UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Measured Sections of the Cretaceous Nanushuk and Colville Groups undivided, Central North Slope, Alaska

By

A. C. Huffman, Jr., T. S. Ahlbrandt,

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and

W. L. Materna, Petroleum Information Co.

Open-File Report 81-177

1981

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and Computer Graphics by

W. L. Materna, Petroleum Information Co.

The Cretaceous Nanushuk Group was evaluated for its hydrocarbon-reservoir potential within and adjacent to the National Petroleum Reserve in Alaska (NPRA) (fig. 1). A major portion of this evaluation was the measurement of detailed (1"=10') sections of the Nanushuk Group in the Northern Foothills Province during the 1977 and 1978 field seasons. Table 1 lists all sections measured in the central North Slope along with API (American Petroleum Institute) numbers, locations, thicknesses, and date of measurement. A detailed section was measured at the type locality of the Schrader Bluff Formation. This section includes the Schrader Bluff and much of the Prince Creek Formations, both of which belong to the overlying Upper Cretaceous Colville Group.

Where possible, measurements were made directly on the rock face with a jacob staff or tape. Covered intervals were measured with a jacob staff or by tape and compass. Representative samples were taken for analyses of porosity, permeability, petrography, geochemistry, and macro- and micro-paleontology. Emphasis of the field descriptions was on detailed sedimentary structures and biologic constituents to aid in the determination of depositional environments.

These field observations were recorded on a standarized form described in Reynolds and others (1975). Data from these forms were encoded and entered

into a computer graphics system developed by Petroleum Information Co. under contract to the USGS. Because this system was still under development, the displays of the 1977 sections differ slightly from those of the 1978 sections, especially in the symbols used in the lithology column. Appendices A and B define the abbreviations and symbols used in the 1977 and 1978 displays, respectively.

Because this study emphasizes genetic stratigraphy and depositional environments, no rock stratigraphic nomenclature below group rank was included in the measured sections nor was any formation or member boundary picked in the field. We feel that much of the confusion surrounding the Nanushuk Group has resulted from nomenclatural problems and that consideration of the depositional system as a whole, without regard to names, will clarify much of the confusion.

References cited

Huffman, A. C., Jr., Ahlbrandt, T. S., Paternack, Ira, Fox, J. E., Lartsch-Winkler, Susan, May, F. E., Scott, R. A., and Materna, W. L., 1981, Measured sections of the Cretaceous Nanushuk Group, undivided, western North Slope, Alaska: U.S. Geological Survey Open-File Report 81-176.

Reynolds, M. W., Ahlbrandt, T. S., Fox, J. E., and Lambert, P. W., 1975, Description of selected drill cores from Paleozoic rocks, Lost Soldier oil field, south-central Wyoming: U.S. Geological Survey Open-File Report 75-662, 73 p..

Table 1.--Measured sections in the Cretaceous Nanushuk and Colville Groups, central North Slope, Alaska

API Number	Section name	Date measured	Stratigraphic thickness		Location	
			m	ft		
50 057 90001	Tuktu Bluff	6/78	1,868	6,129	68°46'10"N,	2°06'54"W
50 057 90010	Type Grandstand	6/78	812	2,663	68°55'46"N,	151°13'03"W
50 057 90011	Roof Top Anticline	7/78	377	1,238	68°50'2[illegible]N,	150°34'49"W
50 057 90012	Arc Mountain	7/78	515	1,690	68°36'57"N,	150°33'28"W
50 119 90001	Ninuluk Bluff	8/77	315	1,036	69°07'15"N,	153°17'30"W
50 119 90002	Awuna River	7/78	169	555	69°02'03"N,	155°02'08"W
50 119 90003	Section Creek	7/78	158	519	69°03'31"N,	155°58'16"W
50 137 90001	Killik Bend	8/77	158	519	68°58'30"N,	153°57'40"W
50 137 90002	Killik Type	7/78	310	1,017	68°52'05"N,	153°23'34"W
50 137 90003	Kurupa Anticline	7/78	1,817	5,963	68°56'16"N,	155°02'23"W
50 203 90001	Marmot Syncline	7/78	1,060	3,476	68°44'34"N,	149°03'56"W
50 223 90001	Lupine River	7/78	563	1,848	69°05'23"N,	148°45'19"W
50 287 90003	Schrader Bluff	7/78	800	2,626	69°09'23"N,	151°01'04"W

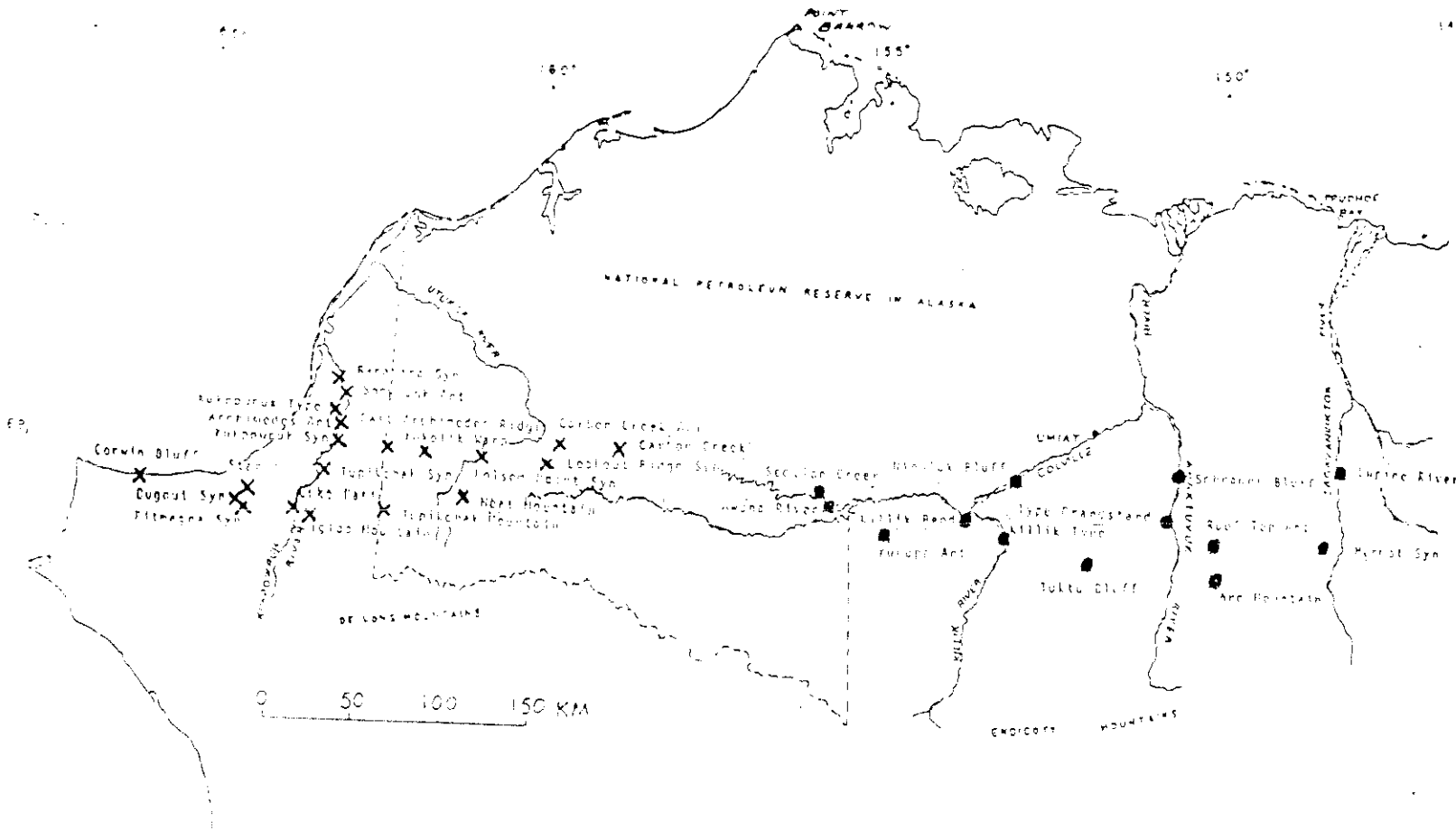


Figure 1 --Location of measured sections (*) of the Nanushuk and Colville Groups, central North Slope, Alaska. Sections measured in the Nanushuk Group in the western North Slope (x) are included in Huffman and others (1981).

Appendix A

EXPLANATION OF SYMBOLS AND ABBREVIATIONS USED IN 1977 MEASURED SECTIONS

[Abbrev., abbreviation. All abbreviations are found in a dictionary of terms used for these computer displays, which is available from Petroleum Information Corp., Denver, Colo.]

Lithology


Conglomerate.


Sandstone.


Sandstone, trough crossbedding.


Sandstone, tabular planar crossbedding.


Siltstone.


Carbonaceous siltstone.


Mudstone.


Claystone (or shale).


Carbonaceous shale.


Coal.


Symmetric ripples.


Asymmetric ripples.


Climbing ripples.


Nondescript ripples.

Thickness of Bedding

Abbrev.	Thickness and splitting description	Scale cm	Scale in.
vtk	Very thickly bedded; massive	100	40
tk	Thickly bedded; blocky	30 -100	12 -40
av	Average bedded; slabby	10 - 30	4 -12
tn	Thinly bedded; flaggy	3 - 10	1.2 - 4
vtn	Very thinly bedded	1 - 3	.4 - 1.2
l	Laminated; platy, shaly	.3- 1	.12- .4
tnl	Thinly laminated; papery, fissile	.3	.12
h	Homogeneous; massive		

Wentworth Scale for Grain Size of Detrital Rocks

φ Code	Grain Size	Scale mm	Scale in.
8	Clay	1/256	0.00015
6	Silt	1/256-1/16	0.00015- .002
4	Very fine sand	1/16-1/8	.002 - .005
3	Fine sand	1/8-1/4	.005 - .01
2	Medium sand	1/4-1/2	.01 - .02
1	Coarse sand	1/2- 1	.02 - .04
0	Very coarse sand	1- 2	.04 - .08
-1	Granule gravel	2- 4	.08 - .15
-2	Fine pebble gravel	4- 8	.15 - .3
-3	Medium pebble gravel	8- 16	.3 - .6
-4	Coarse pebble gravel	16- 32	.6 - 1.2
-5	Very coarse pebble gravel	32- 64	1.2 - 2.5
-6	Cobble gravel	64-256	2.5 -10
-8	Boulder gravel	256	10

Abbreviations for Other Terms Used in Appendix 1

Abbrev.	Name
Facies (informal)	
FLCH	Fluvial channel system.
CHAN	Channel.
SHFC	Shoreface (general).
LSHF	Lower shoreface.
USHF	Upper shoreface.
FORE	Foreshore (general).
LFOR	Lower foreshore.
UFOR	Upper foreshore.
BRIS	Barrier island.
ESTR	Estuarine.
SWMP	Swamp.
TDFL	Tidal flat.
MRNT	Marine (nondescript).
TDCH	Tidal channel.
WLCH	Washover lagoon.
LAGN	Lagoon.
OVBK	Overbank.
BKBH	Backbeach.
DLFT	Delta front.
PDLT	Prodelta
DLPL	Delta plain.
DSBR	Distributary (stream) mouth bar.
OFBR	Offshore bar.
PTBR	Point bar.
SPLY	Splay.
FLPN	Flood plain.

Abbrev.	Name
Degree of calcareousness	
SLY	Slightly.
CAL	Calcareous.
VRY	Very.
HLY	Highly.
Sublithology	
CVRD	Covered interval.
SS	Sandstone.
LS	Limestone.
SH	Shale.
SLT	Siltstone.
MDST	Mudstone.
CSH	Carbonaceous shale.
CSLT	Carbonaceous siltstone.
COAL	Coal.
CNGL	Conglomerate.
Degree of sorting (grains)	
VW	Very well.
W	Well.
MW	Moderately well.
M	Moderate.
MP	Moderately poor.
P	Poor.
VP	Very poor.

Abbrev.	Name
Intraclasts	
CLAY	Clay clasts.
CLRU	Clay rip-up clasts.
CHRT	Chert clasts.
COAL	Coal clasts.
COQU	Coquinal lag clasts.
FEST	Ironstone clasts.
LS	Limestone clasts.
MDRU	Mud rip-up clasts.
MDST	Mudstone pebble clasts.
MUD	Mud (nondescript) clasts.
QTZT	Quartzite clasts.
QTZ	Quartz clasts.
RIPU	Rip-up (nondescript) clasts.
OTHR	Other (nondescript) clasts.
CLCR	Clay concretions.
CYCR	Cycadophyte concretions.
FECR	Iron concretions.
LTCR	Limonite concretions
CONC	Nondescript concretions.
BLAC	Armored clay balls.
BLSS	Sandstone balls.
NODU	Nondescript nodules.

Abbrev.	Name
Types of laminations	
HCCL	Hummocross-lamination.
E	Even parallel.
W	Wavy parallel.
DE	Discontinuous even parallel.
DW	Discontinuous wavy parallel.
C	Curved parallel.
DC	Discontinuous curved parallel.
EN	Even nonparallel.
DEN	Discontinuous even nonparallel.
WN	Wavy nonparallel.
DWN	Discontinuous wavy nonparallel.
CONV	Convolute.
COL	Coaly.
DCOL	Discontinuous coaly.
Trace fossils	
BURW	Nondescript burrow.
USHP	U-shaped burrow.
BILO	Bilobate burrow.
OBLQ	Oblique burrow.
HORZ	Horizontal burrow.
VERT	Vertical burrow.
TRCK	Tracks, type unspecified.
TRAL	Trails, type unspecified.
ZIPR	Zipper trails.
PURL	Pleural tubes.
WORM	Worm tubs, calcareous.
DIPL	*Diplocraterion.*
RICO	*Rhizocorallium.*
AREN	*Arenicolites.*
ROSL	*Rosselia.*
INCR	*Inoceramus.*
ASTR	*Asterosoma.*

Abbrev.	Name
Bedding features	
A	Fault (normal or nondescript).
A-T	Thrust fault.
A-RX	Reverse fault (X=displacement in feet).
B	Fractured.
C	Slickensides.
D	Slumping.
E	Load cast.
F	Flute cast.
G	Bioturbated.
I	Dish.
J	Contorted.
K	Ball and pillow.
P	Boudinage.
Q	Cone-in-cone.
U	Calcite veining.
V	Clay parting.
W	Flame structure.
X	Recumbent fold.
Roundness	
SA	Subangular.
A	Angular.
SR	Subrounded.
R	Rounded.
Angle of crossbeds	
H	High: greater than 20°.
M	Moderate: 11°-20°.
L	Low: 10° or less.

Abbrev.	Name
Bedding plane markings	
SOLE	Sole.
SOLEC	Sole casts.
SCOUR	Scour and fill.
SCURB	Scoured base.
Biological constituents	
CARB	Carbonaceous material.
COCL	Coccoliths.
CORL	Coral.
CRIN	Crinoid.
ECHI	Starfish (asteroid).
EQUM	*Equisetum.*
GAST	Gastropod.
ORGN	Nondescript organic material.
PLNT	Nondescript plant fragments or material.
STEM	Stem (nondescript).
LEAF	Leaf (nondescript).
BRAN	Branch (nondescript).
LOG	Log (nondescript).
ROOT	Roots and (or) rootlets.
CYCD	Cycadophyte.
CYDL	Cycadophyte leaf.
GINK	Gingko.
FERN	Fern.
WOOD	Wood and (or) wood impressions.
SCAP	Scaphopod.
TRTX	*Tritaxia m.* (foraminifera).
TREE	Tree, growth position.
TRNK	Trunk (tree, nondescript).
LOGC	Log, conifer.
CEPH	Cephalopod.

Appendix B

EXPLANATION OF ABBREVIATIONS AND SYMBOLS USED IN 1978 MEASURED SECTIONS

A/A	as above
ABNT	abundant
ABT	about
ABV	above
AMP	amplitude
ANG	angle, angular
APPROX	approximate, approximately
APRS	appears
ASYM	asymmetrical, asymmetrically
AV	average
B & P	ball and pillow
BD	bed
BDD	bedded
BDG	bedding
BENT	bentonite, bentonitic
BIOTURB	bioturbated, bioturbation
BLK	black
BLKY	blocky
BND	bend
BOUDIN	boudinage
BRN	brown
BURN	burrow
CALC	calcareous
CARB	carbonaceous
CHRT	chert
CHRTY	cherty
CLMBG	climbing
CLYST	claystone
CM	centimeter
CMT	cement, cemented
CNGL	conglomerate, conglomeratic
CNTRT	contorted
CONC	concretion, concretionary
CONCH	conchoidal
CONSOL	consolidated
CSE	coarse
CVRD	covered
DEB	debris
DECR	decrease, decreasing
DEG	degree
DEP	deposit
DESC	described

DIA	diameter
DIR	direction
DISC	discontinuous
DISM	disseminated
DIST	distinct
DK	dark
DOL	dolomite, dolomitic
DOLST	dolostone
DOM	dominant
DTRL	detrital
ELG	elongate
EMBD	embedded
EQUIV	equivalent
EVAP	evaporite, evaporitic
EXP	exposure, exposed
EXT	extensive
F	fine
FE	iron
FEST	ironstone
FLTG	floating
FM	formation
FOL	foliated
FOS	fossil, fossiliferous
FRAC	fracture, fractured
FRAG	fragment
FRI	friable
FT	feet
G	good
GLAUC	glauconite, glauconitic
GN	green
GNS	gneiss
GR	grain, grained
GRAN	granule, granular
GRD	grade, grades, graded
GRDG	grading
GY	gray
GYP	gypsum, gypsiferous
HI	high
HLY	highly
HORZ	horizontal

IMBD	imbedded
IMP	impression
IN	inch
INCL	includes, inclusion
INCR	increase, increasing
IND	indurated
INDST	indistinct
INTBD	interbedded
INTCL	intercalated
INTRDISTRIB	interdistributary
INTLAM	interlaminated
INTV	interval
IREG	irregular, irregularly
LAM	laminated, lamination
LEN	lenticular
LNG	long
LRG	large
LS	limestone
M	meter
MAGN	magnetite
MASS	massive, massively
MAT	material
MAX	maximum
MDDY	muddy
MDST	mudstone
MED	medium
MID	middle
MIN	minimum
MM	millimeter
MNR	minor
MNRL	mineral
MOD	moderate
MTX	matrix
MUSC	muscovite
NOD	nodule
NONDESC	nondescript
NORM	normal
NUM	numerous
OCC	occasionally
ORGN	organic
OVRGTH	overgrowth

P	poor, poorly
PARA	parallel
PCT	percent, percentage
PEB	pebble
PERP	perpendicular
PET	petroliferous
PLNT	plant
PLTY	platy
POR	porosity
POS	possible, possibly
PRED	predominant, predominantly
PROB	probable, probably
PT	part
PTG	parting
PYR	pyrite, pyritic
QTZ	quartz
QTZC	quartzitic
QTZT	quartzite
REG	regular
REL	relict
RESD	residue, residual
RESIST	resistant
RI	ripple interval
RIP	ripple
RK	rock
RND	round, rounded
RM	ripple mark
RR	rare
SC	scale
SCAT	scattered
SED	sediment, sedimentary
SEV	several
SH	shale
SHLY	shaly
SIL	silica, siliceous
SIM	similar
SKS	slickensides slickensided
SL	slight, slightly
SLMP	slump
SLT	silt
SLTST	siltstone
SLTY	silty
SM	small
SMPL	sample
SND	sand
SNDY	sandy
SP	species

SRTG	sorting
SS	sandstone
STN	stain
STND	stained
STR	streak
STRATT	stratified
STRGR	stringer
STRI	striated
STRM	stream
STRUCT	structure
STYL	stylolite
SUBORRD	subordinate
SYM	symmetrical, symmetrically
SZ	size
TAB	tabular
TEX	texture
THRU	throughout
TK	thick
TN	thin
TOPO	topography
TR	trace
TRH	trough
TUF	tuffaceous
UNCONF	unconformity, unconformable
UNCONS	unconsolidated
UP	upper
VAR	variable
VERT	vertical
VES	vesicular
VIS	visible
VIT	vitreous
VOLC	volcanic
VRY	very
W	well
W/	with
W/O	without
WHT	white
WTHR	weather
WTHRD	weathered
XBD	crossbed, crossbedded
XBDG	crossbedding
XLAM	cross-laminated
XSTRAT	cross-stratified
XTAL	crystal
YEL	yellow
ZN	zone

SUB-LITHOLOGY

Abbreviation	Lithology
BENT	bentonitic
CNGL	conglomeratic
COAL	coaly
MARL	marlstone
MDDY	muddy
SHLY	shaly
SLTY	silty
SNDY	sandy

GRAIN SIZE

Wentworth Scale for Detrital Rocks

Ø	Textural Class	Metric mm:	English in:
8	clay		
6	silt	1/256 - 1/16	0.00015 - 0.002
3.5	very fine sand	1/16 - 1/8	0.002 - 0.005
2.5	fine sand	1/8 - 1/4	0.005 - 0.01
1.5	medium sand	1/4 - 1/2	0.01 - 0.02
.5	coarse sand	1/2 - 1	0.02 - 0.04
0	conglomeratic		

BEDDING THICKNESS

Abbreviation	Thickness and Splitting Description	cm.	in.
VTK	very thickly bedded; massive	>100	>40
TK	thickly bedded; blocky	30 - 100	12 - 40
AV	average bedded; slabby	10 - 30	4 - 12
TN	thinly bedded; flaggy	3 - 10	1.2 - 4
VTN	very thinly bedded	1 - 3	.4 - 1.2
LAM	laminated; platy, shaly	.3 - 1	.12 - .4
TNL	thinly laminated; papery, fissile	.3	.12
MASS	homogeneous; massive		

TYPES OF LAMINATIONS

Abbreviation	Type of Lamination
CLL	curved parallel
CELL	curved even parallel

TYPES OF LAMINATIONS - (Continued)

Abbreviation	Type of Lamination
COL	coaly
DCLL	discontinuous curved parallel
DCOL	discontinuous coaly
DELL	discontinuous even parallel
DEN	discontinuous even nonparallel
DWLL	discontinuous wavy parallel
DWN	discontinuous wavy nonparallel
ELL	even parallel
EN	even nonparallel
MXL	microcross-stratified
WLL	wavy parallel
WN	wavy nonparallel

BIOLOGIC CONSTITUENTS

Abbreviation	Name
CARB	carbonaceous material
ORGN	organic material
PLNT	nondescript plant fragments or material
BRAN	branch
CYCD	cycadophyte
CYDL	cycadophyte leaf
EQUM	Equisetum (sphenopsid)
FERN	fern
GIKL	gingko leaf
GINK	gingko
LEAF	leaf (nondescript)
LOG	log (nondescript)
LOGC	log, conifer
ROOT	roots and/or rootlets
STEM	stem
TREE	tree, growth position
TRNK	trunk
WOOD	wood and/or wood impressions
MRNE	nondescript marine assemblage
BONE	bone
CEPH	cephalopod
COCL	coccoliths
CORL	coral
CRIN	crinoid
ECHI	starfish (asteroid)
GAST	gastropod
INO	Inoceramus (pelecypod)
OYST	oyster
PLEC	pelecypod (nondescript)
SCAP	scaphopod
TRTX	Tritaxia m. (foram)

TRACE FOSSILS

Abbreviation	Name
BURW	nondescript burrow
BILO	bilobate
HORZ	horizontal
OBLQ	oblique
USHP	u-shaped
VERT	vertical
PURL	pleural tubes
TRAL	trails, type unspecified
TRCK	tracks, type unspecified
WORM	worm tube
ZIPR	zipper trails
AREN	Arenicolities
ASTR	Asterosoma, helicoid funnel form
CRUZ	Cruziana
DIPL	Diplocraterion
ROSL	Rosselia
RIZO	Rhizocorallium
SKOL	Skolithos

CLASTS

Abbreviation	Type
CHRT	chert
CLAY	clay chips
CLRU	clay rip-up
CLST	claystone
COAL	coal
COQU	coquina
FEST	ironstone
GAB	gabbro
GNS	gneiss
IGN	igneous (nondescript)
LS	limestone
MDCH	mud chips
MDRU	mud rip-up
MDST	mudstone
META	metamorphic (nondescript)
MUD	mud pebbles
OTHR	other
QTZ	quartz
QTZT	quartzite
RIPU	rip-up (nondescript)
SHCH	shale chips
SOLE	sole clasts

CLASTS - (Continued)

Abbreviation	Name
	balls:
BLAC	armored clay
BLSS	sandstone
BMUD	mud
	concretions:
CLCN	clay
CONC	nondescript
CYCN	cycadophyte
FECN	iron
LTCN	limonite
MDCN	mud
SHCN	shale
STCN	siltstone
	nodules:
CLND	claystone
NODU	nondescript
PYND	pyrite

FACIES (INFERRED)

Abbreviation	Name
BAR	bar (nondescript)
BECH	beach
BKBH	backbeach
BKSH	backshore
BRIS	barrier island
CHAN	channel
DLFT	delta front
DLPL	delta plain
DMBR	distributary (stream) mouth bar
EOLN	eolian
ESTR	estuarine
FILL	bay fill
FLCH	fluvial channel system
FLDP	flood plain
FLUV	fluvial (nondescript)
FORE	foreshore (general)
LAGN	lagoonal
LFOR	lower foreshore
LSHF	lower shoreface
MRNE	marine (nondescript)
NEAR	nearshore
OFBR	offshore bar
OFFS	offshore

FACIES (INFERRED) - (Continued)

Abbreviation	Name
OVBK	overbank
PDLT	prodelta
PTBR	point bar
SHFC	shoreface (general)
SPLY	splay
STOR	storm deposit
STRM	stream
SWMP	swamp
TDCH	tidal channel
TDDL	tidal delta
TDFL	tidal flat
UFOR	upper foreshore
USHF	upper shoreface
WLGN	washover lagoonal

SORTING (GRAINS)

Abbreviation	Degree
W	well
MW	moderately well
M	moderate
MP	moderately poor
P	poor
VP	very poor

ROUNDNESS

SBAN	subangular
ANG	angular
SBRN	subrounded
RND	rounded

CALCAREOUSNESS

HLY	highly
VRY	very
MOD	moderately
SLY	slightly
NON	non

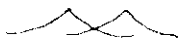
RIPPLE PATTERNS

general (nondescript)

asymmetric

symmetric (oscillatory)

climbing



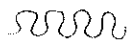
interference

megaripple

truncated symmetric

DEFORMED BEDDING PATTERNS

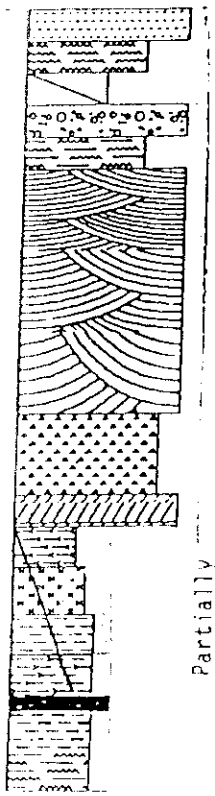
bioturbated



contorted/convoluted

SYMBOL

LITHOLOGY



Sandstone, massive/undifferentiated
Siltstone
Covered
Conglomerate
Carbonaceous siltstone

Low angle

Sandstone, trough cross bedded,

Medium angle

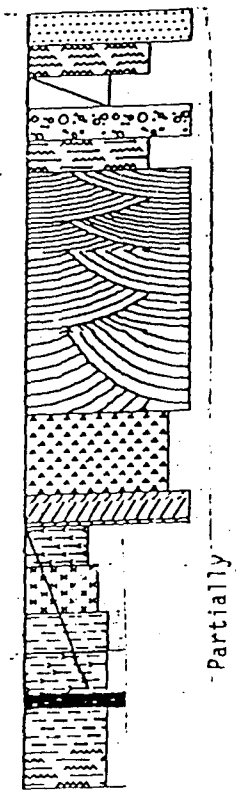
High angle

Chert

Sandstone, planar cross bedded
Bentonite
Tuff
Shale/claystone
Bentonitic shale
Coal
Carbonaceous shale
Mudstone

SYMBOL

LITHOLOGY



Sandstone, massive/undifferentiated
Siltstone
Covered
Conglomerate
Carbonaceous siltstone

Sandstone, trough cross bedded,

- Low angle
- Medium angle
- High angle

Chert

Sandstone, planar cross bedded

Partially covered:
- Bentonite
- Tuff
- Shale/claystone
- Bentonitic shale

Coal
Carbonaceous shale
Mudstone

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Open file report
OF 81 177
PLATE 1

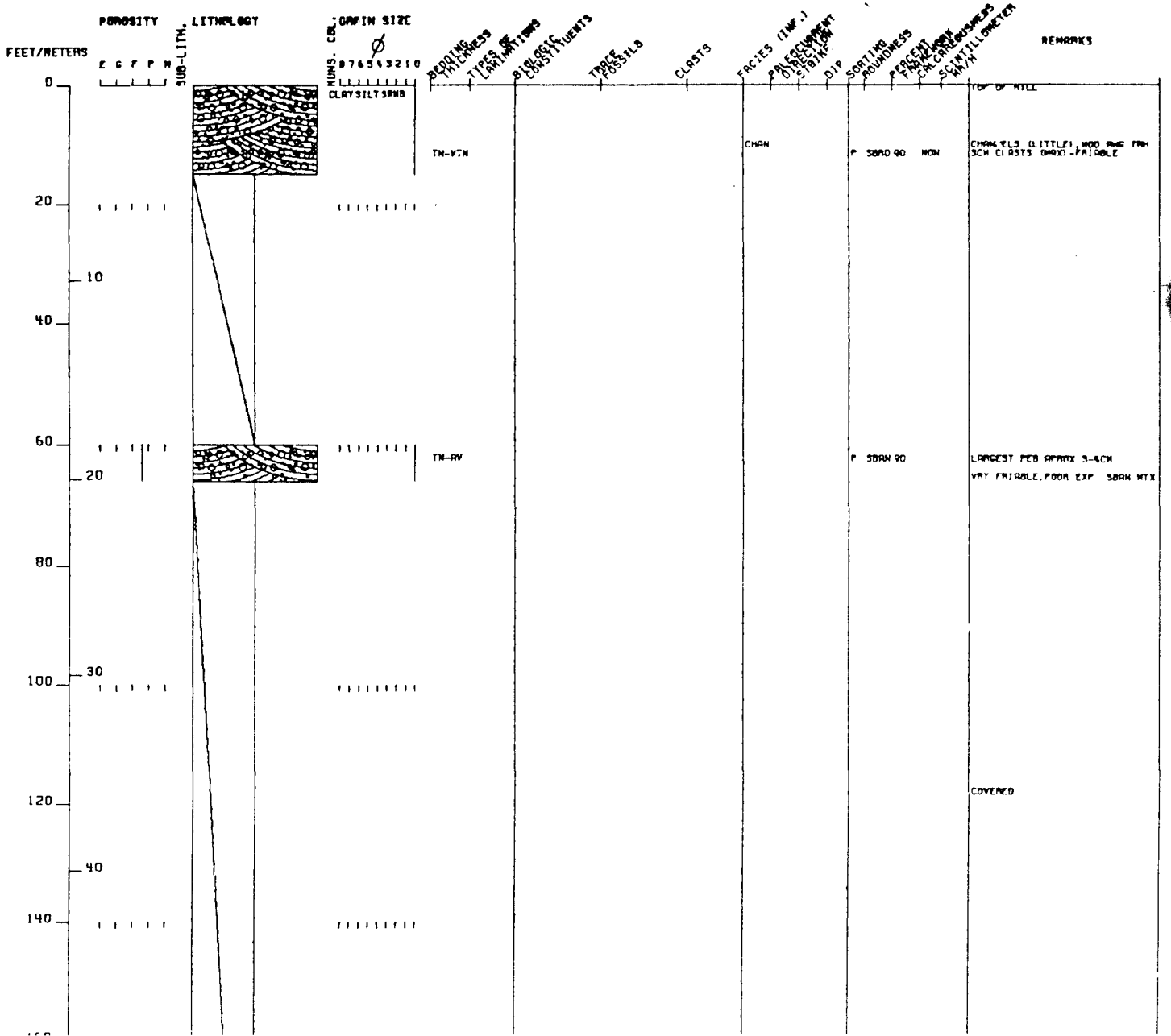
TUKTU BLUFF

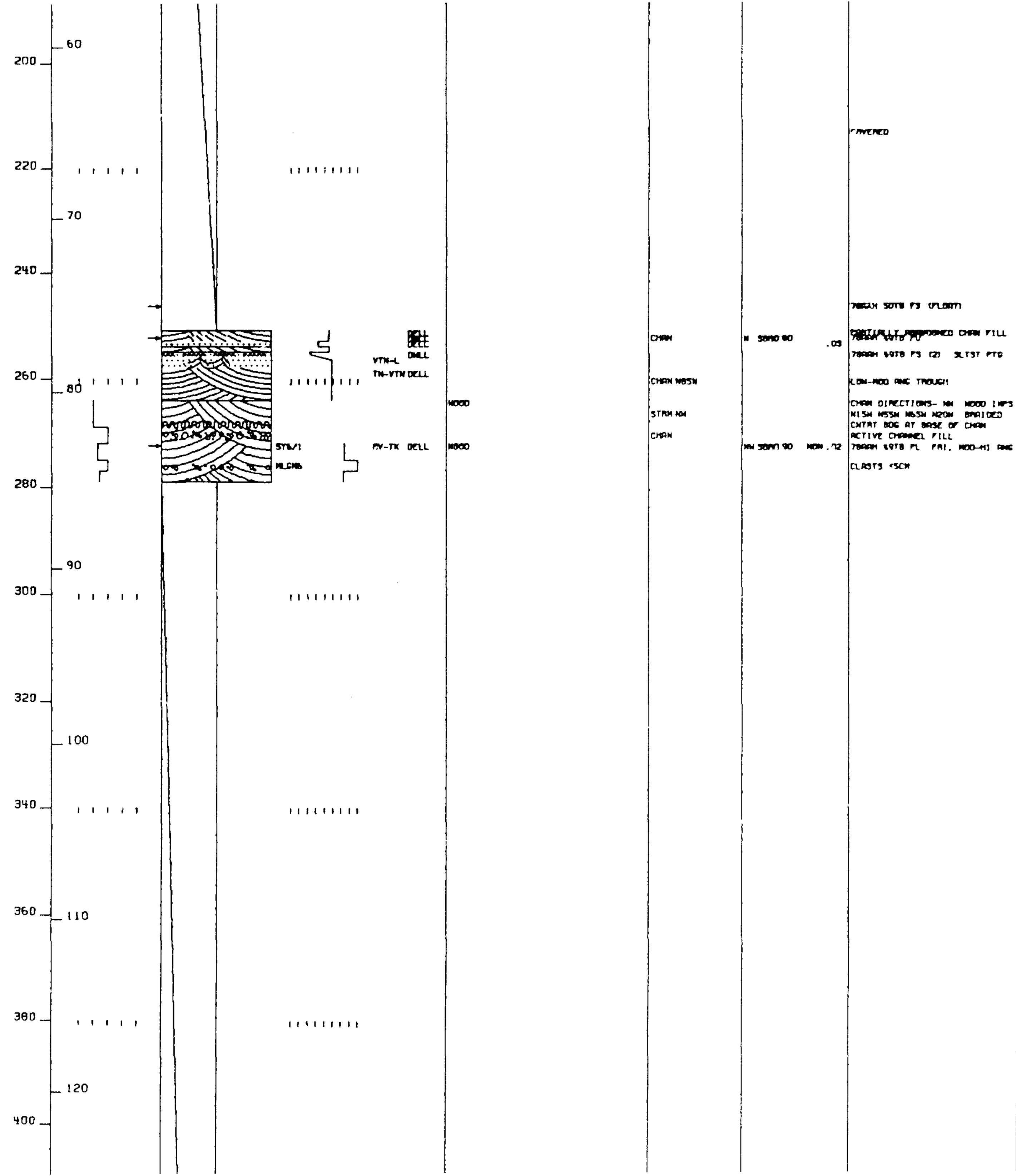
API NO. 50-057-90001

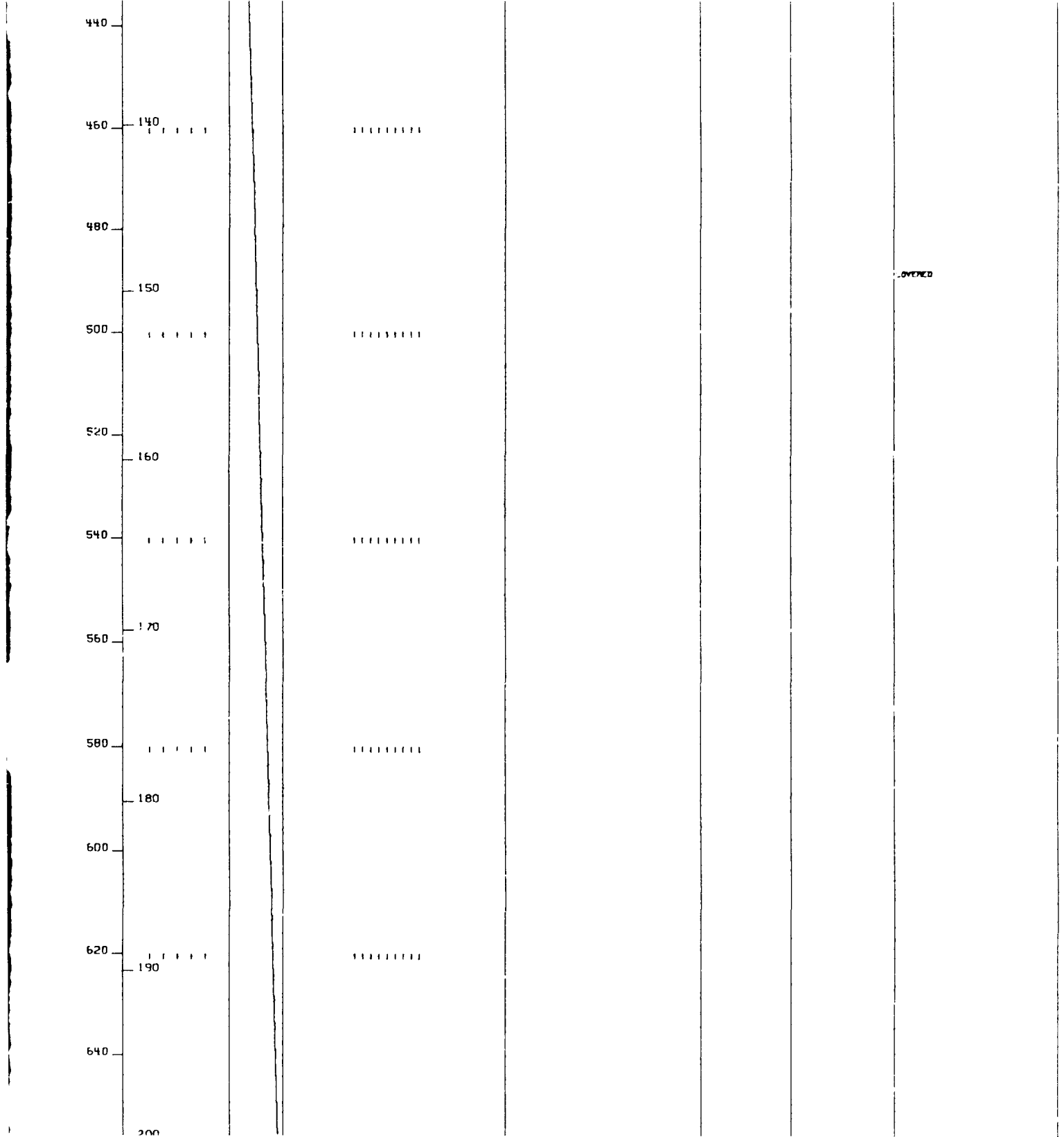
6,129 FT TOP — 1 IN = 20 FT — 6/27/78 BASE

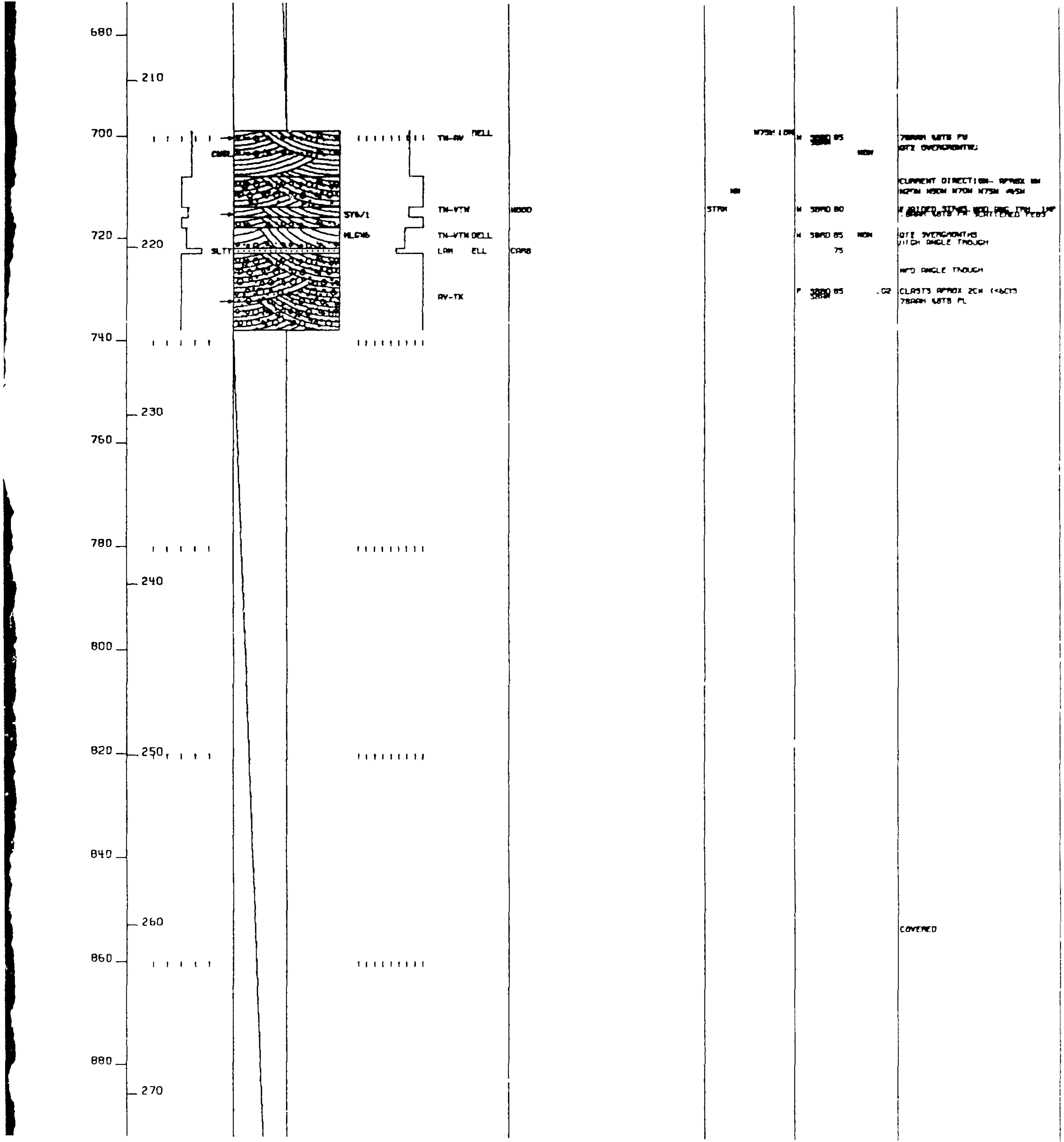
SEC 16, T8S, R1W
68°46'10"N 152°06'54"W

SEC 24, T8S, R2W
68°43'30"N 152°15'50"W

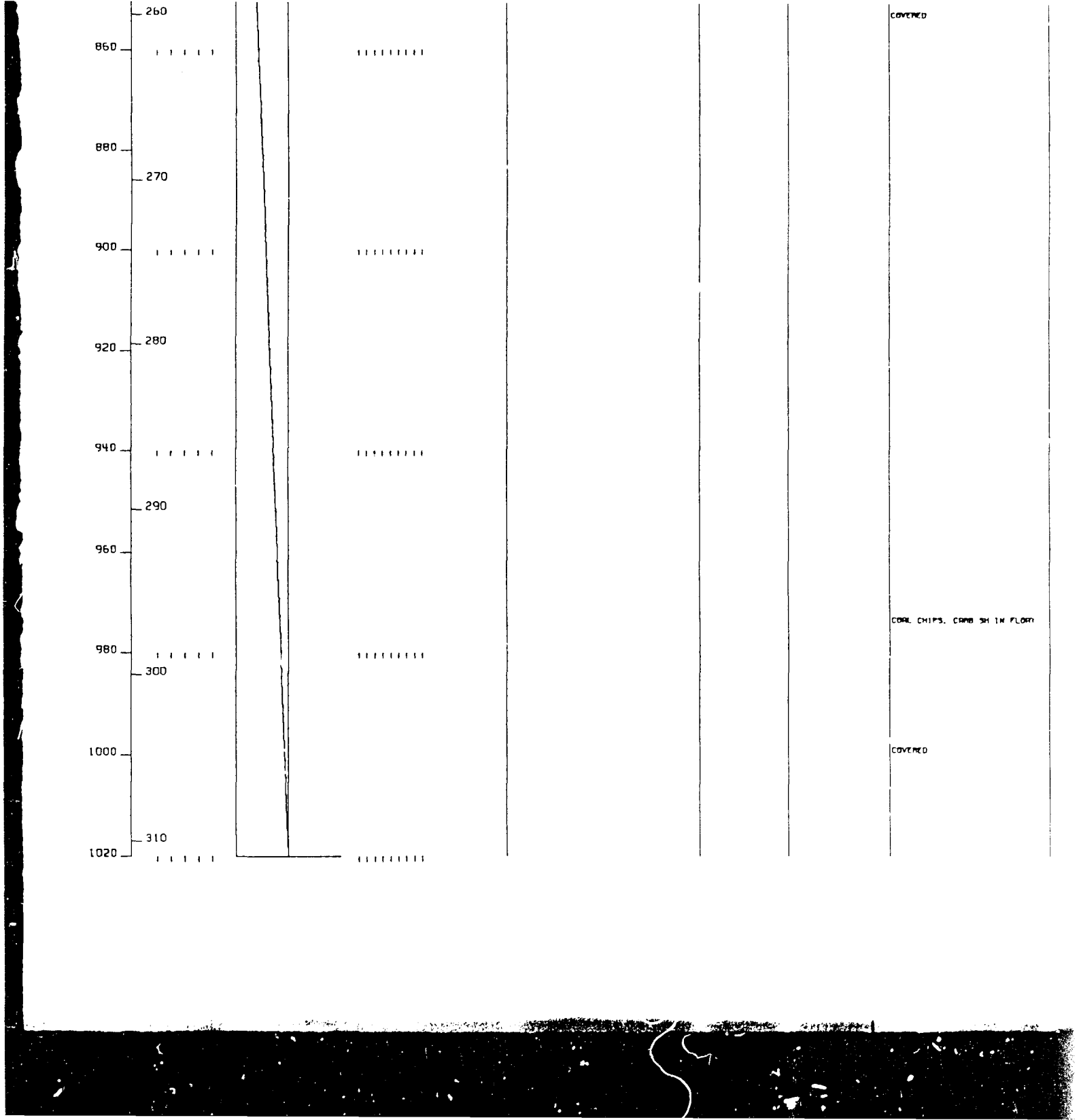



200
220
240
260
280
300
320
340
360
380
400
60
70
80
90
100
110
120
COVERED
7.5YR SOTB FS (FLOAT)
PARTIALLY ABANDONED CHAN FILL
DELL
DELL
VTN-L
TN-VTN DELL
WOOD
5Y6/1
MLCM6
PV-TK DELL
WOOD
CHAN
N 50NO 90
.03
7.5YR S9TB FS (2) SLTST FTG
CHAN N85W
LOW-MOD ANG TROUGH
STRM NW
CHAN DIRECTIONS- NW WOOD IMPS
N15W N55W N65W N20W BRAIDED
CHAN
CNTRT BOG AT BASE OF CHAN
ACTIVE CHANNEL FILL
NW 50NW 90
NON .02
7.5YR S9TB FL FAI, MOD-HI ANG
CLASTS <5CM


440
460
140
480
150
500
520
160
540
170
560
580
180
600
620
190
640
200



680
700
720
740
760
780
800
820
840
860
880
210
220
230
240
250
260
270
CNGL
SLTY
STG/1
TN-AV
TN-VTM
TN-VTM DELL
LAM ELL
AV-TK
DELL
WOOD
CARB
STRM
75
QTZ OVERGROWTHS
HIGH ANGLE TROUGH
MED ANGLE TROUGH
CLASTS APPROX 2CM (<6CM)
COVERED


260
860
880
270
900
920
280
940
290
960
980
300
1000
310
1020
COVERED
COAL CHIPS, CARB SH IN FLOOR
COVERED

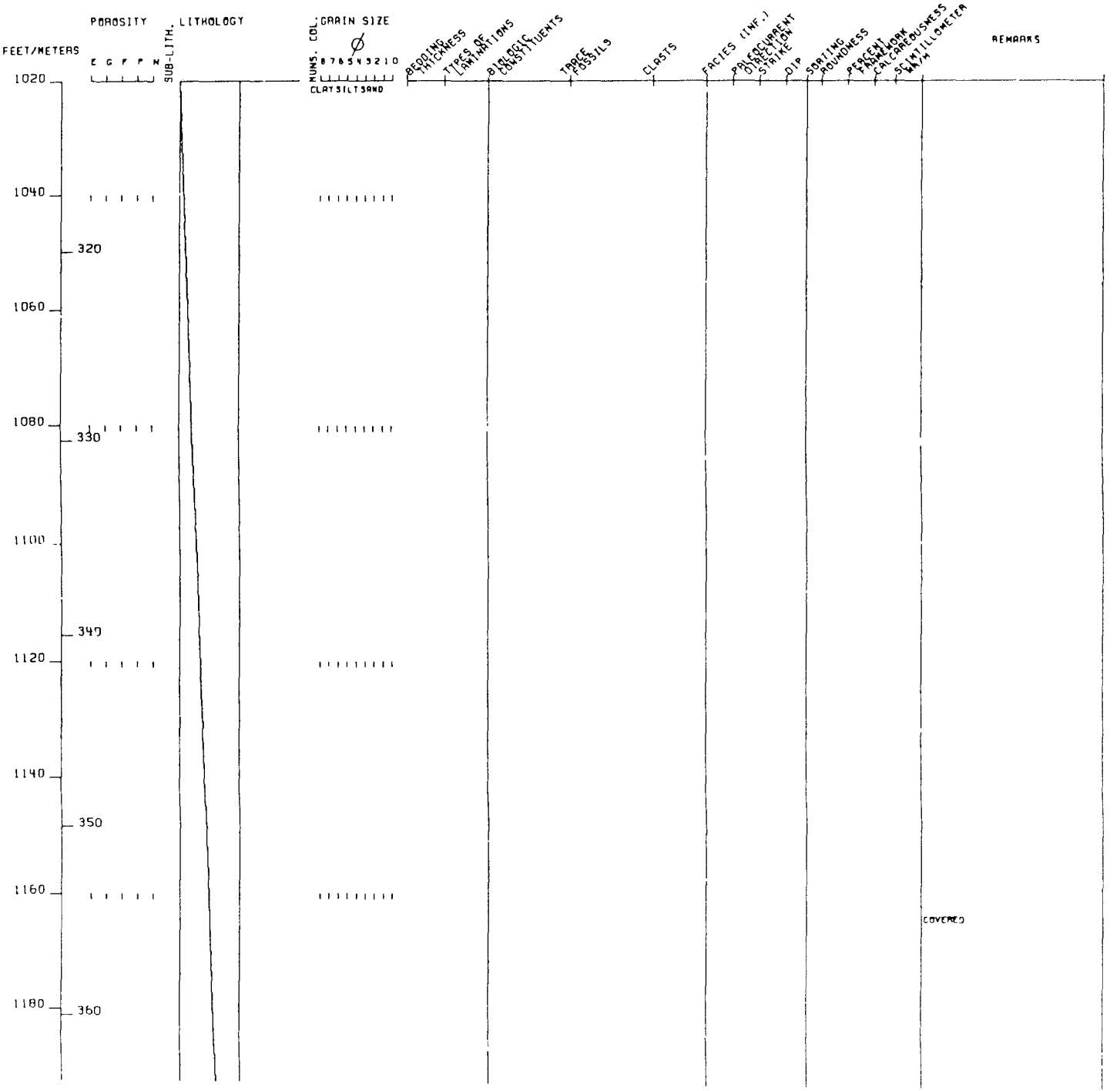
TUKTU BLUFF

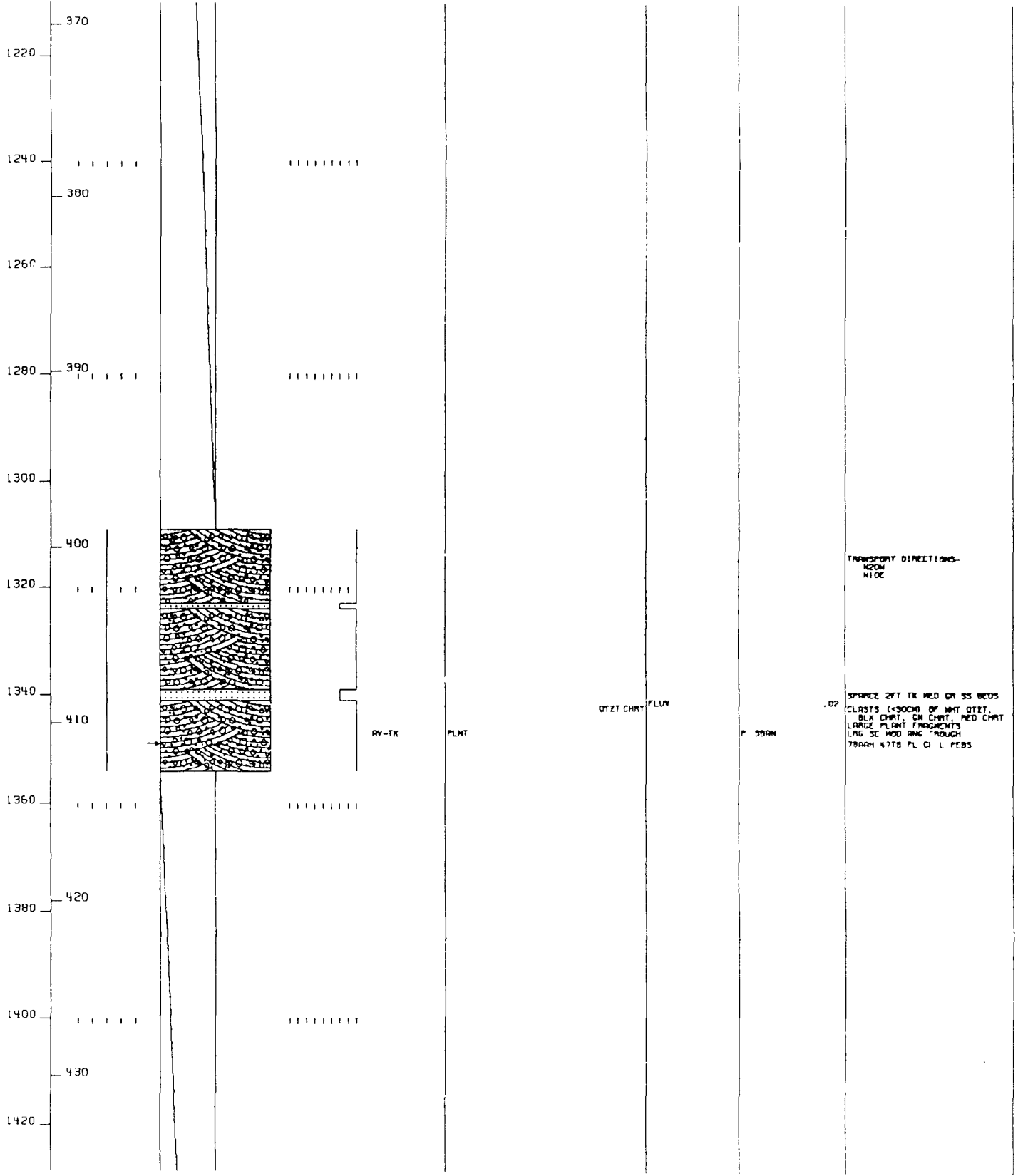
API NO. 50-057-90001

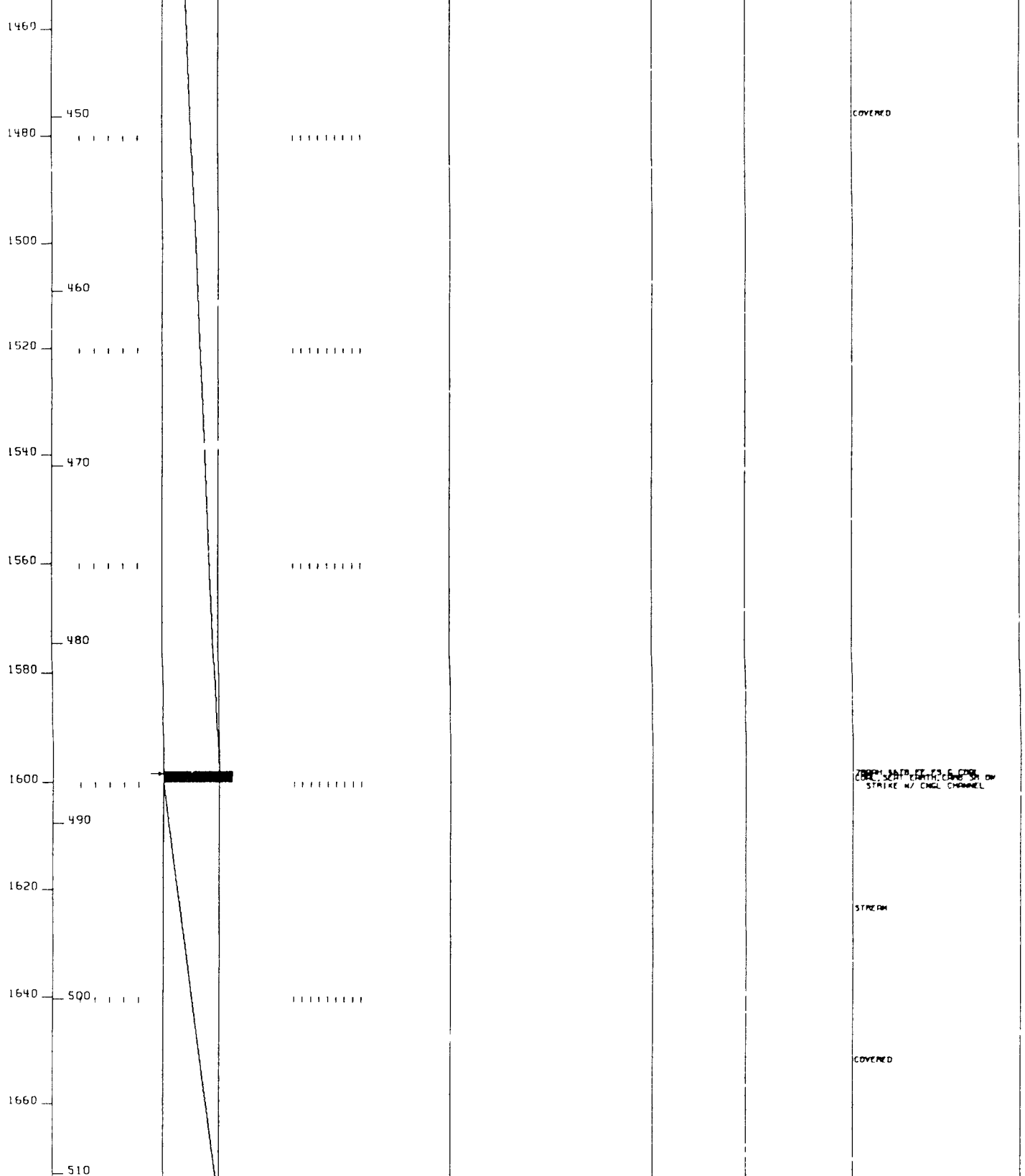
6,129 FT TOP — 1 IN = 20 FT — 6/27/78 BASE

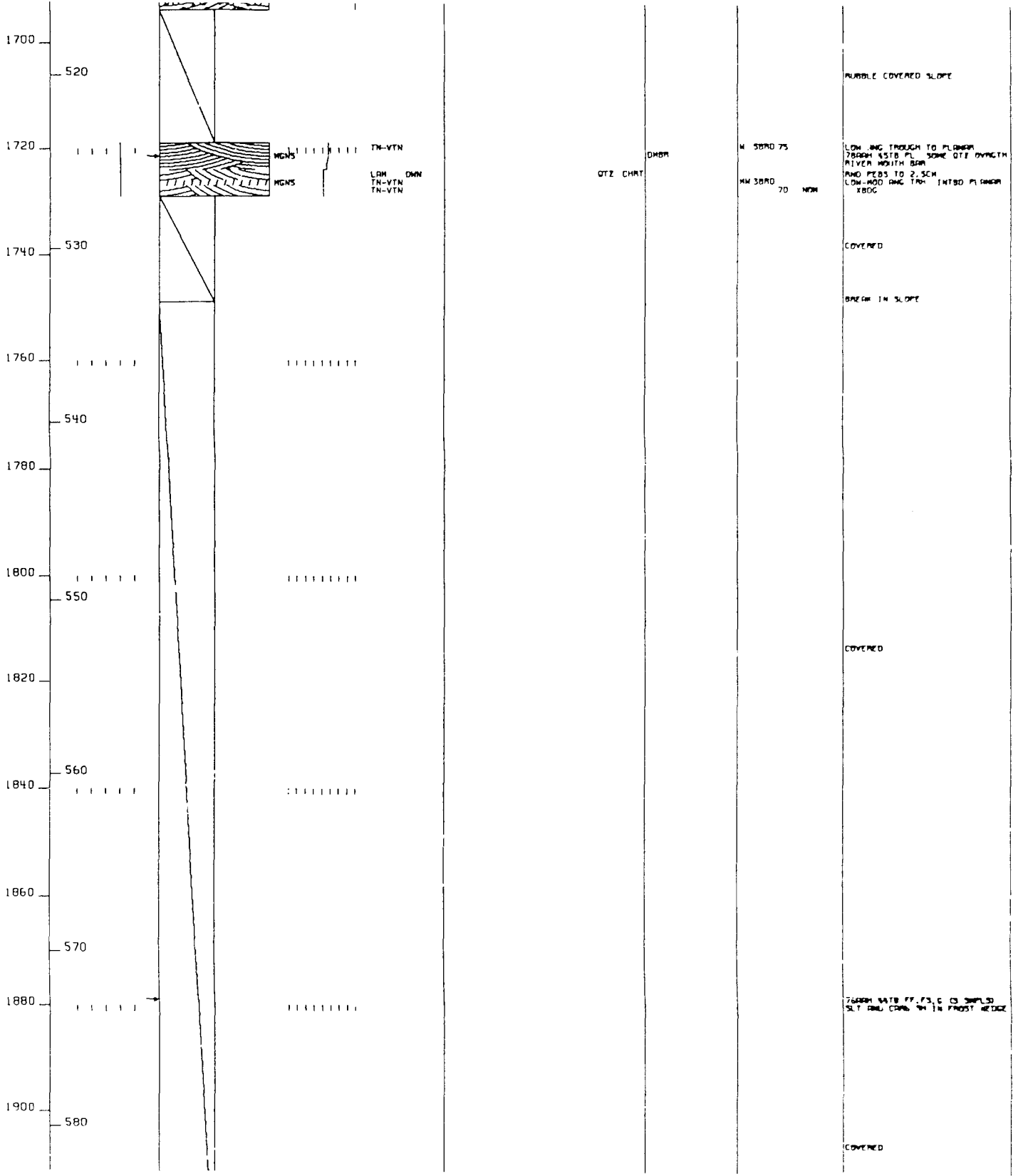
SEC 16, T8S, R1W
68°46'10"N 152°06'54"W

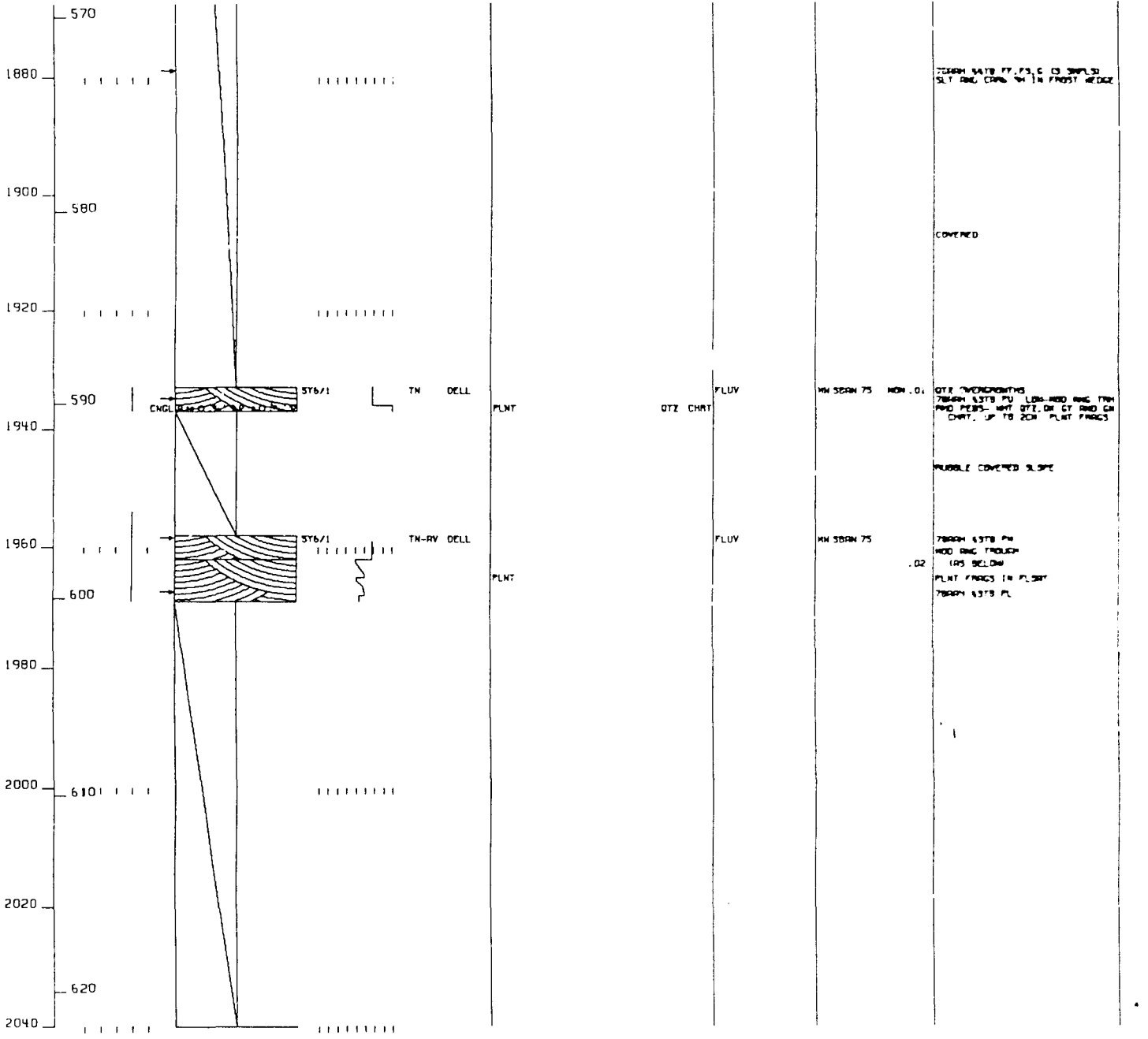
SEC 24, T8S, R2W
68°43'30"N 152°15'50"W




370
1220
1240
380
1260
1280
390
1300
400
1320
1340
410
1360
420
1380
1400
430
1420
AV-TK
PLNT
QTZT CHRT
FLUV
F SBAN
.02
TRANSPORT DIRECTIONS-
N20W
N10E
SPARCE 2FT TK MED GR SS BEDS
CLASTS (<30CM) OF WHT QTZT,
BLK CHRT, GN CHRT, RED CHRT
LARGE PLANT FRAGMENTS
LAG SC MOD ANG TROUGH
79AAH &7TB PL CI L PEBS


1460
450
1480
1500
460
1520
1540
470
1560
480
1580
1600
490
1620
1640
500
1660
510
COVERED
STREAM
COVERED

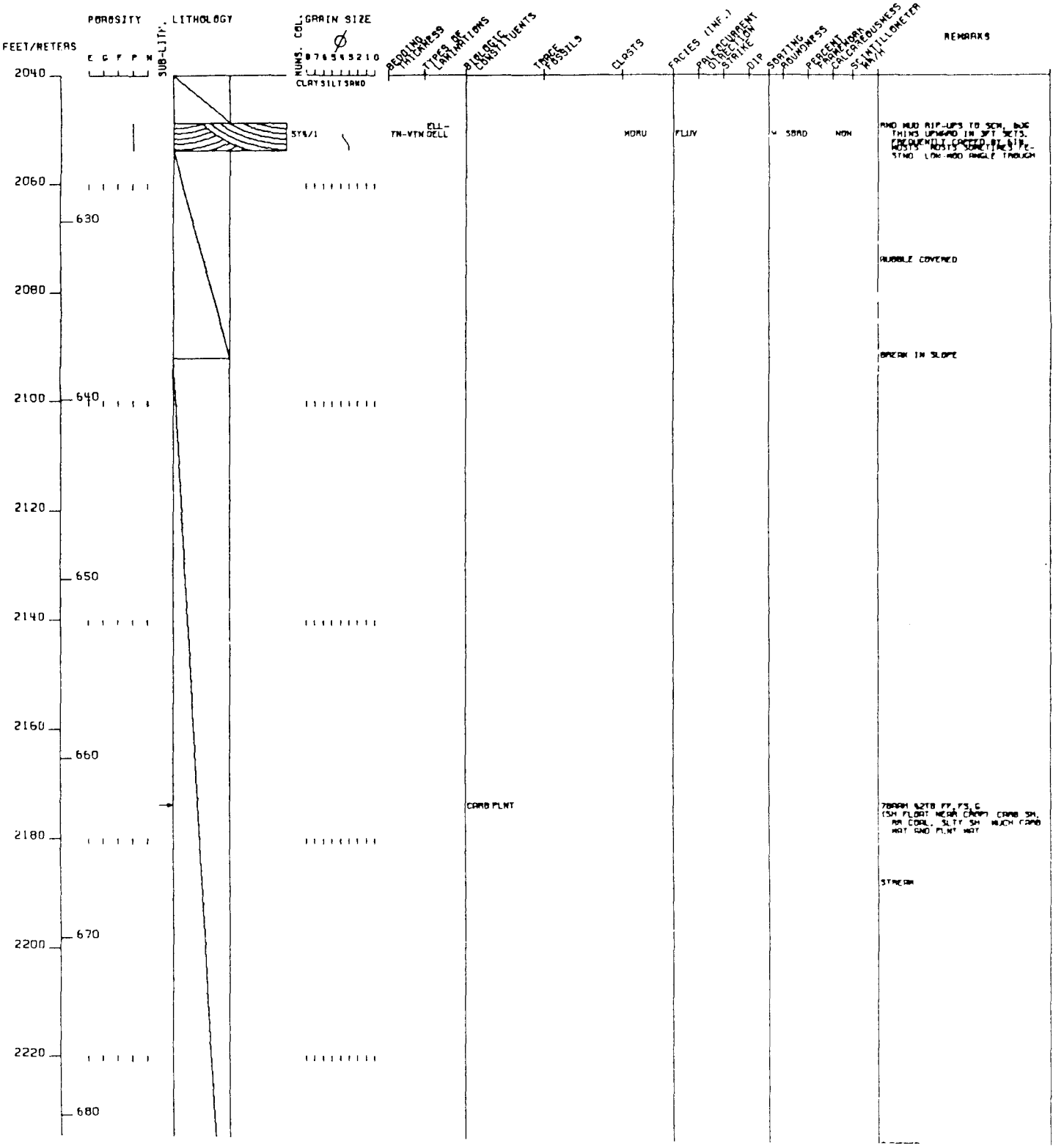

1700
520
1720
MGNS
MGNS
TN-VTN
LAM DMN
TN-VTN
TN-VTN
1740
530
1760
540
1780
1800
550
1820
560
1840
1860
570
1880
1900
580
DMBR
QTZ CHRT
W 38RD 75
NW 38RD
70 NDM
RUBBLE COVERED SLOPE
COVERED
BREAK IN SLOPE
COVERED
COVERED

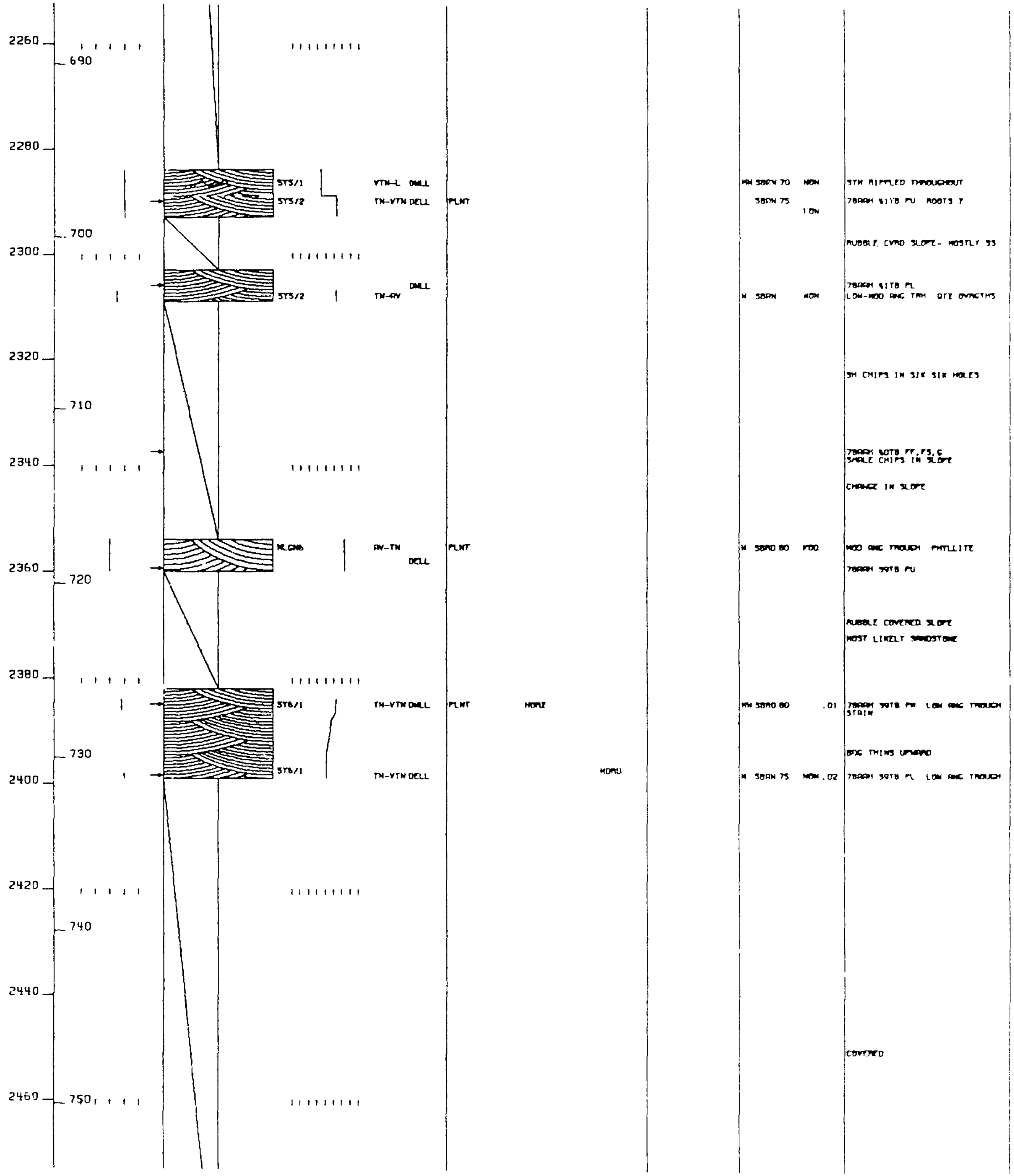

570
1880
1900
580
1920
590
1940
1960
600
1980
2000
610
2020
620
2040
ST6/1
TN DELL
CNGL
FLNT
FLUV
QTZ CHRT
MW SBRN 75
COVERED
ST6/1
TN-RV DELL
FLUV
MW SBRN 75
.02
FLNT

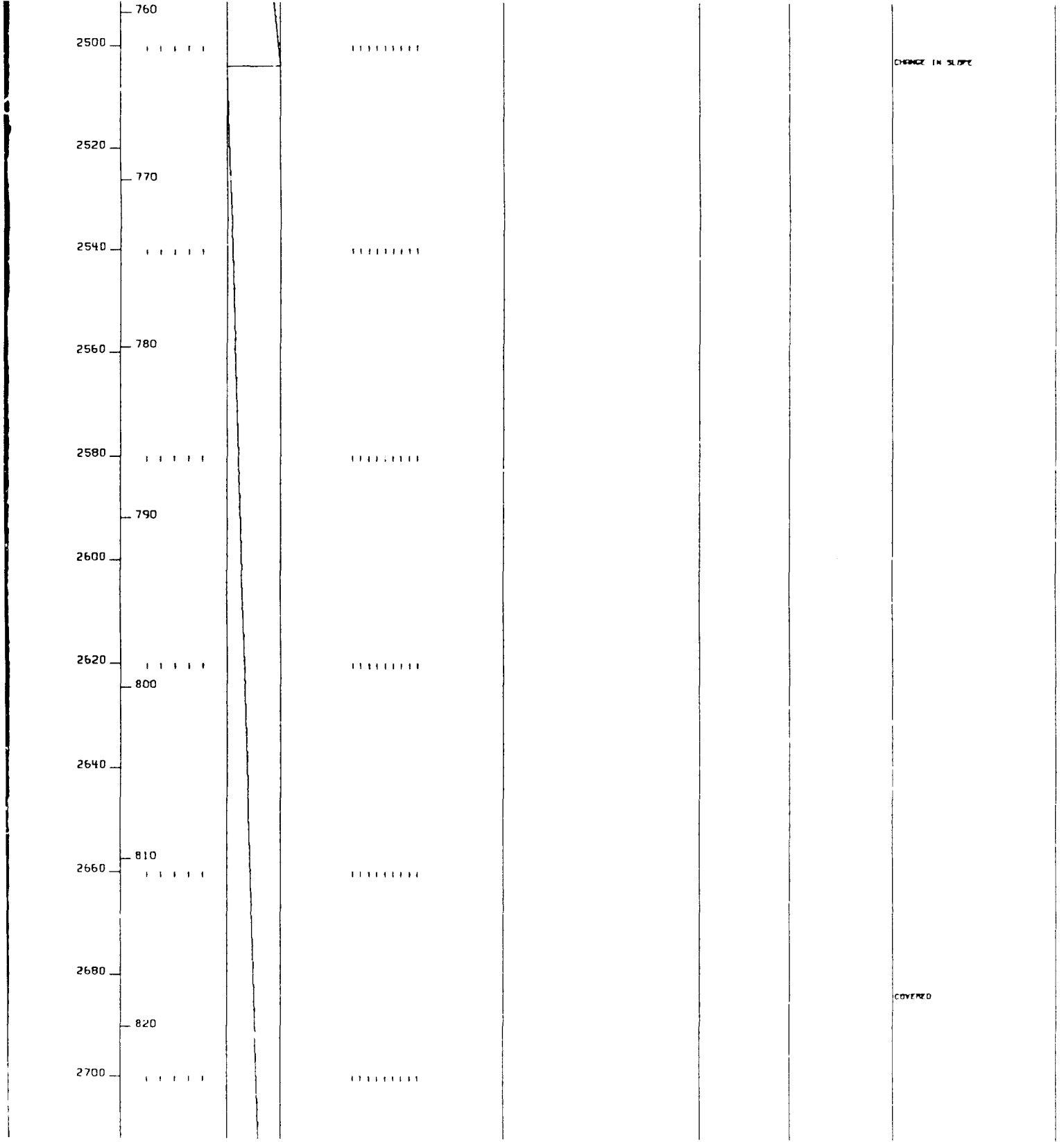
TOP 1 IN = 20 FT BASE

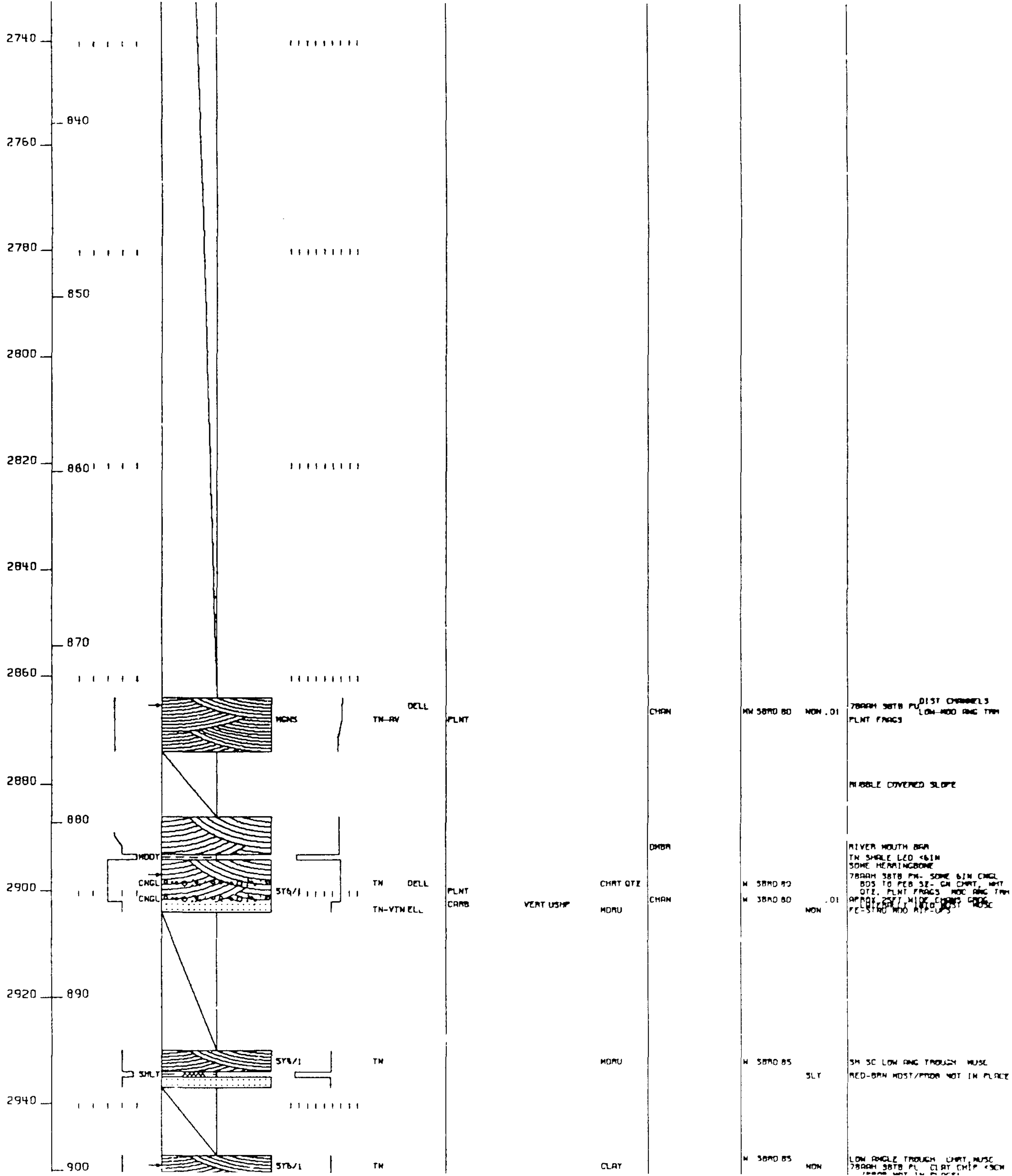
SEC 16, T8S, R1W
68°46'10"N 152°06'54"W

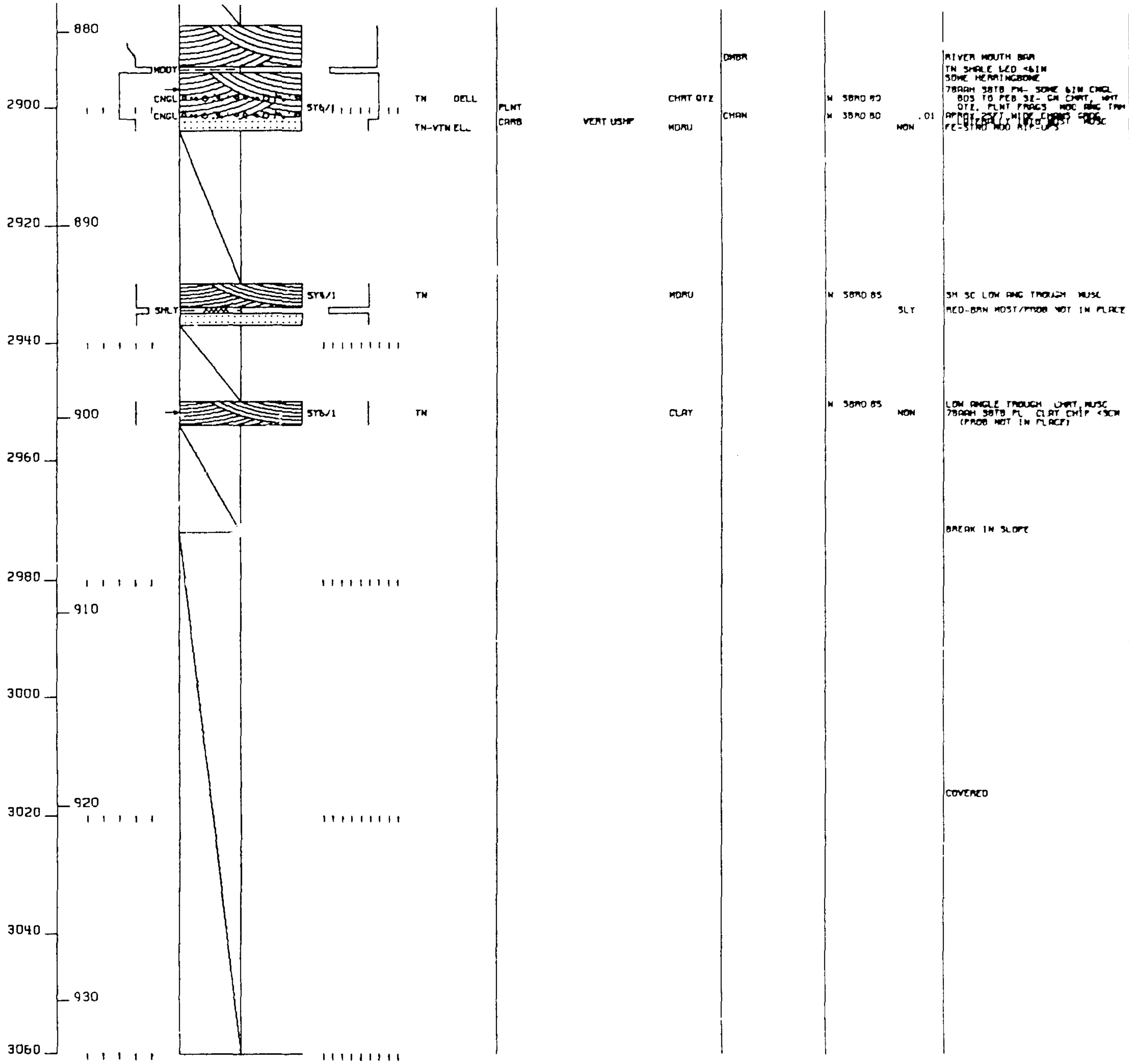
SEC 24, T8S, R2W
68°43'30"N 152°15'50"W




2260
690
2280
SYS/1
VTN-L DWLL
MN 58RV 70 NON
SYN RIPPLED THROUGHOUT
SYS/2
TN-VTN DELL
PLNT
58RN 75
700
2300
RUBBLE CVRD SLOPE- MOSTLY SS
DWLL
SYS/2
TN-RV
2320
SH CHIPS IN SIX SIX HOLES
710
2340
SHALE CHIPS IN SLOPE
CHANGE IN SLOPE
RV-TN
PLNT
M 58RD 80
MOD ANG TROUGH PHYLLITE
DELL
2360
720
RUBBLE COVERED SLOPE
MOST LIKELY SANDSTONE
2380
SY6/1
TN-VTN DWLL
PLNT
HORZ
MN 58RD 80 .01
LOW ANG TROUGH
STRAIN
730
BDG THINS UPWARD
SY6/1
TN-VTN DELL
HORU
M 58RN 75 NON .02
LOW ANG TROUGH
2400
2420
740
2440
COVERED
2460
750


760
2500
CHANGE IN SLOPE
2520
770
2540
2560
780
2580
790
2600
2620
800
2640
810
2660
2680
COVERED
820
2700


2740
840
2760
2780
850
2800
2820
860
2840
870
2860
2880
880
2900
2920
890
2940
900
MGNS
MDDY
CNGL
CNGL
5Y6/1
SHLT
5Y6/1
5Y6/1
DELL
TN-AV
PLNT
CHAN
MW 5BRD 80
NON .01
78AAH 58TB PU
DIST CHANNELS
LOW-MOD ANG TRH
PLNT FRAGS
RUBBLE COVERED SLOPE
DMBR
RIVER MOUTH BAR
TN SHALE LED <6IN
SOME HERRINGBONE
TN
DELL
PLNT
CARB
TN-VTN ELL
VERT USHP
CHRT QTZ
MDRU
CHAN
W 3BRD 80
.01
NON
78AAH 58TB PW- SOME 6IN CNGL
BDS TO PEB SZ- GN CHRT, WHT
QTZ, PLNT FRAGS MOD ANG TRH
TN
MDRU
W 5BRD 85
SLY
5M SC LOW ANG TROUGH MUSC
RED-BRN MDST/PROB NOT IN PLACE
TN
CLAY
W 5BRD 85
NON
LOW ANGLE TROUGH CHRT,MUSC
78AAH 58TB PL CLAY CHIP <5CM

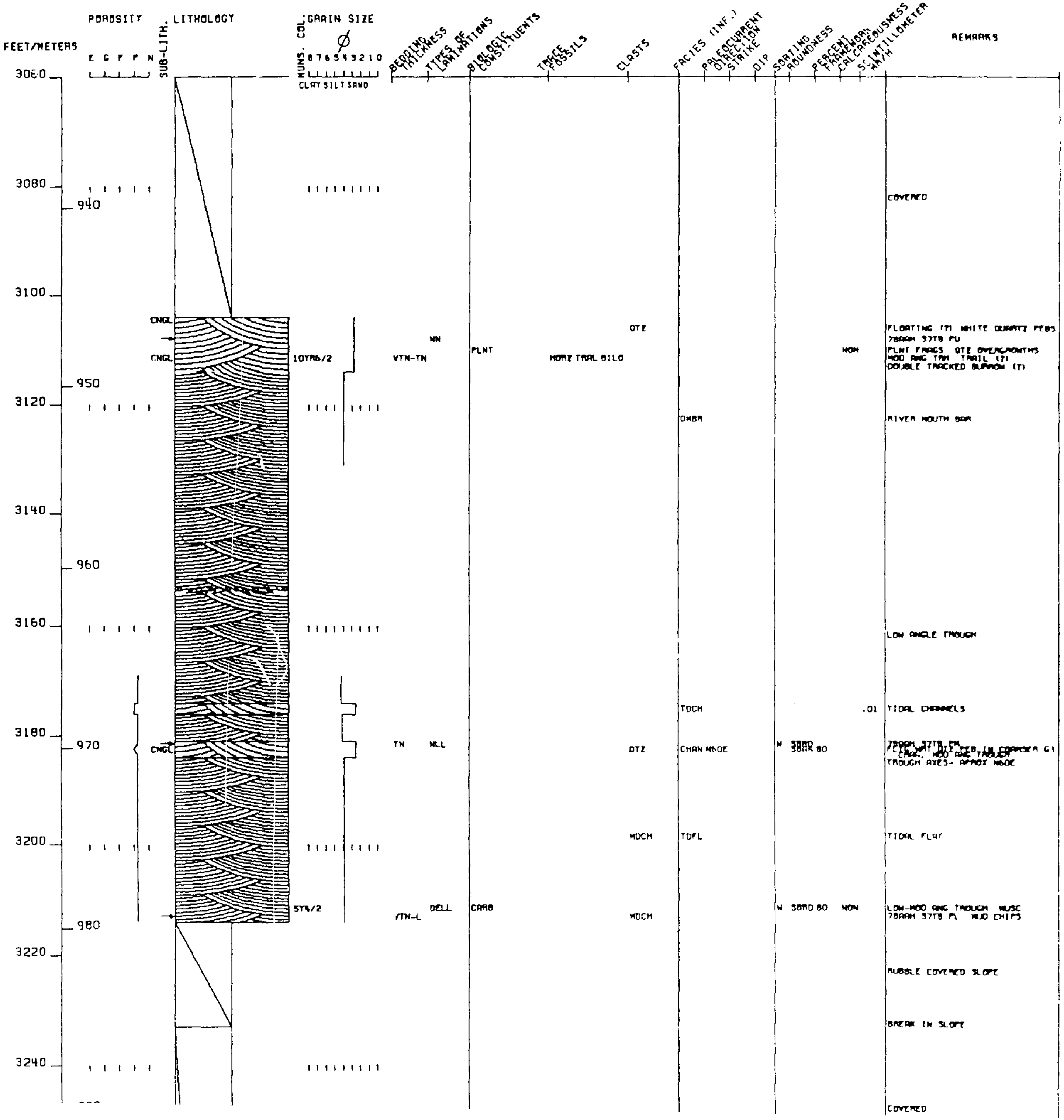

880
890
900
910
920
930
2900
2920
2940
2960
2980
3000
3020
3040
3060
MDDY
CNGL
CNGL
5Y6/1
TN DELL
TN-VTN ELL
PLNT
CARB
VERT USHP
CHNT QTZ
MDRU
DMBR
CHAN
W 5BRO 80
W 5BRO 80
.01
NON
RIVER MOUTH BAR
TN SHALE LED <6IN
SOME HERRINGBONE
7BRAH 5BTB PM- SOME 6IN CNGL
BDS TO PEB 3Z- CM CHRT, WHT
QTZ, PLNT FRAGS MOD ANG TRN
SHLY
5Y6/1
TN
MDRU
W 5BRO 85
SLY
5M SC LOW ANG TROUGH MUSC
RED-BRN MOST/PROB NOT IN PLACE
5Y6/1
TN
CLAY
W 5BRO 85
NON
LOW ANGLE TROUGH CHRT, MUSC
7BRAH 5BTB PL CLAY CHIP <5CM
(PROB NOT IN PLACE)
BREAK IN SLOPE
COVERED

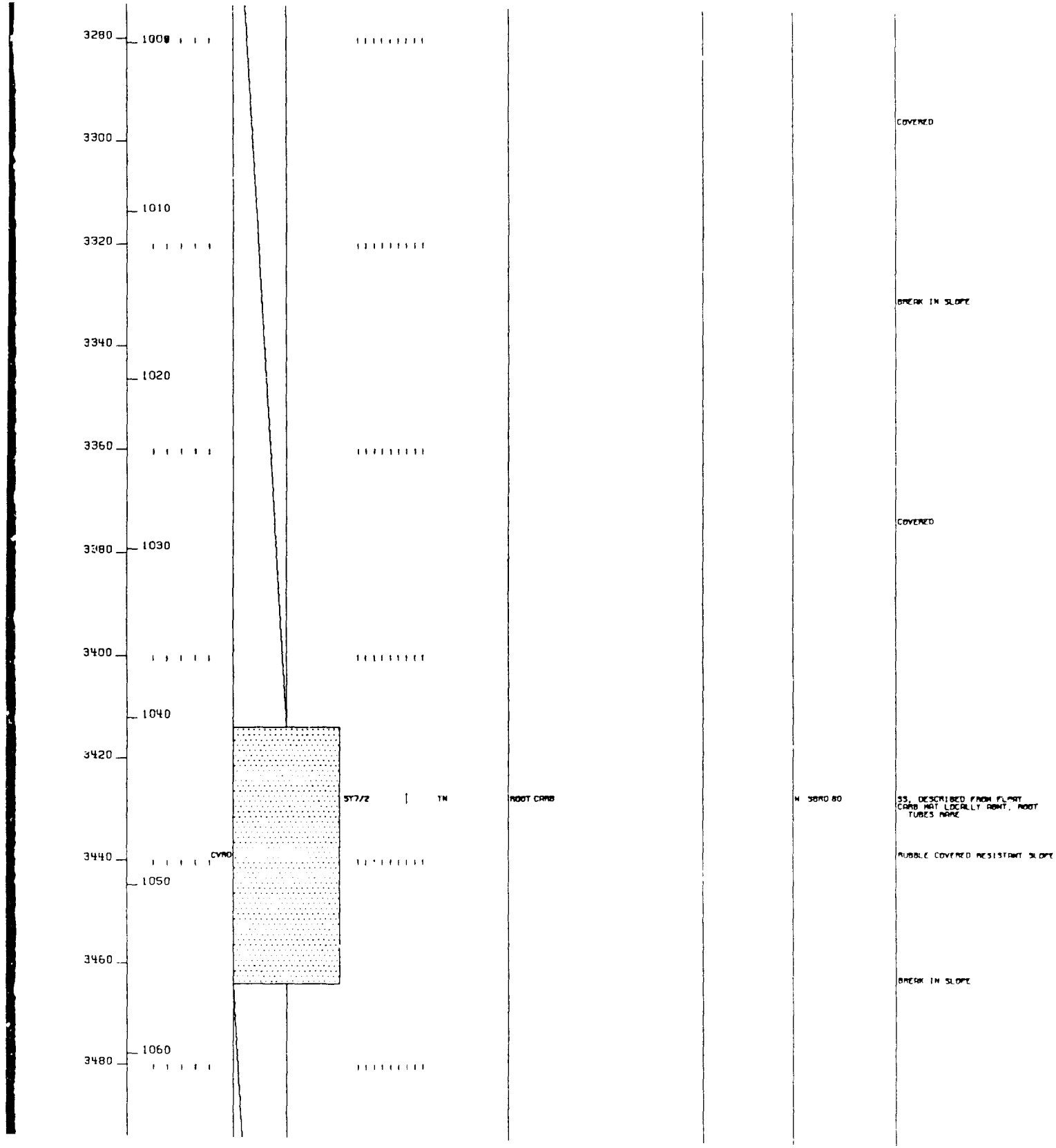
6,129 FT — 6/27/78

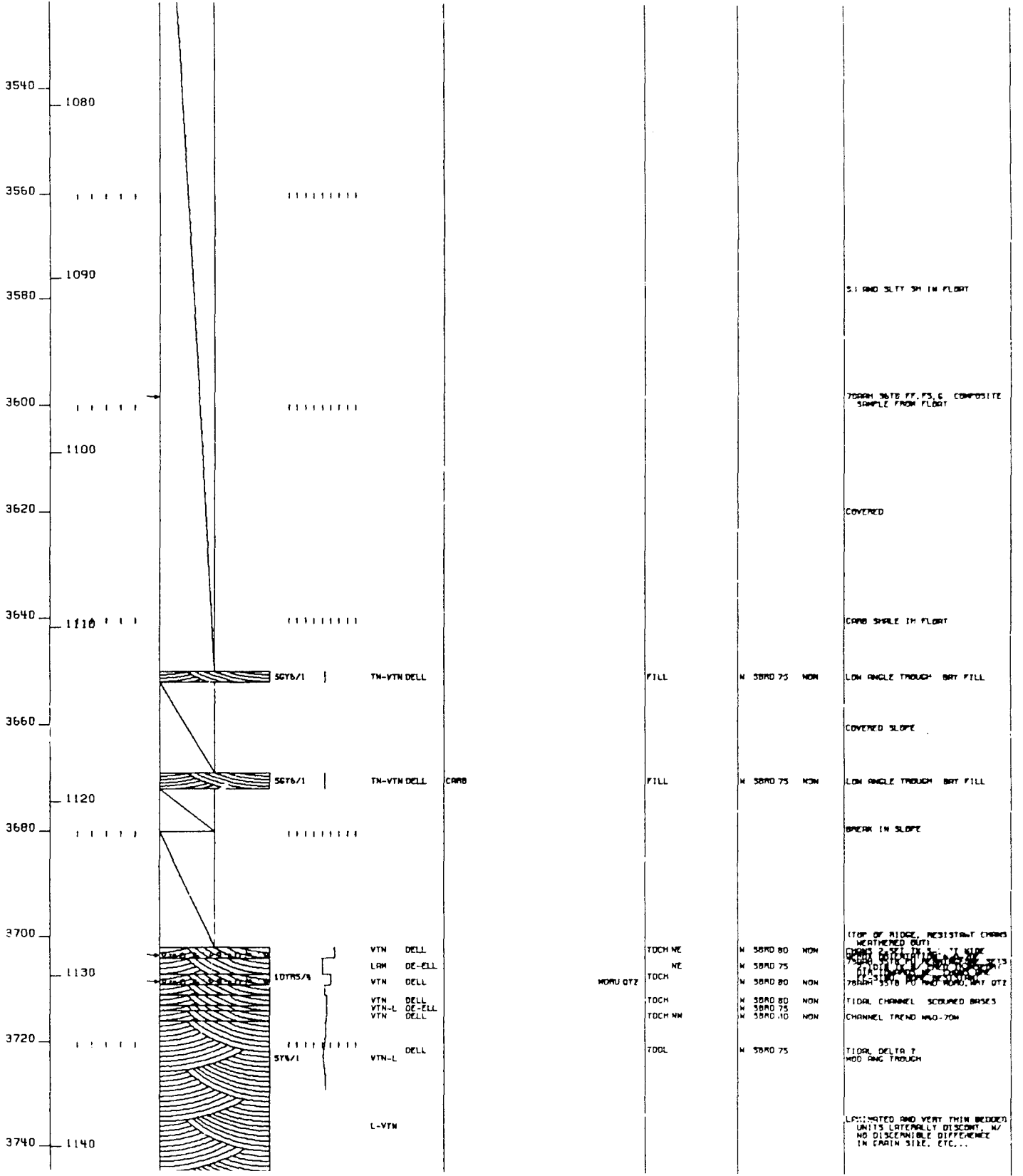
TOP — 1 IN = 20 FT — BASE

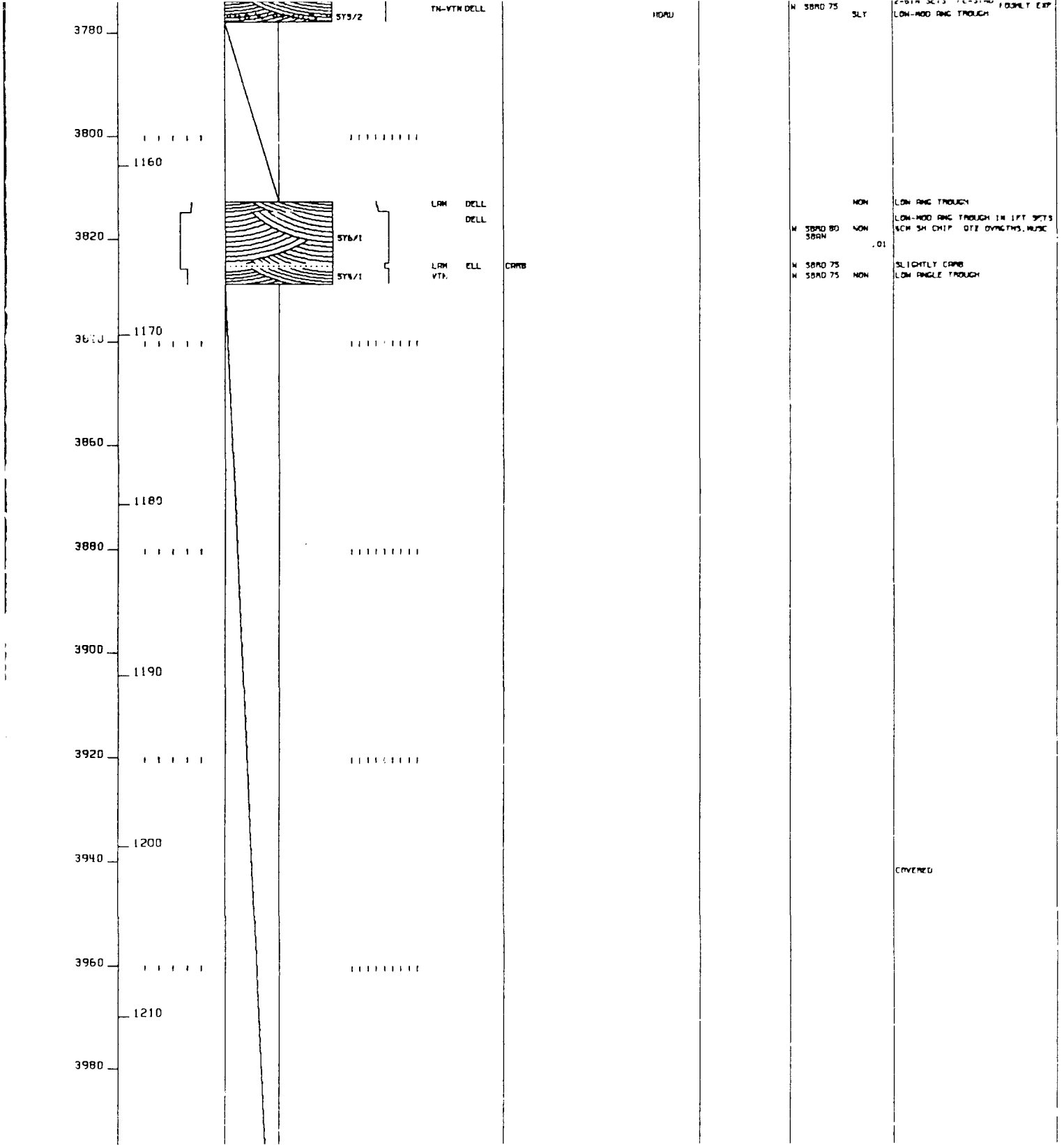
SEC 16, T8S, R1W — SEC 24, T8S, R2W

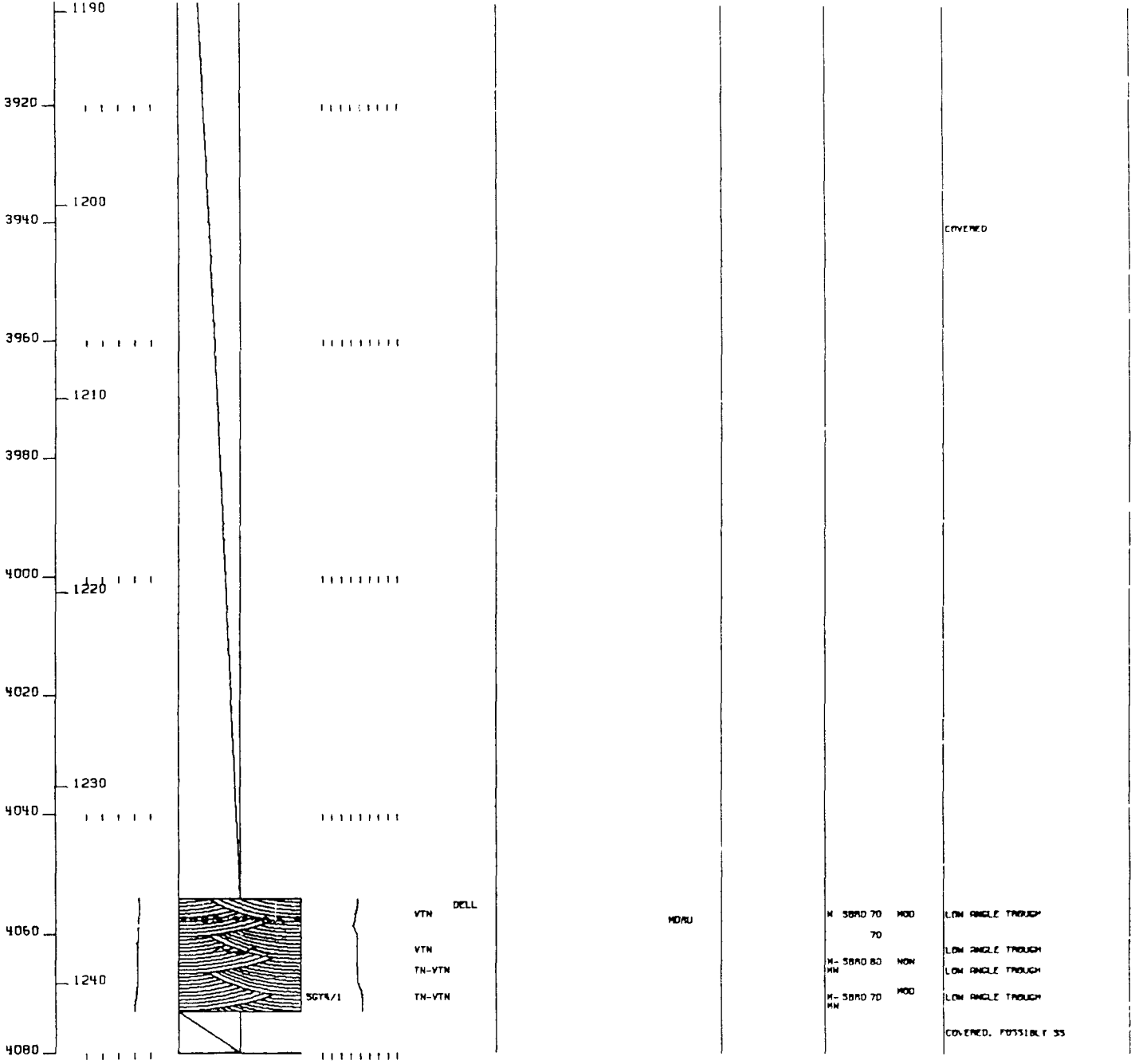
68°46'10"N 152°06'54"W — 68°43'30"N 152°15'50"W




3280
1000
3300
1010
3320
3340
1020
3360
3380
1030
3400
1040
3420
3440
1050
3460
1060
3480
5Y7/2
TN
ROOT CARB
COVERED
BREAK IN SLOPE
COVERED
CYRO
RUBBLE COVERED RESISTANT SLOPE
BREAK IN SLOPE

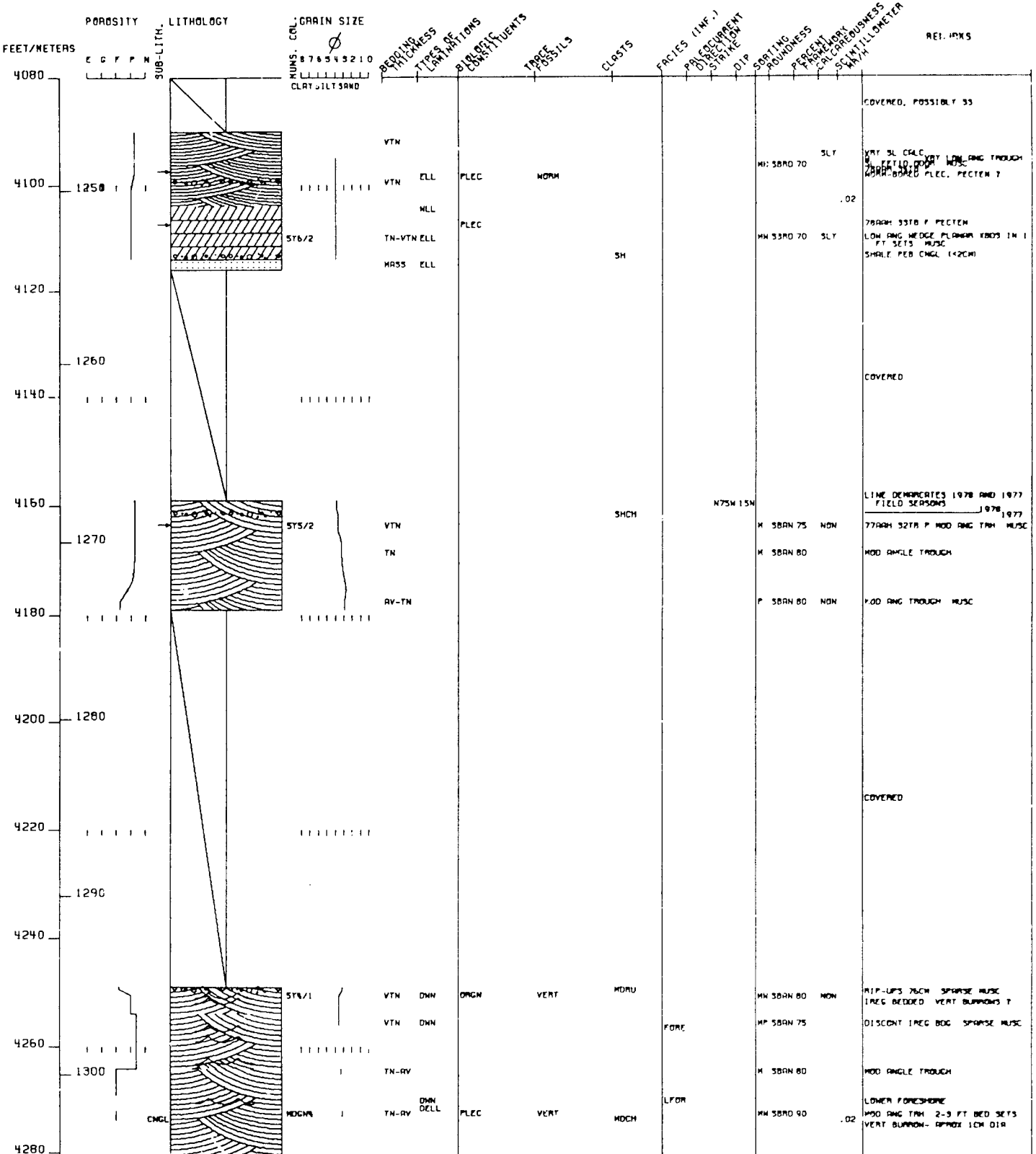

3540
1080
3560
1090
3580
3600
1100
3620
3640
1110
3660
1120
3680
3700
1130
3720
1140
3740
SGY6/1
TN-VTN DELL
SGY6/1
TN-VTN DELL
CARB
10YR5/4
SY6/1
VTN DELL
LAM DE-ELL
VTN DELL
VTN DELL
VTN-L DE-ELL
VTN DELL
DELL
VTN-L
L-VTN
FILL
FILL
TDCH NE
NE
TDCH
TDCH
TDCH NW
TDOL
W 58RD 75 NON
W 58RD 75 NON
W 58RD 80 NON
W 58RD 75
W 58RD 80 NON
W 58RD 80 NON
W 58RD 75
W 58RD 10 NON
W 58RD 75
MORU QTZ
S.I AND SLTY SM IN FLOAT
COVERED
CARB SHALE IN FLOAT
LOW ANGLE TROUGH BRT FILL
COVERED SLOPE
LOW ANGLE TROUGH BRT FILL
BREAK IN SLOPE
(TOP OF RIDGE, RESISTANT CHARS WEATHERED OUT)
TIDAL CHANNEL SCOURED BASES
CHANNEL TREND NNO-70W
TIDAL DELTA ?
MOD ANG TROUGH
LAMINATED AND VERY THIN BEDDED UNITS LATERALLY DISCONT. W/ NO DISCERNIBLE DIFFERENCE IN GRAIN SIZE, ETC...

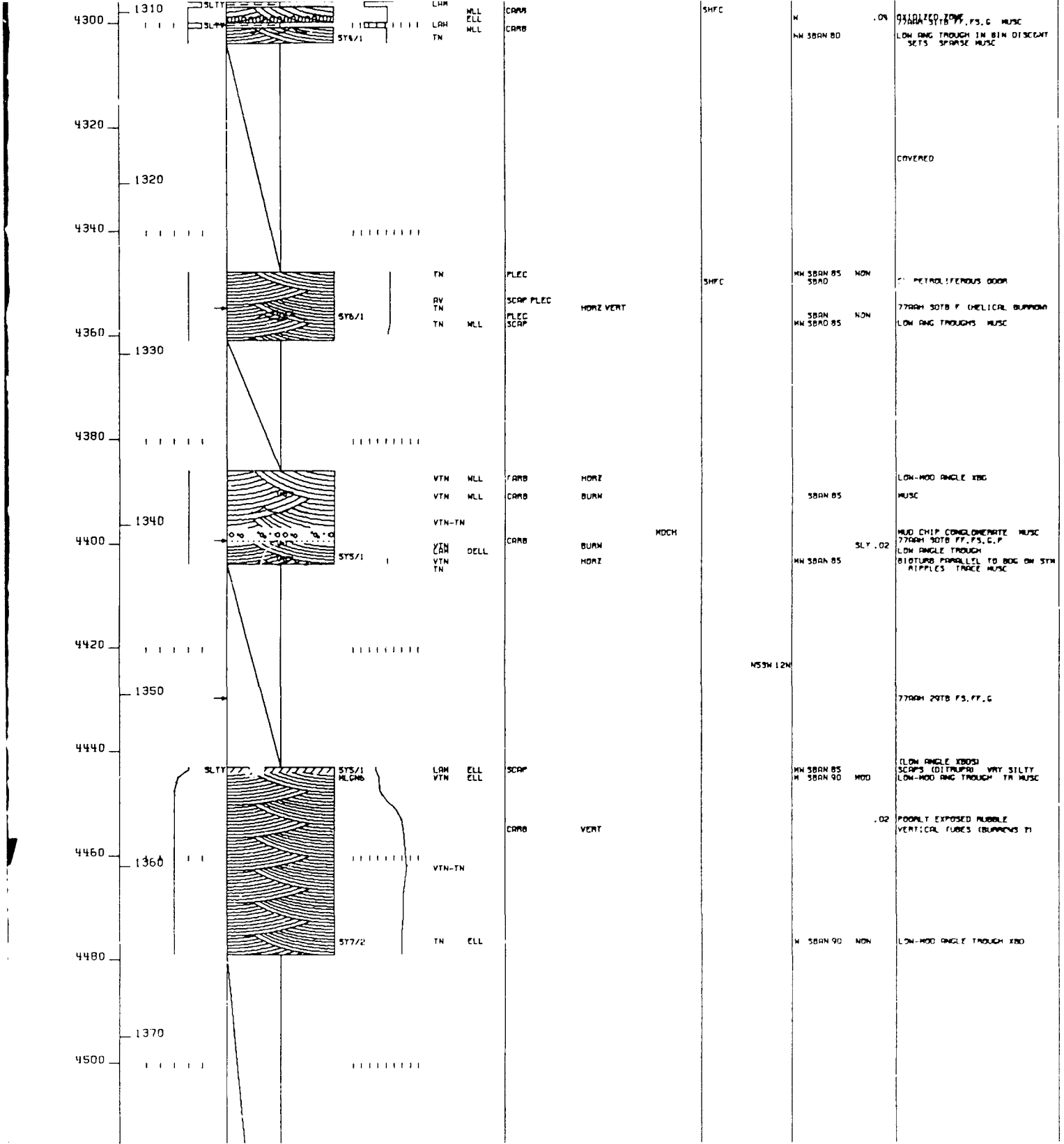

3780
3800
1160
3820
1170
3860
1180
3880
3900
1190
3920
1200
3940
1210
3960
3980
ST5/2
TN-VTN DELL
HORU
ST6/1
LAM DELL
DELL
ST5/1
LAM ELL
VTN.
CARB
W 38RD 75
SLT
LOW-MOD AMG TROUGH
MOD
LOW AMG TROUGH
W 38RD 80
38AN
MOD
LOW-MOD AMG TROUGH IN LFT SETS
%CM SH CHIP OTH OVRETHS. MUSC
.01
W 38RD 75
SLIGHTLY CARB
W 38RD 75
MOD
LOW ANGLE TROUGH
COVERED

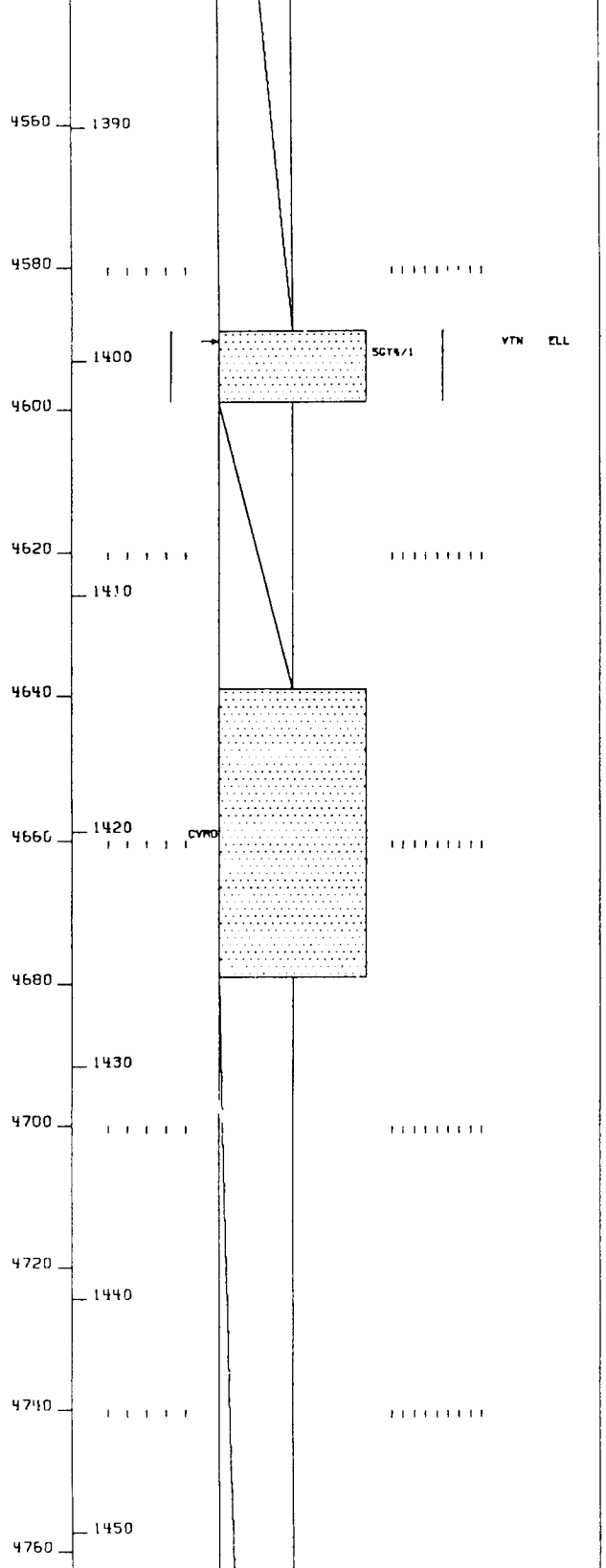

1190
3920
1200
3940
1210
3960
1220
3980
1230
4000
1240
4020
4040
4060
4080
DELL
VTN
VTN
TN-VTN
TN-VTN
SGTS/1
MDAU
COVERED
LOW ANGLE TROUGH
LOW ANGLE TROUGH
LOW ANGLE TROUGH
LOW ANGLE TROUGH
COVERED. POSSIBLY SS

68°46'10"N 152°06'54"W

68°43'30"N 152°15'50"W




4300
1310
4320
1320
4340
4360
1330
4380
1340
4400
1350
4420
4440
1360
4460
1370
4480
4500
SLTY
SLTY
ST6/1
ST6/1
ST5/1
ST5/1
MLCM6
ST7/2
LAM WLL
ELL
LAM WLL
TN
TN
PLEC
AV
TN
SCAP PLEC
FLEC
TN WLL
SCAP
VTN WLL
VTN WLL
VTN-TN
VTN
LAM ELL
TN
VTN ELL
VTN ELL
VTN-TN
TN ELL
CARB
CARB
CARB
HORZ VERT
CARB HORZ
CARB BURN
CARB BURN
HORZ
SCAP
SCAP
CARB VERT
MDCM
SHFC
SHFC
N59W 12N
W .04
NW SBAN 80
NW SBAN 85
SBAD
SBAN NON
NW SBAD 85
SBAN 85
SLT .02
NW SBAN 85
NW SBAN 85
W SBAN 90 MOD
.02
W SBAN 90 NON
OXIDIZED ZONE
77AAM SDTB FF,FS,G MUSC
LOW ANG TROUGH IN BIN DISCONT SETS SPARSE MUSC
COVERED
PETROLIFEROUS ODOR
77AAM SDTB F CHELICAL BURROWS
LOW ANG TROUGHS MUSC
LOW-MOD ANGLE XBG
MUSC
MUD CHIP CONGLOMERATE MUSC
77AAM SDTB FF,FS,C,P
LOW ANGLE TROUGH
BIOTURB PARALLEL TO BDG ON STN RIPPLES TRACE MUSC
77AAM 2DTB FS,FF,G
(LOW ANGLE XBDS)
SCOPS (DITRUPA) VRY SILTY
LOW-MOD ANG TROUGH TR MUSC
POORLY EXPOSED RUBBLE
VERTICAL TUBES (BURROWS ?)
LOW-MOD ANGLE TROUGH XBD



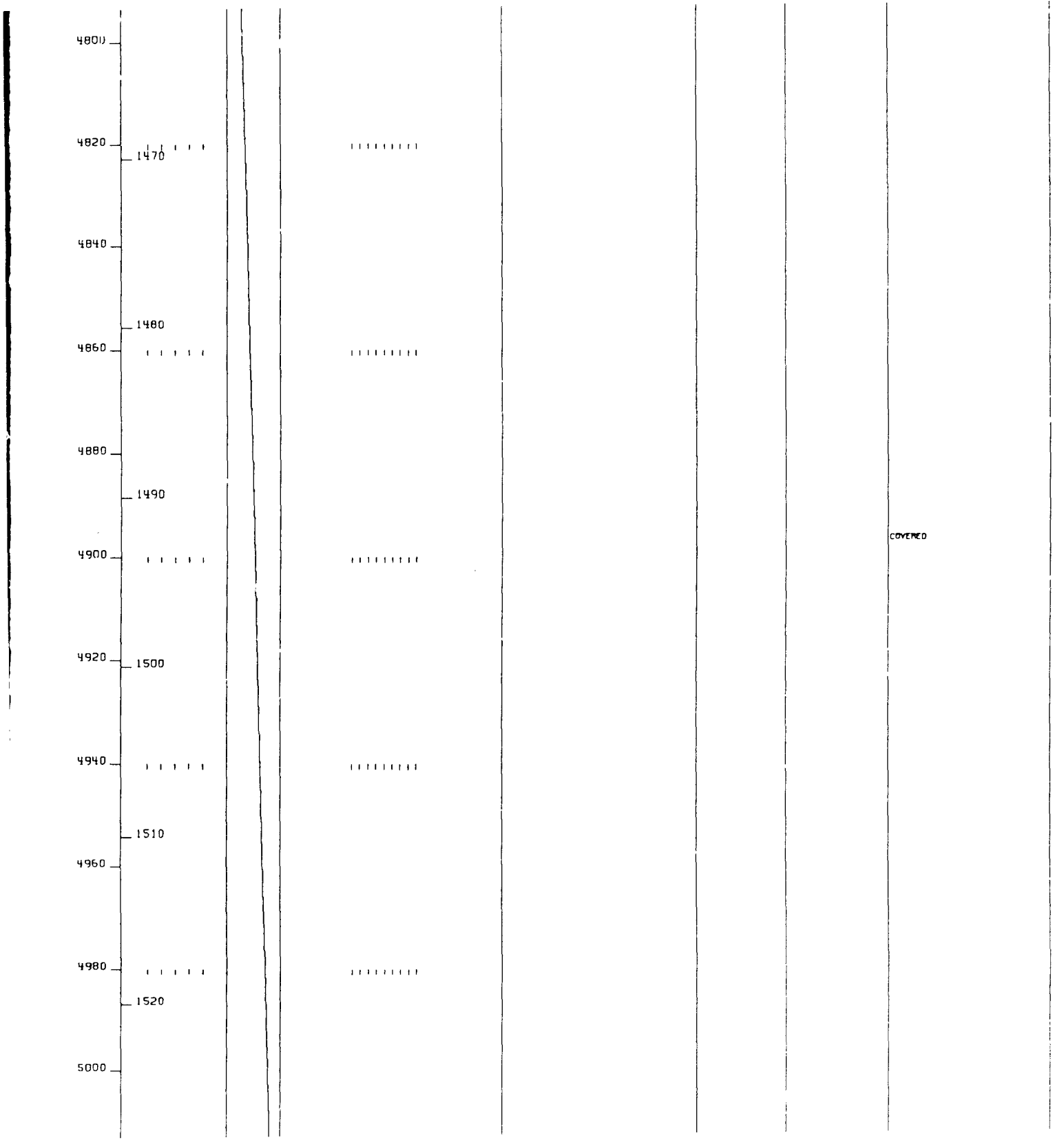
W 38AN 38AO MOD

77RRH 28TB P

33- FLAT, PARALLEL BEDDED

MOSTLY COVERED SANDSTONE

LATERAL TO EAST ON TOP OF RIDGE (APROX 5290-5320FT) THEN 225OFT HORIZONTAL TRAVERSE, 14DEG DIP NORTH COVERED, CONTINUE MEASURING


4800
4820
1470
4840
1480
4860
4880
1490
4900
4920
1500
4940
1510
4960
4980
1520
5000
COVERED


4940
1510
4960
4980
1520
5000
5020
1530
5040
1540
5060
5080
1550
5100

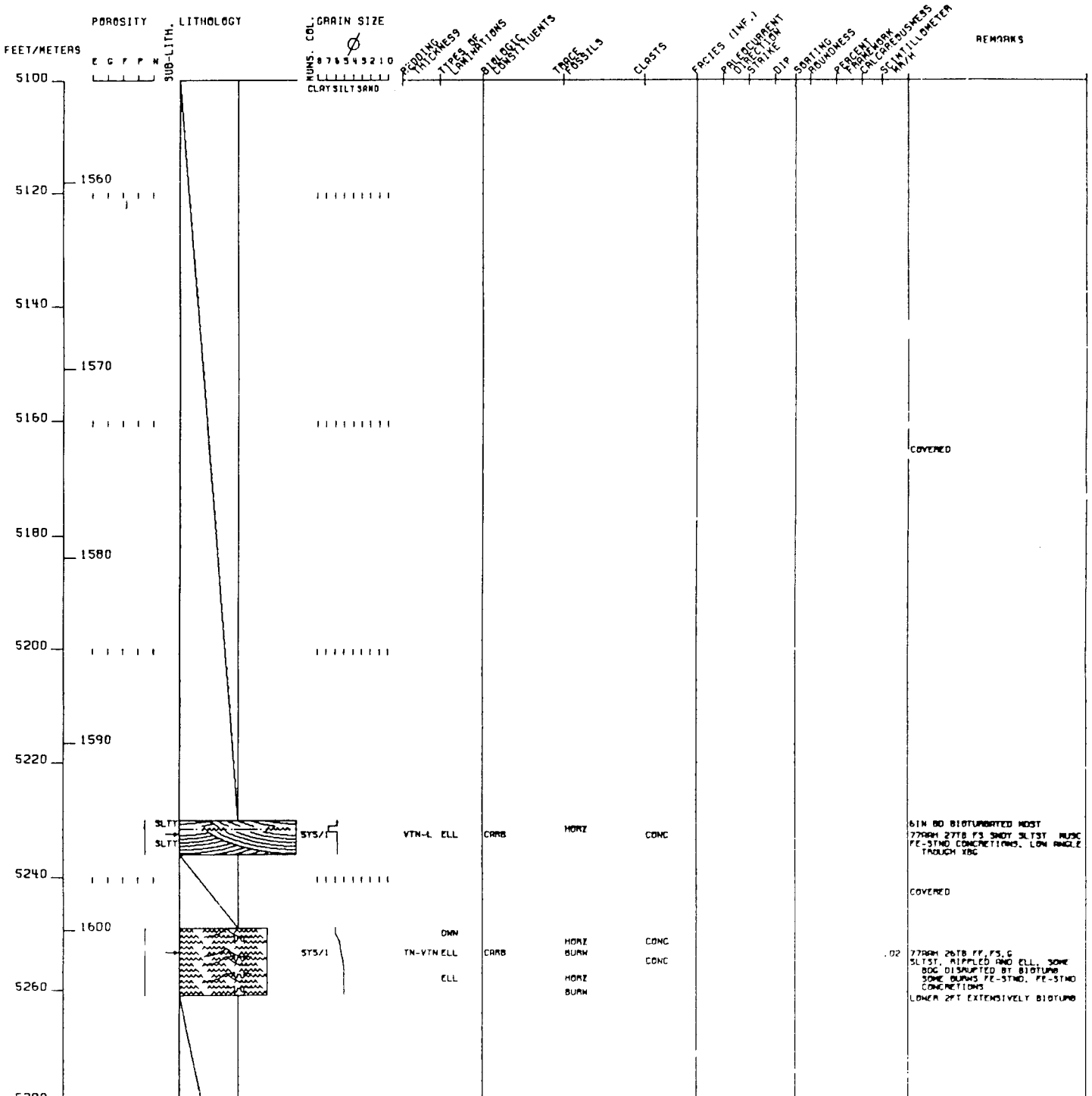
TUKTU BLUFF

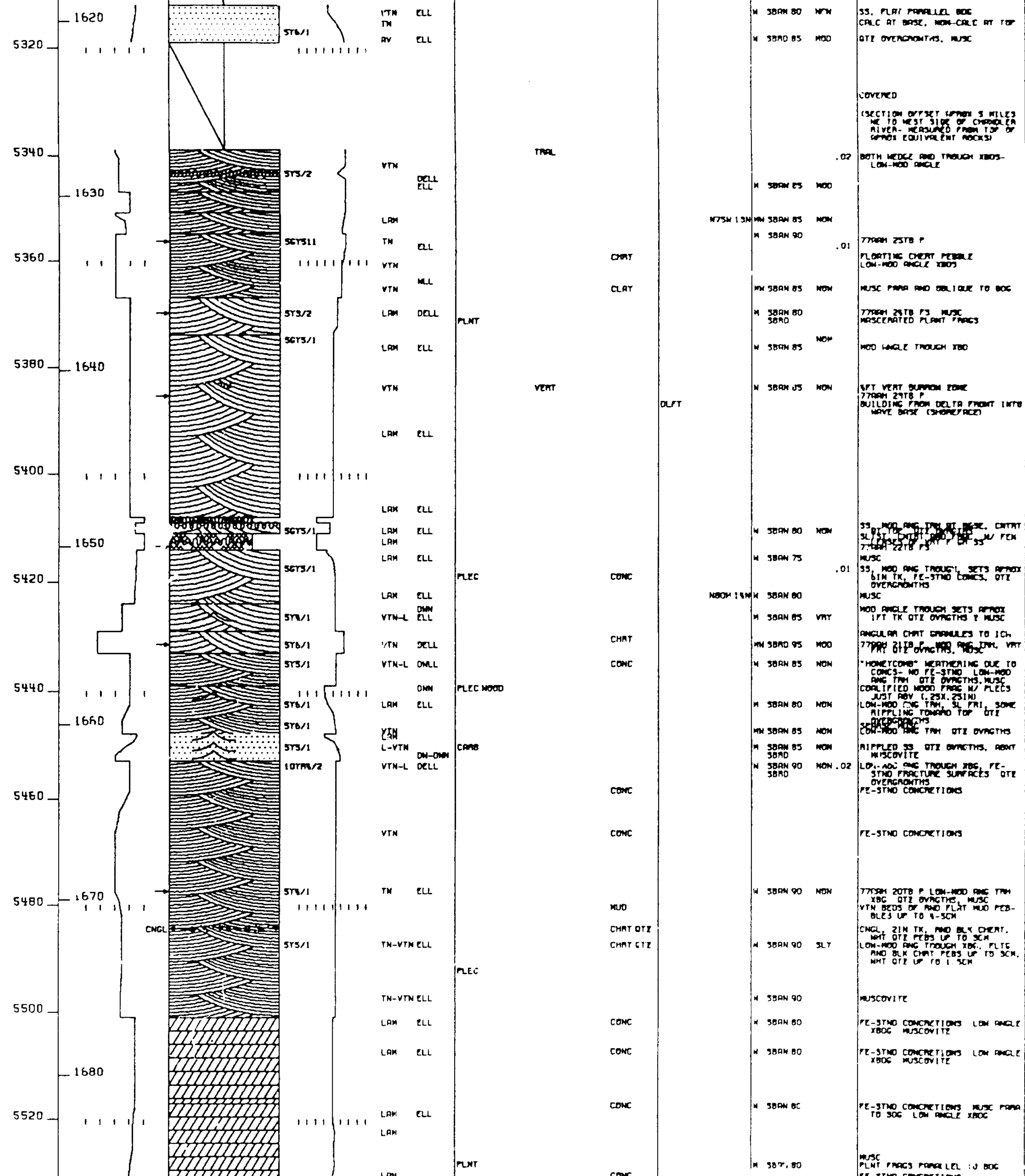
API NO. 50-057-90001

6,129 FT TOP | 1 IN = 20 FT | 6/27/78 BASE | 6 OF 6

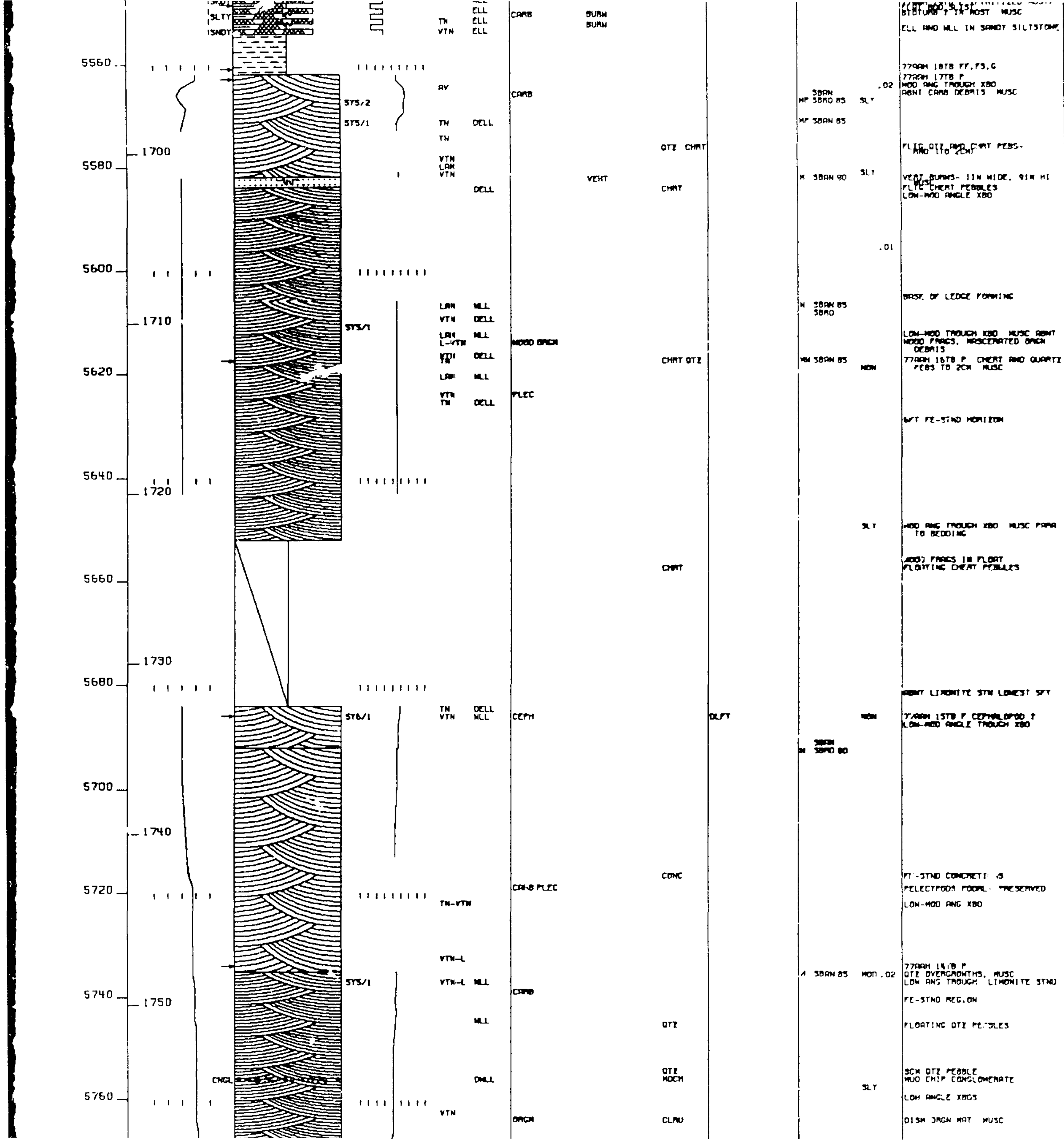
SEC 16, T8S, R1W 68°46'10"N 152°06'54"W

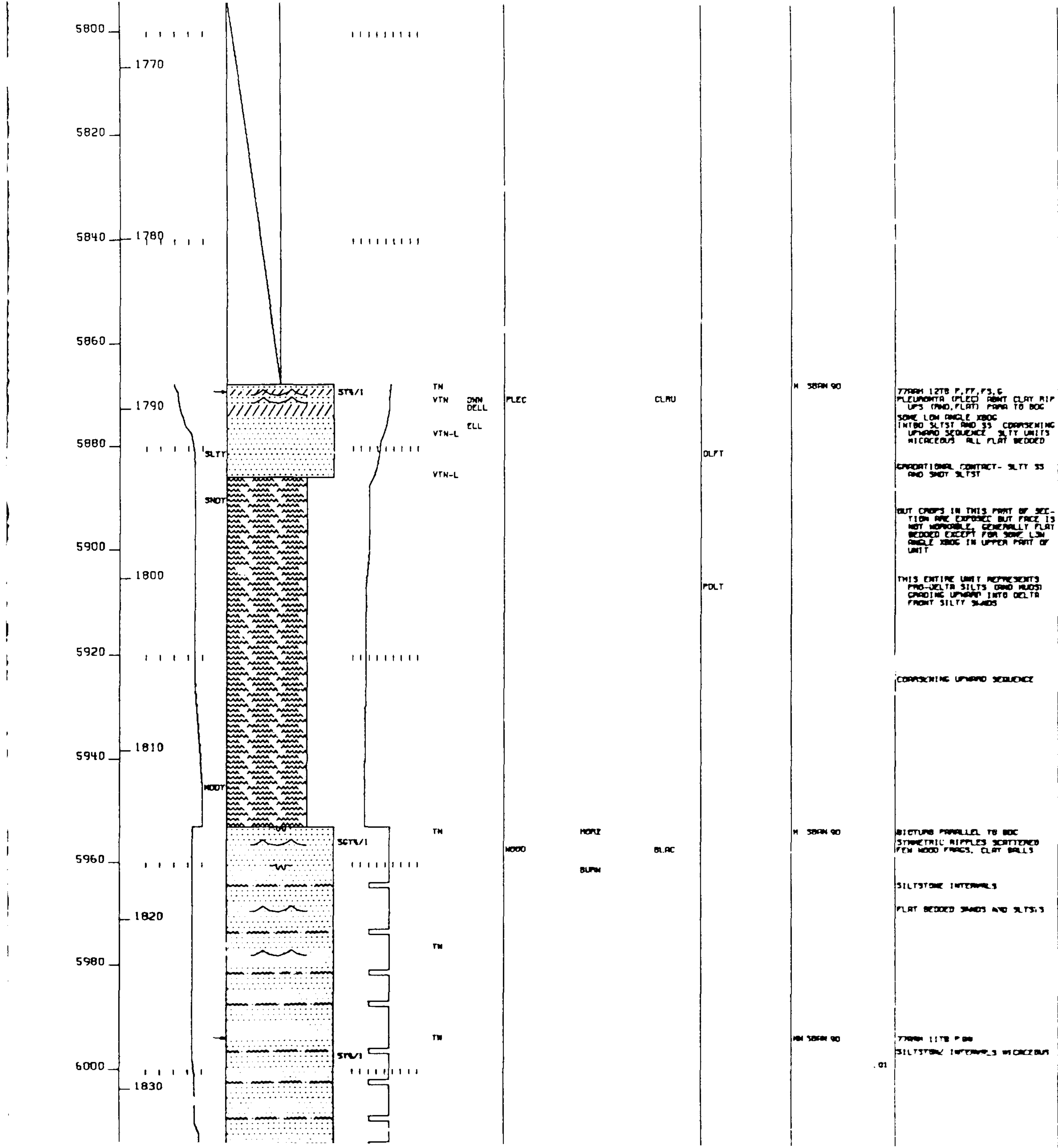
SEC 24, T8S, R2W 68°43'30"N 152°15'50"W

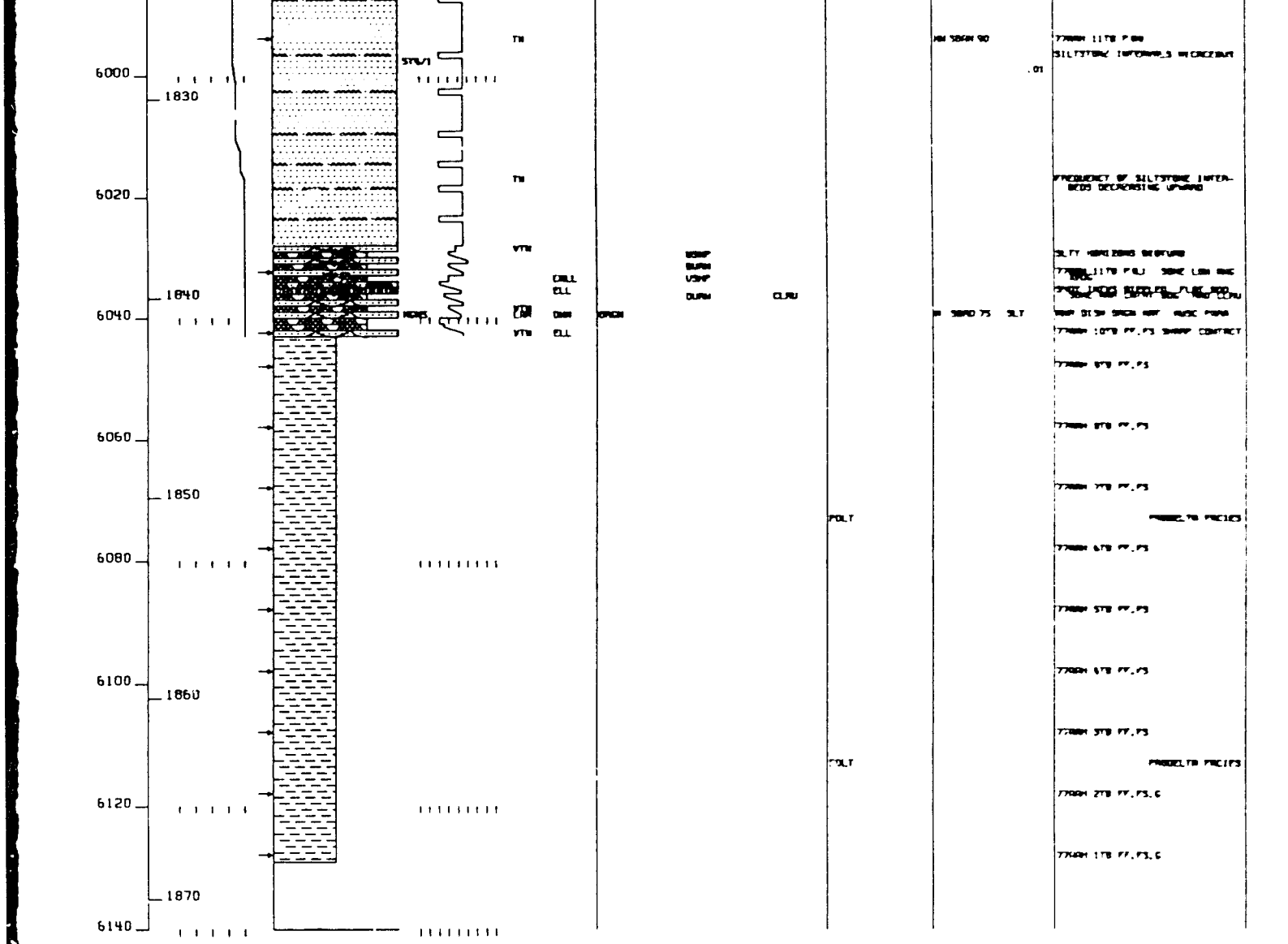




1620
5320
5340
1630
5360
5380
1640
5400
1650
5420
5440
1660
5460
5480
1670
5500
1680
5520
SS. FLAT PARALLEL BDG
CALC AT BASE, NON-CALC AT TOP
QTZ OVERGROWTHS, MUSC
COVERED
(SECTION OFFSET APPROX 5 MILES NE TO WEST SIDE OF CHANDLER RIVER- MEASURED FROM TOP OF APPROX EQUIVALENT ROCKS)
BOTH WEDGE AND TROUGH XBDS- LOW-MOD ANGLE
77AAM 25TB F
FLOATING CHERT PEBBLE
LOW-MOD ANGLE XBDS
MUSC PARA AND OBLIQUE TO BDG
77AAM 24TB F3 MUSC
MASCERATED PLANT FRAGS
MOD ANGLE TROUGH XBD
5FT VERT BURROW ZONE
77AAM 23TB F
BUILDING FROM DELTA FRONT INTO WAVE BASE (SHOREFACE)
MUSC
SS, MOD ANG TROUGH, SETS APPROX 6IN TK, FE-STND CONCS, QTZ OVERGROWTHS
MUSC
MOD ANGLE TROUGH SETS APPROX 1FT TK QTZ OVRGTHS & MUSC
ANGULAR CHRT GRANULES TO 1CM
"HONEYCOMB" WEATHERING DUE TO CONCS- NO FE-STND LOW-MOD ANG TRH QTZ OVRGTHS,MUSC
COALIFIED WOOD FRAG W/ PLECS JUST ABV (.25X.25IN)
LOW-MOD ANG TRH, SL FRI, SOME RIPPLING TOWARD TOP QTZ OVERGROWTHS
LOW-MOD ANG TRH QTZ OVRGTHS
RIPPLED SS QTZ OVRGTHS, ABNT MUSCOVITE
LOW-MOD ANG TROUGH XBG, FE-STND FRACTURE SURFACES QTZ OVERGROWTHS
FE-STND CONCRETIONS
FE-STND CONCRETIONS
77AAM 20TB F LOW-MOD ANG TRH XBG QTZ OVRGTHS, MUSC
VTN BEDS OF RND FLAT MUD PEBBLES UP TO 4-5CM
CNGL, 2IN TK, RND BLK CHERT, WHT QTZ PEBS UP TO 3CM
LOW-MOD ANG TROUGH XBG, FLTG RND BLK CHRT PEBS UP TO 3CM, WHT QTZ UP TO 1.5CM
MUSCOVITE
FE-STND CONCRETIONS LOW ANGLE XBDG MUSCOVITE
FE-STND CONCRETIONS LOW ANGLE XBDG MUSCOVITE
FE-STND CONCRETIONS MUSC PARA TO BDG LOW ANGLE XBDG
MUSC
PLNT FRAGS PARALLEL TO BDG


5560
5580
5600
5620
5640
5660
5680
5700
5720
5740
5760
1700
1710
1720
1730
1740
1750
SYS/2
SYS/1
SYS/1
SYS/1
SYS/1
CNGL
CARB
CARB
CEPH
CARB PLEC
CARB
ORGN
PLEC
BURW
BURW
VERT
QTZ CHRT
CHRT
CHRT QTZ
CHRT
CONC
QTZ
QTZ
MDCH
CLAU
OLFT
.02
.01
SLY
SLT
SLT
SLT
NON
NON
MOD .02
SLY
ELL AND WLL IN SANDY SILTSTONE
779AM 18TB FF,FS,G
77AAM 17TB P
MOD ANG TROUGH XBD
ABNT CARB DEBRIS MUSC
VERT BURWS- 1IN WIDE, 9IN HI
FLTG CHERT PEBBLES
LOW-MOD ANGLE XBD
BASE OF LEDGE FORMING
LOW-MOD TROUGH XBD MUSC ABNT
WOOD FRAGS, MASCERATED ORGN
DEBRIS
77AAM 16TB P CHERT AND QUARTZ
PEBS TO 2CM MUSC
MOD ANG TROUGH XBD MUSC PARA
TO BEDDING
FLOATING CHERT PEBBLES
LOW-MOD ANGLE TROUGH XBD
LOW-MOD ANG XBD
77AAM 14TB P
QTZ OVERGROWTHS, MUSC
FE-STND REG.ON
SCM QTZ PEBBLE
MUD CHIP CONGLOMERATE
LOW ANGLE XBDS
DISM ORGN MAT MUSC


5800
1770
5820
5840
1780
5860
5880
1790
5900
1800
5920
5940
1810
5960
1820
5980
6000
1830
STN/1
SLTY
SNDT
MDDY
SGTN/1
STN/1
TN
VTN
DELL
ELL
VTN-L
VTN-L
PLEC
CLRU
DLFT
PDLT
M 38AN 90
TN
WOOD
HORZ
BURN
BLAC
M 38AN 90
TN
TN
MN 38AN 90
.01
77AAM 12TB P,PP,P3,6
PLEUROMYA (PLEC) ABNT CLAY RIP
UPS (AND,FLAT) PARA TO BDG
SOME LOW ANGLE XBDG
INTBD SLTST AND SS COARSENING
UPWARD SEQUENCE SLTY UNITS
MICACEOUS ALL FLAT BEDDED
GRADATIONAL CONTACT- SLTY SS
AND SNDT SLTST
OUT CROPS IN THIS PART OF SEC-
TION ARE EXPOSED BUT FACE IS
NOT WORKABLE, GENERALLY FLAT
BEDDED EXCEPT FOR SOME LOW
ANGLE XBDG IN UPPER PART OF
UNIT
THIS ENTIRE UNIT REPRESENTS
PRO-DELTA SILTS (AND MUDS)
GRADING UPWARD INTO DELTA
FRONT SILTY SANDS
COARSENING UPWARD SEQUENCE
SIMETRIC RIPPLES SCATTERED
FEW WOOD FRAGS, CLAY BALLS
SILTSTONE INTERVALS
FLAT BEDDED SANDS AND SLTSTS
77AAM 11TB P
SILTSTONE INTERVALS MICACEOUS


6000
1830
6020
6040
1840
6060
1850
6080
6100
1860
6120
1870
6140
FOLT
FOLT

and stratigraphic nomenclature. Use of trade names is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey

Open file report
OF 81-177
PLATE 2

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

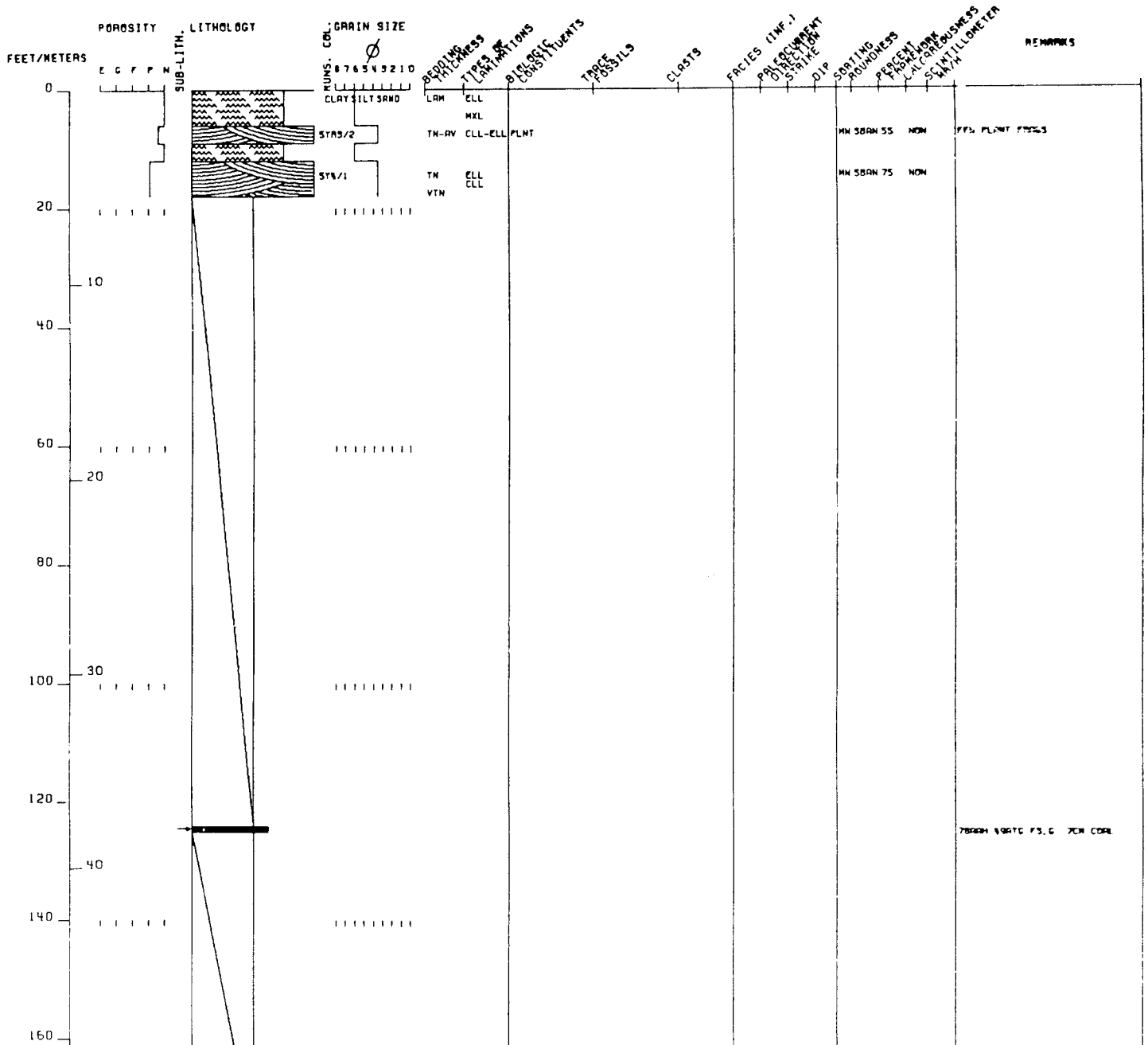
TYPE GRANDSTAND

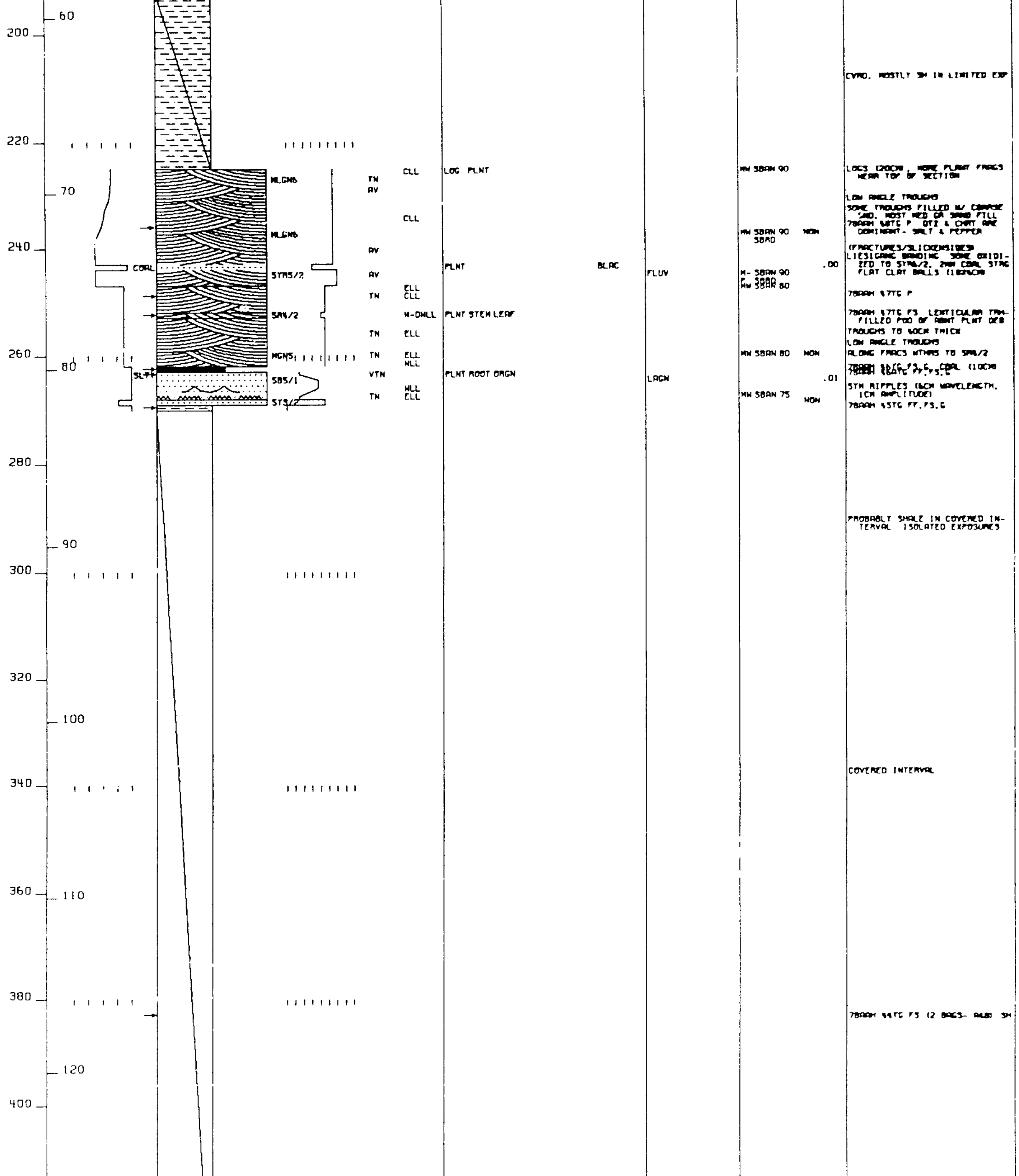
API NO. 50-057-90010

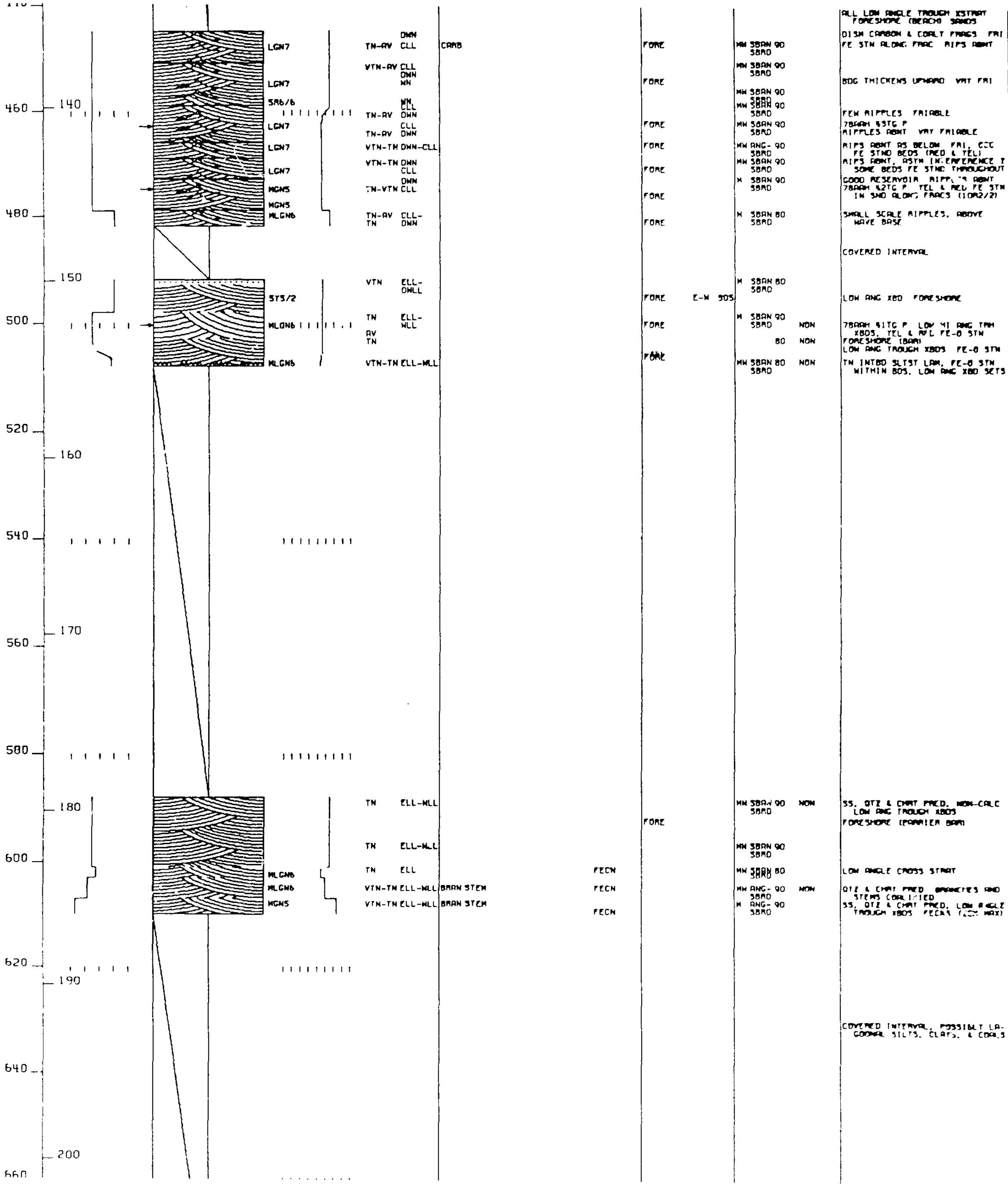
2,663 FT
TOP
SEC 5, T6S, R4E
68°55'46"N 151°13'03"W

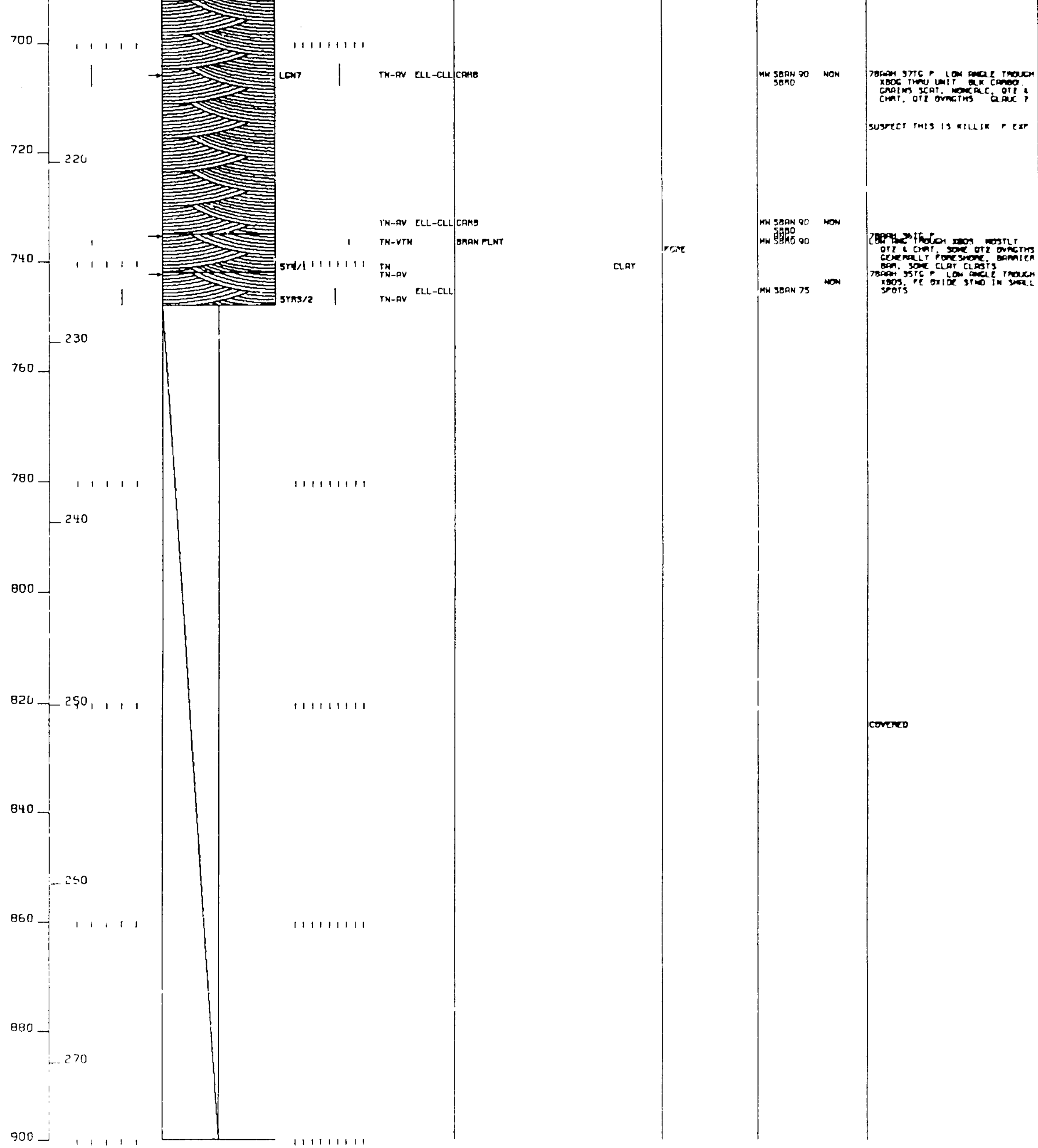
1 IN = 20 FT

6/24/78
BASE
SEC 5, T6S, R4E
68°56'47"N 151°13'20"W




60
200
CVRD, MOSTLY SH IN LIMITED EXP
220
70
MLGN6
TN
AV
CLL
LOG PLNT
MW 58AN 90
LOGS (20CM), MORE PLANT FRAGS NEAR TOP OF SECTION
LOW ANGLE TROUGHS
SOME TROUGHS FILLED W/ COARSE SND. MOST MED GR SAND FILL
CLL
MLGN6
MW 58AN 90 NON 58AD
78AAM 48TG P QTZ & CHRT ARE DOMINANT- SALT & PEPPER
240
AV
COAL
STN5/2
AV
PLNT
BLAC
FLUV
.00
M- 58AN 90
P 58AD
MW 58AN 80
(FRACTURES/SLICKENSIDES)
LIESIGANG BANDING SOME OXIDIZED TO 5YR6/2, 2MM COAL STRG FLAT CLAY BALLS (1X3X5CM)
ELL
TN
CLL
78AAM 47TG P
5N4/2
M-DWLL
PLNT STEM LEAF
78AAM 47TG FS LENTICULAR TRN-FILLED POD OF ABNT PLNT DEB
TN
ELL
TROUGHS TO 40CM THICK
LOW ANGLE TROUGHS
260
80
MGN5
TN
ELL
WLL
MW 58AN 80 NON
ALONG FRACS WTHRS TO 5R4/2
SLTY
78AAM 46TG FS,G COAL (10CM)
78AAM 46ATG FF,FS,G
5B5/1
VTN
PLNT ROOT ORGN
LAGN
.01
WLL
STM RIPPLES (6CM WAVELENGTH, 1CM AMPLITUDE)
TN
ELL
MW 58AN 75
NON
5Y5/2
78AAM 45TG FF,FS,G
280
PROBABLY SHALE IN COVERED INTERVAL ISOLATED EXPOSURES
90
300
320
100
340
COVERED INTERVAL
360
110
380
78AAM 44TG FS (2 BAGS- ALBI SH
120
400


460
480
500
520
540
560
580
600
620
640
660
140
150
160
170
180
190
200
LGN7
LGN7
5R6/6
LGN7
LGN7
LGN7
MGN5
MGN5
MLGN6
5Y5/2
MLGN6
MLGN6
MLGN6
MLGN6
MGN5
TN-AV
VTN-AV
TN-AV
TN-AV
VTN-TN
VTN-TN
TN-VTN
TN-AV
TN
VTN
TN
AV
TN
VTN-TN
TN
TN
TN
VTN-TN
VTN-TN
DWN
CLL
CLL
DWN
WN
WN
CLL
DWN
CLL
DWN
DWN-CLL
DWN
CLL
DWN
CLL
CLL-
DWN
ELL-
DWLL
ELL-
WLL
ELL-WLL
ELL-WLL
ELL-WLL
ELL
ELL-WLL
ELL-WLL
CARB
BRAN STEM
BRAN STEM
FECN
FECN
FECN
FORE
E-W 305
MW 58AN 90
58RD
M 58AN 80
58RD
M ANG- 90
NON
80
ALL LOW ANGLE TROUGH XSTRAT
FORESHORE (BEACH) SANDS
DISM CARBON & COALY FRAGS FRI
FE STN ALONG FRAC RIPS ABNT
BDG THICKENS UPWARD VRY FRI
FEW RIPPLES FRIABLE
78AAM 53TG P
RIPPLES ABNT VRY FRIABLE
RIPS ABNT AS BELOW FRI, CCC
FE STND BEDS (RED & YEL)
RIPS ABNT, ASYM INTERFERENCE ?
SOME BEDS FE STND THROUGHOUT
GOOD RESERVOIR RIPPLES ABNT
78AAM 42TG P YEL & RED FE STN
IN SND ALONG FRACS (10R2/2)
SMALL SCALE RIPPLES, ABOVE
WAVE BASE
COVERED INTERVAL
LOW ANG XBD FORESHORE
78AAM 41TG P LOW HI ANG TRM
XBDS, YEL & AYL FE-O STN
FORESHORE (BAR)
LOW ANG TROUGH XBDS FE-O STN
TN INTBD SLTST LAM, FE-O STN
WITHIN BDS, LOW ANG XBD SETS
SS, QTZ & CHRT PRED, NON-CALC
LOW ANG TROUGH XBDS
FORESHORE (BARRIER BAR)
LOW ANGLE CROSS STRAT
QTZ & CHRT PRED BRANCHES AND
STEMS COALIFIED
SS, QTZ & CHRT PRED, LOW ANGLE
TROUGH XBDS FECNS (2CM MAX)
COVERED INTERVAL, POSSIBLY LA-
GOONAL SILTS, CLAYS, & COALS


700
720
220
740
230
760
780
240
800
820
250
840
260
860
880
270
900
LGN7
TN-AV ELL-CLL CARB
MW SBAN 90 NON
SBRD
78AAM 37TC P LOW ANGLE TROUGH XBDG THRU UNIT BLK CARBON GRAINS SCAT, NONCALC, QTZ & CHRT, QTZ OVRGTHS GLAUC ?
SUSPECT THIS IS KILLIK P EXP
TN-AV ELL-CLL CARB
MW SBAN 90 NON
SBRD
TN-VTN
BRAN PLNT
MW SBRD 90
QTZ & CHRT, SOME QTZ OVRGTHS GENERALLY FORESHORE, BARRIER BAR, SOME CLAY CLASTS
5YR3/2
TN
TN-AV
CLAY
78AAM 35TC P LOW ANGLE TROUGH XBDS, FE OXIDE STND IN SMALL SPOTS
NON
ELL-CLL
MW SBAN 75
TN-AV
COVERED

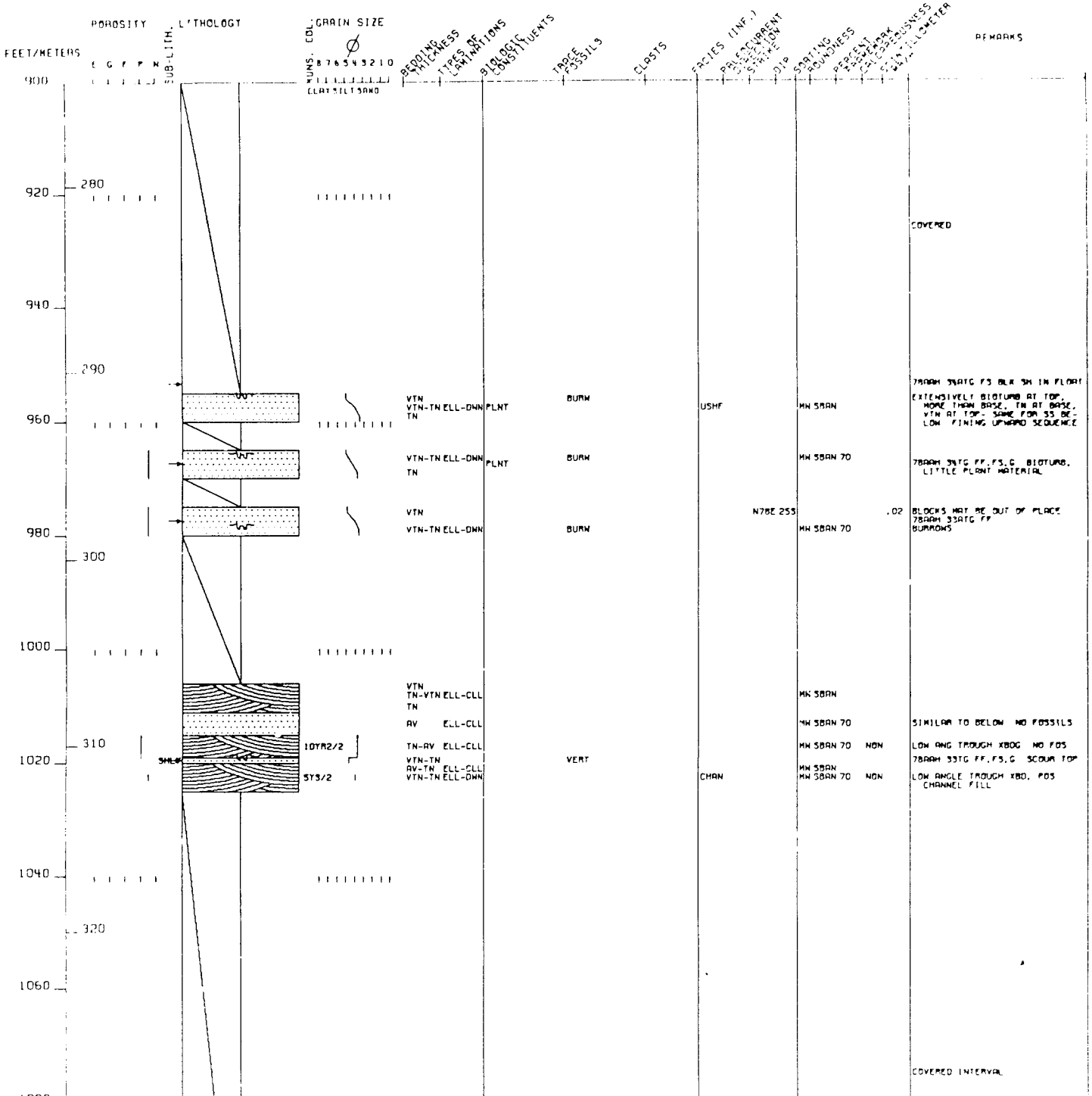
TYPE GRANDSTAND

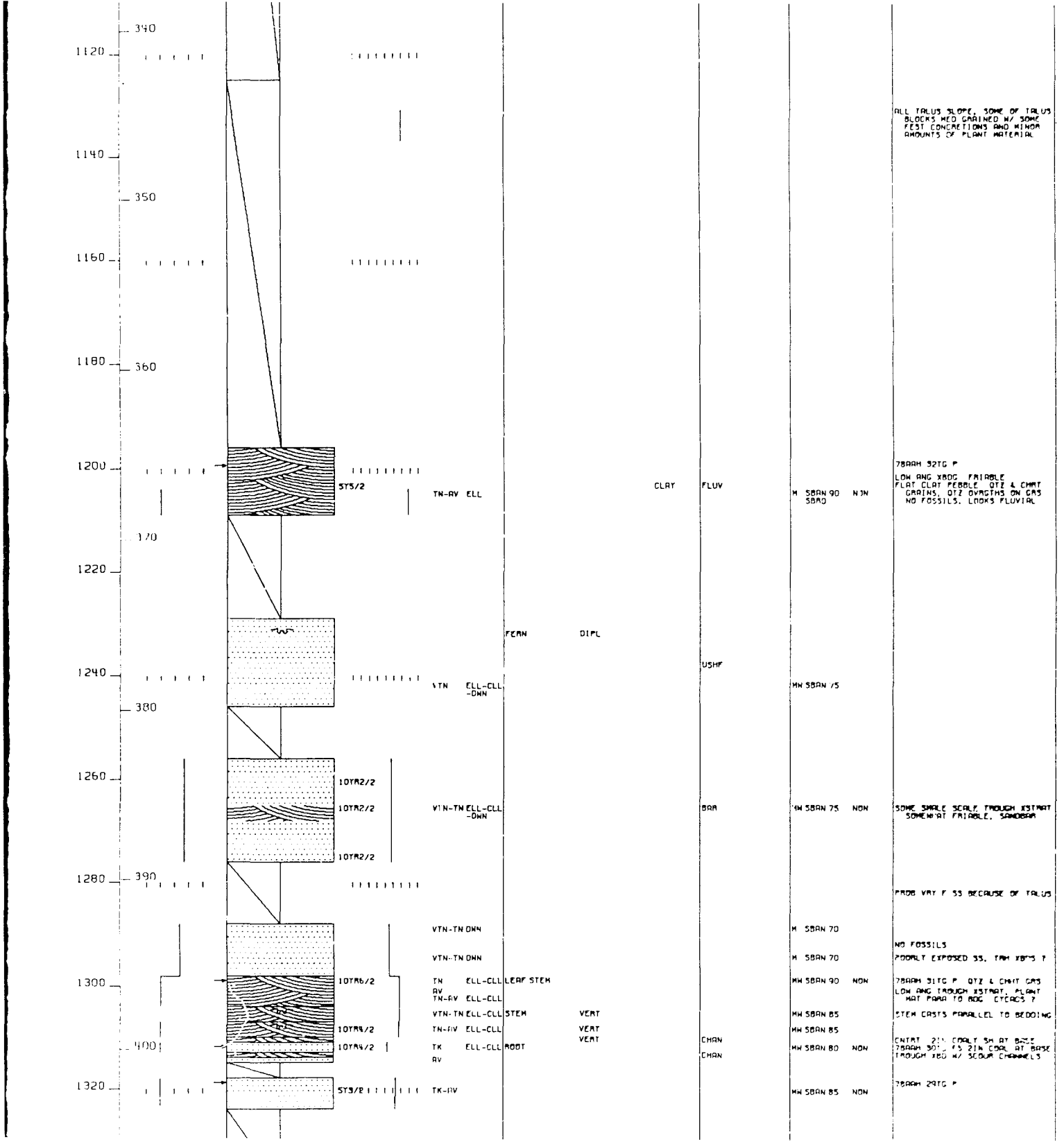
API NO. 50-057-90010

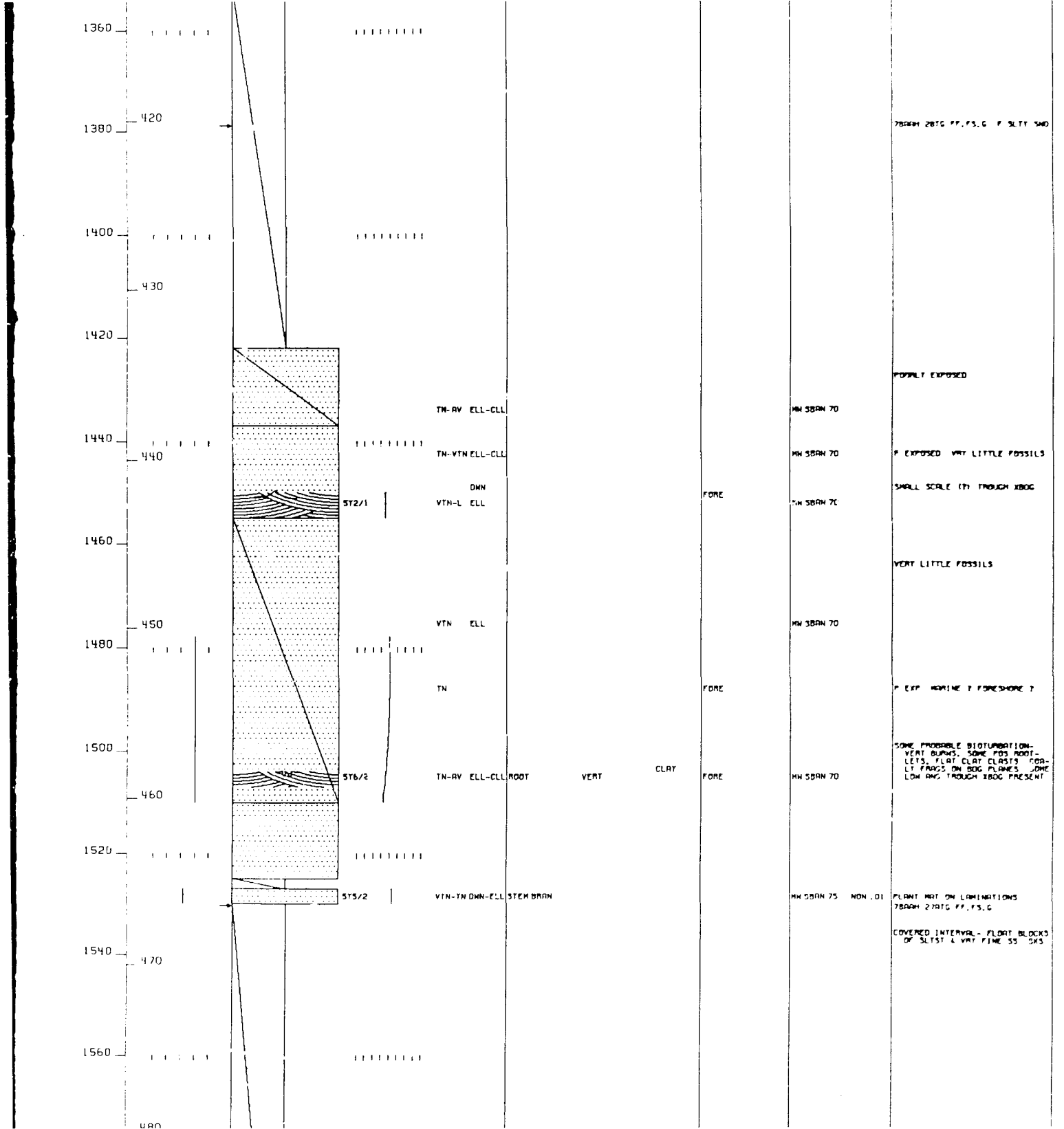
2,663 FT TOP SEC 5, T6S, R4E 68°55'46"N 151°13'03"W

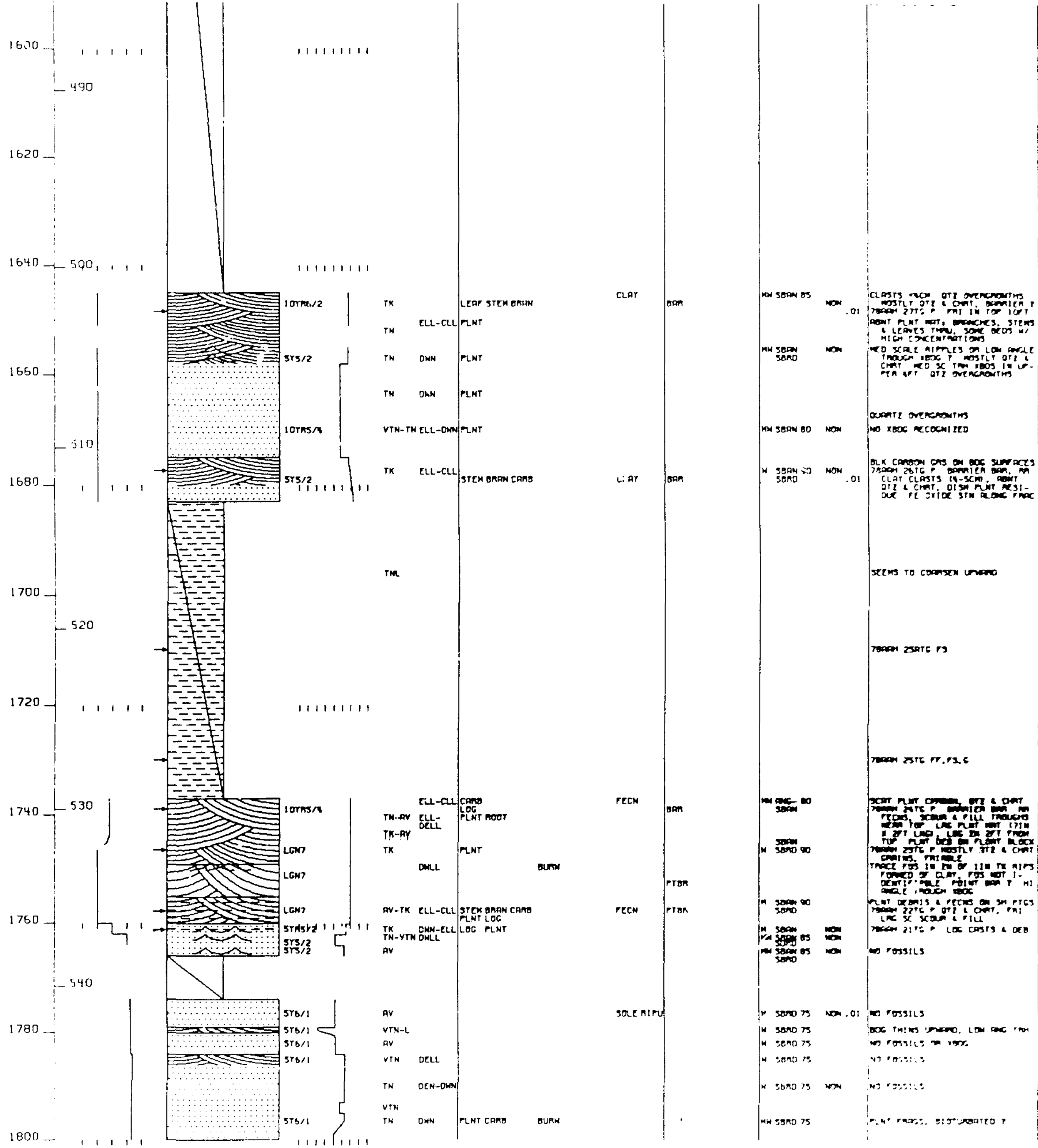
1 IN = 20 FT

6/24/78 BASE SEC 5, T6S, R4E 68°56'47"N 151°13'20"W




340
1120
1140
350
1160
1180
360
1200
5Y5/2
TN-RV ELL
CLAY
FLUV
M SBAN 90 NON
SBAD
170
1220
FERN
DIPL
USHF
1240
VTN ELL-CLL -DWN
MW SBAN 75
380
1260
10YR2/2
10YR2/2
VTN-TN ELL-CLL -DWN
BAR
MW SBAN 75 NON
10YR2/2
390
1280
VTN-TN DWN
M SBAN 70
VTN-TN DWN
M SBAN 70
1300
10YR6/2
TN ELL-CLL LEAF STEM
RV
TN-RV ELL-CLL
MW SBAN 90 NON
VTN-TN ELL-CLL STEM VERT
MW SBAN 85
10YR6/2
TN-RV ELL-CLL VERT
MW SBAN 85
400
10YR6/2
TK ELL-CLL ROOT VERT
CHAN
MW SBAN 80 NON
RV
CHAN
1320
5Y3/2
TK-RV
MW SBAN 85 NON
ALL TALUS SLOPE, SOME OF TALUS BLOCKS MED GRAINED W/ SOME FEST CONCRETIONS AND MINOR AMOUNTS OF PLANT MATERIAL
78AAM 32TG P
LOW ANG XBDG FRIABLE FLAT CLAY PEBBLE, QTZ & CHRT GRAINS, QTZ OVRGTHS ON GRS NO FOSSILS, LOOKS FLUVIAL
SOME SMALL SCALE TROUGH XSTRAT SOMEWHAT FRIABLE, SANDBAR
PROB VRY P SS BECAUSE OF TALUS
NO FOSSILS
POORLY EXPOSED SS, THN XBDS P
78AAM 31TG P QTZ & CHRT GRS
LOW ANG TROUGH XSTRAT, PLANT MAT PARA TO BDG CHCRCS ?
STEM CASTS PARALLEL TO BEDDING
CNTRT 2IN COAL SM AT BASE
78AAM 30TG FS 2IN COAL AT BASE
TROUGH XBD W/ SCOUR CHANNELS
78AAM 29TG P


1360
420
1380
1400
430
1420
440
1440
450
1460
460
1480
470
1500
480
1520
490
1540
500
1560
ST2/1
ST6/2
ST5/2
TN-AV ELL-CLL
TN-VTN ELL-CLL
DWN
VTN-L ELL
VTN ELL
TN
TN-AV ELL-CLL ROOT VERT CLAY
VTN-TN DWN-ELL STEM BRAN
FORE
FORE
FORE
MW 58AN 70
MW 58AN 70
MW 58AN 70
MW 58AN 75 NON .01
78AAH 28TG FF,FS,G F SLTY SND
FOSSIL EXPOSED
F EXPOSED VRY LITTLE FOSSILS
SMALL SCALE (?) TROUGH XBDG
VERY LITTLE FOSSILS
F EXP MARINE ? FORESHORE ?
SOME PROBABLE BIOTURBATION-
VERT BURWS, SOME POS ROOT-
LETS, FLAT CLAY CLASTS COA-
LY FRGS ON BDG PLANES, SOME
LOW ANG TROUGH XBDG PRESENT
PLANT MAT ON LAMINATIONS
78AAH 27TG FF,FS,G
COVERED INTERVAL - FLOAT BLOCKS
OF SLTST & VRY FINE SS SHS



1600
490
1620
1640
500
10YR6/2
TK
LEAF STEM BRHN
CLAY
BAR
MH SBAN 85
NON
.01
ELL-CLL
PLNT
TN
5Y5/2
TN
DWN
PLNT
MH SBAN
SBRD
NON
1660
TN
DWN
PLNT
QUARTZ OVERGROWTHS
10YR5/4
VTN-TN
ELL-DWN
PLNT
MH SBAN 80
NON
NO XBDG RECOGNIZED
510
TK
ELL-CLL
5Y5/2
STEM BRAN CARB
BAR
SBRD
NON
.01
1680
TNL
SEEMS TO COARSEN UPWARD
1700
520
78AAM 25ATG FS
1720
78AAM 25TG FF,FS,G
1740
530
ELL-CLL
CARB
LOG
FECN
BAR
10YR5/4
TN-RY
ELL-
DELL
PLNT ROOT
TK-RY
LGN7
TK
PLNT
SBRD 90
DWLL
BURW
LGN7
FTBR
LGN7
RY-TK
ELL-CLL
STEM BRAN CARB
PLNT LOG
FECN
FTBR
SBAN 90
SBRD
1760
TK
DWN-ELL
LOG PLNT
SBAN
NON
5Y5/2
TN-YTN
DWLL
SBAN 85
NON
5Y5/2
RY
MH SBAN 85
SBRD
NON
NO FOSSILS
540
5Y6/1
RY
SOLE RIPU
SBRD 75
NON .01
NO FOSSILS
1780
5Y6/1
VTN-L
SBRD 75
5Y6/1
RY
SBRD 75
5Y6/1
VTN
DELL
SBRD 75
TN
DEN-DWN
SBRD 75
NON
VTN
5Y6/1
TN
DWN
PLNT CARB
BURW
MH SBRD 75
PLNT FRAGS, BIOTURBATED ?
1800

TYPE GRANDSTAND

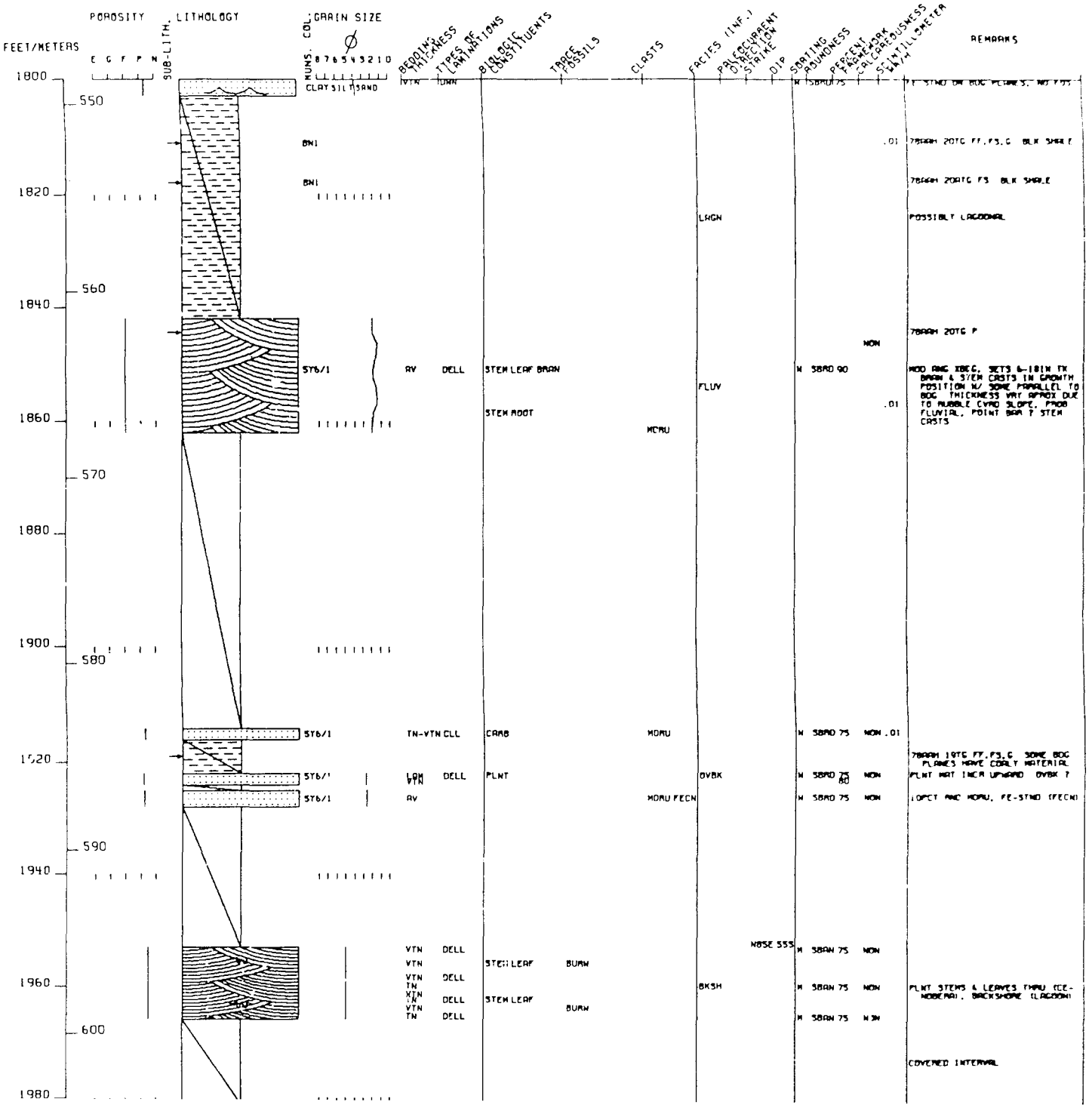
API NO. 50-057-90010

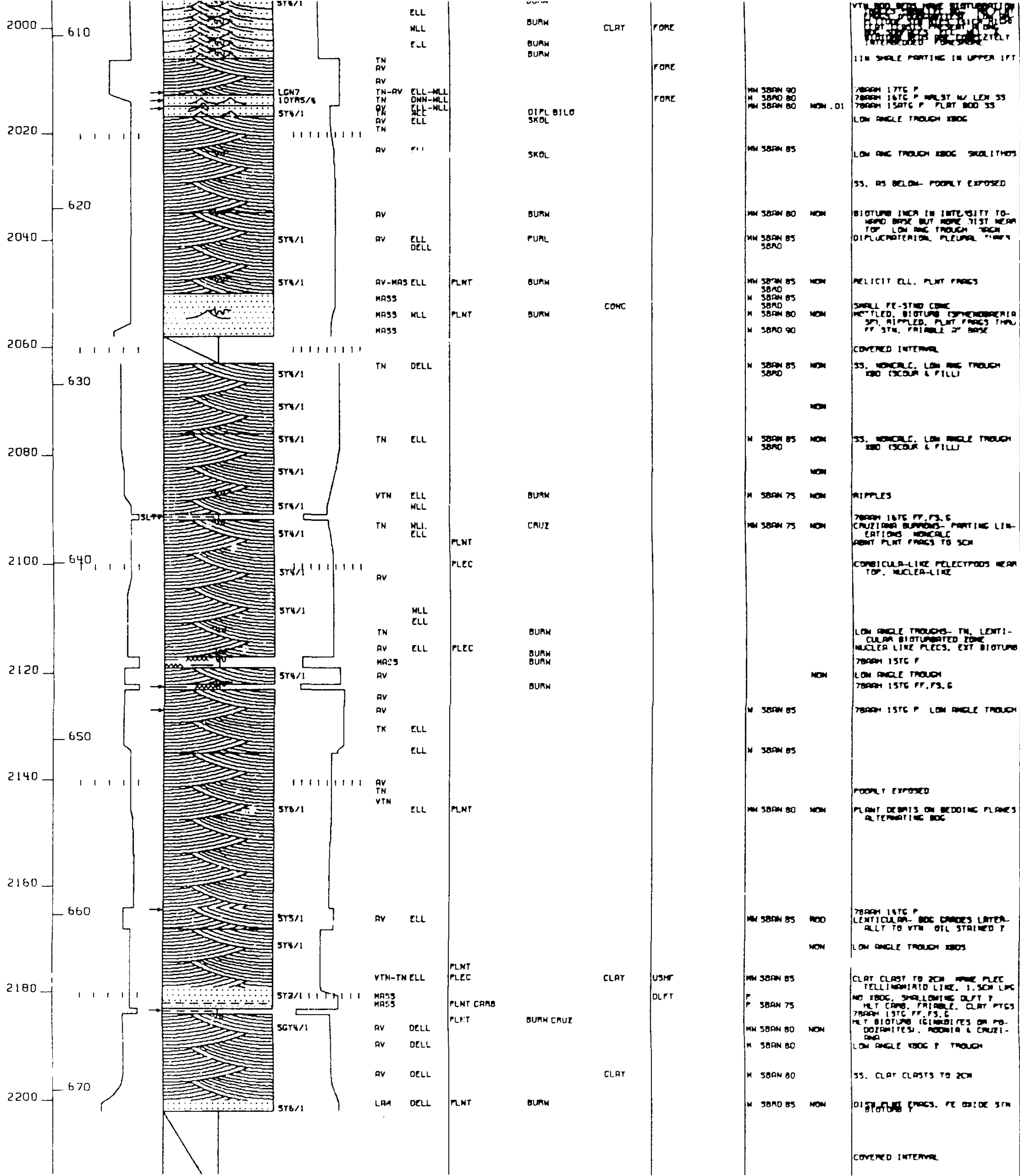
2,663 FT | 6/24/78 | 3 OF 3

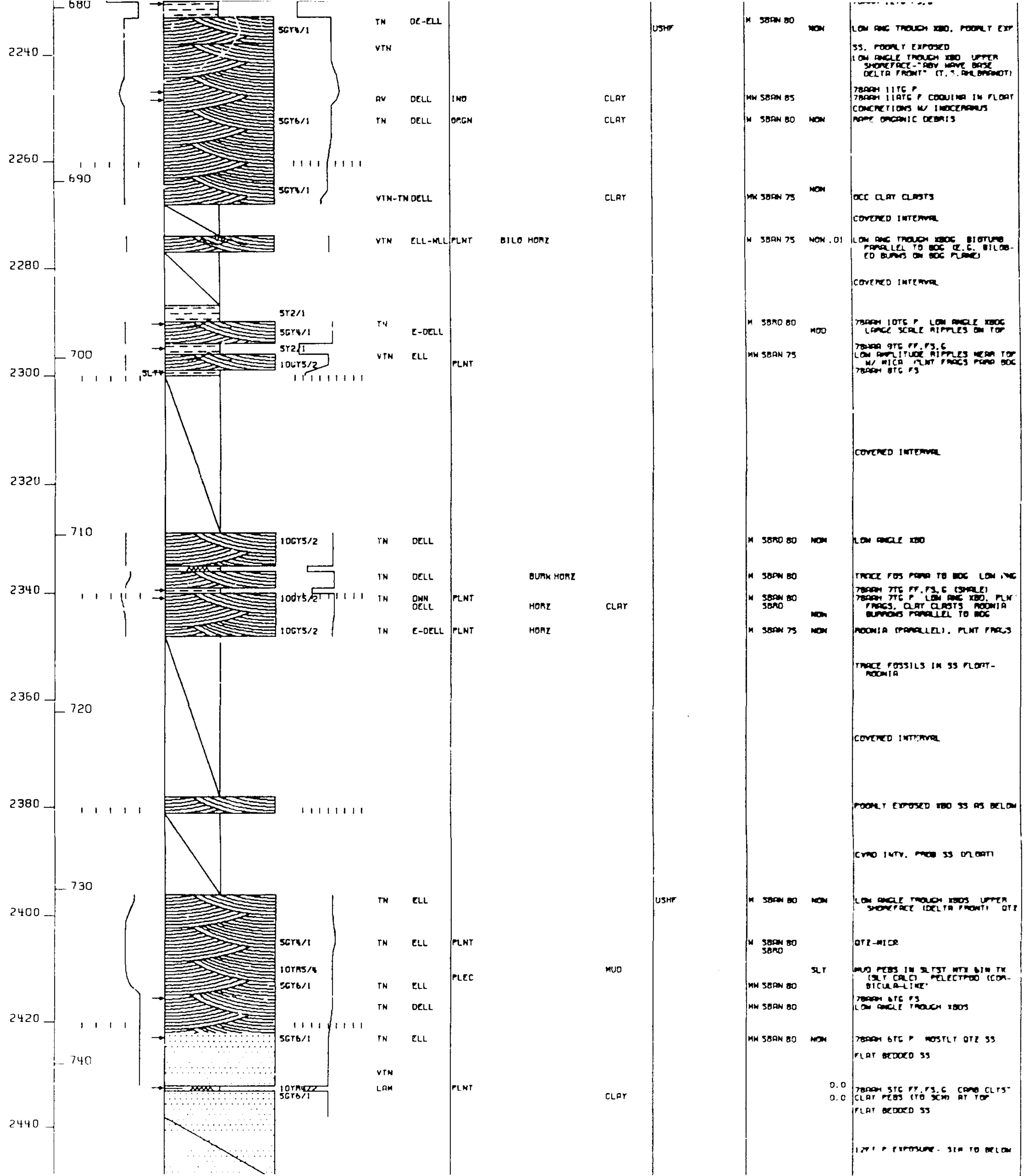
TOP | 1 IN = 20 FT | BASE

SEC 5, T6S, R4E 68°55'46"N 151°13'03"W

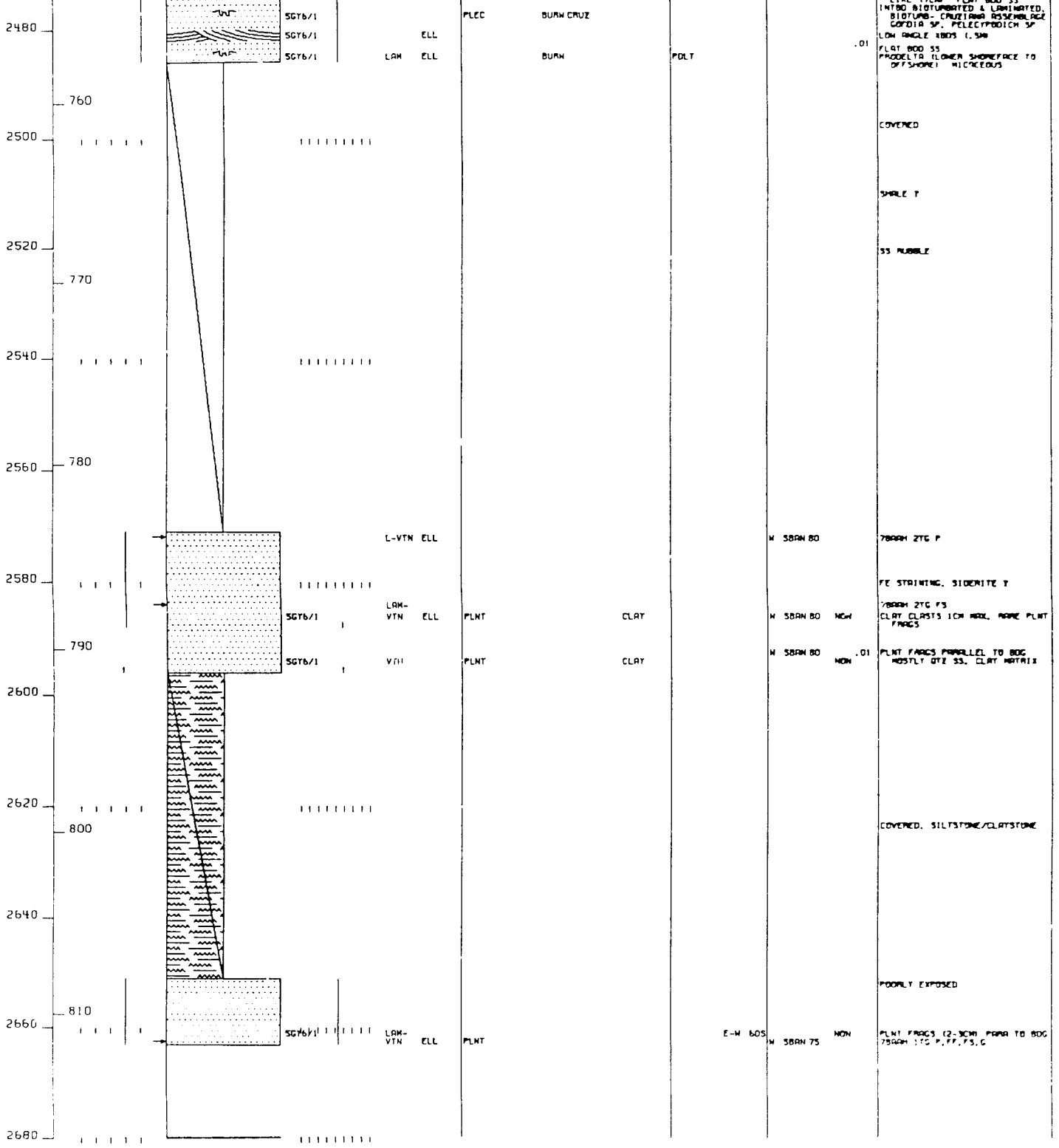
SEC 5, T6S, R4E 68°56'47"N 151°13'20"W




2000
610
2020
620
2040
2060
630
2080
640
2100
2120
650
2140
2160
660
2180
670
2200
ELL BURW CLAY FORE
WLL BURW
ELL BURW
FORE
LGN7 TN-AV ELL-WLL FORE MW 5BAN 90 78AAM 17TG F
10YR5/6 TN DWN-WLL M 5BAD 80 78AAM 16TG F WALST W/ LEN SS
5Y4/1 AV ELL-WLL DIPL BILO MW 5BAN 80 NON .01 78AAM 15ATG F FLAT BDD SS
AV ELL SKOL LOW ANGLE TROUGH XBDG
AV SKOL MW 5BAN 85 LOW ANG TROUGH XBDG SKOLITHOS
SS, AS BELOW- POORLY EXPOSED
AV BURW MW 5BAN 80 NON BIOTURB INCR IN INTENSITY TO-WARD BASE BUT MORE DIST NEAR TOP LOW ANG TROUGH
5Y4/1 AV ELL DELL FURL MW 5BAN 85 5BAD
5Y4/1 AV-MAS ELL PLNT BURW MW 5BAN 85 5BAD NON RELICIT ELL, PLNT FRAGS
MASS M 5BAN 85 5BAD
MASS WLL PLNT BURW CONC M 5BAN 80 NON SMALL FE-STND CONC MOTTLED, BIOTURB
MASS M 5BAD 90
COVERED INTERVAL
5Y4/1 TN DELL M 5BAN 85 5BAD NON SS, NONCALC, LOW ANG TROUGH XBD (SCOUR & FILL)
5Y4/1 NON
5Y4/1 TN ELL M 5BAN 85 5BAD NON SS, NONCALC, LOW ANGLE TROUGH XBD (SCOUR & FILL)
5Y4/1 NON
VTN ELL BURW M 5BAN 75 NON RIPPLES
5Y4/1 WLL
SLTY TN WLL ELL CRUZ MW 5BAN 75 NON 78AAM 16TG FF,FS,G CRUZIANA BURROWS- PARTING LIN-EATIONS NONCALC
5Y4/1 PLNT ABNT PLNT FRAGS TO 5CM
5Y4/1 AV PLEC CORBICULA-LIKE PELECYPODS NEAR TOP, NUCLEA-LIKE
5Y4/1 WLL ELL
TN BURW LOW ANGLE TROUGHS- TN, LENTI-CULAR BIOTURBATED ZONE
AV ELL PLEC BURW NUCLEA LIKE PLECS, EXT BIOTURB
MASS BURW 78AAM 15TG F
5Y4/1 AV NON LOW ANGLE TROUGH
AV BURW 78AAM 15TG FF,FS,G
AV M 5BAN 85 78AAM 15TG F LOW ANGLE TROUGH
TK ELL
ELL M 5BAN 85
AV TN VTN POORLY EXPOSED
5Y6/1 ELL PLNT MW 5BAN 80 NON PLANT DEBRIS ON BEDDING PLANES ALTERNATING BDG
5Y5/1 AV ELL MW 5BAN 85 MOD 78AAM 16TG F LENTICULAR- BDG GRADES LATER-ALLY TO VTN OIL STAINED ?
5Y4/1 NON LOW ANGLE TROUGH XBDS
PLNT
VTN-TN ELL PLEC CLAY USHF MW 5BAN 85 CLAY CLAST TO 2CM
5Y2/1 MASS MASS PLNT CARB OLFT F 5BAN 75 NO XBDG, SHALLOWING OLFT ? WLT CARB, FRIABLE, CLAY PTGS 78AAM 13TG FF,FS,G
PLNT BURW CRUZ
5GY4/1 AV DELL MW 5BAN 80 NON
AV DELL M 5BAN 80 LOW ANGLE XBDG ? TROUGH
AV DELL CLAY M 5BAN 80 SS, CLAY CLASTS TO 2CM
5Y6/1 LAM DELL PLNT BURW M 5BAD 85 NON BIOTURB ?
COVERED INTERVAL



680
TN DE-ELL USHF M 5BAN 80 NON LOW ANG TROUGH XBD, POORLY EXP
5GY4/1
2240
VTN
SS, POORLY EXPOSED
LOW ANGLE TROUGH XBD UPPER SHOREFACE-"ABV WAVE BASE DELTA FRONT" (T.S.AHLBRANDT)
78AAH 11TG P
AV DELL INO CLAY MH 5BAN 85 78AAH 11ATG P COQUINA IN FLOAT
CONCRETIONS W/ INOCERAMUS
5GY6/1 TN DELL ORGN CLAY M 5BAN 80 NON RARE ORGANIC DEBRIS
2260
690
5GY4/1
NON
VTN-TN DELL CLAY MH 5BAN 75 OCC CLAY CLASTS
COVERED INTERVAL
VTN ELL-WLL PLNT BILO HORZ M 5BAN 75 NON .01 LOW ANG TROUGH XBDG BIOTURB PARALLEL TO BDG (E.G. BILOBED BURWS ON BDG PLANE)
2280
COVERED INTERVAL
5Y2/1
TN M 5BAD 80 78AAH 10TG P LOW ANGLE XBDG LARGE SCALE RIPPLES ON TOP
5GY4/1 E-DELL MOD
5Y2/1
78AAA 9TG FF,FS,G
700
VTN ELL MH 5BAN 75 LOW AMPLITUDE RIPPLES NEAR TOP W/ MICA PLNT FRAGS PARA BDG
10GY5/2 PLNT
78AAH 8TG FS
2300
SLT
COVERED INTERVAL
2320
710
10GY5/2 TN DELL M 5BAD 80 NON LOW ANGLE XBD
TN DELL BURW HORZ M 5BAN 80 TRACE FOS PARA TO BDG LOW ANG
78AAH 7TG FF,FS,G (SHALE)
2340
10GY5/2 TN OWN DELL PLNT HORZ CLAY M 5BAN 80 5BAD 78AAH 7TG P LOW ANG XBD, PLNT FRAGS, CLAY CLASTS ROONIA BURROWS PARALLEL TO BDG
NON
10GY5/2 TN E-DELL PLNT HORZ M 5BAN 75 NON ROONIA (PARALLEL), PLNT FRAGS
TRACE FOSSILS IN SS FLOAT-ROONIA
2360
720
COVERED INTERVAL
2380
POORLY EXPOSED XBD SS AS BELOW
CVRD INTV, PROB SS (FLOAT)
730
TN ELL USHF M 5BAN 80 NON LOW ANGLE TROUGH XBDS UPPER SHOREFACE (DELTA FRONT) QTZ
2400
5GY4/1 TN ELL PLNT M 5BAN 80 5BAD QTZ-MICA
10YR5/4 MUD SLY MUD PEBS IN SLTST MTX 6IN TK (SLY CALC) PELECYPOD (CORBICULA-LIKE)
5GY6/1 TN ELL PLEC MH 5BAN 80
78AAH 6TG FS
TN DELL MH 5BAN 80 LOW ANGLE TROUGH XBDS
2420
5GY6/1 TN ELL MH 5BAN 80 NON 78AAH 6TG P MOSTLY QTZ SS
FLAT BEDDED SS
740
VTN
10YR4/2 LAM PLNT 0.0 78AAH 5TG FF,FS,G CARB CLTS
5GY6/1 CLAY 0.0 CLAY PEBS (TO 3CM) AT TOP
FLAT BEDDED SS
2440
12FT P EXPOSURE- SIM TO BELOW


2480
760
2500
2520
770
2540
2560
780
2580
790
2600
2620
800
2640
810
2660
2680
SGY6/1
SGY6/1
SGY6/1
SGY6/1
SGY6/1
SGY6/1
ELL
LAM ELL
L-VTN ELL
LAM-
VTN ELL
VTN
LAM-
VTN ELL
PLEC
BURW CRUZ
BURW
PLNT
CLAY
PLNT
CLAY
PLNT
POLT
E-W 60S
W SBAN 80
W SBAN 80 NOW
W SBAN 80 .01 NON
W SBAN 75 NON
.01
INTBD BIOTURBATED & LAMINATED, BIOTURB- CRUZIANA ASSEMBLAGE GORDIA SP. PELECYPODICH SP
LOW ANGLE XBDS (.5M)
FLAT BDD SS
PRODELTA (LOWER SHOREFACE TO OFFSHORE) MICACEOUS
COVERED
SHALE T
SS RUBBLE
78BRN ZTG F
FE STAINING, SIDERITE T
78BRN ZTG FS
CLAY CLASTS 1CM MAX, RARE PLNT FRAGS
PLNT FRAGS PARALLEL TO BDG MOSTLY QTZ SS, CLAY MATRIX
COVERED, SILTSTONE/CLAYSTONE
POORLY EXPOSED
PLNT FRAGS (2-3CM) PARA TO BDG
78GRN ITG F,FF,FS,C

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Open file report
OF 81-177
PLATE 3

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ROOF TOP ANTICLINE

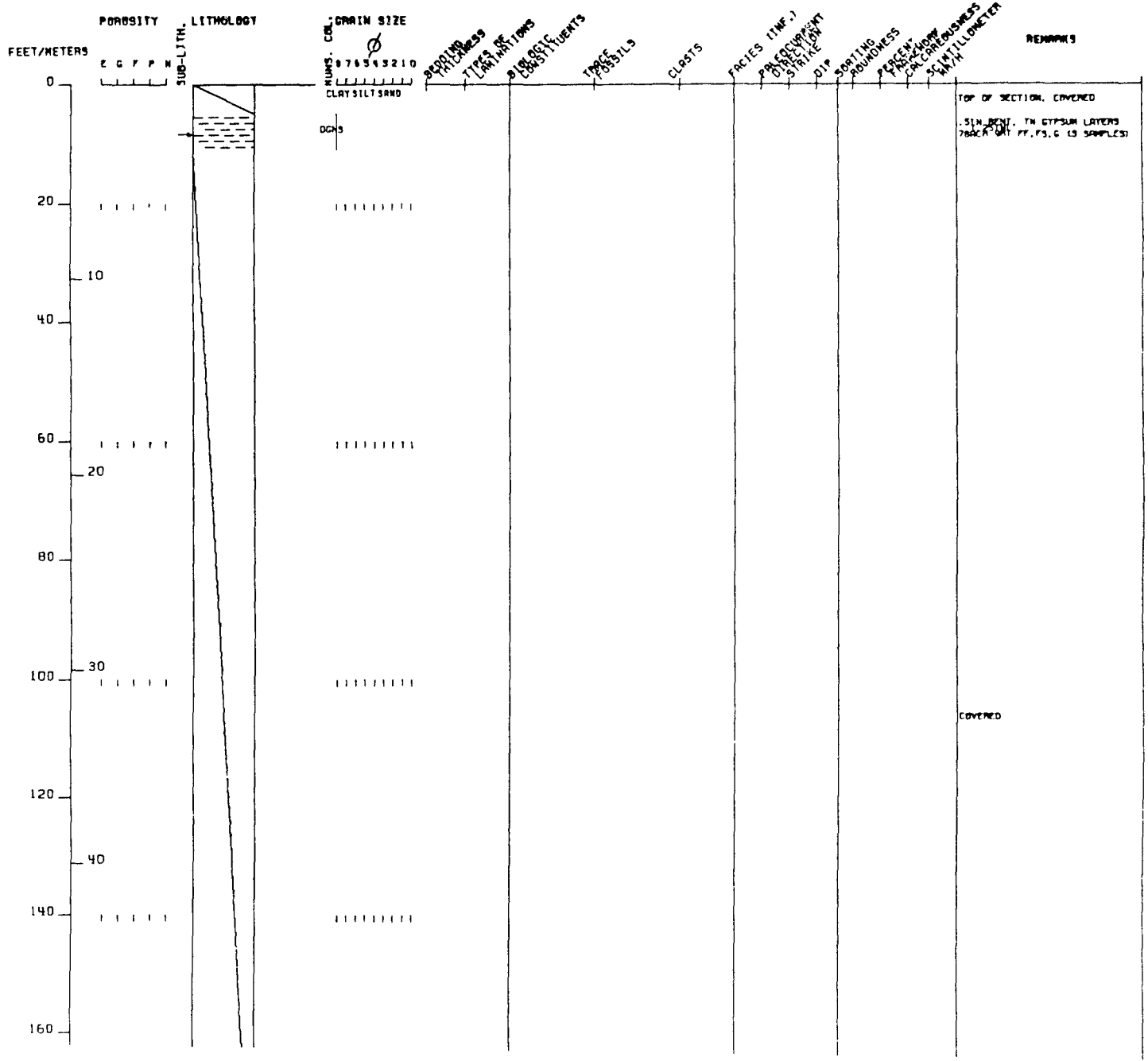
API NO. 50-057-90011

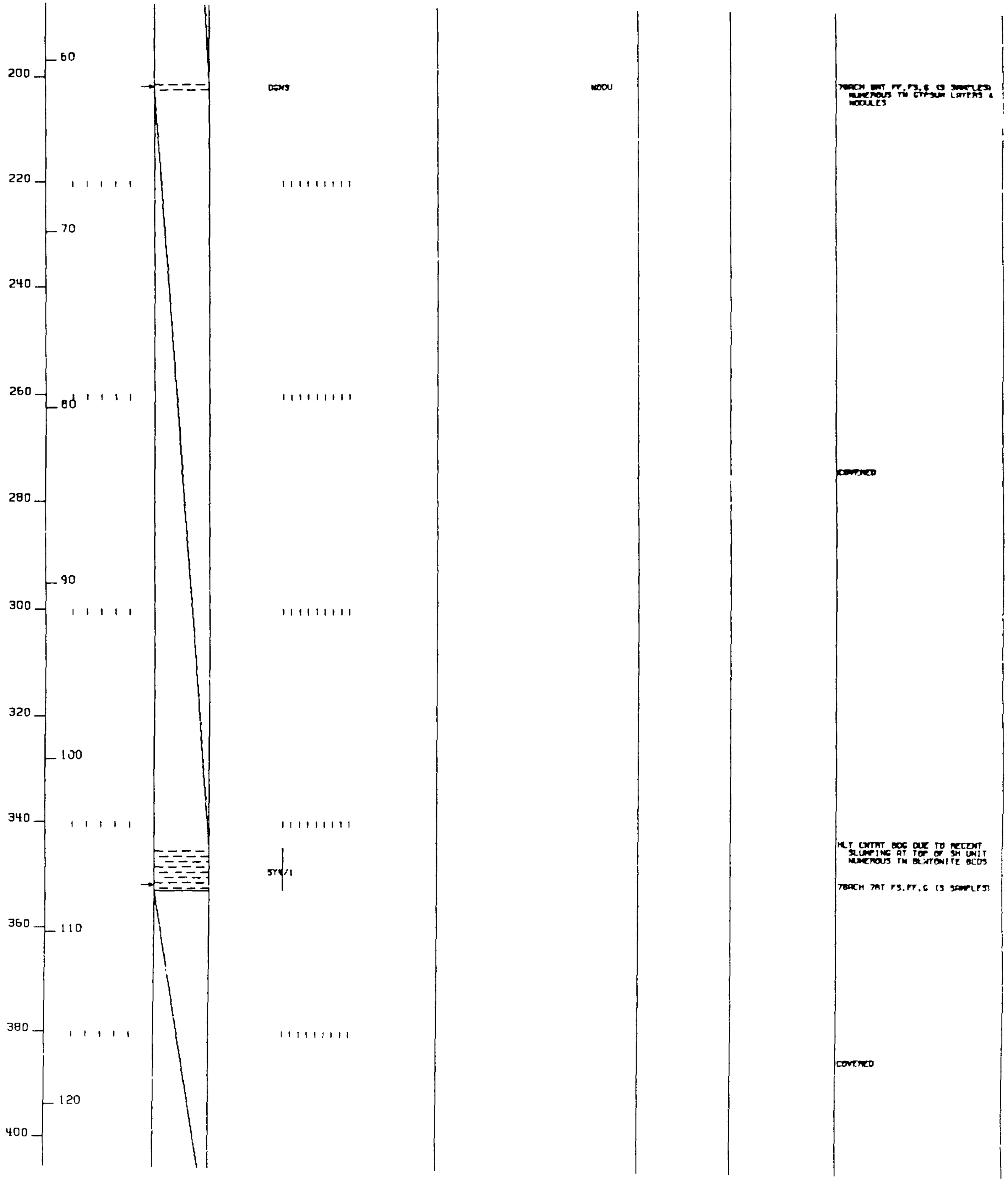
1,238 FT | 7/10/78 | 1 OF 2

TOP | 1 IN = 20 FT | BASE

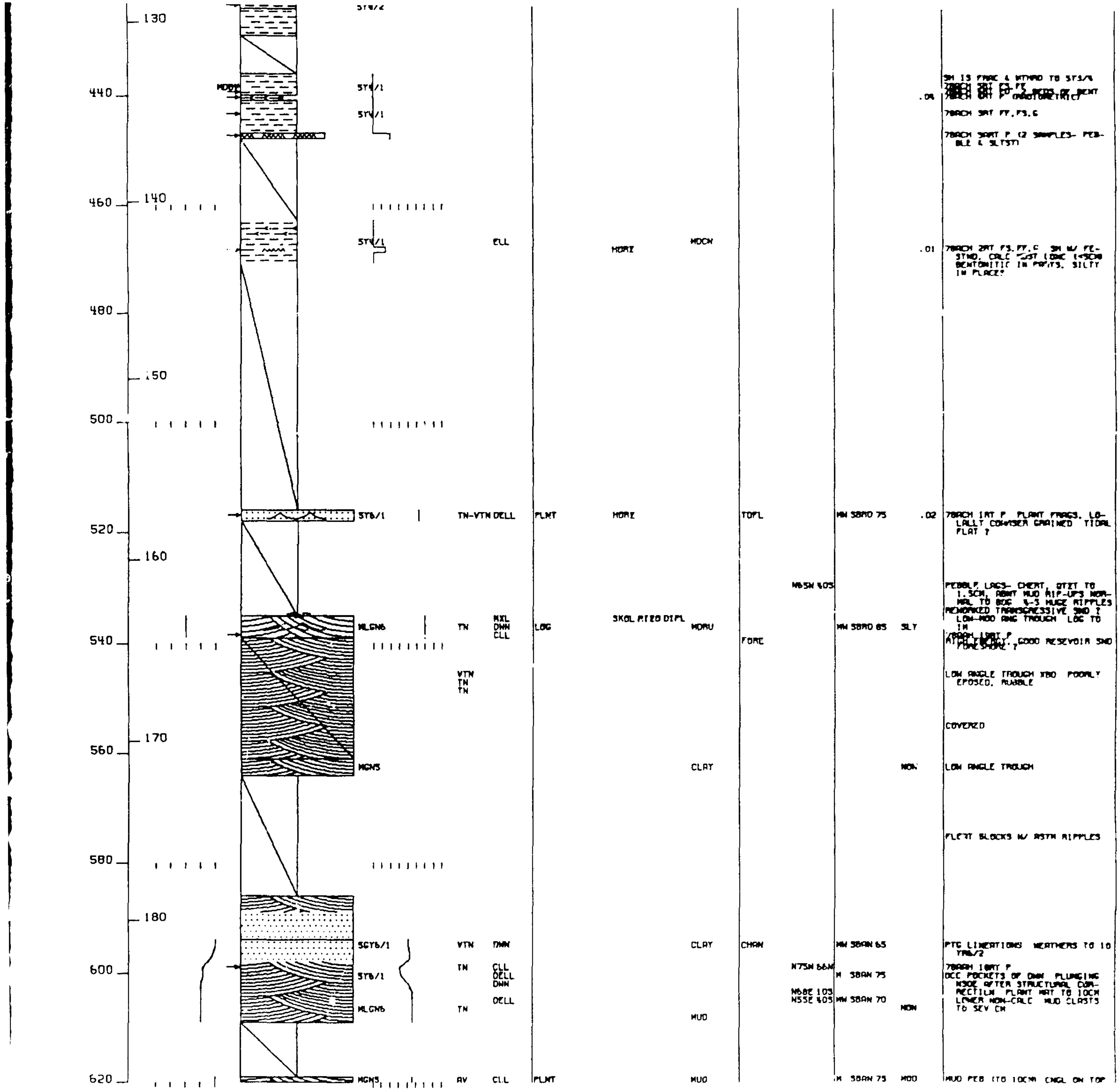
SEC 7, T7S, R6E
68°50'30"N 150°34'49"W

SEC 7, T7S, R6E
68°50'37"N 150°33'31"W





200
220
240
260
280
300
320
340
360
380
400
60
70
80
90
100
110
120
DGNS
NODU
78ACH 8AT FF,FS,G (3 SAMPLES)
NUMEROUS TN GYPSUM LAYERS &
NODULES
COVERED
5Y4/1
MLT CNTRT BDG DUE TO RECENT
SLUMPING AT TOP OF SH UNIT
NUMEROUS TN BENTONITE BEDS
78ACH 7AT FS,FF,G (3 SAMPLES)
COVERED


130
440
460
140
480
150
500
520
160
540
560
170
580
180
600
620
5Y4/1
5Y4/1
5Y4/1
ELL
HORZ
MOCN
.01
5Y6/1
TN-VTN DELL
PLNT
HORZ
TOFL
MW 58AD 75
.02
N65W 40S
MLGN6
TN
MXL
DWN
CLL
LOG
SKOL RIZO DIPL
MORU
FORE
MW 58AD 85
SLT
VTN
TN
TN
MGN5
CLAT
NON
5GY6/1
VTN
DWN
CLAY
CHAN
MW 58AN 65
N75W 66W
5Y6/1
TN
CLL
DELL
DWN
M 58AN 75
N68E 10S
N55E 40S
MW 58AN 70
MLGN6
TN
DELL
MUD
NON
MGN5
AV
CLL
PLNT
MUD
M 58AN 75
MOD
.04
78ACH 5RT FF, FS, C
COVERED
LOW ANGLE TROUGH
MUD PEB (TO 10CM) CNGL ON TOP

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ROOF TOP ANTICLINE

API NO. 50-057-90011

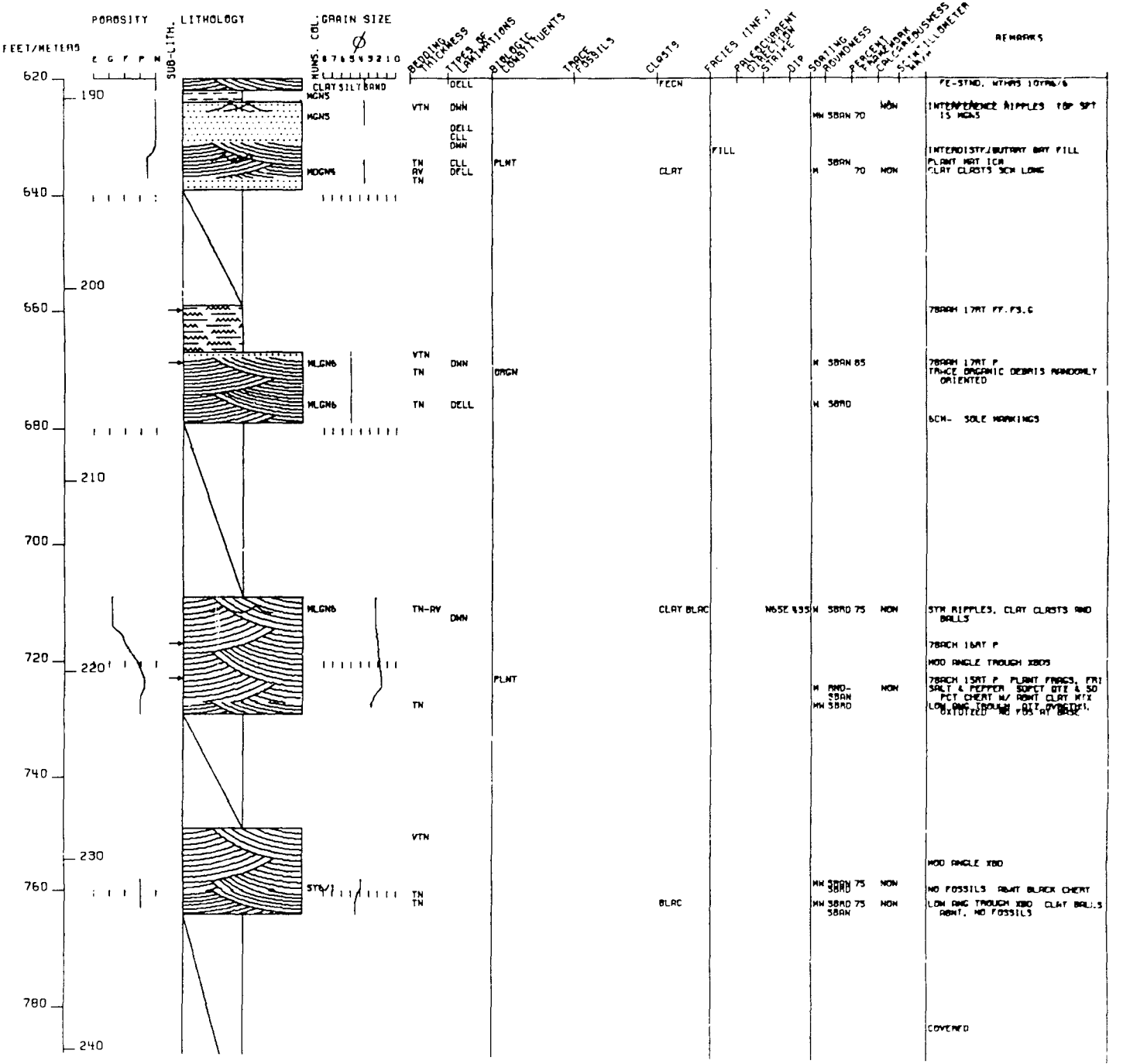
1,238 FT TOP SEC 7, T7S, R6E 68°50'30"N 150°34'49"W

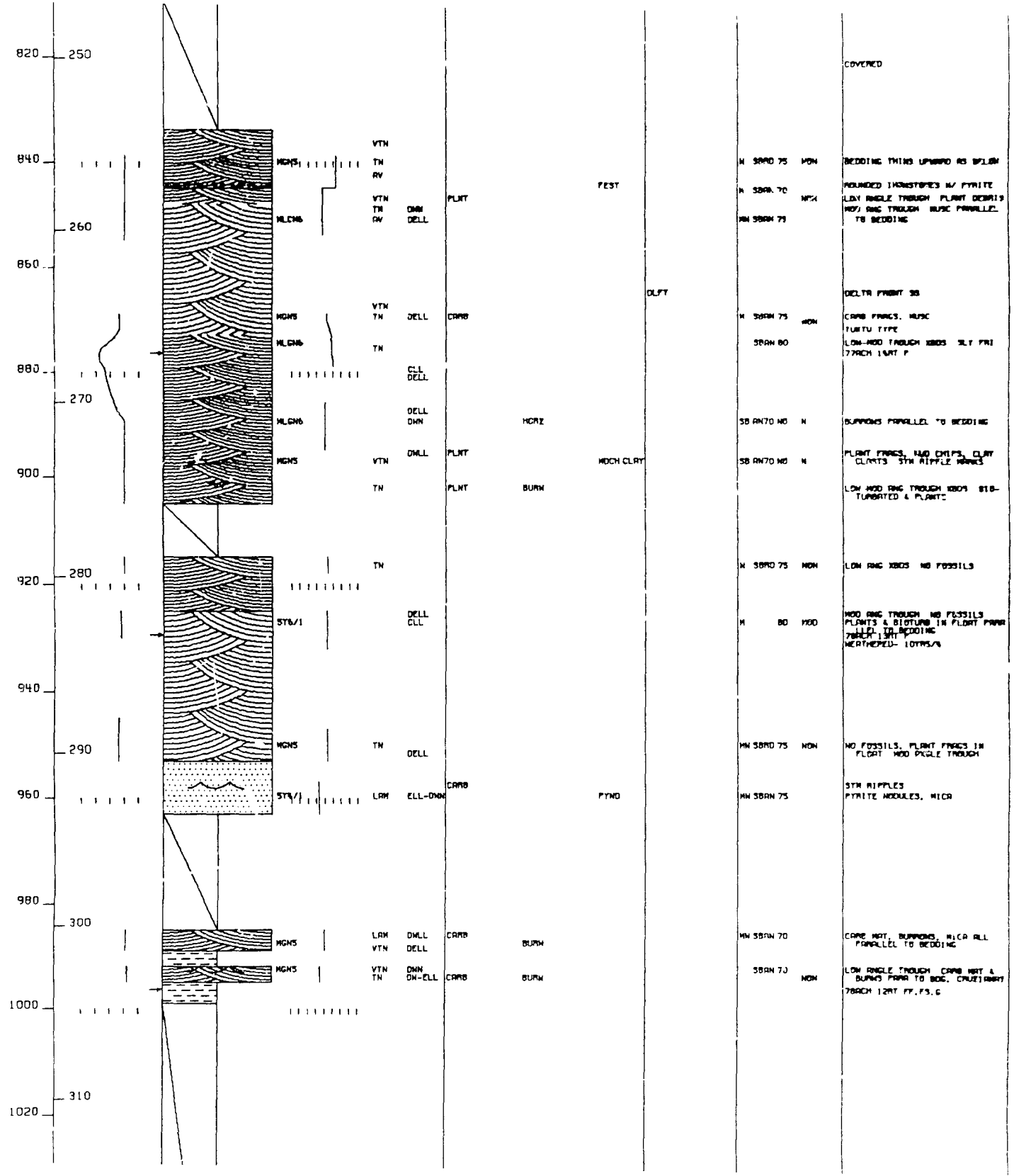
1 IN = 20 FT

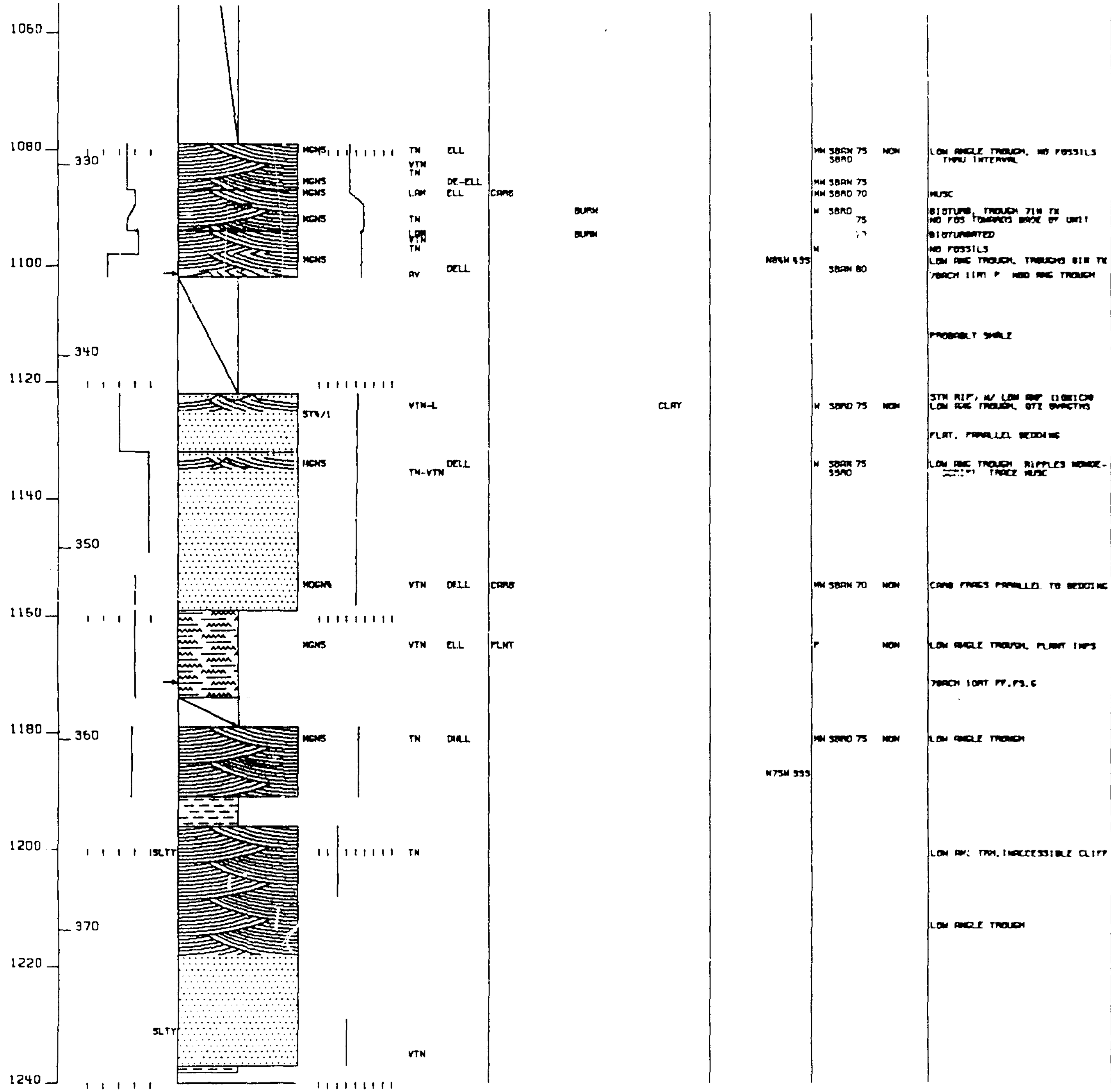
7/10/78

2 OF 2

BASE SEC 7, T7S, R6E 68°50'37"N 150°33'31"W




820
250
840
260
860
880
270
900
280
920
940
290
960
980
300
1000
310
1020
MGNS
MLGNS
MGNS
MLGNS
MGNS
ST6/1
MGNS
ST6/1
MGNS
MGNS
VTN
TN
RV
VTN
TN
RV
VTN
TN
VTN
TN
DWN
DELL
DELL
DELL
DELL
DWN
DWLL
DELL
TN
DELL
CLL
LAM
VTN
VTN
TN
DWLL
DELL
DWN
DW-ELL
PLNT
CARB
PLNT
CARB
CARB
CARB
HORZ
BURW
BURW
FEST
DLFT
MOCH CLAY
PYRO
COVERED
BEDDING THINS UPWARD AS BFLOW
ROUNDED IRONSTONES W/ PYRITE
LOW ANGLE TROUGH PLANT DEBRIS
MOD ANG TROUGH MUSC PARALLEL TO BEDDING
DELTA FRONT SS
CARB FRAGS, MUSC
TURTU TYPE
LOW-MOD TROUGH XBDS SLT FRI
77ACM 1%AT F
BURROWS PARALLEL TO BEDDING
PLANT FRAGS, MUD CHIPS, CLAY CLASTS STR RIPPLE MARKS
LOW MOD ANG TROUGH XBDS BIO-TURBATED & PLANTS
LOW ANG XBDS NO FOSSILS
MOD ANG TROUGH NO FOSSILS
PLANTS & BIOTURB IN FLOAT PARA LEL TO BEDDING
78ACM 13AT F
WEATHERED- 10YRS/%
NO FOSSILS, PLANT FRAGS IN FLOAT MOD ANGLE TROUGH
STR RIPPLES
PYRITE NODULES, MICA
CARB MAT, BURROWS, MICA ALL PARALLEL TO BEDDING
LOW ANGLE TROUGH CARB MAT & BURWS PARA TO BDG. CRUZIANAT
78ACM 12AT FF,FS,G



1060
1080
330
1100
340
1120
1140
350
1160
1180
360
1200
370
1220
1240
LOW ANGLE TROUGH, NO FOSSILS THRU INTERVAL
MUSC
BIOTURBATED
NO FOSSILS
PROBABLY SHALE
FLAT, PARALLEL BEDDING
LOW ANGLE TROUGH

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Open file report
OF 81-177
PLATE 4

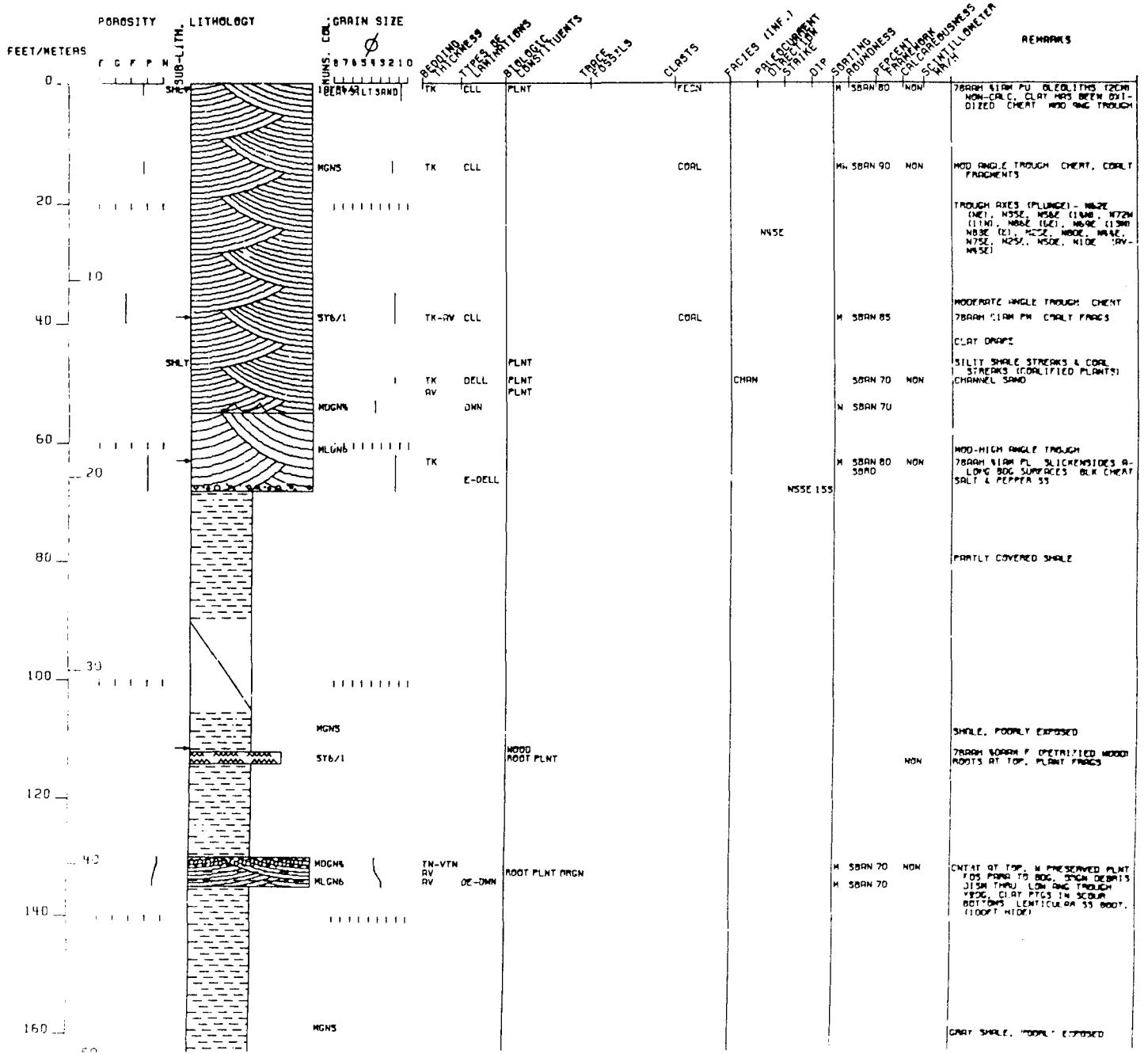
ARC MOUNTAIN

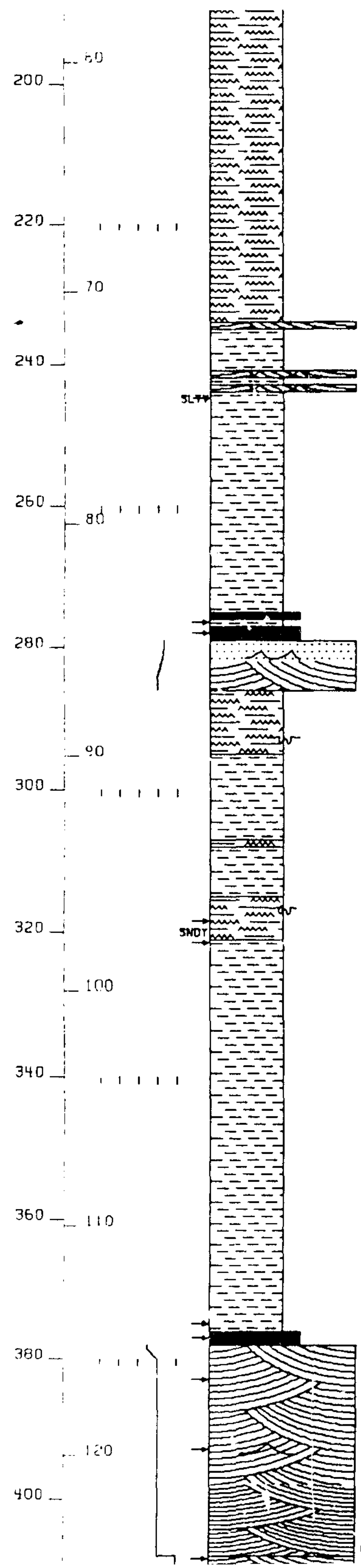
API NO. 50-057-90012

1,690 FT TOP — 1 IN = 20 FT — 7/4/78 BASE

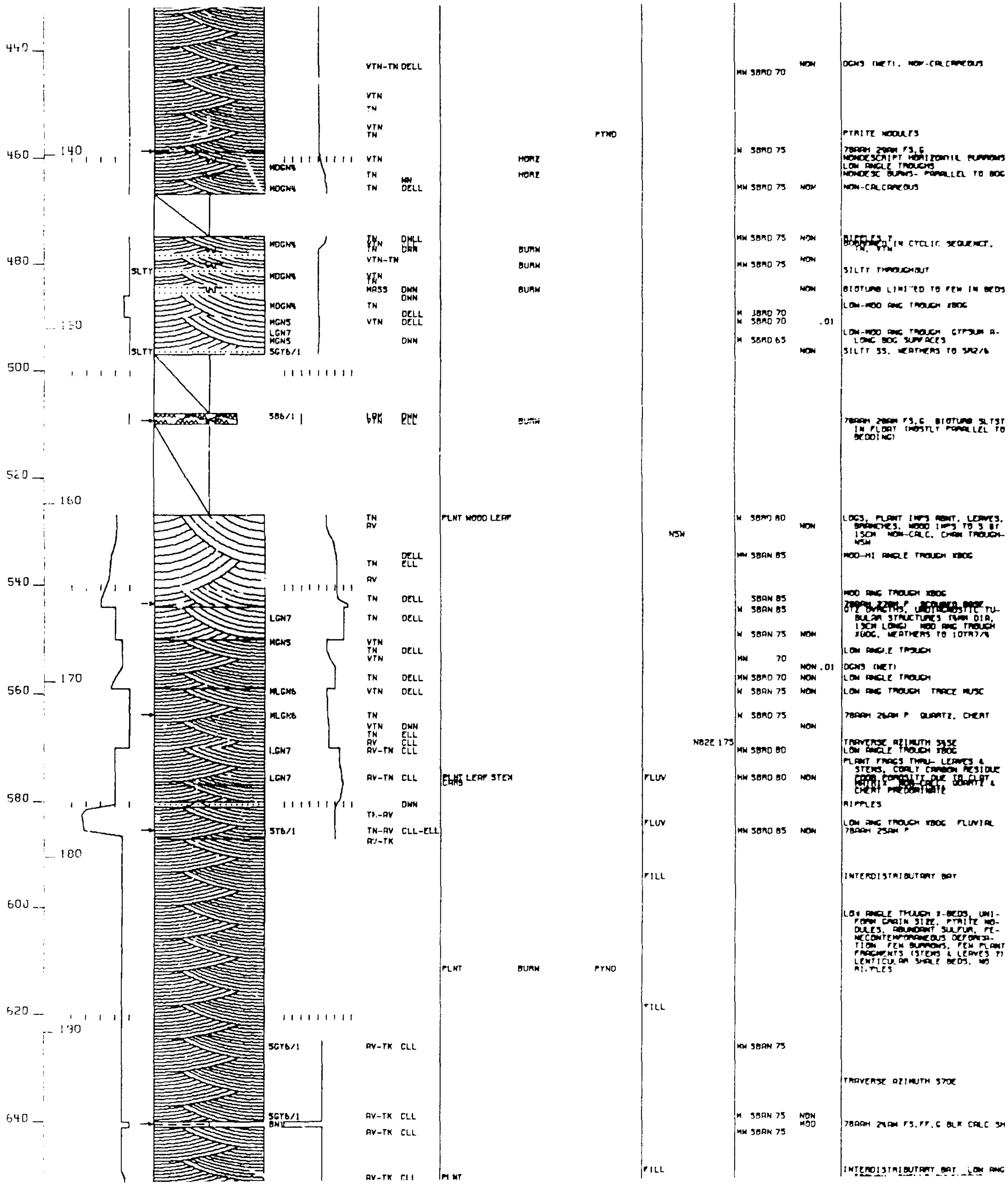
SEC 31, T9S, R7E 68°36'57"N 150°33'28"W

SEC 13, T9S, R6E 68°40'00"N 150°36'31"W

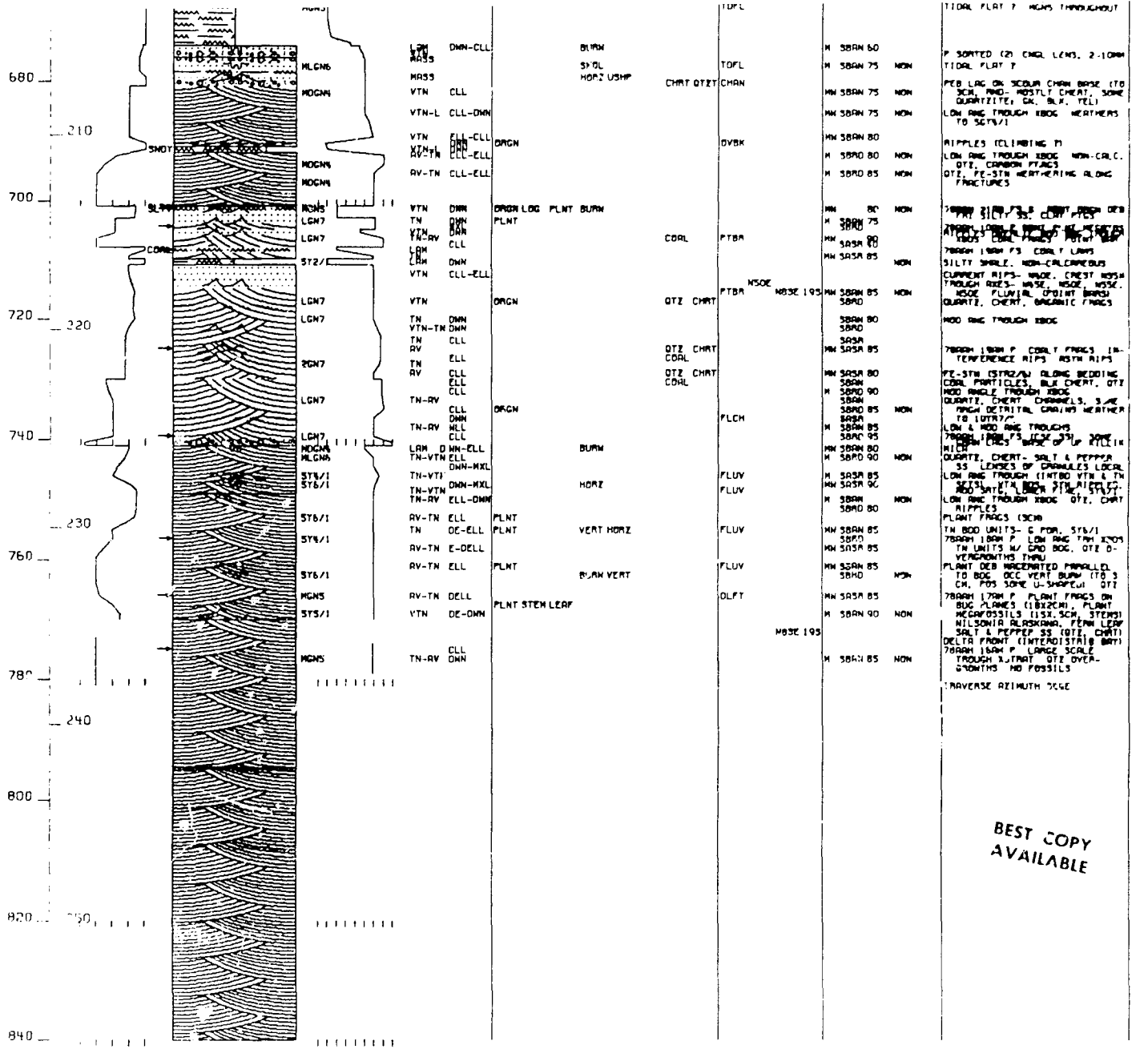




Color	Bedding	Contact	Fossils	Bioturb.	Bar/Unit	Paleocurrent	Sample	Calc.		Remarks
MGNS								NON		78AAH 39AM FS,FF,G SILTY SH- GYPSUM CRYSTALS ALONG FRAC- TURES- PELECYPODS
MGNS	TN	DLLL	PLNT				N 58AN 70	MOD		LOW ANG TROUGH PLANT FRAG
										PARTLY COVERED
										LOW ANG TRH ASYM RIP AS BELOW
MLGN6	TN	DNLL					N 58AN 75	VRY		NO FOSSILS. VERY CALCAREOUS 78AAH 38AM FS,G
	TNL									FISSILE. LOAD CASTS THIS IS THE REVERSE SEQUENCE FROM THE COAL SEQUENCE BELOW
10R2/2										
OGN3									.01	SHALE, HAS 5Y3/6 STREAKS
										31N COAL 78AAH 37AM FS (2.5IN SH PTG) 78AAH 37AM G,C (2FT COAL)
								MLY	.01	FS, FLAT BDD, RIPPLED W/ ABNT PLANT ROOTLETS AT TOP FLUVIAL CHANNEL
MGN5	VTN		ROOT		FLCH	N82E 175	N 58AN 70			
5Y2/1	TK		PLNT	BMUD			N 58AN 75	SLY		MOD ANG TROUGH ABNT PLANT DEB NEAR BASE, FLTG MUD BALLS
5Y4/1			PLNT							BALL & PILLOW CONTAINS LARGE PLANT FRAGS
			PLNT							PLANT FRAGS (1-2CM) & PLNT DEB
			PLNT	BURN						BLOCKY WEATHERING LOAD CASTS NONDESCRIPT BIOTURBATION
		DNN								
										PARTLY EXPOSED SHALE
			PLEC							PELECYPOD
			GAST							FE-STN AT 18IN & TOP BIOTURB FRESHWATER MOST
		DNN	PLEC	BURN						
MDGN6								NON	.02	78AAH 36AM F PLECS SCAT & IN POCKETS LOAD CASTS
GBN2		DNN	PLEC ORGN							78AAH 35AM FF,FS,G NON-CALC ASSEMBLAGE CONSTITU- ENTS- UNIONID, CORBULA
					FILL					LOAD CAST FINE GRAINED BAY FILL
		TNL								FISSILE
										CONCRETIONARY FRACTURE- NODULE WEATHERING W/ 10R3/4 COLOR LOAD CAST
10R2/2										78AAH 36AM FS
									.01	78AAH 33AM FS,S,C (24IN COAL)
MLGN6	AV	DELL	ROOT				MN 58AN			UPPER 6IN WELL ROOTED MOD ANG TROUGH
	AV	DELL					MN 58AN 80			78AAH 32AM P
					FLCH					FLUVIAL CHANNEL MOD ANGLE TROUGH
	AV		PLNT CARB				N 58AN 75	NON		PLANT DEBRIS
MLGN6	AV	DELL	PLNT				MN 58AN 80	SLY		78AAH 31AM P VERT SL CALC, LARGE PLANT FRAGS, SOME RIPPLES MODERATE ANGLE TROUGH
MLGN6	AV	DELL	PLNT CARB				N 58AN 75	NON		LOW ANG TROUGH CARB MAT ALONG BEDDING PLANES, NON-CALC
MLGN6	TK						N 58AN 75	NON		LOW ANG TROUGH NO FOSSILS
	TK					N85E 173	N 58AN 77	NON		
MLGN6	LAM									LOW ANGLE TROUGH



440
VTN-TN DELL
MW 5BRD 70 NON DGNS (WET), NON-CALCAREOUS
VTN
TN
VTN
TN
PYNO
PYRITE NODULES
460 140
N 5BRD 75
78AAH 29AH FS,G
VTN HORZ
NONDESCRIPT HORIZONTAL BURROWS
LOW ANGLE TROUGHS
MDGN4 TN WN HORZ
NONDESC BURWS- PARALLEL TO BDG
MDGN4 TN DELL
MW 5BRD 75 NON NON-CALCAREOUS
MDGN4 TN DWLL
VTN
TN DRN BURW
MW 5BRD 75 NON RIPPLES ?
BDDGMED IN CYCLIC SEQUENCE, TN, VTN
480
VTN-TN BURW
MW 5BRD 75 NON
SLTY MDGN4 VTN TN
SILTY THROUGHOUT
MASS DWN BURW
NON BIOTURB LIMITED TO FEW IN BEDS
DWN
MDGN4 TN
LOW-MOD ANG TROUGH XBDG
DELL
M 3BRD 70
150
MGN5 VTN DELL
M 5BRD 70 .01
LGN7
LOW-MOD ANG TROUGH GYPSUM A-LONG BDG SURFACES
MGN5 DWN
M 5BRD 65
SLTY 5GY6/1
NON SILTY SS, WEATHERS TO 5R2/6
500
5B6/1 LOW VTN DWN ELL BURW
78AAH 28AH FS,G BIOTURB SLTST IN FLOAT (MOSTLY PARALLEL TO BEDDING)
520
160
TN
AV
PLNT WOOD LEAF
N 5BRD 80
NON
NSW
LOGS, PLANT IMPS ABNT, LEAVES, BRANCHES, WOOD IMPS TO 5 BY 15CM NON-CALC, CHAN TROUGH-NSW
DELL
TN ELL
MW 5BAN 85
MOD-HI ANGLE TROUGH XBDG
AV
540
TN DELL
5BAN 85
MOD ANG TROUGH XBDG
78AAH 27AH P SCOURED BASE
LGN7 TN DELL
N 5BAN 85
QTZ OVRGTHS, UNDIAGNOSTIC TU-BULAR STRUCTURES (5MM DIA, 15CM LONG) MOD ANG TROUGH XBDG, WEATHERS TO 10YR7/4
MGN5 VTN
N 5BAN 75 NON
TN DELL
LOW ANGLE TROUGH
VTN
MW 70
NON .01 DGNS (WET)
170
TN DELL
MW 5BRD 70 NON LOW ANGLE TROUGH
560
MLGN6 VTN DELL
N 5BAN 75 NON LOW ANG TROUGH TRACE MUSC
MLGN6 TN
N 5BRD 75
78AAH 26AH P QUARTZ, CHERT
VTN DWN
NON
TN ELL
AV CLL
N82E 175
TRAVERSE AZIMUTH S55E
LGN7 AV-TN CLL
MW 5BRD 80
LOW ANGLE TROUGH XBDG
PLANT FRAGS THRU- LEAVES & STEMS, COALY CARBON RESIDUE
LGN7 AV-TN CLL
PLNT LEAF STEM CARS
FLUV
MW 5BRD 80 NON
GOOD POROSITY DUE TO CLAY MATRIX NON-CALC, QUARTZ & CHERT PREDOMINATE
580
DWN
RIPPLES
TN-AV
FLUV
LOW ANG TROUGH XBDG FLUVIAL
5Y6/1 TN-AV CLL-ELL
MW 5BRD 85 NON
78AAH 25AH P
AV-TK
180
FILL
INTERDISTRIBUTARY BAY
600
LOW ANGLE TROUGH X-BEDS, UNI-FORM GRAIN SIZE, PYRITE NO-DULES, ABUNDANT SULFUR, FE-NECONTEMPORANEOUS DEFORMA-TION FEW BURROWS, FEW PLANT FRAGMENTS (STEMS & LEAVES ?) LENTICULAR SHALE BEDS, NO RIPPLES
PLNT BURW PYNO
620
FILL
190
5GY6/1 AV-TK CLL
MW 5BAN 75
TRAVERSE AZIMUTH S70E
640
5GY6/1 AV-TK CLL
M 5BAN 75 NON
BN1
MOD
78AAH 24AH FS,FF,G BLK CALC SH
AV-TK CLL
MW 5BAN 75
AV-TK CLL
PLNT
FILL
INTERDISTRIBUTARY BAY LOW ANG



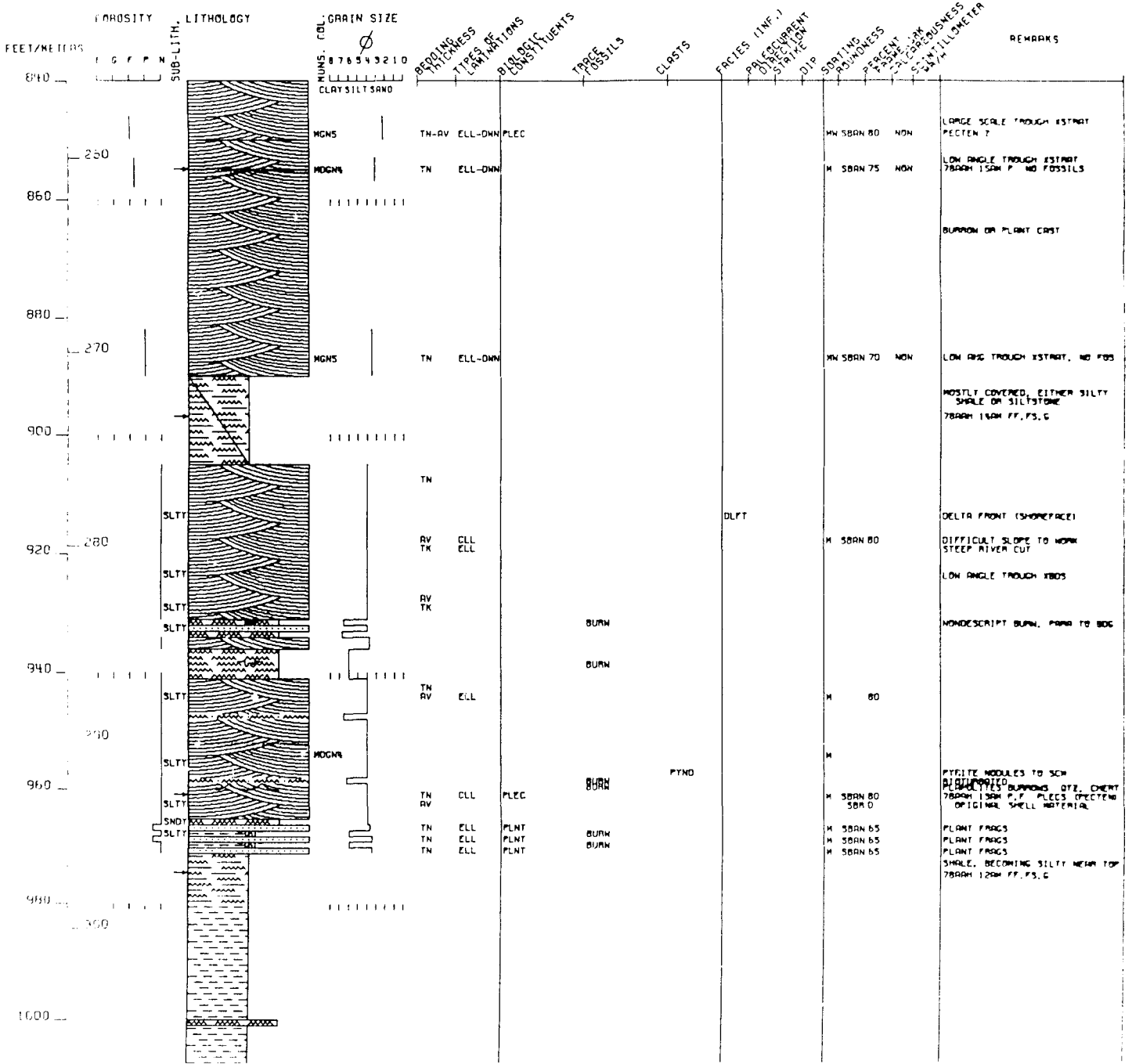
ARC MOUNTAIN

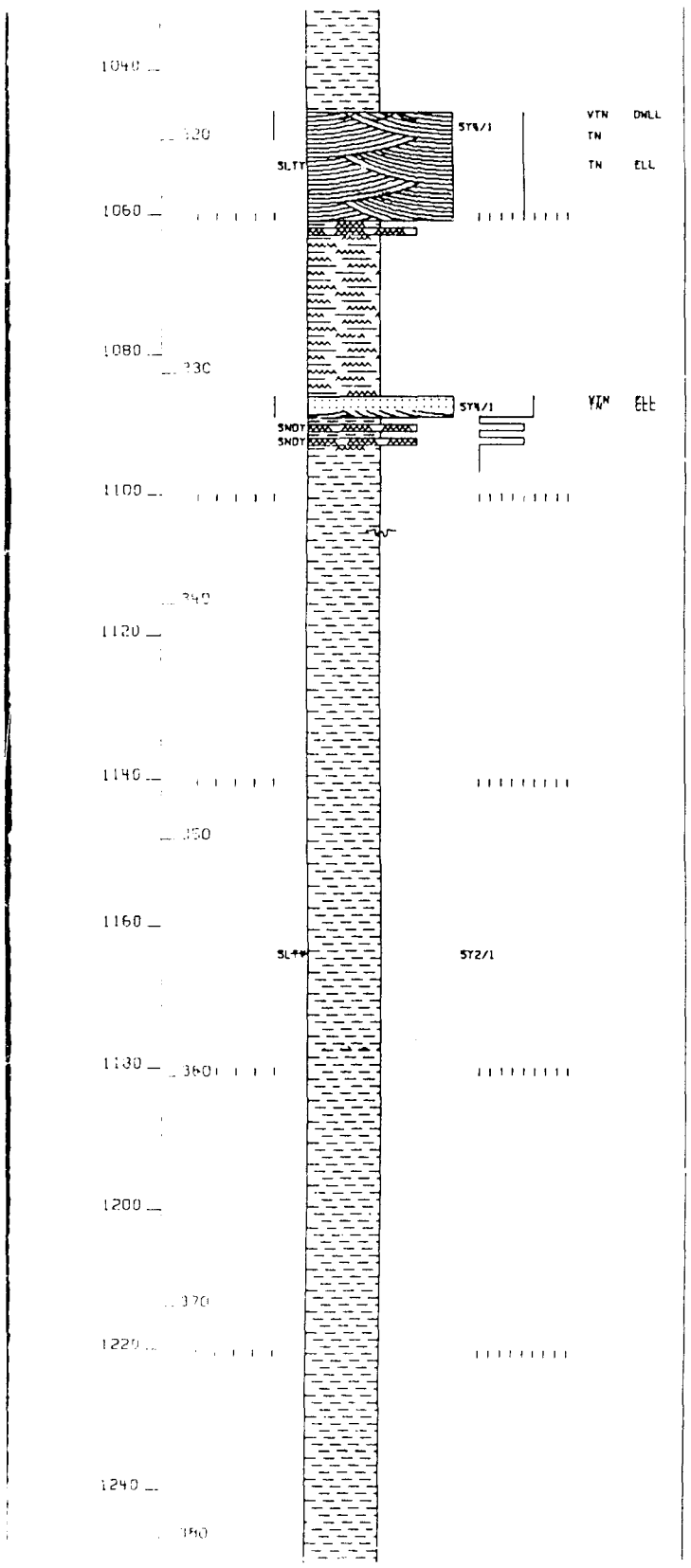
API NO. 50-057-90012

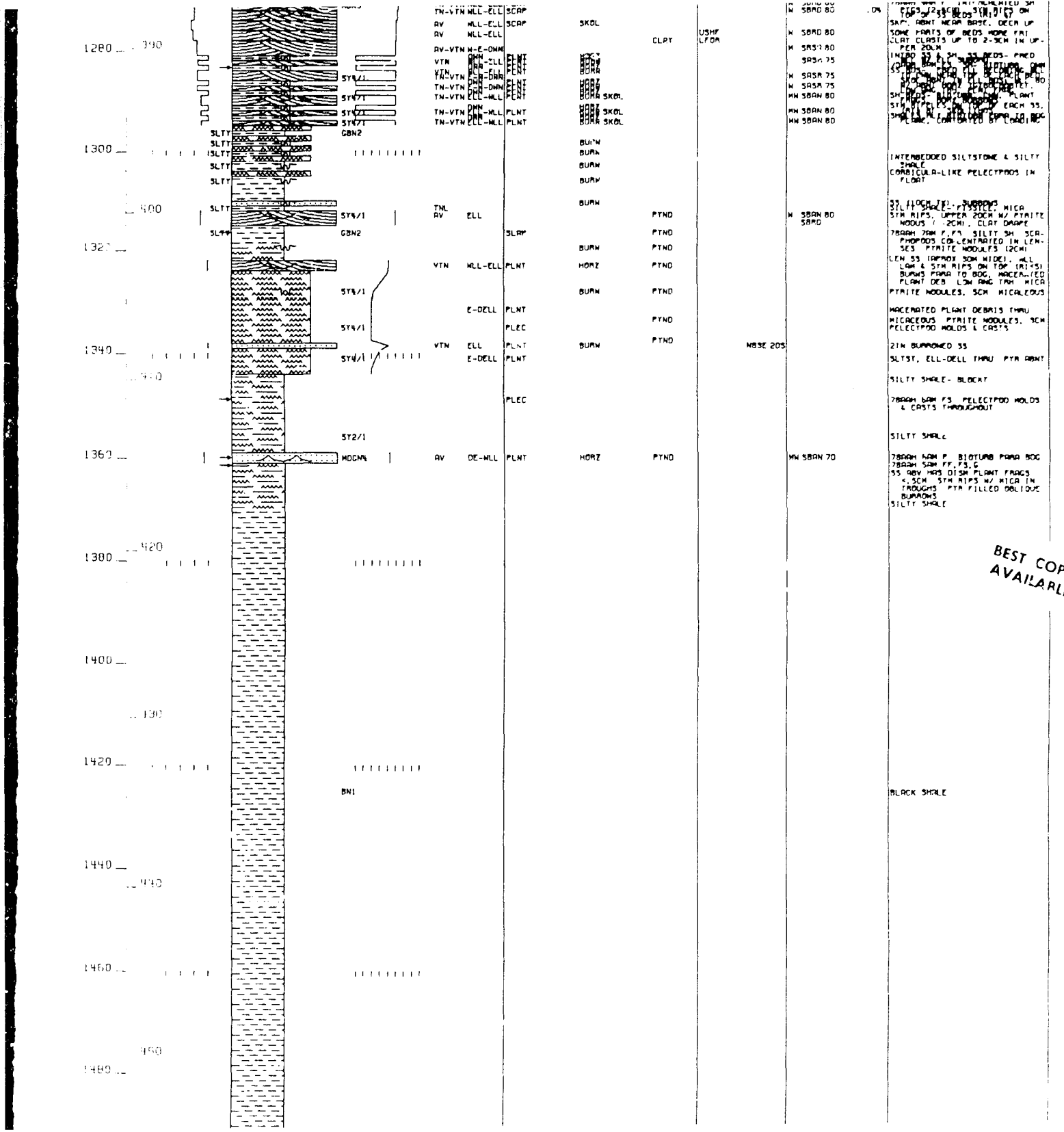
1,690 FT TOP — 1 IN = 20 FT — 7/4/78 — 2 OF 2

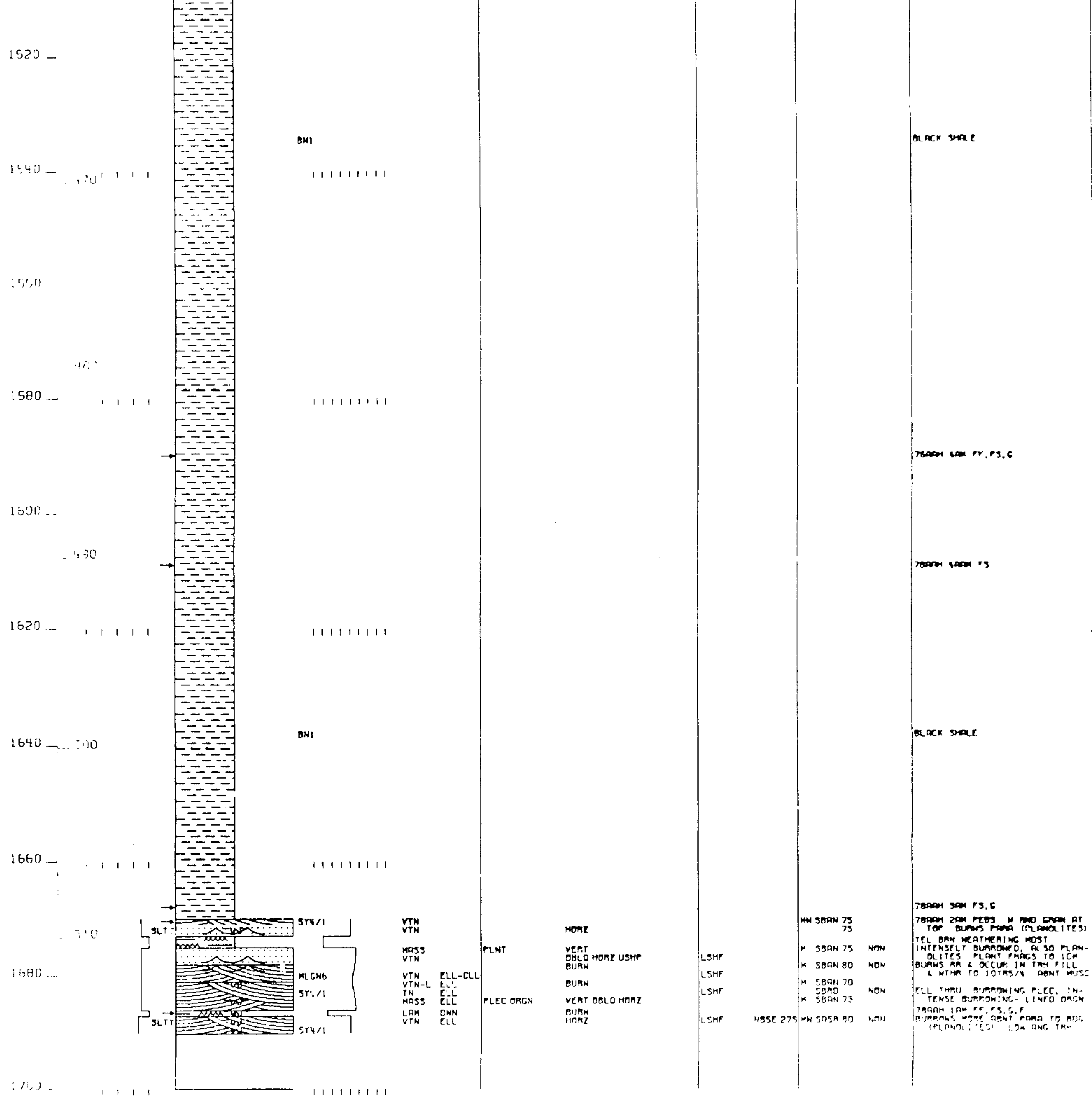
SEC 31, T9S, R7E
68°36'57"N 150°33'28"W

BASE
SEC 13, T9S, R6E
68°40'09"N 150°36'31"W




1040
1060
1080
1100
1120
1140
1160
1180
1200
1220
1240
SLTY
SNDY
SNDY
SL**
5Y8/1
5Y8/1
5Y2/1
VTN DWLL
TN
TN ELL
VTN ELL
TN
BURW
BURW
BURW
MW SBAN 70
MW SBAN 70
MW SBAN 70
BURROWS- NONDESCRIPT, PARALLEL TO BDG, MICA IN RIPPLE TRH (LOW ANGLE)
MIXED SILTSTONES & MUDSTONES
FLAT BEDDED SS
SOME BURROWS- PLANOLITES
78BRH 11RM FF,F3,C SILTY SM (5Y2/1) THIN SILTSTONES (5-20CM) STAINED (10YR6/6) ALONG FRACTURES


1280
1300
1320
1340
1360
1380
1400
1420
1440
1460
1480
SLTT
GBN2
BN1
BEST COPY AVAILABLE



1520
BN1
BLACK SHALE
1540
1580
78AAH 4AH FF,FS,G
78AAH 4AAH FS
1620
1640
BN1
BLACK SHALE
1660
78AAH 3AH FS,G
5Y4/1
SLT
VTN
VTN
HORZ
MN 5BAN 75
75
78AAH 2AH PEBS W AND GRAN AT TOP BURWS PARA (PLANOLITES)
MASS
VTN
PLNT
VERT
OBLQ HORZ USHP
BURW
LSHF
M 5BAN 75 NON
YEL BRN WEATHERING MOST INTENSELY BURROWED, ALSO PLANOLITES PLANT FRAGS TO 1CM
M 5BAN 80 NON
BURWS AA & OCCUR IN TRH FILL & WTHR TO 10YR5/4 ABNT MUSC
1680
MLGN6
VTN ELL-CLL
VTN-L
TN ELL
MASS ELL
BURW
LSHF
M 5BAN 70
5BRD NON
M 5BAN 73
5Y4/1
PLEC ORGN
VERT OBLQ HORZ
ELL THRU BURROWING PLEC. INTENSE BURROWING- LINED ORGN
78AAH 1AH FF,FS,G,F
SLTY
LAM DWN
VTN ELL
BURW
HORZ
LSHF
N55E 275
MN 5A5A 80 NON
5Y4/1

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NO. 50-119-90001

1 IN = 20 FT

TOP

SEC 3, T. 5S, R. 6W

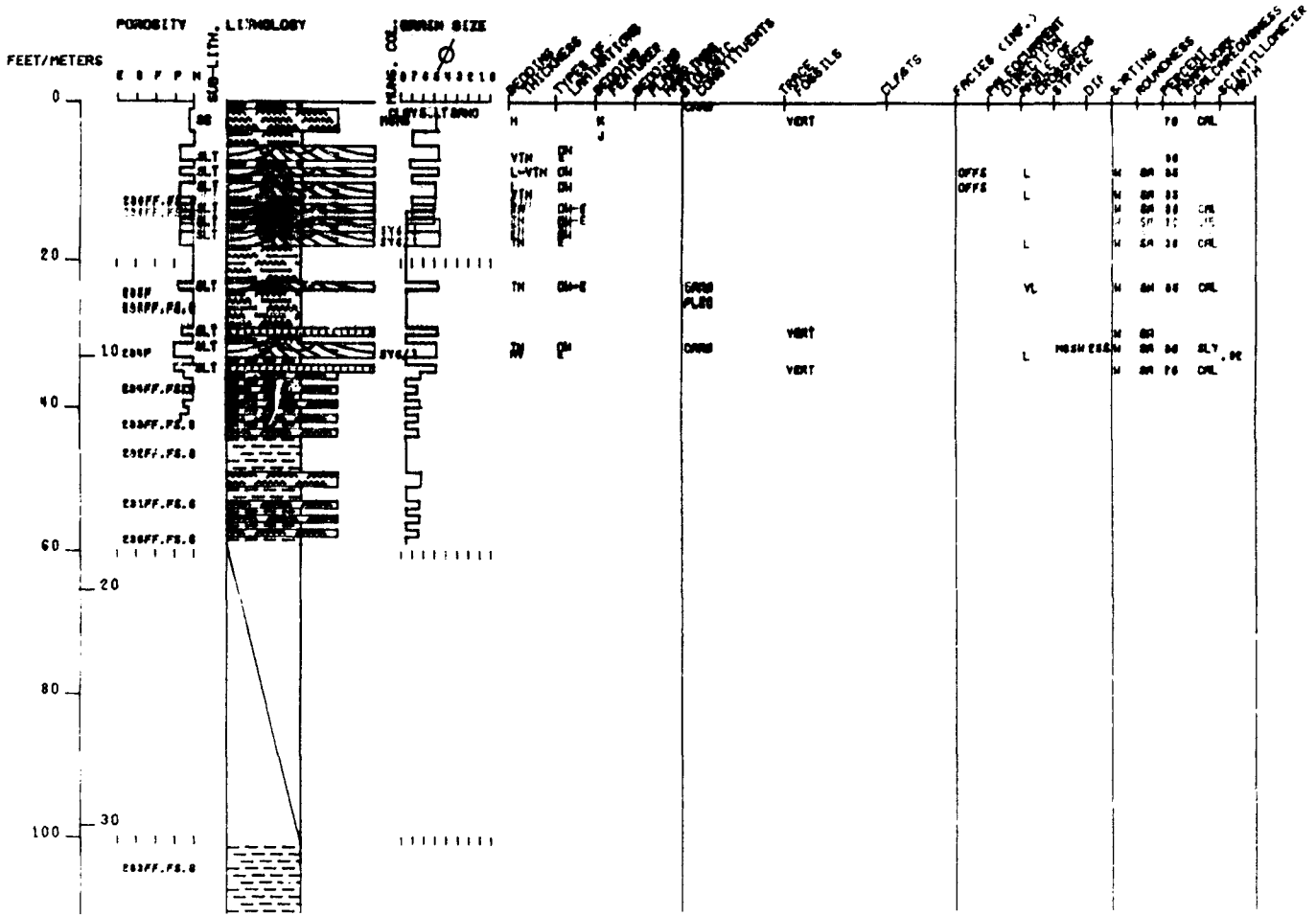
69° 07' 15"N 153° 17' 30"W

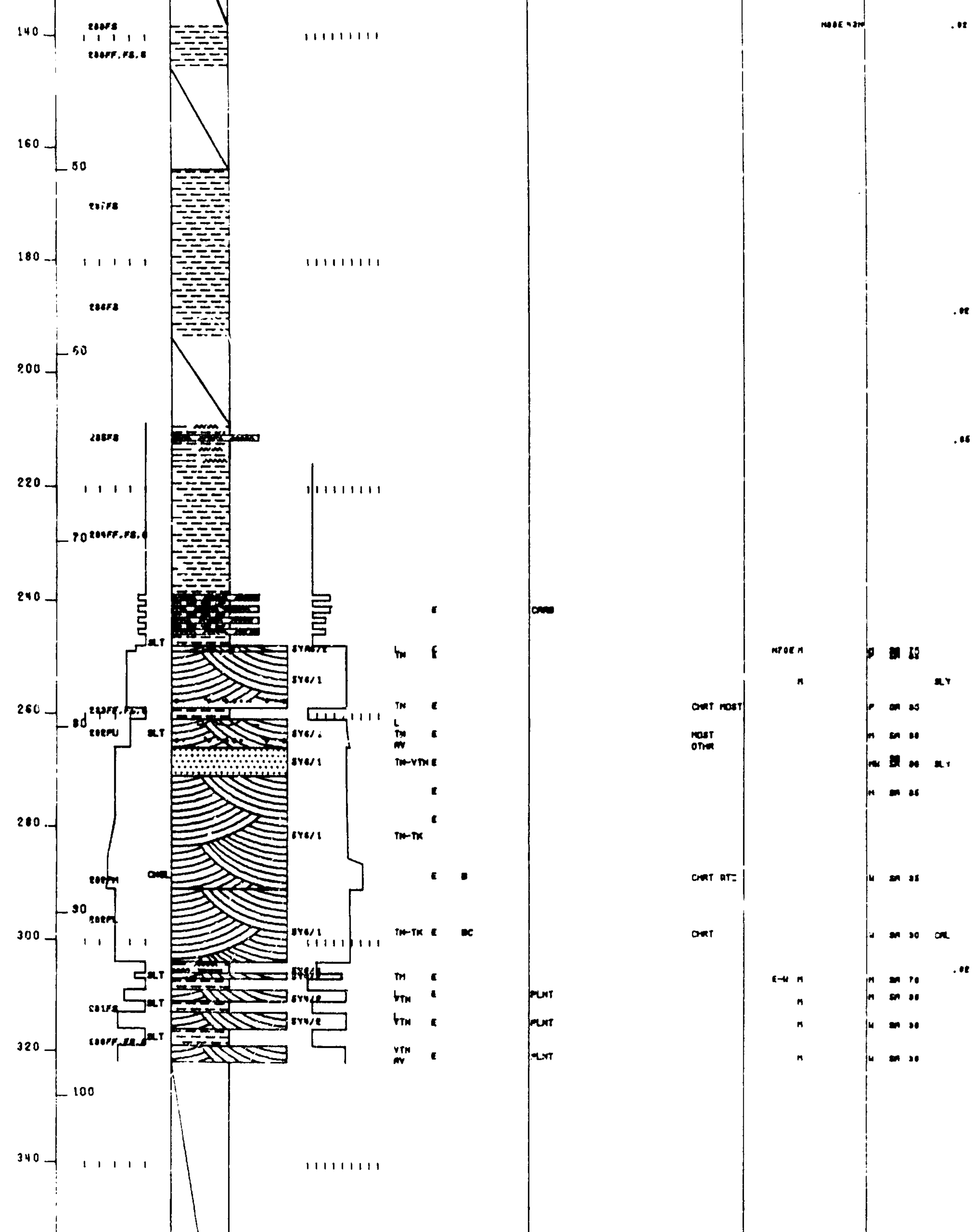
BASE

SEC 3, T. 5S, R. 6W

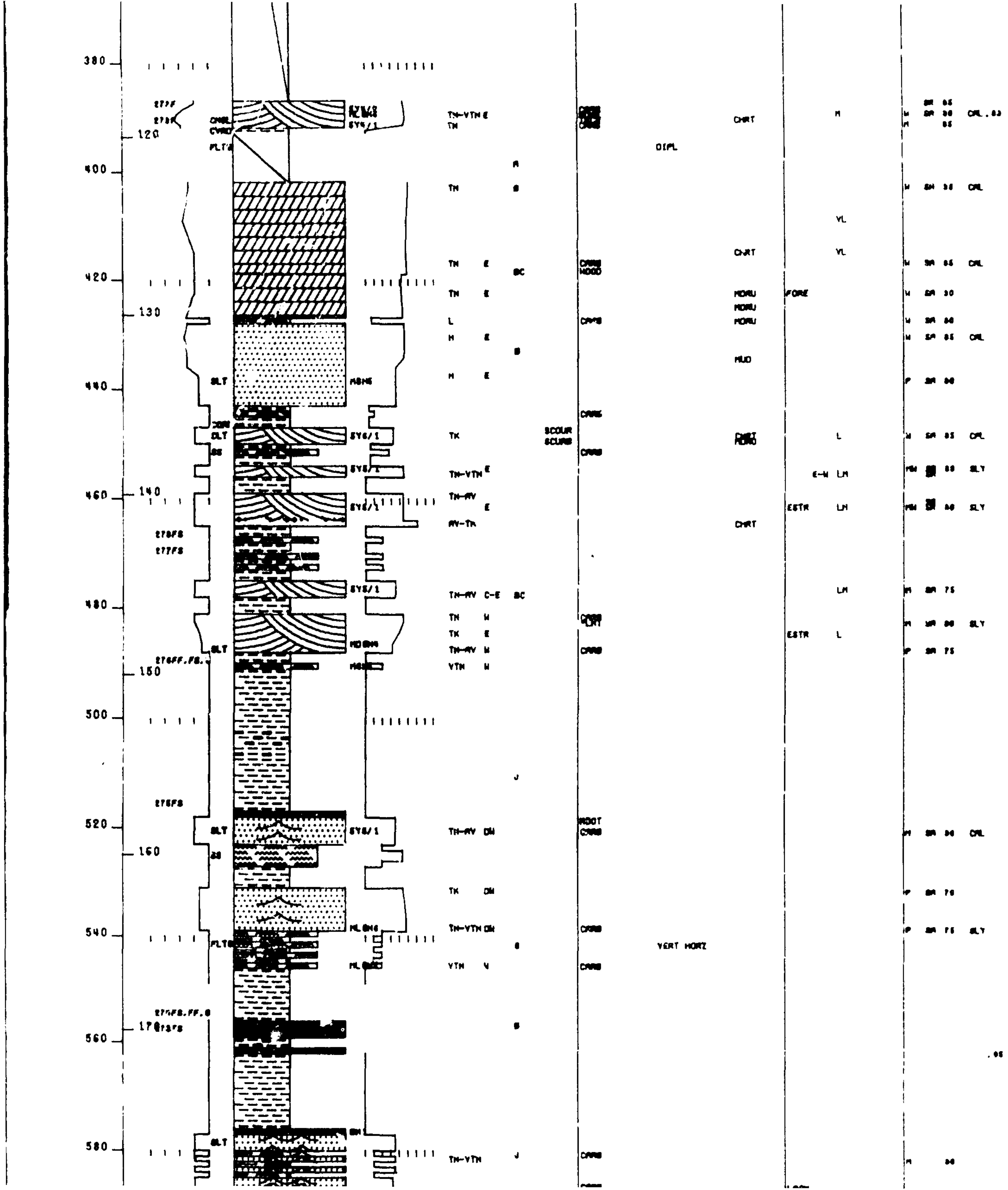
69° 07' 45"N 153° 16' 55"W

1 OF 1

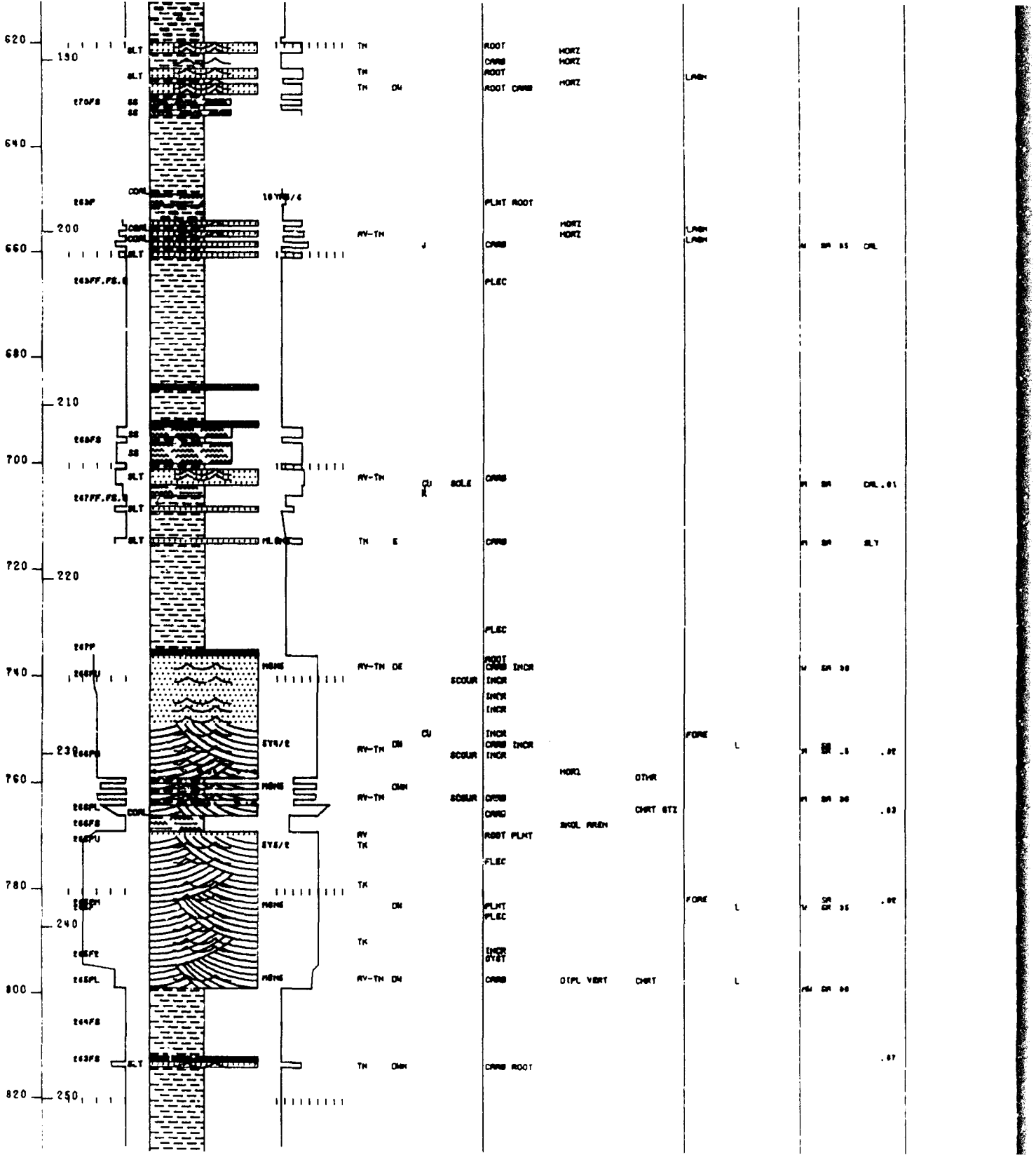


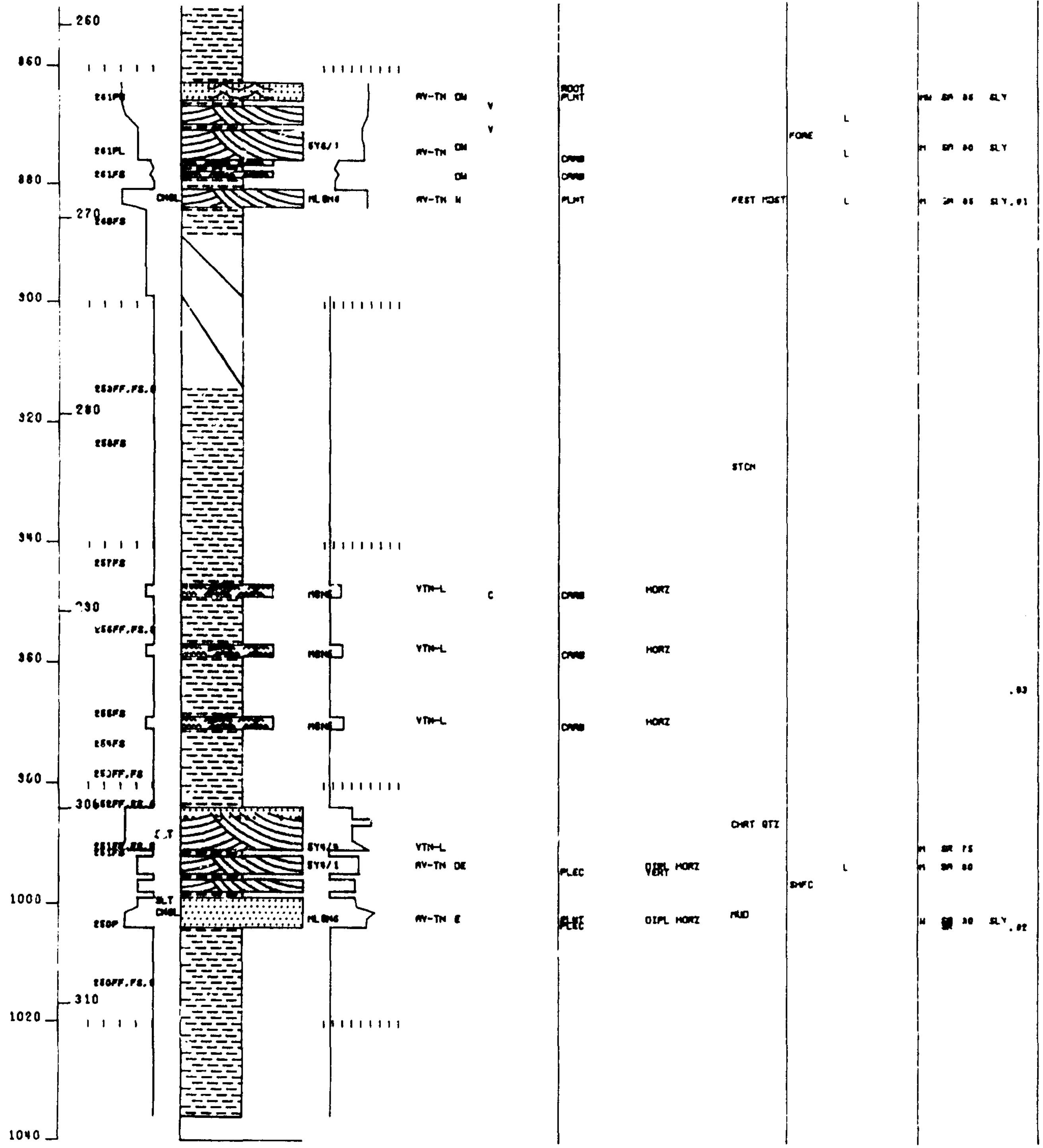


140
160
50
180
60
200
220
70
240
CARB
SLT
260
CHRT MOST
80
SLT
MOST
280
CHRT
90
300
SLT
CAL
SLT
PLNT
SLT
PLNT
320
PLNT
100
340



380
400
420
440
460
480
500
520
540
560
580
120
130
140
150
160
170
DIPL
SCOUR
VERT HORZ





260
860
880
270
310
1000
1020
1040
ROOT PLNT
VTN-L
CARB
HORZ
STCN
CHRT QTZ
DIPL HORZ
MUD

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Open file report
GF 81-177
PLATE 6

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

AWUNA RIVER

API NO. 50-119-90002

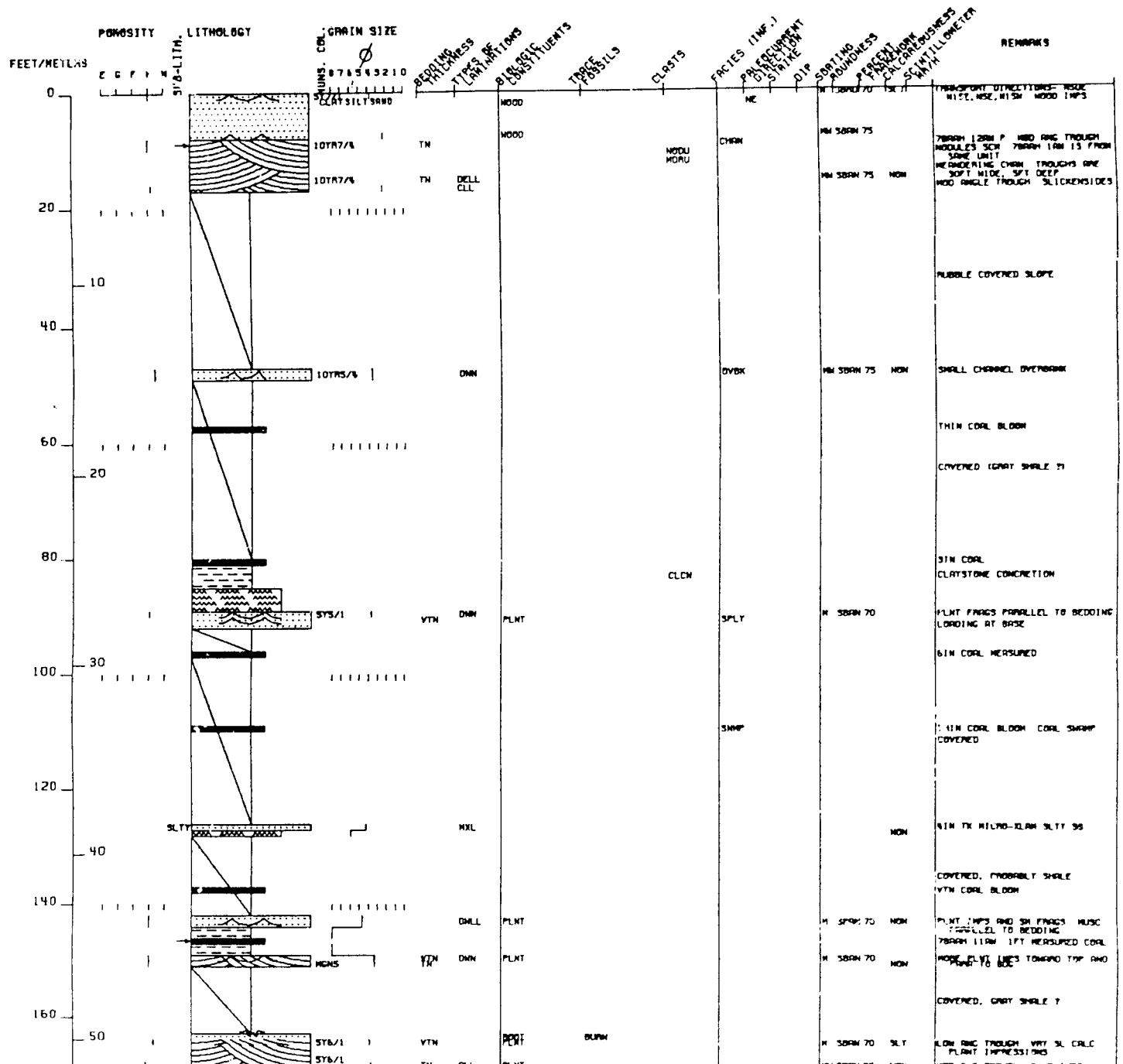
555 FT TOP — SEC 11, T5S, R17W — 69°02'03"N 155°52'08"W

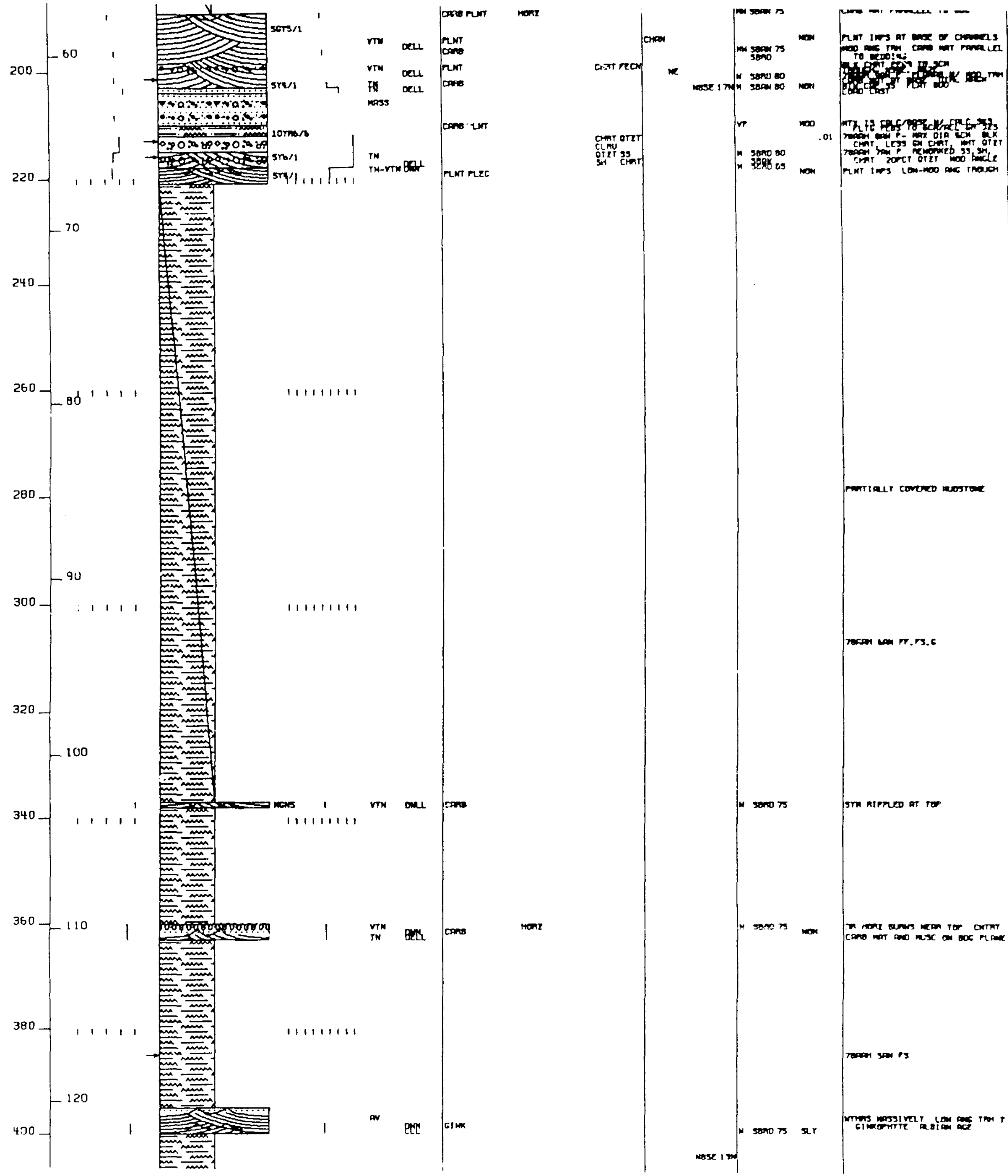
1 IN = 20 FT

7/25/78

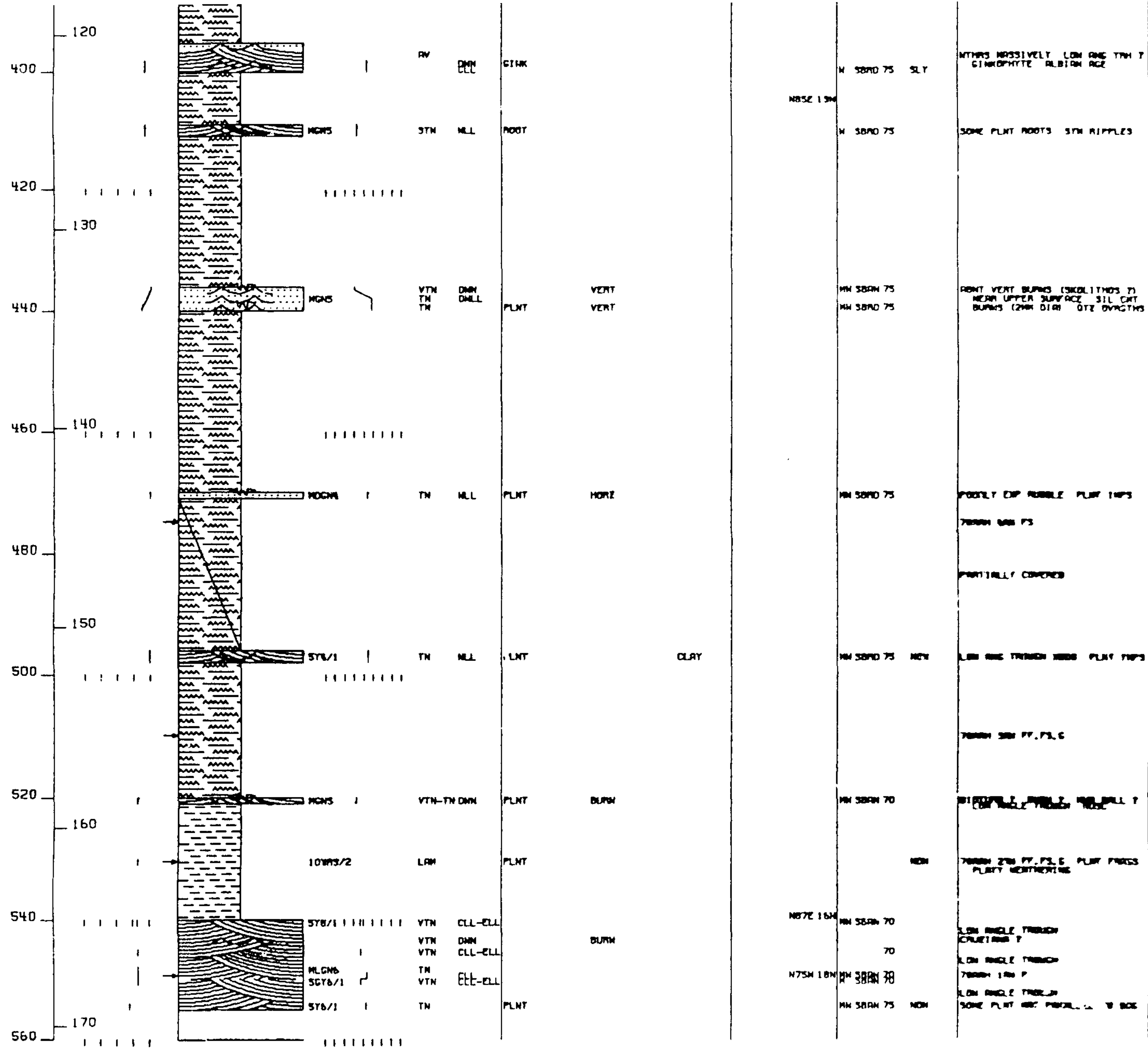
BASE — SEC 11, T5S, R17W — 69°01'27"N 155°52'51"W

1 OF 1





200
220
240
260
280
300
320
340
360
380
400
60
70
80
90
100
110
120
5GY5/1
5Y6/1
10YR6/6
5Y6/1
N6N5
VTN
DELL
TN
MASS
TN-VTN
DNLL
DNN
AV
CARB PLNT
HORZ
PLNT
CARB
PLNT PLEC
GINK
CHRT FECN
CHRT QTZT
CLAU
QTZT SS
SH CHRT
CHAN
NE
NBSE 17N
NBSE 13N
MM SBAN 75
SBAD
M SBAD 80
M SBAN 80
M SBAD 75
M SBAD 65
VF
NON
MOD
SLT
.01
PLNT IMPS AT BASE OF CHANNELS
MOD ANG TRM CARB MAT PARALLEL TO BEDDING
LOAD CAST
CHRT, LESS ON CHRT, WHT QTZT
CHRT 20PCT QTZT MOD ANGLE
PLNT IMPS LOW-MOD ANG TROUGH
PARTIALLY COVERED MUDSTONE
78FAM SAN FF,FS,C
SYM RIPPLED AT TOP
CARB MAT AND MUSC ON BDG PLANE
78BAM SAN FS
WTHRS MASSIVELY LOW ANG TRM T
GINKOPHYTE ALBIAN AGE



120
400
420
130
440
460
140
480
150
500
520
160
540
560
170
MGMS
MDGMS
5Y6/1
10YR5/2
MLGM6
5GY6/1
VTN
TN
LAM
DWN
WLL
CLL-ELL
PLNT
ROOT
VERT
HORZ
BURW
CLAY
MW 58RD 75
MW 58RW 70
N85E 13W
N87E 16W
N75W 18W
NEW
SOME PLNT ROOTS STM RIPPLES
PARTIALLY COVERED
LOW ANGLE TROUGH

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Open file report
OF 81-177
PLATE 7

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

SECTION CREEK

API NO. 50-119-90003

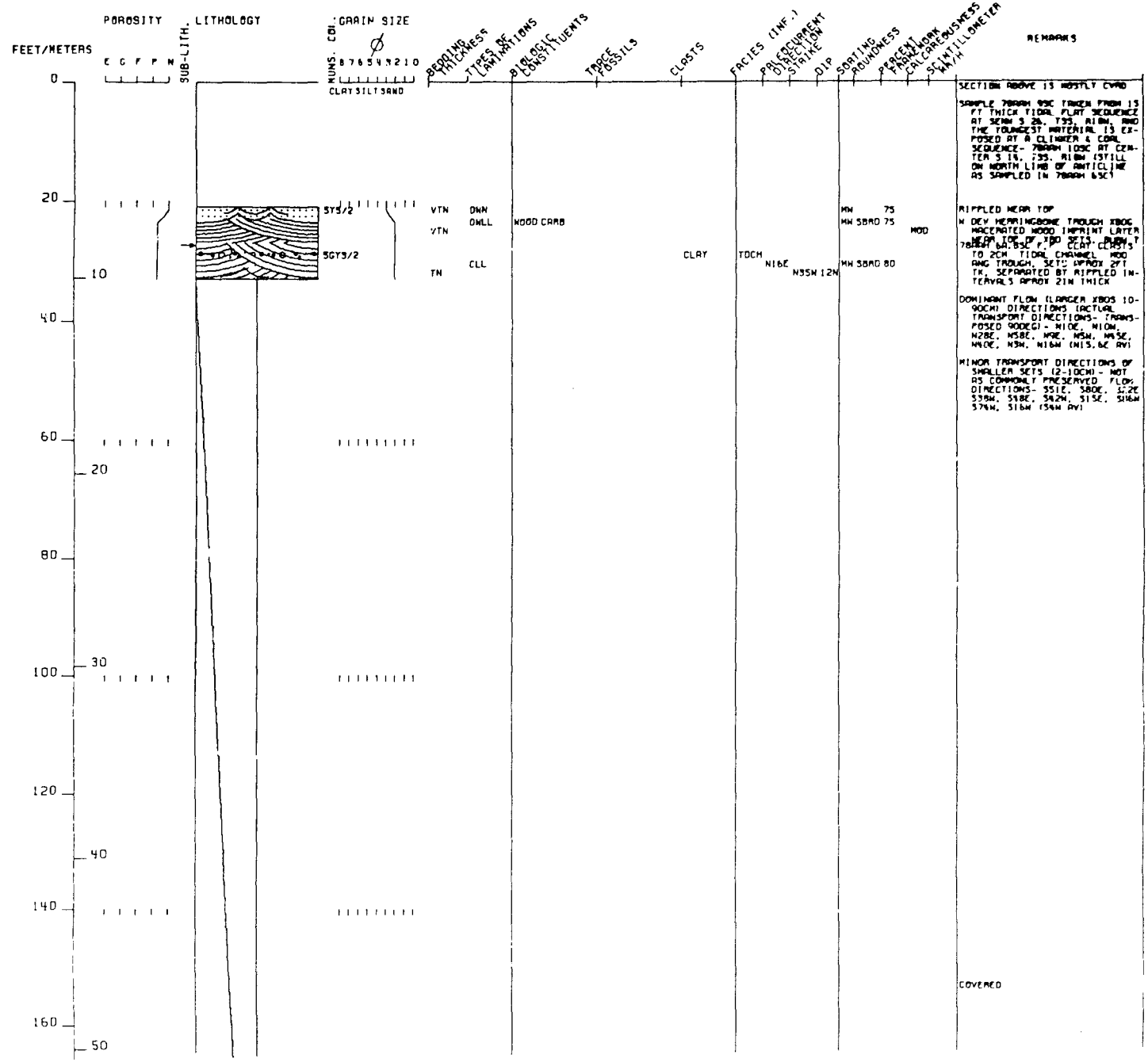
519 FT
TOP
SEC 21, T4S, R18W
69°03'31"N 155°58'16"W

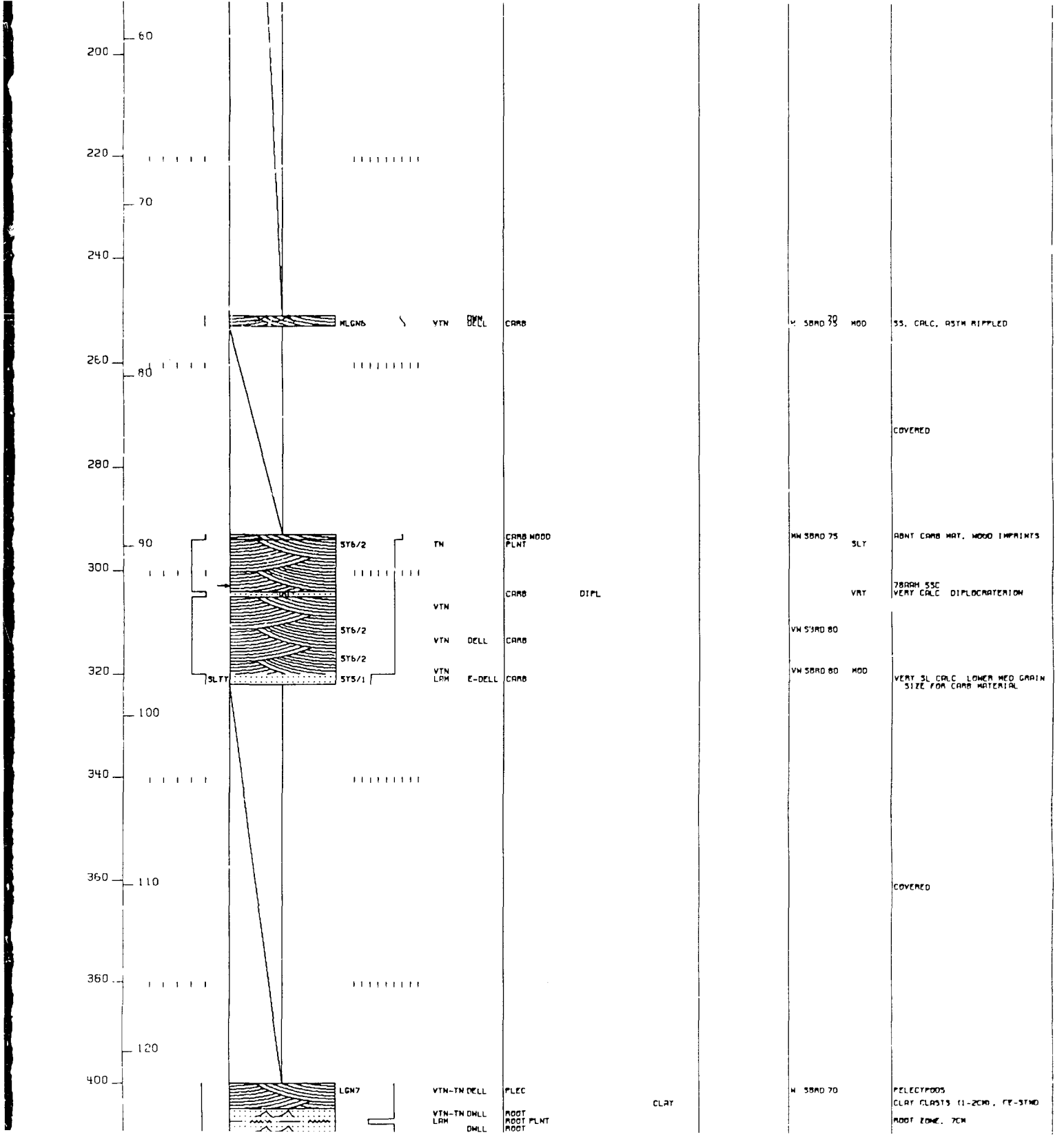
1 IN = 20 FT

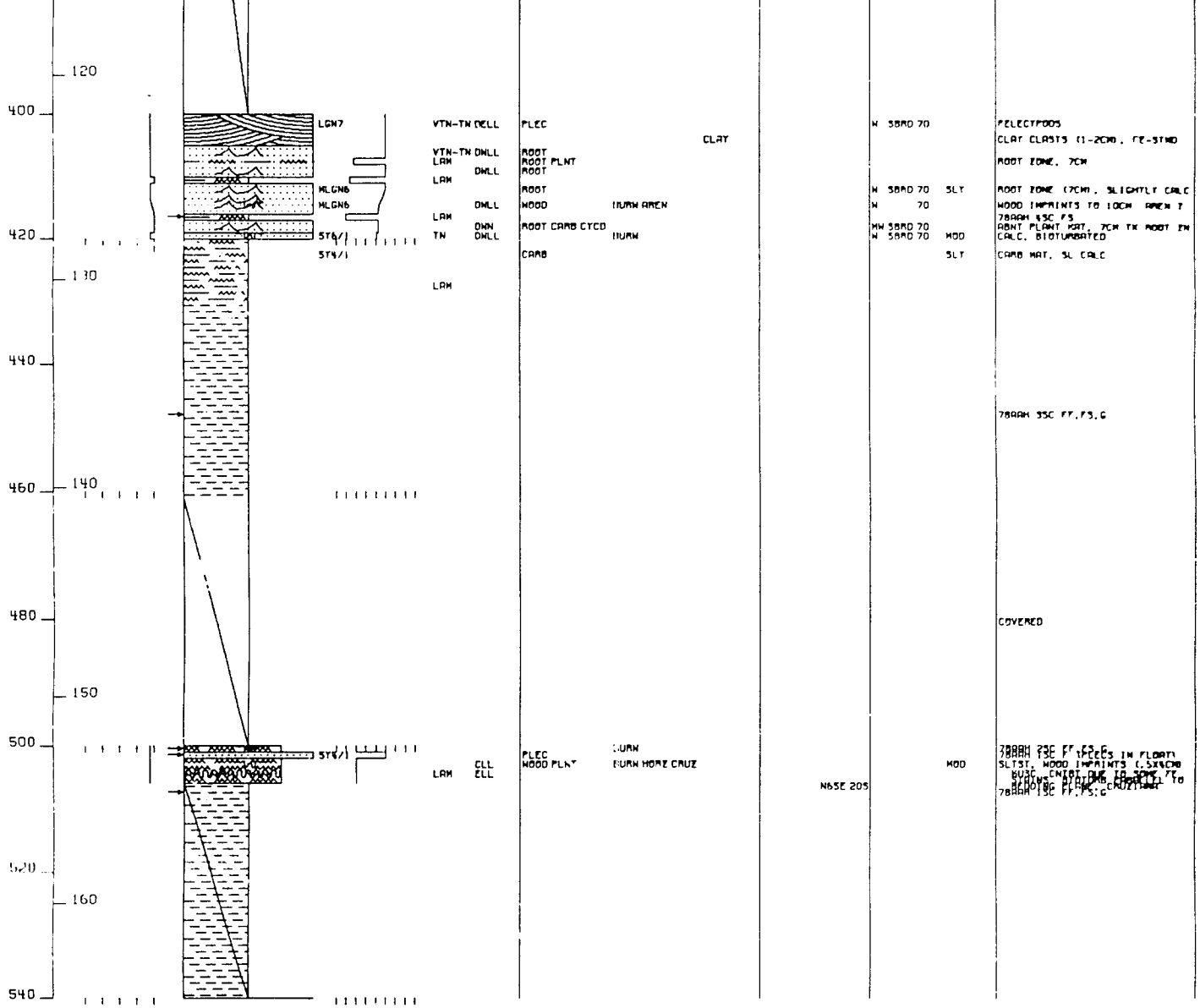
7/24/78

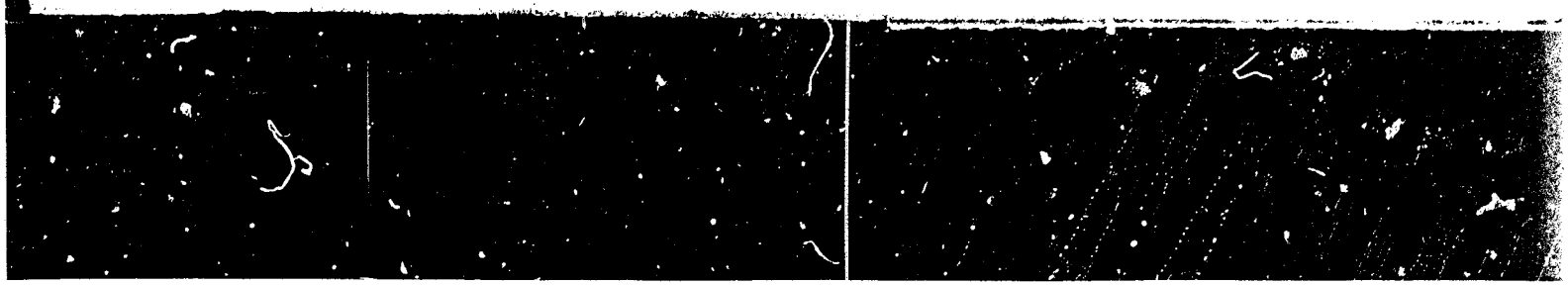
BASE
SEC 21, T4S, R18W
69°04'32"N 156°00'16"W

1 OF 1




60
200
220
70
240
MLGN6
VTN
DWM
DELL
CARB
W SBRD 70
MOD
SS, CALC, RSTM RIPPLED
260
80
COVERED
280
90
ST6/2
TN
CARB WOOD
PLNT
MW SBRD 75
SLT
ABNT CARB MAT, WOOD IMPRINTS
300
CARB
DIPL
VRY
78RRM SSC
VERY CALC DIPLOCRATERION
VTN
ST6/2
VTN
DELL
CARB
VW SBRD 80
ST6/2
320
SLTY
ST5/1
VTN
LAM
E-DELL
CARB
VW SBRD 80
MOD
VERY SL CALC LOWER MED GRAIN
SIZE FOR CARB MATERIAL
100
340
360
110
COVERED
380
120
400
LGN7
VTN-TN
DELL
PLEC
W SBRD 70
PELECYPODS
CLAY CLASTS (1-2CM, CE-STND
CLAY
VTN-TN
LAM
DWLL
ROOT
ROOT PLNT
ROOT
DWLL
ROOT ZONE, 7CM


120
400
130
420
440
140
460
480
150
500
160
520
540
LGM7
MLGM6
MLGM6
ST4/1
ST4/1
VTN-TN DELL
VTN-TN DWLL
LAM
LAM DWLL
LAM
DWLL
LAM
DWN
TN DWLL
LAM
CLL
LAM CLL
PLEC
ROOT
ROOT PLNT
ROOT
ROOT
WOOD
ROOT CARB CYCD
CARB
PLEC
WOOD PLNT
BURW
BURW AREN
BURW
BURW HORZ CRUZ
CLAY
N65E 20S
W 38RD 70
W 38RD 70 SLT
W 70
MW 38RD 70
W 38RD 70 MOD
SLT
MOD
FELECYPODS
CLAY CLASTS (1-2CM), FE-STND
ROOT ZONE, 7CM
ROOT ZONE (7CM), SLIGHTLY CALC
WOOD IMPRINTS TO 10CM AREA ?
78AAM 4SC FS
ABNT PLANT MAT, 7CM TK ROOT ZN
CALC, BIOTURBATED
CARB MAT, SL CALC
78AAM 3SC FF,FS,C
COVERED
78AAM 2SC FF,FS,C
78AAM 1SC FF,FS,C
SLTST, WOOD IMPRINTS (.5X5CM
78AAM 1SC FF,FS,C



Geological Survey [illegible] and stratigraphic nomenclature. [illegible] trade names is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

KILLIK BEND

Open file report
OF 81 177
PLATE 8

API NO. 50-137-90001

519 FT.

8/9/77

TOP

1 IN.-20 FT.

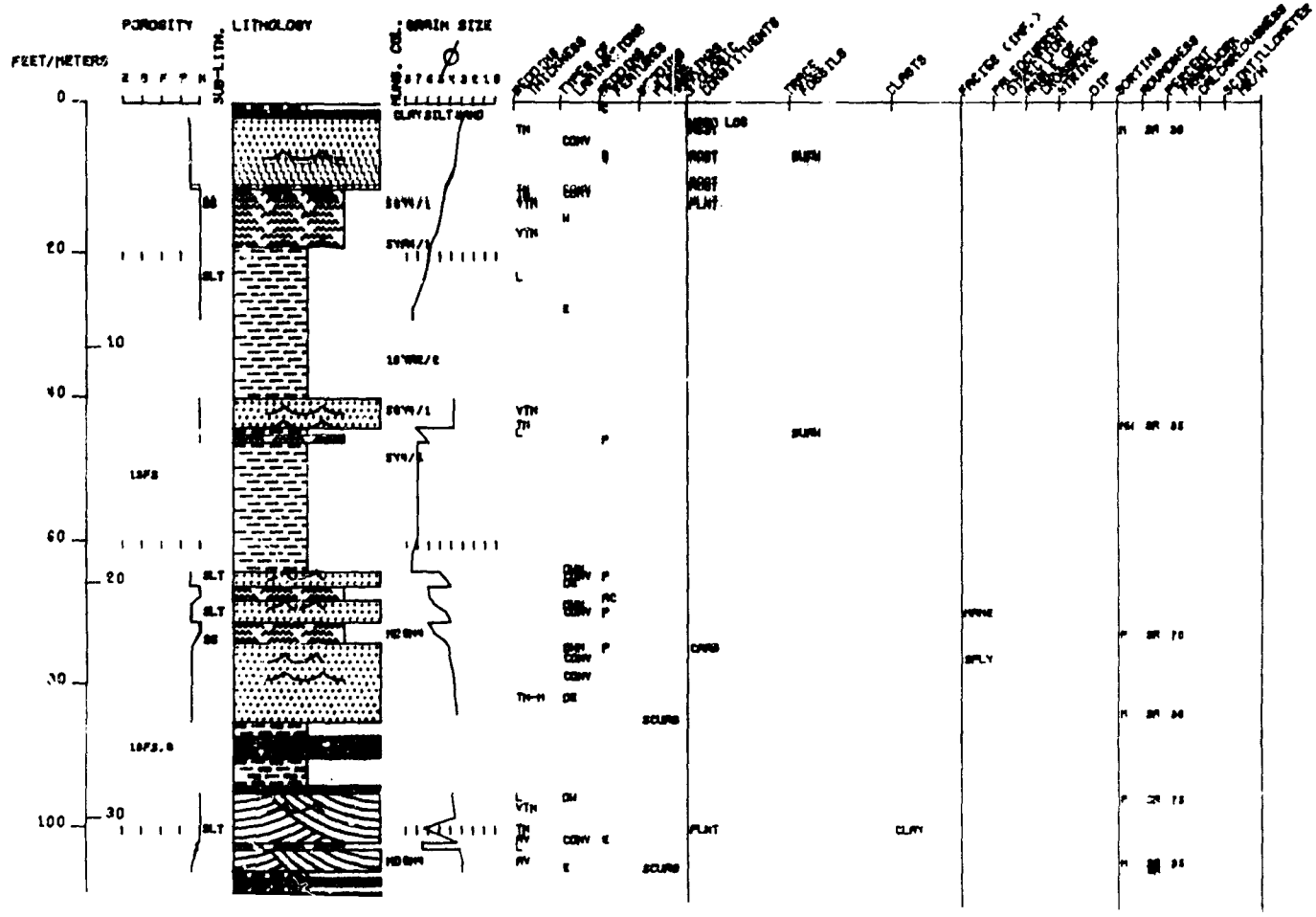
BASE

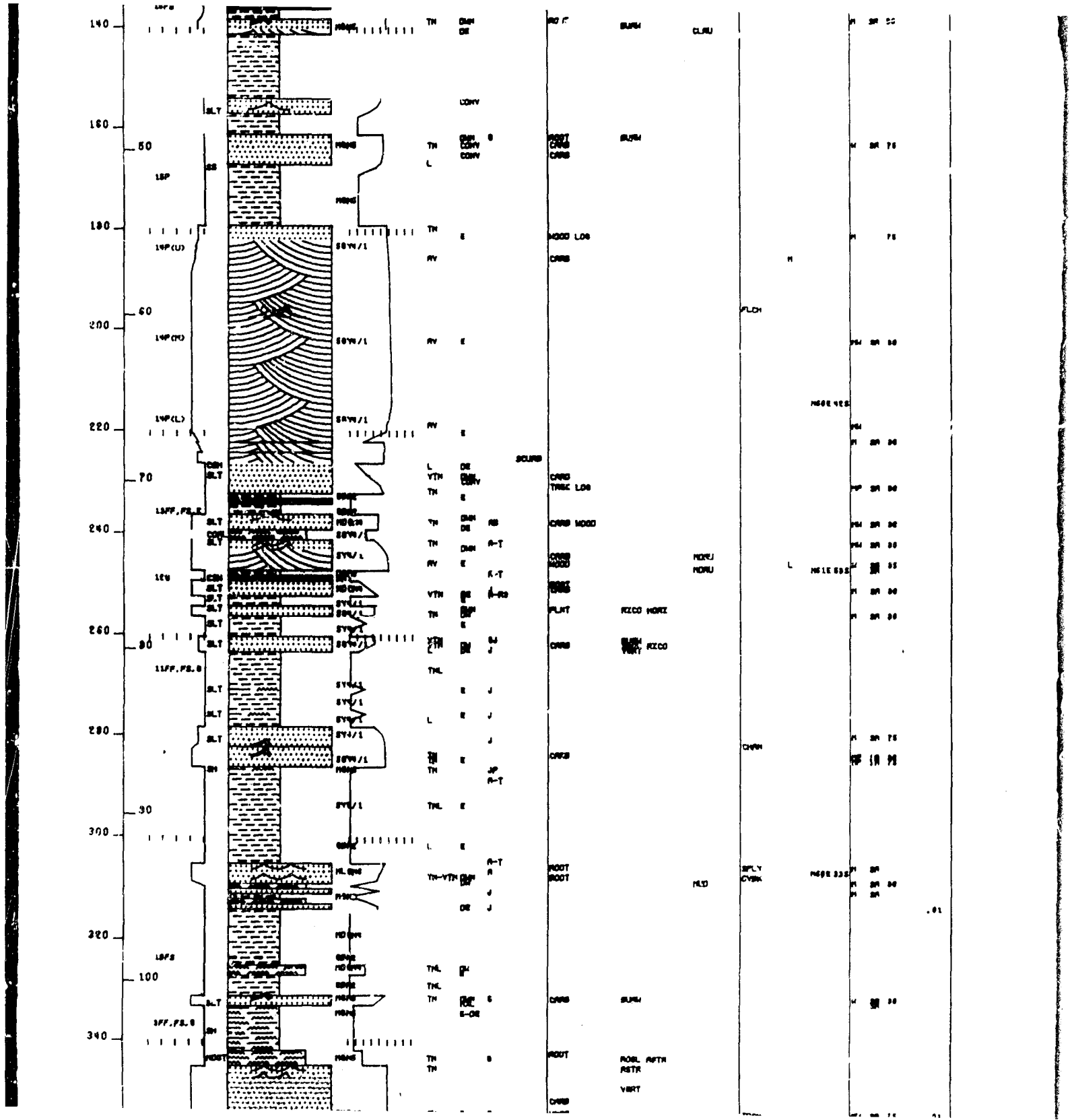
SEC 2,T 5 S,R 9 W

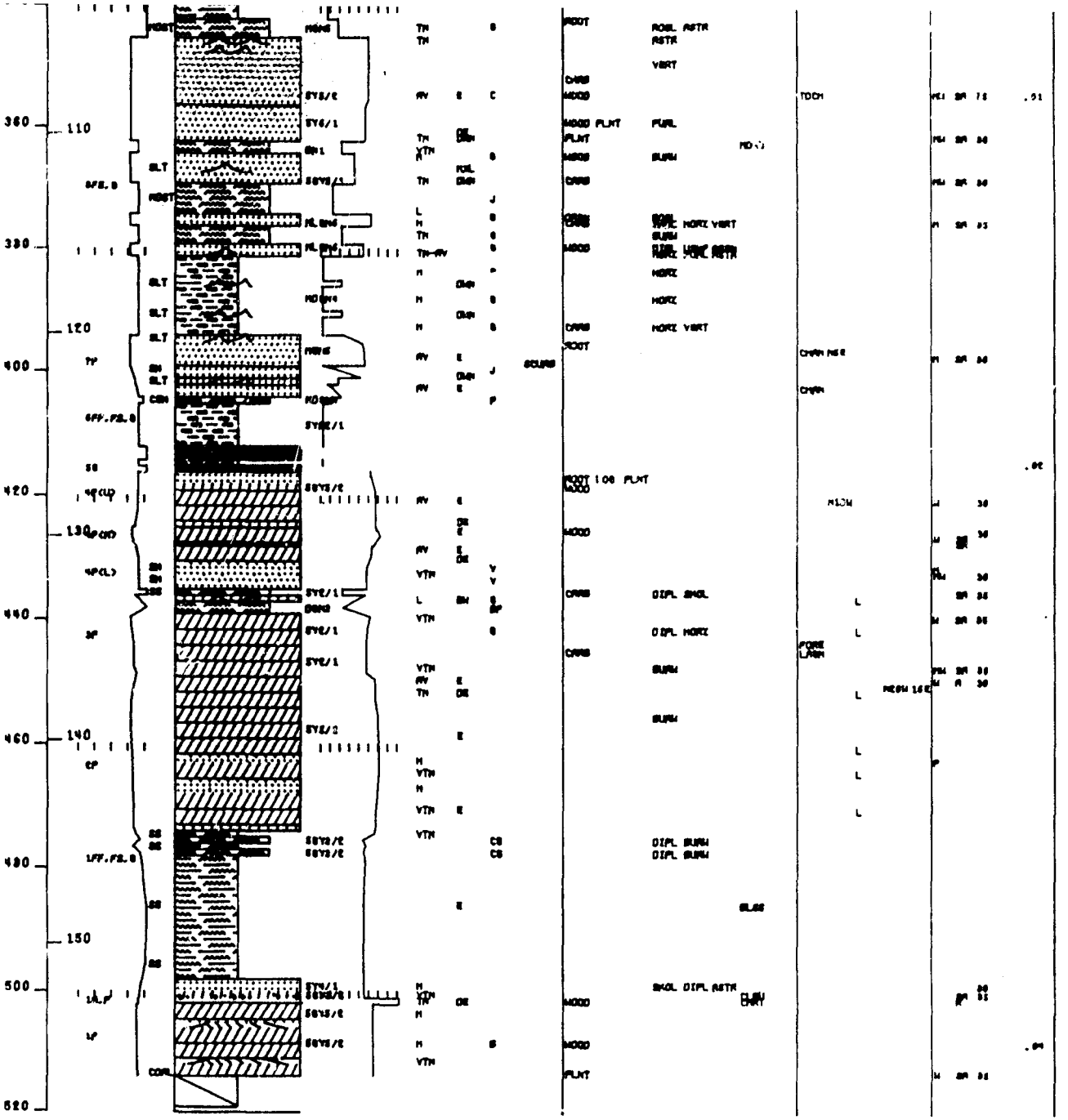
SEC 2,T 5 S,R 9 W

68 58'30"N 153 57'40"W

68 58'55"N 153 57'55"W







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Open file report
OF 81-177
PLATE 9

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

KILLIK TYPE

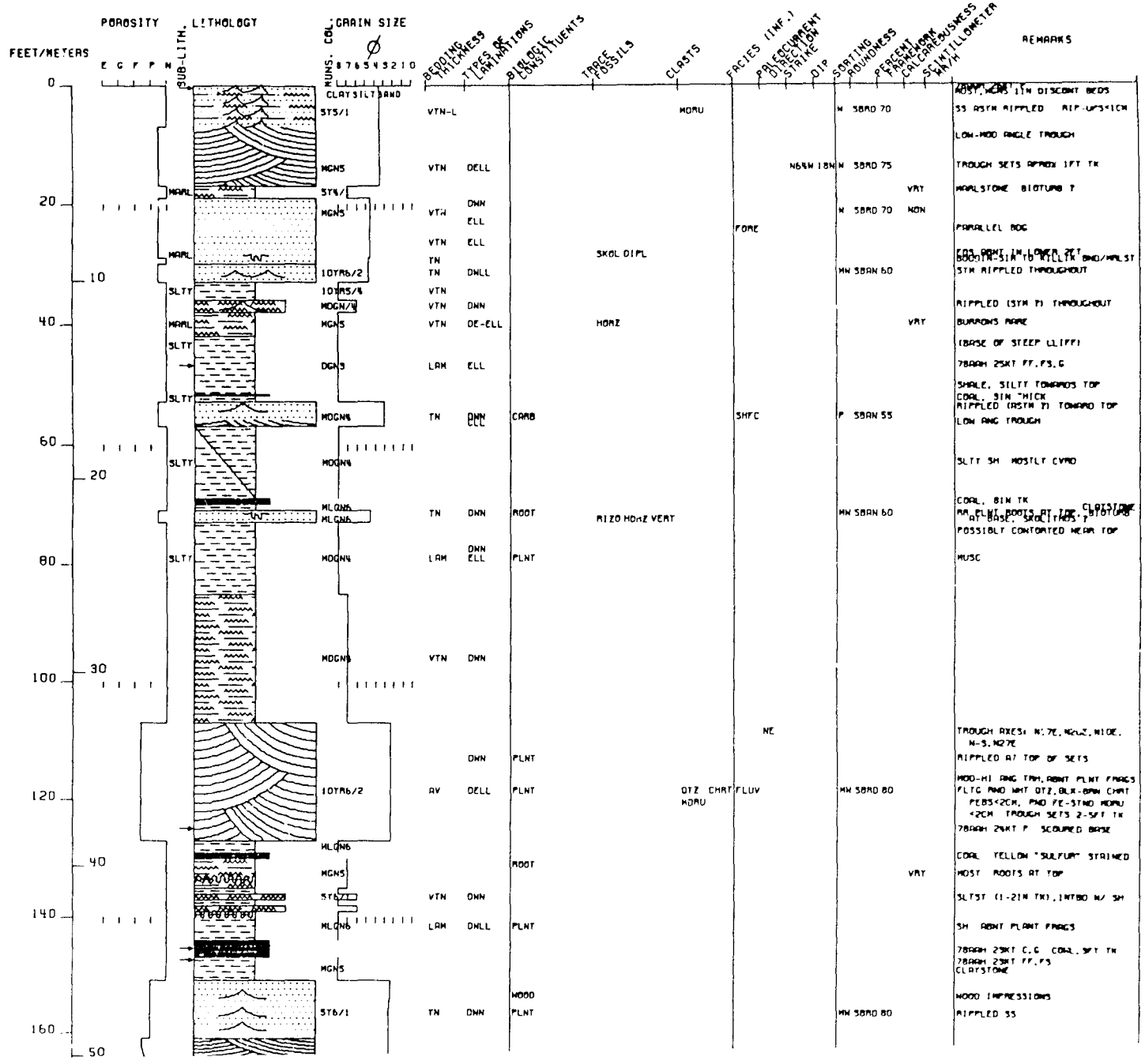
API NO. 50-137-90002

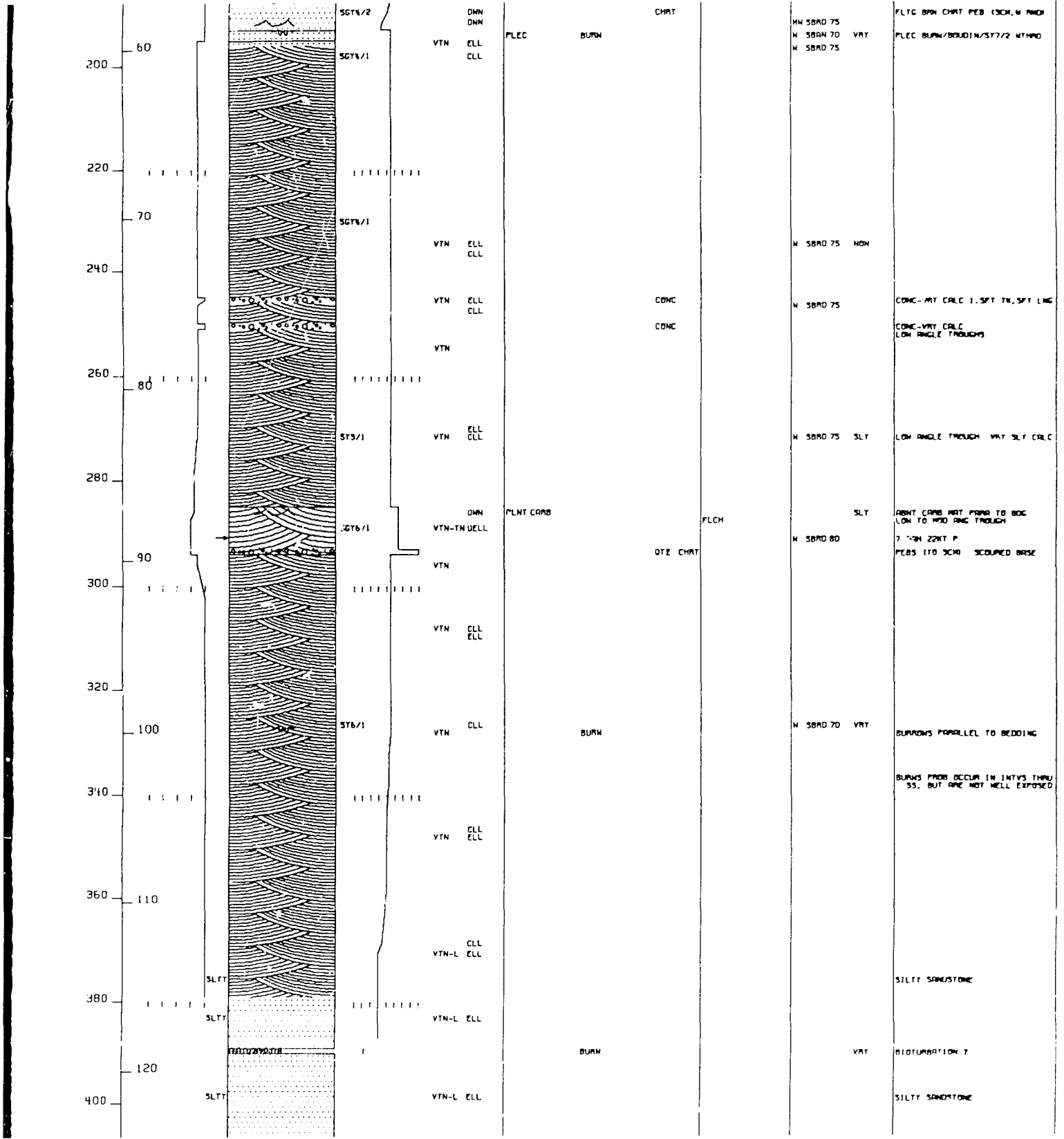
1 OF 1

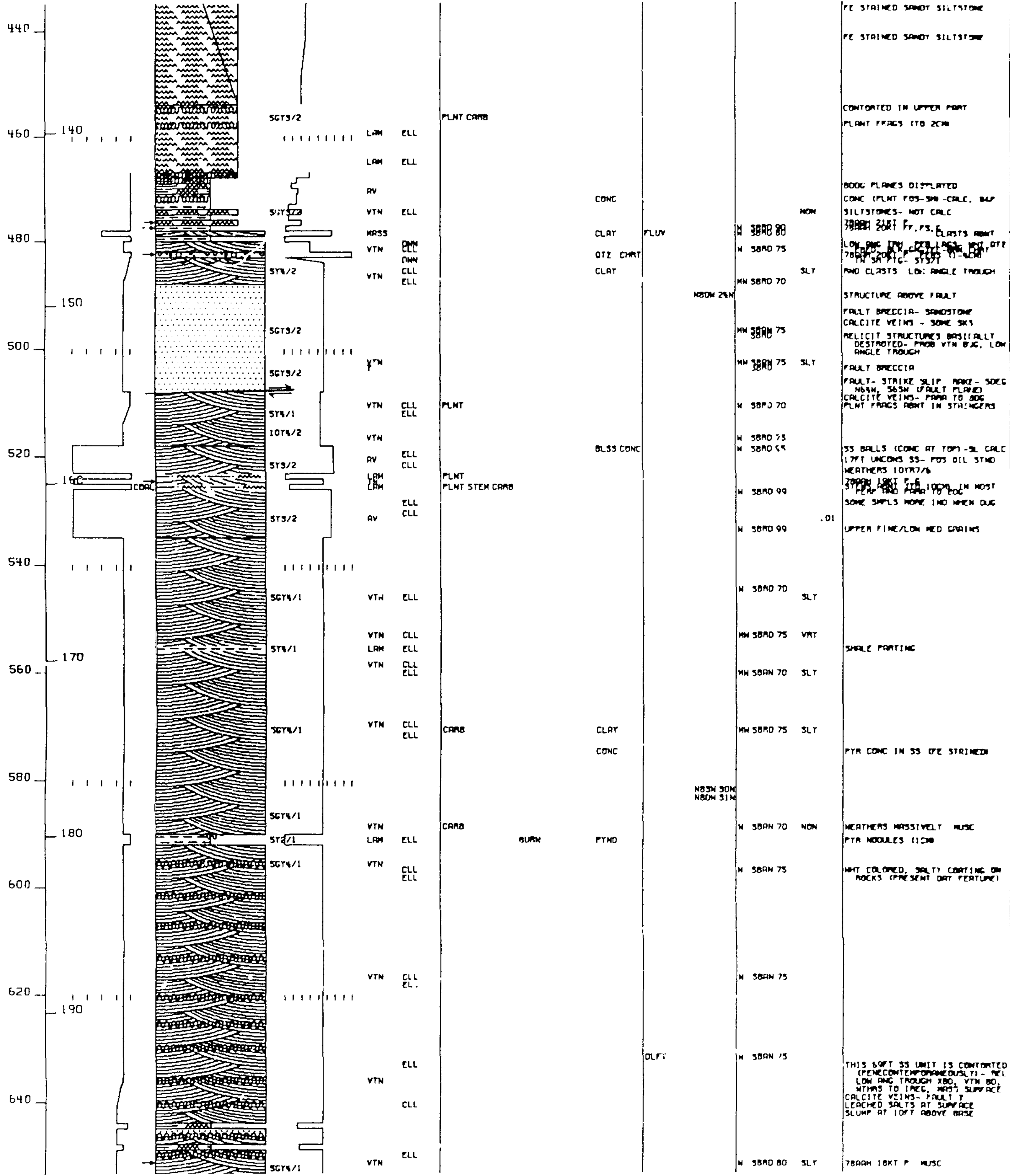
1,017 FT TOP
SEC 8, T7S, R6W
68°52'05"N 153°23'24"W

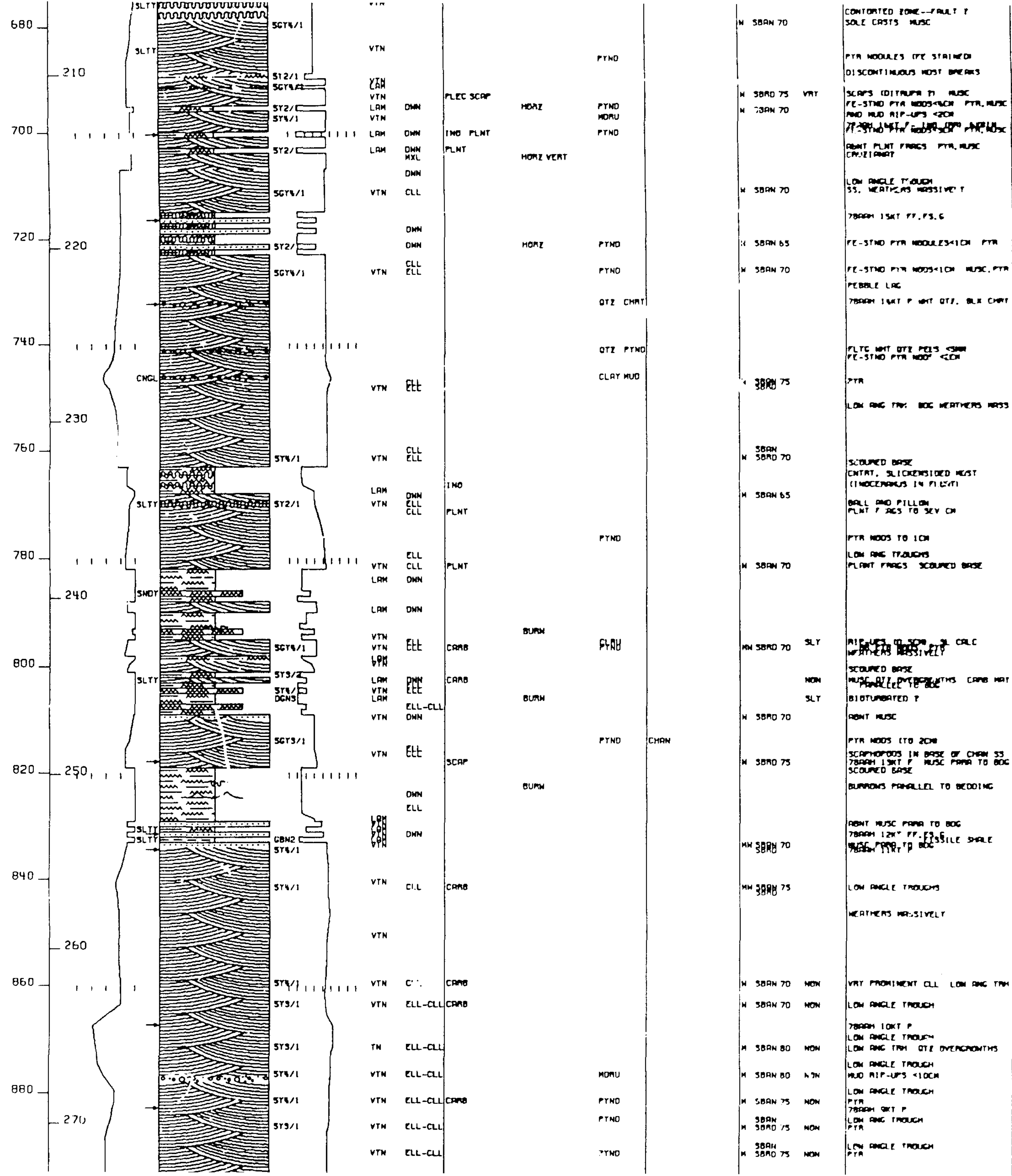
1 IN = 20 FT

7/18/78 BASE
SEC 8, T7S, R6W
68°51'07"N 153°22'03"W

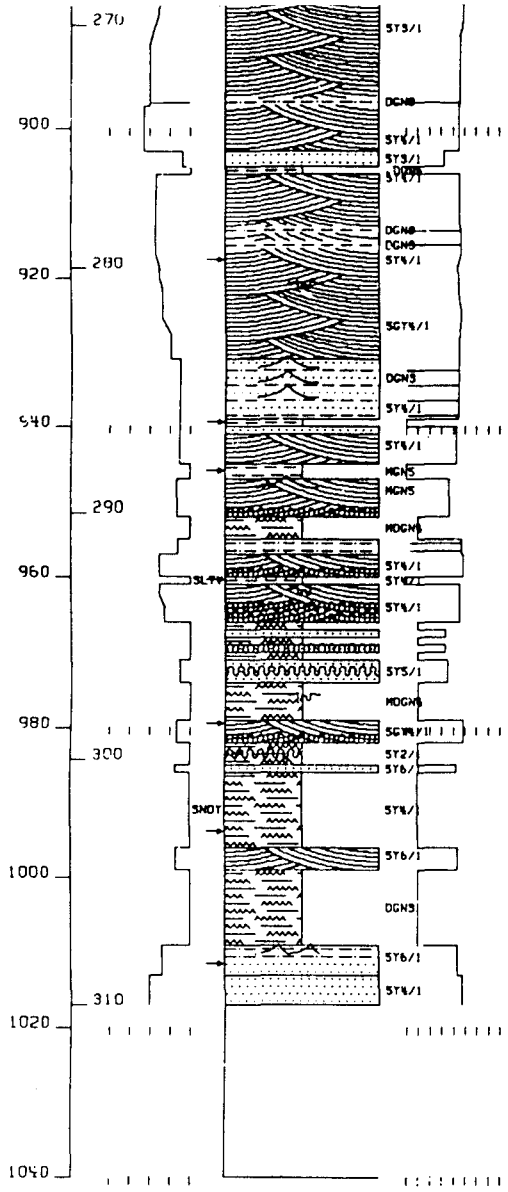



200
60
220
70
240
260
80
280
90
300
320
100
340
360
110
380
120
400
SGT%/2
SGT%/1
SGT%/1
ST3/1
SGY%/1
ST%/1
SLTY
SLTY
SLTY
DWN
DWN
VTN ELL
CLL
VTN ELL
CLL
VTN ELL
CLL
VTN
ELL
VTN CLL
DWN
VTN-TN DELL
VTN
VTN CLL
ELL
VTN CLL
CLL
VTN ELL
CLL
VTN-L ELL
VTN-L ELL
VTN-L ELL
PLEC
PLNT CRAB
BURW
BURW
BURW
CHRT
CONC
CONC
QTZ CHRT
FLCH
HW SBRD 75
W SBAN 70 VRY
W SBRD 75
W SBRD 75 NON
W SBRD 75
W SBRD 75 SLY
SLY
W SBRD 80
W SBRD 70 VRY
VRY
FLTC BRN CHRT PEB (SCH,W RNDD
PLEC BURW/BOUDIN/ST?/2 WTHRD
CONC-VRT CALC 1.5FT TK,5FT LNS
CONC-VRT CALC
LOW ANGLE TROUGHS
LOW ANGLE TROUGH VRY SLT CALC
ABNT CARB MAT FRMN TO BOG
LOW TO MOD ANG TROUGH
7 [illegible]H 22KT P
PEBS (TO 3CM) SCOURED BASE
BURROWS PARALLEL TO BEDDING
BURWS PROB OCCUR IN INTVS THRU
SS, BUT ARE NOT WELL EXPOSED
SILTY SANDSTONE
BIOTURBATION ?
SILTY SANDSTONE


440
460
480
500
520
540
560
580
600
620
640
140
150
160
170
180
190
FE STAINED SANDY SILTSTONE
FE STAINED SANDY SILTSTONE
CONTORTED IN UPPER PART
PLANT FRAGS (TO 2CM)
BDDG PLANES DISPLACED
CONC (PLNT FOS-SM -CALC, B&P
SILTSTONES- NOT CALC
AND CLASTS LOW ANGLE TROUGH
STRUCTURE ABOVE FAULT
FAULT BRECCIA- SANDSTONE
CALCITE VEINS - SOME SKS
RELICIT STRUCTURES BASICALLY DESTROYED- PROB VTN BDG, LOW ANGLE TROUGH
FAULT BRECCIA
FAULT- STRIKE SLIP RAKE- 5DEG N65W, 565W (FAULT PLANE)
CALCITE VEINS- PARA TO BDG
PLNT FRAGS ABNT IN STRINGERS
SS BALLS (CONC AT TOP) -SL CALC
17FT UNCONS SS- POS OIL STND
WEATHERS 10YR7/6
SOME SMPLS NONE IND WHEN DUG
UPPER FINE/LOW MED GRAINS
SHALE PARTING
PYR CONC IN SS (FE STAINED)
WEATHERS MASSIVELY MUSC
PYR NODULES (1CM)
WHT COLORED, SALTY COATING ON ROCKS (PRESENT DAY FEATURE)
THIS 69FT SS UNIT IS CONTORTED (PENECONTEMPORANEOUSLY) - REL LOW ANG TROUGH XBD, VTN BD, WTHRS TO IRREG, MASS SURFACE
CALCITE VEINS- FAULT ?
LEACHED SALTS AT SURFACE
SLUMP AT 10FT ABOVE BASE
78AAH 18KT P MUSC
5GY3/2
5Y4/2
5GY3/2
5Y4/1
10Y4/2
5Y3/2
5GY4/1
5Y4/1
5GY4/1
5Y2/1
5GY4/1
PLNT CARB
PLNT
PLNT STEM CARB
CARB
BURW
CONC
CLAY
QTZ CHRT
BLSS CONC
PYND
FLUV
DLFT
N80W 24N
N83W 30N
N80W 31N
W 5BRD 70
W 5BAN 75
MW 5BRD 75
W 5BRD 80
LAM
VTN
MASS
AV
ELL
CLL
NON
SLY
VRT
.01
COAL



680
210
700
720
220
740
230
760
780
240
800
820
250
840
260
860
880
270
SLTY
SGY4/1
ST2/1
ST2/
ST4/1
ST2/
SGY4/1
ST2/
SGY4/1
CNGL
ST4/1
SLTY
ST2/1
SNDY
SGY4/1
SLTY
ST3/2
ST4/
DGN3
SGY3/1
SLTY
GBN2
ST4/1
ST4/1
ST4/1
ST3/1
ST3/1
ST4/1
ST4/1
ST3/1
VTN
LAM
DWN
ELL
CLL
ELL-CLL
FLEC SCAP
INO PLNT
PLNT
INO
CARB
SCAP
HORZ
HORZ VERT
BURW
PYND
MDRU
QTZ CHRT
QTZ PYND
CLAY MUD
CHAN
M 5BAN 70
M 5BRD 75
M 5BAN 65
M 5BAN 75
M 5BAN 80
MN 5BRD 70
NON
SLT
SLY
CONTORTED ZONE--FAULT ?
SOLE CASTS MUSC
PYR NODULES (FE STAINED)
DISCONTINUOUS MOST BREAKS
SCAPS (DITRUPA ?) MUSC
FE-STND PYR NODS<5CM PYR,MUSC
AND MUD RIP-UPS <2CM
ABNT PLNT FRAGS PYR,MUSC
LOW ANGLE TROUGH
SS, WEATHERS MASSIVELY
78AAM 15KT FF,FS,G
FE-STND PYR NODULES<1CM PYR
FE-STND PYR NODS<1CM MUSC,PYR
PEBBLE LAG
78AAM 14KT P WHT QTZ, BLK CHRT
FLTG WHT QTZ PEBS <5MM
FE-STND PYR NOD <2CM
PYR
LOW ANG TRH SDG WEATHERS MASS
SCOURED BASE
CNTRT, SLICKENSIDED MDST
(INOCERAMUS IN FLOAT)
BALL AND PILLOW
PLNT FRAGS TO SEV CM
PYR NODS TO 1CM
LOW ANG TROUGHS
PLANT FRAGS SCOURED BASE
WEATHERS MASSIVELY
SCOURED BASE
BIOTURBATED ?
ABNT MUSC
PYR NODS (TO 2CM
SCAPHOPODS IN BASE OF CHAN SS
78AAM 13KT F MUSC PARA TO BDG
SCOURED BASE
BURROWS PARALLEL TO BEDDING
ABNT MUSC PARA TO BDG
FISSILE SHALE
LOW ANGLE TROUGHS
WEATHERS MASSIVELY
VRY PROMINENT CLL LOW ANG TRH
LOW ANGLE TROUGH
78AAM 10KT P
LOW ANGLE TROUGH
LOW ANG TRH QTZ OVERGROWTHS
LOW ANGLE TROUGH
MUD RIP-UPS <10CM
LOW ANGLE TROUGH
PYR
78AAM 9KT P
LOW ANG TROUGH
PYR
LOW ANGLE TROUGH
PYR


270
900
280
920
290
940
960
300
980
310
1000
1020
1040
SLFY
SNOT

Open file report
OF 81-177
PLATE 10

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

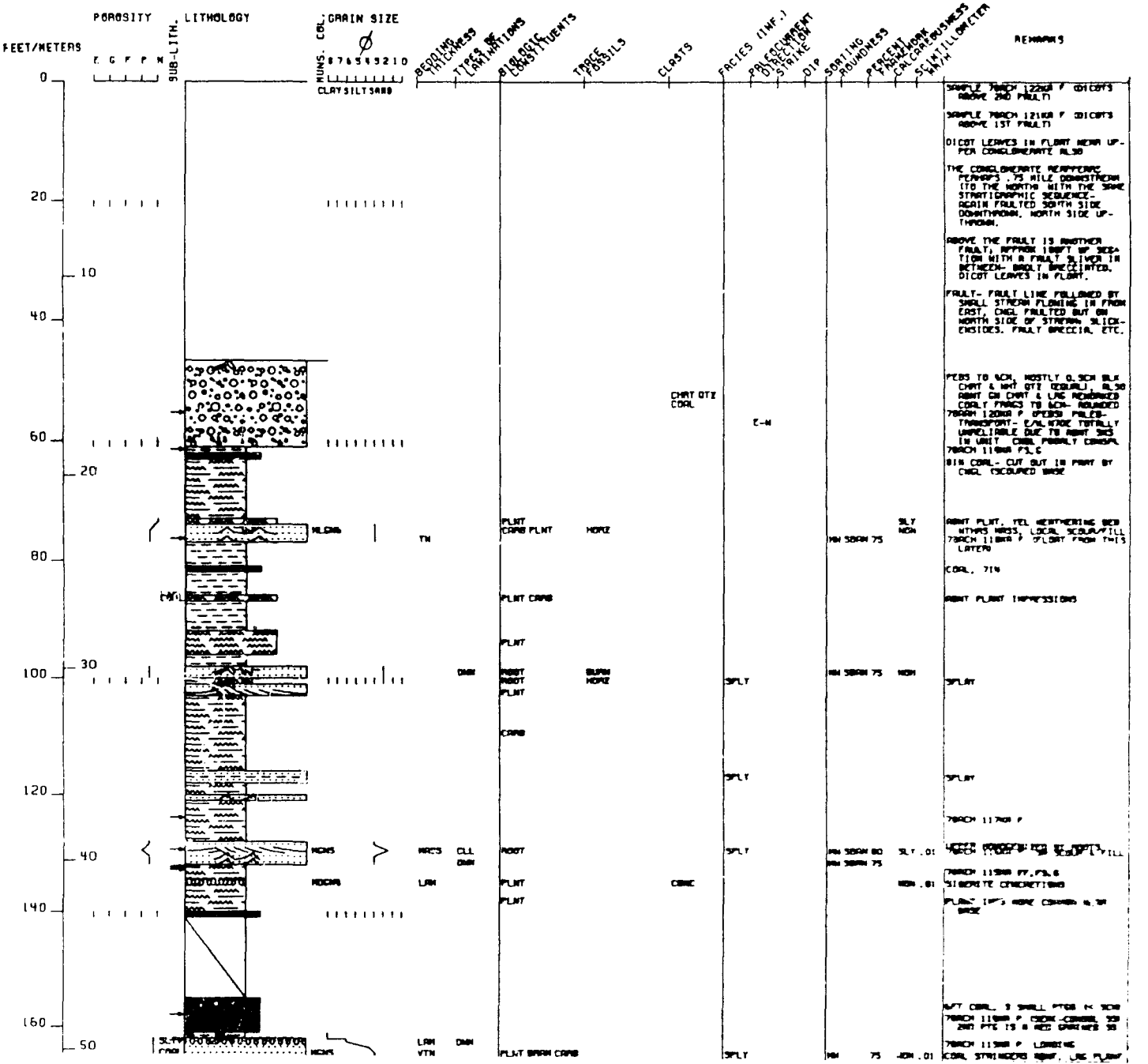
KURUPA ANTICLINE

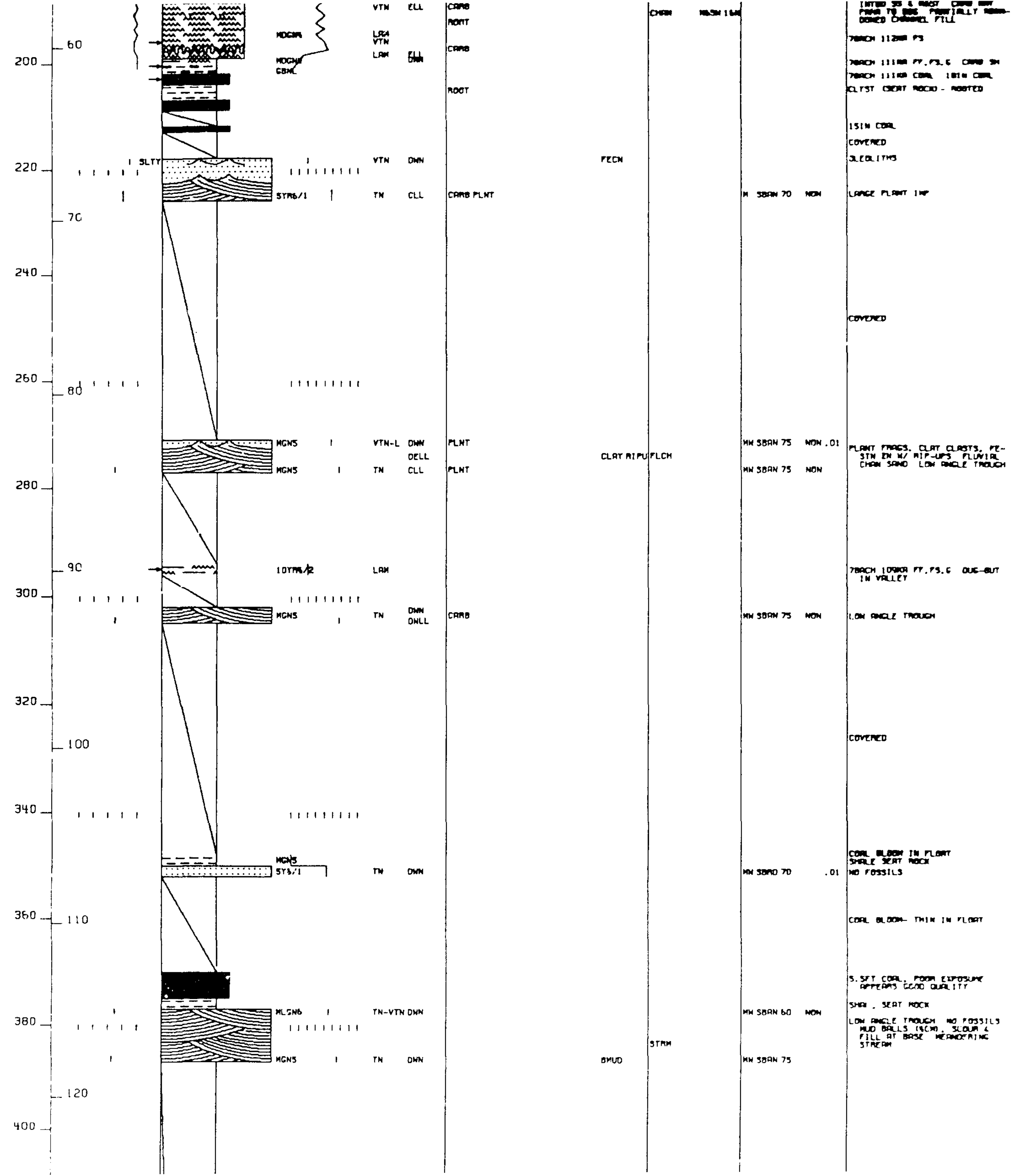
API NO. 50-137-90003

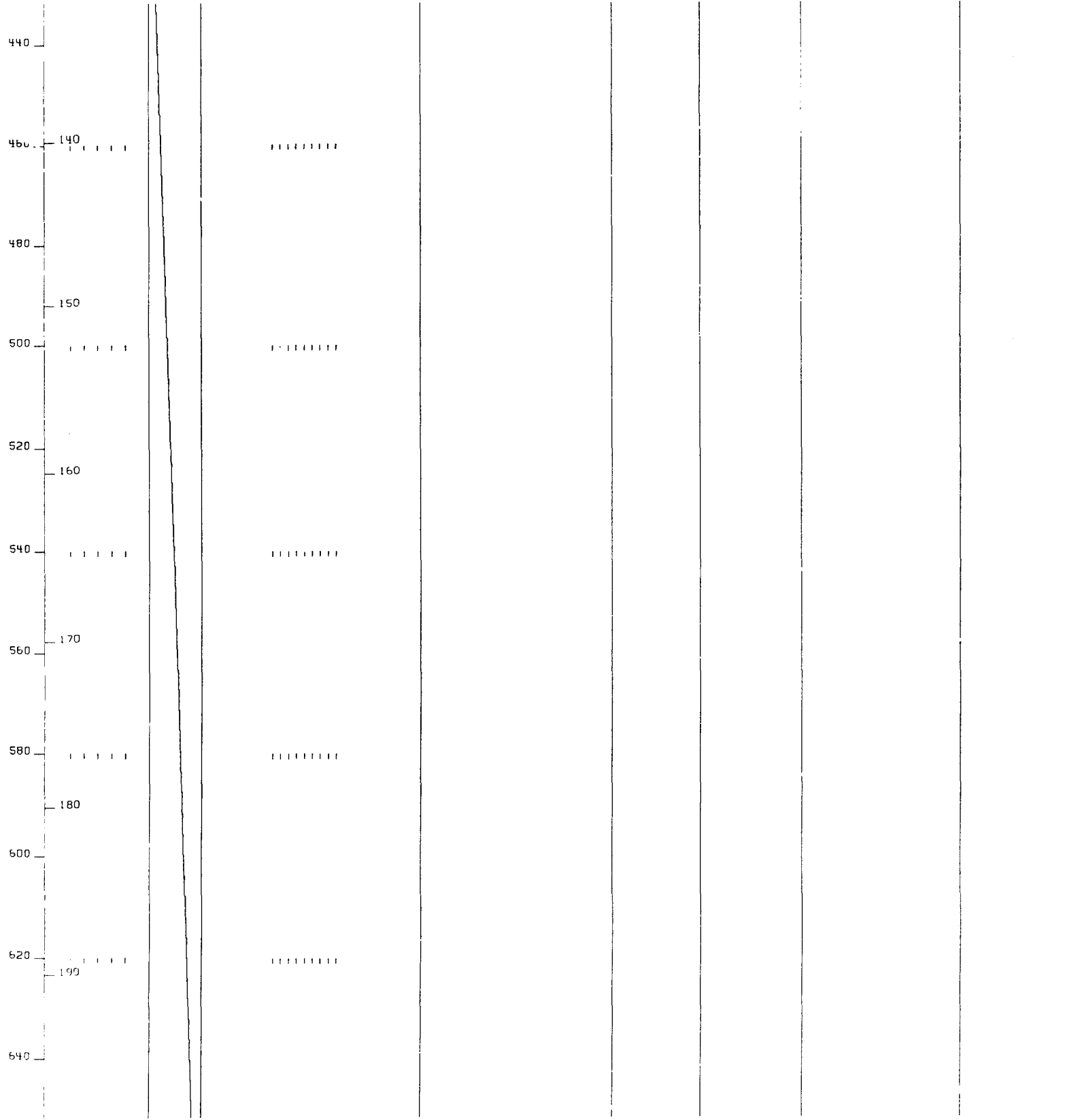
6,010 FT TOP — 1 IN = 20 FT — 7/29/78 BASE — 1 OF 6

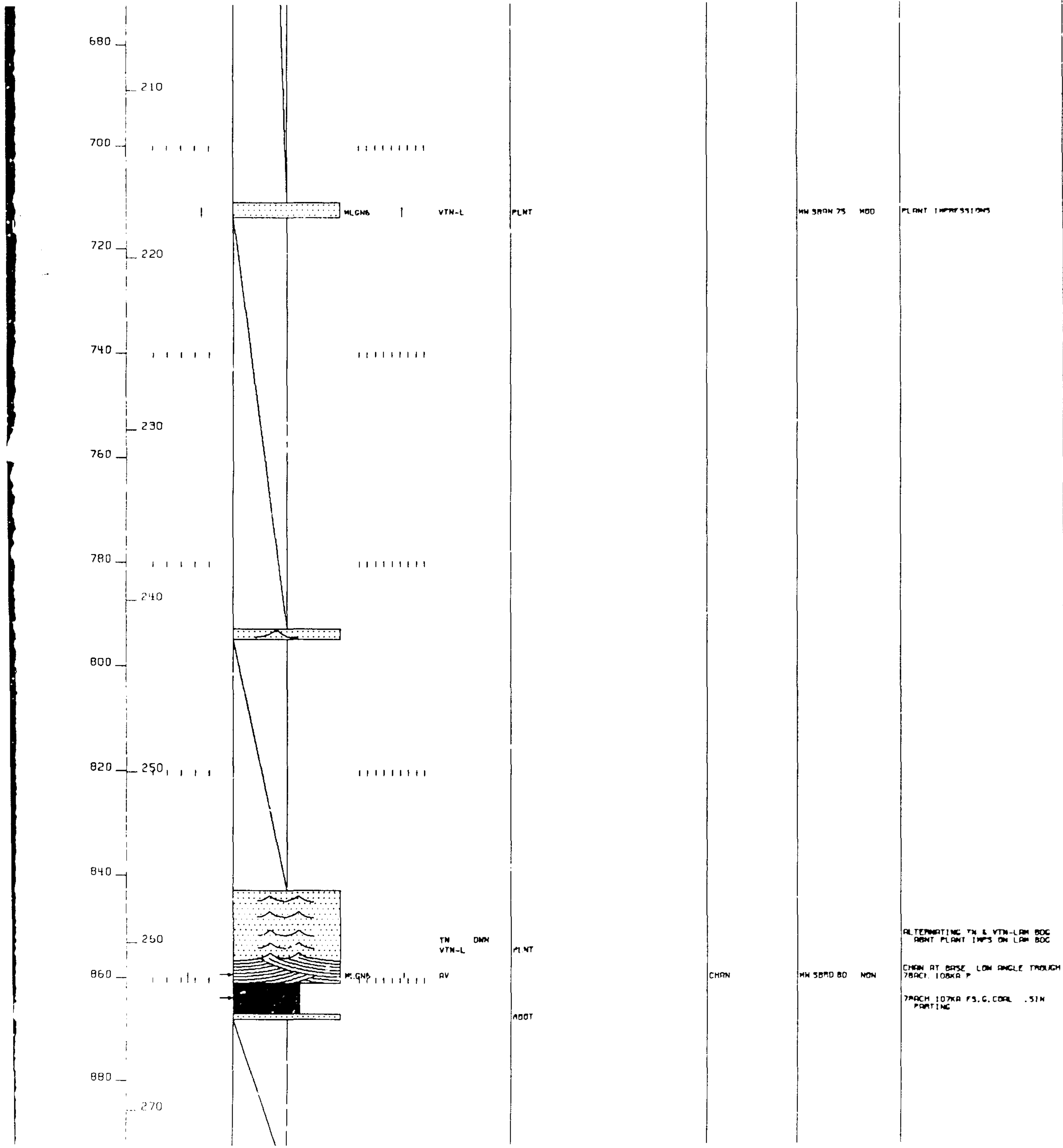
SEC 13, T6S, R14W
68°56'16"N 155°02'23"W

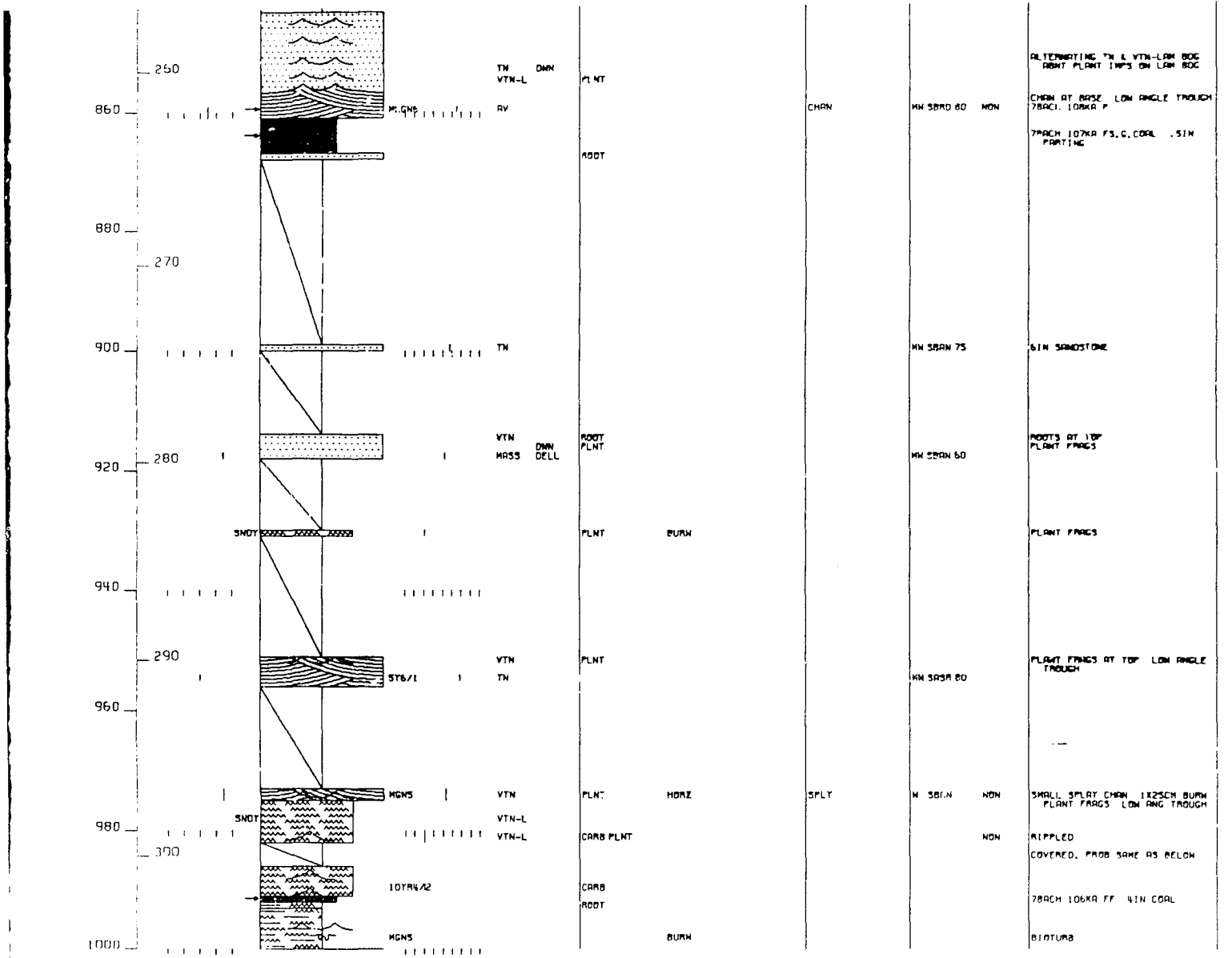
SEC 36, T6S, R14W
68°52'44"N 155°06'21"W




200
220
240
260
280
300
320
340
360
380
400
60
70
80
90
100
110
120
SLTY
STR6/1
MGN5
10YR6/2
MLSN6
VTN
LAM
TN
VTN-L
TN-VTN
DWN
CLL
DELL
DNLL
CARB
ROOT
PLNT
CARB PLNT
FECN
CLAY RIPU
FLCH
STRM
BMUD
M SBAN 70
MW SBAN 75
MW SBAN 60
NON
ROOT
CLYST (SEAT ROCK) - ROOTED
15IN COAL
COVERED
OLEOLITHS
LARGE PLANT IMP
COVERED
PLANT FRAGS, CLAY CLASTS, FE-STN IN W/ RIP-UPS FLUVIAL CHAN SAND LOW ANGLE TROUGH
LOW ANGLE TROUGH
COVERED
COAL BLOOM IN FLOAT
SHALE SEAT ROCK
NO FOSSILS
COAL BLOOM- THIN IN FLOAT
5.5FT COAL, POOR EXPOSURE APPEARS GOOD QUALITY
SHAL, SEAT ROCK
LOW ANGLE TROUGH NO FOSSILS MUD BALLS (5CM), SCOUR & FILL AT BASE MEANDERING STREAM


440
460
140
480
150
500
520
160
540
170
560
580
180
600
620
190
640


680
210
700
MLGNB
VTN-L
PLNT
MW SBRN 75
MOD
PLANT IMPRESSIONS
720
220
740
230
760
780
240
800
820
250
840
250
TN
DWN
VTN-L
PLNT
ALTERNATING TN & VTN-LAM BDG
ABNT PLANT IMPS ON LAM BDG
860
MLGNB
AV
CHAN
MW SBRD 80
NON
CHAN AT BASE LOW ANGLE TROUGH
7BACH 108KA P
7BACH 107KA FS.G.COAL .5IN
PARTING
ROOT
880
270


260
860
880
270
900
280
920
940
290
960
980
300
1000
TN
VTN-L
DWN
PLNT
M.GNS
RV
CHAN
MW SBRD 80
NON
ALTERNATING TN & VTN-LAM BOG
ABNT PLANT IMPS ON LAM BOC
CHAN AT BASE, LOW ANGLE TROUGH
78ACI, 108KA P
7PACM 107KA FS,C,COAL .5IN
PARTING
ROOT
TN
MW SBAN 75
6IN SANDSTONE
VTN
MASS
DWN
DELL
ROOT
PLNT
MW SBAN 60
ROOTS AT TOP
PLANT FRAGS
SNOT
PLNT
BURW
PLANT FRAGS
VTN
PLNT
ST&/I
TN
MW SBSR 80
PLANT FRAGS AT TOP LOW ANGLE
TROUGH
MGNS
VTN
PLNT
HORZ
SPLY
W SBLN
NON
SMALL SPLAY CHAN 12CM BURW
PLANT FRAGS LOW ANG TROUGH
SNOT
VTN-L
VTN-L
CARB PLNT
NON
RIPPLED
COVERED, PROB SAME AS BELOW
10TR4/2
CARB
ROOT
78ACM 106KA FF 4IN COAL
MGNS
BURW
BIOTURB

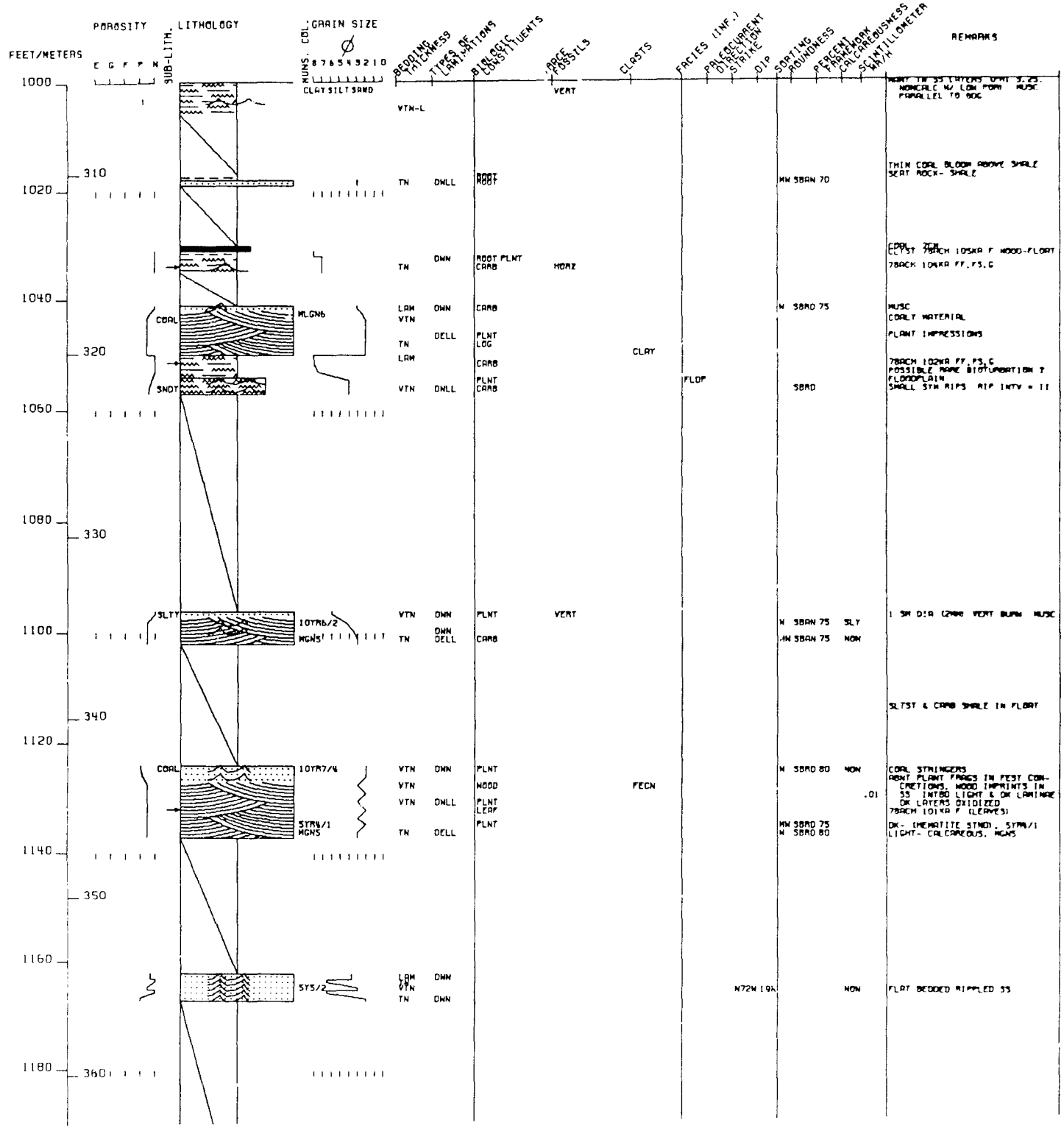
6,010 FT
TOP

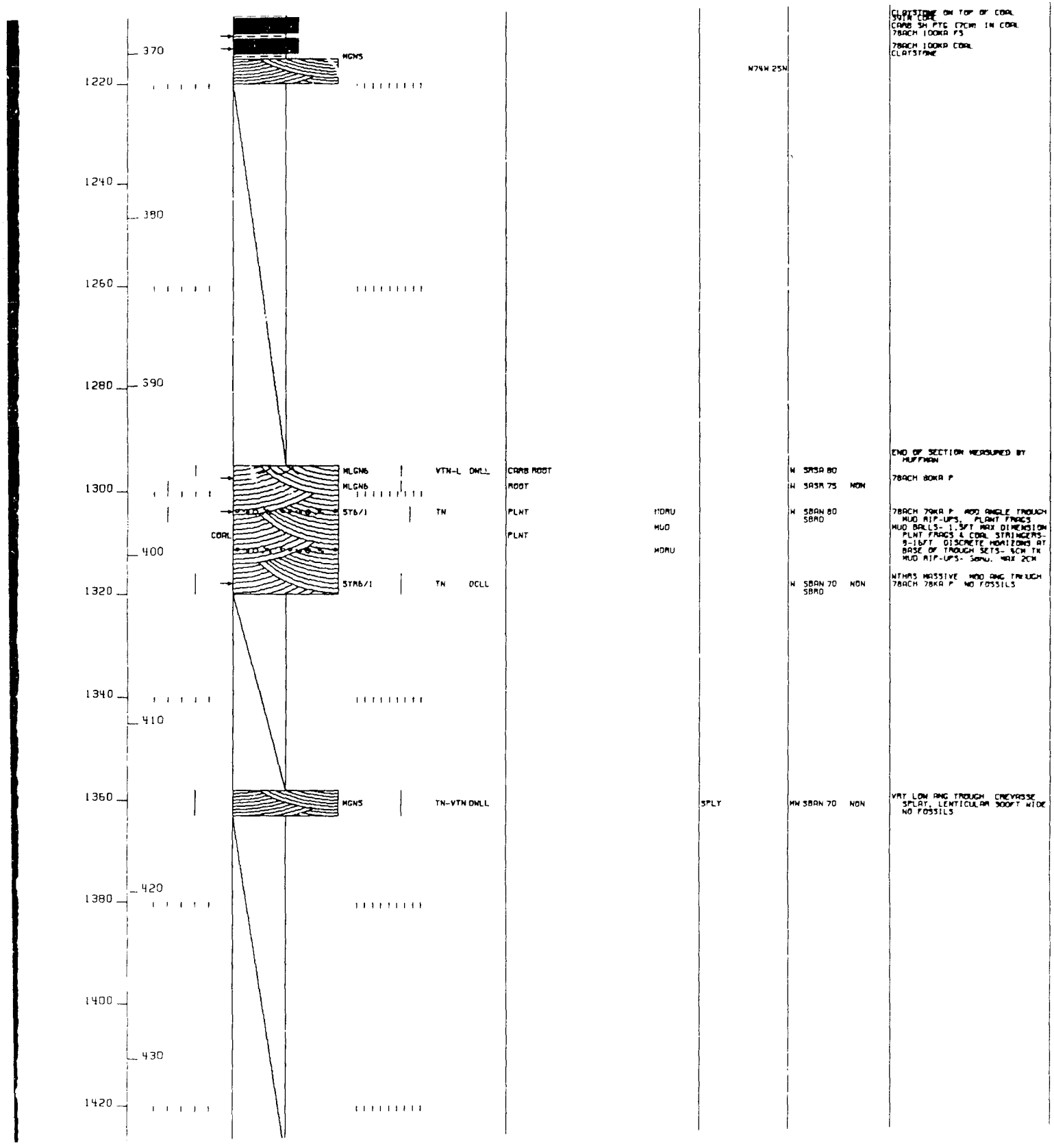
1 IN = 20 FT

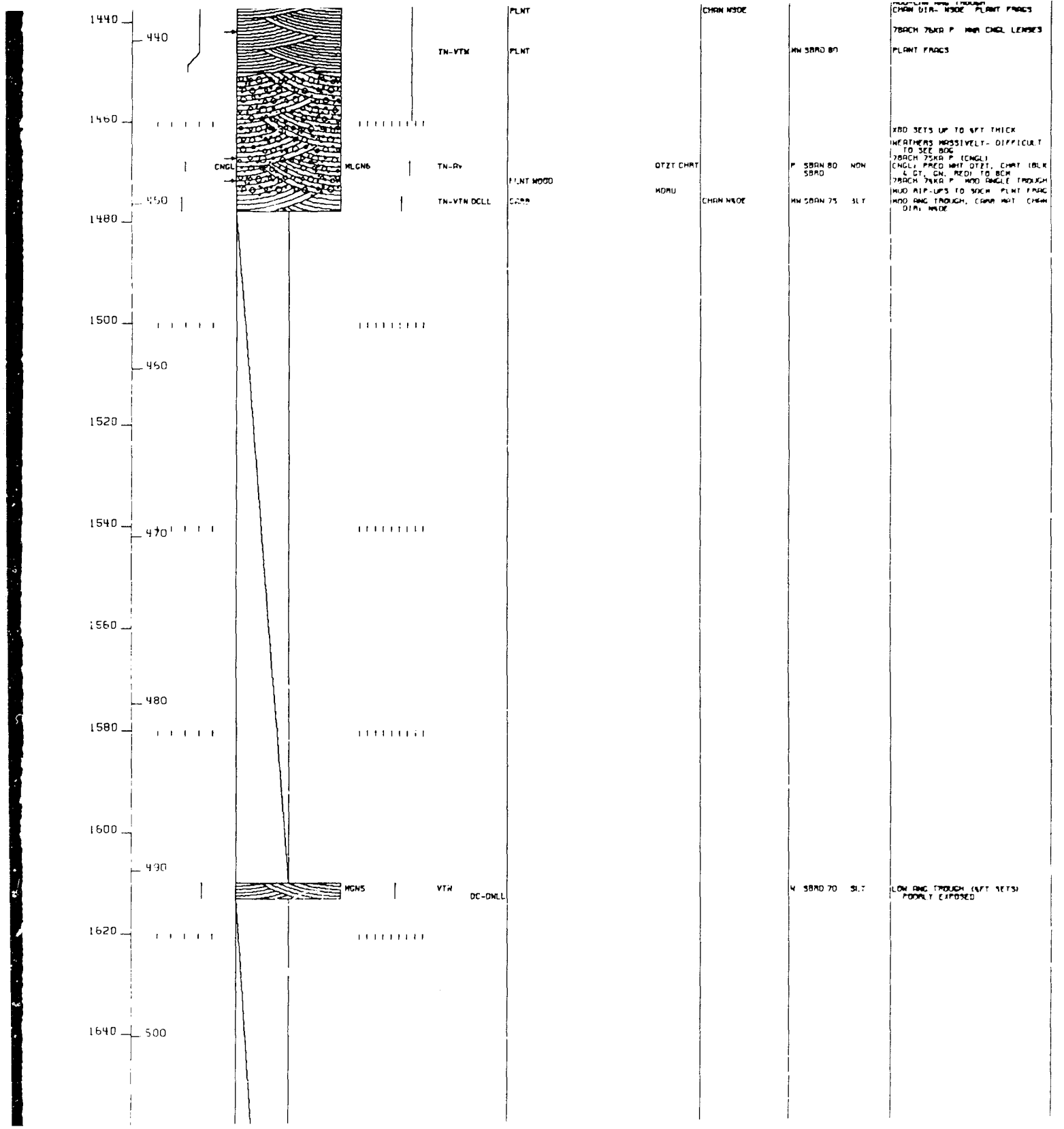
7/29/78
BASE

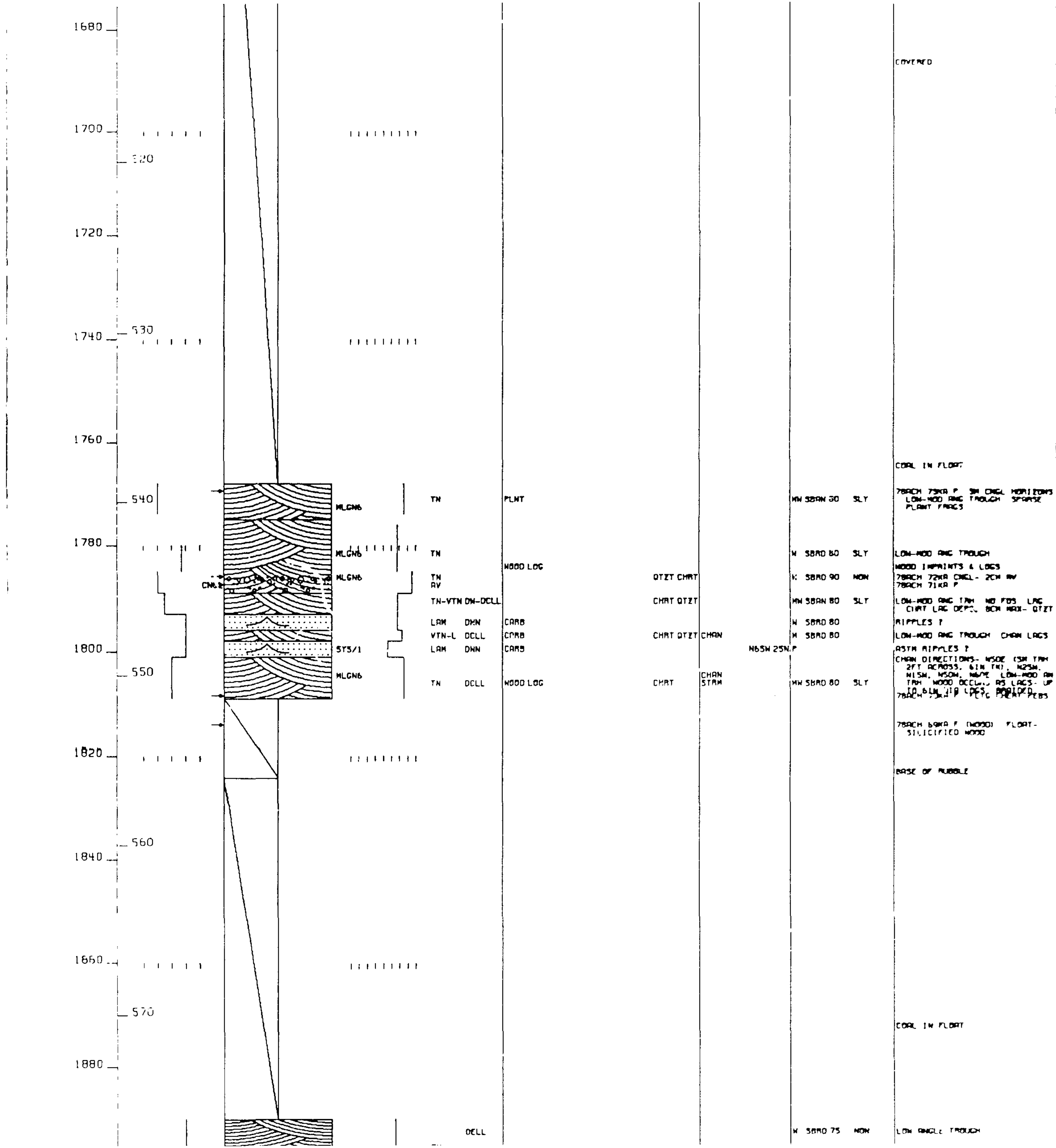
SEC 13, T6S, R14W
68°56'16"N 155°02'23"W

SEC 36, T6S, R14W
68°52'44"N 155°06'21"W

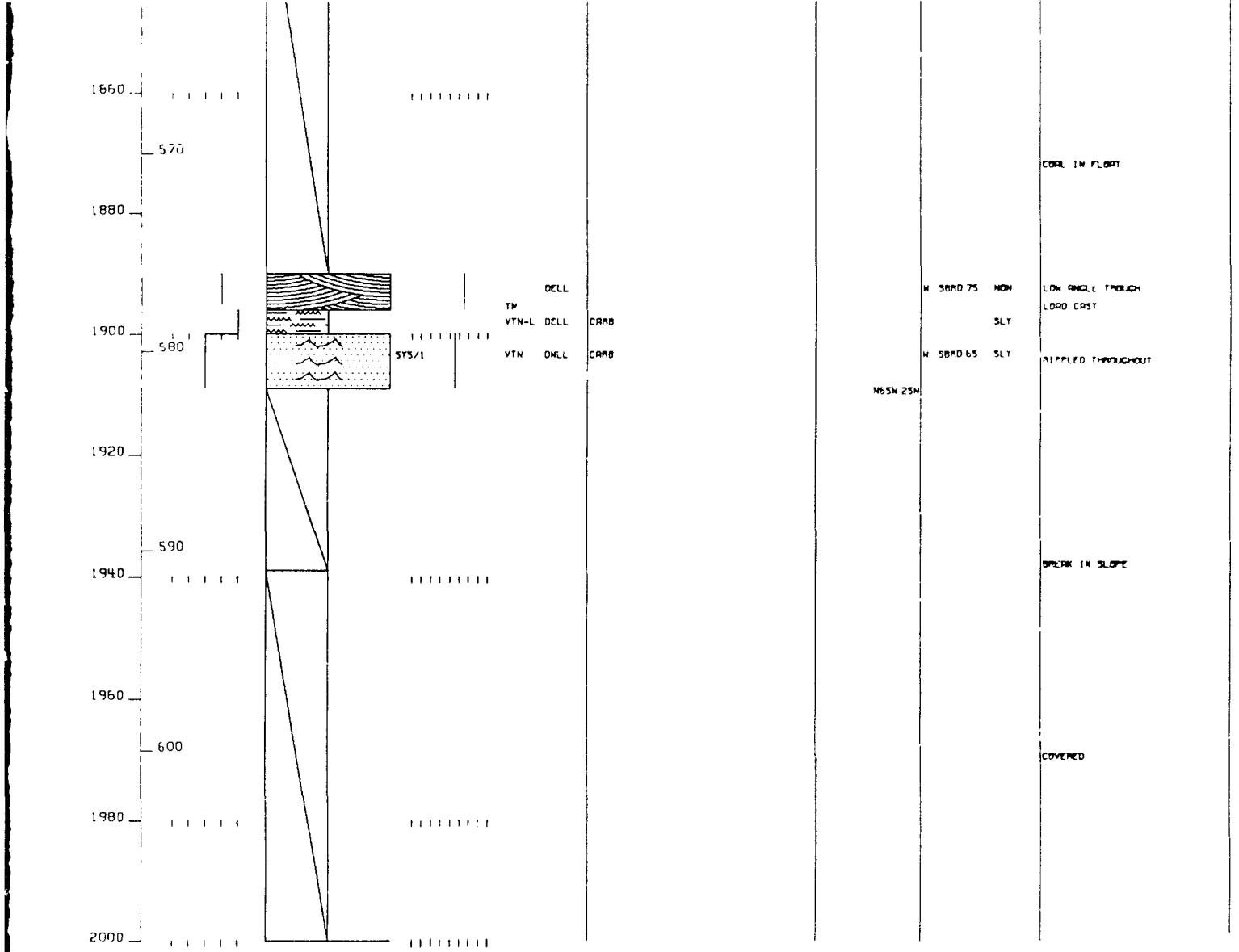



370
380
390
400
410
420
430
1220
1240
1260
1280
1300
1320
1340
1360
1380
1400
1420
MGN5
MLGN6
MLGN6
ST6/1
COAL
ST6/1
MGN5
VTN-L DMLL
TN
TN DCLL
TN-VTN DMLL
CARB ROOT
ROOT
PLNT
PLNT
MDRU
MUD
MDRU
SPLT
W74W 25N
W SRSA 80
W SRSA 75 NON
W SBAN 80 SBRD
W SBAN 70 NON SBRD
NW SBAN 70 NON
CLAYSTONE ON TOP OF COAL
SOFT COAL
CARB SH FTG (2CM) IN COAL
78ACH 100KA FS
78ACH 100KP COAL
CLAYSTONE
END OF SECTION MEASURED BY HUFFMAN
78ACH 80KA P
78ACH 79KA P MOD ANGLE TROUGH MUD RIP-UPS, PLANT FRAGS
MUD BALLS- 1.5FT MAX DIMENSION PLNT FRAGS & COAL STRINGERS- 9-16FT DISCRETE MDATIONS AT BASE OF TROUGH SETS- 6CM TK MUD RIP-UPS- 5CMD. MAX 2CM
MTHRS MASSIVE MOD ANG TROUGH 78ACH 78KA P NO FOSSILS
VRY LOW ANG TROUGH CROSSSE SPLAT, LENTICULAR 300FT WIDE NO FOSSILS


1440
440
1460
460
1480
480
1500
500
1520
520
1540
540
1560
560
1580
580
1600
600
1620
620
1640
640
CNGL
MLGN6
MGN5
TN-VTW
TN-Rv
TN-VTW DCLL
VTW
DC-DWLL
PLNT
PLNT
PLNT WOOD
CHAN N30E
CHAN N30E
QTZT CHRT
MDMU
CHAN DIR- N30E PLANT FRAGS
78ACM 76KR P NMR CNGL LENSES
NW SBRD 80
PLANT FRAGS
X80 SETS UP TO 4FT THICK
WEATHERS MASSIVELY- DIFFICULT TO SEE BOC
78ACM 75KR P (CNGL)
P SBRN 80 NON
SBRD
CNGL; PRED WHT QTZT, CHRT (BLK & GY, GN, RED) TO 8CM
78ACM 74KR P MOD ANGLE TROUGH
MOD AIP-UPS TO 50CM PLNT FRAG
NW SBRN 75 SLT
MOD ANG TROUGH, CMPR WHT CHRT DIM NW30E
W SBRD 70 SLT
LOW ANG TROUGH (4FT SETS) POORLY EXPOSED



1680
1700
520
1720
1740
530
1760
1780
540
1800
550
1820
560
1840
1860
570
1880
COVERED
COAL IN FLOAT
MLGN6
TN
PLNT
MW SBAN 30
SLY
78ACH 73KA P 3M CNGL HORIZONS LOW-MOD ANG TROUGH SPARSE PLANT FRAGS
MLGN6
TN
W SBRD 80
SLY
LOW-MOD ANG TROUGH
WOOD LOG
WOOD IMPRINTS & LOGS
CNL2
MLGN6
TN
AV
QTZT CHRT
W SBRD 90
NON
78ACH 72KA CNGL- 2CM AV
78ACH 71KA P
TN-VTN DW-DCLL
CHRT QTZT
MW SBAN 80
SLY
LOW-MOD ANG TRH NO FOS LAG CHRT LAG DEPO. 8CM MAX- QTZT
LAM
DWN
CARB
W SBRD 80
RIPPLES ?
VTN-L
DCLL
CARB
CHRT QTZT
CHAN
W SBRD 80
LOW-MOD ANG TROUGH CHAN LAGS
STS/1
LAM
DWN
CARB
N65W 25N.P
ASTM RIPPLES ?
MLGN6
TN
DCLL
WOOD LOG
CHRT
CHAN STRM
MW SBRD 80
SLY
CHAN DIRECTIONS- N50E (5M TRH 2FT ACROSS, 6IN TK), N25W, N15W, N50W, N6/E LOW-MOD AN TRH WOOD OCCURS AS LOGS- UP TO 6IN DIA LOGS, ABRADED
78ACH 73KA P PLTG FRCAT PEBS
78ACH 69KA F (WOOD) FLOAT- SILICIFIED WOOD
BASE OF RUBBLE
COAL IN FLOAT
DCLL
W SBRD 75
NON
LOW ANGLE TROUGH


1660
570
1880
1900
580
1920
590
1940
1960
600
1980
2000
DELL
TM
VTN-L DELL CARB
ST3/1
VTN DELL CARB
W SBRD 75 MOD
SLT
W SBRD 65 SLT
N65W 25N
COAL IN FLOAT
LOW ANGLE TROUGH
LOAD CAST
RIPPLED THROUGHOUT
BREAK IN SLOPE
COVERED

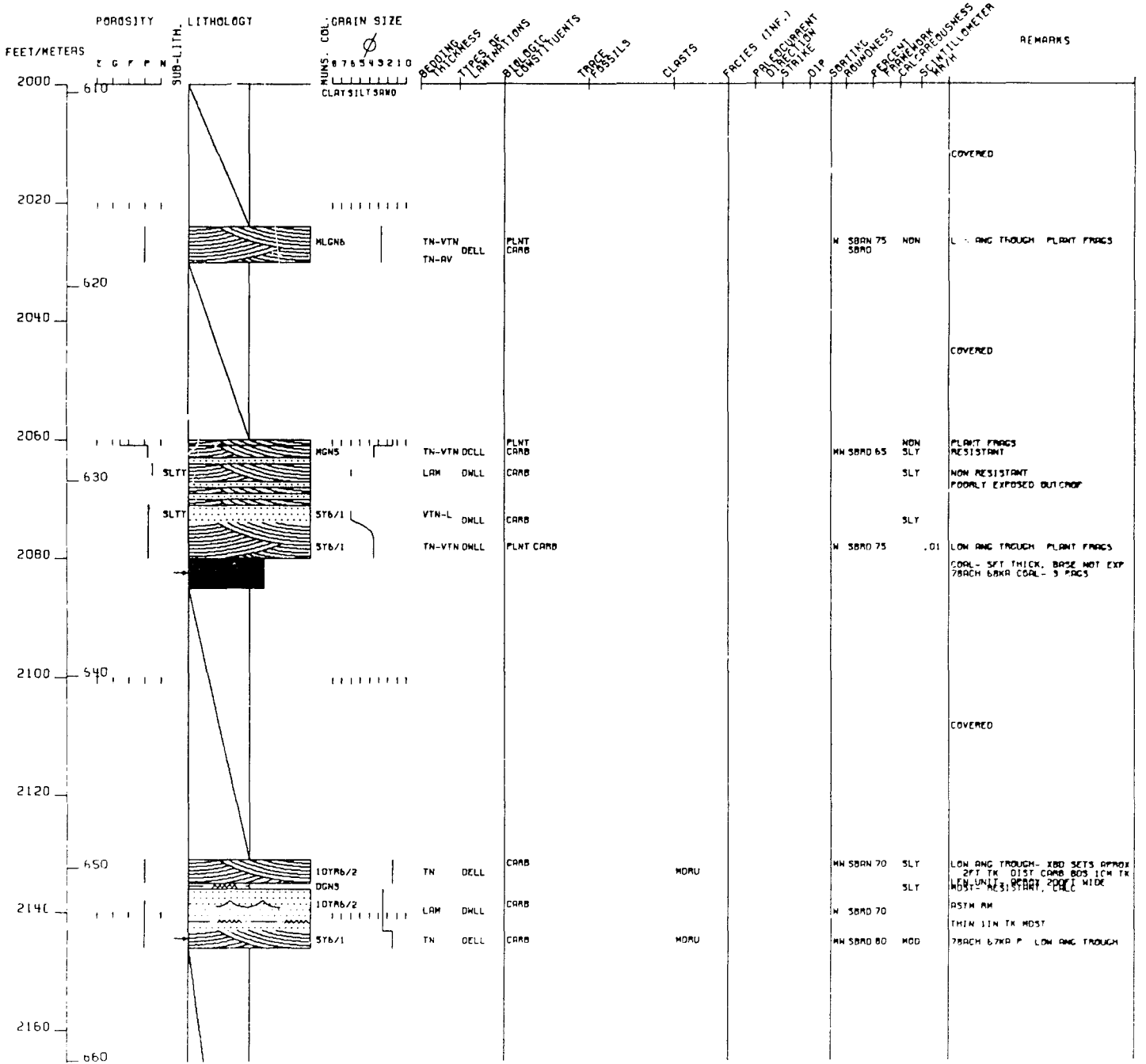
KURUPA ANTICLINE

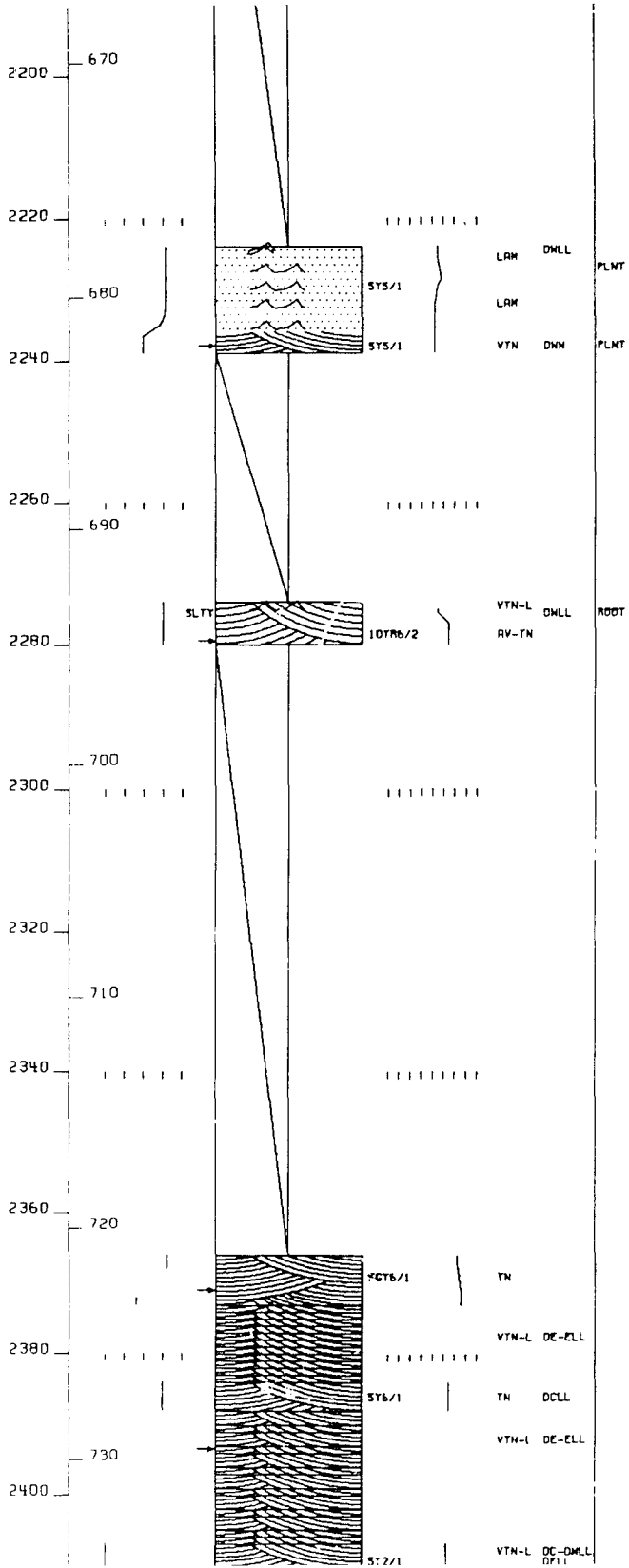
API NO. 50-137-90003

6,010 FT TOP — 1 IN = 20 FT — 7/29/78 — BASE — 3 OF 6

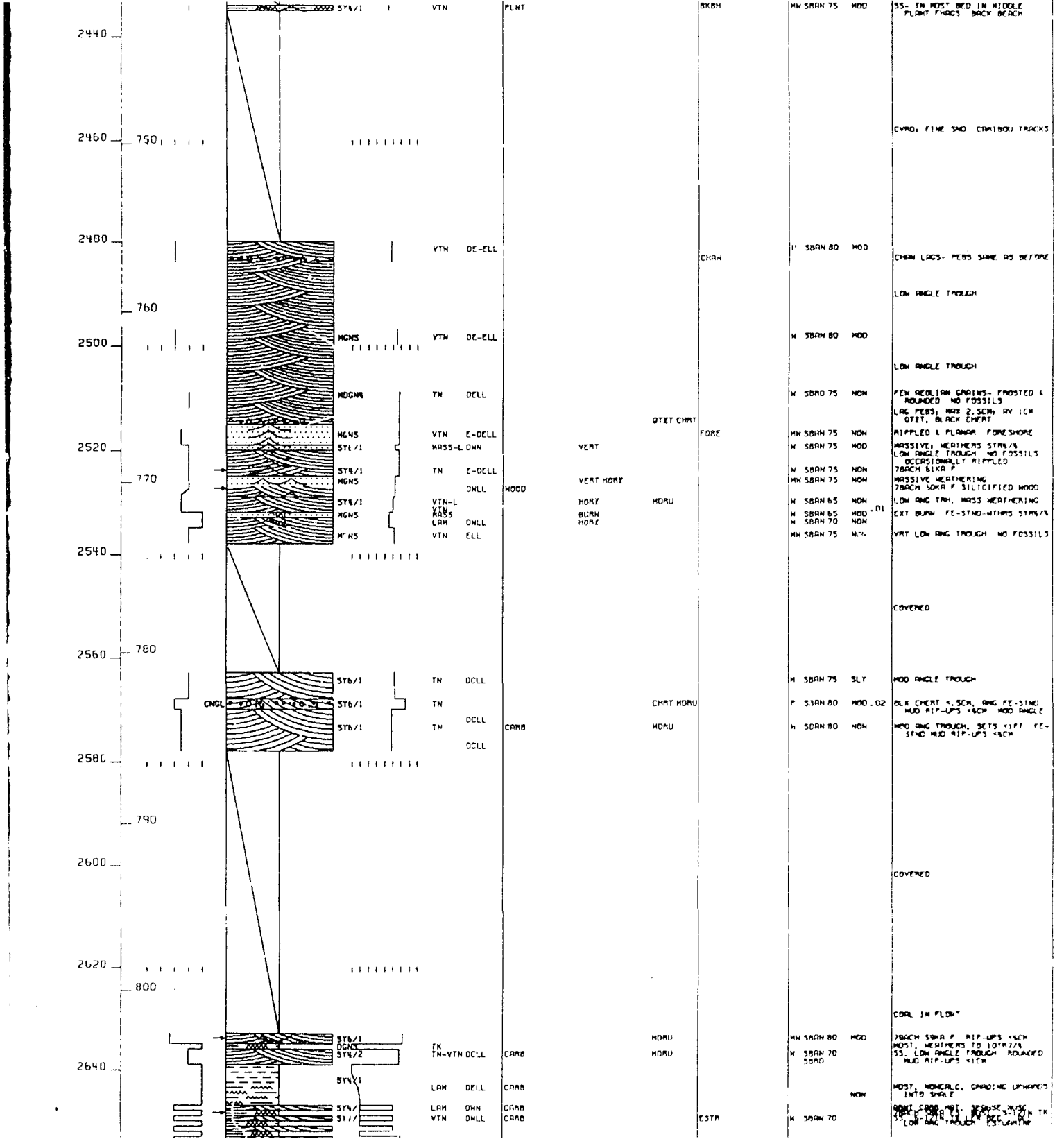
SEC 13, T6S, R14W
68°56'16"N 155°02'23"W

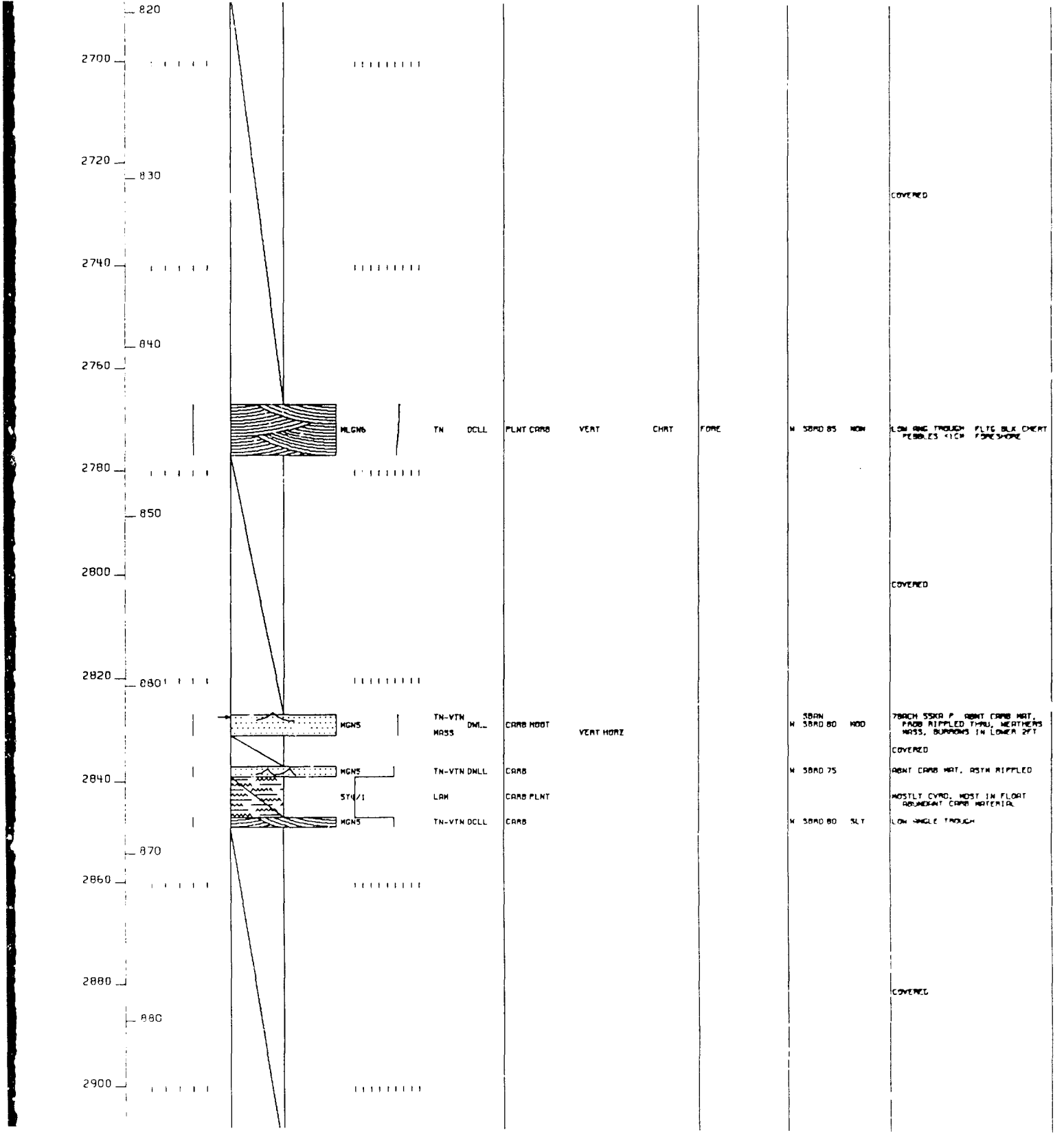
SEC 36, T6S, R14W
68°52'44"N 155°06'21"W

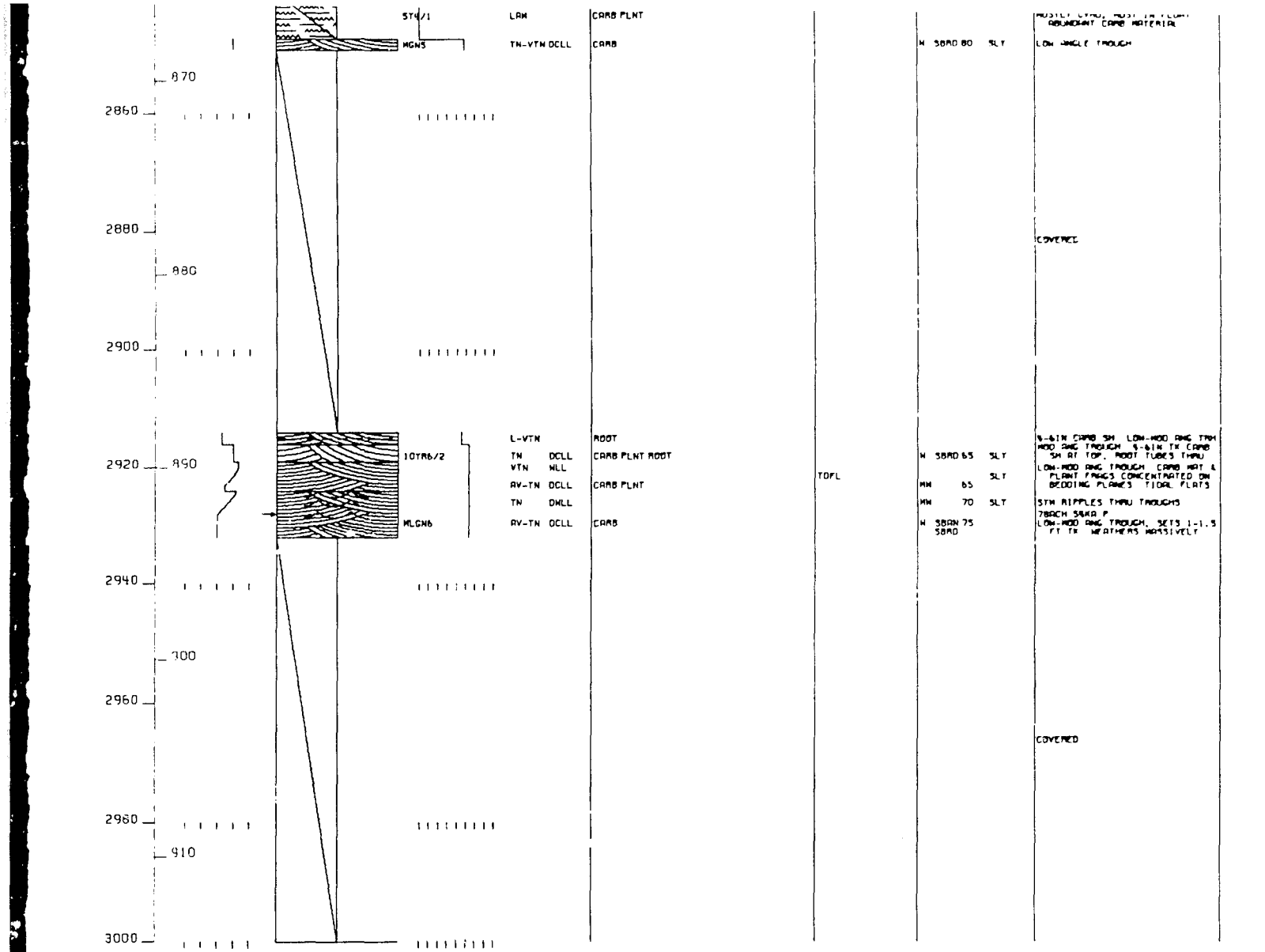




			CHAN	W	SBAD 70	VRY SLT .02	PARTIALLY ABANDONED CHAN FILL LENTICULAR- APPRX 2000FT WIDE ASYM RH THRU
				W	SBAD 70		MINOR SLUMPING LATERALLY GRTR CORL BED (BASE NOT EXPO - 78BCH 65KA CORL LENTICULAR BEDDING
				W	SBAD 75	SLT	78BCH 64KA F (FRESHWATER CLAMS ?) FROM FLOAT, PHOB FROM LOWER 5FT OF UNIT
			FLUV	W	SBAD 65	MOD	LOW-MOD ANG TROUGH 1.5FT TK, RESEMBLES CORWIN CHUFFARD
				W	SBAN 80	NON	78BCH 64KA F NO FOS AT BASE
					75	MOD	LOW ANGLE TROUGH 78BCH 63KA F
				W	SBAD 80		
				W	SBAD 90		INTERCALATED RESISTANT (CARB) [illegible]
			CHRT	W	SBAD 75	NON .01	LOW ANG TROUGH, FLTG CHERT TR .5CM LONG CASTS AT BASE NO FOSSILS LAG OF CSE SAND, G RESERVOIR
				W	SBAD 90		80-100PCT FRAMEWORK, NO FOS 78BCH 62KA F INTERCALATED RESISTANT (CARB) W/ LESS RESISTANT SANDS
			BEDH				BEACH
				W	SBAD 99	NON	


2440
2460
750
2480
760
2500
2520
770
2540
780
2560
790
2580
2600
2620
800
2640
ST6/1
VTN
PLNT
BKBH
SS- TN MOST BED IN MIDDLE PLANT FRAGS BACK BEACH
CYPRO; FINE SND CARIBOU TRACKS
VTN DE-ELL
CHAN
CHAN LAGS- PEBS SAME AS BEFORE
LOW ANGLE TROUGH
MGNS
VTN DE-ELL
LOW ANGLE TROUGH
MDGNS
TN DELL
FEW AEOLIAN GRAINS- FROSTED & ROUNDED NO FOSSILS
LAG PEBS; MAX 2.5CM; AV 1CM QTZT, BLACK CHERT
QTZT CHRT
MGNS
VTN E-DELL
FORE
RIPPLED & PLANAR FORESHORE
ST6/1
MASS-L DWN
VERT
MASSIVE; WEATHERS ST6/1
LOW ANGLE TROUGH NO FOSSILS OCCASIONALLY RIPPLED
ST6/1
TN E-DELL
78ACH &IKA F
MGNS
DWLL
WOOD
VERT HORZ
MASSIVE WEATHERING
78ACH SOKA F SILICIFIED WOOD
ST6/1
VTN-L
HORZ
HDRU
LOW ANG TRH, MASS WEATHERING
MGNS
VTN MASS
BURW
HORZ
EXT BURW FE-STND-WTHRS ST6/1
.01
LAM DWLL
MGNS
VTN ELL
VRT LOW ANG TROUGH NO FOSSILS
COVERED
ST6/1
TN DCLL
MOD ANGLE TROUGH
CNGL
ST6/1
TN
CHRT HDRU
BLK CHERT <.5CM, ANG FE-STND MUD RIP-UPS <5CM MOD ANGLE
.02
DCLL
ST6/1
TN
CARB
HDRU
MOD ANG TROUGH, SETS <1FT FE-STND MUD RIP-UPS <5CM
DCLL
COVERED
ST6/1
HDRU
78ACH SOKA F RIP-UPS <5CM
DGNS
TR
MOST, WEATHERS TO 10YR7/6
ST6/2
TN-VTN DCLL
CARB
HDRU
SS, LOW ANGLE TROUGH ROUNDED MUD RIP-UPS <1CM
ST6/1
LAM DELL
CARB
MOST, NONCALC, GRADING UPWARDS INTO SHALE
ST6/
LAM DWN
CARB
ST7/
VTN DWLL
CARB
ESTR
LOW ANG TROUGH ESTUARINE


820
2700
2720
830
2740
840
2760
2780
850
2800
2820
880
2840
870
2860
2880
880
2900
MLGN6
TN
DCLL
PLNT CARB
VERT
CHRT
FORE
W SBRD 85 MOD
LOW ANG TROUGH FLTG BLK CHERT PEBBLES <1CM FORESHORE
COVERED
COVERED
MGN5
TN-VTN MASS
DML
CARB MDST
VERT HORZ
SBAN
W SBRD 80 MOD
78ACM SSKR F ABNT CARB MAT, PADB RIPPLED THRU, WEATHERS MASS, BURROWS IN LOWER 2FT
COVERED
MGN5
TN-VTN DMLL
CARB
W SBRD 75
ABNT CARB MAT, RSTM RIPPLED
STVI
LAM
CARB PLNT
MOSTLY CYRO, MOST IN FLOAT ABUNDANT CARB MATERIAL
MGN5
TN-VTN DCLL
CARB
W SBRD 80 SLT
LOW ANGLE TROUGH
COVERED


870
2860
880
2880
890
2900
2920
900
2940
910
2960
2980
3000
STH/1
LAM
CARB PLNT
MGNS
TN-VTN DCLL
CARB
W 58RD 80 SLT
LOW ANGLE TROUGH
COVERED
L-VTN
ROOT
10YR6/2
TN DCLL
CARB PLNT ROOT
W 58RD 65 SLT
VTN WLL
TOFL
SLT
AV-TN DCLL
CARB PLNT
MM 65
MM 70 SLT
STH RIPPLES THRU TROUGHS
MLGN6
AV-TN DCLL
CARB
W 58AN 75
58RD
COVERED

KURUPA ANTICLINE

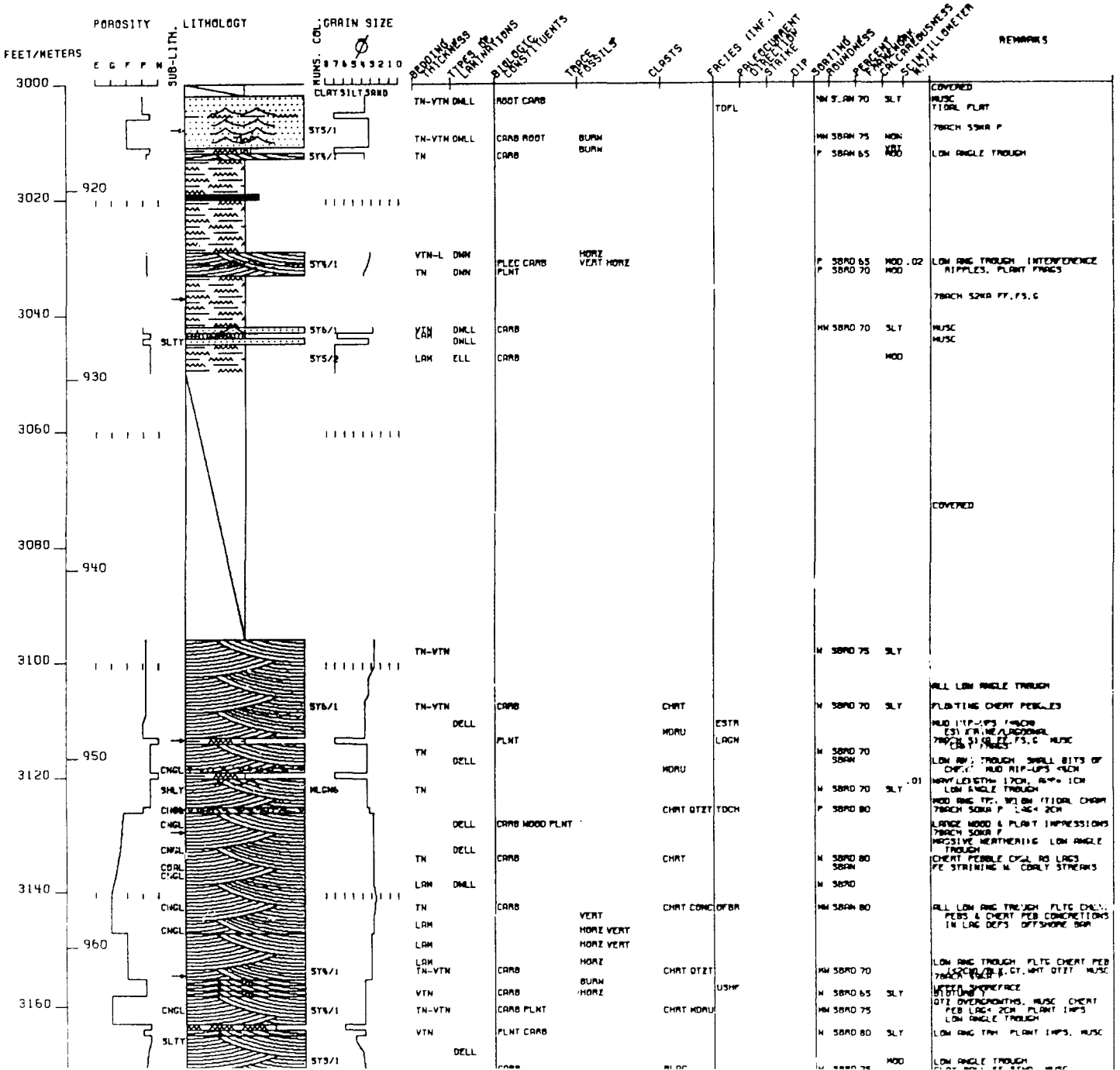
API NO. 50-137-90003

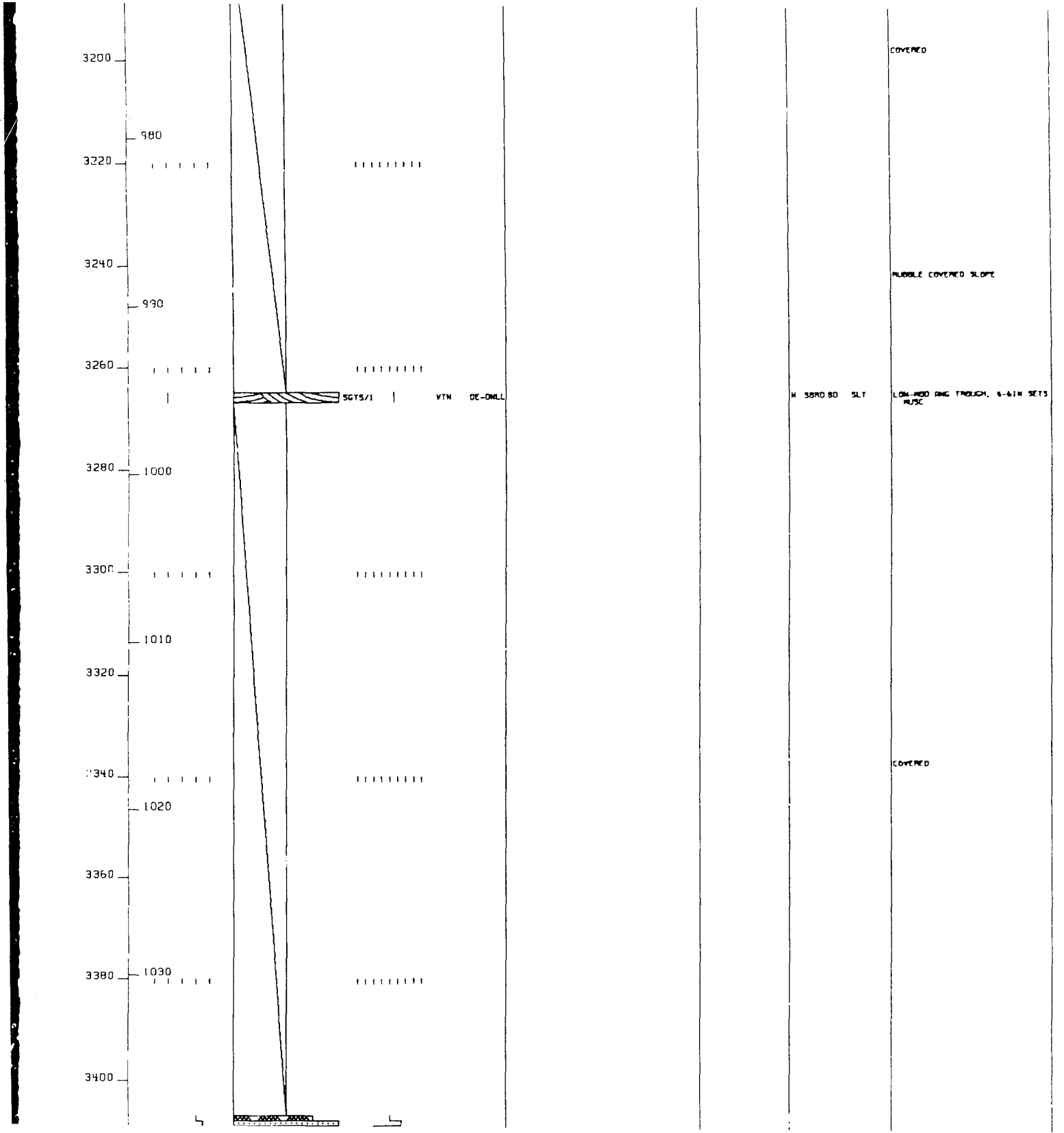
6,010 FT 7/29/78 4 OF 6

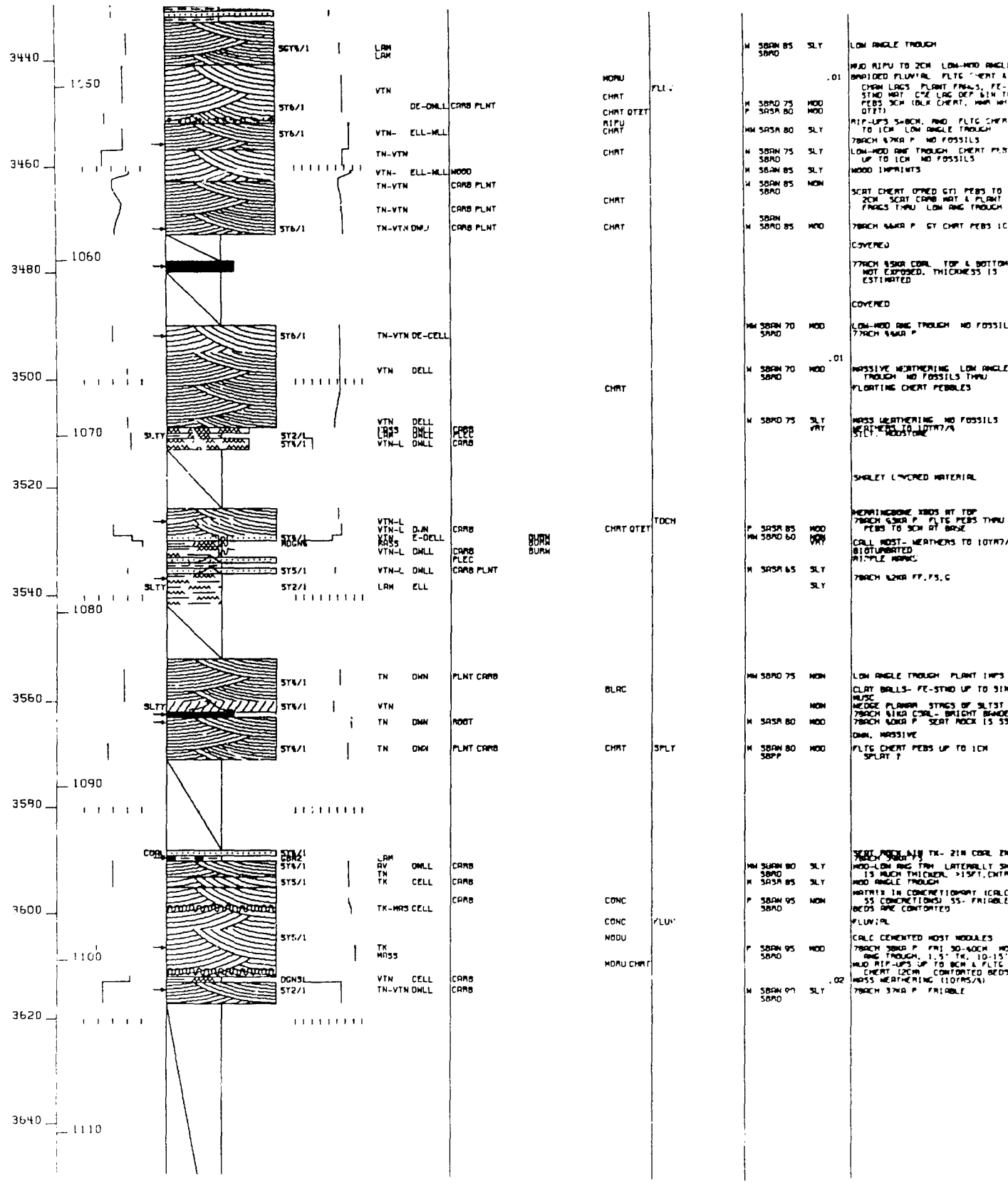
TOP 1 IN = 20 FT BASE

SEC 13, T6S, R14W SEC 36, T6S, R14W

68°56'16"N 155°02'23"W 68°52'44"N 155°06'21"W




3200
980
3220
3240
990
3260
3280
1000
3300
1010
3320
3340
1020
3360
3380
1030
3400
SGYS/1
VTN
DE-DWLL
W SBRO BO SLY
COVERED
RUBBLE COVERED SLOPE
LOW-MOD RNG TROUGH, 6-8 IN SETS
MUSC
COVERED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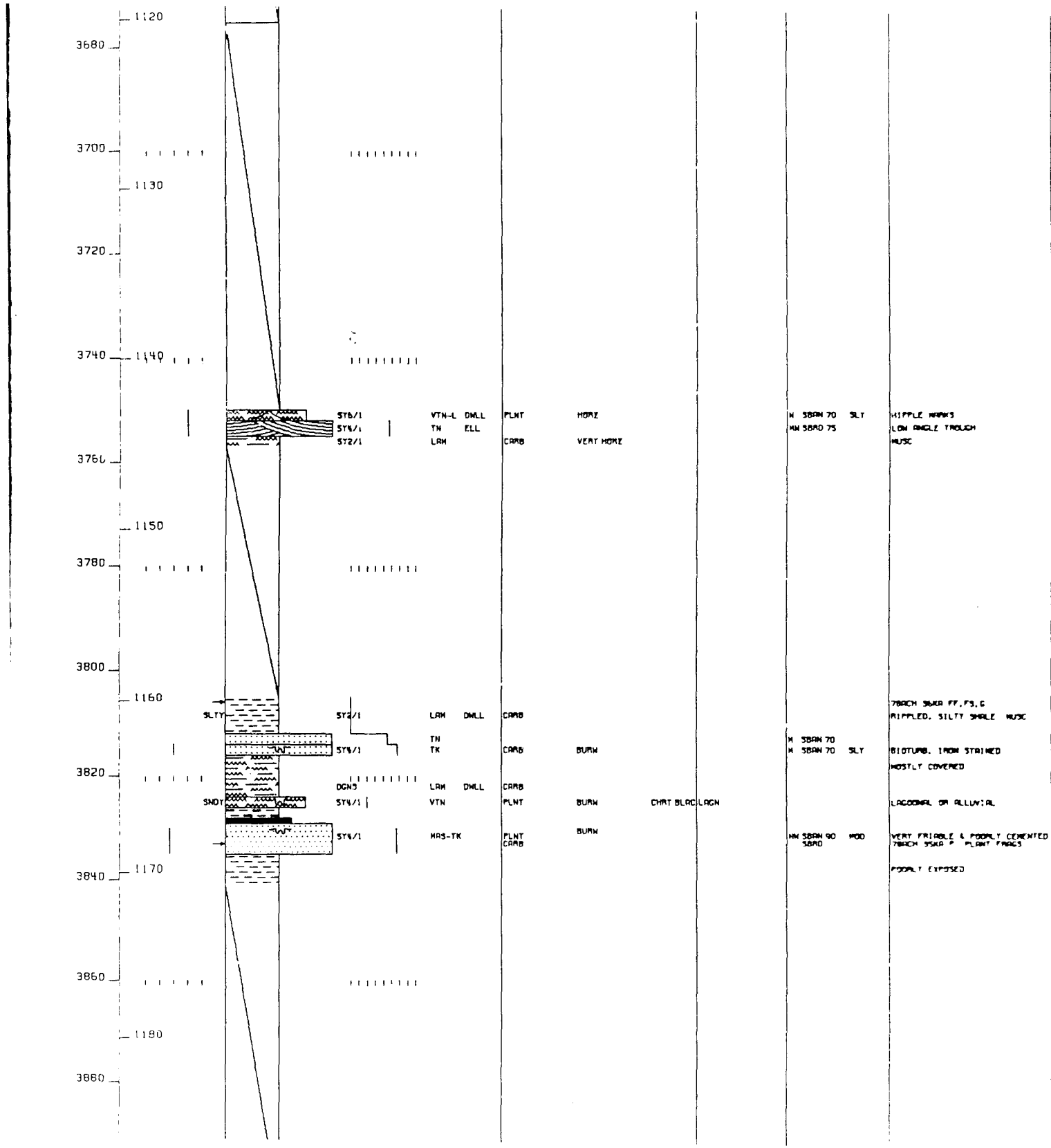
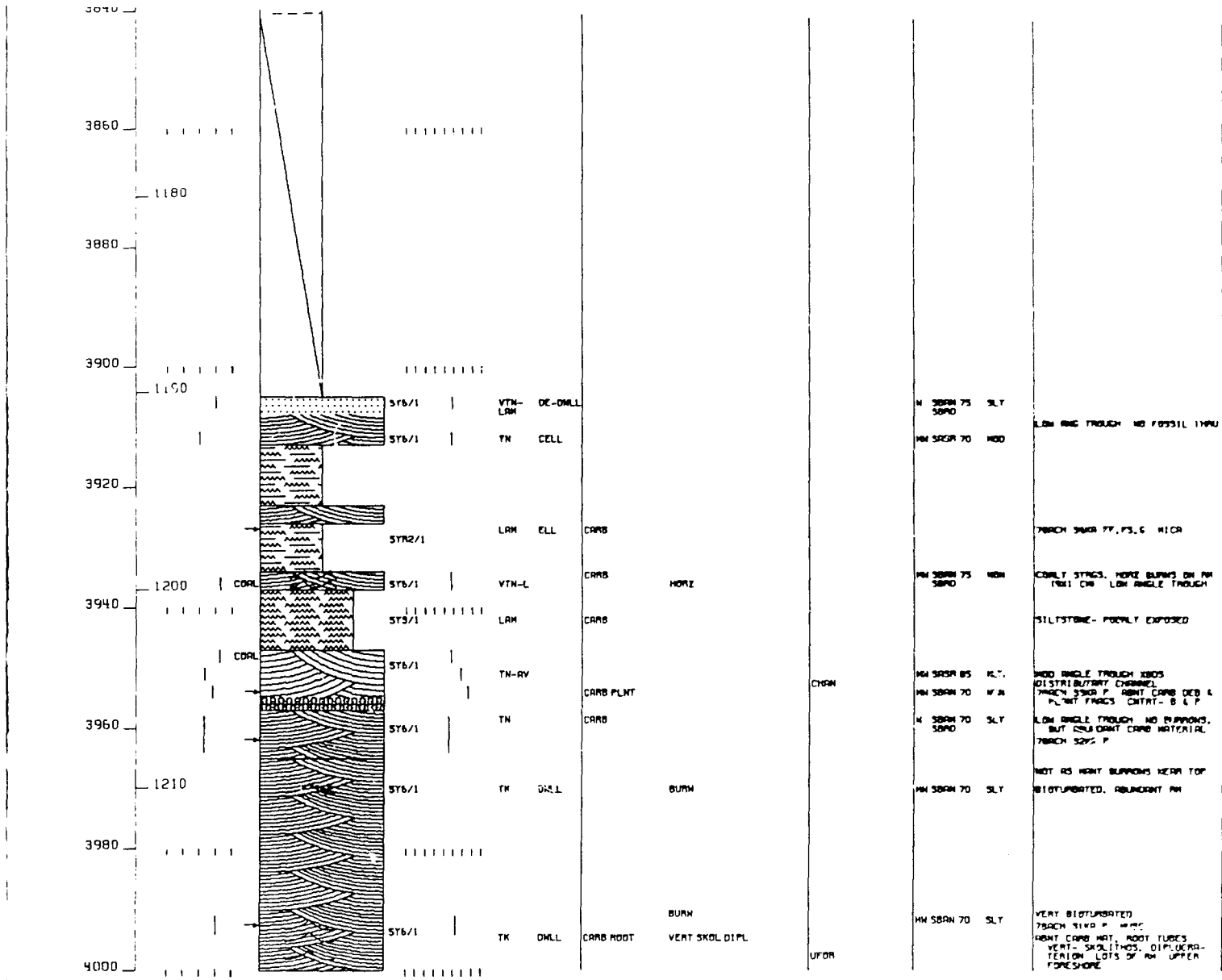
1050
3460
1060
3480
1070
3500
3520
1080
3540
1090
3560
3580
1100
3600
1110
3620
3640
SLTY
COAL


1120
3680
3700
1130
3720
1140
3740
3760
1150
3780
3800
1160
3820
1170
3840
3860
1180
3880
SLTY
SNDY
DGNS
5Y6/1
5Y6/1
5Y2/1
5Y2/1
5Y6/1
5Y6/1
5Y6/1
VTN-L DWLL
TN FLL
LAM
LAM DWLL
TN
TK
LAM DWLL
VTN
MAS-TK
FLNT
CARB
FLNT
CARB
CARB
CARB
CARB
HORZ
VERT HORZ
BURW
BURW
BURW
CHRT BLAC LAGN
W SBAN 70 SLT
NW SBAD 75
W SBAN 70
W SBAN 70 SLT
NW SBAN 90 MOD
SBAD
RIPPLE MARKS
LOW ANGLE TROUGH
MUSC
7BRCH SBAR FF,FS,C
RIPPLED, SILTY SHALE MUSC
BIOTURB. IRON STAINED
MOSTLY COVERED
LAGOONAL OR ALLUVIAL
VERY FRIABLE & POORLY CEMENTED
7BRCH SSAR P PLANT FRAGS
POORLY EXPOSED


3840
3860
1180
3880
3900
1190
3920
1200
3940
1210
3960
3980
4000
COAL
COAL
ST6/1
ST6/1
ST2/1
ST6/1
ST3/1
ST6/1
ST6/1
ST6/1
VTN-LAM
DE-DWLL
TN
CELL
LAM
ELL
VTN-L
LAM
TN-RV
TN
TR
DWLL
TR
DWLL
CARB
CARB
CARB
CARB PLNT
CARB
CARB
CARB ROOT
HORI
BURW
BURW
VERT SKOL DIPL
CHSN
UFOR
M SBRN 75 SLT SBRO
MW SRSR 70 MOD
MW SBRN 75 MOD SBRO
MW SRSR 85
MW SBRN 70
M SBRN 70 SLT SBRO
MW SBRN 70 SLT
MW SBRN 70 SLT
LOW ANG TROUGH NO FOSSIL THRU
LOW ANGLE TROUGH NO BURROWS, BUT ABUNDANT CARB MATERIAL
VERY BIOTURBATED
ABUNDANT CARB MAT, ROOT TUBES VERT- SKOLITHOS, DIPLOCRATERION LOTS OF RH UPPER FORESHORE

KUKUPA ANTICLINE
API NO. 50-137-90003

6,010 FT
TOP

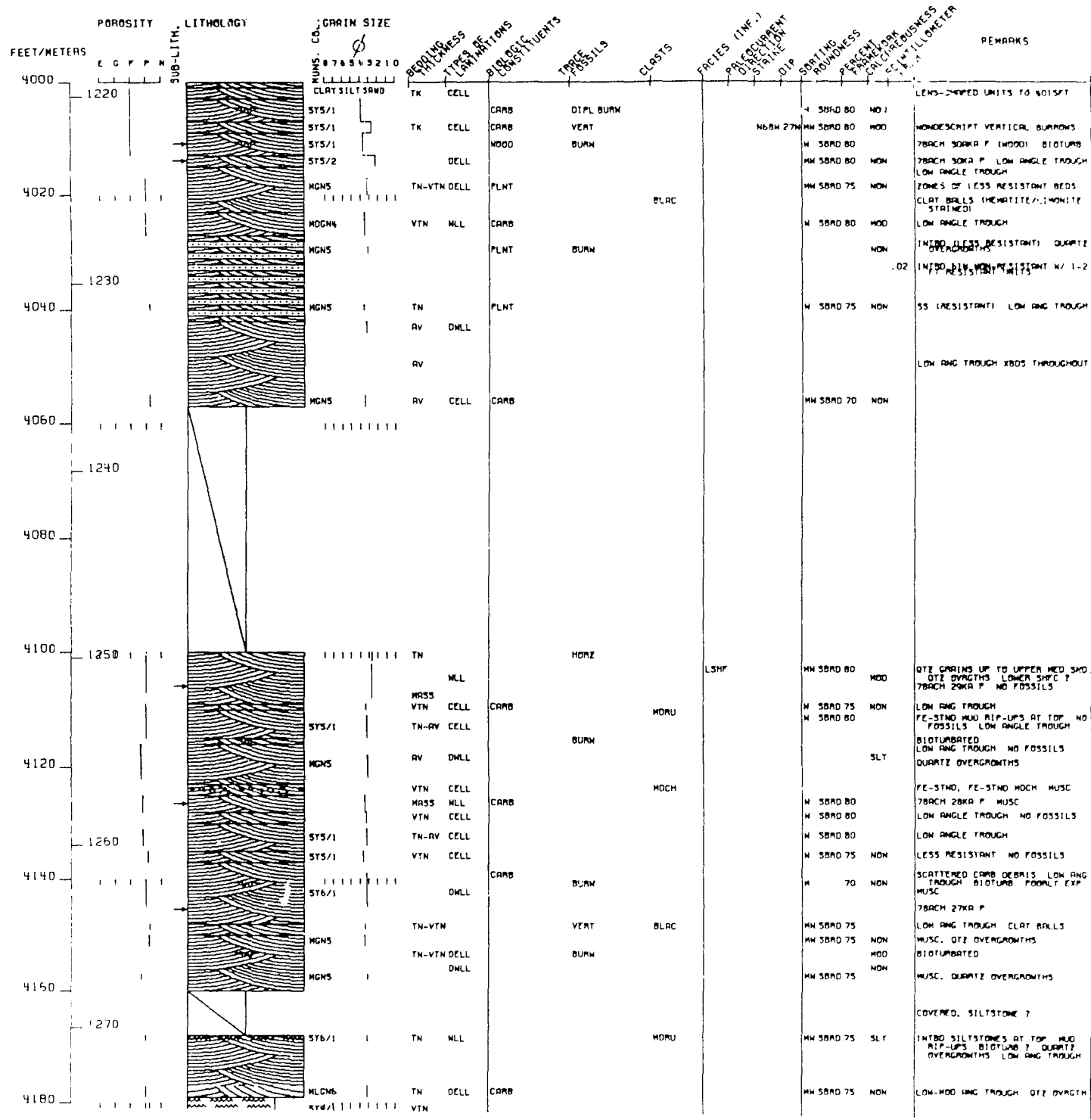
7/29/78

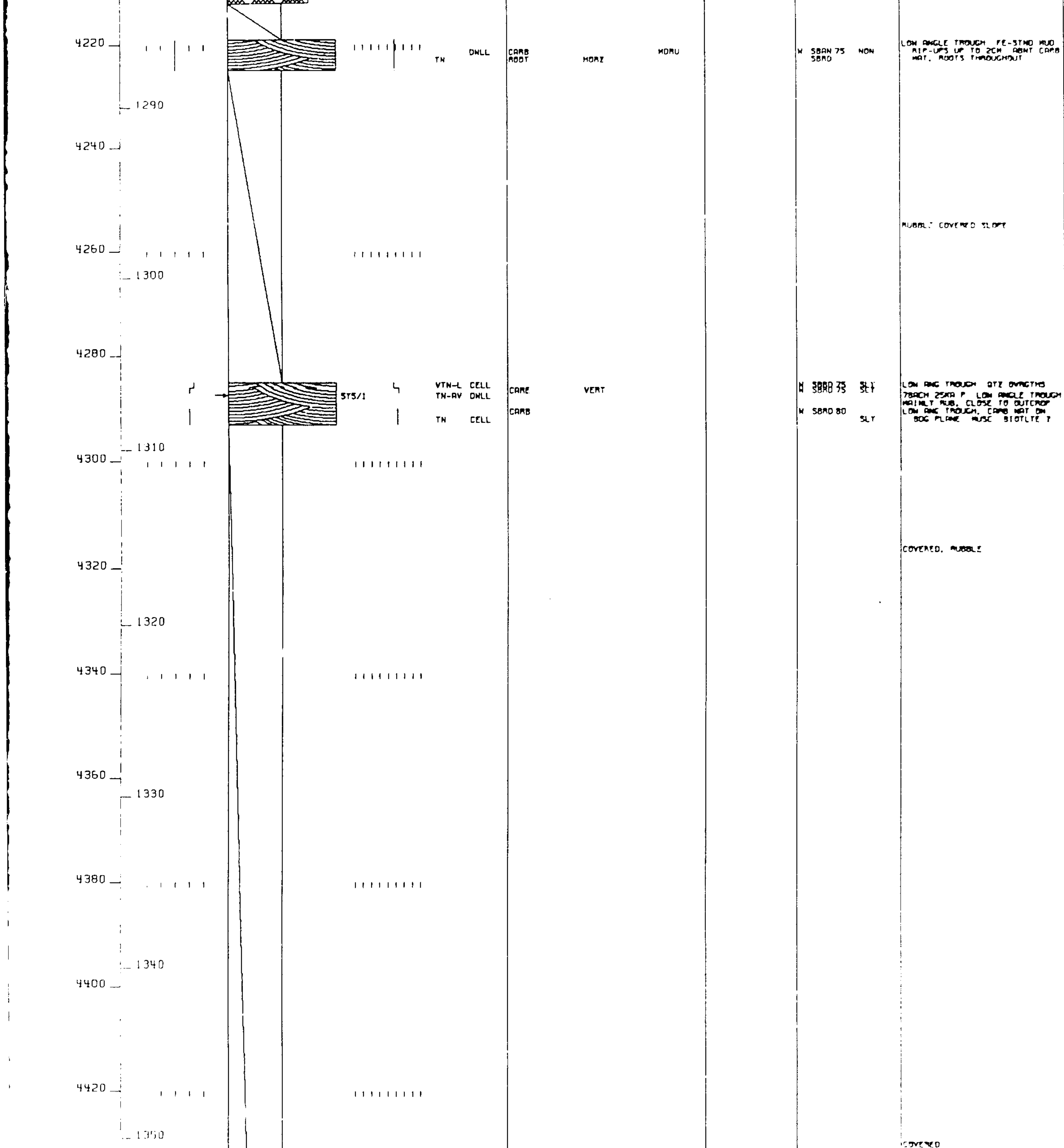
1 IN = 20 FT

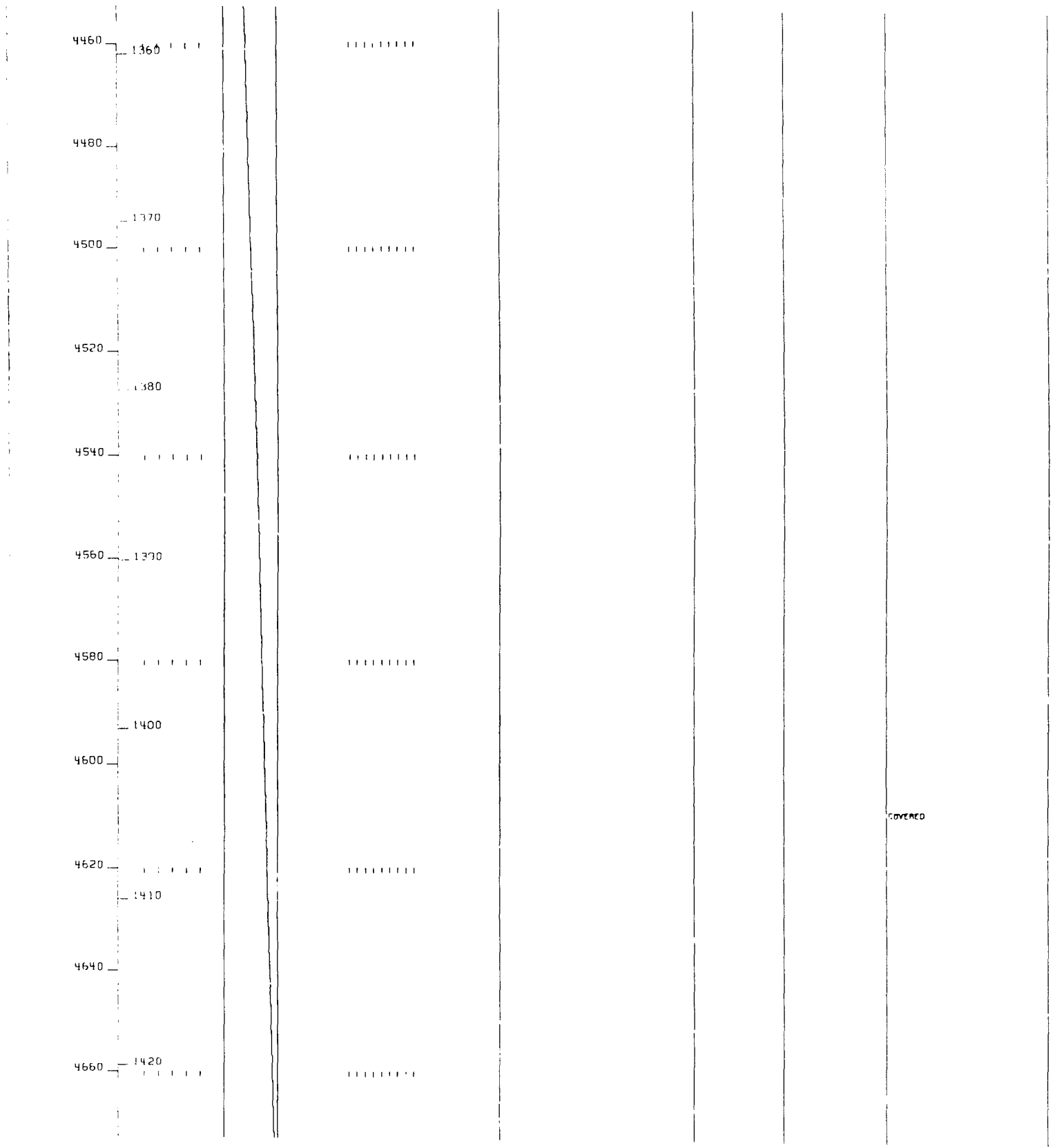
BASE

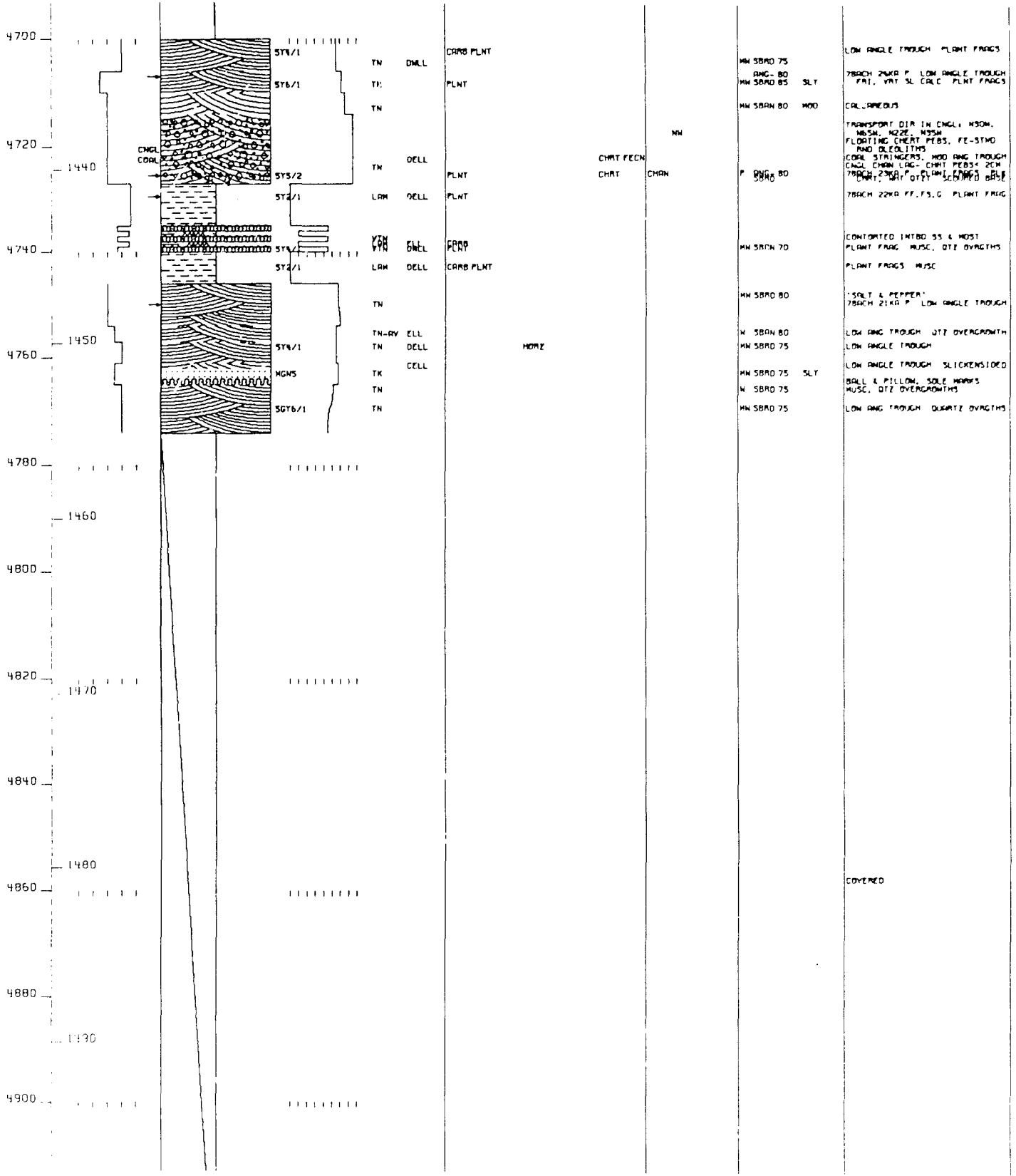
SEC 13, T6S, R14W
68°56'16"N 155°02'23"W

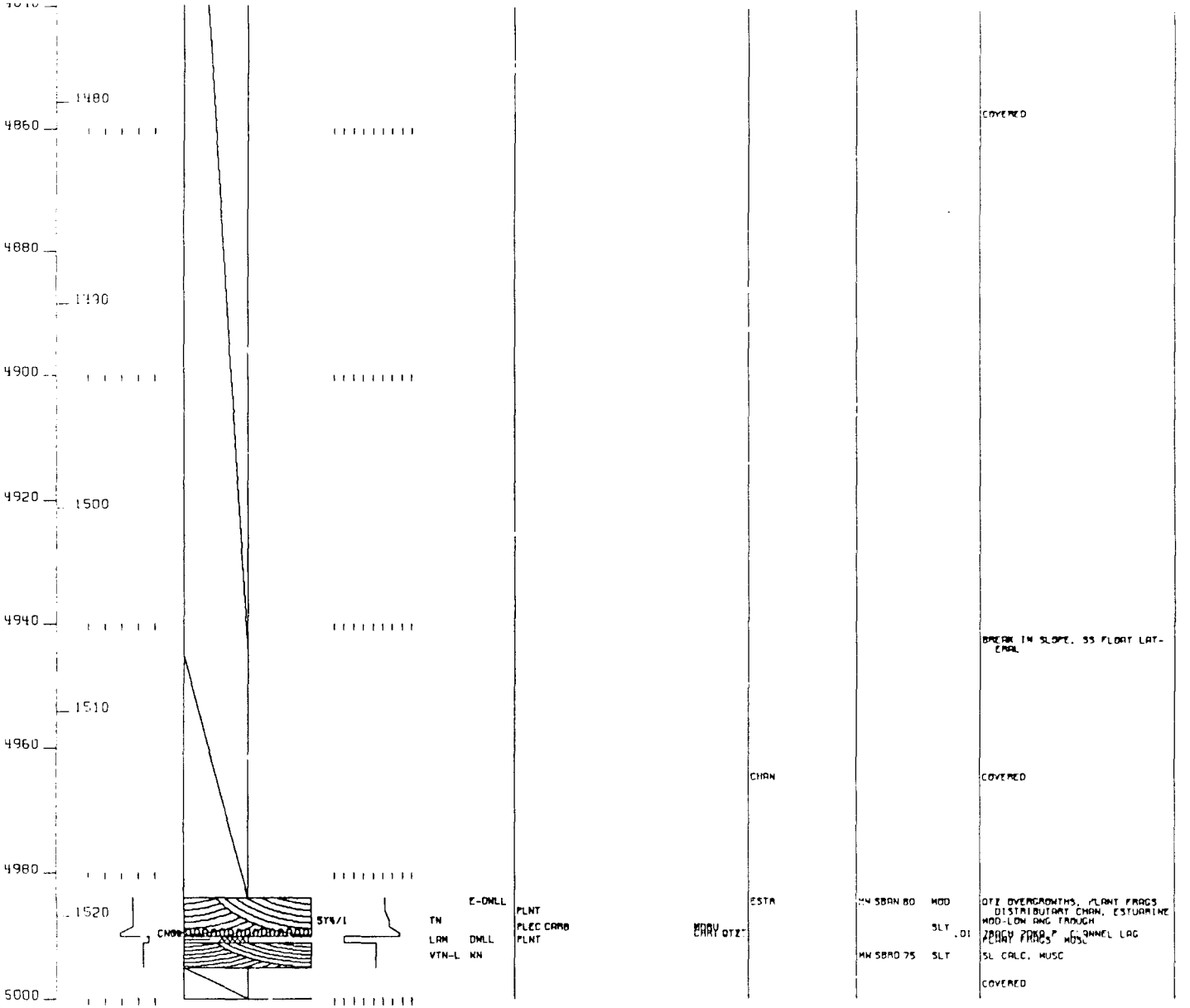
SEC 36, T6S, R14W
68°52'44"N 155°06'21"W




4220
1290
4240
4260
1300
4280
4300
1310
4320
1320
4340
4360
1330
4380
1340
4400
4420
1350
TN DWLL
CARB ROOT
HORZ
HORU
W SBAN 75 NON SBRD
LOW ANGLE TROUGH FE-STND MUD RIP-UPS UP TO 2CM ABNT CARB MAT, ROOTS THROUGHOUT
RUBBLE COVERED SLOPE
5Y5/1
VTN-L CELL
TN-AV DWLL
TN CELL
CARE
VERT
CARB
W SBRD 75 SLY
W SBRD 75 SLY
W SBRD 80 SLY
LOW ANG TROUGH QTZ OVRGTHS
7BACH 25KA P LOW ANGLE TROUGH
MAINLY RUB, CLOSE TO OUTCROP
LOW ANG TROUGH, CARB MAT ON BDG PLANE MUSC BIOTITE ?
COVERED, RUBBLE
COVERED


4460
1360
4480
1370
4500
4520
1380
4540
4560
1390
4580
1400
4600
4620
1410
4640
4660
1420
COVERED


4700
4720
4740
4760
4780
4800
4820
4840
4860
4880
4900
1440
1450
1460
1470
1480
1490
CNGL
COAL
ST6/1
ST5/2
ST2/1
ST4/1
MGNS
SGT6/1
TN
DWLL
PLNT
LAM
DELL
CARB PLNT
CHRT FECN
CHRT
CHAN
MDRE
MW SBRD 75
MW SBRD 85 SLT
MW SBAN 80 MOD
MW SBRD 80
MW SBRN 70
W SBAN 80
W SBRD 75
LOW ANGLE TROUGH PLANT FRAGS
78ACH 24KA P LOW ANGLE TROUGH
FRI, VRY SL CALC PLNT FRAGS
CAL-ARENOUS
TRANSPORT DIR IN CNGL: N30W, N65W, N22E, N35W
FLOATING CHERT PEBS, FE-STMD AND OLEOLITHS
COAL STRINGERS, MOD ANG TROUGH
CNGL CHAN LAG- CHRT PEBS< 2CM
78ACH 23KA P PLANT FRAGS PLE
CHRT, SRT QTZT SCOURED BASE
78ACH 22KA FF,FS,G PLANT FRAG
CONTORTED INTBD SS & MDST
PLANT FRAG MUSC, QTZ OVRGTHS
PLANT FRAGS MUSC
'SALT & PEPPER'
78ACH 21KA P LOW ANGLE TROUGH
LOW ANG TROUGH QTZ OVERGROWTH
LOW ANGLE TROUGH
LOW ANGLE TROUGH SLICKENSIDED
BALL & PILLOW, SOLE MARKS
MUSC, QTZ OVERGROWTHS
LOW ANG TROUGH QUARTZ OVRGTHS
COVERED


4860
4880
4900
4920
4940
4960
4980
5000
1480
1490
1500
1510
1520
COVERED
BREAK IN SLOPE. SS FLOAT LAT-
ERAL
COVERED
E-DMLL
PLNT
TN
PLEC CARB
LAM DMLL
FLNT
VTN-L KN
CHAN
ESTR
MW SBAN 80 MOD
SLT .01
MW SBAD 75 SLT
OTZ OVERGROWTHS, PLANT FRAGS
DISTRIBUTARY CHAN, ESTUARINE
MOD-LOW ANG TROUGH
PLANT FRAGS MOSC
SL CALC, MUSC
COVERED

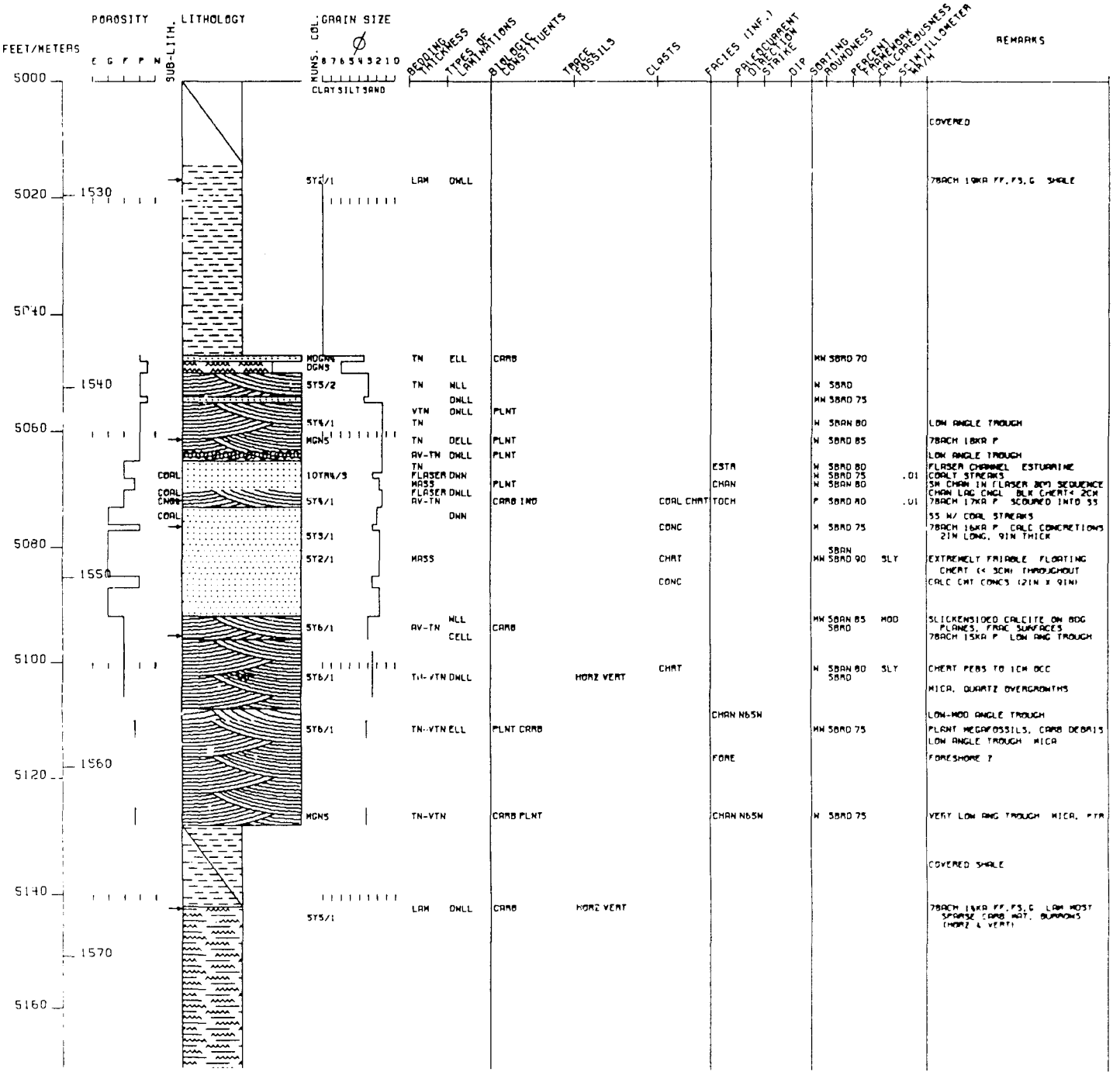
KURUPA ANTICLINE

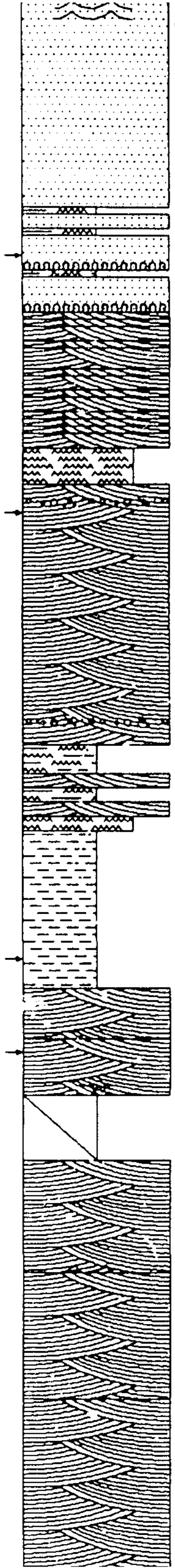
API NO. 50-137-90003

6,010 FT TOP — 1 IN = 20 FT — 7/29/78 BASE — 6 OF 6

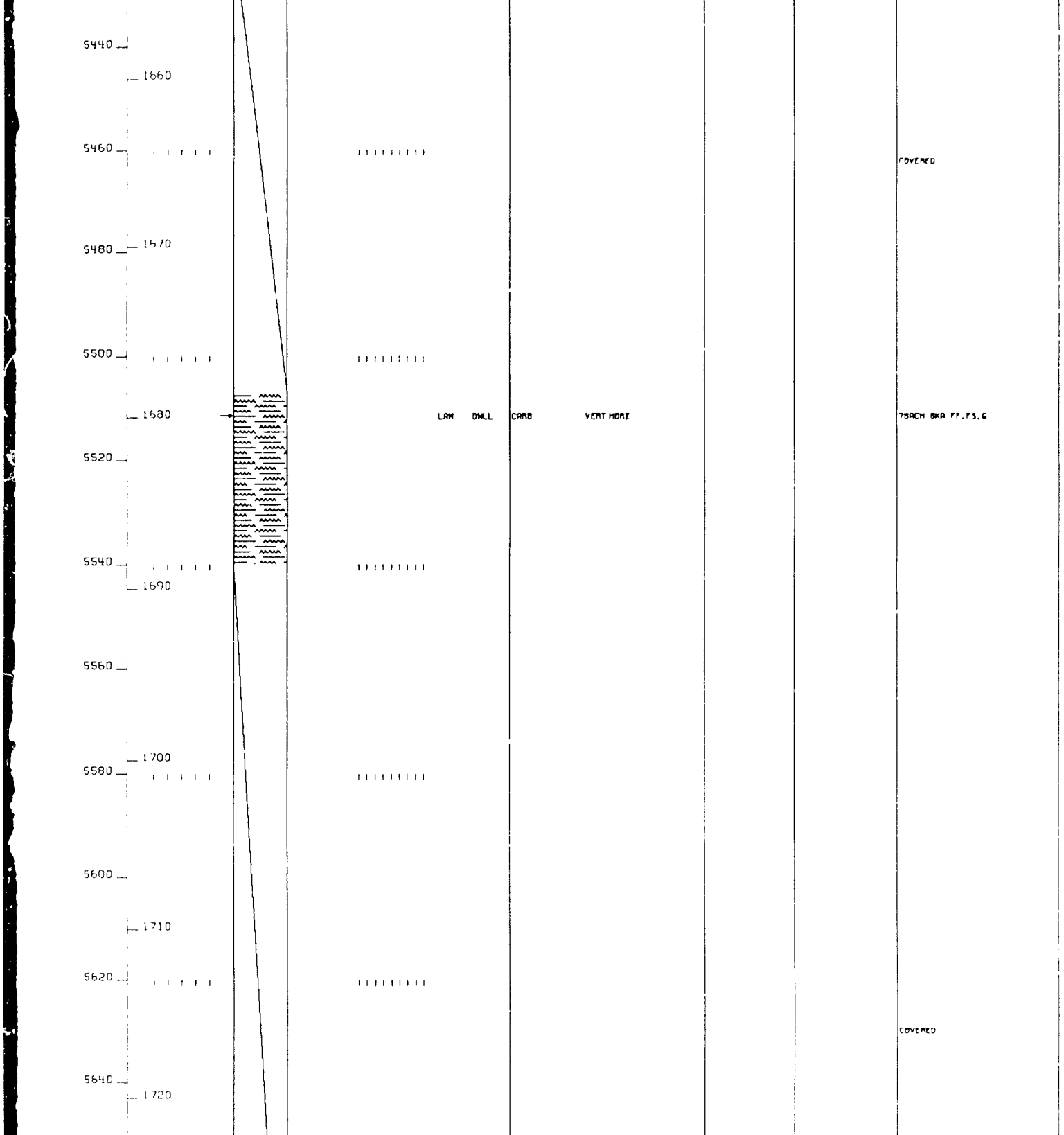
SEC 13, T6S, R14W
68°56'16"N 155°02'23"W

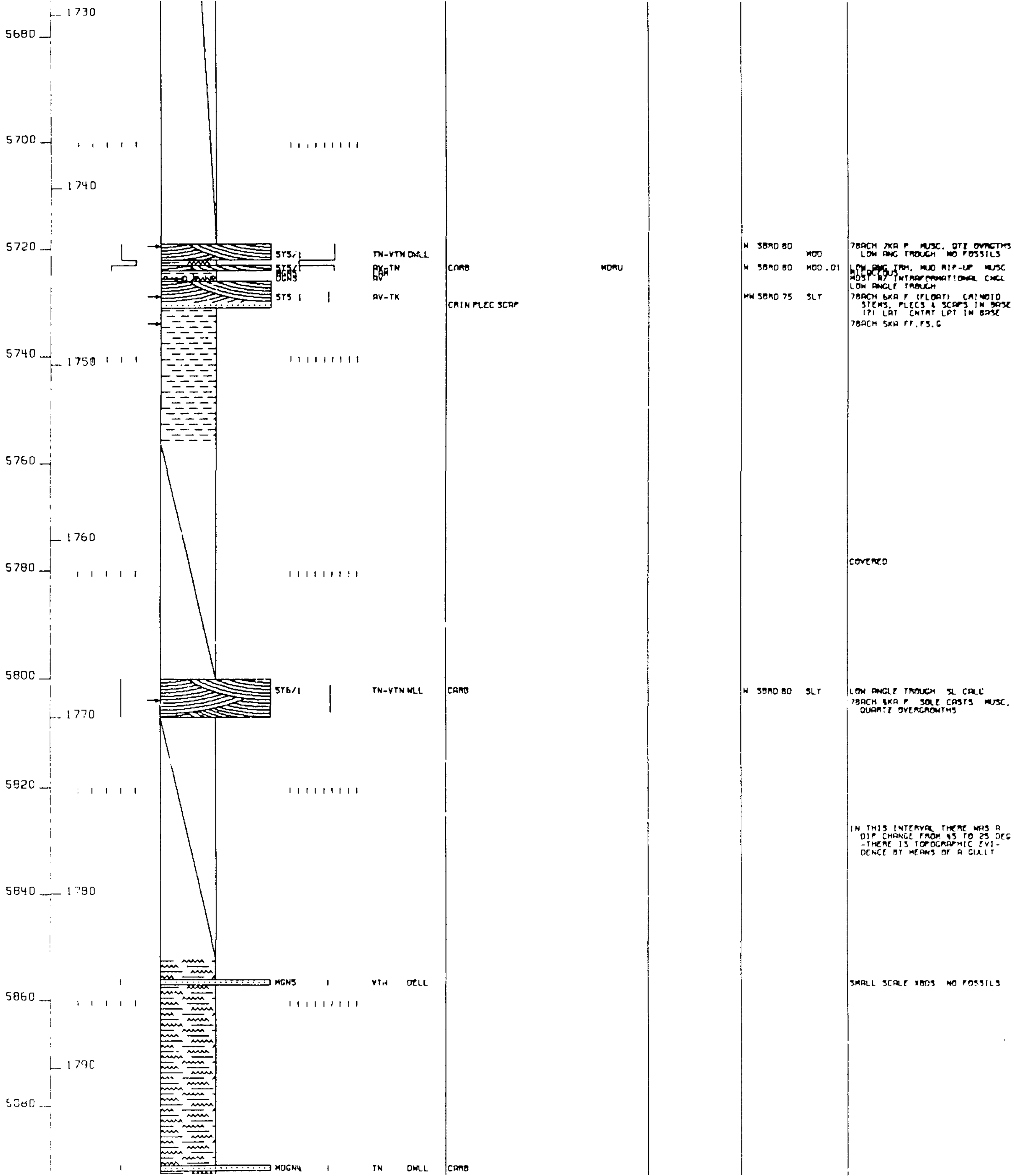
SEC 36, T6S, R14W
68°52'44"N 155°06'21"W

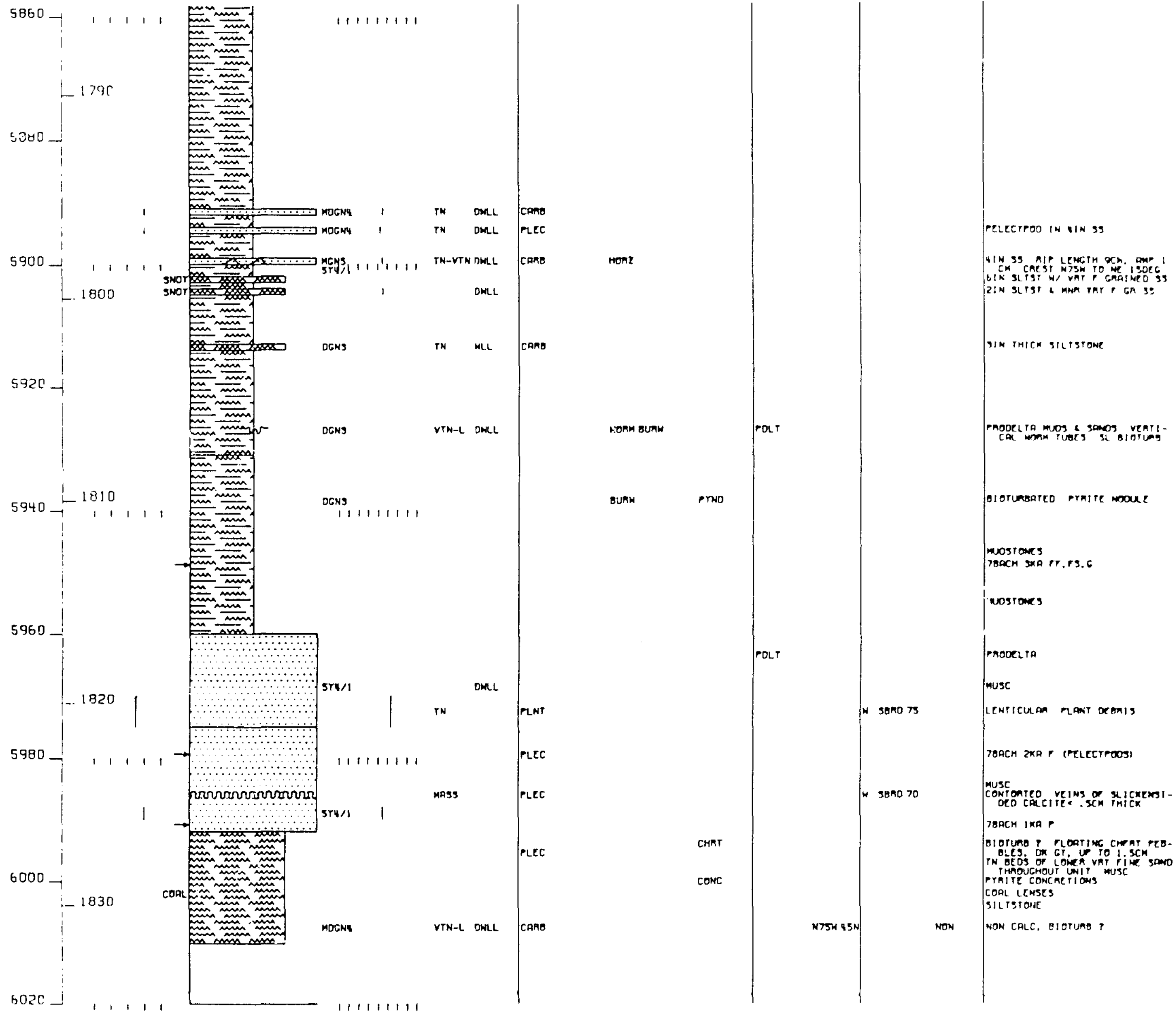




		5Y4/1	VTN	ELL	CARB				N 5BRD 75	SLT		MUSC SLIGHTLY CALCAREOUS
5200												
			MASS	CLL	PLEC							PELECYPODS
	1590											
5220		5Y4/1	MASS			WORM			MW 5BRD 75			WORM TUBES, VERT & HORZ LOW ANGLE TROUGH ?
		5Y6/1	AV-TN	E-CELL					MW 5BRD 75			NO FOSSILS MUSC
		5Y6/1	TK-AV	ELL			MDRU		MW 5BRD 75			DK GY MUD CHIP 3CM LONG 78ACH 12KA P NO FOSSILS
		5Y4/1	LAM	WLL	CARB							MOST BEDS ARE 6IN THICK
			VTN-L	ELL					MW 5BRD 75			NO FOSSILS
		5Y6/1	MASS	CELL								QUARTZ OVERGROWTHS
												CONTORTED AT BASE
							PYND		MW 5BRD 75			HEMATITE & LIMONITE STAINING
					PLEC							PELECYPOD ?
5240									MW 5BRD 75			VERT LOW ANGLE TROUGH
									MW 5BRD 75			VERT LOW ANGLE TROUGH
								DLFT				DELTA FRONT CLAY ON BDG PLANE
		MDGN4	VTN-L		SCAP				MW 5BRD 75			1FT VRT LOW ANG TROUGH BDS ALL FIT THIS DESCRIPTION MUSC
	1600											
									MW 5BRD 75			VRT LOW ANG TROUGH
				CELL					MW 5BRD 75			VRT LOW ANG TROUGH
		MGN5	TN-VTN	DELL					N 5BRD 75			LOW ANGLE TROUGH MUSC
		MDGN4										
5260												
		MDGN4	TN-VTN	DWLL	PLEC	HORZ	MDRU MDCH		MW 5BRD 75	MOD		MUD RIP-UPS, MUD CHIPS PELECYPOD, HORZ BURROWS IN FLOAT 78ACH 11KA P LOW ANG TROUGH
												LOW ANGLE TROUGH
5280	1610											
							MDRU					MUD RIP-UPS
												LOW ANGLE TROUGH
		5Y4/1	TN-VTN	DELL	CARB		BLAC		MW 5BRD 75	MOD		LOW ANG TROUGH CLAY BALLS CARB DEBRIS, RARE MUSC CALC
		MDGN4										MUD STRINGERS (INTERBEDS VTN-LAM, LOW ANGLE TROUGH, LOWER VERY FINE SAND)
5300		5Y8/1	TN-AV						N 5BAN 75			LOW ANGLE TROUGH NO FOSSILS
		MDGN4	VTN-L	DELL					MW 5BAN 70	SLT		LOW ANG TROUGH, NO FOS P EXP
		MDGN4		TNL LAM								SILTSTONE, FISSILE MUSC
	1620											
5320												
		GBN2			CARB							78ACH 10KA FF,FS,G CARBONACEOUS MATERIAL
		5Y5/1	TN-VTN	DWLL	CARB	VERT HORZ			N 5BRD 70	NON		LOW ANGLE TROUGH MUSC
5340											.01	78ACH 9KA P
												LOW ANGLE TROUGH
			TN		ORGN	VERT HORZ	MDRU		N 5BRD 70	SLT		MUD RIP-UPS BIOTURBATED
	1630											RUBBLE COVERED, NON-RESISTANT SLOPE PROBABLY MUDSTONE
		5Y6/1	TN-VTN	DELL	CARB				P 5BRD 70			LOW ANGLE TROUGH
5360												
			TN-VTN		CARB				P 5BRD 70			LOW ANGLE TROUGH CARB MAT ON BDG SURFACES QTZ OVERGROWTH
												LOW ANGLE TROUGH
5380	1640											
		5Y6/1	TN				CLRU		P 5BAN 70			CLAY RIP-UPS
												LOW ANGLE TROUGH
		5Y6/1	TN	DELL	PLNT				P 5BAN 75			PLANT DEBRIS
		5Y6/1	TN	DELL					N 5BAN 50			LOW ANGLE TROUGH
5400												
		5Y6/1	TN	DELL					MW 5BAN 70			


5440
1660
5460
COVERED
5480
1670
5500
5520
1680
LAM
DWLL
CARB
VERT HORZ
7BRCH BKR FF,FS,G
5540
1690
5560
5580
1700
5600
1710
5620
COVERED
5640
1720


5680
5700
5720
5740
5760
5780
5800
5820
5840
5860
5880
1730
1740
1750
1760
1770
1780
1790
5Y5/1
5Y5/
DGN3
5Y5 1
TN-VTN DWLL
AV-TN
AV
AV-TK
CARB
CRIN PLEC SCRP
MDRU
W 5BRD 80
MOD
W 5BRD 80 MOD .01
MW 5BRD 75 SLY
78ACH 7KA P MUSC. QTZ OVRGTHS
LOW ANG TROUGH NO FOSSILS
LOW ANG TRH, MUD RIP-UP MUSC
MOST W/ INTRAFORMATIONAL CNGL
LOW ANGLE TROUGH
78ACH 6KA F (FLOAT) CRINOID
STEMS, PLECS & SCRPS IN BASE
(?) LAT CNTRT LPT IN BASE
78ACH 5KA FF,F5,G
COVERED
5Y6/1
TN-VTN WLL
CARB
W 5BRD 80 SLY
LOW ANGLE TROUGH SL CALC
78ACH 4KA P SOLE CASTS MUSC,
QUARTZ OVERGROWTHS
IN THIS INTERVAL THERE WAS A
DIP CHANGE FROM 45 TO 25 DEG
-THERE IS TOPOGRAPHIC EVI-
DENCE BY MEANS OF A GULLY
MGN5
VTN DELL
SMALL SCALE XBDS NO FOSSILS
MDGN4
TN DWLL
CARB



5860
1790
5880
MDGN4 TN DWLL CARB
MDGN4 TN DWLL PLEC
PELECYPOD IN 4IN SS
5900
MGN5 TN-VTN DWLL CARB HORZ
4IN SS RIP LENGTH 9CM, AMP 1 CM CREST N75W TO NE 150DEG
SNOT 5Y4/1
6IN SLTST W/ VRY F GRAINED SS
1800
SNOT DWLL
2IN SLTST & MNR VRY F GR SS
DGN3 TN WLL CARB
3IN THICK SILTSTONE
5920
DGN3 VTN-L DWLL WORM BURW POLT
PRODELTA MUDS & SANDS VERTICAL WORM TUBES SL BIOTURB
1810
5940
DGN3 BURW PYND
BIOTURBATED PYRITE NODULE
MUDSTONES
78ACH 3KA FF,FS,G
MUDSTONES
5960
POLT
PRODELTA
5Y4/1 DWLL
MUSC
1820
TN PLNT N 38RD 75
LENTICULAR PLANT DEBRIS
5980
PLEC
78ACH 2KA F (PELECYPODS)
MUSC
MASS PLEC N 38RD 70
CONTORTED VEINS OF SLICKENSIDED CALCITE< .5CM THICK
5Y4/1
78ACH 1KA F
CHRT
PLEC
BIOTURB ? FLOATING CHERT PEBBLES, DK GY, UP TO 1.5CM
TN BEDS OF LOWER VRY FINE SAND THROUGHOUT UNIT MUSC
6000
CONC
PYRITE CONCRETIONS
COAL
COAL LENSES
1830
SILTSTONE
MDGN4 VTN-L DWLL CARB N75W 45N NON
NON CALC, BIOTURB ?
6020

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

and stratigraphic nomenclature. Use of trade names is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey

Open file report
OF 81-177
PLATE 11

MARMOT SYNCLINE

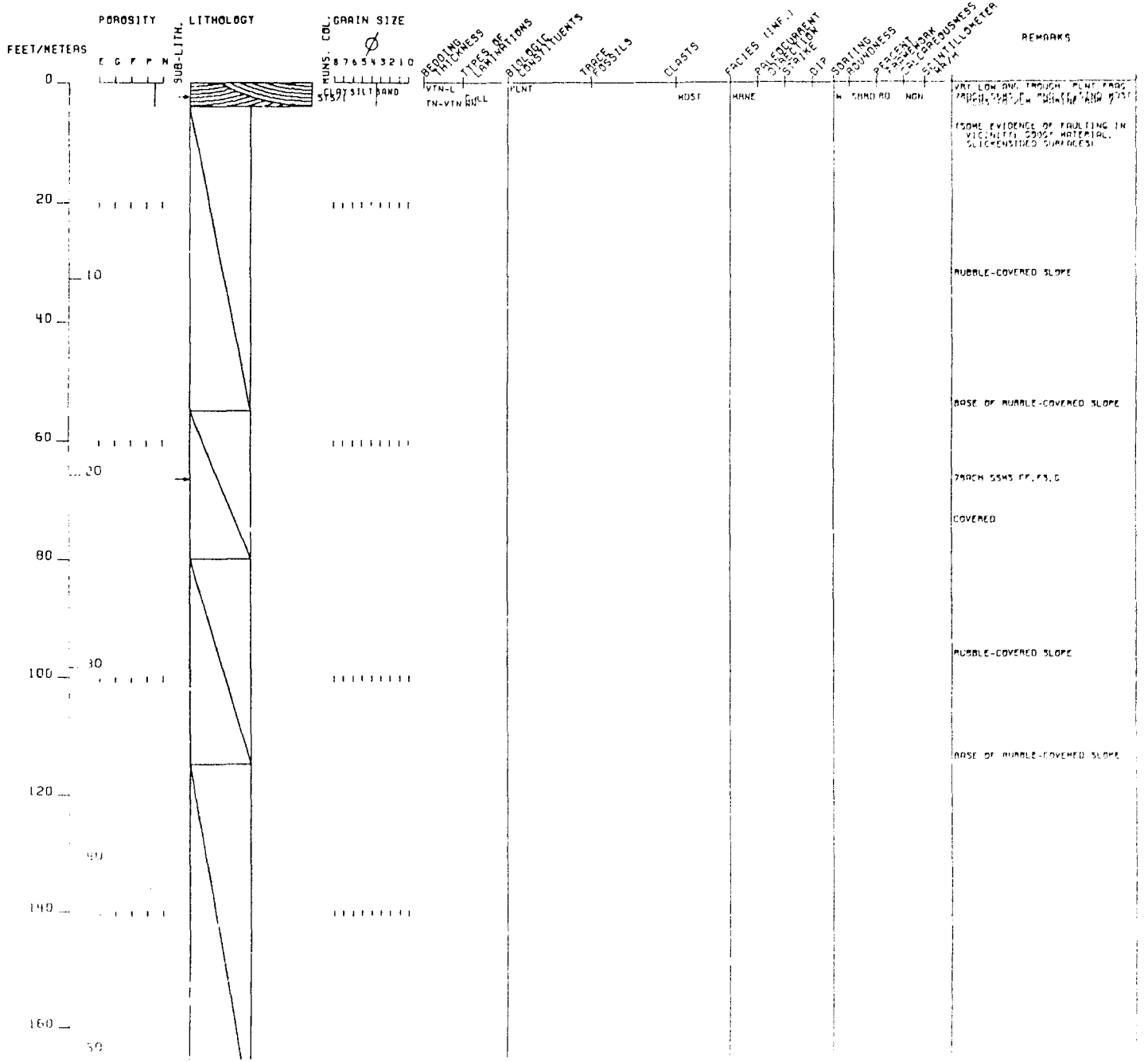
API NO. 50-203-[illegible]

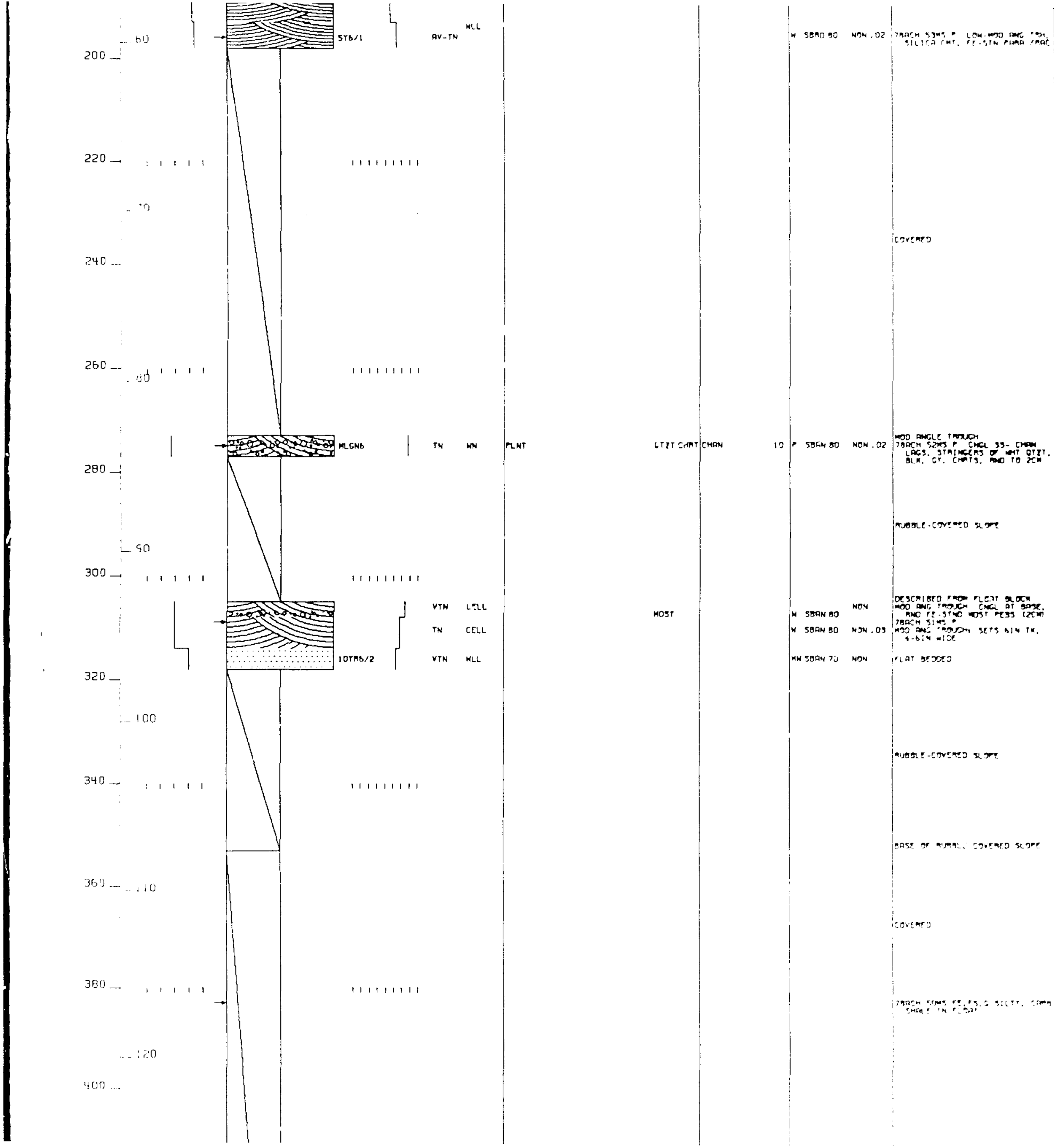
3,476 FT TOP
SEC 27, T8S, R13E
68°44'34"N 149°03'56"W

1 IN = 20 FT

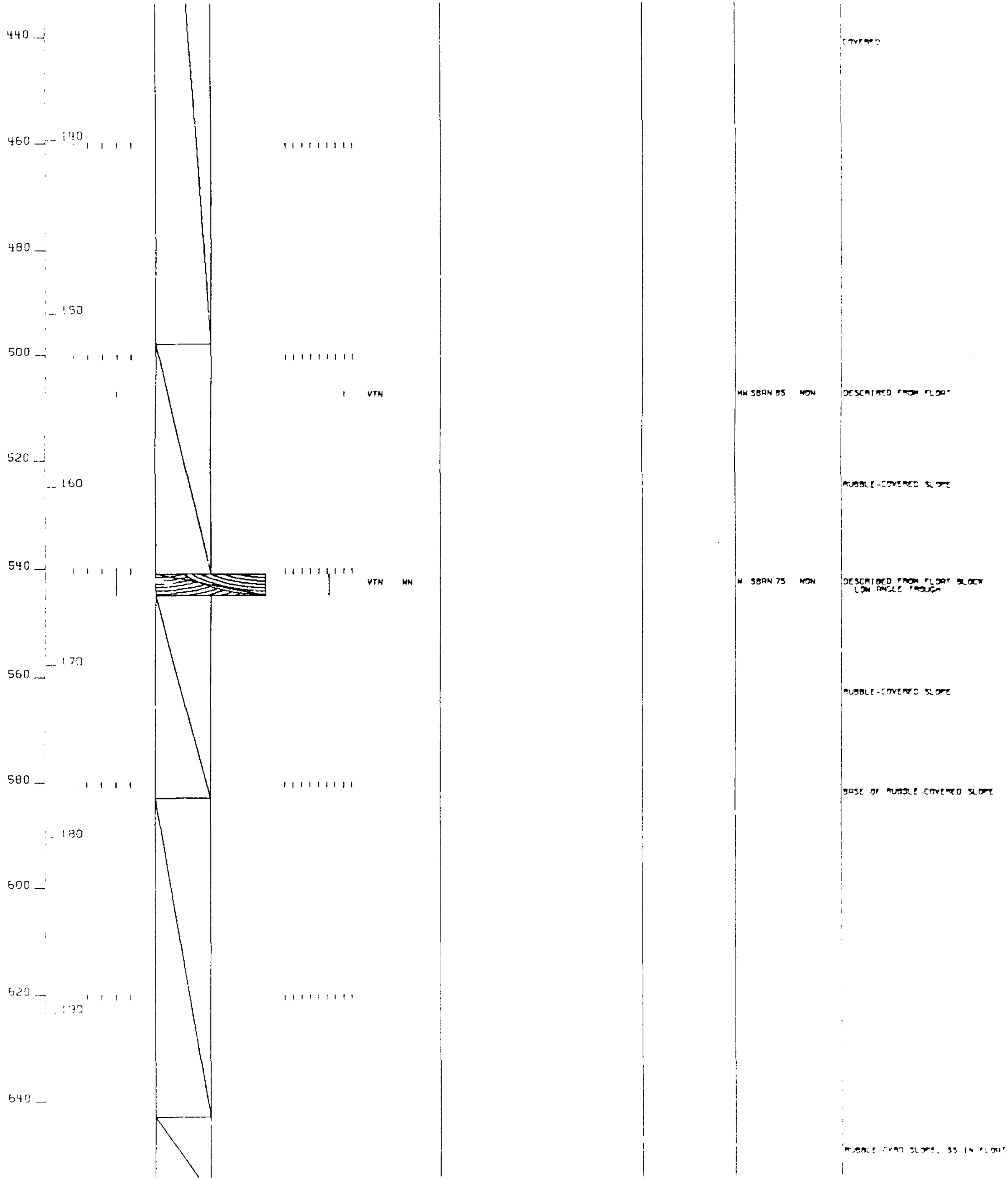
7/5/79

BASE
SEC 27, T8S, R13E
68°43'37"N 149°01'[illegible]"W

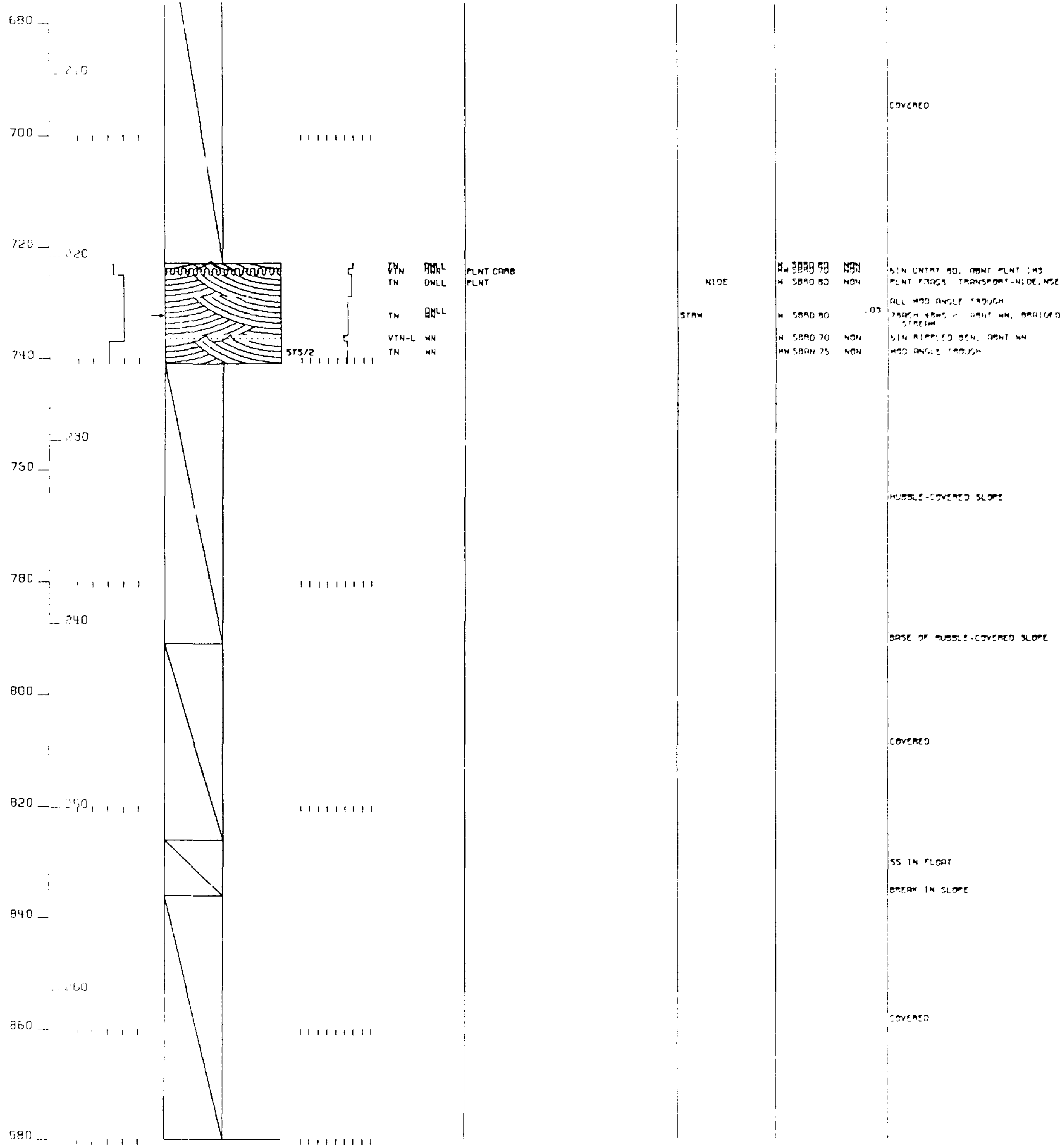




60
200
5Y6/1
AV-TN
WLL
W 58AD 80 NON .02
7BACH 53MS P LOW-MOD ANG TRH, SILICA CMT, FE-STN PARA /BAC
220
240
COVERED
260
80
MLGN6
TN
WN
PLNT
QTZT CHRT
CHAN
10
P 58AN 80 NON .02
MOD ANGLE TROUGH
7BACH 52MS P CHGL 33- CHAN LAGS, STRINGERS OF WHT QTZT, BLK, GY, CHRTS, AND TO 2CM
280
RUBBLE-COVERED SLOPE
90
300
VTN
CELL
MOST
W 58AN 80
NON
DESCRIBED FROM FLOAT BLOCK
MOD ANG TROUGH CNGL AT BASE, AND FE-STND MOST PEBS (2CM)
7BACH 51MS P
TN
CELL
W 58AN 80 NON .03
MOD ANG TROUGH, SETS 6IN TK, 4-6IN WIDE
10YR6/2
VTN
WLL
MW 58AN 70 NON
FLAT BEDDED
320
100
RUBBLE-COVERED SLOPE
340
BASE OF RUBBLE COVERED SLOPE
360
110
COVERED
380
7BACH 50MS FE-FS,G SILTY, COMM SHALE IN FLOAT
120
400



440
460
140
480
150
500
VTN
MW SBAN 85 MON
DESCRIBED FROM FLOAT
520
160
RUBBLE-COVERED SLOPE
540
VTN MN
W SBAN 75 MON
DESCRIBED FROM FLOAT BLOCK
LOW ANGLE TROUGH
170
560
RUBBLE-COVERED SLOPE
580
BASE OF RUBBLE-COVERED SLOPE
180
600
620
190
640


680
700
720
220
740
230
760
780
240
800
820
840
860
880
STS/2
TN DNLL PLNT CARB
TN DNLL PLNT
TN DNLL
VTN-L WN
TN WN
NIDE
STRM
H SBRD 70 NON
H SBRD 80 NON
H SBRD 80
.03
H SBRD 70 NON
MW SBRN 75 NON
COVERED
PLNT FRAGS TRANSPORT-NIDE, NSE
ALL MOD ANGLE TROUGH
SIN RIPPLED BEN, ABNT WN
MOD ANGLE TROUGH
RUBBLE-COVERED SLOPE
BASE OF RUBBLE-COVERED SLOPE
COVERED
SS IN FLOAT
BREAK IN SLOPE
COVERED

MARMOT SYNCLINE

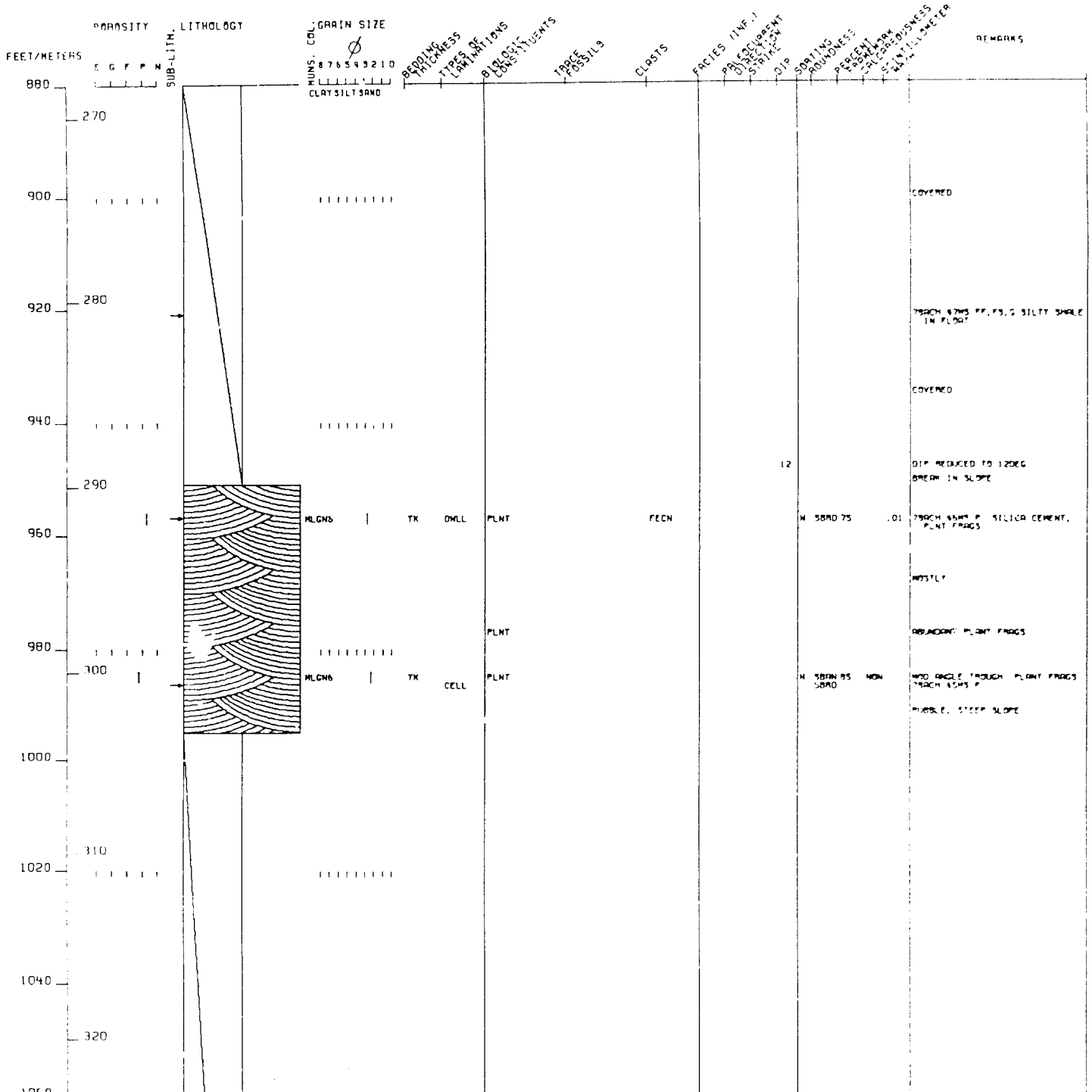
API NO. 50-203-90001

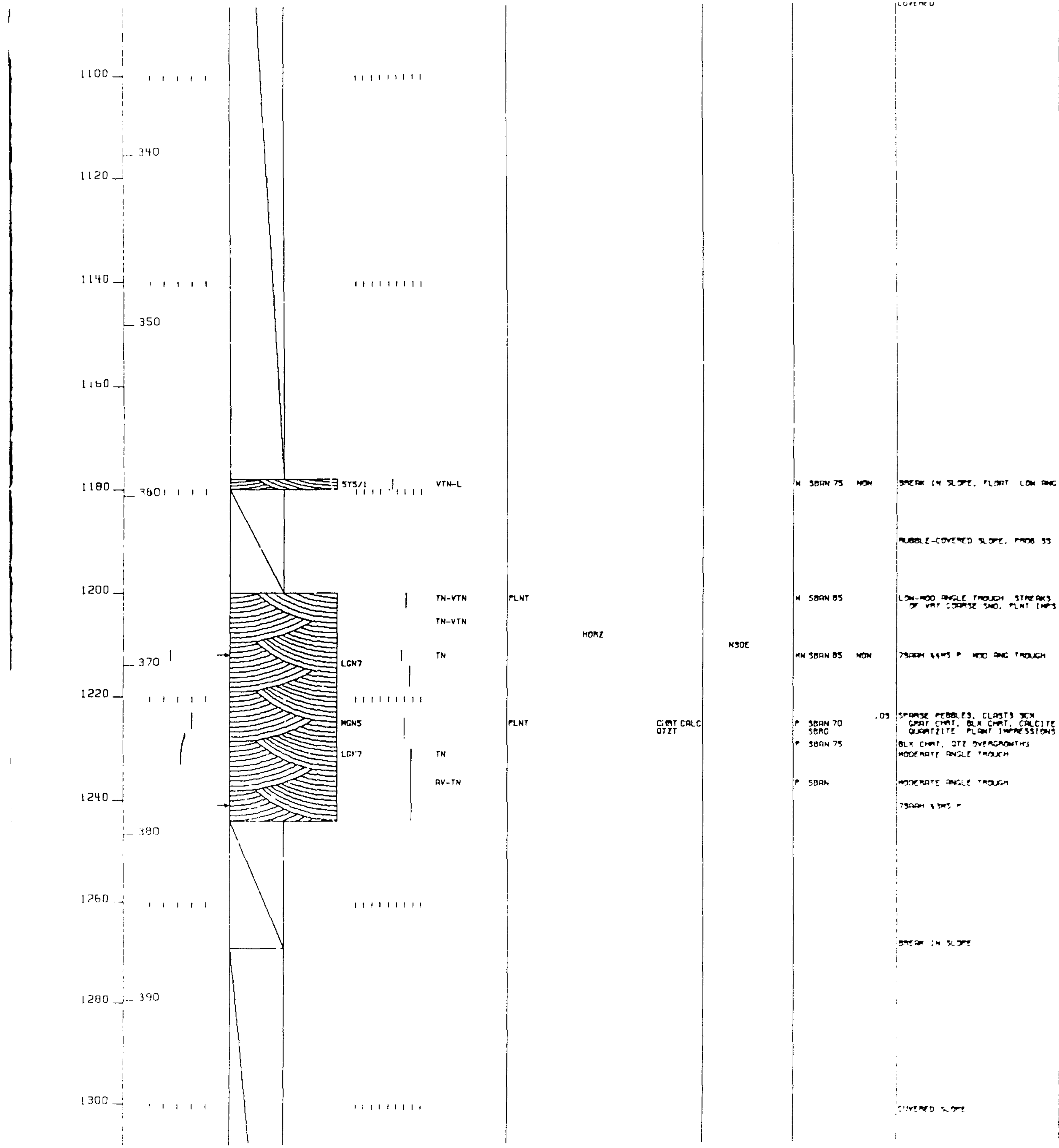
3,476 FT TOP SEC 27, T8S, R13E 68°44'34"N 149°03'56"W

1 IN = 20 FT

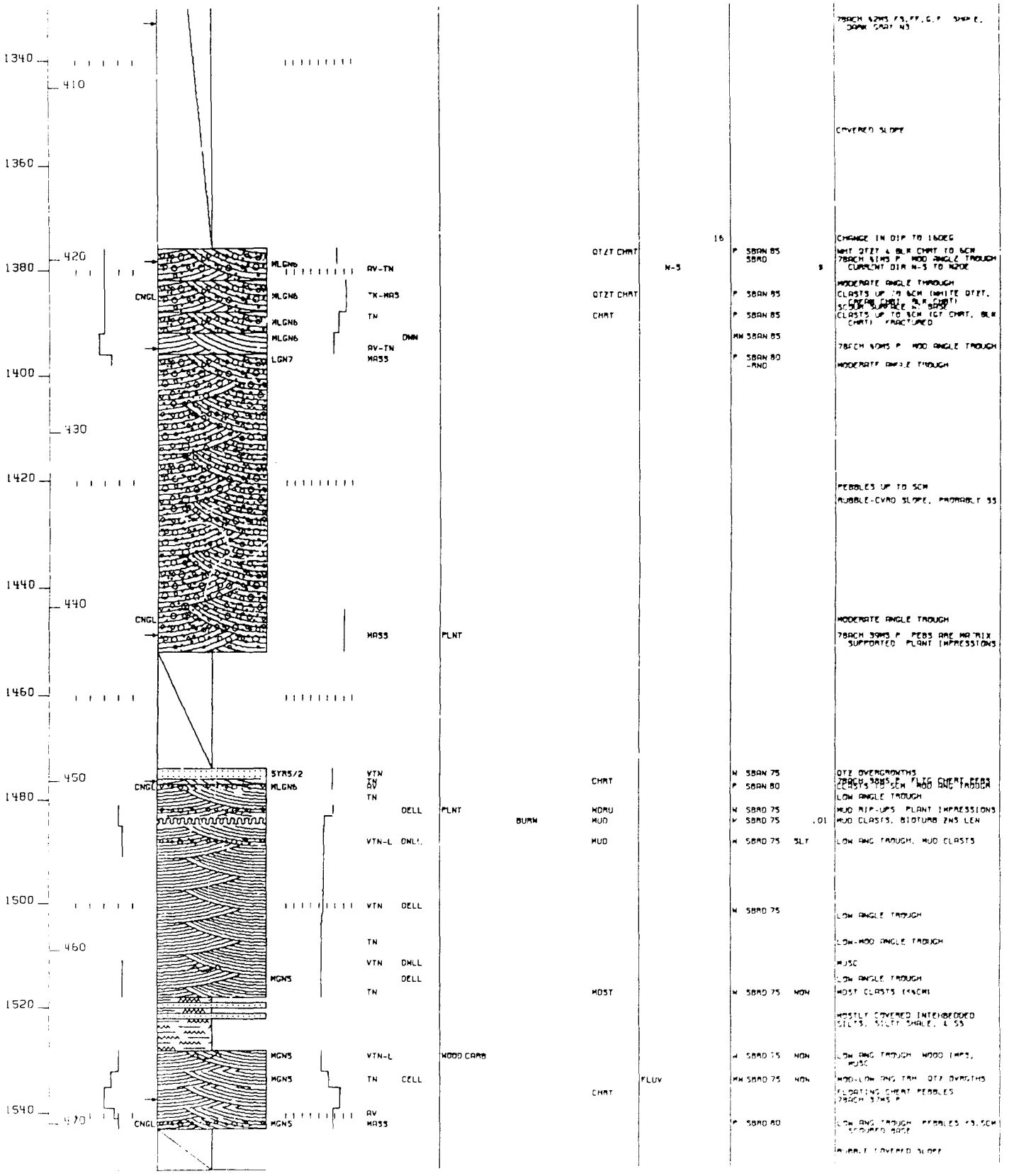
7/6/78

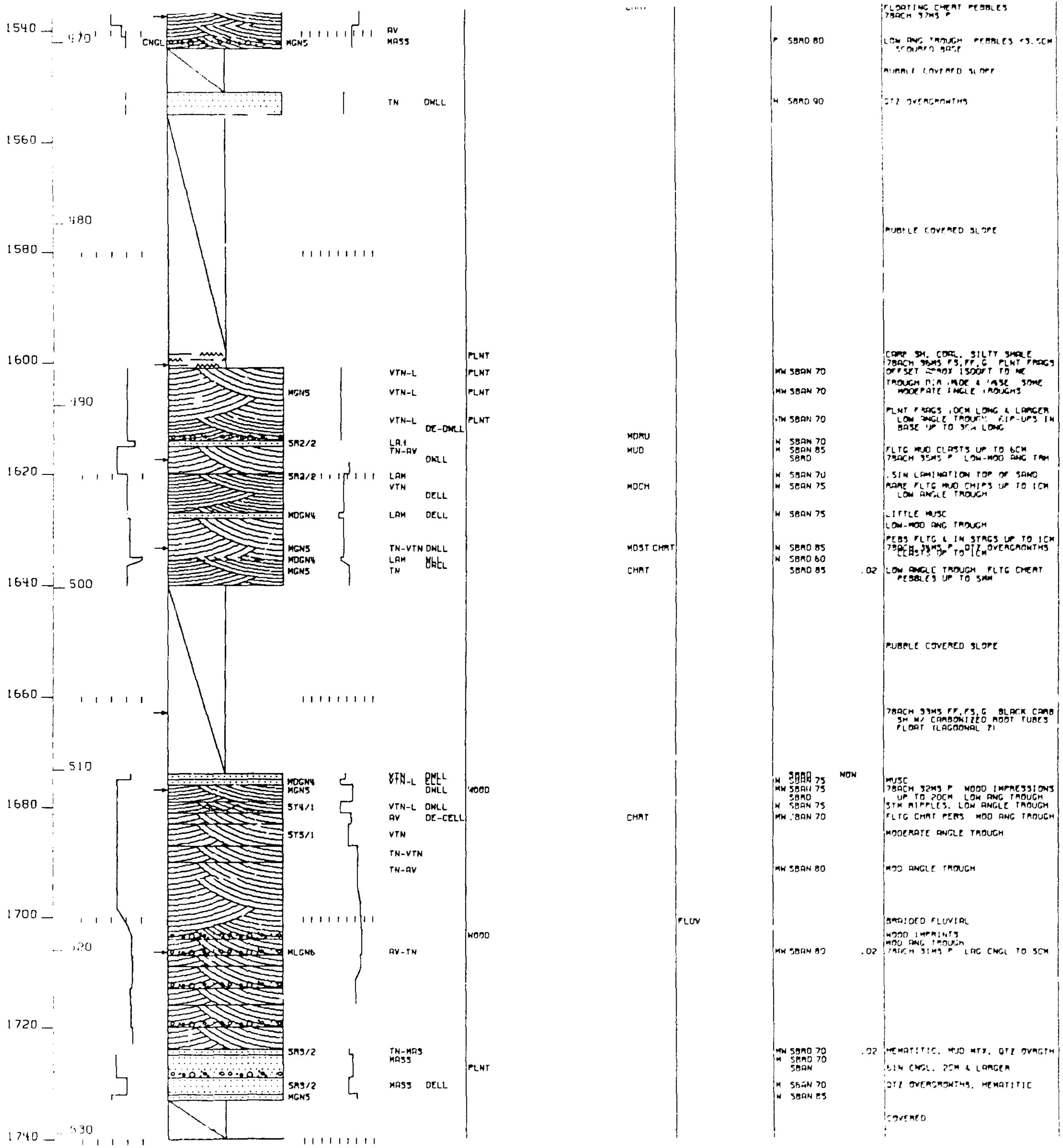
BASE SEC 27, T8S, R13E 68°43'37"N 149°01'11"W





1100
340
1120
1140
350
1160
1180
360
5Y5/1
VTN-L
H 5BAN 75 NON
BREAK IN SLOPE. FLOAT LOW ANG
RUBBLE-COVERED SLOPE. PROB SS
1200
TN-VTN
PLNT
H 5BAN 85
LOW-MOD ANGLE TROUGH STREAKS OF VRY COARSE SND. PLNT IMPS
TN-VTN
HORZ
N30E
370
LGN7
TN
HN 5BAN 85 NON
MOD ANG TROUGH
1220
MGN5
PLNT
CHRT CALC QTZT
.09
P 5BAN 70 5BRO
SPARSE PEBBLES. CLASTS 3CM GRAY CHRT. BLK CHRT. CALCITE QUARTZITE PLANT IMPRESSIONS
P 5BAN 75
BLK CHRT. QTZ OVERGROWTHS
LGN7
TN
MODERATE ANGLE TROUGH
AV-TN
P 5BAN
MODERATE ANGLE TROUGH
1240
380
1260
BREAK IN SLOPE
1280
390
1300
COVERED SLOPE


1340
410
1360
420
1380
430
1400
1420
440
1440
450
1460
1480
460
1500
1520
470
1540
CNGL
MLGN6
MLGN6
MLGN6
MLGN6
LGN7
MGN5
MGN5
MGN5
MGN5
SYR5/2
MLGN6
CNGL
CNGL
CNGL
RV-TN
TK-MAS
TN
RV-TN
MASS
VTN
IN
AV
TN
VTN
VTN-L
VTN
TN
VTN
DELL
TN
VTN-L
TN
RV
MASS
DWN
DELL
DWLL
DELL
DELL
CELL
QTZT CHRT
QTZT CHRT
CHRT
CHRT
CHRT
MDRU
MUD
MUD
MOST
FLNT
FLNT
WOOD CARB
BURN
N-S
FLUV
16
P SBAN 85
SBRD
P SBAN 85
P SBAN 85
MW SBAN 85
P SBAN 80
-RNO
W SBAN 75
P SBAN 80
W SBRD 75
W SBRD 75 .01
W SBRD 75 SLT
W SBRD 75
W SBRD 75 NON
W SBRD 75 NON
MW SBRD 75 NON
P SBRD 80
78BCH 62MS FS,FF,G,P SHEP E, DARK GRAY N3
COVERED SLOPE
CHANGE IN DIP TO 160EG
WHT QTZT & BLK CHRT TO 6CM
78BCH 51MS P MOD ANGLE TROUGH CURRENT DIR N-S TO N20E
MODERATE ANGLE TROUGH
CLASTS UP TO 6CM (WHITE QTZT, GREEN ARGL, BLK CHRT)
SCOUR SURFACE AT BASE
CLASTS UP TO 9CM (GY CHRT, BLK CHRT) FRACTURED
78FCM 40MS P MOD ANGLE TROUGH
MODERATE ANGLE TROUGH
PEBBLES UP TO 5CM
RUBBLE-COVRD SLOPE, PROBABLY SS
MODERATE ANGLE TROUGH
78BCM 39MS P PEBS ARE MATRIX SUPPORTED PLANT IMPRESSIONS
QTZ OVERGROWTHS
78BCM 38MS P FLTC CHERT PEBS
CLASTS TO 5CM MOD ANG TROUGH
LOW ANGLE TROUGH
MUD RIP-UPS PLANT IMPRESSIONS
MUD CLASTS, BIOTURB 2MS LEN
LOW ANG TROUGH, MUD CLASTS
LOW ANGLE TROUGH
LOW-MOD ANGLE TROUGH
MUSC
LOW ANGLE TROUGH
MOST CLASTS (<4CM)
MOSTLY COVERED INTERBEDDED SILTS, SILTY SHALE, & SS
LOW ANG TROUGH WOOD FRFS, MUSC
MOD-LOW ANG TRH QTZ OVRGTHS
FLOATING CHERT PEBBLES
78BCM 37MS P
LOW ANG TROUGH PEBBLES <3.5CM SCOURED BASE
RUBBLE COVERED SLOPE



1540
470
CNGL
MGNS
AV
MASS
TN DWLL
1560
480
1580
1600
1620
1640
500
1660
510
1680
1700
520
1720
1740
530
MGNS
SA2/2
SA2/2
MOGN4
MGNS
MOGN4
MGNS
VTN-L
VTN-L
VTN-L
DE-DWLL
LAM
TN-AV
DWLL
LAM
VTN
DELL
LAM DELL
TN-VTN DWLL
LAM
TN
PLNT
MGNS
MOGN4
MGNS
ST4/1
ST5/1
VTN-L DWLL
AV DE-CELL
VTN
TN-VTN
TN-AV
MLGN6
AV-TN
WOOD
SA3/2
TN-MAS
MASS
SA3/2
MASS DELL
MGNS
MORU
MUD
MOCM
MOST CHRT
CHRT
CHRT
FLUV
P SBRD 80
M SBRD 90
MW SBAN 70
MW SBAN 70
MW SBAN 70
M SBAN 70
M SBAN 85
SBRD
M SBAN 70
M SBAN 75
M SBAN 75
M SBRD 85
M SBRD 60
SBRD 85 .02
SBRD
M SBAN 75
MW SBAN 75
SBRD
M SBAN 75
MW SBAN 70
NON
MW SBAN 80
MW SBAN 80 .02
MW SBRD 70 .02
M SBRD 70
SBAN
M SBAN 70
M SBAN 85
FLOATING CHERT PEBBLES
78ACH 37MS P
LOW ANG TROUGH PEBBLES <3.5CM
SCOURED BASE
RUBBLE COVERED SLOPE
QTZ OVERGROWTHS
RUBBLE COVERED SLOPE
CARB SH, COAL, SILTY SHALE
78ACH 36MS FS,FF,G PLNT FRAGS
OFFSET APROX 1500FT TO NE
TROUGH DIR MODE 4 /45E SOME
MODERATE ANGLE TROUGHS
PLNT FRAGS 10CM LONG & LARGER
LOW ANGLE TROUGH RIP-UPS IN
BASE UP TO 3CM LONG
FLTG MUD CLASTS UP TO 6CM
78ACH 35MS P LOW-MOD ANG TAM
.5IN LAMINATION TOP OF SAND
RARE FLTG MUD CHIPS UP TO 1CM
LOW ANGLE TROUGH
LITTLE MUSC
LOW-MOD ANG TROUGH
PEBS FLTG & IN STRGS UP TO 1CM
78ACH 34MS P QTZ OVERGROWTHS
CLASTS UP TO 1CM
LOW ANGLE TROUGH FLTG CHERT
PEBBLES UP TO 5MM
RUBBLE COVERED SLOPE
78ACH 33MS FF,FS,G BLACK CARB
SH W/ CARBONIZED ROOT TUBES
FLOAT (LAGOONAL ?)
MUSC
78ACH 32MS P WOOD IMPRESSIONS
UP TO 20CM LOW ANG TROUGH
SYM RIPPLES, LOW ANGLE TROUGH
FLTG CHRT PEBS MOD ANG TROUGH
MODERATE ANGLE TROUGH
MOD ANGLE TROUGH
BRAIDED FLUVIAL
WOOD IMPRINTS
MOD ANG TROUGH
78ACH 31MS P LRG CNGL TO 5CM
HEMATITIC, MUD MTX, QTZ OVRGTH
.5IN CNGL, 2CM & LARGER
QTZ OVERGROWTHS, HEMATITIC
COVERED

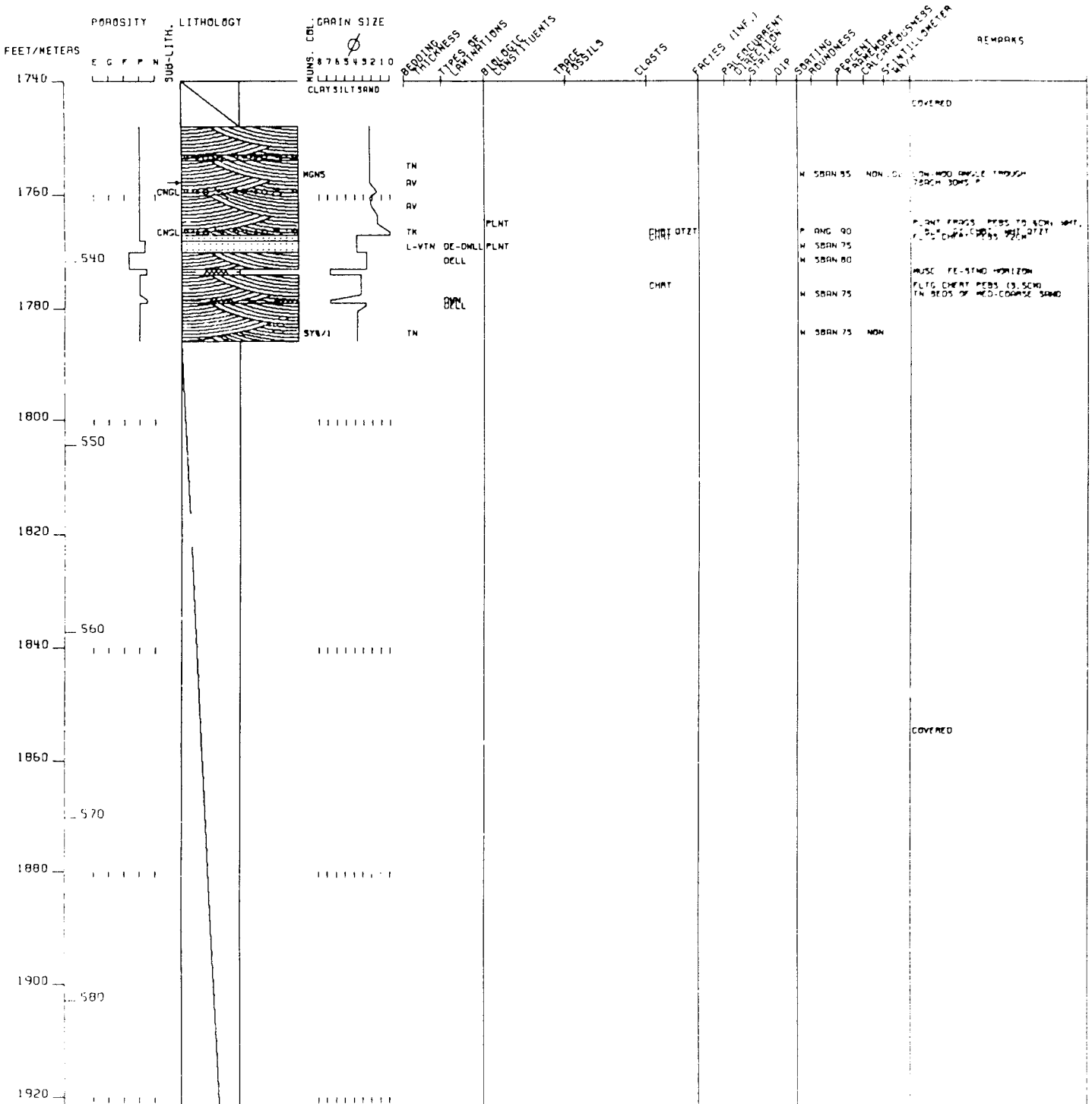
MARMOT SYNCLINE

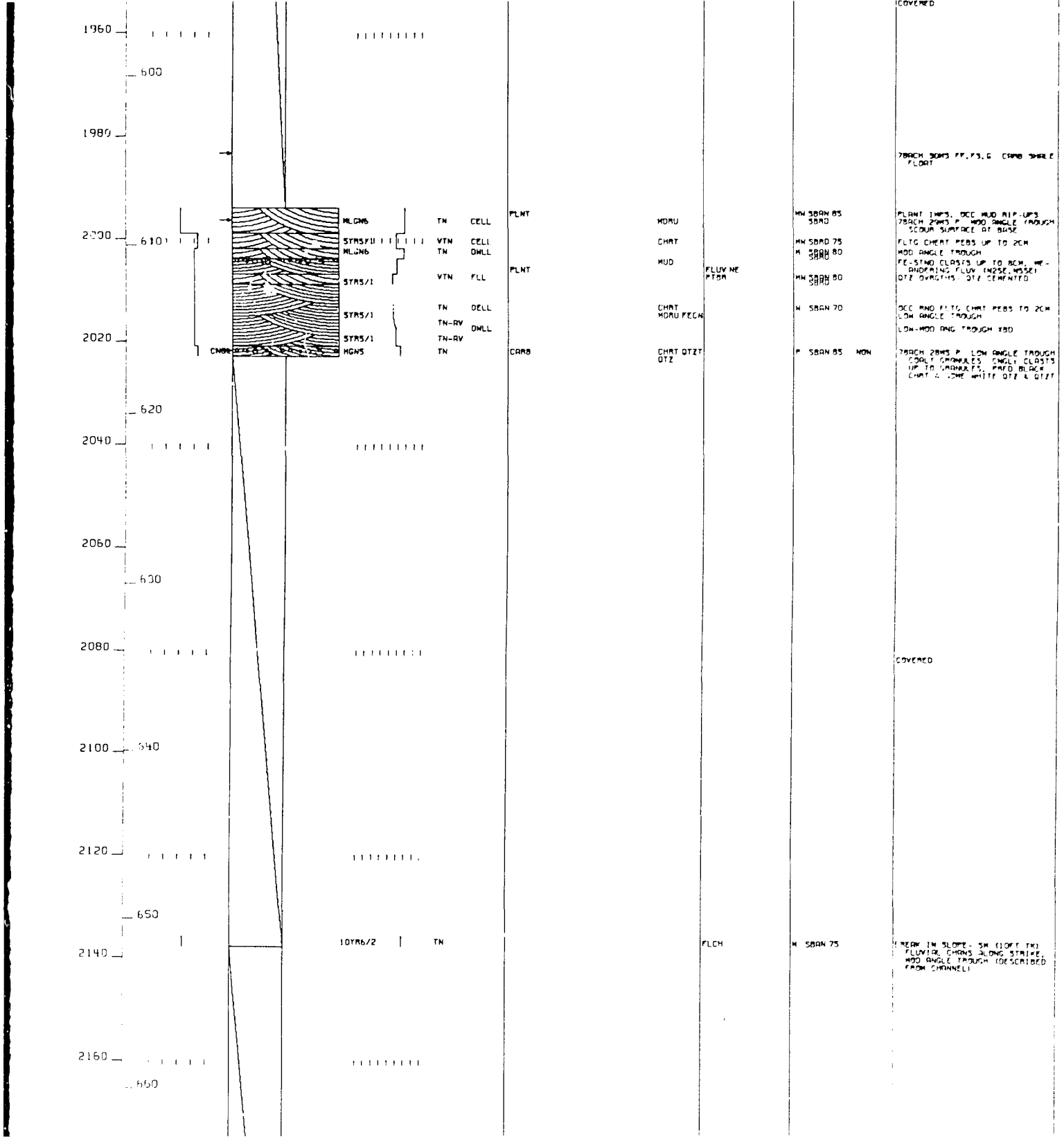
API NO. 50-203-90001

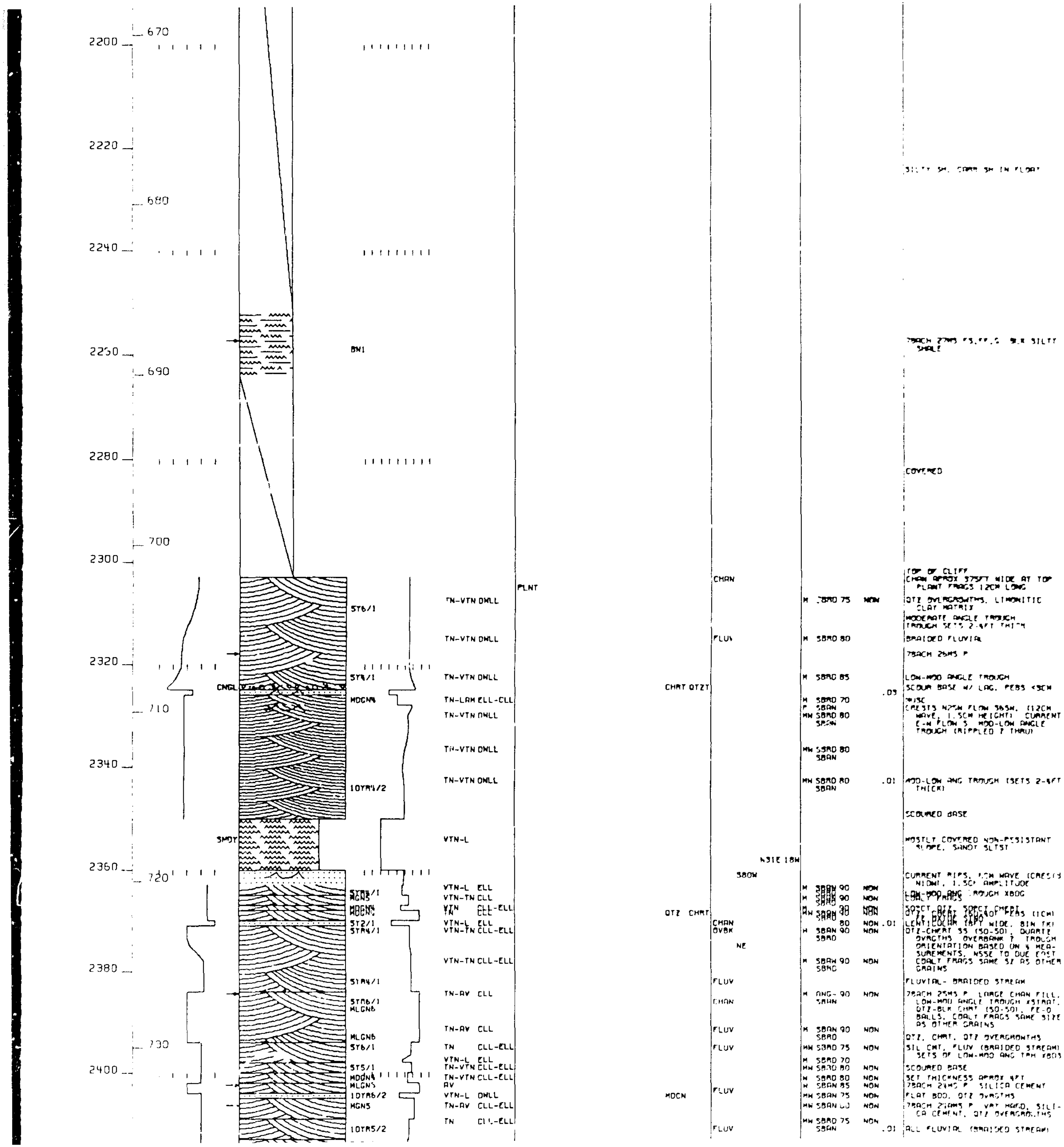
3,476 FT TOP — 1 IN = 20 FT — 7/6/78 BASE

SEC 27, T8S, R13E
68°44'34"N 149°03'56"W

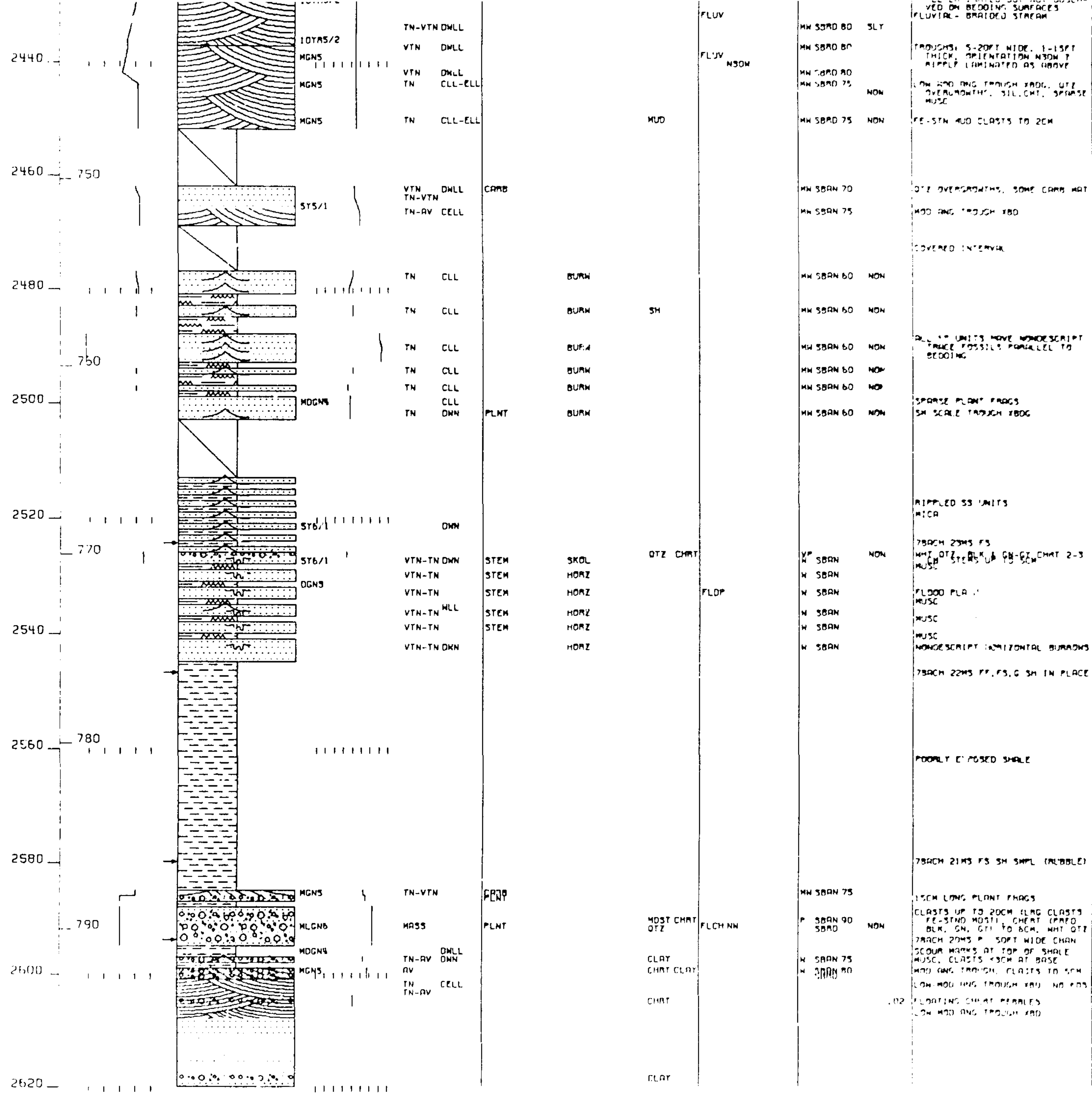
SEC 27, T8S, R13E
68°43'37"N 149°01'11"W




1960
600
1980
2000
610
2020
620
2040
2060
630
2080
2100
640
2120
650
2140
2160
660
MLGN6
STR5/1
MLGN6
STR5/1
STR5/1
CNGL
MGN5
10YR6/2
TN
CELL
VTN
CELL
TN
OWLL
VTN
FLL
TN
DELL
TN-RV
OWLL
TN-RV
TN
PLNT
PLNT
CARB
FLCH
MDRU
CHRT
MUD
CHRT
MDRU FECM
CHRT QTZT
QTZ
FLUV NE
FTBA
MW SBAN 85
SBRD
MW SBRD 75
M SBAN 80
SBRD
MW SBAN 80
SBRD
W SBAN 70
P SBAN 85 NON
M SBAN 75
COVERED
78ACM 30M3 FF,F3,G CARB SHALE
FLOAT
PLANT IMPS, OCC MUD RIP-UPS
78ACM 20M3 P MOD ANGLE TROUGH
SCOUR SURFACE AT BASE
FLTG CHERT PEBS UP TO 2CM
MOD ANGLE TROUGH
FE-STND CLASTS UP TO 8CM, IMBRICATING FLUV (N25E,N55E)
QTZ OVRGTHS, QTZ CEMENTED
OCC AND FLTG CHERT PEBS TO 2CM
LOW ANGLE TROUGH
LOW-MOD ANG TROUGH XBD
78ACM 28M3 P LOW ANGLE TROUGH
COALY GRANULES, CHGLY CLASTS
UP TO GRANULES, PARTD BLACK
CHART & SOME WHITE QTZ & QTZT
COVERED
REAK IN SLOPE- SH (LOFT TK)
FLUVIAL CHANS ALONG STRIKE,
MOD ANGLE TROUGH (DESCRIBED
FROM CHANNEL)



2200
2220
2240
2250
2280
2300
2320
2340
2360
2380
2400
670
680
690
700
710
720
730
BN1
COVERED
TOP OF CLIFF
BRAIDED FLUVIAL
LOW-MOD ANGLE TROUGH
SCOURED BASE
MOSTLY COVERED NON-RESISTANT SLOPE, SANDY SLTST
FLUVIAL- BRAIDED STREAM
QTZ, CHRT, QTZ OVERGROWTHS
SCOURED BASE
78ACH 21HS P SILICA CEMENT
ALL FLUVIAL (BRAIDED STREAM)



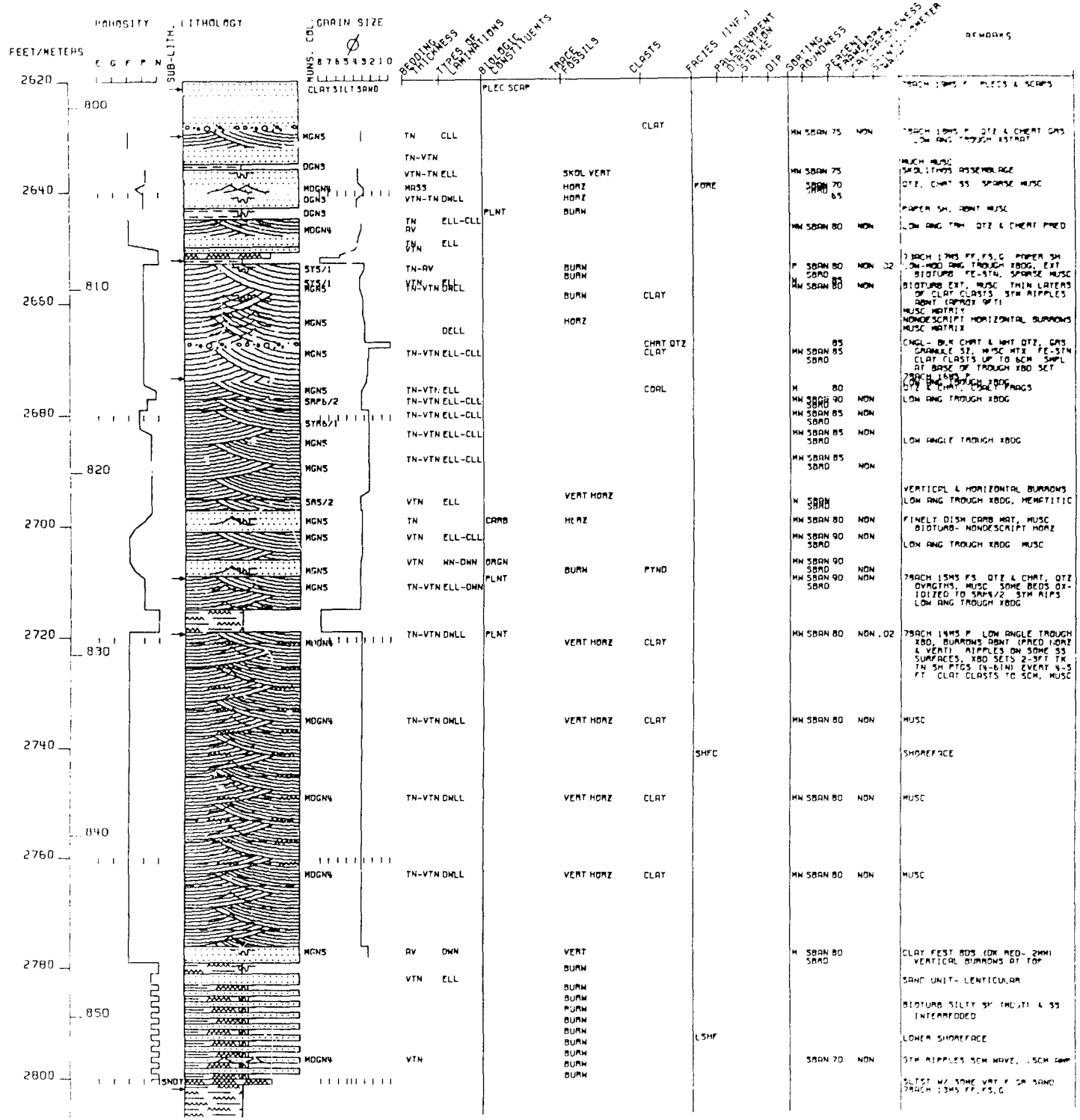
2440
2460
750
2480
760
2500
2520
770
2540
2560
780
2580
790
2600
2620
10YR5/2
MGN5
MGN5
MGN5
5Y5/1
MDGN5
5Y6/1
5Y6/1
OGN5
MGN5
MLGN6
MDGN4
MGN5
TN-VTN DWLL
VTN DWLL
VTN DWLL
TN CLL-ELL
TN CLL-ELL
VTN DWLL
TN-VTN
TN-AV CELL
TN CLL
TN CLL
TN CLL
TN CLL
TN CLL
CLL
TN DWN
DWN
VTN-TN DWN
VTN-TN
VTN-TN
VTN-TN WLL
VTN-TN
VTN-TN DWN
TN-VTN
MASS
DWLL
TN-AV DWN
AV
TN CELL
TN-AV
CARB
PLNT
STEM
STEM
STEM
STEM
STEM
PLNT
BURW
BURW
BURW
BURW
BURW
BURW
SKOL
HORZ
HORZ
HORZ
HORZ
HORZ
MUD
SH
QTZ CHRT
MOST CHRT
QTZ
CLAY
CHRT CLAY
CHRT
CLAY
FLUV
FLUV
N30W
FLDP
FLCH NW
MW SBRD 80 SLY
MW SBRD 80
MW SBRD 80
MW SBRD 75 NON
MW SBRD 75 NON
MW SBAN 70
MW SBAN 75
MW SBAN 60 NON
MW SBAN 60 NON
MW SBAN 60 NON
MW SBAN 60 NON
MW SBAN 60 NO
MW SBAN 60 NON
VP W SBAN NON
W SBAN
W SBAN
W SBAN
W SBAN
W SBAN
MW SBAN 75
P SBAN 90
SBRD NON
W SBAN 75
W SBRD 80
.02
VED ON BEDDING SURFACES
FLUVIAL- BRAIDED STREAM
TROUGHS: 5-20FT WIDE, 1-15FT THICK, ORIENTATION N30W 7 RIPPLE LAMINATED AS ABOVE
LOW MOD ANG TROUGH XBDG, QTZ OVERGROWTHS, SIL.CHT, SPARSE MUSC
FE-STN MUD CLASTS TO 2CM
QTZ OVERGROWTHS, SOME CARB MAT
MOD ANG TROUGH XBD
COVERED INTERVAL
ALL ... UNITS HAVE NONDESCRIPT TRACE FOSSILS PARALLEL TO BEDDING
SPARSE PLANT FRAGS
SM SCALE TROUGH XBDG
RIPPLED SS UNITS
MICA
78ACM 23MS FS
WHT QTZ, BLK & GN-GY CHRT 2-3 CM STEMS UP TO 5CM
MUSC
FLOOD PLA...
MUSC
MUSC
MUSC
NONDESCRIPT HORIZONTAL BURROWS
78ACM 22MS FF,FS,G SH IN PLACE
POORLY EXPOSED SHALE
78ACM 21MS FS SH SMPL (RUBBLE)
15CM LONG PLANT FRAGS
CLASTS UP TO 20CM (LRG CLASTS FE-STND MOST), CHERT (PRED BLK, GN, GY) TO 6CM, WHT QTZ
78ACM 20MS P 50FT WIDE CHAN
SCOUR MARKS AT TOP OF SHALE
MUSC, CLASTS <3CM AT BASE
MOD ANG TROUGH, CLASTS TO 5CM
LOW-MOD ANG TROUGH XBD, NO FOS
FLOATING CHERT PEBBLES
LOW MOD ANG TROUGH XBD

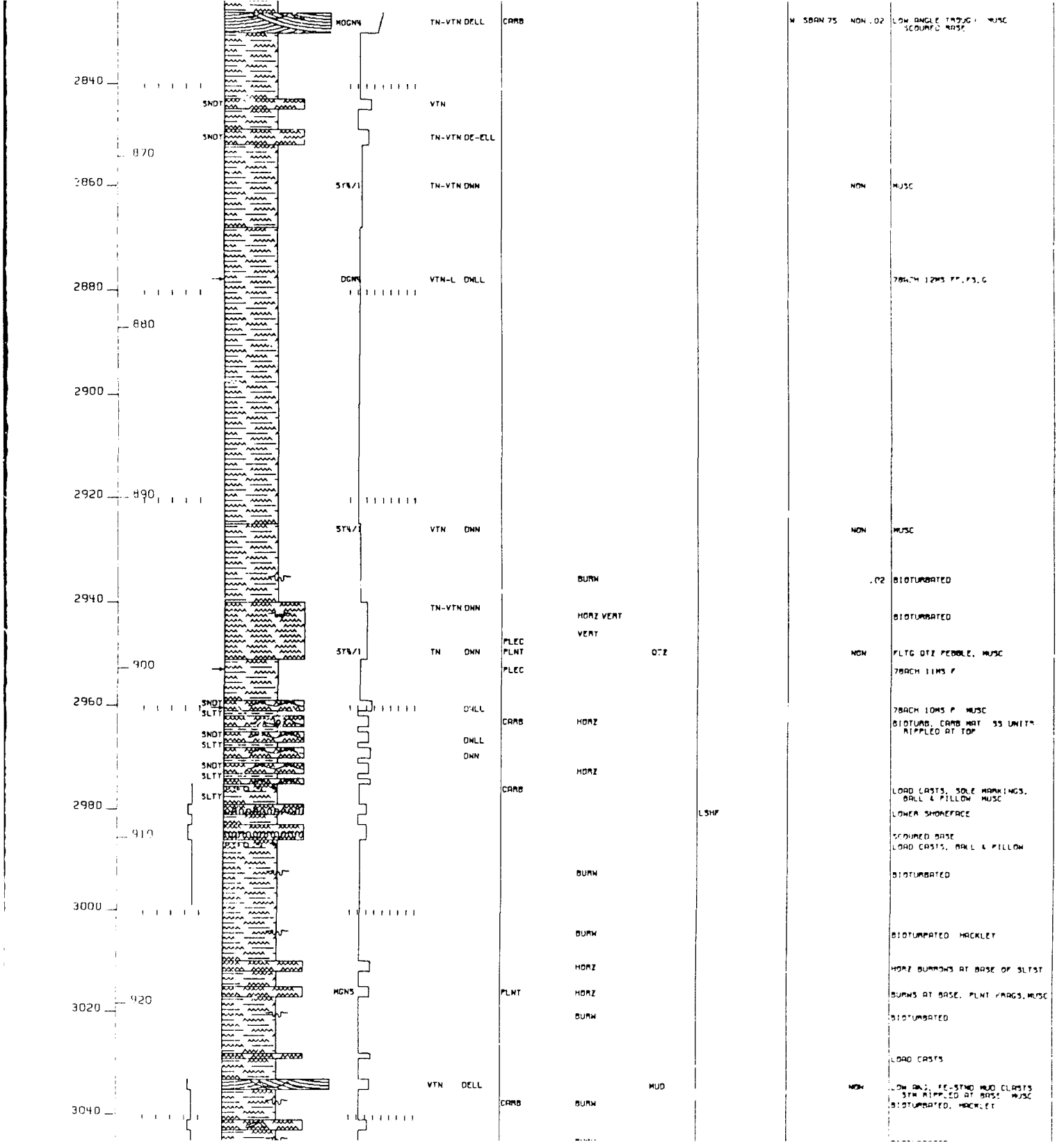
API NO. 50-203-90001

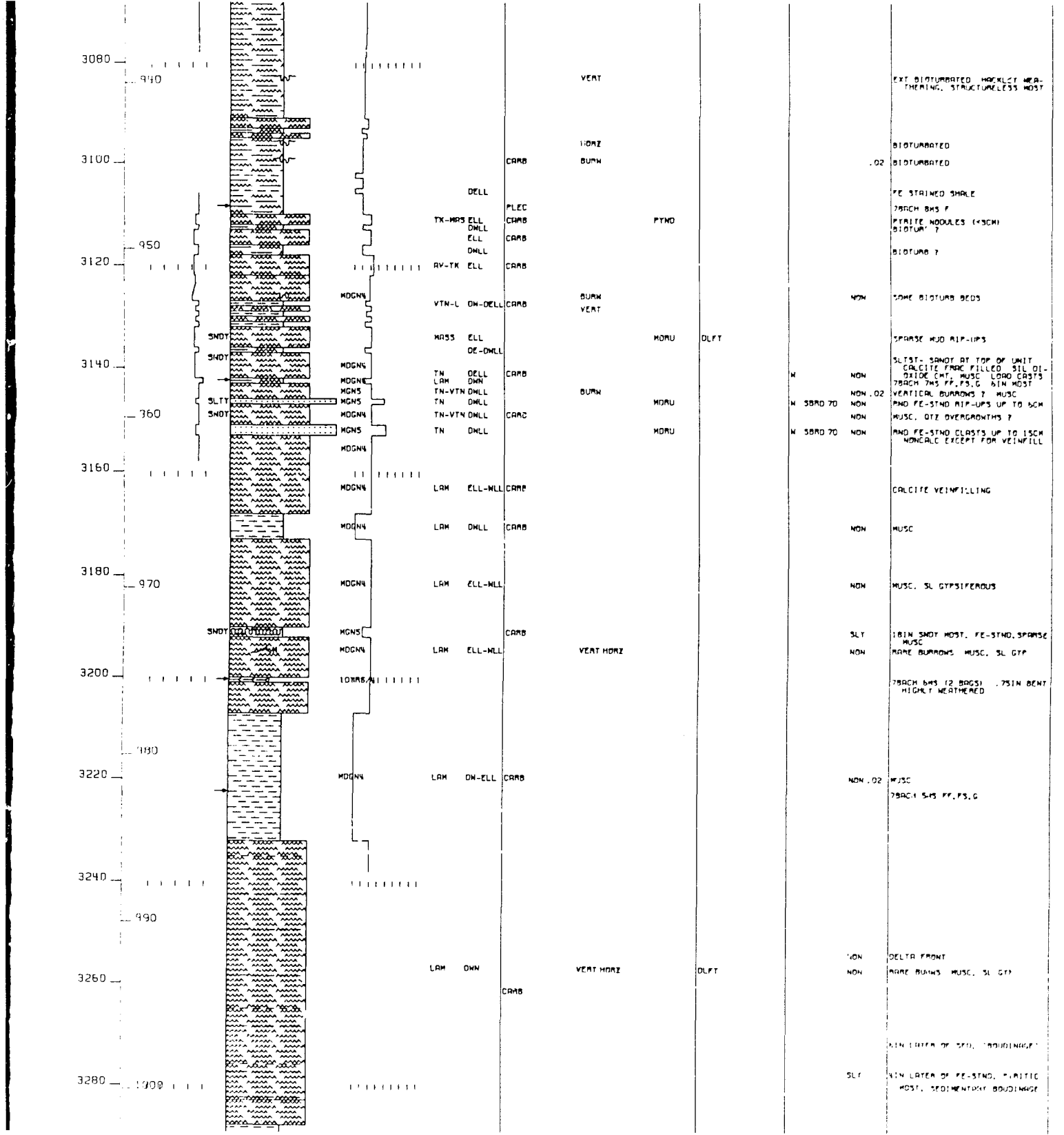
3,476 FT TOP SEC 27, T8S, R13E 68°44'34"N 149°03'56"W

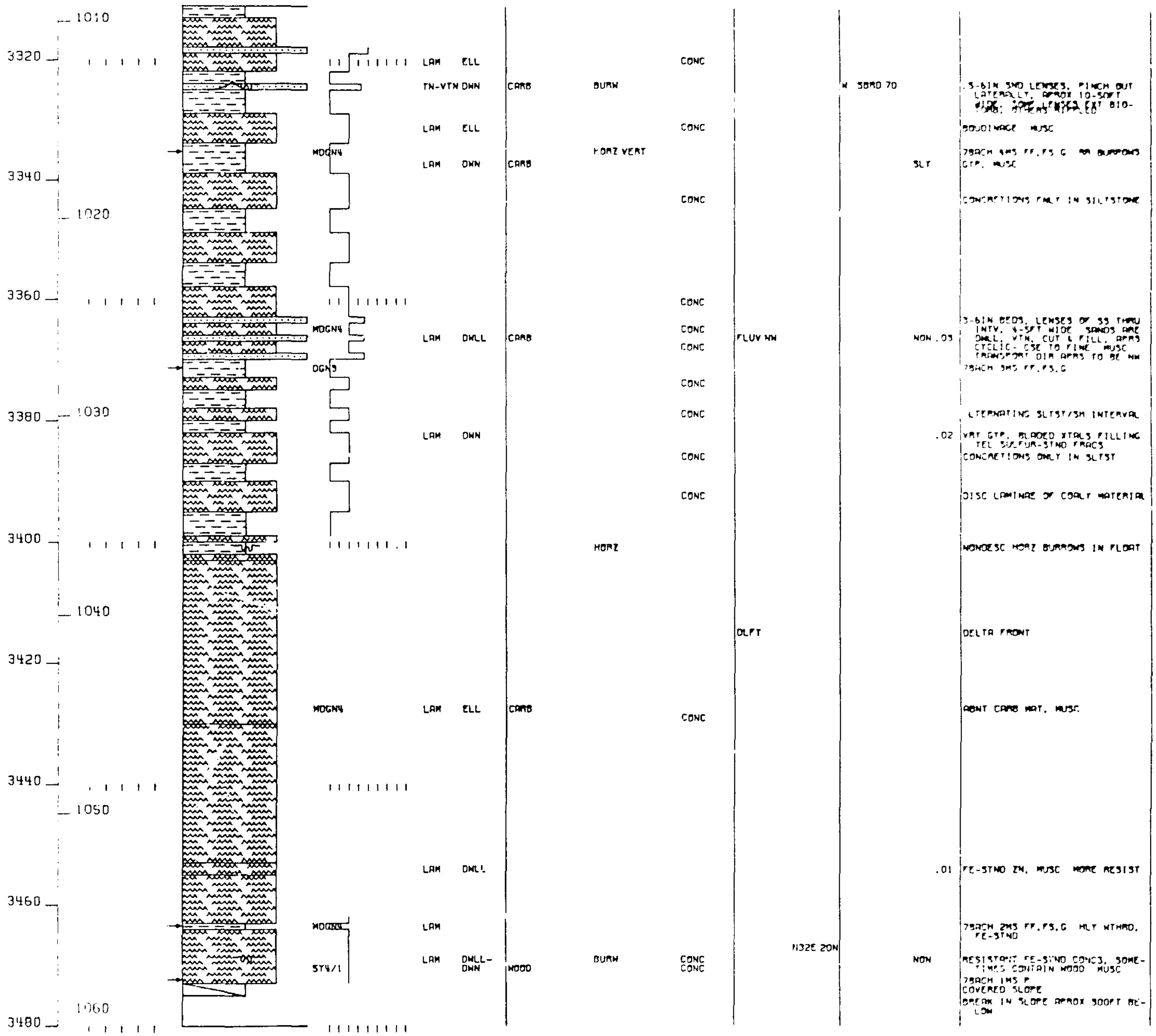
1 IN = 20 FT

7/6/78 BASE SEC 27, T8S, R13E 68°43'37"N 149°01'11"W




2840
870
2860
2880
880
2900
2920
890
2940
900
2960
910
2980
3000
920
3020
3040
MDGN4
SNDY
SNDY
SLTY
SNDY
SLTY
SNDY
SLTY
SLTY
MGN5
VTN
TN-VTN DELL
TN-VTN DE-ELL
TN-VTN DNN
VTN-L DWLL
VTN DNN
TN-VTN DNN
TN DNN
DWLL
DNN
VTN DELL
CARB
PLNT
FLEC
BURW
HORZ VERT
VERT
QTZ
HORZ
MUD
W SBAN 75 NON .02 LOW ANGLE TRUG SCOURED BASE MUSC
NON MUSC
78ACH 12MS FF,FS,G
NON MUSC
.02 BIOTURBATED
BIOTURBATED
NON FLTG QTZ PEBBLE, MUSC
78ACH 11MS F
78ACH 10MS F MUSC
BIOTURB, CARB MAT 55 UNITS RIPPLED AT TOP
LOAD CASTS, SOLE MARKINGS, BALL & PILLOW MUSC
LSHF
LOWER SHOREFACE
SCOURED BASE
LOAD CASTS, BALL & PILLOW
BIOTURBATED
BIOTURBATED HACKLEY
HORZ BURROWS AT BASE OF SLTST
BURWS AT BASE, PLNT FRAGS, MUSC
BIOTURBATED
LOAD CASTS
NON LOW ANG, FE-STND MUD CLASTS STM RIPPLED AT BASE MUSC
BIOTURBATED, HACKLEY


3080
940
3100
950
3120
960
3140
970
3160
980
3180
990
3200
1000
3220
1010
3240
1020
3260
1030
3280
VERT
HORZ
BIOTURBATED
CARB
BURW
.02
BIOTURBATED
FE STAINED SHALE
DELL
PLEC
78BCH BHS F
TX-MRS
ELL
DWLL
CARB
PYRD
PYRITE NODULES (<3CM)
BIOTURB ?
ELL
DWLL
CARB
BIOTURB ?
AV-TK
ELL
CARB
MDGN4
BURW
VERT
MDW
SOME BIOTURB BEDS
VTN-L
DW-DELL
CARB
SNDT
MASS
ELL
DE-DWLL
MORU
DLFT
SPARSE MUD RIP-UPS
SNDT
MDGN4
SLTST- SANDY AT TOP OF UNIT
CALCITE FRAC FILLED SIL OI-
DXIDE CMT, MUSC LOAD CASTS
78BCH 7MS FF,FS,G 6IN MDST
MDGN4
TN
LAM
DELL
DWLL
CARB
W
NON
MGN5
TN-VTN
DWLL
BURW
NON
.02
VERTICAL BURROWS ? MUSC
SLTY
MGN5
TN
DWLL
MORU
W SBRD 70
NON
AND FE-STND RIP-UPS UP TO 6CM
SNDT
MDGN4
TN-VTN
DWLL
CARB
NON
MUSC, QTZ OVERGROWTHS ?
MGN5
TN
DWLL
MORU
W SBRD 70
NON
AND FE-STND CLASTS UP TO 15CM
NONCALC EXCEPT FOR VEINFILL
MDGN4
MDGN4
LAM
ELL-WLL
CARB
CALCITE VEINFILLING
MDGN4
LAM
DWLL
CARB
NON
MUSC
MDGN4
LAM
ELL-WLL
NON
MUSC, SL GYPSIFEROUS
SNDT
MGN5
CARB
SLT
18IN SNDT MDST, FE-STND, SPARSE
MUSC
MDGN4
LAM
ELL-WLL
VERT HORZ
NON
RARE BURROWS MUSC, SL GYP
78BCH 6MS (2 BDGS) .75IN BENT
HIGHLY WEATHERED
MDGN4
LAM
DW-ELL
CARB
NON
.02
MUSC
78BCH 5MS FF,FS,G
NON
DELTA FRONT
LAM
DWW
VERT HORZ
DLFT
NON
RARE BURWS MUSC, SL GYP
CARB
SLF
SLF

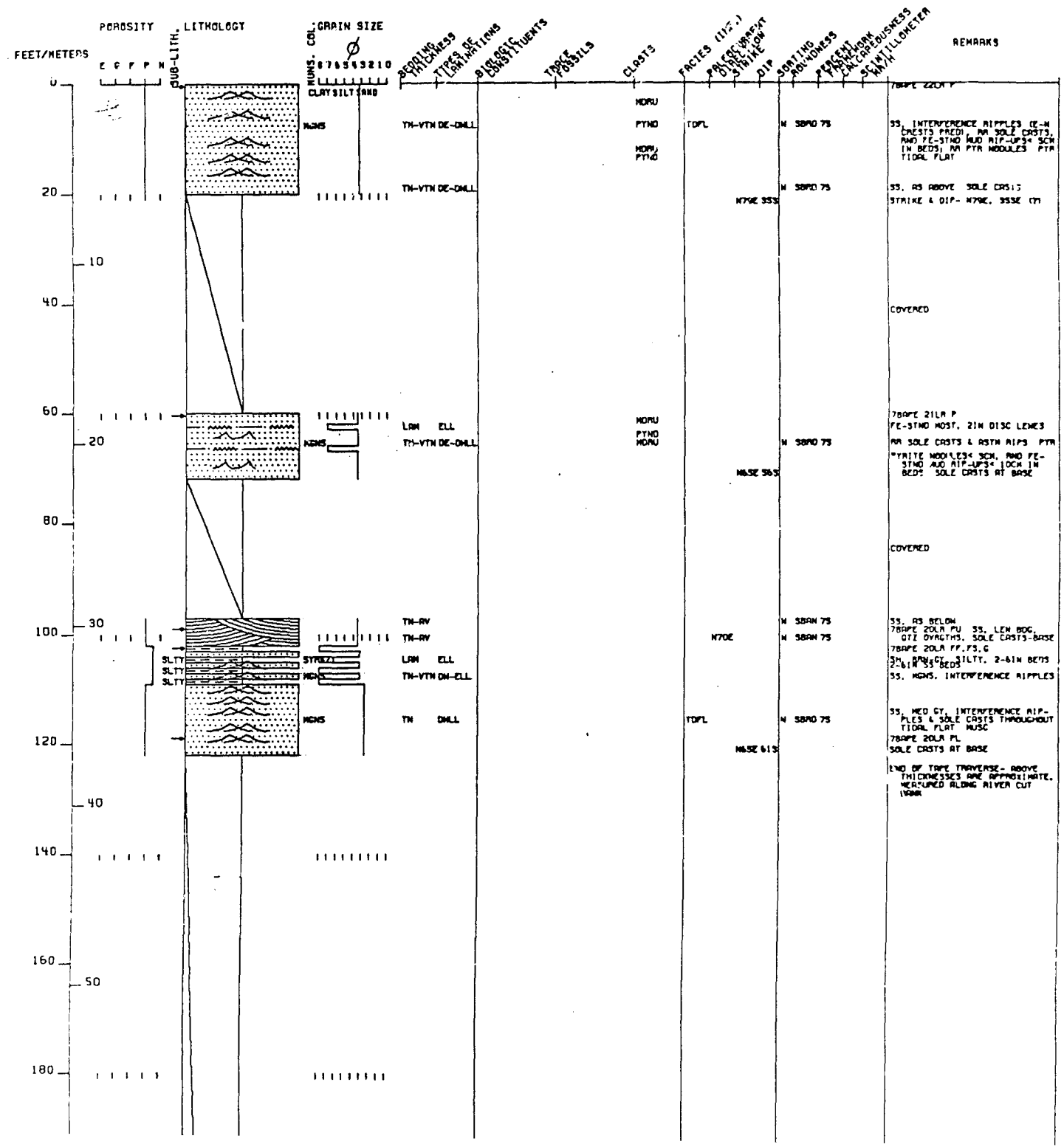


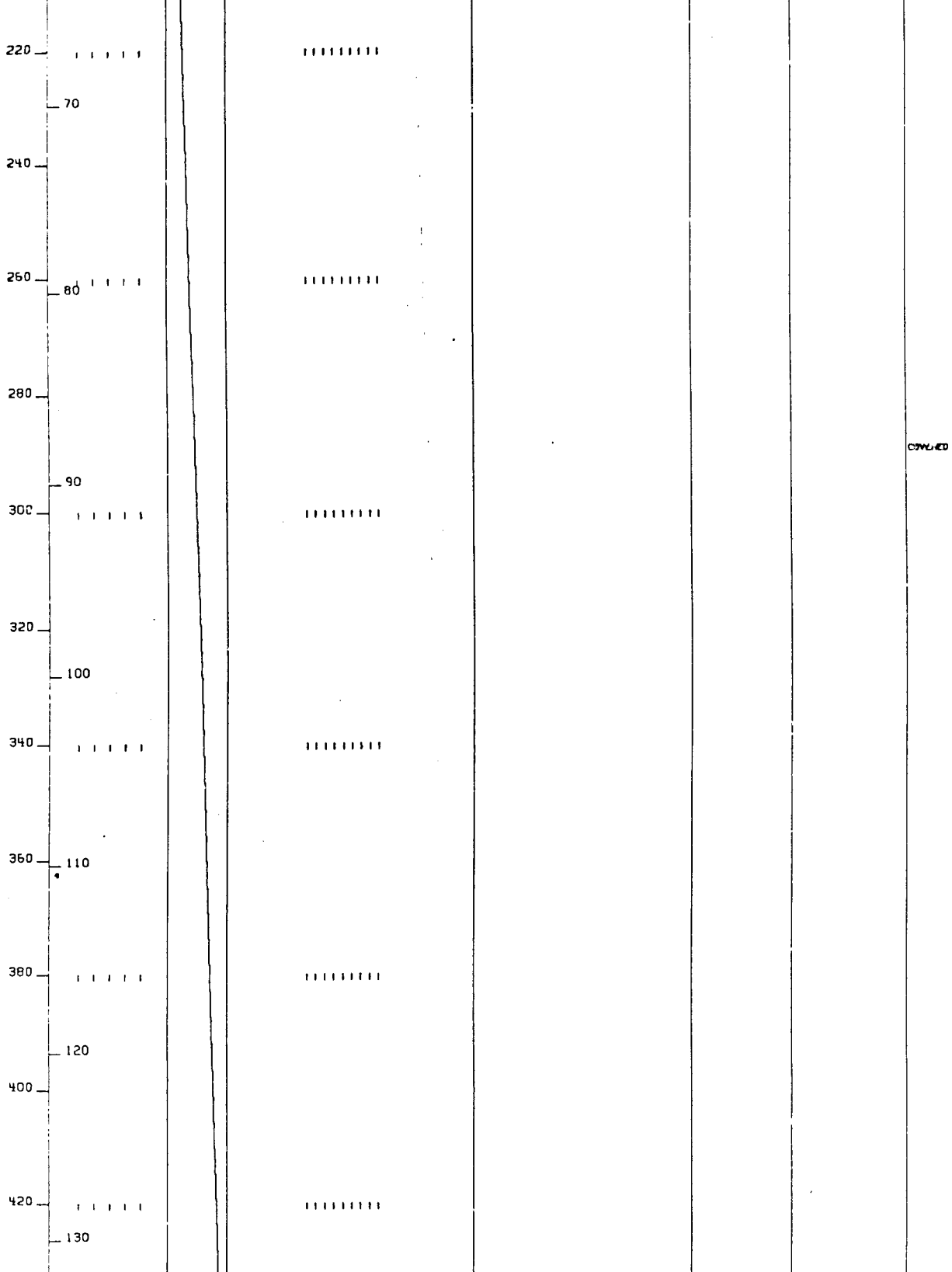
1010
3320
LAM ELL CONC
TN-VTN DWN CARB BURW N 58RD 70
.5-6IN SND LENSES, PINCH OUT LATERALLY, APROX 10-50FT
LAM ELL CONC
BOUDINAGE MUSC
MDGN4 HORZ VERT
7BRCH 9MS FF,FS G
LAM DWN CARB SLT
GYP, MUSC
3340
CONC
CONCRETIONS ONLY IN SILTSTONE
1020
3360
CONC
MDGN4 CONC
LAM DWLL CARB CONC FLUV NW NON .03
3-6IN BEDS, LENSES OF SS THRU INTV, 4-5FT WIDE SANDS ARE DWLL, VTN, CUT & FILL, APRS CYCLIC- CSE TO FINE MUSC TRANSPORT DIR APRS TO BE NW
DGN3
7BRCH 3MS FF,FS,G
CONC
3380
1030
CONC
LTERNATING SLTST/SH INTERVAL
LAM DWN .02
VRY GYP, BLADED XTALS FILLING
TEL SULFUR-STND FRACS
CONC
CONCRETIONS ONLY IN SLTST
CONC
DISC LAMINAE OF COALY MATERIAL
3400
HORZ
NONDESC HORZ BURROWS IN FLOAT
1040
DLFT
DELTA FRONT
3420
MDGN4 LAM ELL CARB CONC
ABNT CARB MAT, MUSC
3440
1050
LAM DWLL .01
FE-STND ZN, MUSC MORE RESIST
3460
MDGN4 LAM
7BRCH 2MS FF,FS,G HLY WTHRD, FE-STND
N32E 20N
5Y4/1 LAM DWLL-DWN WOOD BURW CONC CONC NON
RESISTANT FE-STND CONCS, SOMETIMES CONTAIN WOOD MUSC
7BRCH 1MS P
COVERED SLOPE
BREAK IN SLOPE APROX 300FT BELOW
1060
3480

TOP
SEC 17, T4S, R14E
69°05'23"N 148°45'19"W

1 IN = 20 FT

BASE
SEC 17, T4S, R14E
69°05'41"N 148°46'48"W

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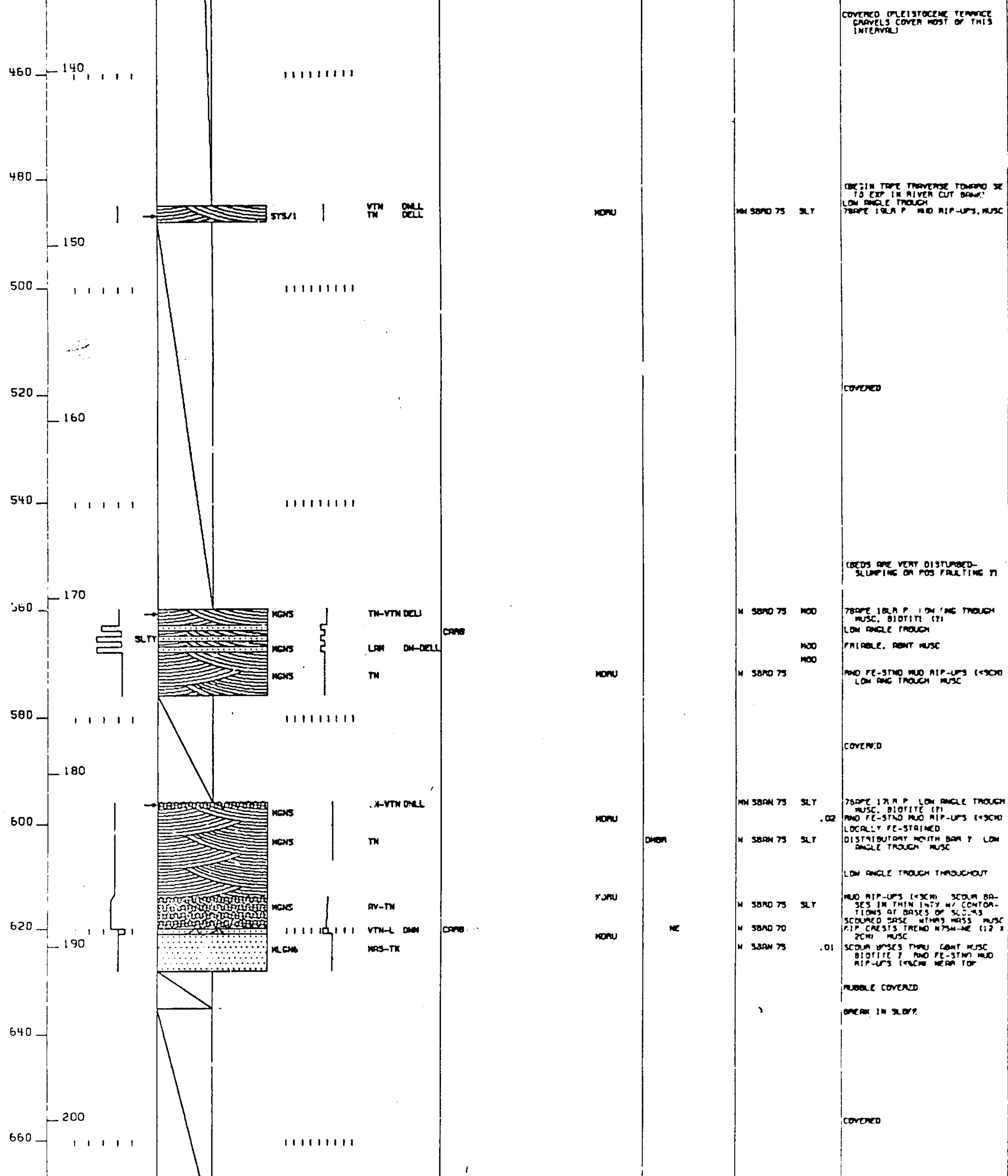
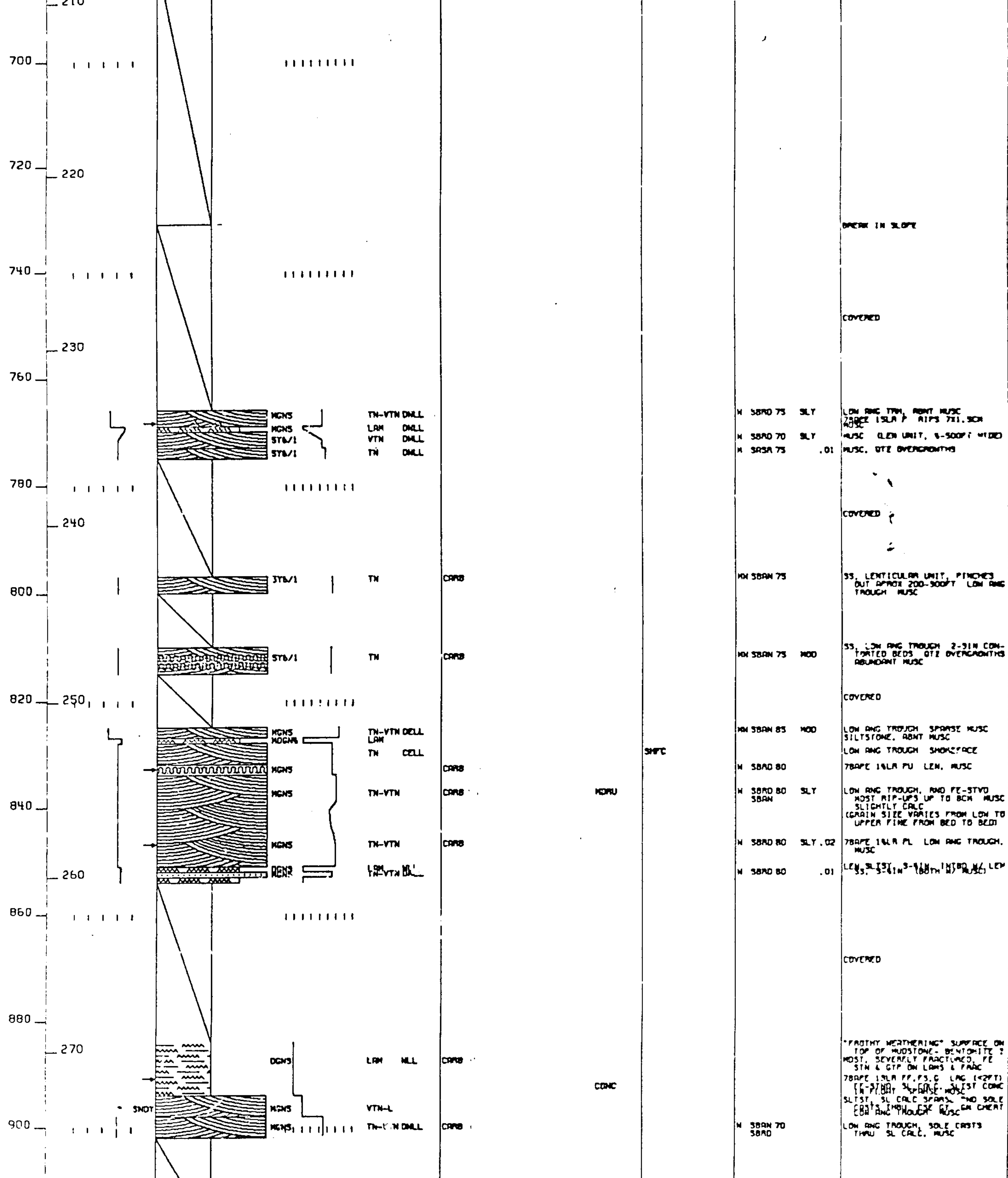
70
240
260
80
280
90
300
320
100
340
360
110
380
120
400
420
130



460
480
500
520
540
560
580
600
620
640
660
140
150
160
170
180
190
200
STS/1
VTN DALL
TN DELL
MDRU
NW SBRD 75 SLT
MGNS
SLTY
TN-VTN DELI
CARB
LAM DW-DELL
TN
N SBRD 75 MOD
MOD
MOD
N SBRD 75
.X-VTN DALL
DMBR
MW SBRN 75 SLY
.02
N SBRN 75 SLT
RV-TN
VTN-L DWN
NE
N SBRD 75 SLY
N SBRD 70
MLCNG
MAS-TK
N SBRN 75
.01
COVERED (PLEISTOCENE TERRACE GRAVELS COVER MOST OF THIS INTERVAL)
(BEGIN TAPE TRAVERSE TOWARD SE TO EXP IN RIVER CUT BANK)
LOW ANGLE TROUGH
7BAPE 19LR P MUD RIP-UPS, MUSC
COVERED
(BEDS ARE VERY DISTURBED- SLUMPING OR POS FAULTING ?)
7BAPE 18LR P LOW ANG TROUGH MUSC, BIOTITE (?)
LOW ANGLE TROUGH
FRIABLE, ABNT MUSC
AND FE-STND MUD RIP-UPS (<5CM) LOW ANG TROUGH MUSC
COVERED
7BAPE 17LR P LOW ANGLE TROUGH MUSC, BIOTITE (?)
AND FE-STND MUD RIP-UPS (<5CM)
LOCALLY FE-STAINED
DISTRIBUTARY MOUTH BAR ? LOW ANGLE TROUGH MUSC
LOW ANGLE TROUGH THROUGHOUT
MUD RIP-UPS (<5CM) SCOUR BASES IN THIN INTV W/ CONTORTIONS AT BASES OF SCOURS
SCOURED BASE WTHRS MASS MUSC
RIP CRESTS TREND N75W-NE (12 X 2CM) MUSC
SCOUR BASES THRU ABNT MUSC BIOTITE ? AND FE-STND MUD RIP-UPS (<5CM) NEAR TOP
RUBBLE COVERED
BREAK IN SLOPE
COVERED

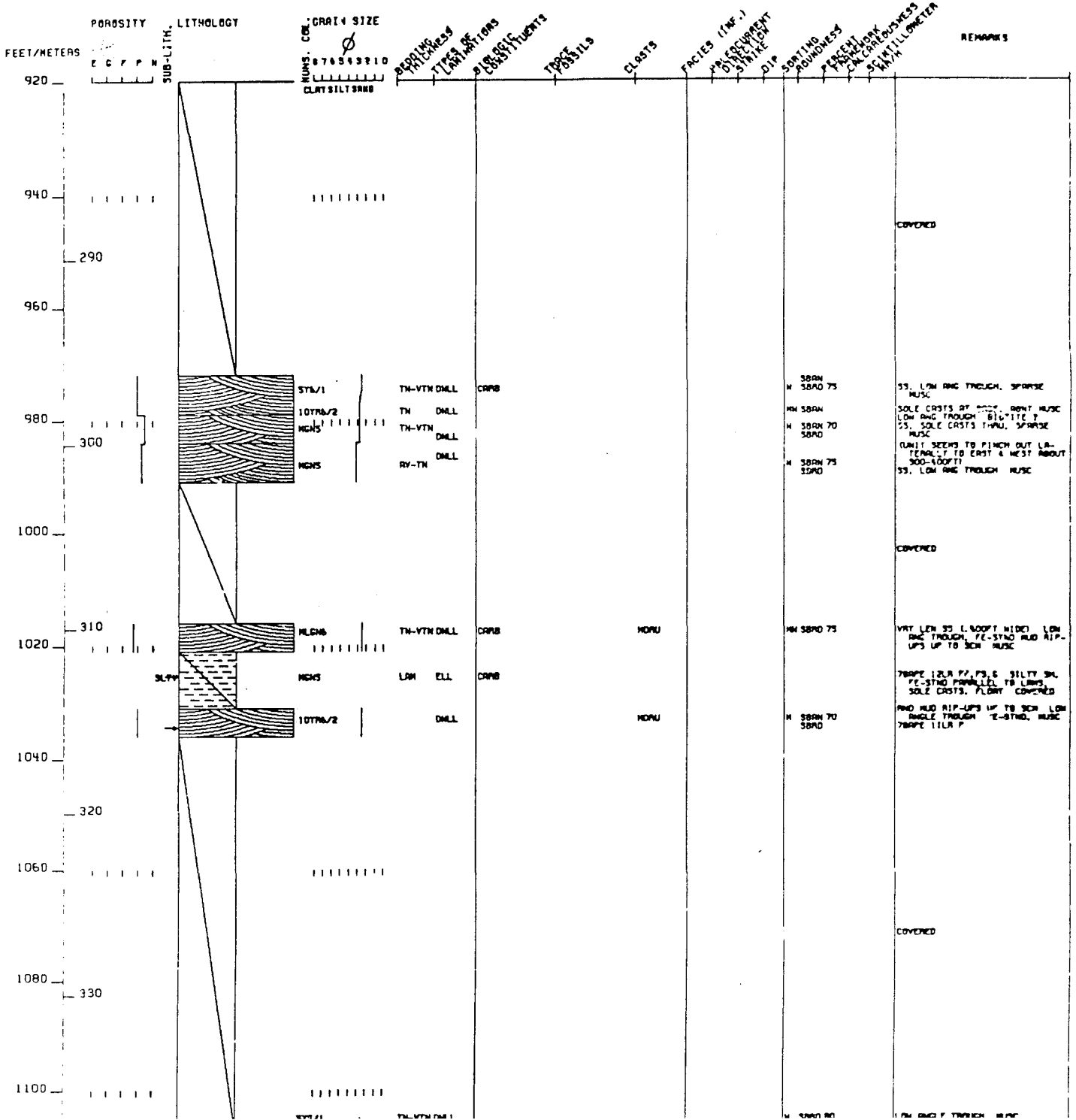

700
720
220
BREAK IN SLOPE
740
COVERED
230
760
MGNS
MGNS
ST6/1
ST6/1
TN-VTN DNLL
LAM DNLL
VTN DNLL
TN DNLL
H SBRD 75 SLY
LOW ANG TRN, ABNT MUSC
H SBRD 70 SLY
MUSC
H SRSA 75 .01
MUSC, QTZ OVERGROWTHS
780
COVERED
240
ST6/1
TN
CARB
HM SBAN 75
SS, LENTICULAR UNIT, PINCHES OUT APROX 200-300FT LOW ANG TROUGH MUSC
800
ST6/1
TN
CARB
HM SBAN 75 MOD
SS, LOW ANG TROUGH 2-3IN CONTORTED BEDS QTZ OVERGROWTHS ABUNDANT MUSC
820
250
COVERED
MGNS
MDGNS
TN-VTN DELL
LAM
TN CELL
HM SBAN 85 MOD
LOW ANG TROUGH SPARSE MUSC
SILTSTONE, ABNT MUSC
SHFC
LOW ANG TROUGH SHOREFACE
MGNS
CARB
H SBRD 80
MGNS
TN-VTN
CARB
MDRU
H SBRD 80 SLY
SBAN
LOW ANG TROUGH, AND FE-STVD MOST RIP-UPS UP TO 8CM MUSC SLIGHTLY CALC
(GRAIN SIZE VARIES FROM LOW TO UPPER FINE FROM BED TO BED)
840
MGNS
TN-VTN
CARB
H SBRD 80 SLY .02
MUSC
260
H SBRD 80 .01
860
COVERED
880
270
"FROTHY WEATHERING" SURFACE ON TOP OF MUDSTONE- BENTONITE ?
MOST, SEVERELY FRACTURED, FE STN & GYP ON LAMS & FRAC
DGNS
LAM NLL
CARB
CONC
SNOT
MGNS
VTN-L
900
MGNS
CARB
H SBAN 70
SBRD
LOW ANG TROUGH, SOLE CASTS THRU SL CALC, MUSC

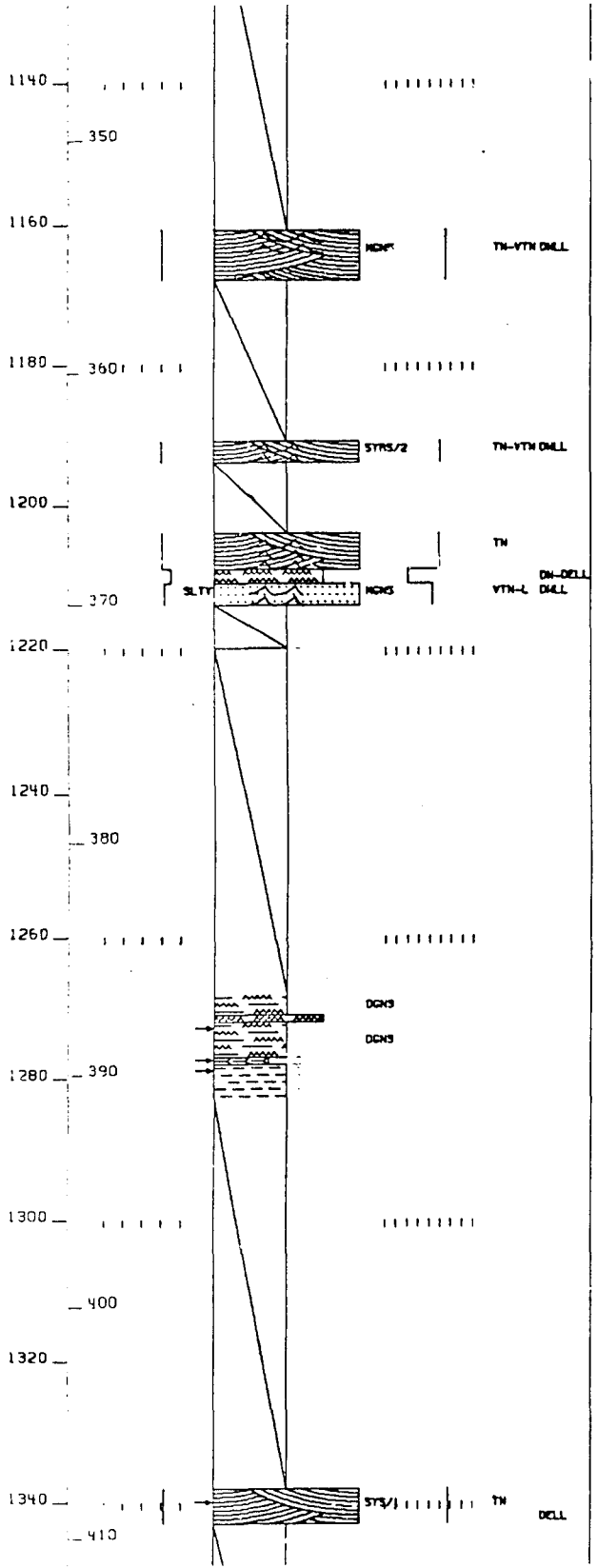
API NO. 50-223-90001

1,848 FT TOP SEC 17, T4S, R14E 69°05'23"N 148°45'19"W

1 IN = 20 FT

7/10/78 BASE SEC 17, T4S, R14E 69°05'41"N 148°46'48"W





COVERED

W SBAN 80 — LOW AMG TROUGH, STH RIPPLED (WAVELENGTH 12CM, AMP 3CM MEASURED TO 10TH/2 MUSC

COVERED

MDPU — W SBAN 70 SBAN — .01 LOW AMG TROUGH, AMD, FE-STND MUD RIP-UP3 UP TO 3CM MUSC

COVERED

MDPU — NESE 633 DFBR — W SBAN 75 — AMD, FE-STND MDPU TO 10CM LOW AMG TRN W/ MUCH RIPPLING ON BDG PLANES (OFFSHORE BAR (?) UNIT PINCHES OUT LATERALLY

W SBAN 70 — MUSC

RUBBLE COVERED SLOPE

BREAK IN SLOPE

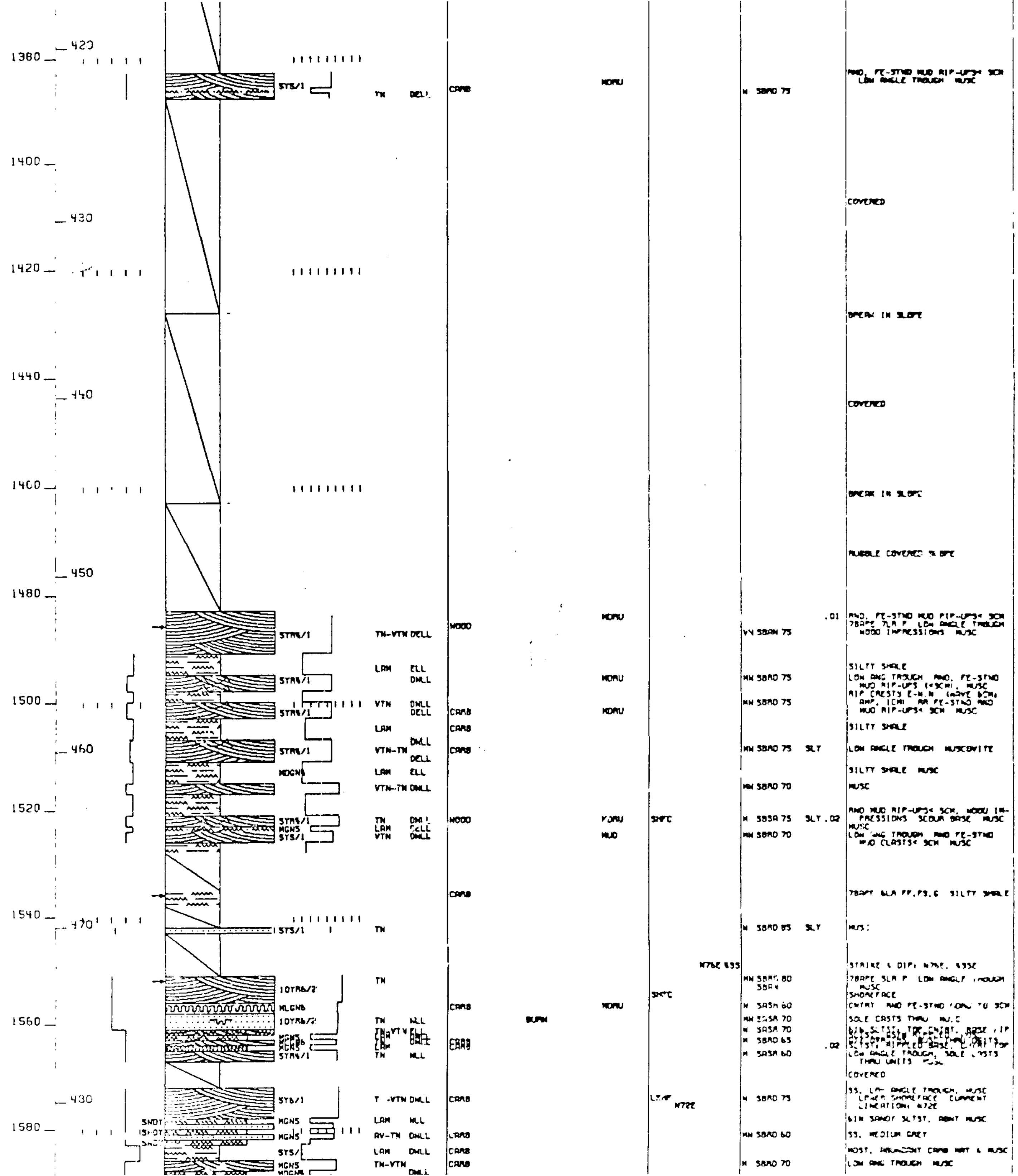
COVERED

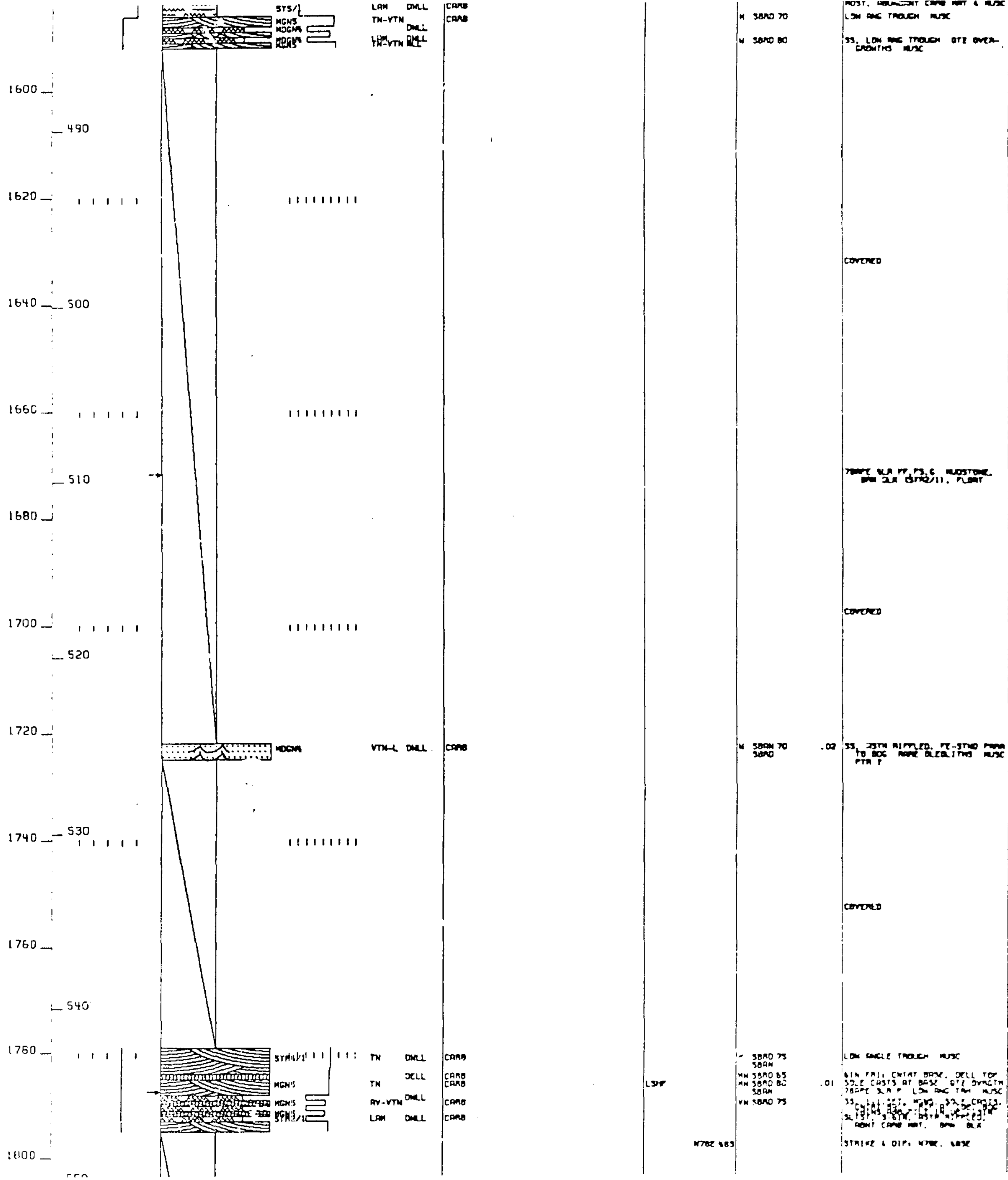
78APE 10LR FF,F3,G DK GY MDST W/ SILTY BEDS (<3CM)

.09 78APE SLR R APROX 15CM BENT IN 78APE, LR FF,F3,G MED GY CLAYSTONE W/ MUSCOVITE

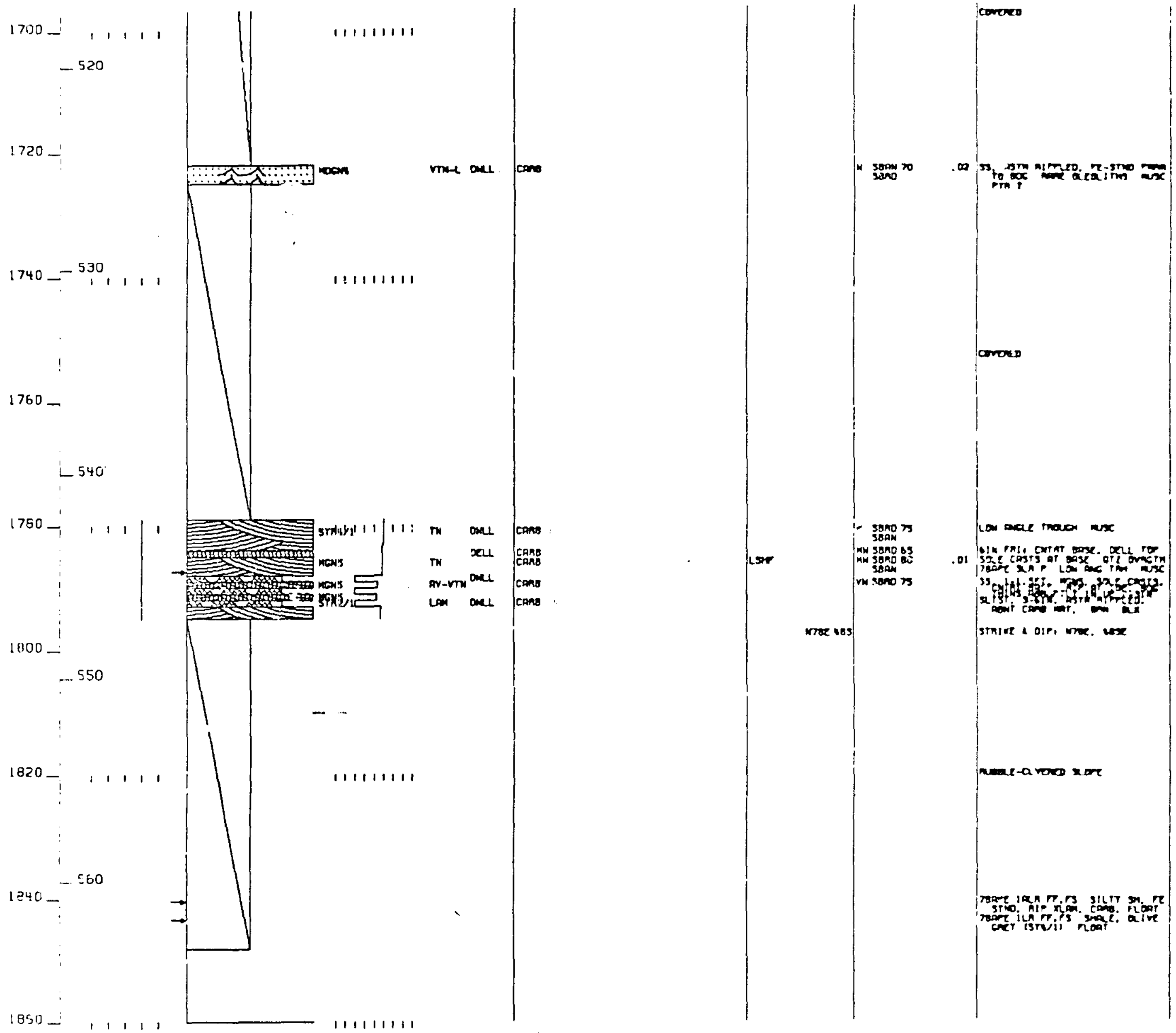
COVERED

W SBAN 75 — 78APE SLR P LOW ANGLE TROUGH, MUSC


1380
1400
1420
1440
1480
1500
1520
1540
1560
1580
420
430
440
450
460
COVERED
BREAK IN SLOPE
COVERED
BREAK IN SLOPE
SILTY SHALE
LOW ANGLE TROUGH MUSCOVITE
SILTY SHALE MUSC
COVERED
SS, MEDIUM GREY
LOW ANG TROUGH MUSC



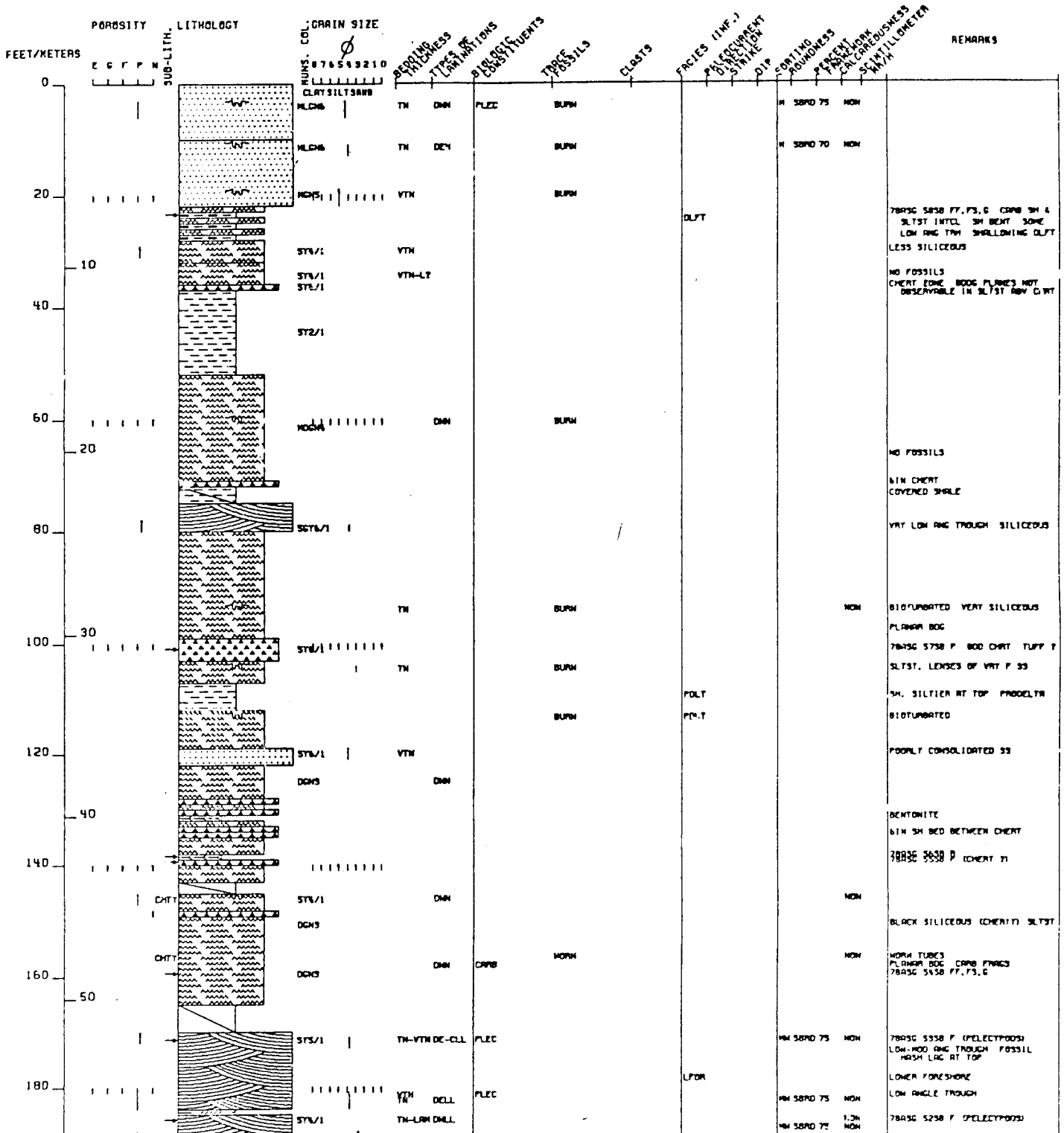
1600
490
1620
1640
500
1660
510
1680
1700
520
1720
1740
530
1760
540
1760
1800
STS/1
MGNS
MDGNS
TN-VTN
LAM
DMLL
CARB
VTN-L DMLL
MDGNS
STRN/1
TN
DELL
RV-VTN
LSHF
N78E 46S
W 5BRD 70
W 5BRD 80
LOW ANG TROUGH MUSC
SS, LOW ANG TROUGH QTZ OVER-
GROWTHS MUSC
COVERED
COVERED
W 5BRN 70
5BRD
.02
SS, 25TN RIPPLED, FE-STND PARA
TO BDG RARE OLEOLITHS MUSC
COVERED
5BRD 75
5BRN
MW 5BRD 65
MW 5BRD 80
5BRN
.01
VW 5BRD 75
LOW ANGLE TROUGH MUSC
STRIKE & DIP, N78E, 46SE

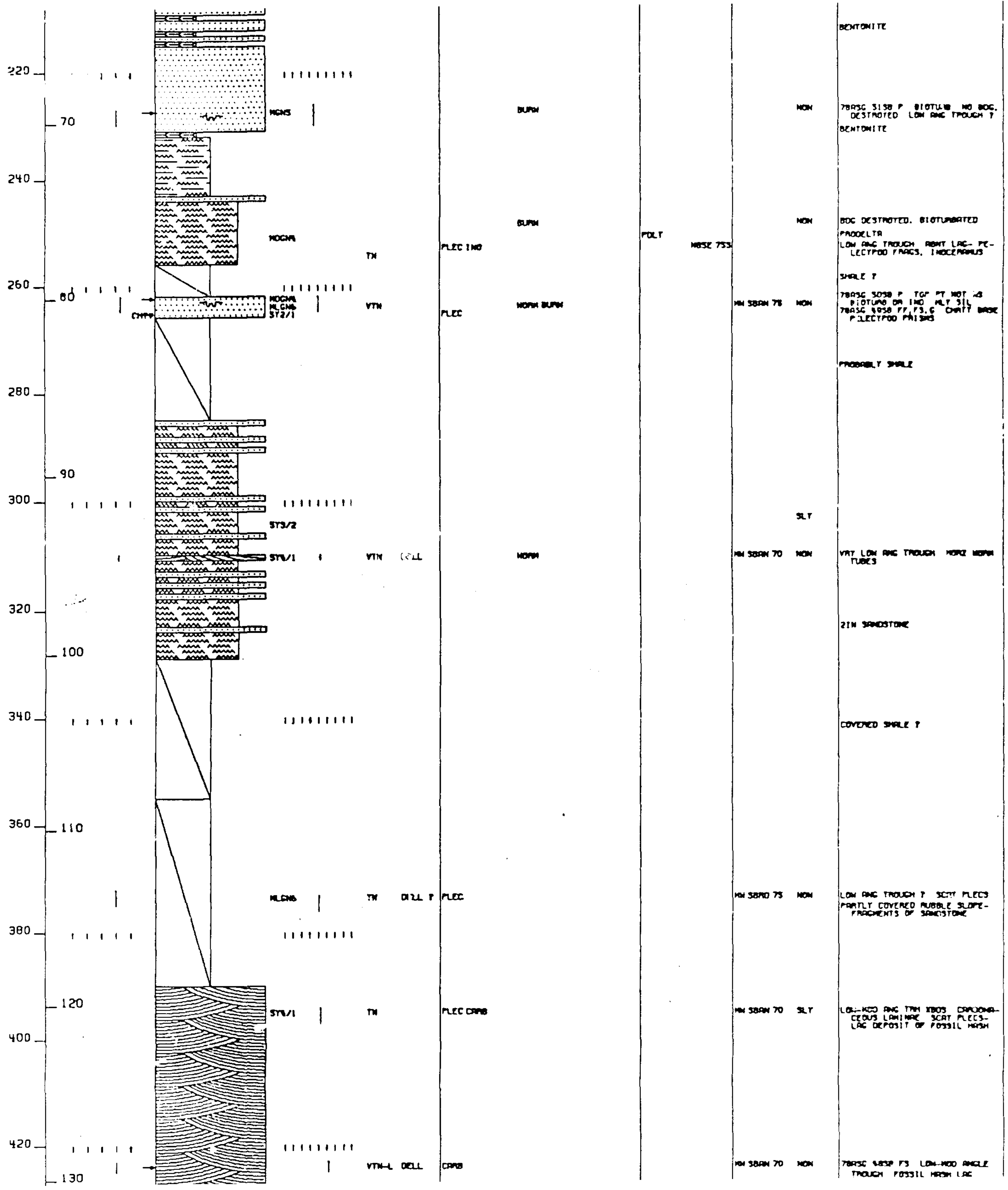

1700
520
COVERED
1720
MDGNS
VTN-L DWLL
CARB
N 5BAN 70
5BAO
.02
SS, ASTM RIPPLED, FE-STND
TO BOC
PTR ?
530
1740
COVERED
1760
540
1780
STN4/1
TN DWLL CARB
LOW ANGLE TROUGH MUSC
MGNS
TN DELL CARB
CARB
RV-VTN DWLL CARB
MGNS
STN2/1
LAM DWLL CARB
5BAD 75
5BAN
MW 5BAD 65
MW 5BAD 80
5BAN
VN 5BAD 75
.01
LSHF
SOLE CASTS AT BASE
LOW ANG TRN MUSC
N78E 465
STRIKE & DIP: N78E, 465E
1800
550
1820
RUBBLE-COVERED SLOPE
560
1840
78APE ILA FF,FS SILTY SH, FE
STND, RIP XLAM, CARB, FLOAT
78APE ILA FF,FS SHALE, OLIVE
GREY (5Y4/1) FLOAT
1850

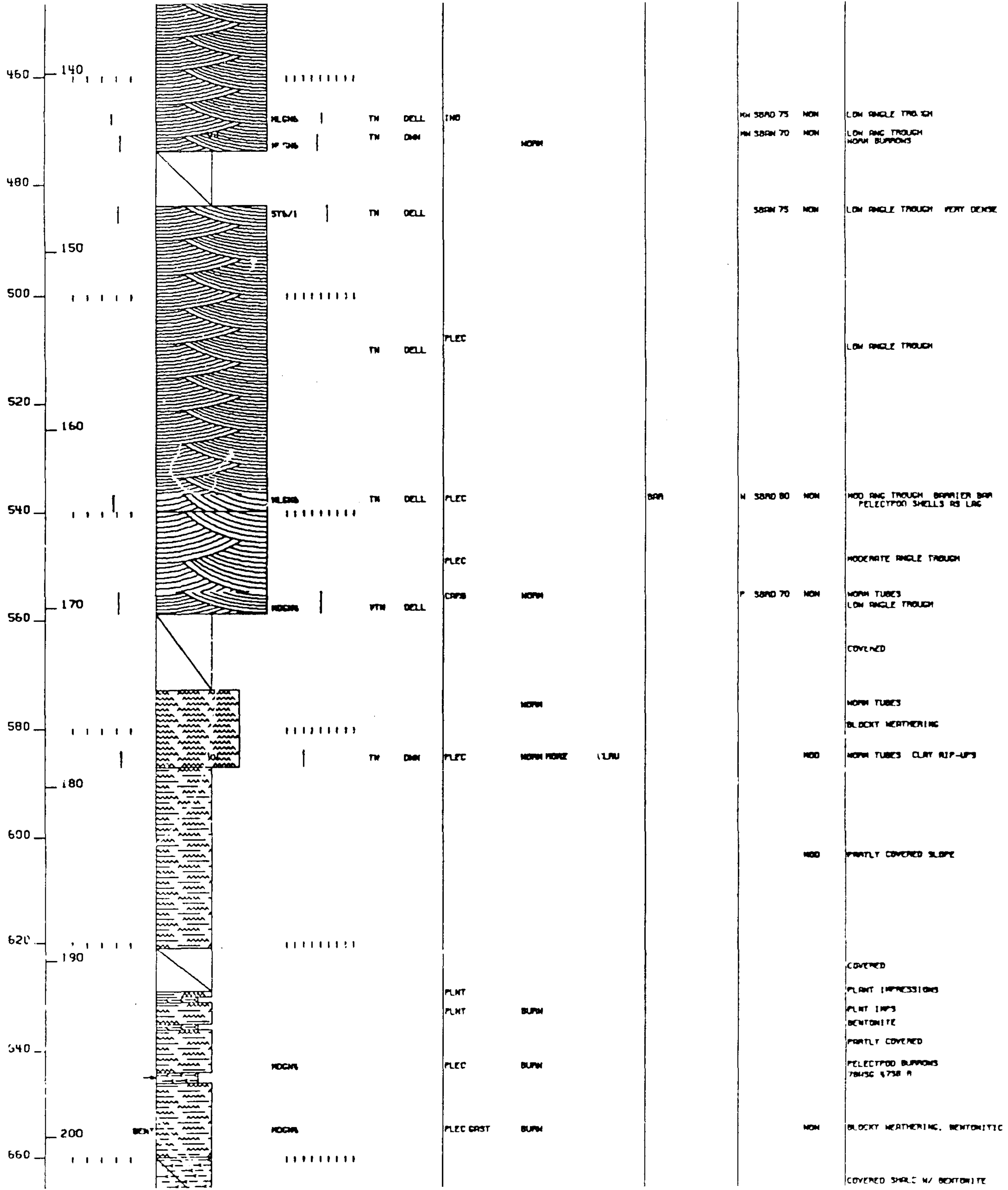
2,626 FT
TOP
SEC 12, T3S, R5E
69°09'23"N 151°01'04"W

1 IN = 20 FT

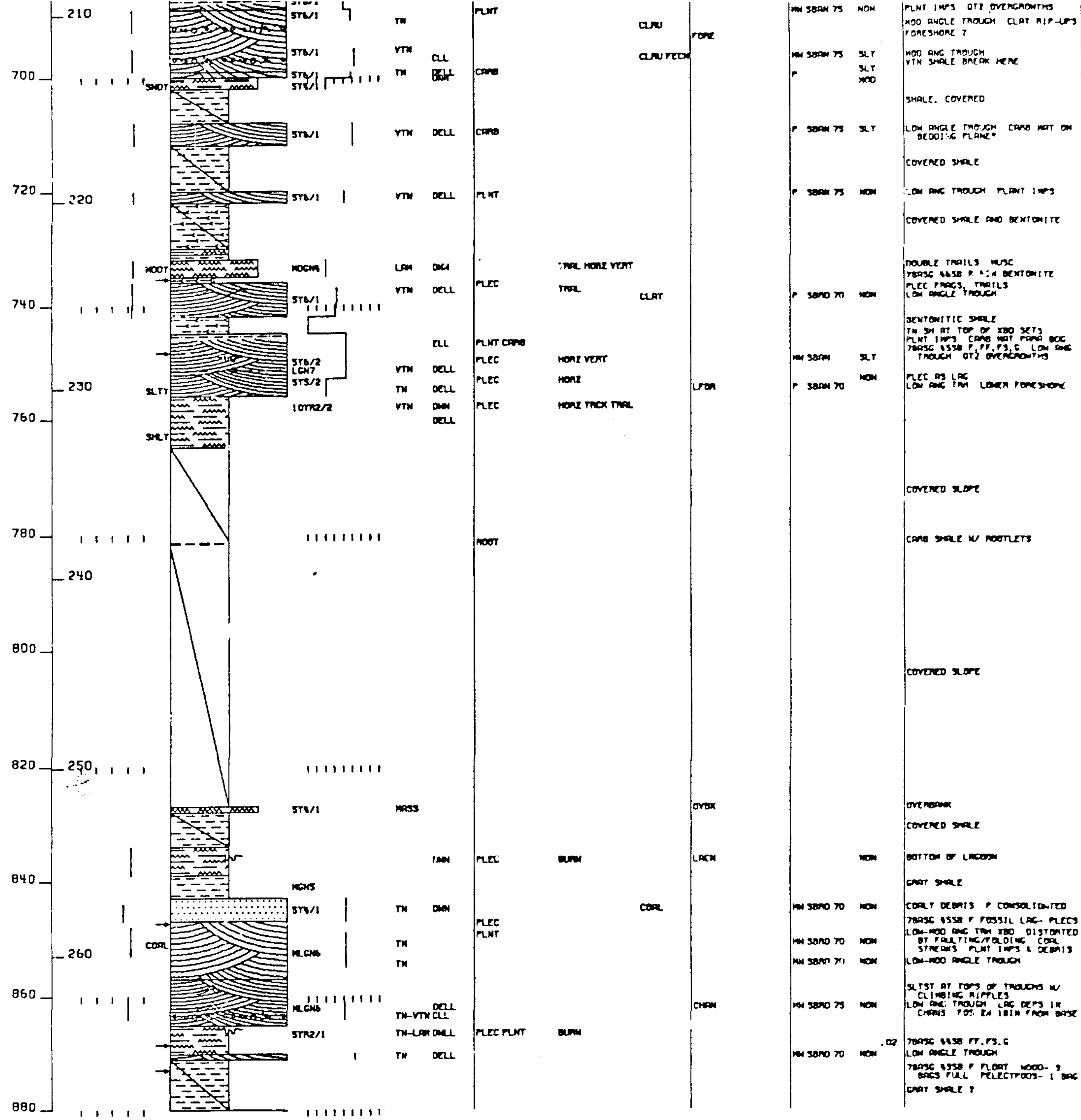
7/11/78
BASE
SEC 12, T3S, R5E
69°09'53"N 151°01'23"W




220
240
260
280
300
320
340
360
380
400
420
70
80
90
100
110
120
130
MGNS
MOGNA
MOGNA
MLGNG
ST2/1
ST3/2
ST4/1
MLGNG
ST4/1
TN
VTN
VTN
TN
TN
VTN-L
DILL ?
DELL
PLEC INO
PLEC
PLEC
PLEC CARB
CARB
BURW
BURW
WORM BURW
WORM
POLT
MBSE 753
MM 58AM 75
MM 58AM 70
MM 58AD 75
MM 58AM 70
MM 58AM 70
NON
SLY
BENTONITE
78ASC 5158 P BIOTURB NO BDG. DESTROYED LOW ANG TROUGH ?
BENTONITE
BDG DESTROYED. BIOTURBATED
PRODELTA
LOW ANG TROUGH ABNT LAG- PE-LECYPOD FRAGS, INOCERAMUS
SHALE ?
PROBABLY SHALE
VRY LOW ANG TROUGH HORZ WORM TUBES
2IN SANDSTONE
COVERED SHALE ?
LOW ANG TROUGH ? SCAT PLECS
PARTLY COVERED RUBBLE SLOPE-FRAGMENTS OF SANDSTONE
CEOUS LAMINAE SCAT PLECS-LAG DEPOSIT OF FOSSIL HASH
TROUGH FOSSIL HASH LAG



460
140
480
150
500
520
160
540
170
560
580
180
600
620
190
640
200
660
MLGNS TN DELL IND
HW SBAD 75 NON LOW ANGLE TROUGH
MFGNS TN DMH
HW SBAN 70 NON LOW ANG TROUGH
WORM BURROWS
WORM
STWV1 TN DELL
SBAN 75 NON LOW ANGLE TROUGH VERY DENSE
TN DELL PLEC
LOW ANGLE TROUGH
MLGNS TN DELL PLEC BAR
N SBAD 80 NON MOD ANG TROUGH BARRIER BAR
PELECYPOD SHELLS AS LAG
PLEC
MODERATE ANGLE TROUGH
CARB WORM
P SBAD 70 NON WORM TUBES
LOW ANGLE TROUGH
MDGNS VTN DELL
COVERED
WORM
WORM TUBES
BLOCKY WEATHERING
TN DMH PLEC WORM HORZ CLAY MOD WORM TUBES CLAY RIP-UPS
MOD PARTLY COVERED SLOPE
COVERED
PLNT
PLANT IMPRESSIONS
PLNT BURW
PLNT IMPS
BENTONITE
PARTLY COVERED
MDGNS PLEC BURW
PELECYPOD BURROWS
78WSC 4738 A
BENT MDGNS PLEC GAST BURW NON
BLOCKY WEATHERING, BENTONITIC
COVERED SHALE W/ BENTONITE



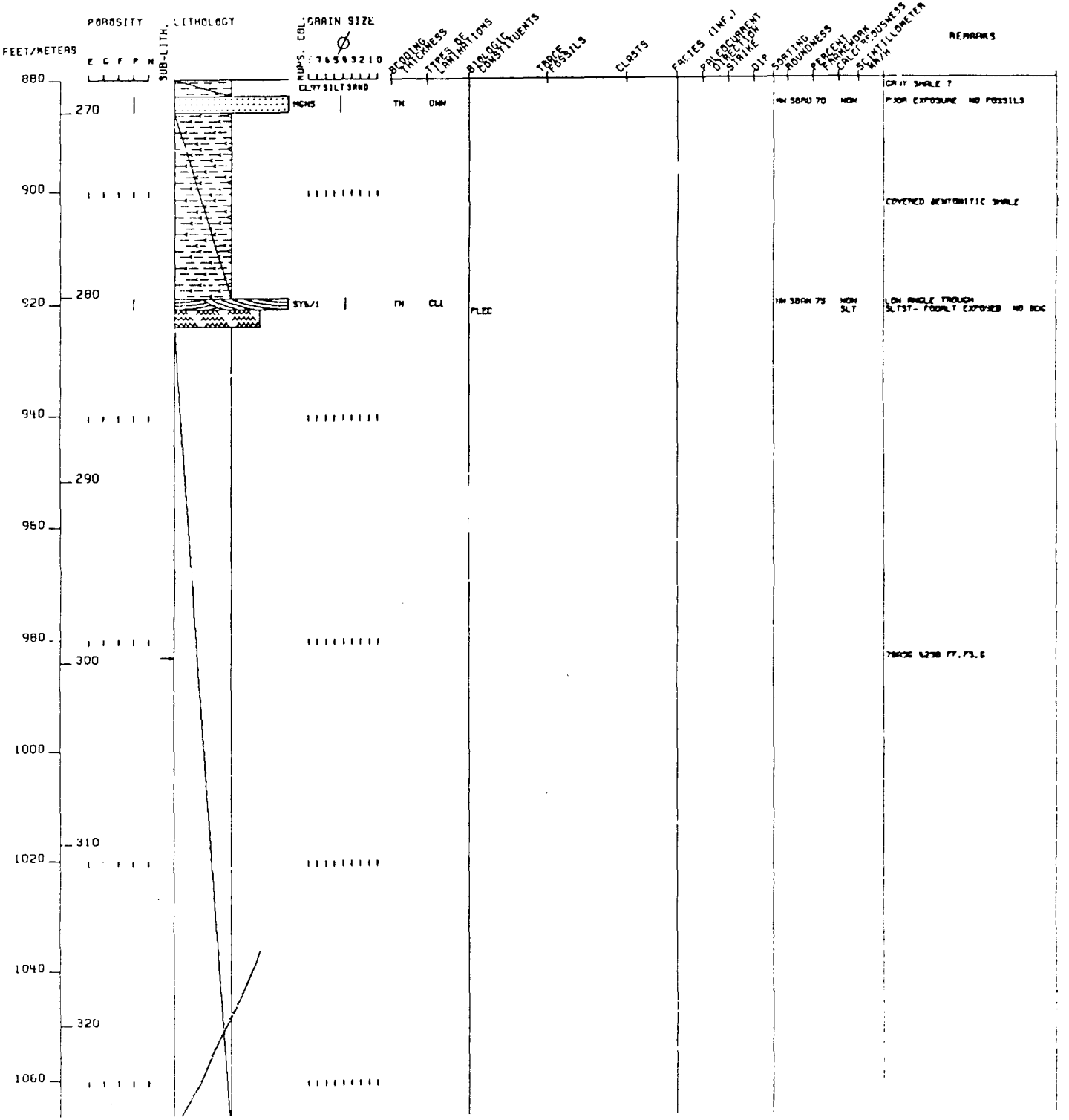
210
700
720
220
740
230
760
780
240
800
820
250
840
260
860
880
PLNT IMPS QTZ OVERGROWTHS
MOD ANGLE TROUGH CLAY RIP-UPS
FORESHORE ?
MOD ANG TROUGH
VTN SHALE BREAK HERE
SHALE, COVERED
LOW ANGLE TROUGH CARB MAT ON BEDDING PLANE*
COVERED SHALE
LOW ANG TROUGH PLANT IMPS
COVERED SHALE AND BENTONITE
DOUBLE TRAILS MUSC
PLEC FRAGS, TRAILS
LOW ANGLE TROUGH
BENTONITIC SHALE
TN SH AT TOP OF XBD SETS
TROUGH QTZ OVERGROWTHS
PLEC AS LAG
LOW ANG TRN LOWER FORESHORE
COVERED SLOPE
CARB SHALE W/ ROOTLETS
COVERED SLOPE
OVERBANK
COVERED SHALE
BOTTOM OF LAGOON
GRAY SHALE
COALY DEBRIS P CONSOLIDATED
LOW-MOD ANG TRN XBD DISTORTED BY FAULTING/FOLDING COAL STREAKS PLNT IMPS & DEBRIS
LOW-MOD ANGLE TROUGH
SLTST AT TOPS OF TROUGHS W/ CLIMBING RIPPLES
LOW ANGLE TROUGH
GRAY SHALE ?

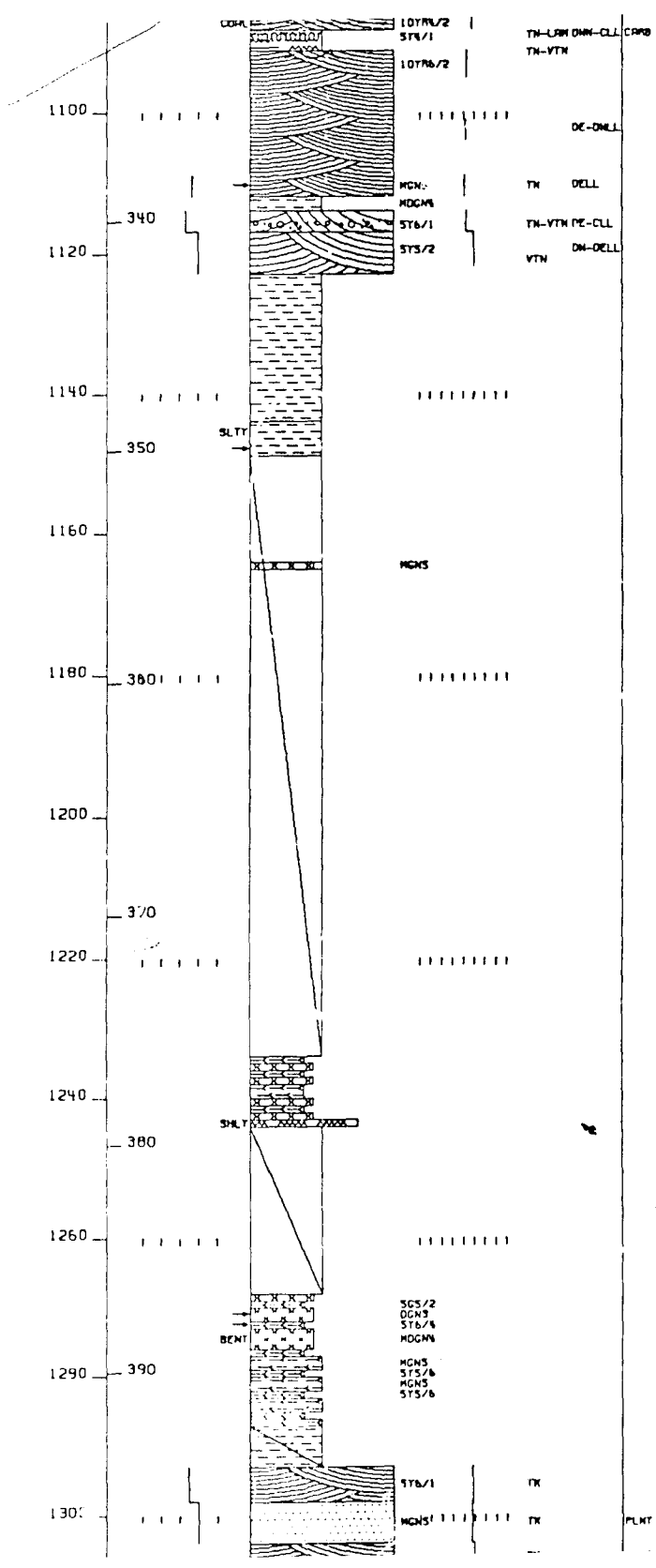
API NO. 50-287-90003

2,626 FT
TOP
SEC 12, T3S, R5E
69°09'23"N 151°01'04"W

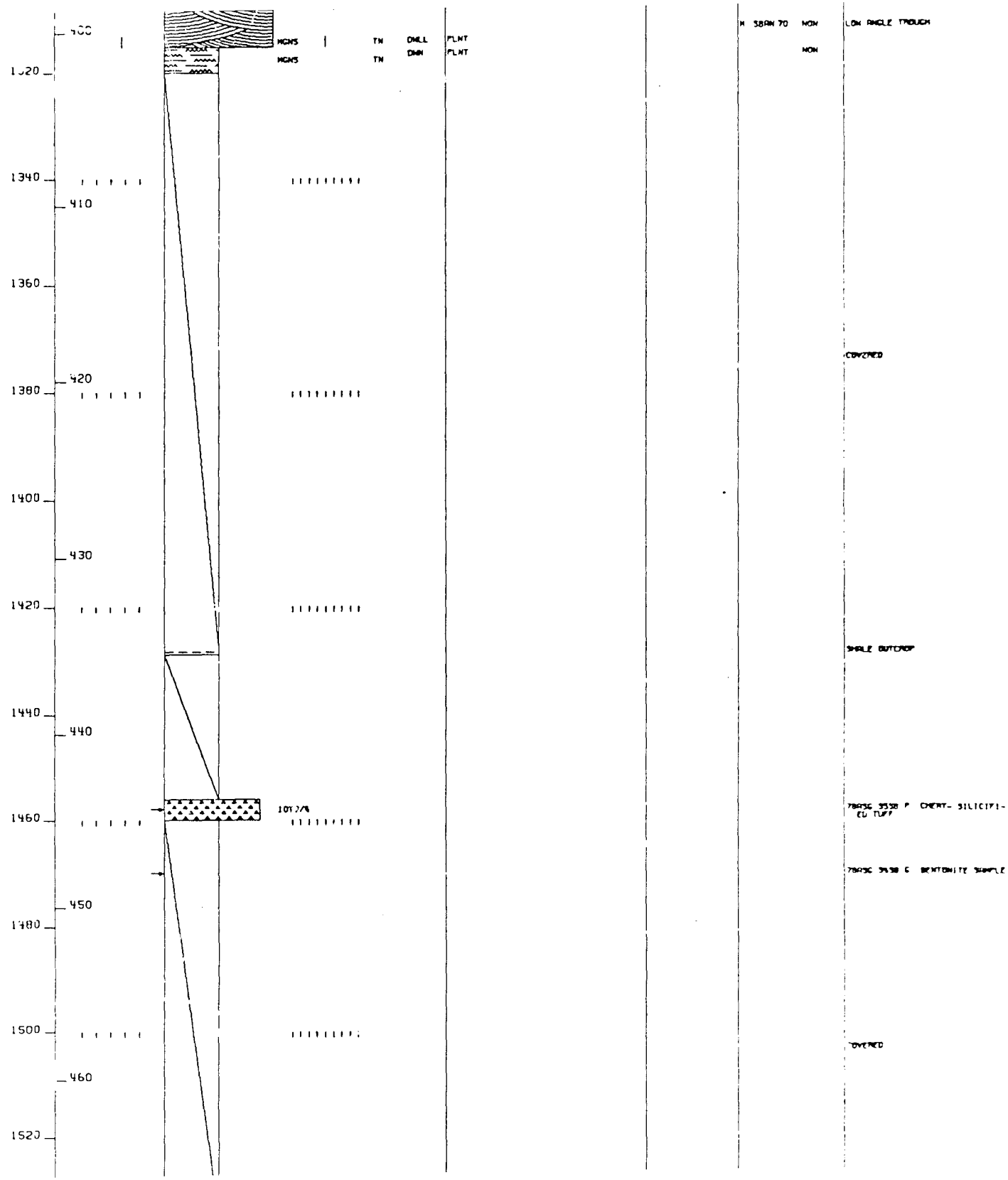
1 IN = 20 FT

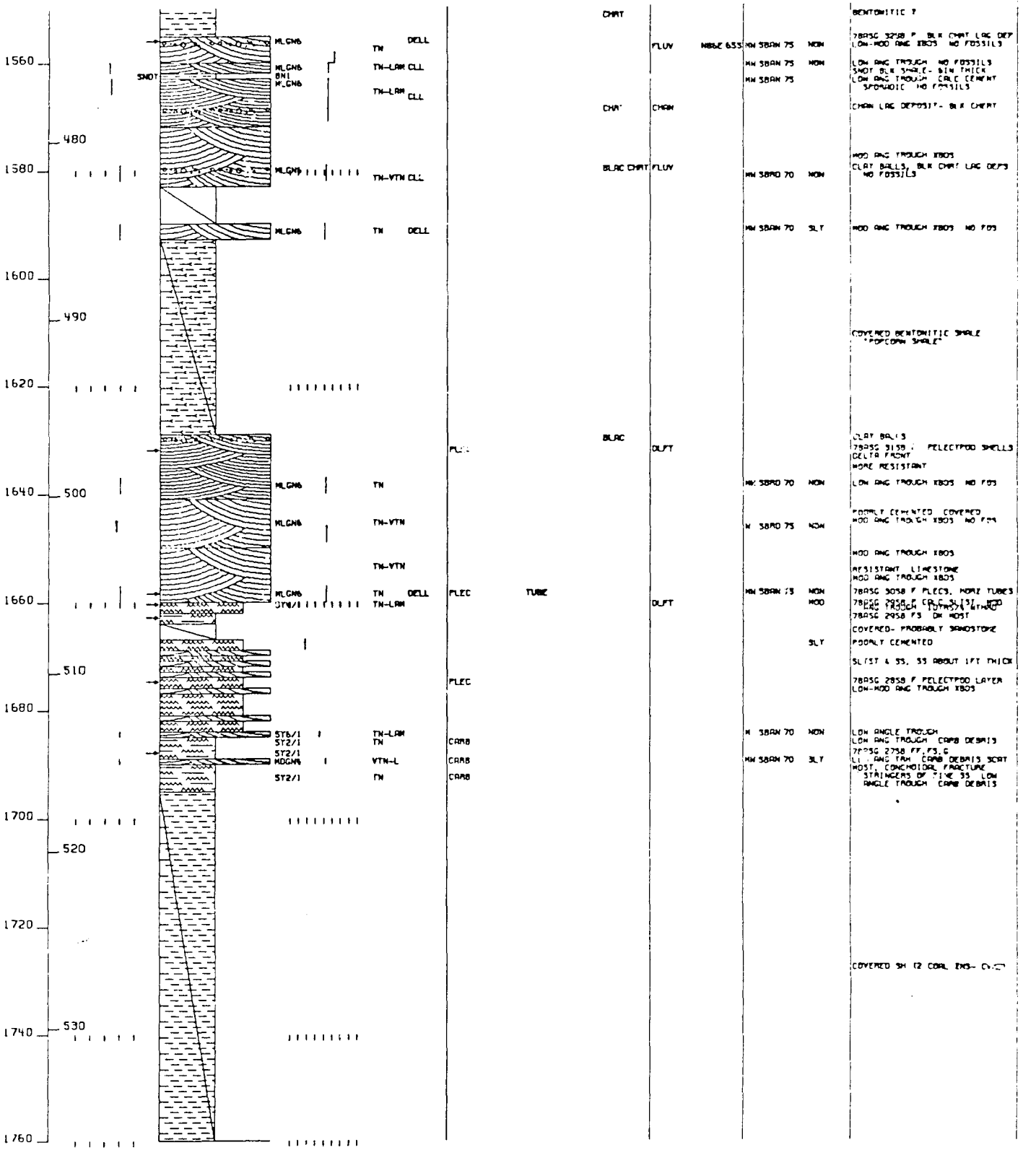
7/11/78
BASE
SEC 12, T3S, R5E
69°09'53"N 151°01'23"W

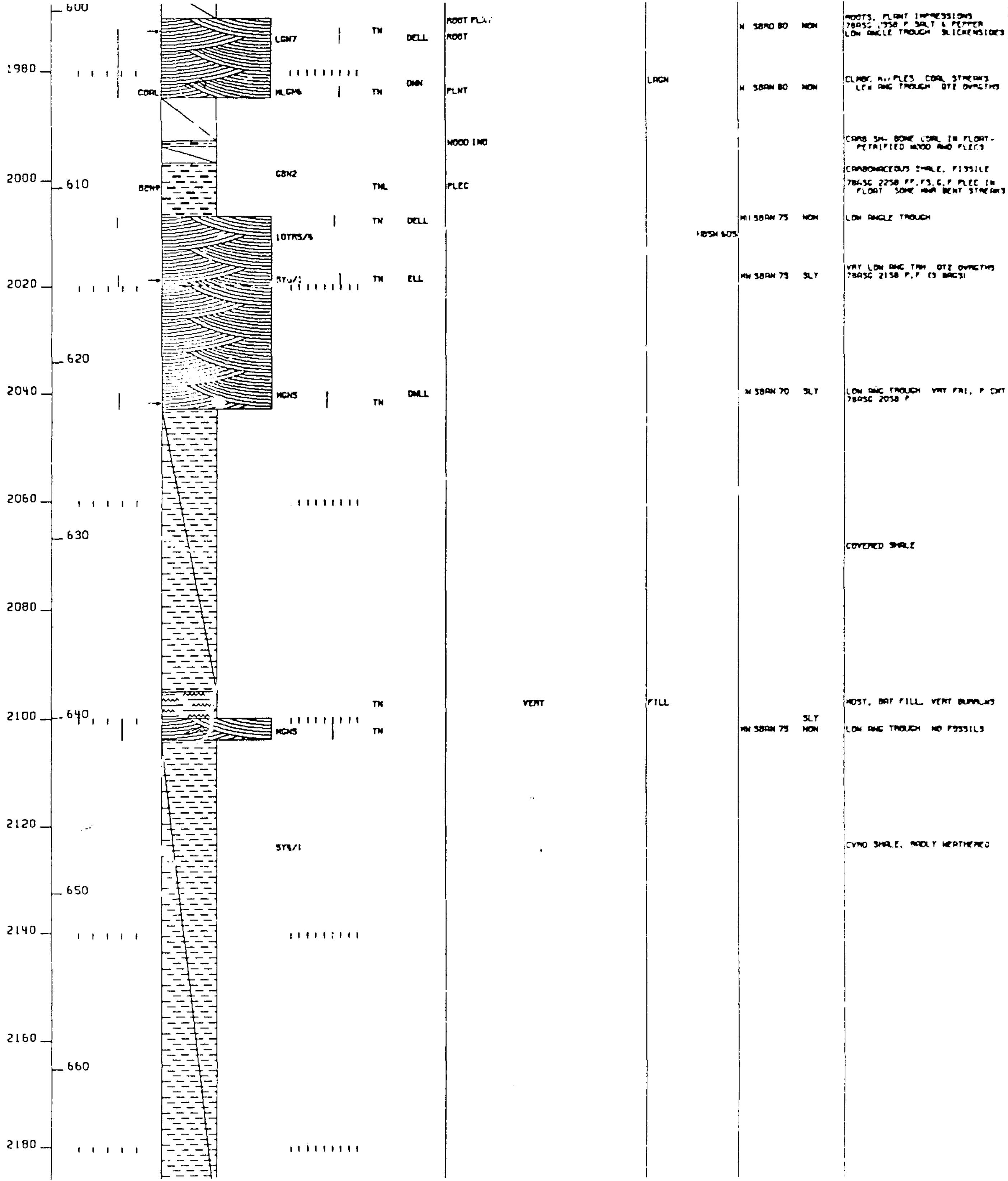


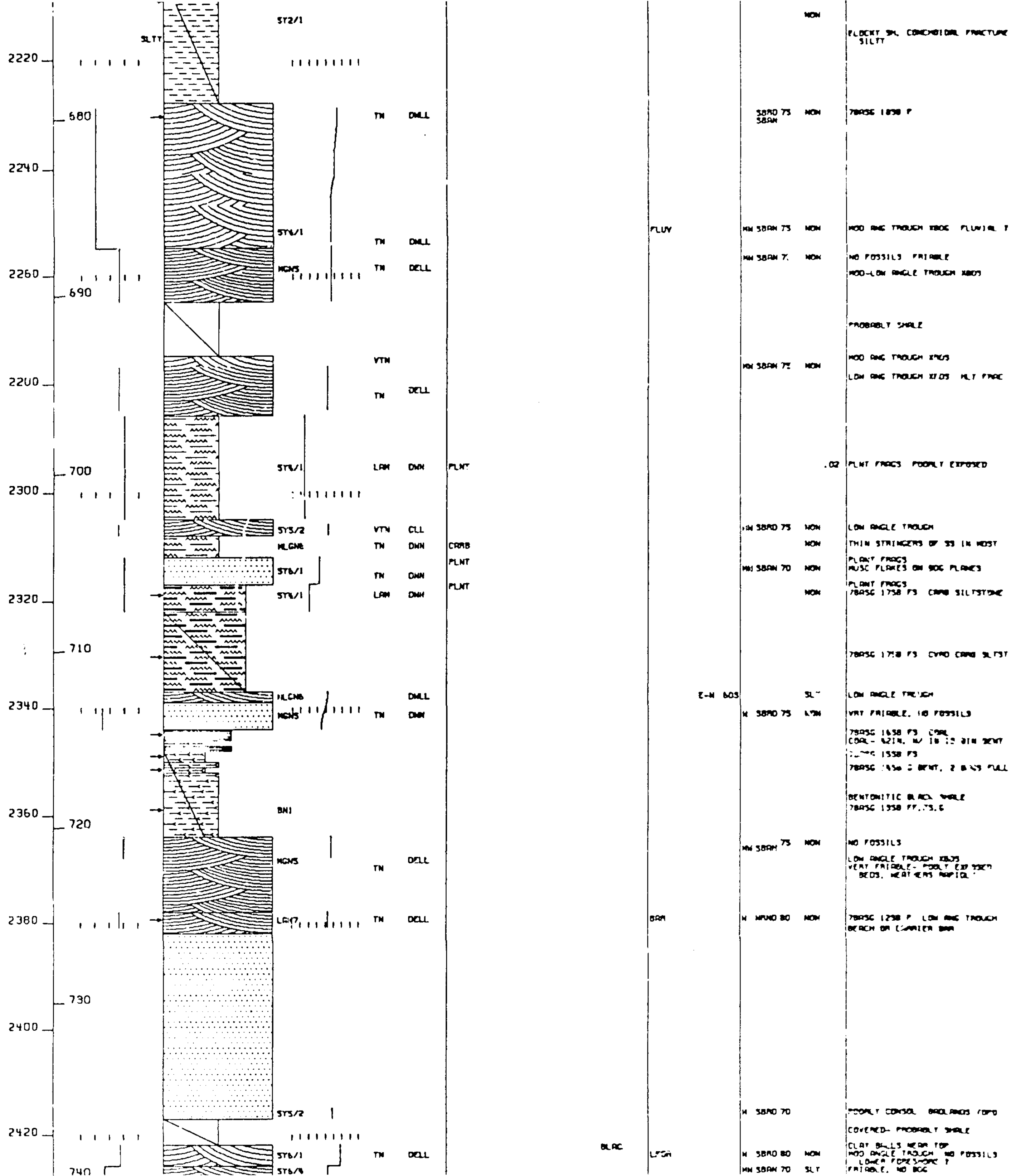


			KW 58RD 75		LOW ANG/SH & COAL STRIP CONSEL
				NON	CNTNT DUE TO FOLDING SCAT CARB DEBRIS MUSC ON BDS
	BLAC	FLUV	KW 58RD 75	NON	LOW ANG TROUGH NO FOSSILS CLAY BALLS- CHANNEL LAG
					MOD-LOW ANGLE TROUGH
			KW 58RD 75		
		FLUV	KW 58RD 75	NON	78ASC 6058 F LOW ANG TRH FRI
					2FT SH- FOOS OF CRLC SHALE
			KW 58AN 75		78ASC 3958 F,F NO FOSSILS
	CHRT	FLUV		NON	LAT CHRT PEBS MOD-HI ANG TRH
		FLUV	KW 58AN 75		
				NON	LOW MOD ANG TROUGH XBDS POOR-LY CONSOLIDATED
					SILTY SHALE
					78-SG 3858 FF, F3, 6
					CHRT TUFF IN FLOAT
				.72	CVRD 8.5FT CONSISTING OF 3 6IN TUFF, IREG SPACED BENTONITE
				MOD	6IN TUFF CRLC SHALE/SLTST
					CVRD BENTONITE AND TUFF
					BENT AND TUFF INTERLAYERED
					78ASG 3750 F 2.5FT TUFF, BLKY
					78ASG 3558 A BENTONITE LAYER
					TUFF W/ MNR BENT AND SHALE
					INTERCOLATED BENTONITE & SHALE FRATIP, Y COVERED SLOPE
		N87E 68S			COVERED SHALE
			KW 58RD .5	NON	LOW ANG TROUGH NO FOSSILS
			KW 58AN 70	NON	

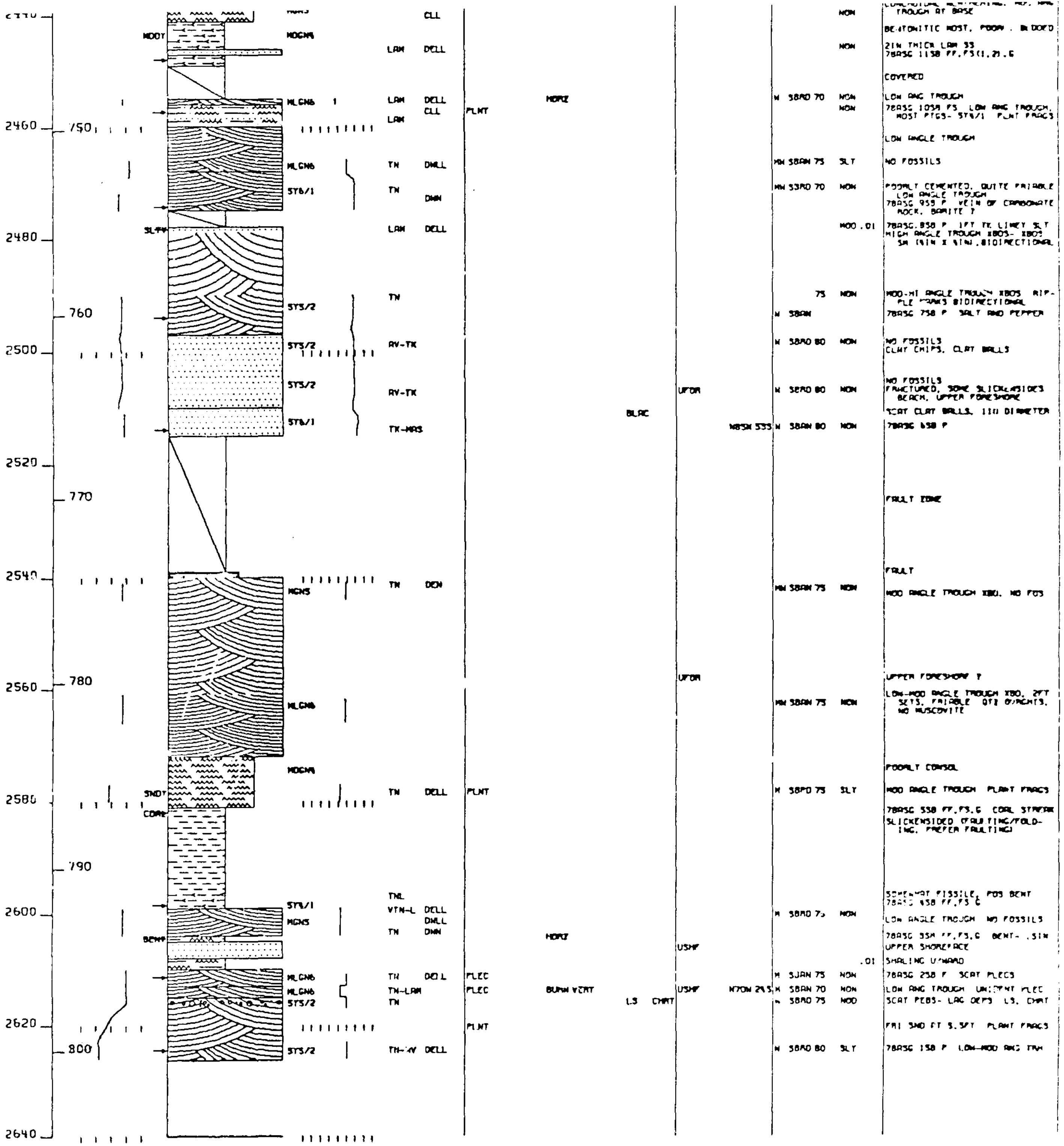

1320
1340
1360
1380
1400
1420
1440
1460
1480
1500
1520
410
420
430
440
450
460
MGNS
MGNS
TN
TN
DMLL
DMN
FLNT
FLNT
M SBRN 70
NON
NON
LOW ANGLE TROUCH
COVERED
SHALE OUTCROP
COVERED


1560
480
1580
1600
490
1620
500
1640
1660
510
1680
520
1700
1720
530
1740
1760
SNDT
MLGN6
TN
DELL
MLGN6
BNI
MLGN6
TN-LAM CLL
TN-LAM CLL
MLGN6
TN-VTN CLL
MLGN6
TN
DELL
MLGN6
TN
MLGN6
TN-VTN
TN-VTN
MLGN6
TN
DELL
TN-LAM
ST6/1
ST2/1
TN-LAM
TN
ST2/1
MDGN6
VTN-L
ST2/1
TN
FLEC
TUBE
FLEC
CARB
CARB
CARB
CHRT
FLUV
MBBZ 653
CHRT
CHAN
BLAC CHRT
FLUV
BLAC
DLFT
DLFT
MW 38AN 75
MW 38AN 75
MW 38AN 75
MW 38RD 70
MW 38AN 70
MW 38RD 70
W 38RD 75
MW 38AN 75
MW 38AN 70
MW 38AN 70
NON
NON
NON
NON
NON
NON
NON
NON
MOD
SLT
NON
SLT
BENTONITIC ?
78RSG 3258 F BLK CHRT LAG DEP
LOW-MOD ANG XBDS NO FOSSILS
LOW ANG TROUGH NO FOSSILS
SNDT BLK SHALE- 8IN THICK
LOW ANG TROUGH CALC CEMENT
SPORADIC NO FOSSILS
CHAN LAG DEPOSIT- BLK CHERT
MOD ANG TROUGH XBDS
CLAY BALLS, BLK CHRT LAG DEPS
NO FOSSILS
MOD ANG TROUGH XBDS NO FOS
COVERED BENTONITIC SHALE
"POPCORN SHALE"
CLAY BALLS
78RSG 3159 ; PELECYPOD SHELLS
DELTA FRONT
MORE RESISTANT
LOW ANG TROUGH XBDS NO FOS
POORLY CEMENTED COVERED
MOD ANG TROUGH XBDS NO FOS
MOD ANG TROUGH XBDS
RESISTANT LIMESTONE
MOD ANG TROUGH XBDS
78RSG 3058 F PLECS, MORE TUBES
78RSG 2958 F CRC SLIST, MOD
ANG TROUGH TOPSET LITHO
78RSG 2958 FS DK MDST
COVERED- PROBABLY SANDSTONE
POORLY CEMENTED
SLIST & SS, SS ABOUT 1FT THICK
78RSG 2858 F PELECYPOD LAYER
LOW-MOD ANG TROUGH XBDS
LOW ANGLE TROUGH
LOW ANG TROUGH CARB DEBRIS
78RSG 2758 FF,FS,C
LL ANG TRH CARB DEBRIS SCRT
MDST, CONCHOIDAL FRACTURE
STRINGERS OF TINY SS LOW
ANGLE TROUGH CARB DEBRIS
COVERED SH (2 COAL EXS- CV)


600
1980
COAL
LGN7
TN
DELL
ROOT
MLGN6
DNN
PLNT
LAGN
N 58RO 80 NON
ROOTS, PLANT IMPRESSIONS
78ASG 1958 P SALT & PEPPER
LOW ANGLE TROUGH SLICKENSIDES
N 58AN 80 NON
CLNBG RIPPLES COAL STREAKS
LOW ANG TROUGH QTZ OVRGTHS
WOOD IMP
CARB SH- BONE COAL IN FLOAT-
PETRIFIED WOOD AND PLECS
2000
610
BENT
G8N2
TNL
PLEC
CARBONACEOUS SHALE, FISSILE
78ASG 2258 FF,FS,G,P PLEC IN
FLOAT SOME AMA BENT STREAKS
MI 58AN 75 NON
LOW ANGLE TROUGH
10YR5/6
2020
5Y6/1
ELL
MW 58AN 75 SLY
VRY LOW ANG TRH QTZ OVRGTHS
78ASG 2158 P,F (3 BAGS)
620
2040
MGN5
DNLL
N 58AN 70 SLY
LOW ANG TROUGH VRY FRI, P CNT
78ASG 2058 P
2060
630
COVERED SHALE
2080
VERT
FILL
MOST, BAT FILL, VERT BURRLWS
2100
640
MGN5
MW 58AN 75 SLY NON
LOW ANG TROUGH NO FOSSILS
2120
5Y6/1
CYNO SHALE, BADLY WEATHERED
650
2140
2160
660
2180



2220
2240
2260
2280
2300
2320
2340
2360
2380
2400
2420
680
690
700
710
720
730
740
SLTY
ST2/1
ST6/1
MGN5
ST5/2
MLGN6
BN1
TN
DLL
DELL
VTN
LAM
DWN
CLL
CRAB
PLNT
FLUV
BAR
BLAC
E-W 605
NON
SLT
FLOCKY SH, CONCHOIDAL FRACTURE
SILTY
78ASG 1850 F
MOD ANG TROUGH XBDG FLUVIAL ?
NO FOSSILS FRIABLE
MOD-LOW ANGLE TROUGH XBDS
PROBABLY SHALE
MOD ANG TROUGH XBDS
.02
PLNT FRAGS POORLY EXPOSED
LOW ANGLE TROUGH
THIN STRINGERS OF SS IN MDST
PLANT FRAGS
MUSC FLAKES ON BDG PLANES
78ASG 1758 FS CARB SILTSTONE
VRY FRIABLE, NO FOSSILS
BENTONITIC BLACK SHALE
NO FOSSILS
LOW ANGLE TROUGH XBDS
BEACH OR BARRIER BAR
COVERED- PROBABLY SHALE
CLAY BALLS NEAR TOP
MOD ANGLE TROUGH NO FOSSILS
FRIABLE, NO BDG


2460
2480
2500
2520
2540
2560
2580
2600
2620
2640
750
760
770
780
790
800
BENTONITIC HOST, POOR . BEDDED
COVERED
LOW ANG TROUGH
LOW ANGLE TROUGH
NO FOSSILS
FAULT ZONE
FAULT
UPPER FORESHORE ?
POORLY CONSOL
UPPER SHOREFACE
SHALING UPWARD
UFOR
USHF
BLAC
HORZ