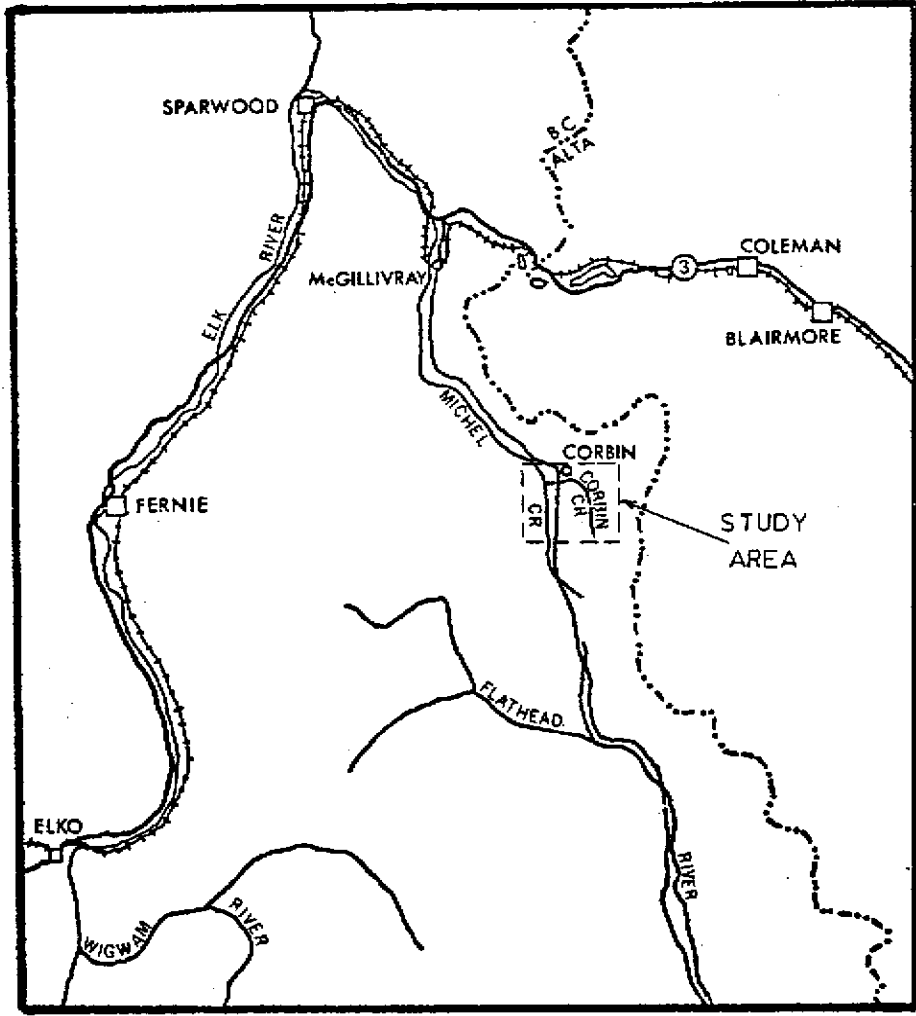


K-SHELL-CORBIN 78(7)A =



CROWS NEST INDUSTRIES LTD.



COAL MOUNTAIN - CORBIN

GEOLOGICAL BRANCH
ASSESSMENT REPORT
PROSPECTUS

00 385 FILE

TABLE II

COAL MOUNTAIN RESERVES

METRIC TONS (2205 lb.) IN SITU

<u>SECTION</u>	<u>WEST SIDE</u>	<u>EAST SIDE</u>
6500	137,300	
6750	312,500	
7000	270,100	
7250	235,900	
7500	554,300	
7750	1,275,200	
8000	1,484,200	
8250	2,049,100	91,200
8500	1,337,600	273,500
8750	1,412,600	257,600
9000	1,432,000	286,300
9250	1,432,000	286,300
TOTALS	<u>11,931,800</u>	<u>1,194,900</u>

PROSPECTUS FOR CORBIN
OPEN FILE

Fernie, British Columbia
Telephone: (604) 423-4464

CROWS NEST INDUSTRIES LIMITED

March 13, 1978

R.H. CROUSE
Vice-President
Mining



Dr. J. T. Fyles
Deputy Minister
Ministry of Mines and
Petroleum Resources
Parliament Buildings
Victoria, B. C.
V8V 1X4

Dear Dr. Fyles:

Re: Prospectus For Corbin
Development - Licence 414

Crows Nest Industries Limited, since 1975, has been actively assessing the above property with the intention of entering the thermal coal market. Our studies have been completed to the extent that they can meet the provisions outlined by the "Guidelines" to Stage I standards.

At this time we are pleased to submit for consideration, the "Prospectus" which will be followed by the Stage I.

Yours very truly,

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

RHC/kr
Encls.

- General Offices
Fernie, B.C.
- Minerals Division
Fernie, B.C.
- Forest Products Division
Main Office
Fernie, B.C.
- Elko Operations
Elko, B.C.

00 385

TABLE OF CONTENTS

List Of Tables And Figures	1
Summary	2
Introduction	3
Geology and Exploration	4
Coal Quality and Reserves	7
Mining Development	9
Access and Surface Facilities	12
Socio-Economic Aspects	14
Biophysical Studies	15
Tables	
Figures	

TABLES AND FIGURES

Table I ✓	Coal Mountain Coal Analyses
Table II ✓	Coal Mountain Reserves
Table III (a) & (b) ✓ ✓	Corbin - Coal Mountain Drill Logs and Washability Data
Figure I ✓	Coal Mountain Vicinity Map
Figure II ✓	Coal Mountain
Figure III(a) to III(l)	Coal Mountain Cross Sections
Figure IV ✓	Geology and Section Lines
Figure V ✓	Geology
Figure VI ✓	Mine Plan Layout - End of Project

SUMMARY

Crows Nest Industries Limited proposes to develop a coal mine in southeastern British Columbia. The development will be on coal licence 414, currently held by the company.

As presently conceived, the mine will produce, over a 15 year life, 6 to 7 million raw metric tons of thermal grade coal by means of open-pit methods. Onsite developments will include overburden dump, drainage collection settling pond systems, top soil and coal stockpiles, coal crusher, access roads and conveyor corridors. The mine and its facilities will disturb roughly 700 acres of land. In total, direct employment for about 80 people will be generated by the project.

It is assumed in this report that a cooperative arrangement can be arrived at with Byron Creek Collieries, who are presently operating in the vicinity, for joint use of their cleaning plant and ancillary facilities.

Documentation of the geology, coal reserves and coal quality is presented. The development plan as presented is subject to modification.

INTRODUCTION

Crows Nest Industries Limited is investigating development of an open-pit coal mine in the Corbin area of southeastern British Columbia (Fig. I). The development will take place on one of three coal licences currently held in the designated area. These licences are 412, 413 and 414, of which 414 is the licence of immediate attention.

Initial design locates the open-pit, overburden dump, stockpiles, water runoff collection and settling pond systems within the boundaries of the licence. However, investigations of stabilities and construction procedures for final design and location for the above facilities, together with road alignments and conveyor corridors are being investigated further. These studies may show safer and hence, preferred locations and configurations other than those indicated by the conceptual design presented. The findings of these studies will be included in later stage submissions.

No firm market has yet been secured for thermal coal, but market assessments to date indicate that there will be customers both in Canada and abroad. This justifies pursuing all necessary measures pertinent to development.

GEOLOGY & EXPLORATION

Coal Mountain, which is the site of the proposed mine, trends in a north-south direction, rising from 5,000 feet at Corbin to an elevation of 6,850 feet at its crest. It is adjacent to and bound by Corbin Creek on the north and east, and Michel Creek to the west.

The strata of Coal Mountain are among the most structurally complicated in southeastern British Columbia. The beds are both tightly folded and highly faulted. Outcrops within the licence area expose both Jurassic strata of the Fernie group and the lower strata of the Cretaceous Kootenay Formation. The mountain core is comprised of contorted Jurassic strata while the summit is the lower portion of the Kootenay Formation (Fig. V).

Within the Kootenay Formation, three distinct stratigraphic units can be identified.

1. Upper sandstone and shale
2. Mammoth seam - shale and coal stringers
3. Moose Mountain basal sandstone

Coal is distributed within the mammoth seam in a series of faulted and disjointed synclinal structures trending north-south, parallel to the mountain crest. Three synclinal coal seams are contiguous along the top and the west side of the mountain while a fourth lies on the eastern slope. This mammoth seam reaches a thickness of over 200 feet and lies at relatively shallow depth. Geological sections are presented in Figures III(a) - (1); section reference lines are presented in Figure IV.

Exploration work completed to date included:

1. Topographic mapping on a scale of 1:2400.
2. Geologic mapping showing attitudes and related elements (Fig. IV).
3. Road construction of some 12,000 feet to give access to drilling sites (Fig. IV).
4. Eighteen holes drilled over a two year period (1974 - 1975), for a total of 7,570 feet (Fig. IV & V).
5. Geophysical logging with gamma ray neutron and density tools conducted over 6,260 feet of the 7,570 feet drilled (Table III a and b).
6. Exploration roads reclaimed to Forestry standards.

CROWS NEST INDUSTRIES

The above work was reported and submitted to Ministry of Mines and Petroleum Resources under the title "Coal Deposits of Lot 6995 K.D., Coal Mountain, Corbin, B. C.", dated January 28, 1976.

COAL QUALITY AND RESERVES

Coal chip samples were collected during the exploration drilling program. Portions of these samples were blended to produce a representative sample of the coal deposit. This sample was then used for tests for coking thermal properties by proximate and ultimate analyses (Table I). The results indicate that this deposit is primarily of thermal value.

Lower portions of the deposit consist of shaley coal which at this time is not included in the recoverable reserves. This coal exhibits a high ash content and low wash recoveries, as shown in test results (Tables III a - b). However, this material and some washery reject fractions may become useful energy resources in the future, depending upon regional coal and power development in the East Kootenays.

The in situ coal reserves within the licence area total 13,000,000 raw metric tons. Ninety percent of the reserve falls within the western flank of the mountain while the remainder is located on the eastern side. Coal reserves were calculated using the following assumptions and parameters:

CROWS NEST INDUSTRIES

1. Tonnages determined by planimetry of vertical cross-sections and applying this area to one-half the distance on either side of the section.
2. A bank cubic yard of coal weighed 2,400 pounds.
3. Fifty-one percent of the coal intersections in the drill holes were considered product coal.
4. Reserves were calculated to within 200 feet of the northern boundary of the coal licence.

Coal reserves are tabulated on Table II.

MINING DEVELOPMENT

Coal deposits lie in two distinct areas within the licence boundaries. The west flank of Coal Mountain contains 90% of the recoverable coal, while the remaining reserves are located on the eastern side. The seams on each flank lie at shallow depths. Due to this low cover of overburden, these deposits exhibit a great potential for surface mining.

As presently conceived, the mine plan calls for construction of two mining pits corresponding to the two coal deposits (Fig.II). The pits will be mined consecutively starting on the east flank. As coal becomes depleted within this pit, mining will be initiated in the second pit, located on the western side. This consecutive arrangement will allow for backfilling into the mined-out pit. Figure VI indicates the end of project layout, showing the east pit backfilled. A geotechnical study will be undertaken to determine the optimum pit wall configuration as well as dump stabilities and construction procedures for settling ponds, stockpiles, drainage collection & filtration, and ground water regime.

Mining will be carried out by conventional open pit mining equipment. Top soil and upper horizon shales encountered

during overburden removal will be stockpiled nearby for use in reclamation. Overburden will be drilled by 6 to 10 inch rotary drills and blasted by using ammonium nitrate fuel oil (ANFO) explosives. Blasted overburden will be loaded by a 10 to 15 cubic yard electric shovel into 50 to 85 ton rear dump trucks. Overburden will be excavated in 30 to 40 foot lifts and removed to a side hill dump or used as backfill. The side hill dump will be located on the eastern flank of Coal Mountain within the Corbin Creek drainage basin.

Adequate measures will be taken towards drainage and runoff control around the dump and pit areas. Runoff water will be diverted into a retention reservoir where suspended solids can settle before being released into Corbin Creek. The decant will be routinely sampled to ensure water quality standards are met.

Coal will not be blasted but will be excavated and loaded by hydraulic excavators into coal haul trucks of 20 to 30 ton size range, and hauled to a stockpile located a short distance from the pit. At the stockpile a breaker, surge bin and conveyor terminal will be located. Coal will be reduced to a maximum size of 2 inches and conveyed to a cleaning plant.

Support equipment for maintenance and supervision will include dozers, graders, cranes and pickups.

ACCESS & SURFACE FACILITIES

Access to the proposed mine is via public road running from Highway #3, south to Corbin and the present mining operation of Byron Creek Collieries (Fig. I). This road is presently being used by the general public and Byron Creek Collieries' employees. A rail spur has been built from the main Crows Nest Pass C.P.R. line to the present loadout facilities of Byron Creek Collieries at McGillivray. This spur is being extended to Byron Creek's new loadout, presently under construction at the foot of Coal Mountain.

Surface facilities will provide for the following operations or functions:

1. Receiving raw coal by conveyor from the pit.
2. Raw coal storage.
3. Crushing coarse coal for plant feed.
4. Coal preparation.
5. Clean coal storage.
6. Unit train loading facilities.
7. Shop, office, dry and warehouse complex.

CROWS NEST INDUSTRIES

Under present operating conditions, Byron Creek will have an excess capacity in their new plant, a capacity which Crows Nest Industries may be able to utilize under agreement. Cooperation between the two companies may also be extended to the use of other ancillary structures and equipment pertinent to mine operations such as coal storage, coal loadout, mine dry, etc.

Byron Creek's plant will clean the 2" x 3/8" fraction by use of dense media vessels, while the fines fractions of 3/8" x 0" will be dry screened from the plant feed and pass directly into clean coal storage.

SOCIO-ECONOMIC ASPECTS

It is anticipated that the mine will employ approximately 80 people. These employees will live in the existing towns of Sparwood, Coleman and Fernie. To a large extent, the work force will be recruited directly from these towns and adjacent areas. Independent studies dealing with socio-economic aspects of the project will be carried out to meet the various stage level requirements. Until these studies are complete, housing patterns and town impacts cannot be fully delineated.

BIOPHYSICAL STUDIES

British Columbia Research Council is completing Stage I biophysical study and impact assessment which was initiated in July of 1975.

TABLE I

COAL MOUNTAIN COAL ANALYSES

<u>LAB. NO.</u>	<u>MOISTURE</u>	<u>ASH</u>	<u>VOL.</u>	<u>F.C.</u>	<u>S.</u>	<u>B.T.U.</u>	<u>P.</u>	<u>FACTORS</u>
6291	1.0	9.6	21.3	68.1	0.32	13545	0.05	adb
		9.7	21.5	68.8	0.32	13680	0.05	db
						15150		daf

ASH FUSION TEMPERATURES (°F)

<u>ATMOSPHERE</u>	<u>INITIAL DEFORMATION</u>	<u>SOFTENING</u>	<u>HEMI-SPHERICAL</u>	<u>FLUID</u>
Reducing	2430	2630+	-	-

MINERAL ANALYSES OF ASH

<u>SiO₂</u>	<u>Al₂O₃</u>	<u>Na₂O</u>	<u>MgO</u>	<u>Fe₂O₃</u>
55.0	27.31	0.82	0.85	4.50

ULTIMATE ANALYSES

<u>H₂O %</u>	<u>C %</u>	<u>H %</u>	<u>N %</u>	<u>Cl %</u>	<u>S %</u>	<u>ASH %</u>	<u>O %</u>
1.10	78.78	4.31	1.14	0.09	0.41	9.34	4.83

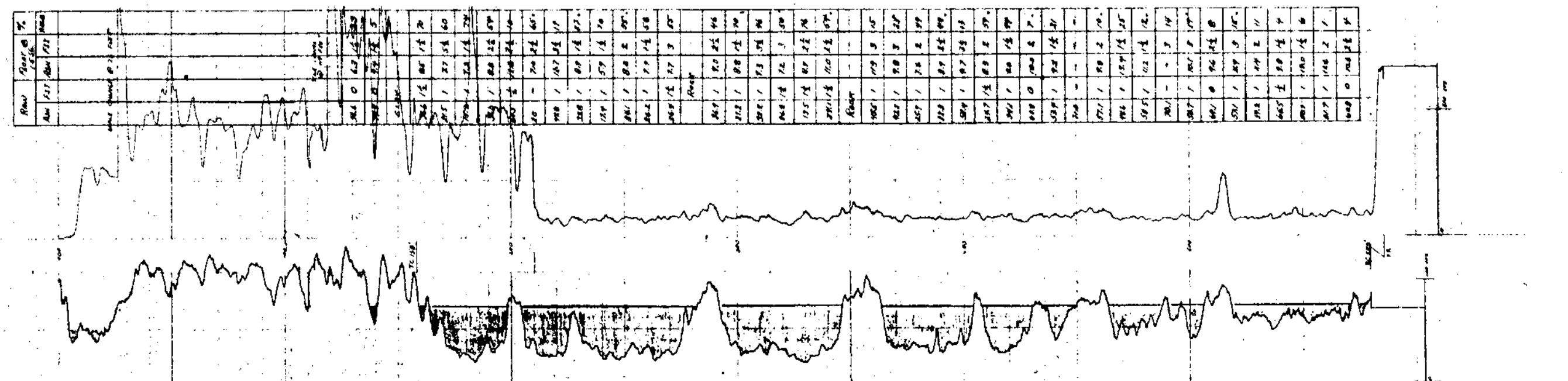
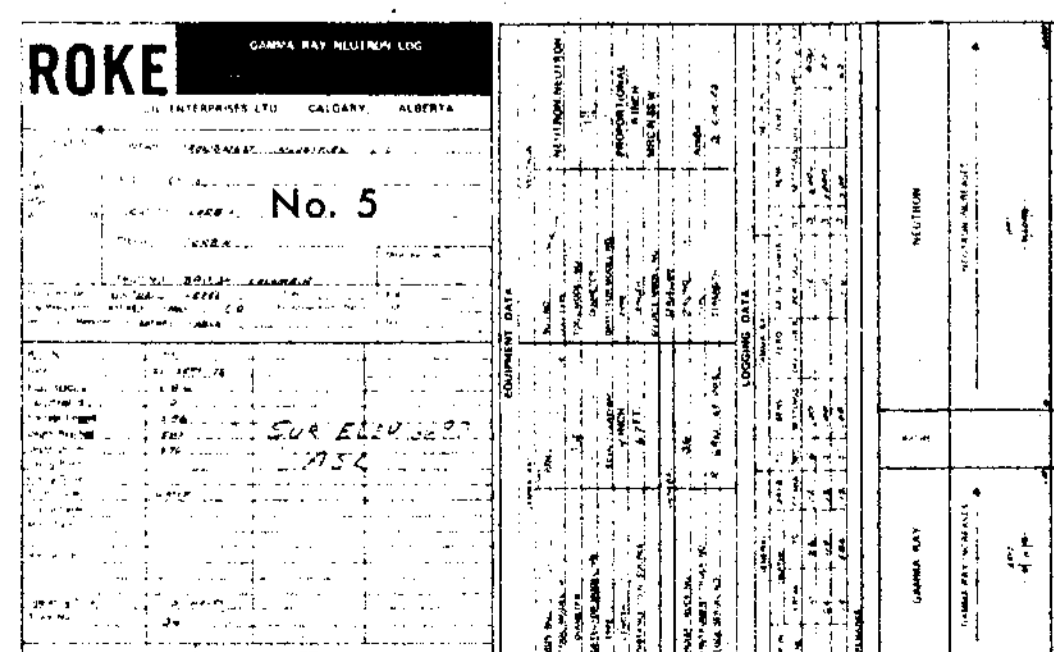
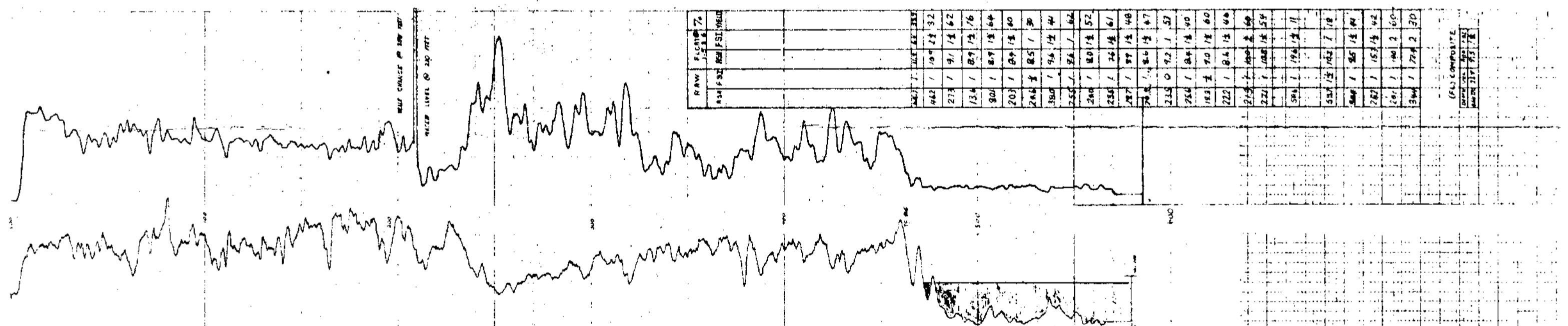
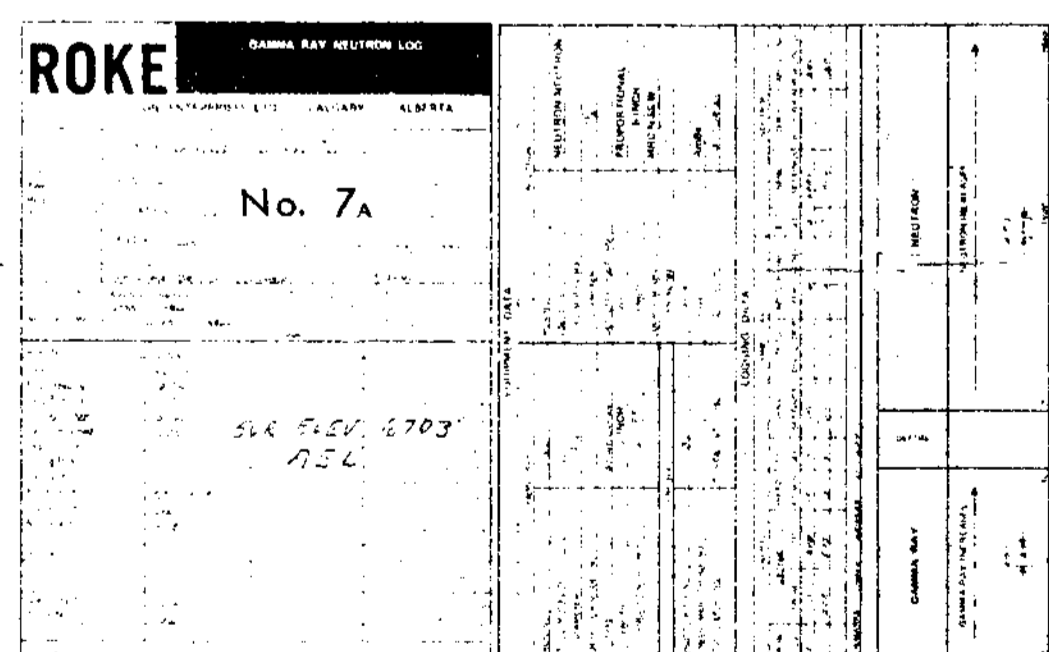
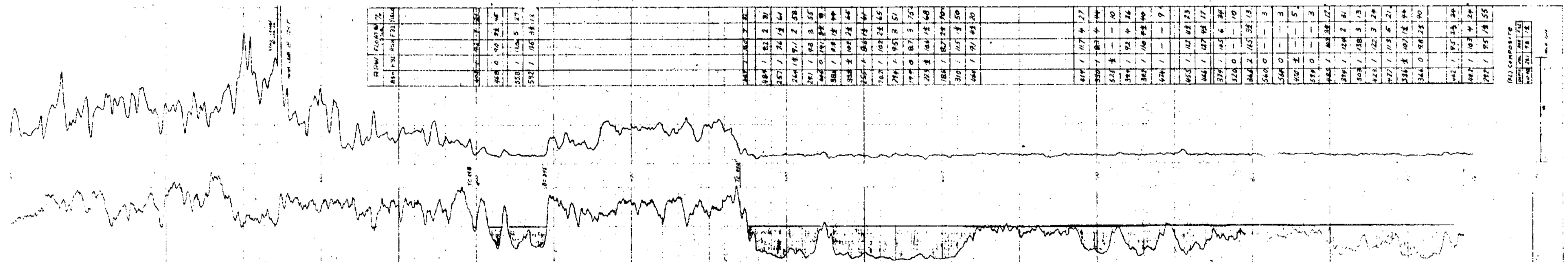
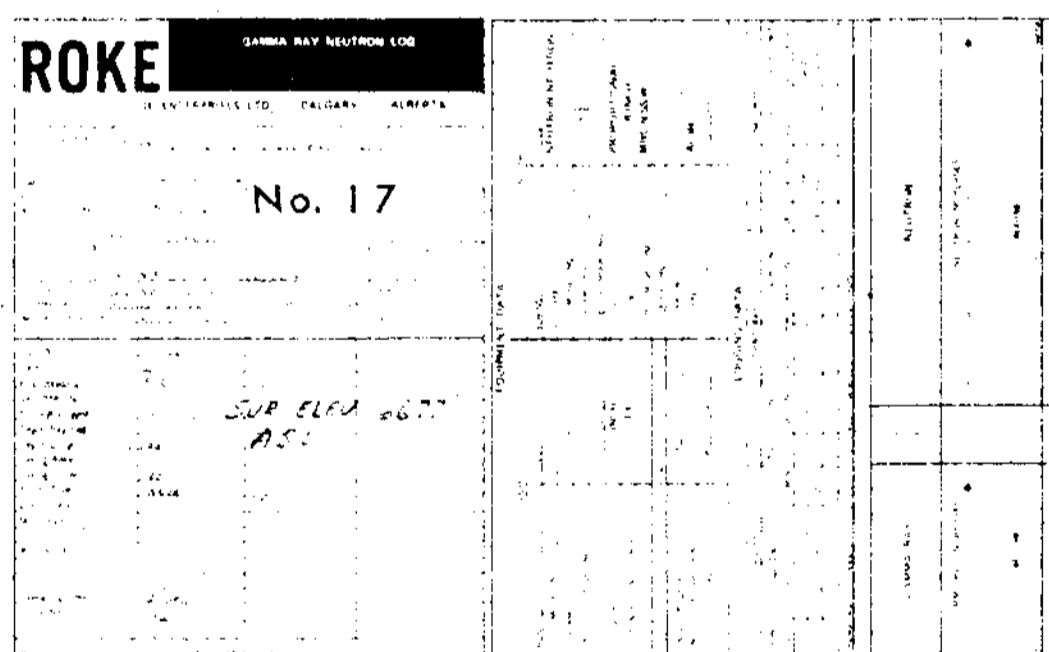
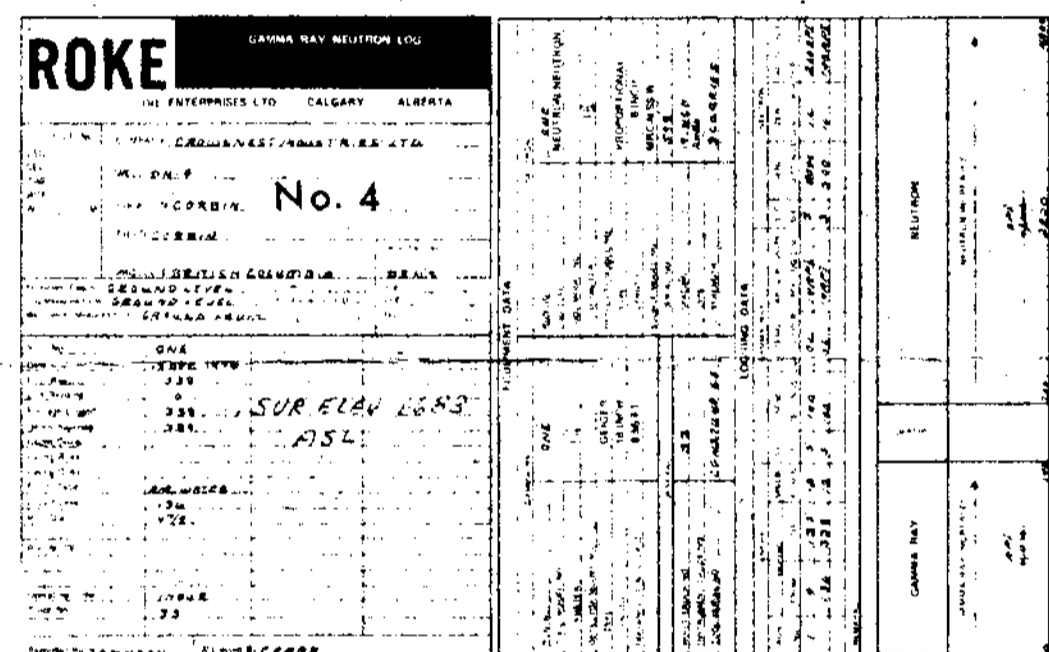
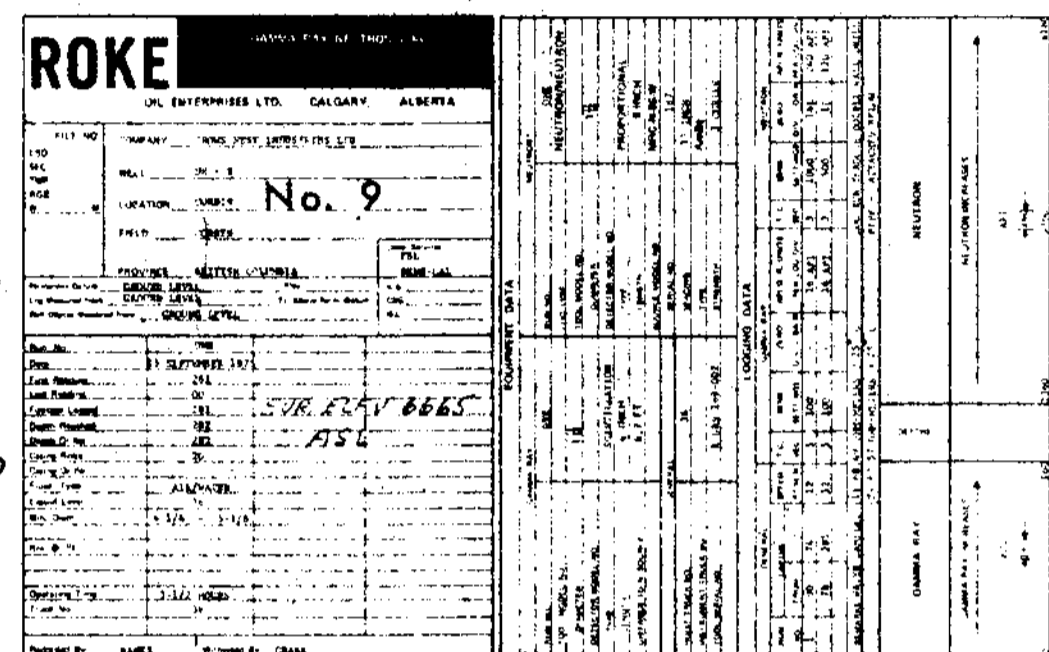
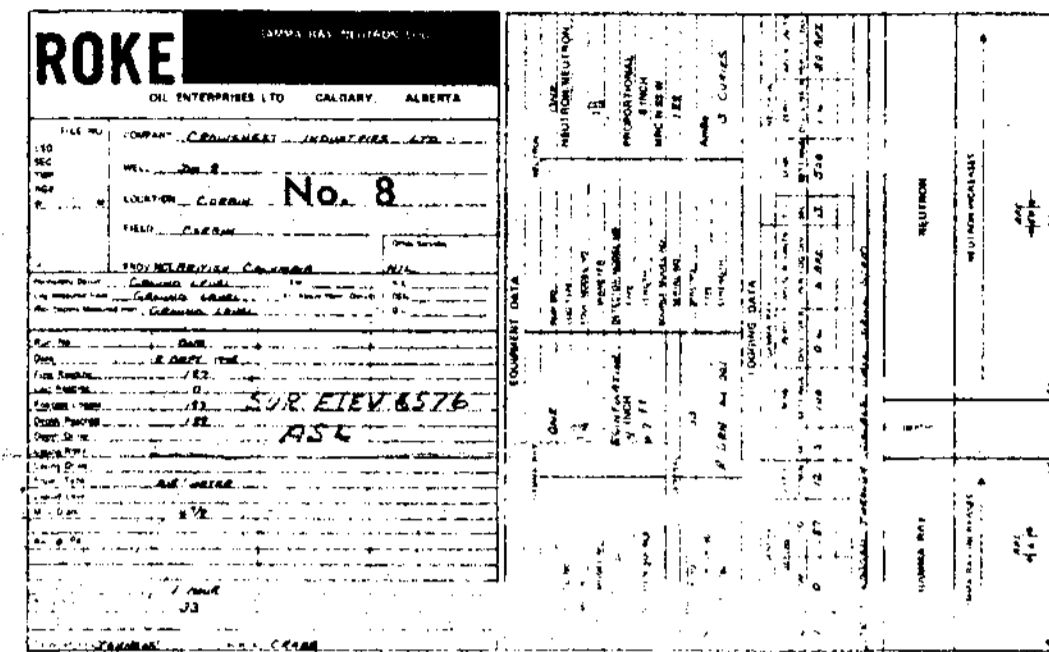
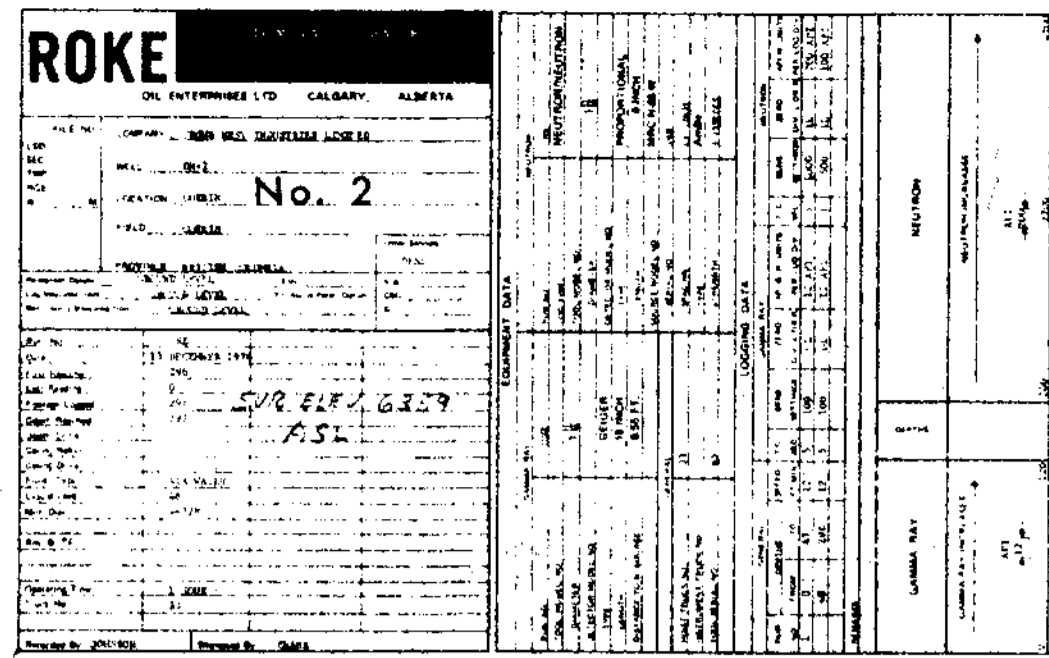
TABLE III(a) & (b)

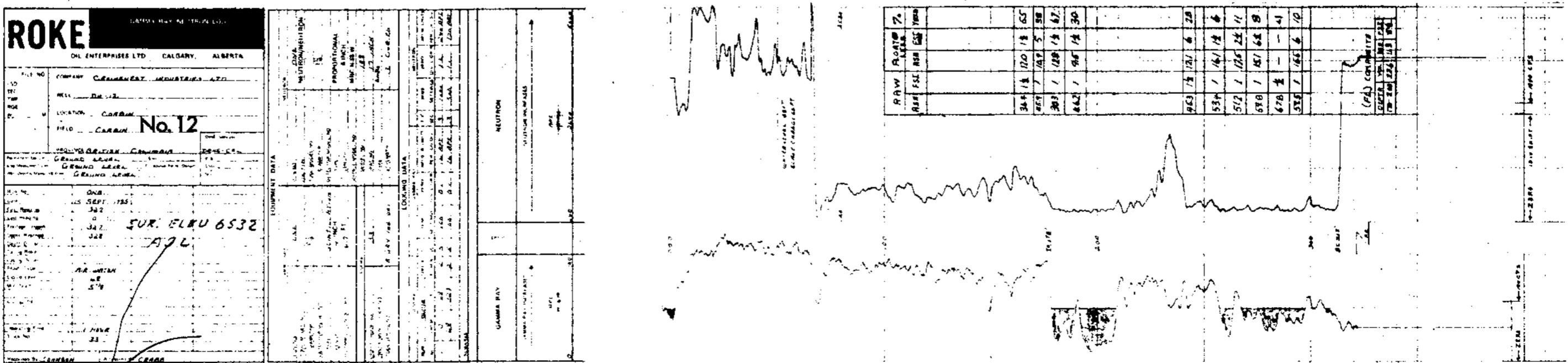
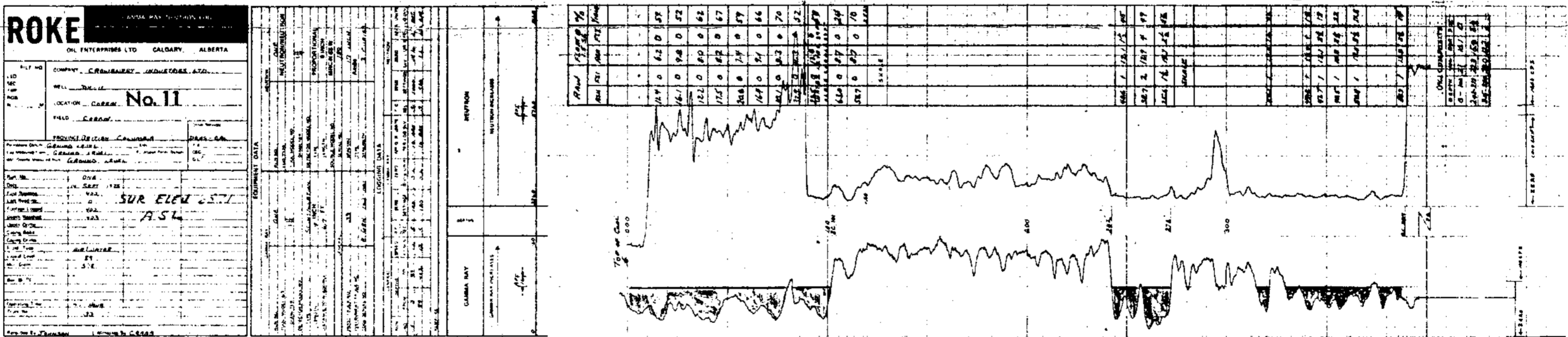
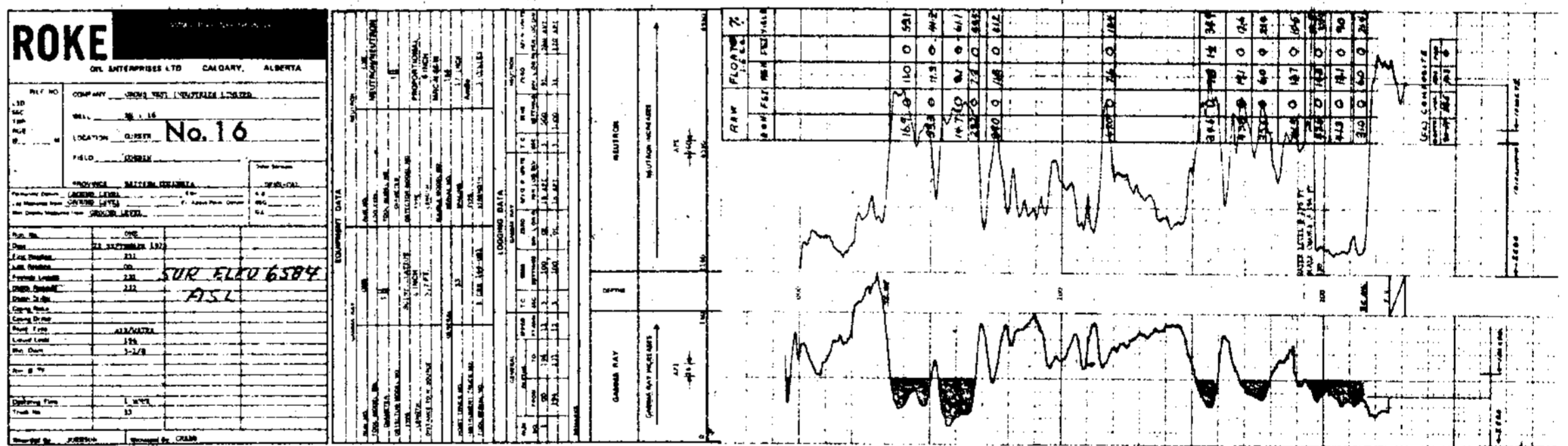
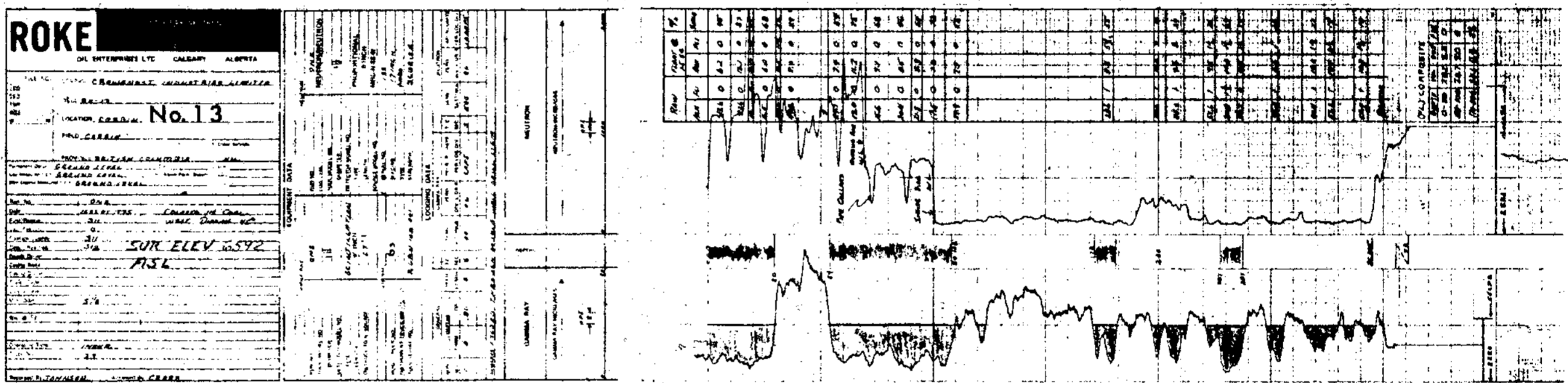
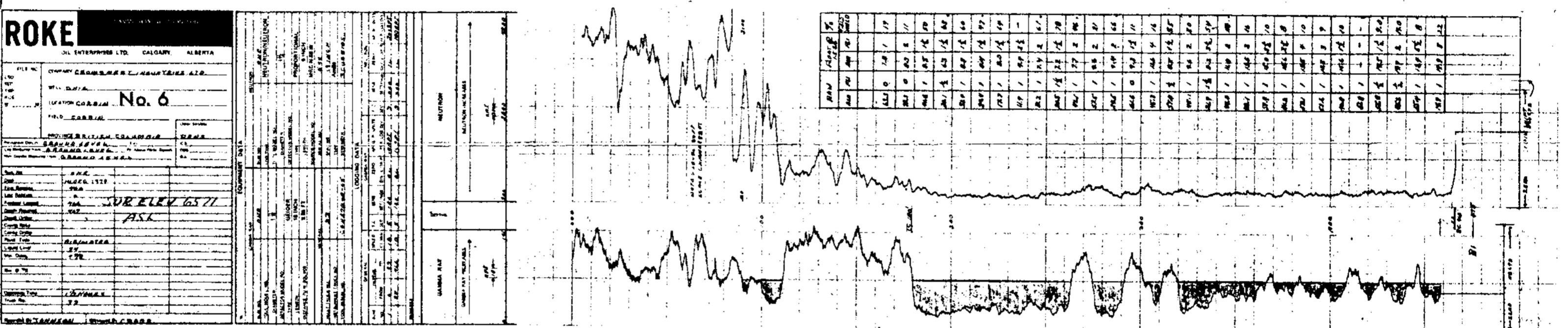
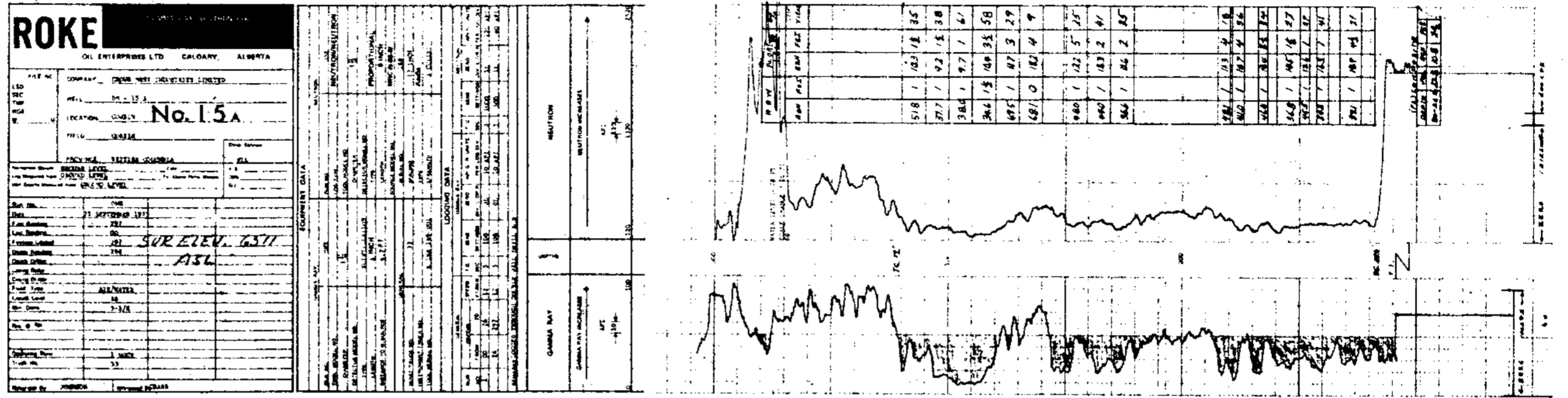
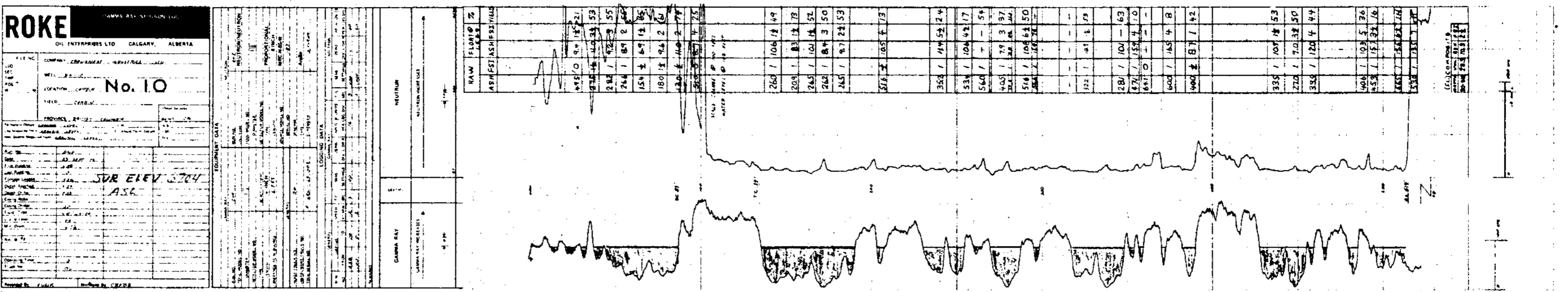
CORBIN - COAL MOUNTAIN DRILL LOGS AND WASHABILITY DATA

CORBIN-COAL MOUNTAIN DRILL LOGS AND WASHABILITY DATA

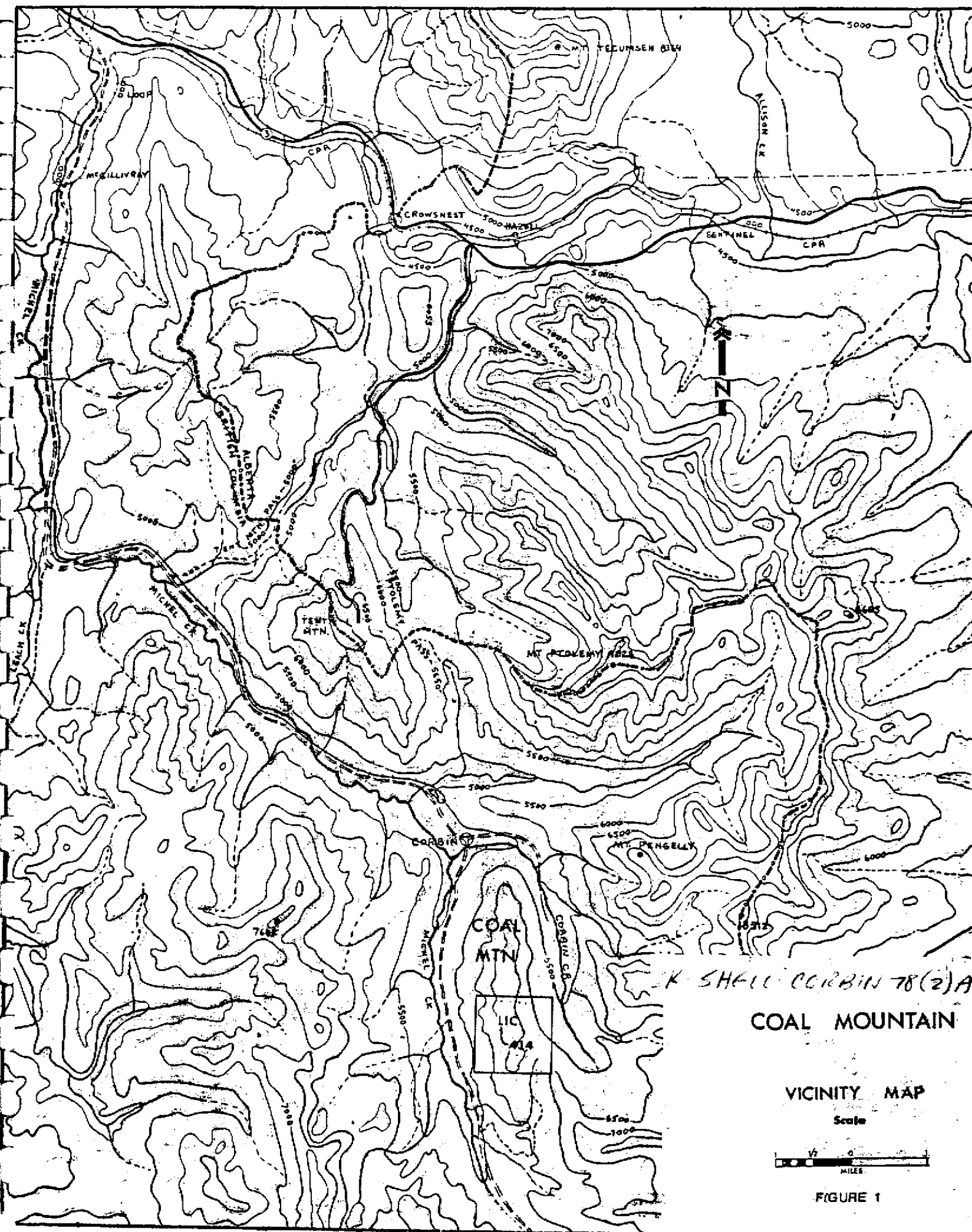
TABLE III a
* K-SHELL CORBIN 78 (7)A.

385
PIC^①





* K-SHELL CORBIN 78(2) A. **385** ②
 r/c CORBIN-COAL MOUNTAIN
 DRILL LOGS AND WASHABILITY DATA

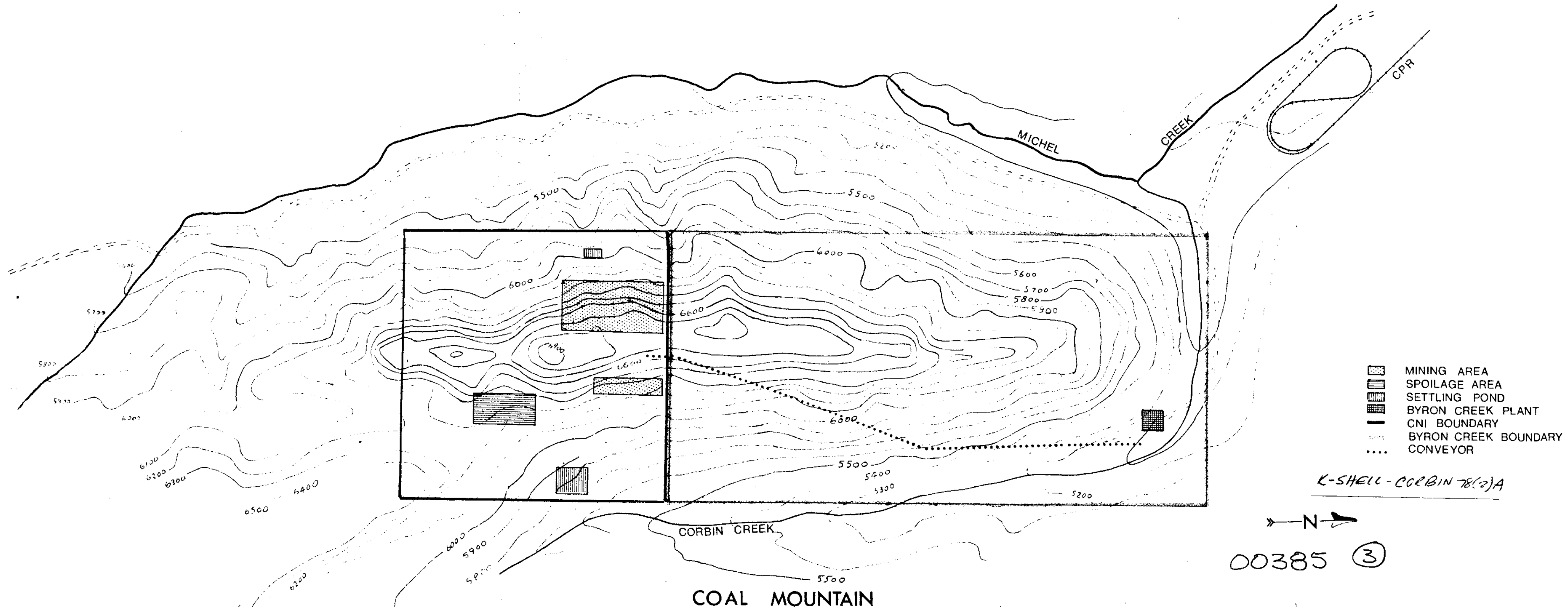


K SHELL CORBIN 78(2)A
COAL MOUNTAIN

VICINITY MAP
 Scale



FIGURE 1



COAL MOUNTAIN

SCALE
4 INCHES = 1 MILE

FIGURE II

FIGURE III(a) to III(l) ✓

COAL MOUNTAIN CROSS SECTIONS

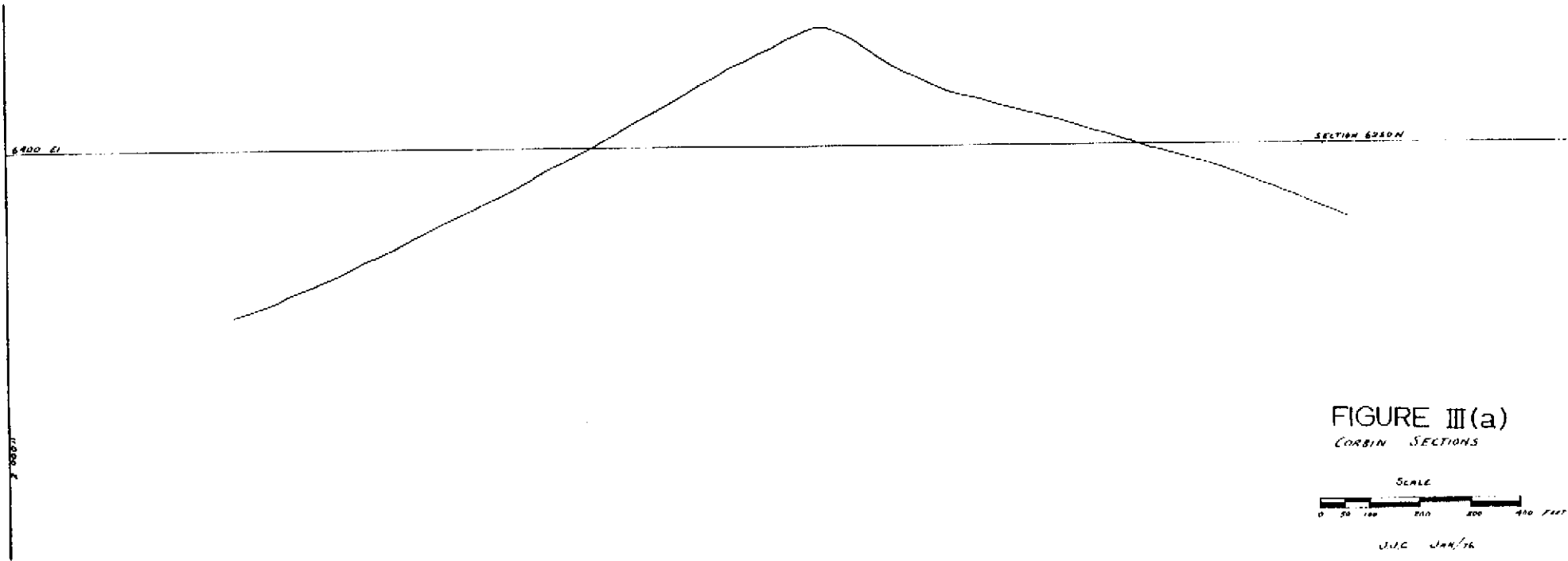
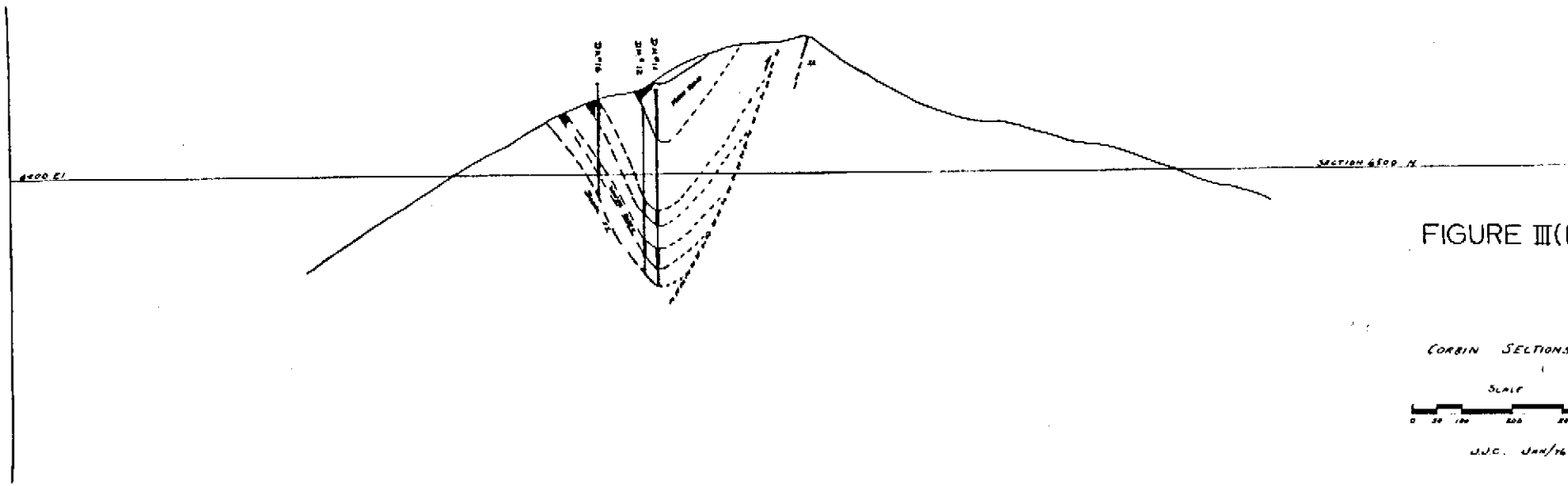


FIGURE III(a)
CORBIN SECTIONS

SCALE
0 50 100 200 400 FEET

JULY JAN/76



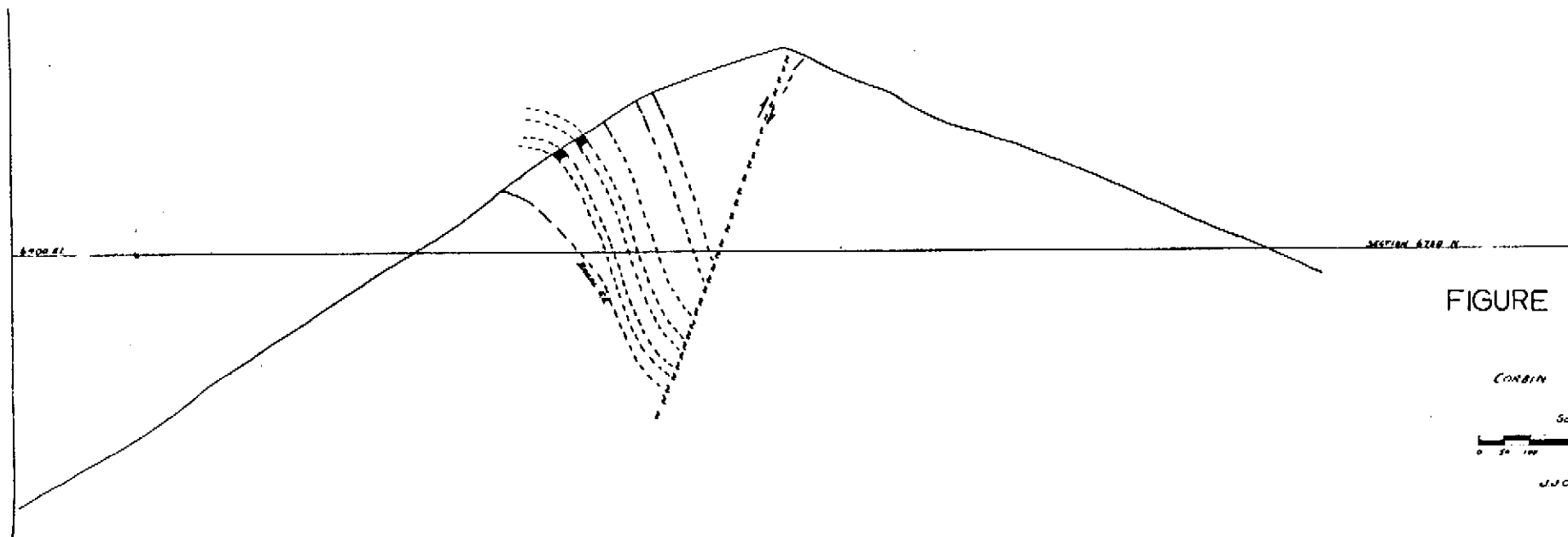


FIGURE III(c)

CORBIN SECTIONS .

SCALE



J.J.C. Jan/76

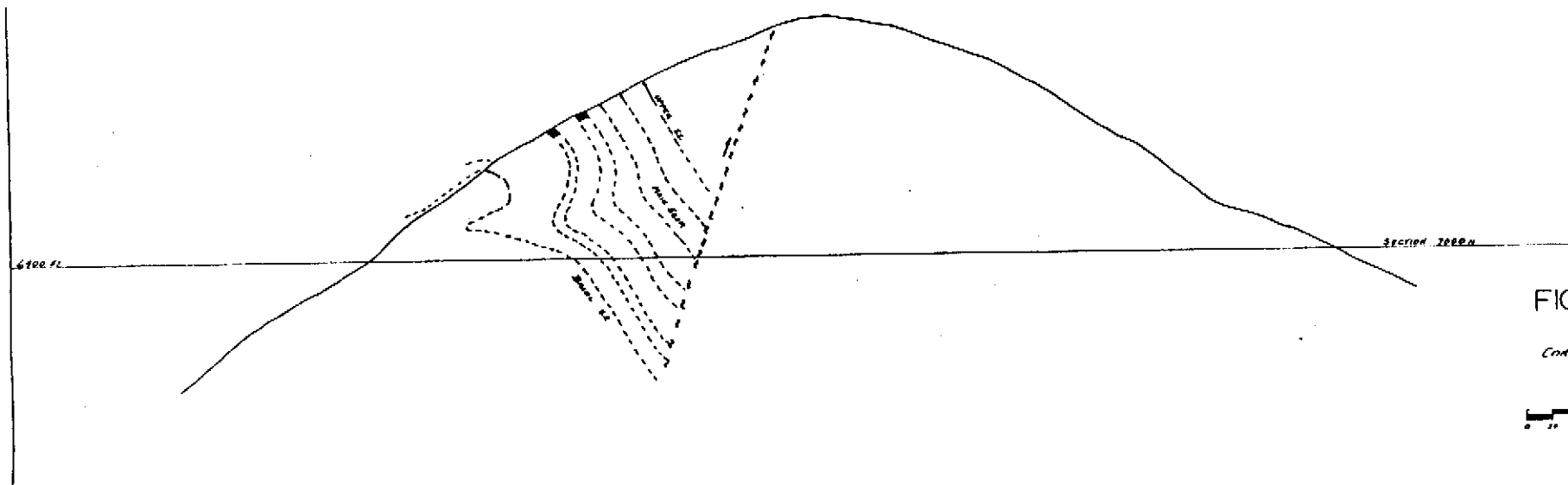


FIGURE III(d)

COMBIN SECTIONS

SCALE



J.S.C. JAN/76

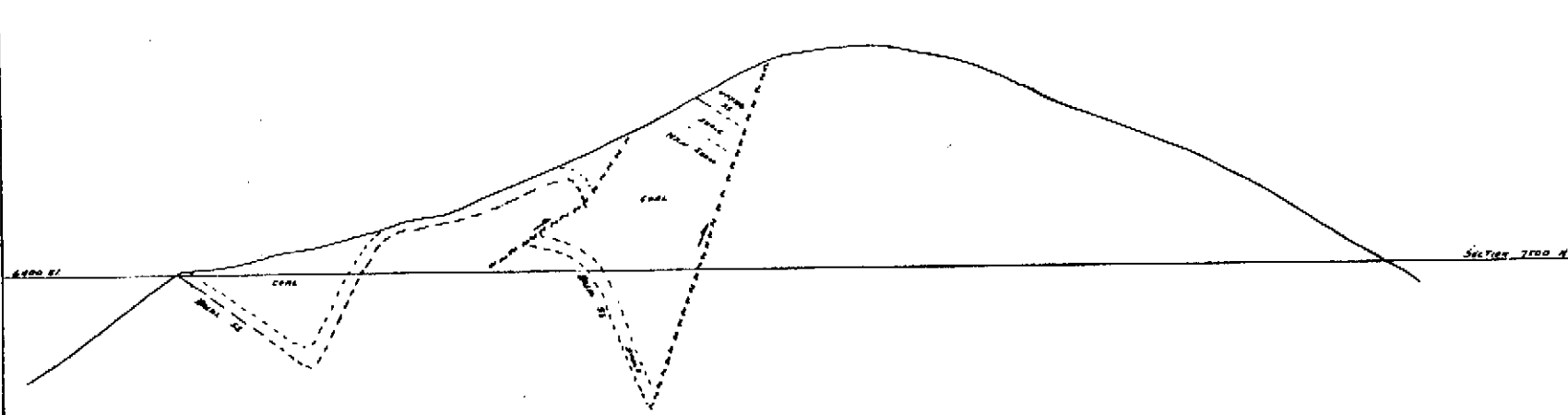


FIGURE III(f)

COASTAL SECTION



U.S.C. JAN/56

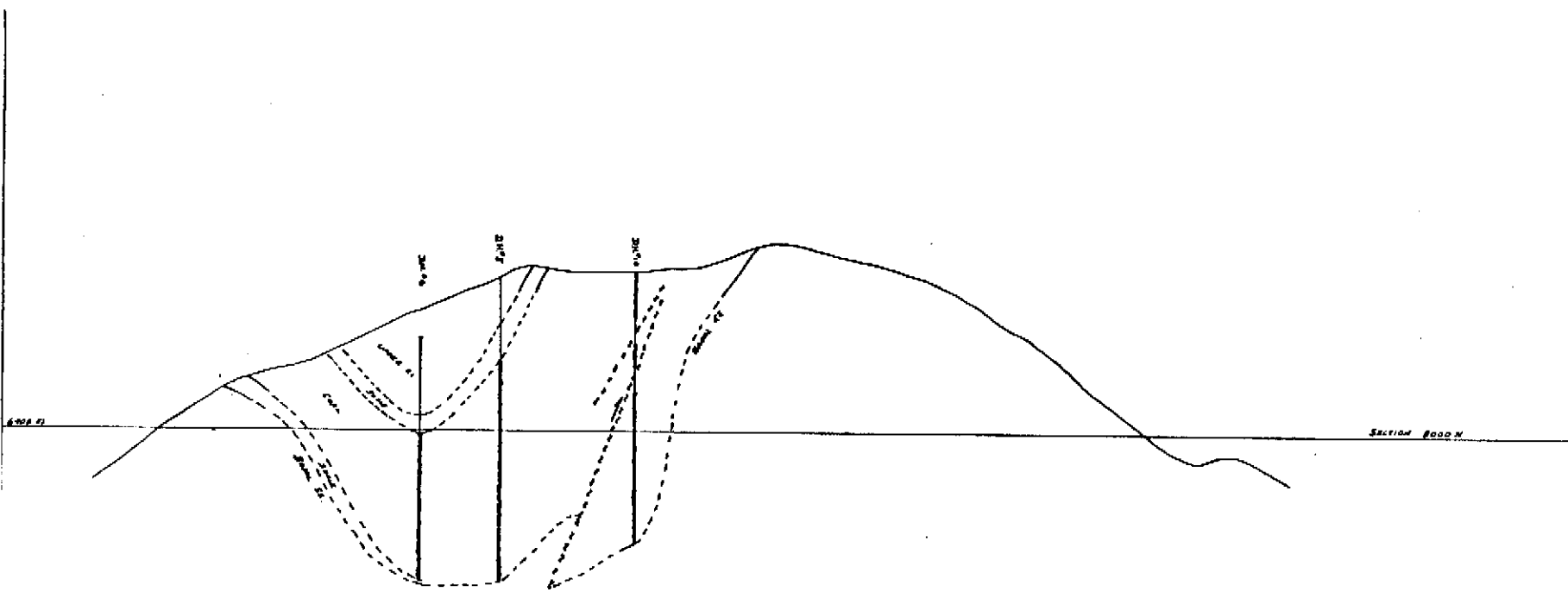
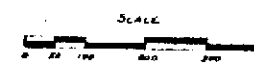


FIGURE III(h)

CORBIN SECTIONS



U.S.C. UNIT/IN

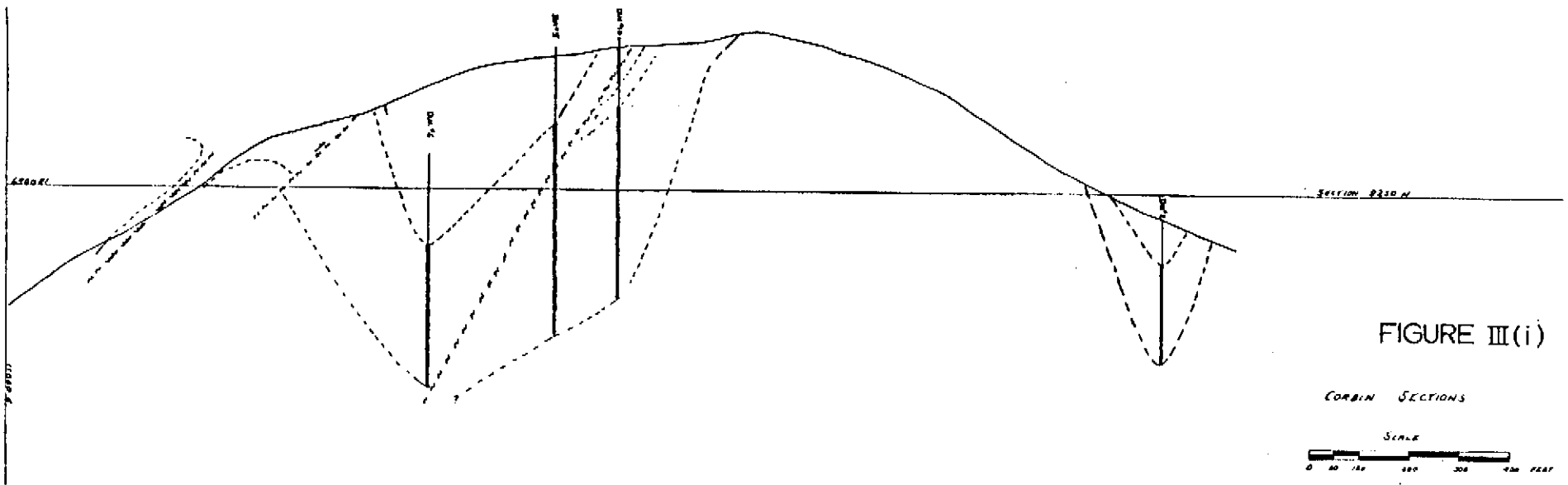


FIGURE III(i)

CORBIN SECTIONS

JJC JAN/76

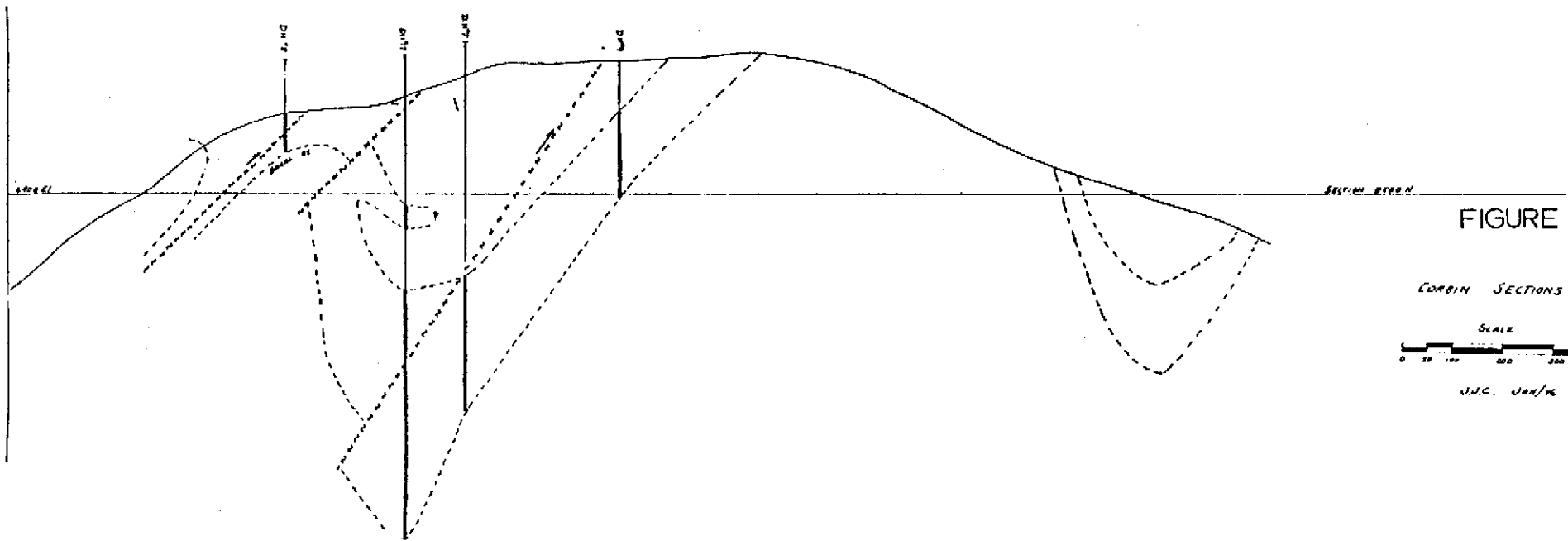


FIGURE III(j)

CORBIN SECTIONS



J.S.C. JAN/76

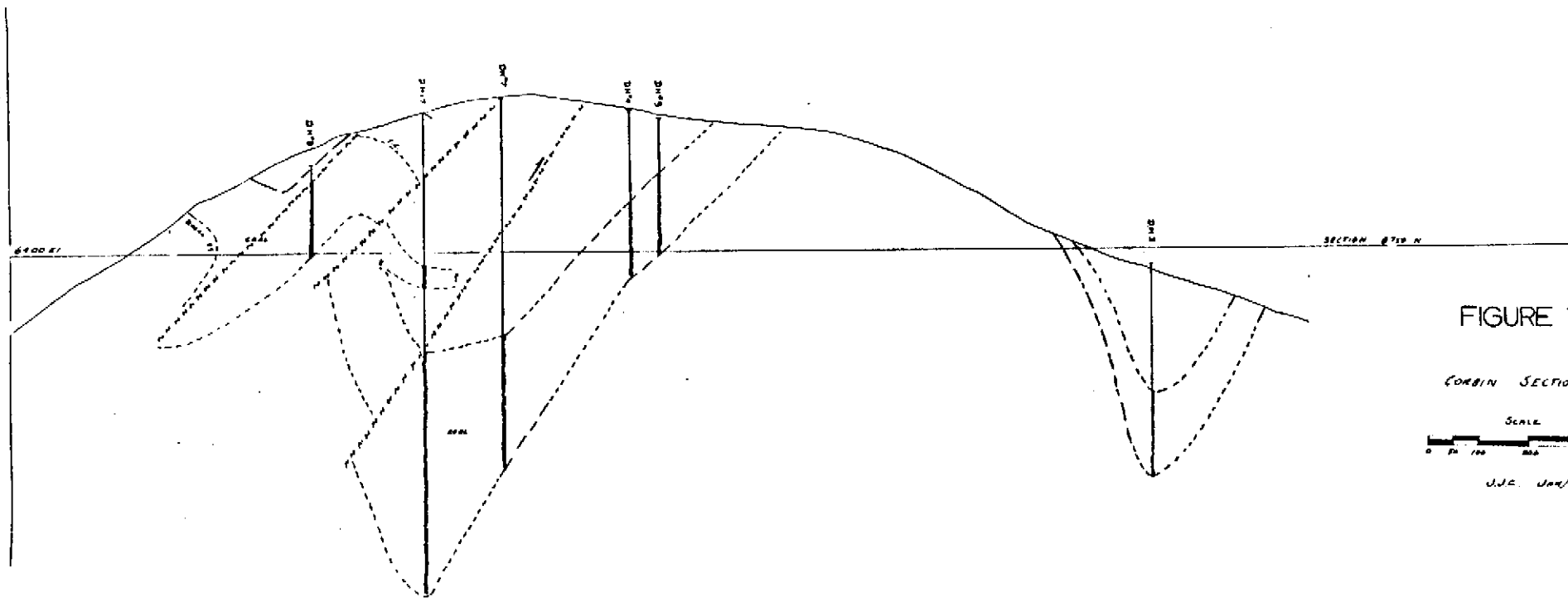


FIGURE III(K)

CORBIN SECTIONS



U.S. UNIT/M

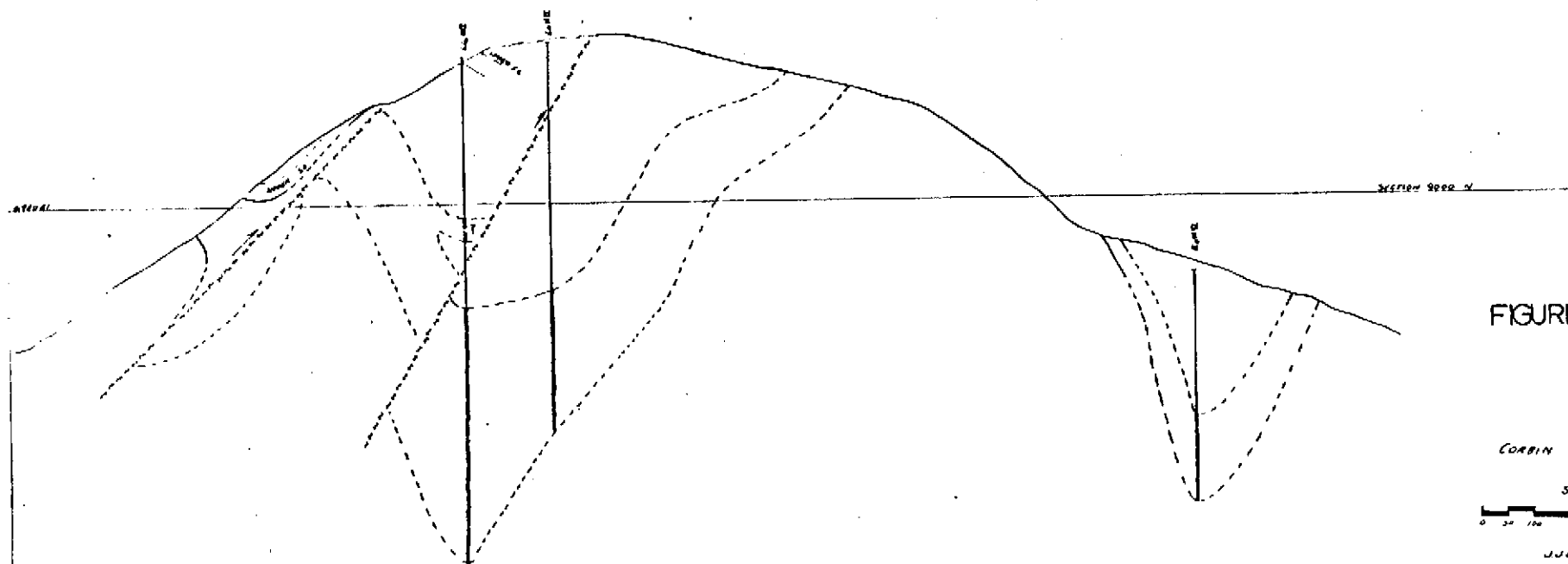
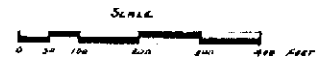


FIGURE III(1)

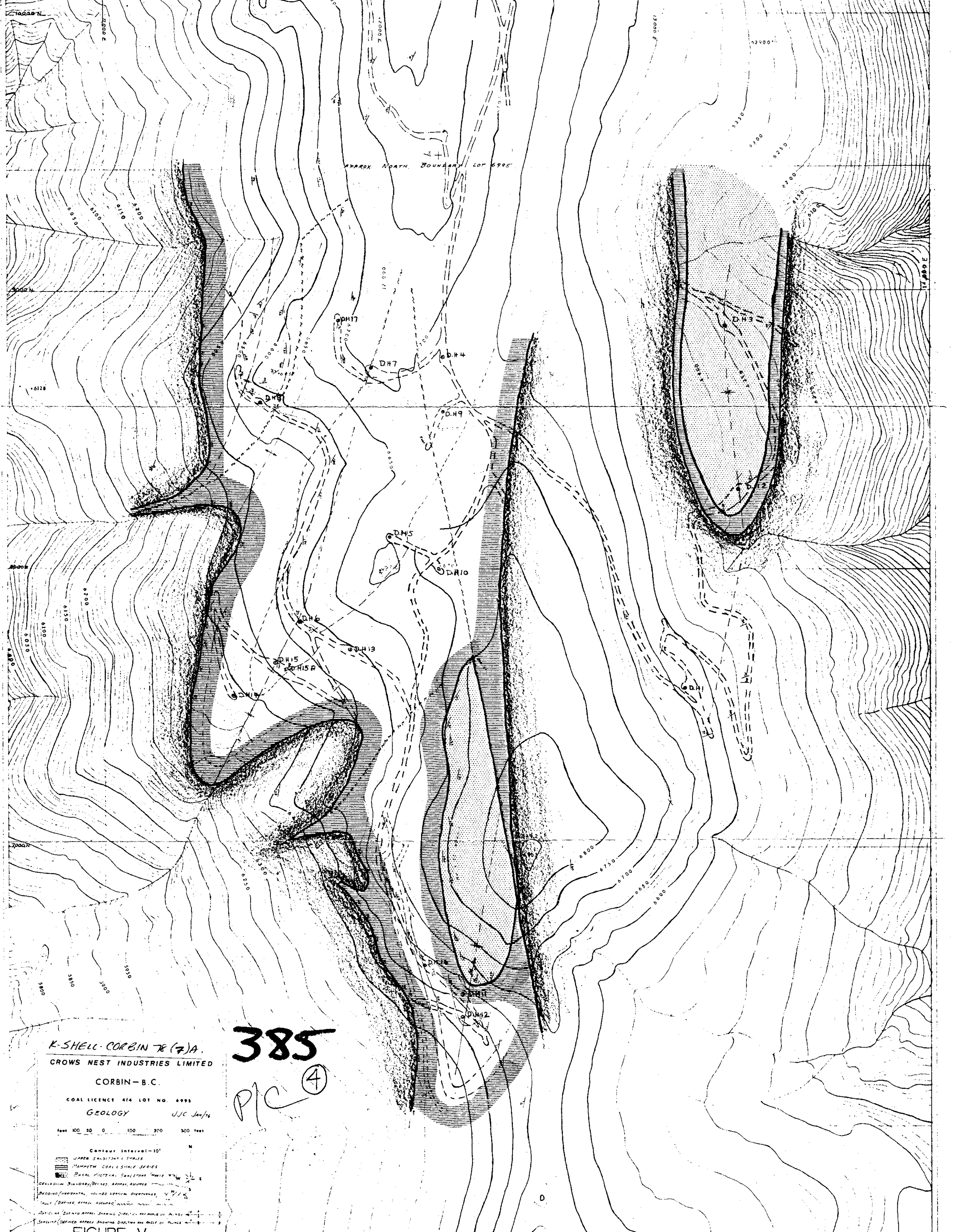
CORBIN SECTIONS



J.S.C. JAN/76

FIGURE IV - GEOLOGY AND SECTION LINES

FIGURE V - GEOLOGY



K-SHELL-CORBIN (7)A
 CROWS NEST INDUSTRIES LIMITED

385

CORBIN-B.C.

COAL LICENCE 414 LOT NO. 6995

GEOLOGY JJC Jan/16

PIC ④

feet 100 50 0 100 200 300 feet

Contour Interval - 10'

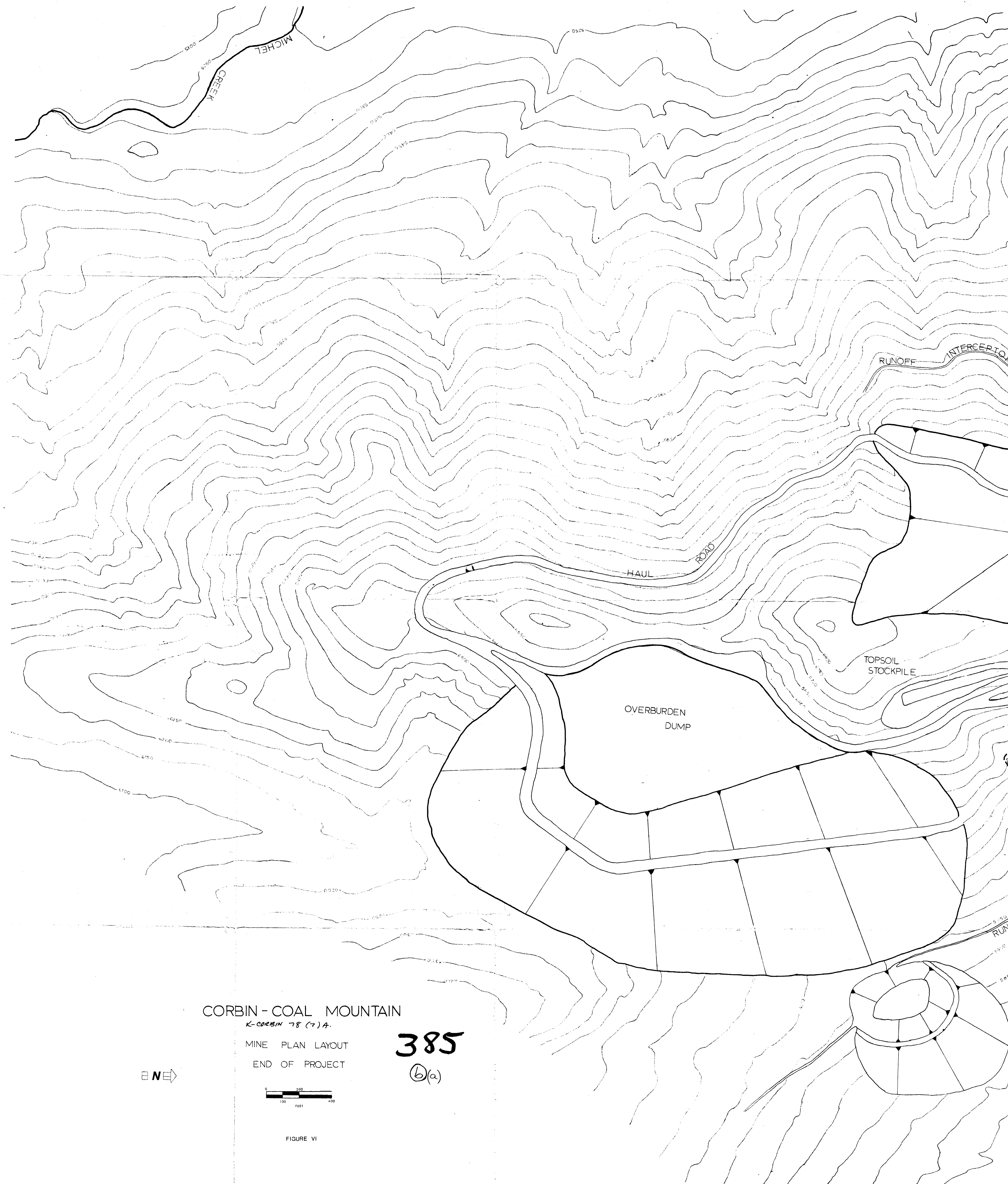
- UPPER SANDSTONE SERIES
- MARLBETH COAL SHALE SERIES
- BASEAL FLINTS
- GEOLOGICAL BOUNDARIES, BELIEVED ACCORD ASSUMED
- BOUNDARY (UNCONFORMITY), BELIEVED ACCORD ASSUMED
- FAULT (DIPING, REVER, ASSUMED)
- DICTIONAL (DIPING) APPROX. SHOWING DIRECTION OF PLUNGE
- SINKING (DIPING) APPROX. SHOWING DIRECTION OF PLUNGE

FIGURE V

FIGURE VI

MINE PLAN LAYOUT - END OF PROJECT

K-SHELL CORBIN 78(7)A



CORBIN - COAL MOUNTAIN
K-CORBIN 78 (7) A.

MINE PLAN LAYOUT
END OF PROJECT

385

(b)(a)

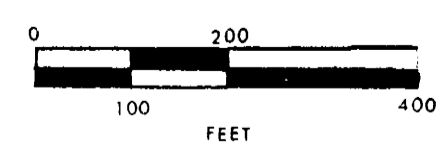


FIGURE VI

