



KANSAS CORPORATION COMMISSION 1060535  
OIL & GAS CONSERVATION DIVISION

Form ACO-1

June 2009

Form Must Be Typed  
Form must be Signed  
All blanks must be Filled

**WELL COMPLETION FORM**  
**WELL HISTORY - DESCRIPTION OF WELL & LEASE**

OPERATOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ + \_\_\_\_\_

Contact Person: \_\_\_\_\_

Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

CONTRACTOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Wellsite Geologist: \_\_\_\_\_

Purchaser: \_\_\_\_\_

Designate Type of Completion:

- New Well       Re-Entry       Workover
- Oil       WSW       SWD       SIOW
- Gas       D&A       ENHR       SIGW
- OG       GSW       Temp. Abd.
- CM (Coal Bed Methane)
- Cathodic       Other (Core, Expl., etc.): \_\_\_\_\_

If Workover/Re-entry: Old Well Info as follows:

Operator: \_\_\_\_\_

Well Name: \_\_\_\_\_

Original Comp. Date: \_\_\_\_\_ Original Total Depth: \_\_\_\_\_

- Deepening       Re-perf.       Conv. to ENHR       Conv. to SWD
- Conv. to GSW
- Plug Back: \_\_\_\_\_ Plug Back Total Depth \_\_\_\_\_
- Commingled      Permit #: \_\_\_\_\_
- Dual Completion      Permit #: \_\_\_\_\_
- SWD      Permit #: \_\_\_\_\_
- ENHR      Permit #: \_\_\_\_\_
- GSW      Permit #: \_\_\_\_\_

Spud Date or Recompletion Date      Date Reached TD      Completion Date or Recompletion Date

API No. 15 - \_\_\_\_\_

Spot Description: \_\_\_\_\_

\_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_- Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

\_\_\_\_\_ Feet from  North /  South Line of Section

\_\_\_\_\_ Feet from  East /  West Line of Section

Footages Calculated from Nearest Outside Section Corner:

- NE       NW       SE       SW

County: \_\_\_\_\_

Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Field Name: \_\_\_\_\_

Producing Formation: \_\_\_\_\_

Elevation: Ground: \_\_\_\_\_ Kelly Bushing: \_\_\_\_\_

Total Depth: \_\_\_\_\_ Plug Back Total Depth: \_\_\_\_\_

Amount of Surface Pipe Set and Cemented at: \_\_\_\_\_ Feet

Multiple Stage Cementing Collar Used?  Yes  No

If yes, show depth set: \_\_\_\_\_ Feet

If Alternate II completion, cement circulated from: \_\_\_\_\_

feet depth to: \_\_\_\_\_ w/ \_\_\_\_\_ sx cmt.

**Drilling Fluid Management Plan**

(Data must be collected from the Reserve Pit)

Chloride content: \_\_\_\_\_ ppm Fluid volume: \_\_\_\_\_ bbls

Dewatering method used: \_\_\_\_\_

Location of fluid disposal if hauled offsite: \_\_\_\_\_

Operator Name: \_\_\_\_\_

Lease Name: \_\_\_\_\_ License #: \_\_\_\_\_

Quarter \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

County: \_\_\_\_\_ Permit #: \_\_\_\_\_

**AFFIDAVIT**

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

**KCC Office Use ONLY**

- Letter of Confidentiality Received  
Date: \_\_\_\_\_
- Confidential Release Date: \_\_\_\_\_
- Wireline Log Received
- Geologist Report Received
- UIC Distribution
- ALT  I  II  III Approved by: \_\_\_\_\_ Date: \_\_\_\_\_



1060535

Operator Name: \_\_\_\_\_ Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West County: \_\_\_\_\_

**INSTRUCTIONS:** Show important tops and base of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed. Attach complete copy of all Electric Wire-line Logs surveyed. Attach final geological well site report.

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i>  Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No  Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Submitted Electronically <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(If no, Submit Copy)</i>  List All E. Logs Run:	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample  Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record <i>(Amount and Kind of Material Used)</i>	Depth

TUBING RECORD:      Size: \_\_\_\_\_ Set At: \_\_\_\_\_ Packer At: \_\_\_\_\_ Liner Run:  Yes  No

Date of First, Resumed Production, SWD or ENHR. \_\_\_\_\_ Producing Method:  Flowing  Pumping  Gas Lift  Other (Explain) \_\_\_\_\_

Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity
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<b>DISPOSITION OF GAS:</b> <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	<b>METHOD OF COMPLETION:</b> <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5)</i> <i>(Submit ACO-4)</i> <input type="checkbox"/> Other (Specify) _____	<b>PRODUCTION INTERVAL:</b> _____ _____
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Form	ACO1 - Well Completion
Operator	O'Brien Energy Resources Corp.
Well Name	Vail 2-30
Doc ID	1060535

All Electric Logs Run

MICRORESISTIVITY
COMPENSATED NEUTRON
DUAL INDUCTION
CEMENT BOND

Form	ACO1 - Well Completion
Operator	O'Brien Energy Resources Corp.
Well Name	Vail 2-30
Doc ID	1060535

Tops

Name	Top	Datum
HEEBNER	4494	-1797
TORONTO	4512	-1815
LANSING	4646	-1949
MARMATON	5282	-2585
CHEROKEE	5442	-2745
ATOKA	5730	-3033
MORROW	5794	-3097
MISSISSIPPI CHESTER	5900	-3203
STE. GENEVIEVE	6164	-3467
ST. LOUIS	6252	-3555

Conservation Division  
Finney State Office Building  
130 S. Market, Rm. 2078  
Wichita, KS 67202-3802



Phone: 316-337-6200  
Fax: 316-337-6211  
<http://kcc.ks.gov/>

Mark Sievers, Chairman  
Ward Loyd, Commissioner  
Thomas E. Wright, Commissioner

Sam Brownback, Governor

August 02, 2011

Joseph Forma  
O'Brien Energy Resources Corp.  
18 CONGRESS ST, STE 207  
PORTSMOUTH, NH 03801-4091

Re: ACO1  
API 15-119-21287-00-00  
Vail 2-30  
NW/4 Sec.30-33S-29W  
Meade County, Kansas

Dear Production Department:

We are herewith requesting that the Well Completion Form ACO-1 and attached information for the subject well be held confidential for a period of two years.

Should you have any questions or need additional information regarding subject well, please contact our office.

Respectfully,

Joseph Forma



**BASIC™**  
ENERGY SERVICES  
Liberal, Kansas

### Cement Report

Customer <i>Obrien Energy</i>		Lease No.		Date <i>5-3-11</i>				
Lease <i>Vail</i>		Well # <i>2-30</i>		Service Receipt <i>1702</i>				
Casing <i>4 1/2 11.5</i>	Depth <i>6378</i>	County <i>Atchafalaya</i>		State <i>KS</i>				
Job Type <i>L.S. 742</i>		Formation		Legal Description <i>30-33-29</i>				
Pipe Data			Perforating Data			Cement Data		
Casing size <i>4 1/2 11.5#</i>			Tubing Size			Lead <i>505K Pipe</i>		
Depth <i>6382</i>			Depth			From		
Volume <i>101615</i>			Volume			To		
Max Press <i>7000</i>			Max Press			From		
Well Connection <i>4 1/2</i>			Annulus Vol.			To		
Plug Depth <i>6386</i>			Packer Depth			From		
						To		
						Tail in <i>1805K-AA2</i>		
						<i>1 511F 5K cement</i>		
						<i>66460L-5K</i>		
Time	Casing Pressure	Tubing Pressure	Bbls. Pumped	Rate	Service Log <i>Yard 700PM</i>			
<i>2030</i>					<i>Arrive On Location</i>			
<i>2045</i>					<i>Safety Meeting @ 11a</i>			
<i>2030</i>					<i>Ris. Annulus in casing</i>			
<i>1130</i>					<i>Circulate w/ Rig</i>			
<i>1200</i>					<i>Hook up to BE 5</i>			
<i>1220</i>	<i>2500</i>		<i>10</i>	<i>1.0</i>	<i>Pressure Test</i>			
<i>1225</i>	<i>490</i>		<i>5</i>	<i>4.0</i>	<i>Pump Water Spacer</i>			
<i>1230</i>	<i>450</i>		<i>12</i>	<i>4.0</i>	<i>Pump Mud Flush</i>			
<i>1235</i>	<i>425</i>		<i>5</i>	<i>4.0</i>	<i>Pump Water Spacer</i>			
<i>1240</i>	<i>350</i>		<i>50</i>	<i>5.0</i>	<i>Pump 1805K cement @ 14.8 #/s</i>			
<i>1250</i>					<i>Pump Plug - Wash 110</i>			
<i>1255</i>	<i>375</i>		<i>88</i>	<i>6.3</i>	<i>Displace</i>			
<i>110</i>	<i>800</i>		<i>10</i>	<i>2.5</i>	<i>Shut Down Displace</i>			
<i>115</i>	<i>1250</i>		<i>1</i>	<i>2.0</i>	<i>Land Plug - Cement Held</i>			
<i>210</i>					<i>Plug Port + Mase 1415</i>			
<i>300</i>					<i>Job Complete</i>			
<i>Thanks for using BASIC Energy Services</i>								
Service Units		<i>19970</i>	<i>30164-19919</i>	<i>143541-19578</i>	<i>V-Team</i>			
Driver Names		<i>F. P. ...</i>	<i>Robert M</i>	<i>11/1/05</i>	<i>Shawn</i>			

*Angie Pearson*  
Customer Representative

*Tami Banta*  
Station Manager

*James Clark*  
Cementer





**BASIC™**  
ENERGY SERVICES  
Liberal, Kansas

# Cement Report

Customer <i>Obison Energy</i>	Lease No. <i>230</i>	Date <i>4.29.11</i>
Lease <i>Yard</i>	Well # <i>230</i>	Service Receipt <i>01272</i>
Casing <i>8 5/8 24#</i>	Depth <i>1551</i>	County <i>Meade</i>
Job Type <i>8 5/8 Surface 242</i>	Formation	Legal Description <i>30-33-29</i>

Pipe Data		Perforating Data		Cement Data
Casing size <i>8 5/8 24#</i>	Tubing Size	Shots/Ft		Lead <i>400# A-Con</i>
Depth <i>1558</i>	Depth	From	To	<i>2.95K1-SK</i>
Volume <i>916 bbls</i>	Volume	From	To	<i>18.1 Gal 54</i>
Max Press <i>1500</i>	Max Press	From	To	Tail in <i>1505# Perm</i>
Well Connection <i>8 5/8</i>	Annulus Vol.	From	To	<i>7.34K1-5# PUS</i>
Plug Depth <i>1509</i>	Packer Depth	From	To	<i>10.3360# SK cont</i>

Time	Casing Pressure	Tubing Pressure	Bbls. Pumped	Rate	Service Log
340					<i>Yard 230 AM</i>
345					<i>Arrive On Location</i>
435					<i>Setup, Mark, Drill</i>
1115					<i># Per Annulus in Casing</i>
1135					<i>Complete w/ PUS</i>
1145	<i>7000</i>		<i>1</i>	<i>11</i>	<i>Work up to PUS</i>
1150	<i>400</i>		<i>210</i>	<i>5.0</i>	<i>Pressure Test</i>
1230	<i>350</i>		<i>37</i>	<i>3.5</i>	<i>Run lead cont @ 11.5 # 5</i>
1245					<i>Run Tail cont @ 11.8 # 5</i>
1250	<i>300</i>		<i>40</i>	<i>4.0</i>	<i>Ann Phe Wash 110</i>
1315	<i>600</i>		<i>15</i>	<i>2.0</i>	<i>Displace</i>
1330	<i>1100</i>		<i>1</i>	<i>1.5</i>	<i>Start Down A 50 bbl</i>
					<i>Lead Phe Float Held</i>
					<i>Cement To Surface</i>
					<i>Sub Complete</i>
					<i>Thanks For Using Basic Energy Services</i>

Service Units	<i>19871</i>	<i>30111-19919</i>	<i>19505-19808</i>	<i>19333-19721</i>
Driver Names	<i>J. Chavez</i>	<i>Shannon</i>	<i>Agustin</i>	<i>Tommy</i>

*Roger Pennington* Customer Representative      *Tommy Ben A* Station Manager      *Tommy Ben A* Cementer

## **O'Brien Energy Resources, Inc.**

**Vail No. 2-30, Singley Field**

**Section 30, T33S, R29W**

Meade County, Kansas

April, 2011

### **Well Summary**

The O'Brien Energy Resources, Corporation, Vail No. 2-30 was drilled to a total depth of 6394' in the Mississippian St. Louis Formation in a record time of 103 rotating hours(61.3 Ft/hr). The Vail No. 2-30 was 4140' due North of the Vail No. 1-30. The Heebner, Toronto and Lansing ran 8', 10' and 12' high relative to this offset. The Cherokee and Atoka came in 6' and 4' high. The Morrow came in 4' low. The Chester, Ste. Genevieve and St. Louis ran 20', 18' and 22' high respectively.

Excellent hydrocarbon shows and gas kick occurred in the Morrow "B" Sandstone interval(5824'-5856') which included four separate but similar and undistinguishable Sandstones in 50% of the samples: Speckled green, salt and pepper, light gray, occasionally white to translucent, hard to friable, fine lower, well sorted, subround grains, siliceous cement, calcareous, clean to argillaceous in part, micaceous, glauconitic, tight to good intergranular porosity, light pale bluegreen hydrocarbon fluorescence(most SS), slow weak streaming to bleeding cut, no stain, show dissipates when dried, interbedded with Shale and sandy Limestone. A 1600 Unit gas kick occurred from 5823' to 5828' and 1350 Units from 5840' to 5846'.

The Chester(6122'-6136') consists of a Limestone: Medium to dark mottled brown to redbrown, varicolored in part, oomictic, microsucrosic, brittle, clean, sandy and fossiliferous, oolitic with good oomoldic porosity, vuggy and intercrystalline porosity, medium brown matrix oil stain, very dull speckled goldbrown hydrocarbon fluorescence in 20% of the samples, excellent streaming cut, dark brown live oil and oil scum in acid. A 960 Unit gas increase occurred.

Additional shows and gas increases were documented in the Upper Chester.

4 1/2" production casing was run to TD on the Vail No. 2-30 on 5/2/11.

Respectfully Submitted,



Peter Debenham



WELL DATA

Operator: O'Brien Energy Resources, Inc., John Forma – Portsmouth, NH  
Geologist: Paul Wiemann – Denver, CO

Prospect Geologist: Ed Schuett, David Ward, Land: Gordon Beannguard

Well: Vail No. 2-30

Location: 380' FNL & 1320' FWL, Section 30, T33S, R29W, Meade County, Kansas – East of Plains.

Elevation: Ground Level 2685', Kelly Bushing 2697'

Contractor: Duke Drilling Rig No. 6, Type: Double jackknife, triple stand, Toolpusher Rick Schollenbarger, Drillers: Terry Sorter, Danny White, Mike Brewer

Company Man: Roger Pearson – Liberal, Kansas

Spud Date: 4/26/11

Total Depth: 5/1/11, Driller 5394', Logger 6401', Mississippian St. Louis

Casing Program: 36 joints of 8 5/8", 155, 24Lbs/ft, set at 1495'. 4 1/2" production casing to TD.

Mud Program: Winter Mud – Adam Norris, displaced 2600' with Chemical Gel/LCM.

Wellsite Consultant: Peter Debenham with mudlogging trailer, Call depth 3000', Box 350, Drake, CO 80515, 720/220-4860.

Samples: 20' to 4700', 10' to TD. Zones of interest saved.

Electric Logs: Weatherford, engineer Ron Hoffman, 1)Dual Induction 2) Compensated Neutron Litho Density 3) Microlog 4) High Res.

Status: 4 1/2" production casing to TD on 5/2/11.

WELL CHRONOLOGY

6 AM

DATE DEPTH

FOOTAGE

RIG ACTIVITY

4/25 Rig up rotary tools. Pump water and mix spud mud.

4/26 1288' 1288' Pump water and mix mud. Drill rathole and mousehole. Spud in 12 1/4" surface hole to 1288'. Survey(1/4 deg.).

4/27 1495' 207' To 1495' and circulate. Drop survey(1 deg.) and trip for surface casing. Run 8 5/8" casing - casing parted. Wait on pipe and screw onto fish and trip. Run and cement 8 5/8" set at 1495' and wait on cement. Back off 8 5/8" and install well head and nipple up BOP and pressure test same.

4/28 2800' 1305' Wait on cement. Trip in and drill plug and cement and 8 5/8" to 1800' and trip for Bit No. 3. Survey(1/2 deg.). Dump suction and drill to 2800'. Displace mud system.

4/29 4320' 1520'

4/30 5495' 1175' To 5016' and circulate and condition mud. Wiper trip 27 stands and circulate. Drilling.

5/1 6394'TD 899' To 6394'TD and circulate. Wiper trip and circulate.

5/2 TD Trip for e-logs and run same. Trip to bottom and circulate. Trip out laying down and run and cement 4 1/2" production casing to TD. Rig down.

BIT RECORD

<u>NO.</u>	<u>MAKE</u>	<u>TYPE</u>	<u>SIZE</u>	<u>OUT</u>	<u>FOOTAGE</u>	<u>HOURS</u>
1	HTC	GTX	12 1/4"	1495'	1495'	19 1/4
2	HTC	GX-28RR	7 7/8"	1800'	305'	6 1/2
3	HTC	Q506F	7 7/8"	6394'	4594'	78

Total Rotating Hours:

103 3/4

Average:

61.63 Ft/hr

DEVIATION RECORD - degree

509' 1/4, 1005' 1/2, 1495' 1, 2700' 1/2, 4357' 1/2, 6394' 3/4

MUDD PROPERTIES

<u>DATE</u>	<u>DEPTH</u>	<u>WT</u>	<u>VIS</u>	<u>PV</u>	<u>YP</u>	<u>pH</u>	<u>WL</u>	<u>CL</u>	<u>LCM-LBS/BBL</u>
4/26	546'	9.4	41	7	16	8.0	n/c	450	6
4/27	1496'	9.5	31	4	6	8.0	n/c	800	4
4/28	1858'	9.0	32	5	6	9.5	n/c	4.8K	tr
4/29	3446'	9.0	39	8	9	9.0	22	8K	4
4/30	4881'	9.0	40	15	7	11.0	8	5K	2
5/1	6040'	9.0	45	16	8	10.5	6.4	3.3K	6

ELECTRIC LOG FORMATION TOPS- KB Elev. 2697'

\*Vale No. 1-30

<u>FORMATION</u>	<u>DEPTH</u>	<u>DATUM</u>	<u>DATUM</u>	<u>POSITION</u>
S. Csg.	1497'	+1200'	-1805'	+8'
Heebner	4494'	-1797'	-1825'	+10'
Toronto	4512'	-1815'	-1961'	+12'
Lansing	4646'	-1949'	-2597'	+12'
Marnaton	5282'	-2585'	-2751'	+6'
Cherokee	5442'	-2745'	-3037'	+4'
Atoka	5730'	-3033'	-3093'	-4'
Morrow	5794'	-3097'	-3223'	+20'
Mississippi Chester	5900'	-3203'	-3485'	+18'
Ste. Genevieve	6164'	-3467'	-3577'	+22'
St. Louis	6252'	-3555'		
TD	6394'	-3697'		

\*Vale No. 1-30, 760'FSL & 1320'FWL, Sec. 30 - 4140' to the South, K.B. Elev. 2679'.

# Petrolific Consulting Services

**Peter Debenham**

**Wellsite Geology**

P.O. Box 350

720/220-4860

Drake, Colorado 80515

[petrolific@earthlink.net](mailto:petrolific@earthlink.net)

Scale 1:240 (5"=100') Imperial

Well Name: O'Brien Energy, Vail No. 2-30, Singley Field

Location: 380°FNL & 1320°FWL, Section 30, 33S, R29W, Meade Co., KS

Licence Number: API: 15-119-21287

Region: Houghton

Spud Date: 4/26/11

Drilling Completed: 5/11/11

Surface Coordinates: 380°FNL & 1320°FWL, Section 30, 33S, R29W, Meade Co., KS

Bottom Hole 380°FNL & 1320°FWL, Section 30, 33S, R29W, Meade Co., KS

Coordinates:

Ground Elevation (ft): 2685' K.B. Elevation (ft): 2697'

Logged Interval (ft): 4200' To: TD Total Depth (ft): 6394'

Formation: Lansing, Morrow, Chester, Ste Genevieve, St. Louis

Type of Drilling Fluid: Chemical Gel/LSND/LCM, displace 2600'.

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

## OPERATOR

Company: O'Brien Energy Resources, Corp.  
Address: 18 Congress St., Suite 207  
Portsmouth, NH 03801

President/Owner John Forma, Geologist Paul Wiemann

## GEOLOGIST

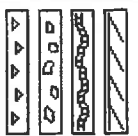
Name: Wellsite: Peter Debenham  
Company: Petrolific Consulting Services  
Address: P.O. Box 350  
Drake, CO 80515

720/220-4860, [Petrolific@gmail.com](mailto:Petrolific@gmail.com)

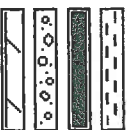
## Comments

Engineer Roger Pearson, Duke Drilling Rig No. 6, Type: Double jackknife, triple stand, Toolpusher Rick Schollenbarger, Drillers: Terry Sorter, Danny White, Mike Brewer, 36 joints of 8 5/8", J-55 set at 1495', Weatherford engineer Ron Hoffman, Winter Mud - Anhy Norris, displace 2600', 4 1/2" production casing run to TD on 5/2/11.

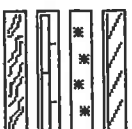
## ROCK TYPES



Anhy  
Benc  
BreC  
Cht



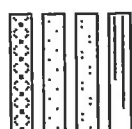
Clyst  
Coal  
Congl  
Dol



Gyp  
Igne  
Lmst  
Meta



Mrlst  
Salt  
Shale  
Shcol



Shgy  
Sltst  
Ss  
Till

- FOSSIL**
- Algae
  - Amph
  - Belm
  - Bioclst
  - Brach
  - Bryozoa
  - Cephal
  - Coral
  - Crin
  - Echin
  - Fish
  - Foram
  - Fossil
  - Gastro
  - Oolite

- Ostra
- Pelec
- Pellet
- Pisolite
- Plant
- Strom

- ACCESSORIES**
- Chtdk
  - Chitt
  - Dol
  - Feldspar
  - Ferrpel
  - Ferr
  - Glau
  - Gyp
  - Hvymin
  - Kaol
  - Marl
  - Minxl
  - Nodule
  - Phos
  - Pyr
  - Salt

- Sandy
- Silt
- Sil
- Sulphur
- Tuft

- TEXTURE**
- Ssstrg
  - Boundst
  - Chalky
  - Cryxln
  - Earthy
  - Finexln
  - Gralnst
  - Lithogr
  - Microxln
  - Mudst
  - Packet
  - Wackest

**OTHER SYMBOLS**

- INTERVALS**
- Core
  - Dst

- POROSITY TYPE**
- Earthy
  - Fenest
  - Fracture
  - Inter
  - Moldic
  - Organic

- Pinpoint
- Vuggy

- ROUNDING**
- Rounded
  - Subbrnd
  - Subang
  - Angular

- OIL SHOWS**
- Even
  - Spotted
  - Ques
  - Dead

Curve Track 1

ROP (min/ft)

Depth

Lithology

Oil Shows

Geological Descriptions

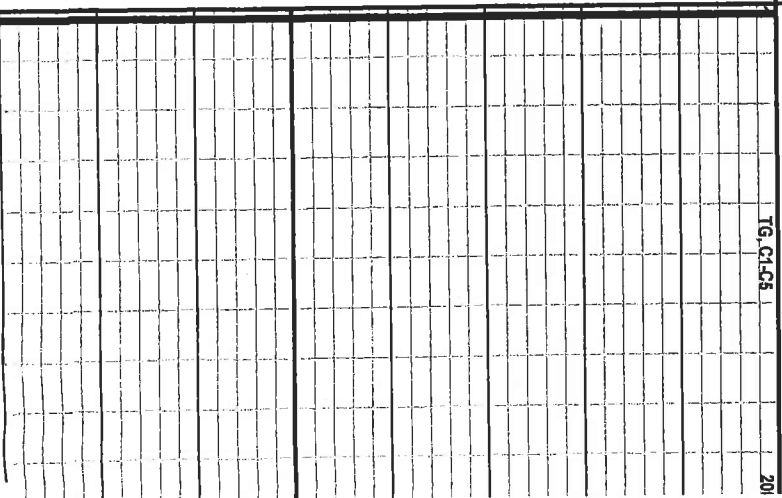
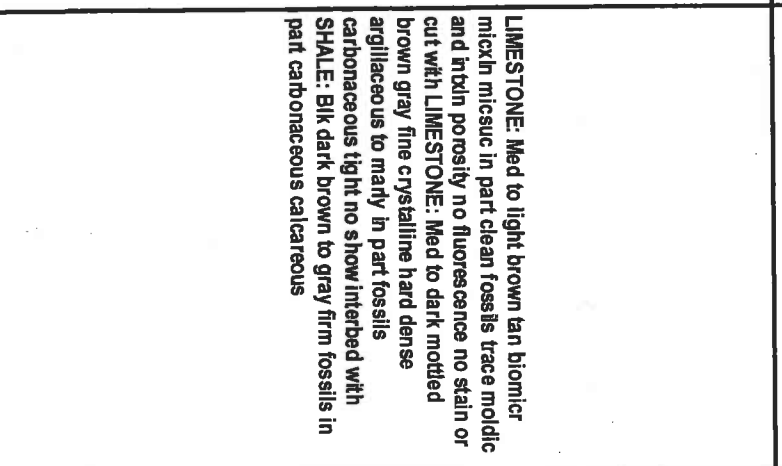
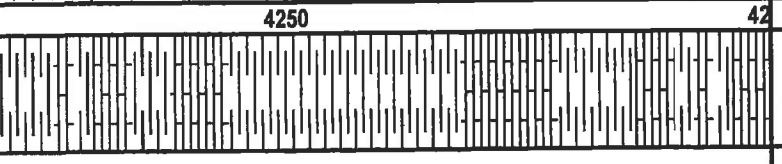
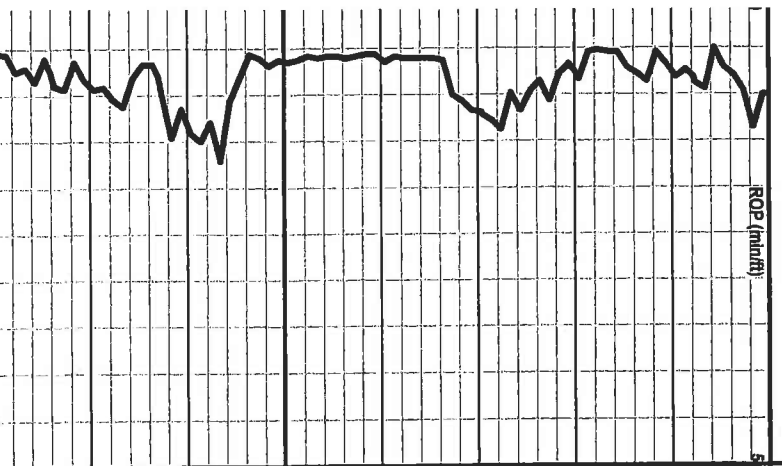
TG, C1-C5

- TG (units)
- C1 (units)
- C2 (units)
- C3 (units)
- C4 (units)
- C5 (units)

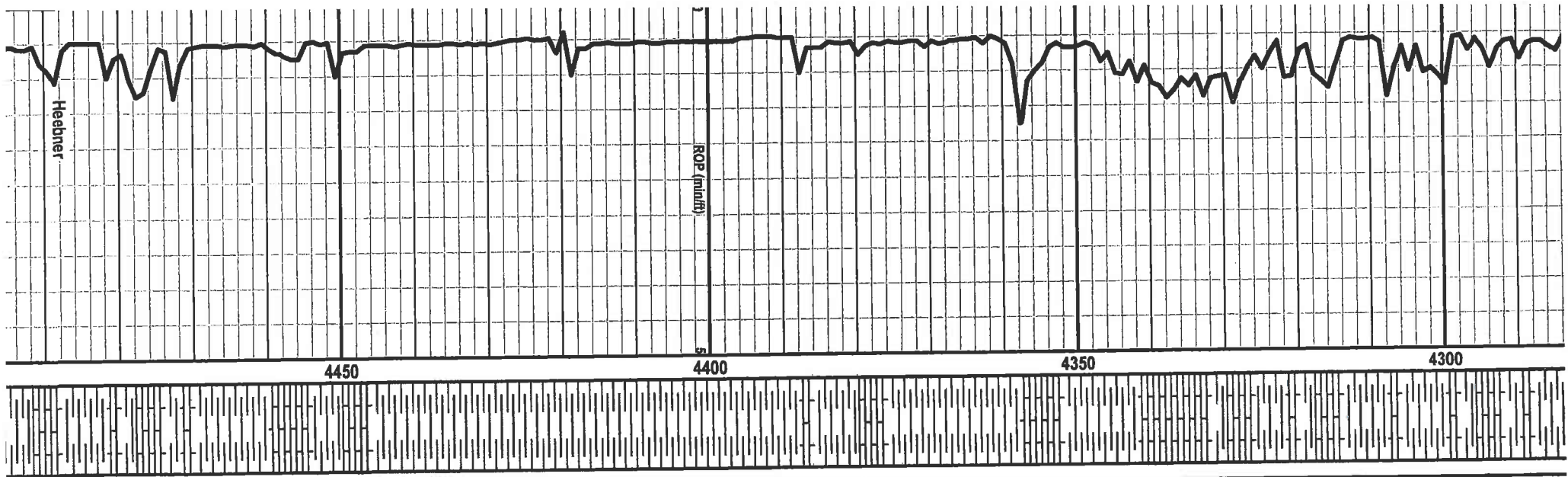
TG, C1-C5

4250

**LIMESTONE:** Med to light brown tan biomic micxn micruc in part clean fossils trace moldic and in bdn porosity no fluorescence no stain or cut with LIMESTONE: Med to dark mottled brown gray fine crystalline hard dense argillaceous to marly in part fossils carbonaceous tight no show interbed with SHALE: Blk dark brown to gray firm fossils in part carbonaceous calcareous







LIMESTONE: Med to light brown tan biomic  
micxn micruc in part clean fossils trace moldic  
and in xln porosity no fluorescence no stain or  
cut with LIMESTONE: Med to dark mottled  
brown gray fine crystalline hard dense  
argillaceous to marly in part fossils  
carbonaceous tight no show interbed with  
SHALE: Blk dark brown to gray firm fossils in  
part carbonaceous calcareous

SHALE: Dk brown gray black firm shfs to blocky  
waxy carbonaceous calcareous interbed with  
LIMESTONE: Med to dark mottled brown gray  
biomic fine crystalline hard dense argillaceous  
tight no show

LIMESTONE: Med to light brown tan biomic  
micxn micruc in part clean fossils trace moldic  
and in xln porosity no fluorescence no stain or  
cut with LIMESTONE: Med to dark mottled  
brown gray fine crystalline hard dense  
argillaceous to marly in part fossils  
carbonaceous tight no show interbed with  
SHALE: Blk dark brown to gray firm fossils in  
part carbonaceous calcareous silty

SHALE: Blk very dark brown firm shfs waxy  
carbonaceous silty in part

LIMESTONE: Dk brown mottled biomic fine

TG, C1-C5

201

Toronto

450

4550

4600

4650

4700

interbed with SHALE: Blk dark brown to gray firm shifs to blocky carbonaceous calcareous silty

LIMESTONE: Med to light brown tan biomicr micxn micruc in part clean fossils trace moldic and inbdn porosity no fluorescence no stain or cut with LIMESTONE: Med to dark mottled brown gray fine crystalline hard dense argillaceous to marly in part fossils carbonaceous tight no show

SHALE: Blk dark brown to gray firm fossils in part carbonaceous calcareous silty

LIMESTONE: Lt to medium brown tan micxn micruc in part clean to argillaceous fossils carbonaceous incis trace inbdn porosity no show with LIMESTONE: Med to dark mottled brown occasional blk fine crystalline dense fossils argillaceous to marly in part carbonaceous tight no show

SHALE: Gy brown firm blocky fossils carbonaceous occasional interbed with LIMESTONE: as above no show

LIMESTONE: Med to dark mottled brown occasional blk fine crystalline dense fossils argillaceous to marly in part carbonaceous tight no show interbed with SHALE: Gy brown firm blocky fossils carbonaceous occasional interbed with LIMESTONE: as above no show

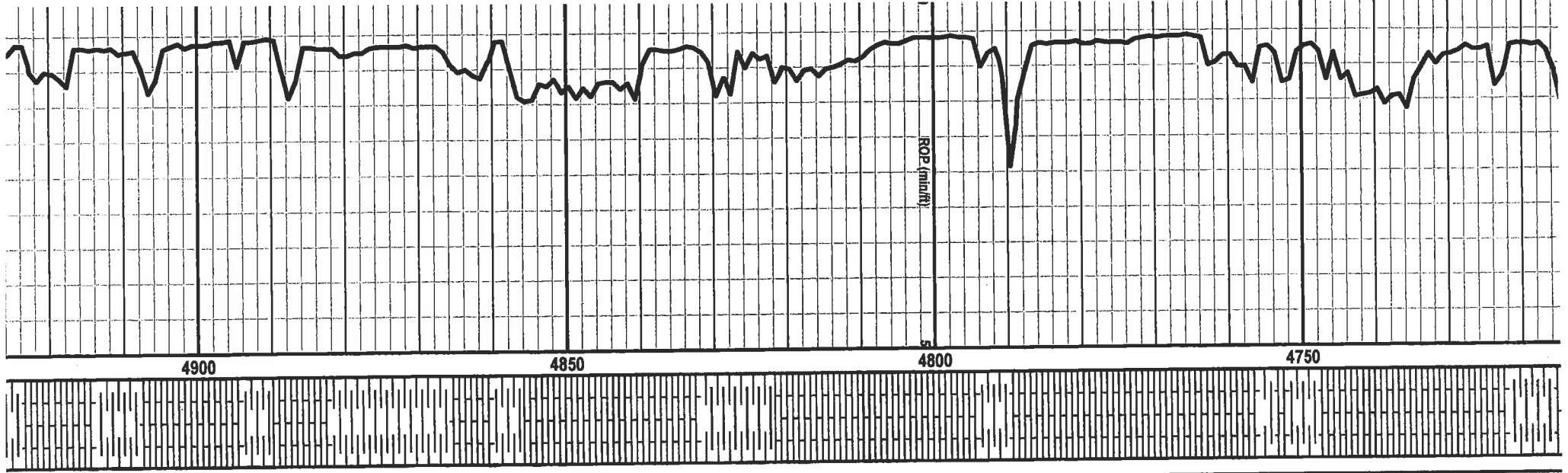
LIMESTONE: Mot brown light brown gray biomicr fine crystalline hard dense fossils clean to argillaceous occasional trace inbdn and moldic porosity no show

LIMESTONE: Med to light mottled brown buff micxn micruc in part sbchky clean fossils trace inbdn porosity light mottled blue hydrocarbon fluorescence(% sample) slow strmg cut no stain weak show

LIMESTONE: Lt mottled brown gray biomicr fine crystalline clean very fossils occasional moldic and inbdn porosity predominant hard and tight no show occasional interbed with SHALE: Dk brown blk blocky firm silty carbonaceous

LIMESTONE: Lt brown fine crystalline brittle clean very oolites well exc moldic porosity no show

TG, C1-C5



LIMESTONE: Med brown crpxln hard dense clean silica in part tight no show with  
 LIMESTONE: Lt brown fine crystalline brittle clean very oolites well exc oomoldic porosity no show

LIMESTONE: Lt to medium brown oomier fine crystalline brittle clean very oolites exc oomoldic porosity no fluorescence no stain or cut

LIMESTONE: Mot brown gray crpxln hard dense silica fossils tight no show

SHALE: Dk brown hard blocky to shifs waxy to silty carbonaceous with LIMESTONE: Brn gray crpxln hard dense tight no show

LIMESTONE: Med brown micxln micruc brittle clean exc oomoldic porosity trace in bitn porosity no show with LIMESTONE: Lt brown buff micxln micruc in part brittle clean shchly fossils hard and silica in part no show

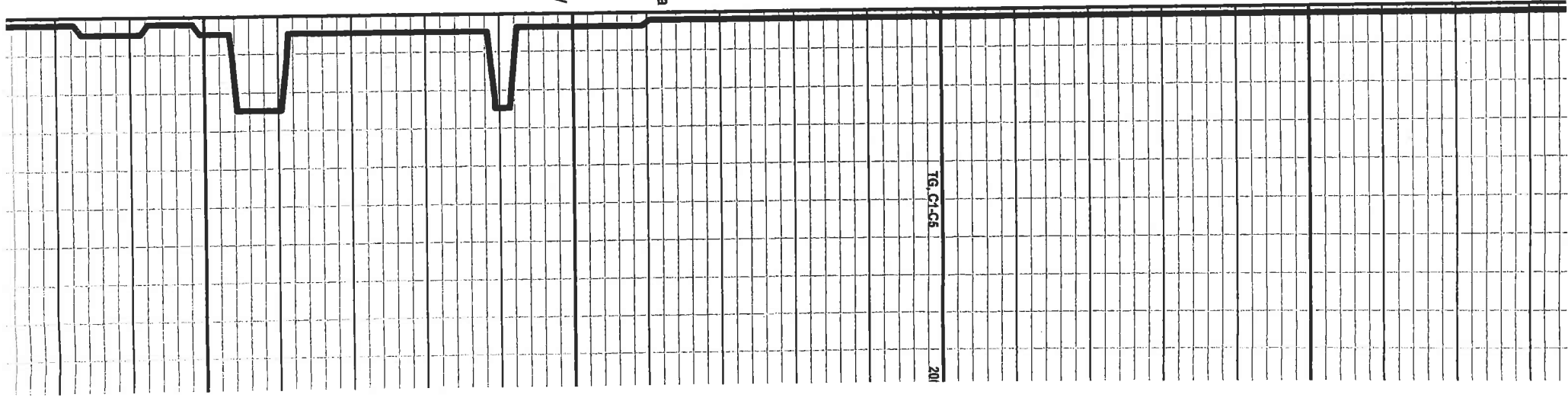
LIMESTONE: Mot brown crpxln hard dense silica fossils clean to argillaceous tight no show

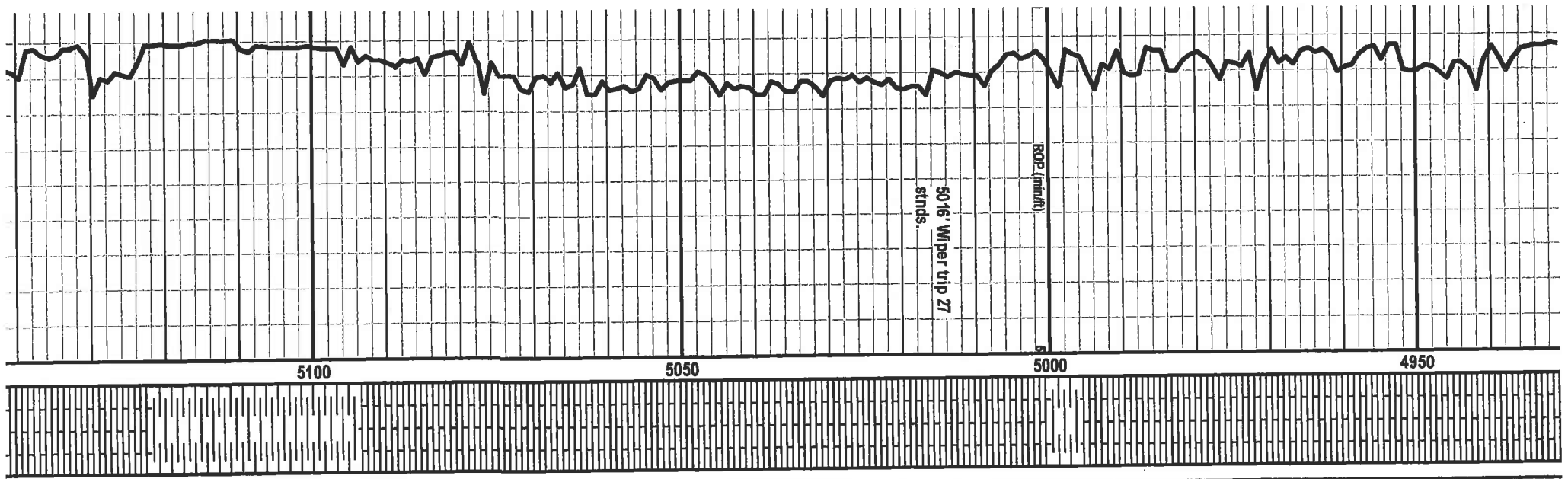
SHALE: Blk very dark brown firm shifs to blocky carbonaceous silty to waxy calcareous interbed with LIMESTONE: Lt brown buff micxln micruc in part brittle clean shchly fossils trace intxln porosity no fluorescence no stain or cut

LIMESTONE: Mot brown very brittle clean very oolites well exc oomoldic porosity mottled orange mineral fluorescence no stain or cut no show

SHALE: Dk brown gray hard blocky silty carbonaceous with LIMESTONE: Mot brown to gray fine crystalline hard dense silica in part poor vs porosity no show

LIMESTONE: Lt to medium mottled brown to gray micxln micruc in part predominant hard and silica tight/ occasional trace moldic and intxln porosity no fluorescence no stain or cut





LIMESTONE: Lt brown gray buff micxl n micsuc very brittle clean chaly in part trace mtdn porosity occasional moldic porosity no show

SHALE: Blk dark brown firm shfs carbonaceous with LIMESTONE: Lt brown gray buff micxl n micsuc very brittle clean chaly in part trace inxl n porosity occasional moldic porosity no show

LIMESTONE: Med to dark mottled brown light brown buff microlcrpxln micsuc in part clean to many silica in part predominant hard and tight occasional micsuc wellinxl n porosity no fluorescence no stain or cut

LIMESTONE: Med to dark mottled brown micr crpxln hard dense silica argillaceous to marly fossils tight no show

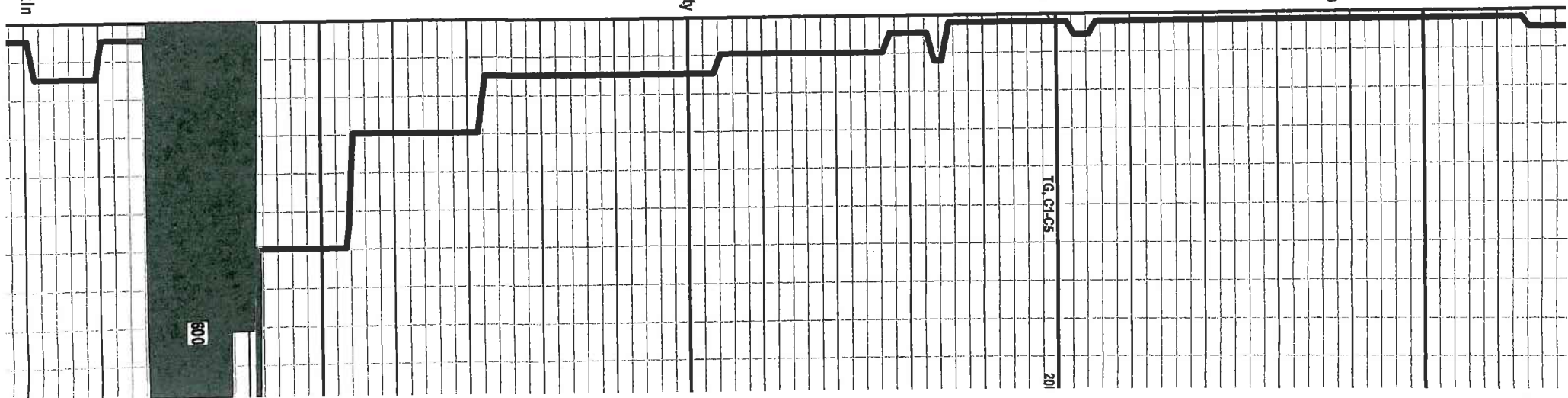
SHALE: Dk brown black dark gray hard blocky carbonaceous calcareous fossils silica in part interbed with LIMESTONE: Pred as above micsuc in part welltrace Intercrystalline porosity no fluorescence no stain or cut

LIMESTONE: Med mottled brown oomier fine crystalline brittle clean very oolites wellexc oomoldic porosity no fluorescence no stain or cut mottled orange mineral fluorescence

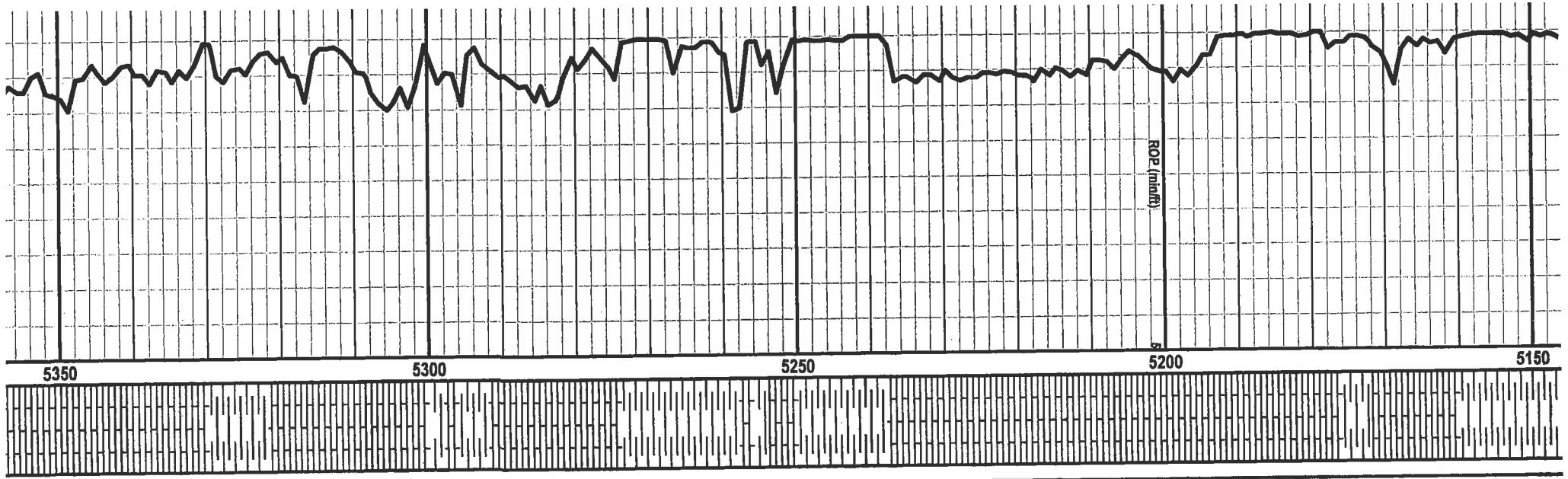
LIMESTONE: Dk mottled gray to brown occasional black crpxln hard dense silica argillaceous to marly in part tight no show

SHALE: Blk very dark brown hard shfs to blocky waxy carbonaceous silty

LIMESTONE: Dk mottled brown gray micr crpxln







dark brown hard shfs carbonaceous

LIMESTONE: Med to dark mottled brown fine crystalline brittle clean very oolites exc oomoldic porosity trace indxn porosity no show

LIMESTONE: Med mottled brown crpxln hard dense brittle in part argillaceous fossils occasional exc oomoldic porosity no show

SHALE: Blk dark brown firm fissile carbonaceous silky interbed with LIMESTONE: Pred as above occasional exc oomoldic porosity no fluorescence no stain or cut

LIMESTONE: Mot brown to gray fine crystalline hard dense silica in part fossils oolites clean tight no show

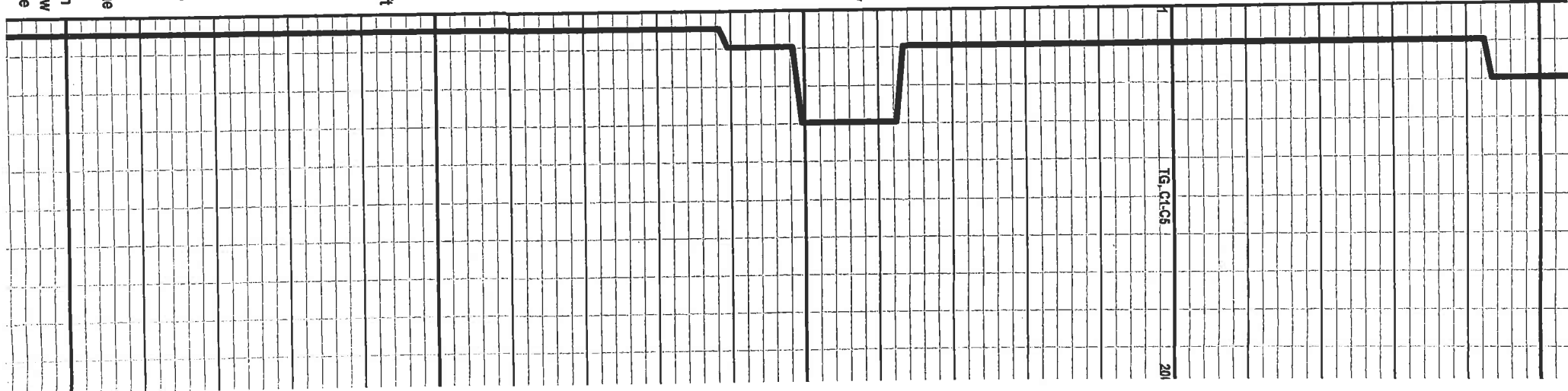
SHALE: Blk dark gray firm shfs to blocky carbonaceous calcareous sily to sndy in part interbed with LIMESTONE: Lt brown buff white fine crystalline shchly clean to argillaceous soft brittle no show

LS: Lt brown white tan micxln chalky in part clean to argillaceous soft brittle poor vis porosity no fluorescence no stain or cut

SHALE with interbed LIMESTONE: as above no show

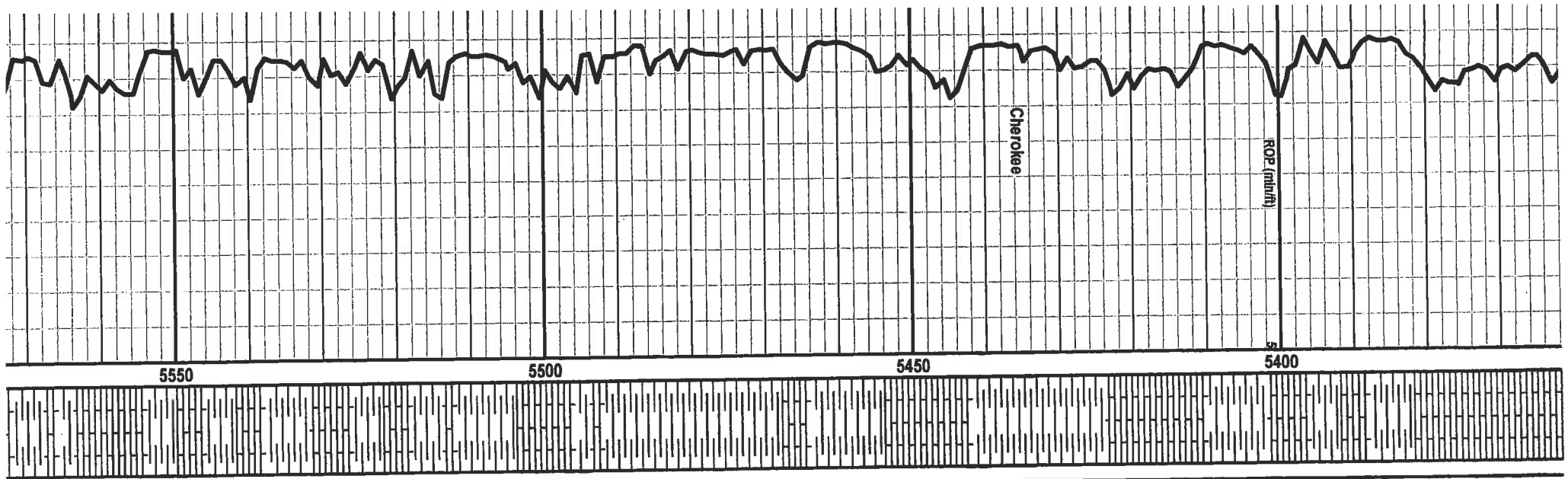
LIMESTONE: Lt brown buff white fine crystalline chalky in part soft brittle clean no show with

LIMESTONE: Med mottled brown oomoldic micxln very oolites well exc oomoldic porosity no show occasional interbed with SHALE: Blk firm fissile



TG: C1-C5  
201





LIMESTONE: Lt brown buff white fine crystalline chaly in part soft brittle clean no show with

LIMESTONE: Med mottled brown oomicr micxl in very oolites welllexc oomoldic porosity no show

SHALE: Blk dark brown firm sfris to blocky waxy to silty carbonaceous

LIMESTONE: Brn micxl micsuc in part clean fossils sbchly tight no show with LIMESTONE: Med mottled brown oomicr micxl in very oolites welllexc oomoldic porosity no show interbed with SHALE: Dk brown to gray blk firm sfris to blocky carbonaceous

SHALE: Blk firm fissile carbonaceous

LIMESTONE: Med to dark brown gray crpxn hard dense silica fossils clean to argillaceous tight no show

SHALE: Blk firm fissile carbonaceous

LIMESTONE: Med to dark brown occasional black crpxn hard dense silica argillaceous fossils poor vis porosity no show

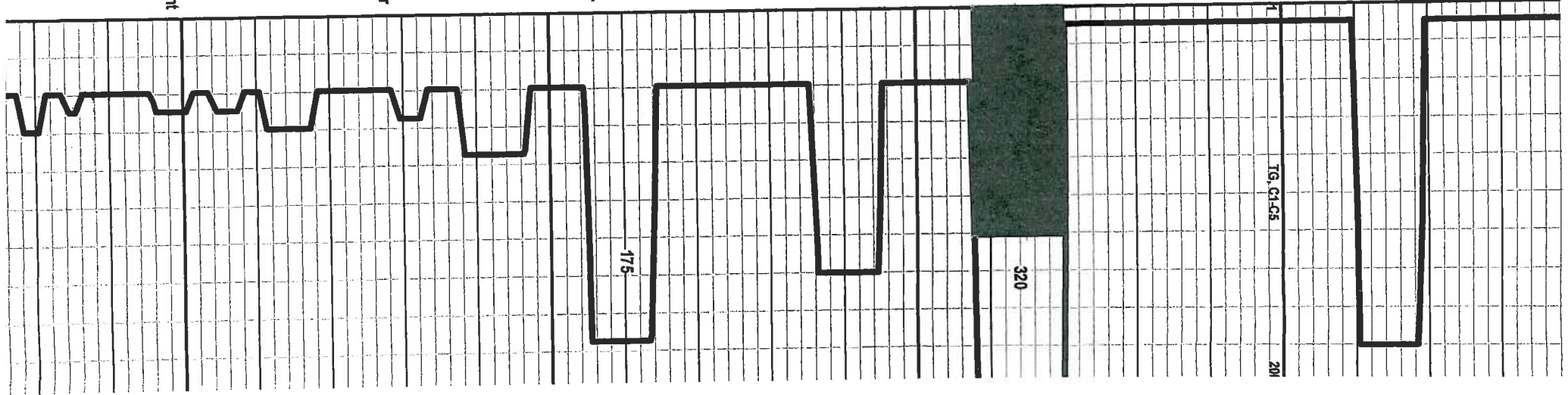
SHALE: Blk dark gray to brown sfris firm carbonaceous silty

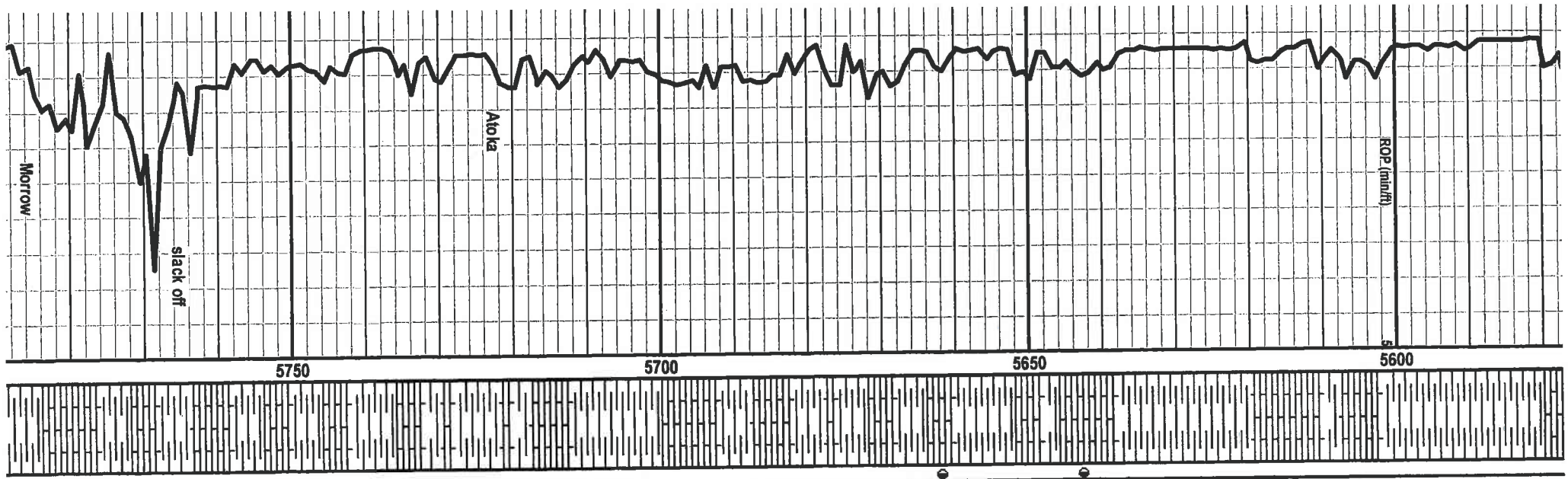
LIMESTONE: Med to dark brown to gray biomicr crpxn hard dense fossils argillaceous to marly carbonaceous tight no show interbed with SHALE: Blk firm fissile carbonaceous

LIMESTONE: Med to dark brown to gray biomicr crpxn hard dense fossils argillaceous to marly carbonaceous tight no show interbed with SHALE: Blk firm fissile carbonaceous

LIMESTONE: Med to dark mottled brown gray occasional black micr crpxn hard dense argillaceous to marly fossils carbonaceous tight interbed with SHALE: Blk firm fissile carbonaceous

QUAL E. Blk dark brown firm sfris to blocky





LIMESTONE: Dk brown fine crystalline hard dense fossils argillaceous to marly tight no show with SHALE: as above

SHALE: Blk dark brown to gray hard blocky to sbfis carbonaceous calcareous silty

LIMESTONE: Mot brown to gray buff micxn firm dense to trace intxn and vuggy porosity sbchly in part clean to argillaceous tr lt blue hydrocarbon fluorescence slow streaming cut no stain

SHALE: Blk dark brown firm sbfis to blocky carbonaceous interbed with LIMESTONE: Mot brown to gray buff micxn firm dense to trace intxn and vuggy porosity sbchly in part clean to argillaceous tr lt blue hydrocarbon fluorescence slow streaming cut no stain

LS: Dk brown black medium to light brown buff micr crpxn to micxn dense sbchly in part fossils clean to marly fossils tight no show trace CRT

SHALE: Blk firm fissile carbonaceous interbed with LS: Dk brown black medium to light brown buff micr crpxn to micxn dense sbchly in part fossils clean to marly fossils tight no show trace CRT

SHALE: Blk dark brown firm fissile to blocky waxy to silty carbonaceous interbed with

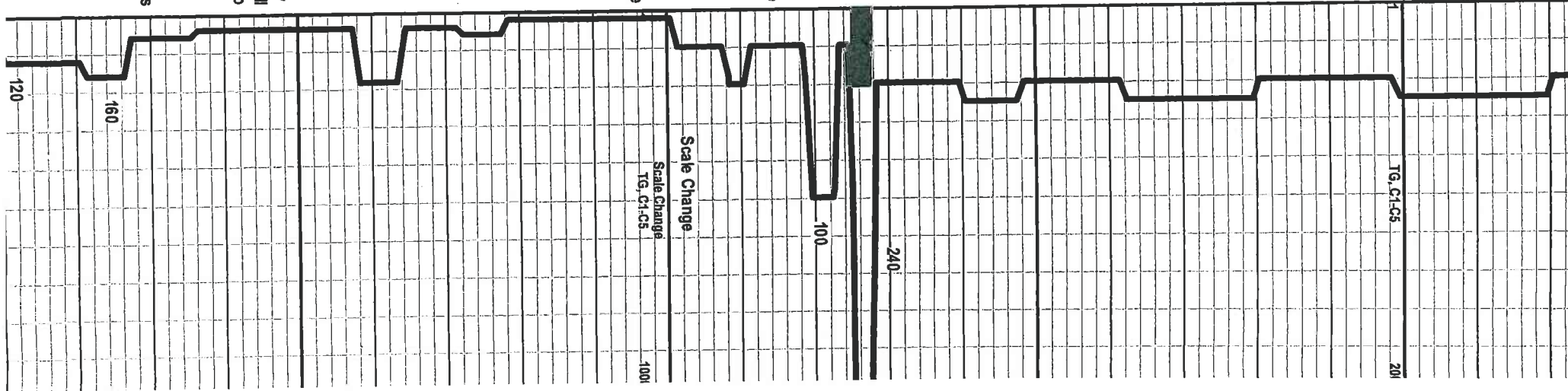
LIMESTONE: Dk to medium brown occasional black crpxn hard dense argillaceous to marly occasional sbchly and clean poor vis porosity no fluorescence no stain or cut

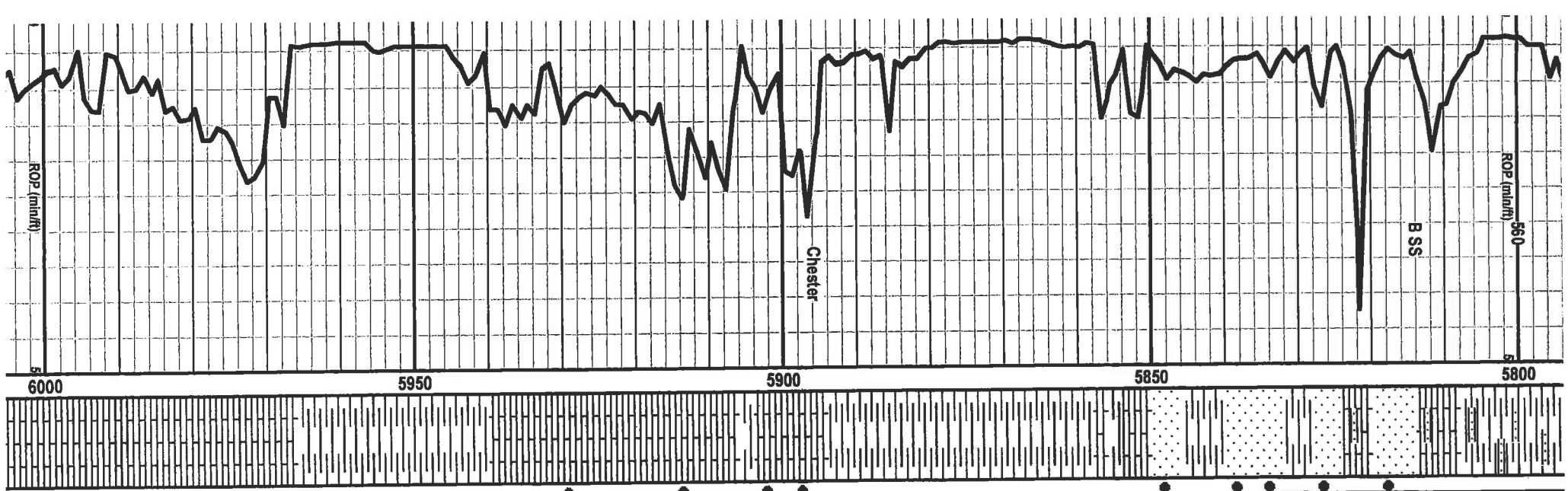
SHALE: Blk firm fissile carbonaceous

LIMESTONE: Dk brown gray black mottled micr fine crystalline dense argillaceous to marly silty carbonaceous occasional sbchly trace very dull pale blue hydrocarbon fluorescence faint cut no stain very weak show

SHALE: Blk firm sbfis carbonaceous calcareous silty tr COAL

LS: Dark mottled gy to brown dark green occ black hard cryplocrystalline sandy glauc onitic pyritic tight no show with SH: Black medium brown blocky very sandy & glauc gradin g to





grains clay cement argillaceous to marly with infill glauc ip occ fr vuggy por tight to occ fr intrgran por no flor no stn weak milky cut occ lt brn wh s&p & cin with intrgran por no vis show

Sandstone(50% spj): Spec gn s&p lt gy to gn occ wh & trnsi hd to fri fi w srd sbmd gis sil cmt calc cin to arg lp mica glauc v tl occ fr intrgran por lt pale bign hyd c flor(most SS) slow wik string to bling cut no stn show dissipates occ cr & wh & cin with gd intrgran por no vis flor no stn or cut intbd with SH & LS: aa

Sandstone(50% spj): Spec gn s&p lt gy to gn occ wh & trnsi hd to fri fi w srd sbmd gis sil cmt calc cin to arg lp mica glauc v tl occ fr intrgran por lt pale bign hyd c flor(most SS) slow wik string to bling cut no stn show dissipates with intbd LS & SH

SH: Blk frm fis carb

SH: Dk gy brn blk frm fis wxy sndy lp with LS: Dark mottled gy to brown dark green occ black hard cryptocrystalline sandy glauc onitic pyritic tight no show

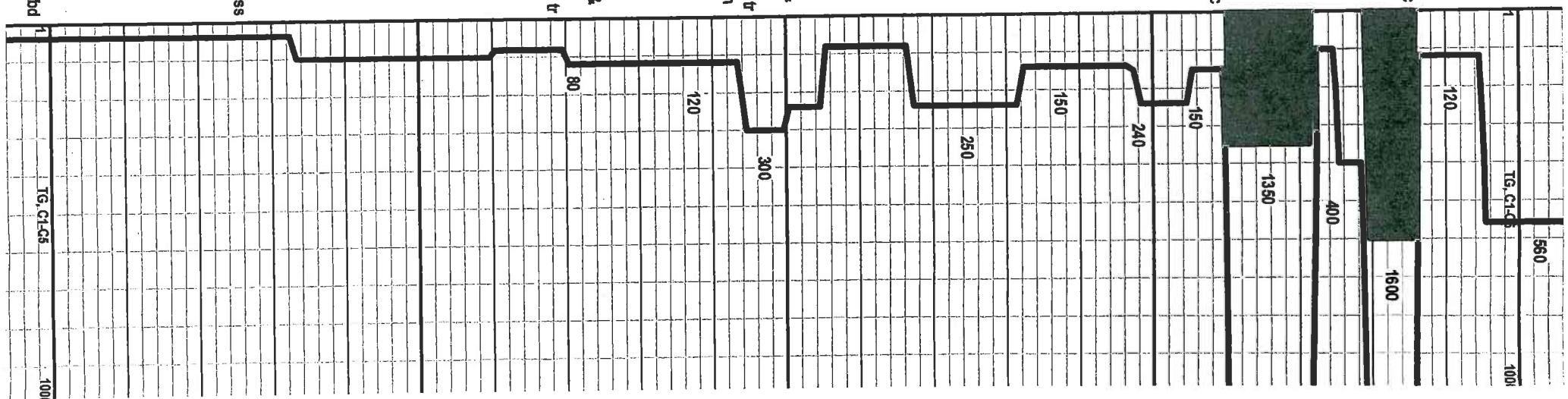
LS: Wh lt bm to bf mot orng biomicr micxln micsuc sft brt chky foss cin to arg lp tr intxln & moldic por abt chik infill pale mot lt bl hyd c flor(8% spj) slow string to bling cut no stn occ tr bri yel flor & gd cut intbd with SH: Dk gy blk frm spky to fis carb

LS: Wh lt bm to bf mot orng biomicr micxln micsuc sft brt chky foss cin to arg lp tr intxln & moldic por abt chik infill pale mot lt bl hyd c flor(8% spj) slow string to bling cut no stn occ tr bri yel flor & gd cut

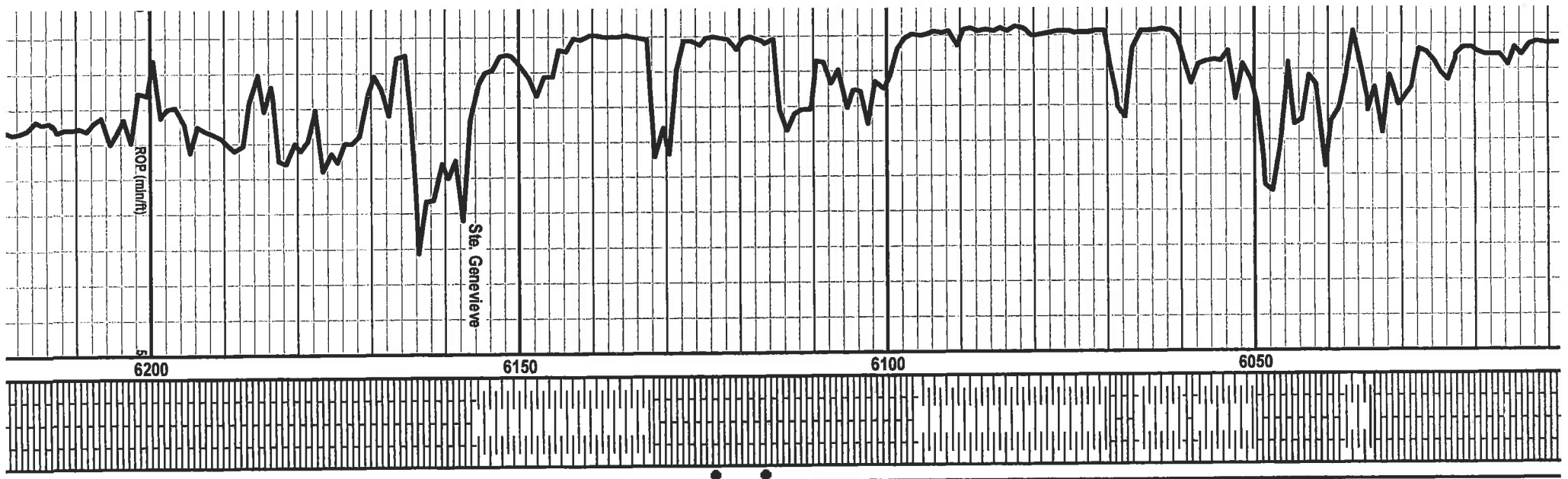
SH: Blk dk brn frm s&fis carb

LS: Bf lt brn to wh lt gy mot orng f xln chiky foss cin p vis por tr lt mot pale bl to yel hyd c flor slow wik bling cut no stn

SH: Dk gy blk brn hd blkly carb sndy lp occ intbd with chkv LS: no show







SH: Med gy ggn red to brn viol mar varic rthy  
 billy wxy to sndy inhd with LS: Lt brn to gy micr  
 f xin sbchky foss sndy cin tt no show

SH: Med gy ggn red to brn viol mar varic rthy  
 billy wxy to sndy inhd with LS: Lt brn to gy micr  
 f xin sbchky foss sndy cin tt no show

LS: Lt brn to gy micr f xin sbchky foss sndy cin  
 tt no show

LS: Med to dk mot brn redbrn varic in part  
 oomicroite mic:xin micsuc brit cin sandy foss &  
 ool occ gd oomoldic por v sndy ip & occ grding  
 to v calc SS tr to occ fr inktInldrgan por gd  
 oomoldic por vuggy por med brn mtx oil stn dull  
 spec goldbrn hydc flor(20% sp) exc string cut  
 dk bm live oil oil scum in acid

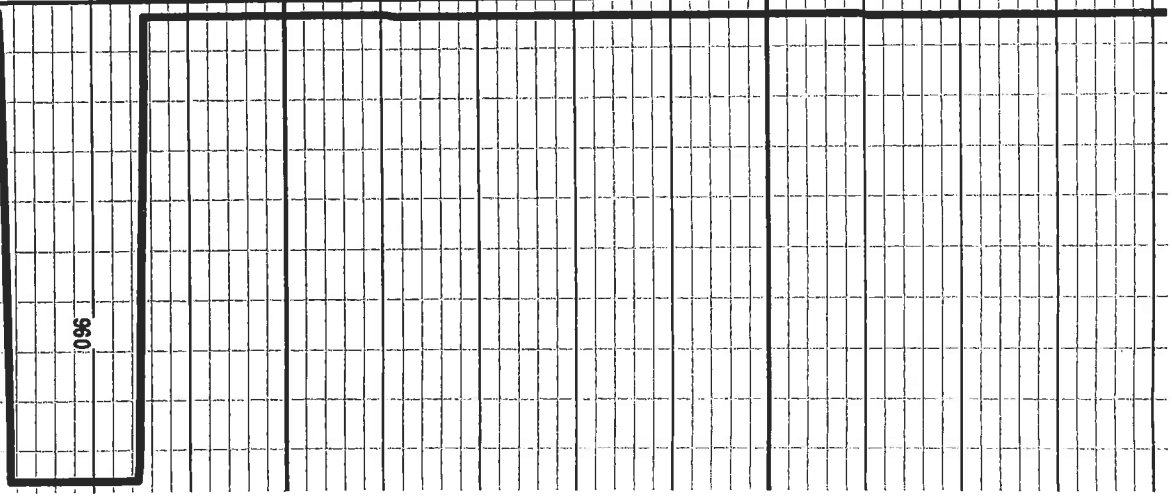
SH: dk gy blk frm sbfis wxy with LS: Pred aa  
 with show oil villed vugs dk hydc flor exc string  
 cut

SH: Gy to brn redbrn ggn mar viol varic rthy  
 billy wxy inhd with LS: Tan med to lt brn bf f xin  
 dns foss sbchky ip p vis por no show

LS: Tan med to lt brn bf gy redbrn brit fri v sndy  
 ip & grding to SS tr inktInldrgan por f vug &  
 moldic por v dull spec goldbrn hydc flor(6% sp)  
 exc explosive cut dk mxt o strn & hvy live oil

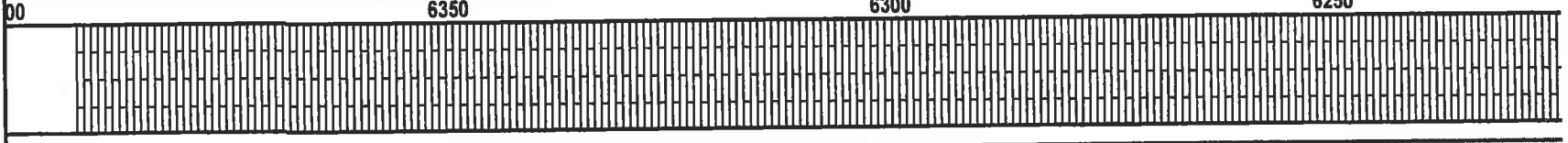
LS: Lt brn bf wh v sndy cin foss p vis por no  
 show tr SH: aa varic ip

LS: Lt brn bf wh v sndy cin foss p vis por no  
 show



TG, C1-53

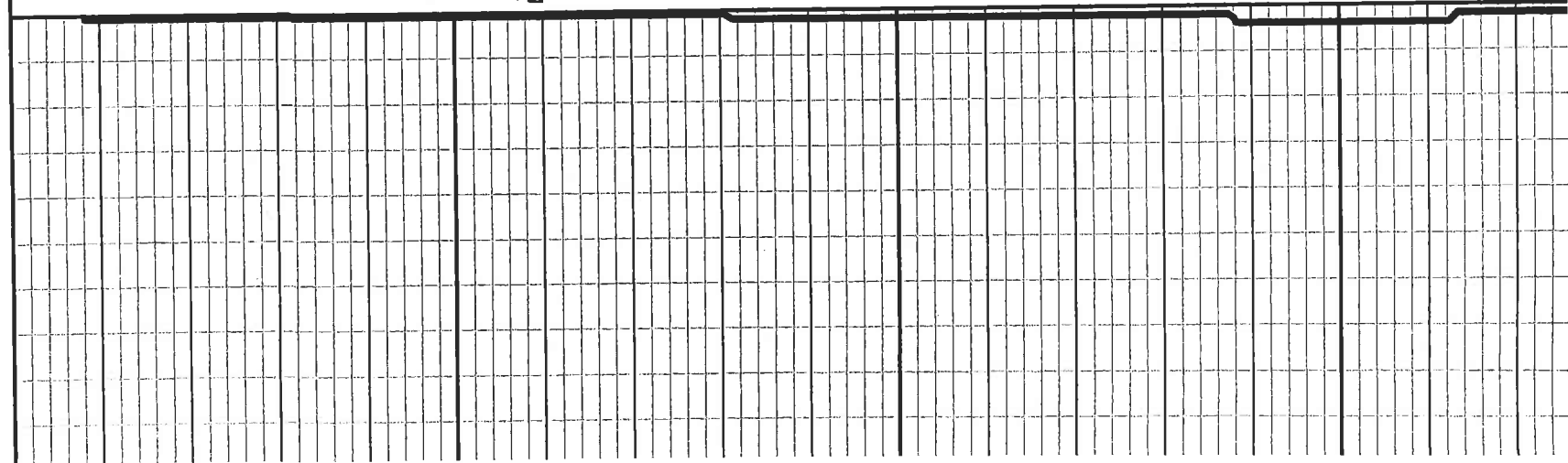
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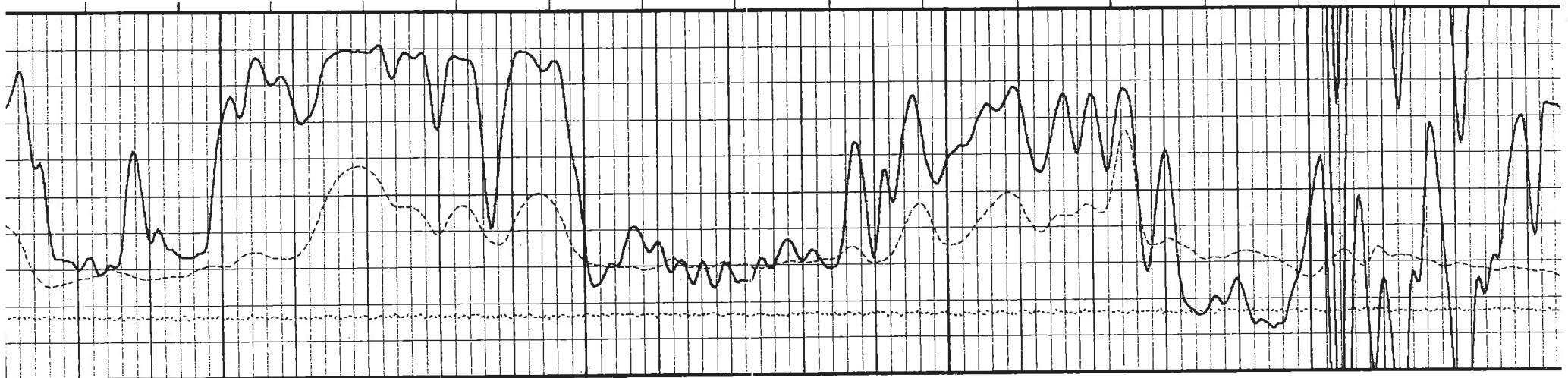
LS: Lt brn bf wh v sndy cin foss p vis por no show

LS: Lt brn bf wh micxln foss sndy v chiky ip p vis por no flor no strn or cut with LS: Wh sft v chiky ip p vis por no show occ v sndy and grding to very calc SS: no show

LS: Lt brn bf wh micxln foss sndy v chiky ip p vis por no flor no strn or cut with LS: Wh sft v chiky ip p vis por no show occ v sndy and grding to SS: Lt tan brn fri v' w strd gfs occ lngran por no flor no strn or cut with SH: Dk brn blk frm sbfis carb







120°

5800

*Mars*

120°

5850

120°

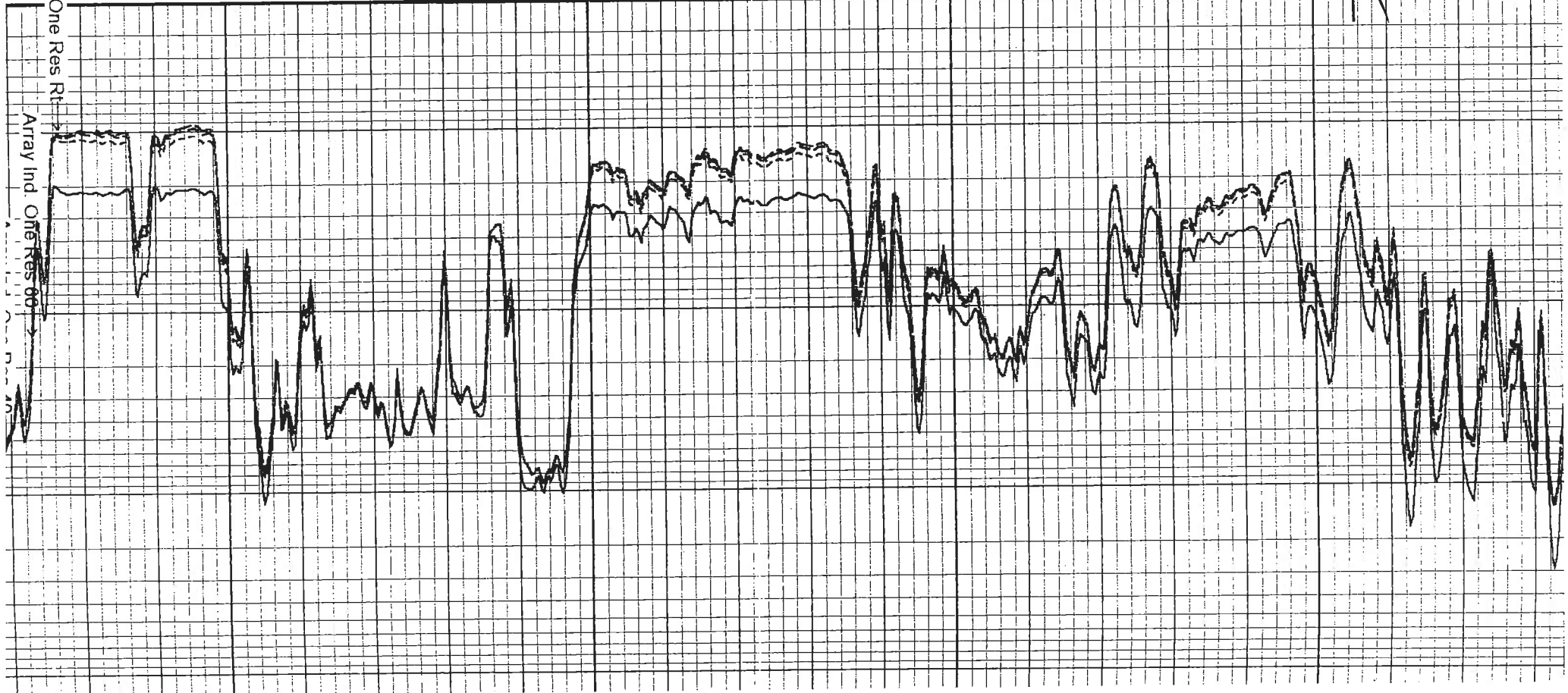
5900

*Chosfer*

120°

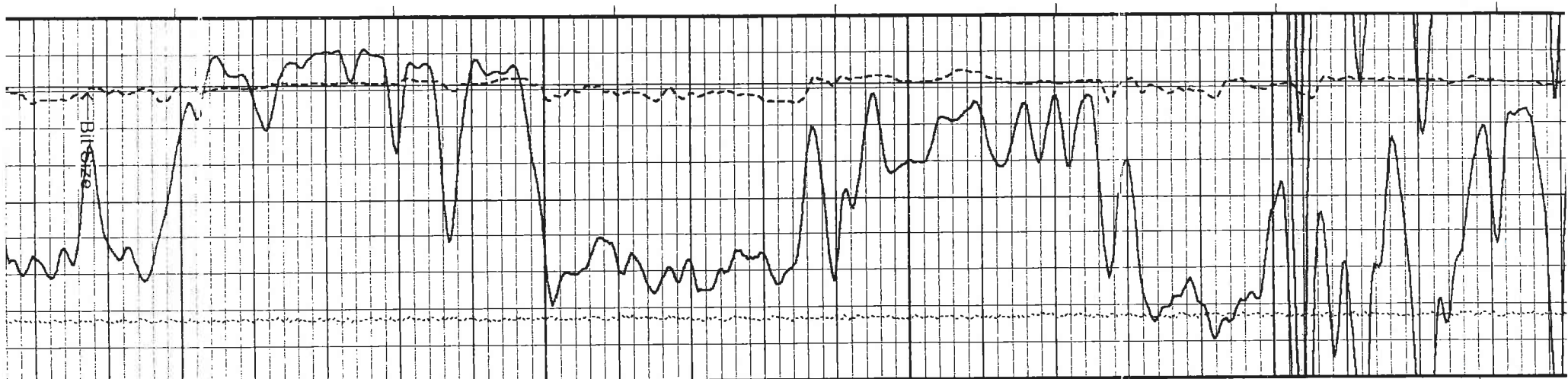
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Array Ind. One Res Rt.



Array Ind. One Res Rt.

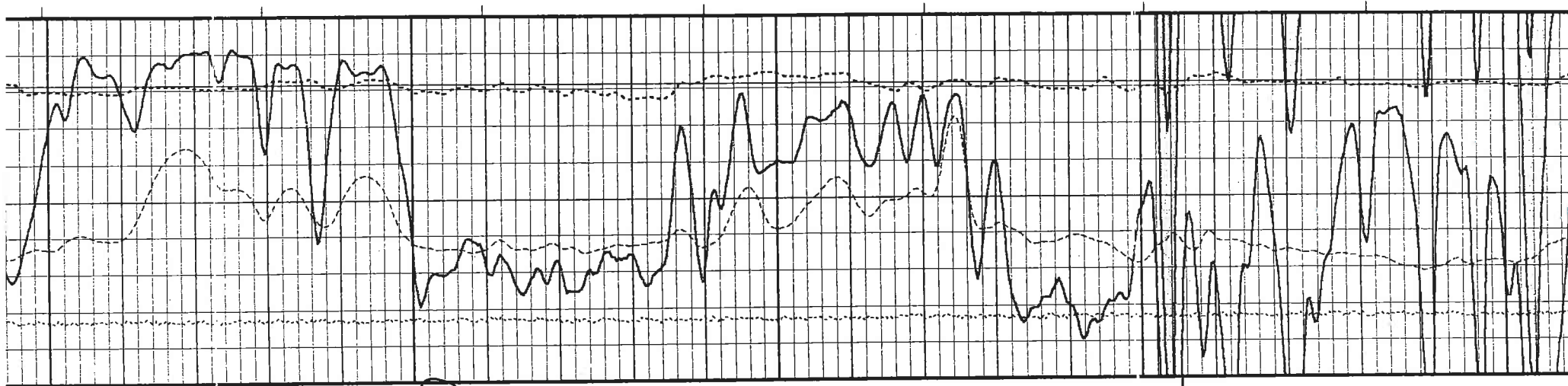
Array Ind. One Res Rt.



5950 | 123°  
 5900 *Clay* | 123°  
 5850 | 122°  
 2000 5800 *Morran* | 122°



Limestone Density Por  
 PE  
 Density Correction



5950

123°

*Master*  
5900

123°

5850

122°

5800

*Master*  
122°

5750

