Beetaloo W-1

Well Completion Report
(Basic)

EP 117
Beetaloo Basin
Northern Territory

22nd July – 6th September 2016

Origin Energy Resources Ltd

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1 INTRODUCTION AND SUMMARY

Beetaloo W-1 was drilled by Origin Energy Resources Ltd in Exploration Permit 117(R) ("EP117") in the Beetaloo Sub-basin ("Beetaloo Basin") approximately 89.1 km south of the Carpentaria Highway, 103.3 km southeast of the town of Daly Waters and 33.2 km east of the Stuart Highway in the Northern Territory (Figure 1). Beetaloo W-1 was the first, and only well drilled in the 2016 Beetaloo drilling program. The well was spudded on 22 July 2016 and reached TD of 3165 mMDRT on 6 September 2016. The well was cased and suspended and the rig released on 14 September 2016.

The primary aim of Beetaloo W-1 was to evaluate the unexplored southern Beetaloo Basin for source rock reservoirs and hybrid source rock-sand plays in the middle section of the Velkerri Formation ("middle Velkerri"; primary target) and Kyalla Formation (secondary target) where no current offset penetrations to the middle Velkerri exist. A secondary aim was to collect conventional core in the Kyalla Formation and sidewall cores throughout the Kyalla and Velkerri formations for petrophysical log calibration as well as capturing potential facies variability that may impact future well stimulation. Both these aims were met successfully. A ternary aim included Diagnostic Fracture Injectivity Testing (DFIT) of prospective intervals to determine breakdown pressures and dominant fracture orientations following post-drilling wireline activities. Changes in the regulatory environment following the Northern Territory general election in August 2016, however prevented the approval of the proposed DFIT program. The intention of the operator is to complete this aim at a later date, pending regulatory approval.

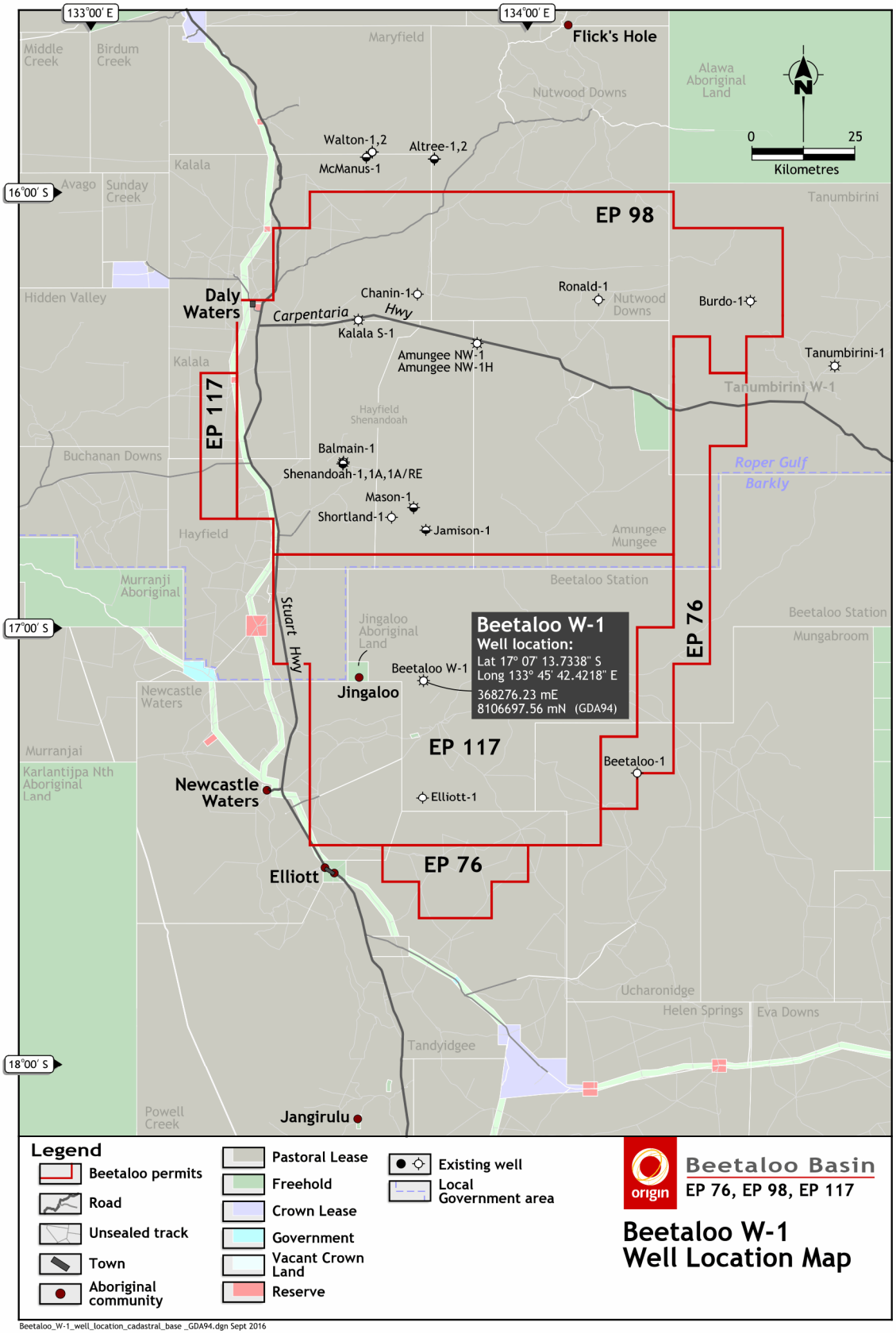

Figure 1. Beetaloo W-1 Location in relation to pastoral leases in the Daly Waters/Beetaloo Basin area

2 WELL SUMMARY SHEET

Well Name:	Beetaloo W-1
Classification:	Exploration
Permit:	EP117(R), Northern Territory
Well Path:	Vertical (1.47 deg. @ TD)
Location:	Latitude: 17°07' 13.7338" S / Longitude: 133°45' 42.4218" E
	Easting: 368 276.23 metres / Northing: 8 106 697.56 metres
Coordinate Reference System:	GDA94 / MGA94 Zone 53
Map Sheet Name:	1:1M Map Sheet: SE53 Newcastle Waters (Graticule Number 958)
	1:250K Map Sheet: SE5306 Beetaloo
	1:100K Map Sheet: 5663 Beetaloo
Offset Well:	Elliott-1 - 29.7 km (S, -180° from Beetaloo W-1)
	Jamison-1 - 38.3 km (N, 0.5° from Beetaloo W-1)
	Shortland-1 - 42.3 km (NNW, -11.0° from Beetaloo W-1)
	Mason-1 - 44 km (NNW, -3.5° from Beetaloo W-1)
	Shenandoah 1A - 58.7 km (NNW, -19.8° from Beetaloo W-1)
Seismic Control:	North-South Control: 2D Seismic Line - Ma91 – 103. Shot Point 3295
Elevation:	232 m (GL above MSL)
RT Elevation:	237.35 m (above MSL)
Total Depth Driller:	3173 mMDRT
Total Depth:	3165 mMDRT
Casing:	16” @ 205.72 mMDRT
	10-3/4” @ 591.6 mMDRT
	7-5/8” @ 1289.82 mMDRT
	4-1/2” @ 3164 mMDRT
Spud:	22-July-2016 @ 21:00 hrs
Reached TD:	6-September-2016 @ 04:00 hrs
Rig Released:	14-September-2016 @ 06:00 hrs
Well Status:	Cased and Suspended
Suspended:	14-September-2016
PBTD:	3128 mMDRT
Permit Interests:	Origin Energy Resources Ltd (Operator - 35%)
	Sasol Petroleum International (35%)
	Falcon Oil & Gas (30%)
Rig Name/Type:	Saxon 185 / Land-Onshore
Drilling Contractor:	Saxon

3 DRILLING

3.1 SUMMARY OF DRILLING AND RELATED OPERATIONS

#	Start Date	End Date	Last 24hr Summary
1	11/07/2016	12/07/2016	• Rigged down and loaded out rig package. • Waited on Daylight.
2	12/07/2016	13/07/2016	• Rigged down and loaded out rig package and mini-camp. • Waited on Daylight.
3	13/07/2016	14/07/2016	• Continued to rig down and move rig package and main camp to Beetaloo W-1. • Waited on Daylight.
4	14/07/2016	15/07/2016	• Waited on Daylight. • Inspected access road, which was rain affected. • Continued rig up on site and moved rig packages in the afternoon when road dried out.
5	15/07/2016	16/07/2016	• Waited on Daylight. • Continued to move remaining rig package to Beetaloo W-1. • Started to rig up rig package and surface equipment.
6	16/07/2016	17/07/2016	• Continued to rig up rig package and surface equipment. • Spud timing potentially delayed until water reserve storage is built up.
7	17/07/2016	18/07/2016	• Continued to rig up rig package and surface equipment. • Spud timing potentially delayed until water reserve storage built up.
8	18/07/2016	19/07/2016	• Continued to rig up rig package and surface equipment. • Spud timing potentially delayed until water reserve storage built up.
9	19/07/2016	20/07/2016	• Continue to rig up rig package and surface equipment. • Held Safe and Reliable Operations meeting. • Held Welcome to Country ceremony. • Continued to rig up rig package and surface equipment. • Spud timing potentially delayed until water reserve storage built up.
10	20/07/2016	21/07/2016	• Continued to rig up rig package and surface equipment.
11	21/07/2016	22/07/2016	• Continued to rig up rig package and surface equipment. • Sourced spider slips for 16" casing.
12	22/07/2016	23/07/2016	• Waited on 'C' Clamp to arrive. • Adjusted and centered riser. • Picked up casing and functioned CRT. • Standby for approval to drill with casing and developed JSA for connections with casing. • Washed down to tag bottom and drilled to 31 mMDRT.
13	23/07/2016	24/07/2016	• Drilled 20" hole with casing from 31 to 190 mMDRT.
14	24/07/2016	25/07/2016	• Drilled 20" hole to 205.7 mMDRT. • Pumped water 1x annulus volume. • Cemented conductor casing. • Bumped plug with 75 psi at 2 bpm. • Pressure tested casing with 752 psi, 677 psi over bump pressure, for 20 min. Good test. • Bled back 1.1 bbl. Float held. • Performed top up cement job. No returns to surface. • Cut and pulled 16" conductor and 22" riser. • Rigged down and laid out CRT.
15	25/07/2016	26/07/2016	• Installed Blooie line and RFCD. • Final cement top up to surface. • Rigged up air package. • RIH and tagged TOC.

			• Drilled plug to 190 mMDRT.
16	26/07/2016	27/07/2016	• Drilled out float track and 2 meters new formation. • Drilled surface hole to 260 mMDRT.
17	27/07/2016	28/07/2016	• Drilled 14 3/4" hole with air/mist from 260 to 278 mMDRT. • Drilled 14 3/4" hole with aerated mud from 278 to 295 mMDRT. • Drill string packed off and tight at 299 mMDRT. • Regained circulation gradually. String free with overpull. • Drilled 14 3/4" hole with viscosified water from 299 to 327 mMDRT.
18	28/07/2016	29/07/2016	• Drilled 14 3/4" hole from 327 to 468 mMDRT.
19	29/07/2016	30/07/2016	• Drilled 14 3/4" hole from 468 to 514 mMDRT.
20	30/07/2016	31/07/2016	• Drilled 14 3/4" hole from 514 to 553 mMDRT.
21	31/07/2016	01/08/2016	• Drilled 14 3/4" hole from 553 to 567 mMDRT. • Circulated hole clean. • POOH to 551 mMDRT. • Ran wireline survey (1.25 degrees). POOH to surface. • Changed out bit. • RIH to 363 mMDRT.
22	01/08/2016	02/08/2016	• RIH from 363 to 567 mMDRT. • Drilled 14 3/4" hole from 567 to 594.13 mMDRT - Surface section TD. • POOH from 594 to 143 mMDRT to run 10 3/4” casing.
23	02/08/2016	03/08/2016	• Continued POOH to surface. • Removed diverter and cut conductor. • Ran 10 3/4" surface casing to 591.6 mMDRT. • Circulated casing. • Rigged up cementers and pressure tested surface lines.
24	03/08/2016	04/08/2016	• Cemented 10 3/4" casing. • Installed and pressure tested wellhead. • Installed and nippled up BOPE.
25	04/08/2016	05/08/2016	• Nippled up and pressure tested BOPE. • Made up 9 7/8" drilling BHA and RIH.
26	05/08/2016	06/08/2016	• Continued RIH from 140 to 533 mMDRT. • Washed down from 533 to tag TOC at 568 mMDRT. • Drilled float and shoe track. • Drilled 3 meters new formation from 594 to 597 mMDRT. • Circulated hole clean. • M/W in / out 8.8 ppg. Conducted LOT, EMW 33.5 ppg, 2500 psi. • Drilled intermediate hole 597 to 599 mMDRT. • Held stand down for safety. • Annular open after LOT, uncontrolled release of pressure. • Drilled intermediate hole 599 to 746 mMDRT.
27	06/08/2016	07/08/2016	• Drilled intermediate hole 746 to 995 mMDRT.
28	07/08/2016	08/08/2016	• Saxon HSE and OE gathered all relevant documents and photos for drops investigation. • Repaired Kable Schlepp (Service loop). • Drilled intermediate hole 997 to 1122 mMDRT.
29	08/08/2016	09/08/2016	• Drilled intermediate hole 1122 to 1286 mMDRT.
30	09/08/2016	10/08/2016	• Continued drilling 9 7/8" Intermediate hole to TD at 1308 mMDRT. • Flow checked and ran survey. • Pulled out of hole for casing run. • Rigged up and ran 7 5/8" casing from surface to 45 mMDRT.
31	10/08/2016	11/08/2016	• Continued to run 7 5/8" casing to setting depth 1304.25 mMDRT. • Cemented 7 5/8" casing with 18 bbls of good cement to surface. • Rigged down and stowed away Drill Quip CRT.

			• Flushed BOP's.
32	11/08/2016	12/08/2016	• Pressure test pack off 250 psi low for 5 mins and 5000 psi high for 20 mins. • Made up 6 3/4" bit, ran in hole to 92 mMDRT. • Shallow tested mud motor, continued to run in hole from 92 to 998 mMDRT. • Slipped and cut 62' drill line and performed break test. Replaced aero union on flow line. Rig service. • Continued to run in hole from 998 to 1254.74 mMDRT. • Pressure tested 7 5/8" casing to 500 psi for 5 mins low and 5000 psi for 20 mins high. • Tagged float collar at 1254.74 mMDRT. This was 14 meters higher than expected. Difference in depths noted as the make-up loss for each joint of casing. • Drilled float collar from 1254.74, tagged cement at 1256 mMDRT, shoe track, shoe at 1289.82 mMDRT. • Drilled rat hole from 1289.82 to 1308 mMDRT.
33	12/08/2016	13/08/2016	• Drilled shoe track. • Drilled 10 meters new formation, performed XLOT. • Drilled 6 3/4" production hole from 1317 to 1525 mMDRT.
34	13/08/2016	14/08/2016	• Circulated hole clean, pulled out of hole from coring run. • Make up coring assembly and run in hole to 1279 mMDRT. • Rig service.
35	14/08/2016	15/08/2016	• Continued to run in hole with coring assembly. • Core 6 3/4" production hole to 1563 mMDRT. • Pulled out of hole.
36	15/08/2016	16/08/2016	• Continued to pull out of hole and lay down core. • Picked up and made up 6 3/4" PDC, Ulterra, U713, 27390 and ran in hole. • Drilled 6 3/4" production hole from 1563 to 1574 mMDRT.
37	16/08/2016	17/08/2016	• Drilled 6 3/4" production hole from 1574 - 1747 mMDRT.
38	17/08/2016	18/08/2016	• Drilled 6 3/4" production hole from 1747 - 1823 mMDRT.
39	18/08/2016	19/08/2016	• Drilled 6 3/4" production hole from 1823 - 1861 mMDRT.
40	19/08/2016	20/08/2016	• Drilled 6 3/4" production hole from 1861 - 1887 mMDRT.
41	20/08/2016	21/08/2016	• Drilled 6 3/4" production hole from 1887 to 1899.4 mMDRT. • Rig repair. • Disconnected hydraulic line to TDS/elevators. • Drilled to 1900 mMDRT. • Removed, repaired and replaced elevator close function hose and signal sender hose. • POOH from 1894 to 1710 mMDRT.
42	21/08/2016	22/08/2016	• POOH. • Pressure tested BOPE. • RIH to 148 mMDRT.
43	22/08/2016	23/08/2016	• RIH to 1900 mMDRT. • Drilled 6 3/4" production hole to 1951 mMDRT.
44	23/08/2016	24/08/2016	• Drilled 6 3/4" production hole from 1951 to 2014 mMDRT.
45	24/08/2016	25/08/2016	• Drilled 6 3/4" production hole from 2014 to 2097 mMDRT.
46	25/08/2016	26/08/2016	• Drilled 6 3/4" production hole from 2097 to 2118.5 mMDRT. • POOH to change bit, jar and stabilizers.
47	26/08/2016	27/08/2016	• RIH. • Drilled 6 3/4" production hole from 2118.5 to 2156 mMDRT.
48	27/08/2016	28/08/2016	• Drilled 6 3/4" production hole from 2156 to 2224 mMDRT.
49	28/08/2016	29/08/2016	• Drilled 6 3/4" production hole from 2224 to 2301 mMDRT.
50	29/08/2016	30/08/2016	• Drilled 6 3/4" production hole from 2301 to 2408 mMDRT.
51	30/08/2016	31/08/2016	• Drilled 6 3/4" production hole from 2408 to 2496 mMDRT.

52	31/08/2016	01/09/2016	• Drilled 6 3/4” production hole from 2496 to 2579 mMDRT.
53	01/09/2016	02/09/2016	• Drilled 6 3/4” production hole. • Control drill to core point from 2745 mMDRT.
54	02/09/2016	03/09/2016	• Drilled 6 3/4” production hole from 2696 to 2799 mMDRT.
55	03/09/2016	04/09/2016	• Drilled 6 3/4” production hole from 2799 to 2915 mMDRT.
56	04/09/2016	05/09/2016	• Drilled 6 3/4” production hole from 2915 to 3046 mMDRT.
57	05/09/2016	06/09/2016	• Drilled 6 3/4” production hole from 3046 to 3156 mMDRT.
58	06/09/2016	07/09/2016	• Drilled 6 3/4” production hole from 3156 to 3173 mMDRT, Well TD. • Circulated well to low salt logging fluid. • Flow checked and POOH.
59	07/09/2016	08/09/2016	• POOH. • Pressure tested BOPE. • Slipped and cut drill line. • Rigged up Schlumberger logging unit.
60	08/09/2016	09/09/2016	• Wireline logs. Logging run #1 - NEXT-HRLA-PEX-GR. Logging run # 2 - CMR-HNGS-HDRS-HGNS-EDTC.
61	09/09/2016	10/09/2016	• Wireline logs. Logging run # 2 - CMR-HNGS-HDRS-HGNS-EDTC. Logging run # 3 - FMI-PPC-MSIP-PPC-GR.
62	10/09/2016	11/09/2016	• Wireline logs. Logging run # 3 - FMI-PPC-MSIP-PPC-GR. Logging run # 4 - MSCT-GR. • Rig up to run 4.5" production casing.
63	11/09/2016	12/09/2016	• Ran 4.5" production casing from 45 to 3164 mMDRT. • Washed and reamed from 2089 to 2131 mMDRT and 3069 to 3164 mMDRT.
64	12/09/2016	13/09/2016	• Ran and landed out 4.5" production casing. • Cemented production casing. WOC. • Halliburton attempted to pressure test the production casing to 5000 psi for 20 min's. Could not get a good test. • Halliburton went back to camp for fatigue management.
65	13/09/2016	14/09/2016	• Waited on Halliburton fatigue hours. PJSM w/ Halliburton and rig crew. • Rig in Halliburton line to 4.5" casing string. Pressure test line. • Conducted extended pressure test of 4.5" casing to minimum 5000 psi for 20 minutes. 35 psi drop (0.7%) over 20 minutes. Test accepted by town. Well acceptance criteria #14. • Broke and laid down Drill Quip equipment. • Tested Cactus packer assembly as per Cactus manual 500 psi 5 min's / 10000 psi 15 min. Well acceptance criteria #13. • Nippled down BOP's
66	14/09/2016	15/09/2016	• Nippled down BOP's. • Installed 5-1/8" master valve and C-section and pressure tested same. • Released rig at 06:00 hrs.

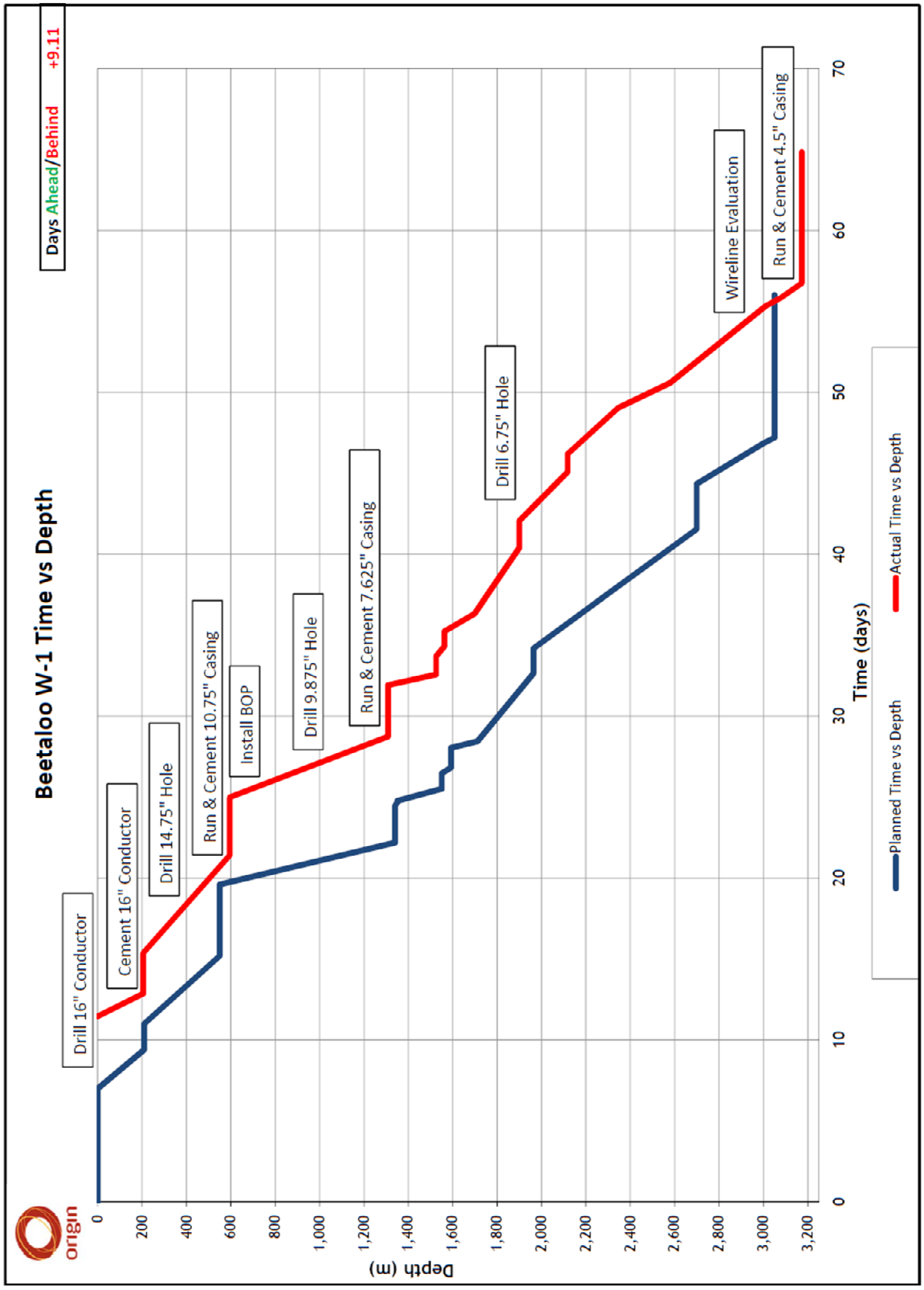

Figure 2. Beetaloo W-1 Time vs Depth Chart

3.2 DRILLING EQUIPMENT INSTALLED IN OR ON THE WELL

The Saxon Energy Services Australia Rig 185 was used to drill Beetaloo W-1. This rig is a 1200 hp AC hydraulic drive rig with a 178,000 daN (400,000 lbf) pull capacity. The rig pumps are two AC/VFD HongHua HHF-1000 triplex pumps powered by AmeriMex Dominator 1150 hp AC electric motors. An air package consisting of two screw compressors rated for 1400 CFM at 350psi and one booster unit capable of 2800 CFM at 1600psi. The mud system consists of three trailer mounted mud tank units rated for 767 bbl capacity complete with two Derrick FLC 504 shale shakers, one Derrick Vac-Flo 500 vacuum degasser and one Derrick DE-1000 FHD centrifuge. The BOP system comprises a 2M Drill Master Elite RFCD-2000, a 5M T3-Energy 11" Annular, a 5M T3-Energy Double Gate Ram (Blind & VBR), a 5M Drilling Spool with 3-1/8" Choke Line and 2-1/16" Kill Line, a 5M Cameron Choke Manifold, and a Control Technology 7 Station 14 Bottle Accumulator.

3.3 HOLE SIZES AND DEPTHS

Details of hole sizes and depths are provided in Table 1. Beetaloo W-1 as drilled schematics showing hole size and depths is provided in Figure 3.

Type	Size (")	Depth (mMDRT)	Rig
Conductor	20	205.72	Saxon 185
Surface	14 3/4	594.13	Saxon 185
Intermediate	9 7/8	1308	Saxon 185
Production	6 3/4	3173	Saxon 185

Table 1. Beetaloo W-1 hole size and depth details

3.4 CASING AND EQUIPMENT INSTALLED IN OR ON THE WELL

Table 2 summarizes the casing and equipment installed in or on Beetaloo W-1. Beetaloo W-1 as drilled schematics showing the casing and equipment dimension is provided in Figure .

Type	Size (")	Weight (lb/ft)	Grade	Thread	Depth (mMDRT)
Conductor	16	75	K55	BTC	205.72
Surface Casing	10 3/4	40.5	K55	BTC	591.6
Intermediate Casing	7 5/8	29.7	P110	JFE FOX	1289.82
Production Casing	4 1/2	15.1	P110	JFE Bear	3164

Table 2. Beetaloo W-1 casing details

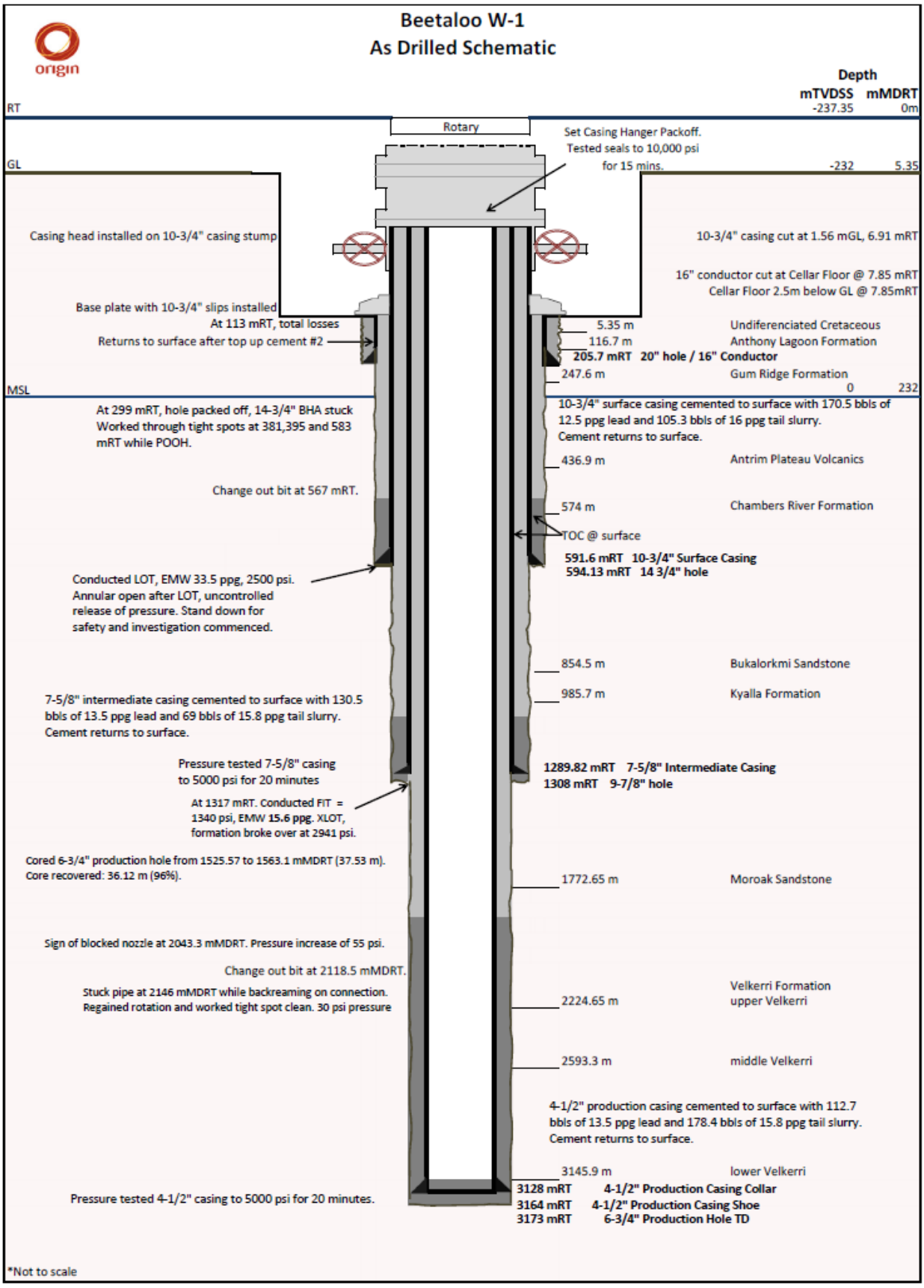

Figure 3. Beetaloo W-1 as drilled schematic

3.5 CEMENTING OPERATIONS CARRIED OUT

String (") / Plug	Cement Type	Cement Additives	Slurry Vol (bbls)	Slurry Density (ppg)	Cement to / from (mMDRT)	Test Press (psi)
Conductor	Class G	Freshwater D-air 3000L Halad-413	161 primary 64.9 top up #1 29.2 top up #2	15.8	7.39 - 205.7	75
Surface Casing Lead	Class G	Freshwater D-Air 3000L Econolite Liquid	170.5	12.5	7.38 - 403	2000
Surface Casing Tail	Class G	Freshwater D-Air 3000L	105.3	16.0	403 - 594.1	2000
Intermediate Casing Lead	Class G	Freshwater D-air 3000L Gascon 469 Halad-413-L HR-5	130	13.5	6.2 - 1255	2000
Intermediate Casing Tail	Class G	Freshwater D-Air 3000L Halad-413-L HR-5	29.5	15.8	1255 - 1308	2000
Production Casing Lead	Class HTB	Gascon 469 SCR - 100 D-Air 3000L Microbond Halad-413 HR-25 SSA-1	112.7	13.5	5.75 -1300	5000
Production Casing Tail	Class HTB	Gascon 469 SCR - 100 D-Air 3000L Microbond Halad-413 SSA-1	178.4	15.8	1300 - 3173	5000

Table 3. Beetaloo W-1 cementing operations

3.6 BIT RECORDS

Bit records and drilling parameters are summarised in Appendix 1.

3.7 DRILLING FLUIDS

Newpark Drilling Fluids was contracted to supply and maintain drilling fluids in Beetaloo W-1. A daily summary of drilling fluids operations and End of Well Report can be found in Appendix 8.

An 8.7 ppg, KCl Polymer Spud and 8.6 ppg, Pre-hydrated Bentonite (Gel) mud were made up to commence operations on Beetaloo W-1. The 20" hole section was drilled with a 16" DWC using KCl polymer mud from 17 mMDRT to a depth of 113 mMDRT where circulation was lost. The remainder of the interval was drilled without returns to section TD at 205.72 mMDRT.

The 14-3/4" surface section was air/mist rotary drilled with 8.5 ppg mist fluid down to 295 mMDRT where significant flow of formation fluid was encountered. At this point air drilling was ceased and conventional polymer mud drilling continued to section TD at 594.13 mMDRT.

NaCl Polymer mud was utilized for the remaining of the well. Drilling of the 9-7/8" intermediate hole commenced at 594.13 mMDRT with an 8.8 ppg, NaCl Polymer mud increasing slightly to 9.0 ppg while drilling to section TD at 1308 mMDRT. Mud was then weighted up to 9.5 ppg for the 6-3/4" section increasing slightly to 9.6 ppg in preparation to coring activities. Following coring retrieval, the well continue drilling with 9.6 ppg polymer mud down to well TD at 3173 mMDRT. Once at TD the whole was cleaned and displaced to a 9.6 ppg low salt Polymer mud in preparation for wireline operations.

4 GEOLOGY

4.1 FORMATION TOPS

Table summarizes the prognosed vs. actual Formation Top depths for Beetaloo W-1

FORMATION	Prognosed Depth		Actual Depth		Difference	COMMENTS
	(mMDRT)	(mTVDSS)	(mMDRT)	(mTVDSS)	(+/- mTVDSS)	
Undifferentiated Cretaceous	5.35	232	5.35	232	-	
Anthony Lagoon Formation	85	152.35	116.7	120.65	31.7 L	** Calibrated w/ wireline
Gum Ridge Formation	238	-0.65	247.6	-10.25	9.6 L	
Antrim Plateau Volcanics	447	-209.65	436.9	-199.55	10.1 H	
Bukalara Sandstone	495	-257.65	Not Present			
Chambers River Formation	520	-282.65	574	-336.65	54 L	** Calibrated w/ wireline
Bukalorkmi Sandstone	790	-552.65	854.5	-617.15	64.5 L	** Calibrated w/ wireline
Kyalla Formation	900	-662.65	985.7	-748.38	85.73 L	**Secondary Target** ** Calibrated w/ wireline
Moroak Sandstone	1700	-1462.65	1772.65	-1535.3	72.65 L	
Velkerri Formation	2285	-2047.65	2224.65	-1987.3	60.35 H	** Calibrated w/ wireline
upper Velkerri	2285	-2047.65	2224.65	-1987.3	60.35 H	** Calibrated w/ wireline
middle Velkerri	2620	-2382.65	2593.3	-2355.95	26.7 H	**Primary Target**
lower Velkerri	2995	-2757.65	3145.9	-2908.51	150.86 L	** Calibrated w/ wireline
Total Depth	**3045**	**-2807.65**	**3165**	**-2927.65**	**120 L**	**Driller TD @ 3173 mMDRT**

Table 4. Beetaloo W-1 prognosed vs. actual Formation Top depths

4.2 RESERVOIR AND PROSPECTIVE HORIZONS

Beetaloo W-1 geological objectives included the middle Velkerri of the Velkerri Formation (primary) and the Kyalla Formation (secondary target).

The middle Velkerri consists of three organic-rich mudstone intervals separated by two organic-lean, finely interbedded, variable mud, siltstone and sandstone rich intervals. The three organic-rich intervals are referred to as the middle Velkerri "A", "B" and "C" shales from oldest to youngest. In Beetaloo W-1, the middle Velkerri was intersected from 2593.3 to 3145.9 mMDRT.

The Kyalla Formation is a silty mudstone with thin planar interbeds of siltstone and sandstone; however more significant intervals of fine sandstone up to 70 m in thickness are recorded in the lower half of the formation (Lanigan et al., 1994). In Beetaloo W-1, the formation was intersected from 985.7 to 1772.65 mMDRT.

The lithological description of the middle Velkerri and Kyalla Formation are summarized in Appendix 2.

5 FORMATION SAMPLING

5.1 DRILL CUTTINGS

Drill cuttings samples were collected over the interval from 17 to 3173 mMDRT (Driller's TD). Sampling intervals were as follow:

Cuttings Interval (m)	Sample Rate (m)	Comments
17 - 205.72	10	No returns from 113 to 205.72 mMDRT
205.72 - 594.13	10	
594.13 - 1308	5	
1308 - 1525	5	
1525 - 3173	3	

Table 5. Drill Cuttings Interval and Sampling Rate Summary

Detailed drill cuttings lithological descriptions are enclosed in Appendix 2.

5.2 FULLBORE CORE

The well was continuously cored in the Kyalla Formation from 1525.57 to 1563.1 mMDRT for a total section of 37.53 meters. Core recovery was good retrieving a total of 36.12 m (96%). The 3.5" diameter conventional core was cut utilising a 42 m, 5-3/4" heavy duty core barrel and full-moon aluminium liners.

A record of the coring run is detailed in the Corepro ALS Oil & Gas End of Well Report in Appendix 3. Core photographs were not available by the time of submission of this report to the Department of Mines and Energy.

5.3 SIDEWALL CORES

Schlumberger's rotary sidewall coring tool (MSCT) was run over the interval from 3071.9 to 1521.3 mMDRT recovering 41 of a total of 48 sidewall cores (0.92" x 2") attempted. Table 6 provides an overview of sidewall cores recovered and depths. A detailed summary of sidewall core depths and natural light photography are enclosed in Appendix 3.

Run #	CORE NUMBER	CORE INTERVAL DRILLERS DEPTH (mMDRT)	CUT (mm)	RECOVER (mm)	COMMENT
4	1	3071.9	50	49	
4	2	3063.9	50	50	
4	3	3052.6	50	47	
4	4	3052.4	50	42	
4	5	3042.7	50	48	
4	6	3042.5	50	49	
4	7	3038.2	50	47	
4	8	3038	50	45	
4	9	3031.1	50	45	
4	10	3030.9	50	45	
4	11	3028.7	50	45	
4	12	3027.6	50	45	
4	13	3027.4	50	50	
4	14	3018.6	50	46	
4	15	3018.4	50	47	
4	16	3006.7	50	45	
4	17	3006.5	50	35	
4	18	2996.45	50	50	
4	19	2626.35	50	47	
4	20	2626.13	50	45	Split
4	21	2618.7	50	46	
4	22	2618.58	50	53	
4	23	3046.48	50	50	
4	24	3046	50	49	
4	25	3002.2	50	45	
4	26	3002	50	47	
4	27	2554.04	50	48	Broken
4	28	2547.7	50	45	
4	29	2546.5	50	47	
4	30	2546.3	50	46	
4	31	2218.2	50	Rubble	Rubble
4	32	2216.65	50	49	
4	33	2189.8	50	Rubble	Rubble
4	34	1775.2	50	Rubble	Rubble
4	35	1735.25	50	46	Lost Marker Disk

4	36	1710.55	50	41	
4	37	1710.35	50	48	
4	38	1702.25	50	30	Broken Core
4	39	1702.05	50	20	
4	40	1700.2	50	20	Broken Core
4	41	1698.35	50	Rubble	Rubble
4	42	1698.15	50	NR	Not Recovered
4	43	1688.3	50	NR	Not Recovered
4	44	1688.1	50	NR	Not Recovered
4	45	1681.95	50	NR	Not Recovered
4	46	1681.75	50	NR	Core Jammed. Not Recovered
4	47	1521.45	50	NR	Core Jammed. Not Recovered
4	48	1521.25	50	NR	Core Jammed Off. Not Recovered

Table 6. Summary of Rotary Sidewall Coring (MSCT) recovery and depths

5.4 MUD GAS

A total of 80 Isojars and 124 Isotubes were collected for Beetaloo W-1. Sampling intervals are summarised in Table 7. A detailed summary of mudgas sample collection depths is enclosed in Appendix 4.

Depth Interval (mMDRT)	Sample Type	Background Gas Sampling	Peak Gas Sampling
17 – 205.72	Isotubes / Isojars	No samples collected	No samples collected
205.72 – 594.13	Isotubes / Isojars	No samples collected	At gas peaks over 3 times background gas
594.13 - 3173	Isotubes / Isojars	1 Isotube sample every 50m 1 Isojar sample every 25m	At gas peaks over 3 times background gas

Table 7. Mudgas Sampling Summary

6 FORMATION EVALUATION

6.1 MUDLOGGING

Geoservices (Schlumberger) provided mudlogging services for the drilling of Beetaloo W-1. These included mud logging, mud gas chromatographic analysis and monitoring, real time and lagged data acquisition, data storage, as well as high resolution digital imaging and X-Ray fluorescence analysis (XRF) on drill cuttings over the interval from 17 to 3173 mMDRT. Mudlogging data, XRF raw values, HDRM cuttings photography, log displays and the Geoservices End of Well Report are enclosed in Appendix 5.

6.2 WIRELINE LOGGING

The following wireline logs were run by Schlumberger at Beetaloo W-1:

WIRELINE LOGGING					
RUN #	Depth (mMDRT)		Description	Operator	Remarks
	From	To			
1	3167.86	1292.6	NEXT-HRLT-HDRS-HGNS-EDTC (PEX - Lithoscanner)	SLB	Repeat section: 3053.2 - 3174.3 mMD Gamma-ray run through casing to surface Micro-resistivity failure
2	3153	1290	CMR-HNGS-HDRS-HGNS-EDTC (CMR)	SLB	HDRS-HGNS run after failure of micro-resistivity in Run 1 Repeat section: 2565.5 - 2685.6 mMD
3	3137.7	940	FMST-MAST-PPC-EDTC (FMI - SonicScanner)	SLB	Repeat section: 1335.6 - 1504.8 mMD
4	3071.9	1521.25	Rotary Sidewall Coring (MSCT)	SLB	48 Cores attempted / 41 recovered (3 rubble)

Table 1. Summary of Wireline Logs

Field data, processed data and log displays for all wireline logs are provided in Appendix 6.

6.3 HYDROCARBON INDICATIONS

6.3.1 GAS DETECTION WHILST DRILLING

Continuous Mud Gas monitoring and chromatographic breakdown of hydrocarbon gases (C_{1-n} - C_5) were performed by Geoservices in Beetaloo W-1. A summary of gas data collected whilst drilling is enclosed in Appendix 7.

6.3.2 FLUORESCENCE

Kyalla Formation:

- **1028 mMDRT (spot sample):** 5% very dull yellow spotted, no direct cut, very faint white thin ring residue.
- **1045 - 1065 mMDRT:** trace dull to very dull yellow spotted, no cut, no crush cut to slow faint white crush cut, trace faint white to very faint white film residue.

7 APPENDICES

Appendix 1: Bit record and drilling parameters summary

Appendix 2: Middle Velkerri lithological description
Kyalla Formation lithological description
Drill cuttings lithological description

Appendix 3: Sidewall core photography
Sidewall core summary depth recovery

	ALS Corepro End of Well Report
Appendix 4:	Mud gas sampling and depth summary
Appendix 5:	Mudlogging data
	Mudlogging and Drill log displays
	Geoservices End of Well Report
	XRF raw values
	HRDM Drill cuttings photography
Appendix 6:	Wireline field data
	Wireline processed data
	Wireline log displays
Appendix 7:	Gas data summary
Appendix 8:	Daily Drilling Reports
	Daily Geological Report
	Daily Drilling Fluids Report
	Newpark Drilling Fluids End of Well Report