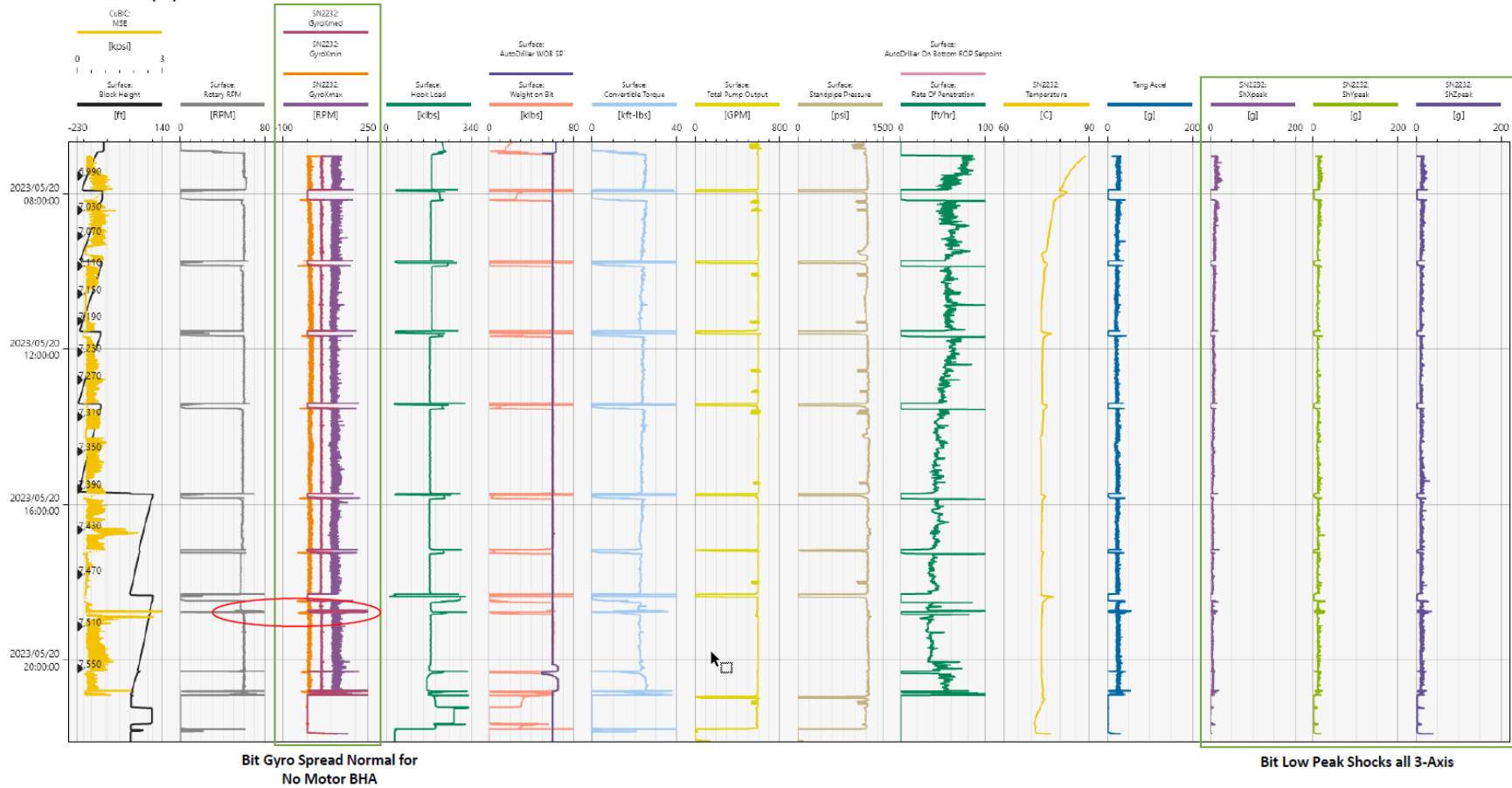


Figure F-50. Entire run for BHA 16.

BHA #16 (9) – Stand Zoom

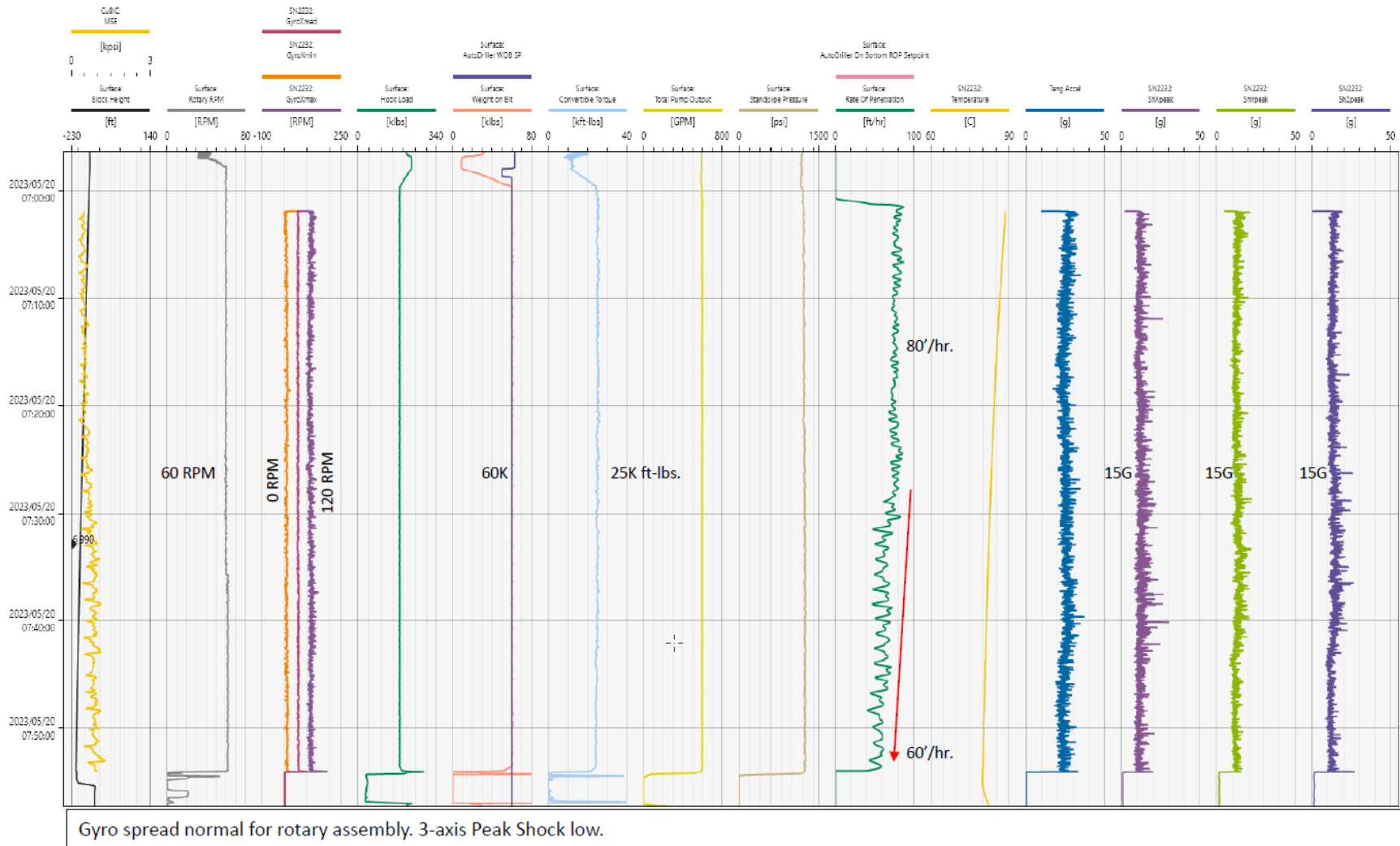


Figure F-51. Zoomed in view of one stand.



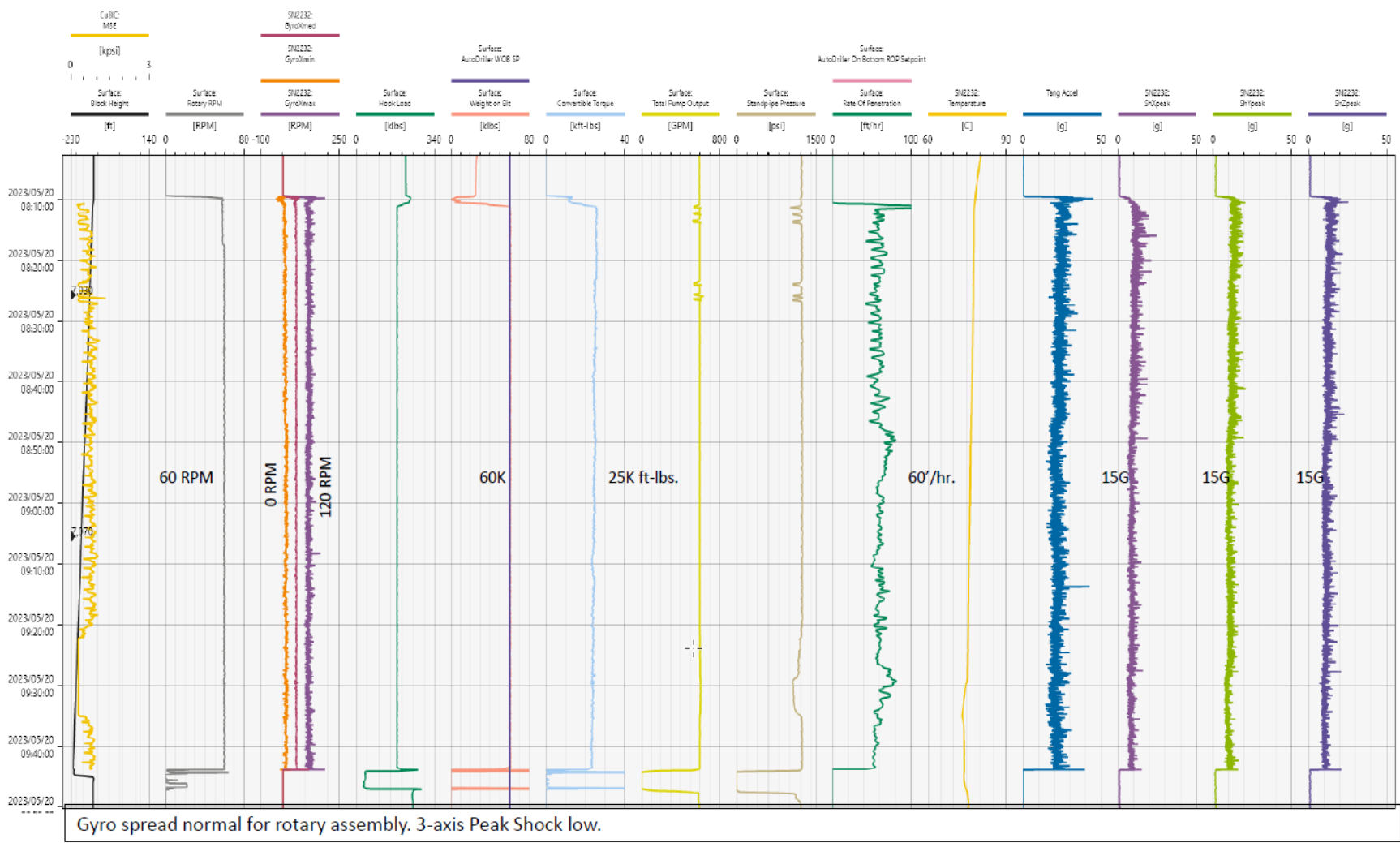


Figure F-52. Zoomed in view of one stand.

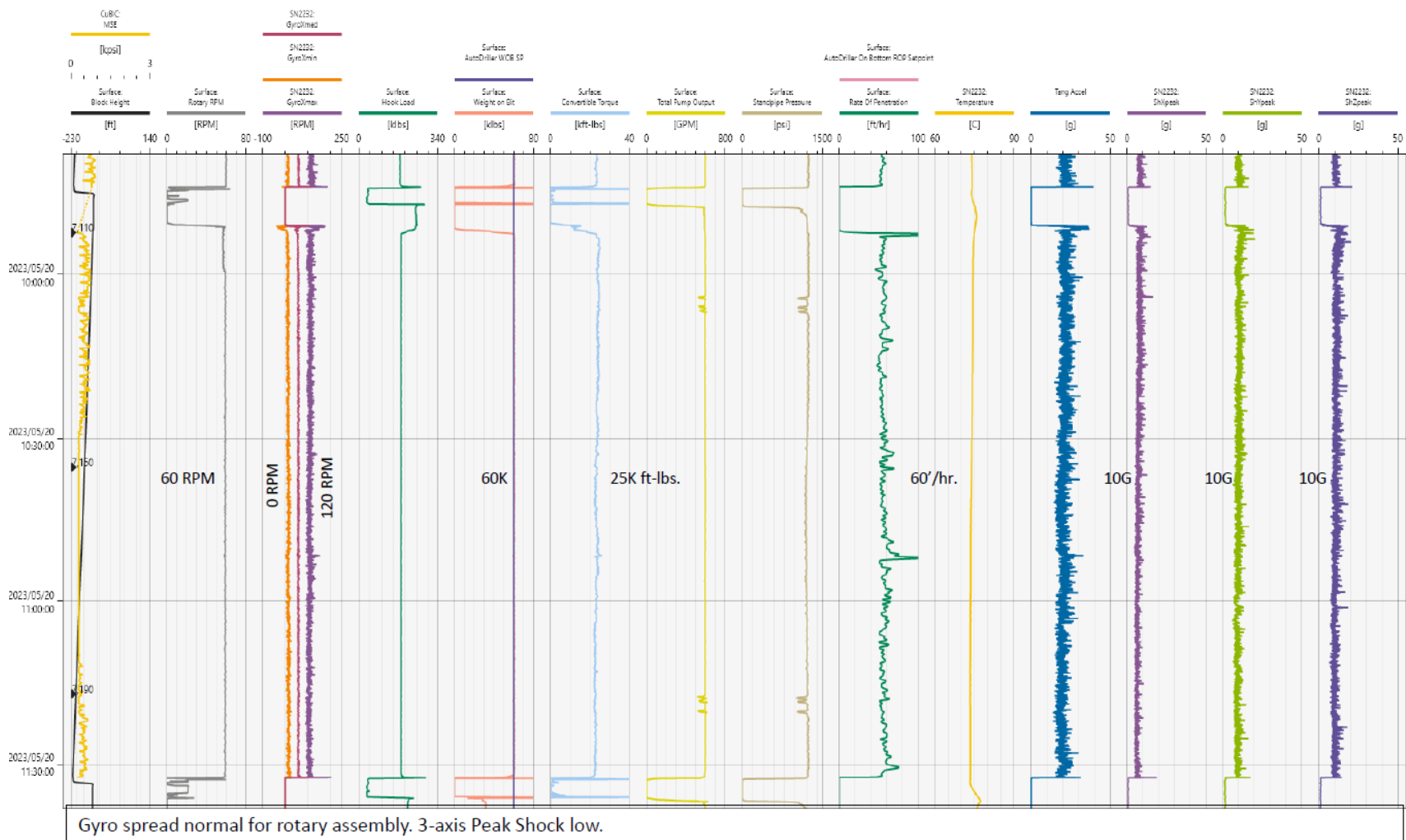


Figure F-53. Zoomed in view of one stand.

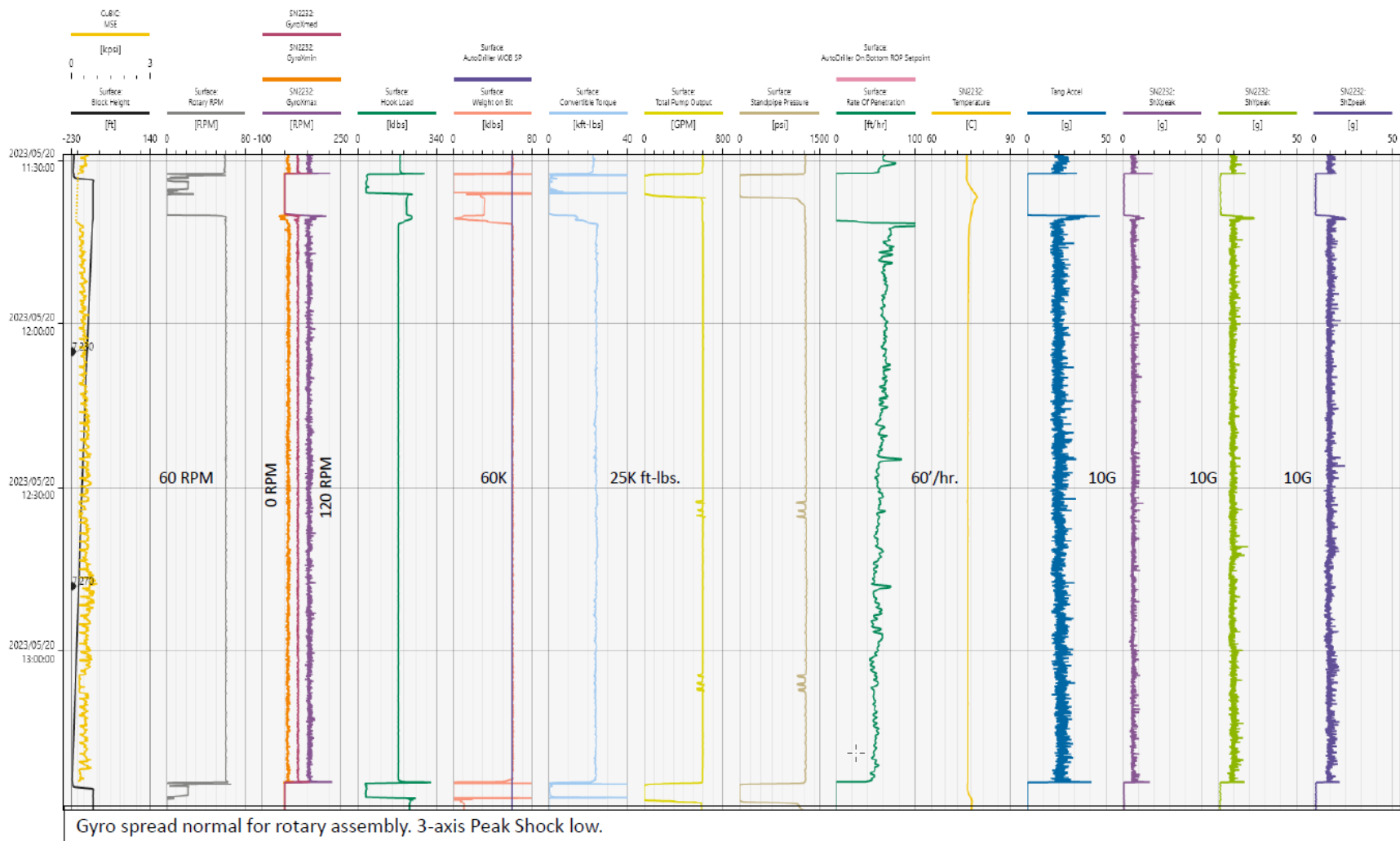


Figure F-54. Zoomed in view of one stand.

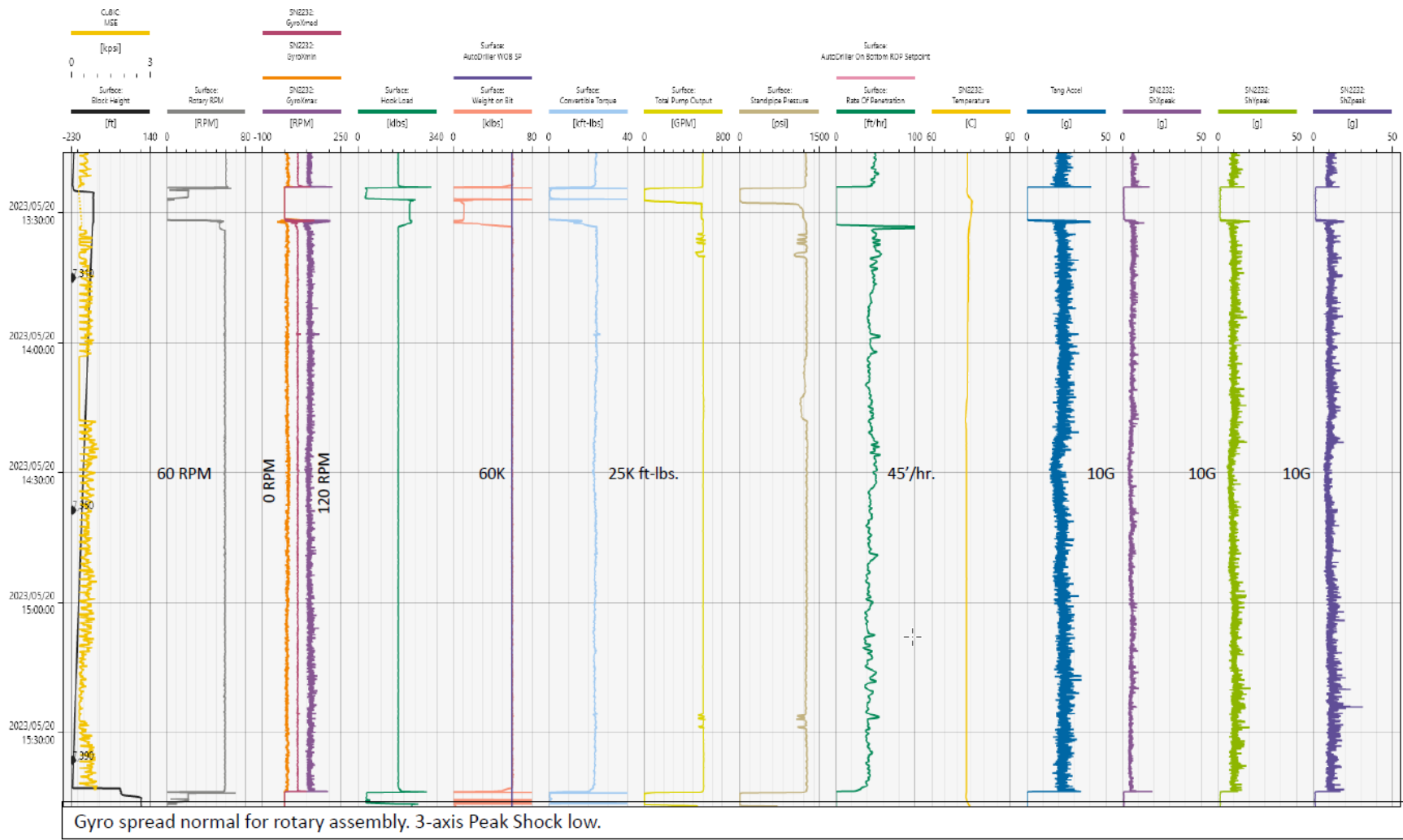


Figure F-55. Zoomed in view of one stand.

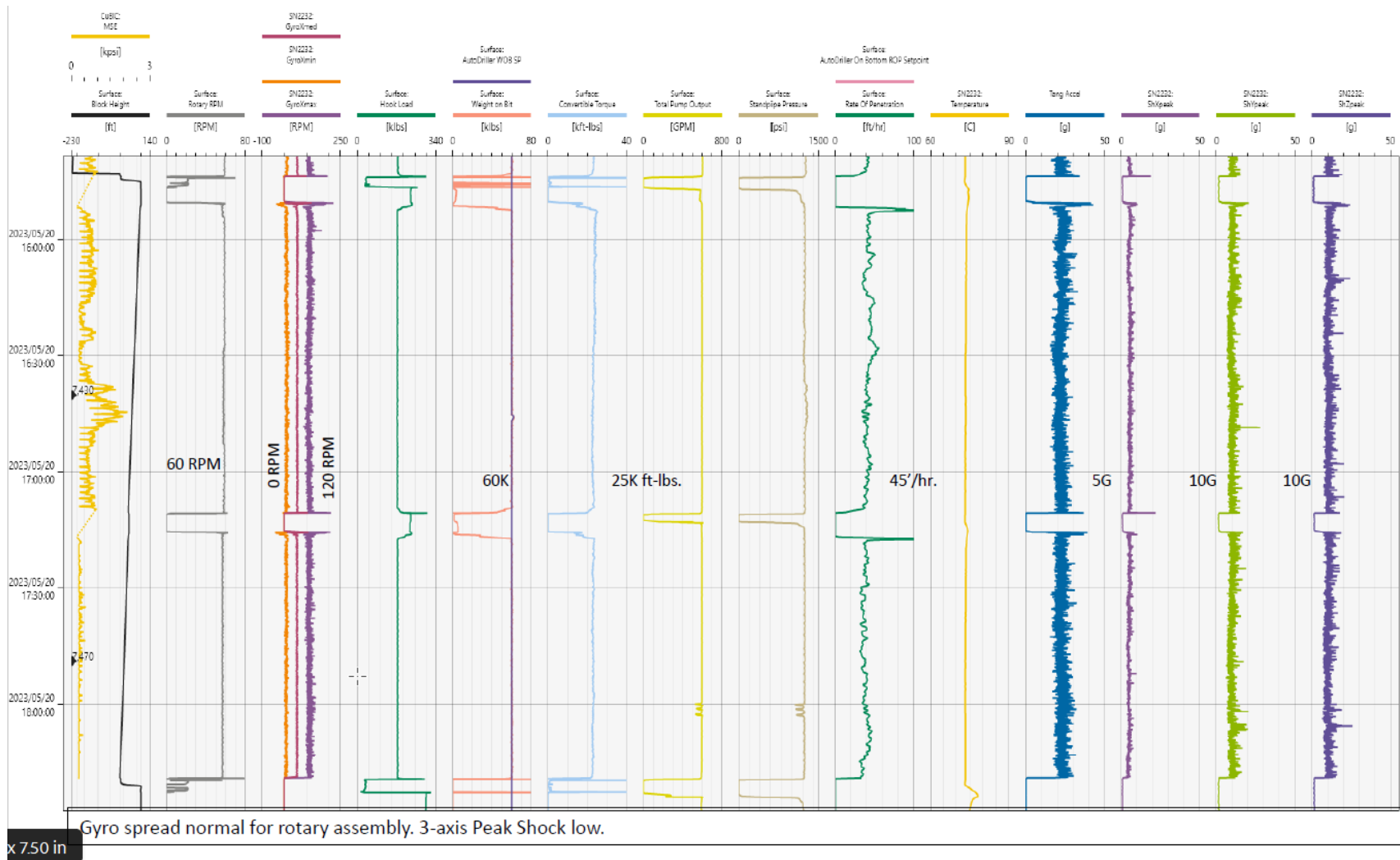


Figure F-56. Zoomed in view of one stand.

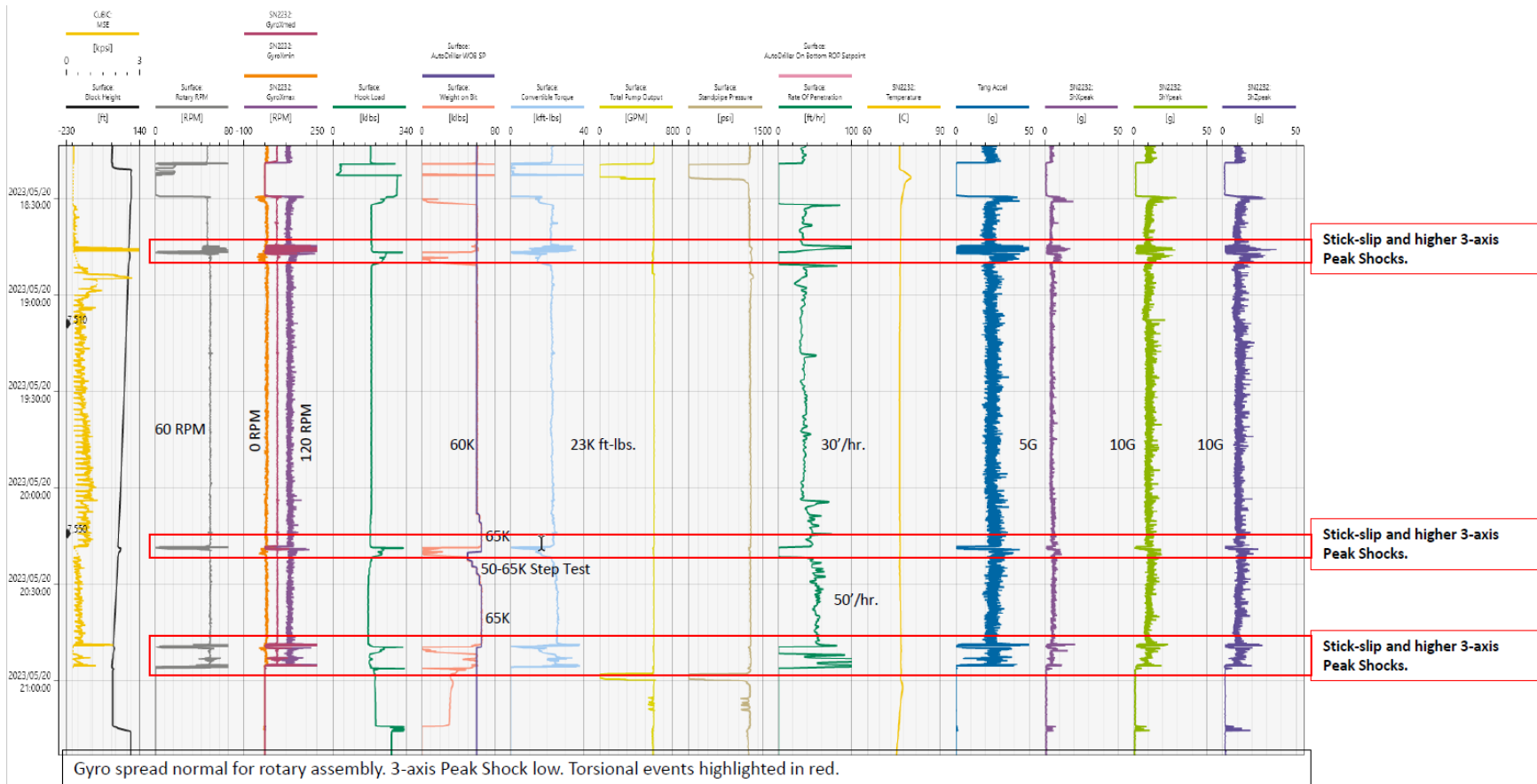


Figure F-57. Zoomed in view of one stand.

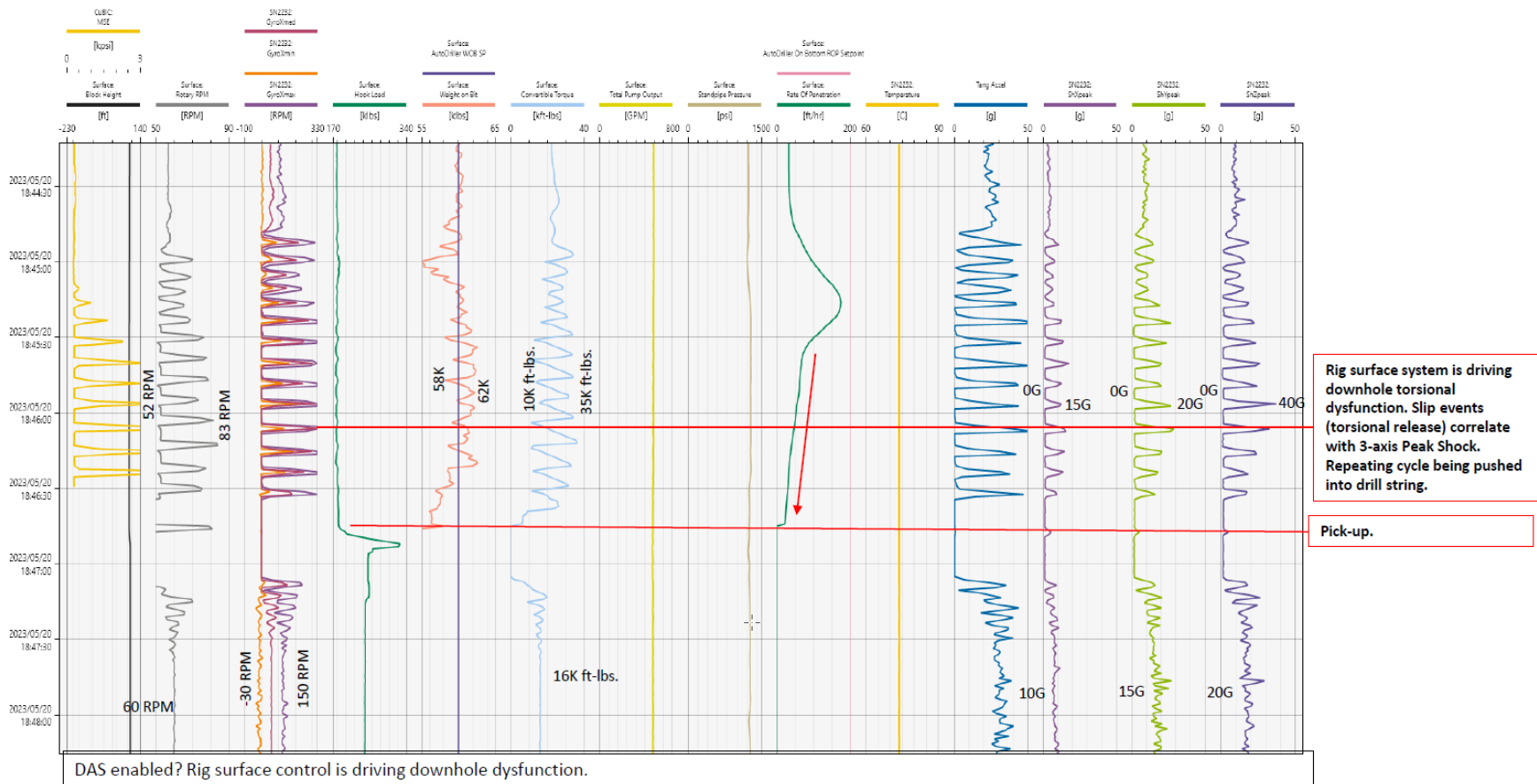


Figure F-58. Zoomed in view of one stand.

F-7 BHA 17

The components in BHA 17 are shown in Figure F-59. The pulled bit is shown in Figure F-60. Figure F-61 shows the stabilizer and roller reamer and Figures K-62 through K- show recorded data.

Interval	BHA #	Run in That Hole Size	Bit Size	Bit Type	Bit Serial Number	Bit Mfg	Depth In (ft MD)	Depth Out (ft MD)	Footage Drilled (ft)	On Bottom Hours	On Bottom ROP (ft/hr)
Tangent	BHA #10	9	9.50	TKC83-A2	A298358	REEDHYCALOG	7584	8085	501	7.53	67

Bottom Hole Assembly															
Job#	OP:039349				Rig	Frontier 16		BHA Length (Usft)			1312.71				
Operator	Utah Forge				BHA #	10		BHA Weight dry (klbs)			70.21				
Well	16B(78)-32 - 16B(78)-32				Bit #	10		BHA Weight Bouyed (klbs)			60.67				
Field	Beaver (University of Utah) - Utah Forge				Depth In (Usft)	0.00		Wt. Below Jars dry (klbs)			70.21				
Date In					Depth Out(Usft)	0.00		Wt. Below Jars Bouyed (klbs)			60.67				
Date Out					Drilled(Usft)	0.00		Drilling / Circ Hours			0.00 / 0.00				
Sensor Offsets															
Survey Offset				N/A				Gamma Offset				N/A			
Gyro Offset				N/A				Gyro Offset				N/A			
#	SN	Description	OD (in)	ID (in)	FN OD (in)	FN Length (Usft)	Cnx Up	Cnx Dn	Unit Weight (lb/ft)	Comp Weight (klbs)	Total Weight (klbs)	Length (Usft)	Total Length (Usft)		
1	A208358	9 1/2 8 Blade PDC bit	6.500	2.750	0.000	0.00	4 1/2 REG P		0.000	0.00	0.00	1.25	1.25		
2		7.15 Mud Motor	6.750	2.000	0.000	0.00	4 1/2 F B	4 1/2 REG B	0.000	0.00	0.00	35.00	36.25		
3	GU1744	FG 9 1/2 Roller reamer	6.625	3.000	6.750	2.19	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	5.39	41.64		
4	125-373	6 3/4 NM Pony DC	6.438	3.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	0.22	50.86		
5	84-772	6 3/4 NMDC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	31.11	81.97		
6	126-076	6 3/4 Pulsar Sub	6.500	3.500	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	3.93	85.90		
7	DR34302	6 3/4 NM Pony DC	6.438	3.500	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	12.24	98.14		
8	153-022	6 3/4 NM Pony DC	6.813	3.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	9.83	107.97		
9	7006	6 3/4 Black Box	6.750	2.250	0.000	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	5.97	113.94		
10	DR48701	6 3/4 Filter sub	6.688	3.250	6.688	0.00	4 1/2 F B	4 1/2 IF P	0.000	0.00	0.00	3.93	117.87		
11		9 JTS, 6 3/4 DCs	6.813	2.875	0.000	0.00	4 1/2 F B	4 1/2 IF P	100.000	27.83	27.83	278.27	386.14		
12		Crossover (DCs to HWDP)	6.537	3.000	0.000	0.00	5 1/2 FHB	4 1/2 IF P	0.000	0.00	27.83	3.15	389.29		
13		30 JTS HWDP	5.500	3.625	0.000	0.00	5 1/2 FHB	5 1/2 FHP	46.400	42.38	70.21	913.42	1312.71		

MOTOR

RR

Black Box

9 x 6 3/4" DC

30 x HWDP

Figure F-59. Components in BHA 17 (conventional motor BHA).



ROP Limiter: BHA was ran with a 1" motor. The BHA wanted to build. Axial vibrations were high which could be due to limiting WOB and not getting enough DOC.

Step test at 7,670 did not change Downhole MSE much.

Solution: To deal with the build tendency, the next run will be ran with higher bit RPM's by increasing Flowrate and Rotary Speed.

Figure F-60. Recovered bit and NOV commentary.



Figure F-61. There is some damage to the stabilizer and the roller reamer in this run.

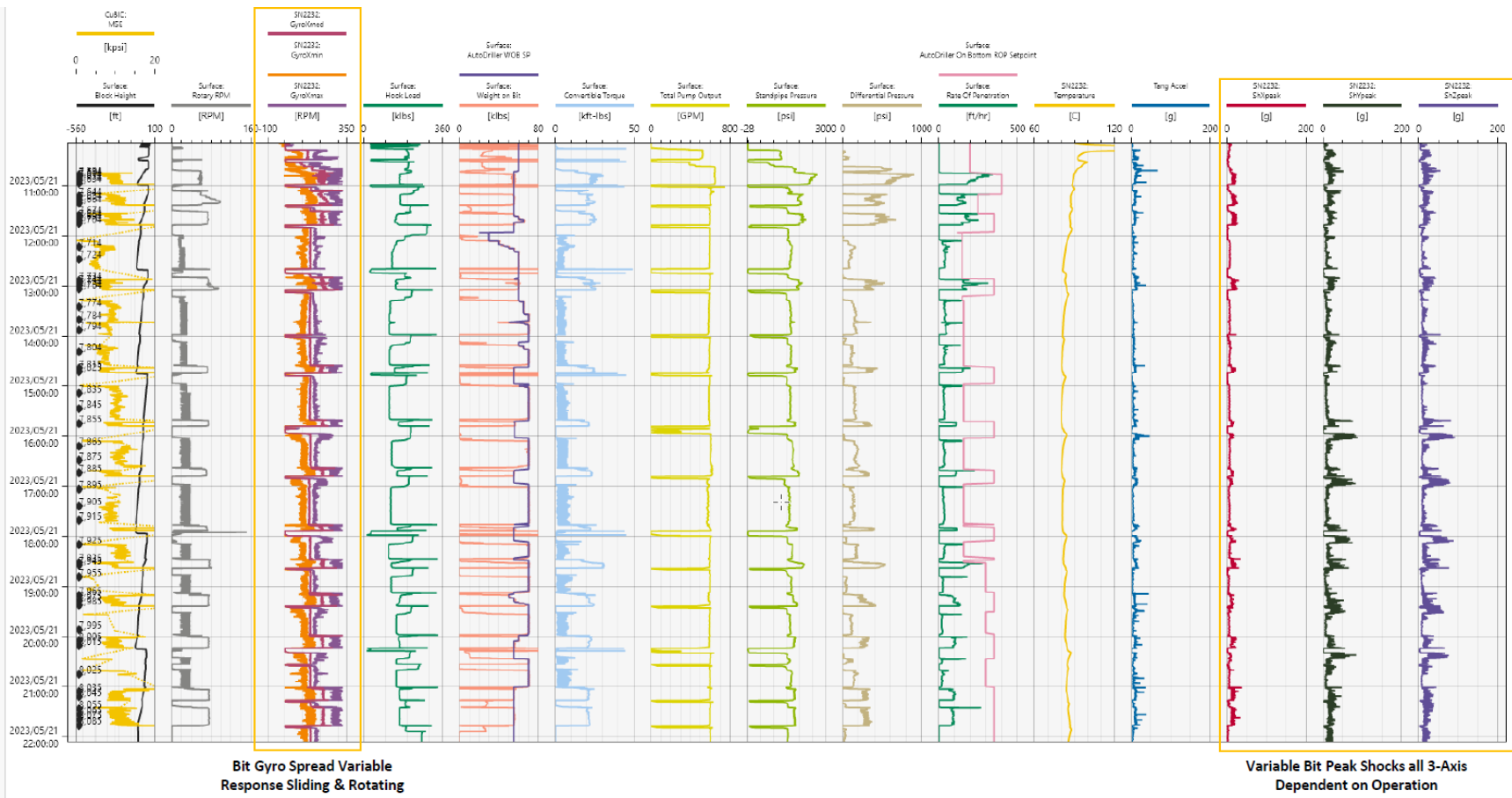
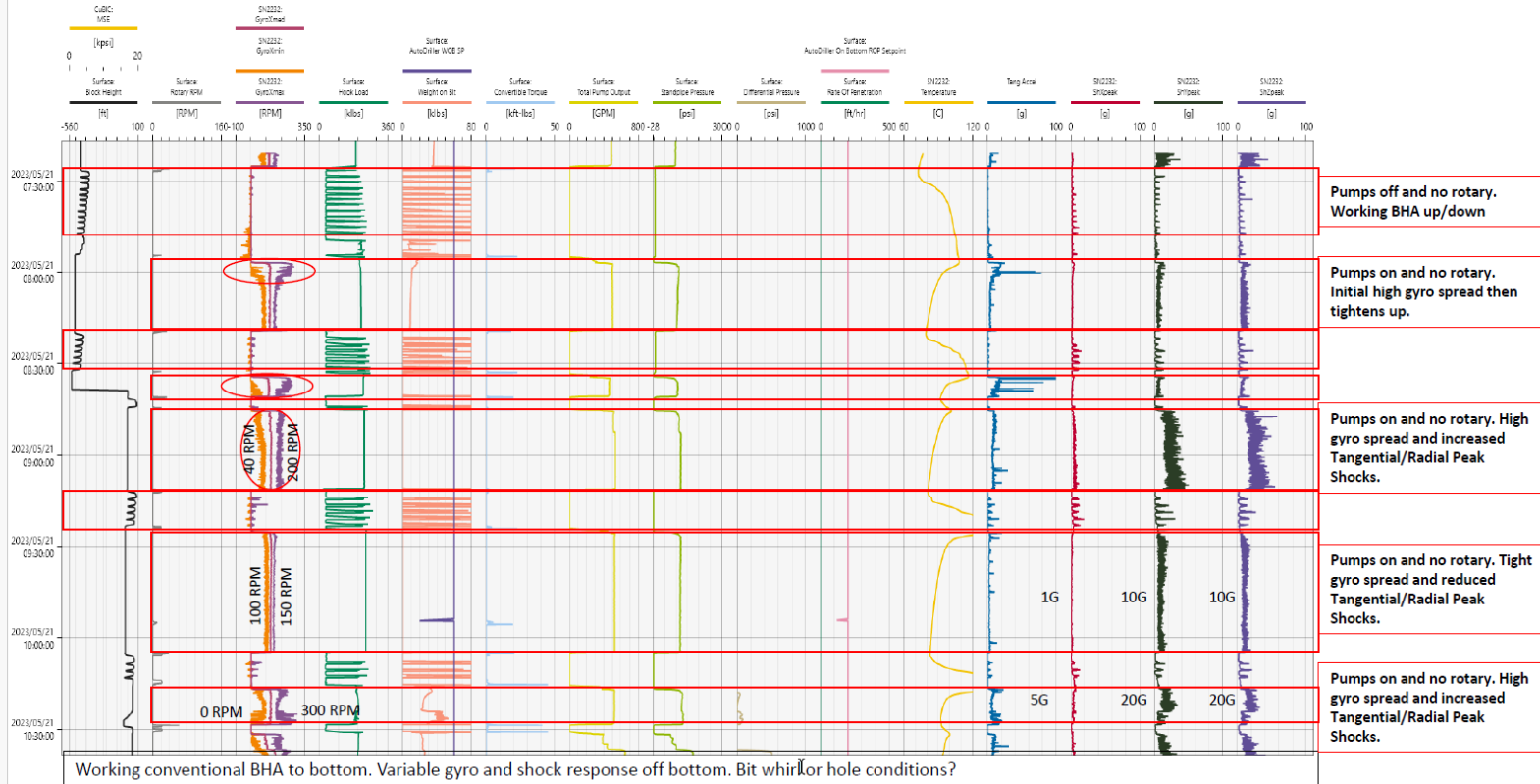


Figure F-62. Data from the full run, with a conventional motor, showing differing responses from sliding and rotating.

BHA #17 (10) – Stand Zoom



- Pumps off and no rotary. Working BHA up/down
- Pumps on and no rotary. Initial high gyro spread then tightens up.
- Pumps on and no rotary. High gyro spread and increased Tangential/Radial Peak Shocks.
- Pumps on and no rotary. Tight gyro spread and reduced Tangential/Radial Peak Shocks.
- Pumps on and no rotary. High gyro spread and increased Tangential/Radial Peak Shocks.

Figure F-63. Zoomed in data, with a conventional motor, working to bottom.

BHA #17 (10) – Stand Zoom

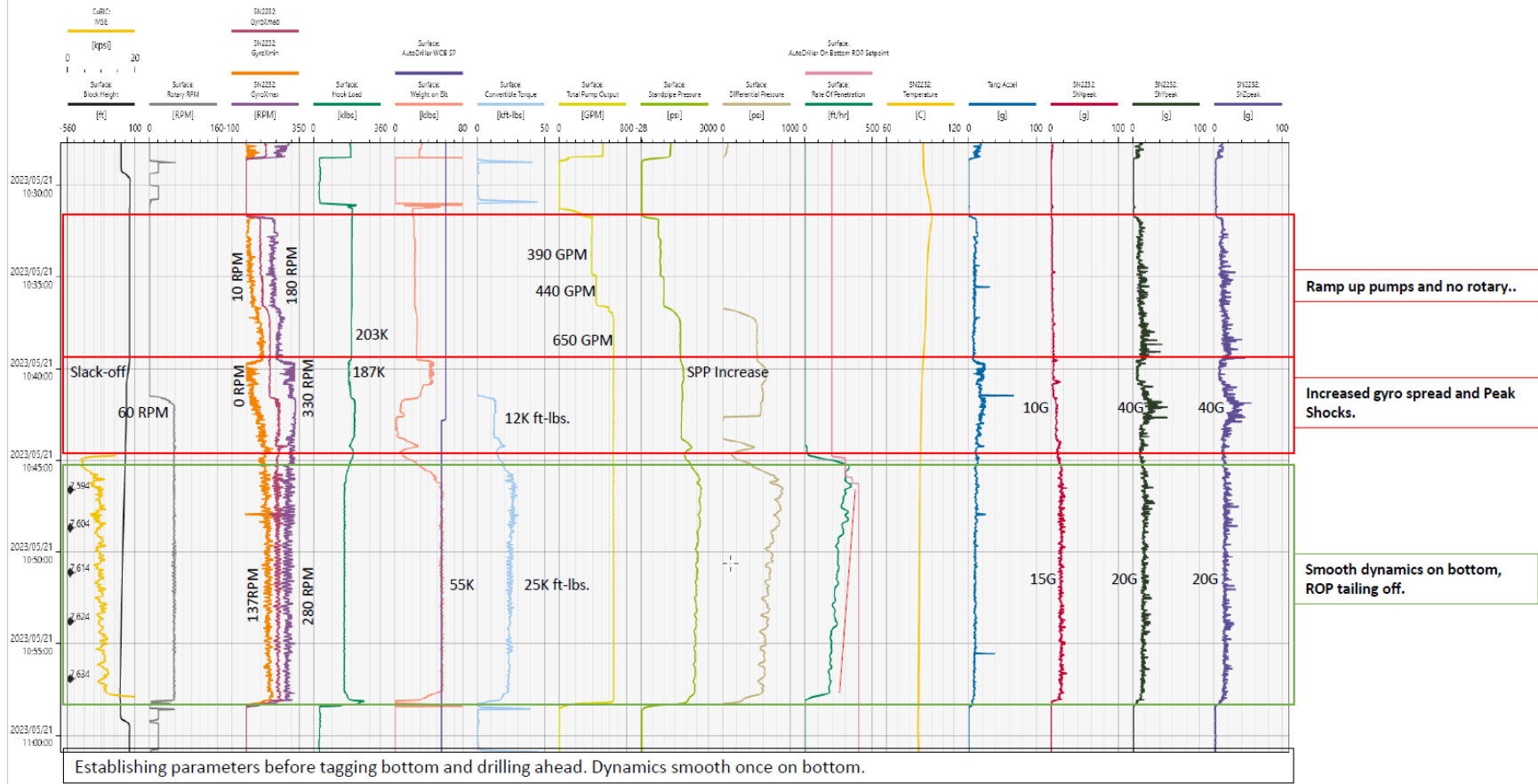


Figure F-64. Data zoomed in on one stand, with a conventional motor, before tagging bottom and drilling ahead.

BHA #17 (10) – Stand Zoom

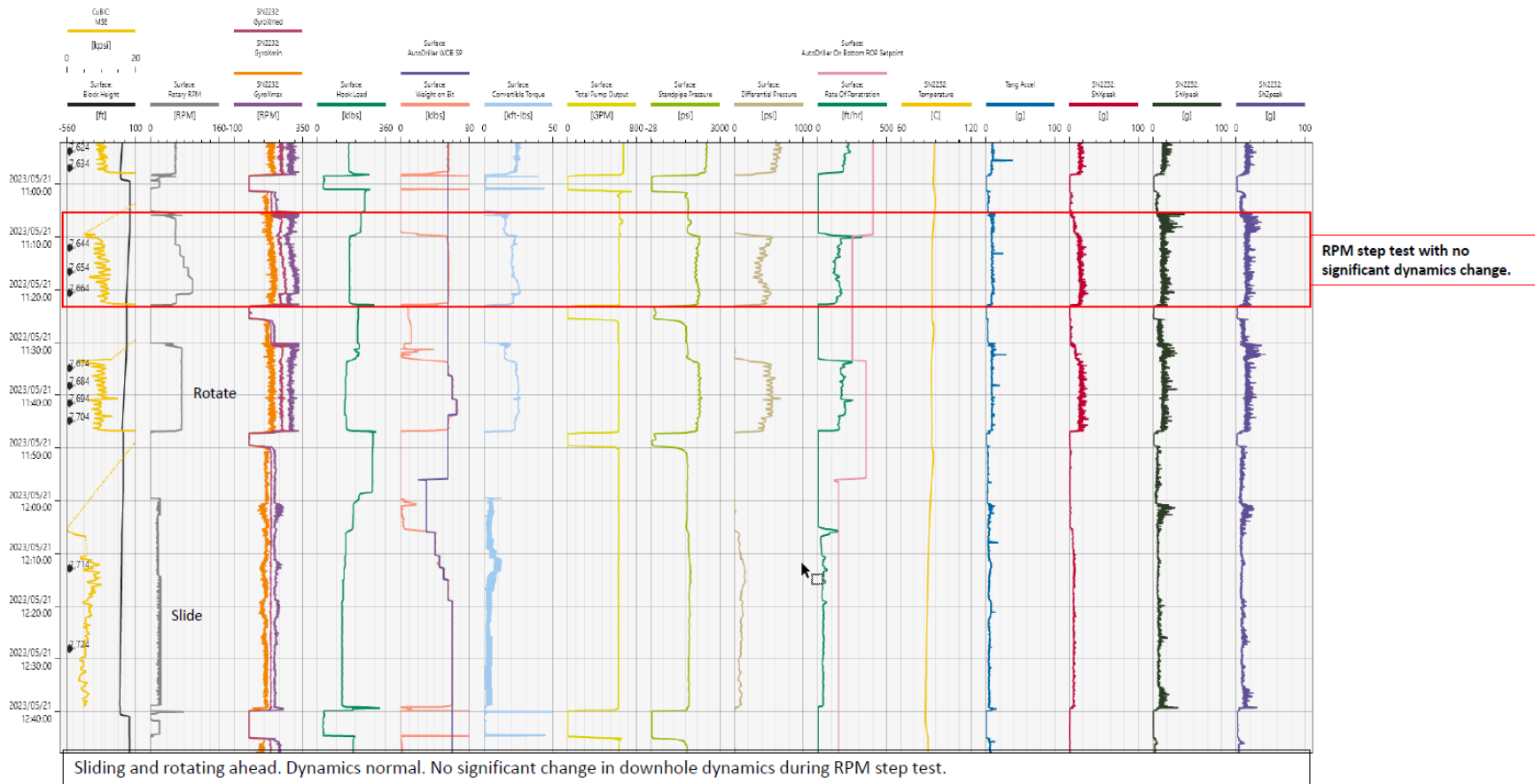


Figure F-65. Data zoomed in on one stand, with a conventional motor, drilling ahead.

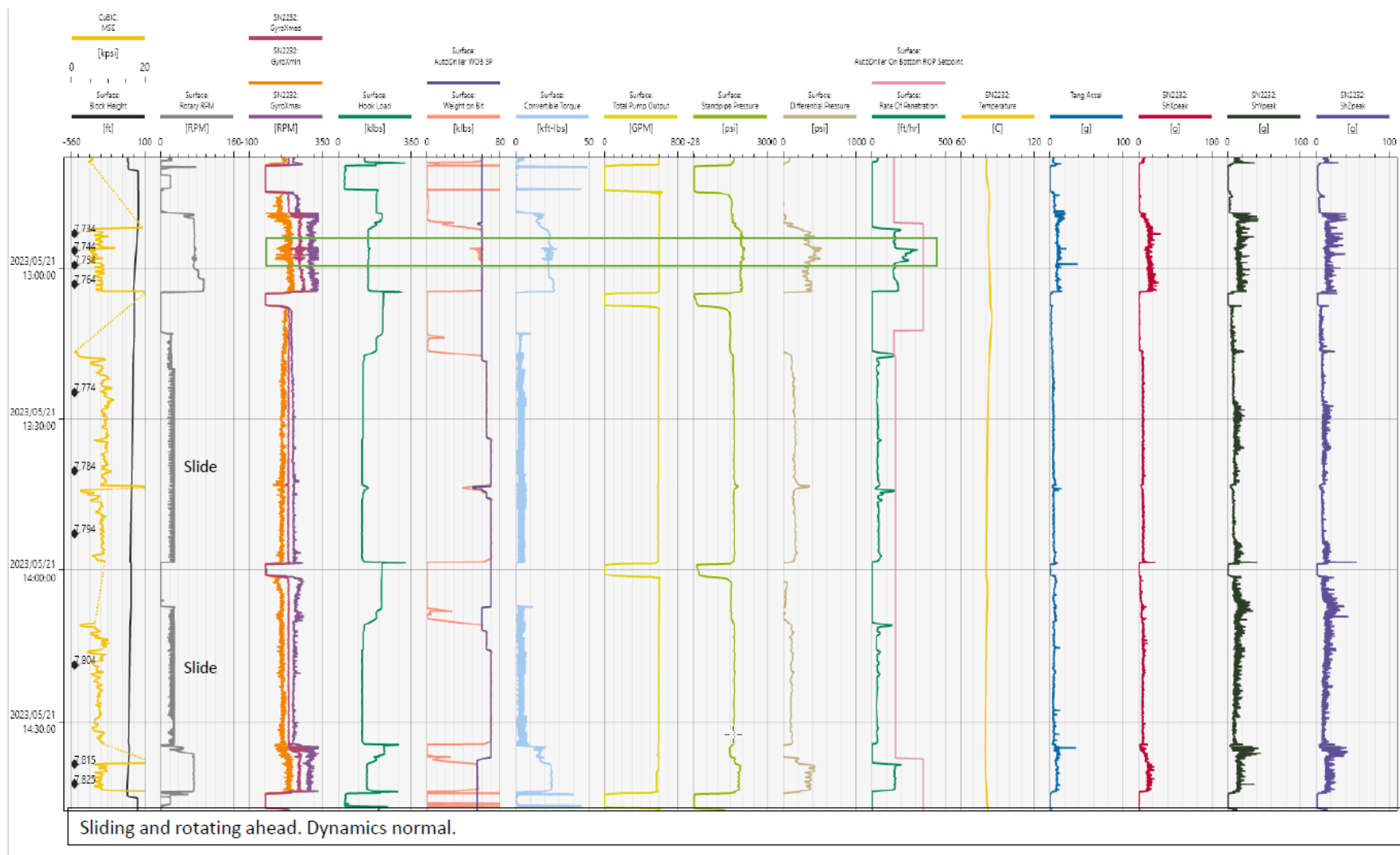


Figure F-66. Data zoomed in on one stand, with a conventional motor, drilling ahead.

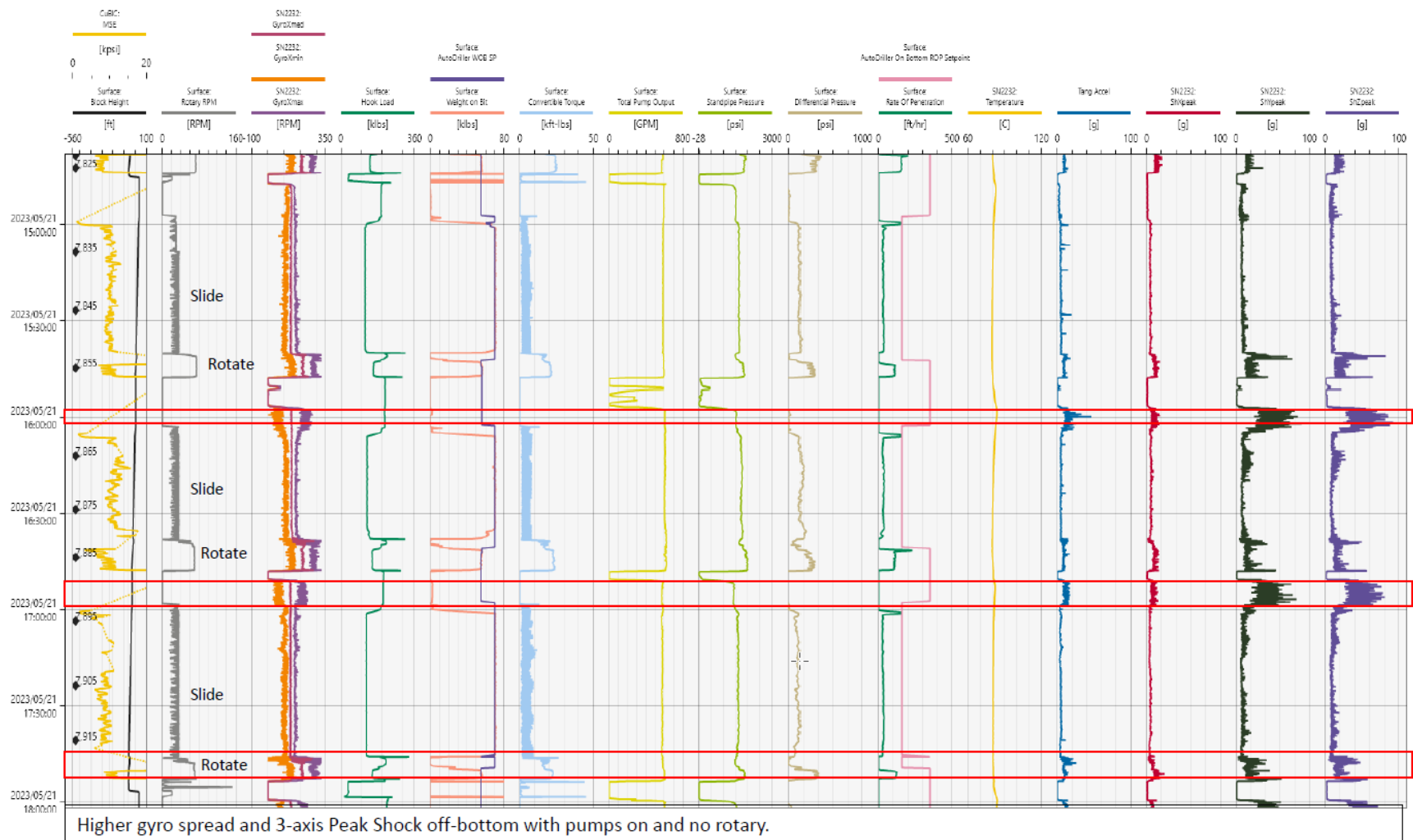


Figure F-67. Data zoomed in on one stand, with a conventional motor, drilling ahead.

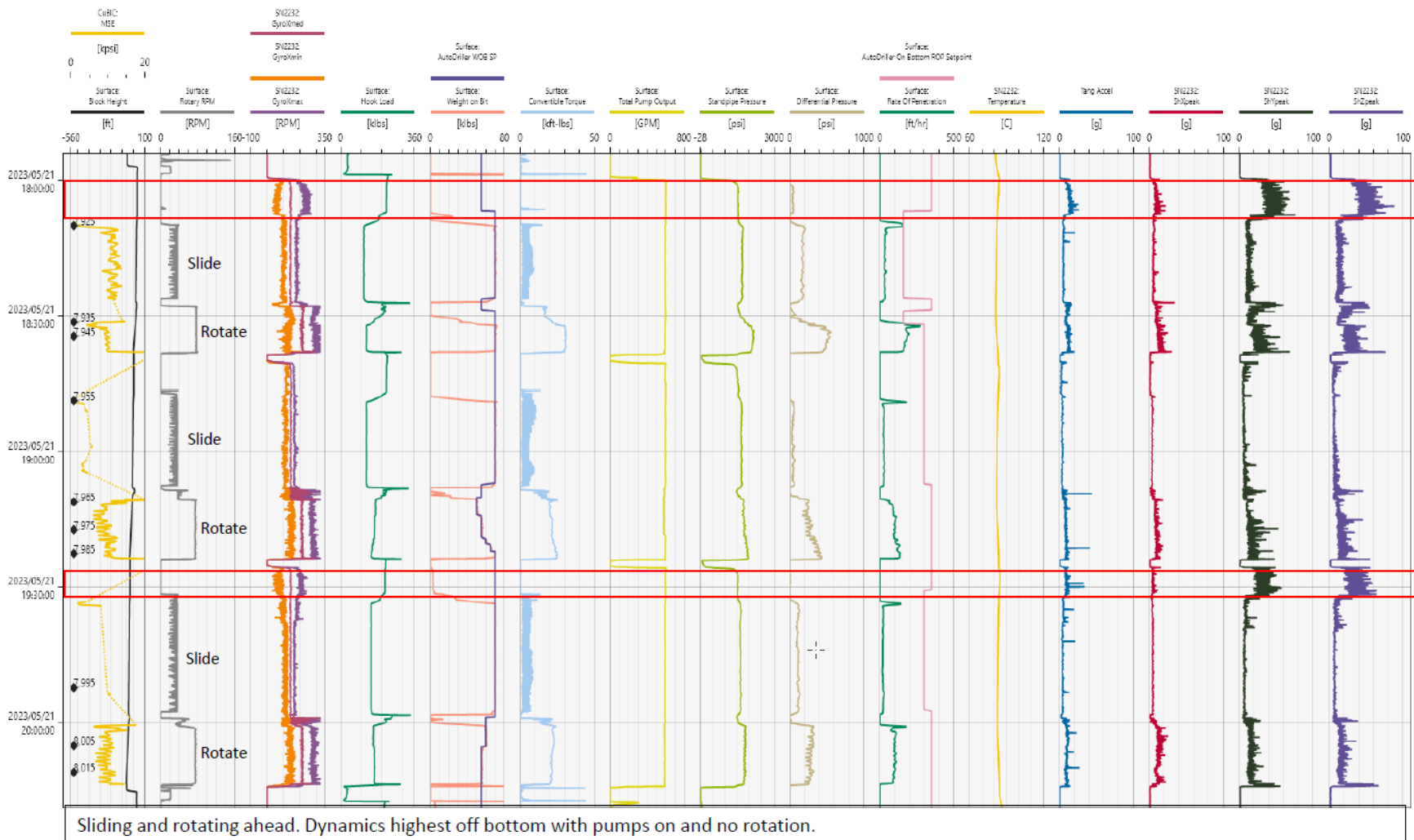


Figure F-68. Data zoomed in on one stand, with a conventional motor, drilling ahead.

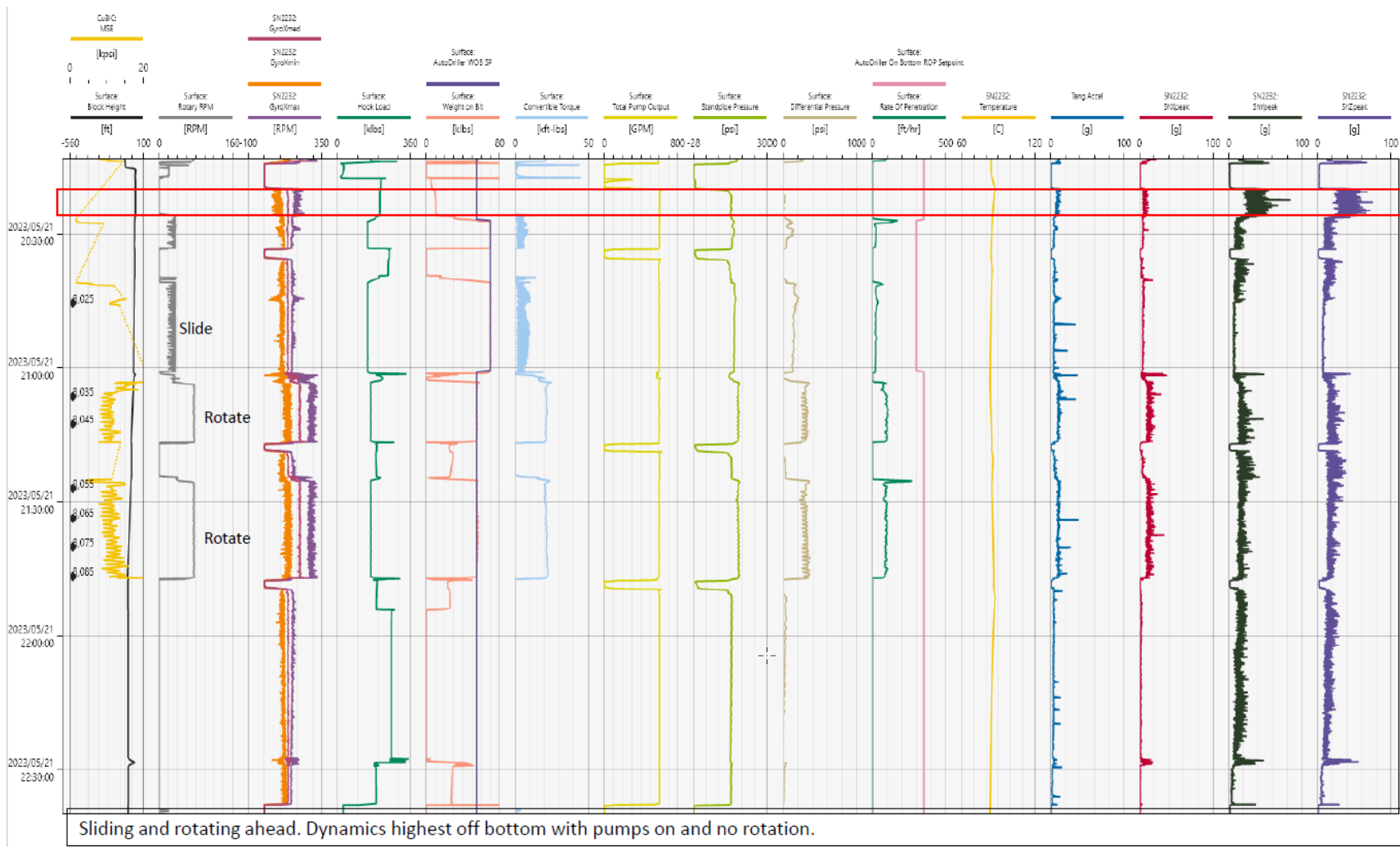



Figure F-69. Data zoomed in on one stand, with a conventional motor, drilling ahead.

F-7.1 Sanvean's Observations on BHA17

- Offset wear on stabilizer.
- Bit shoulder cutters starting to wear.
- Bit dynamics are at highest when off bottom with pumps on and no surface rotation.
- Either bit whirl or unloaded bit grabbing on wellbore.

Appendix G. Canamera and Coring




The University of Utah

16B(78)-32

Presented by:
Canamera Coring Team

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Figure G-1. Coring operations were carried out by Canamera.



Goals and Objectives

All Coring operations were conducted in accordance with the safety programs as prescribed by University of Utah, Canamera, and the Drilling Contractor.

The main objective was achieved by utilizing Canamera's 700 (7.00" OD) Conventional JMS system to core and recover ~240' of Granite formation as planned with the University.

Well Program

- WELL NAME: 16B(78)-32
- LOCATION: Beaver County, UT
- RIG: Frontier 16
- FORMATION: Granite
- DEPTH: Start 4,855'
End 10,493'
- AMOUNT OF CORE: ~210' FT
- CORE SIZE: 4"
- INCLINATION: 0 & 60 Degrees
- MUD SYSTEM: WBM
- BARREL LENGTH: 60' JMS BHA to cut 30' of core

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Figure G-2. The BHA was a 60 ft system with jam mitigation that allowed catching 30 ft of core.

Zone 1 Core Run #1



- CCI 700 60' JMS BHA – 913 Bit
 - Sensored
- Cored from 4,855' – 4,871'
- ROP 8 ft./hr.
- Core jammed
 - @ 4,870 call was made to increase RPM from 35 to 45
 - Pump pressure went up 250 psi
 - Lost torque and ROP
- 16' cored 14.6' Recovered
- Core jam found in the shoe
 - Pictured to the right
- 2 JMS Deployments
 - Primary
 - ~4,860'
 - Secondary
 - ~4,864'



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Figure G-3. Photograph of core fragments from Zone #1m Core Run #1 (4,855 to 4,871 ft). The core jammed. 16 ft were cored and 14.6 ft were recovered.

Zone 1 Core Run #1



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Figure G-4. Core run 1 - The figure on the right is from an unknown location.

Zone 1 Core Run #1 May 9-2023

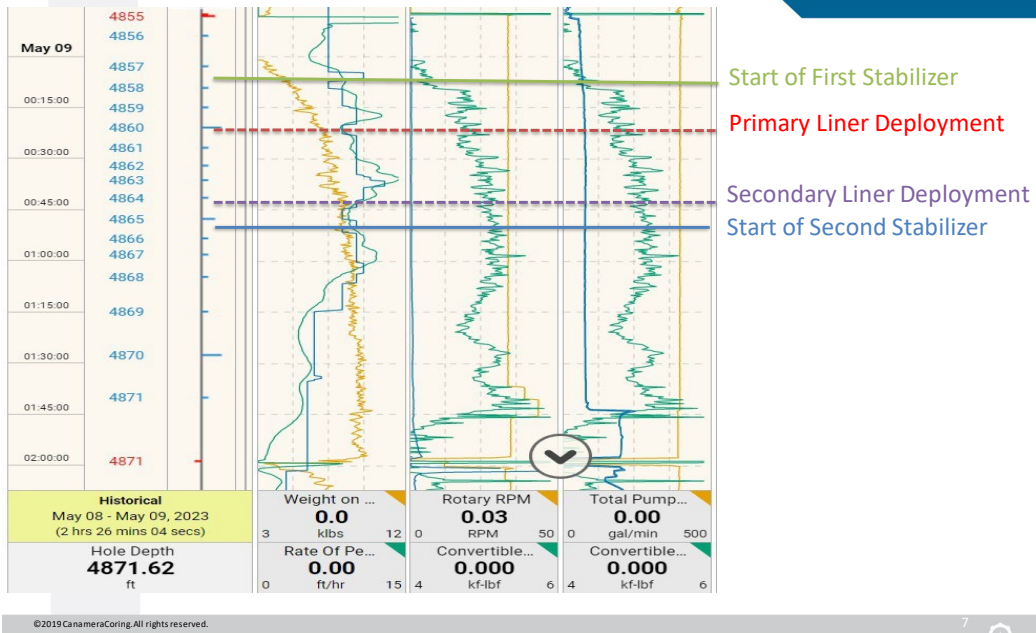


Figure G-5. This shows EDR data. Engagement of stabilizers - going from a 9.5-inch diameter to an 8-3/4-inch hole was a consistent issue.

Zone 1 Core Run #2



- CCI 700 60' JMS BHA – 713 Bit
 - Sensored
- Cored from 4,871' – 4,878'
- ROP 3.5 ft./hr.
- Core jammed
 - @ 4,874 increased rotary to 50 RPM.
 - Began to see erratic torque spikes brought rotary down to 40.
 - 4,878' lost all torque
 - Pumped 3 sweep of torque ease.
 - Brought weight up in increments of 1K from 8k to 20K.
- 7' cored 6' Recovered
- 2 JMS Deployments
 - Primary
 - ~4,873"
 - Secondary
 - ~4,878'



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Figure G-6. This is the second core run in the vertical hole, from 4,871 to 4,878 ft.

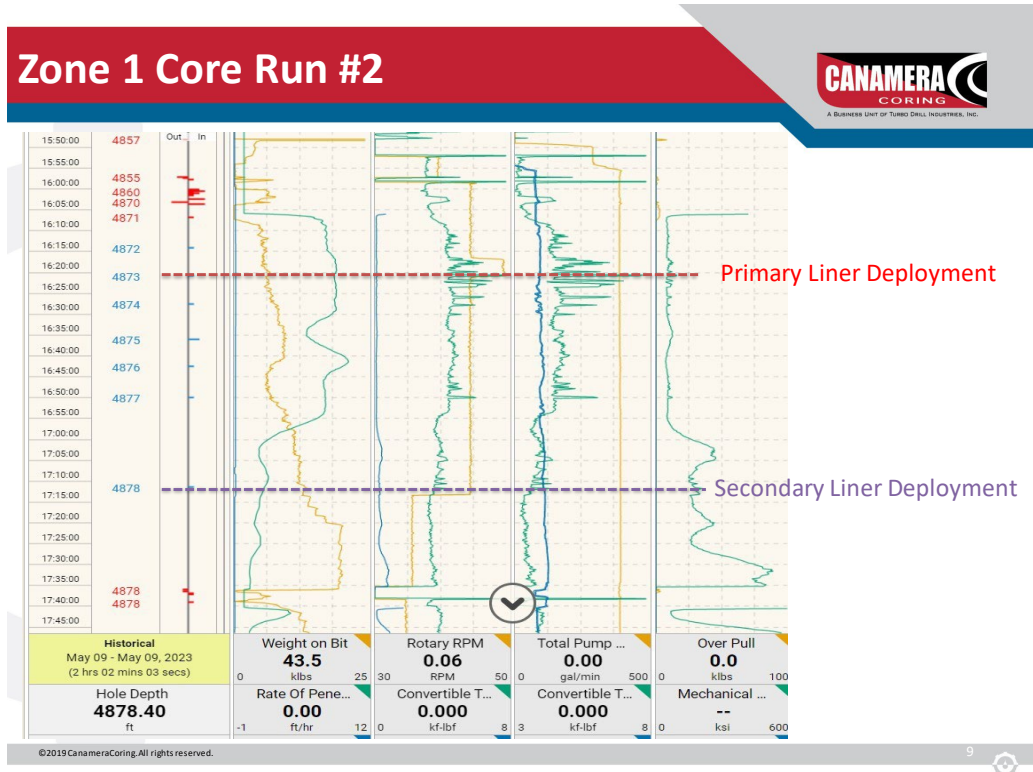


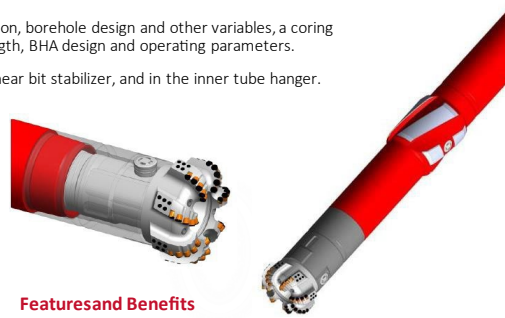
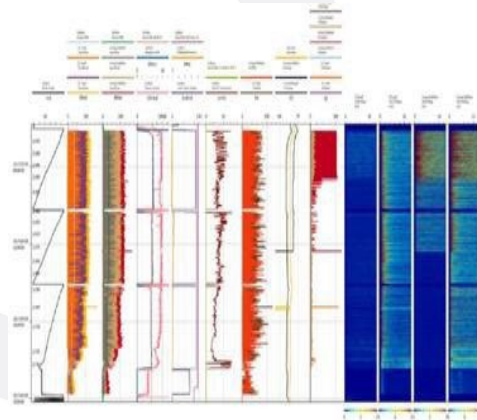
Figure G-7. EDR data for Zone 1, Core Run #2.

Coring Dynamics



Measures Core Barrel Vibration to Improve Core Quality, Recovery and Efficiency

- Downhole forces experienced during the coring process adversely affect critical key performance indicators of a successful coring operation: quality, recovery and efficiency.
- By measuring the effect of operating parameters, equipment selection, borehole design and other variables, a coring program can be optimized through intelligent selection of barrel length, BHA design and operating parameters.
- Data can be collected at three points using CuBIC® 3G; the bit, the near bit stabilizer, and in the inner tube hanger.



Features and Benefits

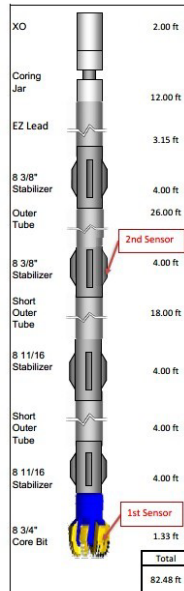
- Rotational measurements: verification of rotating inner tube
 - Is inner barrel stabilization needed?
- Data measured includes
 - Rotation (RPM)
 - Axial and lateral vibration and shock
 - Inclination, time and temperature
- Memory mode
- Easily integrates within all Canamera Coring platforms

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Figure G-8. Bit dynamics can be recorded. Sensor locations are shown in Figure G-9.

BHA



Item	Component	Vendor	OD	ID	Top Connection	Length	Cum Length	Remarks
1	Core Bit	Canamera	8.75 in	4.00 in	6.480 HT	1.33 ft	1.33 ft	
2	8 11/16 Stabilizer	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	5.33 ft	
3	Short Outer Tube	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	9.33 ft	
4	8 11/16 Stabilizer	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	13.33 ft	
5	Short Outer Tube	Canamera	8.38 in	5.75 in	6.480 HT	18.00 ft	31.33 ft	2F-3R Ported Flapper Float 75 klbs Latch Up Only
6	8 3/8" Stabilizer	Canamera	7.00 in	5.75 in	6.480 HT	4.00 ft	35.33 ft	
7	Outer Tube	Canamera	8.38 in	5.75 in	6.480 HT	26.00 ft	61.33 ft	
8	8 3/8" Stabilizer	Canamera	8.38 in	5.75 in	6.480 HT	4.00 ft	65.33 ft	
9	EZ Lead	Canamera	7.00 in	2.50 in	4 1/2 IF	3.15 ft	68.48 ft	
10	Jar	Canamera	6.88 in	2.25 in	4 1/2 IF	12.00 ft	80.48 ft	
11	XO					2.00 ft	82.48 ft	

CORING BHA: 82.48 ft

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Figure G-9. BHA and Sanvean sensor locations for Zone 1.

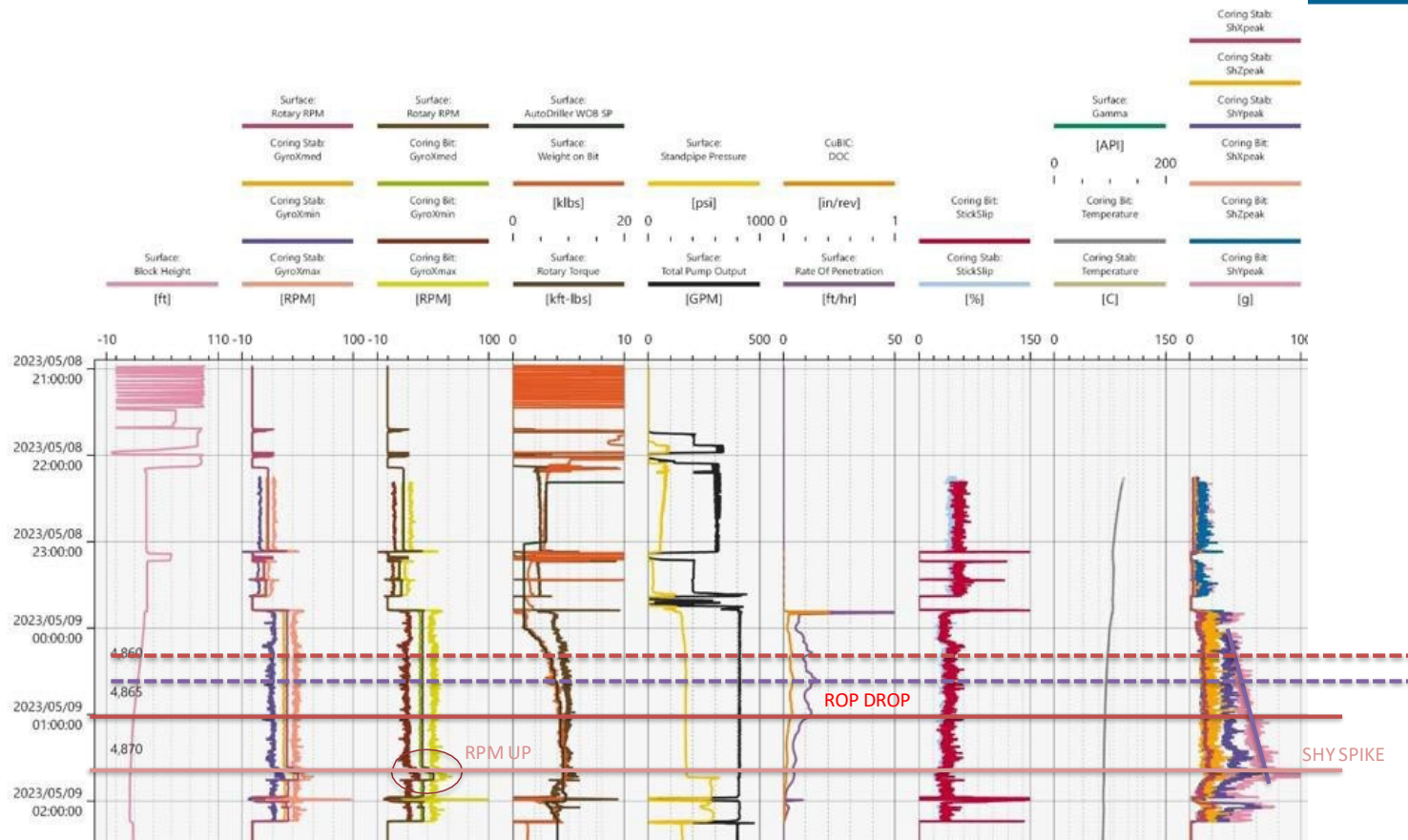
Canamera's recommendations for the next zones to be cored were as follows.

“While drilling to the core point, we recommend the last 5’ be drilled with reduced weight on bit. As per Sanvean and Canamera's recommendations for core #3 - WOB 4k to 12k psi, RPM 35 to 55 rpm, and GPM 350 to 400 gpm. Keep it consistent when coring is going well.”

After coring in the inclined section of the hole (described below) Canamera concluded:

- Lower WOB and gradual upward staging yield longer runs.
- Full hole 8-3/4-inch hole size (i.e., do not start a run in the 9-1/2-inch hole) proved to provide the best runs.
- 8.44” stabilizers and a standard BHA provided the best runs and recoveries.
- The friction reduction shoe seemed to provide better runs and recoveries.
- The jam mitigation system was activated eleven times.

Sensor Zone 1 Core Run #1



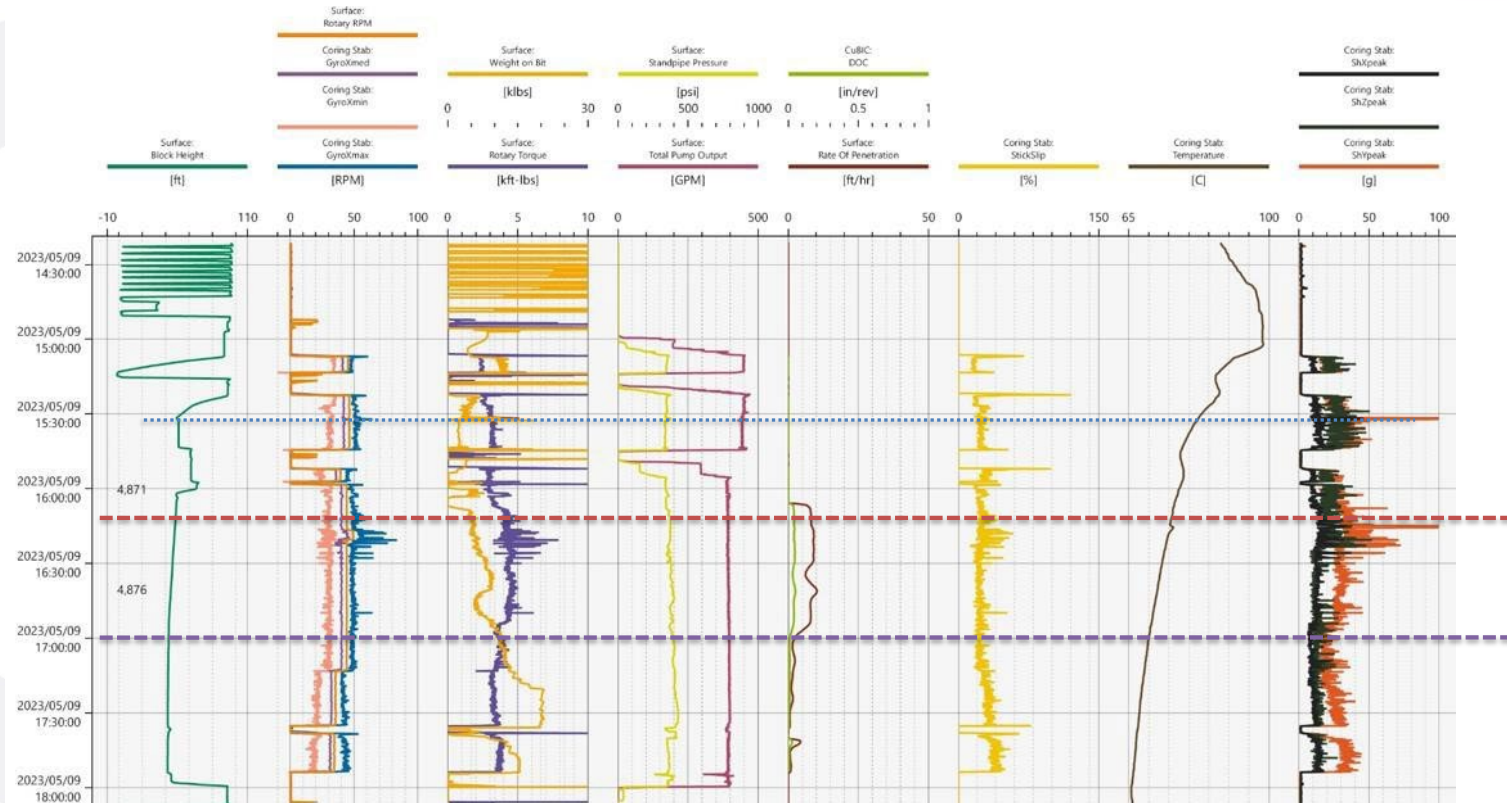
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Figure G-10. Data from sensor - Zone 1, Run 1. Should be able to zoom in to view.



Sensor Zone 1 Core Run #2



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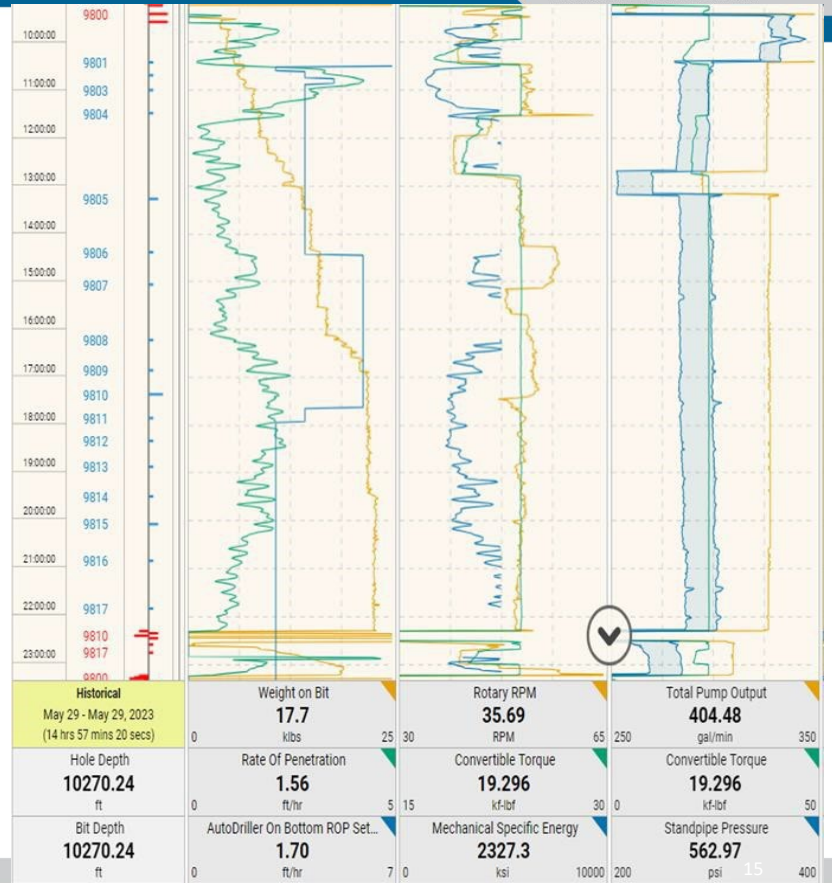
Figure G-11. Data from sensor - Zone 1, Run 2. Should be able to zoom in to view.



Zone 2 Core Run #1



- CCI 700 60' JMS BHA – 913 Bit
 - Sensored
- Cored from 9,800' – 9,817'
- ROP 1.9 ft./hr.
- Core jammed @ 9.817'
- 17' cored 16.6' Recovered
- No JMS deployments
- 8 ¾" Cleanout Run



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Figure G-12. Data from EDR - Zone 2, Run 1. This zone was cored from 9,800 to 9,817 ft MD. Seventeen feet were cored and 16.6 feet were recovered.

BHA 1 – Soft-torque inducing high variance in RPM. ROP seems formation dependent.

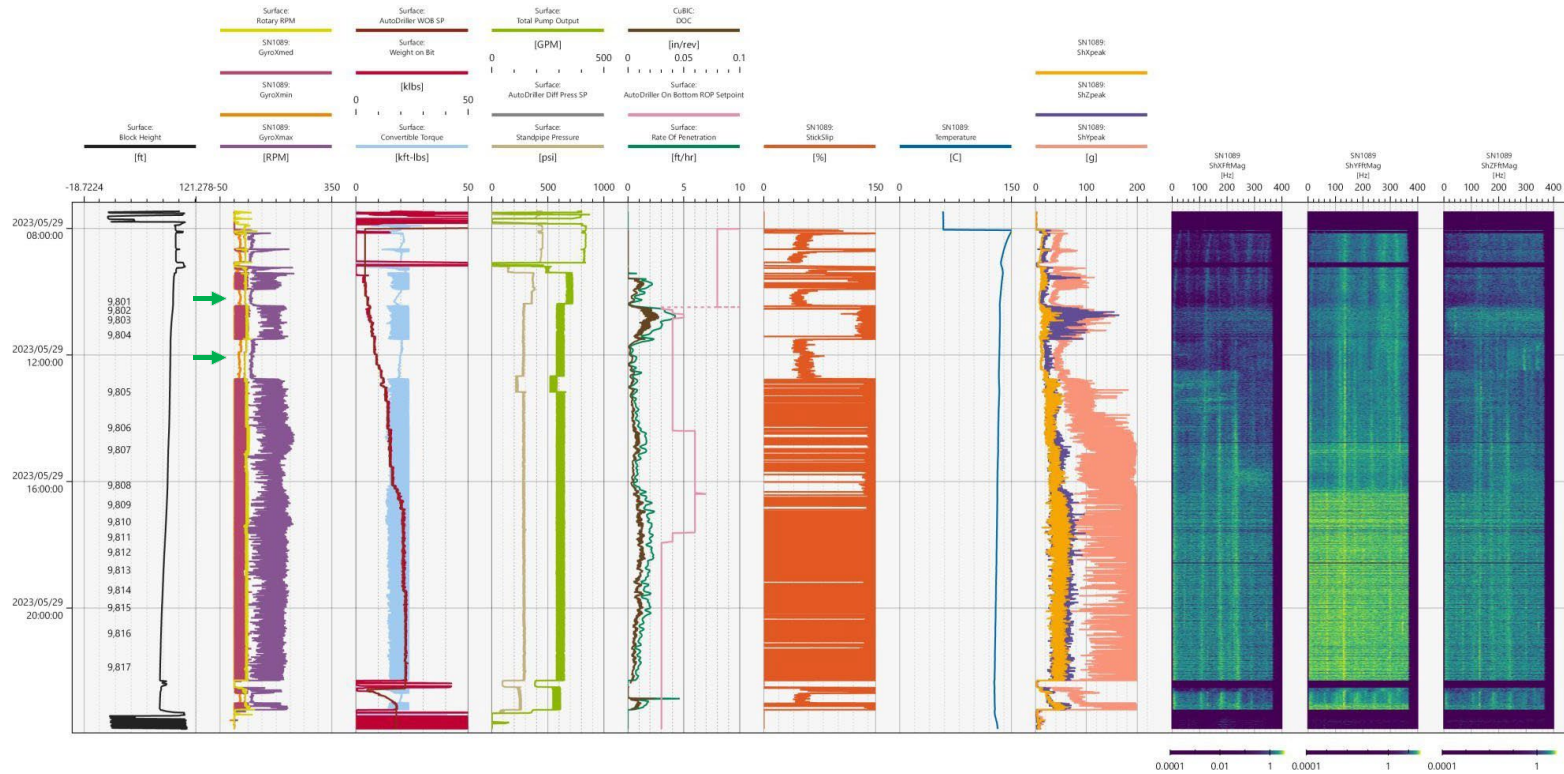


Figure G-13. Data from sensor - Zone 1, Run 2. Should be able to zoom in to view. One of the real lessons learned was that Revit strongly improved the coring performance.

Zone 2 Core Run #2



- CCI 700 60' JMS BHA – 713 Bit
 - Sensored
- Cored from 9,823' – 9,853'
- ROP 2.7 ft./hr.
- 30' cored 28,4' Recovered
- 2 JMS Deployments
 - Primary
 - ~9,828"
 - Secondary
 - ~9,832'
- 9 ½" Drill Ahead

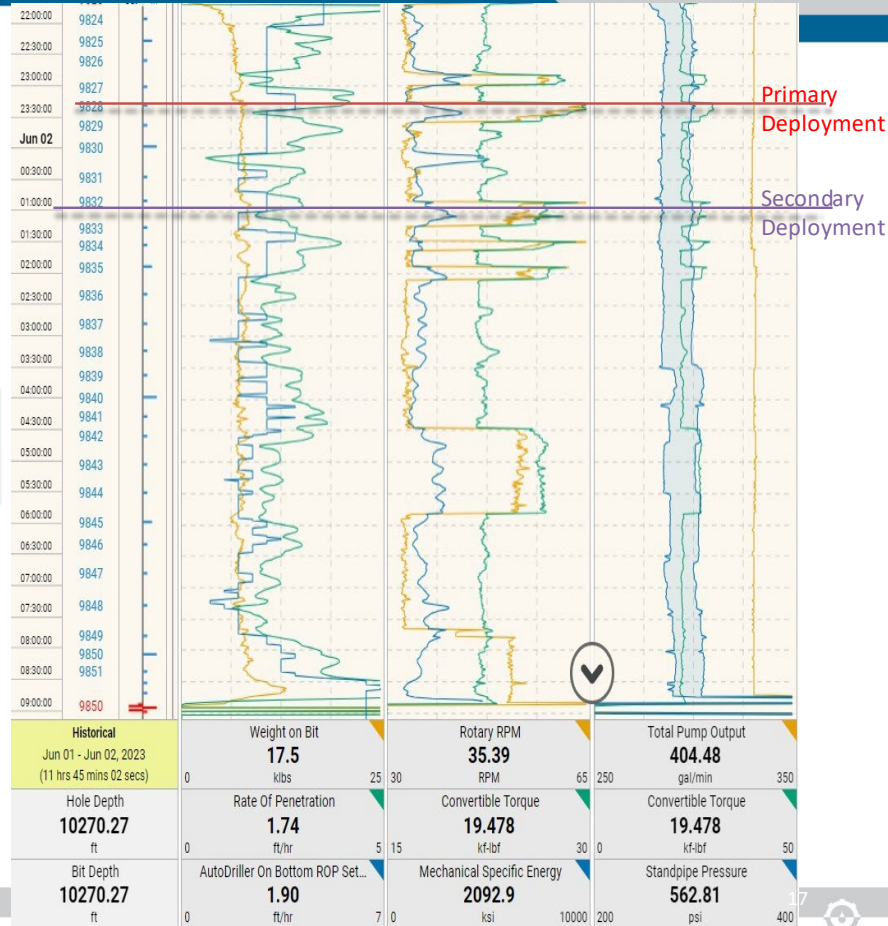


Figure G-14. Data from EDR - Zone 2, Run 2 This zone was cored from 9,828 to 9,832 ft MD. Thirty feet were cored and 28.4 feet were recovered. There were two jam mitigation deployments.

BHA 2 – RPM variation rises during soft-torque ON. ROP priority on autodriller settings?

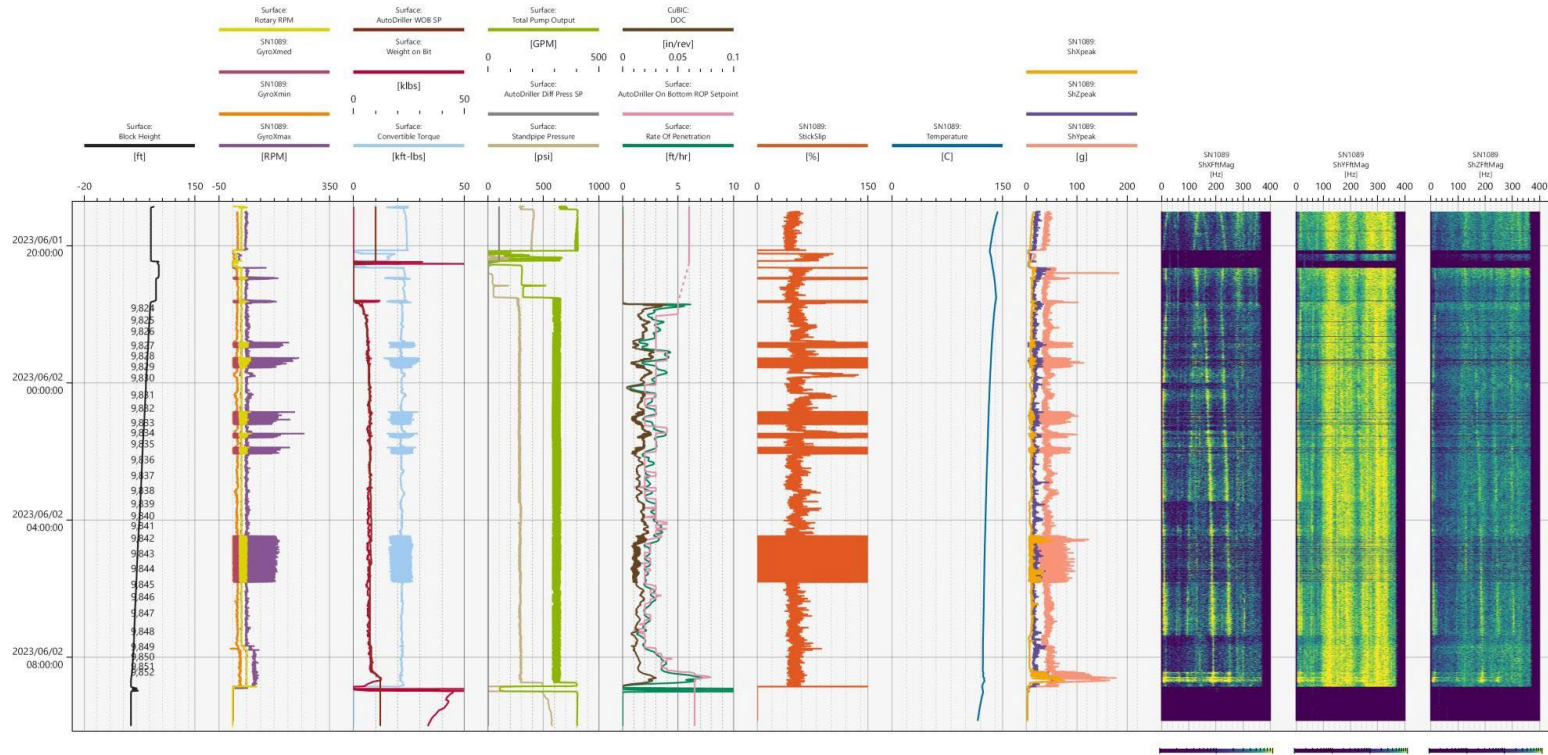
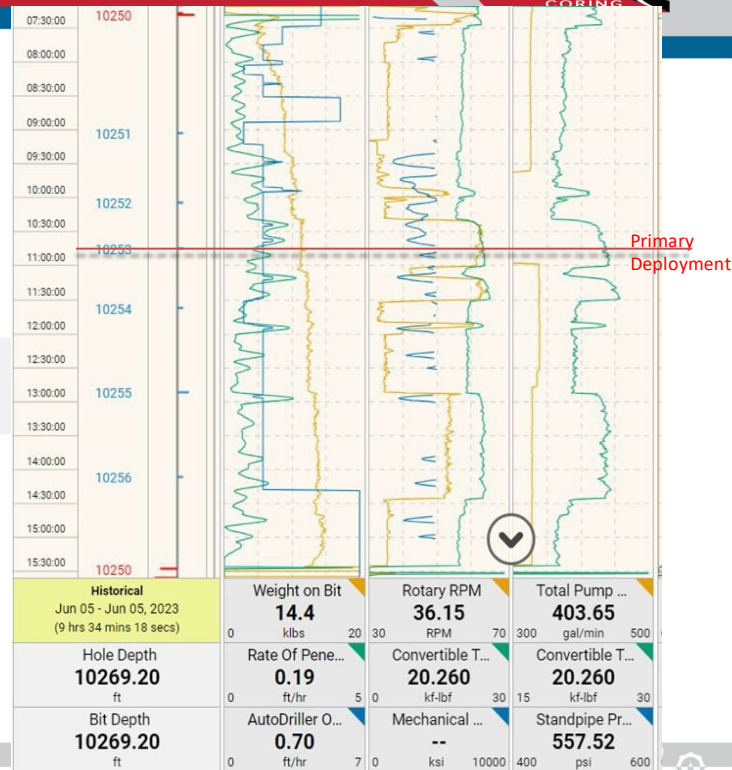


Figure G-15. Sensor from EDR - Zone 2, Run 2 This zone was cored from 9,828 to 9,832 ft MD. Thirty feet were cored and 28.4 feet were recovered. By Soft Torque, Sanvean is referring to Revit. As indicated, coring technicians felt that Revit significantly improved performance.

Zone 2 Core Run #3



- CCI 700 60' JMS BHA – 713 Bit
 - Sensored
- Cored from 10,250' – 10,256'
- ROP 1.3.ft./hr.
- Core jammed @10,256'
- 6' cored 5,5' Recovered
- 1 JMS Deployment
 - Primary
 - ~10,253"
- 8 3/4" Drill Ahead



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Figure G-16. Data from EDR - Zone 2, Run 3 This zone was cored from 10,250 to 10256 ft MD. Six feet were cored and 5.5 feet were recovered. There was one jam mitigation deployment. Note that after this run, the hole was drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.

BHA 3 – Soft-torque ON during parts of run. ROP does not appear to be primary setpoint. As bit plays out, S-T may be inducing high shocks.

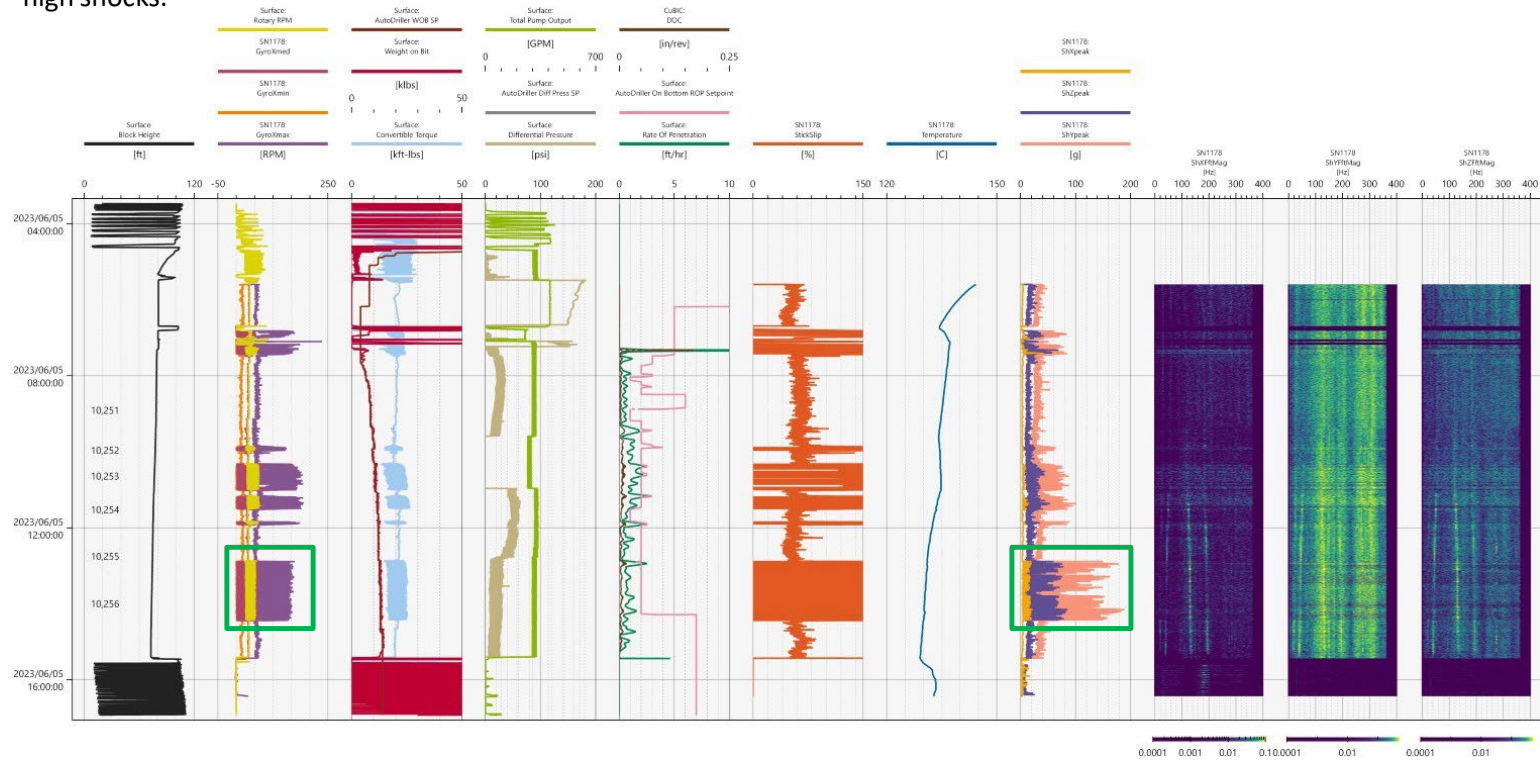


Figure G-17. Data from the sensor - Zone 2, Run 3 This zone was cored from 9,828 to 9,832 ft MD. By Soft Torque, Sanvean is referring to Revit. As indicated, coring technicians felt that Revit significantly improved performance.

Zone 2 Core Run #4



- CCI 700 60' JMS BHA – 713 Bit
 - Sensored
- Cored from 10,264' – 10,272'
- ROP 1 ft./hr.
- Core jammed @ 10,272'
- 8' cored 4,6' Recovered
- No JMS Deployments
- 8 ¾" Drill Ahead

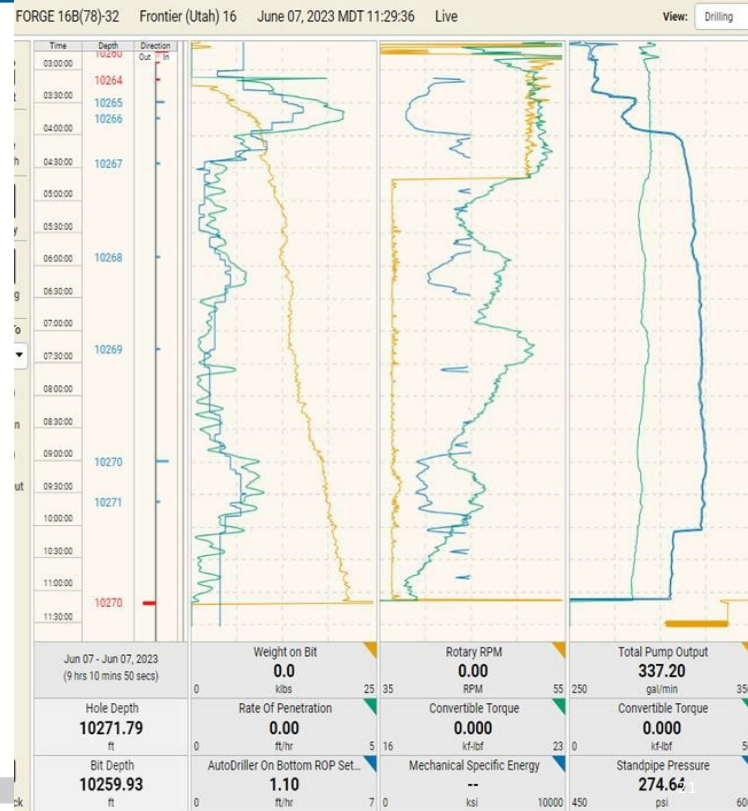


Figure G-18. Data from EDR - Zone 2, Run 4 This zone was cored from 10,250 to 10256 ft MD. Eight feet were cored and 4.6 feet were recovered. Note that after this run, the hole was drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.

BHA 4 – Soft-torque OFF. ROP responds closely to autodriller.

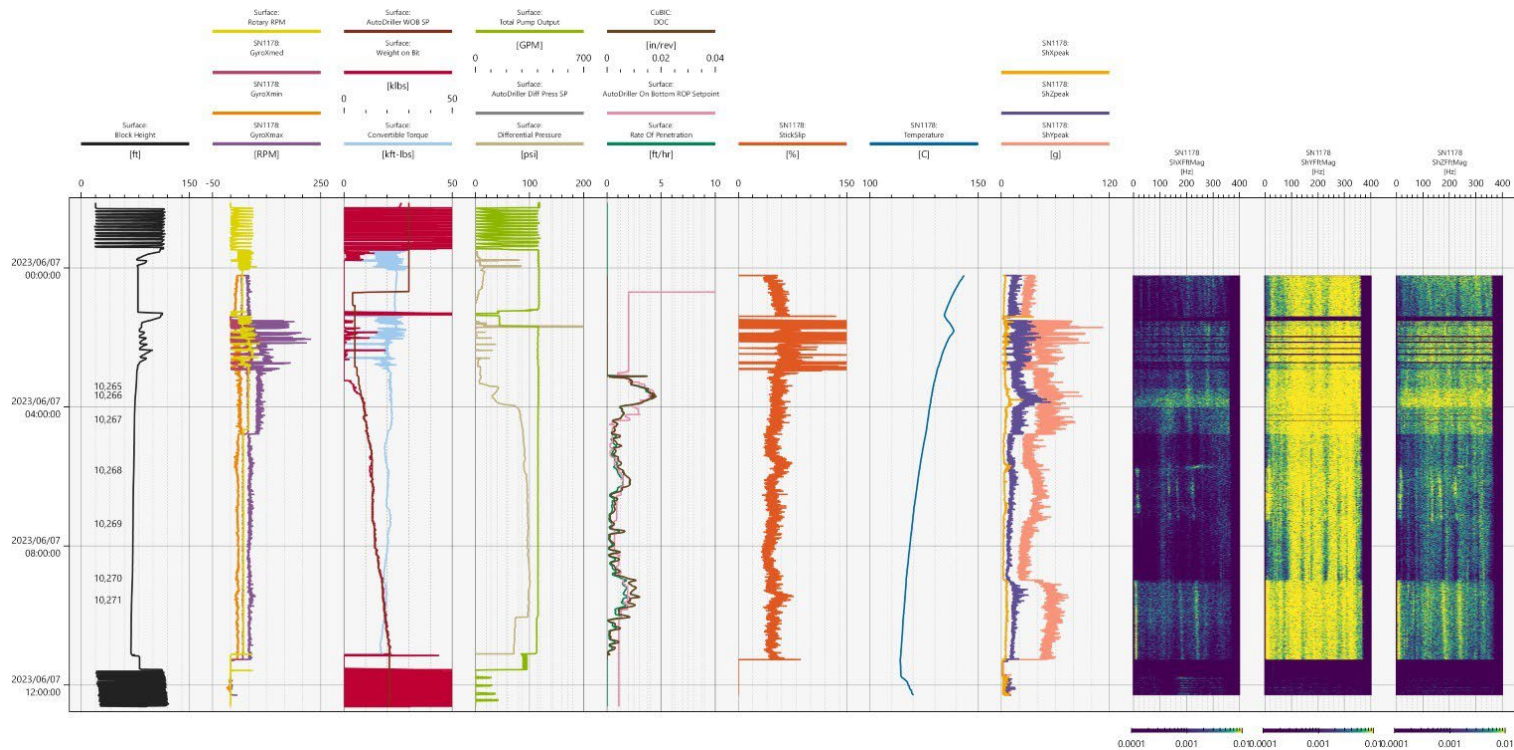


Figure G-19. Data from the sensor - Zone 2, Run 4 This zone was cored from 9,828 to 9,832 ft MD. Thirty feet were cored and 28.4 feet were recovered. By Soft Torque, Sanvean is referring to Revit. As indicated, coring technicians felt that Revit significantly improved performance.

BHA Run #5



Project BHA Details



Name	Utah Forge #5	Core Bit	713	IADC	S232
Components	75.11	Serial #	CCI-3409-01	TFA	1.05
BHA Total	76.42	Size	8.75 x 4.00	Length	15.7480
Description	60' Standard JMS System with 8.44 stabs	Nozzles	14.000		

Name	Description	Serial	Length	ID	OD
Bit Stab		4223-02-01	4.0000	5.750	8.440
Core BBL		4481-01	26.0000	5.750	7.000
Stab		3695-01-07	4.0000	5.750	8.440
Core BBL		1460-7	26.0000	5.750	7.000
Stab		1948-01-05	4.0000	5.750	8.440
EZ-Lead		2674-01-3	2.9800	1.250	7.000
Core Jar		662-003	8.1300	2.250	6.500



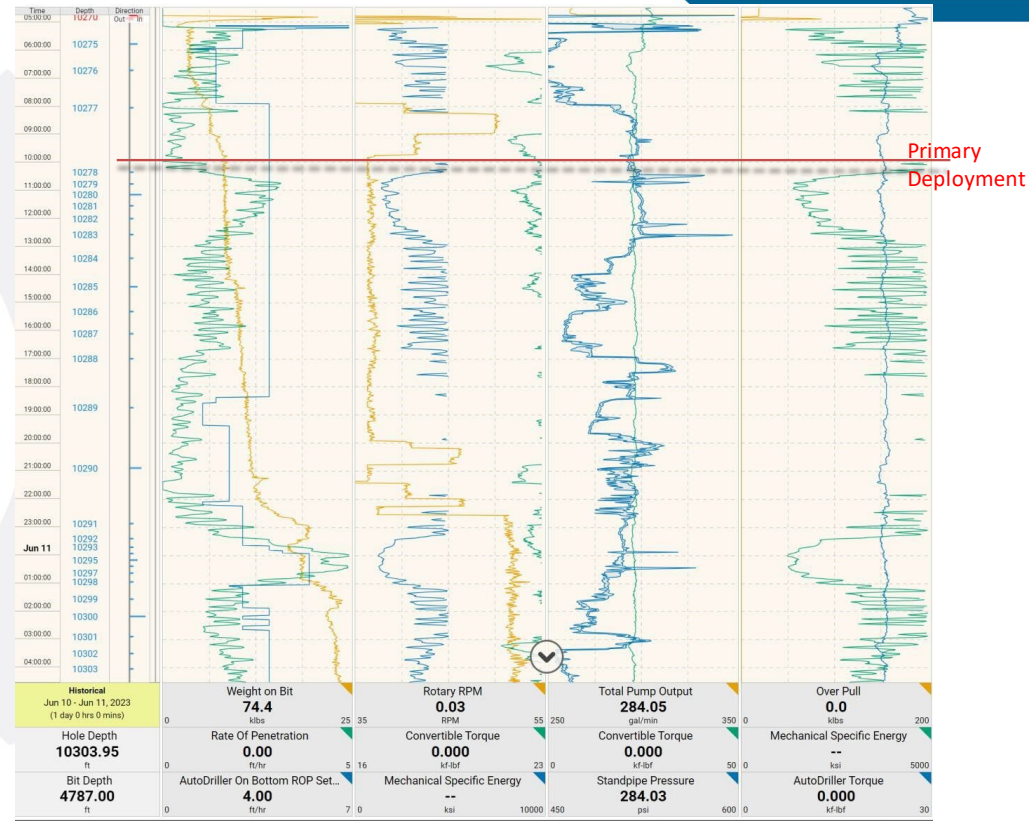
Figure G-20. BHA description for drilling from 10,274 to 10,304 ft MD. See Figure G-21.



Zone 2 Core Run #5



- CCI 700 60' JMS BHA – 8.44 Stabs – 713 Bit
 - Sensored
- Cored from 10,274' – 10,304'
- ROP 1 ft./hr.
- Full Run
- 30' cored 28' Recovered
- 1 JMS Deployments
 - Primary Deployed 10,278'
- 8 3/4" Drill Ahead



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Figure G-21. Data from EDR - Zone 2, Run 5 This zone was cored from 10,274 to 10,304 ft MD. Thirty feet were cored and twenty-eight feet were recovered. Note that after this run, the hole was again drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.



BHA 5 – Soft-torque OFF. Very high shocks, likely formation driven, RPM/WOB do not appear to drive shock. Frequencies shift during instances of higher shock.

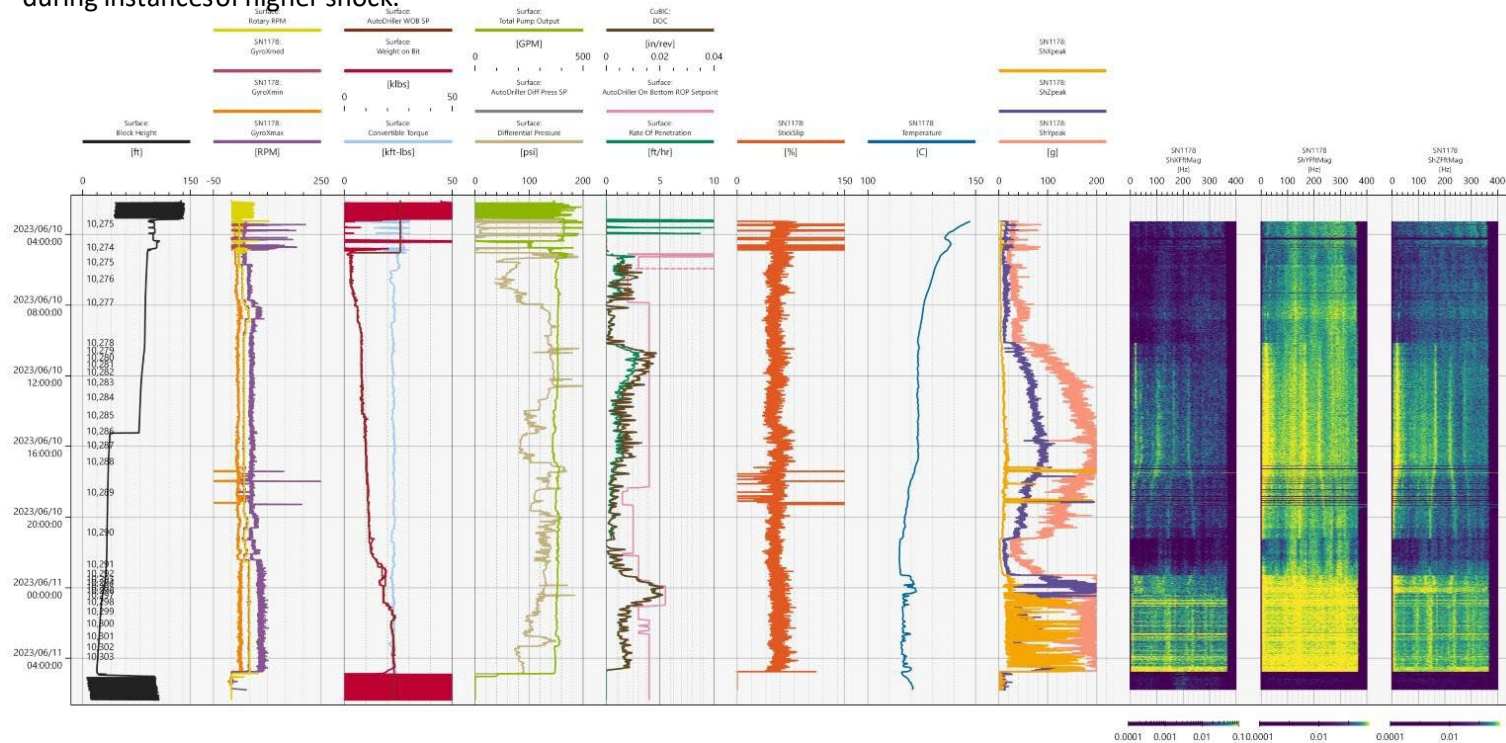


Figure G-22. Data from the sensor - Zone 2, Run 5. This zone was cored from 9,828 to 9,832 ft MD. Thirty feet were cored and 28.4 feet were recovered. By Soft Torque, Sanvean is referring to Revit. As indicated, coring technicians felt that Revit significantly improved performance.

Zone 2 Core Run #6



- CCI 700 60' JMS BHA – 8.44 Stabs – 713 Bit
 - Sensored
- Cored from 10,430' – 10,460'
- ROP 1.3 ft./hr.
- Full Run
- 30' cored 25,7' Recovered
- 1 JMS Deployments
 - 8 3/4" Drill Ahead

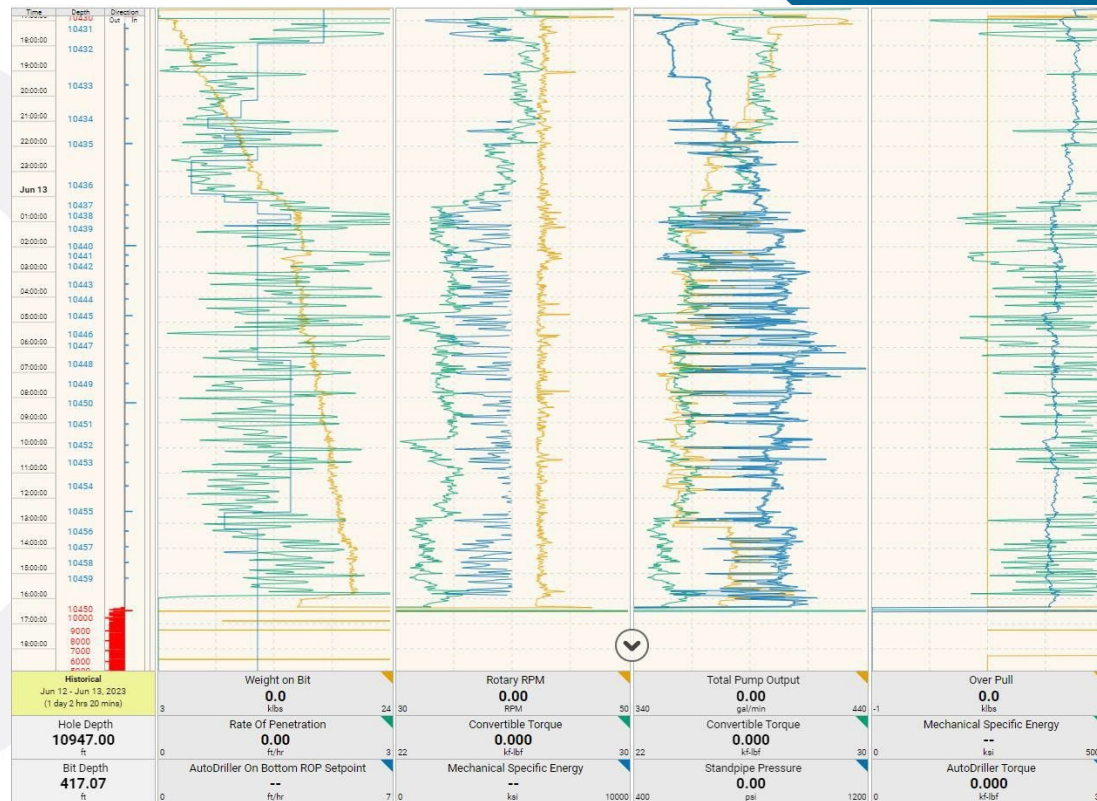


Figure G-23. Data from EDR - Zone 2, Run 6 This zone was cored from 10,430 to 10,460 ft MD. Thirty feet were cored and 25.7 feet were recovered. Note that after this run, the hole was again drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.

BHA 6 – Soft-torque OFF. Relatively low WOB and good cutter engagement resulted in longer run.

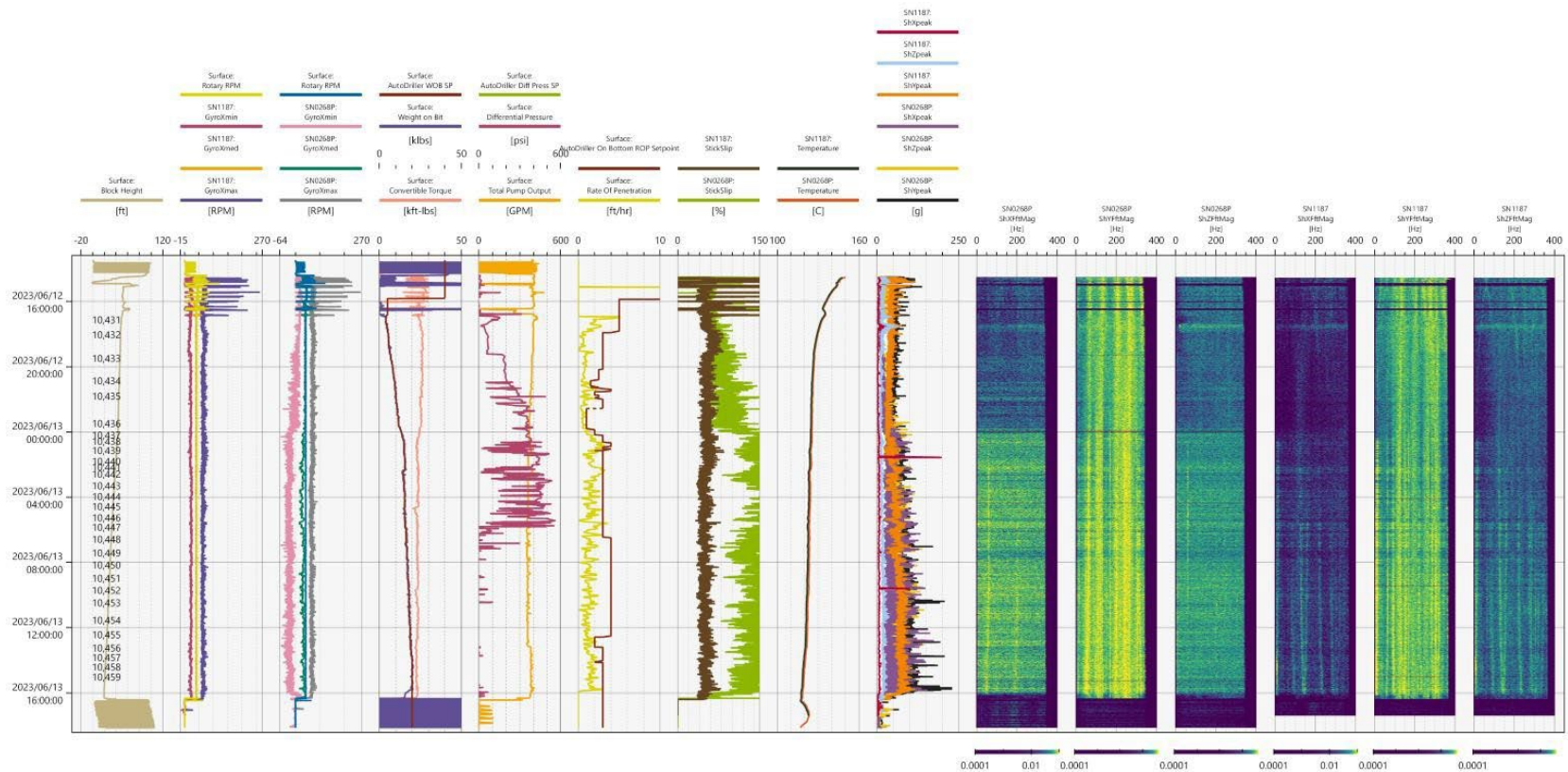


Figure G-24. Data from the sensor - Zone 2, Run 6 This zone was cored from 9,828 to 9,832 ft MD. Thirty feet were cored and 25.7 feet were recovered. By Soft Torque, Sanvean is referring to Revit. Despite what is stated here it is uncertain whether Revit was on or off.

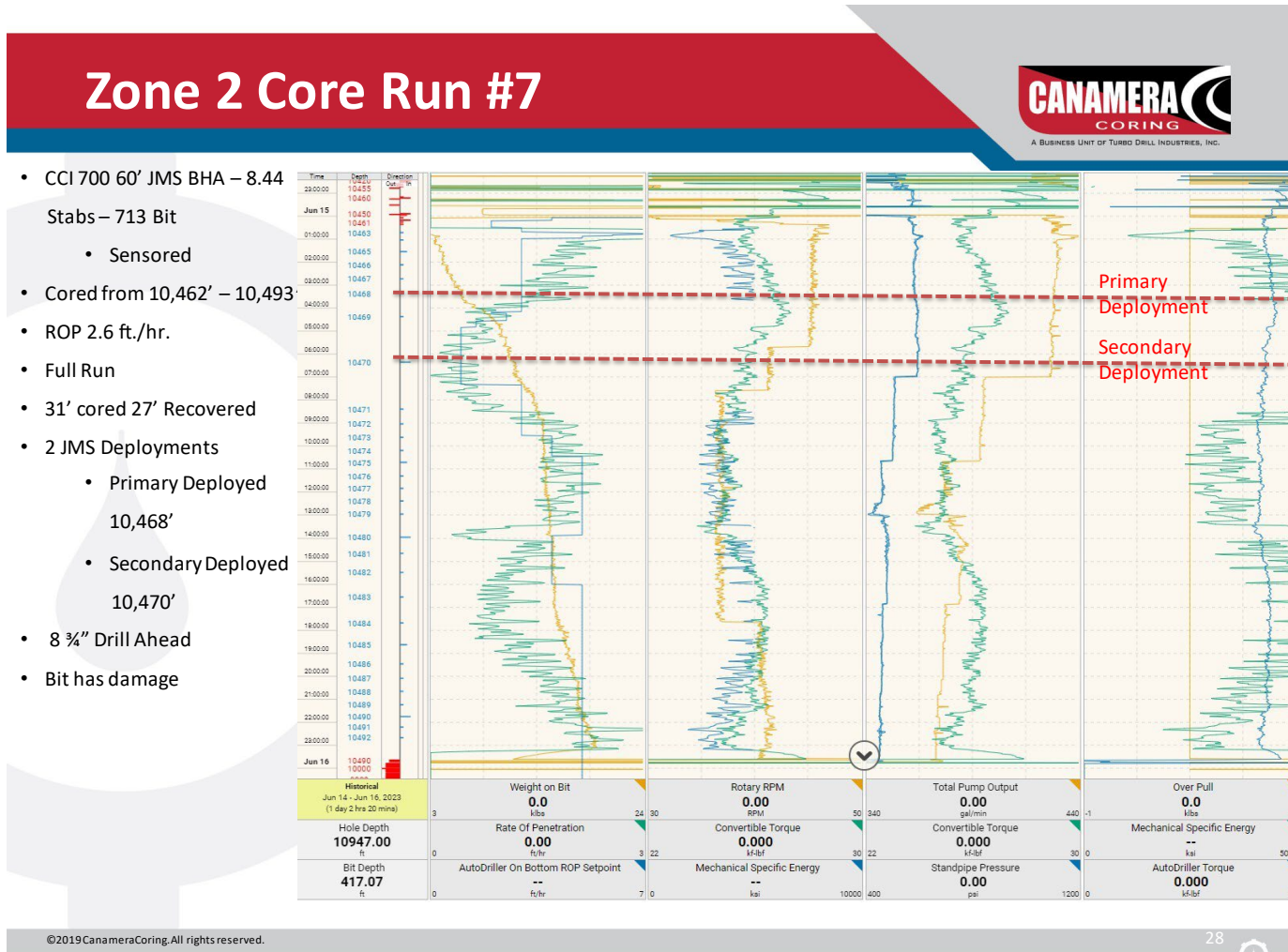


Figure G-25. Data from EDR - Zone 2, Run 7 This zone was cored from 10,462 to 10,493 ft MD. Thirty-one feet were cored and twenty-seven feet were recovered. Note that after this run, the hole was again drilled ahead with an 8-3/4-inch bit to avoid any size mismatch for the next coring run and avoid binding when stabilizers engaged.

BHA 7 – Soft-torque OFF. Interesting FFT response during RPM step test. Shocks rise with WOB, but higher ROP setpoint yields longer run.

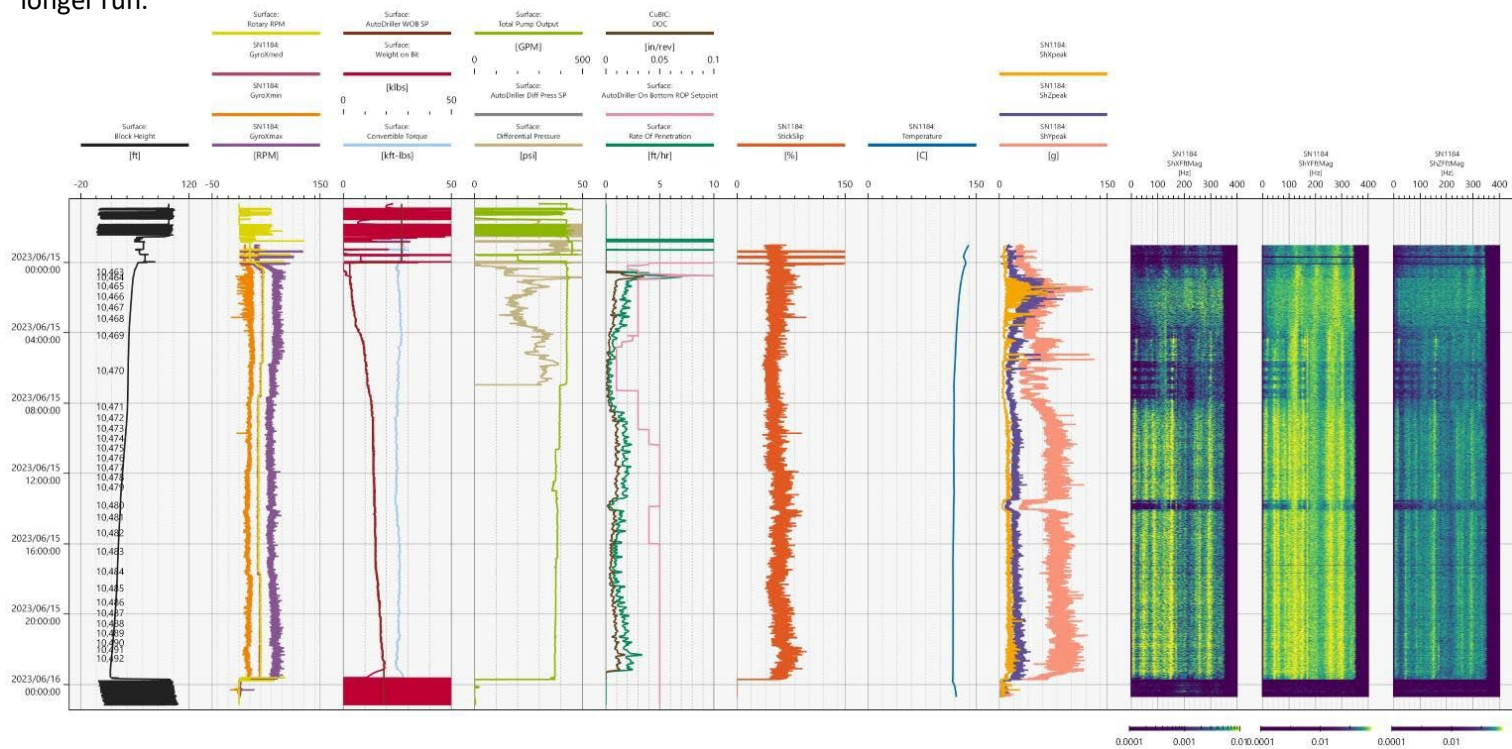


Figure G-26. Data from the sensor - Zone 2, Run 6 This zone was cored from 9,828 to 9,832 ft MD. Thirty-one feet were cored and 27 feet were recovered. By Soft Torque, Sanvean is referring to Revit. Despite what is stated here it is uncertain whether Revit was on or off.

Appendix H: Circulation Program

Circulation Program: July 4/5, 2023, and July 18/19, 2023

H-1. Background

The aim was to implement low-rate injection to interrogate the reservoir between the injection and the production wells, 16A(78)-32 and 16B(78)-32, respectively. In addition, it was desirable to assess if interconnection had resulted from the first fracturing campaign (April 2022) and to determine the partitioning of flow between the three frac stages previously pumped. Consequently, the circulation testing was designed to use low enough injection rates so that limited new hydraulic fracturing would be created and to pump volumes less than each stage of the April 2022 fracture stages - for the same reason. The original circulation plan (changed on the fly as field situations dictated) is included in Appendix A.

H-2. July 4, 2023 - Circulation 1, Day 1

SLB was rigged up with one MPF-331 CT Pump Truck to well 16A(78)-32. Tracer injection was set up for addition into the suction manifold of the CT Pump Truck at a constant concentration using 2,7-nds. The treating pressure at the 16A(78)-32 wellhead is shown for July 4, 2023, in Figures 1 and 2. As can be seen, injection started at 0.5 bpm, was later increased to 2.5 bpm, and finally was increased to a maximum rate of 5 bpm. The single pumping unit could not achieve 5 bpm at the wellhead pressure encountered and the second (standby) unit was rigged up and brought on line. Subsequently, the first pumping unit was shut down due to mechanical issues and the last part of the first day was carried out with a single pumping unit. Notice several features:

- 1) Wellhead pressure did not build rapidly at 0.5 bpm. This is unlike the initial openhole DFIT and shear stimulation treatments which built and opened rapidly. This is not unexpected because additional frac stages have been pumped since those treatments were pumped.
- 2) There could have been some limited fill-up of casing fluid volume at the start of pumping. The cause of the rapid pressure decline for the slug tests performed several days prior is uncertain since the well has held pressure since pumping terminated - indicating almost no reservoir permeability - as expected from lack of drilling mud losses while drilling both wells.
- 3) When the injection rate is increased to 5 bpm, the wellhead pressure builds more rapidly and rolls over at about 4,486 psi, well above the previously determined fracture gradient considering a wellbore filled with water.

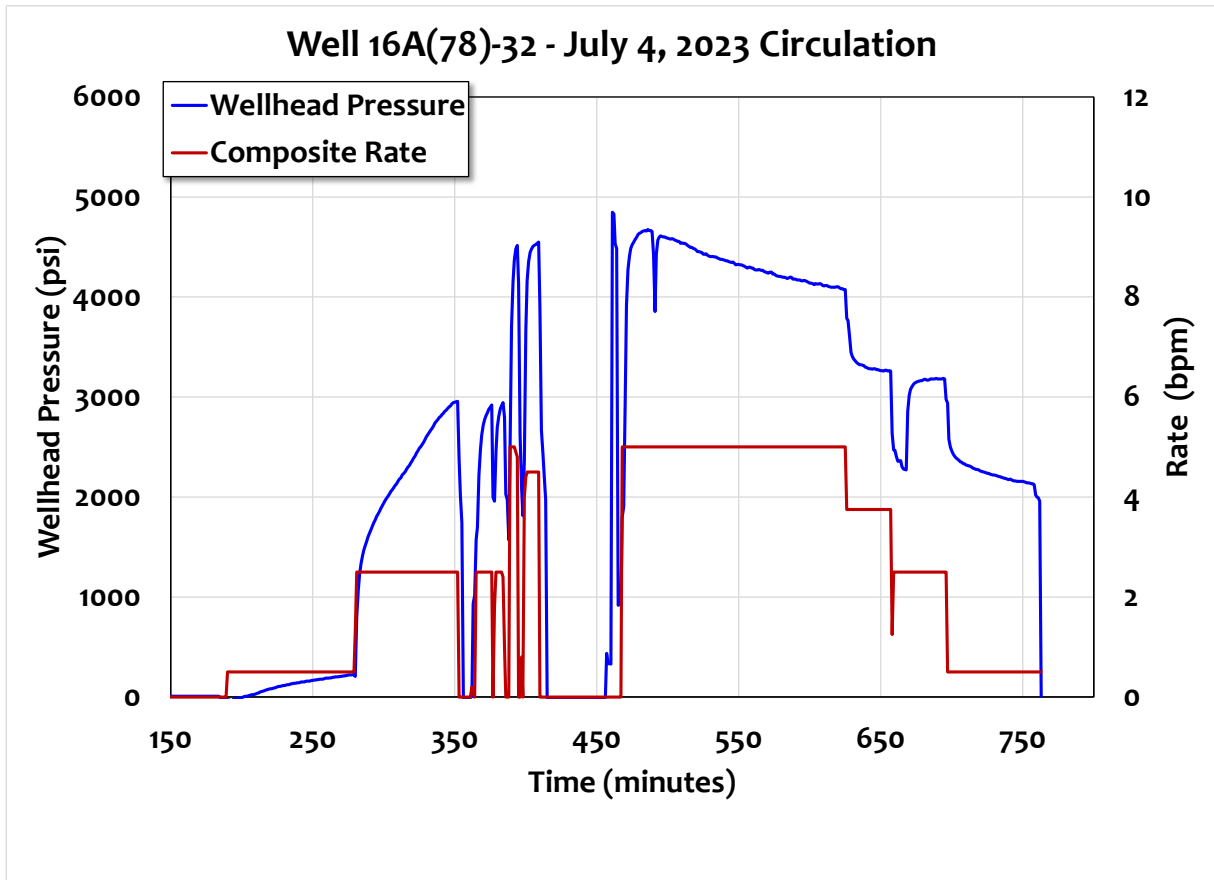


Figure H-1. Treating pressure and total wellhead injection rate for pumping into Well 16A(78)-32 on July 4, 2023. Confirm times - there is a slight discrepancy that needs to be resolved. Time is since SLB recording started on the morning of July 4, 2023. These are data as supplied by SLB. They are available in file UofUforge16A7832_july_4_2023_slb.xlsx

The wellhead pressure on Well 16B(78)-32 built slowly while the flow line was closed. When the wellhead pressure reached 200 psi a throttling valve in the flow line was opened to maintain 200 psi as back-pressure by flowing to the pit. Late in the pumping, the back pressure was reduced to 100 psi. The wellhead pressure in Well 16B(78)-32 is shown in Figure H-3.

Note that the raw SLB data is on Pacific time.

Also note the reduction in treating pressure with time. Some of this may be due to an increase in hydrostatic head as cold fluid enters the wellbore, to thermoelastic aperture increase, to possible precipitate removal, or to reduction in tortuosity.

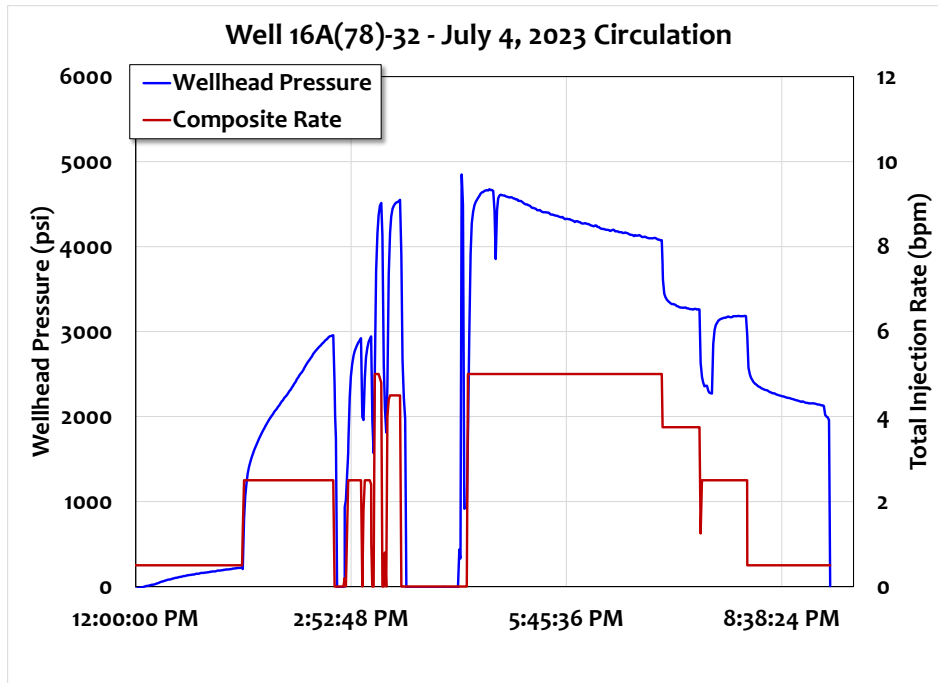


Figure H-2. Treating pressure and total wellhead injection rate for pumping into Well 16A(78)-32 on July 4, 2023. The original SLB data were on Pacific time. They have been converted to Mountain time here. File is UofUforge16A7832_july_4_2023_slb.xlsx

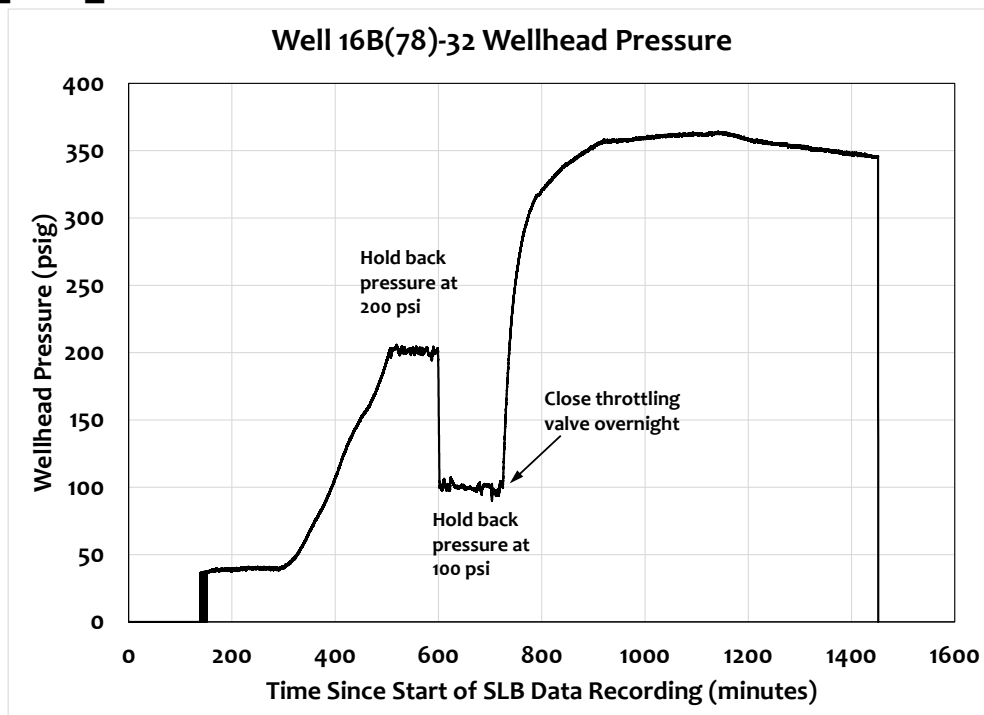


Figure H-3. Pressure response at the throttling valve in Well 16B(78)-32. Per plan, pressure built to 200 psi and was maintained at this level for approximately 100 minutes. Then the pressure was reduced to 100 psi. File is Well 16B_july_4.xlsx.

During the injection, there was flow from the well to the pit, but it was below the lower threshold for the flow meters placed in the flow line from well 16B(78)-32 - per manufacturer, this is 1 bpm.

H-3. July 5, 2023 - Circulation 1, Day 2

The injection program on July 5 was to pump for 6 hours at a constant injection rate of 5 bpm. This program was extended by 20 minutes to perform extra flow measurements. The pressure and rate chronology for the injection well (16A(78)-32) is shown in Figure H-4.

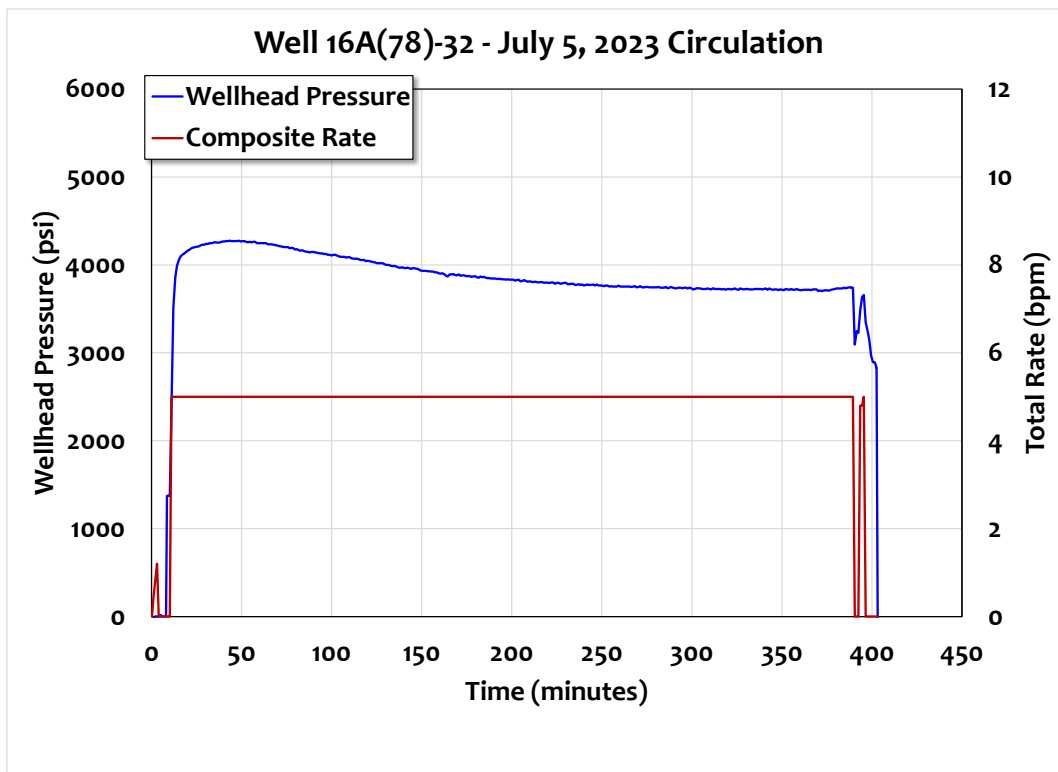


Figure H-4. Wellhead pressure in Well 16A(78)-32, as pumped on July 5, 2023. The ISIP is about 2,900 psi, suggesting a frac gradient of somewhat less than 0.77 psi/ft which is consistent with earlier measurements (Jan 2021) on this well for the original openhole DFIT.

Figure H-5 shows the wellhead pressure response on the production well (16B(78)-32). Figure H-6 shows flow measurements. These were made by timing flow into a five-gallon bucket. Flow was below the detection threshold of the flow meters except during surge cycles. The measured flows are also tabulated in Table H-1.

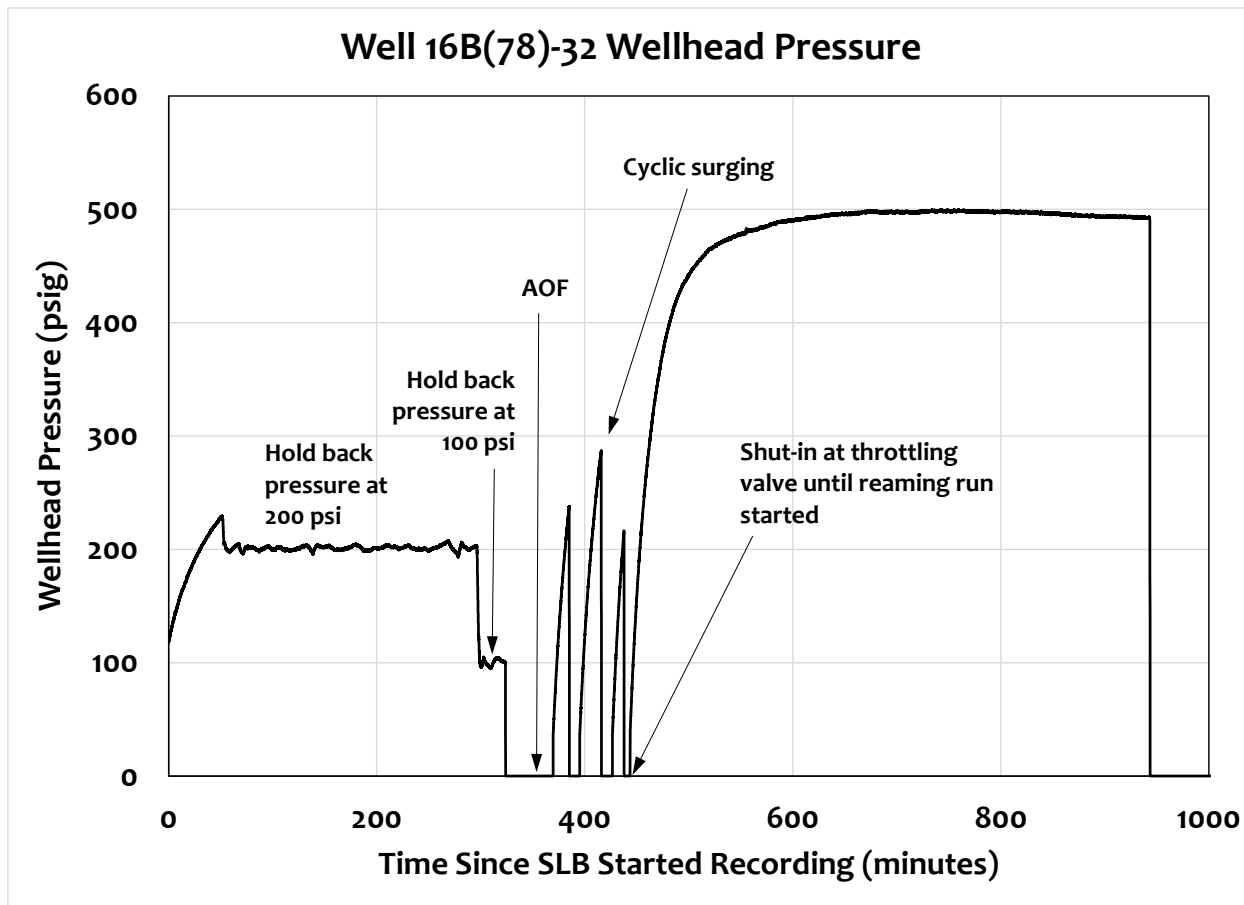


Figure H-5. Pressure response upstream of the throttling valve on Well 16B(78)-32. Of note, the back-pressure was systematically reduced and there were some buildup-surge cycles (although it is unlikely that this was felt substantially downhole). File is Well 16B_july_5_2023.xlsx.

Table H-1. July 5 Flow Measurements (16B(78)-32)

Date	Time (hr:min)	Time (minutes since 12:00 a.m. July 3)	Rate (bph)
July 5, 2023	10:45 a.m.	3,525	2.38
July 5, 2023	11:45 a.m.	3,595	4.20
July 5, 2023	01:40 p.m.	3,700	4.76
July 5, 2023	02:17 p.m.	3,737	5.95
July 5, 2023	02:44 p.m.	3,764	8.92
July 5, 2023	02:50 p.m.	3,770	10.28
July 5, 2023	03:20 p.m.	3,800	9.12
July 5, 2023	03:54 p.m.	3,834	10.45
July 5, 2023	04:25 p.m.	3,865	12.38
July 5, 2023	04:45 p.m.	3,885	14.77

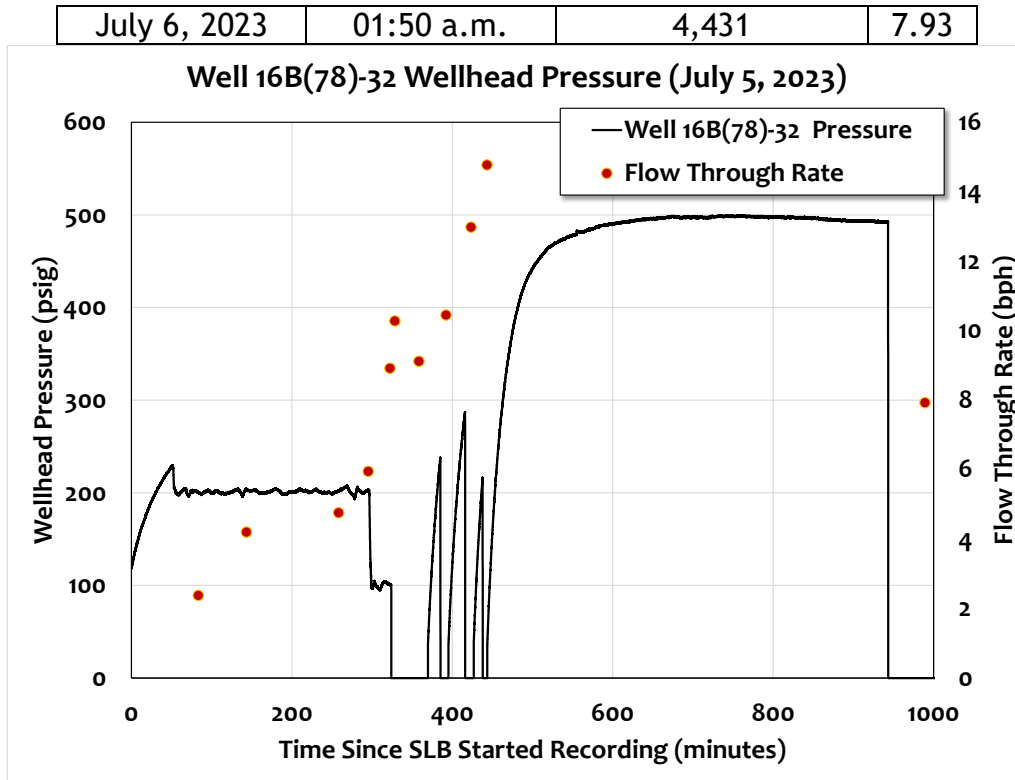


Figure H-6. The July 5, 2023, pressure response is shown as well as measured rates of flow through going to the pit from Well 16B(78)-32.

H-4. Composite Plots and Sampling

Composite plots for both wells are shown in Figures 7 and 8. In addition, bottoms-up samples from Well 16B(78)-32, collected after the circulation testing showed elevated levels of chlorides. These samples are summarized in Table H-2. The following is extracted and slightly modified from an email from A.T. Kuhns with ExLog.

A dummy casing run was carried out where wellbore circulation was done at 10,215 ft MD and annular outflow samples were caught. Subsequently, additional samples were caught while reaming at depths from 10,000 to 10,300 ft MD. During preparation for catching the fluid samples from the deep circulation while reaming (10,000 - 10,300 ft MD) the drill fluids representative (Sean Hart, with Sinclair Drilling Fluids) completed the scheduled mud check and found the chloride content had increased from approximately 500 - 550 ppm established content to approximately 800 ppm. Two full sets (1 - 60 ml, 1 - 250 ml sample bottles) of fluid samples were taken from the suction tank and inventoried as circulation from the deep section was at the shakers.

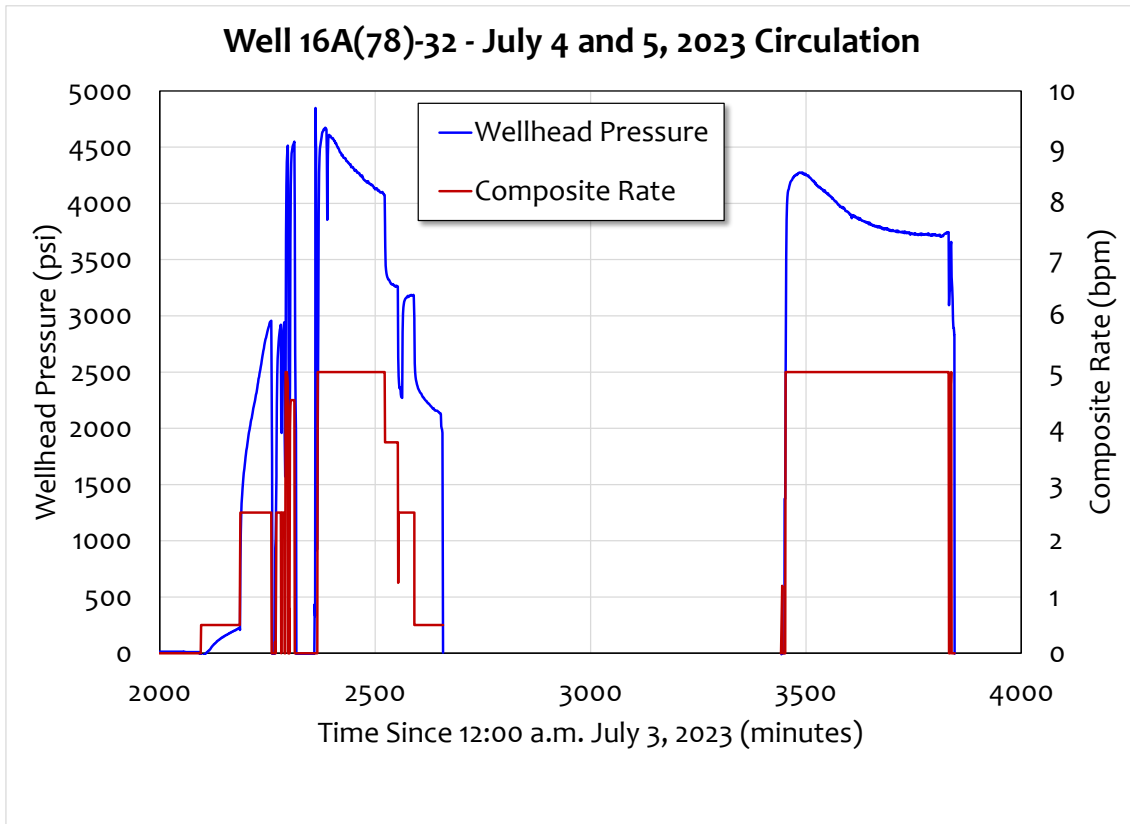


Figure H-7. Wellhead pressure and pumping rate for Well 16A(78)-32.

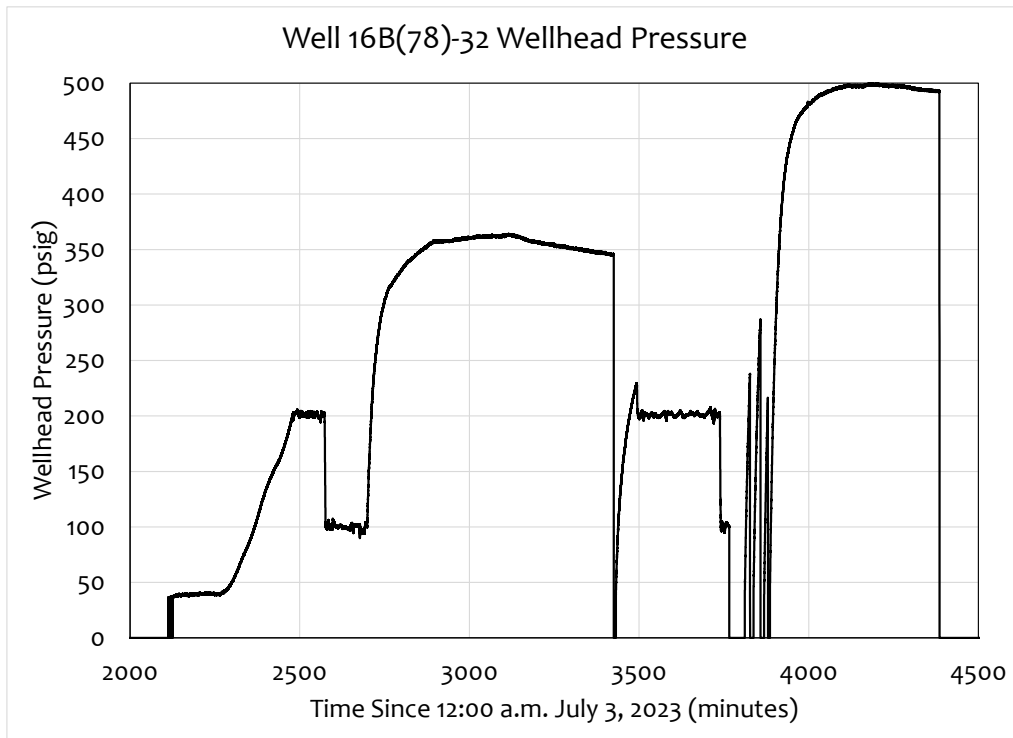


Figure H-8. Wellhead Pressure chronology at Well 16B(78)-32 for injections on July 4 - July 5, 2023.

The first samples of the deep reaming were taken at 13:00 hr. Then two 15-minute interval samples followed. After the two 15-minute intervals were complete as a correlation to the deep casing set samples interval, 10-minute samples were taken for a total of two bottoms-up volumes after the 13:30 hr catch. After completion of the sample catch, all samples from the casing circulation and the deep interval reaming were tested for chloride content.

The purpose of the chloride testing was based on the reported increase in chlorides on flowback of the Well 16A(78)-32 stimulations and by analogy that elevated chlorides in a sample from Well 16B(78)-32 may be an indicator of flow-through fluid from the intervals stimulated and pumped under pressure with tracer-bearing water. This would be diagnostic of a hydraulically induced connection between the wells.

The chloride test results for both circulation events are shown in Tables 3 through 5. Testing parameters were improved with new titration chemicals. A new background of chloride values was established with the new chemicals at a baseline of 500 ppm. The samples were all tested with the same chemical from the same bottle. Of the total samples below, the two that tested highest in chloride content dropped out suspended solids within hours of acquisition.

Table H-6 includes chloride concentration data acquired while circulating for cooldown before cementing (July 12 and 13, 2023).

Table H-3. Field-Measured Chloride Content for circulation at the intended 7” casing setting depth of 10,215 ft MD

Time	Chloride Concentration (ppm)
15:15	500
15:30	4,500
15:45	600
16:00	500
16:15	600
16:30	550
16:43	500

Table H-4. Field-Measured Chloride Content for circulation while reaming from 10,000 to 10,300 ft MD

Time	Chloride Concentration (ppm)	Time	Chloride Concentration (ppm)
13:00	1,050	14:30	950
13:15	900	14:40	950
13:30	850	14:50	1,150
13:40	1,100	15:00	1,200
13:50	2,850	15:10	1,200
14:00	1,000	15:20	1,200
14:10	950	15:30	1,150
14:20	900	15:40	1,050

Table H-5. Field-Measured Chloride Content for circulation before spotting bentonite on 7/8/23 between 17:30 hr and 18:55 hr

Time	Depth (ft MD)	Chloride Concentration (ppm)	Time	Depth (ft MD)	Chloride Concentration (ppm)
17:30	10,910	1,200	18:20	10,920	1,100
17:45	10,866	1,450	18:25	10,931	1,100
17:50	10,900	4,000	18:30	10,862	1,100
17:55	10,926	1,800	18:35	10,873	1,100
18:00	10,859	1,600	18:40	10,893	1,150
18:05	10,873	1,150	18:45	10,910	1,150
18:10	10,890	1,200	18:50	10,930	1,250
18:15	10,906	1,150	18:55	10,847	1,400

Table H-6. Field-Measured Chloride Content for circulation below casing shoe (approximately 10,213 ft MD) before cementing - July 12 and 13, 2023.

Time	Depth (ft MD)	Chloride Concentration (ppm)	Time	Depth (ft MD)	Chloride Concentration (ppm)
22:14	shoe	3,100	23:39	shoe	1,450
22:19	shoe	2,150	23:44	shoe	1,450
22:24	shoe	1,850	23:49	shoe	1,450
22:29	shoe	4,650	23:54	shoe	1,450
22:34	shoe	5,300	23:59	shoe	1,450
22:39	shoe	1,700	00:04	shoe	1,450
22:44	shoe	1,700	00:19	shoe	1,550
22:49	shoe	5,650	00:34	shoe	1,950
22:50	shoe	6,000	00:49	shoe	2,150

Time	Depth (ft MD)	Chloride Concentration (ppm)	Time	Depth (ft MD)	Chloride Concentration (ppm)
22:54	shoe	6,000	01:04	shoe	2,600
22:59	shoe	3,200	01:19	shoe	2,750
23:04	shoe	1,600	01:34	shoe	2,450
23:09	shoe	1,450	01:49	shoe	2,100
23:14	shoe	1,450	02:04	shoe	1,850
23:19	shoe	1,450	02:19	shoe	1,800
23:24	shoe	1,450	02:34	shoe	1,900
23:29	shoe	1,500	02:49	shoe	1,850
23:34	shoe	1,450	03:04	shoe	2,000

H-5. July 18, 2023 - Circulation 2, Day 1

SLB was rigged up with one MPF-331 CT Pump Truck and one cementing unit to Well 16A(78)-32. Tracer injection was set up for addition into the suction manifold of the CT Pump Truck at a constant concentration using 2,6-nds. The treating pressure at the 16A(78)-32 wellhead is shown for July 18, 2023, in Figures 9 and 10. As can be seen, injection started at 2.5 bpm, was later increased to 5 bpm, and finally was increased to a maximum rate of 7.4 bpm. Injection rate fluctuations were experienced while going to 5 bpm while the second unit was brought online. Going to 10 bpm, there were some equipment issues but it was lined out at 7.4 bpm.

Zoomed-in views of the data during pumping are provided in Figure H-11.

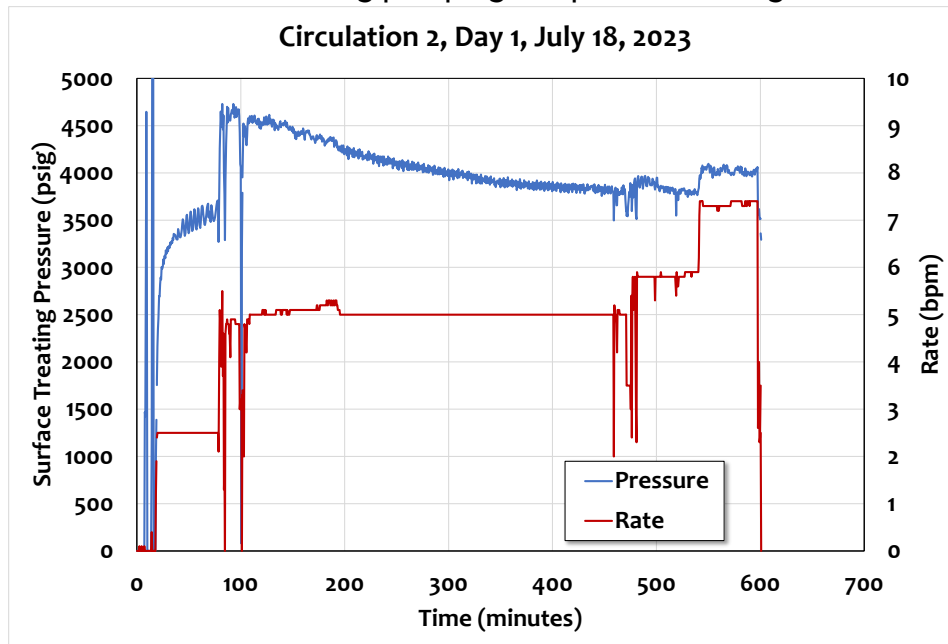


Figure H-9. SLB record of surface pressure and rate at Well 16B(78)-32. This is for the first day of the second circulation test (Utah Forge Day 1 30s.xls). Notice the

declining pressure during the 5 bpm segments and only limited change in surface pressure as the rate was increased. Shut-in data were recorded with Pason equipment (as seen in Figure H-10). See Utah Forge Day 1 30s.xlsx.

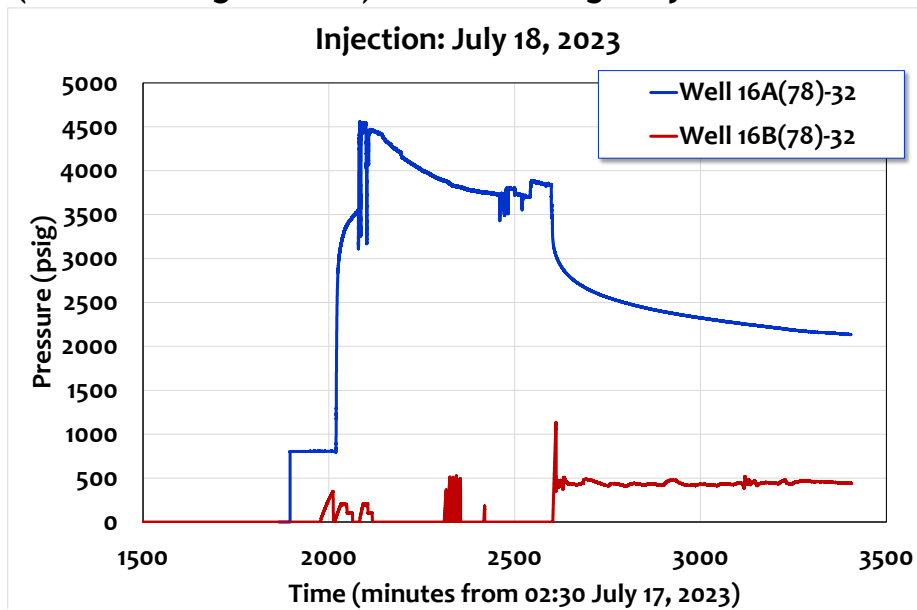


Figure H-10. Pason data for both the injection and the production wells for the first day of the second circulation test. Notice that the back-pressure in the production well (16B(78)-32) was kept low to promote flow paths to the production well. Some shut-in/flowback pressure cycling was used part way through the 5 bpm segment. On shut-down, the back-pressure was maintained at 500 psi by adjusting the throttling valve. These data are available as pason_July-18.xlsx.

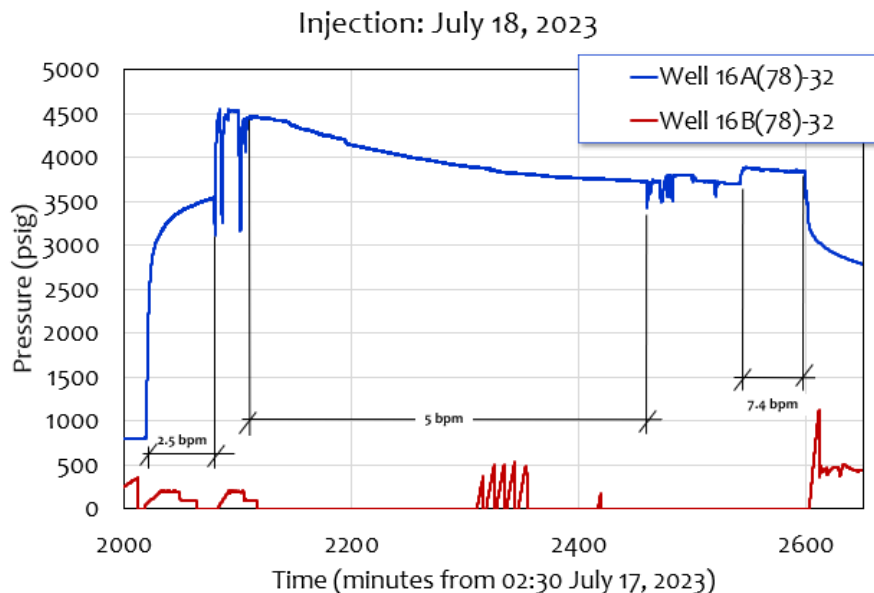


Figure H-11. Notice the cycles in Well 16B(78)-32. During the 2.5 bpm stage, the back-pressure was allowed to build to 200 psi, held, reduced to 100 psi, and

reduced to AOF. While trying to establish and line out the 5 bpm stage, the same protocol was followed. Several surge cycles were implemented part way through the 5 bpm stage. After the 7.4 bpm stage, the pressure rose rapidly and then it was maintained at under 500 psi. These data are available in pason_July-18.xlsx.

Before the treatment, the fluid level in Well 16B(78)-32 was reduced by running in and out of the hole with 10 stands of 4-3/4-inch drill collars without fill-up. Pressure recovery was monitored using the Baker Hughes downhole pressure-temperature gauge that is ported into the 7” casing string with the fiber-optic installation. Those data are shown in Figures 12 and 13. Data recording with that device continued during the subsequent injection. An extended (through injection) version of Figure H-12 is shown in Figure H-14 and data are reported in Table H-7.

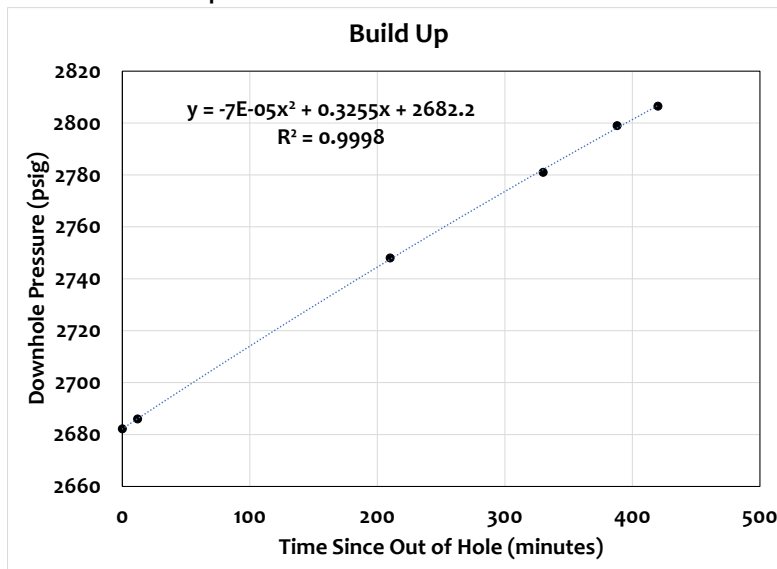


Figure H-12. Downhole pressure was recorded (at the Baker Hughes pressure gauge) after reducing the hydrostatic head in Well 16B(78)-32. These data were fitted with a second-order curve and the zero pressure was estimated by extrapolation.

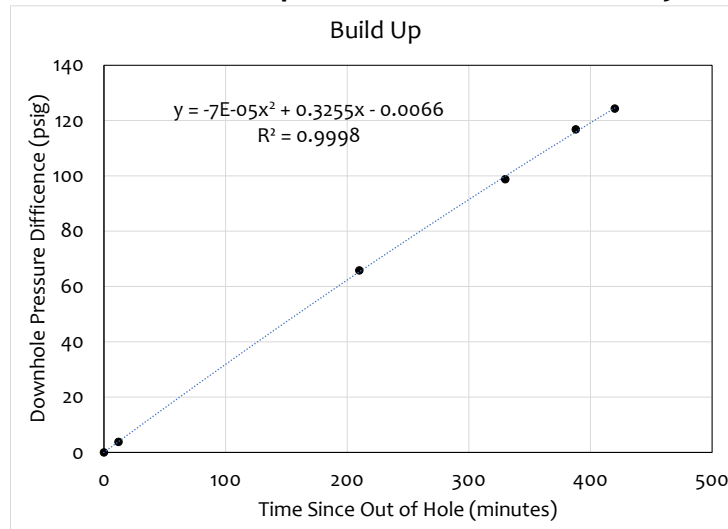


Figure H-13. Differential pressure was recorded after reducing the hydrostatic head in Well 16B(78)-32. Pressure is differenced with respect to pressure from a second-order extrapolation to the start time. The response is near linear with time (minor curvature) (refer to Baker_Pressure_Gauge.xlsx). Time zero is 01:00 a.m. on July 18, 2023.

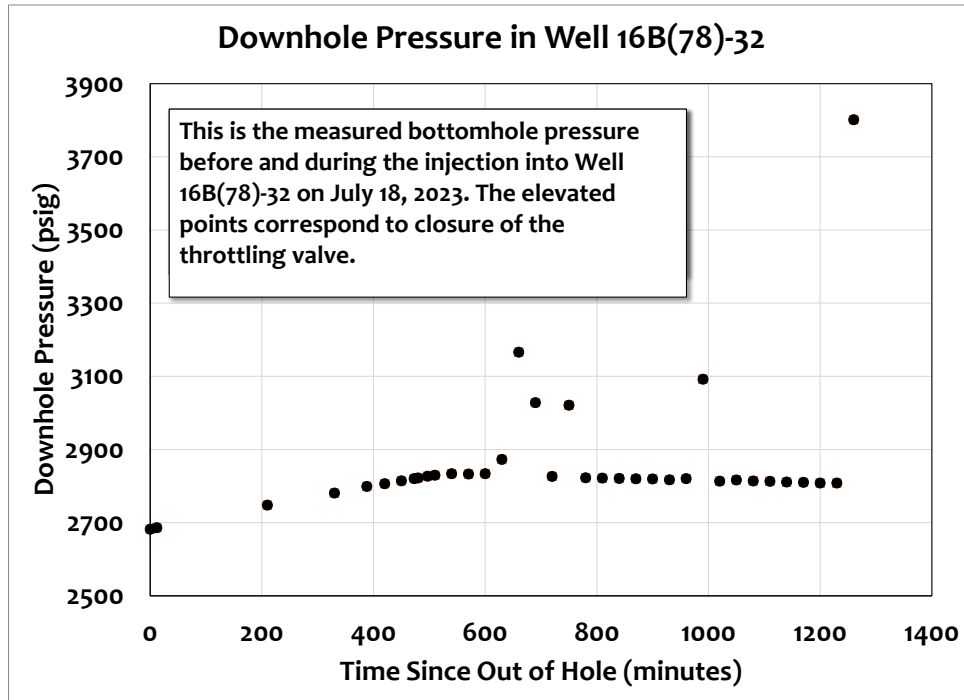


Figure H-14. Downhole pressure was recorded after reducing the hydrostatic head in well 16B(78)-32 and through the injection on July 18, 2023. (refer to Baker_Pressure_Gauge.xlsx). Time zero is 01:00 a.m. on July 18, 2023. The treatment (Circulation 2, Day 1) started at 12:09 p.m. on July 18, 2023.

H-6. July 19 and 20, 2023, Circulation 2, Day “2”

On July 19, 2023, a grease head was rigged up for pressure control while running the SLB HT PLT tool. There was a lubricator on location but the available crane could not lift it. Consequently, it was necessary to flow Well 16A(78)-32 to the pit to relieve pressure. Flowback started at about 4:15 p.m. on July 19 (16:15 July 19, 2023). Rig up continued and the injection started about 09:09 p.m. on July 19 (21:09 July 19, 2023). The spinner data are summarized in Tables 7 and 8 as well as Figures 15 and 16.

Table H-7. Stage Partitioning
(Kevin England, from SLB field print, Figure H-15)⁸

	2.5 bpm	5.0 bpm	7.5 bpm
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⁸ Email, July 20, 2023.

Stage 3 Frac	25%	33.5%	30.7%
Stage 2 Frac	8%	16%	8.3%
Stage 1 (OH) Frac	67%	67%	61%

Table H-8. Stage Partitioning (fraction of total rate entering stage wellbore domain)

(John McLennan, from field notes, Figure H-16)⁹

Rate (bpm)	Stage 1	Stage 2	Stage 3
2.5	0.58	0.18	0.24
5	0.49	0.14	0.37
7.5	0.61	0.08	0.31

⁹ Notes recorded July 19 and 20, 2023.

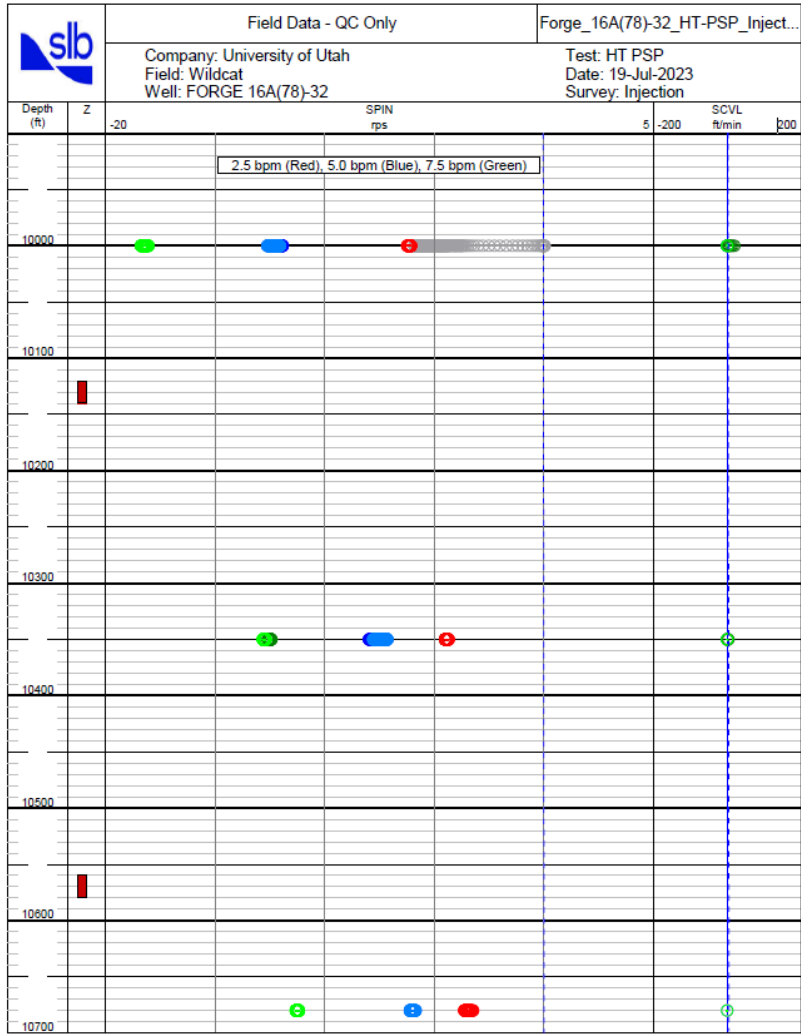


Figure H-15. Field print of SLB data showing flow partitioning at various depths of the spinner. The tool was allowed to stabilize at 10,000 ft MD, 10,350 ft MD, and 10,680 ft MD.

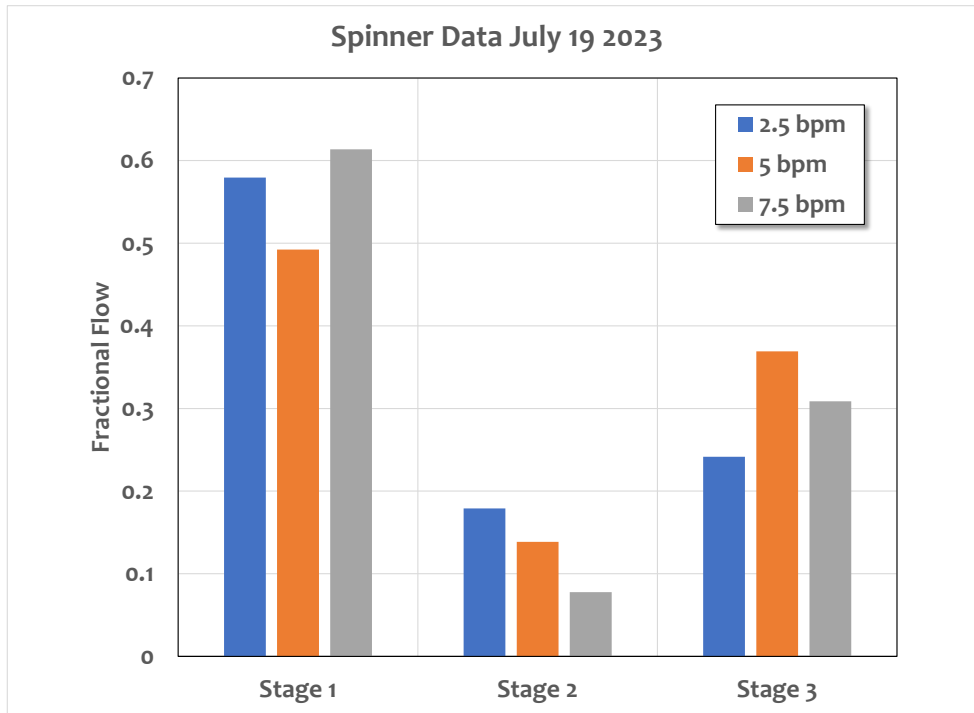


Figure H-16. Preliminary partitioning of flow to different frac stages (based on field notes only).

SLB’s procedure is provided in Appendix B. SLB tabulated results are shown in Figures 17 and 18. Note that as the rate becomes higher, progressively less flow goes into the Stage 1 open hole region. The SLB report is available as [UnivUtah_Forge16A\(78\)-32_HT-PSP-IL_19Jul2023_Interp_Report_An1.pdf](#).

Interpretation Results: Surface Flowrate Results - All Surveys

Type	Intervals		Rate 1 (-2.5 BPM)		Rate 2 (-5.0 BPM)		Rate 3 (-7.5 BPM)	
			Water (bpd)	Water (%)	Water (bpd)	Water (%)	Water (bpd)	Water (%)
Perforation	10120	10140	-1141.3	31.7%	-3066.8	42.3%	-4506.2	41.6%
Perforation	10560	10580	-600.1	16.6%	-608.5	8.4%	-1576.1	14.6%
Openhole	10738	10938	-1863.7	51.7%	-3576.4	49.3%	-4744.9	43.8%*
Totals			-3605.1	100.0%	-7251.7	100.0%	-10827.2	100.0%
Reported Rates:			-3600.0	BWPD	-7200.0	BWPD	-10800.0	BWPD
Calculated rates:			-3605.1	BWPD	-7251.7	BWPD	-10827.2	BWPD

* Clear and confident injection below Bottom-Log-Interval (BLI, 10680'), assumed to be into openhole interval 10738-10938' for all surveys.

Figure H-17. SLB tabulated distribution of flow in the three zones and the three rates. This should be taken as the final distribution of flow - shown graphically in Figure H-18.

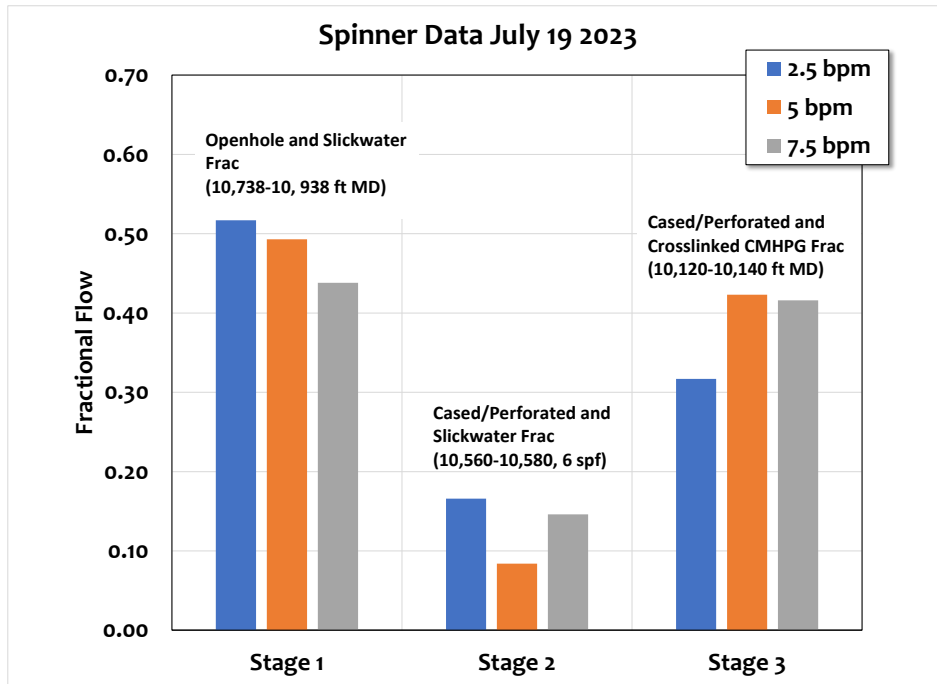


Figure H-18. Final flow distribution - per SLB interpretation.

The pressure records for both wells are shown in Figures 19 through 22.

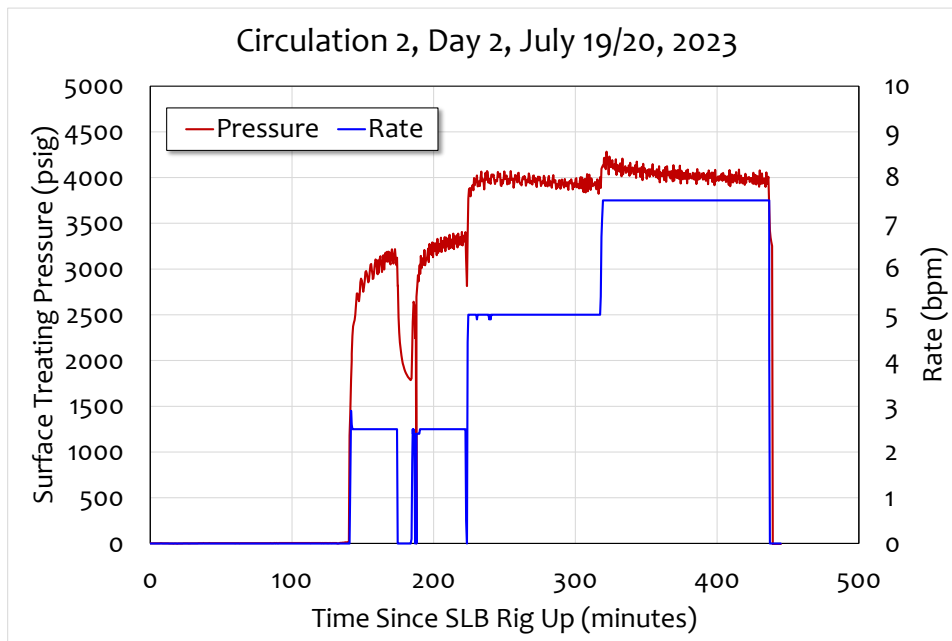


Figure H-19. SLB data for Circulation 2, Day 2. Spinner data were acquired in this well (16A(78)-32) while pumping. These data are in file Utah Forge 16A Day 2 30s_SLB.xlsx.

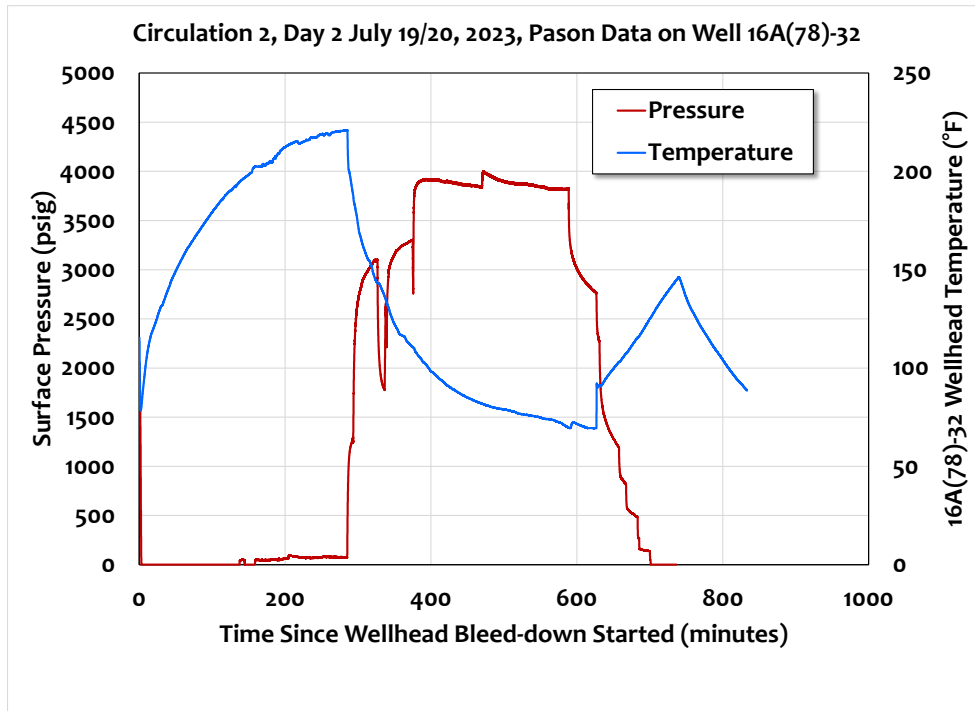


Figure H-20. Pason data for Circulation 2, Day 2. Spinner data were acquired in this well (16A(78)-32) while pumping. These data are in file Pason_Circulation_2_Day_2.xlsx.

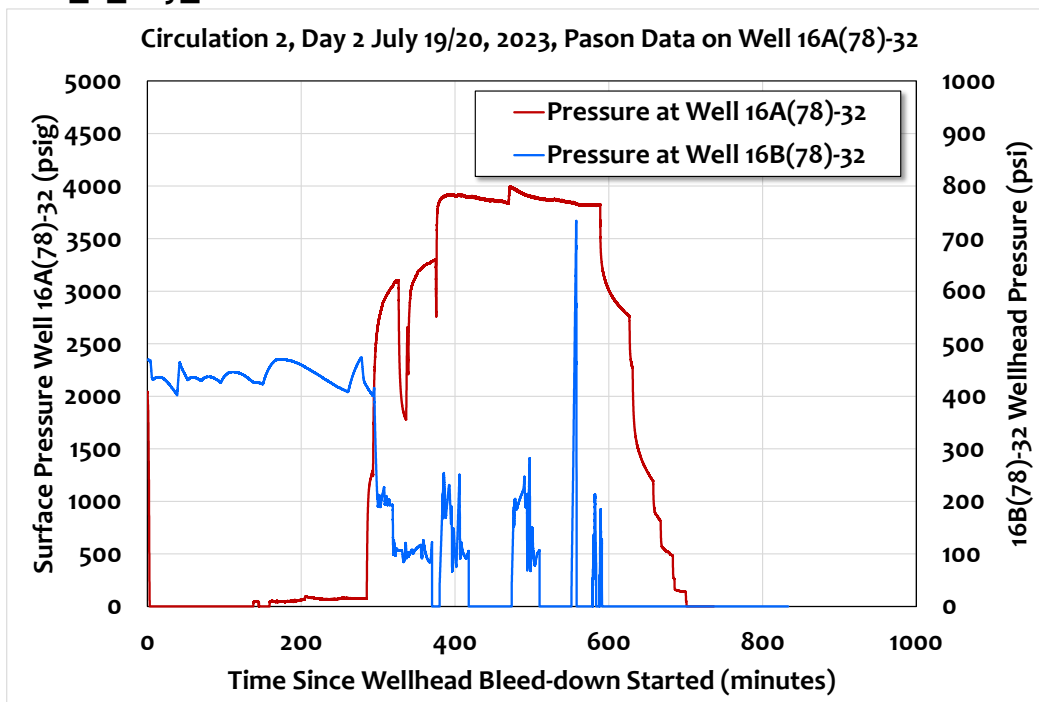


Figure H-21. Pason data for Circulation 2, Day 2. Spinner data were acquired in this well (16B(78)-32) while pumping into the offset well. These data are in the file Pason_Circulation_2_Day_2.xlsx.

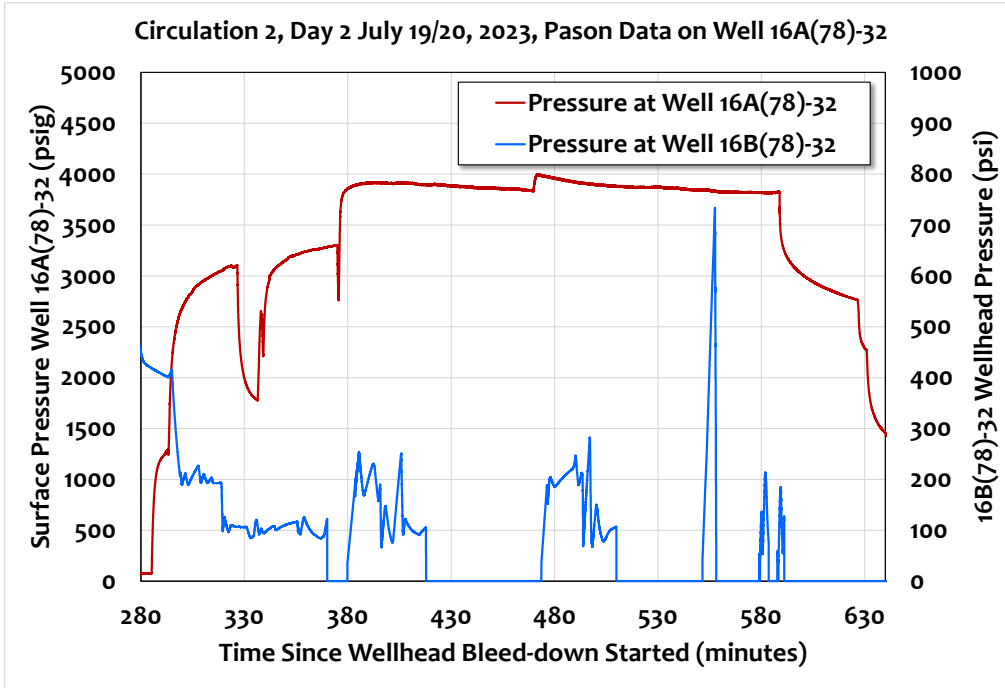


Figure H-22. Pason data for Circulation 2, Day 2. Spinner data were acquired in this well (16B(78)-32) while pumping into the offset well. These data are in file Pason_Circulation_2_Day_2.xlsx. This is a zoomed-in view of Figure H-19.

H-7. Produced Fluid

Chloride sampling up through July 13 has been reported in previous tables (see for example Table H-6). Tables 9 through 13 compile additional data. Tracer data will be added as it becomes available.

Table H-9. July 16, 2023, Circulation Event

Time	Chloride Concentration (ppm)	Time	Chloride Concentration (ppm)
12:15 x 2	1,550	15:15 x 2	1,650
12:30 x 2	1,550	15:30 x 2	2,200
12:45 x 2	1,700	15:45 x 2	1,700
13:00 x 2	1,700	16:00 x 2	1,650
13:15 x 2	1,600	16:15 x 2	1,650
13:30 x 2	1,650	16:30 x 2	1,500
13:45 x 2	1,500	16:45 x 2	1,750
14:00 x 2	1,600	17:00 x 2	1,750
14:15 x 2	1,650	17:15 x 2	1,800
14:30 x 2	1,600	17:30 x 2	2,650
14:45 x 2	1,650	17:45 x 2	2,650

15:00 x 2	2,000		
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Table H-10. July 18, 2023, Monitoring Communication Between Wells

Time	Chloride Concentration (ppm)	Time	Chloride Concentration (ppm)
12:25	950	17:45	1,600
13:15	1,650	18:15	1,550
13:45	1,750	18:45	1,550
14:15	1,750	19:15	1,750
14:45	1,600	19:30	1,650
15:15	1,650	20:26	1,600
15:45	1,550	20:31	1,600
16:15	1,550	21:30	1,650
16:45	1,550	21:50	1,600
17:15	1,550		

Table H-11. July 19, 2023, Monitoring Communication Between Wells (Flowing Back Well 16A(78)-32)

Time	Chloride Concentration (ppm)	Time	Chloride Concentration (ppm)
17:15	250	19:15	1,100
17:32	250	19:30	1,350
17:45	NA	19:45	1,300
18:00	NA	20:00	1,300
18:15	NA	20:15	1,300
18:30	250	20:30	1,400
18:45	1,050	20:45	1,400
19:04	1,300	21:00	1,350

Table H-12. July 19 and 20, 2023, Monitoring Communication Between Wells (Injecting into 16A(78)-32)

Time	Chloride Concentration (ppm)	Time	Chloride Concentration (ppm)
21:30	1,700	00:00	1,650
22:00	1,800	00:30	1,650
22:30	1,650	01:00	1,750
23:00	1,700	01:30	1,600
23:35	1,650	02:00	1,750

Table H-13. July 20, 2023, Monitoring Flow from Well 16B(78)-32
(Flow Back Well 16A(78)-32 and Circulate in Completion Fluid in Well 16B(78)-32)

Time	Chloride Concentration (ppm)	Time	Chloride Concentration (ppm)
07:50	4,400 Flowback Event	14:20	2,750
07:50	4,500 Flowback Event	14:25	400
13:40	2,450	14:30	400
13:45	2,450	14:35	300
13:50	2,650	14:40	350
13:55	3,500	14:45	350
14:00	2,900	14:50	350
14:05	2,100	14:55	450
14:10	2,200	15:00	350
14:15	2,650		

Bucket samples were taken from the discharge of Well 16B(78)-32 at regular intervals. The results are shown in Table H-9 and Figures 23 and 24.

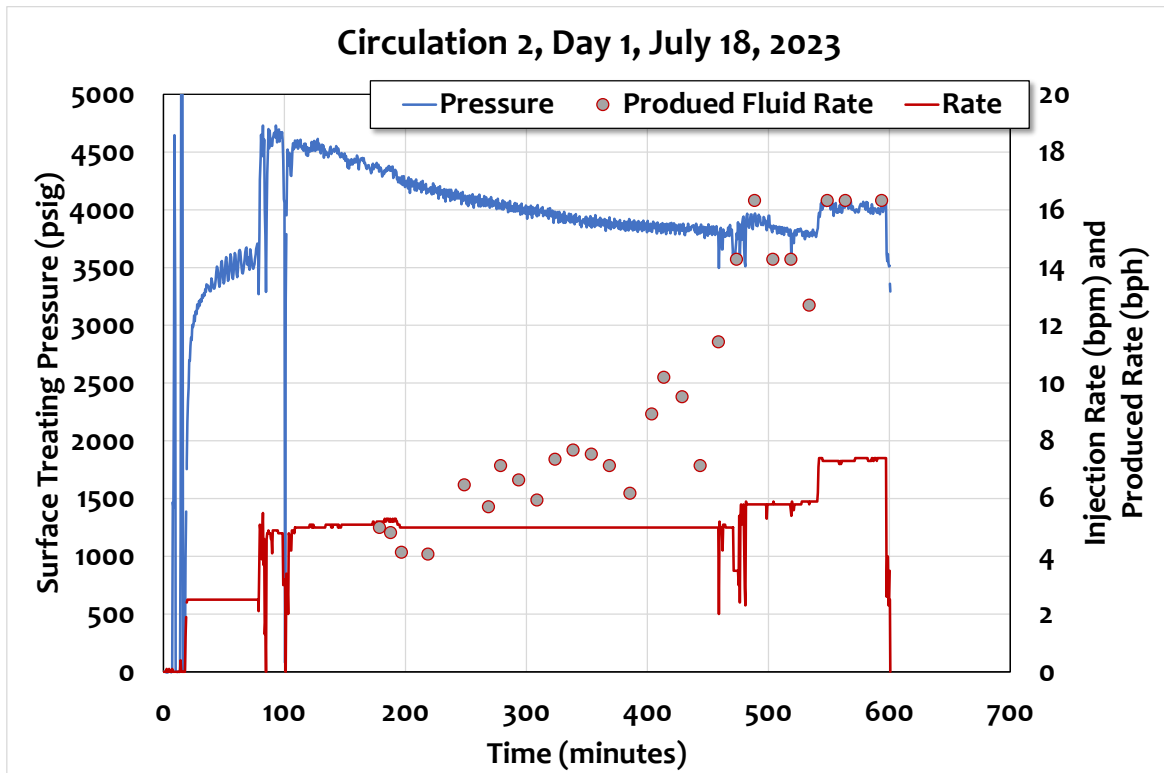


Figure H-23. Produced fluid volumetric flow rates measured downstream of the separator at Well 16B(78)-32 while injecting into Well 16A(78)-32 on July 18, 2023.

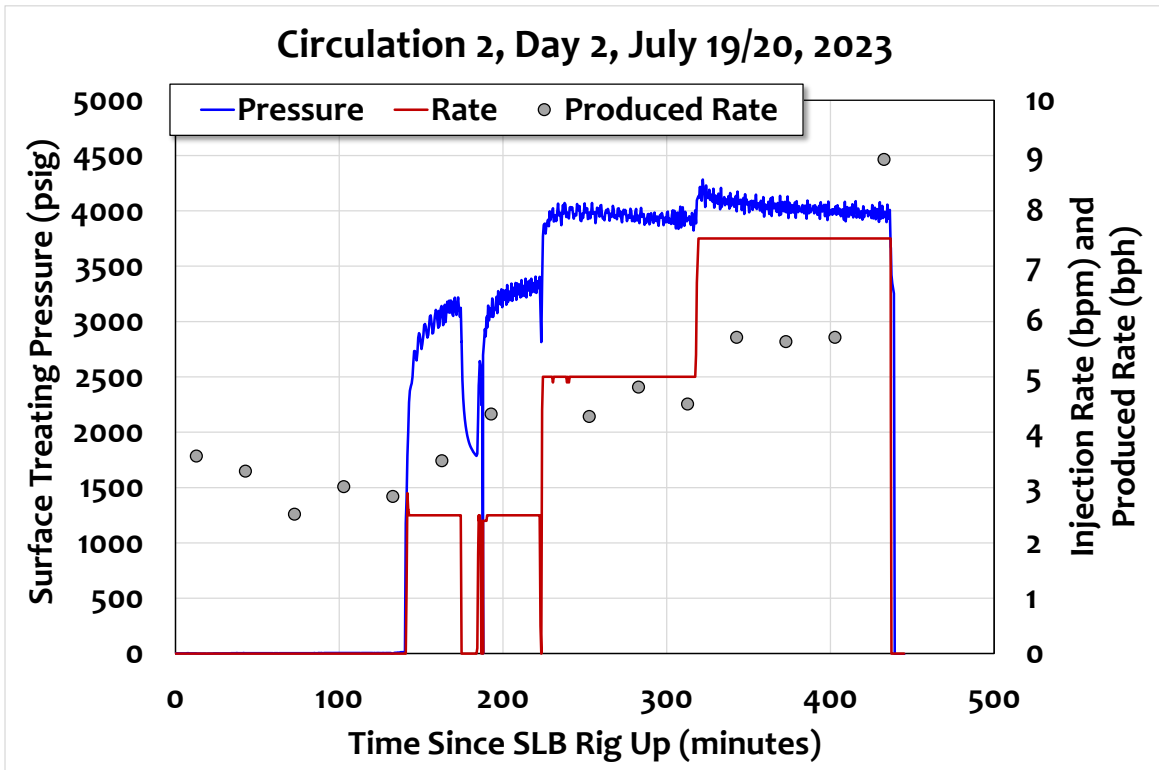


Figure H-24. Produced fluid volumetric flow rates measured downstream of the separator at Well 16B(78)-32 while injecting into Well 16A(78)-32 on July 19/20, 2023.

H-8. Key Observations

1. Injection needs to occur above the minimum in situ principal stress. Pressure rapidly increases to those levels regardless of the rate.
2. A connection was definitively established. Tracer data will be added when they are available.
3. Stimulation previously established a fracture network in a nominally impermeable domain (mixed domain of extensionally opened and propagated natural fractures and hydraulically induced and propagated fractures, with pressure-dependent leakoff into subsidiary fractures with varying degrees of self-propping if any).
4. Initial cycles, like the stimulations in April 2022 showed pressure decline although the mechanisms may be different. In 2022, the mechanisms could have been height growth, pressure-dependent leakoff, and reduction of tortuosity along with possibly some thermal effects. In these 2023 treatments there is limited propagation (although anecdotally Silixa recorded a few detectable microseisms) but reopening and recharging of the finite reservoir container is evident (pressure maintained over days of shut-in) and there is speculation that some precipitation needed to be removed.

... Continued after Table H-14 below

Table H-14 Produced Fluid Rates for Circulation 2, Both Days

Sample Date	Sample Time	Sampling Duration (seconds)	Volume Sampled	Produced Rate (gpm)	Produced Rate (bpm)	Produced Rate (bph)	Time Interval (hh:mm)	Cumulative Time (minutes)	Produced Volume (bbl)	Time from start of SLB recording (minutes) C2,D1 ¹⁰
7/18/23	10:51									0.00
7/18/23	13:50	5.71	quart	2.63	0.06	3.75				178.57
7/18/23	13:59	5.92	quart	2.53	0.06	3.62	0:09	9	0.54	187.57
7/18/23	14:08	6.9	quart	2.17	0.05	3.11	0:09	9	0.47	196.57
7/18/23	14:30	7	quart	2.14	0.05	3.06	0:22	22	1.12	218.57
7/18/23	15:00	4.41	quart	3.40	0.08	4.86	0:30	30	2.43	248.57
7/18/23	15:20	5	quart	3.00	0.07	4.29	0:20	20	1.43	268.57
7/18/23	15:30	4	quart	3.75	0.09	5.36	0:10	10	0.89	278.57
7/18/23	15:45	4.3	quart	3.49	0.08	4.98	0:15	15	1.25	293.57
7/18/23	16:00	4.8	quart	3.13	0.07	4.46	0:15	15	1.12	308.57
7/18/23	16:15	3.88	quart	3.87	0.09	5.52	0:15	15	1.38	323.57
7/18/23	16:30	3.72	quart	4.03	0.10	5.76	0:15	15	1.44	338.57
7/18/23	16:45	3.79	quart	3.96	0.09	5.65	0:15	15	1.41	353.57
7/18/23	17:00	4	quart	3.75	0.09	5.36	0:15	15	1.34	368.57
7/18/23	17:17	4.62	quart	3.25	0.08	4.64	0:17	17	1.31	385.57
7/18/23	17:35	3.2	quart	4.69	0.11	6.70	0:18	18	2.01	403.57
7/18/23	17:45	2.8	quart	5.36	0.13	7.65	0:10	10	1.28	413.57
7/18/23	18:00	3	quart	5.00	0.12	7.14	0:15	15	1.79	428.57
7/18/23	18:15	4	quart	3.75	0.09	5.36	0:15	15	1.34	443.57

¹⁰¹⁰ C2,D1 designates circulation test 2 and day 1

7/18/23	18:30	10	1 gallon	6.00	0.14	8.57	0:15	15	2.14	458.57
7/18/23	18:45	8	1 gallon	7.50	0.18	10.71	0:15	15	2.68	473.57
7/18/23	19:00	7	1 gallon	8.57	0.20	12.24	0:15	15	3.06	488.57
7/18/23	19:15	8	1 gallon	7.50	0.18	10.71	0:15	15	2.68	503.57
7/18/23	19:30	8	1 gallon	7.50	0.18	10.71	0:15	15	2.68	518.57
7/18/23	19:45	9	1 gallon	6.67	0.16	9.52	0:15	15	2.38	533.57
7/18/23	20:00	7	1 gallon	8.57	0.20	12.24	0:15	15	3.06	548.57
7/18/23	20:15	7	1 gallon	8.57	0.20	12.24	0:15	15	3.06	563.57
7/18/23	20:30	6	1 gallon	10.00	0.24	14.29	0:15	15	3.57	578.57
7/18/23	20:45	7	1 gallon	8.57	0.20	12.24	0:15	15	3.06	593.57
7/18/23	21:00	6	1 gallon	10.00	0.24	14.29	0:15	15	3.57	608.57
7/18/23	21:15	6	1 gallon	10.00	0.24	14.29	0:15	15	3.57	623.57
7/18/23	21:30	6	1 gallon	10.00	0.24	14.29	0:15	15	3.57	638.57
7/19/23	6:40	11.46	1 gallon	5.24	0.12	7.48				1188.57
7/19/23	7:30	13.96	1 gallon	4.30	0.10	6.14	0:50	50	5.12	1238.57
7/19/23	8:00	13.55	1 gallon	4.43	0.11	6.33	0:30	30	3.16	1268.57
7/19/23	8:30	13.93	1 gallon	4.31	0.10	6.15	0:30	30	3.08	1298.57
7/19/23	9:00	16.38	1 gallon	3.66	0.09	5.23	0:30	30	2.62	1328.57
7/19/23	9:30	15.3	1 gallon	3.92	0.09	5.60	0:30	30	2.80	1358.57
7/19/23	9:45	61	5 gallons	4.92	0.12	7.03	0:15	15	1.76	1373.57
7/19/23	10:00	61	5 gallons	4.92	0.12	7.03	0:15	15	1.76	1388.57
7/19/23	10:30	62.94	5 gallons	4.77	0.11	6.81	0:30	30	3.40	1418.57
7/19/23	11:00	63.23	5 gallons	4.74	0.11	6.78	0:30	30	3.39	1448.57
7/19/23	11:30	66.07	5 gallons	4.54	0.11	6.49	0:30	30	3.24	1478.57
7/19/23	12:00	68.02	5 gallons	4.41	0.11	6.30	0:30	30	3.15	1508.57
7/19/23	12:30	67.67	5 gallons	4.43	0.11	6.33	0:30	30	3.17	1538.57
7/19/23	13:00	68.4	5 gallons	4.39	0.10	6.27	0:30	30	3.13	1568.57
7/19/23	13:30	70.7	5 gallons	4.24	0.10	6.06	0:30	30	3.03	1598.57
7/19/23	14:00	71.91	5 gallons	4.17	0.10	5.96	0:30	30	2.98	1628.57
7/19/23	14:30	74.69	5 gallons	4.02	0.10	5.74	0:30	30	2.87	1658.57

7/19/23	15:00	68.66	5 gallons	4.37	0.10	6.24	0:30	30	3.12	1688.57
7/19/23	15:30	77.63	5 gallons	3.86	0.09	5.52	0:30	30	2.76	1718.57
7/19/23	16:00	72.78	5 gallons	4.12	0.10	5.89	0:30	30	2.94	1748.57
7/19/23	16:30	70	5 gallons	4.29	0.10	6.12	0:30	30	3.06	1778.57
7/19/23	17:00	84.95	5 gallons	3.53	0.08	5.04	0:30	30	2.52	1808.57
7/19/23	18:00	120	5 gallons	2.5	0.06	3.57	1:00	60	3.57	1868.57
7/19/23	18:30	130	5 gallons	2.31	0.05	3.30	0:30	30	1.65	1898.57
7/19/23	19:00	170	5 gallons	1.76	0.04	2.52	0:30	30	1.26	1928.57
7/19/23	19:30	142	5 gallons	2.11	0.05	3.02	0:30	30	1.51	1958.57
7/19/23	20:00	151	5 gallons	1.99	0.05	2.84	0:30	30	1.42	1988.57
7/19/23	20:30	123	5 gallons	2.44	0.06	3.48	0:30	30	1.74	2018.57
7/19/23	21:00	99	5 gallons	3.03	0.07	4.33	0:30	30	2.16	2048.57
7/19/23	22:00	100	5 gallons	3.00	0.07	4.29	1:00	60	4.29	2108.57
7/19/23	22:30	89	5 gallons	3.37	0.08	4.82	0:30	30	2.41	2138.57
7/19/23	23:00	95	5 gallons	3.16	0.08	4.51	0:30	30	2.26	2168.57
7/19/23	23:30	75	5 gallons	4.00	0.10	5.71	0:30	30	2.86	2198.57
7/20/23	0:00	76	5 gallons	3.95	0.09	5.64	0:30	30	2.82	2228.57
7/20/23	0:30	75	5 gallons	4.00	0.10	5.71	0:30	30	2.86	2258.57
7/20/23	1:00	48	5 gallons	6.25	0.15	8.93	0:30	30	4.46	2288.57
			Cumulative						159.96	

5. Proppant will be a prerequisite for future treatments.
6. Larger volume stages will be required. Fibers in Well 16B(78)-32 should help with constraining the fracture size.
7. Microseismicity, as expected, overestimates the fracture domain.
8. There is definitive communication that can be improved with sustained injection into Well 16A(78)-32 and possibly reciprocal injection into Well 16B(78)-32 that is high-graded by the fiber optics.

H-9. Appendix A: Running PLT in Well 16A(78)-32 during Circulation Test #2

I. Openhole Circulation Evaluation

I.1 Connection Evaluation from 16A(78)-32

It is desirable to establish connectivity but not to create additional fracture geometry or connections with Well 16B(78)-32. It is very likely however that pressure will be above the minimum principal stress. For this reason, before running 7" casing in 16B(78)-32, only inject into 16A(78)-32 to establish where the hydraulic fractures from the three-stage stimulation treatment pumped in April 2022 have grown. Initially, the procedures are:

- Rig up flow lines system with monitoring instrumentation on 16B(78)-32 to a geothermal separator (as shown in Figure 1). The surface flow lines and monitoring equipment on the 16-32 pad are shown in Figures 2 (with and without wireline lubricator for PLT) and 3. **Finalize connections to the separator**
- Rig up treating iron from the SLB pumping equipment to the 16A(78)-32 wellhead. Confirm what sort of connections are required to be able to isolate the fluid injection line for flowback, the addition of a wireline lubricator for potentially running a spinner survey while pumping, etc. Be prepared to pump at surface pressure up to 5,000 psi and pressure test all treating lines and wellhead equipment to 5,000 psi. **Limit any pressure on Well 16B(78)-32 fittings to 3,000 psi in the event (probably unlikely, but nevertheless) that this is experienced.**

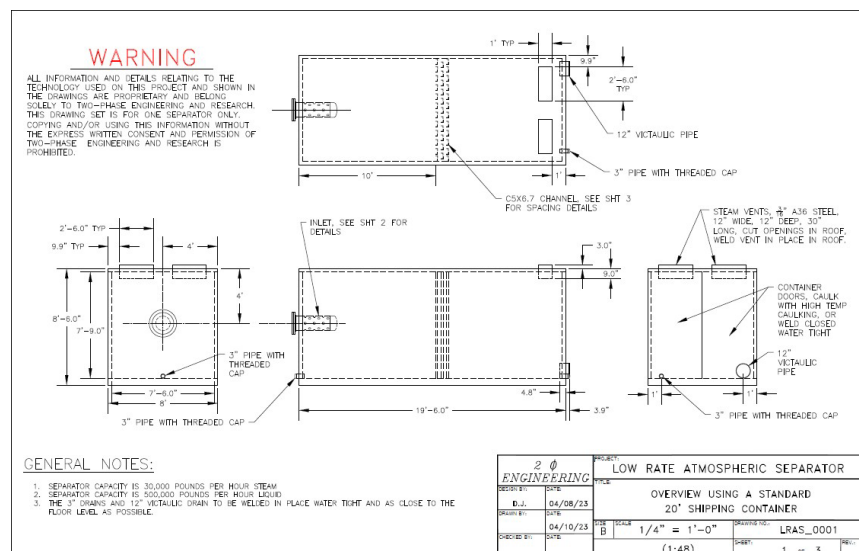


Figure 1. Preliminary separator drawings.

- Start pumping on Well 16A(78)-32 according to the schedule shown in Table 1. Tag this fluid with a discrete tracer (probably 2,7-nts). Start with Well 16B(78)-32 shut-in. This is the only way to overcome wellbore storage and build back pressure. As back-pressure is developed, Well 16B(78)-32 will be progressively flowed to the separator, as described in Table 1.

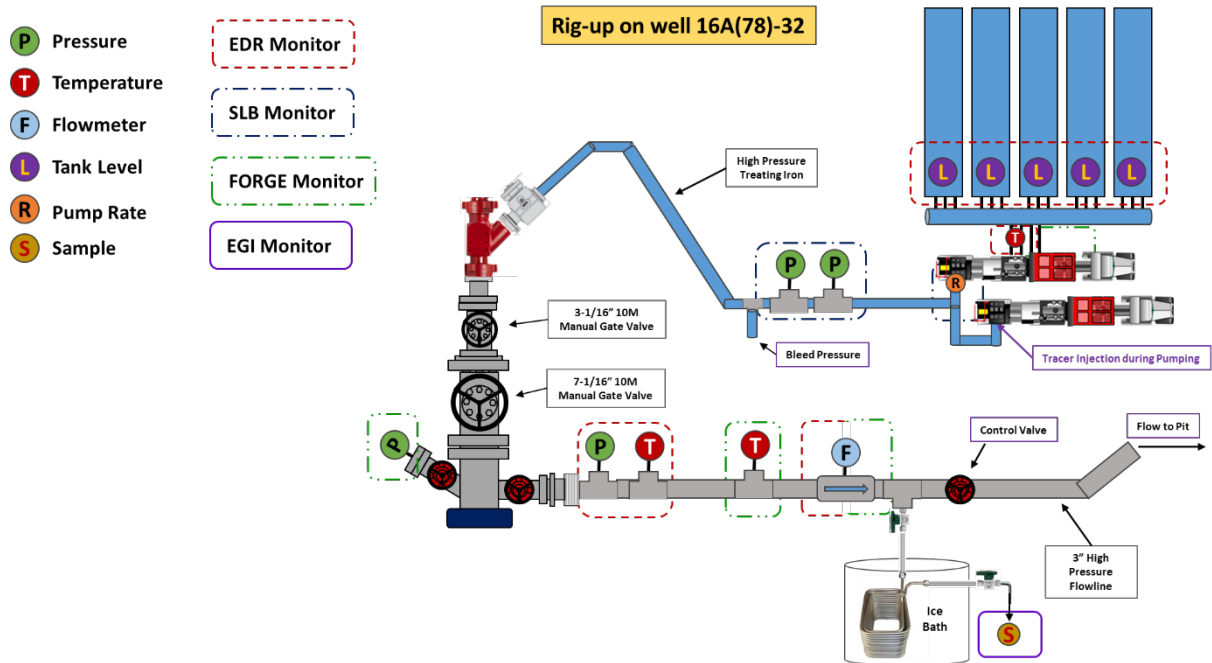


Figure 2A. Proposed installation of monitoring and flow equipment and plumbing on the 16-32 pad for injection Well 16A(78)-32 without PLT.

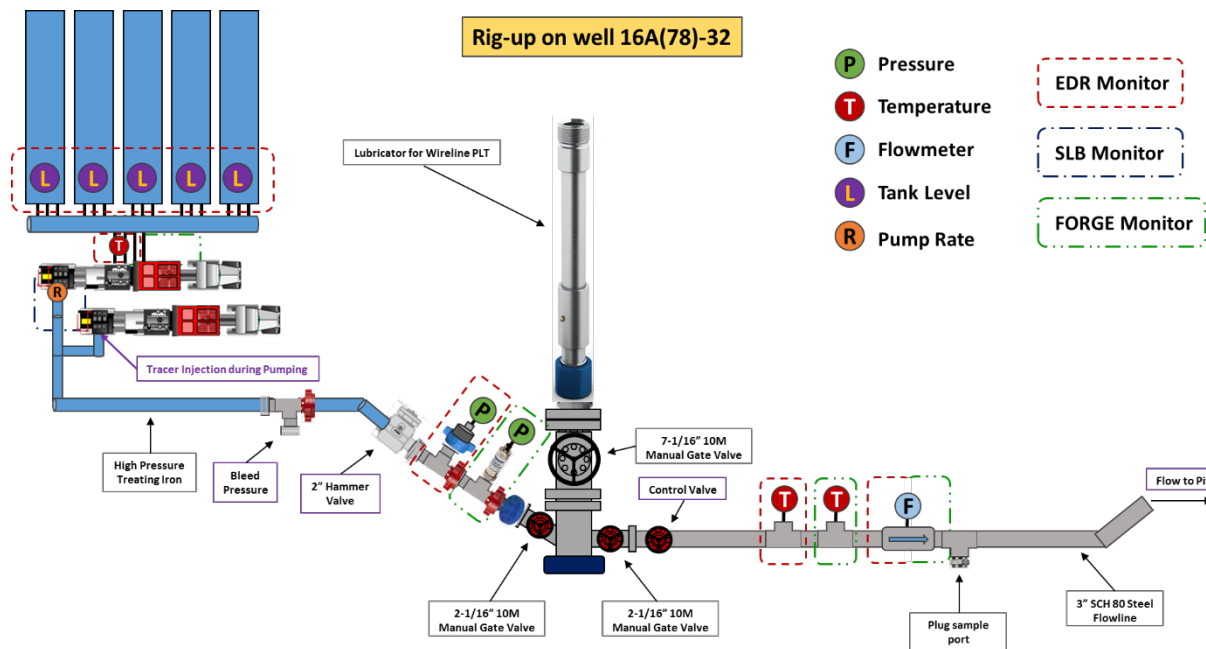


Figure 2B. Proposed installation of monitoring and flow equipment and plumbing on the 16-32 pad for injection Well 16A(78)-32 with PLT.

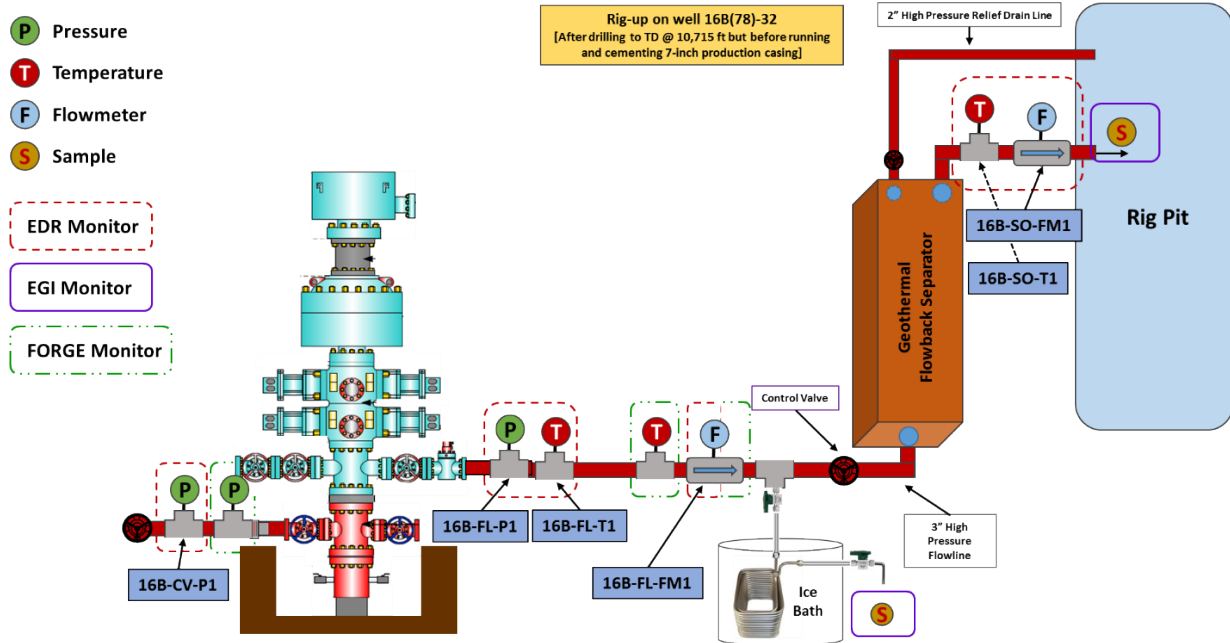


Figure 3. Proposed installation of monitoring and flow equipment and plumbing on the 16-32 pad for injection Well 16B(78)-32 - before running 7-inch casing.

- Sample fluids and save for tracer and water analysis on Well 16B(78)-32. **At least every 30 minutes, starting as soon as testing starts. It is desirable to look for background, residual (from the three frac stages pumped in April 2022) and new tracer pumped during the circulation test.**

Table 1. Openhole measurements before 7” casing is run and cemented

Injection Rate (BPM)	Stage Time (min)	Cumulative Time (min) [hr]	Stage Volume (bbl)	Cumulative Volume (bbl)	Comment
0.5	90	90 [1.5]	45	45	Keep well 16B(78)-32 shut-in until pressure reaches 400 psi, then flow to separator to maintain approximately 400 psi back pressure. If wellhead pressure on 16A reaches 5,000 psi shutdown pumping and decide the next steps.
2.5	90	180 [3]	225	270	Keep well 16B(78)-32 shut-in until pressure reaches 400 psi, then flow to separator to maintain approximately 400 psi back pressure. Or continue flowing to the separator depending on the previous step. If wellhead pressure on 16A reaches 5,000 psi, slow pump rate. If pressure continues to increase to 5,000 psi shutdown pumping and decide the next steps.
5.0	90	270 [4.5]	450	720	Keep well 16B(78)-32 shut-in until pressure reaches 400 psi, then flow to separator to maintain approximately 400 psi back pressure. Or continue flowing to the separator depending on the previous step. If wellhead pressure on 16A reaches 5,000 psi slow pump rate. If pressure continues to increase to 5,000 psi shutdown pumping and decide the next steps.
5.0	90	360 [6.0]			Maintain rate at 5.0 bpm and adjust control valve to decrease back-pressure to 200 psi.
2.5	60	420 [7.0]	150	870	Keep well 16B(78)-32 shut-in until pressure reaches 200 psi, then flow to separator to maintain approximately 200 psi back pressure.
0.5	60	480 [8.0]	30	930	Keep well 16B(78)-32 shut-in until pressure reaches 200 psi, then flow to separator to maintain approximately 200 psi back pressure.
0	720	1200 [20.0]	0	930	200 psi back-pressure, then 0 back-pressure as flow declines. Refill all frac tanks with Milford City water.
5.0	360	1,560 [26.0]	1,800	2,730	Keep well 16B(78)-32 shut-in until pressure reaches 500 psi, then flow to separator and maintain 400 psi back pressure. If wellhead pressure on 16A reaches 5,000 psi slow pump rate. If pressure continues to increase to 5,000 psi shut down pumping and decide the next steps.

					NB: After pumping 250 bbl in this stage, if there are pressure indications of flow into Well 16B(78)-32 but the pressure has not reached 500 psi, slightly
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					open the throttle (control) valve to the separator and maintain back-pressure 200 psi, which will keep water from flashing to steam up to ~375° F.
0	TBD				Shut in both wells. Minimum shut-in time of six hours - more depending on operational considerations and schedules.

Repeated Connection Evaluation from 16A(78)-32 to 16B(78)-32

The procedures (tentatively July 18-19, 2023)¹¹ will be as follows.

- Rig up flow line system at 16B(78)-32. This configuration is shown in Figure 1.
- Rig up treating iron from the SLB pumping equipment to the 16A(78)-32 casing valve and SLB wireline lubricator for running a spinner survey while pumping the circulation test. This configuration is shown in Figure 2. Be prepared to pump at surface pressure up to 5,000 psi and pressure test all treating lines and wellhead equipment to 5,000 psi.
- Well 16B(78)-32 will be initially shut-in while pumping into 16A(78)-32 and pressure will be monitored continuously to detect changes in pressure due to the connectivity between wellbores. When wellhead pressure on 16B(78)-32 reaches 200 psi start opening the throttling valve and flow to the separator maintaining a back-pressure of 100 psi. [Note: The back-pressure may be decreased based on flow behavior. The decision will be made by the FORGE manager and relayed to the DSM to be implemented.]
- Pump water down the casing in Well 16A(78)-32 according to the schedule shown in Table 1. Tag this fluid with a discrete tracer (2,7-nts) by injecting into the suction manifold of the SLB pump truck .

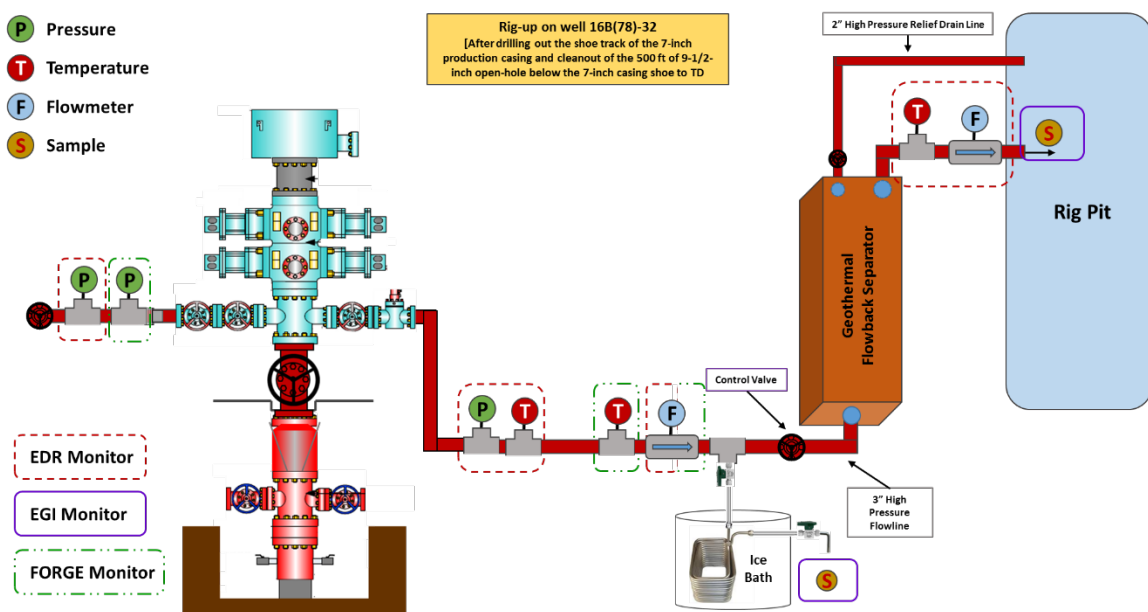


Figure 1. Flow line and data measurement configuration on Well 16B(78)-32 for short-term flow measurements after cementing the 7-inch casing.

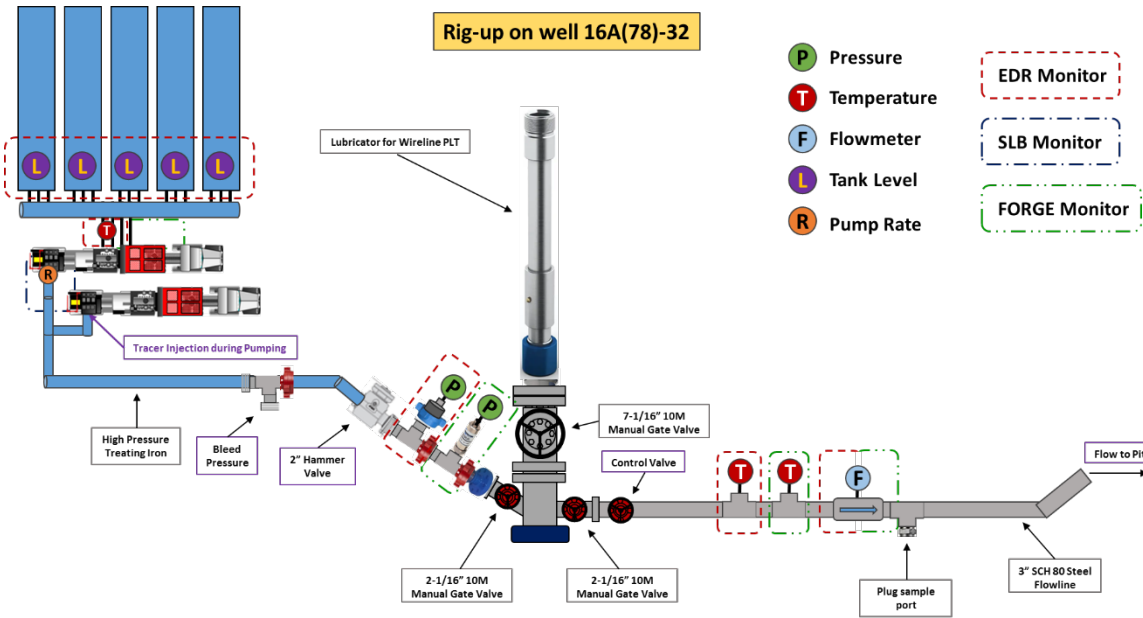


Figure 2. Flow line and data measurement configuration on Well 16A(78)-32 for short-term flow measurements after cementing the 7-inch casing.

Table 1. Open-hole measurements after the 7-inch casing is run and cemented

Injection Rate (BPM)	Stage Time (min)	Cumulative Time (min) [hr]	Stage volume (bbl)	Cumulative volume (bbl)	Comment
2.5	60	60 [1]	150	150	With Well 16B(78)-32 initially shut-in, start pumping water down the casing on Well 16A(78)-32. If wellhead pressure on Well 16B(78)-32 reaches 200 psi, start opening the throttling valve and flow to the separator while maintaining a back-pressure of 100 psi.
5.0	360	420 [7]	1800	1950	Increase injection rate to 5 bpm into Well 16A(78)-32 and maintain 100 psi back-pressure on Well 16B(78)-32 using the throttling valve while allow flow to the separator. [Note: The back-pressure may be decreased based on flow behavior. The decision will be made by the FORGE manager and relayed to the DSM to be implemented.]
10.0	30	450 [7.5]	300	2250	Depending on 16A(78)-32 wellhead pressure and flow conditions on Well 16B(78)-32 increase the injection rate to 10 bpm (or highest rate achievable to keep wellhead

					pressure <5,000 psi). Inject the remaining volume of water available in the frac tanks and then shutdown.
0	840	1290 [21.5]	0	0	Shut-in Well 16A(78)-32 and Well 16B(78)-32 and monitor pressure while re-filling the frac tanks with water. Reset Cumulative Volume to 0 bbl.
5	450	1740 [29]	2250	2250	With Well 16B(78)-32 initially shut-in, start pumping water down the casing on Well 16A(78)-32. If wellhead pressure on Well 16B(78)-32 reaches 100 psi, start opening the throttling valve and flow to the separator while maintaining a back-pressure of 100 psi. [Note: The pressure to start opening the throttling valve and amount of back-pressure may be modified as described previously. Please follow the instructions of the DSM for controlling the pressure.]
0	480	2220 [37]	0	960	Shut-in Well 16A(78)-32 and Well 16B(78)-32 for up to 8 hours and monitor pressure.

Revised Circulation 2 Program (Day 2)

SLB will run their UHT PLT logging tool in Well 16A(78)-32 during Circulation Test #2 on July 19, 2023. The objective of the PLT is to determine the injected fluid distribution profile into three separate intervals. The injection fluid for the circulation test is fresh water. The intervals correspond with the three hydraulic fracturing stages that were pumped on Well 16A(78)-32 in April 2022. All the intervals are in the 65° deviated portion of the wellbore near the toe. The lower interval is the 200 ft of open-hole section below the 7” casing shoe at 10,787 ft MD. The middle interval is a 20 ft perforated section in the 7” casing from 10,560 - 10,580 ft MD. The upper interval is a 20 ft perforated section in the 7” casing from 10,120 - 10,140 ft MD.

The PLT will be conveyed into the deviated section of the wellbore by the Petromac taxi with added weight bars. It is desirable to measure the rate distribution of the injected water into the three intervals at each different surface injection rate (see Circulation Test #2 procedure for pumping schedule).

Just before the beginning of the circulation test RIH with the PLT tool string on the Petromac taxi to a depth of ~10,000 ft MD to be above the upper perforated section. Begin pumping the circulation test at a rate of 2.5 bpm. Once the surface rate and spinner rate have stabilized move the PLT to a depth of ~10,350 ft MD, which is in between the perforated intervals, and take measurements until the spinner rate has stabilized. Move the PLT to a depth of 10,680 ft MD, which is below the lower perforated

interval and above the 7” casing shoe. See the schematic of PLT setting depths in **Figure 1**. [**Note:** Check to see if the sum of the last two spinner rates equals the spinner rate from above the upper perforated interval.]

At the end of the 2.5 bpm stage pull the PLT up the hole to 10,350 ft MD to make a measurement and then up to 10,000 ft MD to make a final measurement. [**Note:** Even at a constant surface injection rate the injected fluid distribution into the three intervals may also be highly dependent upon the surface injection pressure.]

After noting a stable spinner rate at 10,000 ft MD, increase the surface pump rate from 2.5 bpm to 5.0 bpm. Once the surface rate and spinner rate have stabilized move the PLT to a depth of ~10,350 ft MD and take measurements until the spinner rate has stabilized. Move the PLT to a depth of 10,680 ft MD and take measurements until the spinner rate has stabilized.

After approximately 2 hours of pumping at 5.0 bpm pull the PLT up the hole to 10,350 ft MD to make a measurement until the spinner rate has stabilized and then up to 10,000 ft MD to make a measurement. [**Note:** Check to see if the injected fluid distribution into the three intervals is similar on the downward-pass and upward pass at 5.0 bpm.]

If the results are quite a bit different continue pumping at 5.0 bpm for another hour and then, if the spinner rate is stable, move the PLT to a depth of ~10,350 ft MD, and take measurements until the spinner rate has stabilized then to a depth of 10,680 ft MD and take measurements until the spinner rate has stabilized. [**Note:** Check to see if the injected fluid distribution into the three intervals is similar on the downward-pass and upward pass at 5.0 bpm.]

If the results of the downward and upward passes are similar at 5.0 bpm check to see if the fluid distribution into the three intervals is similar when comparing the results at 5.0 bpm with the results at 2.5 bpm.

If the results at the different rates are quite a bit different, consider increasing the surface pump rate from 5.0 bpm to 7.5 bpm (depending on pressure). Perform the same downward and upward passes with the PLT at this higher pump rate. It is important to understand the impact of changing surface injection rate and injection pressure on the distribution of injected fluid into the three separate intervals. [**Note:** If changing the rate from 5.0 to 7.5 bpm please recalculate the pumping time based on the volume of water remaining in the frac tanks. Leave at least 30 minutes of pumping time if planning to increase the surface pump rate to 10.0 bpm to allow time for moving the PLT to the different measurement depths.]

After pumping the available water volume from the frac tanks shut down the pumping equipment and POOH with the PLT. Shut in the 7-1/16” wellhead master valve and monitor pressure overnight while refilling the frac tanks with water.

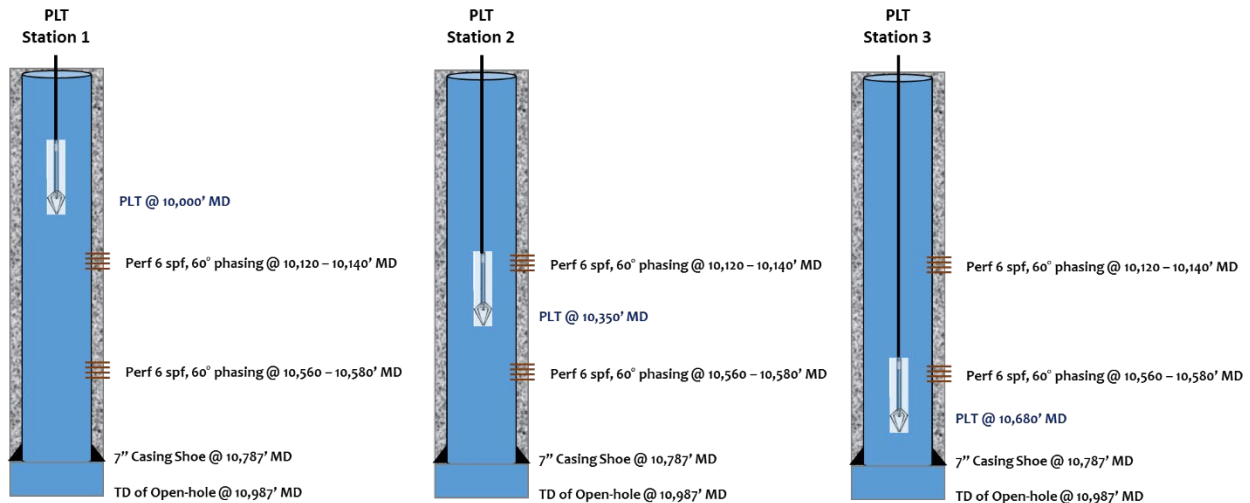


Figure 1. Proposed depths for PLT measurements

Abbreviated Near-Final Program for Circulation 2, Day 2

The approximate protocol followed (pumping plan) is shown below (times may vary according to decisions made on location).

SLB will run their UHT PLT logging tool in Well 16A(78)-32 during Circulation Test #2 on July 19, 2023. The objective of the PLT is to determine the injected fluid distribution profile into three separate intervals. The injection fluid for the circulation test is fresh water. The intervals correspond with the three hydraulic fracturing stages that were pumped on Well 16A(78)-32 in April 2022. All the intervals are in the 65° deviated portion of the wellbore near the toe. The lower interval is the 200 ft of open-hole section below the 7” casing shoe at 10,787 ft MD. The middle interval is a 20 ft perforated section in the 7” casing from 10,560 - 10,580 ft MD. The upper interval is a 20 ft perforated section in the 7” casing from 10,120 - 10,140 ft MD.

The PLT will be conveyed into the deviated section of the wellbore by the Petromac taxi with added weight bars. It is desirable to measure the rate distribution of the injected water into the three intervals at each different surface injection rate (see Circulation Test #2 procedure for pumping schedule).

- 1) RU SLB Wireline to run PLT.
- 2) SLB pumping equipment is already rigged up to the wellhead casing valve.
- 3) Bleed some pressure off the well if necessary.
- 4) Open 7-1/16” wellhead valve.

- 5) RIH with PLT to a depth of **10,000 ft MD**.
- 6) Open SLB 2” hammer valve.
- 7) Start pumping at **2.5 bpm**.
- 8) After 15 minutes (confirm that pump rate and spinner rate are stable) move PLT down to **10,350 ft MD**.
- 9) After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT down to **10,680 ft MD**.
- 10) After 5 minutes at 10,680 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,350 ft MD**.
- 11) After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,000 ft MD**.
- 12) After 5 minutes at 10,000 ft MD (confirm pump rate and spinner rate are stable) increase pump rate to **5.0 bpm**.
- 13) After 15 minutes (confirm pump rate and spinner rate are stable) move PLT down to **10,350 ft MD**.
- 14) After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT down to **10,680 ft MD**.
- 15) After 5 minutes at 10,680 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,350 ft MD**.
- 16) After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,000 ft MD**.
- 17) After 1 additional hour of pumping at **5.0 bpm**, move PLT down to **10,350 ft MD**.
- 18) After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT down to **10,680 ft MD**.
- 19) After 5 minutes at 10,680 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,350 ft MD**.
- 20) After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,000 ft MD**.
- 21) At this time, a decision may be made to increase the rate to **7.5 bpm** and, after 15 minutes (confirm pump rate and spinner rate are stable), **repeat steps 13 to 16 at this rate** or as directed by the Utah FORGE manager.
- 22) Continue pumping at **7.5 bpm** and move the PLT down to **10,350 ft MD** and monitor.
- 23) 30 minutes before the end of pumping move the PLT down to **10,680 ft MD**.
- 24) After 5 minutes at 10,680 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,350 ft MD**.
- 25) After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT up to **10,000 ft MD**.
- 26) Continue pumping at **7.5 bpm** until a decision is made to shut down pumping. Close SLB 2” hammer valve. Bleed pressure off treating line upstream of the 2” hammer valve. RD SLB pumping equipment.
- 27) POOH with SLB PLT

- 28) Close 7-1/16" wellhead valve.
- 29) Bleed off pressure to lubricator and RD SLB Wireline.
- 30) Monitor pressure.

H-190. Appendix B Spinner Survey

Well Bore Information:

Casing..... 7" 38.00#, T-95, 0 - 10738' MD.
Production Tubing None.
KOP 5957' MD / 5955.66' TVD / 5.67 degrees deviation.
EOB 7377' MD / 7045.98' TVD / 67.49 degrees deviation.
Toe..... 10995' MD / 8558.83' TVD / 68.6 degrees deviation.
Perforations 10120-10140', 10560-10580', and Openhole 10738-10938' MD.
Correlation: Schlumberger SlimXtreme Sonic Log CBL-VDL dated 16-Aug-2021.

Ultra-High Temperature PSP Logging Procedure:

1. RU SLB Wireline to run PLT.
2. SLB pumping equipment is already rigged up to the wellhead casing valve.
3. Bleed some pressure off the well if necessary.
4. Open 7-1/16" wellhead valve.
5. RIH with PLT to a depth of 10,000 ft MD.
6. Open SLB 2" hammer valve.
7. Start pumping at 2.5 bpm.
8. After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT down to 10,680 ft MD.
9. After 15 minutes (confirm that pump rate and spinner rate are stable) move PLT down to 10,350 ft MD.
10. After 15 minutes (confirm pump rate and spinner rate are stable) move PLT down to 10,350 ft MD.
11. After 5 minutes at 10,000 ft MD (confirm pump rate and spinner rate are stable) increase pump rate to 5.0 bpm.
12. After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT up to 10,000 ft MD.
13. After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT up to 10,000 ft MD.
14. After 5 minutes at 10,680 ft MD (confirm pump rate and spinner rate are stable) move PLT up to 10,350 ft MD.
15. After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT down to 10,680 ft MD.
16. After 5 minutes at 10,680 ft MD (confirm pump rate and spinner rate are stable) move PLT up to 10,350 ft MD.
17. After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT up to 10,000 ft MD.

18. After 1 additional hour of pumping at 5.0 bpm, move PLT down to 10,350 ft MD.
19. After 5 minutes at 10,350 ft MD (confirm pump rate and spinner rate are stable) move PLT down to 10,680 ft MD.
20. After 5 minutes at 10,680 ft MD (confirm pump rate and spinner rate are stable) move PLT up to 10,350 ft MD.
21. At this time a decision may be made to increase rate to 7.5 bpm and, after 15 minutes (confirm pump rate and spinner rate are stable), repeat steps 13 to 16 at this rate or as directed by the Utah FORGE manager.
22. Continue pumping at 7.5 bpm and move the PLT down to 10,350 ft MD and monitor.
23. 30 minutes before the end of pumping move the PLT down to 10,680 ft MD.
24. POOH with SLB PLT
25. Close 7-1/16" wellhead valve.
26. Bleed off pressure to lubricator and RD SLB Wireline.
27. Monitor pressure.