HALLIBURTON SERVICES

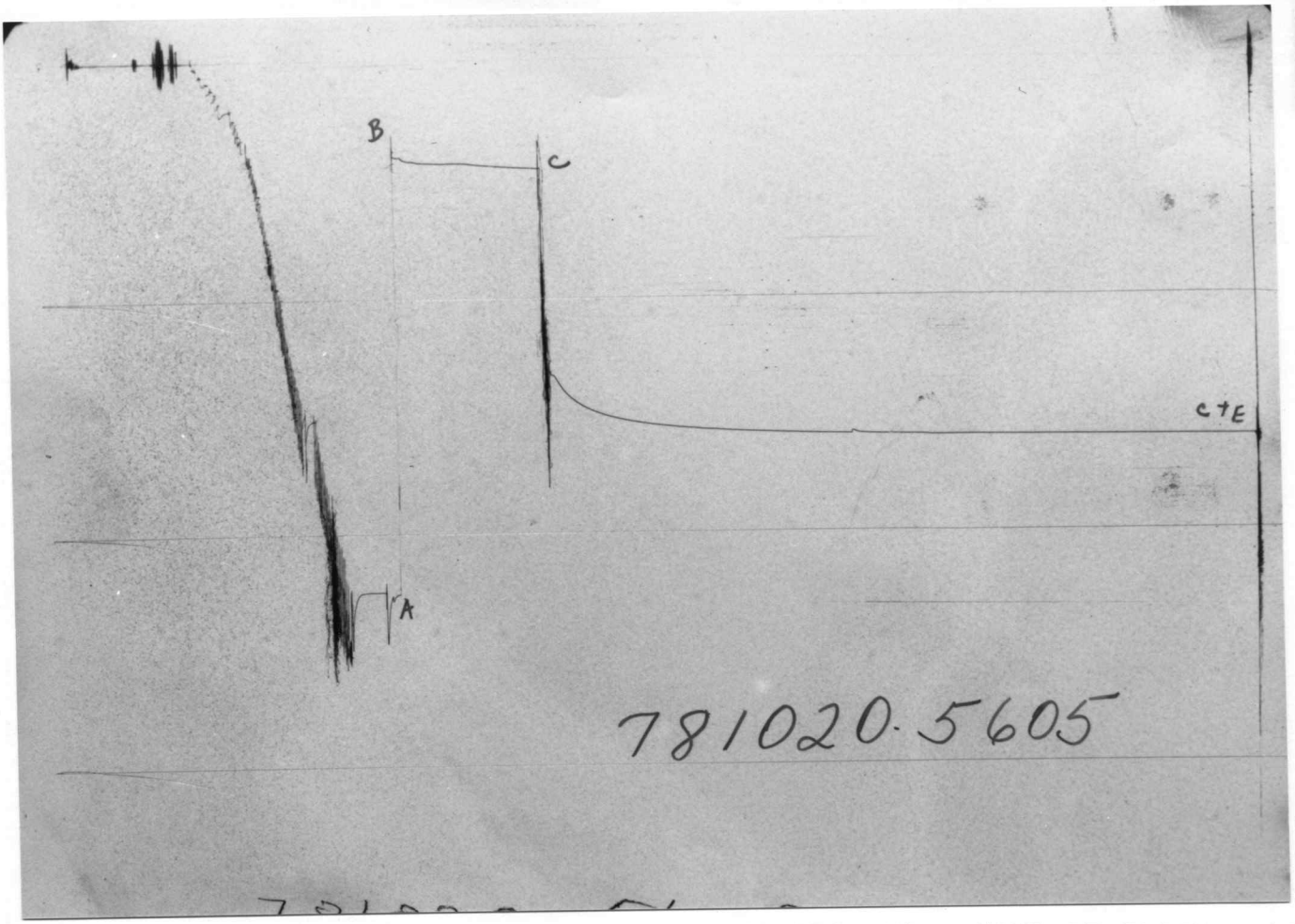
TICKET NO. 78102000

04-MAY-89

PRATT

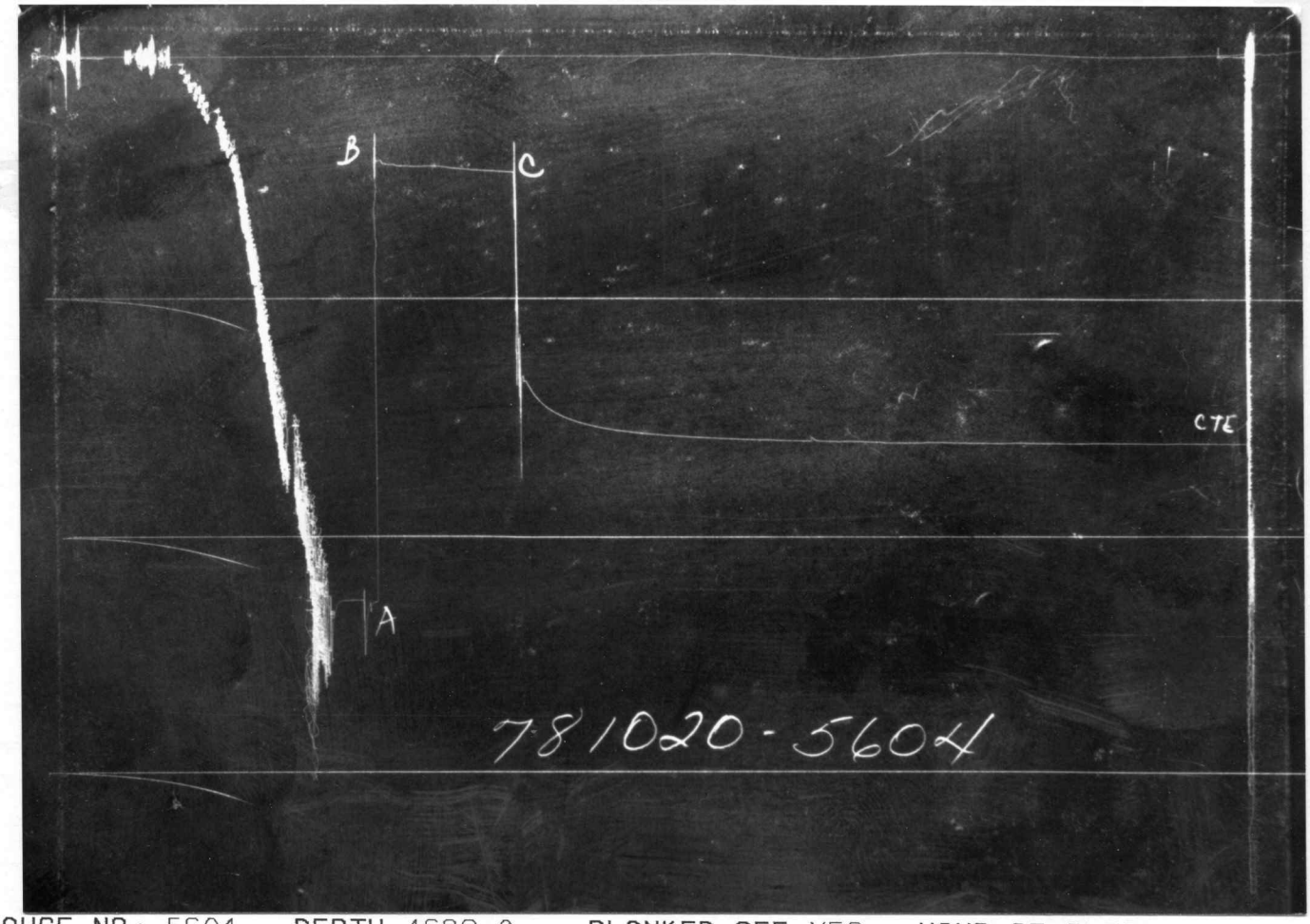
FORMATION TESTING SERVICE REPORT

LEASE NAME: SLOAN	WELL NO.: 1	TEST NO.: 1	TESTED INTERVAL: 4660.0 - 4701.0		LEASE OWNER/COMPANY NAME: J. MARK RICHARDSON
LEGAL LOCATION SEC. - TWP. - RNG: 27 28 20	FIELD AREA	COUNTY: KIOWA		STATE: KANSAS	SM



GAUGE NO: 5605 DEPTH: 4639.0 BLANKED OFF: NO HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC		2259.3			
B	INITIAL FIRST FLOW		398.1	85.0	85.0	F
C	FINAL FIRST FLOW		454.7			
C	INITIAL FIRST CLOSED-IN		454.7			C
D	FINAL FIRST CLOSED-IN					
E	FINAL HYDROSTATIC					



GAUGE NO: 5604 DEPTH: 4698.0 BLANKED OFF: YES HOUR OF CLOCK: 12

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2262	2279.1			
B	INITIAL FIRST FLOW	422	433.0	85.0	85.0	F
C	FINAL FIRST FLOW	463	477.2			
C	INITIAL FIRST CLOSED-IN	463	477.2			C
D	FINAL FIRST CLOSED-IN					
E	FINAL HYDROSTATIC					

EQUIPMENT & HOLE DATA

FORMATION TESTED: _____
NET PAY (ft): _____
GROSS TESTED FOOTAGE: 41.0
ALL DEPTHS MEASURED FROM: KELLY BUSHING
CASING PERFS. (ft): _____
HOLE OR CASING SIZE (in): 7.875
ELEVATION (ft): _____
TOTAL DEPTH (ft): 4701.0
PACKER DEPTH(S) (ft): 4654, 4660
FINAL SURFACE CHOKE (in): 1.50000
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.20
MUD VISCOSITY (sec): 38
ESTIMATED HOLE TEMP. (°F): _____
ACTUAL HOLE TEMP. (°F): 118 @ 4696.0 ft

TICKET NUMBER: 78102000

DATE: 4-19-89 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP: PRATT

TESTER: L.R. PARKER

WITNESS: J. MARK RICHARDSON

DRILLING CONTRACTOR: GABBERT-JONES RIG #11

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ @ ____ °F	_____ ppm
_____	_____ @ ____ °F	_____ ppm
_____	_____ @ ____ °F	_____ ppm
_____	_____ @ ____ °F	_____ ppm
_____	_____ @ ____ °F	_____ ppm
_____	_____ @ ____ °F	_____ ppm

SAMPLER DATA

Psig AT SURFACE: _____
cu.ft. OF GAS: _____
cc OF OIL: _____
cc OF WATER: _____
cc OF MUD: _____
TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____ @ ____ °F
GAS/OIL RATIO (cu.ft. per bbl): _____
GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
_____	_____	_____
_____	_____	_____

RECOVERED:

??

MEASURED FROM TESTER VALVE

REMARKS:

TIGHT HOLE INFORMATION.....

BECAME STUCK IN HOLE.

CHART TIME EXPIRED ON BOTH GAUGES....FINAL HYDROSTATIC NOT RECORDED.

TYPE & SIZE MEASURING DEVICE: _____ TICKET NO: 78102000

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
4-19-89					
0300					CALLED OUT
0440					ON LOCATION, RIG MAKING SHORT
					TRIP
0950					PICKED UP TOOL
1015					TOOL IN TABLE
1020					TOOL THROUGH TABLE
1210					ON BOTTOM, 98,000#
1215	BH				OPENED TOOL WITH WEAK BLOW
1223					INCREASED TO STRONG BLOW
1230	1.5				OPENED 2" LINE, 1 1/2" CHOKE
1232					BLOW DEAD, CLOSED 2" LINE
					WEAK BLOW, INCREASED TO STRONG
					BLOW
1245					CLOSED TOOL, COULD NOT ROTATE
					TOOL...TRIED DIFFERENT WEIGHT..
					STILL COULD NOT ROTATE....
					TRIED TO TRIP JARS...COULD
					NOT TRIP JARS...PULLED TO
					180,000#....COULD NOT COME
					LOOSE.
1340					DROPPED BAR AND KELLY ON TO
					CIRCULATE
1630					SPOTTED 80 BBLS. OF OIL AND
					PIPE FREE
2400					RIGGED UP TO BACK OFF, TWISTED
					OFF DRILL PIPE
4-20-89					
0545					ON BOTTOM-LATCHED ON TO FISH AT
					2317', JARRING.
0700					WENT IN FOR FREE POINT TO BACK
					OFF.
0900					OVERSHOT CAME OFF FISH, CAME
					OUT OF HOLE
1100					FISHING FOR DRILL PIPE, COULD
					NOT STAY ON
1330					CAME OUT OF HOLE - CHANGED

TYPE & SIZE MEASURING DEVICE: _____ TICKET NO: 78102000

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
					OVERSHOT PARTS
1530					FISHING TO RETRIEVE FISH
					TRIED TO BACK OFF....COULD NOT
2000					CAME OUT OF HOLE WITH OVERSHOT
					WENT IN HOLE WITH BIT TO
					CONDITION HOLE
					CAME OUT OF HOLE AND WENT IN
					HOLE WITH WASHOVER PIPE, WASHED
					DOWN TO 2456', CAME OUT OF HOLE
					PUT ON CUTTING TOOL TO CUT OFF
					DRILL PIPE-2436'- CAME OUT OF
					HOLE, NO FISH, WENT IN HOLE WITH
					OVERSHOT, PIPE NOT CUT OFF,
					CAME OUT OF HOLE....
					WENT IN WITH CUTTER...COULD NOT
					GET OVER FISH, CAME OUT OF HOLE
					WENT BACK IN HOLE WITH WASHOVER
					PIPE...CAME OUT OF HOLE WITH
					WASHOVER PIPE, WENT IN WITH
					CUTTER
4-22-89					
0715					CUTTING AT 2385'....
					CAME OUT OF HOLE - NO FISH...
					WENT IN HOLE WITH OVERSHOT, GOT
					ONTO FISH...CAME OUT OF HOLE WITH
					FISH, WENT IN HOLE WITH OVERSHOT,
					LATCHED ONTO NEW FISH AT 2388'.
					WENT IN WITH SPUDDER TO BELOW
					4505'...CAME OUT OF DRILL PIPE
					WITH SPUDDER
1915					PUT ON KELLY. BROKE CIRCULATION
					CONDITIONED HOLE TO CLEAN UP
					HOLE
2300					TOOK KELLY OFF, FOUND FREE POINT
4-23-89					
0020					BACK OFF DRILL PIPE AT 4095'
					TRIPPED OUT OF HOLE...WENT IN

TYPE & SIZE MEASURING DEVICE: _____ TICKET NO: 78102000

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
					HOLE WITH BIT TO CONDITION HOLE
					CAME OUT OF HOLE WITH BIT,
					PICKED UP WASHOVER PIPE, WENT
					IN HOLE WITH WASHOVER PIPE,
					GOT WASHOVER PIPE STUCK AT
					3977'....SPOTTED OIL, LET SOAK
					AND JARRED
1830					WASHOVER PIPE FREE...CIRCULATED
					STARTED WASHING DOWN 1 JT. AT
					A TIME, WASHED DOWN TO 4394',
					CIRCULATED 1 1/2 HRS.
					CAME OUT OF HOLE WITH WASHOVER
					PIPE...WENT IN HOLE, COULD NOT
					GET SCREWED ON....CAME OUT OF
					HOLE...PUT ON OVERSHOT...WENT
					IN HOLE, LATCHED ONTO FISH,
					WENT IN WITH SPUDDER...COULD
					NOT GET INTO FISH, DID SOME
					JARRING...STILL COULD NOT GET
					INTO FISH...CAME OUT OF HOLE
					WITH SPUDDER, PUT KELLY ON TO
					CIRCULATE...WENT IN HOLE WITH
					CHARGE TO TRY TO CLEAR OUT
					OBSTRUCTION.
4-24-89					
1345					WENT IN HOLE WITH SPUDDER,
					COULD NOT GET INTO FISH, CAME
					OUT OF HOLE WITH SPUDDER, CAME
					OUT OF HOLE WITH DRILL PIPE
					WENT IN HOLE WITH CUTTER TO CUT
					4088'
2100					CAME OUT OF HOLE WITH CUTTER
4-25-89					
0000					WENT IN HOLE WITH CUTTER, TRIED
					CUTTING...CAME OUT OF HOLE-NO
					FISH, WENT IN HOLE WITH WASHOVER
					PIPE, WASHED AND REAMED TO

TYPE & SIZE MEASURING DEVICE: _____ TICKET NO: 78102000

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
					4394', CIRCULATED ....CAME OUT
					OF HOLE
1800					PICKED UP 10 DRILL COLLARS, JARS,
					BUMPER SUB, OVERSHOT, WENT IN
					HOLE TO LATCH ON FISH AND JAR.
					JARRED AND CIRCULATED
4-26-89					
0015					TRIED FREE POINT, COULD NOT GET
					BELOW TOP OF FISH
4-27-89					
					WENT INTO DRILL PIPE WITH 1"
					PIPE TO MILL OUT OBSTRUCTION
1100					AT TOP OF OBSTRUCTION, PUSHED
					OBSTRUCTION TO 4557'
					LAID DOWN 1" PIPE
					RAN FREE POINT
1845					BACKED OFF FISH AT 4357'
					TRIPPED OUT OF HOLE WITH FISH
4-28-89					
0000					WENT IN HOLE WITH WASHOVER
					PIPE TO WASH OVER 9 DRILL COLLARS
					AND DST TOOL
1930					TRIPPED OUT TO CHANGE SHOE BIT
					4607', THEN TRIPPED IN TO
					FINISH WASHING OVER...WHEN OUT
					OF HOLE HAD LOST MILLING SHOE
					IN HOLE....WASHED BACK DOWN
					OVER FISH TO SHOE AND MILLED
					ON SHOE MILL, WASHED DOWN TO
					4632'
1800					HAD TO TRIP OUT TO CHANGE SHOE
2100					TRIPPED BACK IN WITH WASHOVER
					PIPE TO FINISH WASHOVER
4-29-89					
					MILLED AT 4632', COULD NOT
					MILL UP IRON
0600					CAME OUT OF HOLE WITH WASHOVER

TYPE & SIZE MEASURING DEVICE: ______________________ | TICKET NO: 78102000

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
					PIPE AND LAID DOWN PIPE. WENT
					IN HOLE WITH SUB TO SCREW ONTO
					DRILL COLLAR
1100					SCREWED ONTO FISH, CAME OUT OF
					HOLE WITH FISH
1400					TOOL IN TABLE.

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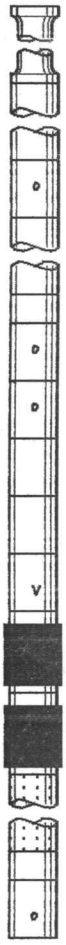
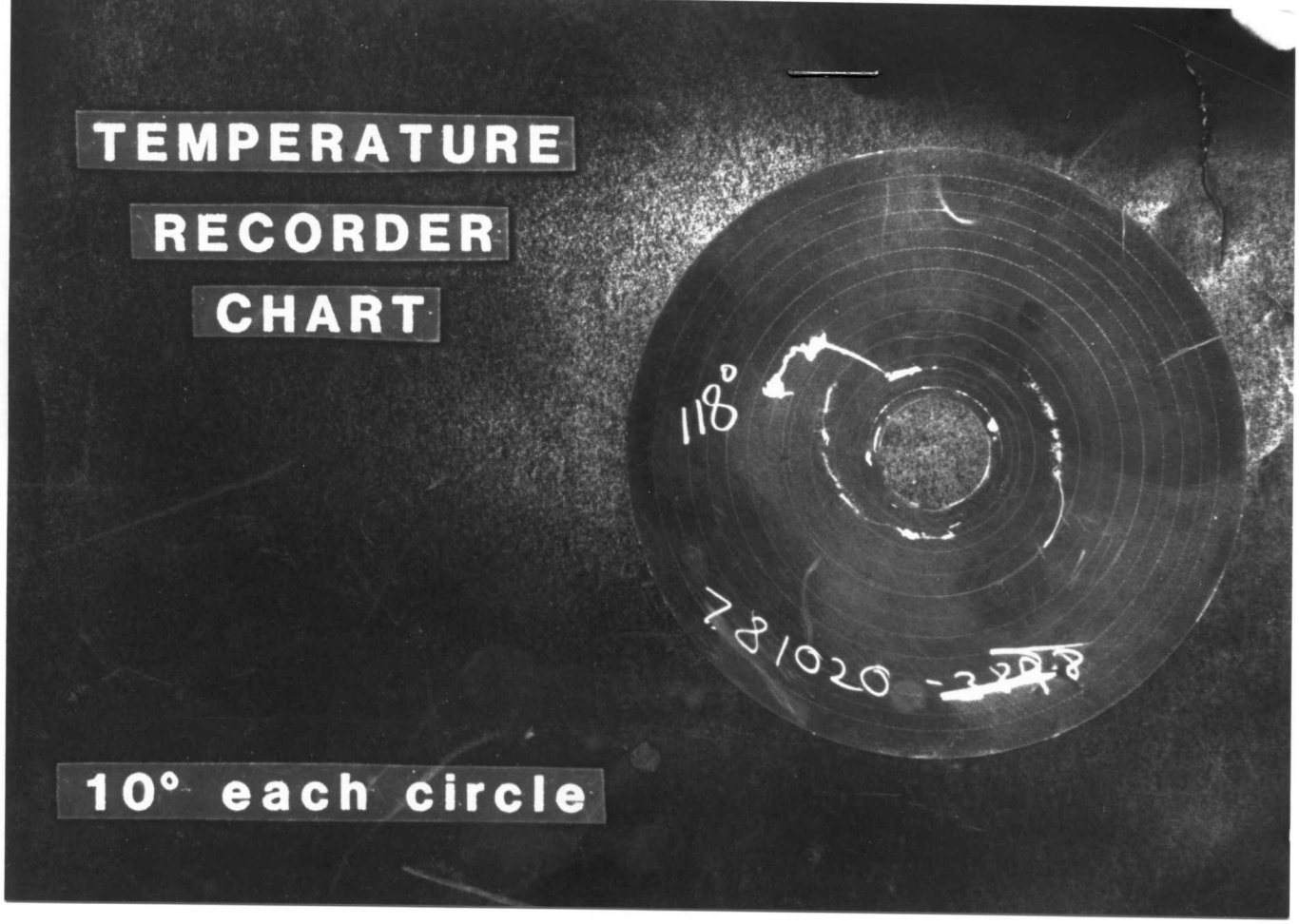


		O.D.	I.D.	LENGTH	DEPTH
1	DRILL PIPE	4.500	3.826	4175.0	
3	DRILL COLLARS	6.000	2.250	330.0	
50	IMPACT REVERSING SUB	6.000	2.750	1.0	4505.0
3	DRILL COLLARS	6.000	2.250	120.0	
5	CROSSOVER	6.000	2.250	1.0	
12	DUAL CIP VALVE	5.000	0.870	6.0	
60	HYDROSPRING TESTER	5.000	0.750	5.0	4637.0
80	AP RUNNING CASE	5.000	2.250	4.0	4639.0
15	JAR	5.000	1.750	5.0	
16	VR SAFETY JOINT	5.000	1.000	3.0	
70	OPEN HOLE PACKER	6.750	1.530	6.0	4654.0
70	OPEN HOLE PACKER	6.750	1.530	6.0	4660.0
20	FLUSH JOINT ANCHOR	5.000	2.370	33.0	
83	HT-500 TEMPERATURE CASE	5.000	2.650	2.0	4696.0
81	BLANKED-OFF RUNNING CASE	5.000		4.0	4698.0
	TOTAL DEPTH				4701.0

EQUIPMENT DATA



EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{1637\ Q_g\ T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{m(P^*) - m(P_f)}{m} - \text{LOG}\left(\frac{k(t/60)}{\phi\ \mu\ c_t r_w^2}\right) + 3.23 \right]$	—
Damage Ratio	$DR = \frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87\ mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g\ m(P^*)}{m(P^*) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{k(t/60)}{\phi \mu c_t}}$	ft