AT+S

HOOSIER F-27

9211-A31-1-2

D.A. #1205

E.A. # 174

Canada Oil and Gas Lands Administration | Administration du pétrole et du gaz des terres du Canada

Nova Scotia	☐	West Coast	☐	Exploratory	☒
Newfoundland	☐	Northern	☒	Development	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Delineation	☐
				Service	☐

AUTHORITY TO DRILL A WELL

APPLICATION

This application is submitted with Section 82 of the Canada Oil and Gas Drilling Regulations. When approved under Section 83 of the Regulations, it is the requisite authority for the commencement of drilling operations.

Well Name in Full: AT&S HOOSIER F-27

Operator: AT&S Exploration Ltd. | Drilling Program No.:

Contractor: Kenting Drilling | Permit or Lease No.:

Drilling Rig or Unit: #33 | Estimated Well Cost: $1 357 500.

Location-Unit: F Section: 27 | Grid Area: 65-30-127-45

* Coordinates: Lat.: 65°26'16.38"N | Long.: 127°49'58.87"W

Area: Norman Wells | Field/Pool:

Elevation-.../KB: 245.73 M (ASL) | Ground: 241.47 M (ASL)

Approx. Spud Date: Feb 1, 1985 | Estimated Days on Location: 30

Anticipated Total Depth: 1075 M Subsea | Target Horizon(s): Silurian-Ordovician Ronning

Anticipated Total Depth Drilled: 1321 MKB | UWI: 300F276539127450

EVALUATION PROGRAM

Ten-metre sample intervals

Five-metre sample intervals: 5 Vials, 2 Bags, Surface to FTD

Canned sample intervals: 375 m - FTD @ 10 m intervals

Conventional cores at: 1 Core in ronning: other cores if warranted

Logs and Tests: DIL-LL, BNCS-GR, CNL-FDC
One test in ronning.

CASING AND CEMENTING PROGRAM

O.D.	Weight:	Grade:	Setting Depth (m KB)	Cementing Program (Volumes):
340	54.5 lb/ft	H-40	30 M	815 Sx incl. 100% excess
245	53.6 Kg/M	J-55 ST&C	375 M	570 Sx incl. 50-100% excess
178	34.2 Kg/M	J-55 ST&C	0-1321 M	2 450 Sx incl. 100% excess

Volumes to be calculated after caliper log

B.O.P. Equipment: Schaffer LWS Single (#2) 254 MM 21 000 KPa
Hydril GK (#1) 254 MM 21 000 KPa
Accumulator 545 Litre Wagner 4
Manifold 76 MM 21 000 KPa

Other Information:

* Dependent on on-site inspection and final Survey.
Location will be within 200' of specification.

Signed: J.R. Winkler | Title: Vice President, Exploration

Date: 17 Oct 1984 | Company: AT&S Exploration Ltd.

APPROVAL

An approved copy of this notice is to be posted at each wellsite.

Signed: J. Hamilton
Engineering Branch

Date: 84.11.21

File: 9211-A31-1-2

Department of Energy, Mines and Resources | Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development | Ministère des Affaires indiennes et du Nord Canadien

Canada

Canada Oil and Gas Lands Administration | Administration du pétrole et du gaz des terres du Canada

D.A. #1205

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				Well Status	
Nova Scotia	☐	West Coast	☐	Suspended	☐
Newfoundland	☐	Northern	☒	Completed	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Abandoned	XX

WELL TERMINATION RECORD

This record is submitted in triplicate in compliance with Section 184 of the Canada Oil and Gas Drilling Regulations.

WELL DATA

Well Name: AT&S HOOSIER F-27 Area: Norman Wells

Grid Area: 65-30-127-45 Field/Pool:

Permit or Lease No.: N84A261 Final Coordinates: Lat.: 65°26'16.38"N Long: 127°49' 58.87"W

Drilling Unit: Kenting #33 Elevations: RT/KB: 245.47 GL: 241.47

Spud Date: 85-01-28 @1230 Hrs Rig Released: 85-03-01 @ 0300 Hrs Total Depth: 1321 M

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives:
340 mm Conductor	71.43	H-40	39 M	16.3 Tonnes of Polar Cement
245 mm Surface	53.60	J-55	387.5 M	28.5 Tonnes of Polar Cement

PLUGGING PROGRAM

Approval of the following program was obtained by (person) V.J. (Vic) Elford from (person) John Hamilton of the Canada Oil and Gas Lands Administration by means of Telephone on February 28 1985.

Type of Plug:	Interval:	Felt:	Cement and Additives:
Cement	1321 - 1221 M	No Feel	5 Tonnes Class G-No Additives
Cement	413 - 353 M	Top @ 350 M	1 Tonne Class G + 3% CaCl 2
Cement	0 - 10 M	0 - 10 M	.5 Tonnes Class 'G'
Cut Csg. Off	1 M Below Ground	Weld on Cap.	

Lost Circulation/Overpressure Zones: Lost Circulations from 710 - 722 M. Full Returns at 722 M

Equipment left on Seafloor (Describe): NIL

Provision for Re-entry (Describe and attach sketch):

Cores: Type: Conventional Intervals: #1 - 986 - 1003

Conventional #2 -1059 - 1069

Other Downhole Completion/Suspension Equipment: NIL

CERTIFICATION

I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate.

Signed: D.R. Winslet P. Eng. Title: Vice President, Exploration

Name: D.R. WINSLET Date: March 15, 1985

ADMINISTRATIVELY REVIEWED BY: Ken DATE 85 05 28

Acknowledged by: Engineering Branch

Date: 1 April 85

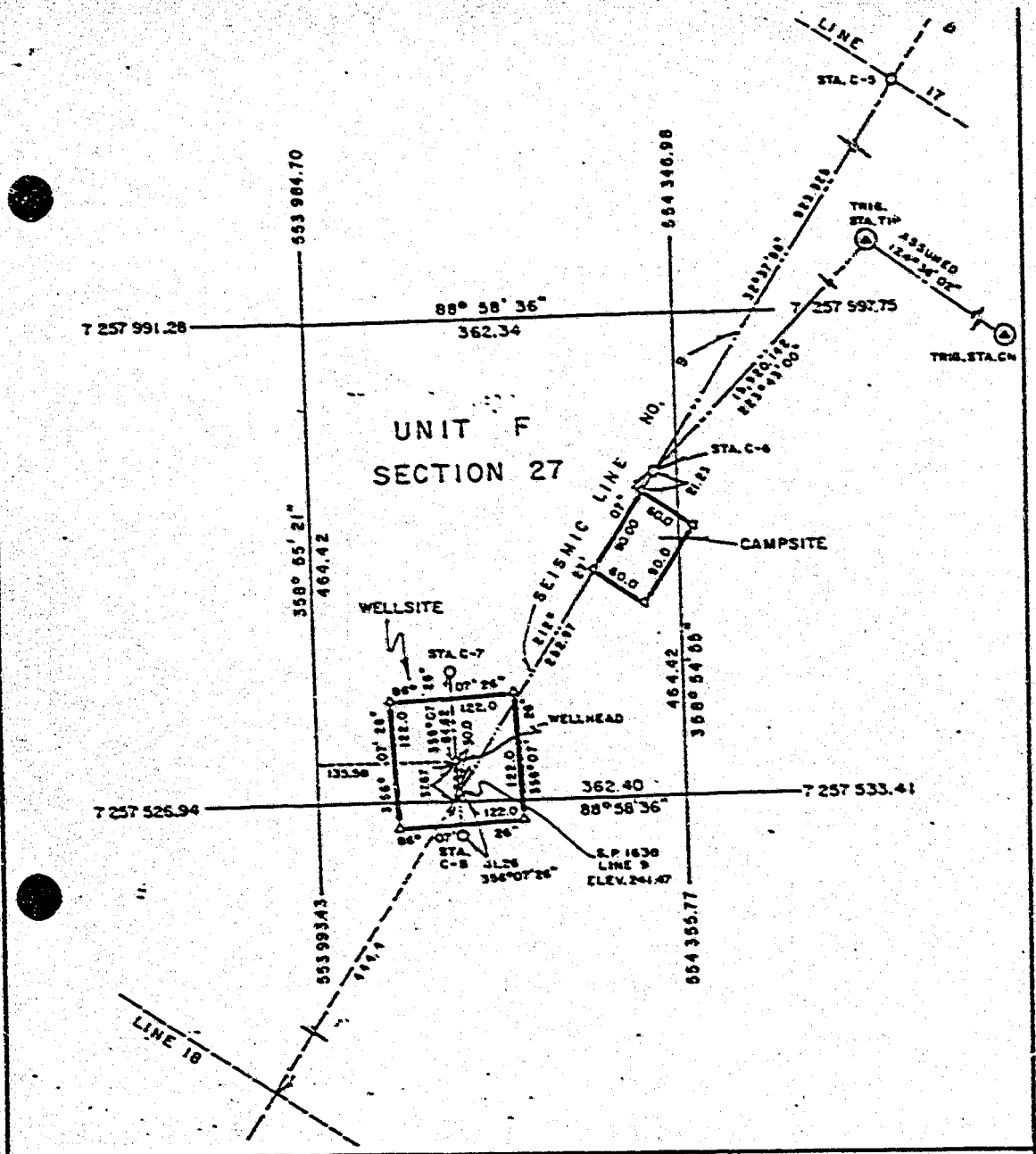
File: 9211-A31-I-2

Department of Energy, Mines and Resources | Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development | Ministère des Affaires indiennes et du Nord canadien

Canada

SUMMARY



N.T.S. MAP SHEET: 96 E | METRIC | NORTHWEST TERRITORIES

A.T. & S. EXPLORATION LTD.

PRELIMINARY SKETCH SHOWING WELL LOCATION

A.T. & S. HOOSIER 27-F

UNIT F, SECTION 27, GRID AREA 65° 30', 127° 45'

A.T. & S. EXPLORATION LTD.

CERTIFIED CORRECT:
THIS 3rd DAY OF SEPTEMBER, A.D. 1984.

CANADA LANDS SURVEYOR

ELEVATION	GEOGRAPHIC CO-ORD'S.	U.T.M. CO-ORDINATES
GROUND AT WELLHEAD : 241.47	NORTH LATITUDE: 65°26'16.38" (65.4378843°) WEST LONGITUDE: 127°49'58.87 (127.8330189°)	NORTHING: 7,257,567.02 EASTING: 554,128.28 CO-ORDINATES ARE COMPUTED FOR ZONE 9, CENTRAL MERIDIAN 129°W.

LEGEND	AREAS REQUIRED	HOSFORD, IMPEY, WELTER AND ASSOCIATES LTD.
Survey Monument found ●	WELLSITE = 3.68 Acres 1.488 ha.	P.O. BOX 1409, YELLOWKNIFE, X1A 2P1
Survey Monument placed ○	CAMPSITE = 1.33 Acres 0.540 ha.	NORTHWEST TERRITORIES
Traverse Station △	FUEL SITE = —— Acres —— ha.	
SCALE 1:5000	TOTAL = 5.01 Acres 2.028 ha.	FILE NO. Y84-014 | DATE: SEPT. 3/84 | cvd

GEOLOGICAL WELLSITE REPORT

FOR

AT&S HOOSIER RIDGE

F-27

UNIQUE WELL IDENTIFIER
300F276530127450

Prepared for

AT&S EXPLORATION LTD.

By

Chris Pollok
Daren Frew

PRO GEO CONSULTANTS

fb

March 1985

PRO GEO CONSULTANTS

TABLE OF CONTENTS

	Page
WELL SUMMARY	1
DAILY SUMMARY	2
CASING SUMMARY	5
ABANDONMENT PROGRAM	5
GEOLOGICAL SUMMARY	5
FORMATION TOPS	7
SAMPLE DESCRIPTIONS	8
DETAILED CORE DESCRIPTIONS	10

WELL SUMMARY

WELL NAME:	AT&S Hoosier Ridge F-27	
CO-ORDINATES:		
LOCATION:	Lat. 65° 26' N; Long. 127° 49' W	
ELEVATIONS:	Ground: KB:	241.47 m 245.73 m
OPERATOR:	AT&S Exploration Ltd.	
DRILLING CONTRACTOR:	Kenting Rig #33	
WELLSITE SUPERVISION:	Toolpusher: Engineer: Geologist:	Elwood Watchel Don Kilpatrick/Earl Staroszik Chris Pollock/Darren Frew
WELL SPUDDED:	05.00 1985-01-30	
DRILLING COMPLETED:	20.00 1985-02-25	
BIT SIZES:	Surface: Downhole:	311 mm 222 mm
CASING SIZES:	Surface: Production:	245 mm
TOTAL DEPTH:	Driller: Logger:	1321 m 1318 m
BOTTOM HOLE FORMATION:	Ronning Group	
CORES CUT:	Two: #1 986.6-1003 m; #2 1059-1069 m	
LOGS RUN:	Dual Laterolog; CNL FDC BHCS; all TD - Sfc.Csg. Dipmeter - TD - 850 m	
DRILL STEM TESTS RUN:	Nil	
RIG RELEASED:	03.00 1985-03-01	
WELL STATUS:	D&A	

DAILY SUMMARY

1985-01-29

- Arrived at wellsite around noon, WOC to set around conductor barrel

1985-01-30

- Spud at 05.00, Drilled surface hole to 116 m by midnight.
- Conductor barrel became displaced at approx. 90 m, therefore shale shaker was out of commission until surface casing was set.
- Shale shaker samples were taken from 40-90 m (formation either Imperial or above)
- Sampling discontinued 95-145 m.
- Flowline sampling resumed in Imperial shale at 150 m.

1985-01-31

- Drilled surface hole to 238 m. Trip for bit at 178 m. Imperial shale.

1985-02-01

- Drilled surface hole to 346 m. Imperial shale.

1985-02-02

- Drilled surface hole to 383 m and set surface casing.

1985-02-03

- Bleed off test, then drilled main hole (222 mm) to 422 m.
- Shale shaker samples were resumed with Canol shale top picked from samples near base of surface hole

1985-02-04

- Drilled to 509 m. Bit trip at 408 m. A J3 bit was taken out in condition 6-5-1 and replaced by another J3. Drilling was in Canol until Hare Indian top was found in the 505 sample.

1985-02-05

- Drilled to 616 m.
- Tripped for bit at 567 m, replaced J3 bit with J33 trying to correct hole deviation.
- Drilling was in Hare Indian until approx.570 m and then in Hume.

1985-02-06

- Drilled to 704 m. Entered Bear Rock formation at approx.675 m

1985-02-07

- Lost circulation at 710 m into suspected fracture porosity. Well did not kick.
- Tripped out J33

1985-02-08

- Trip in Security DMM and drilled to 737 m in Bear Rock formation.
- Tripped out DMM bit because hole deviation was backing back too fast.

1985-02-09

- Tripped in re-run J33 and drilled to 788 m, Bear Rock formation.

1985-02-10

- Drilled to 838 m, lost circulation. Formation was very anhydritic Bear Rock throughout. Last cuttings to reach surface showed no change, nor did the geolograph
- No visible porosity seen all day.

1985-02-11

- Spent all day in unsuccessful attempts to regain circulation at 838 m.

1985-02-12

- Tripped out J33, removed stabilizers and RIH with new Security DNN.
- Drill ahead to 853 m

1985-02-13

- Drilled to 895 m

1985-02-14

- Drill to 906 m, then tripped out DMM and RIH with J33 bit.
- Drilled ahead to 919 m

1985-02-15

- Drilled ahead to 965 m

1985-02-16

- Drilled to 986.4 m, then POH to core on orders from Calgary office.
- Cored to 992 m

1985-02-17

- Continued cutting Core #1 to 1003 m, jammed off
- Tripped out, recovered core and reamed.

1985-02-18

- Resumed drilling at 1003 m. Drilled to 1058 m, conditioned hole for Core #2

1985-02-19

- Drill to 1059 m, circulate sample. Hoist to cut Core #2
- Start coring in Ronning formation

1985-02-20

- Finish cutting Core #2, recover core, ream rathole
- Drill 222 mm hole to 1077 m

1985-02-21

- Drill ahead to 1137 m

1985-02-22

- Drill to 1155 m, trip for bit
- Drill to 1163 m
- Lost 5 drill pipe drill collars and bit in hole.
- Fish for lost pipe.

1985-02-23

- Fishing, recover fish, RIH with Bit #10

1985-02-24

- Drill to 1205 m and trip for bit
- Drill to 1244 m

1985-02-25

- Drill to 1262 m, trip for bit

1985-02-26

- Drill to 1321 m
- POH to log, run logs

1985-02-27

- Finish logging
- Pressure test BOP's and condition hole

1985-02-28

- Condition hole and WOO, lay down drill collars, WOO
- RIH with open ended drill pipe

1985-03-01

- Condition hole and run plugs
- Rig released at 03.00 1985-03-01

CASING SUMMARY

Surface Casing

Ran 32 jts. 245 mm J-55 53.6 kg/m surface casing. Cemented by Nowsco with 28.5 tonnes polar set. Landed at 383 m. Plug down at 21.00 hours 1985-02-02. Logs subsequently found 2 joints had fallen to 387.5 m

ABANDONMENT PROGRAM

Plug #1 — 1321-1221 m.
Cemented with 1.5 tonnes Class G cement
Plug down at 10.45 hrs. 1985-02-28

Plug #2 — 413-353 m
Cemented with 1 tonne Class G cement
Plug down at 14.45 hrs. 1985-02-28. Felt at 350 m.

GEOLOGICAL SUMMARY

The primary objective of this well was to find hydrocarbons in the Ronning Group, the top of which was prognosed to come in just below 900 m of depth. The upper dolomite member of the Bear Rock was considered to be a secondary objective.

Formations tops were found as follows:

Imperial Shale: Due to drilling difficulties, there was a gap in sampling between 90 and 150 meters below KB. At 150 m, there is no doubt that the formation was Imperial. Above 90 m, there is doubt as to whether the formation was Imperial or overlying strata. No logs were run at this depth due to surface casing.

Canol Shale: Interbedded dark bituminous shale and medium grey shale were found in samples immediately after drilling out from surface casing at 387.5 m. The precise Canol top is not clear because the flowline samples of the hole behind surface casing consisted only of the coarser cuttings and the Canol was later found to form very small cuttings, so the first of the Canol may have been missed. Again this is a sample top due to surface casing, but attention is drawn to the gamma ray on the Sonic log which shows some radioactivity up to 377 m, as read through casing.

Kee Scarp: No Kee Scarp was found.

Hare Indian: At 505 m or 259 m below sea level by both samples and logs.

Hume: Picked from logs at 566.5 m, or 321 m below sea level

Bear Rock (Upper Dolomite): Picked from logs at 672.4 m (-427 m ss)

Bear Rock (first significant anhydrite): From logs 705.5 m (-460 m ss).

Bear Rock (base of significant anhydrite): From logs 907.5 m (-662 m ss)

Ronning Group: No precise top is picked. It could be contended that the decrease in anhydrite content at 907.5 m marks the Ronning top, but it is pointed out that the anhydrite does not end abruptly at this depth, and that there is no marked change in the nature of the dolomite fraction of the samples.

Zones of Interest

Hare Indian

Attention is drawn to the gas recorder shows centered on 550 m. There was positively no visible porosity in this shaly formation, so the gas effect is presumed to be due to fractures.

Upper Bear Rock

Weak oil shows were seen in samples and there was some gas recorder response in the upper dolomite of the Bear Rock. Porosity is shown to be low on logs and the extremely slow cut obtained from samples shows very low permeability.

Lost Circulation Zones

Circulation was lost at 710 m and at 838 m. The well did not kick when the mud level fell in the annulus on either of these occasions.

Dolomites below heavy bedded anhydrite in the Bear Rock

No shows of live oil were seen below the base of the heavy anhydrite and down to T.D. Isolated vugs in Core #1 released sulfurous water when cracked open.

Cores

It was the original intention to core the top of the Ronning at shortly below 900 m. Apart from the phasing out of bedded anhydrite, the samples showed no signs of a formation change at or near this depth. It was eventually decided to cut a core anyway for general geological information. This was Core #1 from 986.6 to 1003 m. At 1025 m, there was a significant influx of chert in the samples and this chert content persisted, so a second core was cut from 1059 to 1069 m. Again the purpose was to gain general geological information.

Core #1 consisted of very fine sucrosic and cryptocrystalline dolomite with scattered vugs predominantly filled with anhydrite and occasionally quartz. Some vugs were not

totally infilled. These open vugs contained water with a sulfurous smell but are not associated with any hydrocarbon shows. Permeability appeared to be non existent.

Core #2 consisted of tight microcrystalline to fine crystalline sucrosic dolomite with beds and bands of white and blue chert. The dolomite had some scattered vugs filled with quartz and anhydrite. Permeability appeared to be nil.

After coring the well was drilled to a commitment depth of 1321 m KB and logged. The decision was then made to abandon the well and plugs were run.

The rig was released on March 1, 1985.

FORMATION TOPS

(See Geological Summary for Explanations)

FORMATION	SAMPLE		LOG	
	Depth (m)	Subsea	Depth (m)	Subsea
Imperial	?	?	-	-
Canol	? 385±-10	?139.27	377	-131.27
Kee Scarp		Not Present		
Hare Indian	505	-259.27	505	-259.27
Hume	575	-329.27	566.5	-321.77
Bear Rock	675	-429.27	672.5	-427
Ronning	?907.5	-661.77	? 907.5	-661.77
T.D.	1321	-1075.27	1318	-1072.27

SAMPLE DESCRIPTIONS

Depth (m)	Description
Surface Outcrop	An outcrop of rock was revealed by the bulldozer digging a new sump. The rock is a borderline case between a firm very calcareous very fine grained sandstone, and a very sandy limestone. Many pelecypod fossils were seen. The formation was seen to be dipping at between 5 and 10° in a southwesterly direction. Base of sump - 35 m below KB. Behind conductor pipe - no samples.
40-90	FORMATION UNCERTAIN.
10-70	Siltstone; mid grey. Most cuttings slightly calcareous, argillaceous.
70-75	Sandstone; very fine, calcareous, light grey and light brown, grading to silt grain size.
75-80	Mostly Siltstone grain size. Less universally calcareous.
80-85	Siltstone; light grey
85-90	Siltstone; medium grey, argillaceous.
95-145	Not sampled. Conductor pipe slipped, shale shaker had to be bypassed. Flowline sampling not started until 150 m sample.
150-383	IMPERIAL SHALE Shale; medium grey, micaceous, mostly non calcareous. This one description applies to the whole Imperial interval. These were flowline samples and it was only possible to catch the coarser pieces. It was later noticed that the Canol shale formed very small cuttings so, if Canol had been entered below 383 m, it might not have been seen in the samples.
385±10-505±10	CANOL SHALE
385±-450	Shale; very dark grey, bituminous along with some medium to medium dark grey, non bituminous cuttings. Samples smell of heavy oil when being dried.
450-455	Shale; a/a, with minor dolomitic siltstone
455-480	Shale; a/a
480-495	Shale; a/a, with occasional calcareous cuttings.
495-505±	Shale a/a, with increased quantity of calcareous cuttings.
	KEE SCARP. No Kee Scarp material was seen in samples.
505-575±	HARE INDIAN
505	Strong increase in number of calcareous and silty shale cuttings.
510	Influx of medium grey calcareous shale

Depth (m)	Description
515	Sample missed
520	Shale; medium grey, calcareous. Form thin plate and spike shaped cuttings. Looks like Imperial, but more calcareous and more delicate.
525	Shale; medium grey to light grey, variably calcareous. Still a few bituminous cuttings which are taken to be cavings.
525-565	As 525 sample. Some Canol type bituminous cuttings still present in each sample, enough to give oil smell on drying. Gas recorder shows, but no visible porosity.
565-575±	As previous with progressive increase of calcite and cryptocrystalline limestone fragments.
575±-675	HUME
675-695	Dolomite; slightly calcareous, medium brownish grey, fine sucrosic crystalline. Weak chlorothene cut. Oily smell off samples even before heating. Occasional calcareous cuttings and pieces of white recrystallized calcite.
695-710	Some minor anhydrite present. Circulation was lost at 710 m, but the well did not kick.
710-865	Anhydrite and dense crypto crystalline dolomite. No shows. Circulation was lost again at 838 m, but again the well did not kick.
865-888	Increase anhydrite, decrease dolomite
888-907.5	Dolomite; tight, cryptocrystalline, some very fine sucrosic with traces of pyrobitumen, decreasing anhydrite with depth.
907.5-1321	RONNING
907.5-940	Dolomite; medium to light brownish grey, very fine sucrosic, pyritic, only small amount of anhydrite.
940-960	Dolomite; medium to light brownish grey, fine crystalline, occasionally sucrosic, parallel oriented crystals, increase sucrosic with depth. Anhydrite; traces (puffballs)
960-986.6	Dolomite; medium to light brownish grey, fine to medium parallel oriented crystalline, tight, traces of white porcelain Chert in upper 5 meters of interval Anhydrite; traces (probable infilling of vugs).
986.6-1003	Core #1 - See detailed core description
1003-1010	Dolomite; nearly pure white, very fine sucrosic, also fine to medium crystalline dolomite with parallel crystal arrangement, no anhydrite

Depth (m)	Description
1025–1059	Dolomite; white, occasionally darker, medium sucrosic, tight Chert; porcelain, white
1059–1069	Core #2 – See detailed core description
1069–1110	Dolomite; white to very light grey brown, micro to very fine crystalline, sucrosic, hard, clean to occasional chert matrix, tight, no shows. Shale; minor, dark grey, splintery in part, blocky to subfissile, slightly calcareous
1110–1150	Dolomite; white, occasionally light grey and light grey brown, very fine crystalline, sucrosic, hard, clean to cherty, no shows
1150–1166	Dolomite; a/a, microcrystalline
1166–1275	Dolomite; white occasional light grey, occasional light grey brown, cryptocrystalline to very fine crystalline, occasional fine crystalline, sucrosic, hard, clean, cherty in part, argillaceous in part, tight, no shows Shale; traces
1275–1321 FTD	Dolomite; a/a, frequently dark brown, occasionally silty and shaly

DETAILED CORE DESCRIPTIONS

Core No.1 — 986.6–1003 — Ronning — Cut 16.4 m, Rec. 16.4 m

Depth (m)	Description
986.6–989	Dolomite; medium grey/brown, some very fine sucrosic crystalline, some cryptocrystalline, slightly argillaceous. Scattered former vugs filled with clear crystalline anhydrite. Occasional stylolites with pyrite crystals and pyrobitumen, also pyrobitumen filled fractures. No visible bedding. No oil shows.
989–992.9	Dolomite; a/a, with occasional vugs which are not fully filled with anhydrite. The contribution of these vugs to porosity is small and they appear to be very poorly connected. Freshly broken vugs inside the core contain water with a sulphurous smell. No visible bedding. No oil shows.

Depth (m)	Description
992.9-995.8	Dolomite; basical a/a. Colour has slight purple tinge to the grey/brown. No more open vugs.
995.8-998.3	Contorted interval. Dolomite as previous with thin beds (up to 3 cm) of green/grey shale in contorted bedding pattern.
998.3-1001.9	Dolomite; similar to previous with visible thin bedding which is nearly normal to the bore hole.
1001.9-1002.4	Contorted interval. Large (up to 10 cm) former vugs filled with quartz and anhydrite. Some vugs not 100% filled. Basic rock type is same dolomite. The fillings of the former vugs show quartz deposited first, with crystalline and hydrite deposited nearer to the vug centres.
1002.4-1003	Dolomite; similar to that which was seen throughout the core. No visible bedding. Some quartz blebs near base.

There were no oil shows in this core and there was no gas indicated by the gas recorders.

Core No.2 1059-1069 m Ronning

Cut 10 m
Rec. 10 m

Depth (m)	Description
1059-1060	Dolomite; massive thinly bedded (normal to borehole), rare thin bands of white opaque chert, occasional stylolites, occasional vertical fractures 100% filled with pyrite and calcite, no porosity, no shows. Dolomite is light-medium grey, microcrystalline, sucrosic, very hard, silty and slightly argillaceous.
1060-1060.65	Dolomite; massive, thin bedded, abundant bands white-blue chert (up to 3 cm wide). Secondary pyrite fracture filling, rare quartz lined vugs, up to 2 cm, vugs not interconnected. Bedding predominantly normal to borehole. Dolomite light grey, crystalline, sucrosic, very hard, occasionally silty in part, rare chert, tight, no shows.
1060.65-1061.45	Dolomite; massive, occasional thin beds white opaque chert. Dolomite light grey-light brown, very fine crystalline, sucrosic, very hard, tight, no shows.
1061.45-1063.79	Dolomite; very thin bedded, variable abundant of vugs (up to 2 cm) partially filled with quartz and anhydrite, not interconnected. Scattered parallel white chert beds at 1062 m, rarer stylolites, no shows. Dolomite light grey-brown, very fine-fine crystalline, sucrosic, very hard, cherty in part, tight, no shows

Depth (m)	Description
1063.79-1069	Dolomite; massive, very thin bedded, near base of interval, 4 cm white opaque chert at 1064.35 m, rare scattered vugs, up to 2 cm partially filled with quartz and anhydrite, very rare random fractures, rare stylolites, no shows. Dolomite, light grey-medium grey and grey brown at base, microcrystalline and sucrosic, hard, occasional chert, slightly argillaceous, tight, no shows

BIT RECORD

WELL NAME: HOOSIER F-27

BIT NO.	SERIAL	SIZE MM	TYPE	HOURS	CONDITION
1A	MC644	444.5	3AT	6-3/4	2-2-I
1	932	311.2	XDV	28-1/2	4-6-I
2	941	311.2	XDV	41	3-6-I
4	AH324	222	J3	10-1/4	2-3-I
5	1505	222	J33	80	3-5-I
6	28890	222	DMM	15-3/4	3-3-I
9	1509	222	J33	3-1/4	2-2-I

HISTORY LOG

MUD LOG

BEARSPAW
LOGGING SERVICES LTD.

OPERATOR AT&S EXPLORATION LTD.

WELL AT&S HOOSIER RIDGE F-27

STATE or PROV. NORTHWEST TERRITORIES
LOCATION Lsd ___ Sec ___ Twp ___ Rge ___ W ___
Lat 65°26'N
Long 127°49'W
ELEVATION K.B. 245.73m Ground Elev: 241.47m.
DATE SPUDDED 30/01/85 ; 0500h.
SCALE 1:600
TECHNICIANS C.D.FREW

MUD LEGEND

W WEIGHT in lb/ft³
V VISCOSITY
WL WATER LOSS in cc.
FC FILTER CAKE
Pm ALKALINITY
Rm MUD RESISTIVITY in Ω.m/m²
Rmf FILTRATE RESISTIVITY in Ω.m/m²

DRILLING LEGEND

NB NEW BIT
RRB RERUN BIT
DB DIAMOND BIT
DCB DIAMOND CORE BIT
TB TURBO BIRD
DS DEVIATION SURVEY
W/B WEIGHT ON BIT
RPM ROTATION
PP PUMP PRESSURE
SPM PUMP STROKES
LC LOST CIRCULATION
TG TRIP GAS
NR NO RETURNS

LITHOLOGY LEGEND

SANDSTONE, ANHYDRITE, GLACIAL TILL
SALTSTONE, GYPSUM, METAMORPHIC
SHALE, SALT, BRECCIA
LIMESTONE, COAL, CONGLOMERATE
DOLOMITE, IGNEOUS, CHERT
CLAYSTONE, TUFF

ENGINEERING LEGEND

C1 CORE NO.1
DST 1 DRILLSTEM TEST NO.1
DRY
WATER
OIL
GAS

PENETRATION RATE min./m
SCALE 1 1 1.0 10
SCALE 2 10 100

DEPTH

POROSITY

INTERP. LITH.

GRAIN SIZE

PERCENT LITH. 0 50 100

FLUOR

GAS FROM MUD
TOTAL GAS, METHANE, ETHANE, PROPANE, ISO-BUTANE, BUTANE
0 .1 .3 1.0 10 100

GAS FROM CUTTING 1.0 0.5 0.2

CORES

DESCRIPTION

DST

DATE

BIT DATA

Commence Logging at 390 metres in CANOL

SH m-dk gy,silty in pt,m hd,firm,blky,dull-micmica 20% of sample is cement

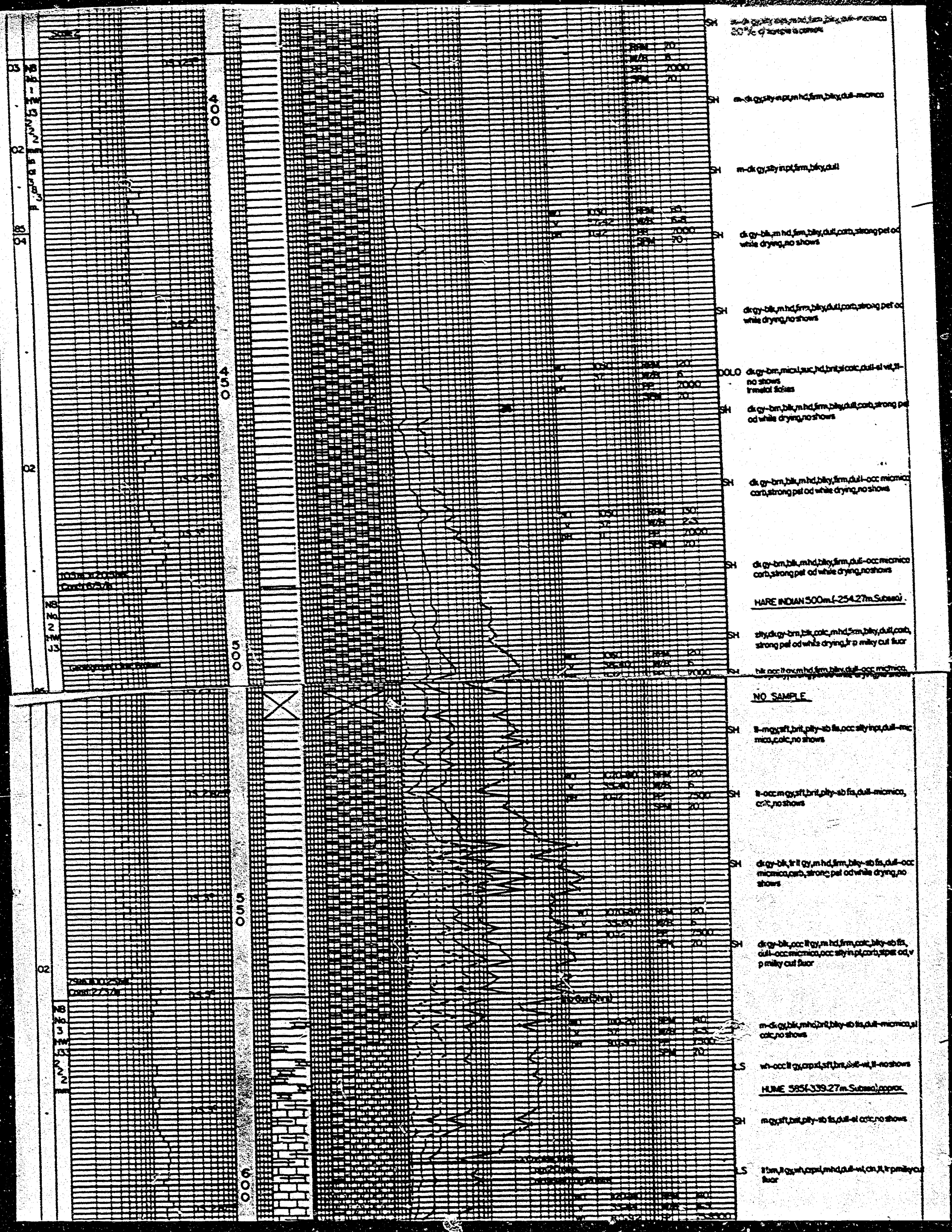
SH m-dk gy,silty in pt,m hd,firm,blky,dull-micmica

SH m-dk gy-sly in pt,firm,blky,dull

SH dk gy-blk,m hd,firm,blky,dull,carb,strong pet od while drying,no shows

SH dk gy-blk,m hd,firm,blky,dull,carb,strong pet od while drying,no shows

DOLO dk gy-brn,micxl,suc,hd,brit/coal,dull-el wt,lt-


400
450
500
550
600
NB No. 2 HW J33
NB No. 3 HW J33
HARE INDIAN 500m (-254.27m Subsea)
NO SAMPLE
HUME 585 (-339.27m Subsea) approx.

SH dk gy-blk,fr ll gy,m hd,firm,platy-sb fis,dull-occ micromica,carb,strong pet od while drying,no shows

SH dk gy-blk,occ ll gy,m hd,firm,calc,platy-sb fis, dull-occ micromica,occ stly in pt,carb,slight od,v p milky cut fluor

SH m-dk gy,blk,m hd,brit,platy-sb fis,dull-micromica,sl calc,no shows

LS wh-occ ll gy,crpxl,sft,brit,dull-vit,ll-no shows

HUME 585(-339.27m.Subsea)approx.

SH m gy,sft,brit,platy-sb fis,dull-sl calc,no shows

LS ll brn,ll gy,wh,crpxl,m hd,dull-vit,dn,fl,fr p milky cut fluor

LS m-dk brn,ll gy,wh,occ red,crpxl,m hd,brit,dn,fl-no shows

SH m gy,m hd,brit,platy-sb fis,dull,sl calc,no shows

fr c metal flakes

LS m-dk gybrn,crpxl-occ micxl,hd,-vit,org-stly in pt,fl-no shows

LS m-dk gy,brn,crpxl-occ micxl,hd,dull,org-stly in pt,fl-no shows

LS m gy,occ m brn,wh,crpxl,hd,stly in pt,dn,fl-no shows

SH m gy,sft,firm,sb fis-blky,dull-micmica,sl calc,sl carb in pt,no shows

LS m gy,ll brn,wh,occ red,crpxl,hd,dn-fr stly,fl-no shows

DOL dk brn,vf-fxl,suc,hd,vit,sl org,pos o stn,pinpt sl, p milky yel cut fluor,o smell from fresh sample

BEAR ROCK 675m.(-429.27m.Subsea)

DOL m-dk gybrn,vf-fxl,suc,hd,brit,sl org,pos o stn, pinpt sl,p milky yel cut fluor,o smell on fresh sample

DOL m-dk gy brn,vf-fxl,suc,hd,brit,sl org,pos o stn, pinpt sl,p milky yel cut fluor,o smell on fresh sample

ANHY wh-ll gy,sft,vfly,occ oily fl,pearly,dn

NO SAMPLE

DOL ll-m gy,stly,crp-micxl,hd,dull,org,fl,fr-p milky yel cut fluor,sl sulph od while drying

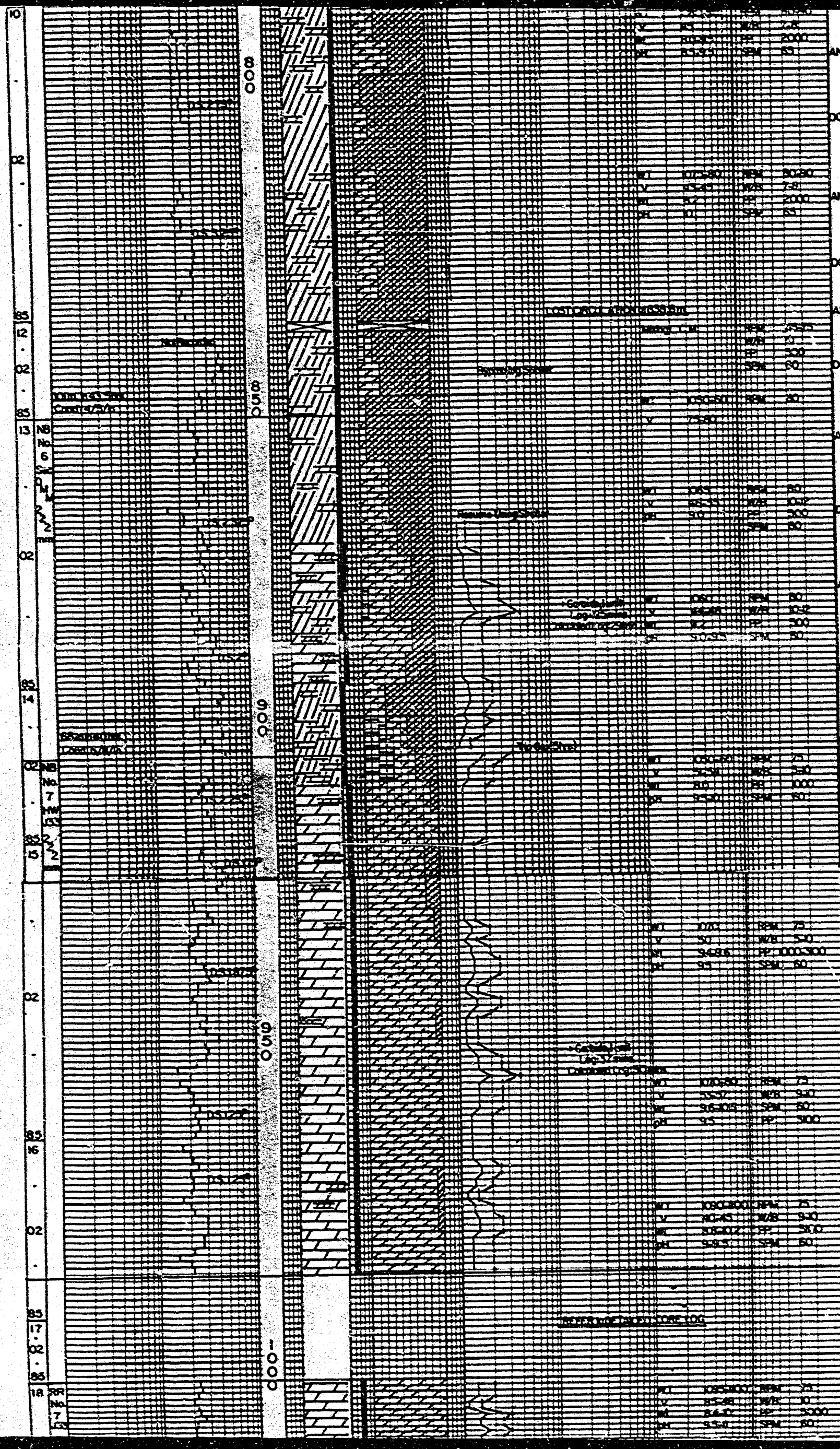
NO SAMPLE

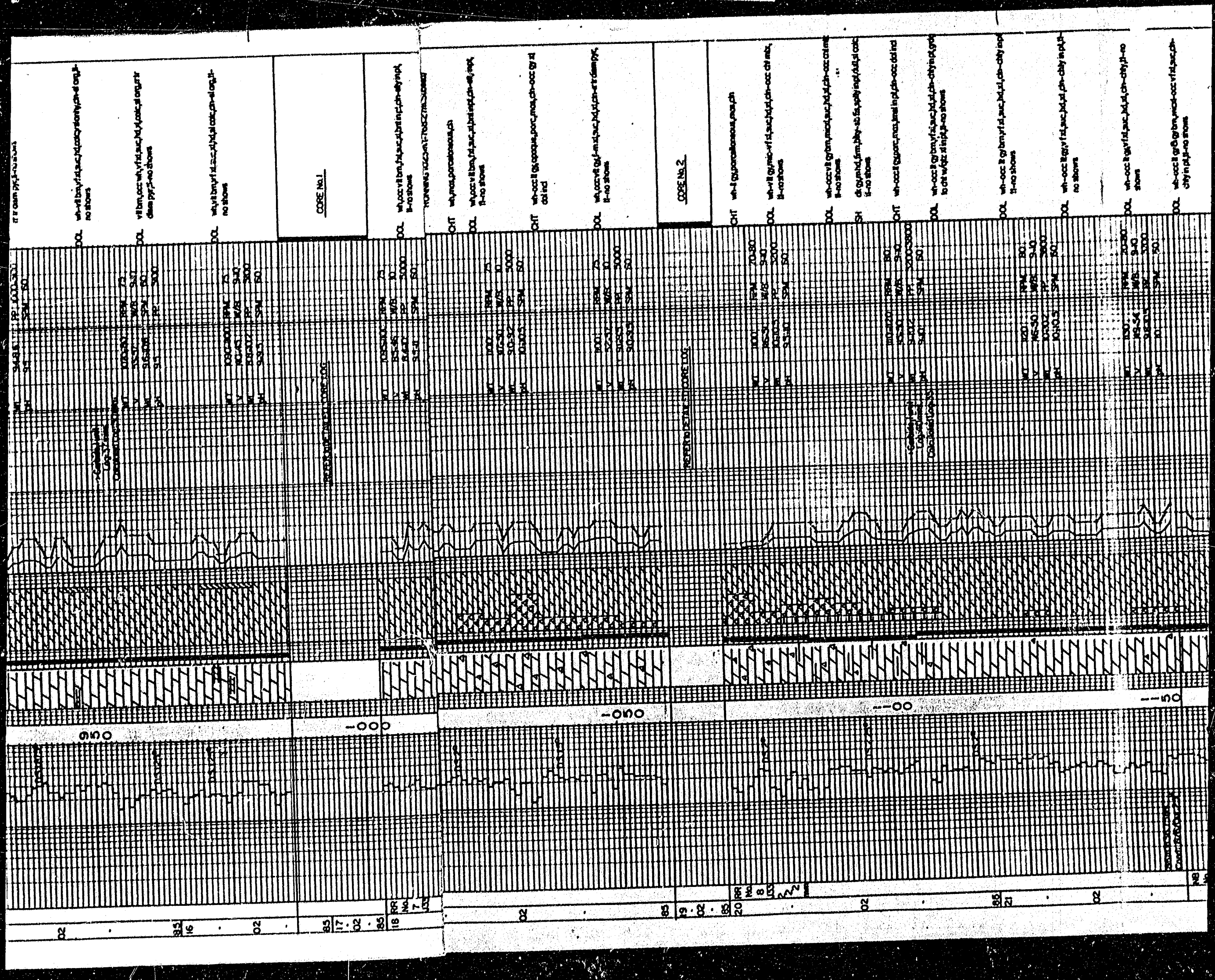
DOL ll-m gy,dk gy-brn,mic-vfxl,suc,hd,vit,v org,occ calc sl,fl-no shows

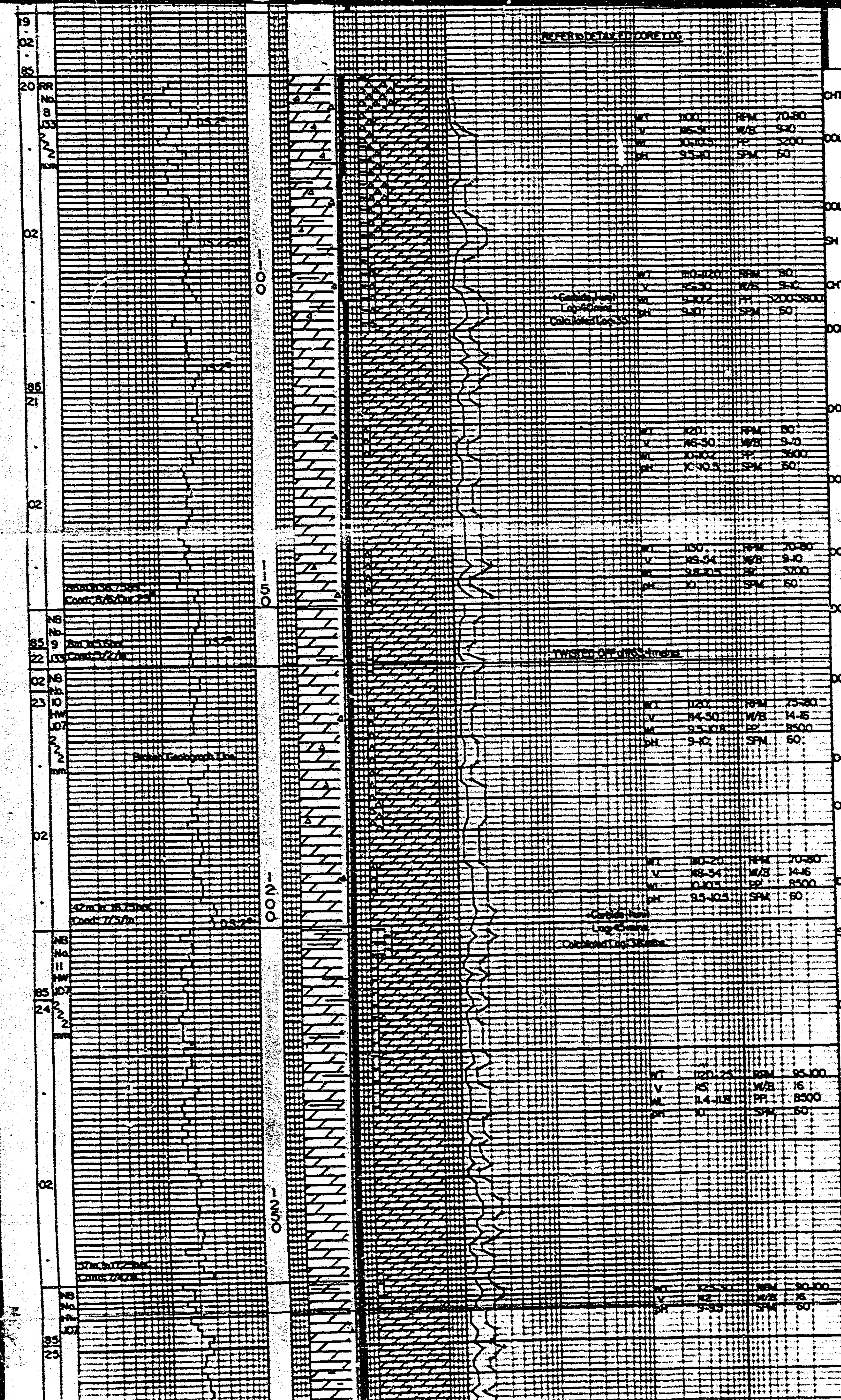
DOL dk gy,dk brn,stly in pt,hd,crpxl,dull-sl vit,slly, v org,fl-no shows

ANHY wh-ll gy brn,occ m gy,dol,dull-vfly,occ gran, sft,fol

02		500								SH	m gy,sft,fsm,sl fis-blky,dull-v micmica,sl calc,sl carb lnpl,no shows
										LS	m gy,lt bm,wh,occ mot,crpsl hd,dn-lr slty,lt-no shows
										DOL	dk bm,vf-fxl,suc,hd,vit,sl org,pos o sh,pinbd ø, p milky yel cut fluor,o smell from fresh sample
											BEAR ROCK 675m.(-429.27m.Subsea)
										DOL	m-dk gy bm,vf-fxl,suc,hd,brt,sl org,pos o sh, pinbd ø,p milky yel cut fluor,o smell on fresh sample
		700								DOL	m-dk gy bm,vf-fxl,suc,hd,brt,sl org,pos o sh, pinbd ø,p milky yel cut fluor,o smell on fresh sample
95											
07										ANHY	wh-lt gy,sft,rthy,occ pty lam,earthy,ch
02											NO SAMPLE
08	NB No. 4 Sec D M M									DOL	lt-m gy,anhy,crp-micxl,hd,dull,org,lt,trvp milky yel cut fluor,sl sulph od v=mle drying
											NO SAMPLE
02										DOL	lt-m gy,dk gy-bm,mic-vfxl,suc,hd,vit,v org,occ calc xl,lt-no shows
85											
09	NB No. 5 RR									DOL	dk gy,dk bm,anhy inpl,hd,crpsl,dull-sl vit,slty, v org,lt-no shows
		750								ANHY	wh-lt gy bm,occ m gy,dol,dull-rthy,occ gran, sft,fol
02										DOL	dk bm,lt bm,anhy,org,mic-vfxl,suc inpl,hd,lt-no shows
										ANHY	vlt bm,wh,mbm,rthy-micmica,dol,sft,mhd,gran frbl,ch
85										DOL	lt gy bm,lt gy,anhy,mic-fxl,suc inpl,hd,vit,occ calc xl,sl org,lt-no shows
10										ANHY	wh-lt gy,sft-rthy,gran,frbl,ch.
02		800								DOL	m gy,m gy-bm,mic-vfxl,suc inpl,anhy,hd,sl org no shows
										ANHY	lt-m gy bm,wh,rthy-micmica,dol,hd,occ sft, sl org-lt,no shows
										DOL	m gy,m bm,mic-vfxl,anhy,suc inpl,sl org,lt-no shows
35										ANHY	wh,lt gy bm,m bm,hd,occ sft,micxl-gran inpl, frbl inpl,sl dol,ch
12											
02										DOL	m gy-bm,mic-vfxl,suc,hd,sl anhy,tr calc xl,sl sl org,shly inpl,lt-no shows
85											
13	NB No. 6 Sec D M M									ANHY	wh,dk gy,lt gy bm,hd-occ sft,micxl-gran,fbl inpl occ pty & pearly,sl dol,no shows
										DOL	m gy bm,mic-vfxl,suc,hd,sl anhy,tr calc xl,sl org shly inpl,no shows


800
850
900
950
1000
NB No. 6
NB No. 7
RR No. 7
CORE No.1
CORE LOG


CORE No.1
CORE No.2
PROPERTY OF PETROLEUM CORE LOG
-000
-050
--00
--50



CORE No. 2

CHT wh-lt gy,porcellaneous,mas,cln

DOL wh-v lt gy,mic-vf xl,suc,hd,xl,cln-occ chl mtx, tt-no shows

DOL wh-occ v lt gy brn,micxl,suc,hd,xl,cln-occ chl mtx tt-no shows

SH dk gy,m hd,firm,blky-sb fis,splty in pt,dull,sl calc tt-no shows

CHT wh-occ lt gy,porc,mas,trnsl in pt,cln-occ dol incl

DOL wh-occ lt gy brn,vf xl,suc,hd,xl,cln-chly in pt,grdg to cht w/qtz xl in pt,tt-no shows

DOL wh-occ lt gy brn,vf xl,suc,hd,xl,cln-chly in pt tt-no shows

DOL wh-occ lt gy,vf xl,suc,hd,xl,cln-chly in pt,tt-no shows

DOL wh-occ lt gy,vf xl,suc,hd,xl,cln-chly,tt-no shows

DOL wh-occ lt gy & gy brn,micxl-occ vf xl,suc,cln-chly in pt,tt-no shows

DOL wh-occ lt gy brn,mic-vf xl,occ f xl,suc,hd,xl,cln-chly in pt-tt-no shows

DOL wh,-occ lt m gy,crp-vf xl,suc,hd,xl,cln-sl arg, chly in pt, tt-no shows

CHT wh,lt gy,rr tr glauc gn,porc,op,mas,occ dol incl

DOL wh,occ lt gy,crpxl-vf xl,suc,xl,cln-sl arg,chly in pt,tt-no shows

SH dk gy-blk,m hd,firm,splty-sb fis,dull-no show

DOL wh-lt gy brn,mic-vf xl,suc,hd,xl,cln-chl mtx in pt, tt-no shows

DOL wh-lt gy brn,mic-vf xl,suc,hd,xl,cln-chl in pt,tt-no shows

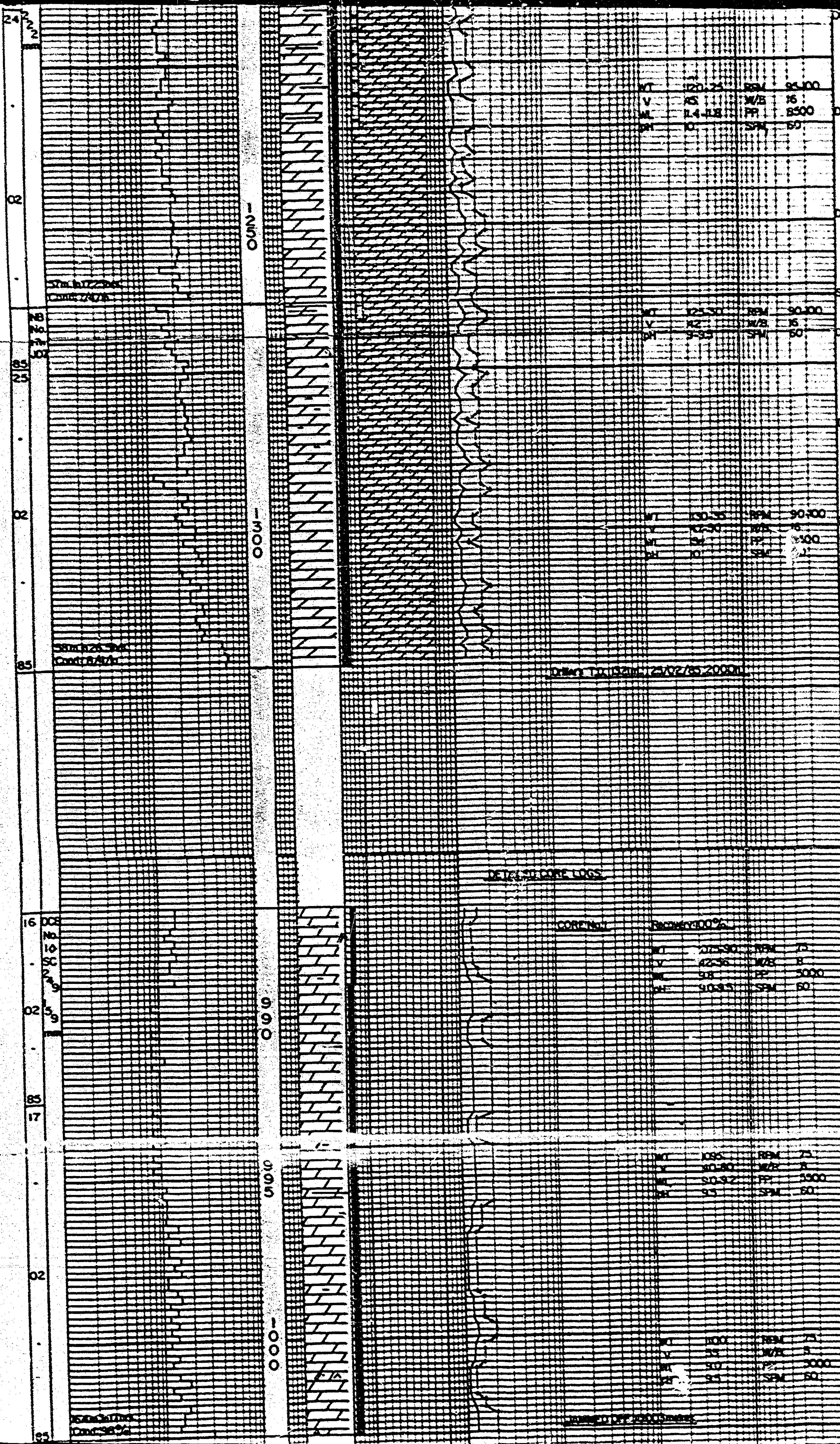
DOL wh-occ lt gy brn,mic-vf xl,occ f xl,suc,hd,cln-chl in pt,tt-no shows

SH dk gy-blk,m hd,firm,splty,dull,no shows

DOL wh-occ lt gy brn,mic-vf xl,occ f xl,suc,hd,cln-chl in pt,tt-no shows

DOL wh-lt gy brn,dk brn,crp-vf xl,suc in pt,hd,slty, slty chl mtx in pt,tt-no shows

7



DOL wh-ll gy brn,mic-vf xl,suc,hd,xl,cln-chl inpl,ll-no shows

DOL wh-ll gy brn,mic-vf xl,suc,hd,xl,cln-chl inpl,ll-no shows

DOL wh-occ ll gy brn,mic-vf xl,occ f xl,suc,hd,cln-chl inpl,ll-no shows

SH dk gy-blk,m hd,firm,splty,dull,no shows

DOL wh-occ ll gy brn,mic-vf xl,occ f xl,suc,hd,cln-chl in pl,ll-no shows

DOL wh-ll gy brn,dk brn,crp-vf xl,suc in pl,hd,slty,shly,chl mtx inpl,ll-no shows

DOL wh-ll gy brn,occ dk brn,crp-vf xl,suc,hd,cln,slty in pl,chl mtx in pl,ll-no shows

DOL wh-ll gy,crp-vf xl,suc,mas in pl,v hd,cln-occ slty,chl in pl,ll-no shows

986.6-989m: DOL:mas w/scat unconnected vugs up to 4cm in sze,filled w/clr xl anhy,no vis bdg,occ stylo fl w/xl pyr & pyrobit,tr pyrobit fl frac.Dol is m gy brn-occ dk gy,pred vfxl-suc,occ crpxl-mas,hd,sl arg,ll-no shows

989-992.9m. DOL:mas,no vis bdg,r scat surf vugs,-unconnected,occ fill w/clr xl anhy,occ stylo fl w/xl pyr & pyrobit,tr pyrobit fl fracs.Dol is m gy brn,mic-vf xl,suc,sl arg,ll-no shows.

992.9-995.8m.DOL:mas,no vis bdg,Dol is m gy brn,mic-vf xl,suc,sl arg,ll-no shows

995.8-998.3m.DOL:mas w/thin contorted sh beds (up to 3cm) near top of int,occ random pyr fill fracs thru.Dol is ll-m gy,mic-vf xl,hd,mas-suc in pt,sl arg,ll-no shows.Sh is m gn,m hd,firm,fis-plty,dull-micmica,no shows

998.3-1001.9m.DOL:v thin bdd(bdg nearly normal to borehole)grdg to mas near base of int.Dol is ll-dk gy,mic-vf xl,suc,hd,cln-sl arg,ll-no shows

1001.9-1002.4m.DOL:highly contorted,lg(up to 10cm) qtz & anhy fl vugs(up to 100 % fl).Dol is ll-m gy brn,mic-vf xl,hd,mas,suc,sl arg,ll-no shows.Qtz:primary vug fl clr eshed prism cxl.Anhy secondary vug fill,clr-pale blue,xl-occ mas,vc plty & bladelike xl

1002.4-1003m.DOL:mas,no vis bdg,Dol is ll-m gy brn,mic-vf xl,hd,suc,cln-sl arg,ll-no shows,occ blebs wh mas chl(up to 2 cm) at base of int

DETAILED CORE LOGS

CORE No.1 Recovery 100%

CORE No.2 Recovery 100%

PENETRATION RATE (min/20cm)

GAS (TOTAL MUD %)

ENDED CORING 1069 metres

986.6–989m: DOL:mas w/scat unconnected vugs,up to 4cm in size,filled w/clr xl only,no vis bdg,occ stylo fl w/xl pyr & pyrobit,tr pyrobit fl fracs.Dol is:mgy brn-occ dk gy,pred vf-xl-suc,occ crpxl-mas,hd,sl arg,fl-no shows

989–992.9m: DOL:mas,no vis bdg,rr scat surf vugs,-unconnected,occ fill w/clr xl only;occ stylo fl w/xlpyr & pyrobit,tr pyrobit fl fracs.Dol is:m gy brn,mic-vf xl,suc,sl arg,fl-no shows

992.9–995.8m:DOL:mas,no vis bdg,Dol is:mgy brn,mic-vf xl,suc,sl arg,fl-no shows

995.8–998.3m:DOL:mas w/thin contorted sh beds up to 3cm,near top of int,occ random pyr fl fracs thru.Dol is:fl-m gy,mic-vf xl,hd,mas-suc in pt,sl arg,fl-no shows.Sh is:m gy,sm hd,firm,fis-pty,dull-micmica,no shows

998.3–1001.9m:DOL:v thin bdd bdg nearly normal to borehole,tr concs near base of int.Dol is:fl-dk gy,mic-vf xl,suc,hd,cln-sl arg,fl-no shows

1001.9–1002.4m:highly contorted,v/up to 10cm,qtz & anhy fl vugs(up to 100% fl).Dol is:fl-m gy brn,mic-vf xl)hd,mas,suc,sl arg,fl-no shows.Qtz:primary vug fl clr elshed prism c xl.Anhy:secondary vug fl,clr-pale blue,xl-occ mas,vc pity & bladelike xl

1002.4–1003m.DOL:mas,no vis bdg,Dol is:fl-m gy brn,mic-vf xl,hd,suc,cln-sl arg,fl-no shows,occ blebs wh mas chl(up to 2cm.)at base of int

1059–1060m.DOL:mas thin bdd,bdg normal to borehole,rr thin concordant bands wh op chl,occ stylo,occ vert fracs fl w/pyr & calc.Dol is:fl-m gy,micxl,suc,vhd,slty-sl arg in pt,fl-no shows

1060–1060.65m.DOL:mas thin bdd w/abnt bands wh-blue chl(up to 3cm.),suc pyr fracs fl,rr qtz lined vugs up to 2cm. no interconnection between vugs,bdg pred parallel,normal to borehole,distorted in pl.DOL is:fl-m gy micxl,suc,vhd,rel ch-occ slty in pt,rr chl mtx,fl-no shows

1060.65–1061.45m.DOL:mas,occ thin bd wh op chl Dol is:fl gy,fl gy brn,vf-f xl,suc,vhd,rel ch,fl-no shows

1061.45–1063.79m.DOL:v thin bdd,var abnt vugs(up to 2cm.)occ lined w/qtz & anhy,no interconnection,scat parallel wh chl blebs at 1062.05m,rr stylo.Dol is:fl-m gy,fl gy brn,vf-f xl,suc,v hd,rel ch-chl mtx in pl,fl-no shows

1063.79–1069m.Dol:mas,occ v thin bdg-pred at base 4cm wh op chl at 1064.35m,rr scat vugs up to 2cm,occ part lined w/qtz & anhy,v rr random fracs,v rr stylo.Dol is:v fl gy borng fl-m gy & gy brn at base,micxl,suc,hd,occ chl mtx,ch-sl arg,fl-no shows

CORE LABORATORIES - CANADA, LTD.

Petroleum Reservoir Engineering

CORE ANALYSIS

ATIS EXPLORATION LTD.
ATIS HOOSIER RIDGE F-27
WILDCAT, N.W.T.,
65°26'16.38" N LAT. 127°49'58.87" W LONG.
85-02-27

TABLE OF CONTENTS

Section I:	Core Analysis Data, tabulated
Section II:	Histograms Porosity with cut-off ranges, tabulated Permeability with cut-off ranges, tabulated Grain Density
Section III:	Cross Plots (Kmax vs. Ø) with cut-off ranges, tabulated
Attachments:	Correlation Coregraphs
Color	Porosity, Permeability, Gamma Ray, Residual Saturations

CORE LABORATORIES — CANADA, LTD.

COMPANY ATIS EXPLORATION LTD.
WELL ATIS HOOSIER RIDGE F-27
FIELD WILDCAT, N.W.T.
LOCATION 65°25'16.38" N LAT. 127°49'58.87" W LONG.

FORMATION REAR CREEK
CORING EQUIPMENT DIAMOND
CORE DIAMETER.(mm) 100
CORING FLUID WATER BASE MUD

PAGE 1
FILE 7004-85-262C
DATE 85-02-27
ANALYSTS RP

FULL DIAMETER ANALYSIS

Sample Number	Depth Metres (m)	m Rep.	Sample Length	Permeability to Air Millidarcys aD Max.	aD 90 des.	aD V	Perm. X m	Porosity	Porosity X m	Density kg/m3 Bulk	Density kg/m3 Grain	Residual Saturation (Frac of Pore Vol) Oil	Residual Saturation (Frac of Pore Vol) Water	VISUAL EXAMINATION
	CORE NO. 1	986.60 m - 1003.00	(core received	16.30 m)	(15 Boxes)									
NA	986.60-90.42	3.82	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
1	990.42-90.60	0.18	.14	0.56	0.56	0.07	0.101	0.052	0.009	2710	2860	-	-	dol i ppv sv anhy frs
NA	990.60-91.92	1.32	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
2	991.92-92.10	0.18	.08	0.15	0.10	0.20	0.027	0.057	0.010	2700	2860	-	-	dol i sv mv anhy
NA	992.10-93.80	1.70	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
3	993.80-93.94	0.14	.12	0.22	0.21	0.18	0.031	0.030	0.004	2760	2840	-	-	dol i ppv sv vfrac
NA	993.94-94.60	0.66	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
4	994.60-94.72	0.12	.09	0.77	0.56	0.63	0.092	0.041	0.005	2710	2830	-	-	dol i ppv sv vfrac
NA	994.72-95.48	0.76	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
5	995.48-95.59	0.11	.10	3.40	0.27	2.43	0.374	0.021	0.002	2770	2830	-	-	dol i ppv sv vfrac
NA	995.59- 3.10	7.51	-	-	-	-	-	-	-	-	-	-	-	No analysis requested

CORE LABORATORIES - CANADA, LTD.

COMPANY ATIS EXPLORATION LTD.
WELL ATIS HOOSIER RIDGE F-27

FORMATION
CORING EQUIPMENT ROWING DIAMOND

FILE 7004-85-2620

FULL DIAMETER ANALYSIS

Sample Number	Depth Metres (m)	m Rec.	Sample Length	Permeability to Air Millidarcys mD Max.	mD 90 deg.	mD V	Perm. X m	Porosity	Porosity X m	Density kg/m3 Bulk	Density kg/m3 Grain	Residual Saturation (Frac of Pore Vol) Oil	Residual Saturation (Frac of Pore Vol) Water	VISUAL EXAMINATION
	CORE NO. 2	1059.00 m - 1069.00	(core received	10.10 m)	(9 Boxes)									
NA	1059.00-61.70	2.70	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
6	1061.70-61.89	0.19	.09	68.7	50.0	14.7	13.056	0.046	0.009	2700	2830	-	-	dol i mv frac
NA	1061.89-62.29	0.40	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
7	1062.29-62.48	0.19	.14	1.11	0.28	0.01	0.211	0.059	0.011	2620	2790	-	-	dol i sv mv calc
8	1062.48-62.63	0.15	.10	784.	56.7	1.67	117.712	0.059	0.009	2630	2790	-	-	dol i sv mv calc
NA	1062.63-63.11	0.48	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
9	1063.11-63.33	0.22	.08	3730.	4.60	0.01	821.117	0.067	0.015	2650	2840	-	-	dol i sv mv lam
NA	1063.33-64.32	0.99	-	-	-	-	-	-	-	-	-	-	-	No analysis requested
10	1064.32-64.60	0.28	.09	1.16	0.34	0.06	0.325	0.022	0.006	2780	2840	-	-	dol i vfrv sv frac
NA	1064.60-69.10	4.50	-	-	-	-	-	-	-	-	-	-	-	No analysis requested

CORE LABORATORIES - CANADA, LTD.

WELL AT&S HOOSIER RIDGE F-27

FORMATION BEAR CREEK

SUMMARY INTERVAL 986.60-1059.00

FILE 7004-85-262C

TOTAL 72.40

METRES ANALYZED 0.73

METRES NOT ANALYZED: TOTAL 71.67 DENSE 0.00 LOST 0.00 *NA 15.77 DRILLED 55.90 RUBBLE 0.00

SUMMARY OF ANALYZED CORE:	METRES	FRACTION OF ANALYZED CORE	WEIGHTED AVERAGE POROSITY	POROSITY METRES	WEIGHTED AV. HORIZONTAL PERMEABILITY	PERMEABILITY METRES	WEIGHTED AVERAGE RESID. OIL	WEIGHTED AVERAGE TOT. WATER
TOTAL	0.730	1.000	0.043	0.031	0.856	0.625	0.000	0.000
BY PERM RANGES								
LESS THAN 0.01 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.01 0.09 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.10 0.49 mD	0.320	0.438	0.045	0.014	0.161	0.058	0.000	0.000
0.50 0.99 mD	0.300	0.411	0.048	0.014	0.644	0.193	0.000	0.000
1.0 9.99 mD	0.110	0.151	0.021	0.002	3.400	0.374	0.000	0.000
GREATER THAN 9.99 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*NOT ANALYZED BY REQUEST

CORE LABORATORIES - CANADA, LTD.

WELL AT&S HOOSIER RIDGE F-27 PAGE 4

FORMATION ROHING

SUMMARY INTERVAL 1059.00-1069.10 FILE 7004-89-262C

TOTAL 10.10

METRES ANALYZED 1.03

METRES NOT ANALYZED: TOTAL 9.07 DENSE 0.00 LOST 0.00 *NA 9.07 DRILLED 0.00 RUBBLE 0.00

SUMMARY OF ANALYZED CORE:	METRES	FRACTION OF ANALYZED CORE	WEIGHTED AVERAGE POROSITY	POROSITY METRES	WEIGHTED AV. HORIZONTAL PERMEABILITY	PERMEABILITY METRES	WEIGHTED AVERAGE RESID. OIL	WEIGHTED AVERAGE TOT. WATER
TOTAL	1.030	1.000	0.048	0.050	924.067	951.789	0.000	0.000
BY PERM RANGES								
LESS THAN 0.01 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.01 0.09 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.10 0.49 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.50 0.99 mD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0 9.99 mD	0.470	0.456	0.037	0.017	1.140	0.536	0.000	0.000
GREATER THAN 9.99 mD	0.560	0.544	0.058	0.032	1698.666	951.253	0.000	0.000

*NOT ANALYZED BY REQUEST

CORE LABORATORIES - CANADA, LTD.

CODE KEY - DESCRIPTIONS

anhy = Anhydrite
AST = Appears similiar to
bk = Break
bldr = Boulder
c = Coarse
calc = Calcite (areous)
carb = Carbonaceous
cbl = Cobble
CEC = Cation exchange capacity
cgl = Conglomerate
cht = Chert
coal = Coal/Coal Inclusion
dol = Dolomite
f = Fine
fest = Ironstone
foss = Fossil (iferous)
frac = Fracture
fri = Friable
glauc = Glauconite (ic)
grnl = Granule
gyp = Gypsum
h frac = Horizontal fracture

hal = Halite (Salt)
i = Intergranular
lam = Laminae (Laminated)
lmy = Limy
ls = Limestone
lv = Large vug
m = Medium
mi = Mud invaded
mic = Micaceous
mshy or shy = Moderately shaly (20-40%)
mv = Medium vug
NA = Not analysed by request
NP = No permeability measurement
ool = Oolitic
OB = Overburden
P = Preserved for future studies
pbl = Pebble
POA = portion removed for oil analysis
ppv = Pinpoint Vug
PSA = Particle size analysis
pyr = Pyrite (ic)
pyrbit = Pyrobitumen

SCAL = removed for special core analysis
sdy = Sandy
SEM = Scanning electron microscope analysis
sh = Shale
sltst = Siltstone
slty = Silty
ss = Sandstone
sshy = Slightly Shaly(<20%)
sty = Stylolite (ic)
sulf = Sulphur
sv = wet/dry sieve analysis
tr = Trace
TS = Thin section
uncons = Unconsolidated
vfrac = Vertical fracture
vf = Very fine
VOB = Vertical overburden sample
vshy = Very shaly (>40%)
vug = Vuggy (ular)
x = Broken core
** = Permeability > 10240 mD

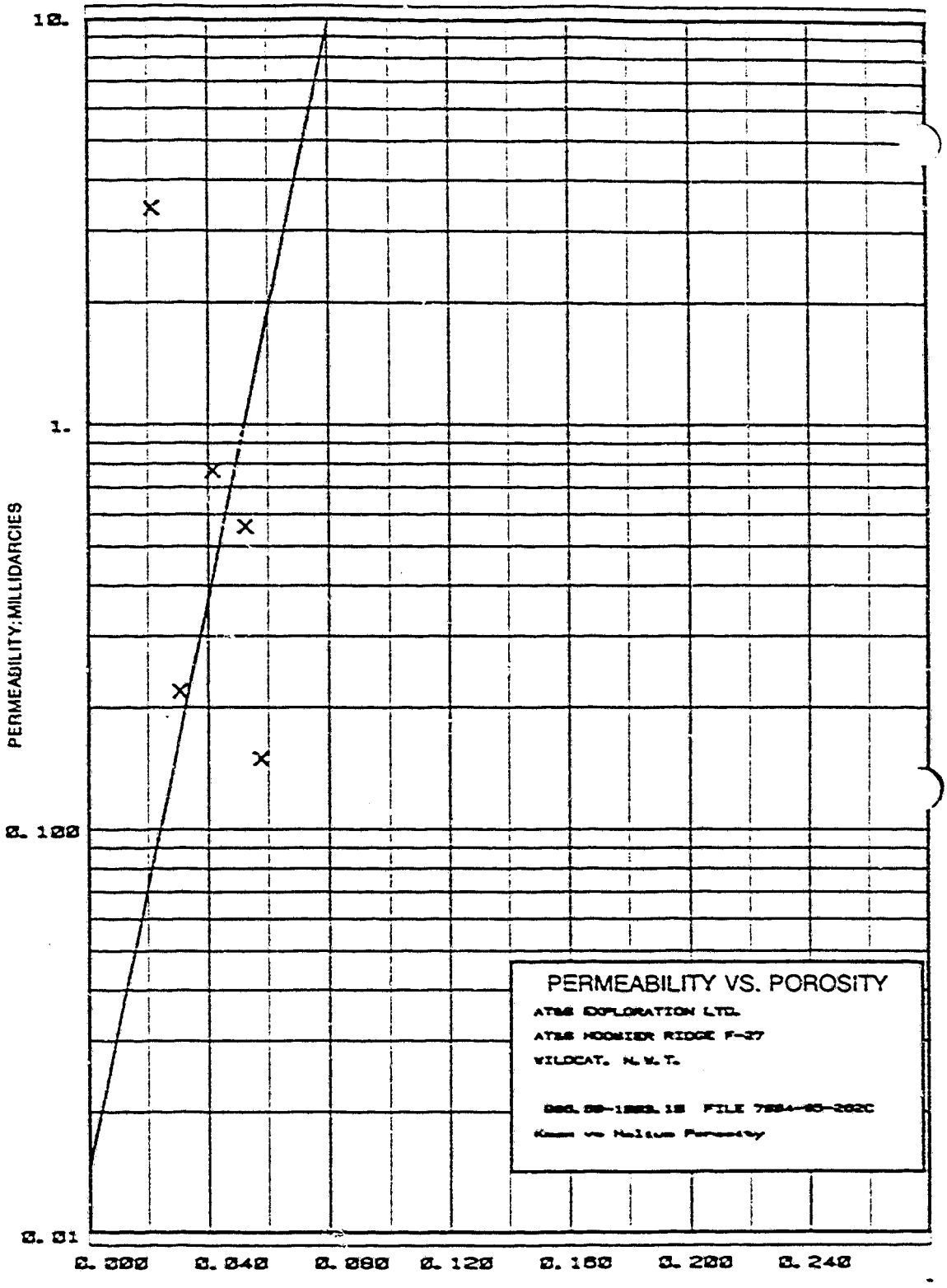
CLEANING

Solvent
Extraction Equipment
Extraction Time
Drying Equipment GRAVITY OVEN
Drying Time 36 HOURS
Drying Temperature 132 DEG.C

ANALYSIS

Pore volume measured by Boyle's Law in a Hassler holder using He
X Grain vol msrd by Boyle's Law in a modified U.S.B.M. porosimeter using He
Grain volume measured by Boyle's Law in a matrix cup using He
X Bulk volume measured by calipering
Bulk Volume by Archimedes Principle
Porosity determined by summation of fluids (retort)
Fluid saturations by retort on end pieces of full diameter samples
Fluid saturation by retort
Water saturations by Dean-Stark
Oil saturations by weight difference in Dean-Stark
Permeabilities measured on 20mm cubes
Permeabilites measured on mm diameter drilled plugs
X Core Gamma Composite
Core Gamma Spectral

REMARKS:



EQUATION OF REDUCED LINE RELATING PERMEABILITY (K) TO POROSITY

LOG (K) = (SLOPE)(POROSITY) - LOG OF INTERCEPT

K = ANTILOG (SLOPE)(POROSITY) - LOG OF INTERCEPT

RANGE	SYMBOL	EQUATION OF THE LINE
1	X	PERM=ANTILOG (0.3526) (POROSITY) -1.0297

PERMEABILITY VS POROSITY

FILE: 7004-85-2620

COMPANY: ATIS EXPLORATION LTD.

WELL : ATIS HOOSIER RIDGE F-27

FIELD : WILDCAT, N.W.T.

PROVINCE:

FORMATION: BEAR CREEK

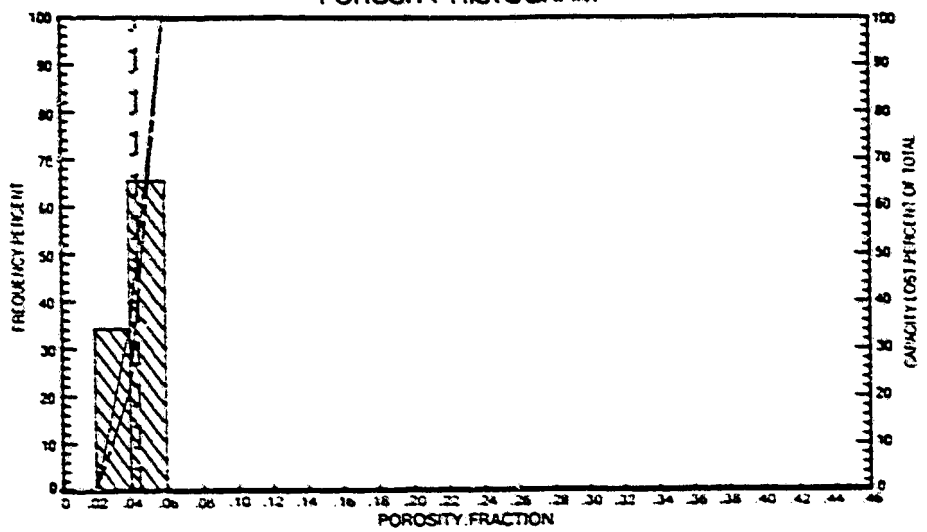
AIR PERMEABILITY : MD - MAXIMUM (UNCORRECTED FOR SLIPPAGE)
POROSITY : FRACTION (HELIUM)

DEPTH INTERVAL	METERS ANALYZED	RANGE # SYMBOL	PERMEABILITY MINIMUM	PERMEABILITY MAXIMUM	POROSITY MIN.	POROSITY MAX.	POROSITY AVERAGE	PERMEABILITY AVERAGES ARITHMETIC	HARMONIC	GEOMETRIC
986.60 - 1003.10	0.73	1 (X)	0.000	10.0	0.000	0.460	0.043	0.86	0.31	0.47

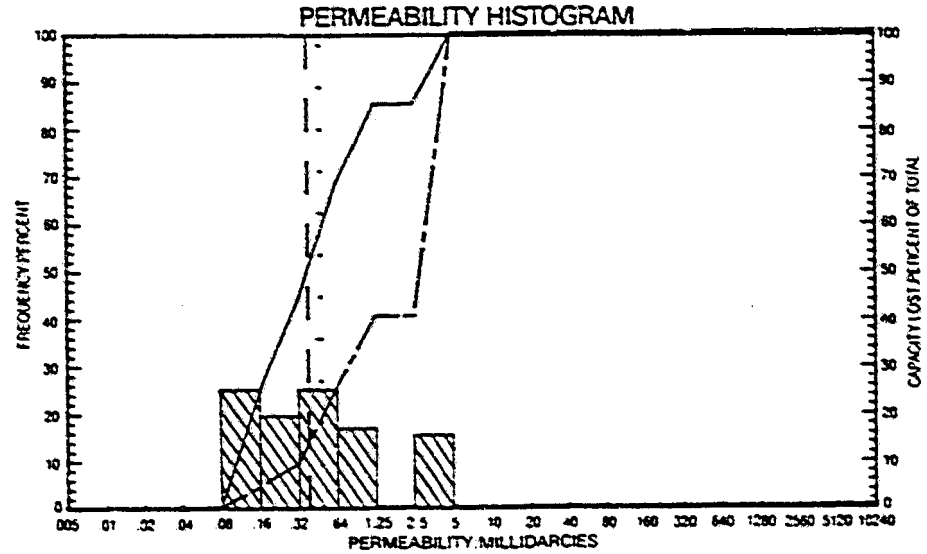
EQUATION OF REDUCED LINE RELATING PERMEABILITY(K) TO POROSITY :
LOG(K) = (SLOPE)(POROSITY) + LOG OF INTERCEPT
K = ANTILOG((SLOPE)(POROSITY) + LOG OF INTERCEPT)

RANGE	EQUATION OF THE LINE
1	PERM = ANTILOG((0.3526)(POROSITY) + -1.8297)

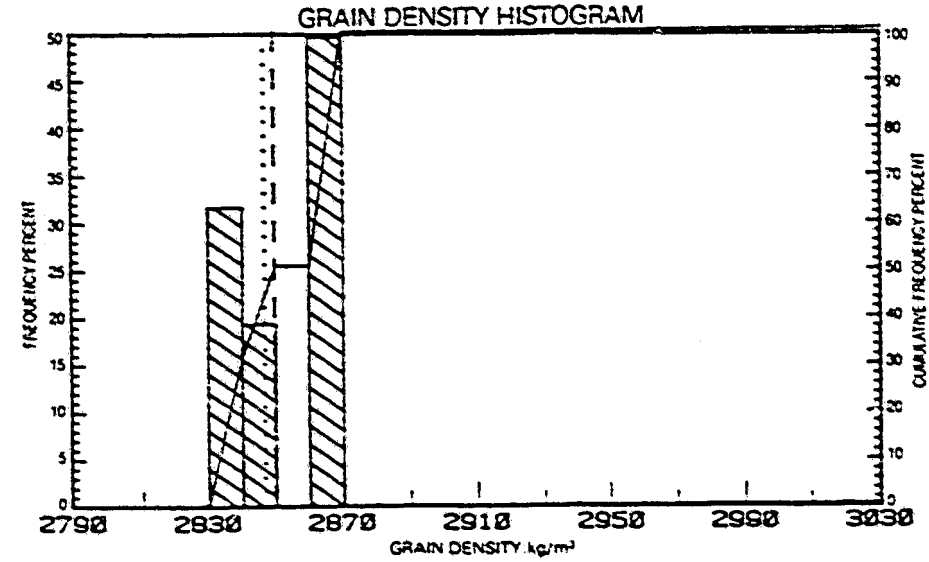
POROSITY HISTOGRAM



PERMEABILITY HISTOGRAM



GRAIN DENSITY HISTOGRAM



ATES EXPLORATION LTD.
ATES HOOSIER RIDGE F-27
WILDCAT. N.W.T.

990.66-1662.18 FILE 7284-65-262C
Klinkenberg and Helium Porosity

LEGEND

- MEDIAN VALUE
- CUMULATIVE FREQUENCY
- CUMULATIVE CAPACITY LOST
- ARITHMETIC MEAN POROSITY
- GEOMETRIC MEAN PERMEABILITY
- ARITHMETIC MEAN GRAIN DENSITY

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATIS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATIS HOOSIER RIDGE F-27
PROVINCE:

AIR PERMEABILITY : MD. (MAXIMUM) RANGE USED 0.000 TO 10.
POROSITY : FRACTION (HELIUM) RANGE USED 0.000 TO .46

(PERMEABILITY UNCORRECTED FOR SLIPPAGE)

DEPTH LIMITS : 986.60 - 1003.10 INTERVAL LENGTH : 16.50
METRES ANALYZED IN ZONE : 0.73 LITHOLOGY EXCLUDED : NONE

DATA SUMMARY

POROSITY AVERAGE	PERMEABILITY AVERAGES ARITHMETIC	HARMONIC	GEOMETRIC
0.043	0.86	0.31	0.47

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATIS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATIS HOOSIER RIDGE F-27
PROVINCE:

GROUPING BY POROSITY RANGES

POROSITY RANGE	METRES IN RANGE	AVERAGE POROSITY	AVERAGE PERM. (GEOM.)	AVERAGE PERM. (ARITH)	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.020 -0.040	0.2	0.026	0.734	1.6	34.2	34.2
0.040 -0.060	0.5	0.051	0.370	0.459	65.8	100.0

TOTAL NUMBER OF METRES = 0.73

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATAS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATAS HOOSIER RIDGE F-27
PROVINCE:

GROUPING BY PERMEABILITY RANGES

PERMEABILITY RANGE	METRES IN RANGE	AVERAGE PERM. (GEOM.)	(ARITH)	AVERAGE POROSITY	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.078 - 0.156	0.2	0.150	0.150	0.037	24.7	24.7
0.156 - 0.312	0.1	0.220	0.220	0.030	19.2	43.8
0.312 - 0.625	0.2	0.560	0.560	0.032	24.7	68.5
0.625 - 1.250	0.1	0.770	0.770	0.041	16.4	84.9
2.500 - 5.000	0.1	3.4	3.4	0.021	15.1	100.0

TOTAL NUMBER OF METRES = 0.73

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATLAS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATLAS HOOSIER RIDGE F-27
PROVINCE:

POROSITY-METRES OF STORAGE CAPACITY LOST FOR SELECTED POROSITY CUT OFF

POROSITY CUT OFF	METRES LOST	CAPACITY LOST (%)	METRES REMAINING	CAPACITY REMAINING (%)	ARITH MEAN	MEDIAN
0.000	0.0	0.0	0.7	100.0	0.043	0.045
0.020	0.0	0.0	0.7	100.0	0.043	0.045
0.040	0.2	21.0	0.5	79.0	0.051	
0.060	0.7	100.0	0.0	0.0		

TOTAL STORAGE CAPACITY IN POROSITY-METRES = 0.031

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

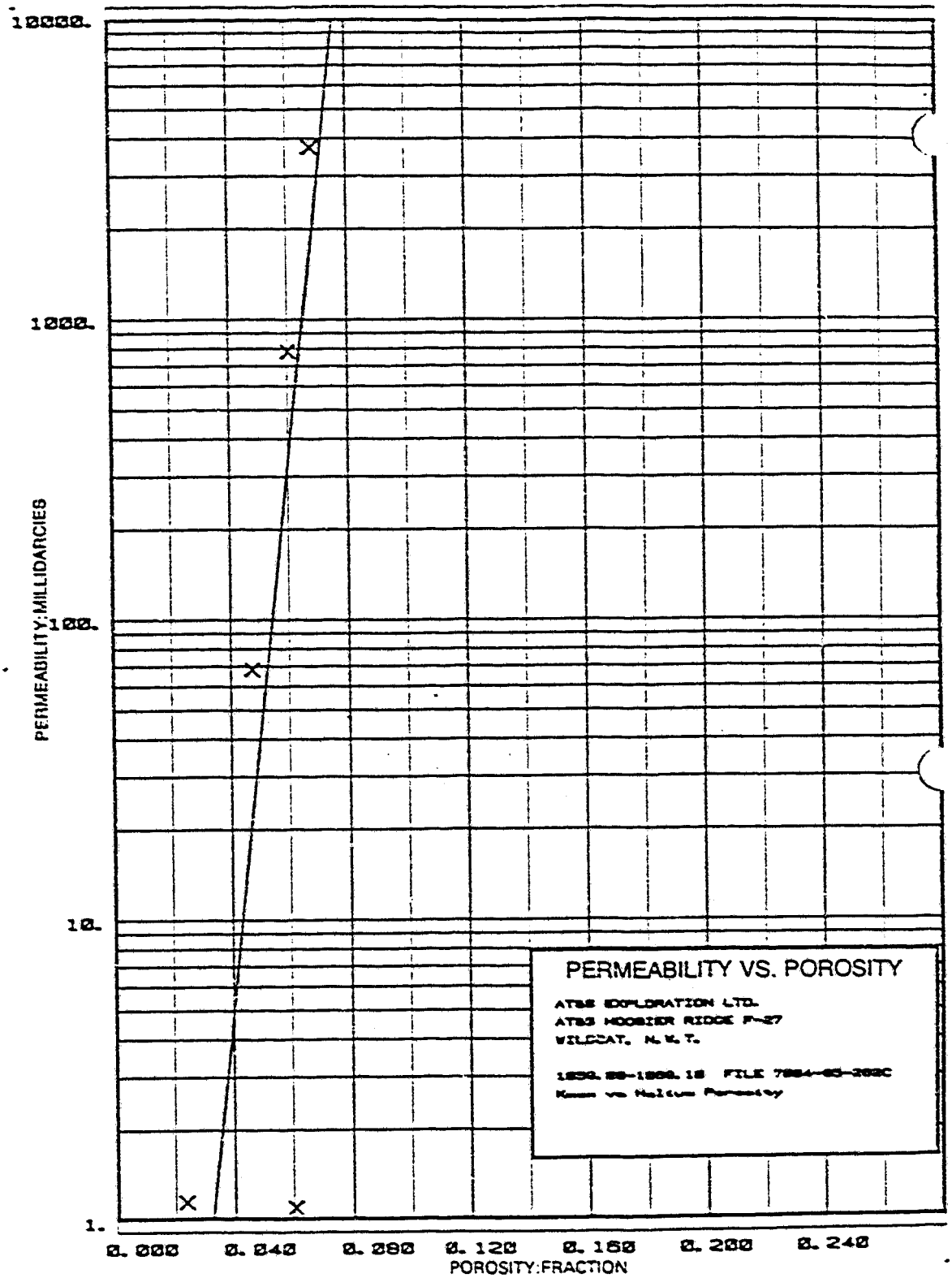
COMPANY: AT&S EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : AT&S HOOSIER RIDGE F-27
PROVINCE:

MILLIDARCY-METRES OF FLOW CAPACITY LOST FOR SELECTED PERMEABILITY CUT OFF

PERMEABILITY CUT OFF	METRES LOST	CAPACITY LOST (%)	METRES REMAINING	CAPACITY REMAINING (%)	GEOM MEAN	MEDIAN
0.005	0.0	0.0	0.7	100.0	0.47	0.37
0.010	0.0	0.0	0.7	100.0	0.47	0.37
0.020	0.0	0.0	0.7	100.0	0.47	0.37
0.039	0.0	0.0	0.7	100.0	0.47	0.37
0.078	0.0	0.0	0.7	100.0	0.47	0.37
0.156	0.2	4.3	0.6	95.7	0.68	0.53
0.312	0.3	9.2	0.4	90.8	1.00	0.72
0.625	0.5	25.4	0.2	74.6	1.57	
1.250	0.6	40.2	0.1	59.8	3.40	
2.500	0.6	40.2	0.1	59.8	3.40	
5.	0.7	100.0	0.0	0.0	1.00	

TOTAL FLOW CAPACITY IN MILLIDARCY-METRES(ARITHMETIC) = 0.63



EQUATION OF REDUCED LINE RELATING PERMEABILITY (K) TO POROSITY

LOG (K) = (SLOPE)(POROSITY) - LOG OF INTERCEPT

K = ANTILOG (SLOPE)(POROSITY) - LOG OF INTERCEPT

RANGE	SYMBOL	EQUATION OF THE LINE
1	X	PERM=ANTILOG (8.9847) (POROSITY) -2.8168

PERMEABILITY VS POROSITY

COMPANY: ATAS EXPLORATION LTD.

WELL : ATAS HOOSIER RIDGE F-27

FIELD : WILDCAT, N.W.T.

PROVINCE:

FORMATION: ROWING

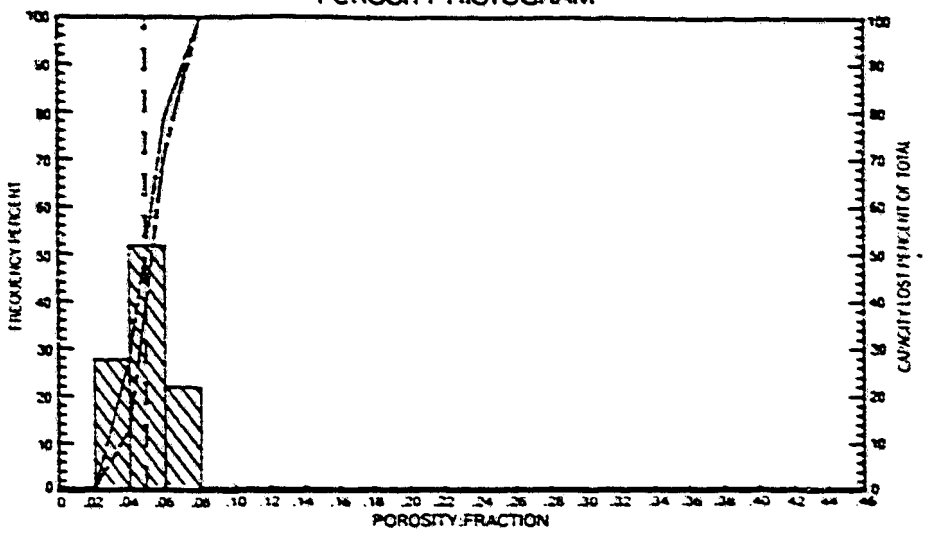
AIR PERMEABILITY : MD - MAXIMUM (UNCORRECTED FOR SLIPPAGE)
POROSITY : FRACTION (HELIUM)

DEPTH INTERVAL	METERS ANALYZED	RANGE # SYMBOL	PERMEABILITY MINIMUM	PERMEABILITY MAXIMUM	POROSITY MIN.	POROSITY MAX.	POROSITY AVERAGE	PERMEABILITY AVERAGES ARITHMETIC	HARMONIC	GEOMETRIC
1059.00 - 1059.10	1.03	1 (X)	0.000	10000.0	0.000	0.460	0.048	924.	2.5	35.

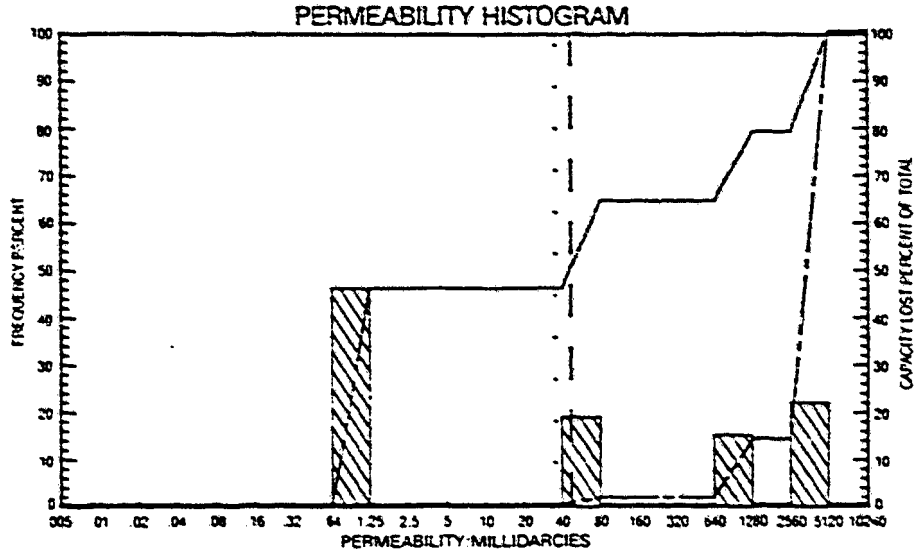
EQUATION OF REDUCED LINE RELATING PERMEABILITY(K) TO POROSITY :
LOG(K) = (SLOPE)(POROSITY) + LOG OF INTERCEPT
K = ANTILOG((SLOPE)(POROSITY) + LOG OF INTERCEPT)

RANGE	EQUATION OF THE LINE
1	PERM = ANTILOG((0.9047)(POROSITY) + -2.8160)

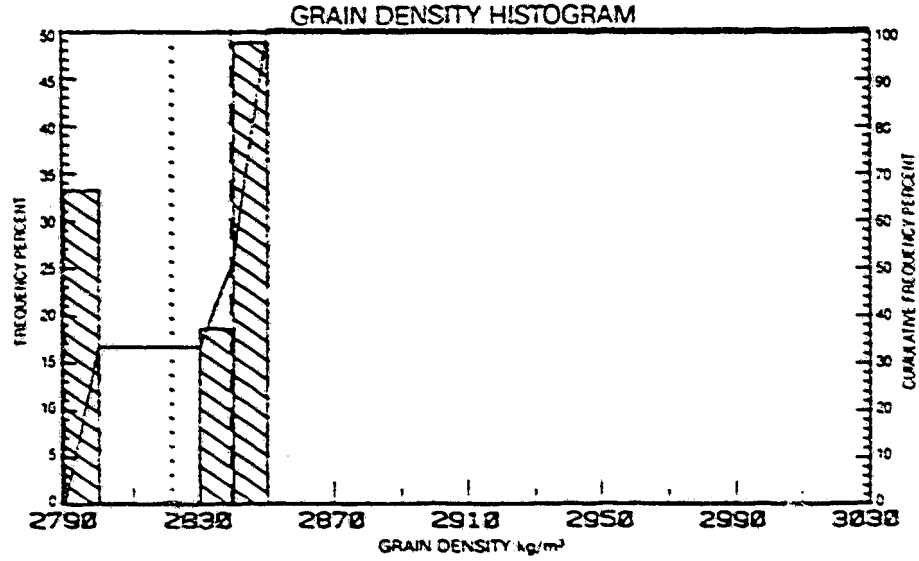
POROSITY HISTOGRAM



PERMEABILITY HISTOGRAM



GRAIN DENSITY HISTOGRAM



ATEX EXPLORATION LTD.
ATEX HOOSIER RIDGE F-27
WILDCAT, N.W.T.

1850.00-1860.18 FILE 7E84-85-262C
Kmax and Helium Porosity

LEGEND
MEDIAN VALUE
CUMULATIVE FREQUENCY
CUMULATIVE CAPACITY LOST
ARITHMETIC MEAN POROSITY
GEOMETRIC MEAN PERMEABILITY
ARITHMETIC MEAN GRAIN DENSITY

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATIS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATIS MOOSIER RIDGE F-27
PROVINCE:

AIR PERMEABILITY : MD. (MAXIMUM) RANGE USED 0.000 TO 10000.
POROSITY : FRACTION (HELIUM) RANGE USED 0.000 TO .46

(PERMEABILITY UNCORRECTED FOR SLIPPAGE)

DEPTH LIMITS : 1059.00 - 1069.10 INTERVAL LENGTH : 10.10
METRES ANALYZED IN ZONE : 1.03 LITHOLOGY EXCLUDED : NONE

DATA SUMMARY

POROSITY AVERAGE	PERMEABILITY AVERAGES ARITHMETIC	HARMONIC	GEOMETRIC
0.048	924.	2.5	35.

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATLAS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATLAS HOOSIER RIDGE F-27
PROVINCE:

GROUPING BY POROSITY RANGES

POROSITY RANGE	METRES IN RANGE	AVERAGE POROSITY	AVERAGE PERM. (GEOM.)	AVERAGE PERM. (ARITH)	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.020 -0.040	0.3	0.022	1.2	1.2	27.2	27.2
0.040 -0.060	0.5	0.054	31.	247.	51.5	78.6
0.060 -0.080	0.2	0.067	3730.	3730.	21.4	100.0

TOTAL NUMBER OF METRES = 1.03

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATIS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATIS HOOSIER RIDGE F-27
PROVINCE:

GROUPING BY PERMEABILITY RANGES

PERMEABILITY RANGE	METRES IN RANGE	AVERAGE PERM. (GEOM.)	(ARITH)	AVERAGE POROSITY	FREQUENCY (PERCENT)	CUMULATIVE FREQUENCY (%)
0.625 - 1.250	0.5	1.1	1.1	0.037	45.6	45.6
40.- 80.	0.2	69.	69.	0.046	18.4	64.1
640.- 1280.	0.2	784.	784.	0.059	14.6	78.6
2560.- 5120.	0.2	3730.	3730.	0.067	21.4	100.0

TOTAL NUMBER OF METRES = 1.03

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATIS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATIS HOOSIER RIDGE F-27
PROVINCE:

POROSITY-METRES OF STORAGE CAPACITY LOST FOR SELECTED POROSITY CUT OFF

POROSITY CUT OFF	METRES LOST	CAPACITY LOST (%)	METRES REMAINING	CAPACITY REMAINING (%)	ARITH MEAN	MEDIAN
0.000	0.0	0.0	1.0	100.0	0.048	0.047
0.020	0.0	0.0	1.0	100.0	0.048	0.049
0.040	0.3	12.4	0.8	87.6	0.058	
0.060	0.8	70.3	0.2	29.7	0.067	
0.080	1.0	100.0	0.0	0.0	0.000	

TOTAL STORAGE CAPACITY IN POROSITY-METRES = 0.030

STATISTICAL DATA FOR POROSITY AND PERMEABILITY HISTOGRAM

COMPANY: ATLAS EXPLORATION LTD.
FIELD : WILDCAT, N.W.T.

WELL : ATLAS HOOSIER RIDGE F-27
PROVINCE:

MILLIDARCY-METRES OF FLOW CAPACITY LOST FOR SELECTED PERMEABILITY CUT OFF

PERMEABILITY CUT OFF	METRES LOST	CAPACITY LOST (%)	METRES REMAINING	CAPACITY REMAINING (%)	GEOM MEAN	GEOM MEDIAN
0.005	0.0	0.0	1.0	100.0	35.41	47.14
0.010	0.0	0.0	1.0	100.0	35.41	47.14
0.020	0.0	0.0	1.0	100.0	35.41	47.14
0.039	0.0	0.0	1.0	100.0	35.41	47.14
0.078	0.0	0.0	1.0	100.0	35.41	47.14
0.156	0.0	0.0	1.0	100.0	35.41	47.14
0.312	0.0	0.0	1.0	100.0	35.41	47.14
0.625	0.0	0.0	1.0	100.0	35.41	47.14
1.250	0.5	0.1	0.6	99.9	633.41	970.06
2.500	0.5	0.1	0.6	99.9	633.41	970.06
5.	0.5	0.1	0.6	99.9	633.41	970.06
10.	0.5	0.1	0.6	99.9	633.41	970.06
20.	0.5	0.1	0.6	99.9	633.41	970.06
40.	0.5	0.1	0.6	99.9	633.41	970.06
80.	0.7	1.4	0.4	98.6	1981.93	2858.46
160.	0.7	1.4	0.4	98.6	1981.93	2858.46
320.	0.7	1.4	0.4	98.6	1981.93	2858.46
640.	0.7	1.4	0.4	98.6	1981.93	2858.46
1280.	0.8	13.8	0.2	86.2	3729.99	
2560.	0.8	13.8	0.2	86.2	3729.99	
5120.	1.0	100.0	0.0	0.0	1.00	

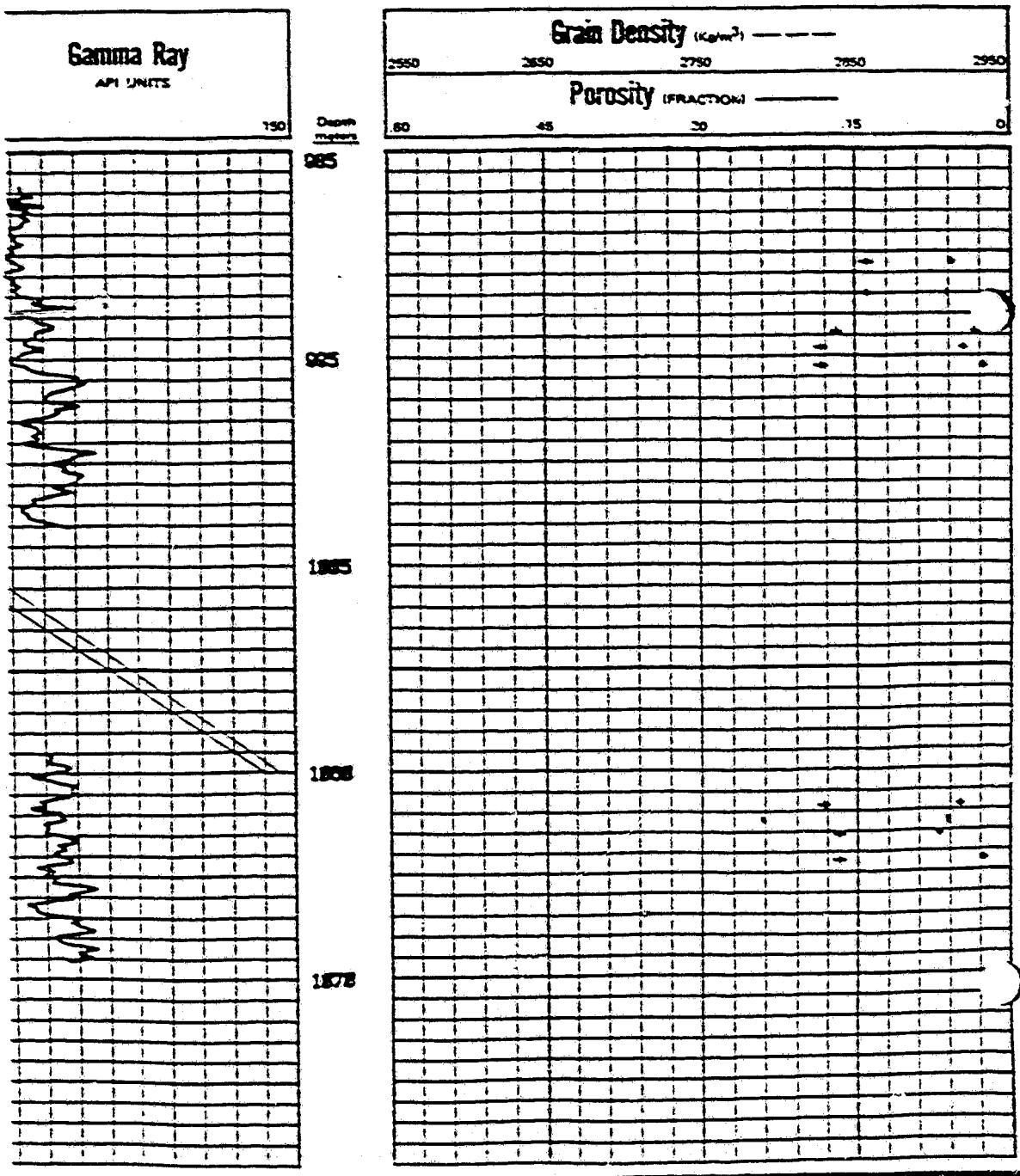
TOTAL FLOW CAPACITY IN MILLIDARCY-METRES(ARITHMETIC) = 931.79

CORE LABORATORIES — CANADA, LTD. *Petroleum Reservoir Engineering*

COMPANY	AT&S EXPLORATION LTD.	FILE NO.	7004-85-2620
WELL	AT&S HOOSIER RIDGE F-27	DATE	
FIELD	WILDCAT	FORMATION BEAR CREEK	ELEV.
PROVINCE	N.W.T	DRLG. FLD. WATER BASE MUD	CORES 1,2
LOCATION	65°26'16.38" N LAT. 127°49'58.87" W LONG.		

CORRELATION COREGRAPH

VERTICAL SCALE: 40m = 24m



CORE LABORATORIES – CANADA, LTD. LAB *Petroleum Reservoir Engineering*

COMPANY AT&S EXPLORATION LTD. FILE NO. 7004-85-262 C

WELL AT&S HOOSTER RIDGE F-27 DATE

FIELD WILDCAT FORMATION BEAR CREEK ELEV.

PROVINCE N.W.T. DRLG. FLD. WATER BASE MUD CORES 1,2

LOCATION 65°26'16.38" N LAT. 127°49'58.87" W LONG.

CORRELATION COREGRAPH

VERTICAL SCALE: 10mm = 24m

Total Water

FRACTION PORE SPA

1.00 .80 .60 .40 .20

Gamma Ray

RADIATION INCREASE

0 API 150

Permeability X .10

MILLIDARCIES

1000 100 10 1

Porosity

FRACTION

.30 .20 .10 0

Oil Saturation

FRACTION PORE SPA

0 .20 .40 .60 .80

Depth meters

985

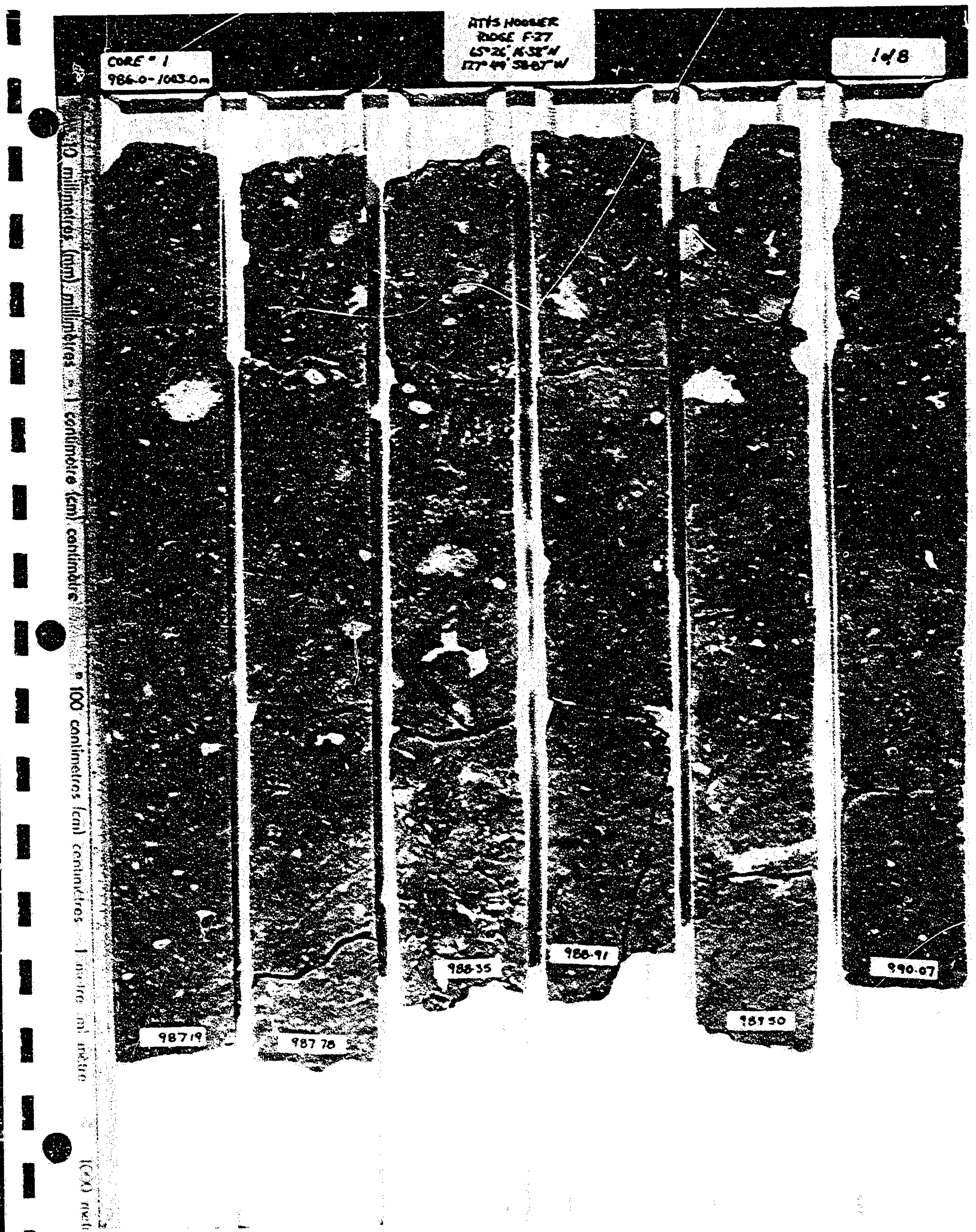
995

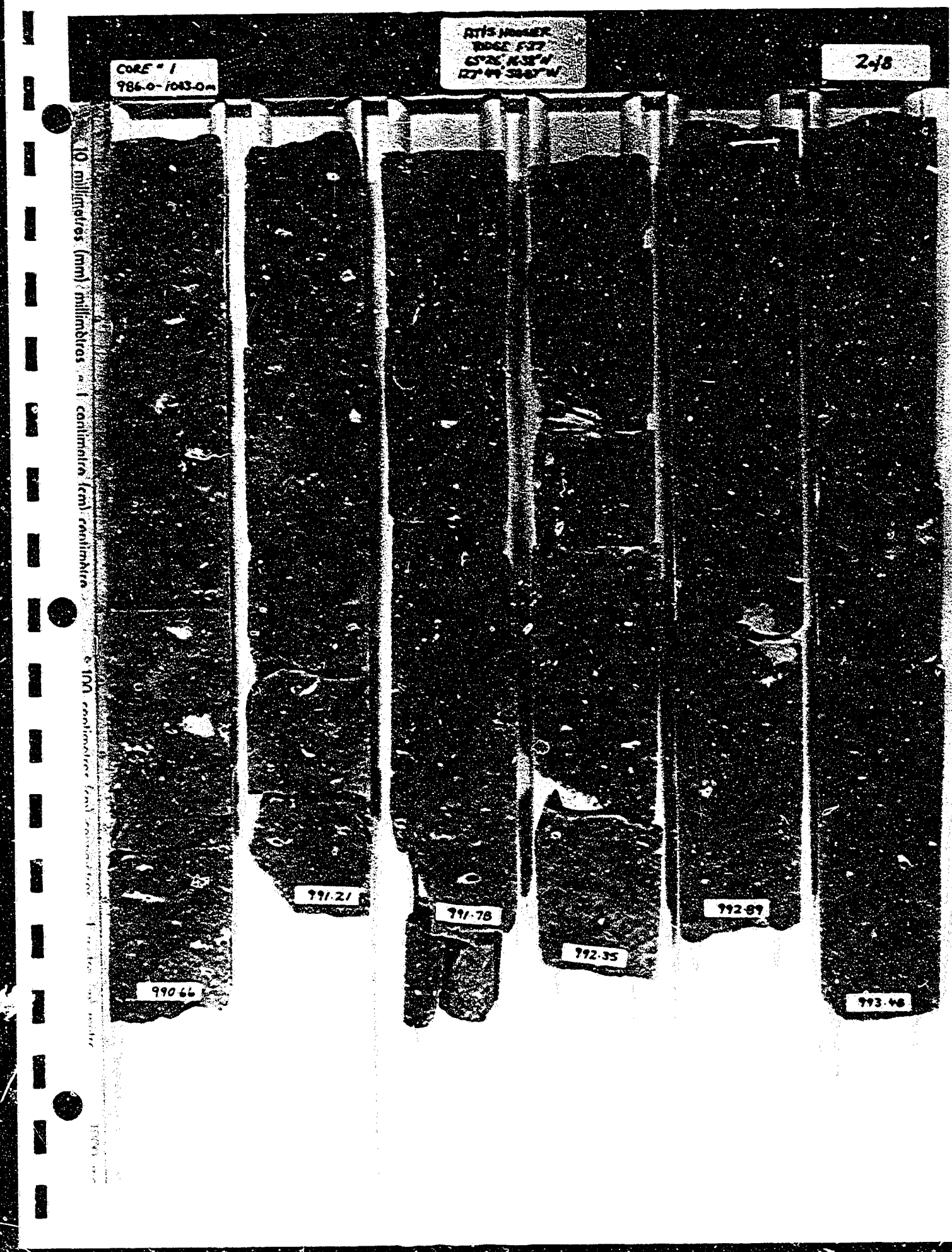
1005

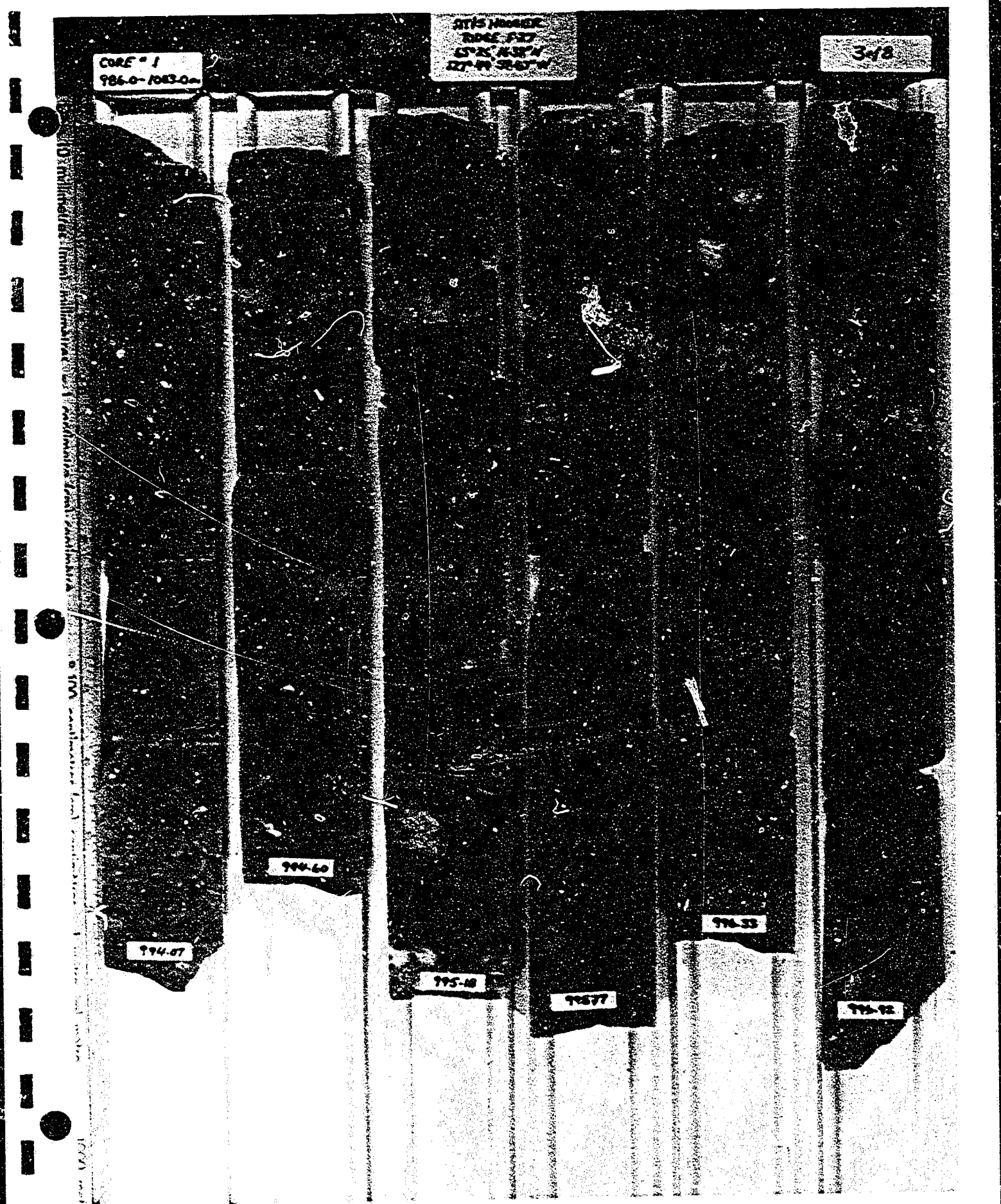
1015

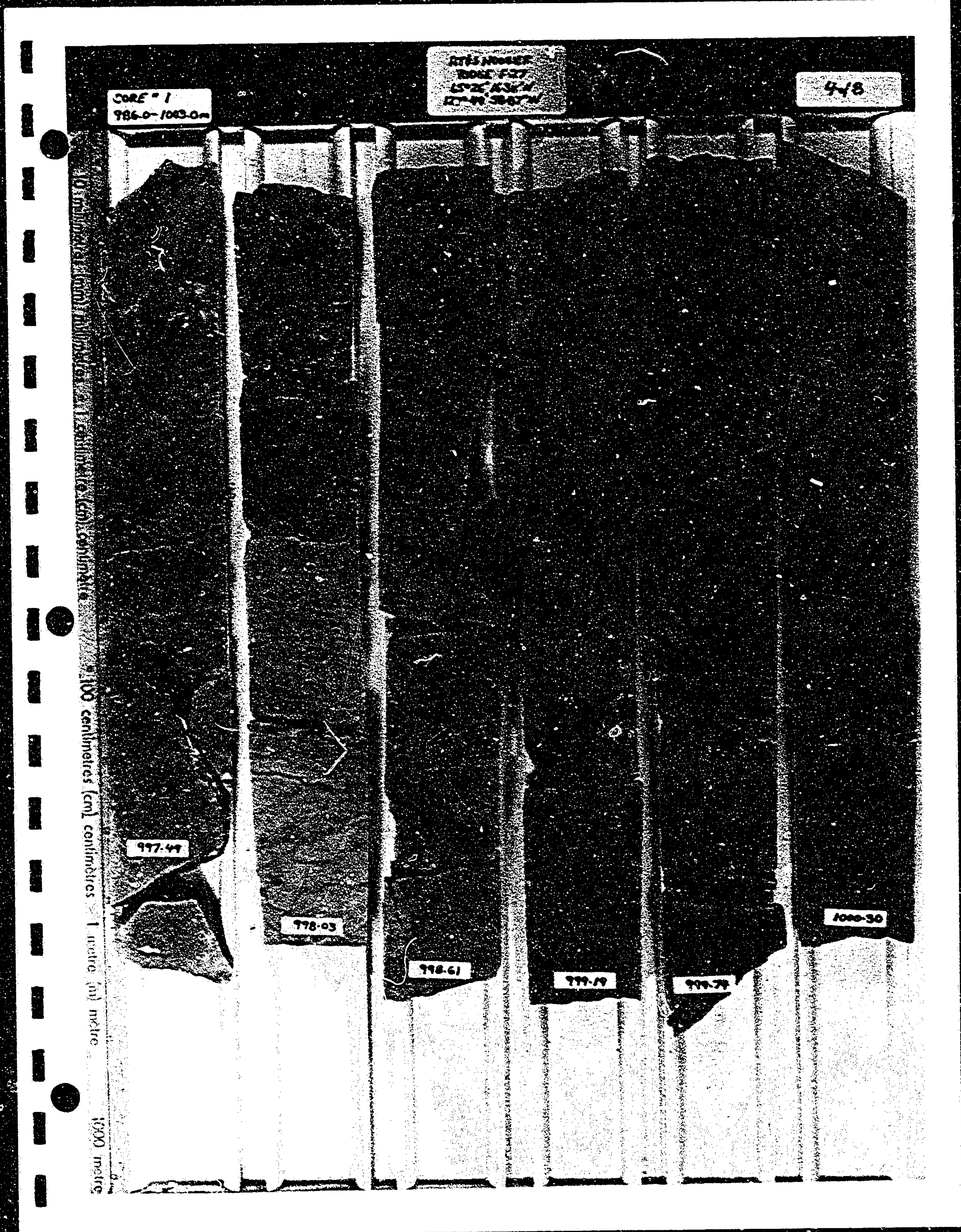
1025

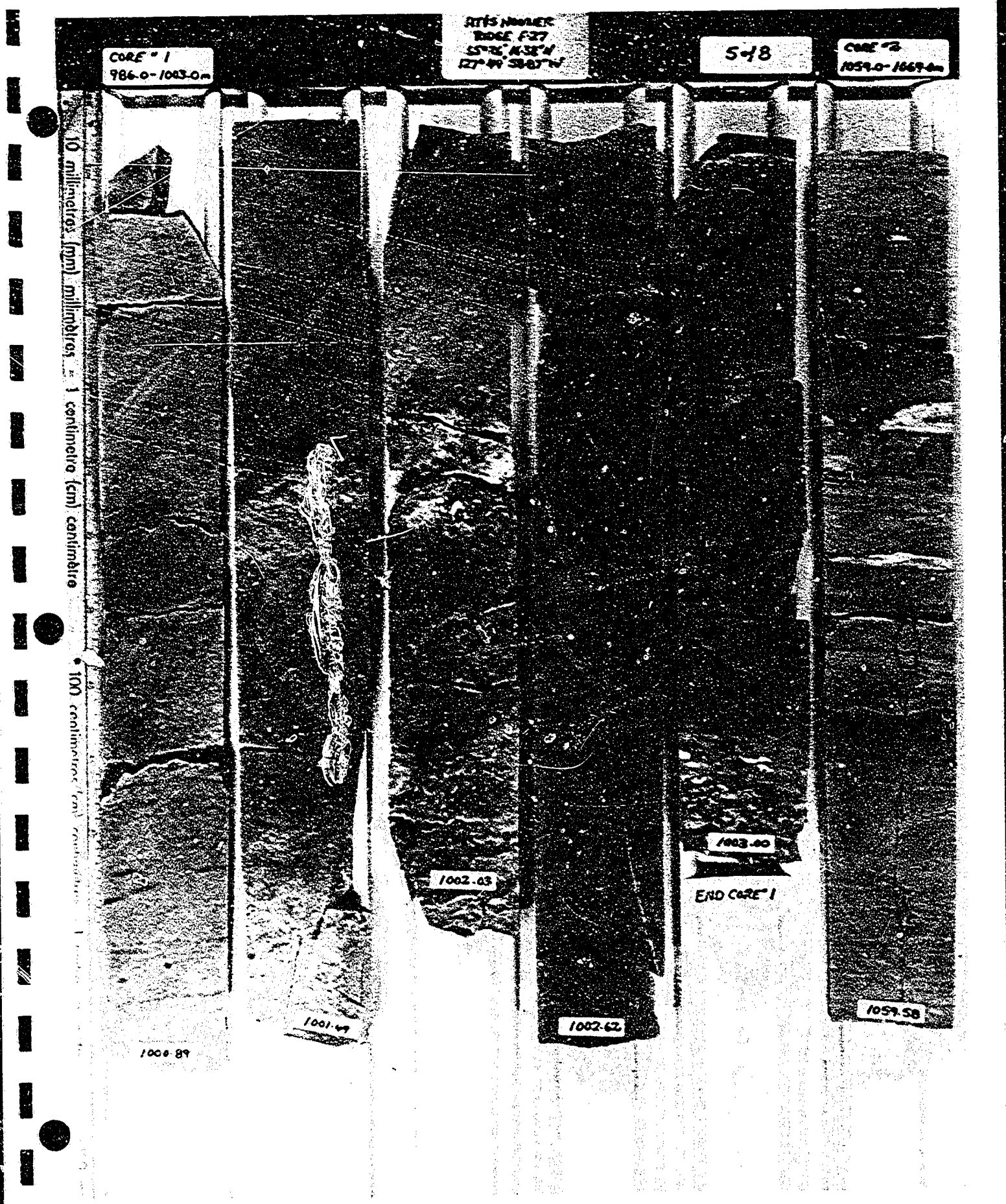
CORE PHOTO-
GRAPH HOOSIER

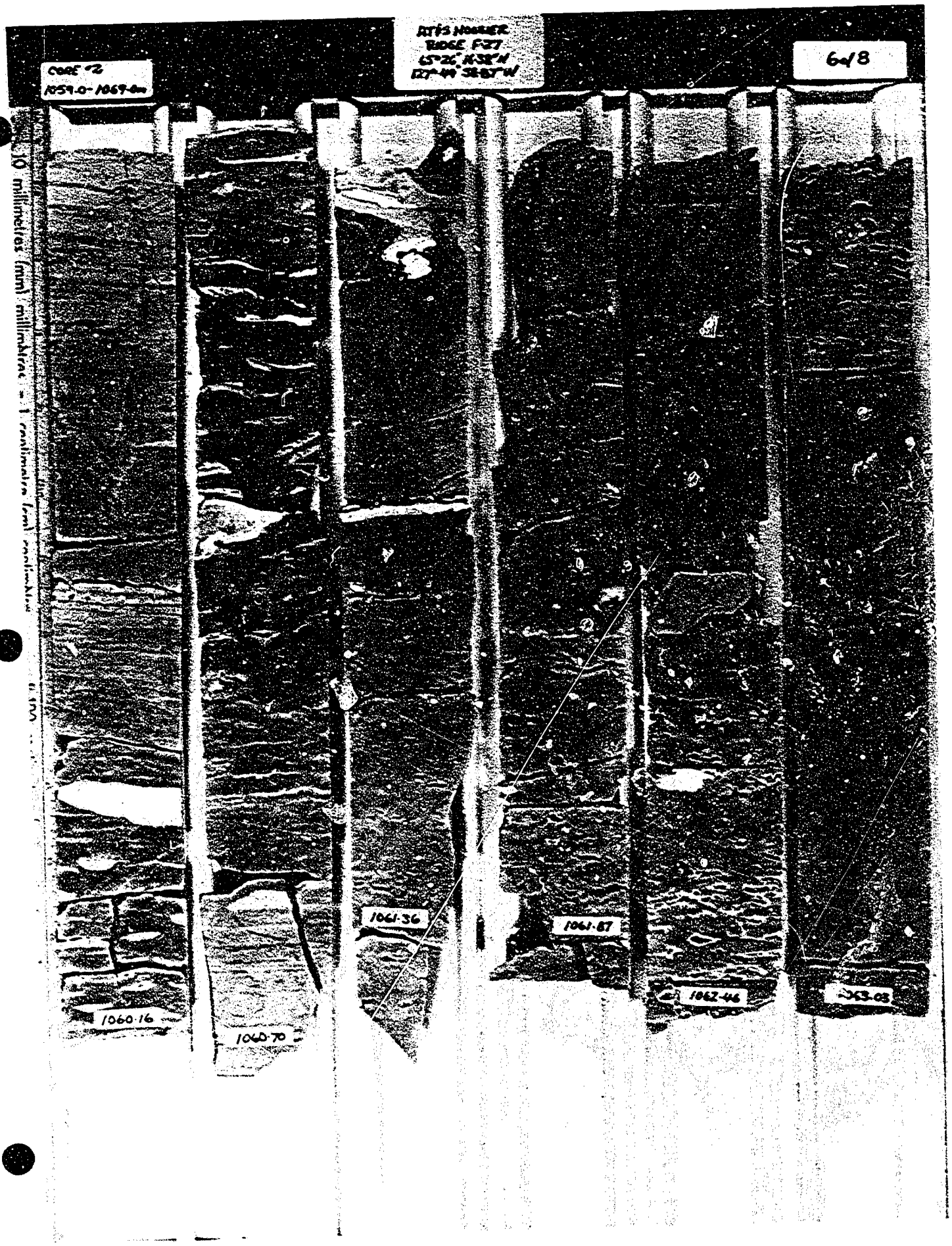

CORE # 1
986.0-1003.0m
ATTS HOOSIER RIDGE F-27
65°26' 16.38"N
127°49' 58.07"W
1 of 8
10 millimetres (mm) millimètres = 1 centimetre (cm) centimètre
100 centimetres (cm) centimètres = 1 metre (m) mètre
987.19
987.78
988.35
988.91
989.50
990.07


CORE # 1
986.0-1043.0m
2/8
10 millimetres (mm) millimètres = 1 centimetre (cm) centimètre
990.66
991.21
991.78
992.35
992.89
993.48

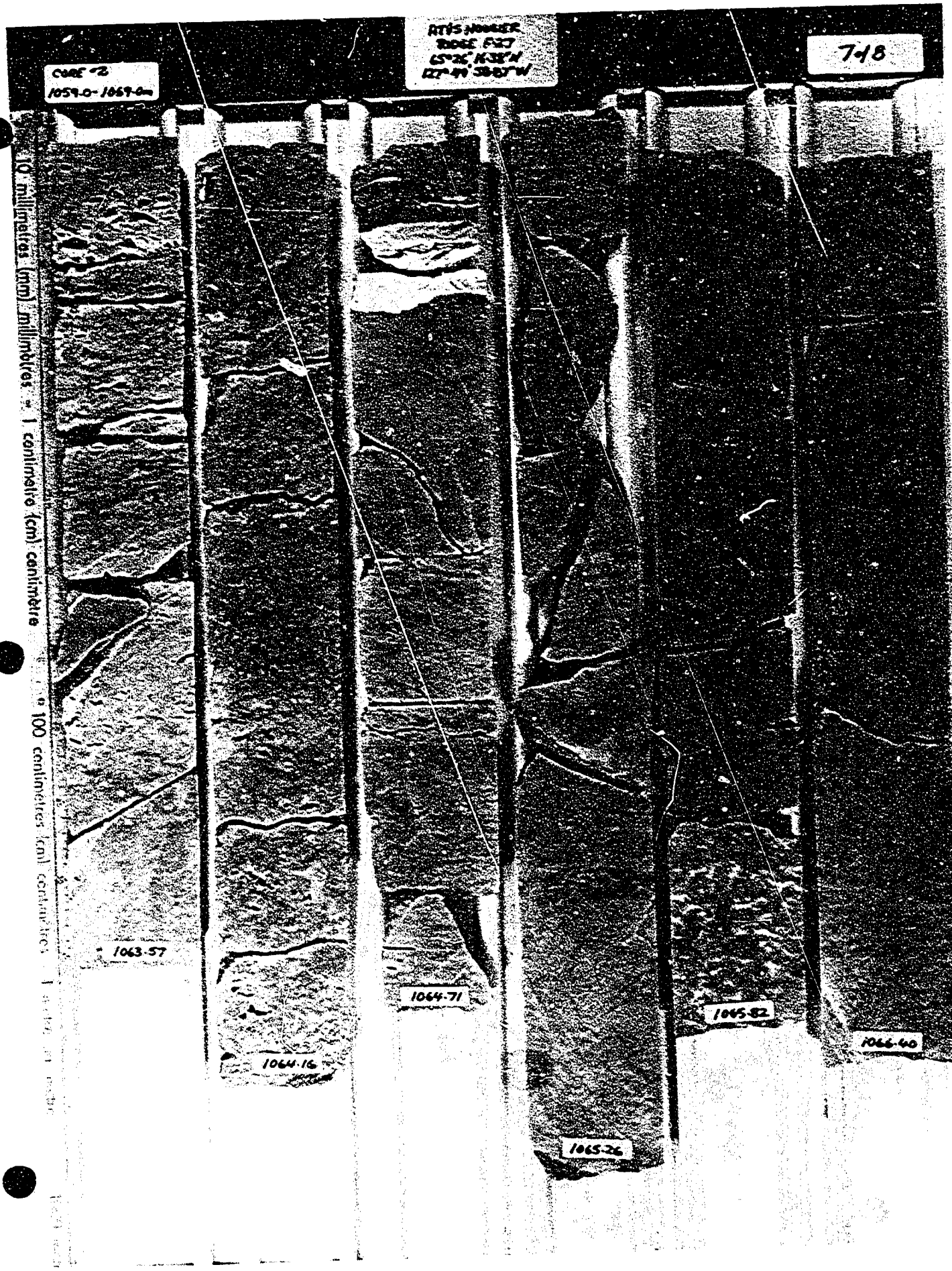

CORE # 1
986.0-1043.0m
3-18
994.07
994.60
995.18
995.77
996.33
996.92


CORE # 1
986.0-1003.0m
448
997.49
998.03
998.61
999.19
999.79
1000.30

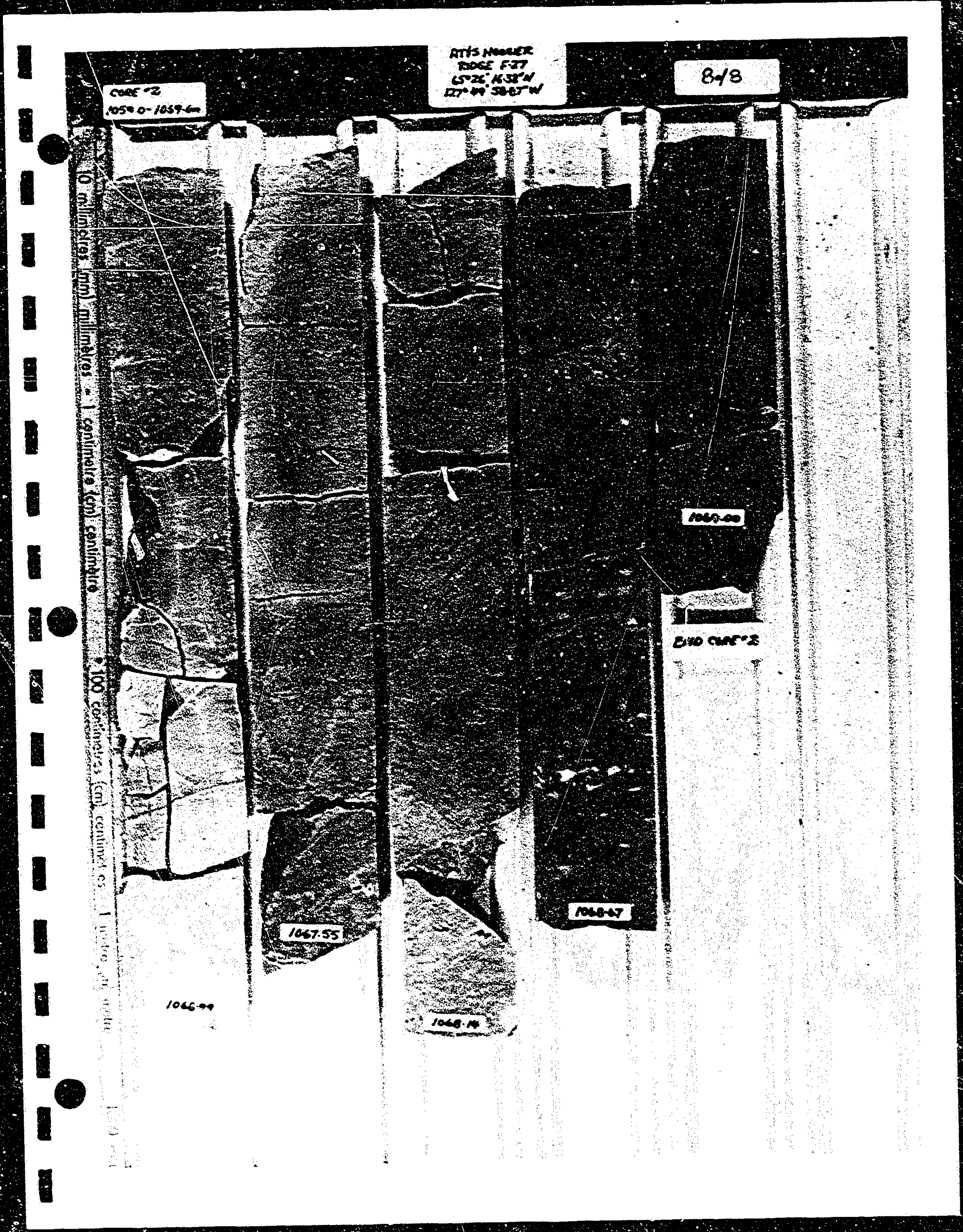

CORE # 1
986.0-1003.0m
ARIS HUNTER
RIDGE F37
5-48
CORE #2
1059.0-1069.4m
10 millimetres (mm) millimètres = 1 centimetre (cm) centimètre
100 centimetres (cm) centimètres
1000.89
1001.49
1002.03
1002.62
1003.00
END CORE #1
1059.58



10 millimetres (mm) millimètres = 1 centimetre (cm) centimètre



10 millimetres (mm) millimètres = 1 centimetre (cm) centimètre
100 centimetres (cm) centimètres



8/8
1067.55
1068.67
END CORE #2

ELECTRICAL
LOG