APPENDIX H:

REGIONAL LEADVILLE FACIES AND CORE DESCRIPTIONS FROM WELLS IN THE PARADOX AND FAULT BELT AREA, UTAH
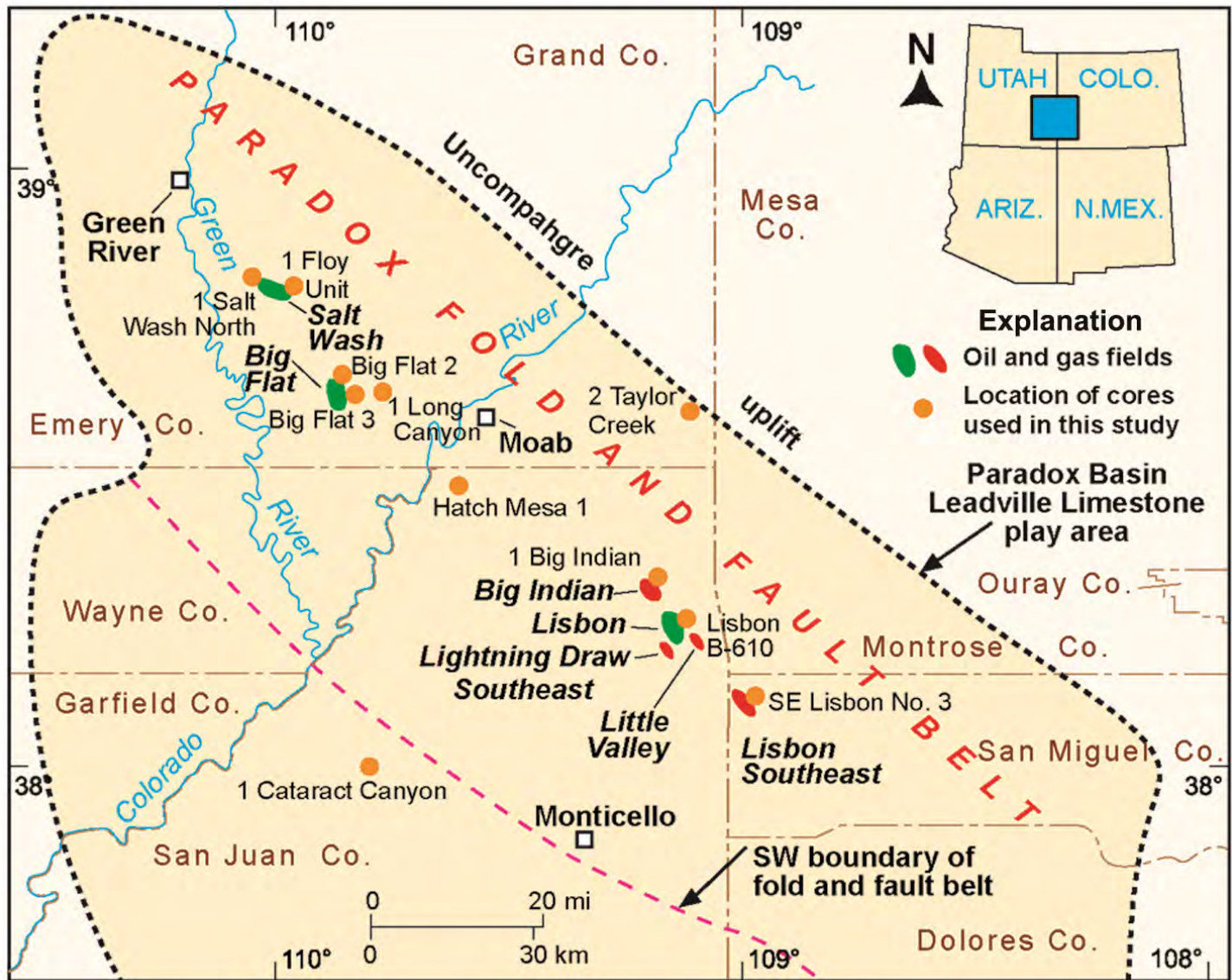
Figure H.1 Location of Leadville Limestone cores used to determine inferred average depositional profiles of regional facies.

Explanation

Regional Leadville Facies Coding

#1 Crinoidal Grainstone:
Open-marine, moderate- to high-energy shoals

#2 Oolitic/Coated Grain/"Hard" Peloid Grainstone:
Restricted marine, high-energy shoals

#3 Peloid/Skeletal Packstone/Wackestone:
Low-energy, open marine, below wave base

#4 "Soft" Peloid Mudstone:
Low-energy, nearshore, often restricted marine sometimes with tidal-flat features and cryptalgal laminae; converted by early dolomitization

Diagenetic Overprints

Karsting and sediment infilling of karst cavities

Hydrothermal alteration, dolomite, and bitumen linings

Combination of karsting and hydrothermal alteration, etc.

Salt Wash North No. 1

API No. 43-019-30282
NE1/4SW1/4 section 9, T. 23 S., R. 17 E., SLBL&M
Grand County, Utah
P&A

Cored Interval: 8855–8883.5 ft

Unit 1. 8855.0–8858 ft: dolostone, slight effervescing, peloidal packstone/grainstone with early dolomite; massive with hydrothermal overprint (dissolution and black bitumen).

Contact: stylolitic.

Unit 2. 8858–8863 ft: limetone, crinoidal/skeletal packstone/wackestone with white fractures and vertical tectonic sylolites.

Contact: stylolitic.

Unit 3. 8863–8883.4 ft (base of cored interval): dolomitic limestone, light blue to black from bitumen plugging, peloidal grainstone/packstone/wackestone with heavy hydrothermal thermal dolomitic overprint and micro intercrystalline porosity impregnated with bitumen.
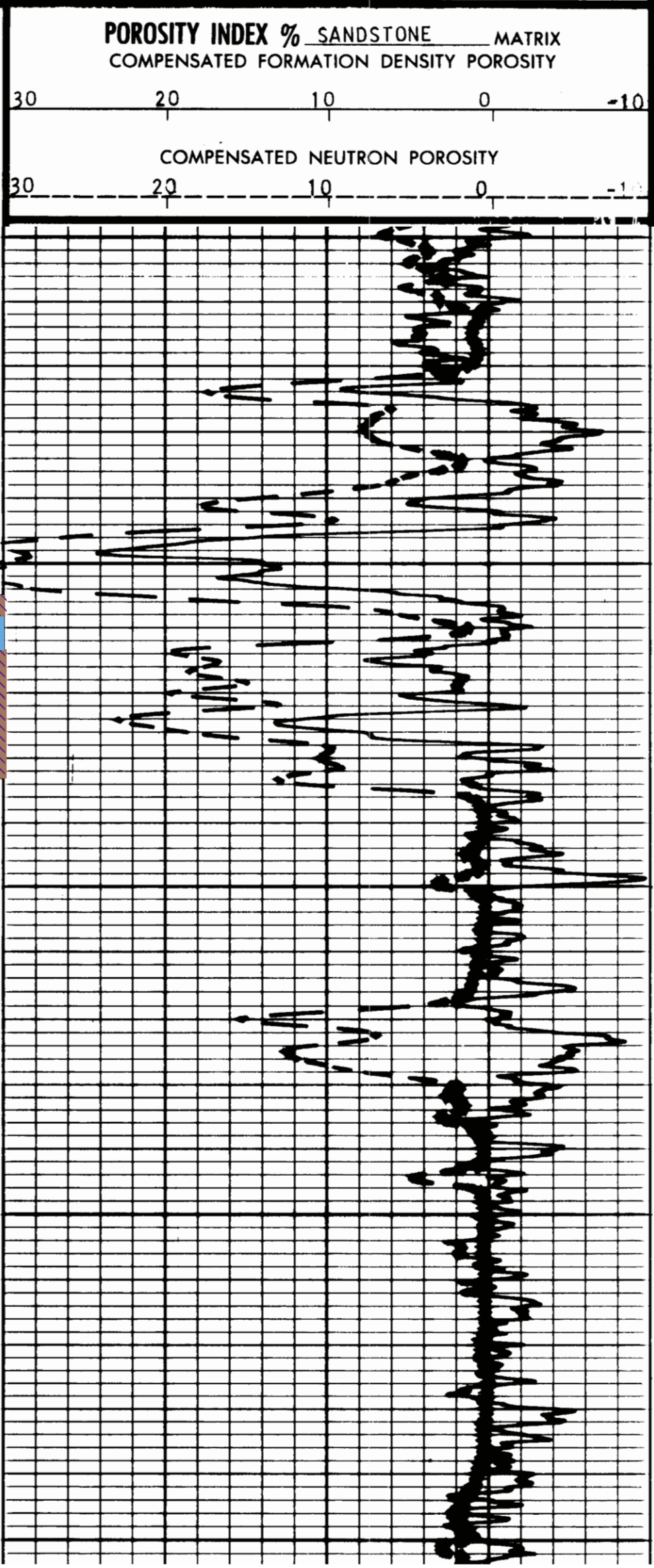
Schlumberger

COMPENSATED NEUTRON-FORMATION DENSITY
SIMULTANEOUS

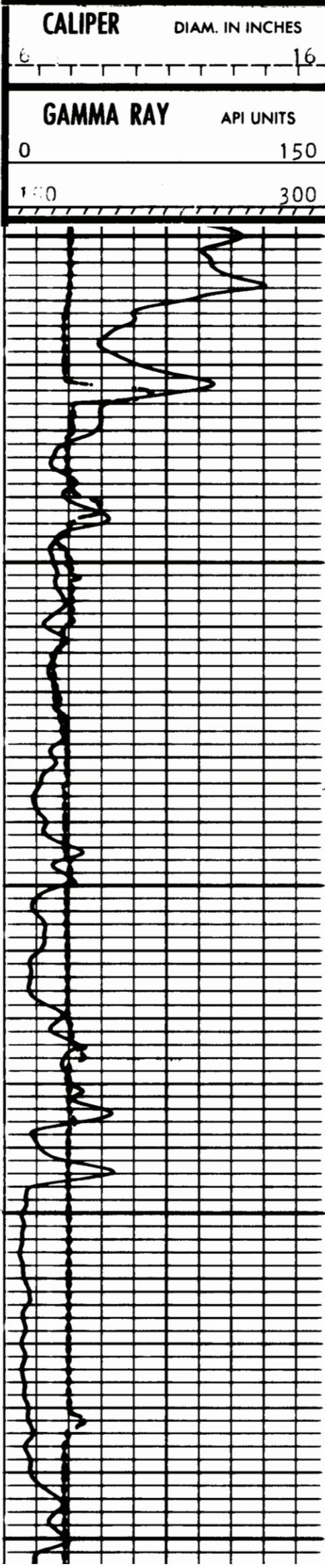|	
COUNTY	GRAND
FIELD	SALT WASH
LOCATION	
WELL	SALT WASH NORTH UNIT #1
COMPANY	RESERVE OIL AND GAS

COMPANY RESERVE OIL AND GAS COMPANY

WELL SALT WASH NORTH UNIT #1

FIELD SALT WASH

COUNTY GRAND STATE UTAH

LOCATION			
NE¼, SW¼			
API SERIAL NO	SEC 9	TWP 23S	RANGE 17E

	Elev.: 4443	Elev.: K.B. 4463
		D.F. ----
		G.L. 4443

Other Services:
DIL
DLL
BHC-GR

Permanent Datum:	GL	
Log Measured From	KB	; Elev.: 4443
Drilling Measured From	KB	.20 Ft. Above Perm. Datum

Date	5/27/76	6/21/76
Run No.	ONE	TWO
Depth—Driller	5321	9069
Depth—Logger	5322	9064
Btm. Log Interval	5321	9066
Top Log Interval	1745	5000
Casing—Driller	8 5/8 @ 1737	8 5/8 @ 1747
Casing—Logger	1745	1745
Bit Size	7 7/8	7 7/8
Type Fluid in Hole	FGM	SALT MUD
Dens.	9.0	10.7
Visc.	40	40
pH	9.5	9.5
Fluid Loss	13. ml	10 ml
Source of Sample	FLOWLINE	PIT
Rm @ Meas. Temp.	.95 @ 80 F	.047 @ 94 F
Rmf @ Meas. Temp.	.78 @ 80 F	.042 @ 94 F
Rmc @ Meas. Temp.	-- @ -- F	.084 @ 94 F
Source: Rmf Rmc	M	M C
Rm @ BHT	-- @ -- F	.032 @ 138F
Max. Rec. Temp.	110 F	138 F
Equip. Location	GEIGER GJ	7759 VERNAL
Recorded By	GEIGER	STRAWN
Witnessed by Mr.	RIGGS	RIGGS
TIME		
Circulation Stopped	1600	1300
Logger on Bottom	2100	2300
		7674

CALIPER — DIAM. IN INCHES
6 — 16

GAMMA RAY — API UNITS
0 — 150
150 — 300

DEPTH

POROSITY INDEX % SANDSTONE MATRIX
COMPENSATED FORMATION DENSITY POROSITY
30 — 20 — 10 — 0 — -10

COMPENSATED NEUTRON POROSITY
30 — 20 — 10 — 0 — -1

800

1000
HGCWM

1580 CC
50 GWM

GTS
125 mcf
6 min

8900

90
VS MCSW
240'
HG % SWCM
192
SMCSW

9000

Floy Unit No. 1

Cored Interval: 9400–9666 ft

Unit 1. 9400–9407 ft: limestone, medium-dark gray, peloidal/skeletal packstone/wackestone, vaguely bedded, no visible matrix porosity; replacement nodule of anhydrite at 9406 ft.

Contact: gradational.

Unit 2. 9407–9412.5 ft: limestone; white to light gray, massive crinoidal grainstone; tightly cemented with no visible porosity, bitumen, or hydrothermal overprint. Small cracks filled with green clay indicating karstification.

Contact: sharp.

Unit 3. 9412.5–9441 ft: limestone, light-medium gray, skeletal/peloidal/crinoidal packstone/wackestone with occasional with chert and small anhydrite nodules nodules; no visible porosity, bitumen, evidence of karstification, or hydrothermal overprint. Some vertical sylolites.

Contact: sharp.

Unit 4. 9441–9443 ft: limestone, crinoidal grainstone/packstone with abundant medium amplitude stylolites; no bitumen.

Contact: sharp.

Unit 5. 9443–9454 ft: dolostone, medium brown and black oolitic/"hard" peloid grainstone with extensive hydrothermal alteration and bitumen impregnation of pores.

Contact: sharp.

Unit 6. 9454–9467 ft: limestone, white to cream-colored, crinoidal grainstone with occasional small rugose corals; no hydrothermal or karst overprint.

Contact: sharp.

Unit 7. 9467–9469 ft: limestone, medium gray, skeletal/soft-peloidal/crinoidal wackestone with small rugose corals; no karst or hydrothermal overprints.

Contact: sharp.

Unit 8. 9469–9489 ft: limestone, white to cream-colored, crinoidal grainstone/packstone with low permeable syntaxial cements; no karst or hydrothermal overprints.

Contact: sharp.

Unit 9. 9489–9496 ft: limestone, medium gray, fossiliferous (skeletal)/"soft" peloidal wackestone with abundant bioturbation; no karst or hydrothermal overprints.

Contact: sharp.

Unit 10. 9496–9521 ft: limestone, white to cream colored, crinoidal grainstone.

Contact: sharp.

Unit 11. 9521–9557 ft (±): limestone, light-medium gray, hard peloidal/oolitic/coated grain grainstone, thin to medium bedding with internal fine stratification, occasional low-amplitude stylolites; no karst or hydrothermal overprints. Contact with unit below is gradational.

Unit 12. 9557–9577 ft±: limestone, medium gray, skeletal/crinoidal packstone/wackestone with thin seams and cavity fills of green clay (karst?); no hydrothermal alteration or bitumen.

Contact: gradational.

Unit 13. 9577–9646 ft: limestone, white to cream-colored, crinoidal grainstone with occasional other skeletal grains; some vertical stylolites and early chert replacement nodules (in lower third of the unit).

Contact: sharp.

Unit 14. 9646–9666 ft (base of core): dolostone (mostly), white, saddle dolomite, coarse grained containing large vugs with saddle dolomite, coarse calcite, and megaquartz; no bitumen. Originally crinoidal grainstone.
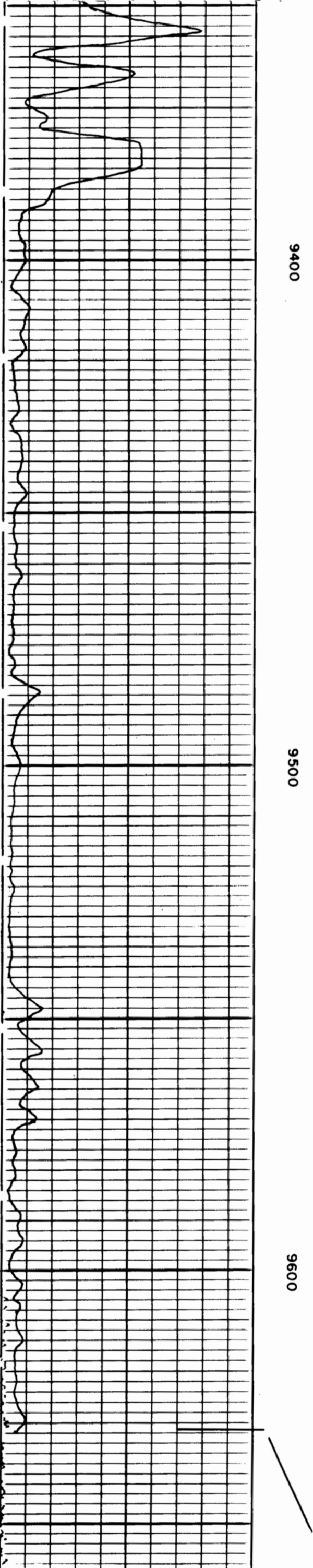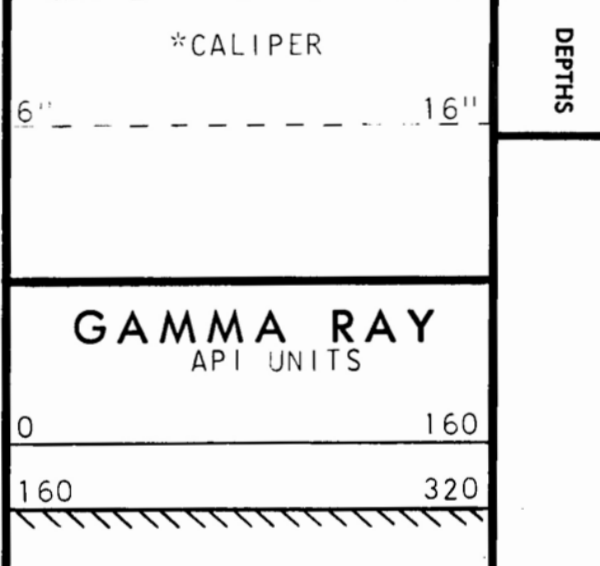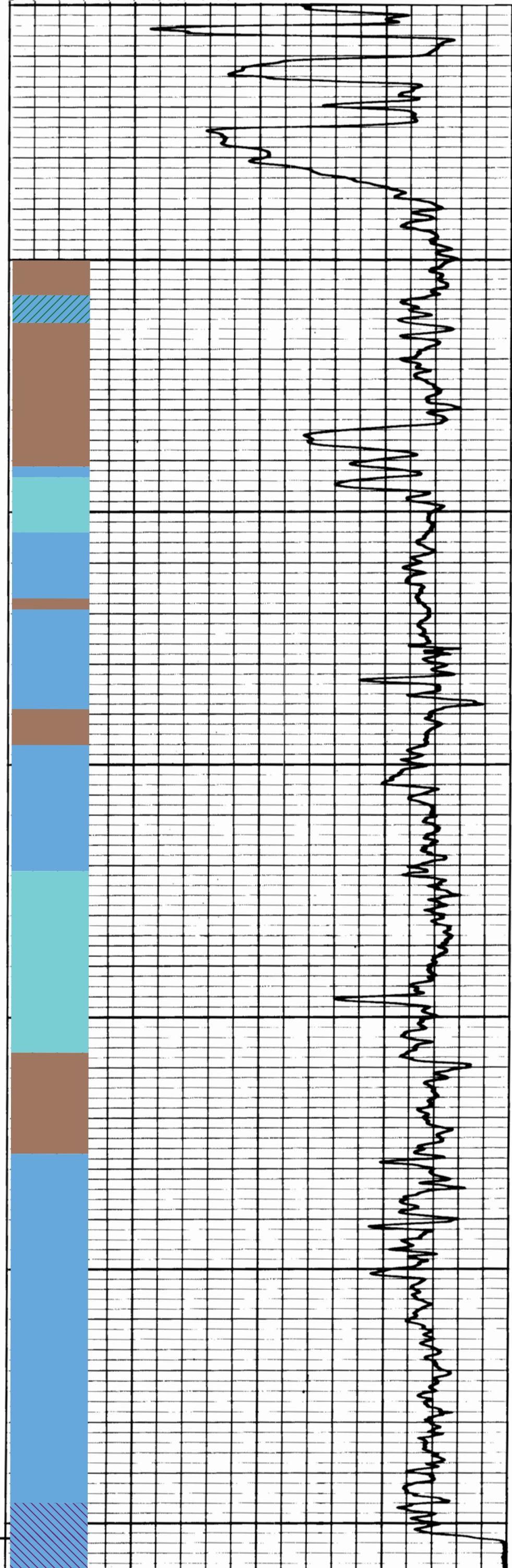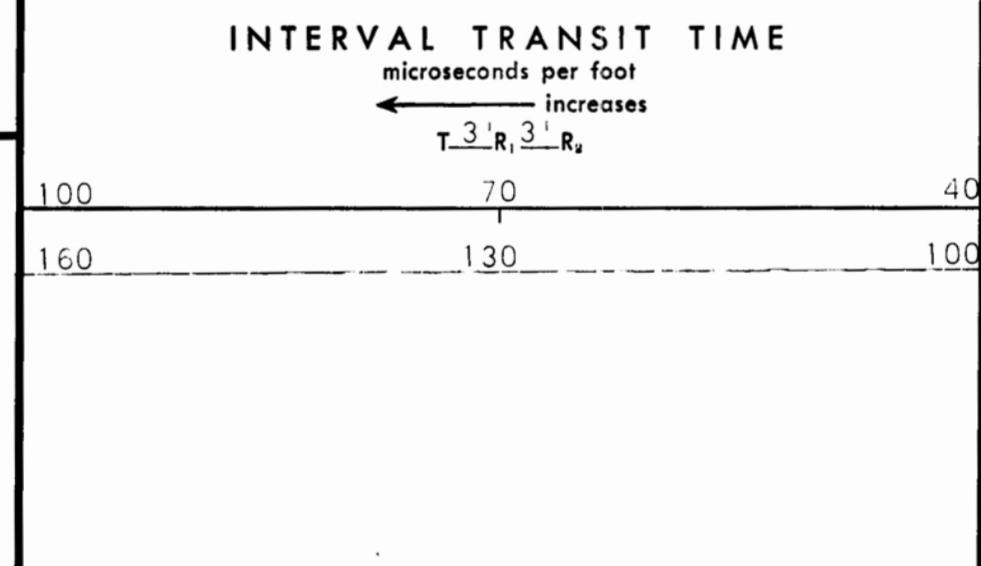
SCHLUMBERGER

SONIC LOG

SCHLUMBERGER WELL SURVEYING CORPORATION
Houston, Texas

COMPANY	BELCO PETROLEUM CORPORATION	Other Surveys
WELL	FLOY UNIT 1	LL ST
FIELD	WILDCAT	Location of Well
LOCATION	SEC.11-23S-17E	
COUNTY	GRAND	
STATE	UTAH	

LOCATION 1313'NSL-1540'EWL

Elevation: K.B. 4298
D.F.
or G.L. 4286

COUNTY	GRAND, UTAH
FIELD or LOCATION	WILDCAT
WELL	FLOY UNIT 1
COMPANY	BELCO PETROLEUM CORPORATION

RUN No.	ONE
Date	9-12-62
First Reading	9553
Last Reading	150
Feet Measured	9503
Csg. Schlum.	1675
Csg. Driller	1675
Depth Reached	9662
Bottom Driller	9663
Mud Nat.	SALT SAT.
Mud Resist.	SALT SAT.
Dens.	Visc.	11.9 @ 103
Res. BHT	.07 @ 88 °F
	.038 @ 156 °F
pH	6.4 @ °F
Wtr. Loss	5.6 @ °F
Rmf	.042 @ 91 °F CC 30 min
Rmc	@ °F CC 30 min
Bit Size	8 3/4-CSG. TO 8-9025, 8 3/8-9151, 7 7/8-TD
	8 3/4-CSG. TO TD
Casing	8-9025, 8 3/8-9151, 7 7/8-TD
Spacing:	
T3'R3'R TD	To CSG.
T3'R1'R TD	To 9300
T3'R1'R TD	To
Opr. Rig Time	7 HOURS
Truck No.	3501 CORTEZ
Recorded By	CLAYTON
Witness	MR. HUTTON

Log Depths Measured From K.B. 12 Ft. above G.L.

CALIPER 6" — 16"

GAMMA RAY
API UNITS
0 — 160
160 — 320

DEPTHS

INTERVAL TRANSIT TIME
microseconds per foot
increases
$T_{3'R}, {3'R_W}$

100 — 70 — 40
160 — 130 — 100

9400

9500

9600

Big Flat No. 2, Big Flat Field

API No. 43-019-11002
SW1/4NE1/4 section14, T. 26 S., R. 19 E., SLBL&M
Grand County, Utah
P&A

Cored Interval: 7704–7807 ft

Unit 1. 7704–7713.4 ft: dolostone, light-medium gray, "soft" peloidal mudstone, massive to bioturbated with feeding traces, subtidal depositional environment. Two thin, black, low-energy shale partings in upper 1 ft. Some black bitumen staining, splotchy and scattered (resembling a shale). Additional shaly partings between 7707–7708 ft. White anhydrite replacement nodules and fracture fillings between 7708–7709 ft. Limy interval with some bitumen and pyrite concentrations from 7709.2–7710 ft. Additional shaly partings at 7710.6 ft and 7772 ft, otherwise massive.

Contact: sharp.

Unit 2. 7713.4–7718.3 ft: limestone, light gray and light brown-gray, crinoidal/skeletal/peloidal packstone/wackestone, vaguely bedded to massive with some apparent oil stains, cross-cutting saddle dolomite replacement, some linear dissolution and sulfide concentrations, and minor black bitumen.

Contact: gradational.

Unit 3. 7718.3–7722 ft: limestone, light-medium brown and gray-brown, slightly to moderately partially dolomitized crinoid/skeletal/peloid packstone/wackestone, some small brachiopods; oil-stained (?) throughout. Some porosity development due to dissolution and dolomitization; a few secondary anhydrite nodules.

Contact: sharp.

Unit 4. 7720±–7784.4 ft±: limestone, generally white, predominantly crinoidal grainstone, generally well-sorted with variable grain size of columnals, rugose corals at 7761.5 ft, massive to medium bedded with medium to low amplitude stylolites at bed boundaries. Early, light brown chert nodules (diameter up to 4–6 in.) at 7744 and 7734 ft. Two forms of breccia and dissolution are most prominent: (1) karst with infilling by green shale and by pink feldspathic sands, and (2) hydrothermal dolomite overprint; lowest karst cavity fill with shale at ~7778 ft.

Contact: sharp.

Unit 5. 7784.4±–7786.5 ft±: calcite and anhydrite as cave filling or replacement, bedded to mottled.

Contact: gradational.

Unit 6. 7786.5–7807 ft (base of core): limestone, white, crinoidal grainstone as in Unit 4.

McCULLOUGH
TOOL COMPANY
RADIATION LOG

R-3593

|		
Location of Well	**COMPANY** THE PURE OIL COMPANY	
	WELL BIG FLAT #2	
	FIELD BIG FLAT	
	COUNTY GRAND **STATE** UTAH	
	LOCATION SECTION 14 - 26S - 19E	
	SW of NE	

COMPANY THE PURE OIL CO.
WELL BIG FLAT #2
FIELD BIG FLAT
COUNTY GRAND STATE UTAH
LOCATION SEC. 14 - 26S - 19E
SW of NE

Log Meas. From	KELLY BUSHING	Elev. 6114'
Drlg. Meas. From	KELLY BUSHING	Elev. 6114'
Perm. Datum	GROUND LEVEL	Elev. 6103'

Rec. Trk. No. 955	Trk. No. 1453	Trk. Oper. COX	Log Ticket No. 68343
Date	7-9-58	Maximum Recorded Temp.	
Total Depth (Driller)	6143'	Effective Depth (McCullough)	6143'
Type of Fluid in Hole	MUD	Fluid Level	FULL
O.D. of Instrument	3½"	Length of Device—Overall	11'
Neutron Source # 003-004-012-166-193-232-312		Spacing 19½" Setting 3.5 CU	
Recorded By	MANNING	Witnessed By MR. MERRELL	

Type of Log	GAMMA RAY	GAMMA RAY	NEUTRON	NEUTRON	NEUTRON
Run No.	2 (2")	1 (5")	2 (2")	2(2")	1 (5")
Top of Logged Interval	0'	4200'	0'	4160'	4200'
Bottom of Logged Interval	6135'	6135'	4160'	6141'	6141'
Time Constant and Instrument Setting	G-3 TC-3.25SEC D-200---R-4		O3 TC6.75S D-185 R-5	G-3 TC-3SEC D-185---R-6	
Logging Speed Ft./Min.	60'	28'	60'	60'	28'
Statistical Variation					
Sensitivity	2.7 MICRO-ROENTGENS/HR./IN.	2.7	150 COUNTS /SEC./IN.	300 COUNTS PER SEC. PER IN.	

GAMMA ⟶
RADIATION INCREASE

NEUTRON ⟶
RADIATION INCREASE

MICRO-ROENTGENS/HR.

2.7   5.4   8.1   10.8

COUNTS/SEC.

0   300   600   900   1200

7700
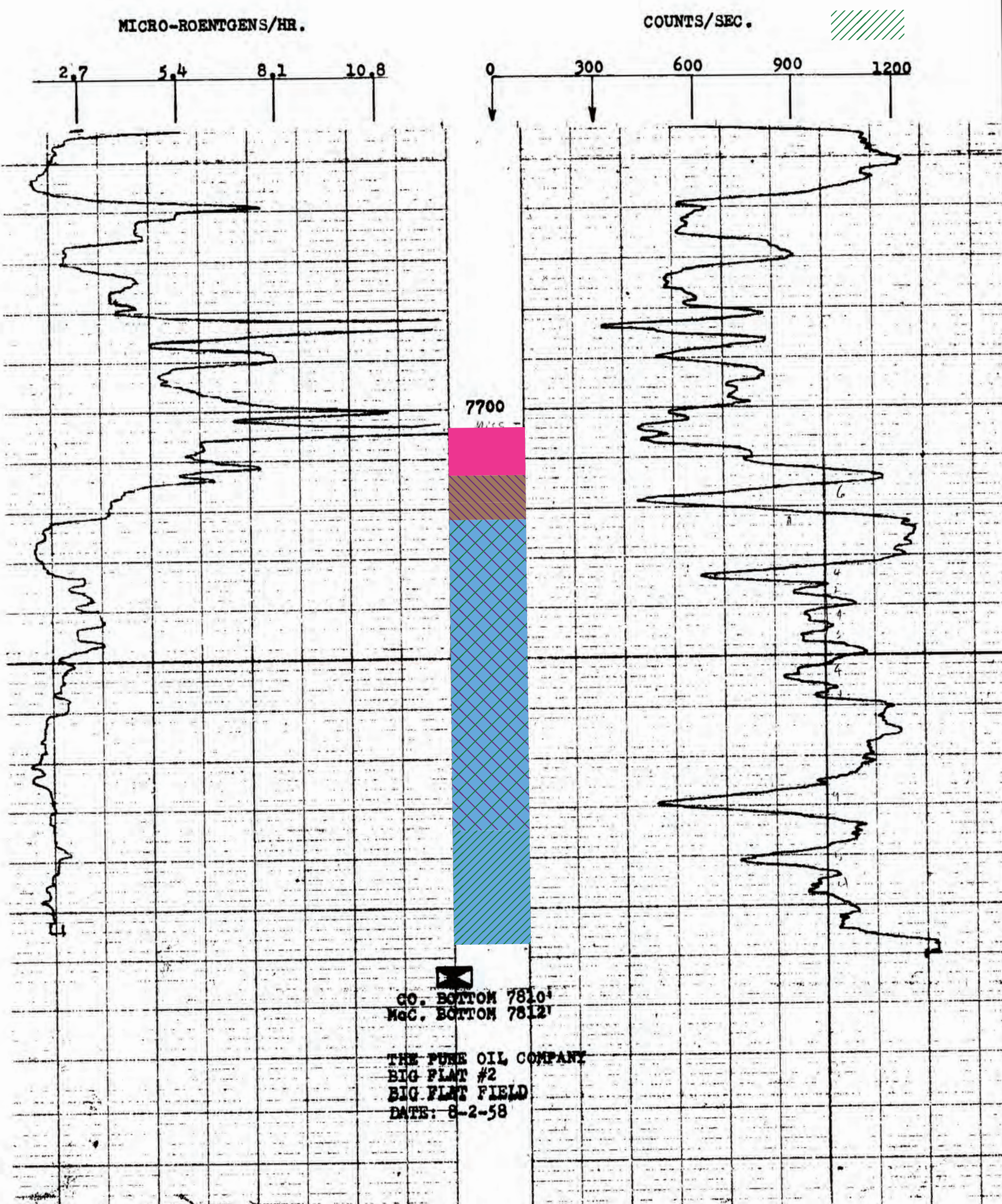
GO. BOTTOM 7810'
McC. BOTTOM 7812'

THE PURE OIL COMPANY
BIG FLAT #2
BIG FLAT FIELD
DATE: 8-2-58

Big Flat Unit No. 3, Big Flat Field

API No. 43-019-15778
NE1/4NE1/4 section 23, T. 26 S., R. 19 E., SLBL&M
Grand County, Utah
P&A

Core Interval: 7615–7794 ft

Unit 1. 7615–7621 ft±: dolostone, slightly limy, peloidal wackestone/packstone/mudstone, bedded to laminated with brecciated karst overprint; some clasts intensely fractured with bitumen plugging.

Contact: sharp.

Unit 2. 7621–7627 ft±: limestone, white to light gray, peloidal/skeletal packstone/grainstone with minor porosity, brecciation due to karsting, moderate hydrothermal overprint, and bitumen-lined fractures.

Contact: sharp.

Unit 3. 7627–7651 ft: limestone, white to black, oolitic grainstone with significant preserved interparticle porosity (2–8%?), salt- and pepper-colored appearance due to bitumen, mild to moderate hydrothermal etching and fracturing; no significant karst overprint.

Contact: sharp.

Unit 4. 7651–7657 ft: limestone, white to cream-colored, "soft" peloidal mudstone/wackestone with cryptalgal laminae, no visible porosity; minor hydrothermal alteration and bitumen.
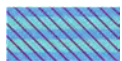
Contact: sharp.

Unit 5. 7657–7663 ft: limestone, white and black ("salt and pepper"), mixed (50/50) oolitic/crinoidal grainstone with modest interparticle porosity and patchy syntaxial overgrowths; vertical fractures and pores lined with bitumen.

Contact: sharp.

Unit 6. 7663-7667 ft: limestone, white and black, peloidal mudstone/wackestone/packstone with one zone of probable karst breccia; some bitumen with thin hydrothermally altered matrix.

Contact: sharp.

Unit 7. 7667–7676 ft: limestone, white and black ("salt and pepper"), oolitic/crinoidal grainstone with minor amounts of probable karst breccia and bitumen coating of hydrothermal leaching; some small scale, medium-angle cross-stratification.

Contact: sharp.

Unit 8. 7676–7684 ft: limestone, medium-dark gray and minor white, peloidal/skeletal grainstone/packstone, very heavy hydrothermal alteration and leaching with only small patches of unaltered rock; heavy bitumen coating of micro porosity.

Contact: sharp.

Unit 9. 7684–7705 ft: limestone, white, to 7699 ft, then dolostone, medium brown to medium brown-gray, crinoidal grainstone/packstone with increase of bryozoan fragments in lower 5 ft, generally low permeability, except crinoidal moldic porosity and bryozoan intraparticle porosity in dolostone; minor karst cracks filled with gray-green clays. Minor hydrothermal alteration and bitumen.

Contact: sharp.

Unit 10. 7705–7707.5 ft: dolostone, medium brown, peloid mudstone/wackstone, intensely fractured with pyrobitumen linings; small patches of hydrothermal etching of low permeability matrix with bitumen.

Contact: gradational.

Unit 11. 7707.5–7715 ft: limy dolostone, light-medium brown, skeletal/peloidal packstone/wackestone with patches of low permeability rock alternating with moldic porosity; abundant fractures lined with bitumen and hydrothermal etching and bitumen coatings.

Contact: gradational.

Unit 12. 7715–7754 ft±: limestone, white and black ("salt and pepper"), crinoidal/bryozoan grainstone with rugose corals, fair to good intrapartical and moldic porosity lined with bitumen; massive to thick bedded with abundant fractures also lined with bitumen.

Contact: gradational.

Unit 13. 7754–7764 ft: limestone, white with patches of black and white ("salt and pepper"), peloidal/skeletal packstone/grainstone, scattered intraparticle porosity and limited moldic porosity with bitumen-coating of pores; fractures also lined with bitumen.

Contact: gradational.

Unit 14. 7764–7788 ft: limestone, white and "salt and pepper" appearance due to bitumen lining porosity, crinoidal/skeletal grainstone. good visible moldic and interparticle matrix porosity, 8–12%.

Contact: gradational.

Unit 15. 7788–7794 ft (base of core): limestone, white, very similar to Unit 13 (7754–7764 ft), peloidal/skeletal crinoidal packstone/wackestone, extensive hydrothermal leaching, sometimes patchy, with fractures lined with bitumen.

McCullough

SCINTILLOMETER

NUCLEAR

GAMMA RAY-NEUTRON LOG

FILING NO. R-5419

COMPANY	THE PURE OIL COMPANY
WELL	BIG FLAT UNIT # 3
FIELD	BIG FLAT
COUNTY	GRAND	STATE	UTAH

LOCATION:

SEC. 23 TWP. 26 S. RGE. 19 E.

PERMANENT DATUM	GROUND LEVEL	ELEV. 5997'
LOG MEASURED FROM K.B., 13 FT. ABOVE PERMANENT DATUM	
DRILLING MEASURED FROM	K.B.

ELEVATIONS:
KB. 6010'
DF. 6009'
GL. 5997'

OTHER SERVICES:

DATE	9-10-60
RUN NO.	
TYPE LOG	G. — N.
DEPTH—DRILLER	8600'
DEPTH—LOGGER	8605'
BOTTOM LOGGED INTERVAL	8604'
TOP LOGGED INTERVAL	4289'
TYPE FLUID IN HOLE	WATER
SALINITY PPM CL.	
DENSITY LB/GAL.	
LEVEL	FULL
OPR. RIG TIME	
MAX. REC. TEMP. DEG. F	
RECORDED BY	MR. FUGLAAR
WITNESSED BY	MR. RASMUSSEN

BORE HOLE RECORD

RUN NO.	BIT	SIZE	FROM	TO
1				
2				
3	7-3/4"	4289'	7298'	
4	5-7/8"	7298'	8600'	

CASING RECORD

SIZE	WGT.	FROM	TO
13-3/8"			
8-5/8"	32-24#	0'	4289'
7"	32-29#	0'	7298'
OPEN HOLE		0'	7298'

GAMMA

MICRO-ROENTGENS/HR./IN.

0   2.72   5.44

NEUTRON

COUNTS/SEC./IN.

0   300   600   900   1200

7600

7700

7798'
7800'

7"
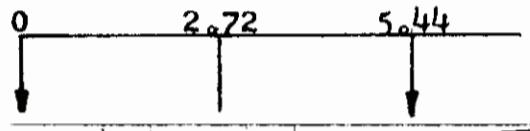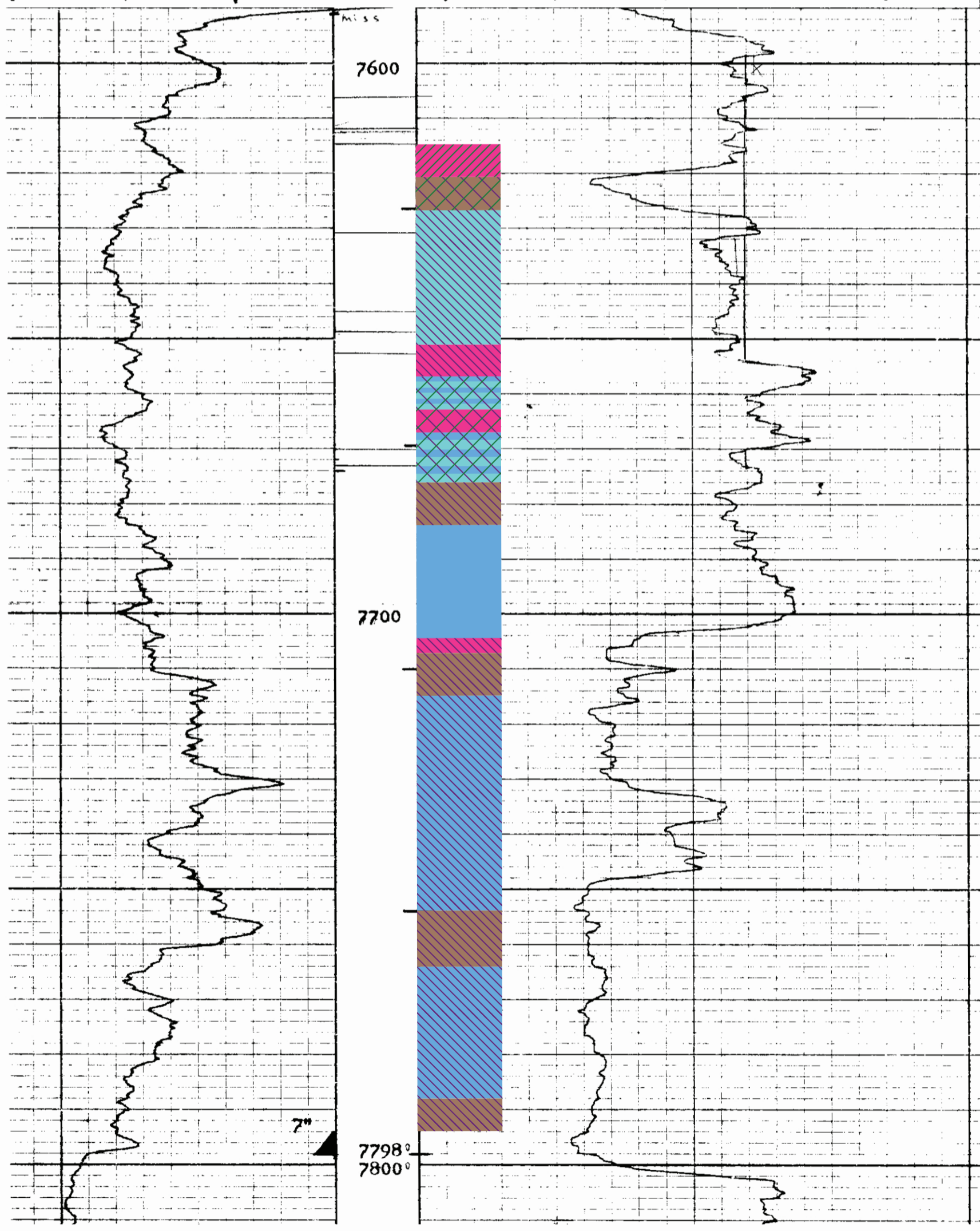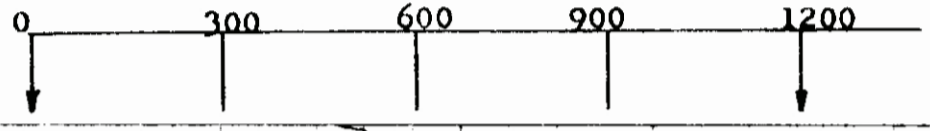
Long Canyon Unit No. 1, Long Canyon Field

API No. 43-019-15925
SE1/4NW1/4 section 9, T. 26 S., R. 20 E., SLBL&M
Grand County, Utah
Producing

Cored Interval: 9696–9761 ft

Unit 1. 7696–7703 ft.: limestone, light gray, oolitic grainstone with no visible porosity, all porosity lost by pressure solution with very little early cement; massive and bioturbated throughout with abundant vertical and horizontal stylolites.

Contact: sharp.

Unit 2. 7703–7710 ft: limestone, white to light gray, peloidal/skeletal grainstone/packstone, bioturbated with distinct *Callianassa*-style burrows, mostly horizontal low to moderate amplitude stylolites; no visible porosity.

Contact: sharp.

Unit 3. 7710–7716 ft: limestone, light gray, oolitic grainstone with no visible porosity, all porosity lost by pressure solution with very little early cement; massive and bioturbated throughout with abundant vertical and horizontal stylolites.

Contact: sharp.

Unit 4. 7716–7724 ft: limestone, white to light gray, skeletal/peloidal grainstone/packstone, bioturbated with distinct *Callianassa*-style burrows, mostly horizontal low to moderate amplitude stylolites; no visible porosity. Small rugose coral at ~7717 ft.

Contact: sharp.

Unit 5. 7724–~7735 ft±: dolostone, white to light brown, oolitic/hard peloid grainstone/packstone with pressure solution welding of grains, cross-cutting hydrothermal dolomite, zebra banding, and rimmed microstructures (railroad track-like fractures). Some visible intercrystalline, channel, and vug porosity types with light bitumen coatings.

Contact: gradational.

Unit 6. ~7735–7744 ft±: dolostone, light brown to medium gray-brown, peloidal/skeletal packstone/wackestone, alternating bedding and bioturbation; no visible porosity except in patches hydrothermal dolomite and bitumen overprints.

Contact: sharp.

Unit 7. 7744±–7746 ft: dolostone, white, oolitic/peloidal grainstone, thin bedded and beach-style, low-angle cross-stratification; zebra bedding and hydrothermal dolomite overprint.

Contact: gradational.

Unit 8. 7746–7758 ft: dolostone, medium brown, peloidal/skeletal grainstone/packstone with benthic forams and peloids, bedded with current laminations; no visible matrix porosity.

Contact: gradational.

Unit 9. 7758–7761 ft (base of core): dolostone, dark brown to dark gray-brown, peloidal/coated grains packstone/wackestone, thin-bedded with minor overprints of dissolution and bitumen; some vertical fractures, open and propped with hydrothermal alteration.

Note: no evidence of karsting in cored interval.

COMPANY	SOUTHERN NATURAL GAS COMPANY
WELL	LONG CANYON UNIT #1
FIELD	WILDCAT
COUNTY	GRAND STATE UTAH

COUNTY GRAND, UTAH
FIELD or
LOCATION WILDCAT
WELL LONG CANYON UNIT #1
COMPANY SOUTHERN NATURAL GAS COMPANY

Location: 2339' FNL-2473' FWL

Sec. 9   Twp. 26S   Rge. 20E

Other Services: I, SL, IES

Permanent Datum: GL   ; Elev.: 5780
Log Measured From   KB   ; Elev.: K.B. 5794
Drilling Measured From KB , 14 Ft. Above Perm. Datum   D.F.
                                                          G.L. 5780

Date	7-4-62	8-17-62	8-24-62
Run No.	ONE	THREE	FOUR
Type Log	GRN	GRN	GRN
Depth—Driller	4504	7888	8132
Depth—Logger	4411	7889	8135
Bottom logged interval	4410	7888	8134
Top logged interval	100	7504	7888
Type fluid in hole	AIR & WTR.	LOW SOLIDS	LOW SOLIDS
Salinity, PPM Cl.	NA	14,200	
Density	NA	8.8	9.0
Level	3860	FULL	FULL
Max rec. temp., deg F.	NA	118	120
Operating rig time	3 HOURS	1½ HRS.	1½ HRS.
Recorded by	CLAYTON	CLAYTON	CLAYTON
Witnessed by	MR. BUDD	MR. SOMERVILLE - MR. BUDD	

BORE-HOLE RECORD

RUN				
No.	Bit	From	To	
1	13 3/4	261	4504	
2	13 1/8	7500	7892	
3	8 1/8	7500	7892	
4	8 1/8	7500	8132	

CASING RECORD

No.	Size	Wgt.	From	To
1	16"	65	SURF.	261
2	7 5/8	39	4507	7500

THIS HEADING AND LOG CONFORMS TO API RP 33

FOLD HERE

GAMMA RAY
API UNITS

GAMMA RAY ZERO _____ 0 DIV. TO LEFT
OF THIS LINE ⟶

0	160
160	320

DEPTHS

7700

7800

NEUTRON

NEUTRON ZERO _____ 6 DIV. TO LEFT OF THIS LINE ⟶

720   1920   3120
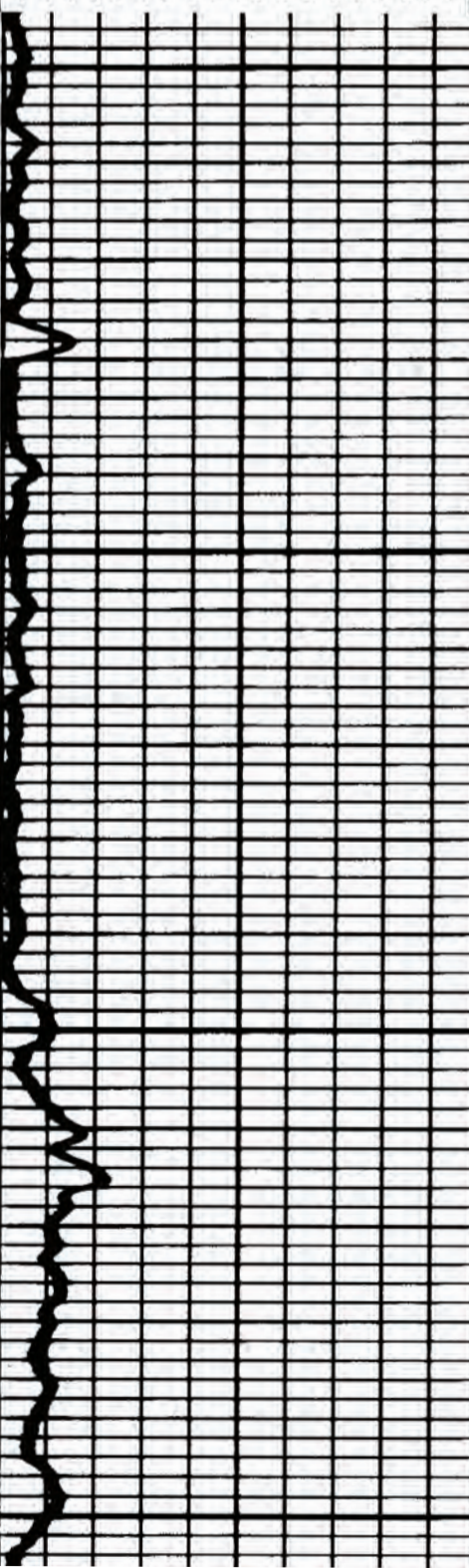
Taylor Creek Unit No. 2

API No. 43-019-31157
NW1/4SE1/4 section 12, T. 26 S., R. 25 E., SLBL&M
Grand County, Utah
P&A

Cored Interval: 16,405–16,490 ft (lower part of Leadville Limestone)

Unit 1. 16,405–16,412 ft: dolostone, light-medium gray, crinoidal/skeletal/"soft" peloidal wackestone/packstone, massive and bioturbated.

Contact: sharp.

Unit 2. 16,412–16,415.5 ft: limestone, white to light gray, crinoidal grainstone/packstone, medium to coarse grained, well-cemented with syntaxial overgrowths; occasional moderate amplitude stylolites.

Contact: gradational.

Unit 3. 16,415.5–16,429 ft: dolostone, light-medium gray, skeletal/peloidal wackestone/packstone with occasional breccia, rip-up clasts, and bioturbation.

Contact: sharp.

Unit 4. 16,429–16,442.4 ft: dolostone, white, crinoidal/skeletal grainstone/packstone, internally bedded to bioturbated; upper contact marked by medium scale cross-bedding and marine hard ground of encrusting sponge.

Contact: sharp.

Unit 5. 16,442.4–16,456.5 ft: dolostone, medium gray, skeletal/peloidal packstone/wackestone. no visible porosity, massive to bioturbated.

Contact: sharp.

Unit 6. 16,456.5–16,475.6 ft: dolostone, white to light gray, crinoidal/skeletal grainstone/packstone, generally massive to medium scale cross-bedding; both horizontal to vertical stylolites. No visible porosity.

Contact: stylolitic.

Unit 7. 16,475.6–16,490 ft (base of core): dolostone, medium-dark gray, skeletal/peloidal grainstone/packstone, cross-bedded with rip-up breccia clasts and oncolites; some structural deformation and some fractures filled with white anhydrite.

CSU

COMPENSATED NEUTRON FORMATION DENSITY

COMPANY: AMSCO PRODUCTION COMPANY
WELL: TAYLOR CREEK #1
FIELD: WILDCAT
COUNTY: GRAND
STATE: UTAH
NATION: USA
LOCATION:

SEC: 12

DATE: 29 JUN 90
API NO: 1-2-5

	TENS(LB..)	10000.	0.0
		DPHI	2.71
CALI(IN..)	.30000		-.1000
4.0000	14.000	NPHI	LIME
GR (GAPI)	.30000		-.1000
0.0	200.00		

16400

16500
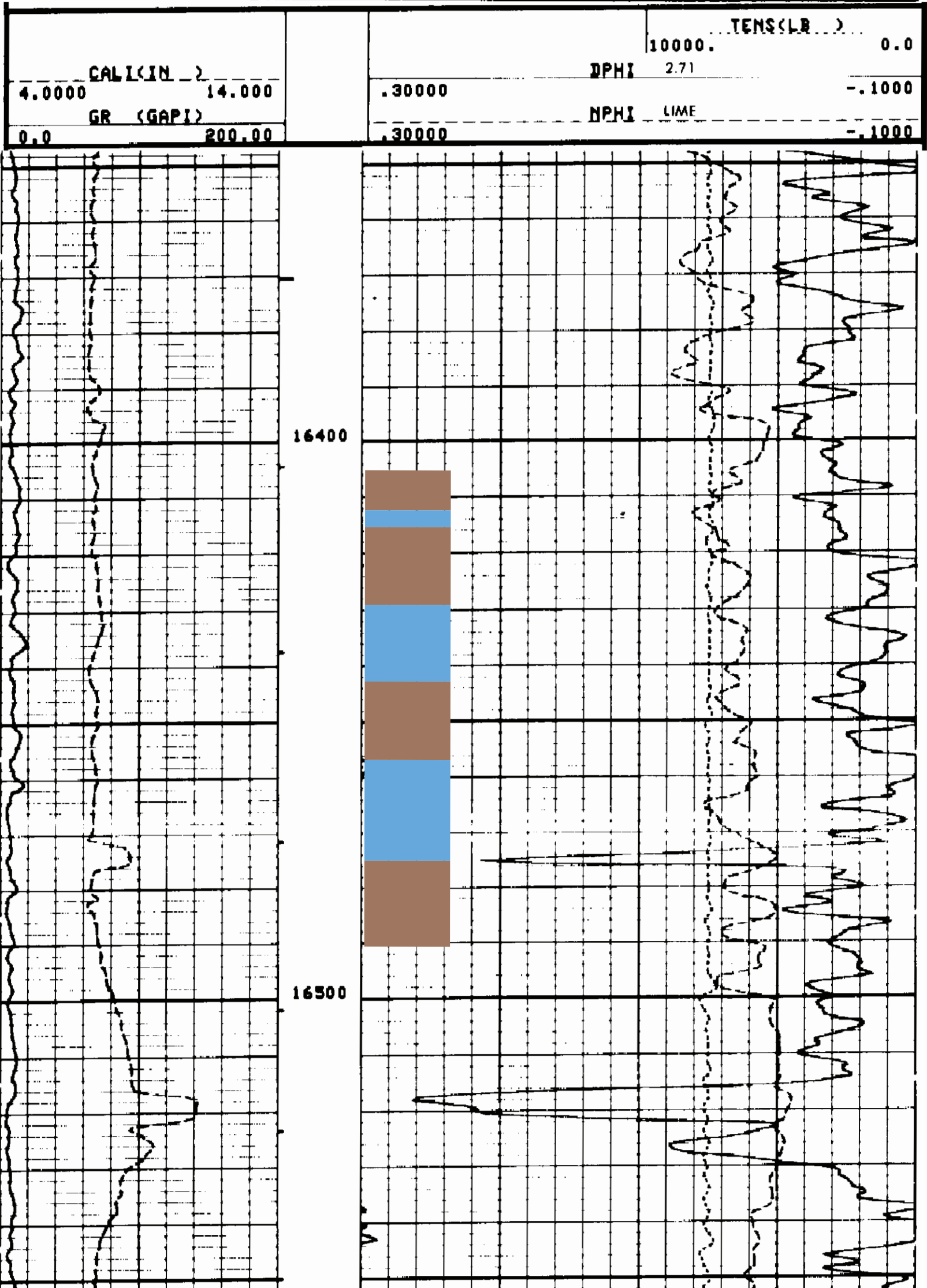
Hatch Mesa No. 1

API No. 43-037-10982
NE1/4SW1/4 section 22, T. 28 S., R. 21 E., SLBL&M
San Juan County, Utah
P&A

Core Chips: 7751–7783 ft

Unit 1. 7751–7760 ft: dolostone, white to light gray to light-medium gray, originally "hard" peloid/oolitic grainstone overprinted with large saddle dolomite and small vugs but no bitumen; some moldic porosity. Patches of coarse, sucrosic ("sugary") dolomite. Some possible bitumen in finer dolomite with porosity at 7754 ft; possible crinoids at 7755 ft. Vugs with well-terminated quartz crystals at 7757 ft.

Unit 2. 7760–7767 ft: limey dolostone, white to light gray, "soft" peloid/microfossil wackestone/packstone; no visible porosity.

Unit 3. 7767–7770 ft: limy dolostone, white to light gray, "soft" peloid/microfossil wackestone/packstone; no visible porosity. Large mass of white fibrous anhydrite at 7768 ft, large masses of white anhydrite at 7769 ft, and anhydritic dolomite at 7670 ft.

Unit 4. 7770–7772 ft: dolostone, medium gray-brown, coated grain/oolitic/skeletal/crinoidal grainstone, with massive anhydrite replacement.

Unit 5. 7772–7778 ft: slightly limy dolostone, light-medium gray, "soft" peloidal/skeletal wackestone/packstone with no porosity, small nodules of anhydrite and abundant stylolites.

Unit 6. 7778–7781 ft: dolostone, light brown, "soft" peloidal mudstone with no fossils.

Unit 7. 7781–7783 ft (end of core chips): dolomitic limestone; white, crinoidal/peloidal/coated grain grainstone with good molding porosity.

Note: the nature of the contacts between units could not accurately be determined because the samples were core chips.

SCHLUMBERGER

GAMMA RAY - NEUTRON

SCHLUMBERGER WELL SURVEYING CORPORATION

Houston, Texas

COMPANY RICHFIELD OIL CORPORATION

COUNTY	SAN JUAN, UTAH
FIELD or LOCATION	WILDCAT
WELL	HATCH MESA 1
COMPANY	RICHFIELD OIL CORPORATION

WELL	HATCH MESA 1
FIELD	WILDCAT
COUNTY	SAN JUAN	**STATE** UTAH

Location: 2200'FWL-1430'FSL

Sec. 22 Twp. 28S Rge. 21E

Other Services:
LL, SL, CDM

Permanent Datum:	GL	; Elev.: 5986
Log Measured From:	KB	Elev.: K.B. 5998
Drilling Measured From KB	, 12 Ft. Above Perm. Datum	D.F.
		G.L. 5986

Date	12-6-61	1-3-61	
Run No.	ONE	TWO	
Type Log	GRN	GRN	
Depth—Driller	7477	8518	
Depth—Logger	7481	8518	
Bottom logged interval	7478	8517	
Top logged interval	100	7478	
Type fluid in hole	SALT BASE	SALT BASE	
Salinity, PPM Cl.	115,000	150,000	
Density	10.0	10.5	
Level	FULL	FULL	
Max. rec. temp., deg. F.	124	115	
Operating rig time	6 HOURS	1 HOURS	
Recorded by	HANDLEY	CLAYTON	
Witnessed by	MR. BRITT	MR. CONRAD	

BORE-HOLE RECORD

No.	Bit	From	To
1	9 7/8	2131	7477
2	9 7/8	7477	7595
3	8 3/4	7595	851

CASING RECORD

RUN	Size	Wgt.	From	To
	10 3/4		SURF.	2191

GAMMA RAY	DEPTHS	NEUTRON
API UNITS		API UNITS

0	160		480	1680	2880
160	320				
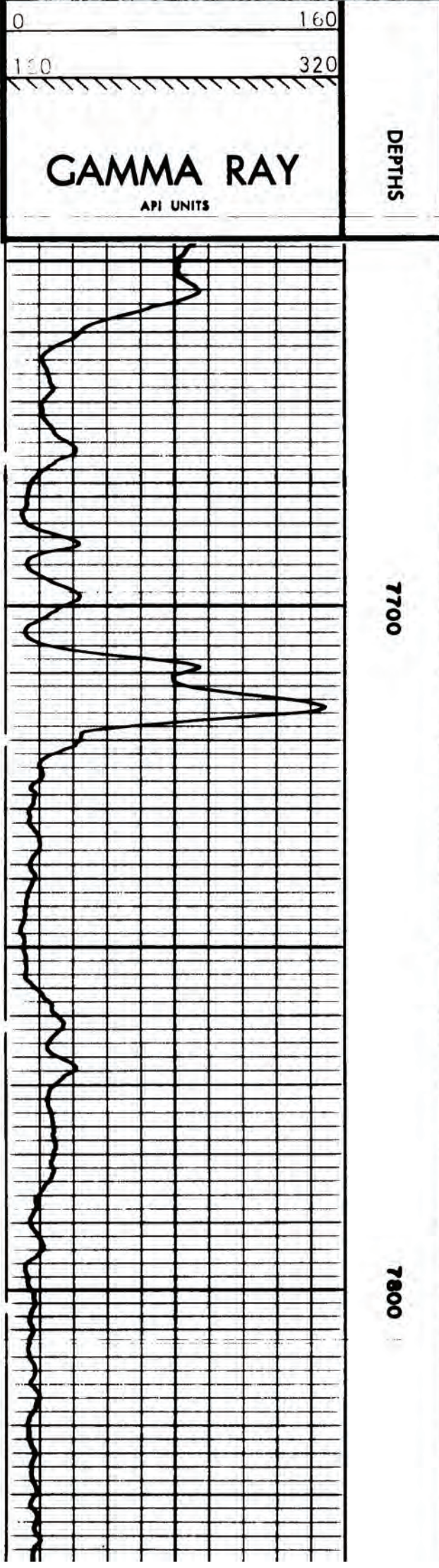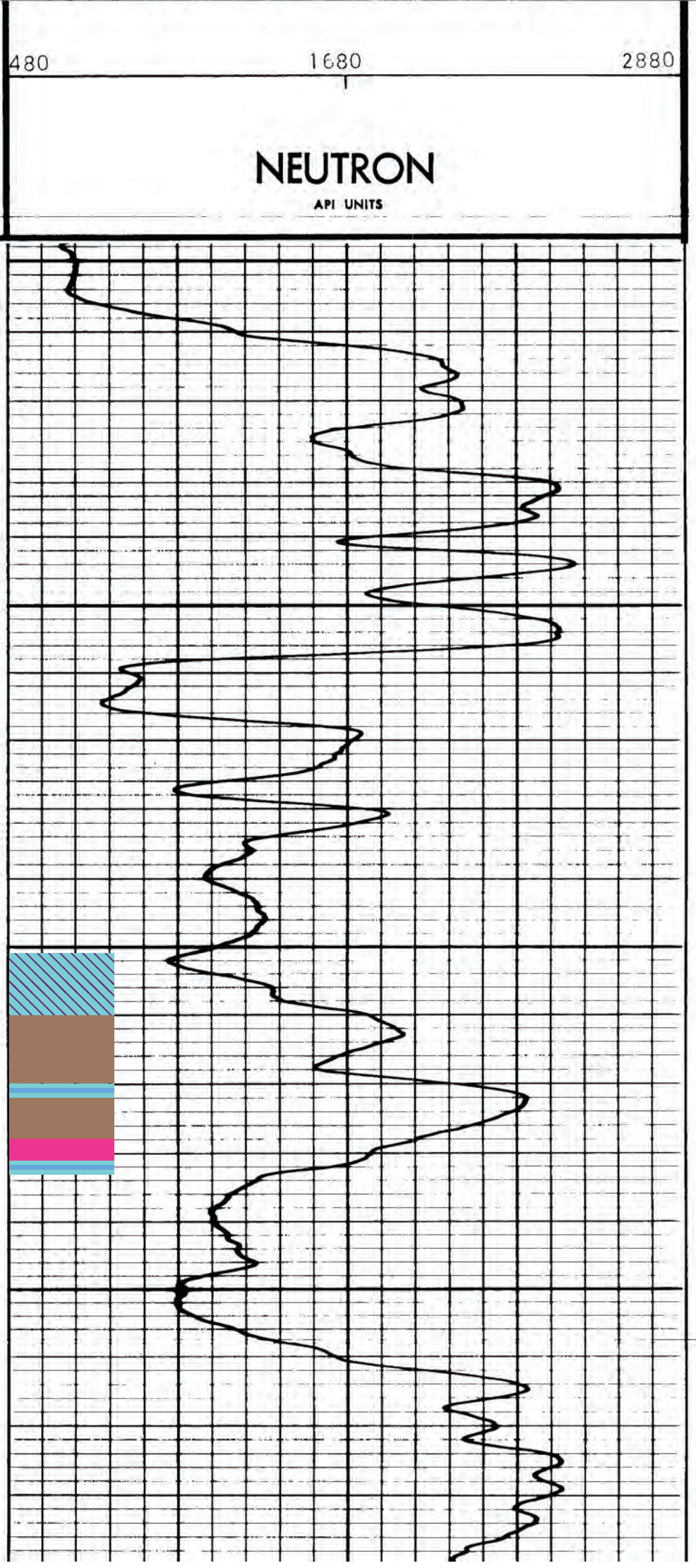
7700

7800
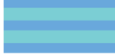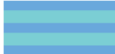
Cataract Canyon No. 1

API No. 43-037-11247
NW1/4SE1/4 section 28, T. 32 S., R. 19 E., SLBL&M
San Juan County, Utah
P&A

Core Chips: 3215–3319 ft

Unit 1. 3215–3225 ft: dolostone, light-medium brown, crinoidal/oolitic/peloidal grainstone with preserved interparticle porosity and small vugs lined with small dolomite rhombs.

Unit 2. 3225–3235 ft: dolostone, medium brown, crinoidal/oolitic/peloidal grainstone with moldic porosity.

Unit 3. 3235–3245 ft: dolostone, medium brown, crinoidal grainstone with moldic porosity and minor intercrystalline porosity; some clear anhydrite filled scattered molds.

Unit 4. 3245–3252 ft: dolostone, medium brown, crinoidal grainstone with moldic porosity and minor intercrystalline porosity; some clear anhydrite filled scattered molds.

Unit 5. 3252–3255 ft: dolostone, medium brown, crinoidal grainstone with moldic porosity and minor intercrystalline porosity; some clear anhydrite filled scattered molds with large amplitude stylolites, minor white anhydrite.

Unit 6. 3255–3259 ft: dolostone, medium brown, crinoidal grainstone with moldic porosity and minor intercrystalline porosity; some clear anhydrite filled scattered molds with large amplitude stylolites, minor white anhydrite.

Unit 7. 3259–3262 ft: dolostone, light medium-brown, crinoidal/skeletal grainstone, no moldic porosity; high-amplitude stylolites.

Unit 8. 3262–3264 ft: dolostone, light medium-brown, crinoidal grainstone with patches of moldic porosity; high-amplitude stylolites.

Unit 9. 3264–3267 ft: dolostone, light medium-brown, crinoidal/skeletal grainstone with brachiopod and bryozoan fragments, low porosity, no molds.

Unit 10. 3267–3275.5 ft: dolostone, light medium-brown, crinoidal grainstone, limited moldic porosity, generally low permeability and massive (cloth bag of large core chunks); stylolites abundant and anhydrite along fractures.

Unit 11. 3275.5–3283 ft: dolostone, light medium-brown, crinoidal grainstone with abundant crinoidal moldic porosity, generally low permeability and massive, stylolites abundant; small patches of white anhydrite.

Unit 12. 3283–3284.5 ft: dolostone, medium brown, peloidal/skeletal packstone/wackestone with patches of coarse dolomite; hydrothermal overprint, but no bitumen.

Unit 13. 3284.5–3288.5 ft: dolostone, medium brown, crinoidal/peloidal/skeletal packstone/grainstone with moldic porosity.

Unit 14. 3288.5–3298 ft: dolostone, medium-dark brown, crinoidal grainstone with moldic porosity; some molds filled with clear anhydrite.

Unit 15. 3298–3309 ft: dolostone, medium-dark brown, crinoidal/skeletal grainstone with large rugose corals, moldic porosity; some molds filled with clear anhydrite.

Unit 16. 3309–3319 ft: dolostone, light-medium brown, crinoidal grainstone with fair intercrystalline porosity and some moldic porosity.

Unit 17. 3319–3323 ft (end of core chips): dolostone, light-medium brown, crinoidal grainstone with fair intercrystalline porosity and some moldic porosity.

Note: the nature of the contacts between units could not accurately be determined because the samples were core chips.

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

Gamma Ray-Neutron

SIMULTANEOUS

COMPANY	THE TEXAS COMPANY
WELL	CATARACT CANYON #1
FIELD	WILDCAT
LOCATION	SEC. 28 32S 19E
	2311/S & 1980/E
COUNTY	SAN JUAN
STATE	UTAH

COUNTY	SAN JUAN
FIELD or LOCATION	WILDCAT
WELL	CATARACT CANYON #1
COMPANY	THE TEXAS COMPANY

Location of Well
L, LLM

Elevation: D.F.:
K.B.: 7126
or G.L.: 7112

FILING No. S-J-R

RUN NO.	ONE				
Date	11-14-56				
Depth Reference	KB				
First Reading	4943				
Last Reading	0000				
Footage Measured	4943				
Max. Depth Reached	4944				
Bottom Driller	4946				
Maximum Temp. F.	110				
Mud. Nature	SALT BASE				
" Density	11.0				
" Viscosity	65				
Resistivity	.4 @	66 °F.	@	°F.
Casing Size & 1	10 3/4"	to 540	to	to
Weight 2	—	to —	to	to
Open Hole 1	8 3/4"	to TD	to	to
2	—	to —	to	to
Fluid Level	FULL				
Recording Speed (ft/hr)	3000				
Sensitivity Tap	GR)500	N) 3	300	
Time Constant	3				
Panel	TYPE C				
Opr. Rig Time	6 HRS				
Sonde Size & Type	3 5/8 B				
Truck No.	1523 GJ				
Observer	RUSEN				

GAMMA RAY MICROGRAMS RA-EQ/TON	FR 4943	NEUTRON STANDARD COUNTS/SECOND
GAMMA RAY ZERO 2 DIV. TO LEFT OF THIS LINE		NEUTRON ZERO 10 DIV. TO LEFT OF THIS LINE
5 30		150 300 45

3200

3300
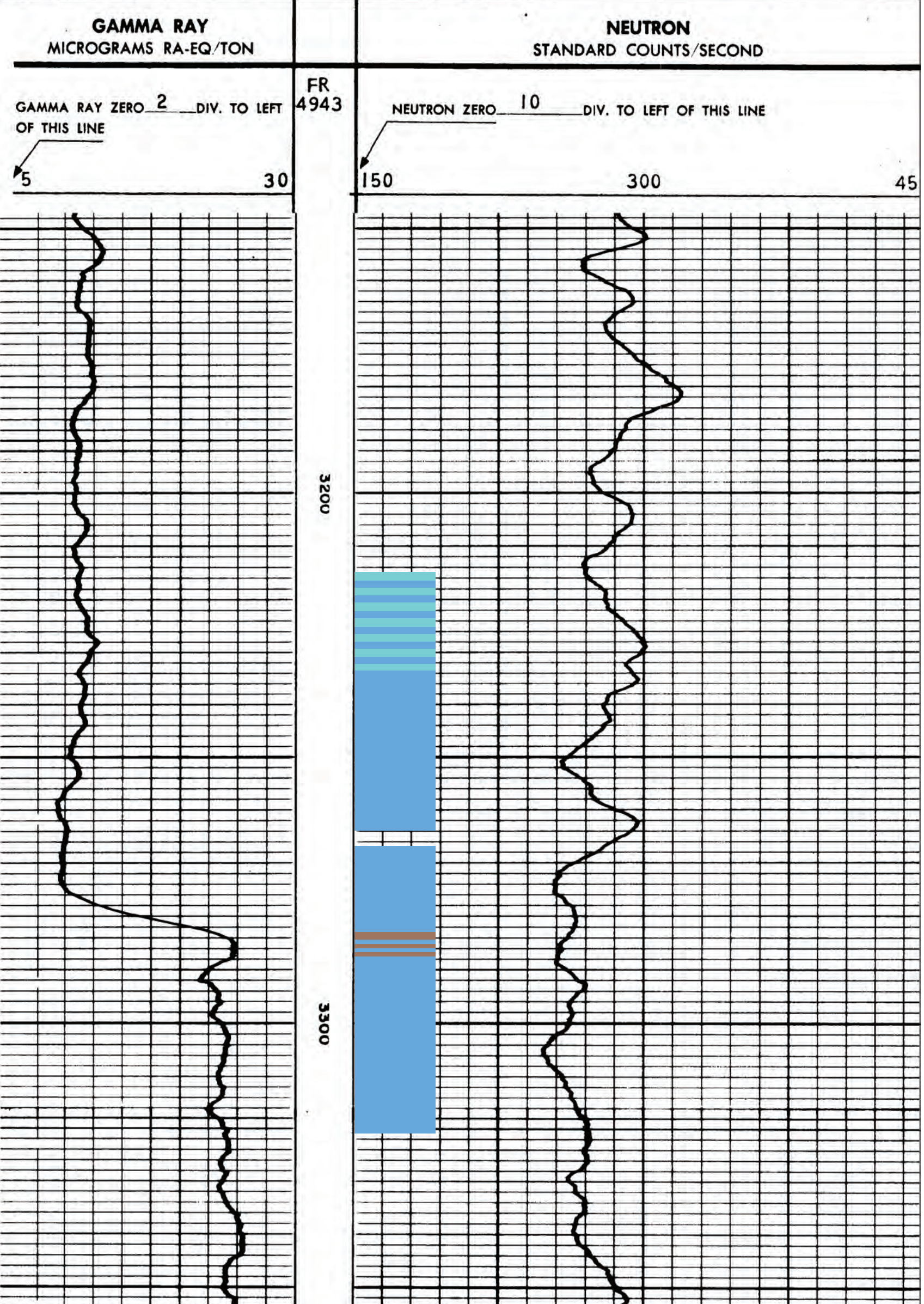
Big Indian USA No. 1, Big Indian Field

API No. 43-037-16219
SE1/4NE1/4 section 33, T. 29 S., R. 24 E., SLBL&M
San Juan County, Utah
Shut-In

Core Interval: 9869–10,191 ft

Unit 1. 9869–9892 ft±: limestone, white to very light gray, mostly crinoidal grainstone, low permeability with syntaxial overgrowths, massive to faintly bedded, regularly spaced medium amplitude stylolites, possible oil staining in dolomites; two thin, partially dolomitized intervals near base (<1 ft each) with small vugs. Top of perforations reported at 9886 ft.

Contact: sharp.

Unit 2. 9892–9900 ft±: dolostone, light brown, crinoidal grainstone, high intercrystalline porosity; probably oil stained.

Contact: sharp.

Unit 3. 9900–9907.5 ft: limestone, white, crinoidal grainstone, low- to medium-angle cross-bedding, low permeability with syntaxial overgrowths.

Contact: sharp.

Unit 4. 9907.5–9914 ft (9010–9912 ft missing): dolostone, light brown, peloidal/crinoidal/skeletal, packstone/wackestone, some intercrystalline porosity and crinoidal moldic porosity; possible oil stained.

Contact: sharp.

Unit 5. 9914–9951 ft: limestone, white, crinoidal grainstone with occasional rugose corals and other large fossils, very permeability with syntaxial overgrowths; well-bedded with regularly spaced, medium-amplitude stylolites. No karsting or hydrothermal overprint.

9951–10,021 ft: missing core

Unit 6. 10,021–10,028 ft±: dolostone, black and dark gray, crinoidal grainstone/packstone with possible mixture of ooids and peloids, moldic and intercrystalline porosity; extensive bitumen impregnation and micro porosity (hydrothermal overprint). Breccia at the top (1 ft).

Contact: sharp.

Unit 7. 10,028±–10,059 ft: limestone, light-medium gray, oolitic grainstone with scattered peloids, thin to medium bedded including low-angle, beach-type cross-stratification near base (10,057–10,059 ft), low permeabilty due to complete cementation and pressure-solution grain contacts; vertical fractures common, filled with black bitumen.

Contact: sharp.

Unit 8. 10,059–10,063.5 ft±: limestone, medium-dark gray, peloidal packstone/wackestone with rip-up clasts and brecciation, some partial dolomitization with bitumen impregnation and possible hydrothermal overprint.

Contact: sharp.

Unit 9. 10,063.5±–10,065 ft: limestone, light gray, oolitic grainstone, cross-bedded, low permeability.

Contact: sharp.

Unit 10. 10,065–10,072 ft±: dolostone, medium brown to black, originally a peloidal mudstone/wackestone with occasional possible cryptalgal laminae; hydrothermally altered and brecciated with extensive black pyrobitumen micropore coatings.

Contact: sharp.

Unit 11. 10,072±–10,100 ft± (10,082–10,095 ft missing): dolostone, medium brown-gray to dark gray, oolitic grainstone with excellent moldic and intercrystalline porosity, abundant low- to medium-angle cross-stratification; some brecciation and hydrothermal overprint with bitumen impregnation. Two thin white oolitic limestone intervals (10,094–10,095 ft, 10,098–10,099 ft).

10,100±–10,109 ft: missing core

Unit 12. 10,109–10,120 ft: dolostone and limestone, medium-dark gray, peloidal wackestone/packstone and grainstone with some horizontal laminations alternating with bioturbated(?) intervals; some black pyrobitumen impregnation.

Contact: gradational.

Unit 13. 10,020–10,128 ft: limestone, white to light-medium gray, oolitic grainstone with occasional rip-up clasts, well bedded, thin to medium scale with abundant low- to medium-angle cross-stratification; some beach/foreshore intervals. No visible porosity, but black bitumen-lined fractures.

Contact: sharp.

Unit 14. 10,128–10,135 ft: dolostone (mostly), medium brown and medium gray-brown, "soft" peloid wackestone/packstone with some limy intervals, massive to bedded with some laminations; mild hydrothermal overprint with bitumen-lined fractures. Some white anhydrite-filled fractures.

10,135–10,148 ft: missing core

Unit 15. 10,148–10,150 ft: limestone, white, coated grain/oolitic/"hard" peloid grainstone, well cemented (low permeability) with clusters of high-amplitude stylolites and bitumen-lined fractures.

10,150-10,181 ft: missing core

Unit 16. 10,181–10,184 ft: dolostone, medium brown and black, peloidal wackestone/packstone/grainstone(?), mostly "soft" peloids and minor ooids; significant hydrothermal overprint and brecciation. Extensive bitumen infilling.

Contact: sharp.

Unit 17. 10,184–10,191ft (base of core): limestone, white to light gray, peloidal/skeletal packstone/grainstone, vague thin bedding to wavy bedding with low amplitude stylolites; no visible porosity.

SCHLUMBERGER

GAMMA RAY - NEUTRON

SCHLUMBERGER WELL SURVEYING CORPORATION
Houston, Texas

COMPANY	PURE OIL COMPANY		
FIELD or			
WELL	BIG INDIAN USA-1		
COUNTY	SAN JUAN, UTAH		

WELL	BIG INDIAN USA-1
FIELD	WILDCAT
COUNTY	SAN JUAN	STATE	UTAH

Location: C-SE-NE

Sec. 33 Twp. 29S Rge. 24E

Other Services:
SGR, LL

Permanent Datum:	KB	; Elev., 7126
Log Measured From:	KB	
Drilling Measured From	KB	Ft. Above Perm. Datum

Date	8-26-61
Run No.	ONE
Type Log	GRN
Depth—Driller	11,143
Depth—Logger	10,476
Bottom logged interval	10,475
Top logged interval	9,700
Type fluid in hole	775
Salinity, PPM Cl.	—
Density	9.5
Level	FULL
Max. rec. temp., deg. F.	148
Operating rig time	3 HOURS
Recorded by	ED M1XA
Witnessed by	MR. HARVEY MERRELL

Elev.: K.B. 7126
D.F. 7124
G.I. 7114

RUN	BIT	BORE-HOLE RECORD			CASING RECORD	
No.	No.	From	To	Size	From	To
1	6"	11,143	10,476	7"		
				29=	Gl	10,489

GAMMA RAY
API UNITS

0 —————— 120
120 —————— 240

DEPTHS

NEUTRON
API UNITS

320 ———— 1120 ———— 1920

CORRECTED COLLARS   UNCORRECTED COLLARS

9800

9900

10000

10100

10200
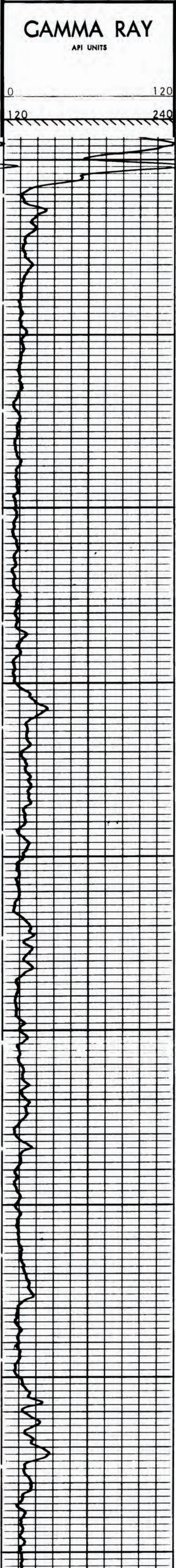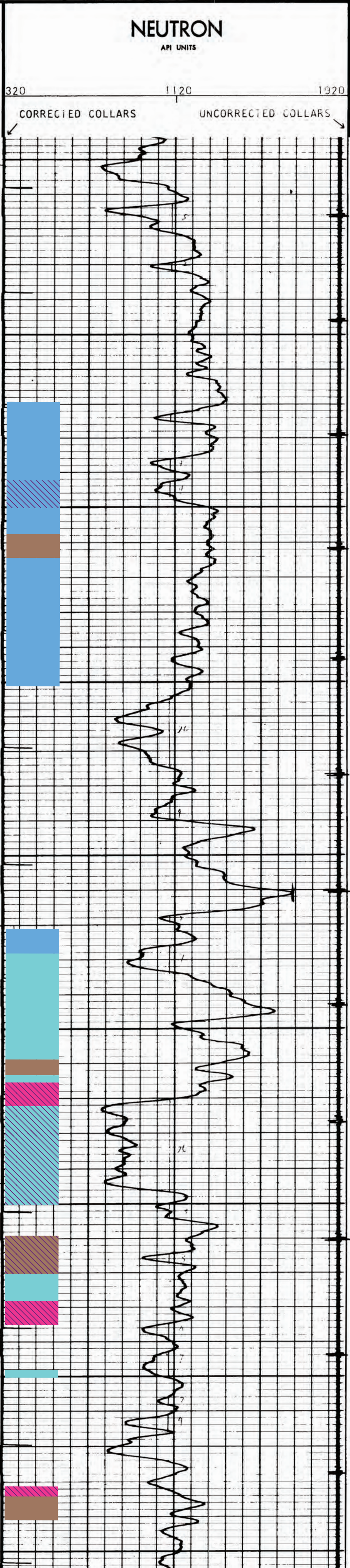
Lisbon Unit No. B-610 (N.W. Lisbon No. 1), Lisbon Field

API No. 43-037-16469
NE1/4NW1/4 section 10, T. 30 S., R. 24 E., SLBL&M
San Juan County, Utah
Producing

For core description from Lisbon Unit No. B-610, refer to plate B.2 in appendix B.

CORE LAB

CORE LABORATORIES, INC. Petroleum Reservoir Engineering

COMPANY	THE FORE OIL COMPANY	DATE ON 7/23/60 FILE NO. RP-3-1232
WELL	SOUTHEAST LISBON #3	DATE OFF 8/17/60 ENGRS. ENGLISH
FIELD	SOUTHEAST LISBON	FORMATION AS NOTED ELEV. 6632' GR
COUNTY	SAN MIGUEL STATE COLORADO	DRLG. FLD. SALT BASE MUD CORES DIAMOND
LOCATION	SEC16 T4N R19W	REMARKS SAMPLED BY CLIENT

Special Analysis
CORE REPORT

SAND		LIMESTONE		CONGLOMERATE	⊠	CHERT	
SHALE		DOLOMITE		VERTICAL FRACTURE			

Column headings: DEPTH FEET · PERMEABILITY, Millidarcys (MAX, 90°, h) · POROSITY PERCENT · RESIDUAL SATURATION PERCENT SPACE (OIL, TOTAL WATER) · PERMEABILITY Maximum · POROSITY PERCENT · TOTAL WATER · OIL SATURATION PERCENT PORE SPACE

MISSISSIPPIAN

(Large numeric core-analysis data table with graphical permeability, porosity, total water, and oil saturation curves plotted alongside lithologic and facies coding columns — rows numbered 1 through 131, depths from approximately 8906 ft through 9100+ ft.)

Explanation

Regional Leadville Facies Coding

#1 Crinoidal Grainstone:
Open-marine, moderate- to high-energy shoals

#2 Oolitic/Coated Grains/"Hard" Peloid Grainstone:
Restricted marine, high-energy shoals

#3 Peloid/Skeletal Packstone/Wackestone:
Low-energy, marine, below wave base

Diagenetic Overprints

Karsting and sediment infilling of karst cavities

Hydrothermal alteration, dolomite, and bitumen lining