AD-A199 229

INSTALLATION RESTORATION PROGRAM PHASE II - CONFIRMATION/QUANTIFICATION STAGE 2

VOLUME IV

LUKE AIR FORCE BASE, ARIZONA

Roy F. Weston, Inc.
West Chester, Pennsylvania 19380

DTIC
ELECTE
SEP 1 9 1988
D

JUNE 1988

FINAL REPORT FOR PERIOD SEPTEMBER 1986 TO JUNE 1988

Approved for Public Release; Distribution is Unlimited

PREPARED FOR:

HEADQUARTERS TACTICAL AIR COMMAND
COMMAND SURGEON'S OFFICE (HQ TAC/SGPB)
LANGLEY AIR FORCE BASE, VIRGINIA

UNITED STATES AIR FORCE
OCCUPATIONAL & ENVIRONMENTAL HEALTH LABORATORY (USAFOEHL)
TECHNICAL SERVICES DIVISION (TS)
BROOKS AIR FORCE BASE, TEXAS 78235-5501

88 9 19 053

welenco

WELL ENGINEERING SERVICES

ELECTRIC LOG

FILING NO.

COMPANY [illegible] DRILLING, INC.

WELL [illegible]

FIELD LUKE AIR FORCE BASE

STATE ARIZONA COUNTY MARICOPA

LOCATION LUKE A.F.B.

SEC ____ TWP ____ RGE ____

OTHER SERVICES
F-LOG
GAMMA-RAY
CALIPER

Permanent Datum: Gr. Elev. ____
Log Measured From: Rotary Table 0 Ft. Above Perm. Datum
Drilling Measured From: G.L.

Elev.: K.B. ____
D.F. ____
G.L. ____

Date	10-29-86	10-30-86		
Run No.	ONE	TWO		
Depth—Driller	575'	482.5'		
Depth—Logger	587'	486'		
Btm. Log Inter.	582'	486'		
Top Log Inter.	90'	350'		
Casing—Driller	10" @ 90'	8 5/8 @ 326'	@	@
Casing—Logger		8 5/8 @ 322'		
Bit Size	5 7/8"	5"		
Type Fluid in Hole	WATER	WATER		
Dens. / Visc.	N/A	N/A	/	/
pH / Fluid Loss	N/A / ml	N/A / ml	/ ml	/ ml
Source of Sample	PIT	PIT		
Rm @ Meas. Temp.	13.0 @ 77 °F	13.0 @ 77 °F	@ °F	@ °F
Rmf @ Meas. Temp.	13.0 @ 77 °F	13.0 @ 77 °F	@ °F	@ °F
Rmc @ Meas. Temp.	N/A @ °F	N/A @ °F	@ °F	@ °F
Source: Rmf / Rmc	M / M	M / M	/	/
Rm @ BHT	N/A @ °F	N/A @ °F	@ °F	@ °F
Time Since Circ.	1 hour	1 hour		
Max. Rec. Temp.	N/A °F	N/A °F	°F	°F
Equip. / Location	41 / LUKE	41 / LUKE	/	/
Recorded By	[illegible]	[illegible]		
Witnessed By				

This Heading and Line Conform To API RP 31-A

Fold Here

REMARKS

Scale Changes

Type Log	Depth	Scale/Hr	Scale/Inch

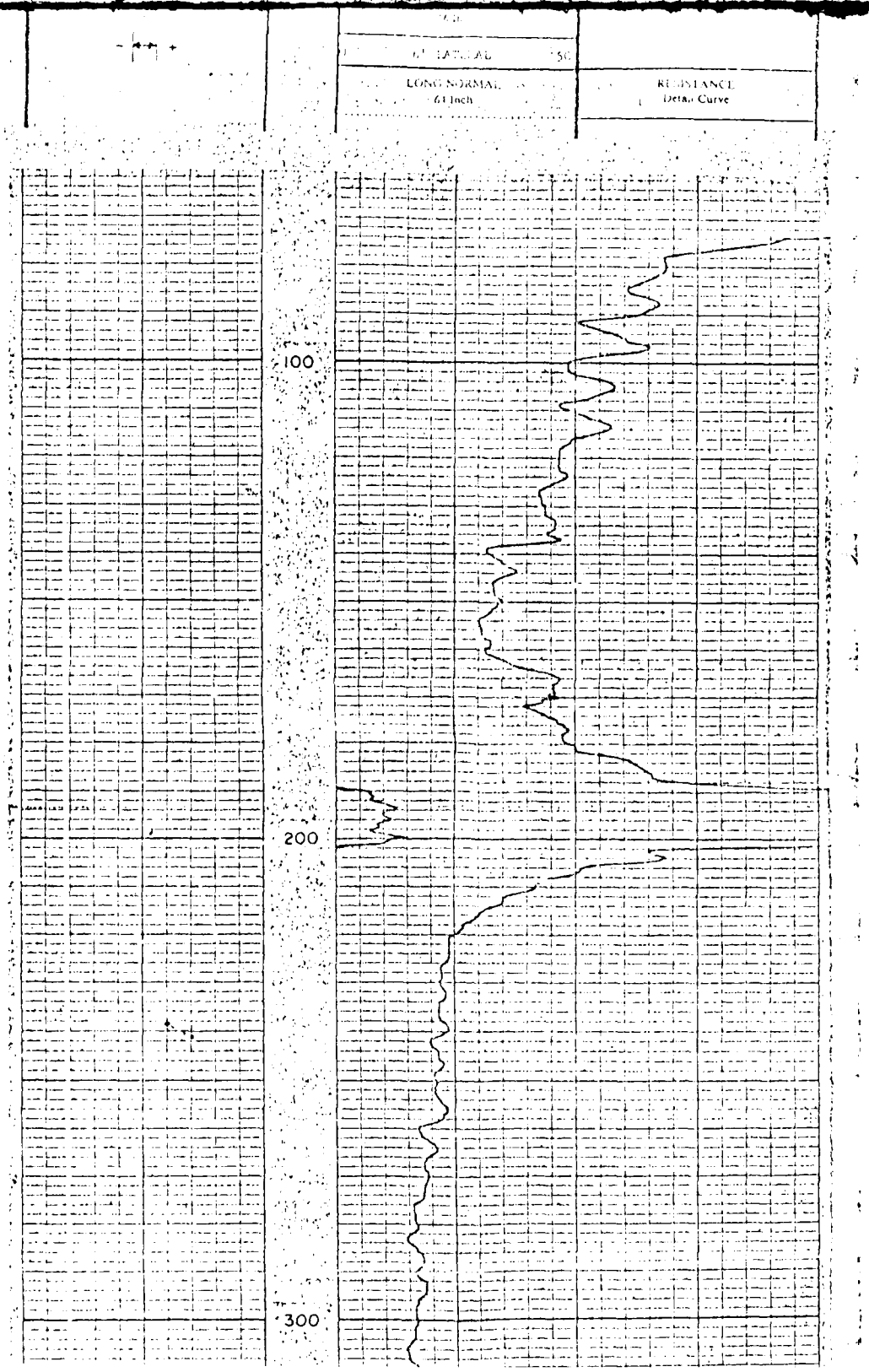
Equipment Data

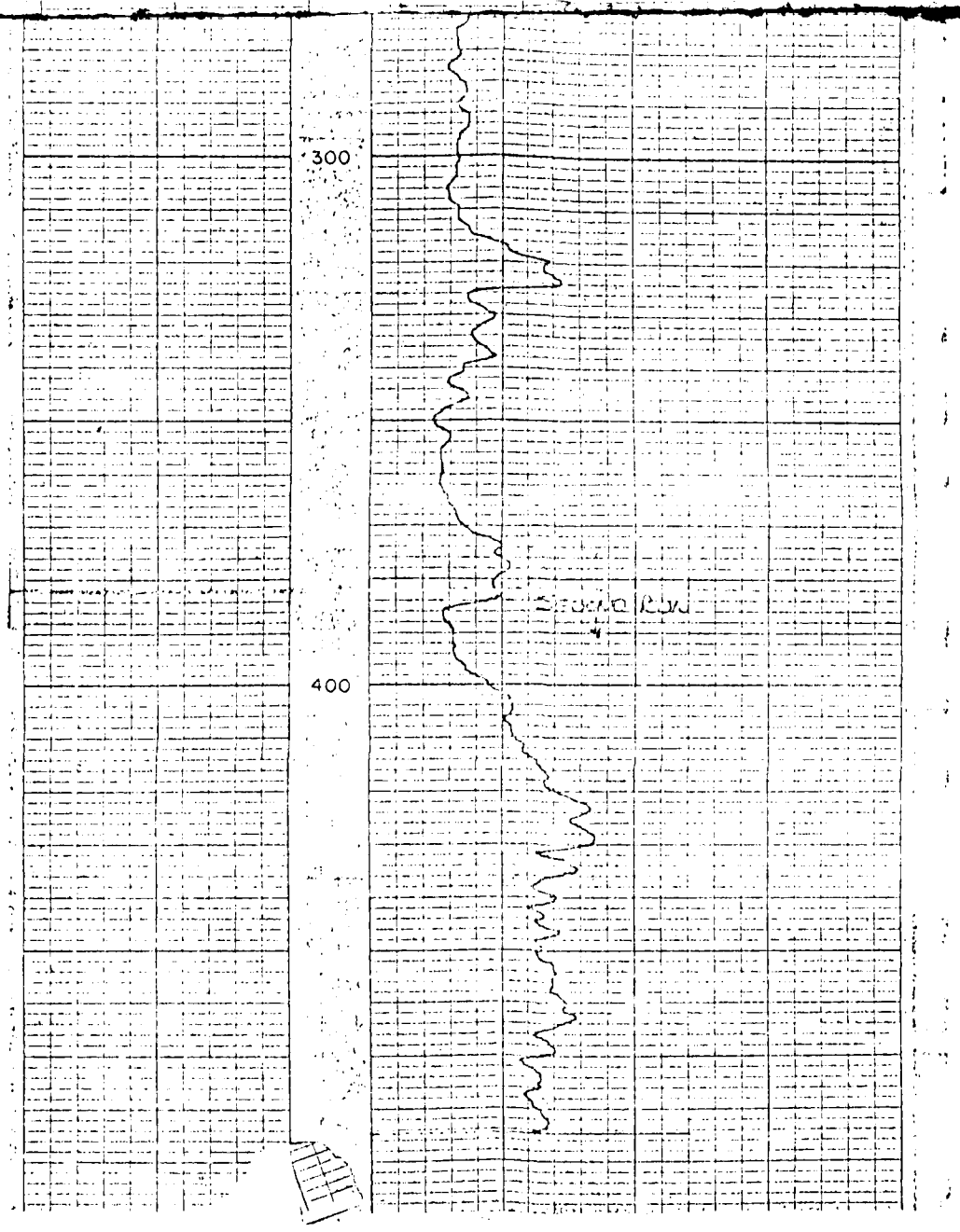
Tool Type	Pad Type	Tool Position	Other

Changes in Mud Type or Additional Samples

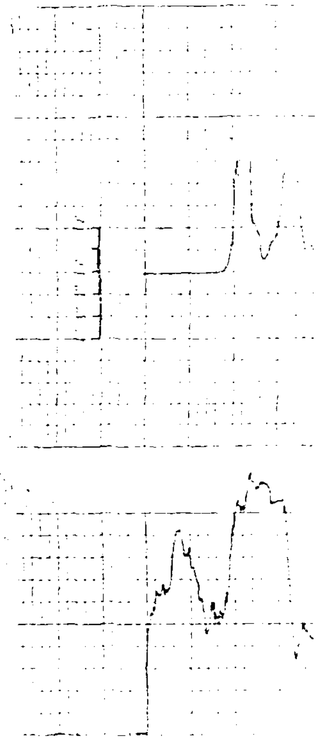
Date	Sample No.	Depth—Driller	Type Fluid in Hole	Dens.	Visc.	pH	Fluid Loss	Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source: Rmf / Rmc	Rm @ BHT	Rmf @ BHT	Rmc @ BHT
							ml		@ °F	@ °F	@ °F	/	@ °F	@ °F	@ °F

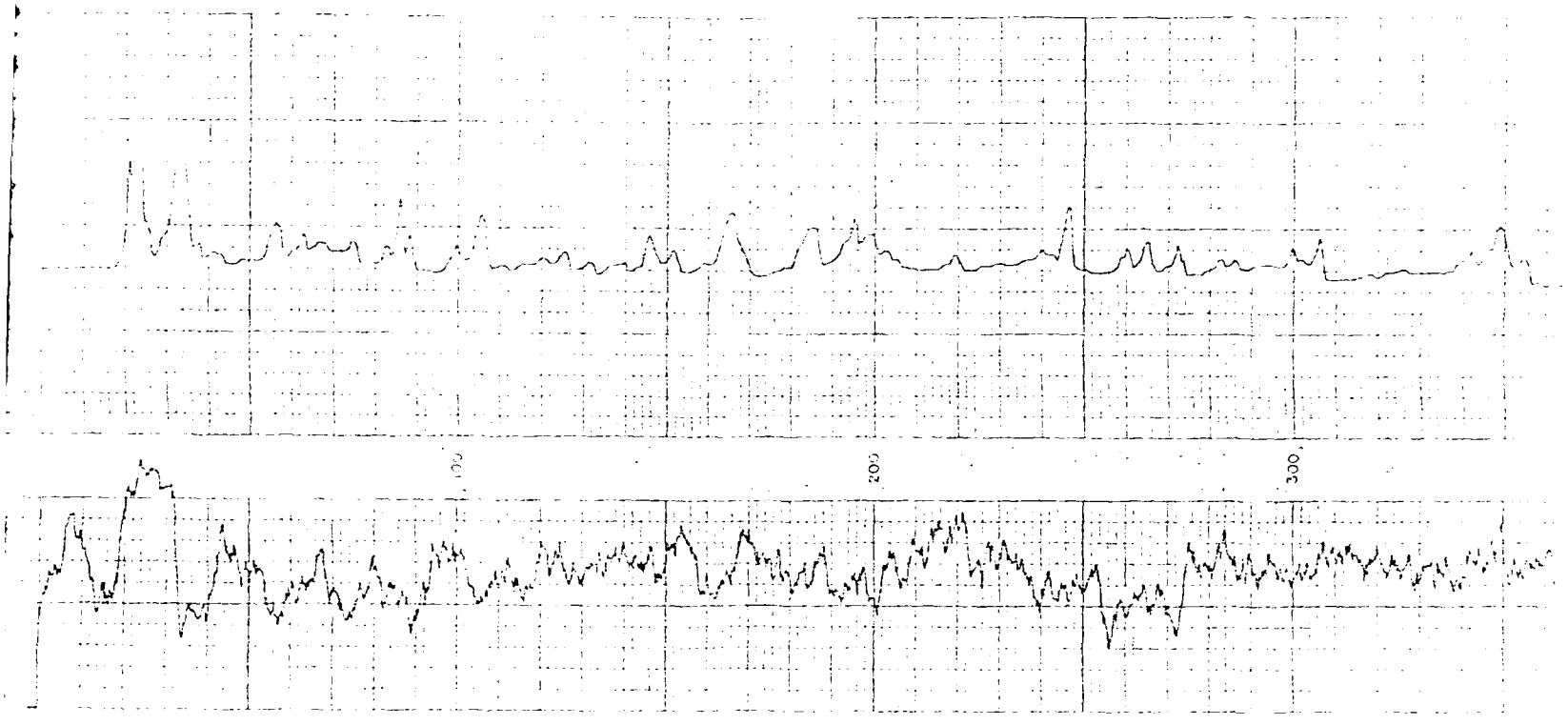
SPONTANEOUS POTENTIAL millivolts	Depths	RESISTIVITY ohms, m²/m	RESISTIVITY ohms, m²/m	RESISTANCE Detail Curve
5			SHORT NORMAL 16 inch 16" LATERAL LONG NORMAL 64 inch	

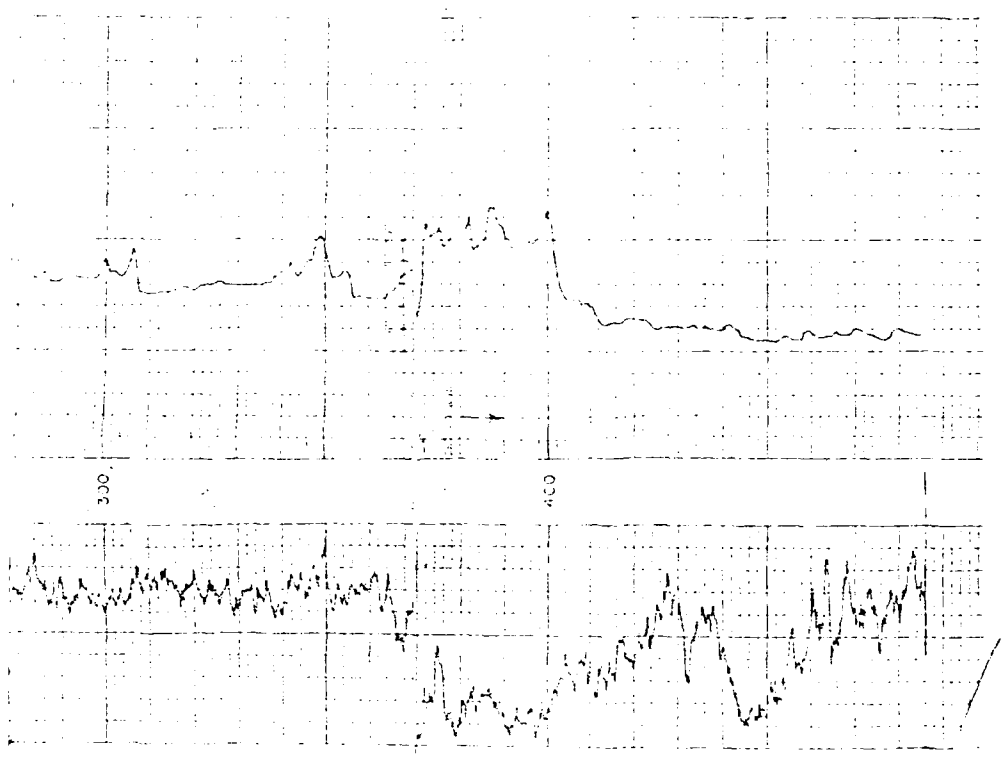

LONG NORMAL
64 Inch
RESISTANCE
Detail Curve
100
200
300


300
400
SECOND RUN

Gamma-Ray Caliper




100
200
300


300
400

Welence

WELL ENGINEERING SERVICES

ELECTRIC LOG

RUN NO.

COMPANY: EXLTS DRILLING, INC.

WELL: N/A

FIELD: LUKE AIR FORCE BASE

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LUKE A.F.B.

SEC ____ TWP ____ RGE ____

OTHER SERVICES: ALL DIPMETER, GAMMA-RAY, CALIPER

Permanent Datum: G.L. Elev. ____
Log Measured From: G.L. 10 Ft. Above Perm. Datum
Drilling Measured From: G.L.

Elev.: K.B. ____ D.F. ____ G.L. ____

Date	10-29-86	10-30-86		
Run No.	ONE	TWO		
Depth—Driller	275'	297.5'		
Depth—Logger	277'	297.5'		
Bottom Log Inter.	272'	296'		
Top Log Inter.	50'	50'		
Casing—Driller	10" @ 50'	8 5/8" @ 50'	@	@
Casing—Logger	-	8 5/8" @ 50'		
Bit Size	9 7/8"	7"		
Type Fluid in Hole	WATER	WATER		
Dens. / Visc.	N/A	N/A	/	/
pH / Fluid Loss	N/A / ml	N/A / ml	/ ml	/ ml
Source of Sample	FLT	FLT		
Rm @ Meas. Temp.	N/A @ °F	N/A @ °F	@ °F	@ °F
Rmf @ Meas. Temp.	N/A @ °F	N/A @ °F	@ °F	@ °F
Rmc @ Meas. Temp.	N/A @ °F	N/A @ °F	@ °F	@ °F
Source: Rmf / Rmc	M	M	/	/
Rm @ BHT	N/A @ °F	N/A @ °F	@ °F	@ °F
Time Since Circ.	1 HR	1 HR		
Max. Rec. Temp.	N/A °F	N/A °F	°F	°F
Equip. Location	1 / 1	1 / 1	/	/
Recorded by	[illegible]	[illegible]		
Witnessed by				

This Header and Log Conform To API RP 31

Field Header

REMARKS

Changes in Mud Type or Additional Samples

Date / Sample No. / Type—Driller / Type Fluid in Hole / Dens. / Visc. / pH / Fluid Loss / Source of Sample / Rm @ Meas. Temp. / Rmf @ Meas. Temp. / Rmc @ Meas. Temp. / Source: Rmf / Rmc / Rm @ BHT

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

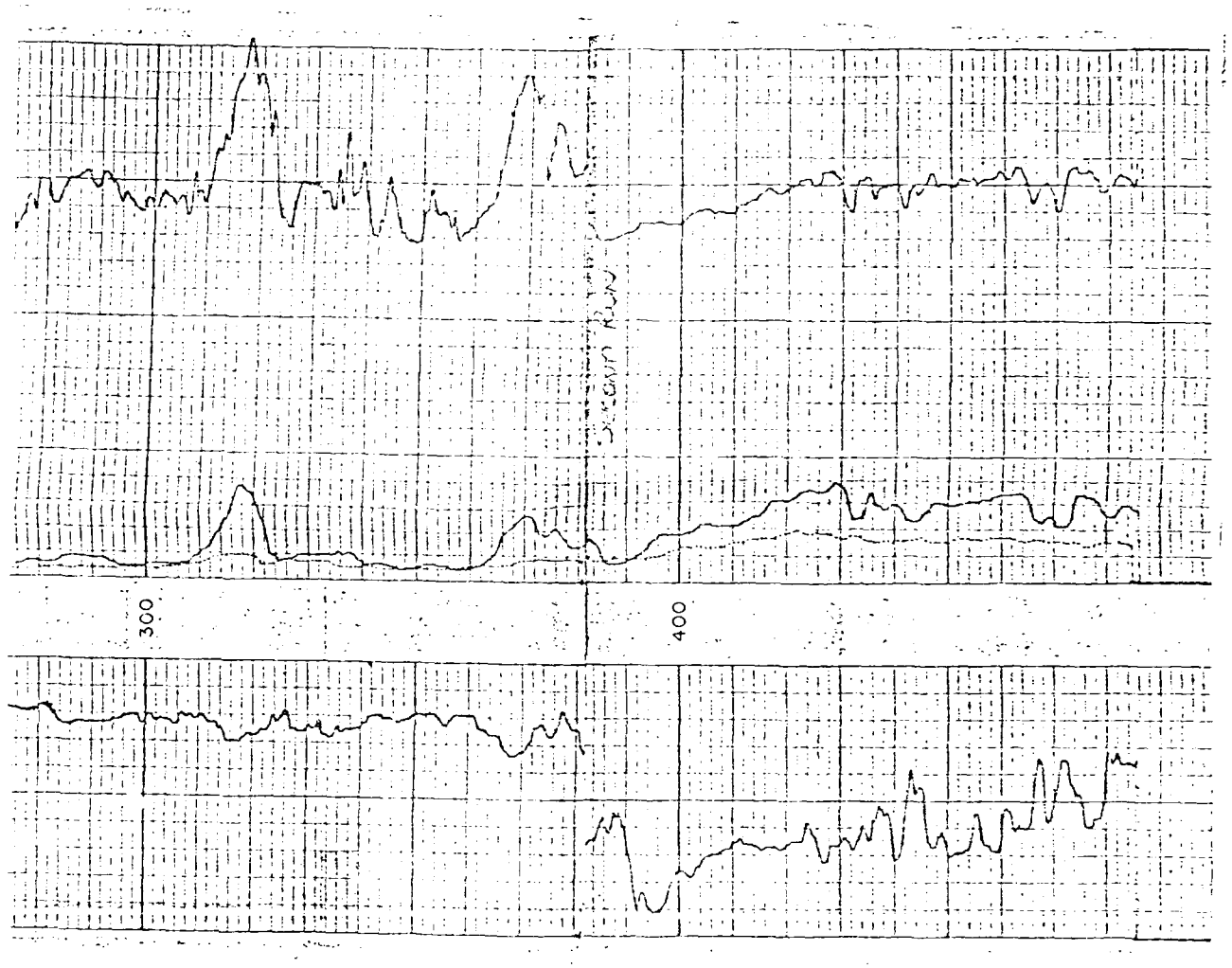
Run No.	Tool Type	Tool Serial No.	Tool Position
ONE	[illegible]	[illegible]	[illegible]
TWO	[illegible]	[illegible]	[illegible]

Cover

SPONTANEOUS POTENTIAL millivolts	Depths	RESISTIVITY ohms, m²/m	RESISTIVITY ohms, m²/m
+ / ± / ▼		SHORT NORMAL 16 inch	LONG NORMAL 64 inch
		0	50

RESISTANCE Detail Curve

100
200
300


300
400

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO

COMPANY SEVLIN DRILLING, INC.

WELL 103

FIELD LUKE AIR FORCE BASE

STATE ARIZONA COUNTY MARICOPA

LOCATION LUKE A.F.B.

SEC ____ TWP ____ RGE ____

OTHER SERVICES
CALIPER
GAMMA-RAY
6' LATERAL

Permanent Datum G.L. Elev. ____
Log Measured From G.L. 0 Ft. Above Perm. Datum
Drilling Measured From G.L.

Elev.: K.B. ____
D.F. ____
G.L. ____

Date	10-26-86	10-28-86		
Run No.	ONE	TWO		
Depth—Driller	366'	420'		
Depth—Logger	370'	419'		
Btm. Log Inter.	335'	345'		
Top Log Inter.	30'	350'		
Casing—Driller	10" @ 30'	6 5/8 @ 350'	@	@
Casing—Logger	-	-		
Bit Size	14 3/4"	9 7/8"		
Type Fluid in Hole	WATER	WATER		
Dens. / Visc.	-	-		
pH / Fluid Loss	N/A / ml	N/A / ml	/ ml	/ ml
Source of Sample	PIT	PIT		
R_m @ Meas. Temp.	12.25 @ 77 °F	12.25 @ 77 °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	12.25 @ 77 °F	12.25 @ 77 °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	N/A @ °F	N/A @ °F	@ °F	@ °F
Source: R_{mf} / R_{mc}	M /	M /	/	/
R_m @ BHT	N/A @ °F	N/A @ °F	@ °F	@ °F
Time Since Circ.	-	-		
Max. Rec. Temp.	N/A °F	N/A °F	°F	°F
Equip. / Location	A1 / TEMPE	F1 / TEMPE	/	/
Recorded By	CORDELL	CORDELL		
Witnessed By	MR. S.E. SMITH	MR. C. HILL		

Fold Here

This Reading and Log Conform To API RP 31.

REMARKS

Changes in Mud Type or Additional Sample

Date	Sample No.	Depth—Driller	Type Fluid in Hole	Dens.	Visc.	pH	Fluid Loss	Source of Sample	R_m @ Meas. Temp.	R_{mf} @ Meas. Temp.	R_{mc} @ Meas. Temp.	Source: R_{mf} / R_{mc}	R_m @ BHT	R_{mf} @ BHT	R_{mc} @ BHT
							ml		°F	°F	°F			°F	°F

Basic Changes

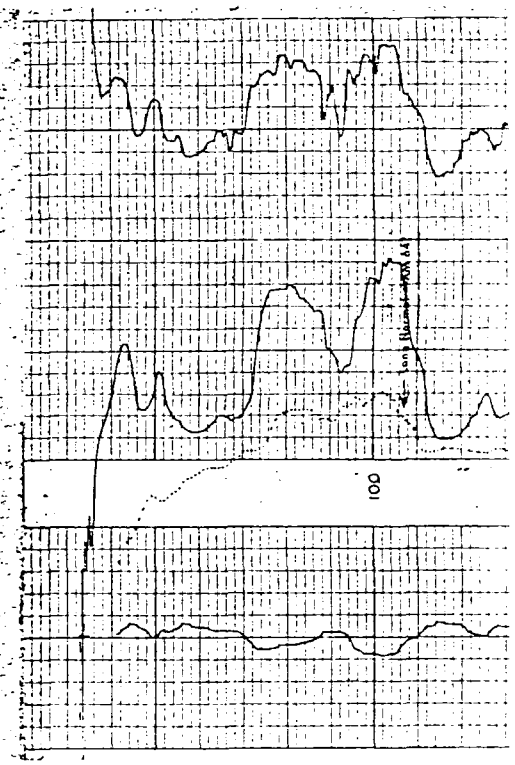
Type Log	Depth	Scale Up Hole	Scale Down Hole

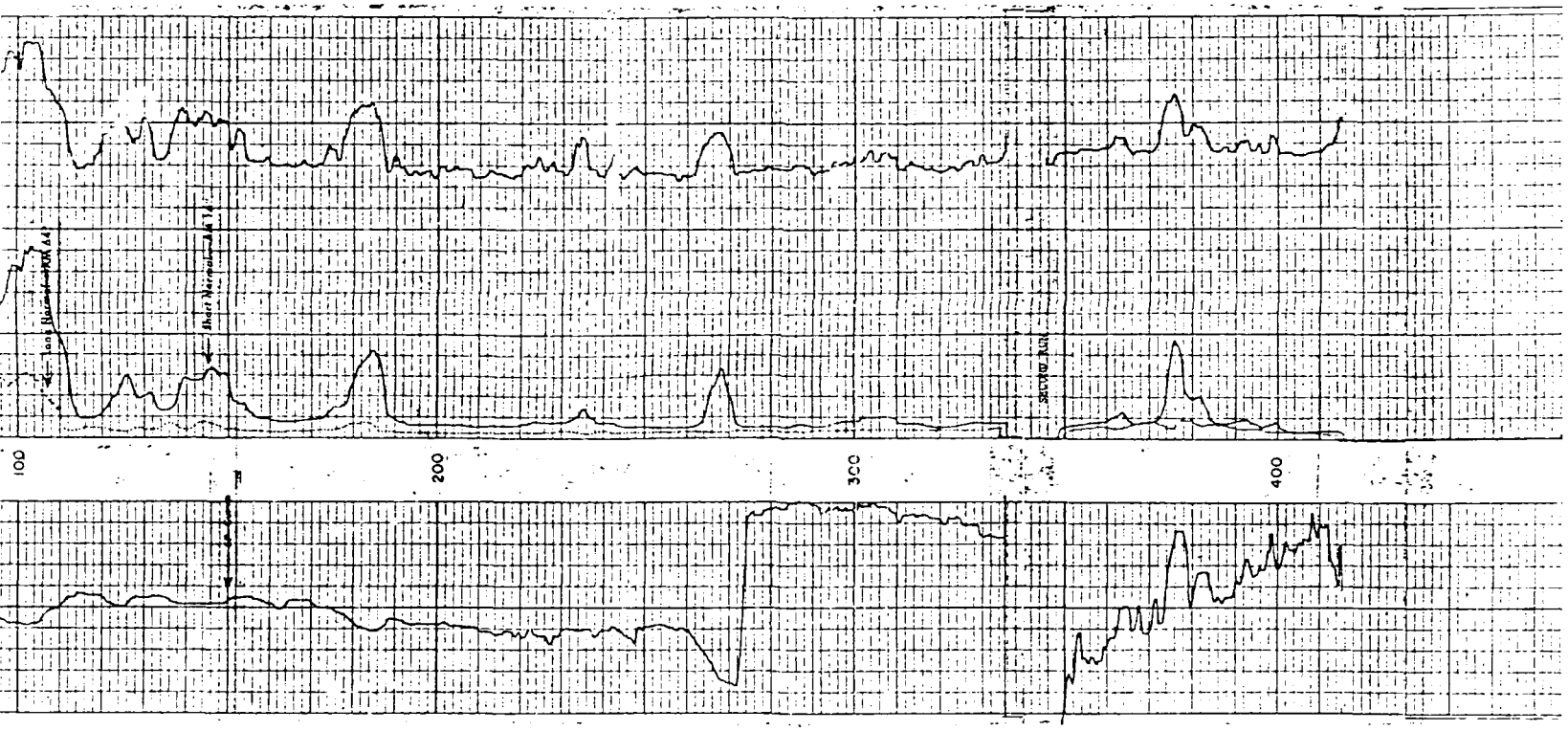
Equipment Data

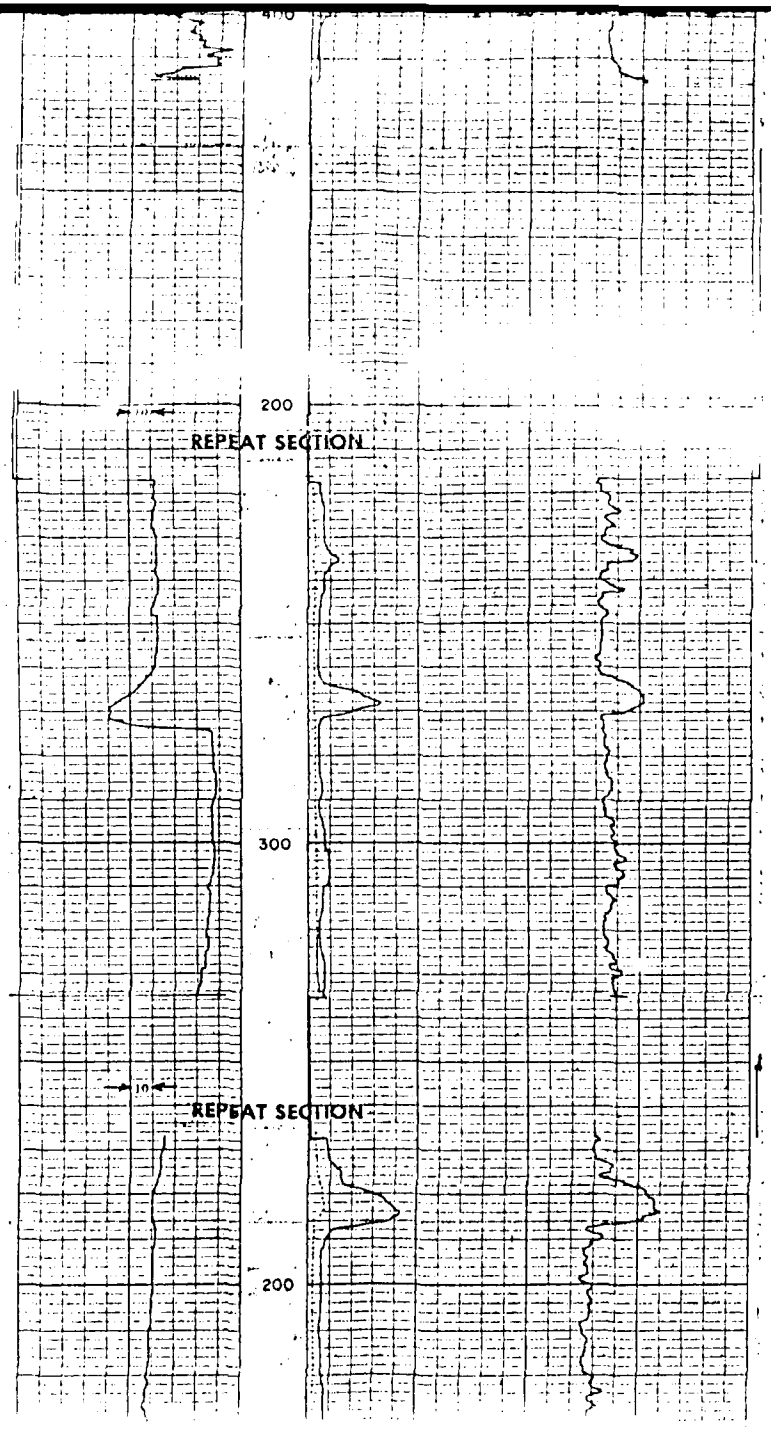
Run No.	Tool Type	Pad Type / Tool Position	Other
ONE	ELECTRIC LOG	FREE	
TWO	ELECTRIC LOG	FREE	

STUCK IN HOLE AT BOTTOM OF CASING FROM 4:45 AM UNTIL 12:00 NOON.

SPONTANEOUS POTENTIAL millivolts	Depths	RESISTIVITY ohms, m/m: SHORT NORMAL 16 Inch	RESISTIVITY ohms, m/m: LONG NORMAL 64 Inch	RESISTANCE Dual Curve
5 + / -		50	50	




100
200
300
400
SECOND RUN


200
REPEAT SECTION
300
10
REPEAT SECTION
200

23

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO

COMPANY REYLIK DRILLING, INC.

WELL 103

FIELD LUKE AIR FORCE BASE

STATE ARIZONA COUNTY MARICOPA

LOCATION:

SEC ____ TWP ____ RGE ____

OTHER SERVICES
CALIPER
GAMMA-RAY
E-LOG

Permanent Datum: G.L. Elev.
Log Measured From G.L. 0 Ft. Above Perm. Datum
Drilling Measured From G.L.

Elev.: K.B. ____
D.F. ____
G.L. ____

Date	10-26-86			
Run No.	ONE			
Depth—Driller	346'			
Depth—Logger	336'			
Btm. Log Inter.	335'			
Top Log Inter.	50'			
Casing—Driller	10" @ 20'	@	@	@
Casing—Logger	-			
Bit Size	14 3/4"/ 9 7/8"			
Type Fluid in Hole	WATER			
	-			
Dens. | Visc.	N/A	|	|	|
pH | Fluid Loss	N/A | ml	| ml	| ml	| ml
Source of Sample	PIT			
R_m @ Meas. Temp.	12.25 @ 77 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	12.25 @ 77 °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	N/A @ °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}	M |	|	|	|
R_m @ BHT	N/A @ °F	@ °F	@ °F	@ °F
Time Since Circ.	-			
Max. Rec. Temp.	N/A °F	°F	°F	°F
Equip. | Location	#1 TEMPE	|	|	|
Recorded By	CORBELL			
Witnessed By	MR. S.E. JACKETT			

Fold Here

This Heading and Log Conform To API RP 31

REMARKS

Changes in Mud Type or Additional Samples

Date	Sample No.	Depth—Driller	Type Fluid in Hole	Dens.	Visc.	pH	Fluid Loss	Source of Sample	R_m @ Meas. Temp.	R_{mf} @ Meas. Temp.	R_{mc} @ Meas. Temp.	Source: R_{mf} | R_{mc}	R_m @ BHT	R_{mf} @ BHT	R_{mc} @ BHT
							ml		°F	°F	°F		°F	°F	°F
									@	@	@		@	@	@

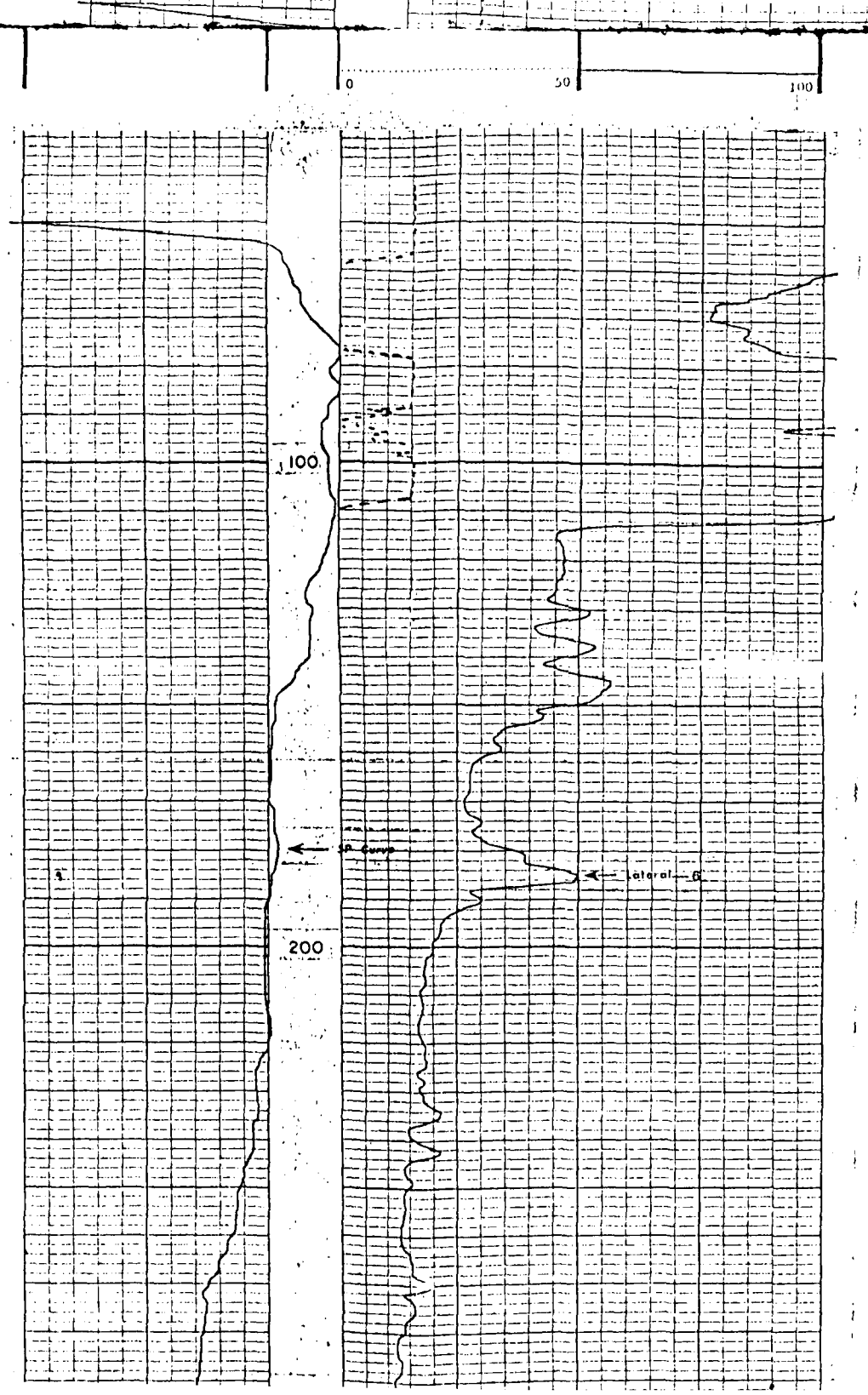
Scale Changes

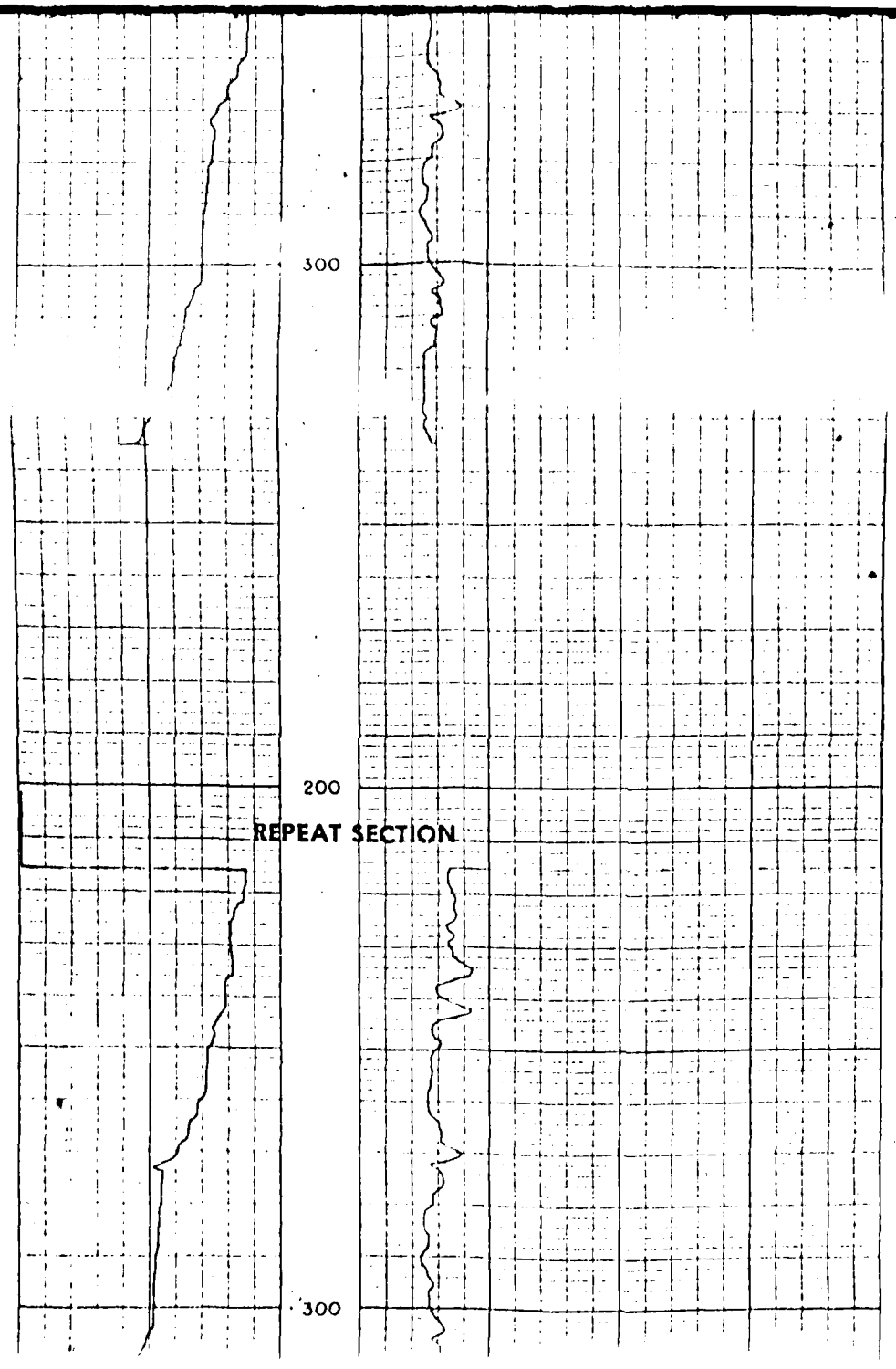
Type Log	Depth	Scale Up Hole	Scale Down Hole
—			

Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	6' LATERAL		TREE	

SPONTANEOUS POTENTIAL millivolts	Depths	RESISTIVITY ohms, m²/m	RESISTIVITY ohms, m²/m
5 + -		6' LATERAL 0 50 100	


0
50
100
100
SP Curve
Lateral 6
200


300
200
REPEAT SECTION
300

103

welenco

WELL ENGINEERING SURVEYS

Gamma-Ray Caliper

COMPANY: BEVLIK DRILLING, INC.

WELL: 103

FIELD: LUKE AIR FORCE BASE

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LUKE A.F.B.

SEC. ____ TWP. ____ RGE. ____

OTHER SERVICES: E-LOG, LATERAL

PERMANENT DATUM: G.L. ELEV. ____

LOG MEASURED FROM: G.L. 0 FT. ABOVE PERM. DATUM

DRILLING MEASURED FROM: G.L.

ELEV.: K.B. ____ D.F. ____ G.L. ____

DATE	10-26-86	10-28-86
RUN NO.	ONE	TWO
TYPE LOG	GAMMA-CALIPER	GAMMA-CALIPER
DEPTH-DRILLER	346'	420'
DEPTH-LOGGER	336'.	419'
BOTTOM LOGGED INTERVAL	335'	417'
TOP LOGGED INTERVAL	0'	350'
TYPE FLUID IN HOLE	WATER	WATER
MAX. REC. TEMP., DEG. F.	N/A	N/A
RECORDED BY	CORBELL	CORBELL
WITNESSED BY	MR. S.E. BARATT	MR. G. HILL

RUN NO	BORE-HOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
1	14 3/4	SURFACE	20'	10"		SURF.	20'
	9 7/8	20'	346'				
2	"	346'	420'	6 5/8		SURF.	350'

EQUIPMENT DATA

Gamma Ray		Neutron	
Run No.	ONE	Run No.	
Tool Model No.	GCN77AX1A65	Log Type	
Diameter	1 11/16"	Tool Model No.	
Detector Model No.	-	Diameter	
Type	GM	Detector Model No.	
Length	18"	Type	
Distance to N. Source	-	Length	
		Source Model No.	
		Serial No.	
		Spacing	
		Type	

General

Host Truck No. #1

Instrument Truck No. #1

Tool Serial No.

LOGGING DATA

General				Gamma Ray				Neutron		
Run No	Depths From	Depths To	Speed Ft/Min	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API N. Units per Log Div.
1	332'	20'	25	3	250	41	20				
2	417'	350'	25	3	250	41	20				

Reference Literature:

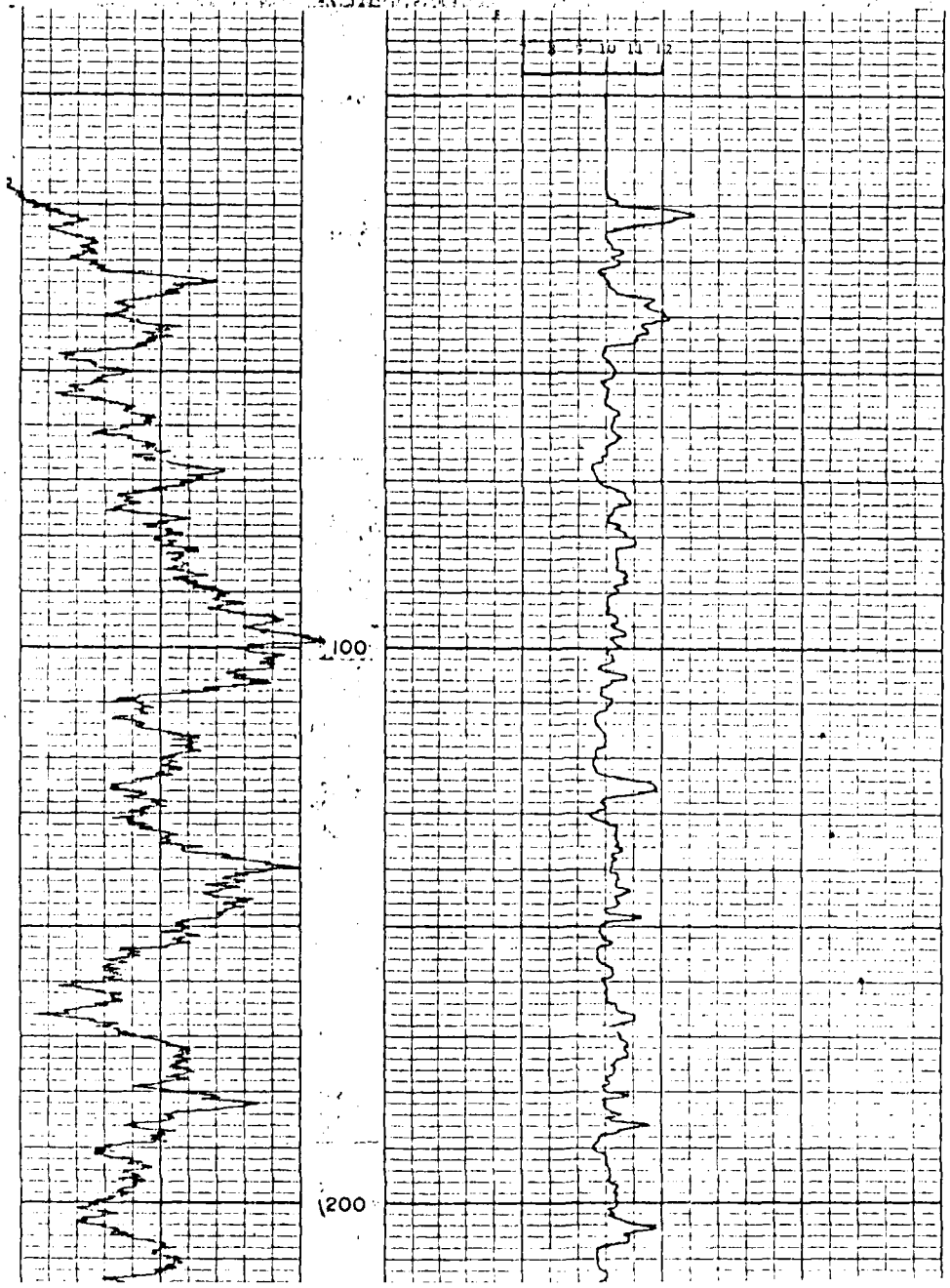
Remarks:

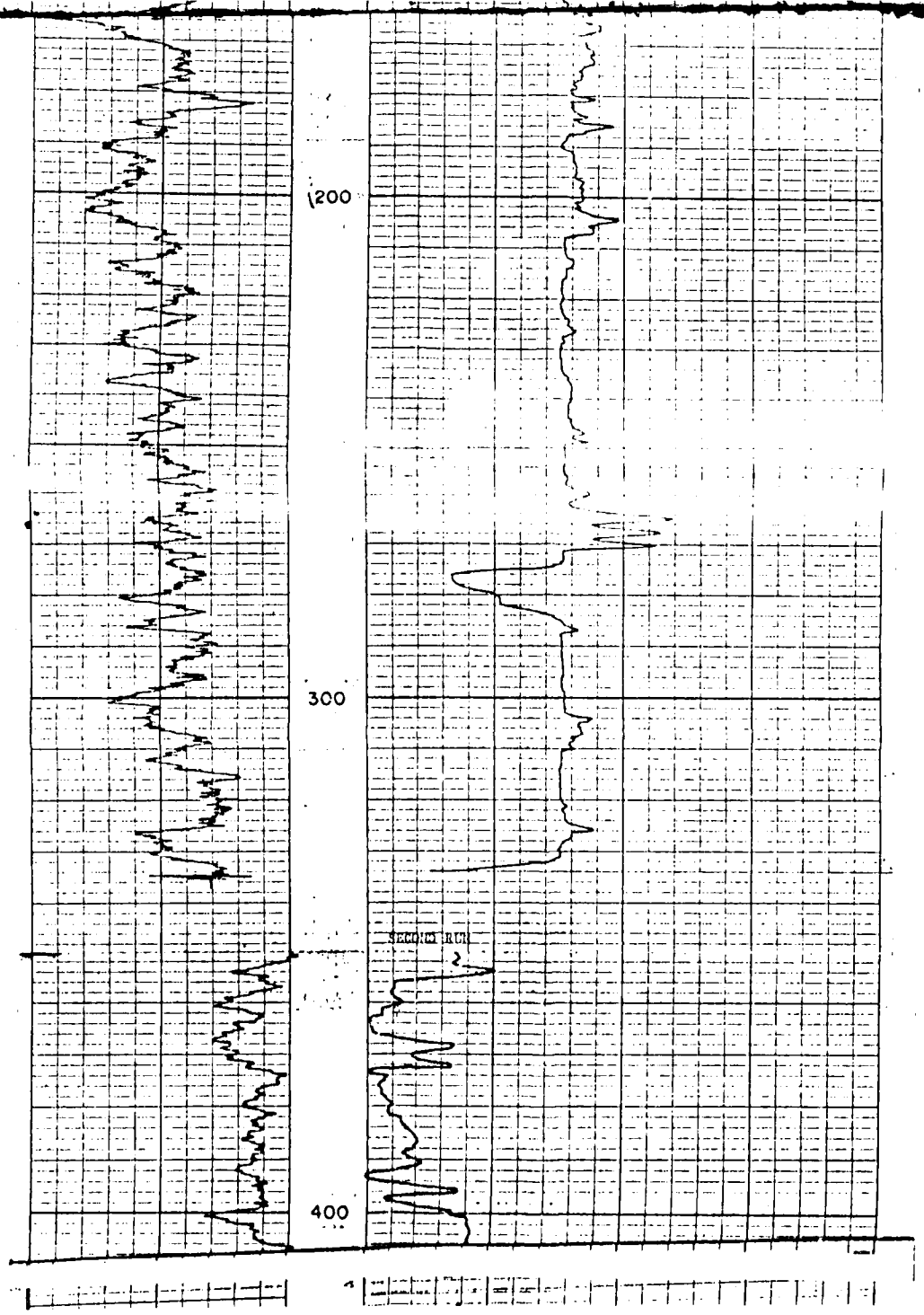
Fold Here

GAMMA-RAY	DEPTHS	CALIPER
API GAMMA-RAY UNITS		INCHES

Fold Here

GAMMA-RAY	DEPTHS	CALIPER
API GAMMA-RAY UNITS 40 280		INCHES




200
300
400
SECOND RUN

COMPANY

WELL

FIELD

STATE COUNTY

LOCATION

Other Services

Permanent Datum

Log Measured From

Drilling Measured From

Elev.: K.B.

D.F.

G.L.

Date

Run No.

Depth-Driller

Depth-Logger

Bottom Log Interval

Top Log Interval

Casing-Driller

Casing-Logger

Bit Size

Type Fluid in Hole

Dens.

Visc.

pH

Fluid Loss

Source of Sample

Rm @ Meas. Temp.

Rmf @ Meas. Temp.

Rmc @ Meas. Temp.

Source: Rmf / Rmc

Rm @ BHT

Time Since Circ.

Max. Rec. Temp. °F

Equipment Location

Recorded by

Witnessed by

REMARKS

Cleaner Run? Type of Additional Sample

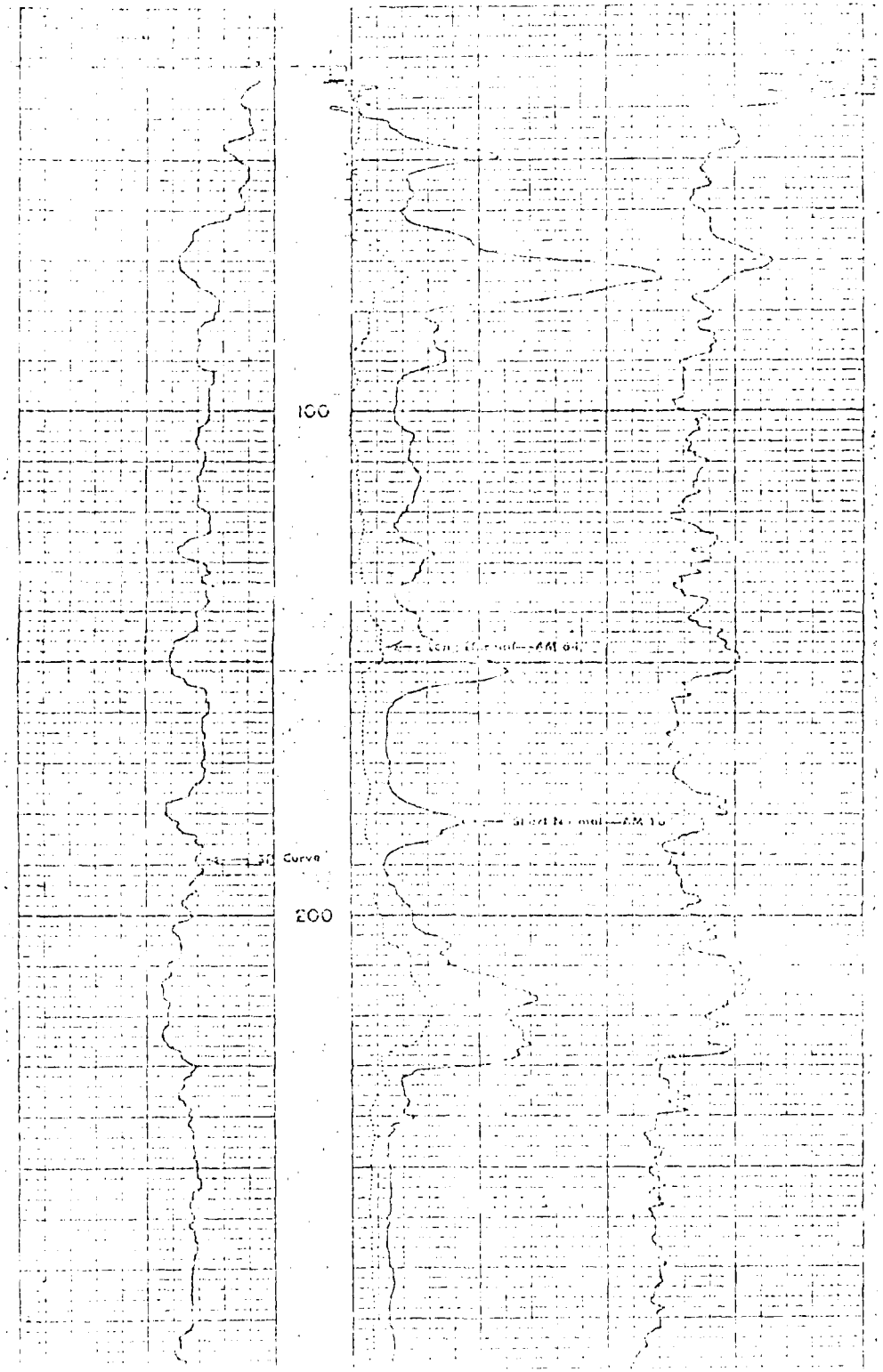
Scale Changes

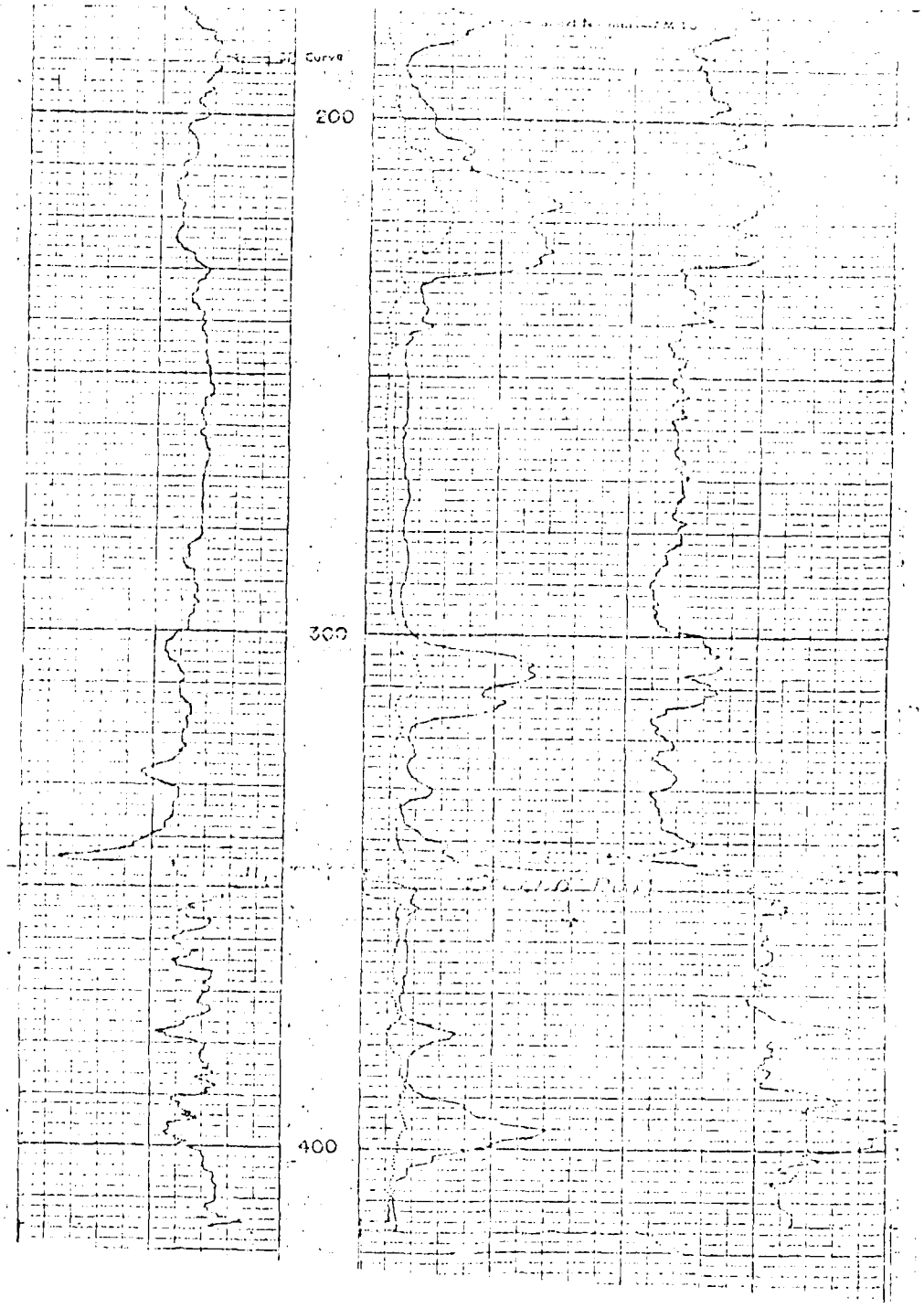
Type Log	Depth	Scale Up Hole	Scale Down Hole

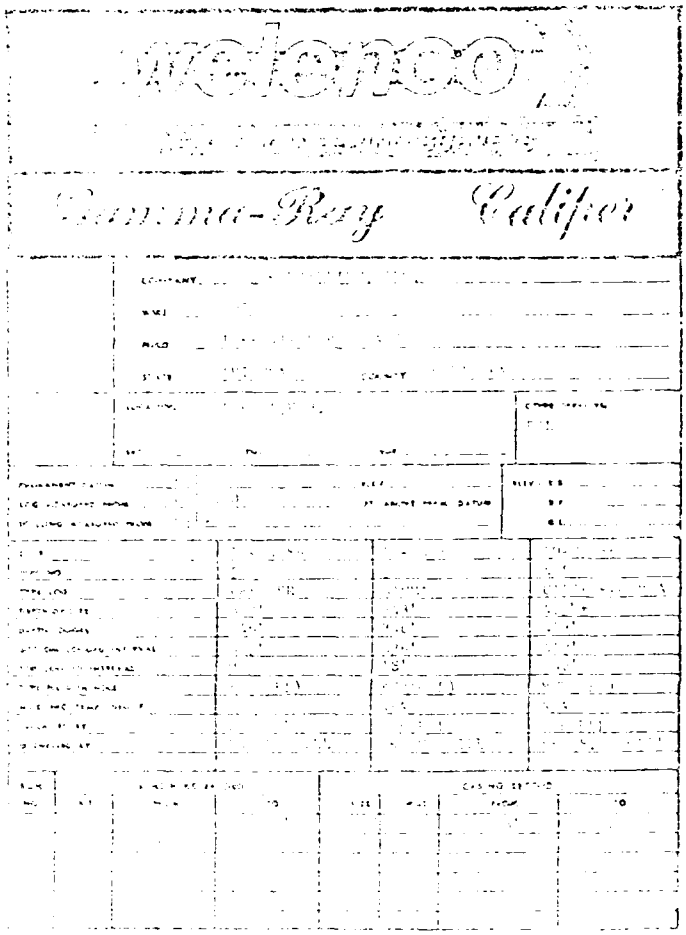
Equipment Data

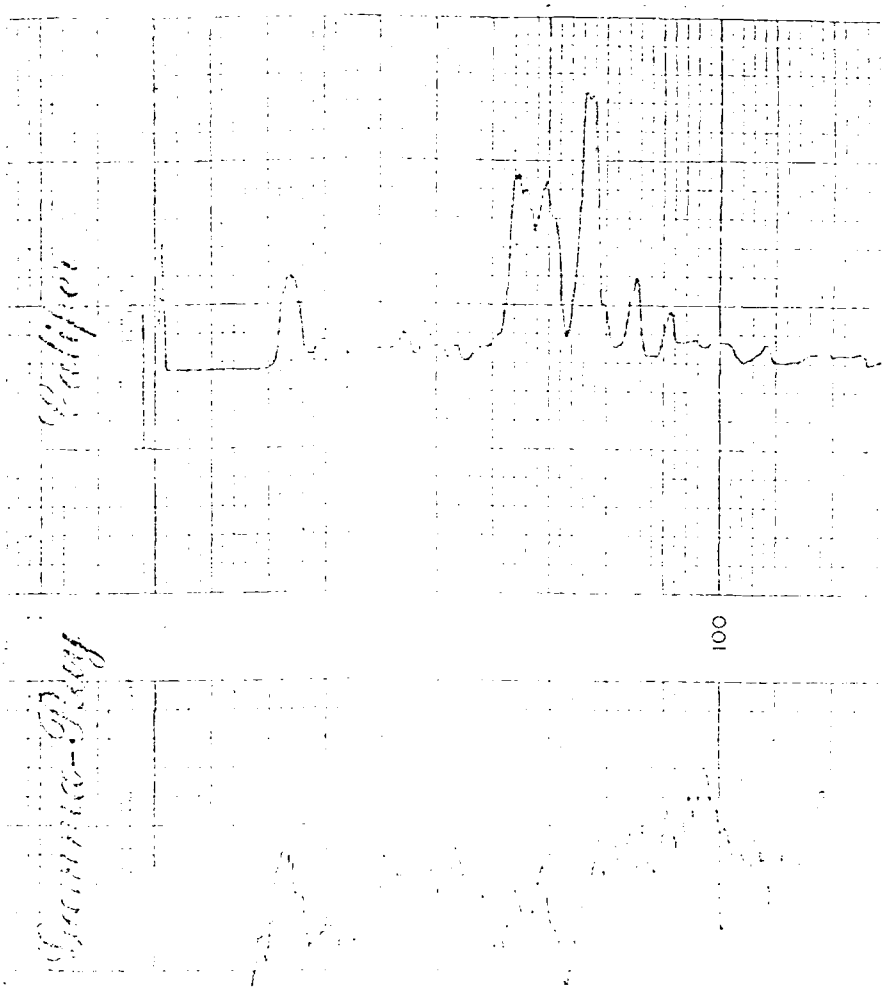
Run No.	Tool Type	Bed Type	Bed Position	Other

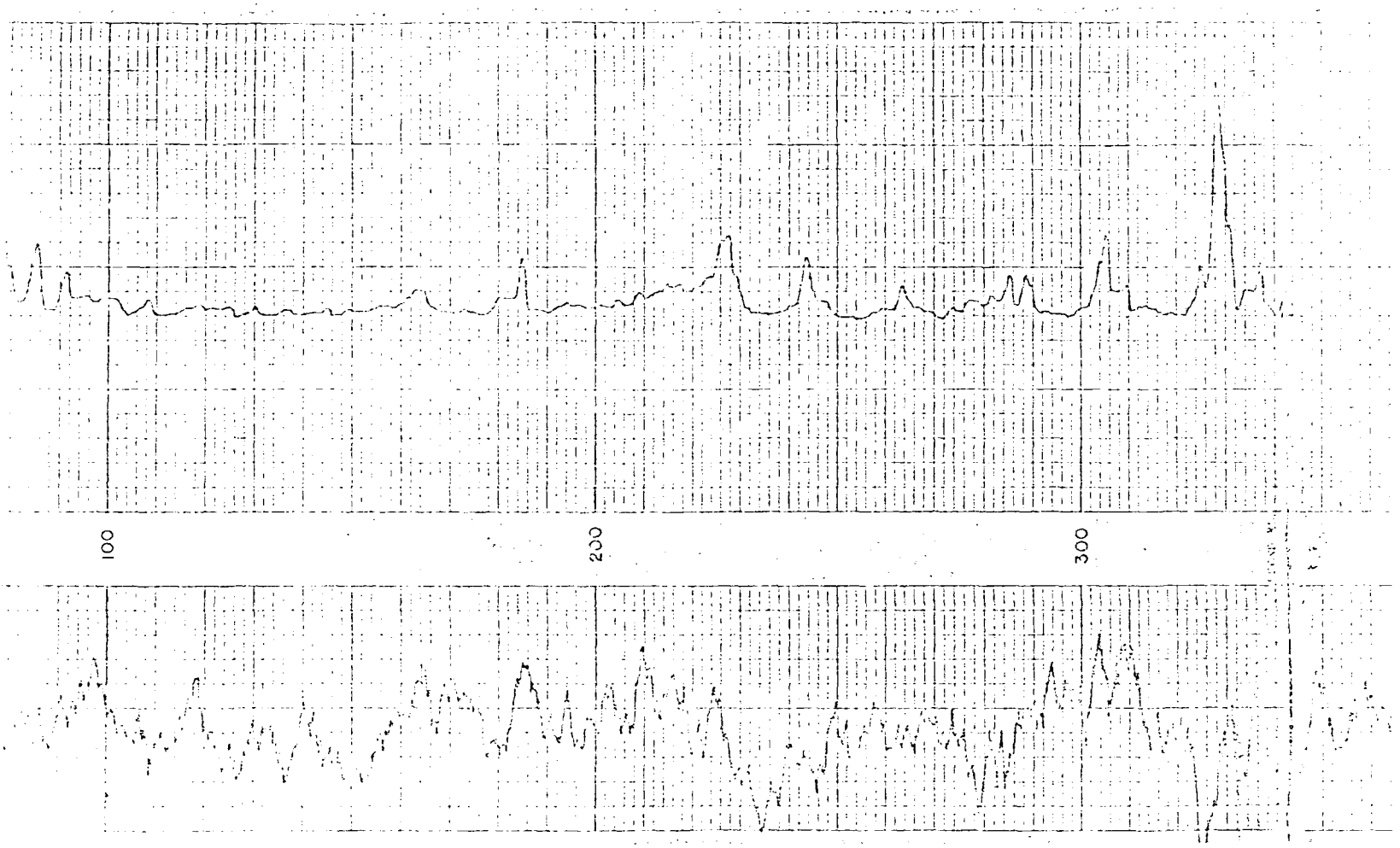
SPONTANEOUS POTENTIAL millivolts	Tracks	RESISTIVITY ohms, m²/m	RESISTIVITY ohms, m²/m
S − +		SHORT NORMAL	
		LONG NORMAL	RESISTANCE Delta Curve

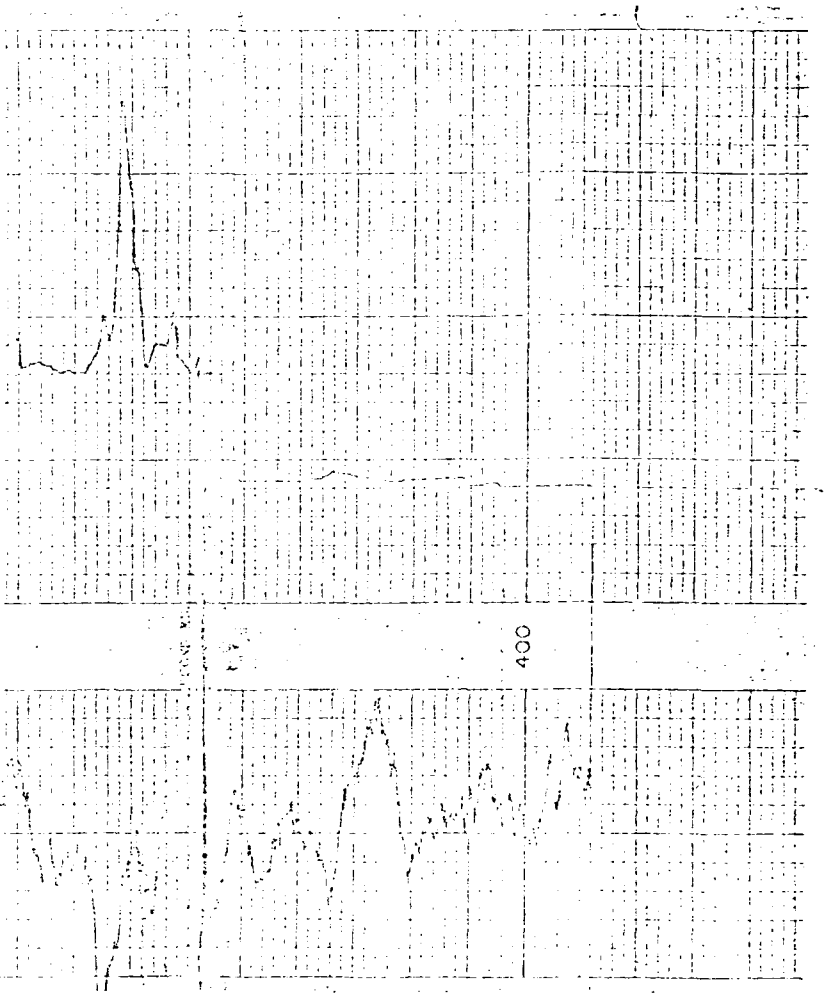

100
200


Curve
200
300
400


Gamma-Ray Caliper


Caliper
100
Gamma-Ray


100
200
300


400

Welenco

WELL ENGINEERING SERVICES

Gamma-Ray Caliper

COMPANY: [illegible] DRILLING
WELL: SOL [illegible]
FIELD: LUKE AIR FORCE BASE
STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LUKE A.F.B.
SEC. ___ TWP. ___ RGE. ___

OTHER SERVICES: ELECTRIC LOG

EQUIPMENT DATUM: G.L.
ELEV.
LOG MEASURED FROM: G.L., 0' FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM: G.L.
D.F.
G.L.

DATE	12-2-86	12-2-86
RUN NO.	ONE	TWO
TYPE LOG	GR-CALIPER	GR CALIPER
FIRST READING	154'	233'
DEPTH LOGGED	154'	233'
RATE LOGGED INTERVAL	133'	224'
TOP LOGGED INTERVAL	21'	150'
TYPE FLUID IN HOLE	BENTONITE	WATER
MAX. REC. TEMP., DEG. F		
ENGINEER BY	CORNELL	CORNELL
WITNESSED BY	MR. K.	SAMPELSON

RUN NO.	BIT	BOREHOLE RECORD FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
1	7 7/8"	38'	154'	10 3/4"		SURFACE	38'
	[illegible]	[illegible]	[illegible]	[illegible]		SURFACE	250'

EQUIPMENT DATA

Gamma Ray
Run No.
Log Type
Unit
Detector Model No.
Diameter
Type
Length
Source to N. Source
Serial No.
Shielding
Type
Strength

Neutron
Run No.
Log Type
Unit
Detector Model No.
Diameter
Type
Length
Source Model No.
Serial No.
Shielding
Type
Strength

General
Head Truck No.
Instrument Truck No.
Tool Serial No.

LOGGING DATA

General

Run No.	Depths From	To	Speed FT/Min	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.
1	154'	0'	20	3	100/80	8	20
2	224'	224'	20	3	100/80	8	20

Gamma Ray

T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.

Neutron

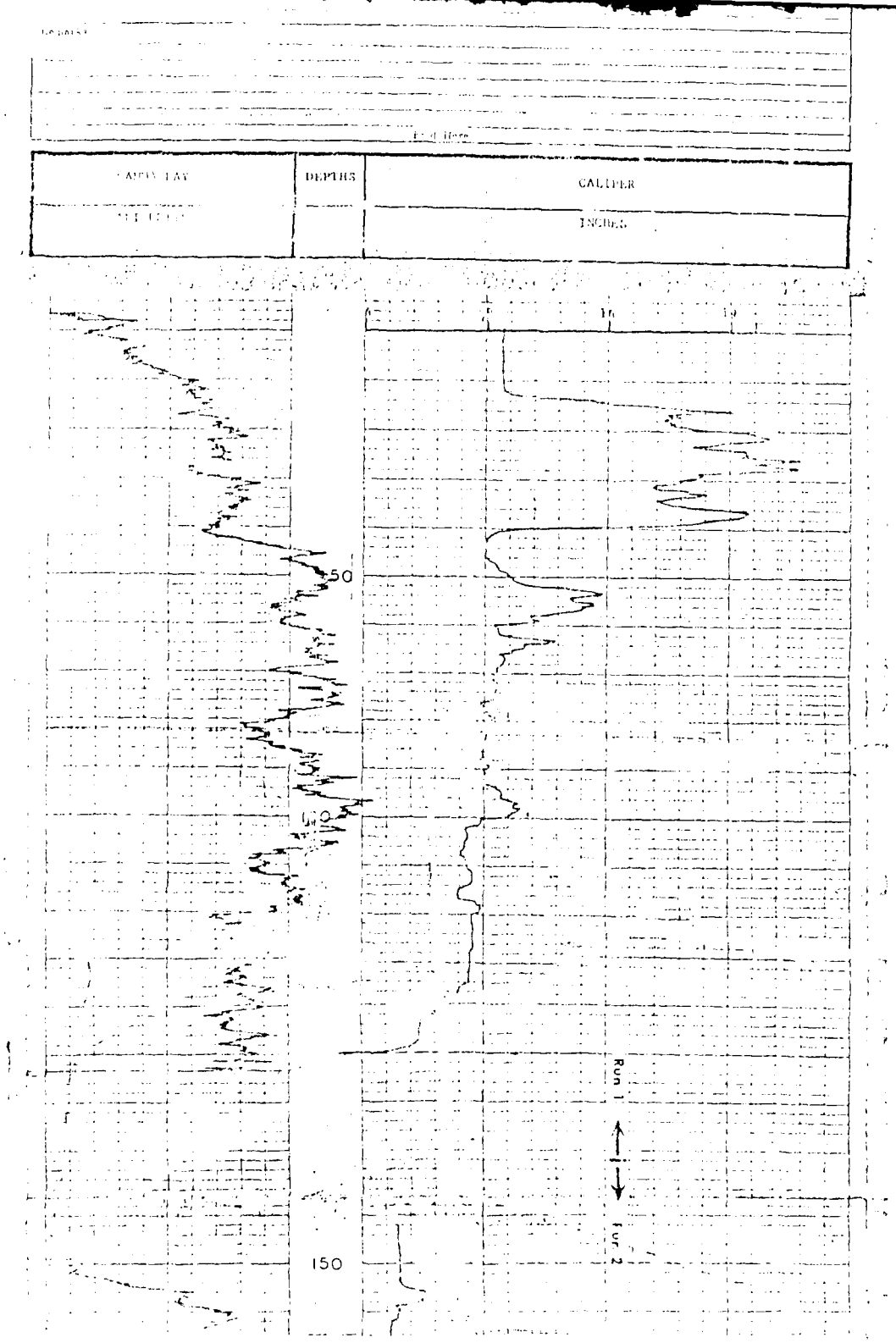
T.C. Sec.	Sens. Settings	Zero Div. L or R	API N. Units per Log Div.

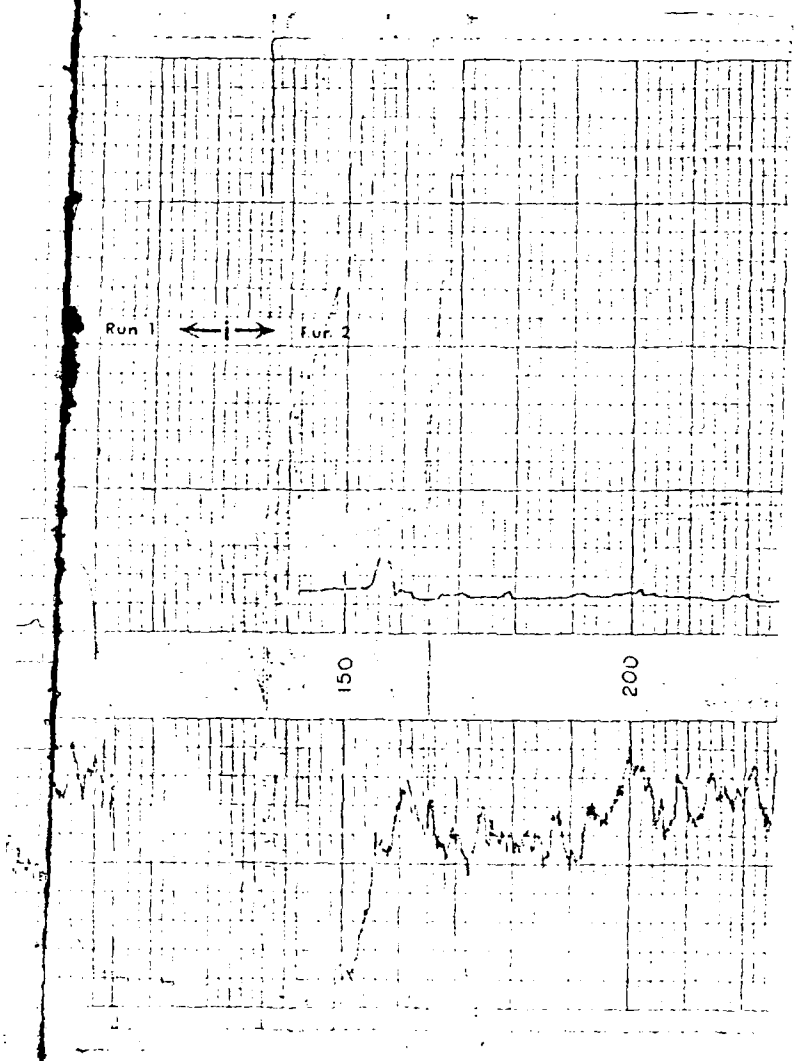
Recorded Elevations

Remarks

Total Hours

APPROVED BY	DEPTHS	CALIPER
		TOTALS


DEPTHS
CALIPER
INCHES
16
50
100
150
Run 1
Run 2


Run 1
Fur. 2
150
200

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO.

COMPANY: BENLIK DRILLING

WELL: NO. 1 3

FIELD: LUKE AIR FORCE BASE

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LUKE A.F.B.

SEC ____ TWP ____ RGE ____

OTHER SERVICES: GAMMA RAY, CALIPER

Permanent Datum: G.L. Elev. ____ Elev.: K.B. ____

Log Measured From: G.L. 0' Ft. Above Perm. Datum D.F. ____

Drilling Measured From: G.L. G.L. ____

Date	12-2-86	12-2-86		
Run No.	ONE	TWO		
Depth—Driller	[illegible]	[illegible]		
Depth—Logger	154'	1[illegible]'		
Btm. Log Inter.	153'	[illegible]		
Top Log Inter.	[illegible]	[illegible]		
Casing—Driller	[illegible] @ 18'	[illegible] @ 154'	@	@
Casing—Logger				
Bit Size				
Type Fluid in Hole	[illegible]	WATER		
Dens. / Visc.		/	/	/
pH / Fluid Loss	/ ml	/ ml	/ ml	/ ml
Source of Sample	PIT	PIT		
Rm @ Meas. Temp.	[illegible] @ [illegible] °F	[illegible] @ [illegible] °F	@ °F	@ °F
Rmf @ Meas. Temp.	[illegible] @ °F	[illegible] @ [illegible] °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: Rmf / Rmc	/	/	/	/
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.		[illegible]		
Max. Rec. Temp.	°F	°F	°F	°F
Equip. / Location	[illegible]	[illegible]	/	/
Recorded By	[illegible]	[illegible]		
Witnessed By	[illegible]	[illegible]		

This Heading and Log Conform To API RP 31-B

Fold Here

REMARKS

Changes in Mud Type or Additional Samples

Date / Sample No.

Depth—Driller

Type Fluid in Hole

Dens. / Visc.

pH / Fluid Loss

Source of Sample

Rm @ Meas. Temp.

Rmf @ Meas. Temp.

Rmc @ Meas. Temp.

Source: Rmf / Rmc

Rm @ BHT

Rmf @ BHT

Rmc @ BHT

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Date	Tool Type	Tool Position
ONE	12-2-86	Gamma Ray	Other
TWO	12-2-86	Caliper	Other

RESISTIVITY ohms. m²/m

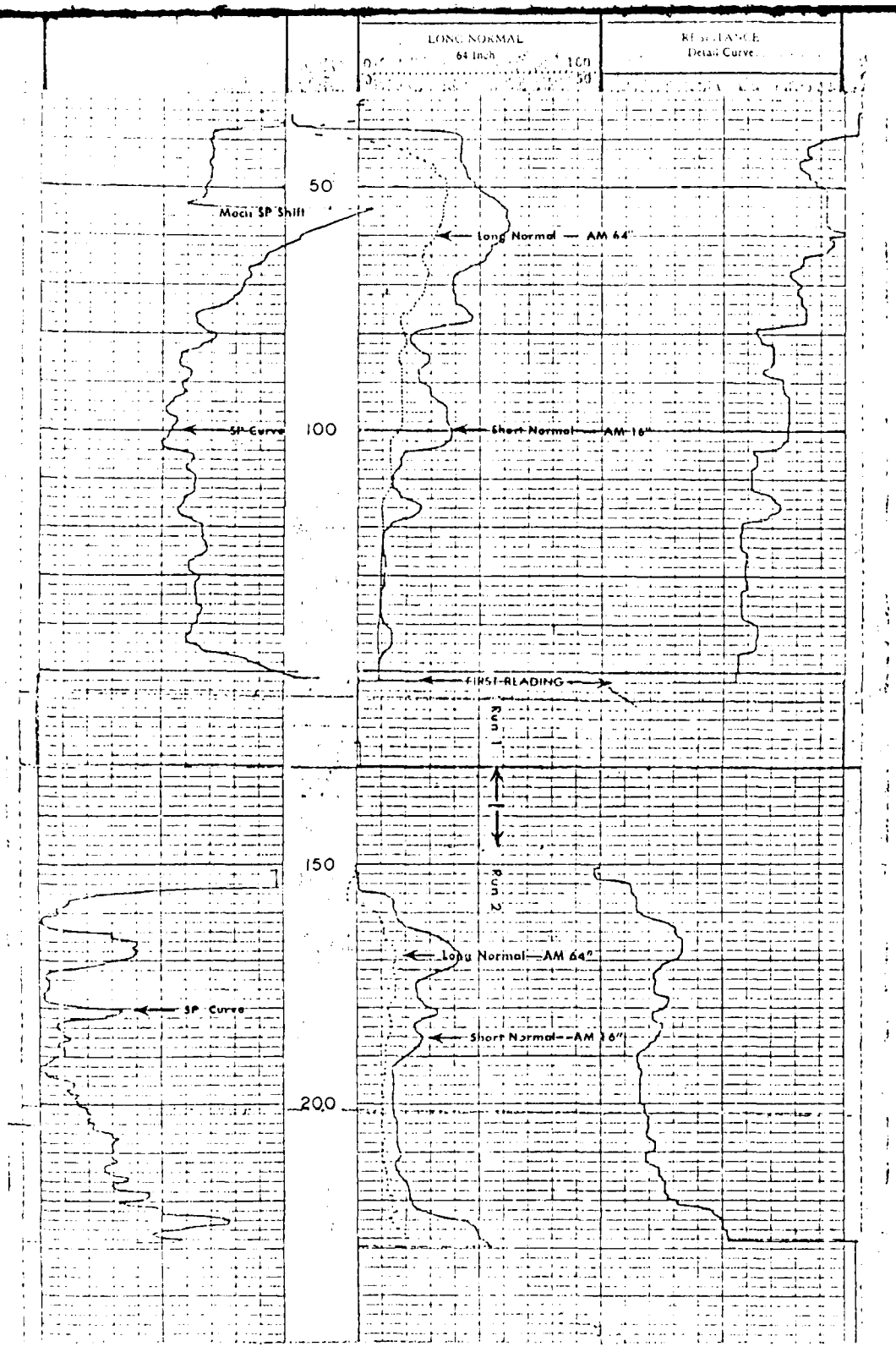
SHORT NORMAL 16 inch 10 50

LONG NORMAL 64 inch 100 500

RESISTANCE Detail Curve

Depths

SPONTANEOUS POTENTIAL millivolts


LONG NORMAL
64 Inch
100
50
RESISTANCE
Detail Curve
50
Mock SP Shift
Long Normal — AM 64"
SP Curve
100
Short Normal — AM 16"
FIRST READING
150
Long Normal—AM 64"
SP Curve
Short Normal—AM 16"
200

welenco

ELECTRIC LOG

FILING NO

COMPANY: [illegible]

WELL: [illegible]

FIELD: [illegible]

STATE: [illegible] COUNTY: [illegible]

LOCATION: LUKE A.F.B.

SEC ____ TWP ____ RGE ____

OTHER SERVICES: 6' LATERAL, CALIPER, GAMMA RAY

Permanent Datum: G.L. Elev. ____

Log Measured From: G.L. 6' Ft. Above Perm. Datum

Drilling Measured From: G.L.

Elev.: K.B. ____ D.F. ____ G.L. ____

Date	10-31-86	11-2-86		
Run No.	ONE	TWO		
Depth—Driller	370'	433'		
Depth—Logger	392'	433'		
Btm. Log Inter.	390'	432'		
Top Log Inter.	30'	370'		
Casing—Driller	10" @ [illegible]	6 5/8" @ 370'	@	@
Casing—Logger	10" @ 23'	6 5/8" @ 370'		
Bit Size				
Type Fluid in Hole	WATER	WATER		
Dens. | Visc.				
pH | Fluid Loss	ml	ml	ml	ml
Source of Sample	PIT	PIT		
R_m @ Meas. Temp.	[illegible] @ [illegible] °F	[illegible] @ [illegible] °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	[illegible] @ [illegible] °F	[illegible] @ [illegible] °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}				
R_m @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.	[illegible]	[illegible]		
Max. Rec. Temp.	°F	°F	°F	°F
Equip. | Location	[illegible]	[illegible]		
Recorded By	[illegible]	[illegible]		
Witnessed By	[illegible]	[illegible]	[illegible]	

This Heading and Log Conform To API RP 31

Fold Here

REMARKS

Changes in Mud Type or Additional Samples

Date	Sample No.	Depth—Driller	Type Fluid in Hole	Dens. | Visc.	pH | Fluid Loss	Source of Sample	R_m @ Meas. Temp.	R_{mf} @ Meas. Temp.	R_{mc} @ Meas. Temp.	Source: R_{mf} R_{mc}	R_m @ BHT	R_{mf} @ BHT	R_{mc} @ BHT
					ml		@ °F	@ °F	@ °F		@ °F	@ °F	@ °F

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

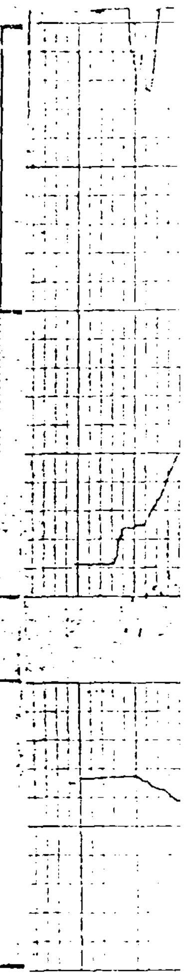
Run No.	Tool Type	Pad Type	Tool Position	Other
[illegible]	[illegible]		[illegible]	
[illegible]	[illegible]			

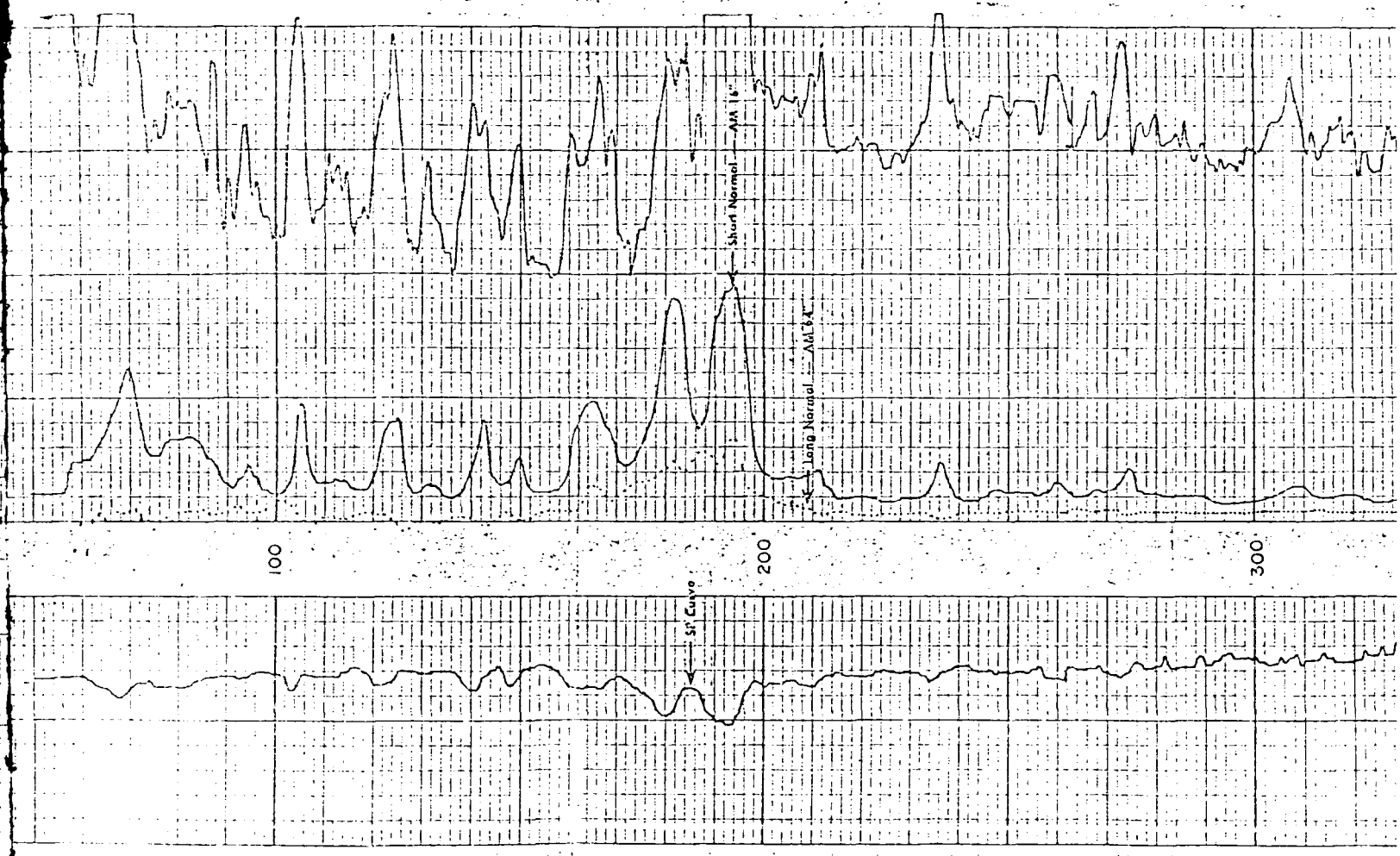
RESISTIVITY ohms. m²/m — RESISTANCE Detail Curve

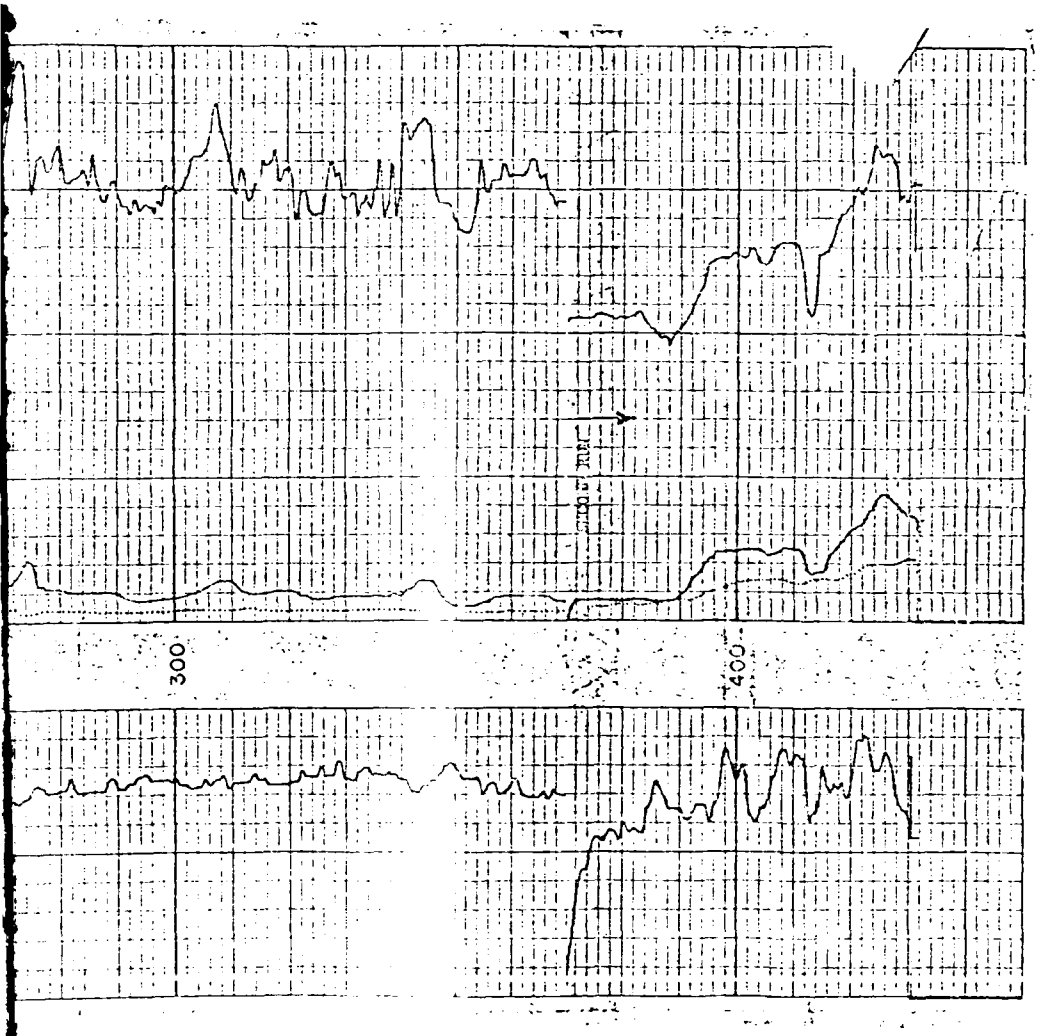
RESISTIVITY ohms. m²/m — SHORT NORMAL 16 Inch (0–50); LONG NORMAL 64 Inch (0–50)

Depths

SPONTANEOUS POTENTIAL millivolts (+ 5 −)




Short Normal — AM 16"
Long Normal — AM 64"
100
200
300
SP Curve


300
400

welenco

WELL ENGINEERING SERVICES

ELECTRIC LOG

COMPANY: NEVADA DRILLING

WELL: 3-A

FIELD: LAKE AIR FORCE BASE

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LAKE A.F.B.

SEC ____ TWP ____ RGE ____

Other Services: ELECTRIC LOG, CALIPER, GAMMA RAY

Permanent Datum: G.L. Elev. ____

Log Measured From: G.L. ____ Ft. Above Perm. Datum

Drilling Measured From: G.L.

Elev.: K.B. ____ D.F. ____ G.L. ____

Date	10-31-86	11-2-86		
Run No.	ONE	TWO		
Depth—Driller	321'	320'		
Depth—Logger	321'	320'		
Btm. Log Inter.	321'	320'		
Top Log Inter.	301'	320'		
Casing—Driller	10" @ 20'	6 5/8" @ 320'	@	@
Casing—Logged	10" @ 20'	6 5/8" @ 320'		
Bit Size				
Type Fluid in Hole	WATER	WATER		
Dens. / Visc.		/	/	/
pH / Fluid Loss	/ ml	/ ml	/ ml	/ ml
Source of Sample	PIT	PIT		
Rm @ Meas. Temp.	13.2 @ 75 °F	13.1 @ 75 °F	@ °F	@ °F
Rmf @ Meas. Temp.	12.5 @ 75 °F	13.1 @ 75 °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source Rmf / Rmc	/	/	/	/
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.	1 hr.	1 hr.		
Max. Rec. Temp.	°F	°F	°F	°F
Equip. Location	/	/	/	/
Recorded By				
Witnessed By				

Time Bleeding and Log Chokes To API RP 31.

REMARKS

Changes in Mud Type or Additional Samples

Time Log Interval

Time Circ. Stopped

Time Logger On Bottom

Type Fluid in Hole

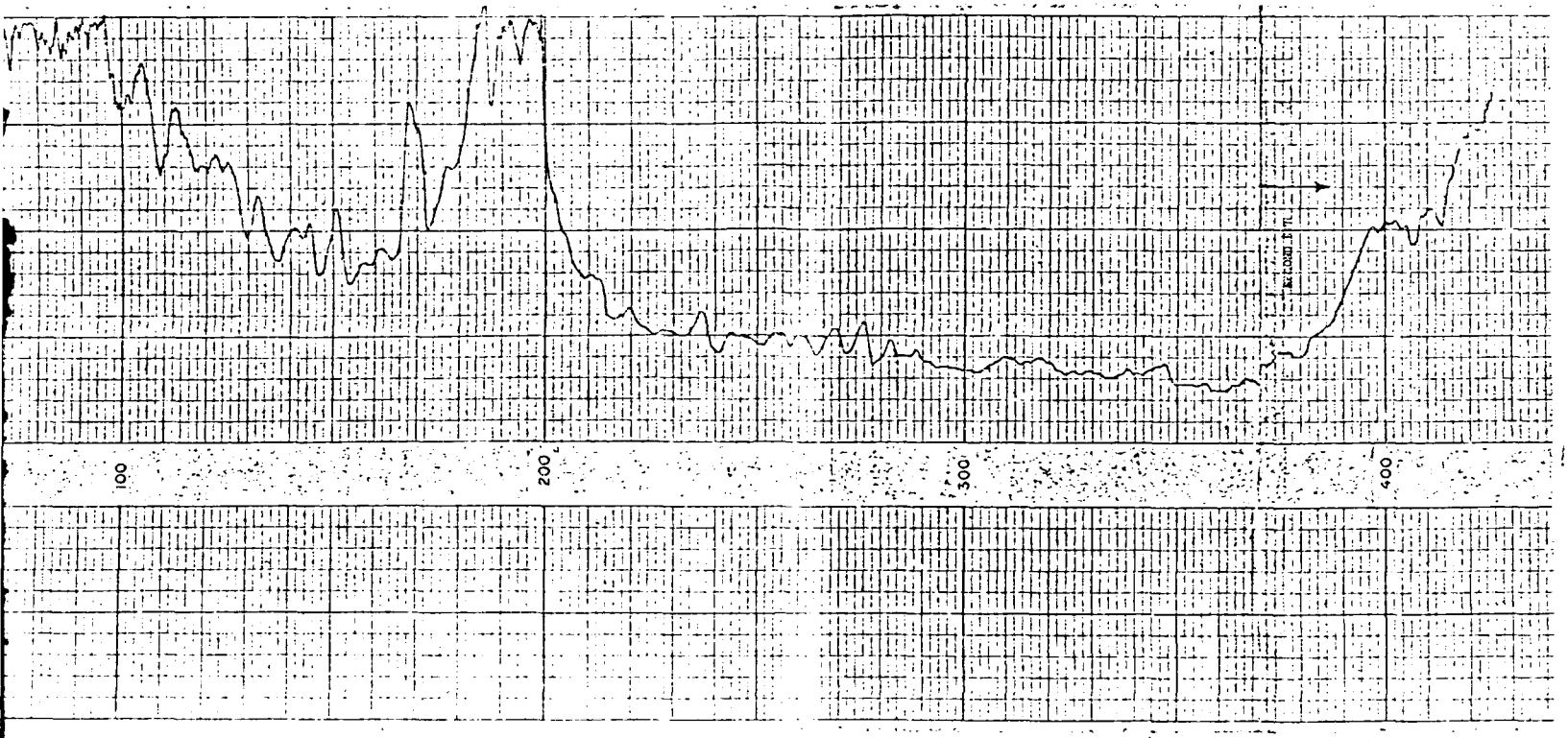
Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Tool Position

Visc. / Fluid Loss / pH / Source of Sample / Rm @ Meas. Temp. / Rmf @ Meas. Temp. / Rmc @ Meas. Temp. / Source Rmf / Rmc / Rm @ BHT


100
200
300
400

welenco

WELL ENGINEERING SERVICES

Gamma-Ray Caliper

COMPANY [illegible]

WELL 3-5

FIELD LUKE AIR FORCE BASE

STATE ARIZONA COUNTY MARICOPA

LOCATION LUKE A.F.B.

OTHER SERVICES: ELECTRIC LOG, 6" LATERAL

DATE	10-31-76	11-2-76
RUN NO.	ONE	TWO
TYPE LOG	GAMMA-CALIPER	GAMMA-CALIPER
DRILLER'S DEPTH	320'	430'
LOGGER'S DEPTH	322'	433'
BOTTOM LOGGED INTERVAL	318'	432'
TOP LOGGED INTERVAL	0'	370'
TYPE FLUID IN HOLE	WATER	WATER
MAX. REC. TEMP., DEG. F		
RECORDED BY	CORNELL	CORNELL
WITNESSED BY	MR. JARVIS	MR. GONZALEZ

BORE-HOLE RECORD				CASING RECORD			
RUN NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	6 7/8"	SURFACE	320'	10"		SURFACE	320'
2	6"	320'	433'	6 5/8"		SURFACE	370'

EQUIPMENT DATA

Gamma Ray: Run No. / Unit No. / Tool Model No. / Detector Model No. / Type / Length / Diameter / Source of N Source

General: Hard Depth No. / Instrument Truck No. / Tool Serial No.

Caliper: Run No. / Log Type / Tool Model No. / Detector Model No. / Type / Length / Diameter / Source of N Source

General: Hard Depth No. / Instrument Truck No. / Tool Serial No.

LOGGING DATA

Gamma Ray: General Depths Run No. / From / To; Speed Ft/Min; T.C. Sec; Scale Settings; Location Area; Dist. Log R; API N Units per Log Div.

Caliper: General Depths Run No. / From / To; Speed Ft/Min; T.C. Sec; Scale Settings; Location Area; Dist. Log R; API N Units per Log Div.

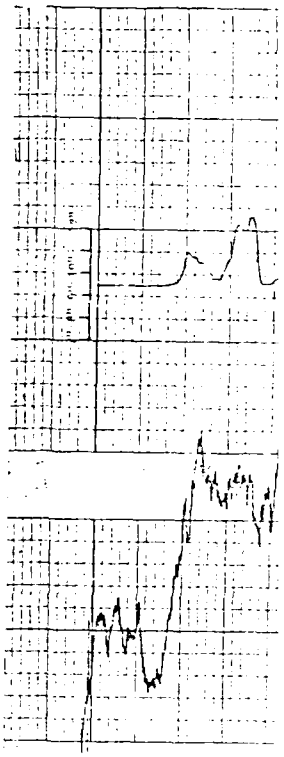
Remarks

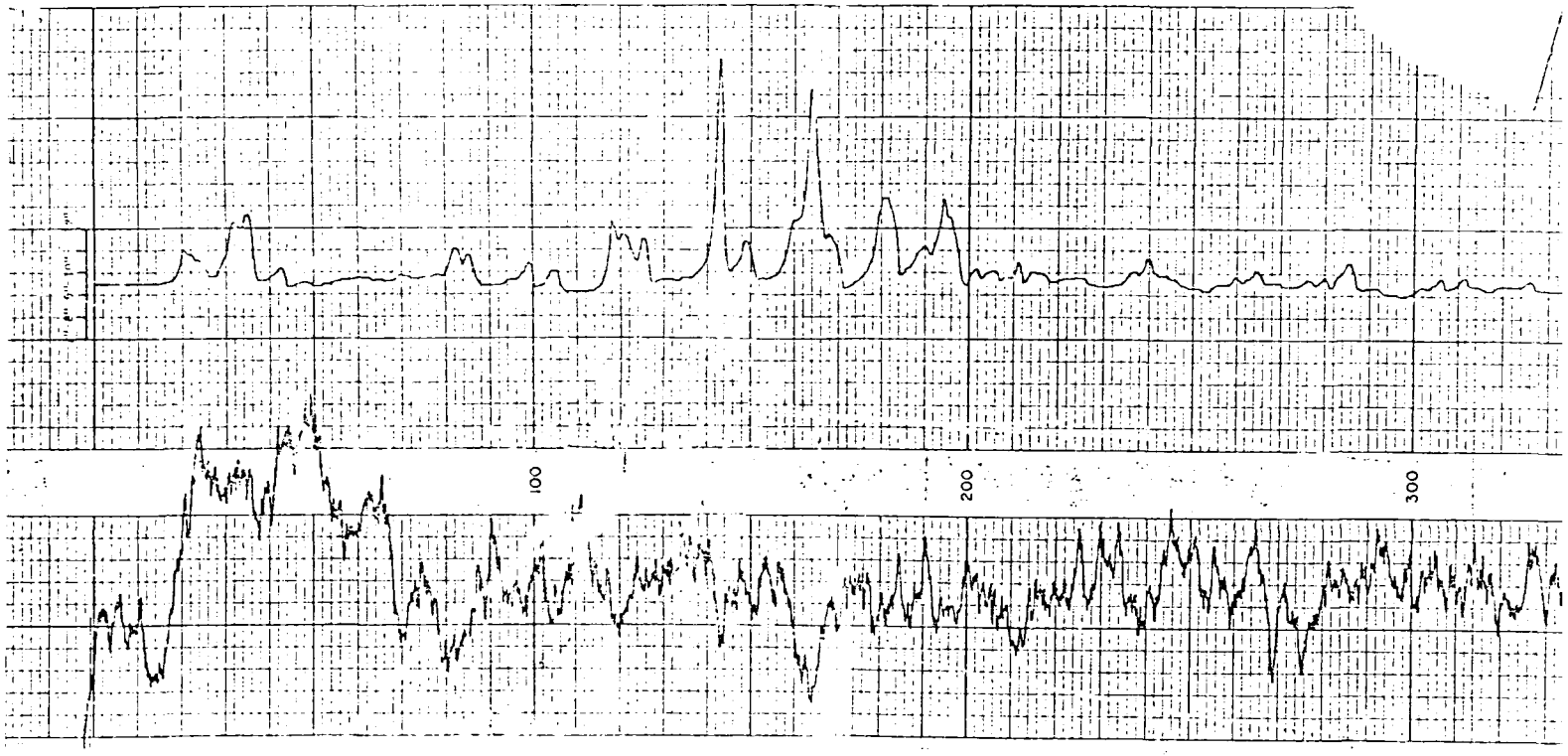
Field No.

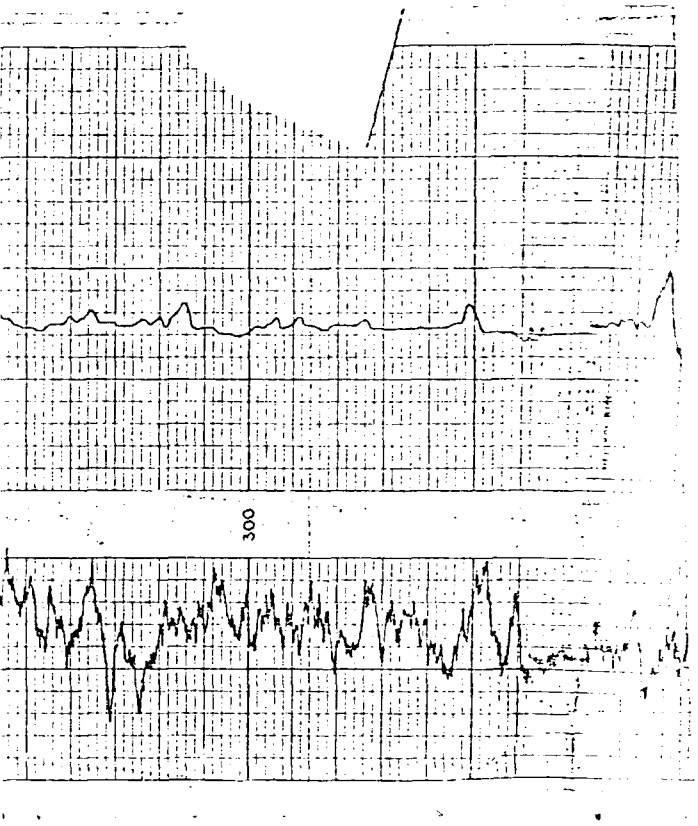
CALIPER

DEPTHS

GAMMA RAY




100
200
300


300

6' LATERAL

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO

COMPANY: REYLIK DRILLING

WELL: 106

FIELD: LUKE AIR FORCE BASE

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LUKE A.F.B.

SEC ____ TWP ____ RGE ____

Other Services: GAMMA RAY, CALIPER, ELECTRIC LOG

Permanent Datum: G.L. Elev. ____ Elev.: K.B. ____
Log Measured From: G.L. 0' Ft. Above Perm. Datum D.F. ____
Drilling Measured From: G.L. G.L. ____

Date	11-4-86	11-5-86		
Run No.	ONE	TWO		
Depth—Driller	375'	453'		
Depth—Logger	356'	451'		
Btm. Log Inter.	359'	450'		
Top Log Inter.	60'	381'		
Casing—Driller	20" @ 20'	6 5/8 @ 370.5'	@	@
Casing—Logger				
Bit Size				
Type Fluid in Hole	WATER/MUD	MUD		
Dens. / Visc.				
pH / Fluid Loss	/ ml	/ ml	/ ml	/ ml
Source of Sample	PIT	PIT		
R_m @ Meas. Temp.	25 @ 62 °F	1.8 @ 62 °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	25 @ 62 °F	1.8 @ 62 °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}	/	/	/	/
R_m @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.	5 HS	2 HS		
Max. Rec. Temp.	°F	°F	°F	°F
Equip. / Location	[illegible]	[illegible]	/	/
Recorded By	[illegible] CRAIG	[illegible] CRAIG		
Witnessed By	[illegible]	[illegible]		

This Heading and Log Conform To API RP 31

Fold Here

Basic Changes: Scale Up Hole / Scale Down Hole

Type Log / Depth

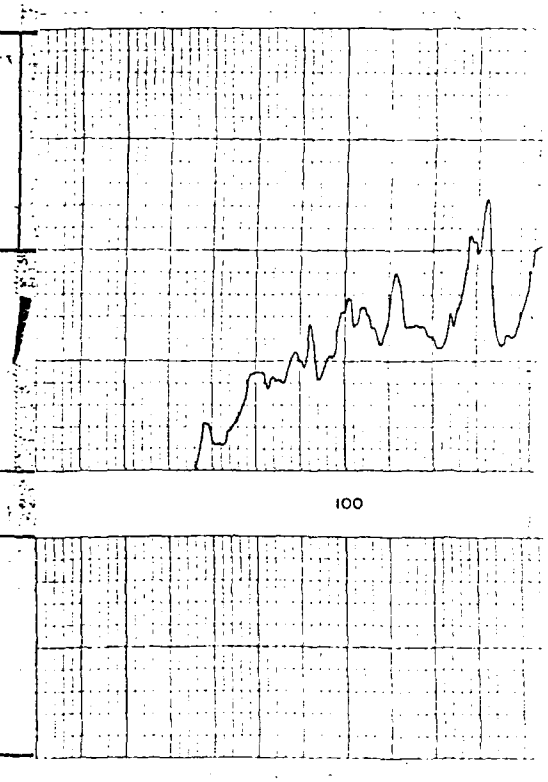
Equipment Data: Run No. / Tool Type / Tool Position

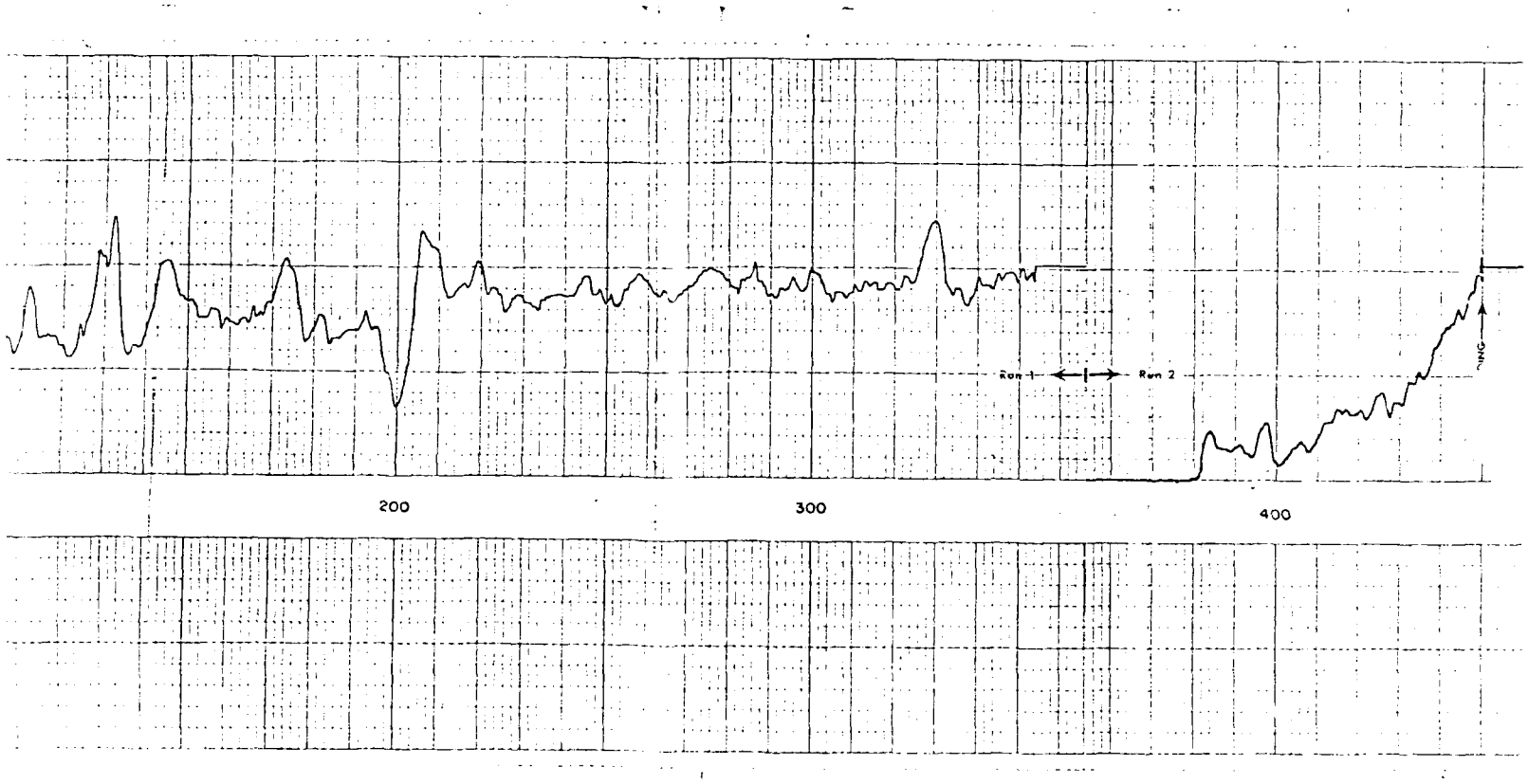
Other

Changes in Mud Type or Additional Samples: Date / Sample No. / Depth—Driller / Type Fluid in Hole / Dens. / Visc. / pH / Fluid Loss / Source of Sample / R_m @ Meas. Temp. / R_{mf} @ Meas. Temp. / R_{mc} @ Meas. Temp. / Source: R_{mf} R_{mc} / R_m @ BHT / R_{mf} @ BHT / R_{mc} @ BHT

REMARKS: RUN 1: ABOUT 2 HOURS AFTER THE E-LOG, WELL WAS HOSED UP.

RESISTIVITY ohms, m'/m			
RESISTIVITY ohms, m'/m	6' LATERAL		
Depths			100
SPONTANEOUS POTENTIAL millivolts	+ / -		




Run 1
Run 2
200
300
400

welenco

WELL LOGGING SERVICES

ELECTRIC LOG

FILING NO

COMPANY: BEYLIK DRILLING

WELL: 106

FIELD: LUKE AIR FORCE BASE

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LUKE A.F.B.

SEC ____ TWP ____ RGE ____

OTHER SERVICES: GAMMA RAY, CALIPER, 6' LATERAL

Permanent Datum: G.L. Elev. ____
Log Measured From: G.L. 0' Ft. Above Perm. Datum
Drilling Measured From: G.L.

Elev.: K.B. ____ D.F. ____ G.L. ____

Date	11-3-86	11-5-86		
Run No.	ONE	TWO		
Depth—Driller	370'	453'		
Depth—Logger	351'	453'		
Btm. Log inter.	350'	452'		
Top Log Inter.	0'	375'		
Casing—Driller	13" @ 20'	6 5/8 @ 375.5'	@	@
Casing—Logger				
Bit Size				
Type Fluid in Hole	WATER	MUD		
Dens. / Visc.				
pH / Fluid Loss	ml	ml	ml	ml
Source of Sample	PIT	PIT		
Rm @ Meas. Temp.	.25 @ 62 °F	7.8 @ 80 °F	@ °F	@ °F
Rmf @ Meas. Temp.	.25 @ 62 °F	7.8 @ 80 °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: Rmf / Rmc	-	-		
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.	[illegible] HRS.	2 [illegible] HRS.		
Max. Rec. Temp.	°F	°F	°F	°F
Equip. / Location	CU / TEMPE	CU / TEMPE		
Recorded By	D. L. CRAIG	D. L. CRAIG		
Witnessed By	MR. JARATT/MR. BOATENG			

Fold Here

This Heading and Logo Conform To API RP 31 G

REMARKS

Changes in Mud Type or Additional Samples

Date	Sample No.	Depth—Driller	Type Fluid in Hole	Dens.	Visc.	pH	Fluid Loss	ml

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	ELECTRIC LOG		FULL	
TWO	ELECTRIC LOG		FULL	

Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source: Rmf / Rmc	Rm @ BHT	Rmf @ BHT	Rmc @ BHT
	@ °F	@ °F	@ °F	-	@ °F	@ °F	@ °F

RUN 1: WATER WAS DUMPED INTO THE WELL AFTER THE HOLE WAS DRILLED WITH FOAM. THIS OF WATER WAS 250 PPM.

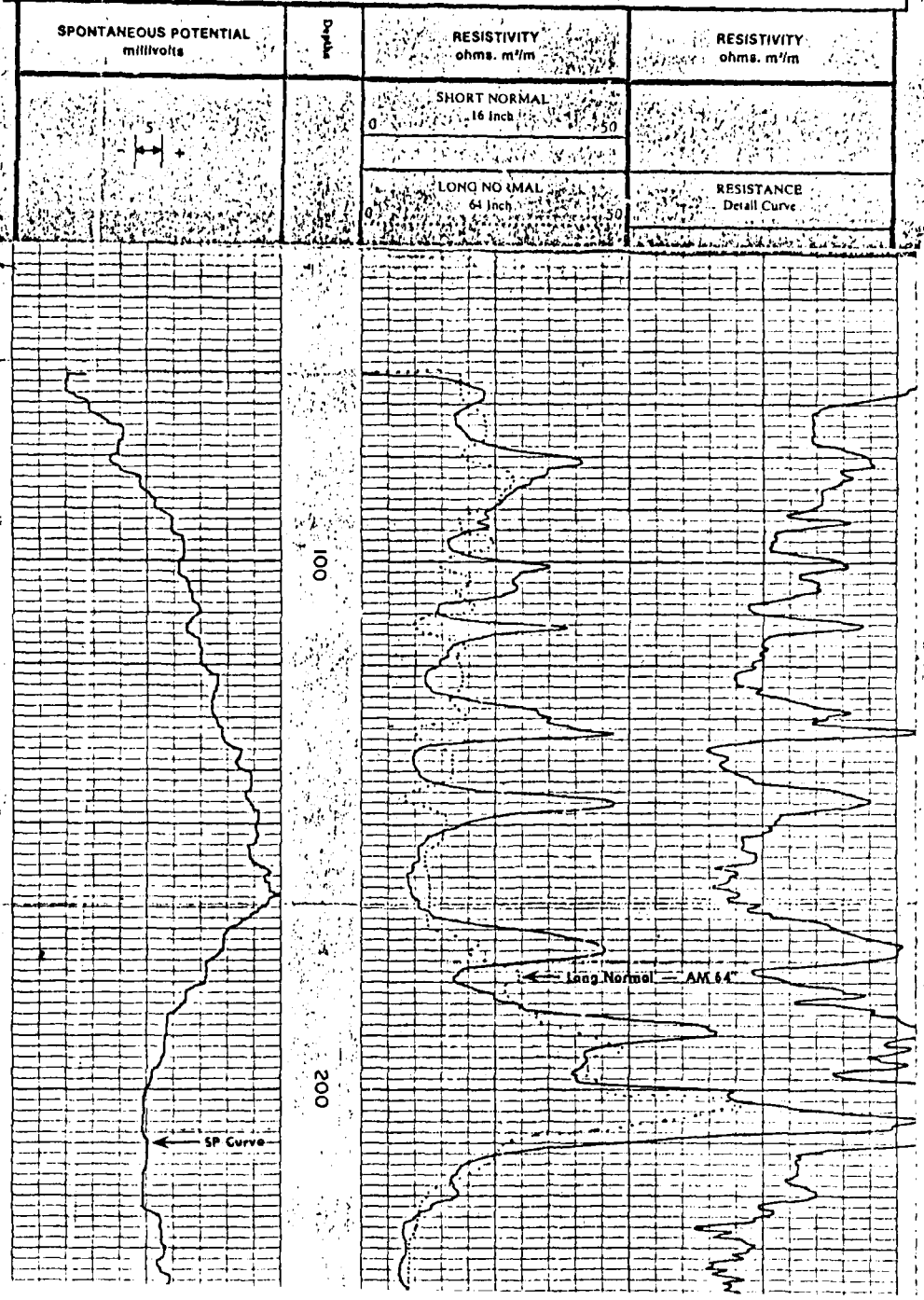
RUN 2: DRILLER'S FLUID THIS 600 PPM.

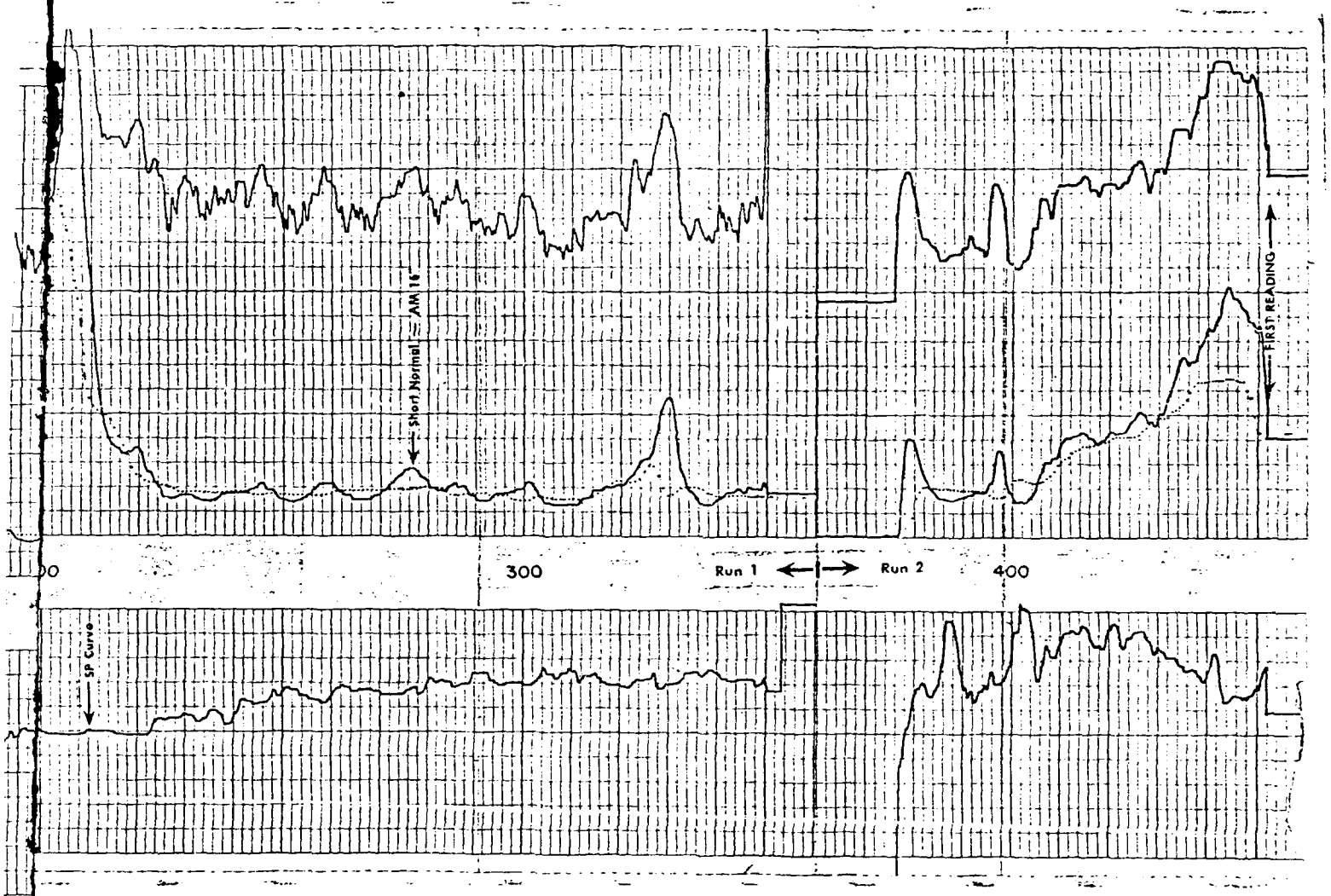
SHORT NORMAL

Source: R_{mf} | R_{mc}									
R_m @ BHT	@ °F	@ °F							
R_{mf} @ BHT	@ °F	@ °F							
R_{mc} @ BHT	@ °F	@ °F							

RUN 1: WATER WAS DUMPED INTO THE WELL AFTER THE HOLE WAS DRILLED WITH FOAM. TDS OF WATER WAS 250 PPM.

RUN 2: DRILLING FLUID TDS 600 PPM.




Short Normal — AM 16
FIRST READING
300
Run 1
Run 2
400
SP Curve

welence

WELLS ENGINEERING SURVEYS

Gamma-Ray Caliper

COMPANY [illegible]

WELL [illegible]

FIELD [illegible]

STATE [illegible] COUNTY [illegible]

LOCATION LAKE [illegible]

OTHER SERVICES [illegible]

SEC. [illegible] TWP. [illegible] RGE. [illegible]

PERMANENT DATUM [illegible] ELEV. [illegible]

LOG MEASURED FROM [illegible] FT. ABOVE PERM. DATUM

DRILLING MEASURED FROM [illegible]

ELEV.: K.B. [illegible]

D.F. [illegible]

G.L. [illegible]

DATE	11-4-80	11-5-80	
RUN NO.	ONE	TWO	
TYPE LOG	GAMMA-CALIPER	GAMMA-CALIPER	
DEPTH-DRILLER	[illegible]	[illegible]	
DEPTH-LOGGER	[illegible]	[illegible]	
BOTTOM LOGGED INTERVAL	[illegible]	[illegible]	
TOP LOGGED INTERVAL	[illegible]	[illegible]	
TYPE FLUID IN HOLE	WATER	MUD	
MAX. REC. TEMP., DEG. F			
RECORDED BY	[illegible]	[illegible]	
WITNESSED BY	[illegible]	[illegible]	

RUN NO.	BIT	BORE-HOLE RECORD FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
1	[illegible]	SURFACE	[illegible]	[illegible]		SURFACE	[illegible]
2	[illegible]	[illegible]	[illegible]				

EQUIPMENT DATA

Gamma Ray: Run No. [illegible]; Tool Model No. [illegible]; Diameter [illegible]; Detector Model No. [illegible]; Type [illegible]; Length [illegible]; Distance to M. Source [illegible]

Neutron: Run No. [illegible]; Tool Type [illegible]; Tool Model No. [illegible]; Diameter [illegible]; Detector Model No. [illegible]; Type [illegible]; Length [illegible]; Source Model No. [illegible]; Source No. [illegible]; Spacing [illegible]; Type [illegible]; Strength [illegible]

(General): Hoist Truck No. [illegible]; Instrument Truck No. [illegible]; Tool Serial No. [illegible]

LOGGING DATA

General: Run No. [illegible]; Depths From [illegible] To [illegible]; Speed Ft/Min [illegible]; T.C. Sec. [illegible]; Gain Settings [illegible]

Gamma Ray: Type Det. Low B [illegible]; A.P.I. Units per Log Div. [illegible]

Neutron: T.C. Sec. [illegible]; Gain Settings [illegible]; Area Det. Low B [illegible]; A.P.I. Units per Log Div. [illegible]

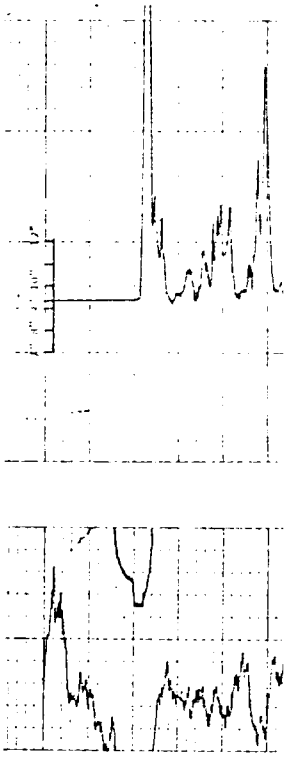
Reference Interpretation

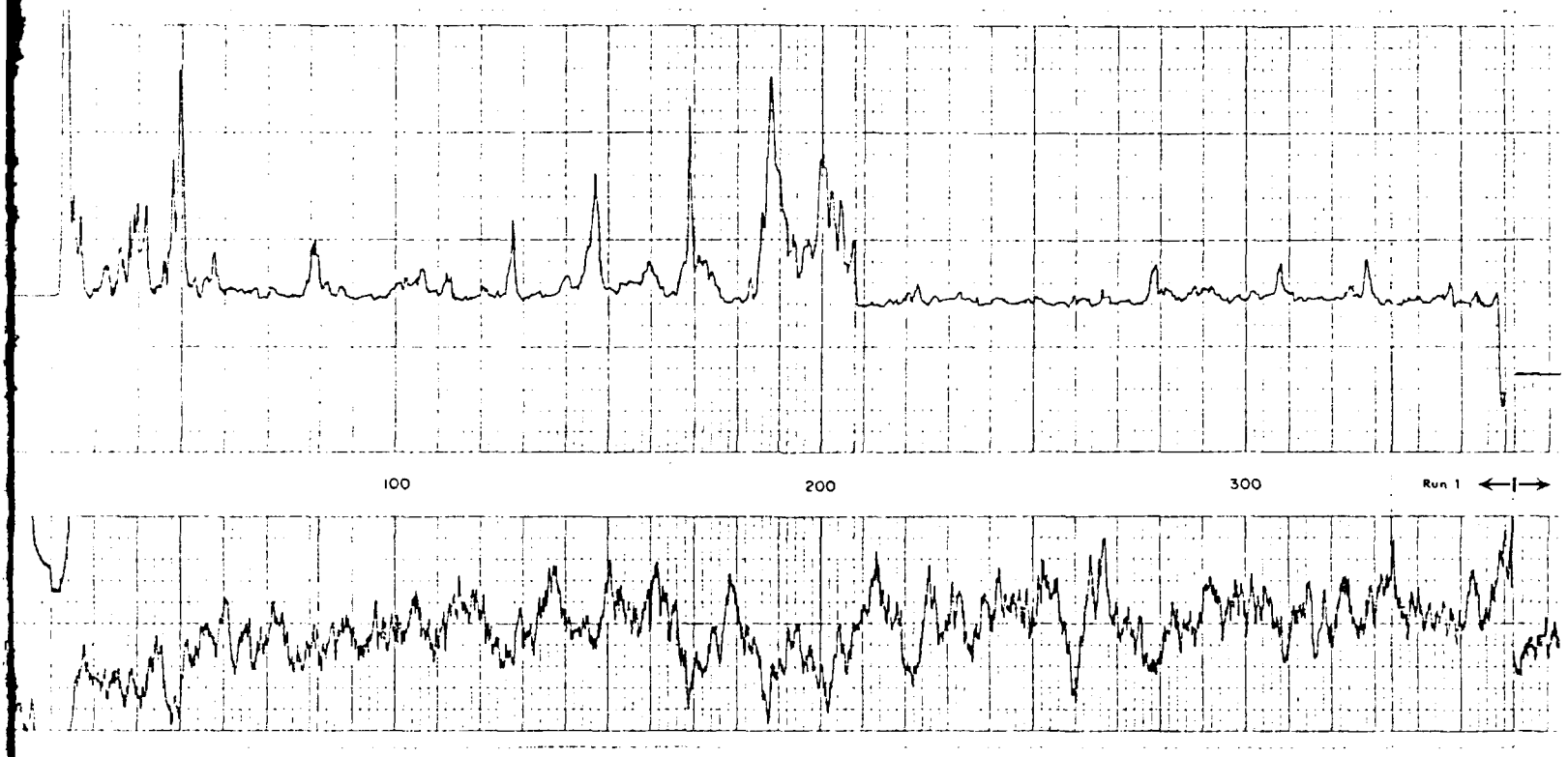
Remarks

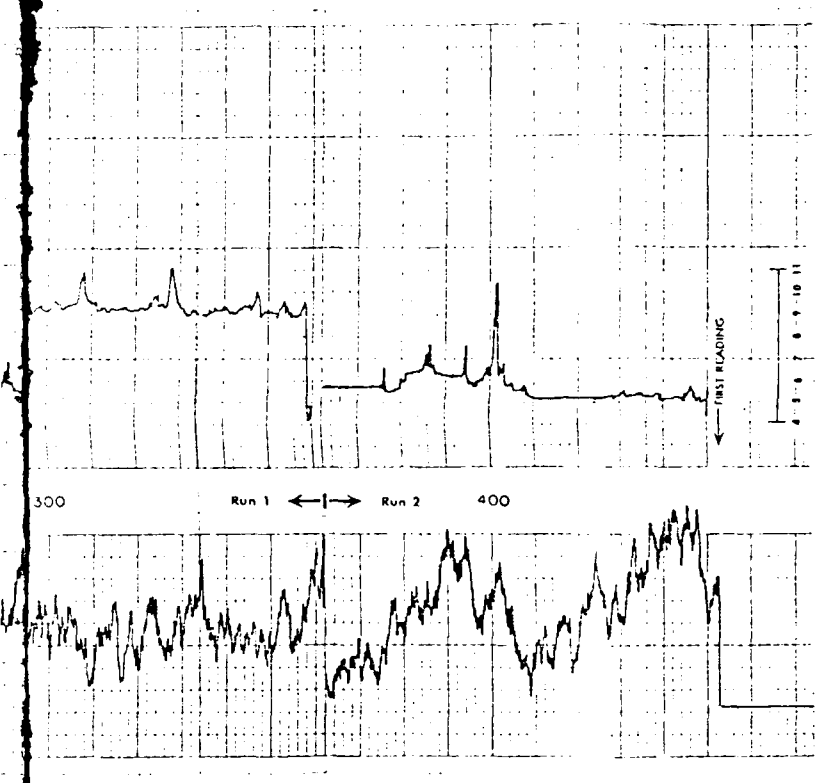
Full Page

CALIPER | DEPTHS | GAMMA RAY

API GAMMA RAY UNITS




100
200
300
Run 1


FIRST READING
300
Run 1
Run 2
400

welenco

WELL ENGINEERING SURVEYS

Gamma-Ray Caliper

COMPANY: [illegible] DRILLING COMPANY

WELL: 6207

FIELD: LUKE AIR FORCE BASE

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: LUKE A.F.B.

OTHER SERVICES:

PERMANENT DATUM: G.L. ELEV.:

LOG MEASURED FROM: G.L. FT. ABOVE PERM. DATUM

DRILLING MEASURED FROM: G.L.

ELEV.: K.B.: D.F.: G.L.:

DATE	11-24-86	11-26-86
RUN NO.	ONE	TWO
TYPE LOG	G/R-CALIPER	G/R-CALIPER
DEPTH-DRILLER	341'	420'
DEPTH-LOGGER	341'	415' 414'
DEPTH OF LOGGING INTERVAL	340'	414' 412'
TOP LOGGED INTERVAL	0'	330' 330'
TYPE FLUID IN HOLE	BENTONITE	BENTONITE
DENS. VISC. PH. FLUID LOSS		
RECORDED BY	JACOVITCH	JACOVITCH
WITNESSED BY	MR. K. SAMUELSON	

RUN

NO.	BIT	BORE-HOLE RECORD FROM	TO	SIZE	WGT.	CASING RECORD FROM	TO
1	7 7/8	20'	341'	7 7/8		SURFACE	20'
2	5"	341'	420'	4"		SURFACE	342'

EQUIPMENT DATA

Gamma Ray

	ONE	TWO
Run No.		
Tool Model No.	GRN/XLS/372	GRN/XLS/372
Diameter	1 11/16"	1 11/16"
Detector Model No.		
Diameter		
Detector Model No.		
Type	C.K.	C.K.
Length	18"	18"
Distance to N. Source		

Neutron

Run No.	
Log Type	
Tool Model No.	
Diameter	
Detector Model No.	
Type	
Length	
Source Model No.	
Serial No.	
Spacing	
Type	
Strength	

General

Hoist Truck No.
Instrument Truck No.
Tool Serial No.

LOGGING DATA

General

Run No.	Depths From	To	Speed Ft./Min	T.C. Ser	Scale Settings
1	340'	0'	20	2	100/200
2	414'	330'	20	2	100/200

Gamma Ray

Zero Div.	After R. Tests per Log Div.
71	71
71	70

Neutron

T.C. Ser	Scale Settings	Zero Div.	After R. Tests per Log Div.

Reference Literature:

Remarks:

Foot Divs.

CALIBER

DEPTHS

INCHES

GAMMA RAY

API UNITS

DOT

Run 1
0
100
200
300

Run 2
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
10.5
11.0
11.5
12.0
12.5
13.0
13.5
14.0
14.5
15.0
15.5
16.0
16.5
17.0
17.5
18.0
18.5
19.0
19.5
20.0
20.5

108

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO

COMPANY: BEYLIK DRILLING

WELL: NO. 108

FIELD: LUKE AFB

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: SEC. ____ TWP ____ RGE ____

OTHER SERVICES: GAMMA, CALIPER

Permanent Datum: G.L. Elev. ____
Log Measured From: G.L. ____ Ft. Above Perm. Datum
Drilling Measured From: G.L.

Elev.: K.B. ____ D.F. ____ G.L. ____

Date	12/5/86			
Run No.	TWO			
Depth—Driller	420'			
Depth—Logger	420'			
Btm. Log Inter.	419'			
Top Log Inter.	347'			
Casing—Driller	6 5/8" @ 343'	@	@	@
Casing—Logger	-			
Bit Size	6"			
Type Fluid in Hole	WATER			
Dens. | Visc.	N/A	|	|	|
pH | Fluid Loss	N/A | ml	| ml	| ml	| ml
Source of Sample	PIT			
R_m @ Meas. Temp.	4.25 @ 70°F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: R_{mf} R_{mc}	|	|	|	|
R_m @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.	1 HR.			
Max. Rec. Temp.	N/A °F	°F	°F	°F
Equip. | Location	1 | TEMPE	|	|	|
Recorded By	COGDELL			
Witnessed By	MR. [illegible]			

Fold Here

This Heading and Log Conform To API RP 31

NOTE: UNABLE TO RUN INDUCTION DUE TO EXCESSIVE ELECTRICAL NOISE FROM POWER LINES. (RUN 1)

REMARKS

Changes in Mud Type or Additional Samples

Date	Sample No.	Depth—Driller	Type Fluid in Hole	Dens. | Visc.	pH | Fluid Loss	Source of Sample	R_m @ Meas. Temp.	R_{mf} @ Meas. Temp.	R_{mc} @ Meas. Temp.	Source: R_{mf} | R_{mc}	R_m @ BHT	R_{mf} @ BHT	R_{mc} @ BHT
							°F	°F	°F		°F	°F	°F
							@	@	@		@	@	@

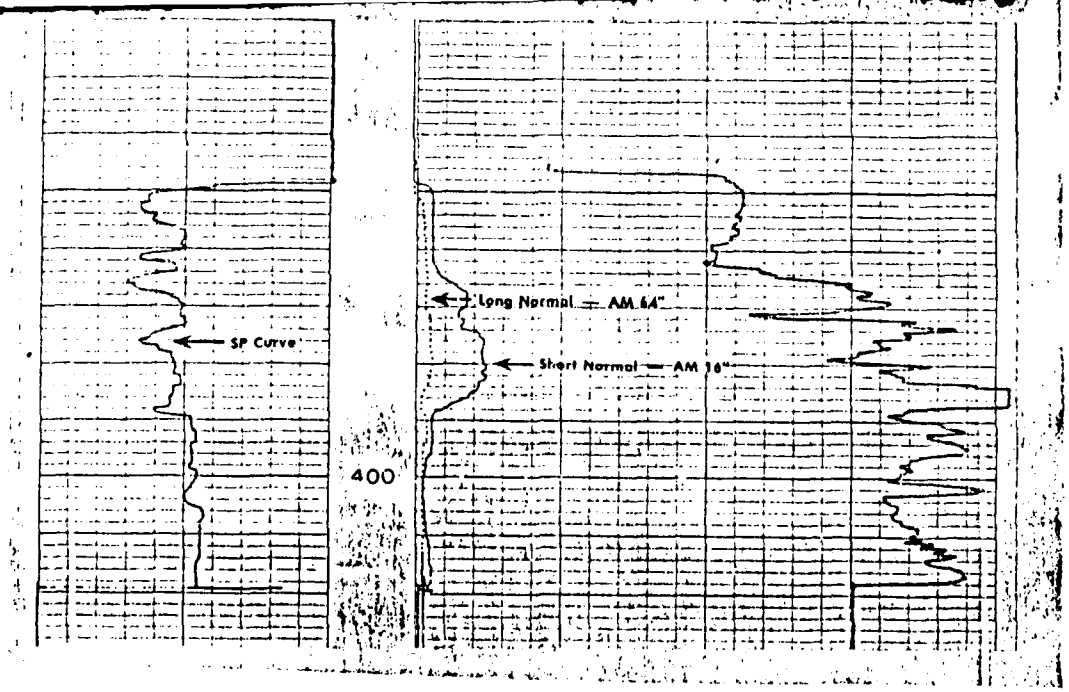
Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Other
TWO	16-1/4 L-LOG		THREE	

SPONTANEOUS POTENTIAL millivolts	Depths	RESISTIVITY ohms. m²/m	RESISTIVITY ohms. m²/m	RESISTIVITY ohms. m²/m
5 + -			SHORT NORMAL 16 inch 0 10	RESISTANCE Detail Curve
			LONG NORMAL 64 inch 0 100	


SP Curve
Long Normal — AM 64"
Short Normal — AM 16"
400

welenco

WELL ENGINEERING SURVEYS

Gamma-Ray Caliper

COMPANY: REVLON PRODUCTS
WELL: NO. 108
FIELD: LUKE AFB
STATE: ARIZONA COUNTY: MARICOPA

LOCATION: SEC. ____ TWP. ____ RGE. ____

OTHER SERVICES: 16-64 E-LOG

PERMANENT DATUM: G.L. ELEV. ____
LOG MEASURED FROM: G.L. FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM: G.L.

ELEV.: K.B. ____ D.F. ____ G.L. ____

DATE	12/4/86		12/5/86	
RUN NO.	ONE		TWO	
TYPE LOG	GAMMA	CALIPER	GAMMA	CALIPER
DEPTH-DRILLER	343'		420'	
DEPTH-LOGGER	360'	363'	418'	411'
BOTTOM LOGGED INTERVAL	359'	352'	417'	410'
TOP LOGGED INTERVAL	0'	0'	340'	340'
TYPE FLUID IN HOLE	WATER		WATER	
SALT. DEN. VISC. PH. F.	N/A		N/A	
RECORDED BY	CORNELL		CORNELL	
WITNESSED BY	MR. K. SAMELSON		S. JARLETT	

RUN	BORE-HOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	6 7/8"	20'	343'	10"		SURFACE	20'
2	6"	343'	420'	6 5/8"		SURFACE	343'

EQUIPMENT DATA

Gamma Ray

Run No.	1	TWO
Tool Model No.	GRS-7391-5A/A	GRS-7391-5A/A
Diameter	1 11/16"	1 11/16"
Detector Model No.		
Type	CM	CM
Length	18"	18"
Distance to N. Source		

Neutron

Run No.	
Log Type	
Tool Model No.	
Diameter	
Detector Model No.	
Type	
Length	
Source Model No.	
Serial No.	
Spacing	
Type	
Strength	

General

Hoist Truck No.	
Instrument Truck No.	
Tool Serial No.	

LOGGING DATA

General

Run No.	Depths From	Depths To	Speed Ft/Min	T.C. Sec	Scale Settings
1	343'	0'	20	3	1100/2000
2	420'	343'	20	3	1100/2000

Gamma Ray

	Zero Div. Line R	API GR Units per Log Div.
1	61	20
2	41	20

Neutron

	Zero Div. Line R	T.C. Sec	Scale Settings	API N Units per Log Div.

Release Literature:

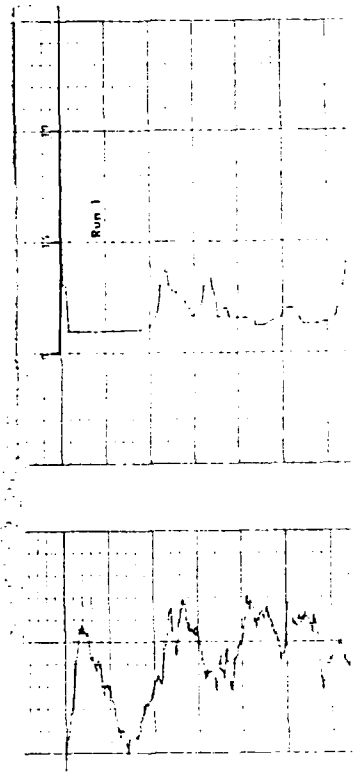
Remarks

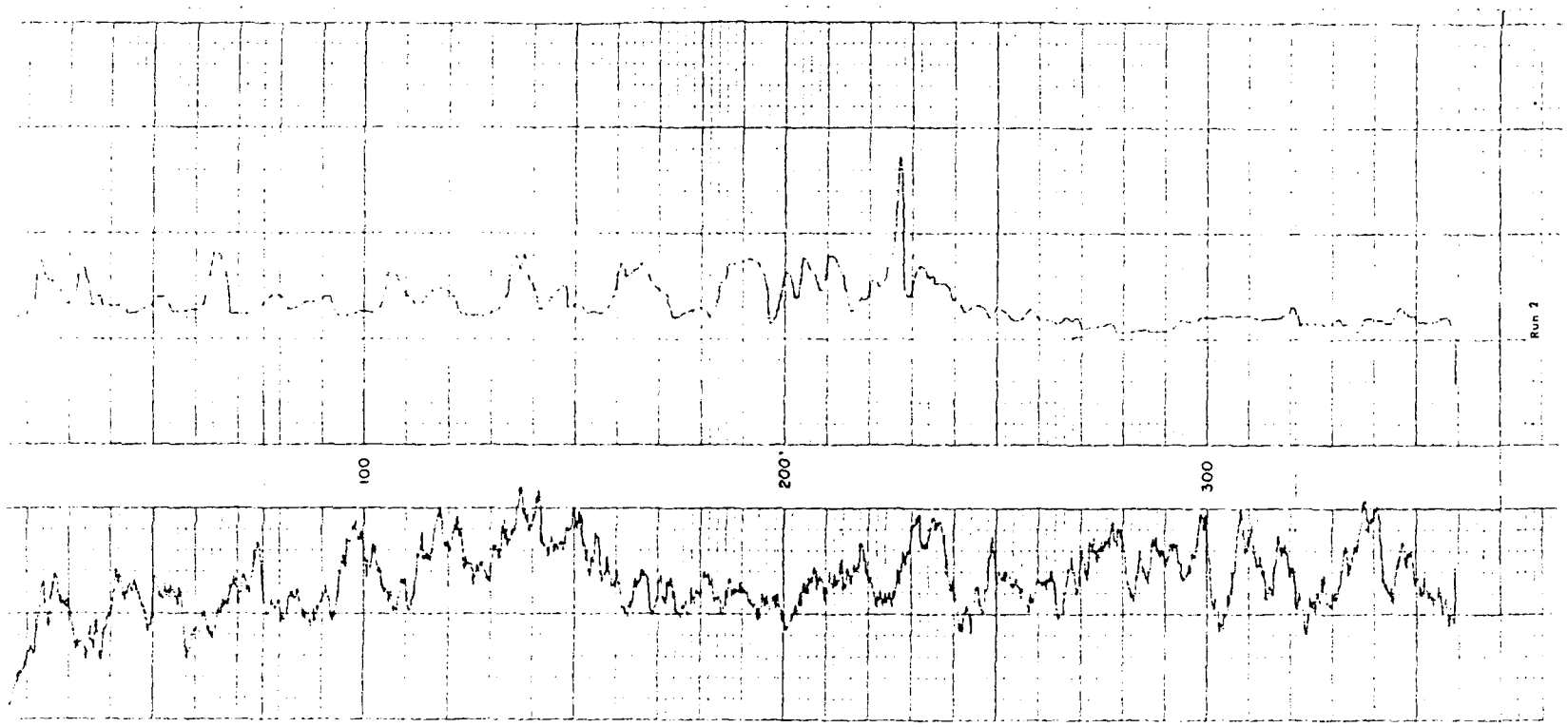
Fold Here

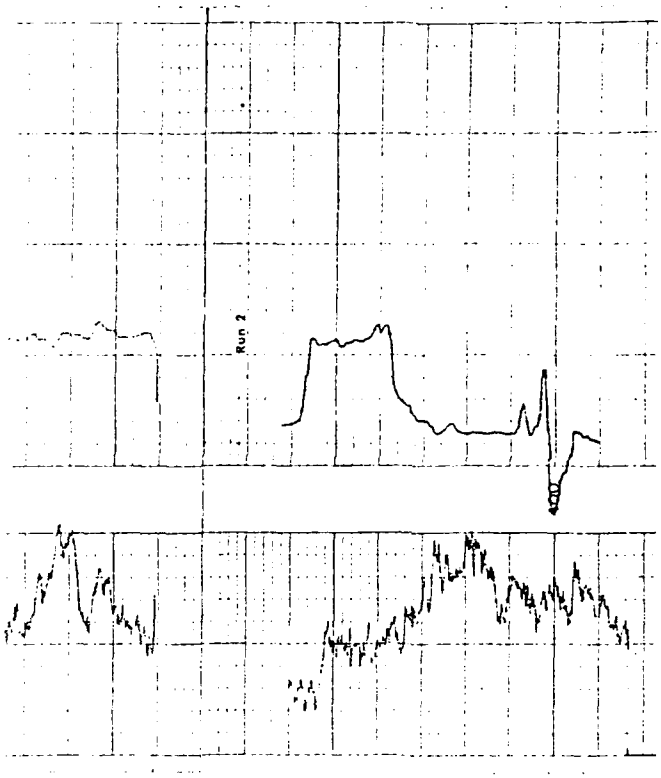
CALIPER IN INCHES

DEPTHS

GAMMA API UNITS 200




100
200'
300
Run 2


Run 2

welenco

WELL ENGINEERING SERVICES

Gamma-Ray Caliper

COMPANY: BENLIK DRILLING, INC.
WELL: S 109
FIELD: LUKE A.F.B.
STATE: ARIZONA COUNTY: MARICOPA

LOCATION: SEC. TWP. RGE.

OTHER SERVICES: 16-64 E-LOG; 6' LATERAL

PERMANENT DATUM: G.L. ELEV.
LOG MEASURED FROM: G.L. FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM: G.L.

ELEV.: K.B.
D.F.
G.L.

DATE	11-12-86	11-13-86
RUN NO.	ONE	TWO
TYPE LOG	GAMMA RAY CALIPER	GAMMA CALIPER
DEPTH-DRILLER	365'	470'
DEPTH-LOGGER	371' 371'	466' 466'
BOTTOM LOGGED INTERVAL	370' 365'	465' 465'
TOP LOGGED INTERVAL	0' 0'	375' 370'
TYPE FLUID IN HOLE	WATER	WATER
DENS. VISC. PH/FL. RM. F.	N/A	N/A
RECORDED BY	ROBERTI	ROBERTI
WITNESSED BY	DEBBIE JONES LT. STOVES	PHIL HUNTER

RUN NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
BORE-HOLE RECORD				CASING RECORD			
1	7 7/8	0'	365'	10 3/4	CONDUCTOR	0'	40'
2	6"	365'	470'	6 5/8		0'	470'

EQUIPMENT DATA

Gamma Ray: Serial No. / Tool Model No. / Diameter / Detector Model No. / Type / Length / Distance to Source

Neutron: Run No. / Log Type / Tool Model No. / Diameter / Detector Model No. / Type / Length / Source Model No.

General: Hoist Cable No. / Instrument Truck No. / Tool Scale No.

Gamma Ray: Run No. / Scale / Speed FPM / T.C. Sec. / Gain / Zero Div. Left / Scale Settings / Zero Div. Right

Neutron: Run No. / Scale / Speed FPM / T.C. Sec. / Gain / Zero Div. Left / Scale Settings / Zero Div. Right

Caliper: Run No. / Scale / Speed FPM / T.C. Sec. / Gain / Zero Div. Left / Scale Settings / Zero Div. Right

Gamma Ray: Run No. / Scale / Speed FPM / T.C. Sec. / Gain / Zero Div. Left / Scale Settings / Zero Div. Right

Neutron: Run No. / Scale / Speed FPM / T.C. Sec. / Gain / Zero Div. Left / Scale Settings / Zero Div. Right

Caliper: Run No. / Scale / Speed FPM / T.C. Sec. / Gain / Zero Div. Left / Scale Settings / Zero Div. Right

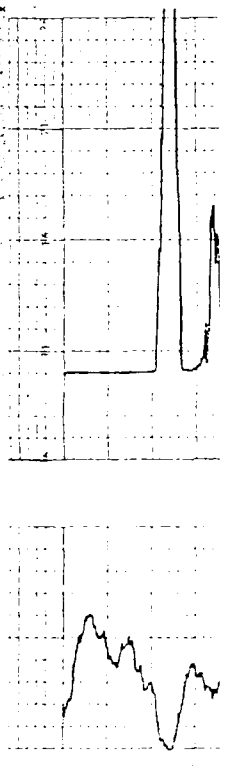
Reference Elevation

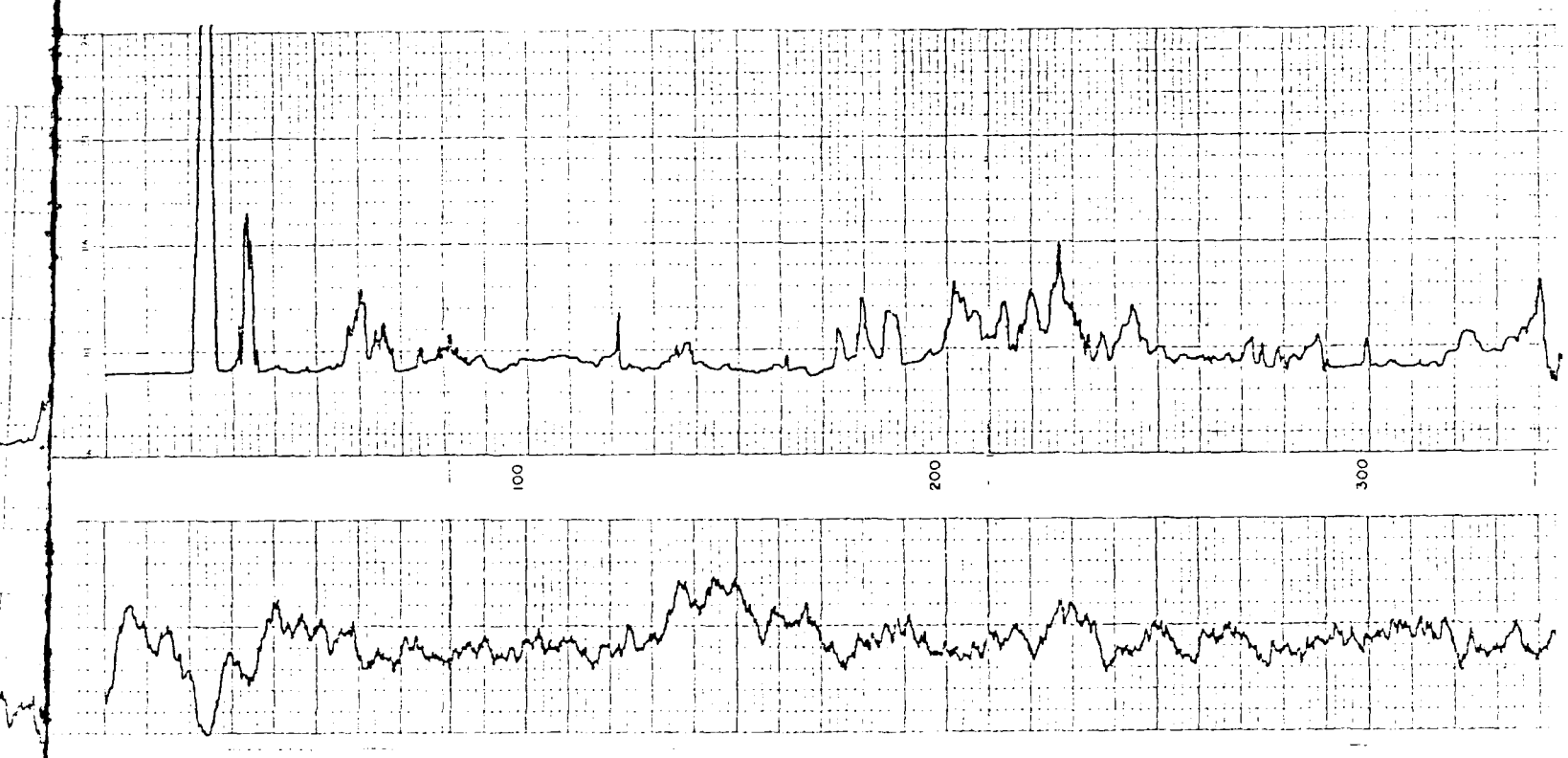
Witnessed By: GAMMA RAY BENLIK CALIBRATION 5.6.B. AS 5.6.B.

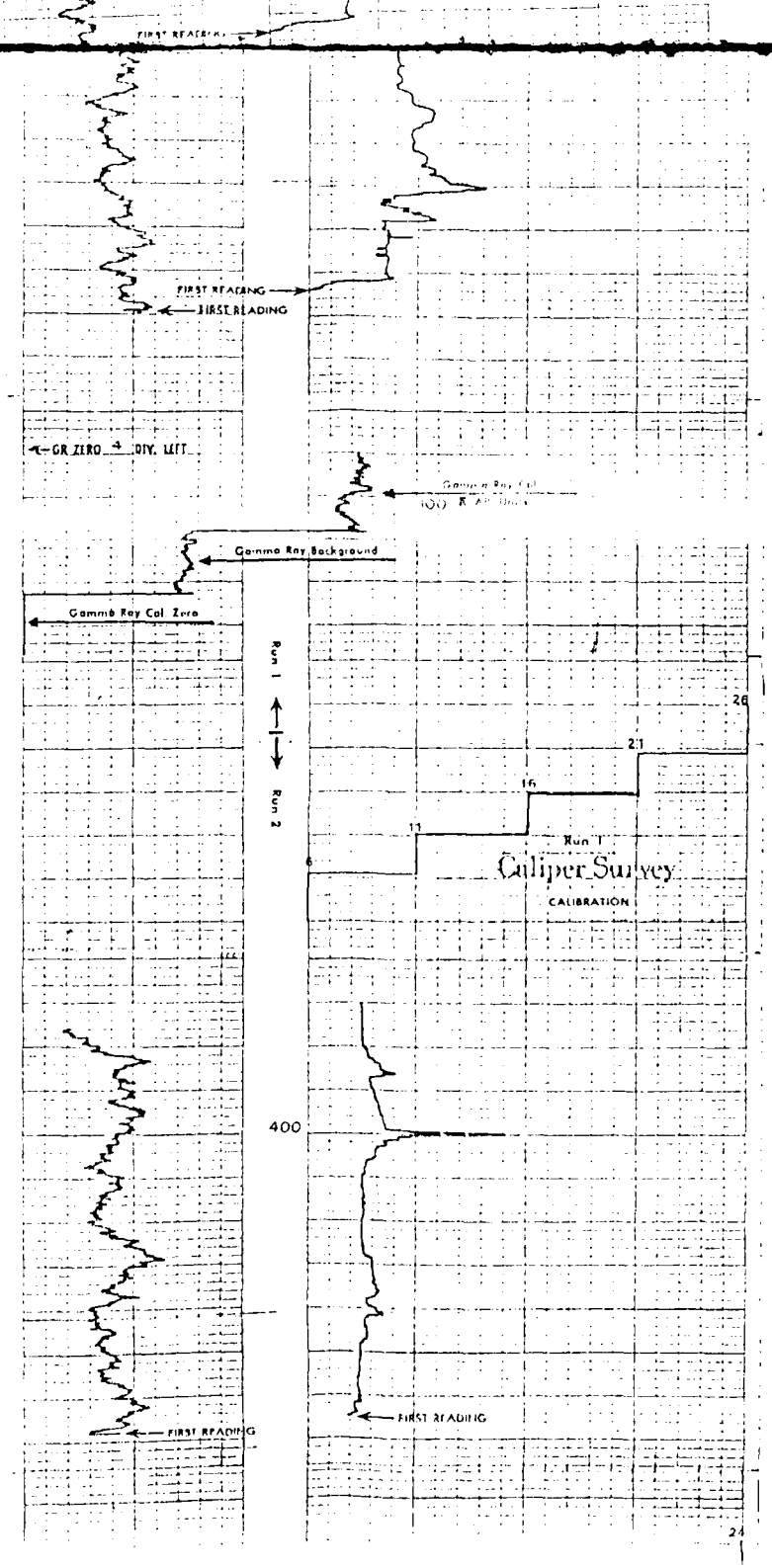
Recorded By

Field Recap

CALIPER	DEPTHS
HOLE DIAM. IN INCHES	




100
200
300


FIRST READING
FIRST READING
GR ZERO 4 DIV. LEFT
Gamma Ray Background
Gamma Ray Cal Zero
Run 1
Run 2
400
FIRST READING
FIRST READING
6
11
16
21
26
Run 1
Caliper Survey
CALIBRATION
24

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO

COMPANY: NEVELTE DRILLING, INC.

WELL: # 104

FIELD: LUKE A.F.B.

STATE: ARIZONA COUNTY: MARICOPA

LOCATION:

SEC ____ TWP ____ RGE ____

OTHER SERVICES: 6' LATERAL, GAMMA RAY, CALIPER

Permanent Datum: G.L. Elev. ____
Log Measured From: G.L. Ft. Above Perm. Datum
Drilling Measured From: G.L.

Elev.: K.B. ____ D.F. ____ G.L. ____

Date	11-17-86	11-[illegible]-86		
Run No.	ONE	Two		
Depth—Driller	385'	470'		
Depth—Logger	376'	470'		
Bottom Log Inter.	375'	468'		
Top Log Inter.	44'	282'		
Casing—Driller	10 3/4" @ 20'	6 5/8" @ 380'	●	●
Casing—Logger	--	--		
Bit Size	9 7/8"	6"		
Type Fluid in Hole	WATER	WATER		
Dens. | Visc.	N/A	N/A		
pH | Fluid Loss	N/A | ml	N/A | ml	| ml	| ml
Source of Sample	PIT	PIT		
R_m @ Meas. Temp.	[illegible] @ 76 °F	3.1 @ 78 °F	● °F	● °F
R_{mf} @ Meas. Temp.	[illegible] @ 79 °F	3.1 @ 78 °F	● °F	● °F
R_{mc} @ Meas. Temp.	N/A @ °F	N/A @ °F	● °F	● °F
Source R_{mf} R_{mc}	M |	M |	|	|
R_m @ BHT	N/A @ °F	N/A @ °F	● °F	● °F
Time Since Circ.	1 HOUR	1 1/2 HOUR		
Max. Rec. Temp.	N/A °F	N/A °F	°F	°F
Equip. | Location	CV-1 | PHX	CV-1 | PHX	|	|
Recorded By	RON BILL	[illegible]		
Witnessed By	[illegible]	[illegible]		

This Reading and Log Conform To API RP 31

Fold Here

REMARKS

Changes in Mud Type or Additional Samples

Date	Sample No.	Depth—Driller	Type Fluid in Hole	Dens.	Visc.	pH	Fluid Loss	Source of Sample	R_m @ Meas. Temp.	R_{mf} @ Meas. Temp.	R_{mc} @ Meas. Temp.	Source R_{mf} R_{mc}	R_m @ BHT	R_{mf} @ BHT	R_{mc} @ BHT
							ml		● °F	● °F	● °F	–	● °F	● °F	● °F

Basic Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Tool Position
● °F	[illegible]	[illegible]
● °F	[illegible]	[illegible]
● °F	[illegible]	[illegible]

Other

RESISTIVITY ohms. m²/m

RESISTIVITY ohms. m²/m

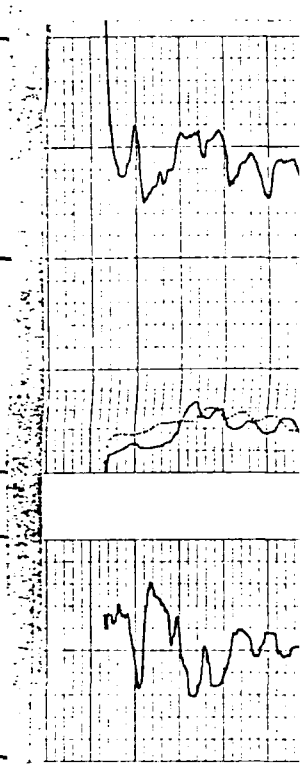
SHORT NORMAL 16 inch (0 – 100)

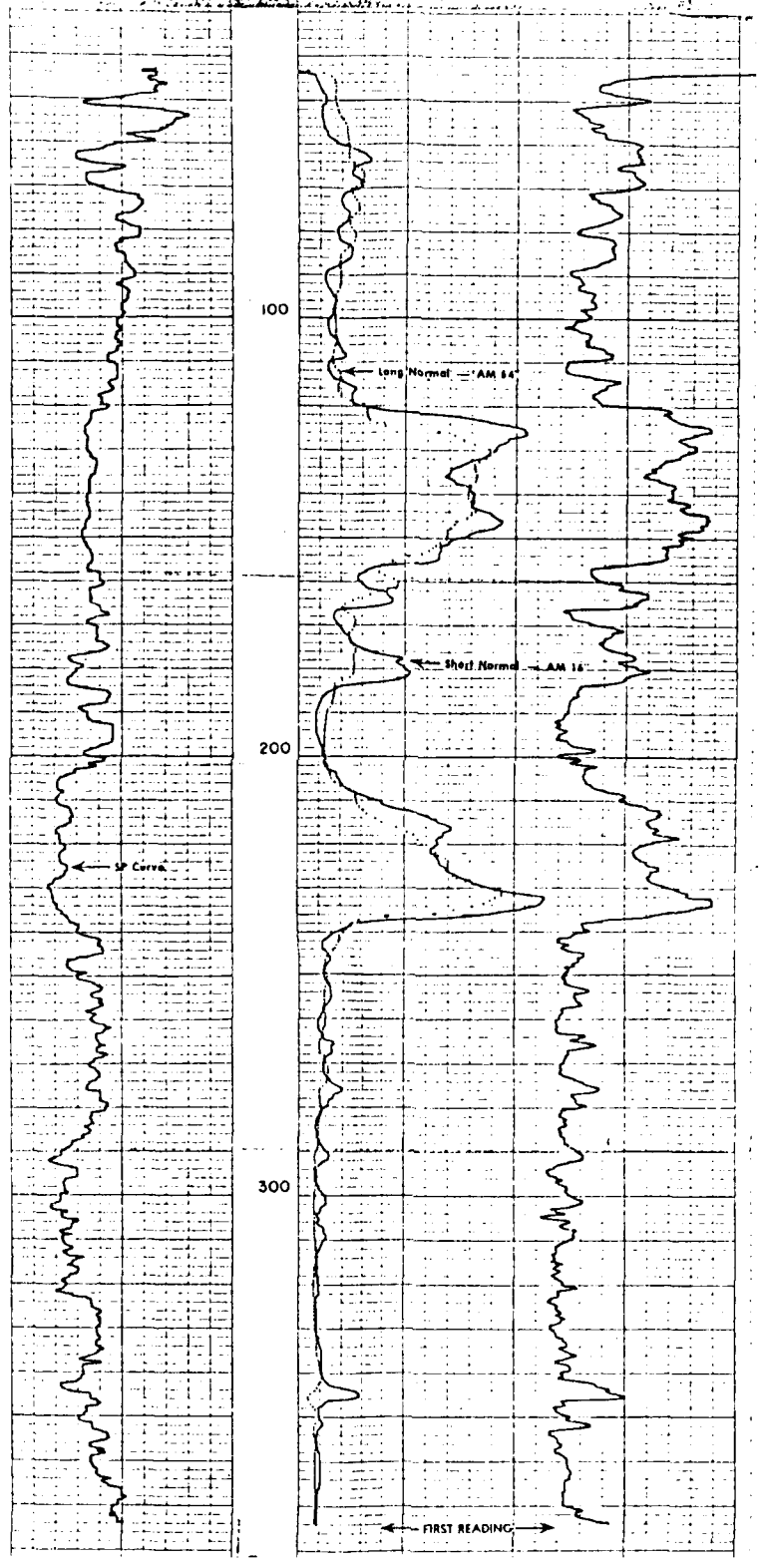
LONG NORMAL 64 inch (0 – 100)

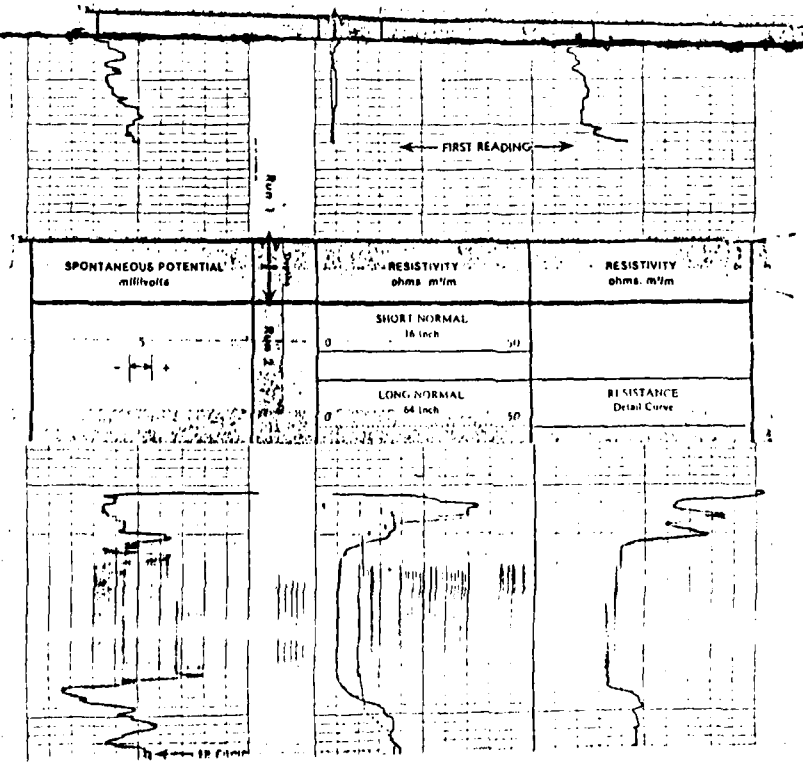
Depths

SPONTANEOUS POTENTIAL millivolts

RESISTANCE Detail Curve




100
200
300
Long Normal — AM 64
Short Normal — AM 16
SP Curve
FIRST READING


FIRST READING
Run 1
Run 2
SPONTANEOUS POTENTIAL
millivolts
RESISTIVITY
ohms m²/m
RESISTIVITY
ohms. m²/m
SHORT NORMAL
16 inch
0
50
LONG NORMAL
64 inch
0
50
RESISTANCE
Detail Curve

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

COMPANY

WELL

FIELD

STATE COUNTY

LOCATION

SEC TWP RGE

OTHER SERVICES

Permanent Datum Elev.

Log Measured From Ft. Above Perm. Datum

Drilling Measured From

Date				
Run No.				
Depth—Driller				
Depth—Logger				
Depth Log Inter.				
Top Log Inter.				
Casing—Driller	@	@	@	@
Casing—Logger				
Bit Size				
Type Fluid in Hole				
Dens. / Visc.				
pH / Fluid Loss	ml	ml	ml	ml
Source of Sample				
Rm @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F	@ °F
Source: Rmf / Rmc				
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.				
Max. Rec. Temp.	°F	°F	°F	°F
Equip. / Location				
Recorded By				
Witnessed By				

This Heading and Log Conform To API RP 31

REMARKS

Scale Changes

Type Log	Depth	Scale/In. Hole	Scale/Out Hole

Equipment Rec.

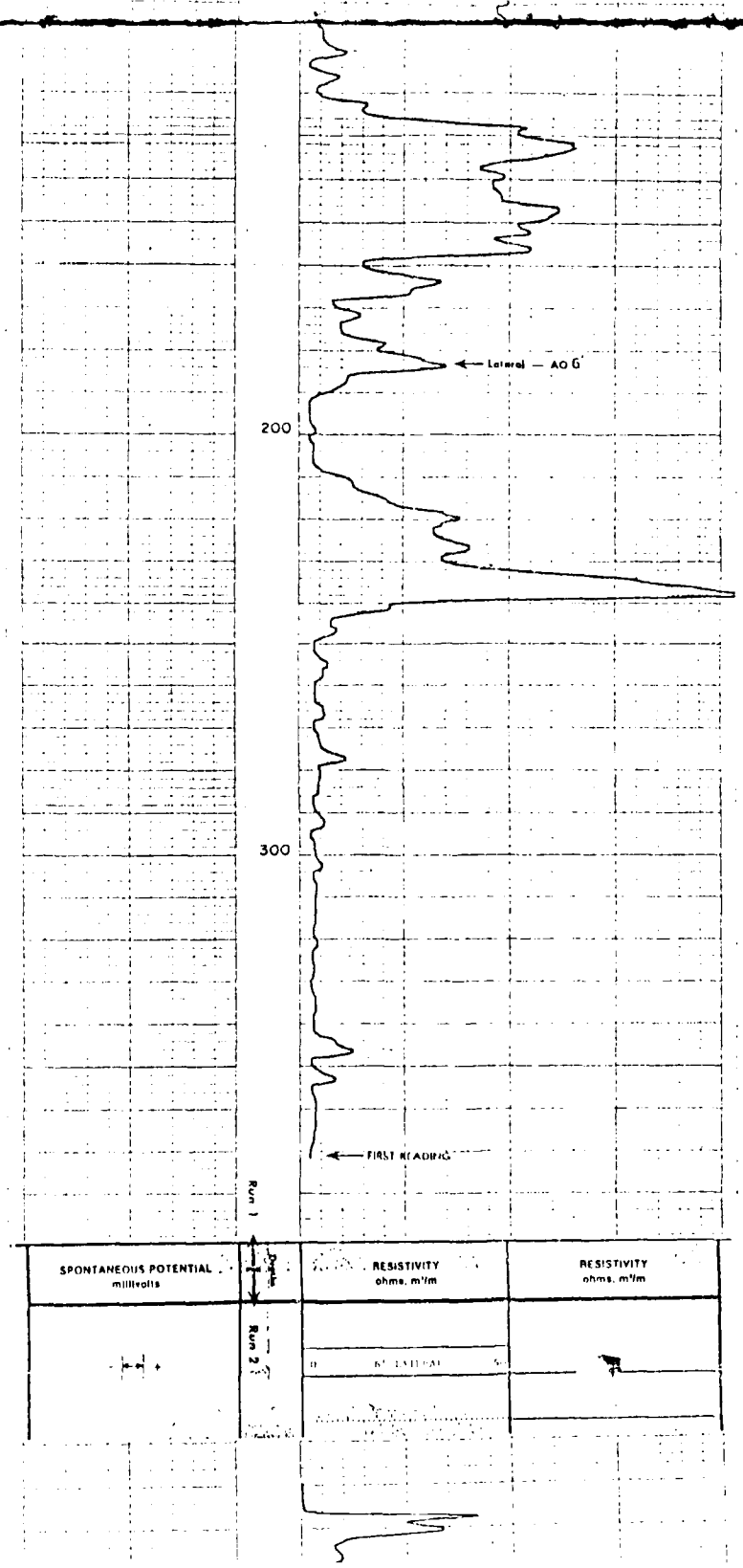
Equipment	Rec. No.	Pad Type	Pad Position

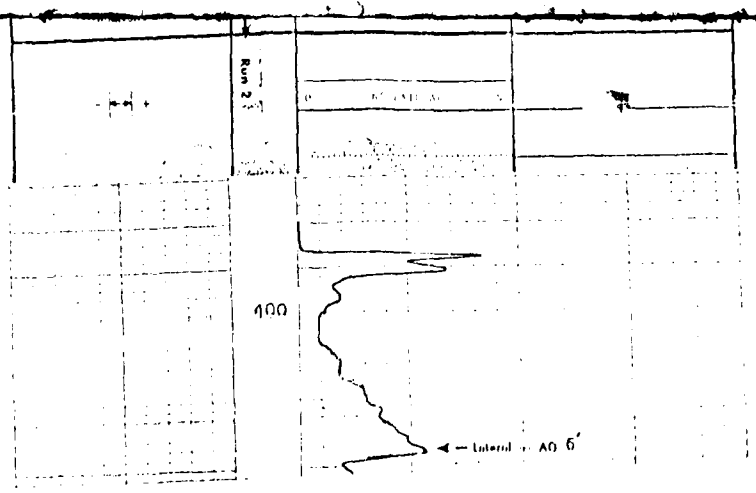
Charges to Had Type or Additional Samples

Date	Sample No.	Depth	Type Fluid in Hole	Date	Time	pH	Fluid Loss	Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source: Rmf / Rmc	Rm @ BHT	Rmf @ BHT	Rmc @ BHT
							ml		@ °F	@ °F	@ °F		@ °F	@ °F	@ °F

Field Office

SPONTANEOUS POTENTIAL millivolts	Temp. Diff.	RESISTIVITY ohms m²/m	RESISTIVITY ohms m²/m
+			
−			


Lateral — AO 6'
200
300
FIRST READING
Run 1
Depth
Run 2
SPONTANEOUS POTENTIAL
millivolts
RESISTIVITY
ohms, m²/m
RESISTIVITY
ohms, m²/m


Run 2
100
Interval = 40.6'

welenco

WELL ENGINEERING SURVEYS

Gamma-Ray Caliper

COMPANY: SKYLIN DRILLING, INC.
WELL: # 110
FIELD: LUKE A.F.B.
STATE: ARIZONA COUNTY: MARICOPA

LOCATION:
Sec. ___ Twp. ___ Rge. ___

OTHER SERVICES: 16-64 E-LOG, 6' LATERAL

PERMANENT DATUM: G.L. ELEV.
LOG MEASURED FROM: G.L. FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM: G.L.
ELEV.: G.L. K.B. D.F. G.L.

DATE	11-14-86	11-16-86
RUN NO.	ONE	TWO
TYPE LOG	GAMMA CALIPER	GAMMA CALIPER
DEPTH-DRILLER	358'	430'
DEPTH-LOGGER	358' 353'	430' 426'
DEPTHS LOGGED INTERVAL	357' 352'	429' 425'
TOP LOGGED INTERVAL	0' 0'	340' 340'
TYPE FLUID IN HOLE	WATER	WATER
MAX. REC. TEMP., DEG. F.	N/A	N/A
RECORDED BY	ROBERTI	ROBERTI
WITNESSED BY	CHRIS KRUMM	T. RODRIGUEZ KIRT SCHELLSON

RUN NO.	BIT	BORE-HOLE RECORD FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
1	9 7/8"	20'	358'	10 3/4	CONS.	0'	20'
2	6"	358'	430'	6 5/8		0'	340'

EQUIPMENT DATA

Gamma Ray			Neutron	
Run No.	ONE	TWO	Run No.	
Tool Model No.	C27X6LD	C27X6LD	Log Type	
Diameter	2"	2"	Tool Model No.	
Detector Model No.	--	--	Diameter	
Type	SC INT.	SC INT.	Detector Model No.	
Length	5'	5'	Type	
Distance in N Square	--	--	Length	
			Source Model No.	
			Source Serial No.	

General		
Hoist Truck No.	CV-1 TWA	CV-1
Instrumental Truck No.	CV-1	CV-1
Tool Serial No.	153	153
Spacing		
Type		
Strength		

LOGGING DATA

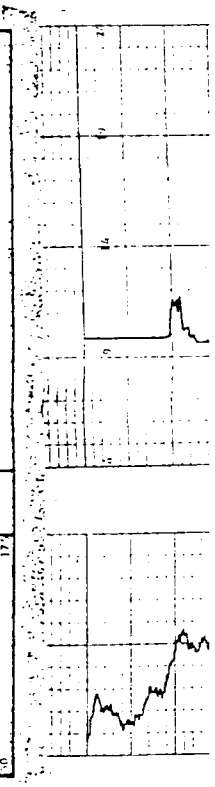
General					Gamma Ray					Neutron		
Run No.	Depths From	Depths To	Speed Ft/Min	T.C. Sec	Sens. Settings	Zero Div. L or R	API/GR Units per Log Div	T.C. Sec	Sens. Settings	Zero Div. L or R	API/N Units per Log Div
1	337'	0'	20	2	100/200	L.L.	12.5				
2	427'	340'	20	2	100/200	L.L.	12.5				

Reference Literature:

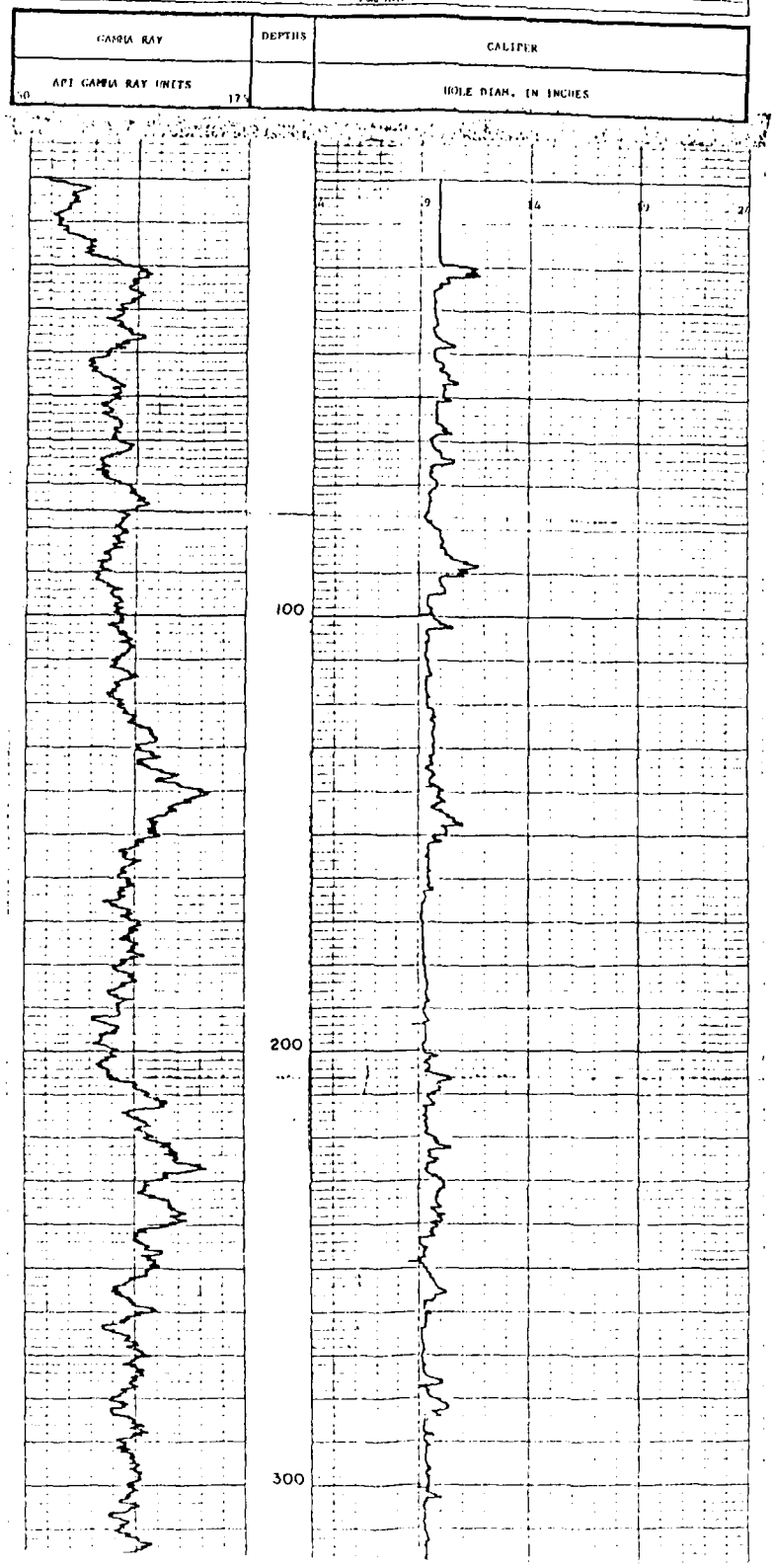
Remarks: GAMMA RAY AND CALIPER CALIBRATIONS SAME FOR RUN'S ONE AND TWO

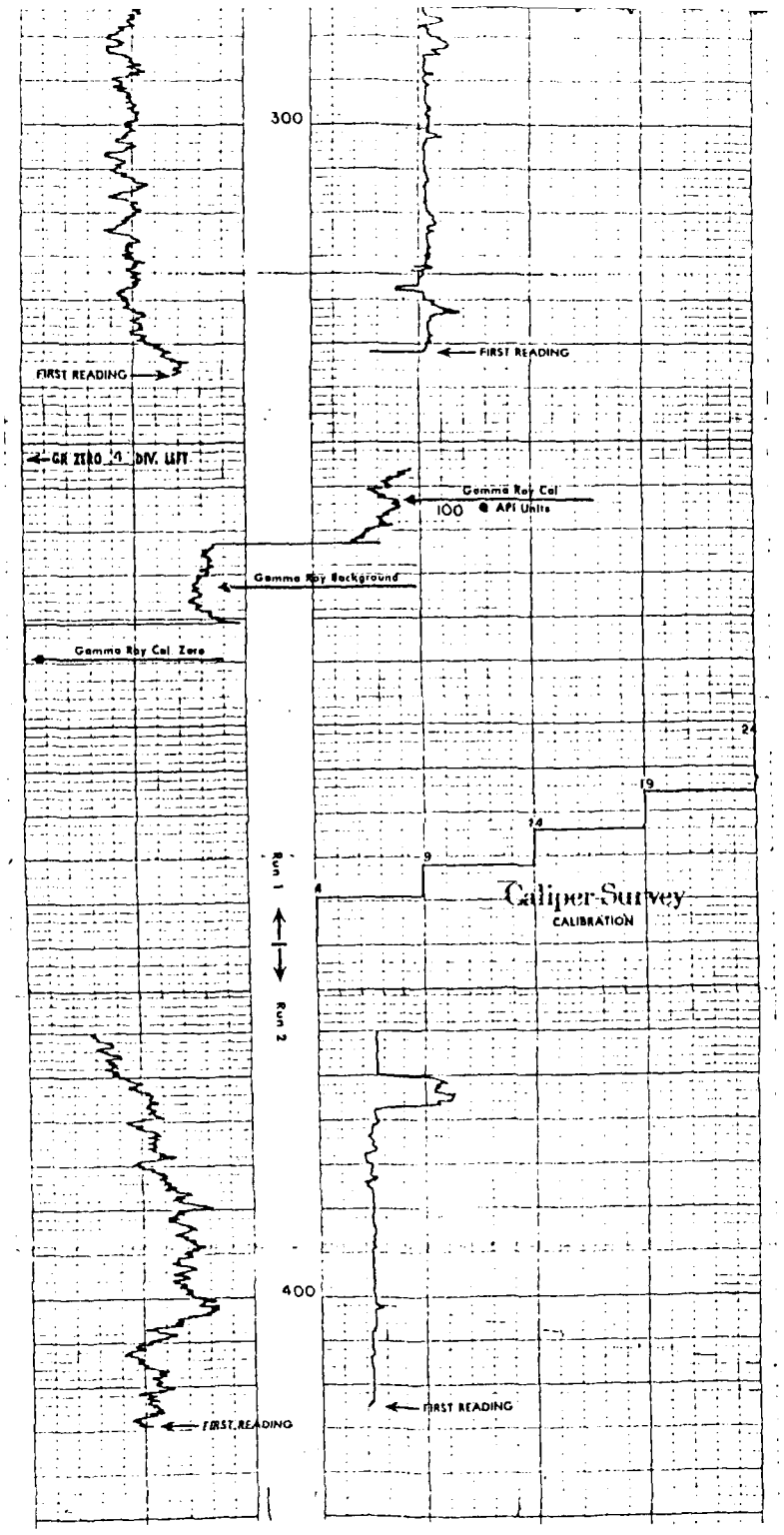
Fold Here

GAMMA RAY	DEPTHS	CALIPER
API GAMMA RAY UNITS 177		HOLE DIAM. IN INCHES



Fold Here


GAMMA RAY
API GAMMA RAY UNITS
DEPTHS
CALIPER
HOLE DIAM. IN INCHES
100
200
300


300
400
FIRST READING
FIRST READING
FIRST READING
FIRST READING
GR ZERO 1 DIV. LEFT
Gamma Ray Cal
100 @ API Units
Gamma Ray Background
Gamma Ray Cal. Zero
24
19
14
9
4
Run 1
Run 2
Caliper Survey
CALIBRATION

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO

COMPANY: BENLIK DRILLING, INC.

WELL: # 110

FIELD: LUKE A.F.B.

STATE: ARIZONA COUNTY: MARICOPA

LOCATION

SEC ____ TWP ____ RGE ____

OTHER SERVICES
6' LATERAL
GAMMA RAY
CALIPER

Permanent Datum: G.L. Elev. ____
Log Measured From: G.L. ____ Ft. Above Perm. Datum
Drilling Measured From: G.L.

Elev.: K.B. ____
D.F. ____
G.L. ____

Date	11-14-86	11-14-86		
Run No.	ONE	TWO		
Depth—Driller	438'	439'		
Depth—Logger	438'	430'		
Btm. Log Inter.	427'	429'		
Top Log Inter.	55'	332'		
Casing—Driller	16 3/4 @ 20'	6 5/8 @ 350'	@	@
Casing—Logger	--	--		
Bit Size	7 7/8"	6"		
Type Fluid in Hole	WATER	WATER		
Dens. | Visc.	N/A	N/A |	|	|
pH | Fluid Loss	N/A | ml	N/A | ml	| ml	| ml
Source of Sample	PIT	PIT		
R_m @ Meas. Temp.	[illegible] @ 65 °F	[illegible] @ 69 °F	@ °F	@ °F
R_{mf} @ Meas. Temp	[illegible] @ 65 °F	[illegible] @ [illegible] °F	@ °F	@ °F
R_{mc} @ Meas. Temp	[illegible] @ °F	[illegible] @ °F	@ °F	@ °F
Source: R_{mf} R_{mc}	[illegible] |	[illegible] |	|	|
R_m @ BHT	N/A @ °F	N/A @ °F	@ °F	@ °F
Time Since Circ.	[illegible]	[illegible]		
Max. Rec. Temp.	N/A °F	[illegible] °F	°F	°F
Equip. | Location	[illegible] | [illegible]	[illegible] | [illegible]	|	|
Recorded By	[illegible]	[illegible]		
Witnessed By	[illegible]	[illegible]		

Fold Here

This Heading and Log Conform To API RP 31 A

REMARKS

Changes in Mud Type or Additional Samples

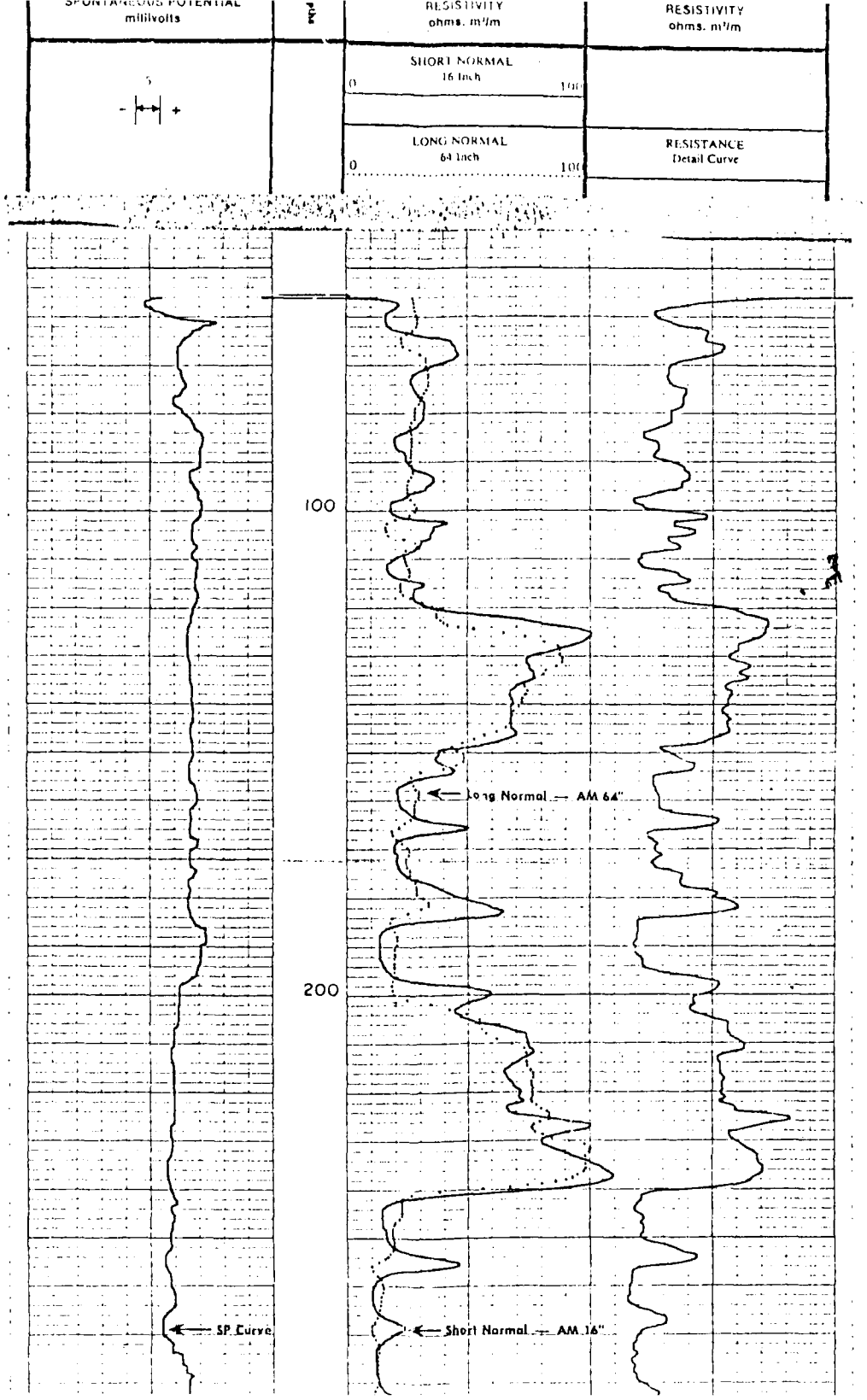
Date	Sample No.	Depth—Driller	Type Fluid in Hole	Type Log	Depth	Scale Changes: Scale Up Hole	Scale Down Hole

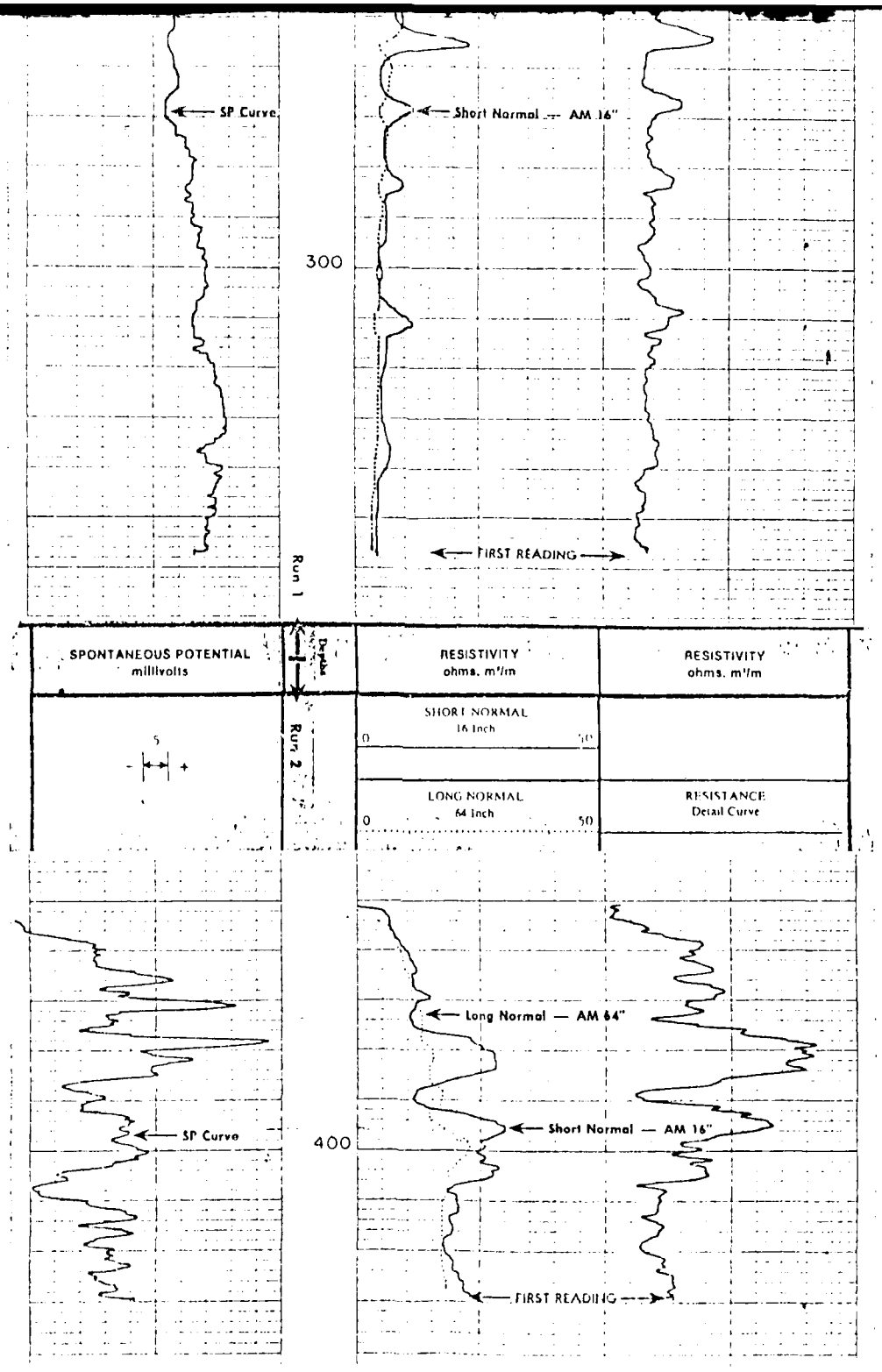
Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	[illegible]	[illegible]	[illegible]	
TWO	[illegible]	[illegible]	[illegible]	

Item	Viscosity	Fluid Loss	Source of Sample	R_m @ Meas. Temp.	R_{mf} @ Meas. Temp.	R_{mc} @ Meas. Temp.	Source: R_{mf} R_{mc}	R_m @ BHT	R_{mf} @ BHT	R_{mc} @ BHT
ONE	°F	ml	°F	°F	°F	°F	°F	°F	°F	°F
TWO	°F		°F	°F	°F	°F	°F	°F	°F	°F

SPONTANEOUS POTENTIAL millivolts	Depths	RESISTIVITY ohms, m²/m: SHORT NORMAL 16 Inch (0 – 100)	RESISTIVITY ohms, m²/m: LONG NORMAL 64 Inch (0 – 100)	RESISTANCE Detail Curve
5 + –				


SPONTANEOUS POTENTIAL
millivolts
RESISTIVITY
ohms. m²/m
RESISTIVITY
ohms. m²/m
SHORT NORMAL
16 Inch
0
100
LONG NORMAL
64 Inch
0
100
RESISTANCE
Detail Curve
100
200
Long Normal — AM 64"
SP Curve
Short Normal — AM 16"


SP Curve
Short Normal — AM 16"
300
FIRST READING
Run 1
Depths
SPONTANEOUS POTENTIAL
millivolts
RESISTIVITY
ohms. m²/m
RESISTIVITY
ohms. m²/m
SHORT NORMAL
16 Inch
0
50
5
Run 2
LONG NORMAL
64 Inch
0
50
RESISTANCE
Detail Curve
Long Normal — AM 64"
SP Curve
400
Short Normal — AM 16"
FIRST READING

welenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO.

COMPANY: [illegible] DRILLING, INC.

WELL: [illegible]

FIELD: [illegible]

STATE: ARIZONA COUNTY: [illegible]

LOCATION

SEC ____ TWP ____ RGE ____

OTHER SERVICES: 16-64 E-LOG, GAMMA RAY, CALIPER

Permanent Datum: [illegible] Elev. ____

Log Measured From: [illegible] Ft. Above Perm. Datum

Drilling Measured From: [illegible]

Elev.: K.B. ____ D.F. ____ G.L. ____

Date	11-1[illegible]-66	11-14-66		
Run No.	[illegible]	[illegible]		
Depth—Driller	[illegible]	[illegible]		
Depth—Logger	[illegible]	[illegible]		
Btm. Log Inter.	[illegible]	[illegible]		
Top Log Inter.	[illegible]	[illegible]		
Casing—Driller	[illegible] @ [illegible]	[illegible] @ [illegible]	@	@
Casing—Logger	--	--		
Bit Size	[illegible]	[illegible]		
Type Fluid in Hole	[illegible]	[illegible]		
Dens. / Visc.	N/A	N/A	/	/
pH / Fluid Loss	[illegible] / ml	[illegible] / ml	/ ml	/ ml
Source of Sample	FLT	FLT		
R_m @ Meas. Temp.	[illegible] @ [illegible] °F	[illegible] @ [illegible] °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	[illegible] @ [illegible] °F	[illegible] @ [illegible] °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	[illegible] @ °F	[illegible] @ °F	@ °F	@ °F
Source R_{mf} R_{mc}	[illegible]	[illegible]	/	/
R_m @ BHT	[illegible] @ °F	[illegible] @ °F	@ °F	@ °F
Time Since Circ.	[illegible]	[illegible]		
Max. Rec. Temp.	[illegible] °F	[illegible] °F	°F	°F
Equip. / Location	[illegible] / [illegible]	[illegible] / [illegible]	/	/
Recorded By	[illegible]	[illegible]		
Witnessed By	[illegible]	[illegible]		

This Reading and Log Conform To API RP 31.

Field Here

REMARKS

Changes in Mud Type or Additional Samples

Date / Sample No. / Depth—Driller / Depth Fluid in Hole / Type Fluid in Hole / Dens. / Visc. / pH / Fluid Loss / Source of Sample / R_m @ Meas. Temp. / R_{mf} @ Meas. Temp. / R_{mc} @ Meas. Temp. / Source R_{mf} R_{mc} / R_m @ BHT / Max. Rec. Temp. / Equip. / Location / Recorded By / Witnessed By

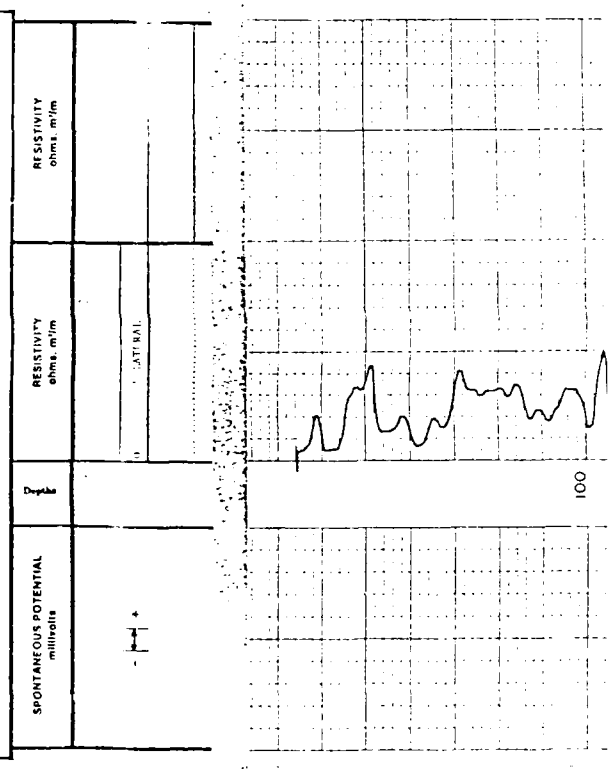
Basic Changes

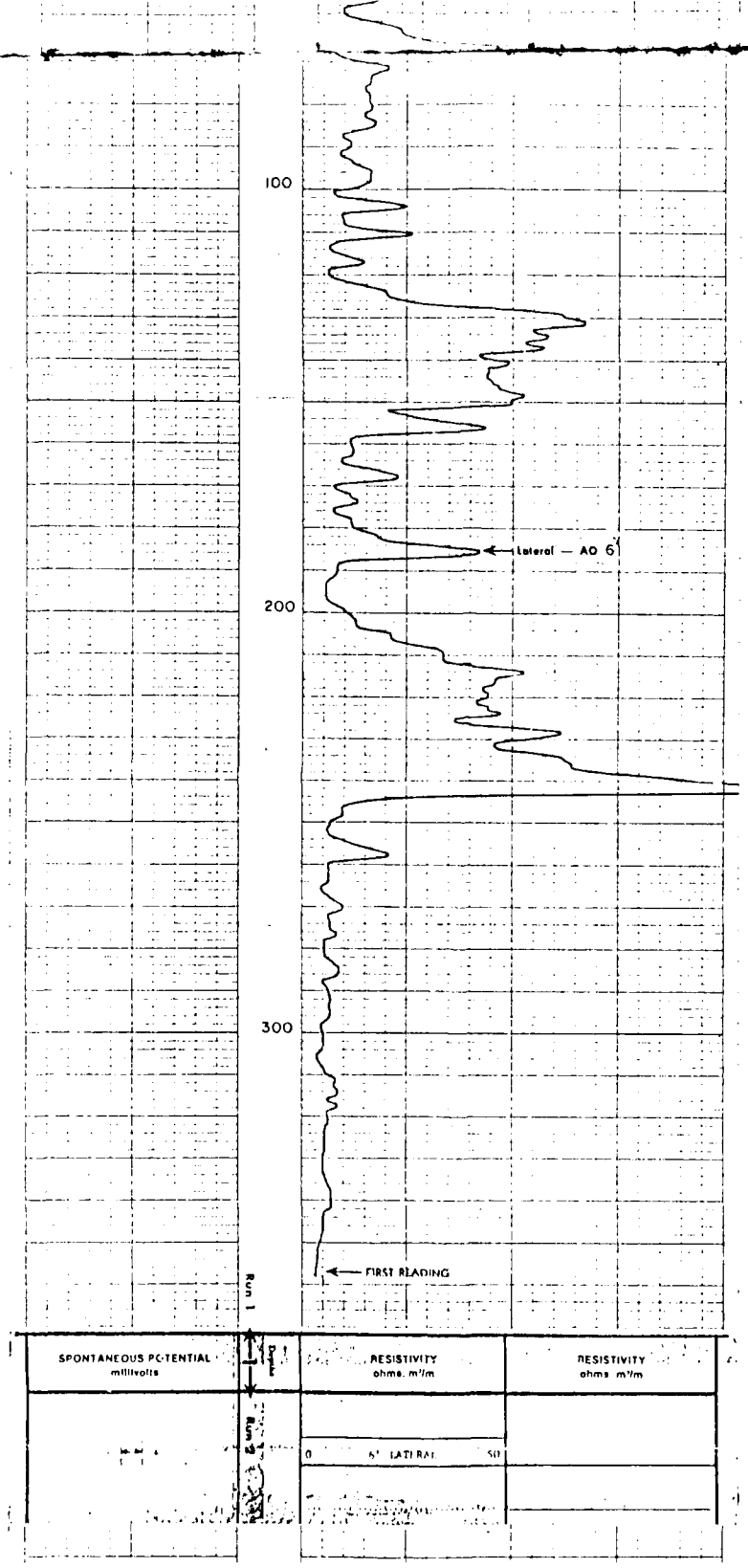
Type Log	Depth	Scale Up Half	Scale Down Half

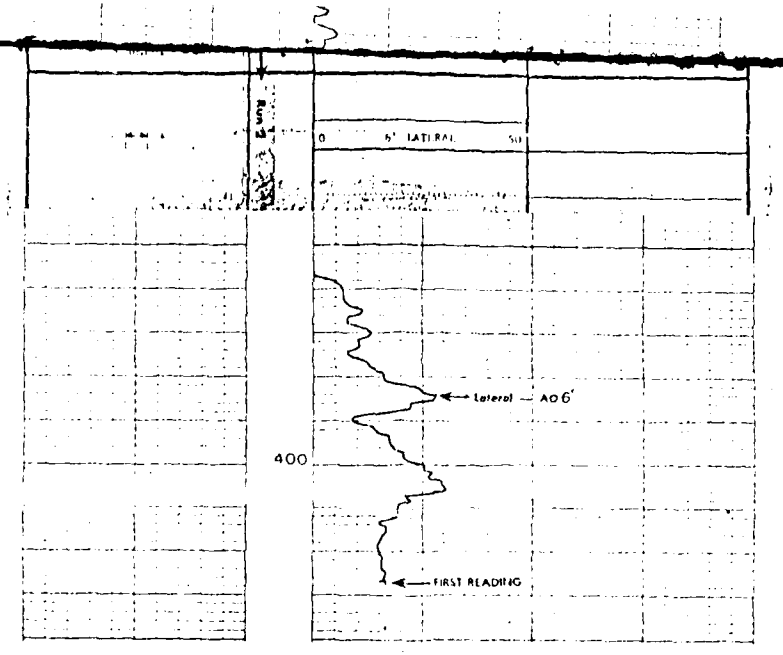
Equipment Data

Run No.	Tool Type	Tool Position
[illegible]	GAMMA RAY	[illegible]
[illegible]	CALIPER	[illegible]

Other




100
200
300
Lateral — AO 6'
FIRST READING
Run 1
Run 2
SPONTANEOUS POTENTIAL
millivolts
RESISTIVITY
ohms. m²/m
RESISTIVITY
ohms m²/m
0
6' LATERAL
50


0
6' LATERAL
50
Lateral — 406'
400
FIRST READING

welenco

WELL ENGINEERING SURVEYS

Gamma-Ray Caliper

COMPANY: BEYLIK DRILLING, INC.

WELL: #111

FIELD: LUKE AFB

STATE: ARIZONA COUNTY: MARICOPA

LOCATION: SEC. ___ TWP. ___ RGE. ___

SONDE SERVICES: 16-64 E-LOC

PERMANENT DATUM: G.L. ELEV. ___ SURV. E.R. ___

LOG MEASURED FROM: G.L. FT. ABOVE PERM. DATUM G.P. ___

DRILLING MEASURED FROM: G.L. G.L. ___

DATE	11/18/86		11/19/86	
RUN NO.	ONE		TWO	
TYPE LOG	GAMMA CALIPER		GAMMA CALIPER	
DEPTH-DRILLER	350'		431'	
DEPTH-LOGGER	349'	346'	431'	431'
BOTTOM LOGGED INTERVAL	346'	345'	431'	431'
TOP LOGGED INTERVAL	0'	0'	350'	348'
TYPE FLUID IN HOLE	WATER		BENTONITE	
MAX. REC. TEMP. DEG. F	N/A		N/A	
RECORDED BY	ROBERTI		JACOVITCH/SPOON	
WITNESSED BY	DEBBIE JONES		DEBBIE JONES	

RUN NO.	BIT	BORE-HOLE RECORD FROM	TO	CASING RECORD SIZE	WGHT	FROM	TO
1	4 7/8"	20'	350'	10 3/4"		0'	20'
2	6"	350'	431'	6 5/8"		0'	350'

EQUIPMENT DATA

	Gamma Ray		Neutron
Run No.	ONE	TWO	
Tool Model No.	GZ7X6LD	GZ7X6LD	
Diameter	2"	2"	
Detector Model No.	-	-	
Type	SCINT.	SCINT.	
Length	4'	4'	
Distance to N. Source	-	-	

Run No.		
Log Type		
Tool Model No.		
Diameter		
Detector Model No.		
Type		
Length		
Source Model No.		
Serial No.		
Rating		
Type		
Strength		

General Metal Truck No.	CIL-1 N/PIUS	CIL-1 N/PIUS
Instrument Truck No.	CIL-1 N/PIUS	CIL-1 N/PIUS
Tool Serial No.		

LOGGING DATA

General Run No.	Depths From	To	Speed Ft/Min	T.C. Sec.	Gamma Ray Sens Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Neutron Sens Settings	Zero Div. L or R	API N Units per Log Div.
1	3/0'	0'	20	5	100/2000	4L	17.5				
2	421	350'	20	5	100/2000	4L	17.5				

Reference Literature

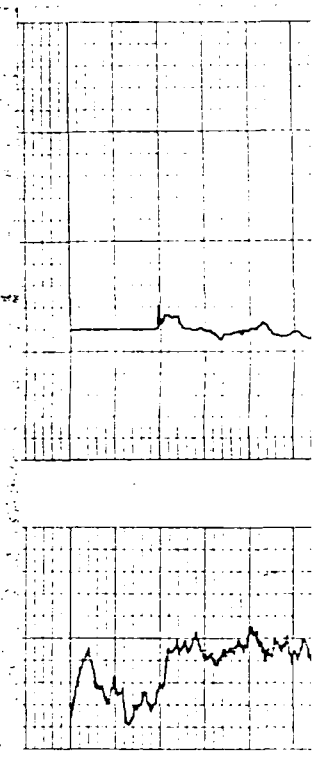
Remarks:

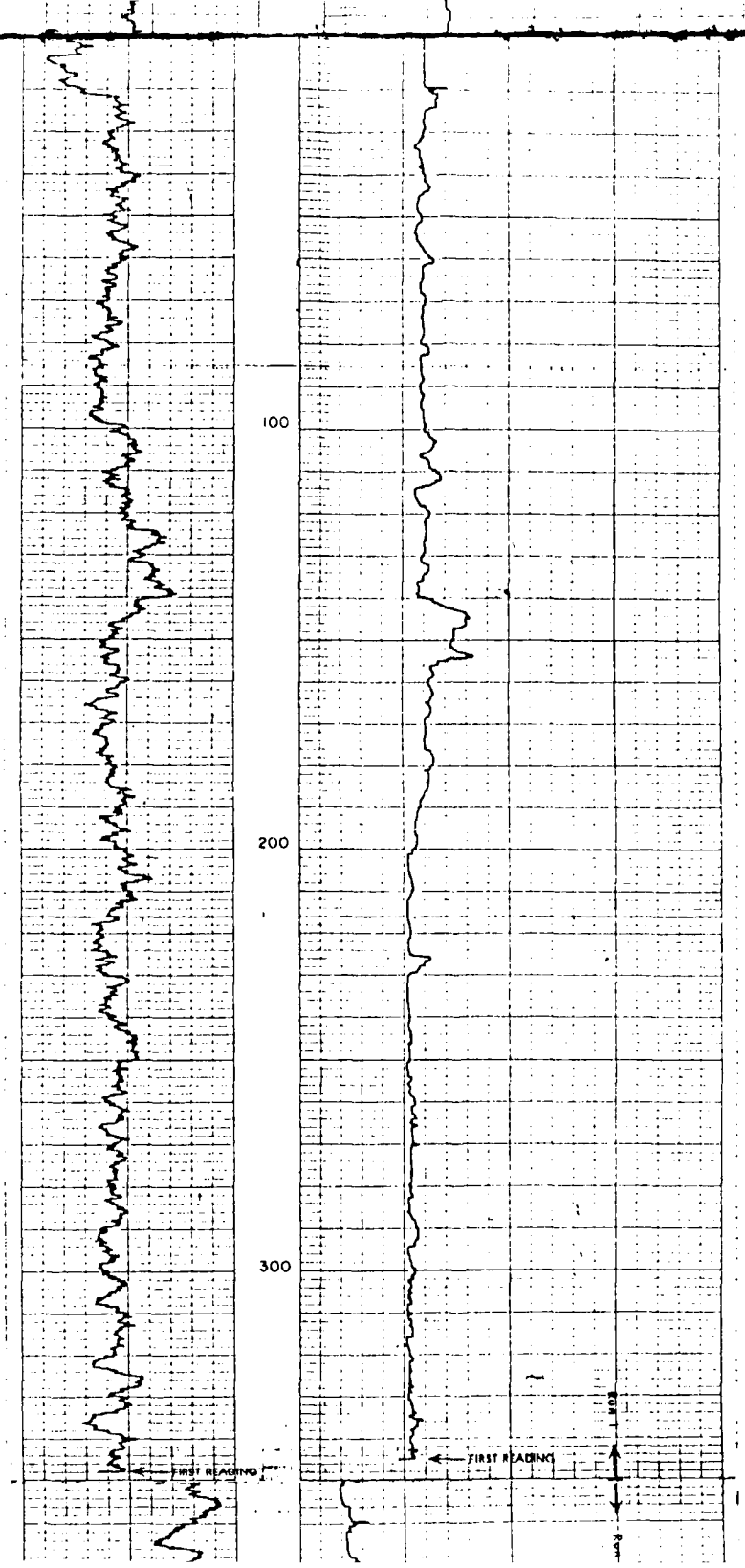
Field Tiers

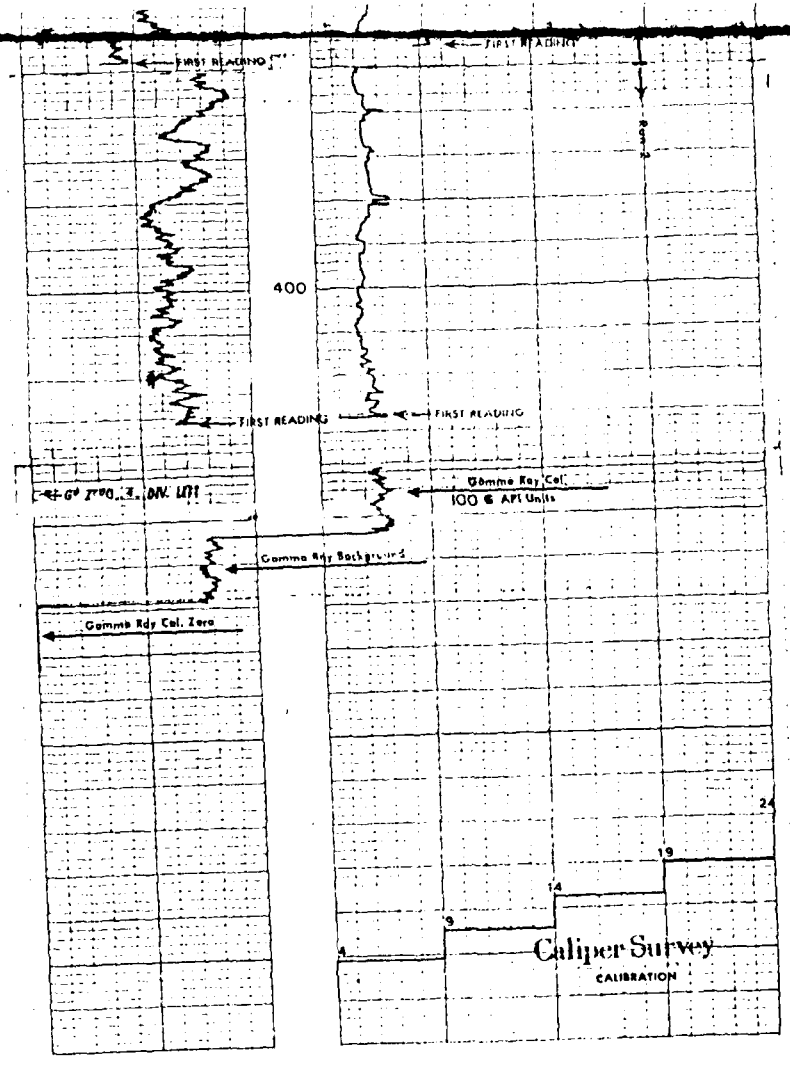
CALIPER IN INCHES

DEPTHS

GAMMA API UNITS




100
200
300
FIRST READING
FIRST READING
FORT
PORT


FIRST READING
FIRST READING
400
FIRST READING
FIRST READING
Gamma Ray Cal.
100 @ API Units
Gamma Ray Background
Gamma Ray Cal. Zero
24
19
14
9
4
Caliper Survey
CALIBRATION

wetenco

WELL ENGINEERING SURVEYS

ELECTRIC LOG

FILING NO

COMPANY REVLIN DRILLING, INC.

WELL [illegible]

FIELD LUKE AFB

STATE ARIZONA COUNTY MARICOPA

LOCATION: SEC TWP RGE

OTHER SERVICES: GAMMA CALIPER

Permanent Datum: G.L. Elev.
Log Measured From G.L. Ft. Above Perm. Datum
Drilling Measured From G.L.

Elev.: K.B. D.F. G.L.

Date	12/19/86	12/19/86		
Run No.	ONE	TWO		
Depth—Driller	350'	431'		
Depth—Logger	350'	429'		
Btm. Log Inter.	349'	428'		
Top Log Inter.	42'	350'		
Casing—Driller	10 3/4 @ 20'	4 7/8 @ 350'	●	●
Casing—Logger				
Bit Size	7 7/8"	7 7/8"		
Type Fluid in Hole	WATER	BENTONITE		
Density / Visc.	N/A	N/A		
pH / Fluid Loss	N/A ml	N/A ml	ml	ml
Source of Sample	PIT	PIT		
Rm @ Meas. Temp	[illegible] @ [illegible] °F	[illegible] @ 60 °F	● °F	● °F
Rmf @ Meas. Temp	[illegible] @ [illegible] °F	[illegible] @ [illegible] °F	● °F	● °F
Rmc @ Meas. Temp	[illegible] @ °F	N/A @ °F	● °F	● °F
Source: Rmf / Rmc	[illegible]	[illegible]		
Rm @ BHT	N/A @ °F	N/A @ °F	● °F	● °F
Time Since Circ.	[illegible]	[illegible]		
Max. Rec. Temp.	[illegible] °F	[illegible] °F	°F	°F
Equip. / Location	[illegible]	[illegible]		
Recorded by	[illegible]	[illegible]		
Witnessed by	[illegible]	[illegible]		

Field Items

REMARKS

Changes In Mud Type or Additional Sample

Date / Sample No.
Depth—Driller
Type Fluid in Hole
Density / Visc.
pH / Fluid Loss ml
Source of Sample
Rm @ Meas. Temp
Rmf @ Meas. Temp
Rmc @ Meas. Temp
Source: Rmf / Rmc
Rm @ BHT
Rmf @ BHT
Rmc @ BHT

This Heading and Log Conform To API RP 31-B

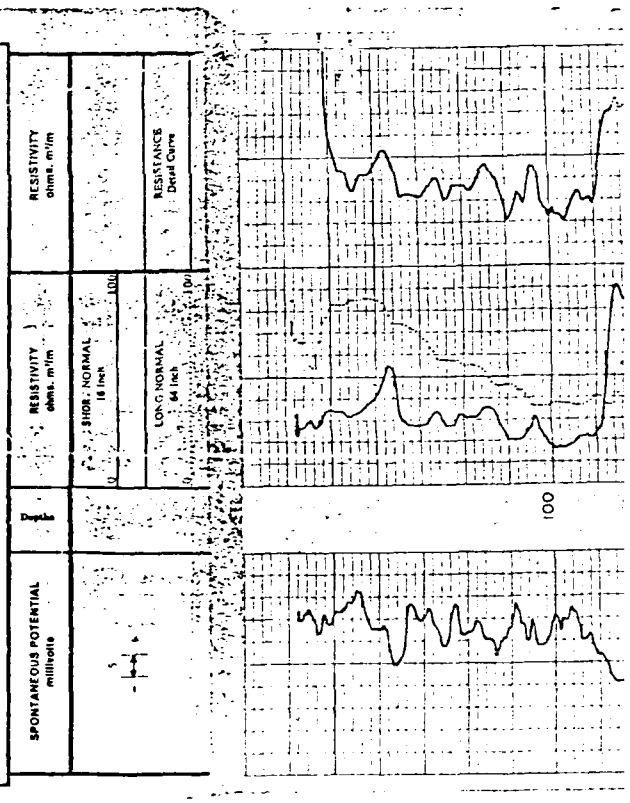
Type Log | Depth | Scale Changes: Scale Up Hole, Scale Down Hole

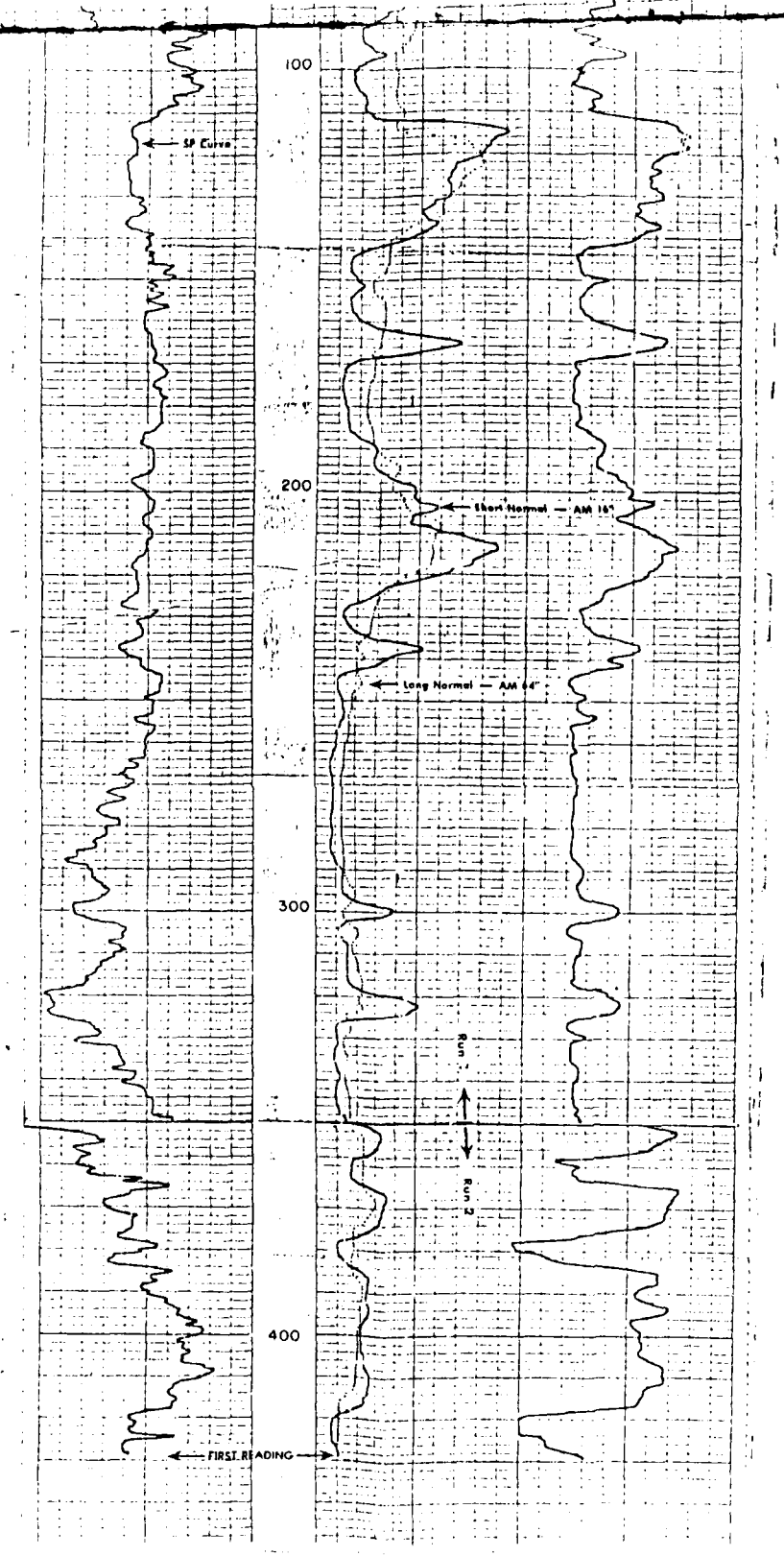
Equipment Data

Run No.	Tool Type	Tool Position
ONE	16-64 & LOG	SHORT
TWO	16-64 & LOG	LONG

Other

°F	●	●
°F	●	●
°F	●	●
ml	●	●
°F	●	●
°F	●	●
°F	●	●
°F	●	●
°F	●	●
°F	●	●
°F	●	●




100
200
300
400
SP Curve
Short Normal — AM 16"
Long Normal — AM 64"
Run 1
Run 2
FIRST READING