CLARA W 4 DIR

TELECO INC., RAVENNA, ITALY.

END OF WELL REPORT

CLIENT:	AGIP S.P.A.
RIG:	CORMORANT
FIELD:	CLARA OVEST
LOCATION:	MARE ADRIATICO
WELL NO:	CLARA W 4 DIR
HOLE SECTIONS:	12¼", 8½"
OPERATING DEPTHS:	12¼" SECTION: 306m - 1147m
	8½" SECTION: 1147m - 2188m
DATES START:	2 MARCH 1988
END:	12 MARCH 1988
TELECO JOB NO:	TIY 075/00
PREPARED BY:	G. SODEN
CHECKED BY:	G. SODEN

TELECO INC., RAVENNA, ITALY

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TELECO INC., RAVENNA, ITALY.

RIG REPORT

DRILLING CONTRACTOR:	FORAMER S.A.
RIG NAME:	CORMORANT / NATIONAL
RIG TYPE:	PLATFORM
MUD PUMP TYPE:	TRIPLEX
MUD PUMP MAKE:	NATIONAL 12 - P - 60
MUD COMPANY:	AVA S.P.A.
SPUD DATE:	19 DECEMBER 1987
DIRECTIONAL DRILLING COMPANY:	SMITH DATADRILL
SURVEY COMPANY:	SMITH DATADRILL
ELECTRIC LOGGING COMPANY:	SCHLUMBERGER
MUD LOGGING COMPANY:	EXPLORATION LOGGING

TELECO INC., RAVENNA, ITALY.

MEASUREMENT SPECIFICATIONS

MEASUREMENT UNITS:	METRIC
DEPTH UNITS:	METRES
DEPTH REFERENCED TO:	DRILL FLOOR
REF. POINT TO SEA LEVEL:	28 METRES
REF. POINT TO SEA BED:	100 METRES
REF. POINT TO DRILL FLOOR:	-
FLOW RATE:	LITRES PER MINUTE
MUD WEIGHT:	SPECIFIC GRAVITY
PLASTIC VISCOSITY:	CENTIPOISE
YELD POINT:	GRAMMES PER SQUARE CENTIMETRE
GEL STRENGTHS:	GRAMMES PER SQUARE CENTIMETRE
FILTRATE:	MILLILITRES
CHLORIDES:	GRAMMES PER LITRE NaCL
MUD RESISTIVITY:	OHM - METRES
TEMPERATURE:	CENTIGRADE
WEIGHT ON BIT:	TONNES
JET SIZE/TFA:	SQUARE CENTIMETRES

TELECO INC., RAVENNA, ITALY.

OPERATIONS SUMMARY

RUN NUMBER:	1	2			
HOLE SIZE:	12¼	8½			
ASSEMBLY TYPE:	STEERABLE SYSTEM	STEERABLE SYSTEM			
DEPTH START	306	1147			
DEPTH END:	1147	2188			
TIME/DATE IN HOLE:	03.00 02.03.88	11.00 05.03.88			
TIME/DATE OUT HOLE:	08.30 04.03.88	23.00 12.03.88			
TOOL NUMBER:	884-14	1592-7			
TOOL TYPE:	D-MTF	RD-MTF			
DATA RATE: BITS/SECOND	0.4 BPS	0.4 BPS			
NO. TELECO SURVEYS:	34	42			
SERVICE TYPE:	DIR	RES/DIR			
TIME/DATE FAILURE:	-	-			
CONFIRMED TELECO FAILURE:	-	-			
TIME/DATE LOST IN HOLE:	-	-			

TELECO INC., RAVENNA, ITALY.

RUN DETAIL SUMMARY

RUN NUMBER:	1	2			
MUD MOTOR TYPE:	SMITH F2000S	SMITH F2000S			
BENT SUB:	1°BH	¾°BH			
MUD MOTOR: DRLG HRS:	24.9	51.7			
ROTARY DRLG HRS:	13.6	32.7			
CIRC. HRS:	29.9	56.7			
AVERAGE FLOW RATE:	1800	1400			
MIN/MAX WOB:	0/10	6/18			
MIN/MAX RPM:	130/210	140/215			
PREDOMINANT FORMATION	CLAYSTONE	CLAYSTONE			
MUD TYPE:	LS	LS			
AVERAGE MUD WEIGHT	1.250	1.360			
MAX SAND CONTENT	0.8	TRACE			
JARRING:	NO	NO			
DEPTH DRILLED:	841	1041			

Teleco Oilfield Services Inc.

11 Mar 1988

DIRECTIONAL SURVEY LISTING

Company: AGIP SpA

Well: CLARA W 4 DIR

Field: CLARA OVEST

Job No: TIY 075/00

Survey Calculation Method: Minimum Curvature
Vert Sect Calculation Method: Overall

Proposal Azimuth:	293.00
Total Azimuth Correction:	-.50
Proposal Origin North:	0.00
Proposal Origin East:	0.00

TELECO SONAT

DIRECTIONAL SURVEY LISTING

Company: AGIP SpA
Well: CLARA W 4 DIR

M.Depth Meters	Inc Deg	Azt Deg	NORTH Meters	EAST Meters	TVD Meters	DLS Deg/30m	VS Meters
			TIE-ON COORDINATES				
0.00	0.00	293.00	0.00	0.00	0.00	0.00	0.00
138.00	1.00	180.00	-1.20	0.00	137.99	.22	-.47
165.00	1.25	46.00	-1.24	.21	164.99	2.34	-.68
174.00	1.25	25.00	-1.08	.32	173.99	1.54	-.72
188.00	1.00	344.00	-.82	.35	187.99	1.79	-.65
216.00	2.25	302.00	-.30	-.18	215.98	1.79	.05
245.00	4.25	312.00	.72	-1.46	244.93	2.18	1.63
273.00	5.50	287.00	1.81	-3.51	272.83	2.65	3.94
292.00	6.50	284.00	2.34	-5.43	291.72	1.68	5.91
315.00	7.00	280.00	2.90	-8.07	314.56	.91	8.56
355.00	8.50	288.80	4.27	-13.27	354.20	1.45	13.89
383.00	13.40	296.20	6.37	-18.14	381.68	5.54	19.19
412.00	19.00	295.50	9.89	-25.43	409.52	5.89	27.27
440.00	24.50	293.40	14.16	-34.88	435.52	6.05	37.64
468.00	26.20	291.60	18.74	-45.95	460.82	2.03	49.62
525.00	33.90	293.40	29.71	-72.28	510.12	4.15	78.14
553.00	38.10	292.40	36.10	-87.44	532.77	4.62	94.60
610.00	42.60	294.50	50.81	-121.27	576.20	2.51	131.48
667.00	43.40	294.10	66.81	-156.70	617.89	.45	170.35
725.00	44.20	295.90	83.78	-193.08	659.75	.78	210.46
781.00	44.60	294.10	100.33	-228.59	699.76	.72	249.62
839.00	44.70	290.20	115.69	-266.33	741.03	1.44	290.36
896.00	45.80	290.20	129.67	-304.32	781.16	.59	330.79
953.00	44.60	290.90	143.86	-342.19	821.33	.69	371.20
1009.00	46.10	291.60	158.31	-379.32	860.68	.86	411.02
1066.00	45.90	292.00	173.53	-417.39	900.28	.19	452.01
1124.00	44.70	292.40	189.11	-455.56	941.07	.65	493.23
1173.00	44.50	292.70	202.30	-487.33	975.96	.18	527.64
1230.00	44.20	292.00	217.45	-524.18	1016.72	.31	567.48
1287.00	43.80	292.40	232.41	-560.84	1057.72	.26	607.07
1344.00	44.30	292.00	247.39	-597.54	1098.69	.31	646.70
1401.00	44.60	291.30	262.11	-634.64	1139.38	.31	686.60
1457.00	43.50	292.70	276.69	-670.74	1179.63	.80	725.53
1514.00	43.80	293.80	292.23	-706.88	1220.87	.44	764.87
1571.00	43.10	294.10	308.14	-742.71	1262.26	.39	804.07
1628.00	42.70	295.10	324.29	-777.99	1304.01	.42	842.85
1685.00	41.40	293.40	339.97	-812.79	1346.34	.92	881.01
1742.00	40.30	293.40	354.78	-847.01	1389.45	.59	918.30

TELECO SONAT

DIRECTIONAL SURVEY LISTING

Company: AGIP SpA
Well: CLARA W 4 DIR

M.Depth Meters	Inc Deg	Azt Deg	NORTH Meters	EAST Meters	TVD Meters	DLS Deg/30m	VS Meters
1799.00	40.50	292.70	369.24	-881.00	1432.86	.27	955.24
1856.00	41.00	293.80	383.93	-915.18	1476.04	.47	992.44
1913.00	36.21	292.40	397.90	-947.88	1520.57	2.60	1028.00
1970.00	33.20	293.40	410.52	-977.77	1567.43	1.64	1060.44
2027.00	30.50	293.80	422.56	-1005.33	1615.84	1.45	1090.52
2084.00	27.20	293.41	433.57	-1030.53	1665.76	1.77	1118.02
2141.00	24.90	293.41	443.51	-1053.50	1716.97	1.23	1143.05
2169.00	23.80	295.50	448.29	-1064.01	1742.48	1.52	1154.59

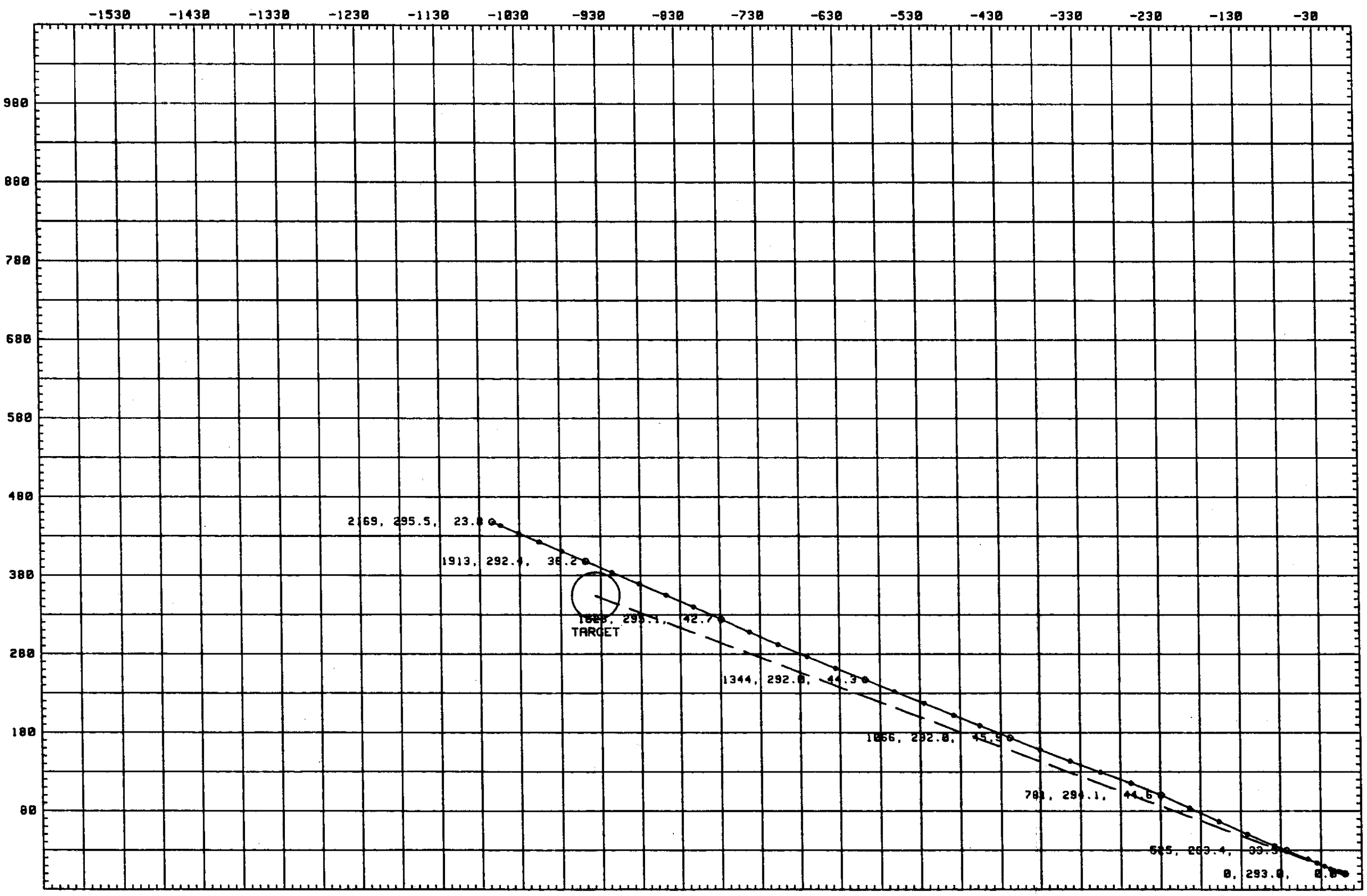
TELECO SONAT

East (meters)

-1530 -1430 -1330 -1230 -1130 -1030 -930 -830 -730 -630 -530 -430 -330 -230 -130 -30

North (meters)

980 880 780 680 580 480 380 280 180 80



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PLAN VIEW

Labeled Surveys: M.Depth Azimuth Inclination

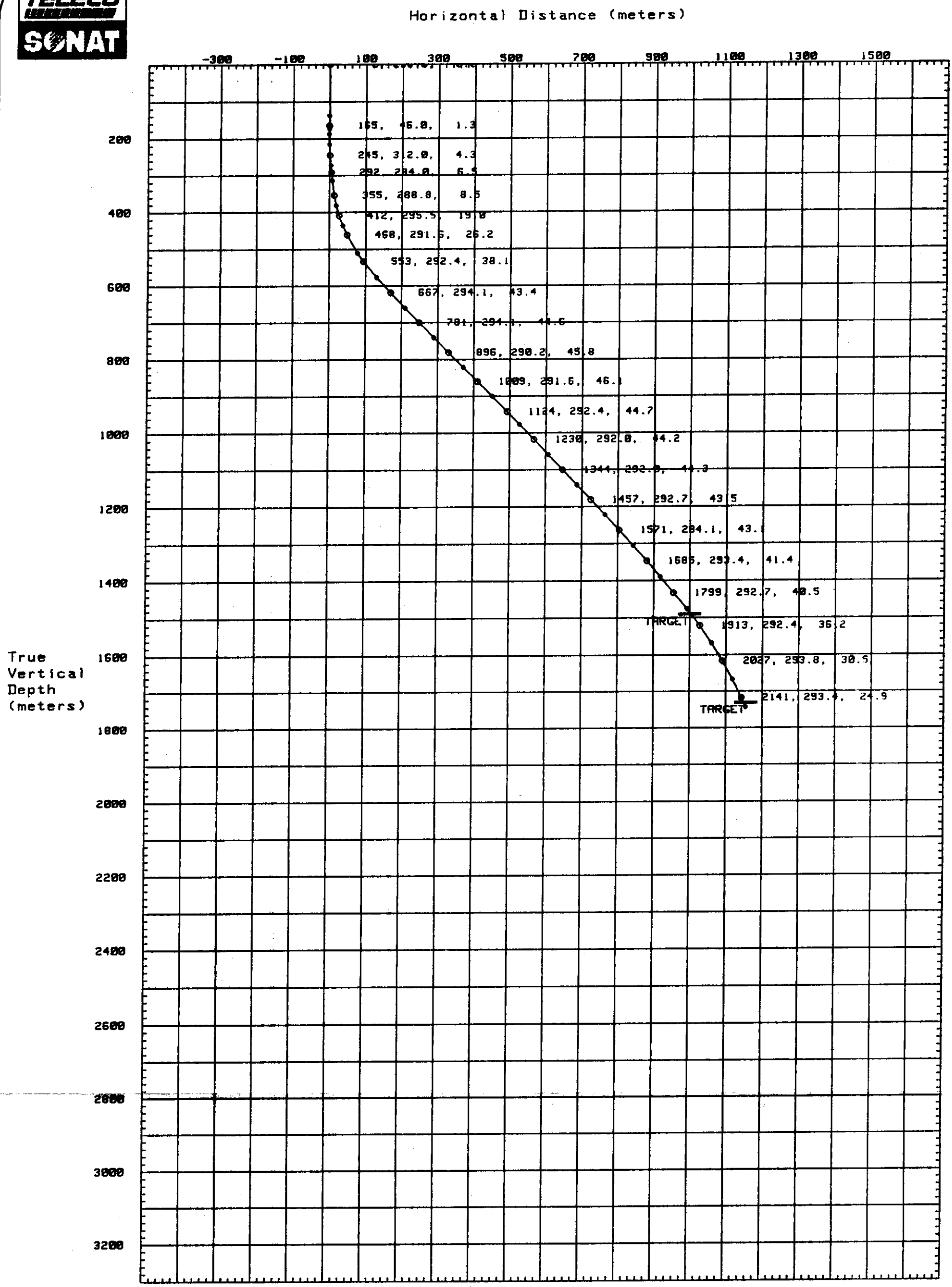
Scale: 1cm= 50(meters)

Company: AGIP SpA

Well: CLARA W 4 DIR

Date: 11 Mar 1988

TELECO SONAT



VERTICAL SECTION
Date: 11 Mar 1988
Company: AGIP SpA
Well: CLARA W 4 DIR

Labeled Surveys: M.Depth Azimuth Inclination
V.S. Calc. Method: Overall
Scale: 1cm= 100(meters)

TELECO INC., RAVENNA, ITALY

PERFORMANCE REPORT

Introduc

Teleco MWD Services were employed on the Clara Ovest field for the drilling of the 12¼" and 8½" hole sections of every well.

Directional-only services were provided in the 12¼" hole section and Resistivity-Directional services in the 8½" hole section.

12¼" Hole section

A Smith F2000S steerable system in conjunction with a Teleco Multiple Toolface MWD tool completed this hole section in one bit run without problems.

Hole angle was built at approximately 5° per 30 metres to 45° in the proposal direction 293°. The extra inclination was required as insufficient inclination had been built in the 17½" hole section.

One sufficient inclination had been built, the well was rotary drilled to the 9⅝" casing point, maintaining inclination and azimuth.

8½" Hole Section

Another Smith F2000S steerable system and a Teleco Resistivity-directional tool completed this hole section in one run.

A failure in the surface decoding system (probably caused by excessive power supply fluctuation) used for resistivity logging required the use of the back-up surface system until the arrival of a new signal decoding unit. The back-up system could not decode resistivity data and Resistivity logging did not start until 1576 metres. Fortunately this was well above the gas levels and did not cause any problems for correlation with offset logs.

Directional data was provided throughout this hole section and the well angle and direction were maintained to 1850 metres before gradually dropping the well inclination to 24.9° at 2188 metres.

During circulation before pulling out of hole a washout in a cross-over sub caused the string to part. The fish was successfully recovered.

TELECO INC., RAVENNA, ITALY

MAINTENANCE REPORT

EQUIPMENT DESCRIPTION:	TR 2300 Surface decoding and signal processing equipment (Number 017)
OPERATIONAL PROBLEM:	MRU (MWD signal receiver unit) failed during the start of the 8½" hole section
FAULT FOUND:	EPROM failure probably due to instable power supply
COMMENTS:	Changed to alternative surface gear while waiting on spare unit (see Performance Report)

--oOo--

EQUIPMENT DESCRIPTION:	8¼" Directional-only downhole tool (Number 884-14)
OPERATIONAL PROBLEM:	None
FAULT FOUND:	-
COMMENTS:	Operated to specification throughout the 12¼" hole section

--oOo--

EQUIPMENT DESCRIPTION:	6¾" Resistivity-Directional downhole tool (Number 1592-7)
OPERATIONAL PROBLEM:	None
FAULT FOUND:	-
COMMENTS:	Operated to specification throughout the 8½" hole section

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TELECO INC., RAVENNA, ITALY.

ENGINEER DEPLOYMENT SUMMARY

ENGINEER	DEPARTURE TIME/DATE	RETURN TIME/DATE
G. SODEN	08.00 02.03.88	12.00 10.03.88
A. BOLLINGER	13.00 04.03.88	09.00 07.03.88
A. SMITH	09.00 07.03.88	12.00 10.03.88

TELECO INC., RAVENNA, ITALY.

TOOL DEPLOYMENT SUMMARY

TOOL NO:	O.D.	SERVICE TYPE	TOTAL CIRC. HOURS
884-14	8¼"	DIR	29.9
866-21	8¼"	DIR	0.0 (not used)
1543-5	6¾"	RES-DIR	0.0 (not used)
1592-7	6¾"	RES-DIR	56.7

TELECO INC., RAVENNA, ITALY

BHA RECORD LISTING

TELECO RUN NUMBER	1	2			
BIT TYPE	SMITH FDS	REED HP11			
HOLE SIZE	12¼	8½			
JETS/TFA	4.88	2.95			
DEPTH START	306	1147			
DEPTH END	1147	2188			
MIN/MAX/WOB	0/10	6/18			
MIN/MAX/RPM	130/210	140/215			
ROTARY DRILLING HRS	13.6	32.7			
MONEL ABOVE DIR SENSOR	17.44	18.49			
MONEL BELOW DIR SENSOR	6.19	9.23			
PREDOMINANT FORMATION	CLAYSTONE	CLAYSTONE			

TELECO INC., RAVENNA, ITALY

MUD RECORD

DATE	02.03.88	03.03.88	06.03.88	06.03.88	06.03.88
TIME	24.00	15.00	01.00	10.00	17.00
DEPTH	746	1012	1295	1470	1618
MW	1.250	1.250	1.300	1.350	1.350
PV	17	16	12	16	19
YP	9.5	8.5	12.5	9	7
GELS	3/10	3/9	3/9	2/8	2/9
FILTRATE	7.8	7.5	5.9	5.1	5.0
CHLORIDES	5.3	5.0	7.8	7.3	6.9
PH/ES	9.5	9.5	10	10	10
SOLIDS	15	15	15	14	16
SAND	0.8	TRACE	TRACE	TRACE	TRACE
OIL	-	-	-	-	-
WATER	85	85	85	86	84
KcL	-	-	-	-	-
KOH	-	-	-	-	-
KLIGNITE	-	-	-	-	-
MUD TYPE	LS	LS	LS	LS	LS

TELECO INC., RAVENNA, ITALY

MUD RECORD

DATE	07.03.88	08.03.88			
TIME	07.00	07.00			
DEPTH	1820	2160			
MW	1.360	1.370			
PV	18	18			
YP	8	9			
GELS	2.5/7	2.5/9			
FILTRATE	4.8	4.8			
CHLORIDES	6.2	5.4			
PH/ES	9.5	10			
SOLIDS	17	19			
SAND	TRACE	TRACE			
OIL	-	-			
WATER	83	81			
KcL	-	-			
KOH	-	-			
KLIGNITE	-	-			
MUD TYPE	LS	LS			

TELECO INC., RAVENNA, ITALY

FORMATION EVALUATION SERVICE REPORT

The Teleco Formation Evaluation MWD Service was utilised on this occasion for the following purposes:

LITHOLOGY IDENTIFICATION

REAL TIME CORRELATION

RESERVOIR DETECTION

RESERVOIR THICKNESS DETERMINATION

RESERVOIR PAY ZONE THICKNESS DETERMINATION

RESERVOIR FLUID DETERMINATION

TELECO INC., RAVENNA, ITALY

MWD LOG REPORT

Introduction

MWD Formation Evaluation Services began at 1576 metres and ended at 2188 metres. A problem with the computer (see Performance Report) meant that no resistivity logging was possible from the 9⅝" casing shoe to 1576 metres.

A 16" short normal MWD resistivity device was used with readings being corrected for downhole mud resistivity (Rm), collar and borehole sizes.

The freshwater mud system used resulted in minimal resistivity corrections.

Run number 2

From 1576 metres to 1680 metres resistivity readings exhibited a steady trend from 2.4 to 2.2 ohm-metres interrupted by one negative deflection down to 1.8 ohm-metres for a thin water-saturated sand level within this thick Claystone sequence.

From 1680 metres, resistivity readings became more variable - from 1.7 ohm-m to 2.4 ohm-m - down to 1947 metres indicating a more mixed Sand - Claystone lithology.

From 1947 metres to 2173 metres the resistivity log indicated that the reservoir levels had been penetrated. Resistivity values from 1.3 ohm-m to 7.9 ohm-metres (Corresponding to 2.3% Methane - from Exploration Logging) indicated both water and gas-saturated Sand levels respectively. Claystones showed a trend of around 2.0 ohm-m in this section of the well.