

ORIGINAL
No. 7167


A Gyrodata Directional Survey

BRASKEM
Well: Mina 35, 9 5/8"
Location: RIGLESS, SAL GEMA
Job Number: BZ0419GVC030

MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
523.00	29.22	224.02	502.64	2.48	68.04 S	73.57W
524.00	29.32	224.00	503.51	2.48	68.39 S	73.91W
525.00	29.42	223.96	504.38	2.50	68.74 S	74.25W
526.00	29.51	223.99	505.25	2.53	69.10 S	74.59W
527.00	29.61	223.99	506.12	2.62	69.45 S	74.93W
528.00	29.69	223.99	506.99	2.68	69.81 S	75.27W
529.00	29.78	224.01	507.86	2.68	70.16 S	75.62W
530.00	29.87	223.97	508.73	2.64	70.52 S	75.96W
531.00	29.98	223.91	509.59	2.57	70.88 S	76.31W
532.00	30.09	223.87	510.46	2.49	71.24 S	76.66W
533.00	30.19	223.79	511.32	2.45	71.60 S	77.00W
534.00	30.28	223.77	512.19	2.43	71.97 S	77.35W
535.00	30.36	223.78	513.05	2.39	72.33 S	77.70W
536.00	30.44	223.79	513.91	2.38	72.70 S	78.05W
537.00	30.52	223.81	514.78	2.33	73.06 S	78.40W
538.00	30.59	223.80	515.64	2.27	73.43 S	78.76W
539.00	30.67	223.77	516.50	2.20	73.80 S	79.11W
540.00	30.75	223.75	517.36	2.13	74.17 S	79.46W
541.00	30.82	223.76	518.22	2.09	74.54 S	79.82W
542.00	30.93	223.74	519.07	2.02	74.91 S	80.17W
543.00	31.01	223.76	519.93	1.95	75.28 S	80.53W
544.00	31.06	223.78	520.79	1.88	75.65 S	80.88W
545.00	31.11	223.80	521.65	1.79	76.02 S	81.24W
546.00	31.17	223.87	522.50	1.68	76.40 S	81.60W
547.00	31.20	223.88	523.36	1.59	76.77 S	81.96W
548.00	31.26	223.91	524.21	1.50	77.14 S	82.32W
549.00	31.32	223.87	525.07	1.41	77.52 S	82.68W
550.00	31.35	223.88	525.92	1.31	77.89 S	83.04W
551.00	31.41	223.88	526.77	1.20	78.27 S	83.40W
552.00	31.45	223.89	527.63	1.07	78.65 S	83.76W
553.00	31.49	223.94	528.48	0.95	79.02 S	84.12W
554.00	31.52	223.95	529.33	0.83	79.40 S	84.48W
555.00	31.55	224.00	530.19	0.73	79.77 S	84.85W
556.00	31.60	224.02	531.04	0.65	80.15 S	85.21W
557.00	31.63	224.06	531.89	0.53	80.53 S	85.58W
558.00	31.64	224.12	532.74	0.42	80.90 S	85.94W

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MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
559.00	31.66	224.14	533.59	0.35	81.28 S	86.31W
560.00	31.66	224.17	534.44	0.28	81.66 S	86.67W
561.00	31.66	224.14	535.29	0.24	82.03 S	87.04W
562.00	31.68	224.11	536.15	0.22	82.41 S	87.40W
563.00	31.68	224.09	537.00	0.19	82.79 S	87.77W
564.00	31.68	224.07	537.85	0.16	83.17 S	88.13W
565.00	31.66	224.07	538.70	0.17	83.54 S	88.50W
566.00	31.63	224.06	539.55	0.17	83.92 S	88.86W
567.00	31.58	224.05	540.40	0.17	84.30 S	89.23W
568.00	31.53	224.01	541.25	0.22	84.67 S	89.59W
569.00	31.50	223.92	542.11	0.24	85.05 S	89.95W
570.00	31.48	223.86	542.96	0.28	85.42 S	90.32W
571.00	31.47	223.81	543.81	0.32	85.80 S	90.68W
572.00	31.46	223.79	544.66	0.36	86.18 S	91.04W
573.00	31.43	223.82	545.52	0.43	86.55 S	91.40W
574.00	31.41	223.80	546.37	0.46	86.93 S	91.76W
575.00	31.39	223.75	547.22	0.51	87.31 S	92.12W
576.00	31.40	223.72	548.08	0.53	87.68 S	92.48W
577.00	31.39	223.66	548.93	0.54	88.06 S	92.84W
578.00	31.39	223.64	549.79	0.55	88.44 S	93.20W
579.00	31.40	223.60	550.64	0.56	88.81 S	93.56W
580.00	31.42	223.59	551.49	0.59	89.19 S	93.92W
581.00	31.47	223.57	552.35	0.62	89.57 S	94.28W
582.00	31.51	223.58	553.20	0.69	89.95 S	94.64W
583.00	31.56	223.55	554.05	0.72	90.33 S	95.00W
584.00	31.59	223.52	554.90	0.72	90.71 S	95.36W
585.00	31.63	223.48	555.75	0.72	91.09 S	95.72W
586.00	31.67	223.42	556.61	0.69	91.47 S	96.08W
587.00	31.70	223.38	557.46	0.70	91.85 S	96.44W
588.00	31.76	223.34	558.31	0.75	92.23 S	96.80W
589.00	31.80	223.30	559.16	0.78	92.61 S	97.17W
590.00	31.85	223.27	560.01	0.77	93.00 S	97.53W
591.00	31.90	223.24	560.86	0.76	93.38 S	97.89W
592.00	31.93	223.20	561.70	0.74	93.77 S	98.25W
593.00	31.94	223.18	562.55	0.75	94.15 S	98.61W
594.00	31.93	223.11	563.40	0.76	94.54 S	98.98W

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MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
595.00	31.93	223.08	564.25	0.82	94.93 S	99.34W
596.00	31.93	223.04	565.10	0.87	95.31 S	99.70W
597.00	31.95	222.95	565.95	0.93	95.70 S	100.06W
598.00	31.97	222.93	566.80	1.02	96.09 S	100.42W
599.00	31.97	222.89	567.64	1.12	96.47 S	100.78W
600.00	31.96	222.84	568.49	1.21	96.86 S	101.14W
601.00	31.93	222.82	569.34	1.31	97.25 S	101.50W
602.00	31.91	222.77	570.19	1.42	97.64 S	101.86W
603.00	31.89	222.68	571.04	1.58	98.03 S	102.22W
604.00	31.86	222.59	571.89	1.70	98.42 S	102.57W
605.00	31.82	222.52	572.74	1.84	98.80 S	102.93W
606.00	31.79	222.48	573.59	1.97	99.19 S	103.29W
607.00	31.71	222.39	574.44	2.07	99.58 S	103.64W
608.00	31.62	222.27	575.29	2.18	99.97 S	104.00W
609.00	31.53	222.16	576.14	2.26	100.36 S	104.35W
610.00	31.43	222.02	576.99	2.32	100.74 S	104.70W
611.00	31.34	221.92	577.85	2.41	101.13 S	105.05W
612.00	31.25	221.86	578.70	2.51	101.52 S	105.39W
613.00	31.14	221.76	579.56	2.76	101.90 S	105.74W
614.00	31.02	221.67	580.41	2.86	102.29 S	106.08W
615.00	30.90	221.61	581.27	2.95	102.67 S	106.42W
616.00	30.76	221.59	582.13	2.99	103.06 S	106.76W
617.00	30.63	221.57	582.99	2.90	103.44 S	107.10W
618.00	30.48	221.55	583.85	3.00	103.82 S	107.44W
619.00	30.35	221.58	584.71	3.11	104.20 S	107.78W
620.00	30.22	221.63	585.58	3.23	104.58 S	108.11W
621.00	30.11	221.64	586.44	3.38	104.95 S	108.44W
622.00	30.02	221.65	587.31	3.41	105.33 S	108.78W
623.00	29.90	221.69	588.17	3.41	105.70 S	109.11W
624.00	29.80	221.65	589.04	3.35	106.07 S	109.44W
625.00	29.72	221.68	589.91	3.28	106.44 S	109.77W
626.00	29.63	221.64	590.78	3.26	106.81 S	110.10W
627.00	29.52	221.71	591.65	3.23	107.18 S	110.43W
628.00	29.23	222.22	592.52	3.18	107.54 S	110.76W
629.00	29.13	222.24	593.39	3.11	107.91 S	111.08W
630.00	29.02	222.34	594.27	3.07	108.27 S	111.41W

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MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
631.00	28.95	222.38	595.14	3.05	108.62 S	111.74W
632.00	29.05	221.83	596.02	3.03	108.98 S	112.06W
633.00	28.93	221.70	596.89	3.00	109.34 S	112.38W
634.00	28.79	221.64	597.77	2.97	109.70 S	112.71W
635.00	28.61	221.76	598.64	2.89	110.06 S	113.02W
636.00	28.42	221.93	599.52	2.86	110.42 S	113.34W
637.00	28.31	221.96	600.40	2.82	110.77 S	113.66W
638.00	28.21	221.93	601.28	2.76	111.12 S	113.98W
639.00	28.19	221.63	602.16	2.71	111.48 S	114.29W
640.00	28.17	221.34	603.05	2.67	111.83 S	114.61W
641.00	28.09	221.33	603.93	2.63	112.18 S	114.92W
642.00	28.03	221.32	604.81	2.56	112.54 S	115.23W
643.00	27.97	221.34	605.69	2.34	112.89 S	115.54W
644.00	27.91	221.41	606.58	2.32	113.24 S	115.85W
645.00	27.83	221.47	607.46	2.28	113.59 S	116.16W
646.00	27.71	221.51	608.35	2.30	113.94 S	116.46W
647.00	27.60	221.54	609.23	2.45	114.29 S	116.77W
648.00	27.48	221.58	610.12	2.39	114.64 S	117.08W
649.00	27.38	221.62	611.01	2.32	114.98 S	117.39W
650.00	27.33	221.66	611.89	2.21	115.32 S	117.69W
651.00	27.25	221.73	612.78	2.09	115.67 S	118.00W
652.00	27.20	221.72	613.67	2.04	116.01 S	118.30W
653.00	27.14	221.69	614.56	2.01	116.35 S	118.60W
654.00	27.09	221.69	615.45	2.05	116.69 S	118.91W
655.00	27.05	221.64	616.34	2.11	117.03 S	119.21W
656.00	27.00	221.63	617.23	2.10	117.37 S	119.51W
657.00	26.96	221.61	618.12	2.10	117.71 S	119.81W
658.00	26.91	221.61	619.01	2.11	118.05 S	120.11W
659.00	26.83	221.62	619.91	2.07	118.38 S	120.41W
660.00	26.76	221.66	620.80	2.01	118.72 S	120.71W
661.00	26.67	221.71	621.69	1.95	119.06 S	121.01W
662.00	26.60	221.73	622.59	1.87	119.39 S	121.31W
663.00	26.54	221.73	623.48	1.78	119.72 S	121.61W
664.00	26.47	221.73	624.38	1.71	120.06 S	121.91W
665.00	26.40	221.71	625.27	1.69	120.39 S	122.20W
666.00	26.33	221.69	626.17	1.65	120.72 S	122.50W

DWPM/AL
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A Gyrodata Directional Survey

BRASKEM
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MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
667.00	26.27	221.66	627.06	1.63	121.05 S	122.79W
668.00	26.20	221.66	627.96	1.60	121.38 S	123.09W
669.00	26.14	221.65	628.86	1.57	121.71 S	123.38W
670.00	26.07	221.69	629.76	1.56	122.04 S	123.67W
671.00	26.00	221.84	630.65	1.54	122.37 S	123.96W
672.00	25.95	221.96	631.55	1.56	122.69 S	124.26W
673.00	25.88	221.95	632.45	1.57	123.02 S	124.55W
674.00	25.85	221.85	633.35	1.53	123.34 S	124.84W
675.00	25.82	221.65	634.25	1.52	123.67 S	125.13W
676.00	25.76	221.49	635.15	1.46	123.99 S	125.42W
677.00	25.73	221.49	636.05	1.42	124.32 S	125.71W
678.00	25.70	221.52	636.96	1.40	124.64 S	125.99W
679.00	25.67	221.55	637.86	1.36	124.97 S	126.28W
680.00	25.64	221.57	638.76	1.32	125.29 S	126.57W
681.00	25.60	221.58	639.66	1.29	125.62 S	126.86W
682.00	25.57	221.63	640.56	1.25	125.94 S	127.14W
683.00	25.54	221.66	641.46	1.21	126.26 S	127.43W
684.00	25.52	221.73	642.37	1.22	126.58 S	127.72W
685.00	25.49	221.85	643.27	1.22	126.90 S	128.00W
686.00	25.46	221.89	644.17	1.41	127.23 S	128.29W
687.00	25.41	221.93	645.07	1.57	127.54 S	128.58W
688.00	25.35	221.94	645.98	1.59	127.86 S	128.86W
689.00	25.31	221.91	646.88	1.64	128.18 S	129.15W
690.00	25.25	221.97	647.79	1.49	128.50 S	129.43W
691.00	25.22	222.03	648.69	1.37	128.82 S	129.72W
692.00	25.19	222.06	649.60	1.38	129.13 S	130.00W
693.00	25.15	222.12	650.50	1.43	129.45 S	130.29W
694.00	25.12	222.17	651.41	1.50	129.76 S	130.57W
695.00	25.10	222.20	652.31	1.58	130.08 S	130.86W
696.00	25.07	222.28	653.22	1.64	130.39 S	131.14W
697.00	25.05	222.33	654.12	1.69	130.70 S	131.43W
698.00	25.03	222.37	655.03	1.74	131.02 S	131.71W
699.00	24.96	222.36	655.94	1.78	131.33 S	132.00W
700.00	24.89	222.39	656.84	1.86	131.64 S	132.28W
701.00	24.62	222.54	657.75	1.92	131.95 S	132.57W
702.00	24.41	222.67	658.66	1.96	132.26 S	132.85W

DNP/AL
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MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
703.00	24.32	222.72	659.57	2.00	132.56 S	133.13W
704.00	24.25	222.72	660.48	2.08	132.86 S	133.41W
705.00	24.38	222.55	661.39	2.12	133.16 S	133.68W
706.00	24.45	222.47	662.30	2.20	133.47 S	133.96W
707.00	24.42	222.50	663.21	2.29	133.77 S	134.24W
708.00	24.34	222.54	664.13	2.52	134.08 S	134.52W
709.00	24.24	222.66	665.04	2.68	134.38 S	134.80W
710.00	24.13	222.70	665.95	2.78	134.68 S	135.08W
711.00	24.03	222.67	666.86	2.85	134.98 S	135.36W
712.00	23.94	222.67	667.78	2.80	135.28 S	135.63W
713.00	23.85	222.65	668.69	2.79	135.58 S	135.91W
714.00	23.78	222.67	669.60	2.82	135.88 S	136.18W
715.00	23.67	222.73	670.52	2.86	136.17 S	136.45W
716.00	23.58	222.79	671.44	2.71	136.47 S	136.72W
717.00	23.49	222.88	672.35	2.60	136.76 S	137.00W
718.00	23.39	222.96	673.27	2.60	137.05 S	137.27W
719.00	23.29	223.08	674.19	2.64	137.34 S	137.54W
720.00	23.19	223.20	675.11	2.87	137.63 S	137.81W
721.00	23.08	223.29	676.03	3.05	137.91 S	138.08W
722.00	22.96	223.39	676.95	3.15	138.20 S	138.34W
723.00	22.70	223.53	677.87	3.20	138.48 S	138.61W
724.00	22.50	223.58	678.79	3.26	138.76 S	138.88W
725.00	22.38	223.61	679.72	3.23	139.03 S	139.14W
726.00	22.27	223.63	680.64	3.20	139.31 S	139.40W
727.00	22.30	223.63	681.57	3.15	139.58 S	139.66W
728.00	22.29	223.72	682.49	3.10	139.86 S	139.92W
729.00	22.20	223.84	683.42	3.14	140.13 S	140.19W
730.00	22.10	223.98	684.34	3.09	140.40 S	140.45W
731.00	21.98	224.10	685.27	3.08	140.67 S	140.71W
732.00	21.88	224.18	686.20	3.03	140.94 S	140.97W
733.00	21.79	224.25	687.13	2.99	141.21 S	141.23W
734.00	21.69	224.36	688.06	2.97	141.47 S	141.49W
735.00	21.62	224.53	688.99	2.96	141.74 S	141.75W
736.00	21.52	224.67	689.92	2.95	142.00 S	142.00W
737.00	21.40	224.83	690.85	2.90	142.26 S	142.26W
738.00	21.28	225.00	691.78	2.73	142.52 S	142.52W

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BRASKEM
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MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
739.00	21.12	225.11	692.71	2.64	142.77 S	142.77W
740.00	21.05	225.25	693.64	2.61	143.02 S	143.03W
741.00	21.01	225.42	694.58	2.61	143.28 S	143.28W
742.00	20.99	225.54	695.51	2.73	143.53 S	143.54W
743.00	20.97	225.63	696.44	2.79	143.78 S	143.80W
744.00	20.87	225.77	697.38	2.77	144.03 S	144.05W
745.00	20.81	225.84	698.31	2.73	144.28 S	144.31W
746.00	20.74	225.93	699.25	2.68	144.52 S	144.56W
747.00	20.69	226.00	700.18	2.68	144.77 S	144.81W
748.00	20.64	226.08	701.12	2.68	145.01 S	145.07W
749.00	20.55	226.13	702.05	2.66	145.26 S	145.32W
750.00	20.45	226.23	702.99	2.65	145.50 S	145.58W
751.00	20.35	226.31	703.93	2.60	145.74 S	145.83W
752.00	20.28	226.40	704.87	2.54	145.98 S	146.08W
753.00	20.19	226.48	705.80	2.49	146.22 S	146.33W
754.00	20.09	226.52	706.74	2.39	146.46 S	146.58W
755.00	20.00	226.55	707.68	2.37	146.69 S	146.83W
756.00	19.89	226.59	708.62	2.38	146.93 S	147.08W
757.00	19.80	226.67	709.56	2.40	147.16 S	147.32W
758.00	19.71	226.70	710.50	2.44	147.39 S	147.57W
759.00	19.63	226.74	711.45	2.40	147.62 S	147.81W
760.00	19.55	226.76	712.39	2.39	147.85 S	148.06W
761.00	19.47	226.77	713.33	2.38	148.08 S	148.30W
762.00	19.37	226.86	714.27	2.36	148.31 S	148.54W
763.00	19.27	226.86	715.22	2.35	148.53 S	148.78W
764.00	19.18	226.86	716.16	2.32	148.76 S	149.02W
765.00	19.10	226.87	717.11	2.26	148.98 S	149.26W
766.00	19.03	226.80	718.05	2.22	149.21 S	149.50W
767.00	18.96	226.83	719.00	2.20	149.43 S	149.74W
768.00	18.88	226.92	719.94	2.15	149.65 S	149.98W
769.00	18.81	226.94	720.89	2.10	149.87 S	150.21W
770.00	18.75	226.97	721.84	2.05	150.09 S	150.45W
771.00	18.69	227.01	722.78	2.00	150.31 S	150.68W
772.00	18.65	227.06	723.73	2.03	150.53 S	150.92W
773.00	18.59	227.19	724.68	2.02	150.75 S	151.15W
774.00	18.53	227.32	725.63	2.05	150.96 S	151.38W

DNP/AL
Fig. 2.174
Q

A Gyrodata Directional Survey

BRASKEM
Well: Mina 35, 9 5/8"
Location: RIGLESS, SAL GEMA
Job Number: BZ0419GVC030


MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
775.00	18.48	227.46	726.57	2.06	151.18 S	151.62W
776.00	18.43	227.64	727.52	2.03	151.39 S	151.85W
777.00	18.41	227.81	728.47	2.04	151.60 S	152.08W
778.00	18.38	228.01	729.42	2.04	151.81 S	152.32W
779.00	18.34	228.22	730.37	2.05	152.02 S	152.55W
780.00	18.30	228.38	731.32	2.07	152.23 S	152.79W
781.00	18.25	228.50	732.27	2.06	152.44 S	153.02W
782.00	18.20	228.54	733.22	2.04	152.65 S	153.26W
783.00	18.15	228.57	734.17	2.02	152.86 S	153.49W
784.00	18.10	228.56	735.12	1.99	153.06 S	153.72W
785.00	18.06	228.59	736.07	1.97	153.27 S	153.96W
786.00	18.00	228.63	737.02	1.95	153.47 S	154.19W
787.00	17.88	228.73	737.97	1.97	153.67 S	154.42W
788.00	17.80	228.77	738.92	1.96	153.88 S	154.65W
789.00	17.69	228.79	739.88	1.96	154.08 S	154.88W
790.00	17.59	228.78	740.83	1.97	154.28 S	155.11W
791.00	17.54	228.71	741.78	1.97	154.48 S	155.33W
792.00	17.41	228.71	742.74	2.02	154.67 S	155.56W
793.00	17.31	228.72	743.69	2.11	154.87 S	155.78W
794.00	17.21	228.70	744.65	2.56	155.07 S	156.01W
795.00	17.11	228.67	745.60	2.55	155.26 S	156.23W
796.00	17.05	228.61	746.56	2.56	155.46 S	156.45W
797.00	16.99	228.57	747.51	2.79	155.65 S	156.67W
798.00	16.92	228.54	748.47	2.39	155.84 S	156.89W
799.00	16.88	228.50	749.43	2.35	156.04 S	157.11W
800.00	16.83	228.47	750.38	2.37	156.23 S	157.32W
801.00	16.79	228.43	751.34	2.08	156.42 S	157.54W
802.00	16.73	228.56	752.30	1.97	156.61 S	157.76W
803.00	16.68	228.66	753.26	1.96	156.80 S	157.97W
804.00	16.62	228.72	754.21	1.93	156.99 S	158.19W
805.00	16.55	228.82	755.17	1.91	157.18 S	158.40W
806.00	16.49	228.83	756.13	1.96	157.36 S	158.61W
807.00	16.41	228.83	757.09	1.96	157.55 S	158.83W
808.00	16.28	228.83	758.05	2.00	157.74 S	159.04W
809.00	15.79	228.90	759.01	2.03	157.92 S	159.25W
810.00	15.75	228.86	759.97	2.05	158.10 S	159.45W

ORIGINAL
Fig. 7.175
[Signature]

A Gyrodata Directional Survey

BRASKEM
Well: Mina 35, 9 5/8"
Location: RIGLESS, SAL GEMA
Job Number: BZ0419GVC030

MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
811.00	15.69	228.81	760.94	2.09	158.28 S	159.66W
812.00	15.41	228.74	761.90	2.14	158.45 S	159.86W
813.00	15.76	228.64	762.86	2.15	158.63 S	160.06W
814.00	15.75	228.51	763.83	2.22	158.81 S	160.26W
815.00	15.69	228.42	764.79	2.27	158.99 S	160.47W
816.00	15.92	228.42	765.75	2.32	159.17 S	160.67W
817.00	15.91	228.36	766.71	2.36	159.35 S	160.88W
818.00	15.84	228.29	767.67	2.39	159.53 S	161.08W
819.00	15.77	228.26	768.64	2.42	159.71 S	161.28W
820.00	15.68	228.31	769.60	2.44	159.89 S	161.48W
821.00	15.58	228.34	770.56	2.45	160.07 S	161.69W
822.00	15.45	228.41	771.53	2.45	160.25 S	161.89W
823.00	15.31	228.46	772.49	2.38	160.43 S	162.08W
824.00	15.18	228.49	773.45	1.98	160.60 S	162.28W
825.00	15.06	228.55	774.42	2.01	160.77 S	162.48W
826.00	14.96	228.60	775.39	2.09	160.95 S	162.67W
827.00	14.85	228.68	776.35	1.96	161.12 S	162.86W
828.00	14.77	228.91	777.32	2.42	161.28 S	163.06W
829.00	14.67	229.07	778.29	2.53	161.45 S	163.25W
830.00	14.57	229.24	779.25	2.55	161.62 S	163.44W
831.00	14.49	229.46	780.22	2.83	161.78 S	163.63W
832.00	14.39	229.56	781.19	2.90	161.94 S	163.82W
833.00	14.31	229.72	782.16	2.92	162.10 S	164.01W
834.00	14.22	229.93	783.13	2.94	162.26 S	164.20W
835.00	14.14	230.15	784.10	2.95	162.42 S	164.38W
836.00	14.07	230.36	785.07	2.94	162.57 S	164.57W
837.00	14.00	230.57	786.04	2.92	162.73 S	164.76W
838.00	13.95	230.78	787.01	2.86	162.88 S	164.95W
839.00	13.88	230.98	787.98	2.80	163.03 S	165.13W
840.00	13.82	231.10	788.95	2.75	163.18 S	165.32W
841.00	13.70	231.33	789.92	2.70	163.33 S	165.50W
842.00	13.58	231.54	790.89	2.66	163.48 S	165.69W
843.00	13.47	231.69	791.86	2.60	163.63 S	165.87W
844.00	13.37	231.96	792.84	2.53	163.77 S	166.05W
845.00	13.31	232.09	793.81	2.46	163.91 S	166.24W
846.00	13.25	232.22	794.78	2.41	164.05 S	166.42W

DNP/AL
Fis. 7.176


A Gyrodata Directional Survey

BRASKEM
Well: Mina 35, 9 5/8"
Location: RIGLESS, SAL GEMA
Job Number: BZ0419GVC030

MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
847.00	13.18	232.29	795.76	2.38	164.19 S	166.60W
848.00	13.10	232.35	796.73	2.42	164.33 S	166.78W
849.00	13.01	232.37	797.71	2.44	164.47 S	166.96W
850.00	12.91	232.38	798.68	2.39	164.61 S	167.13W
851.00	12.81	232.42	799.65	2.26	164.74 S	167.31W
852.00	12.69	232.33	800.63	2.11	164.88 S	167.49W
853.00	12.60	232.33	801.61	1.98	165.01 S	167.66W
854.00	12.53	232.32	802.58	1.84	165.14 S	167.83W
855.00	12.47	232.42	803.56	1.80	165.27 S	168.00W
856.00	12.43	232.59	804.53	1.66	165.41 S	168.17W
857.00	12.36	232.71	805.51	1.52	165.54 S	168.34W
858.00	12.33	232.77	806.49	1.43	165.67 S	168.51W
859.00	12.29	232.75	807.47	1.31	165.79 S	168.68W
860.00	12.25	232.76	808.44	1.25	165.92 S	168.85W
861.00	12.20	232.79	809.42	1.19	166.05 S	169.02W
862.00	12.12	232.76	810.40	1.12	166.18 S	169.19W
863.00	12.00	232.89	811.38	1.06	166.30 S	169.36W
864.00	11.88	233.01	812.35	1.00	166.43 S	169.52W
865.00	11.85	233.20	813.33	0.94	166.55 S	169.69W
866.00	11.92	233.53	814.31	0.91	166.68 S	169.85W
867.00	12.01	233.63	815.29	0.90	166.80 S	170.02W
868.00	12.09	233.84	816.27	0.93	166.92 S	170.19W
869.00	12.16	233.92	817.24	0.96	167.05 S	170.36W
870.00	12.14	233.99	818.22	0.96	167.17 S	170.53W
871.00	12.16	234.13	819.20	0.96	167.29 S	170.70W
872.00	12.19	234.34	820.18	0.99	167.42 S	170.87W
873.00	12.19	234.52	821.15	1.03	167.54 S	171.04W
874.00	12.20	234.66	822.13	1.07	167.66 S	171.21W
875.00	12.22	234.83	823.11	1.08	167.78 S	171.38W
876.00	12.23	234.96	824.09	1.09	167.91 S	171.56W
877.00	12.25	235.14	825.06	1.12	168.03 S	171.73W
878.00	12.26	235.29	826.04	1.13	168.15 S	171.90W
879.00	12.27	235.43	827.02	1.15	168.27 S	172.08W
880.00	12.28	235.59	828.00	1.14	168.39 S	172.25W
881.00	12.29	235.86	828.97	1.05	168.51 S	172.43W
882.00	12.31	236.12	829.95	0.98	168.63 S	172.61W

DNV
Fig. 7-177


A Gyrodata Directional Survey

BRASKEM
Well: Mina 35, 9 5/8"
Location: RIGLESS, SAL GEMA
Job Number: BZ0419GVC030

MEASURED DEPTH meters	INCL deg.	AZIMUTH deg.	VERTICAL DEPTH meters	NORMALIZED DOGLEG deg/30m	HORIZONTAL COORDINATES meters	
883.00	12.33	236.46	830.93	0.89	168.75 S	172.78 W
884.00	12.34	236.68	831.90	0.80	168.86 S	172.96 W
885.00	12.38	236.84	832.88	0.00	168.98 S	173.14 W
886.00	12.41	237.07	833.86	0.00	169.10 S	173.32 W
887.00	12.43	237.30	834.83	0.00	169.22 S	173.50 W
888.00	12.44	237.54	835.81	0.00	169.33 S	173.68 W
889.00	12.45	237.68	836.79	0.00	169.45 S	173.87 W
890.00	12.44	237.75	837.76	0.00	169.56 S	174.05 W
891.00	12.44	237.78	838.74	0.00	169.68 S	174.23 W
892.00	12.45	237.77	839.72	0.00	169.79 S	174.41 W
893.00	12.45	237.77	840.69	0.00	169.91 S	174.60 W
894.00	12.45	237.76	841.67	0.00	170.02 S	174.78 W
895.00	12.45	237.79	842.65	0.00	170.14 S	174.96 W
896.00	12.47	237.76	843.62	0.00	170.25 S	175.14 W
897.00	12.47	237.72	844.60	0.00	170.37 S	175.33 W
898.00	12.44	237.68	845.58	0.00	170.48 S	175.51 W
899.00	12.42	237.49	846.55	0.00	170.60 S	175.69 W

Final Station Closure: Distance: 244.89 m Az: 225.84 deg.

DNP/AL
Fis. 7.178
[Signature]

Parte 5
Controle de Qualidade

Survey QC - RGS-CT Continuous Specification Sheet

gyrodata**SURVEY QUALITY CONTROL - SPECIFICATION DATA****PRE-JOB CALIBRATION VERIFICATION (ROLL TEST)**

System Parameter	dGx	dGy	dmbo	Mean Gravity Error *	Stdev Gravity Error
Standard Deviation	0.005	0.005	0.005	0.00016	0.00001
Tolerance	0.033	0.033	0.087	0.00591	0.00720

GYRO VERIFICATION (ADVANCED INITIALISATION)

Gyro Compass Parameter	Gyro noise	dGx	dGy	dmbo	Max corr coef
Standard Deviation	0.048	0.006	0.005	0.000	0.03
Tolerance	0.141	0.033	0.033	0.087	0.45
Initialisation inclination standard deviation					0.11
Initialisation azimuth standard deviation					0.26
Initialisation azimuth uncertainty in percent of error model - Tolerance < 100%					39%

ACCELEROMETER VERIFICATION (G-TOTAL TEST) - not applicable for 2 accelerometer systems

G-Total Test Parameter	Mean Gravity Error	Mean Gravity Error Standard Deviation
Error	0.00008	0.00002
Tolerance	0.00592	0.01818

CALIBRATION

Tool Number	FA088	Calibration Date	06 Jan 2016
-------------	-------	------------------	-------------

OPERATING TEMPERATURE

Calibration range	From	30.03	To	120.04
Gyro operating range	From	63.45	To	64.15
In-Spec if +/- 2.5 °C of Calibration				

CONTINUOUS DRIFT CORRECTION

Linear Drift Uncertainty	0.16	Random Walk Uncertainty	0.07
Tolerance	0.46	Tolerance	0.23

CONTINUOUS MISALIGNMENT CORRECTION

Misalignment Parameter	dMx	dMy	Cross corr coef
Standard Deviation	0.00	0.00	0.36
Tolerance	0.12	0.12	0.70

DEPTH CONTROL

Wireline Company	Line type	Encoder SF
Max Depth (TD)	CCL Corrected	
Zero Depth (Rig up)	Rezero Depth	
Given pup joint depth	Measured PJ	
Strech cor. At TD divided by TD/1000		Spec' - 1.5/1000
Dif. Between rigup and rezero depths divided by TD/1000		Spec' - 2.0/1000
Dif. Between given and meas depth divided by meas/1000		Spec' - 2.0/1000

INDIVIDUAL STATION REPORT

% of Total stations accepted	Tolerance > 80%	100%
Consecutive Interval out of Specification	Tolerance < 100 m (300 ft)	0 meters

SURVEY RUNNING TIME

Rig up	Rig down
Start Inrun	Field Survey Presented
End outrun	Lost Time
Comments	

DNP/11/1L
Fts. 7/180
BN

Survey QC - RGS-CT Continuous Specification Sheet

gyrodata

ACCEPTANCE SUMMARY

	Accept Yes / No
Pre-job calibration verification (roll test)	YES
Gyro Verification (Advanced Initialisation)	YES
Accelerometer verification (G-Total Test)	YES
Operating temperature within calibration range (+/- 2.5°)	YES
Continuous Drift Correction	YES
Continuous Misalignment Correction	YES
Depth Control	
Individual Station Report	YES

NAME AND DATE

Click here to enter text.

SIGNATURE

Click here to enter text.

Note : Any modifications or amendments to this sheet must be reported to the client representative and the Gyrodata survey focal point.

Survey QC – Vertical Continuous Analysis Sheet

gyrodata

SURVEY QUALITY CONTROL – SPECIFICATION DATA

PRE-JOB CALIBRATION VERIFICATION (ROLL TEST)

System Parameter	dGx	dGy	dmbo	Mean Gravity Error	Stdev Gravity Error
Standard Deviation	0.005	0.005	0.005	0.00016	0.00001
Tolerance	0.033	0.033	0.087	0.00591	0.00720

CALIBRATION

Tool Number	FA088	Calibration Date	06 Jan 2016
-------------	-------	------------------	-------------

OPERATING TEMPERATURE

CONTINUE FROM PREVIOUS PAGE					
Calibration range	From	30.03	To	120.04	
Gyro operating range for Job	From	63.45	To	64.15	In-Spec if +/- 2.5 °C of Calibration

INCLINATION DIFFERENCE TEST


Chi-square test value	4.9
Tolerance	34.4
Number of overlapping survey stations used	15.0

CO-ORDINATE DIFFERENCE TEST

	North	East	Vertical
Chi-square test value	3.6	7.4	0.0
Tolerance	34.4	34.4	34.4
Number of overlapping survey stations used	15.0	15.0	15.0

DNPV/AL
Fls. 7.182


Parte 6
Relatório Cronológico
da Operação

DNP VIAL
Fls. 7.183


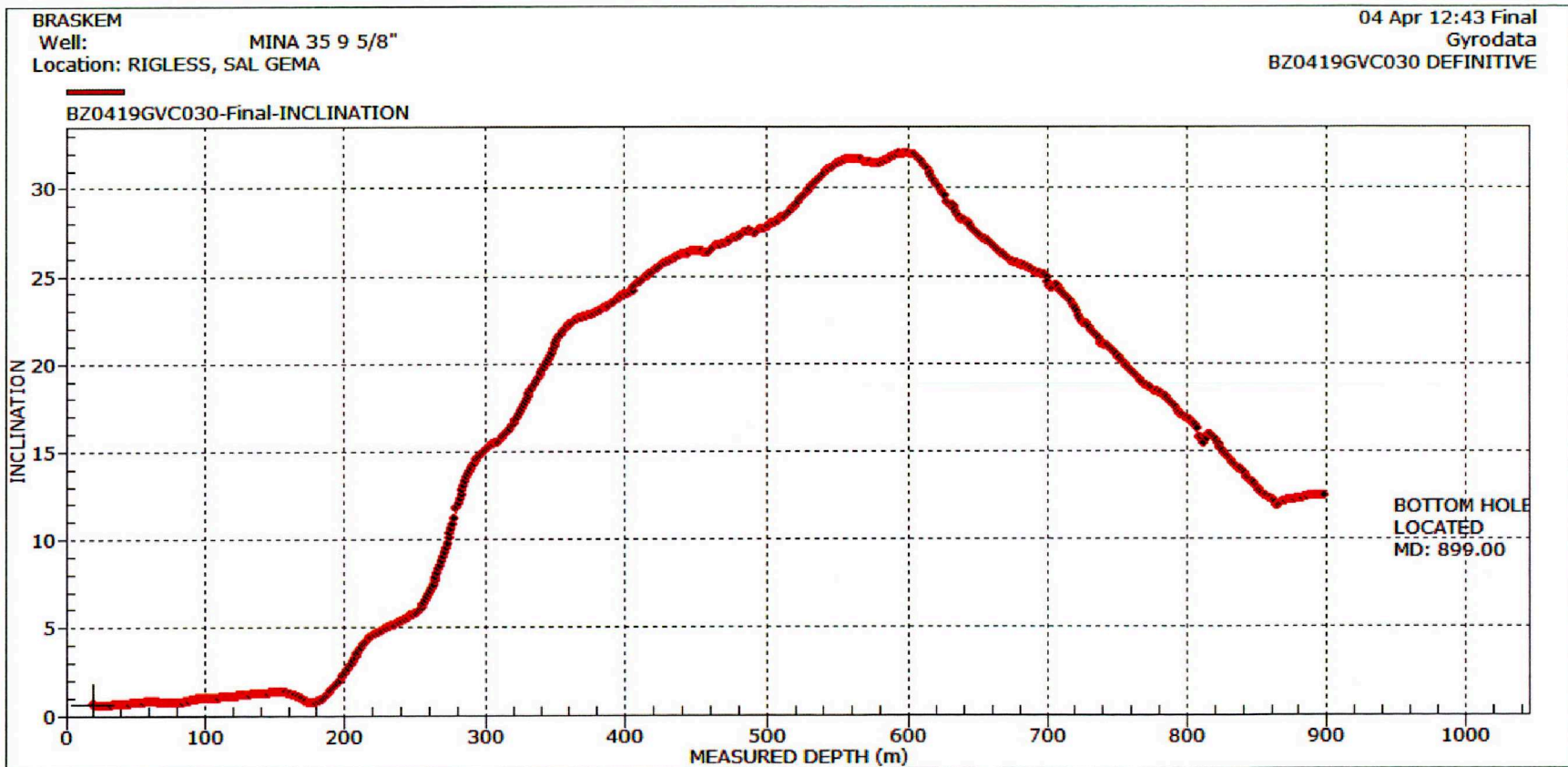
6.0 RELATÓRIO CRONOLÓGICO DA OPERAÇÃO

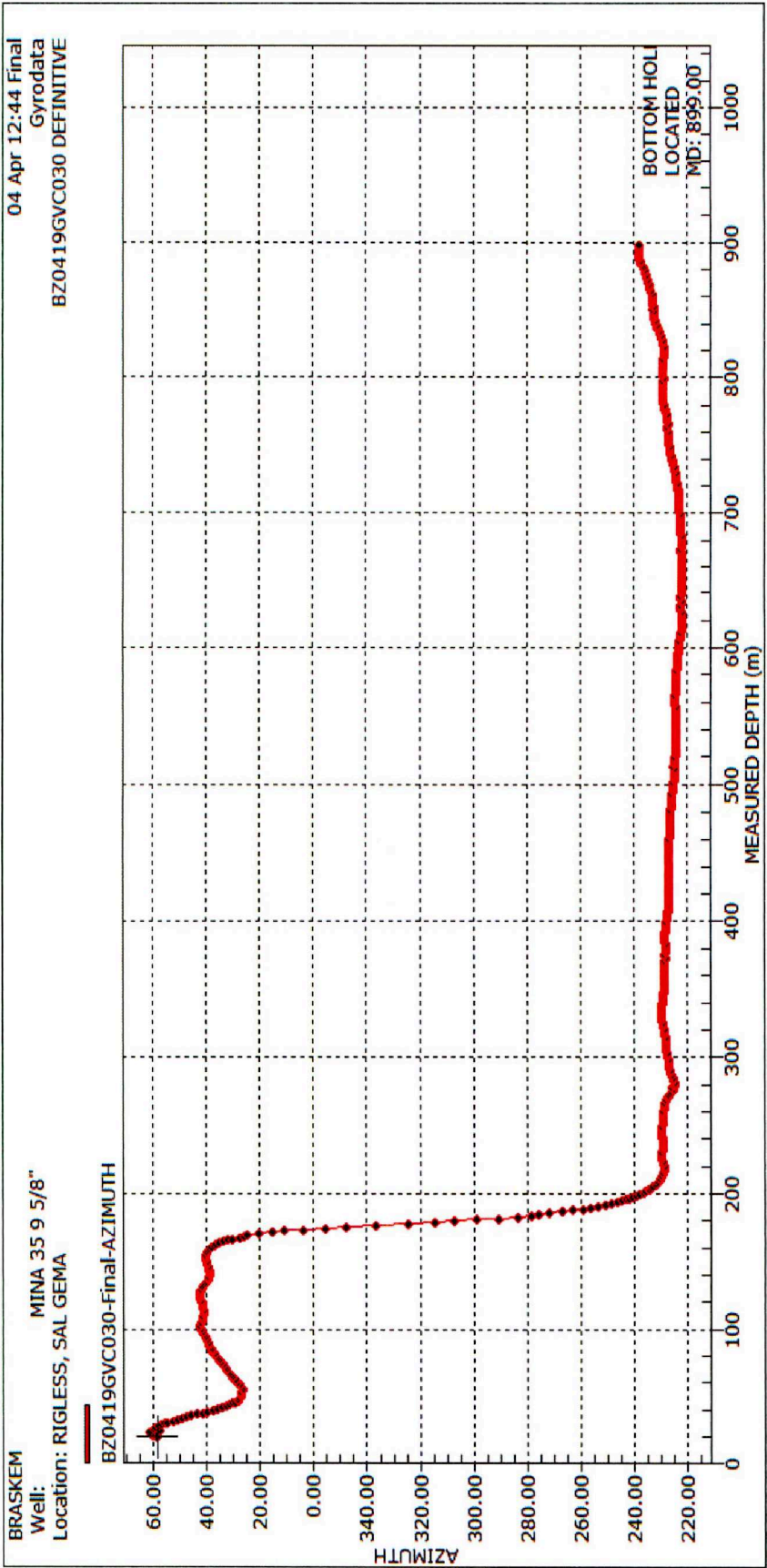
03 de abril de 2019

14:30 Chegada da equipe na mina 35
15:10 Conexão gyrodata/flodim
16:00 Início de corrida mina 35
19:45 Desmontagem de equipamentos
20:30 Pós calibração

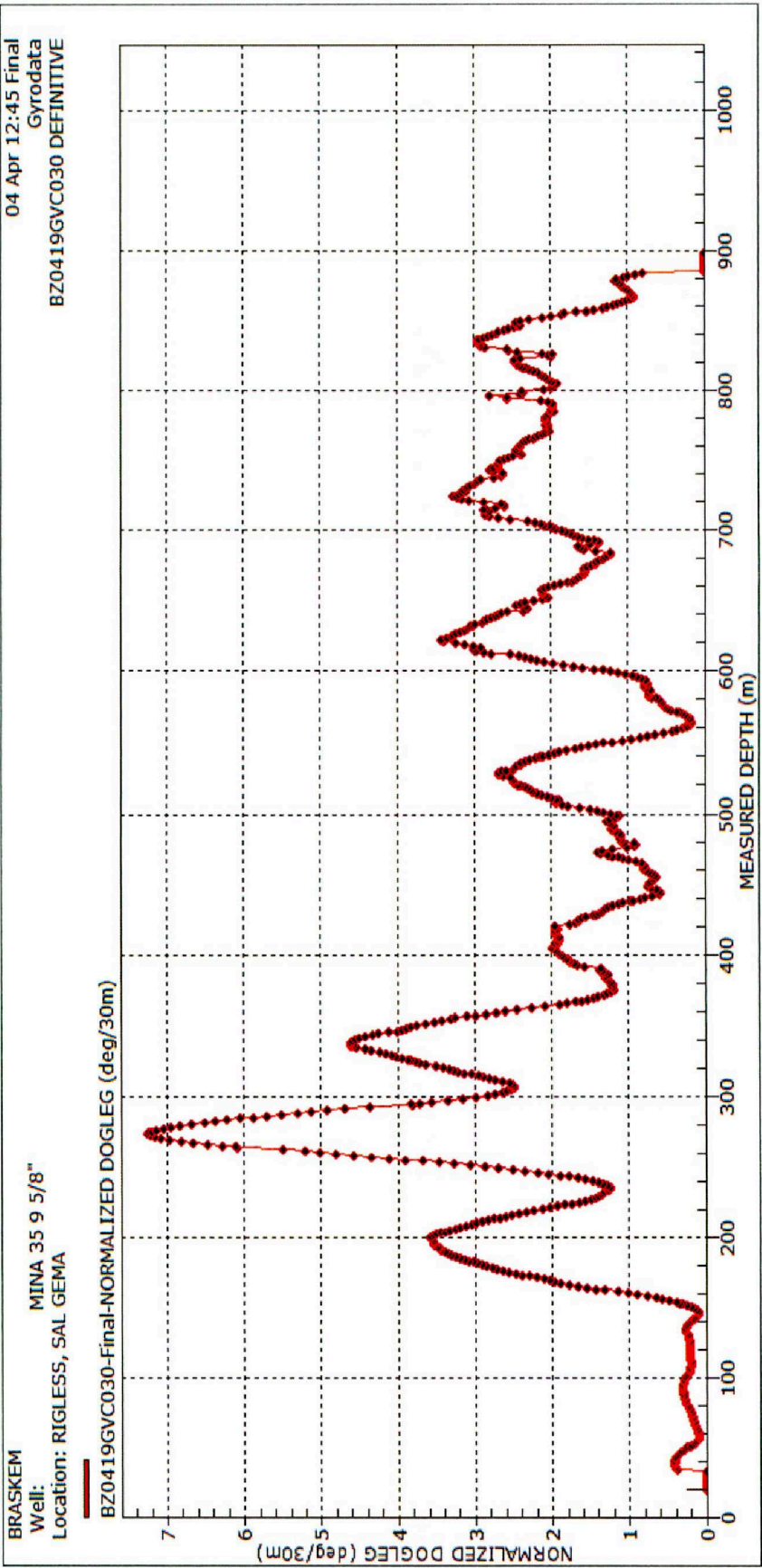
Parte 7
Gráficos

04/04/14
 16.7.185

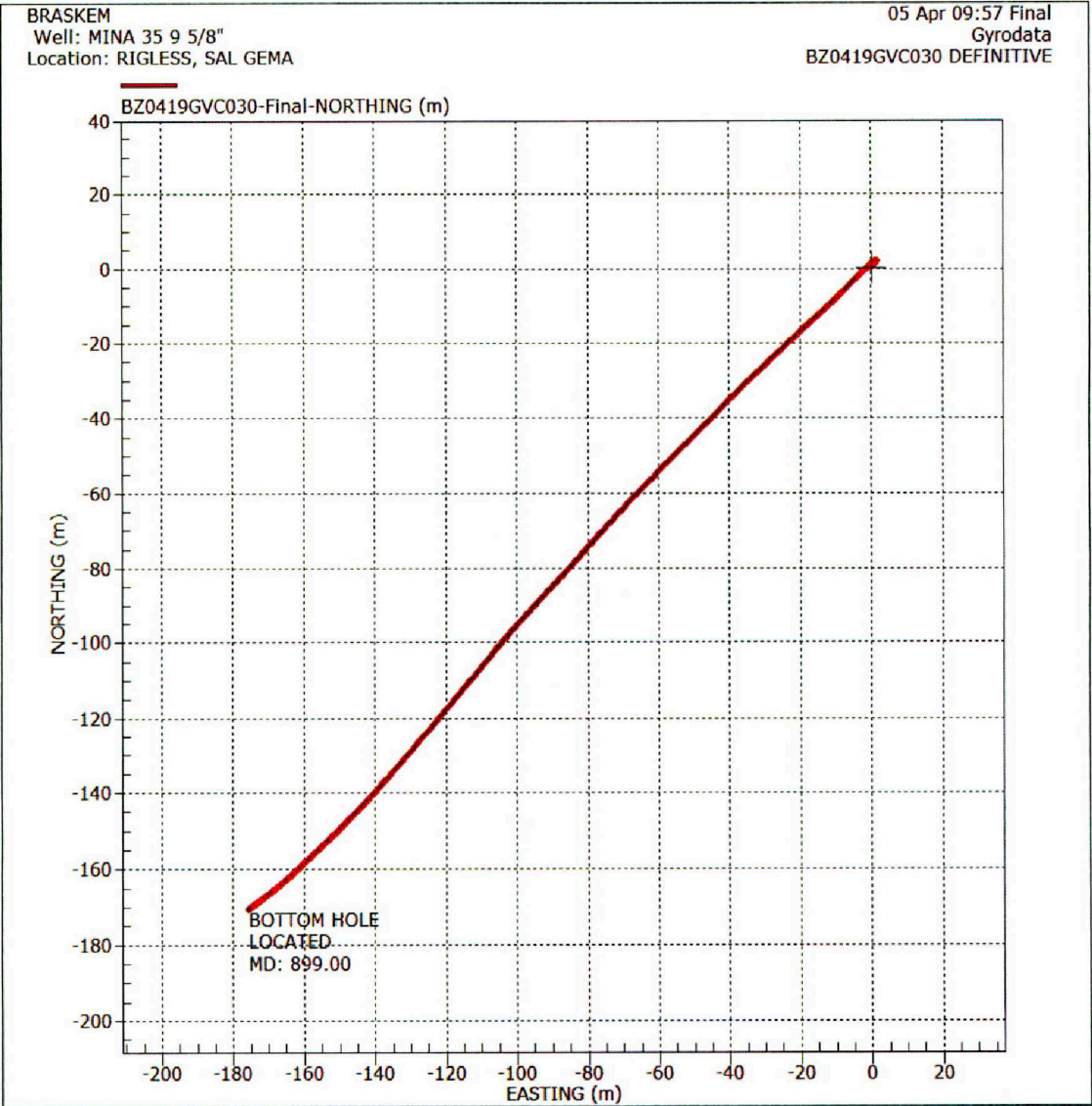






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Fls. 7187
Ⓟ



INP V'AL
Fls. 7. 188
[Signature]



DNPA/AL
Fls. 7.189




Braskem

Campo: Sal Gema

Poço: Mina 07

Gyro Multshot Contínuo

Data da Amostragem: 4 de Abril de 2019

Número de Trabalho: BZ0419GVC031

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DNP/AL
Fis. 7.191


Parte 1
Discussão