MAR 19790010: RICHARDSON RIVER

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V-AF-161(2)

1979 0010

YEAR-END REPORT

1979 EXPLORATION PROGRAM

RICHARDSON RIVER PROJECT

NORTHEASTERN, ALBERTA

NTS 74-L-2, 3, 6, 7

September 1979

[redacted]

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I. SUMMARY

The 1979 Exploration Program on the three Quartz Mineral permits #6876120002, #6876120004, and #6876120005 was designed to test the Questor airborne INPUT conductors located on permit #6876120005 and to further define the location of the western margin of the Athabasca Formation. Two cut and picketed grids totalling roughly 75 line kilometers were established over the airborne conductors within permit #6876120005. Ground geophysical surveying included Max Min II horizontal loop electromagnetics with vertical loop electromagnetic confirmation and magnetics. Eleven diamond drill holes totalling 1295.8 metres were completed between March 20 and June 22, 1979. One hundred and three core samples were geochemically analysed for uranium, lead, nickel, and cobalt content.

The drilling results indicated that:

a. The two southern permits lie to the west of the Athabasca Formation.

b. A fault zone or series of faults parallel to the Richardson River coincide with the conductors outlined by the airborne and ground geophysical surveys.

c. The conductors are due to graphitic schists within a sequence of sheared steeply dipping metasedimentary rocks and to chloritized shear zones.

d. The graphitic schists contained anomalous (2 - 3 times background) U_3O_8 values.

e. The presence of graphitic schists along the fault zone indicates a favorable environment for uranium deposition.

f. The Athabasca Formation underlying permit #6876120002 appears to be of uniform thickness, in excess of 200 metres thick.

II. INTRODUCTION

Norcen Energy Resources Ltd., on behalf of the Norcen Uranium Joint Venture (participants include Norcen, E & B Explorations Ltd., Ontario Hydro, and Campbell Chibougamau Mines Ltd.) holds title to three Quartz Mineral Permits in northeastern Alberta. These 3 permits covering 76,800 acres represent the remaining land holdings that at one time totalled 11 permits covering 485,677 acres. For simplicity the permits are referred to the Richardson North (permit #6876120002-48,640 acres) and Richardson South (permit #6876120004-3,200 acres and #6876120005-24,960 acres).

The exploration target in this area is the Athabasca Formation - Basement unconformity type uranium deposit. The Key Lake, Midwest Lake, Collins Bay, Maurice Bay, and the recent Canadian Occidental - Inco discovery are all examples of this type of deposit. The deposits are typified by high-grade ore, proximity to a major structure, occur at as near the Precambrian-Athabasca unconformity, are associated with metasedimentary rock types within the basement complexes, and frequently occur near magnetic highs. Chlorite and graphite schists are thought to be important pathfinder rock types.

B P Canada Ltd. and Utah Mines Ltd. have taken an option on the three permits held by the Norcen Uranium Joint Venture. At the completion of the 1979 exploration program BP and Utah will jointly hold 50% equity in the northern permit and 25% equity in the two southern permits.

III. LOCATION AND ACCESS

The Richardson Permits occur in two irregular shaped tracts of land separated by an area which has been withdrawn from staking by the Alberta government. The northern permit #687612002 encompasses 48,640 acres south of Richardson Lake between the Maybelle River on the east and extending just beyond the Richardson River on the west. The southern permits #687612004 and #687612005 encompass 28,160 acres which are diagonally intersected by the Richardson River. The southern boundary of the southern permit is approximately 165 kilometres north of Fort McMurray, Alberta.

The area is accessible by float or ski equipped aircraft available from Fort McMurray, landing at Boat Lake in the southern permit or Larocque Lake three kilometres northeast of the southern permit. A DC3 aircraft available in Fort McMurray is capable of carrying freight to Embarras most of the year or to Larocque Lake during ideal ice and snow conditions. The airstrip at Embarras, a former lumber mill, is maintained by Alberta Forest Services. This airstrip is approximately 22 kilometres from the centre of the northern permit and 30 kilometres from the centre of the southern permits.

A little used winter road connecting Embarras with Fort McKay cuts across the southern permit and can provide access to the area for tracked vehicles.

IV. HISTORY

The northeast corner of Alberta was first explored for its uranium potential in the late 1960's and early 1970's. Most of the work at that time was in the form of reconnaissance airborne spectrometer and scintillometer surveys. The absence of anomalies and the pervasive glacial cover in this area resulted in limited ground follow up. In 1976 Great Plains Development Company of Canada Limited (a subsiduary of Norcen Energy Resources Limited) on behalf of its uranium joint venture, acquired 6 Quartz Mineral Exploration permits totalling 256,077 acres along the interpolated margin of the Athabasca Formation. The 1976 work program which included lake bottom geochemistry, prospecting and a surficial study indicated that the edge of the Athabasca Formation was located further west than indicated on published geological maps. In 1977 Norcen Energy Resources Limited applied for 5 additional permits covering 229,600 acres to the east of the Athabasca River. In 1977 eight stratigraphic drill holes indicated that the margin of the Athabasca Formation occurred between the Richardson and Maybelle Rivers. In 1978 a Questor Mark IV INPUT electromagnetic survey was flown over the permit areas.

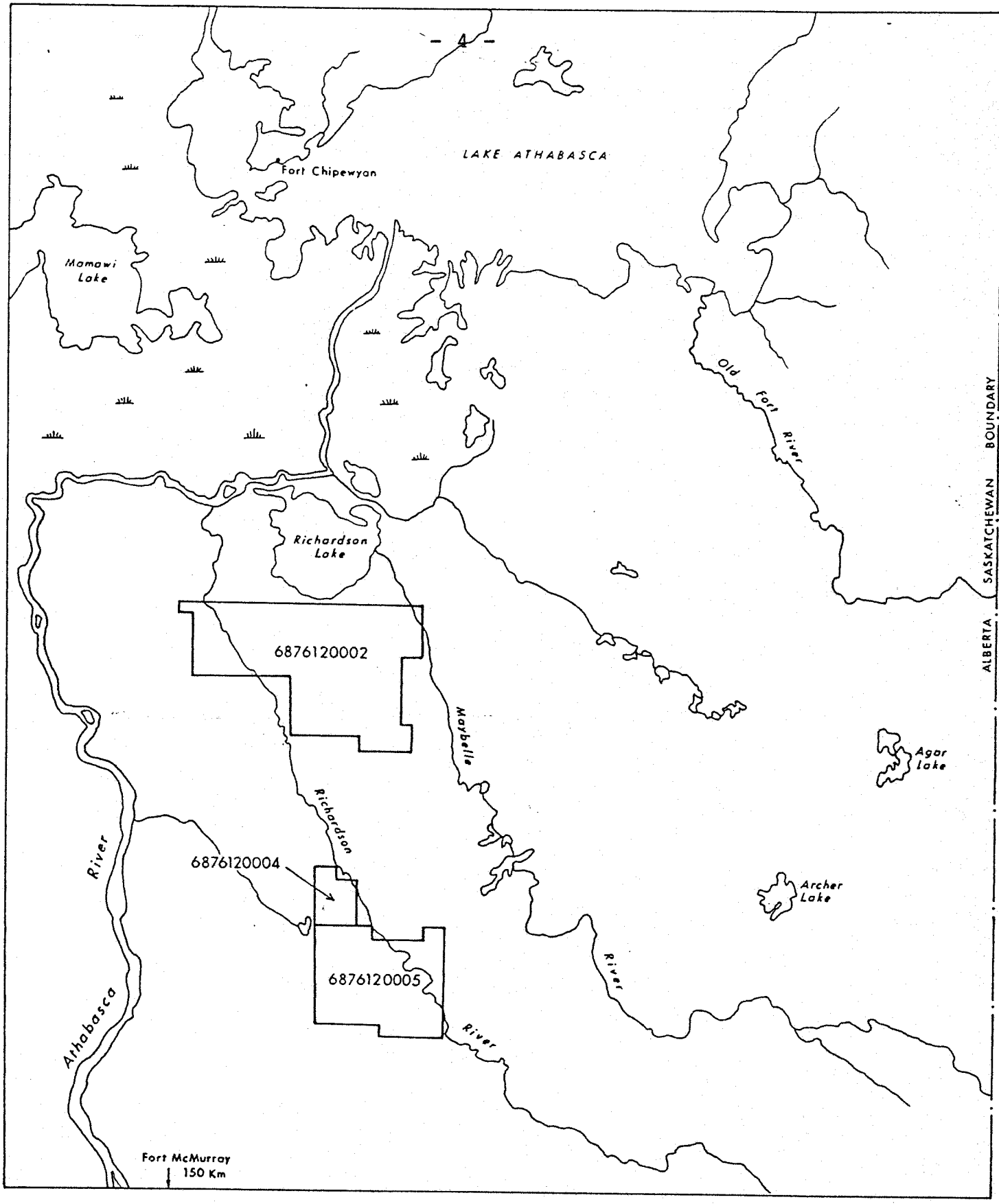

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FIGURE 6

NORTH-EASTERN ALBERTA

NORCEN JOINT VENTURE LAND HOLDING

0 5 10 15 Km
0 5 10 Miles
SCALE 1:500,000

Three electromagnetic conductors were outlined on permit #6876120005. The objectives of the present program were:

1. were to test the nature of the conductors mentioned above.

2. to locate the western rim of the Athabasca Basin, examine the unconformity and the underlying basement rocks.

V. REGIONAL GEOLOGY

The northeast corner of Alberta is occupied by approximately 15,500 square kilometres of the Canadian Shield, which consists of a complex of igneous, metamorphic and sedimentary rocks ranging in age from 1.7 billion years to older and forms part of the Churchill Structural Province.

The Precambrian rocks in the area include a basement complex of intrusive and metasedimentary gneisses which are unconformably overlain by the flat lying Athabasca Formation. The basement complex has been metamorphosed to amphibolite facies and structurally deformed during the Hudsonian Orogeny.

South of Lake Athabasca lie rocks of the Athabasca Formation within the Athabasca intracratonic basin. This Formation covers an area of 104,000 square kilometres mainly in Saskatchewan and reaches a thickness of 1,830 metres. Approximately 3,100 square kilometres of this Athabasca Formation occurs in Alberta and outcrops on islands in Lake Athabasca as well as small peninsulas located at Shelter Point and Fidler Point on the north shore of Lake Athabasca. The Athabasca Formation is considered to belong to the Paleohelikian Era (1.3 - 1.7 billion years).

The Athabasca Formation consists of quartz sandstone with minor interbeds of shale and siltstone and a basal gritty sandstone conglomerate unit. A pronounced unconformity underlies the Athabasca Formation and in some localities, depending on the composition of the Archean basement rocks, a regolith is developed.

A wedge of middle and upper Devonian sedimentary rocks unconformably overlaps the edge of the Athabasca Formation in northeastern Alberta. These rocks are rarely found in outcrop due to a thick blanket of glacial outwash which covers all of the Norcen permit areas. Exposure of these formations occur on

the southwest shore of Lake Claire 25.6 kilometres (16 miles) northwest and along the banks of the Firebag River 20 kilometres (12.5 miles) south of the permits.

These Devonian sediments are primarily mudstone to sandy mudstones with minor interbeds of sandstone. A coarse grit with occasional basal conglomerate is frequently present lying unconformably on the Athabasca Formation (if present) or the basement rocks. In several locations the LaLoche Formation (Lower Devonian ?), a hematitic regolithic unit, is present at the base of the Devonian sediments. This La Loche Formation rarely excess 1 metre in thickness.

The area is characterized by a thick accumulation (up to 85 metres) of Quaternary and Recent unconsolidated sediments, primarily sands. This overburden is largely cobble or boulder free except near the bedrock surface. Cobbles and boulders are commonly present up to 10 metres above the bedrock interface.

VI. 1979 EXPLORATION PROGRAM

A. Geophysical Summary

In 1978 a Questor Mark VI INPUT EM and accompanying magnetics survey was flown over the lands held under permits #6876120002, #6876120004, and #6876120005. This survey located three conductors all of which are contained within the boundaries of permit #6876120005. No bedrock conductors were located on permit #6876120004 and #6875120002.

An inspection of the airborne data tapes revealed extremely conductive overburden records for the northern permit (#6876120002). This conductive noise is recorded up to the fourth channel of the INPUT data. It is likely that this conductive overburden has masked any response that might be expected if conductors are present.

In 1979 a geophysical consulting group, MPH Consultants Ltd., of Toronto, were retained to outline and define two of the above mentioned conductors on the ground. For control two base lines were emplaced at a bearing of 046° and cross line cut at 90° to the baseline every 150 metres. The APEX Max Min II horizontal loop electromagnetic system was used reading the 444 and 1777 Hz frequencies utilizing a 200 metre cable. Readings were taken every 25 metres along the cut lines. A vertical loop McPhar SS-15 unit was used to confirm the conductive axis location.

East Grid - On the east grid the electromagnetic conductors found were extremely weak (1 mho) and deep features (100 meters) which are interpreted to represent shear features. These showed no direct correlation with the magnetic anomalies. There was no apparent structural intersections involving the electromagnetic anomalies. Fault structure interpreted from the magnetics showed a possible fault or shear zone.

West Grid - One fairly strong (5-7 mho) conductor was mapped on this grid It was a 600 metre section contained within the major conductor. This section could represent a graphitic and/or sulphide assemblage. It was intersected by two weaker conductive zones. From airborne magnetics and airphoto analysis several linear structures were found to crosscut the major conductor which in some cases affects the conductor trace.

Completion of the ground magnetic survey on this grid is strongly recommended to provide greater control on the strucutural interpretation put forward to date. Several possible strucutural features have been outlined which warrant further investigations.

Details on the ground geophysical survey are included in Geophysical Report on Richardson River Project Northern Alberta by D. Jones June 1979 of MPH Consulting Limited.

A linear magnetic feature was defined on Permit #6876120002 by the airborne magnetics. A small grid was emplaced by compass and flagging for control. Using a proton precession magnetometer (Geometrics 816) and accompanying base station recorder (Barringer M-123) four of five grid lines were completed. Ground magnetic data was obtained for the small grid on permit #6876120005. Severe magnetic storms hampered accurate data recovery for a large part of the time while geophysical crews were in the area.

B. Drilling Survey

Twelve hundred and eighty six metres of diamond drilling was carried out during the period March 20 to April 21 and from June 1 to June 22, 1979. D. W. Coates Enterprises Ltd. of Richmond, British Columbia was engaged as the drilling contractor. A Longyear 38 was employed drilling BQ wireline.

The drill and equipment was flown by DC-3 to the Embarass airstrip. All drill moves were helicopter supported.

Drill hole RR-1 was collared to test whether the western edge of the Athabasca Formation was marked by the Richardson River.

Drill holes RR-2, RR-5, RR-6, RR-7, and RR-8 were collared to test the ground electromagnetic conductors located by the geophysical surveying. Drill holes RR-3, RR-4, RR-9, RR-10 and RR-11 were collared in an attempt to locate the western extent of the Athabasca Formation. Core recovery averaged above 90% in all drill holes. Water circulation was lost in drill holes RR-8 and RR-9 resulting in abandonment of both holes before the projected depths had been reached. Drill hole RR-10 was abandoned due to unseasonally cold weather in April during which the nearby slew used for a water supply froze solid.

A breakdown of the drilling is given below:

	Bearing	Dip	Total Depth (metres)	
Permit #6876120004				
RR-1	0°	-90°	79.5	
				79.5
	Bearing	Dip	Total Depth (metres)	
Permit #6876120005				
RR-2	046°	-72°	99.7	
RR-3	0°	-90°	69.2	
RR-4	0°	-90°	35.6	
RR-5	046°	-75°	121.0	
RR-6	046°	-68°	102.7	
RR-7	046°	-75°	117.5	
RR-8	046°	-75°	111.9	
				657.6
Permit #6876120002				
RR-9	0°	-90°	83.8	
RR-9A	0°	-90°	46.9	
RR-10	0°	-90°	151.5	
RR-11	0°	-90°	276.5	
				558.7
				1 295.8

	Depth (metres)	Lithology
RR-1	0 - 58.5	Quaternary and Recent Sediments
	58.5 - 73.3	Devonian Sediments
	73.3 - 73.3	Devonian ? LaLoche Formation (regolith)
	73.5 - 79.5	Precambrian basement paragneisses
RR-2	0 - 12.8	Quaternary and Recent Sediments
	12.8 - 23.2	Devonian Sediments
	23.2 - 23.5	Devonian ? LaLoche Formation (Regolith)
	23.5 - 99.7	Precambrian basement paragneisses
Note:	Probable Conductor	50.3 - 53.0 metres - biotite (chlorite) gneiss/schist with limonitic blebs and disseminated sulphides (5%)
RR-3	0 - 28.6	Quaternary and Recent Sediments
	28.6 - 69.2	Precambrian basement gneiss
RR-4	0 - 23.7	Quaternary and Recent Sediments
	23.7 - 35.6	Precambrian basement gneiss
RR-5	0 - 54.2	Quaternary and Recent Sediments
	54.2 - 68.6	Devonian Sediments
	68.6 -121.0	Precambrian basement paragneisses and schists
Note:	Conductor 103.0 - 109.4 metres - graphitic schist.	
RR-6	0 - 29.0	Quaternary and Recent Sediments
	29.0- 33.0	Devonian Sediments
	33.8-102.7	Precambrian basement paragneisses and schists
Note:	Probable Conductor	85.3 - 89.0 metres - fault zone with brecciation, clays, and abundant fault gouge.
RR-7	0 - 59.4	Quaternary and Recent Sediments
	59.4 -78.0	Devonian Sediments
	78.0-117.5	Precambrian basement paragneisses and minor schists
RR-8	0 - 61.0	Quaternary and Recent Sediments
	61.0- 81.4	Devonian Sediments
	81.4- 83.5	Devonian ? LaLoche Formation (Regolith)
	83.5-111.9	Precambrian basement paragneisses and minor schists
RR-9	0 - 83.8	Quaternary and Recent Sediments
RR-9A	0 - 46.9	Quaternary and Recent Sediments

	Depth (Metres)	Lithologies
RR-10	0 - 58.8	Quaternary and Recent Sediments
	58.8-151.5	Precambrian Athabasca Formation -
RR-11	0 - 58.2	Quaternary and Recent Sediments
	58.2-267.3	PreCambrian Athabasca Formation
		58.2 - 246 Clean Sandstone
		246 - 264.2 hematitic sandstone siltstone
		264.2 - 267.3 Conglomerate, sandstone, siltstone
	267.3 - 276.5	PreCambrian basement paragneiss

C. GEOCHEMICAL SUMMARY

Selected sections from drill core were split in the field and geochemically assayed for U_3O_8, Ni, Co, and Pb contents. Four histograms are presented, one for each element analysed.

Statistical Analysis	Mean (ppm)	Standard Derivation (ppm)	1st Order Anomaly (Values Greater Than) (ppm)	2nd Order Anomaly (Values Greater Than) (ppm)
Uranium in Sampled Core (94 Samples)	1.156	2.143	3.299	5.442
Uranium in Sampled Core minus values from Intrusive (drill hole RR-3) (87 Samples)	0.610	0.708	1.318	2.026
Nickel in Sampled Core (94 Samples)	35.861	27.126	62.987	90.113
Lead in Sampled Core (94 Samples)	12.20	5.146	17.346	22.492
Cobalt in Sampled Core (94 Samples)	18.319	10.12	28.439	38.559

The seven best U_3O_8 values received (3.8 ppm ranging to 11.1 ppm) are all from drill hole RR-3 and are samples of granitic gneiss. The remaining 87 samples are believed to be sedimentary in origin and it is this suite that has been used to determine anomalous U_3O_8 zones.

Nine Core Samples were assayed from drill hole RR-11 on permit #6876120002. Mean value from these nine assays are uranium 0.9 ppm, lead 6 ppm, nickel 22 ppm and cobalt 5 ppm.

GEOCHEMICAL ANOMALOUS DRILL SECTIONS
AS DEFINED BY THE STATISTICAL ANALYSIS

Drill Hole	Depth/metres	Values (ppm) U_3O_8	Lithology
RR- 2	20.4 - 21.4	1.6	Devonian coarse sandy grit to basal conglomerate
	21.4 - 22.4	1.8	Devonian ? LaLoche Formation (Regolith)

Drill Hole	Depth/metres	Values (ppm) U_3O_8	Lithology
RR- 5	105.5 -106.7	1.4	graphitic schist
	106.7 -107.9	3.3	graphitic schist
	107.9 -109.1	1.6	graphitic schist
	109.1 -111.6	2.0	graphitic schist
RR- 6	42.7 - 43.9	3.1	feldspar-quartz-chlorite paragneiss
	53.6 - 54.9	1.8	chlorite schist (hematite)
	54.9 - 55.5	3.1	chlorite schist (hematite)
	86.3 - 87.5	1.6	chlorite schist (fault zone
	87.5 - 88.4	1.4	chlorite schist (fault zone
RR- 8	101.3 -102.0	1.8	feldspar-quartz-chlorite paragneiss (hematite)
	102.0 -102.6	1.4	feldsapr-quartz-chlorite paragneiss (hematite)

* The statistical analysis does not include assays from permit #6876120002.

Drill Hole Number	Depth/metres	Values ppm Ni	Lithology
RR- 2	25.4 - 26.4	84	chloritic paragneiss
	51.8 - 52.9	67	chloritic paragneiss (conductor ?)
	52.9 - 53.9	82	biotite feldspar quartz paragneiss
	53.9 - 54.8	84	biotite feldspar quartz paragneiss
	55.9 - 56.8	71	biotite feldspar quartz paragneiss
	56.8 - 58.6	94	biotite feldspar quartz chlorite schist
RR- 5	71.0 - 72.2	104	chlorite schist
	86.5 - 87.5	116	chlorite schist
	87.5 - 88.1	72	chlorite schist
RR- 8	98.8 - 99.4	78	feldspar quartz chlorite paragneiss (hematite)
	99.4 - 100.0	79	feldspar quartz chlorite paragneiss (hematite)
	100.0 - 100.6	86	chlorite feldspar quartz paragneiss (hematite)
	100.7 - 101.3	82	chlorite feldspar quartz paragneiss (hematite)
	101.3 - 102.0	94	feldspar quartz chlorite paragneiss (hematite)
	102.0 - 102.6	89	feldspar quartz chlorite paragneiss (hematite)

Drill Hole	Depth/metres	Values ppm Co	Lithology
RR- 2	25.4 - 26.4	29	chloritic paragneiss
	47.9 - 48.9	34	biotite feldspar quartz paragneiss
	48.9 - 49.9	29	biotite feldspar quartz paragneiss
	51.8 - 52.8	29	chloritic paragneiss (conductor ?)
	52.8 - 53.9	37	biotite feldspar quartz paragneiss
	53.9 - 54.8	31	biotite feldspar quartz paragneiss
	55.9 - 56.8	33	biotite feldspar quartz paragneiss
	56.8 - 58.6	39	biotite feldspar quartz chlorite schist
RR- 5	71.0 - 72.2	30	chlorite schist
RR- 6	52.4 - 53.6	29	chlorite schist (hematite)
	53.6 - 54.9	34	chlorite schist (hematite)

RR- 6 (con't)	56.1 - 57.0	36	chlorite schist (hematite)
	57.0 - 57.9	37	chlorite schist (hematite)
	57.9 - 58.8	36	chlorite schist (hematite)
RR- 8	98.8 - 99.4	31	feldspar quartz chlorite paragneiss (hematite)
	99.4 - 100.0	30	feldspar quartz chlorite paragneiss (hematite)
	100.0 - 100.6	29	feldspar quartz chlorite paragneiss (hematite)
	101.3 - 102.0	33	feldspar quartz chlorite paragneiss (hematite)
	102.0 - 102.6	36	feldspar quartz chlorite paragneiss (hematite)

Drill Hole	Depth in metres	ppm Pb	Lithology
RR- 2	25.4 - 26.4	19	chloritic paragneiss
RR- 3	31.6 - 32.6	20	granitic gneiss
RR- 8	81.4 - 82.8	28	Devonian ? LaLoche Formation (regolith ?)
	82.8 - 83.2	25	Devonian ? LaLoche Formation (regolith ?)
	83.2 - 84.1	26	Devonian ? LaLoche Formation (regolith ?)
	84.1 - 85.0	23	Devonian ? LaLoche Formation (regolith ?)
	85.0 - 86.0	19	chlorite schist
	101.3 - 102.0	21	feldspar quartz chlorite paragneiss (hematite)
	102.0 - 102.6	26	feldspar quartz chlorite paragneiss (hematite)

Minor radioactivity (slightly above background) is present at the base of the Devonian sediments overlying the basement rocks in drill hole RR-2. Anomalous cobalt and nickel concentrations (up to 2 times background) are present in a zone straddling the probable conductor within chlorite schists and paragneisses of drill hole RR-2.

The graphitic schist zone intersected in drill hole RR-5 is anomalous (2 -3 times background) in U_3O_8 concentrations. Two narrow zones of chlorite schist contain anomalous (up to 2 times background) cobalt and nickel values in drill hole RR-5.

Hematized chlorite schists and paragneisses contain anomalous (2 -3 times background) U_3O_8 values in drill hole RR-6. A fault zone is present here and likely provided the channel for solution migration as evidenced by the hematitic alteration . Anomalous (slightly above background) cobalt is associated with some of the hematized rocks in drill hole RR-6.

Minor radioactivity (slightly above background) is found associated with hematized paragneisses in drill hole RR-8. Anomalous (slightly above background) cobalt and nickel are associated with this hematitic alteration. Lead values up to twice background are associated with the hematitic alteration and in the overlying Devonian LaLoche Formation ? (regolith ?).

It is interesting to note that the anomalous geochemical values are associated with primarily the chlorite rich basement rocks particularly where hematite alteration is present and tectonic movement has occurred. The geochemical values for nickel and cobalt also reflect proximity to the major fault zone and resulting alteration zones in the area. The graphite zone appears to be anomalous in uranium oxide and represents the primary target for additional exploration.

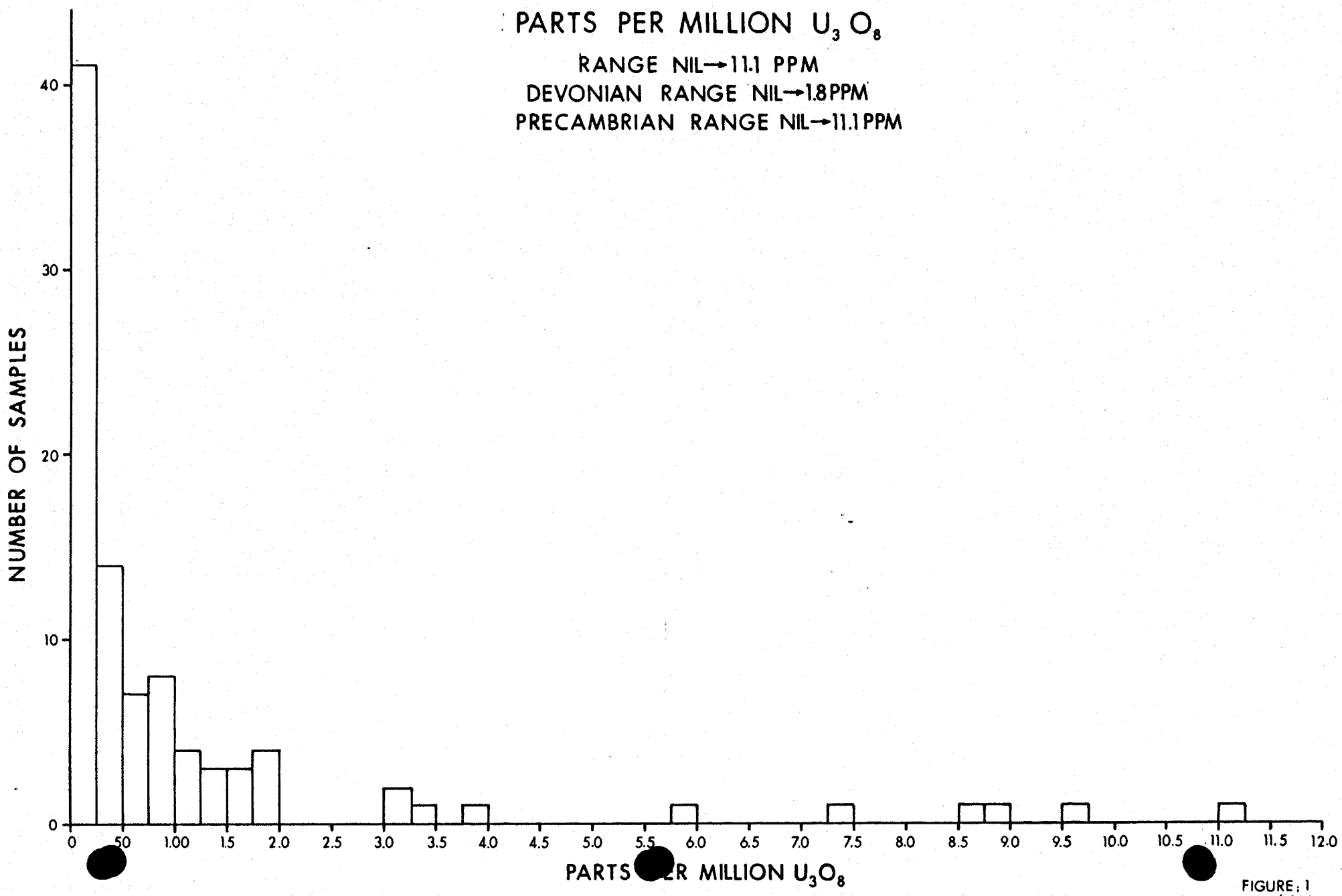

FIGURE: 1
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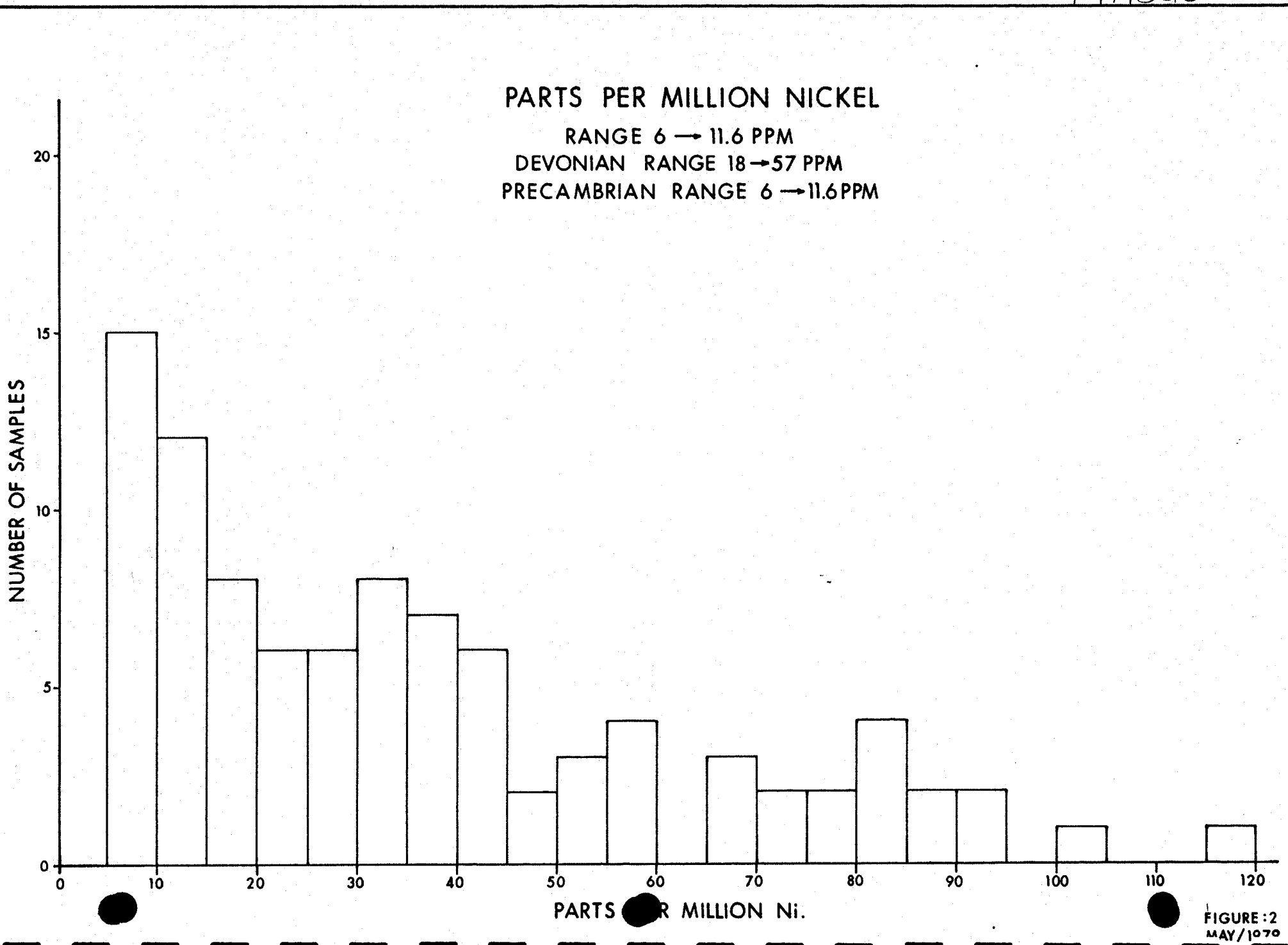

FIGURE: 2
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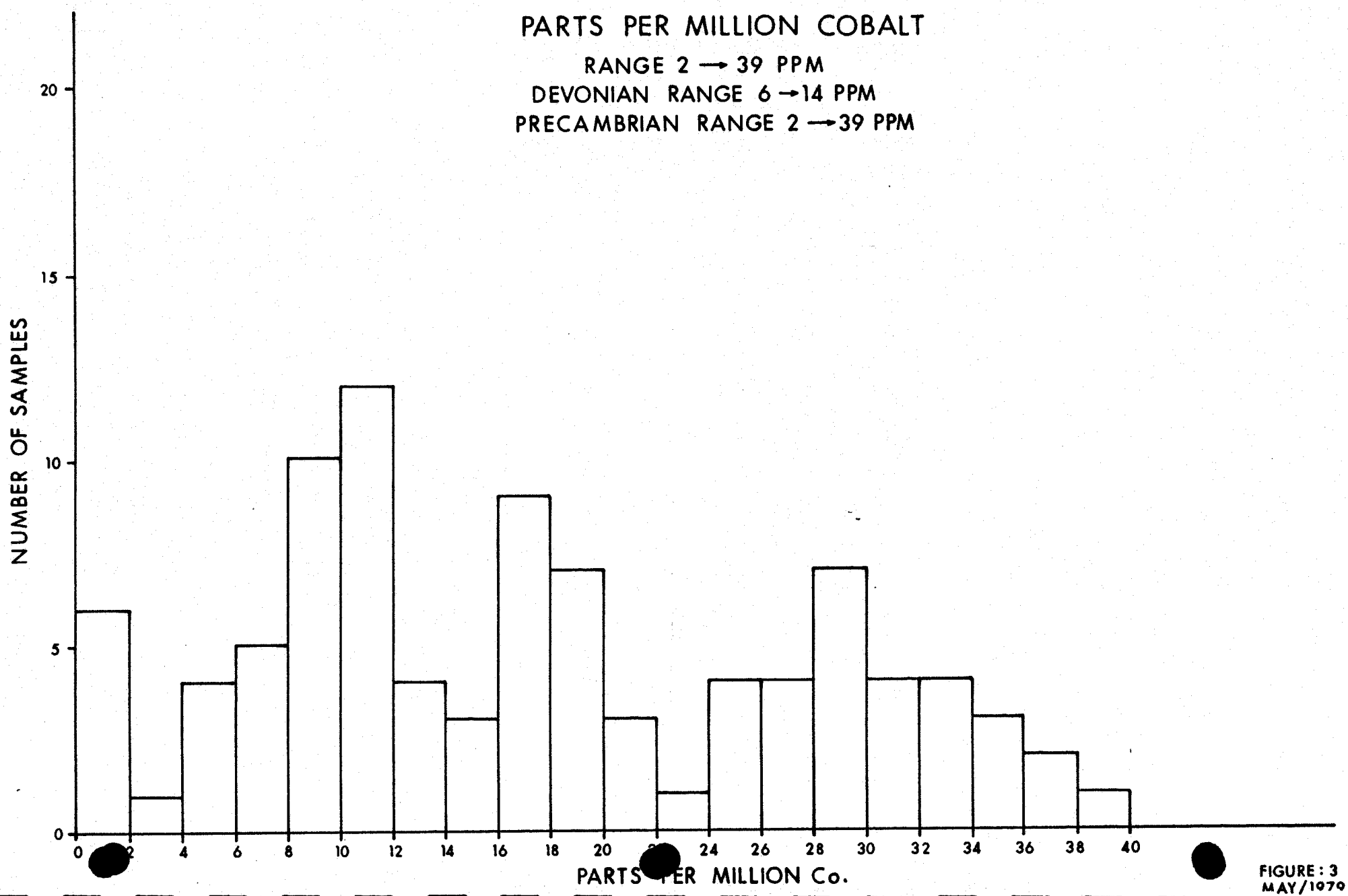

FIGURE : 3
MAY/1979

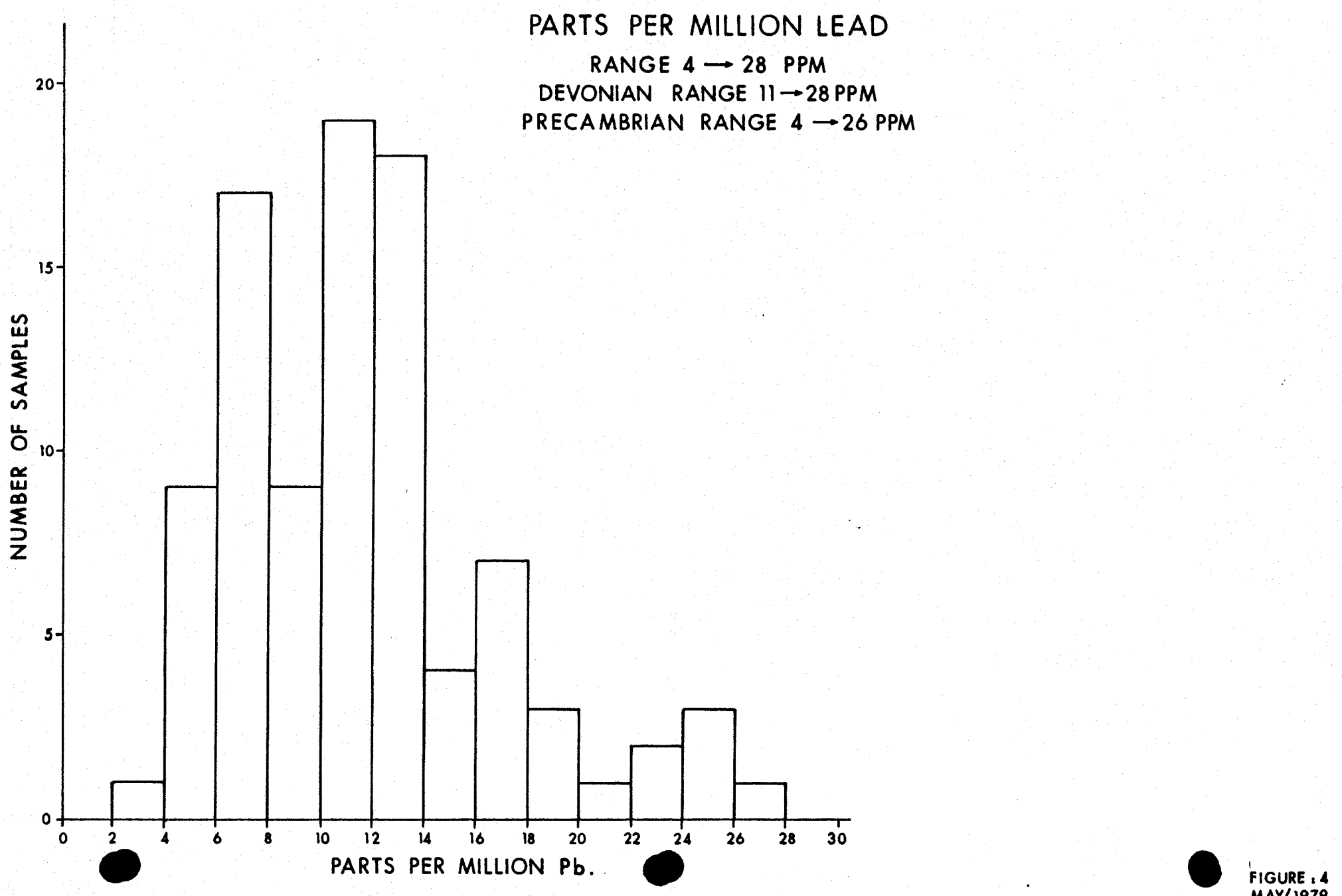

FIGURE : 4
MAY/1970

D. GEOLOGICAL SUMMARY

The 1977 drilling program defined the western edge of the Athabasca Formation to lie between the Maybelle and Richardson Rivers. Assessment data filed for permit #187 by Eldorado Nuclear coupled with the Norcen et al 1979 drilling project has further defined this western rim to lie in the vicinity of Barber and Larocque Lake slightly east of the Norcen permit #6876120005. Results of the stratigraphic drilling in the north permit #6876120002 indicate a uniform thickness of Athabasca Formation between the 1977 drill hole on the Maybelle River and drill hole number 11, 206 metres vs 209 metres. this would appear to indicate that the basin is structurally controlled and not pinching out to the west as previously conceived.

Devonian sediments (primarily mudstones) unconformably overlie the Precambrian basement rocks, or where present, the Athabasca Formation, in the southern area (Boat Lake, Larocque Lake area) and can be found several kilometres east of permit #6876120005. At this time no Devonian sediments have been found within permit #6876120002.

As mentioned above no Athabasca Formation has been found within the southern permits (#6876120004 and #6876120005). The conductors found within permit #6876120005 lie within the Precambrian basement complex. Drill testing of these conductors has located volcanoclastic rock types not previously known to exist in the area. The basement metasediments, now primarily paragneisses and schists, represent a volcanic sedimentary regime that has been highly metamorphosed and structurally deformed. The paragneisses and schists represent greywackes, argillites (pelites) and perhaps volcanic tuff. Metamorphism, granitization ? (migmitization ?) has resulted in the banded and highly schistose nature now seen. The metamorphic grade appears to be amphibolite facies. The chlorite schists found along the Richardson River fault zone are likely the result of chemical alteration by solutions migrating along the fault trace producing the retrograde metamorphism.

Precambrian basement intrusive gneisses have been recognized in cores from the eastern edge of permit #6876120005 south of Barber Lake and possibly at the eastern edge of permit #6876120004.

The presence of massive graphitic schists along the Richardson River Fault indicate a favorable reducing environment for uranium deposition. The extent of the graphitic schist is unknown at present; but the geophysical conductor indicates it may extend for 6.4 kilometres along the fault which parallels the Richardson River.

The Maybelle and Richardson Rivers are thought to represent large scale fault traces. The Richardson River fault zone is evidenced in drill cores by brecciation, fault gouge, and in places highly altered zones where the feldspars have been altered to clays, hematite is abundant and low temperature minerals are now found (chlorite, epidote). Although a restricted amount of data is available near the Maybelle River, it appears that the block between the two rivers has an upward stratigraphic displacement of 25-50 metres relative to the stratigraphy east of the Maybelle River and west of the Richardson River.

A description of the Quaternary and Recent sediments, the Devonian sediments, and the Athabasca Formation has be presented in the "Regional Geology" section. The Precambrian basement regime has not been delved into in much detail. A description of the units is given below.

Paragneiss - Several mineral assemblages of paragneiss represent the bulk of the sediments within the basement complex. The paragneisses exhibit a prominent banding of alternating leucocratic (feldspars and quartz) and melanocratic (mafics - biotite, chlorite, amphiboles ?) mineral assemblages. For simplicity in drill core logging three paragneiss groups have been used:

(a) feldspar + quartz $\pm$ biotite paragneiss

(b) chlorite + feldspar + quartz $\pm$ biotite paragneiss

(c) feldspar + quartz + chlorite $\pm$ biotite paragneiss

These distinctions were made in the field with no supporting thin sections identification or whole rock analysis. All of the three groups grade into one another. Group (c) represents perhaps an altered equivalent of (a) where the biotites have been altered to chlorite by retrograde metamorphism or locally by chemical solutions migrations along the Richardson Fault.

Chlorite and Biotite Schists

The distinction between the schists and the paragneiss has been arbitrarily determined by the degree of mineral segregation observed in the drill cores. These rock types commonly have gradational boundaries. The schists have a greater abundance of mafic minerals (predominantly chlorite). Whether this is due to the primary composition or an effect of alteration is difficult to determine.

There does appear to be an association between the schists and local shearing. Locally the shearing appears to be confined to the chlorite, chlorite-biotite, and graphitic schists.

Graphite Schists

Graphite occurs as fine disseminations within chloritic schists to massive graphite schists where the graphite content is greater than 80% of the rock mass. No clear cut relationship between the chlorite and graphite schist is known. The graphite schists appear conformable with the stratigraphy.

The origin of the graphite is speculative. It is likely that the graphitic schists represent pelitic zones conformably deposited within the sedimentary sequence.

CONCLUSIONS

Permits 6876120004, 6876120005

Exploration to date on the Richardson River South permits has outlined a favourable structural trap containing a geological and geochemical environment similar to the uranium deposits within the Athabasca Formation in Saskatchewan. This structure has been outlined by ground geophysical surveys and drill testing indicates the presence of faulting, brecciation and an increased background in uranium values associated with chloritic and hematitic alteration. Results from the 1979 exploration program indicate:

1. The presence of a large fault zone with local offsetting faults.

2. Paragneisses similar to those present in the Wollaston Fold. Belt in Saskatchewan.

3. The presence of graphite indicating a local reducing environment.

4. Thick chloritic and hematitic alteration zones associated with the Richardson River Fault.

5. An increased uranium background associated with chloritic and hematitic alteration.

6. No Athabasca Formation is present on these permits.

Uranium deposits in Saskatchewan occur at the intersection of similar structures and the pre Athabasca unconformity. The absence of Athabasca Formation on these permits may be the result of erosion by glaciation. The presence of in excess of 30 metres of Athabasca Formation intersected by Eldorado Nuclear in a hole 3 kilometres east of the Norcen Permits would suggest this possibility.

VIII. CONCLUSIONS AND RECOMMENDATIONS

a.) Permits #6876120004, 6876120005

The presence of graphitic schists within metasedimentary rocks along a major fault near the Richardson River provides an excellent exploration target warranting additional work. The near proximity of this structure to the present margin of the Athabasca Formation (5 to 10 kilometres) would suggest that this area was once part of the Athabasca basin prior to erosion and glaciation.

No further work is planned for southern permits in 1979. It is strongly recommended that application for lease of these permit areas be made as soon as possible. Further work in this area should include a series of drill holes along this structure which represents an environment similar to the known Unconformity-Type uranium deposits in Saskatchewan.

Recommendations for 1980:

1.	Lease payments 38,160 acres @ $.25	9,540.00
2.	Completion of the ground magnetic survey	15,000.00
3.	Diamond Drilling 1,500 m @ 130/metre	195,000.00
	Total	219,540.00

Permit #6876120002

Exploration on the Richardson River North Permit has progressed at a slower rate than the southern permit due to limiting physical factors in this area. The area is covered by thick sand overburden in excess of 60 metres thick and contains conductive horizons which mask any conductors present within the bedrock. Drilling in 1979 encountered a boulder horizon at the base of the overburden in which two strings of rods were lost prior to abandonment of the hole. This permit has no local water supply except for the Richardson River and seasonal bogs, one of which froze solid, suspending drilling and leading to abandonment of hole number 10.

Results of the drilling to basement indicated a uniform thickness of the Athabasca Formation between the 1977 drill hole on the Maybelle River and Drill Hole number 11, 206 metres vs 209 metres . This would appear to indicate that the basin is structurally controlled and not pinching out to the west as Saskatchewan indicates that major structures of this type represent prime exploration targets. Southwest trending faults associated with the uranium deposits at Uranium City Saskatchewan, if projected along strike, should extend into this permit area.

Recommendations for 1980

The primary objective for 1980 in the Richardson River North Permit is to locate major strucutural features which may be associated with uranium deposits. An audio frequency magnetic system designed to locate large weak conductive zones such as regional faults should be carried out over this area. An aeromagnetic study to delineate magnetic structures and determine the depth to magnetic basement should be carried out. In addition one or two stratigraphic drill holes should be completed along the Richardson Fault. Follow-up diamond drilling will be required to test favourable structures outlined by the AFMAG survey.

Lease Payment	
48,640 acres @ $.25/acre	$ 12,160
AF MAG Survey	
950 line kilometres @ $32/kilometre	30,400
Aeromagnetic Study	5,000
Stratigraphic Diamond Drilling	
500 metres @ $130/metre	$ 65,000
Follow-up drilling on favourable structures outlined by the AF MAG Survey	
2,000 metres @ $130/metre	$260,000
	$372,560

RICHARDSON RIVER NORTH EXPENDITURES (Estimated) (687612 W2)

1979 Expenditures

Land Rentals	$ 7,296.00
Geophysical Consultants	$ 5,000.00
Diamond Drilling	$53,812.00
Helicopter and Fixed Wing Charter	$34,976.00
Geological Support	$ 4,800.00
Camp Costs	$ 1,333.00
Expediting	$ 1,895.00
Watchman	$ 1,750.00
Helicopter Fuel	$ 5,208.00
Expense Accounts	$ 298.00
Instrument Rentals Spectrometers, Telephone	$ 460.00
Miscellaneous	$ 894.00
Overhead @ 5%	$ 5,633.00
Overhead @ 10% Salaries, Expense Accounts	$ 510.00
Total	$123,865.00

RICHARDSON RIVER SOUTH PERMITS (Estimated)

1979 Expenditures

Land Rentals	$ 4,224.00
Linecutting	$ 15,194.00
Geophysical Consultants	$ 33,208.00
Diamond Drilling	$ 73,943.00
Helicopter Fixed Wing Charter	$ 56,485.00
Geological Support (Salaries)	$ 10,300.00
Expediting	$ 1,000.00
Watchman	$ 1,750.00
Fuel Helicopter	$ 13,610.00
Assays	$ 700.00
Expense Accounts	$ 1,220.00
Instrument Rentals Scintillometers	$ 460.60
Miscellaneous	$ 2,300.00
Overhead @ 5%	$ 10,144.76
Overhead @ 10% Salaries, Expense Accounts	$ 1,152.00
Total	$225,690.00

Property: [redacted] Hole No. [redacted] Page [redacted]

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
- chlorite alteration - clay alteration along fractures slickensides - hematite associated with quartz and carbonate in fractures - fracture zone 63.85 -64.95 - fractures oriented 45 degrees to core axis - fractures at 64.19 near perpendicular to core axis, quartz carbonate infilling, slickensides Granite (65.53 - 69.19) - becomes very siliceous - mafic content 10-15 % - minor clay alteration - quartz carbonate filling fractures with 3 to 5% carbonate - local quartz veins					

[redacted] NORCEN ENERGY RESOURCES LIMITED [redacted]
MONDRIE RECEIVED

Property: Richardson Quartz Mineral Permit _ Alberta Hole No. RR4

Sheet Number: 1 Of 1 NTS No. Started March 31, 1979

Collar TWP 104 R6 Claim No. 6876120005 Completed March 31, 1979

Section 26 Bearing Ultimate Depth 35.66m/117ft.

Elevation 289.5 DIP -90 degrees Proposed Depth

Logged by: G. Wilson

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 - 23.77 - sand with a few boulders Unconformity Precambrian Basement Rocks Granodiorite (23.77 - 35.66) - possibly some paragneiss within the granodiorite -local gneissosity oriented 40-45 degrees to the core axis - irregular fractures with pyrite aggregates in fractures - biotite and chlorite in fractures - pink medium to coarse grained 25.17-32.12 and from 33.22 to 35.66 - hematite localized in fractures PVC Pipe 35.66m/117ft.					

MORTEN ENERGY RESOURCES LIMITED

DIAMOND DRILL RECORD

Property: Richardson Quartz Mineral Permit - Alberta — Hole No. RR5

Sheet Number: 1 of 5 — NTS No. 74L — Started April 1, 1979

Collar BL 2400 + 260E — Claim No. 687612005 — Completed April 4, 1979

Bearing 046 — Ultimate Depth 121m/397ft.

Elevation 262.1 meters — DIP -75 — Proposed Depth

Logged by: L. Smith

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 - 53.95) - sand and boulders - gneiss boulders 47.55 to 50.60 - Devonian and Athabasca sandstone boulders from 50.60 to 53.95	Assay Interval				
Devonian Mudstone (53.95 to 60.05) - mudstone with narrow sand lenses or beds			95-100	SPP - 2 15 cp 5	
			95-100%	20-25cps	
Devonian Mudstone and Sandy Mudstone (60.05 to 63.10m) - Mudstone 60.05 to 61.72, 61.87 to 62.64 - Sandy Mudstone 63.10 to 61.87 -Muddy Sandstone 62.64 to 63.10			95-100%	25cps	
Devonian Mudstone (63.10 to 64.14m) - Mudstone 63.10 to 64.62 - Sandy Mudstone 64.62 to 65.68 - Coarse Grit (10mm) in muddy matrix 65.68 to 64.14 - Clast Matrix Ratio 1:4 to 1:5			100%	25cps	
Gritty Sandstone (64.14 to 67.36) - quartz and feldspar clasts (to 20mm) and minor chlorite feldspar paragneiss clasts	66.1 - 67.4 67.4 - 68.6		90%	20-30cps	U_3O_8 0.2 Pb 11 Ni 21 Co 12 U_3O_8 0.2 Pb 11 Ni 25 Co 12

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Devonian (?) Conglomerate LaLoche Formation 67.36 to 68.58 - Precambrian clasts of paragneiss and schists in a muddy matrix	68.6 - 69.8		90%	20-30cps	U_3O_8 0.2 Pb 9 Ni 43 Co 18
	69.8 - 71.0				U_3O_8 0 Pb 9 Ni 59 Co 22
Unconformity Precambrian Basement Rocks Chlorite Schists (68.58 - 72.24m) -highly weathered - chlorite content 80-90% - 1 to 3% disseminated pyrite -schistosity 40 to45 degrees to core axis	71.0 - 72.2		85-90% 90-95%	20 -30cps 25-35cps	U_3O_8 0 Pb 13 Ni 104 Co 30
Chlorite Schists and Chlorite Paragneiss (72.24 to 75.29) - chlorite schist with increased feldspar producing local gneissosity - schistosity 30 to 45 degrees to core axis			90-95%	25-35cps	
Chlorite Schists (75.29 to 78.33) - brecciation 76.50 to 76.80 - narrow 10mm seams of chlorite rubble - brown rusty veins containing siderite - parallel and crosscutting schistosity - siderite vein 76.2 to 76.50 - carbonate veins 77.11 to 77.41 from 1 to 10mm wide			90-95%	20-40cps	
Chlorite Schists (78.33 to 81.53m) - schistosity 40 to 45 degrees to core axis - carbonate in fractures - minor displacements along fractures					

NORCEN ENERGY RESOURCES LIMITED
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Property: Richardson Quartz Mineral Permit Alberta [redacted] Hole No. RR1

Sheet Number: 1 of 2 NTS No. [redacted] Started March 21,1979

Collar Tp 105 R6 Sec. 14W Claim No. 6876120004 Completed March 22, 1979

West of the 4th meridian Bearing [redacted] Ultimate Depth 79.5m/261ft.

Elevation 299m DIP -90 degrees Proposed Depth [redacted]

Logged by: G. Wilson

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0-58.52m) Sand - (0-51.20m) Sand and boulders - (51.20-58.52m) Devonian Mudstone, Sandstone (58.52-70.28m) - light to dark brown mudstone - grading into light brown to beige muddy sandstone with quartz pebbles up to 0.5cm. in diameter. - grey mud seams throughout - minor disseminated Pyrite (2%) - locally where Sandstone has been leached vugs have formed which contain pyrite crystals Devonian Sandy Mudstone (70.28-71.32) - grey brown mudstone with medium grained sandstone lenses - very soft Devonian Mudstone Sandstone (71.32-73.15) - grey brown mudstone grading down to light brown medium to coarse sandstone - minor mudstone seams throughout - poorly consolidated in places - bedding is very irregular oriented 43 degrees to core axis.	Assay Interval 72.1-73.1	Pyrite 2%	90%		U_3O_8 0.4 Pb12 Ni 18 Co 6.0

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
irregular interval of hematite coating sand grains.		hematite			
Regolith (73.15-73.45m) -fragments of the basement rock in a matrix of light grey brown muddy sandstone	73.1-74.2		97%		U_3O_8 0.2 Pb 14 Ni 18 Co 6.0
Unconformity					
Precambrian Basement Biotite Quartz Feldspar Gneiss - foliation and gneissosity oriented 60 to 87 degrees to the core axis - Coarse grained - abundant smoky quartz - fractured throughout commonly at 60 degrees to core axis - chlorite associated with fractures - tension fractures filled with dark brown mud - minor pyrite in fractures	73.4-75.1	Pyrite in fractures	97%		U_3O_8 0.8 Pb 8 Ni 8 Co 6
END OF HOLE	79.45m/261ft.				
PVC Pipe to 74.7m/245ft.					
Average Core Recovery 82%					

NORCEN ENERGY RESOURCES LIMITED

DIAMOND DRILL RECORD

Property: Richardson River Mineral Permit Alberta Hole No. RR2

Sheet Number: 1 of 5 NTS No. Started March 25, 1979

Collar Twp 104 R6 Section 23 of the Claim No. 6876120005 Completed March 27, 1979

4th meridian Bearing 046 degrees Ultimate Depth 99.7m/327ft.

Elevation 274.3m DIP -72 degrees Proposed Depth

Logged by: L. Smith

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0-12.3m) - sand with quartz feldspar gneiss boulders occuring at the unconformity with the Devonian	Assay Interval				
Devonian Mudstone (12.3-17.37m) - top 45cm. grey sand. Mudstone overlying very fine grained greenish grey mudstone with minor carbonate in the matrix.			60-70%	TV-1A 900-1100 cpm	
Devonian Sandy Mudstone (17.32-20.42m) - medium grey coloured mudstone with quartz and feldspar sand grains up to 4mm - sand content increases with depth - tar filling fractures from 17 to 18.1m - Pyrite along bedding of 19.8m		pyrite	80-85%	900-1100 cpm	
Devonian Sandstone LaLoche Formation (20.42-21.0m) - coarse gritty sandstone - coarsens with depth	20.4-21.4m				U_3O_8 1.6 Pb 14 Ni 23 Co 11
Regolith Sandstone Conglomerate LaLoche Formation (21.0-23.47m) - coarsens with depth to coarse grained grit with recognizable basement clasts from 21.0 to 23.47m - brown rusty hematitic alteration from 21.0	21.4-22.4m 22.4-23.4m		80-85%		U_3O_8 1.8 Pb 11 Ni 18 Co 9.0 U_3O_8 0.4 Pb 13 Ni 18 Co 9

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
to 21.3m and pronounced hematitic alteration from 23.1 to 23.47m	22.4-23.4m	hematitic alteration			U_3O_8 0.4 Pb 13 Ni 18 Co 9
Unconformity Precambrian Basement Rocks Altered Zone (23.47-26.52m)	23.4-24.4m				U_3O_8 0.0 Pb 11 Ni 28 Co 11
- angular clasts of quartz feldspar gneiss and paragneiss in a sandy matrix from 23.47 to 25.3m	24.4-25.4m		90%		U_3O_8 0.0 Pb 11 Ni 52 Co 18
- these rocks have a leached appearance giving the rock a light grey colour				800-1500 cpm	
- lower section 25.34 to 26.5m contains grey green chlorite rich paragneiss with numerous fractures	25.4-26.4				U_3O_8 0.0 Pb 19 Ni 84 Co 29
- fractures filled with quartz, feldspar(?) carbonate with narrow seams and blebs of pyrite up to 3%		Up to 3% py.			
Chlorite Feldspar Quartz Paragneiss (26.52- 27.43m) - green grey colour			95-97%		
Feldspar Quartz Paragneiss (27.43-28.35m) - leached light grey					
Feldspar Qaurtz Paragneiss (28.35-31.43m) - similar to the above but not as leached and lighter colour					
Amphibole (?) Biotite Chlorite Paragneiss (31.55-32.61m) - contains 1-2 percent disseminated pyrite		Pyrite 1-2%	98-100%	1000-1100 cpm	
Quartz Feldspar Paragneiss (32.61-35.66m) - quartz and feldspar interbanded with chlorite biotite and amphiboles			100%	1000-1100 cpm	

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Pegmatite (35.66-36.58m) - coarse feldspar crystals - pink colour				900cpm	
Biotite Quartz Feldspar Paragneiss (36.58-39.00m) - biotite and chlorite interbanded with quartz and feldspar			100%		
Pematite (39.00-39.62m) - same as above					
Biotite Quartz Feldspar Paragneiss (39.62-41.85m) - same as the above					
Biotite Quartz Feldspar Paragneiss (41.85-47.85m) - grades to dark grey amphibole chlorite gneiss - coarse grained feldspars from 46.0 to 46.33m			100%	1000-1100 cpm	
Biotite Paragneiss (47.85-48.46m)	47.9-48.9m				U_3O_8 0.0 Pb 11 Ni 48 Co 34
Biotite Quartz Feldspar Paragneiss (48.46-50.29m)	48.9-49.9m				U_3O_8 0.2 Pb 11 Ni 39 Co 29
Chlorite Feldspar Quartz Paragneiss (50.29-50.90m) - dark grey black - colour possibly due to fine grained graphite may represent conductor	49.9-50.8m	graphite (?)			U_3O_8 0.2 Pb 9 Ni 37 Co 22
Biotite Chlorite(?) Paragneiss (50.90-53.95m) - biotite and chlorite up to 70% with rusty blebs of altered sulphides, limonite - conductor possibly extends from 50.3 to 53.03m	50.8- 51.8m 51.8- 52.9m 52.9- 53.9m	pyrite limonite	100%	1000-1100 cpm	U_3O_8 0.0 Pb 10 Ni 44 Co 25 U_3O_8 0.6 Pb 11 Ni 67 Co 29 U_3O_8 0.2 Pb 12 Ni 82 Co 37
Biotite Feldspar Quartz Paragneiss (53.95-57.00m) - more leucocratic than the above	53.9- 54.8m				U3O8 0.4 Pb 12 Ni 84 Co 31

Property: [redacted] Hole No. [redacted] Page [redacted]

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
- shistosity 40 degrees to core axis	54.9- 55.9m		100%	1000-1100 cpm	U_3O_8 1.0 Pb 8 Ni 33 Co 17
Biotite Feldspar Quartz Paragneiss (57.00-60.04m)	55.9- 56.8m				U_3O_8 0.2 Pb 10 Ni 71 Co 33
- similar to zone 50.3 to 53.05m but less mafic	56.8- 58.6		100%	1000-1100 cpm	U_3O_8 0.2 Pb 14 Ni 94 Co 39
Chlorite Schist (60.04-63.09m) - biotite possibly altered to chlorite - minor limonite and hematite 2-3% - schistosity 40 degrees ot core axis		limonite hematite	100%	1000-1100cpm	
Biotite Quartz Feldspar Paragneiss (63.09- 72.24m) - highly chloritic 60-70% beds,pyrite 1-2% - local strong hematitic alteration from 66.14 69.19m		hematitic alteration	96%	800-1000cpm	
Amphibole Chlorite Biotite Paragneiss (72.24 -75.59m) - more mafic than above 70-80% - sections of quartz feldspar segregations with 1% pyrite		pyrite 1%	95%	800-1000cpm	
Feldspar Quartz Paragneiss (75.59 -77.08m) - quartz feldspar with biotite 60-70% grading down to chloritic segregations at 77.08m			96%	1000-1400cpm	
Biotite Chlorite Peldspar Paragneiss (77.08-78.43m) - dark grey green biotite (chlorite) feldspar paragneiss			95%	1000-1400cpm	
Biotite Quartz Feldspar Paragneiss (78.43-81.07m) - prominent banding at irregular intervals - mafic content 15-20% - pyrite in fractures and within the mafic bands occurs disseminated and in blebs up to 4%		pyrite disseminated and in blebs	98%	1000-1400cpm	
Biotite Quartz Feldspar Paragneiss (81.07-88.09m) - Coarse grained feldspar segregation at 87.6m					

Property: [redacted] Hole No. [redacted] Page [redacted] of [redacted]

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
- pink feldspar crystals up to 1cm. - mafic content 20-30 % - light coloured section with leached appearance at 85.10m - disseminated pyrite 1%		pyrite 1%	98%	1000-1400cpm	
Biotite Quartz Feldspar Paragneiss (88.09-99.67m) - grades into grey amphibole, chlorite biotite quartz paragneiss at irregular intervals - mafic content 30-90% throughout - common fractures filled wiht quartz and chlorite - foliation 50 degrees to core axis - disseminated pyrite 2% - pink pegmatitic sections occur at irregular intervals - 95.10-96.93m fractures parallel to core lined with chlorite local displacement .5cm. - pronounced banding throughout - dark grey mafic bands with pink irregular felsic bands of varying widths		pyrite 2%	98% 96%	1000-1400cpm 1000-1400cpm	
END OF HOLE	99.67m/327ft.				

NORCEN ENERGY RESOURCES LIMITED
DIAMOND DRILL RECORD

Property: Richardson Quartz Mineral Permit - Alberta | Hole No. RR3

Sheet Number: 1 of 3 | NTS No. 74L | Started March 28, 1979

Collar Tp 104 R6 | Claim No. 6876120005 | Completed March 29, 1979

Section 35 West of the 4th | Bearing | Ultimate Depth 69.19m /227ft.

Elevation 281.9 m | DIP -90 | Proposed Depth

Logged by: G. Wilson

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 - 28.65) Sand with a few boulders of underlying bedrock	Assay Interval				
Unconformity Precambrian Basement Rocks					
Granite Gneiss (28.65 - 30.11 m) = intrusive (?) -white to light grey - generally medium grained with sections of very siliceous fine grained material - Composition Quartz 35%, Kspar 30, Plag 32, Biotite 3%, Pyrite 1% - common fractures at 40° to core axis	28.6 -29.6 29.6 - 30.6		100%	800-1000 cpm	U_3O_8 8.6 Pb 4 Ni 6 Co 2 U_3O_8 3.8 Pb 5 Ni 7 Co 2
Granite Gneiss (30.11 - 31.06) - highly fractured zone - green clay mineral and tar in fracture - feldspars altered to clay - minor hemitite stain	30.6 - 31.6	minor hemitite	100%	800-1000 cpm	U_3O_8 6.0 Pb 5 Ni 7 Co 2
Granite (31.6 - 40.41m)	31.6 - 32.6				U_3O_8 11.1 Pb 20 Ni 6 Co 2

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
- light grey to white locally pink - hemitite and malchite (minor) aligning fractures - disseminated pyrite to 3% - feldspars altered to clays	32.6 - 33.6 33.6 - 34.6 34.6 - 35.5	hemitite malachite pyrite in fractures	100%	800-1000 cpm	U_3O_8 9.7 Pb 6 Ni 6 Co 2 U_3O_8 9.0 Pb 5 Ni 6 Co 3 U_3O_8 7.4 Pb 6 Ni 9 Co 5
Chlorite Feldspar Quartz Biotite Paragneiss (40.41 - 40.69m) - biotite and chlorite 40-70%					
Granite Gneiss (40.69 - 42.06) - as above					
Paragneiss (42.06 - 42.37) - as above					
Granite Gneiss (42.37 - 42.67) - as above					
Paragneiss (42.67 - 44.81) - as above					
Paragneiss (44.81 - 47.00) - as above					
Granite (47.00 - 48.37m) - altered, leached appearance - feldspars altered to clay - calcite and pyrite in fractures		calcite and pyrite in fractures			
Granodiorite (47.38 - 65.53) - dark to light grey - medium to coarse grained with fine grained sections					

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Chlorite Feldspar Quartz Paragneiss (81.53 to 84.43) - same as chlorite schist except 20 - 30% feldspar forming gneissosity - gneissosity 40 to 50 degrees to core axis - 81.99 shear zone mud and chlorite rubble - 82.75 - 83.51 brecciation possibly fault gouge - 84.12 fault gouge 10cm.			90-95%	20-30cps	
Chlorite Biotite Schist (84.43 to 84.73)					
Feldspar Quartz Chlorite Biotite Paragneiss (84.73 to 85.03) - offset along fractures - pyrite 1%			90-95%	20-30cps	
Chlorite Feldspar Quartz Biotite Paragneiss (85.03 to 85.95)	86.5 - 87.5				U_3O_8 0.2 Pb 11 Ni 116 Co 28
Chlorite Biotite Schist (85.95 - 87.48m) -breccia zone 86.56 to 87.48m - siderite filling veinlets to 10mm	87.5 -88.1				U_3O_8 0.2 Pb 8 Ni 72 Co 20
-also gangue rubble chlorite and mud	88.1 - 89.0				U_3O_8 0.4 Pb 8 Ni 27 Co 12
Chlorite Biotite Schist (87.48 to 90.52m) - siderite filling fractures 88.08 to 89.00 - altered zone local hematite - chlorite slickensides - core highly altered kayolin and talc	89.0 - 90.2	hematite siderite	90-95%	15-40cps 40cps@90.22	U_3O_8 0.2 Pb 8 Ni 38 Co 15
Chlorite Feldspar Quartz Paragneiss (90.52 to 93.57m) - 90.52 to 91.74 intense fracture zone siderite infilling fractures - schistosity 40 to 45 degrees to core axis		siderite		15-35cps	

Property: [redacted] Hole No. [redacted] Page [redacted]

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Chlorite Schist (93.57 to 95.40) - several brecciated zones 93.88 to 94.18, 94.49 to 94.79, 95.40 to 96.01 - carbonate in breccia zone			90-95 %	15-45cps 94.79m 40cps 96.01m 45cps	
Feldspar Quartz Chlorite Paragneiss (95.40 to 96.62m) - red feldspars					
Chlorite Feldspar Quartz Paragneiss (96.62 to 99.67m) - trace of graphite	96.6 - 97.8m	trace of amounts of graphite	80-85 %	15-45cps 97.53 45cps	U_3O_8 0.2 Pb 8 Ni 41 Co 18
- soft yellow clay present	97.8 - 99.1				U_3O_8 0.0 Pb 7 Ni 46 Co 19
Chlorite Schist (99.67 to 99.97 m)					
Graphite Schist (99.97 to 100.28m)	99.1 - 100.0				U_3O_8 0.0 Pb 11 Ni 35 Co 19
Chlorite Schist (100.28 to 102.10m) - this zone has traces to thin graphite seams throughout	100.0 - 100.6				U_3O_8 0.4 Pb 10 Ni 19 Co 10
	100.6- 101.8				U_3O_8 0.0 Pb 8 Ni 55 Co 20
Feldspar Quartz Chlorite Biotite Paragneiss (102.10 to 103.02m)					
Chlorite Schist (103.02 to 103.63m) - 5 to 10 % graphite	101.8 - 103.0				U_3O_8 0.4 Pb 6 Ni 31 Co 12
Graphite Schist (103.63 to 105.77) - 103.63 to 104.85 zone of brecciation, dark sooty appearance - varies from graphite schist to massive graphite - 105.46 to 105.76 massive graphite luster - brecciation and intense fracturing common, carbonate common	103.0 - 104.2	graphite	80-90%	15-35cps	U_3O_8 0.6 Pb 15 Ni 33 Co 19

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
- schistosity plane - several shear zones - chlorite rubble and fault gouge	104.2 - 105.5				U_3O_8 1.0 Pb 13 Ni 34 Co 21
Graphite Schist (105.77 to 108.81m)	105.5 - 106.7	graphite			U_3O_8 1.4 Pb 8 Ni 39 Co 25
- same as above - brecciated 105.77 to 106.98 and 108.20 to 108.81m	106.7 - 107.9	graphite	90-95%	15-35cps	U_3O_8 3.3 Pb 11 Ni 33 Co 20
	107.9 -109.1				U_3O_8 1.6 Pb 10 Ni 41 Co 27
Graphite Schist (108.81 to 111.86m) - as above with chlorite schist 109.42 to 111.09 and 111.39 to 111.86 - disseminated pyrite 1 - 2%	109.1 - 110.3	graphite pyrite	90-95%	20-40cps 110-40cps	U_3O_8 1.2 Pb 7 Ni 37 Co 18
	110.3-111.6				U_3O_8 2.0 Pb 11 Ni 43 Co 27
Chlorite Schist (111.86 to 113.84m)	111.6 - 112.8		95-100%	20-35cps	U_3O_8 0.6 Pb 14 Ni 35 Co 17
Graphite Schist (113.84 to 114.3m)	112.8 - 114.0				U_3O_8 0.6 Pb 14 Ni 29 Co 17
- 1 -2% disseminated pyrite		graphite 1-2% pyrite			
Chlorite Feldspar Quartz Paragneiss (114.3 to 117.96m) - brecciated at 117.65 to 117.80 - pyrite and quartz crystals at 115.37	114.0 - 114.9		95-100%	20-30cps	U_3O_8 0.0 Pb 18 Ni 28 Co 17
Chlorite Feldspar Quartz Paragneiss (117.96 to 121m) - as above			95-100%	15-25cps	
End of Hole Plastic Pipe to 115.82m/380ft.	121m/397ft.				

NORCEN ENERGY RESOURCES LIMITED

DIAMOND DRILL RECORD

Property: Richardson River Permit Alberta Hole No. RR6

Sheet Number: 1 of 6 NTS No: 74-L Started April 5, 1979

Collar BL 1200 + 650E Claim No. 687612005 Completed April 6, 1979

Bearing 046 Ultimate Depth 102.72m/337ft.

Elevation 262.1 m DIP -68 degrees Proposed Depth

Logged by: L. Smith

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 - 28.65)	Assay Intervals				
Devonian Mudstone (28.65 - 31.09)			95-100%	SPP-2 45-50cps	
Devonian Muddy Sandstone 31.09 to 31.24m)					
Devonian Regolith LaLoche Formation (31.24 to 31.55m) - coarse grit with rusty hematite stain			95-100%	40-50cps	
Devonian (?) Basal Conglomerate (31.55 to 33.52m) - clasts up to 15mm of Paragneiss and chlorite schist - matrix mudstone - clast:Matrix ratio, 1:43 to 1:40 - this zone is weathered, leached and appears brecciated 32.30 to 32.45m - mud seam at 32.91m	33.5 - 34.2				U_3O_8 0.4 Pb6 Ni 15 Co 12
Unconformity Precambrian Basement Rocks	33.5 - 34.2		95-100%	45-50 cps	U_3O_8 0.4 Pb 6 Ni 15 Co 12
Chlorite Feldspar Paragneiss (33.52 to 35.66m) - contains narrow chlorite schist bands - 34.06 10mm seam of highly weathered clay - chlorite rich layer	34.2 - 35.7				U_3O_8 0.2 Pb 8 Ni 13 Co 13

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
- foliation and gneissosity 30-45 degrees to core axis - numerous fractures filled with silica carbonate and epidote - chlorite sections contain 1-2% pyrite		pyrite 1-2%			
Chlorite Feldspar Quartz Paragneiss (35.66 to 38.10m) - chlorite 50-70% - feldspar and quartz 50-30% - gneissosity 20 degrees to core axis - brecciation from 36.58 to 36.88m	35.7-36.6		85-90%	45-50cps	U_3O_8 0.0 Pb 8 Ni 12 Co 13
Feldspar Quartz Chlorite Paragneiss (38.1 to 39.17m) - chlorite 20-35%					
Chlorite Feldspar Quartz Paragneiss (39.17 to 41.45m) - 1-5% disseminated pyrite - shear zone chlorite schist at 39.32m - rubble for 15cm.	39.3-40.2		90-95%	45-55cps 40.23m 55cps	U_3O_8 0.2 Pb 6 Ni 11 Co 10
Feldspar Quartz Chlorite Paragneiss (41.45 to 42.37m)		5% pyrite			
Chlorite Feldspar Quartz Paragneiss (42.37 to 42.75m)					
Feldspar Quartz Chlorite Paragneiss (42.27 to 43.29m)	42.7-43.9				U_3O_8 3.1 Pb 7 Ni 11 Co 10
Chlorite Feldspar Quartz Paragneiss (43.29 to 44.04m)		7-8% pyrite	100%	30-40cps	
Feldspar Quartz Chlorite Paragneiss (44.04 to 44.50m)					
Chlorite Feldspar Quartz Paragneiss (44.50 to 44.81m)					

Property: [redacted] Hole No. [redacted] Page [redacted]

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Feldspar Quartz Chlorite Paragneiss (44.81 to 46.32m) - gneissosity 0-15 degrees to core axis					
Chlorite Feldspar Quartz Paragneiss (46.32 to 46.63m) - weathered, altered, leached - rubbly shear zone (?)			100%	30-40cps	
Feldspar Quartz Chlorite Paragneiss (46.63 to 48.00m)					
Chlorite Feldspar Quartz Paragneiss 48.00 to 48.62m)					
Feldspar Quartz Chlorite Paragneiss (48.62 to 50.60m)			100%	30-40cps	
Chlorite Feldspar Quartz Paragneiss (50.60 to 51.51m) - gneissosity 0 to 15 degrees to core axis - trace of pyrite in chlorite sections					
Feldspar Quartz Chlorite Paragneiss (51.51 to 52.58m) - quartz content higher than normal	52.4 - 53.6				U_3O_8 0.2 Pb 13 Ni 11 Co 29
Chlorite Schist (52.58 to 53.95m) - dark grey colour - quartz and feldspar content less than 15% - limonite and hematite stain common - hematite alteration specularite at 53.34 to 53.95	53.6 - 54.9	hematite	95-100%	30-40cps	U_3O_8 1.8 Pb 14 Ni 11 Co 34
Chlorite Schist (53.95 to 57.00m) - limonite and hematite throughout, 15-20% from 56.08 to 57.00, trace of pyrite - schistosity 0-15 degrees to core axis	54.9 - 55.5	hematite limonite pyrite	95-100%	30-40 cps	U_3O_8 3.1 Pb 13 Ni 10 Co 32

Description	Depth Metres	Mineral-ization	Core Covery	Rad Count	Assay
Chlorite Schist (57.00 to 60.05m)	55.5 - 56.1				U_3O_8 0.0 Pb 14 Ni 10 Co 34
- less hematite and limonite than above - 57.91 to 58.52 hematite red colour 10-20% of chlorite schist	56.1 - 57.0		95-100%	30-50cps	U_3O_8 0.0 Pb 14 Ni 11 Co 36
- 59.74 to 60.05 sheared of brecciated chlorite rubble with little hematite or limonite	57.0 - 57.9				U_3O_8 0.2 Pb 18 Ni 13 Co 37
Chlorite Schist (60.05 to 60.80m)	57.9 - 58.8				
- brecciated from 60.05 to 60.50 rubbly 10-20% feldspar in this zone					U_3O_8 0.2 Pb 16 Ni 13 Co 36
- 2-4% disseminated pyrite				(60.35m) 60cps	
Chlorite Feldspar Quartz Paragneiss (60.80 to 60.96m)					
Feldspar Chlorite Quartz Paragneiss (60.96 to 61.87m)			95-100%	50cps	
Chlorite Feldspar Quartz Paragneiss (61.87 to 62.11m)					
Feldspar Chlorite Quartz Paragneiss (62.11 to 63.09m)					
Chlorite Feldspar Quartz Paragneiss (63.09 to 64.00m)					
Feldspar Quartz Chlorite Paragneiss (64.00 to 66.14m)				40-50cps	
- chlorite content increases to 35% at 64.61				(64.31m) 75cps	
Feldspar Quartz Chlorite Paragneiss (66.14 to 67.36m)				(64.46m) 70cps	
				30-75cps	
Chlorite Feldspar Quartz Paragneiss (67.36 to 67.51m)	67.4 - 68.6			(67.51m) 75cps	U_3O_8 0.2 Pb 8 Ni 9 Co 8

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Feldspar Chlorite Quartz Paragneiss (67.51 to 66.19m)	68.9 - 69.8		95-100%	69.0m 70cps	U_3O_8 0.4 Pb 7 Ni 9 Co 9
Chlorite Feldspar Paragneiss (66.19 to 69.80m) - probably a shear zone at 69.04					
Feldspar Chlorite Paragneiss (69.80 to 70.71m)			95-100%	50-60cps	
Chlorite Feldspar Paragneiss (70.71 to 72.24m) - gneissosity at 0-10 degrees to core axis					
Chlorite Feldspar Quartz Paragneiss (72.23 to 72.54m) - chlorite content varies from 50-80% - possible shear zone at 72.54			95-100%	50-60cps	
Chlorite Feldspar Quartz Paragneiss (72.54 to 76.2m) - chlorite 50%					
Feldspar Chlorite Quartz Paragneiss (76.2 to 77.88m)			95-100%	45-60cps	
Chlorite Feldspar Paragneiss (77.88 to 78.64m) - gneissosity 10 to 20 degrees to core axis					
Feldspar Chlorite Quartz Paragneiss (78.64 to 78.94m)				45-75cps	
Chlorite Feldspar Quartz Paragneiss (78.94 to 79.55m)			95-100%		
Feldspar Quartz Chlorite Paragneiss (79.55 to 80.16m) - quartz vein with xenoliths of wall rock at 80.00m				(79.55m) 75cps	

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Chlorite Feldspar Quartz Paragneiss (80.16 to 81.38m) - alteration at 80.77 and 81.22 to 81.38 - chlorite content increases and feldspars altered to clay			95-100%	45-75cps	
Chlorite Feldspar Quartz Paragneiss (81.38 to 85.95m) - fractured and altered			95-100%	40-50cps	
Fault Zone (85.95 to 89.30m) - feldspars altered to clays - chlorite sericite plus Fault Gouge - clay and mud seams 85.89 to 85.95 - brecciation	85.3 - 86.3			40-80cps	U_3O_8 0.6 Pb 7 Ni 11 Co 10
	86.3 - 87.5		95-100%	(85.95m)	U_3O_8 1.6 Pb 11 Ni 9 Co 10
	87.5 - 88.4			80cps	U_3O_8 1.4 Pb 9 Ni 9 Co 8
	88.4 - 89.3			40-75cps	U_3O_8 0.8 Pb 7 Ni 9 Co 8
Feldspar Clorite Quartz Paragneiss (89.30 to 90.52m) - alteration decreases away from fault zone - chlorite content decreases towards 90.52	89.3 - 89.9		95-100%	(89.0m) 75cps	U_3O_8 0.4 Pb 6 Ni 11 Co 9
Feldspar Chlorite Quartz Paragneiss (90.52 to 96.62m) - feldspar 50 to 70% - chlorite 10 to 50% - gneissosity 10 to 15 degrees to core axis - chlorite content decreases with depth			95-100%	40-50cps	
			95-100%	30-40cps	
Feldspar Quartz Chlorite Paragneiss (96.62 to 99.67m) - chlorite content 5 to 20%			95-100%	30-40cps	
Feldspar Quartz Chlorite Paragneiss (99.67 to 102.72m) - gneissosity 20 to 45 degrees to core axis			95-100%	30cps	
PVC to 102.72m End of Hole 337ft. /102.72m					

[redacted] NORCEN ENERGY RESOURCES LIMITED [redacted]
DIAMOND DRILL RECORD

Property: [redacted] Richardson River Permit Alber[redacted] Hole No. RR 7

Sheet Number: 1 of 3 NTS No. 74 L Started April 8, 1979

Collar BL 2100 + 265E Claim No. 687612005 Completed April 9, 1979

Bearing 043 Ultimate Depth 117.96m/387ft.

Elevation 298.7 meters DIP -80 degrees Proposed Depth

Logged by: G. McWilliams

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 - 58.5m) - glacial sand with a few boulders overlying bedrock	Assay Intervals				
Devonian Mudstone (58.5 - 63.1m) - grey colour calcareous sand lenses up to 15cm thick - gypsum stringers - dip 80 degrees to core axis			95-100%		
Devonian Mudstone (63.1 to 65.84m) - calcareous - brown to tan colour - local concentrations of sand up to 20% - pyrite 1%			95-100%		
Devonian Sandy Mudstone (65.84 - 68.28m) - grey to tan colour - pyrite lining vugs			95-100%		
Devonian Mudstone to Sandy Mudstone (68.28 - 74.98m) - light grey calcareous - mudstone grading down to green - sandy mudstone with 20% sand grains	* 74.7 - 75.6		95-100%		U_3O_8 0.4 Pb 16 Ni 31, Co 12

Description	Depth Metres,	Mineral-ization	Core Covery	Bag Count	Assay
Devonian Muddy Sandstone (74.98 - 75.90m)	75.6 -76.6		95-100%		U_3O_8 0.2 Pb 12 Ni 19 Co 8
- green grey - medium to coarse grained - fining upwards					
Regolith LaLoche Formation (75.90 - 78.03m)					U_3O_8 0.2 Pb 14 Ni 18 Co 7
- angular fragments of highly fractured weathered basement rocks with quartz carbonate mudstone filling intersticial spaces	76.5 - 77.4		95-100%		
- basement rocks highly chloritized - opalescent quartz	77.4 - 78.3				U_3O_8 0.4 Pb 13 Ni 57 Co 16
Unconformity					
Precambrian Basement Rocks					
Chlorite Schist (78.03 - 80.47m)					
- chlorite and epidote 40 to 70% - appears to represent a shear zone	78.2 -79.2		95-100%		U_3O_8 0.6 Pb 14
- Quartz and feldspar grains elongated	79.2 - 80.2				Ni 55 Co 20
Feldspar Quartz Chlorite Paragneiss (80.47 - 86.87m)					U_3O_8 0.2 Pb 18 Ni 29 Co 12
- brecciated on top alteration decreasing with depth	80.2 - 81.1				U_3O_8 0.6 Pb 17 Ni 25 Co 11
- chlorite and epidote 20 to 40% - Disseminated pyrite 1% - siderite stringets up to 15mm thick 1-2% of the unit			95-100%		
Feldspar Quartz Chlorite Paragneiss (86.87 - 92.05m)					
- chlorite 10 to 40% - mafic clots 5mm 5 to 15% - chlorite slickensides align fractures - gneissosity 65 degrees to core axis			95-100%		

Description	Depth Metres/	Mineral-ization	Core Covery	Rad Count	Assay
Feldspar Quartz Chlorite Paragneiss (92.05 - 99.66m) - siderite stringers at 97.8 - geneissosity at 98m is 45 degrees to core axis			95-100%		
Chlorite Schist (99.66 - 100.58m)			95-100%		
Feldspar Quartz Chlorite Paragneiss (100.58 - 105.61m) - gneissosity at 102.7 is 62 degrees to core axis					
Chlorite Schist (105.61 - 106.07m) - chlorite 80% - possibly represents shear zone			95-100%		
Feldspar Quartz Chlorite Paragneiss (106.07 - 117.96m) - chlorite 10-25% - siderite stringers 109.7 to 110.6m and 114 to 115.2m - gneissosity at 107.3m, 35 degrees - gneissosity at 113.39m, 25 degrees - gneissosity at 117.96m, 20 degrees	113.7 - 114.3 114.3 - 114.9 114.9 - 115.5		95-100%		U_3O_8 0.4 Pb 10 Ni 27 Co 16 U_3O_8 1.2 Pb 14 Ni 40 Co 12 U_3O_8 0.2 Pb 11 Ni 39 Co 9
End of Hole					

NORCEN ENERGY RESOURCES LIMITED

DIAMOND DRILL RECORD

Property: Richardson River Permit Alber[redacted] Hole No. RR 8

Sheet Number: 1 of 3 NTS No. 74 L Started April 9, 1979

Collar BL 2100 + 300E Claim No. 687612005 Completed April 11, 1979

Bearing Ultimate Depth 111.86m/367ft.

Elevation 294.1 m DIP Proposed Depth

Logged by: G. McWilliams

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 to 60.96m) - sand with some boulders overlying the Devonian rocks	Assay Intervals				
Devonian Mudstone (60.96 to 63.55m) - green grey colour - dark laminations possibly organic debris - bedding oriented 75 degrees to core axis			90%	TV 1A 600-700cpm	
Devonian Mudstone (63.55 to 64.0m) - brown colour - silt and sand laminations			95-100%	600-700cpm	
Devonian Mudstone (64.0 to 64.62m) - green grey calcareous			95-100%	600-700cpm	
Devonian Sandstone (64.62 to 68.58m) - green grey - few laminations oriented 90 degrees to core axis - becomes gritty at bottom			95-100%	600-700cpm	

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Devonian Sandstone Sandy Mudstone (68.58 to 81.38m) - grey brown to green grey colour - sandstone beds occur at 68.58 to 68.88, 70.10 to 71.32, 75.59 to 75.74 - gypsum occurs filling vugs - minor laminations oriented perpendicular to core axis - dissiminated pyrite 1%		pyrite 1%	90-95%	700cpm	
Devonian (?) LaLoche Formation (81.38 to 83.52m) - sandstone grading down to a coarse gritty pebbly sandstone - extremely angular pebbles of chert and gneiss	81.4 - 82.8				U_3O_8 0.2 Pb 28 Ni 22 Co 13
	82.8 - 83.2		95%	600-800cpm	U_3O_8 0.0 Pb 25 Ni 23 Co 14
Regolith and Altered Basement (83.52 to 85.0m) - highly weathered, sheared and brecciated	82.3 - 84.1				U_3O_8 0.4 Pb 26 Ni 19 Co 11
	84.1 - 85.0		95%	600-800cpm	U_3O_8 0.2 Pb 23 Ni 41 Co 18
Chlorite Schist (85.0 to 87.48m) - shear zone - undullating foliation - 80% chlorite	85.0 - 86.0		95-100%	700-1000cpm	U_3O_8 1.0 Pb 19 Ni 57 Co 25
Feldspar Quartz Chlorite Paragneiss (87.48 to 99.67m) - grey brown colours - hematite forms surface coating, give rock rusty brown colour - local massive hematite seams	98.8 - 99.4				U_3O_8 1.2 Pb 23 Ni 78 Co 31
	99.4 - 100.0		95-100%	600-900cpm	U_3O_8 1.2 Pb 17 Ni 79 Co 30
Chlorite Feldspar Quartz Paragneiss (99.67 to 100.43m) - dark green grey colour - contains graphite and pyrite disseminations up to 25% combined	100 - 100.6	graphite pyrite	95-100%	2100cpm	U_3O_8 0.2 Pb 16 Ni 86 Co 29

Description	Depth Metres/	Mineral-ization	Core Covery	Bag Count	Assay
Feldspar Chlorite Quartz Paragneiss (100.43 to 101.50m)		hematite	95-100%	700-1000cpm	
Chlorite Feldspar Quartz Paragneiss (101.50 to 103.93m)	100.7 - 101.3				U_3O_8 0.2 Pb 14
- green grey colour - contains dissiminated graphite and pyrite		graphite pyrite	95-100%	2000cpm	Ni 82 Co 27
Feldspar Quartz Chlorite Paragneiss (103.43 to 107.29	101.3 - 102.0				U_3O_8 1.8 Pb 21 Ni 94 Co 33
	102.0 - 102.6		95-100%	800-1000cpm	U_3O_8 1.4 Pb 26 Ni 89 Co 36
Chlorite Feldspar Quartz Paragneiss (107.29 to 107.75m) - green grey colour - contains fine disseminated graphite and pyrite		graphite pyrite	95-100%	2200cpm	
Feldspar Quartz Chlorite Paragneiss (107.29 to 111.86m) - banded grey to rusty brown - quartz crystals and pyrite cubes forming along joint surfaces - orientation of gneissosity 40-60 degrees to core axis		hematite	95%	800-1100cpm	
Hole lost due to loss of circulation in what would appear to be a highly porous fracture zone					
End of Hole					

[redacted] NORCEN ENERGY RESOURCES LIMITED [redacted]

Property: [redacted] Richardson River Permit Alberta [redacted] Hole No. RR 9 [redacted]

Sheet Number: 1 of 1 NTS No. 74 L Started April 13, 1979

Collar TP 107 R6 Sec 1 Claim No. 687612002 Completed to 57.93

Bearing Ultimate Depth Abandon 59.7m/190ft.

Elevation 207.3 m DIP -90 degrees Proposed Depth

Logged by: G. Wilson

Description	Depth Metres/	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 to 57.91m) - sand with boulders at bottom - boulders of Devonian Mudstone and Athabasca sandstone					
Hole lost due to caving around boulders.	57.9/190ft.				

NORCEN ENERGY RESOURCES LIMITED

DIAMOND DRILL RECORD

Property: [redacted] Richardson Quartz Mineral Permit A[redacted]rta Hole No. RR10

Sheet Number: 1 of 2 NTS No. 74L Started April 18 1979

Collar TP 107 R6, Section 6 Claim No. 6876120004 Completed April 20 1979

West of the 4th Bearing Ultimate Depth 151.49m/497 ft.

Elevation 274m DIP Proposed Depth

Logged by: Glen McWilliams

Description	Depth Metres/feet	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden 0 - 58.52				McPhar TV 1A Background	4-600 cpm
Proterozoic Athabasca Sandstone					
58.52 - 60.05 white, fine to medium grained			90	550	
60.05 - 63.09 as above			100	500	
63.09 - 66.14 as above			100	500	
66.16 - 69.19 pink, fine to medium grained with pink solution bands			100	400	
69.19 - 72.24 white, fine to medium grained pink solution bands			95	400	
72.24 - 75.29 white with pink solution bands			95	400	
75.29 - 78.33 white with pink solution bands fine to medium grained, dark spots containing pyrite		pyrite 1%	100	400	
78.33 - 81.38 white with pink and maroon solution bands			100	400	
81.38 - 84.45 as above			100	500	
84.45 - 87.48 white, fine to medium grained pink and maroon solution bands			100	500	
87.48 - 90.53 as above			100	500	
90.53 - 93.57 white fine to medium grained with thin clay laminations			100	500	
93.57 - 96.62 white with dark pyrite spots up to 5mm diameter	pyrite 1%		100	500	
96.62 - 99.67 white with dark pyrite spots minor clay chips			100	500	
99.67 -102.72 as above			100	500	
102.72-105.77 white pink interbedded disseminated pyrite, fine to medium grained			100	500	

Description	Depth Metres/feet	Mineral-ization	Core Covery	Bag Count	Assay
105.77 - 108.81 - white with pink solution bands, clay chips			100	450	
108.81 - 111.86 - as above			100	450	
111.86 - 114.91 - as above			100	400	
114.91 - 117.96 - white with local friable sections (poorly cemented)			95	400	
117.96 - 121.00 - as above			100	400	
121.00 - 124.05 - as above			100	400	
124.05 - 127.10 - white with pink and maroon solution bands			100	400	
127.10 - 130.15 - as above			100	500	
130.15 - 133.20 - as above			100	500	
133.20 - 136.25 - pink to green grey with maroon solution bands scattered clay chips			100	500	
136.25 - 139.29 - white with pink solution bands			100	500	
139.29 - 142.34 - medium grained white to grey sandstone, siltstone beds up to 4cm thick			100	500	
142.34 - 145.39 - medium grained, white to grey green			100	550	
145.39 - 148.44 - as above			100	600	
148.44 - 151.49 - white, medium grained local green clay in matrix			100	650	

Hole was abandon at 151.49/497ft. due to lack of water due to local pond freezing solid

NORTHERN ENERGY RESOURCES LIMITED

DIAMOND DRILL RECORD

Property: Richardson Quartz Mineral Permit Alberta — Hole No. RR11

Sheet Number: 1 — NTS No. 74L — Started June 14, 1979

Collar Tp 106 R6 Section 6 — Claim No. 6876120002 — Completed June 16, 1979

West of the 4th — Bearing — Ultimate Depth 276.45m/907ft

Elevation 274m — DIP -90 — Proposed Depth

Logged by: G. McWilliams

Description	Depth Metres/feet	Mineral-ization	Core Recovery	Bag Count	Assay
Quaternary and Recent Overburden (0 - 58.22m)					
- sand with boulders overlying bedrock				McPhar TV 1A cpm	
Proterozoic Athabasca Sandstone				Background	400 - 600
58.22 - 60.05 white, fine - medium grained			85	400	
60.05 - 63.09 as above			100	450	
63.09 - 66.14 minor pink solution bands			100	400	
66.14 - 69.19 white with pale pink solution bands			100	400	
69.19 - 72.24 as above with dark grey spots of pyrite 2mm diameter		Pyrite 1%	100	400	
72.24 - 75.29 fine to medium grained with solution bands			100	400	
75.29 - 78.33 as above			100	400	
78.33 - 81.38 local friable sections					
81.38 - 84.45 minor pale pink solution bands			100	400	
84.45 - 87.48 white to pale pink, fine to medium grained			100	400	
87.48 - 90.53 white with pink solution bands dark grey pyrite spots .5 to 4mm		Pyrite 1%	100	450	
90.53 - 93.57 white with pink solution bands			100	400	
93.57 - 96.62 fine grained, dark grey pyrite spots 1-2 mm		Pyrite 1%	100	400	
96.62 - 99.67 fine to medium grained white to palo pink			100	450	
99.67 -102.72 white with palo pink bands 1mm to 1 cm thick			100	400	
102.72 -105.77 as above			100	400	
105.77 -108.81 fine to medium grained with thin beds of granules			100	400	

Description	Depth Metres/feet	Mineral-ization	Core Covery	Bag Count	Assay
Proterozoic Athabasca Sandstone					
108.81 - 111.86 fine to medium grained white with pink solution bands			100%	500 - 600	
111.86 - 114.91 as above			95	450	
114.91 - 115.52 white pink, medium grained poorly cemented friable			80	500	
115.52 - 117.96 white fine to medium grained			95	500	
117.96 - 121.00 as above with thin clay laminations			100	500	
121.00 - 124.05 fine to medium grained white with pink solution banding			100	500	
124.05 - 127.10 as above			100	400	
127.10 - 127.71 as above			100	500	
127.71 - 127.96 pale green colour due to clay in matrix			100	500	
127.96 - 130.15 fine to medium grained pink solution bands			100	500	
130.15 - 133.20 as above			100	500	
133.20 - 136.25 as above with white clay laminations			95	500	
136.25 - 138.23 pink white interbeds			100	500	
138.23 - 139.29 white medium to coarse grained white clay forms cement			100	500	
139.29 - 142.34 medium to coarse grained			100	400	
142.34 - 145.39 as above			100	400	
145.39 - 148.43 pink, medium grained			100	500	
148.43 - 151.49 as above			100	500	
151.49 - 154.53 white pink medium grained locally green, chlorite in matrix			100	500	
154.53 - 157.58 white pink medium grained			100	500	
157.58 - 160.62 as above			100	500	
160.62 - 163.68 as above			100	500	
163.68 - 166.11 green grey, medium grained			100	500	
166.11 - 166.73 pink, medium grained			100	500	
166.73 - 169.17 solution banding			100	500	
169.17 - 172.82 white pink, medium to coarse			100	500	
172.82 - 175.87 pink with pale green interbeds			100	500	
175.87 - 178.92 pink medium to coarse grained pink and green clay minerals			100	600	
178.92 - 181.97 medium to coarse grained with scattered pebbles			100	500	

Description	Depth Metres/feet	Mineral-ization	Core Covery	Bag Count	Assay
Proterzoic Athabasca Sandstone					
181.97 - 185.01 pink, medium to coarse grained white clay minerals in matrix			100	500	
185.01 - 188.06 green and pink solution bands			100	500	
188.06 - 191.01 medium grained to gritty grey and pink colours scattered rounded pebbles 2cm diameter			100	500	
191.01 - 194.06 medium to coarse grained white clay in matrix thin 15 cm bed with green clay matrix			100	500	
194.06 - 197.21 medium to coarse grained light pink colour well cemented with white clay			100	500	
197.21 - 200.25 as above			100	600	
200.25 - 203.30 pink with ligh green interbeds scattered rounded pebbles			100	500	
203.30 - 206.34 as above			100	500	
206.34 - 209.40 poorly sorted sandstone pebbles 2% green and pink interbeds 30 to 70cm thick			90	600	
209.40 - 212.45 as above 10% angular to subrounded pebbles			95	600	
212.45 - 215.50 pale pink to pale green coarse to gritty sandstone scattered pebbles and granules			90	650	
215.50 - 218.54 medium to coarse grained local concentrations of granules and pebbles to 2.5 cm pale green to pale pink			100	700 -800	
218.54 - 221.59 gritty sandstone angular grains clay in matrix			100	700-800	
221.59 - 223.11 medium to coarse grained scattered pebbles , pink and maroon solution bands					
223.11 - 224.64 sandstone conglomerate pebble up to 5cm light green to grey maroon pebbles subrounded					

Property: Richardson River Hole No. RR11 Page

Description	Depth Metres/feet	Mineral-ization	Core Covery	Bag Count	Assay
Proterozoic Athabasca Sandstone Conglomerate					
224.64 - 227.69 green and maroon beds 30 to 60cm thick Conglomerate pebbles rounded to subrounded pebble in a coarse sand matrix with white and green clay and hematite forming cement			100	800	
227.69 - 230.73 medium to coarse grained with gritty beds 10 to 40 cm thick					
230.73 - 233.78 gritty sandstone pink to grey maroon colour			100 100	800 750	
233.78 - 235.61 gritty sandstone tan to maroon siltstone laminations quartz pebbles and siltstone chips					
235.61 - 236.83 gritty sandstone as above			100	700	
236.83 - 239.88 coarse grained angular to subrounded blue quartz eyes white clay in matrix			100	800	
239.88 - 242.93 maroon to grey colour poorly sorted, medium to coarse grained with granules beds appear perpendicular to core axis			100	600-700	
242.93 - 245.97 as above Red Beds		hematite	100	700-900	
245.97 - 246.58 poorly sorted gritty sandstone		hematite	100	700-900	
246.58 - 246.89 interbedded siltstone sandstone		hematite	100	700-900	
246.89 - 249.02 poorly sorted gritty sandstone		hematite	100	700-900	
249.02 - 250.55 interlaminated siltstone and fine sandstone		hematite	100	700-900	
250.55 - 252.06 interbedded siltstone and sandstone fining upwards		hematite	100	700-900	
252.06 - 253.29 interbedded siltstone and coarse gritty sandstone		hematite	100	800-1000	
253.29 - 254.05 laminated siltstone and fine sandstone		hematite	100	800-1000	
254.05 - 255.12 thinly bedded red sandstone		hematite	100	800-1000	

Description	Depth Metres/feet	Mineral-ization	Core Covery	Bag Count	Assay
255.12 - 255.73 red sandy siltstone		hematite	100	800-1100	ppm
255.73 - 258.17 red siltstone with dispersed sand grains		hematite	100	800-1100	
258.17 - 261.21 siltstone and coarse sandstone interbedded beds from 3 to 50 cm contacts vary from sharp to gradational rip up structure (chips of siltstone incorporated with sandstone)		hematite	100	800-1200	U Pb Ni Co
261.21 - 262.13 interbedded red siltstone and conglomerate	261.21 - 262.13	hematite	100	1800-3500	1.2 7 14 5
262.13 - 263.04 conglomerate, coarse sand and pebbles cemented by hematite and silt	262.13 - 263.04	hematite	100	1800-3500	1.6 9 9 4
263.04 - 264.26 as above	263.04 - 264.26	hematite	100	1800-3500	1.0 7 6 3
264.26 - 265.18 conglomerate appears to have formed as rubble from the basement, poorly sorted, angular quartz clasts, chloritic volcanic fragments with local cherty silt beds tan coloured from 1 to 5cm thick	264.26 - 265.17		100	1800-2100	1.0 7 9 3
265.18 - 266.09 as above	265.18 - 266.09		100	1800-2100	1.4 6 11 5
266.09 - 267.31 as above	266.09 - 267.31		100	1800-2100	1.8 4 16 4
Unconformity					
Precambrian Basement Complex					
267.31 - 268.22 altered granite 10% chlorite, feldspars altered to clay and epidote, hematite forms surface coating on fractures oriented 25 degress to the core axis	267.31 - 268.22		100	1200-1500	nil 4 15 5
268.22 - 269.14 as above	268.22 - 269.14		100	1200-1500	nil 2 32 5
269.14 - 270.36 feldspar chlorite gneiss	269.14 - 270.36		100	1200-1500	0.4 4 88 12
270.36 - 271.27 feldspar quartz chlorite gneiss foliation 60 - 70 degrees to core axis	270.36 - 271.27		100	800	
271.27 - 272.19 as above	271.27 - 272.19		100	800	
272.19 - 273.41 as above	272.19 - 273.41		100	800	

Description	Depth Metres/feet	Mineralization	Core Covery	Mag Count	
Precambrian Basement Complex					
271.41 - 276.45 feldspar quartz chlorite gneiss, chloritized homatized and silicified foliation 70 degrees to core axis highly sheared and altered chlorite 5-30% hematite forms coating on quartz and feldspar epidote 5 - 10%			100	800-900	
End of Hole 276.45m/907feet Core Recovery 97%					

To: NORCEN ENERGY RESOURCES LIMITED,
27th Flr., 715 - 5th Avenue S.W.,
Calgary, Alberta T2P 2X7

ATTN: Laurie Smith

File No. 16797
Date April 12, [illegible]
Samples Rock Cores

Certificate of ASSAY
LORING LABORATORIES LTD.

Page # 1

SAMPLE No.	PPM U3O8	PPM Pb	PPM Ni	PPM Co
"Rock Cores"				
RR 4301 N	0.2	11	21	12
RR 4302 N	0.2	11	25	12
RR 4303 N	0.2	9	43	18
RR 4304 N	NIL	9	59	22
RR 4305 N	NIL	13	104	30
RR 4306 N	0.2	11	116	28
RR 4307 N	0.2	8	72	20
RR 4308 N	0.4	8	27	12
RR 4309 N	0.2	8	38	15
RR 4310 N	0.2	8	41	18
RR 4311 N	NIL	7	46	19
RR 4312 N	NIL	11	35	19
RR 4313 N	0.4	10	19	10
RR 4314 N	NIL	8	55	20
RR 4315 N	0.4	6	31	12
RR 4316 N	0.6	15	33	19
RR 4317 N	1.0	13	34	21
RR 4318 N	1.4	8	39	25
RR 4319 N	3.3	11	33	20
RR 4320 N	1.6	10	41	27
RR 4321 N	1.2	7	37	18
RR 4322 N	2.0	11	43	27
RR 4323 N	0.6	14	35	17
RR 4324 N	0.6	11	29	17
RR 4325 N	NIL	18	28	17
RR 4326 N	0.4	6	15	12
RR 4327 N	0.2	8	13	13
RR 4328 N	NIL	8	12	13

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: NORCEN ENERGY RESOURCES LIMITED,
27th Flr., 715 - 5th Avenue S.W.,
Calgary, Alberta T2P 2X7

ATTN: Laurie Smith

File No. 16797
Date April
Samples Rock C

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM U308	PPM Pb	PPM Ni	PPM Co
RR 4329 N	0.2	6	11	10
RR 4330 N	3.1	7	11	10
RR 4331 N	0.2	13	11	29
RR 4332 N	1.8	14	11	34
RR 4333 N	3.1	13	10	32
RR 4334 N	NIL	14	10	34
RR 4335 N	NIL	14	11	36
RR 4336 N	0.2	18	13	37
RR 4337 N	0.2	16	13	36
RR 4338 N	0.2	8	9	8
RR 4339 N	0.4	7	9	9
RR 4340 N	0.6	7	11	10
RR 4341 N	1.6	11	9	10
RR 4342 N	1.4	9	9	8
RR 4343 N	0.8	7	9	8
RR 4344 N	0.4	6	11	9
RR 4245 N	8.6	4	6	2
RR 4246 N	3.8	5	7	2
RR 4247 N	6.0	5	7	2
RR 4248 N	11.1	20	6	2
RR 4249 N	9.7	6	6	2
RR 4250 N	9.0	5	6	3
RR 4276 N	7.4	6	9	5

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Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: NORCEN ENERGY RESOURSES LIMITED
27th Floor
715 - 5th Avenue S.W.
CALGARY , Alberta T2T 2X7
ATTN : Glen McWilliams

File No. 17196
Date July 3rd , 1979
Samples Rock

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM U3O8	PPM Pb	PPM Ni	PPM Co
" ROCK SAMPLES "				
4201N	1.2	7	14	5
4202N	1.6	9	9	4
4203N	1.0	7	6	3
4204N	1.0	7	9	3
4205N	1.4	6	11	5
4206N	1.8	4	16	4
4207N	Nil	4	15	5
4208N	Nil	2	32	5
4209N	0.4	4	88	12

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.
Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: NORCEN ENERGY RESOURCES LIMITED,
27th Flr., 715 - 5th Avenue S.W.,
Calgary, Alberta T2P 2X7

ATTN: Laurie Smith

File No. 16770
Date April 5, 1979
Samples Rock Cores

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM U3O8	PPM Ni	PPM Co
"Rock Cores"			
RR-4226-N	0.4	18	6
RR-4227-N	0.2	18	6
RR-4228-N	0.3	8	6
RR-4229-N	1.6	23	11
RR-4230-N	1.3	18	9
RR-4231-N	0.4	18	9
RR-4232-N	NIL	28	11
RR-4233-N	0.3	52	18
RR-4234-N	NIL	84	29
RR-4235-N	NIL	48	34
RR-4236-N	0.2	39	29
RR-4237-N	0.2	37	22
RR-4238-N	NIL	44	25
RR-4239-N	0.6	67	29
RR-4240-N	0.2	82	37
RR-4241-N	0.4	84	31
RR-4242-N	1.0	33	17
RR-4243-N	0.2	71	33
RR-4244-N	0.2	94	39

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Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: NORCEN ENERGY RESOURCES LIMITED,
27th Flr., 715 - 5th Avenue S.W.,
Calgary, Alberta T2P 2X7

ATTN: Laurie Smith

File No. 16770
Date April 5, 1979
Samples Rock Cores

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM Pb
"Rock Cores"	
RR-4226-N	12
RR-4227-N	14
RR-4228-N	8
RR-4229-N	14
RR-4230-N	11
RR-4231-N	13
RR-4232-N	11
RR-4233-N	11
RR-4234-N	19
RR-4235-N	11
RR-4236-N	11
RR-4237-N	9
RR-4238-N	10
RR-4239-N	11
RR-4240-N	12
RR-4241-N	12
RR-4242-N	8
RR-4243-N	10
RR-4244-N	14

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Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: NORCEN ENERGY RESOURCES LIMITED,
27th Flr., 715 - 5th Avenue S.W.,
Calgary, Alberta T2P 2X7

ATTN: Laurie Smith

File No. 16818
Date April 19, 1979
Samples Core

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM U308	PPM Ni	PPM Co
"Core Samples"			
RR 4351 N	0.4	31	12
RR 4352 N	0.2	19	8
RR 4353 N	0.2	18	7
RR 4354 N	0.4	57	16
RR 4355 N	0.6	55	20
RR 4356 N	0.2	29	12
RR 4357 N	0.6	25	11
RR 4358 N	0.4	27	16
RR 4359 N	1.2	40	12
RR 4360 N	0.2	39	9
RR 4361 N	0.2	22	13
RR 4362 N	NIL	23	14
RR 4363 N	0.4	19	11
RR 4364 N	0.2	41	18
RR 4365 N	1.0	57	25
RR 4366 N	0.2	82	27
RR 4367 N	1.8	94	33
RR 4368 N	1.4	89	36
RR 4369 N	1.2	79	30
RR 4370 N	1.2	78	31
RR 4371 N	0.2	86	29
RR 4372 N	0.4	69	23
RR 4373 N	0.8	69	31
RR 4374 N	1.0	56	26

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Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

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Licensed Assayer of British Columbia

CANADA

EDITION 1 74 M/14

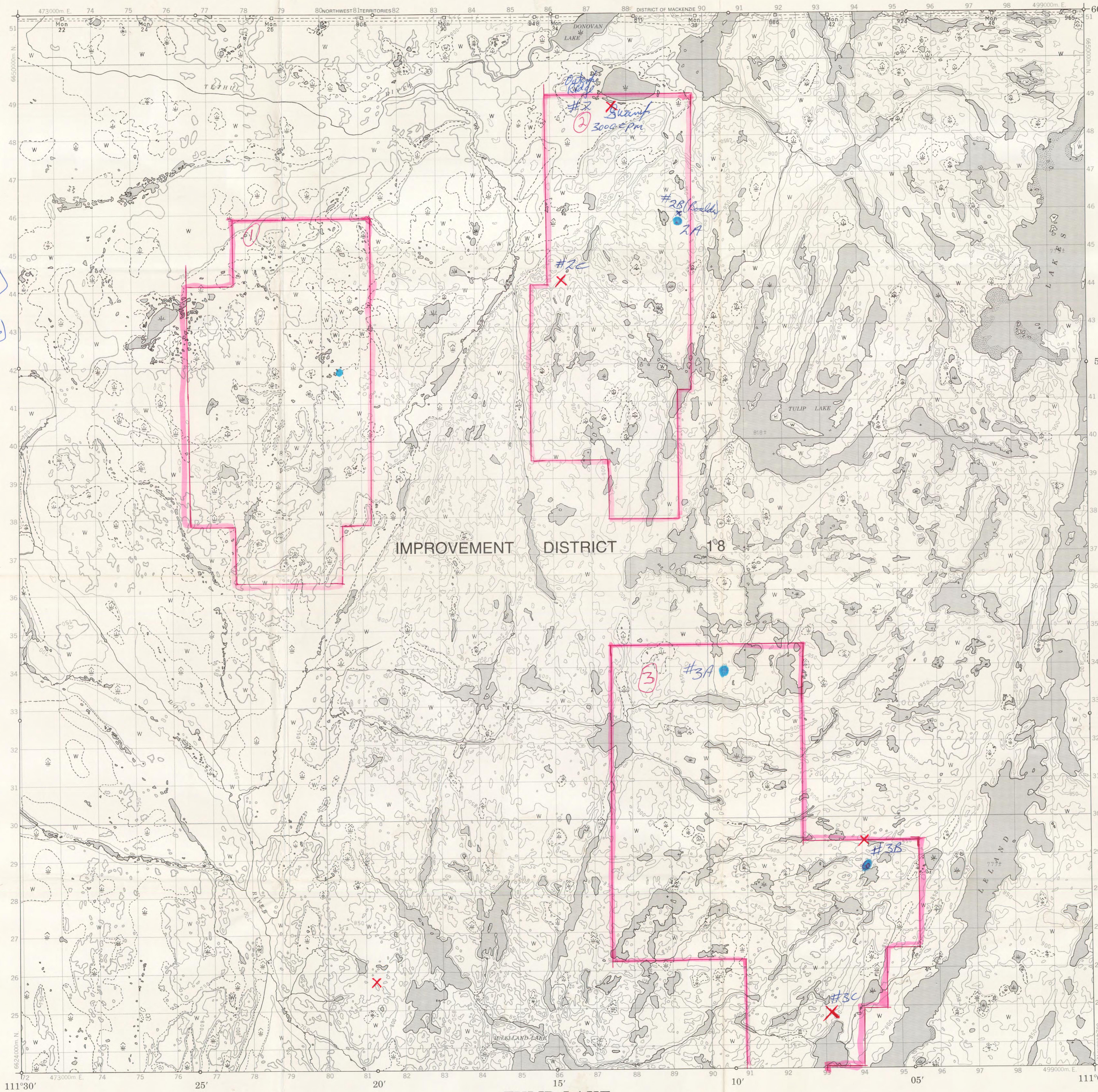
Military users, refer to this map as: Référence de la carte pour usage militaire: SERIES A 741 SÉRIE / MAP 74 M/14 CARTE / EDITION 1 MCE ÉDITION

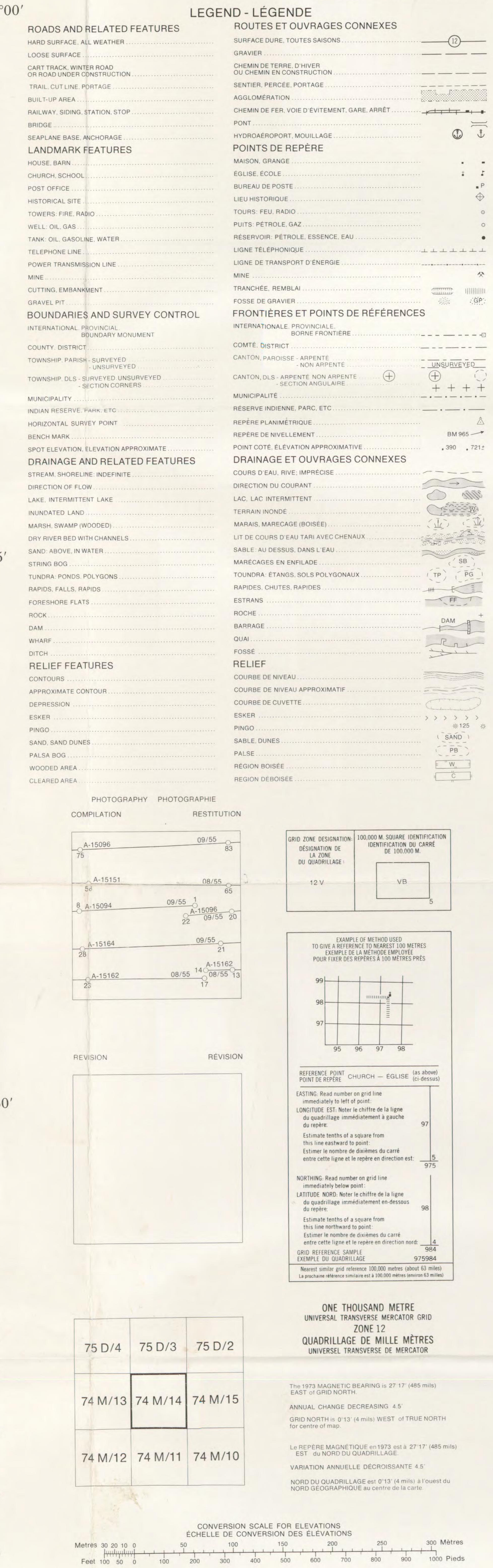
● U/Th Highs (Airborne)

× U/Th Anomalies (Individual Flt. Lines)

□ E. Jones Permit Area

19800006





TULIP LAKE

ALBERTA – NORTHWEST TERRITORIES

WEST OF FOURTH MERIDIAN - OUEST DU QUATRIÈME MÉRIDIEN

Scale 1:50,000 Échelle

PRODUCED BY SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA, 1973.

CONTOUR INTERVAL .... 50 FEET

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NORTH AMERICAN DATUM 1927

TRANSVERSE MERCATOR PROJECTION

CES CARTES SONT EN VENTE AU BUREAU DE DISTRIBUTION DES CARTES, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA

SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927

PROJECTION TRANSVERSE DE MERCATOR

ÉTABLIE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA, EN 1973.

ÉQUIDISTANCE DES COURBES .... 50 PIEDS

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CARTER MAPPING LIMITED
510 - 5 Street S.W., Calgary, Alberta
T2P 1V6
264-1230

74 M/14

EDITION 1

CANADA

EDITION 1 74 M/2

Military users, refer to this map as: Référence de la carte pour usage militaire:
SERIES A741 SÉRIE
MAP 74 M/2 CARTE
EDITION 1 MCE EDITION

501000m. E. 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 528000m. E.

6567000m. N.

59°15′

10′

05′

59°00′

6541000m. N.

111°00′ 55′ 50′ 45′ 40′ 35′ 110°30′

RYAN LAKE

FLETCHER LAKE

LAKE ATHABASCA

5E

5D

LEGEND - LÉGENDE

ROADS AND RELATED FEATURES
HARD SURFACE, ALL WEATHER
LOOSE SURFACE
CART TRACK, WINTER ROAD OR ROAD UNDER CONSTRUCTION
TRAIL, CUT LINE, PORTAGE
BUILT-UP AREA
RAILWAY, SIDING, STATION, STOP
BRIDGE
SEAPLANE BASE, ANCHORAGE

LANDMARK FEATURES
HOUSE, BARN
CHURCH, SCHOOL
POST OFFICE
HISTORICAL SITE
TOWERS: FIRE, RADIO
WELL: OIL, GAS
TANK: OIL, GASOLINE, WATER
TELEPHONE LINE
POWER TRANSMISSION LINE
MINE
CUTTING, EMBANKMENT
GRAVEL PIT

BOUNDARIES AND SURVEY CONTROL
INTERNATIONAL, PROVINCIAL, BOUNDARY MONUMENT
COUNTY, DISTRICT
TOWNSHIP, PARISH - SURVEYED, UNSURVEYED
TOWNSHIP, DLS - SURVEYED, UNSURVEYED - SECTION CORNERS
MUNICIPALITY
INDIAN RESERVE, PARK, ETC.
HORIZONTAL SURVEY POINT
BENCH MARK
SPOT ELEVATION, ELEVATION APPROXIMATE

DRAINAGE AND RELATED FEATURES
STREAM, SHORELINE, INDEFINITE
DIRECTION OF FLOW
LAKE, INTERMITTENT LAKE
INUNDATED LAND
MARSH, SWAMP (WOODED)
DRY RIVER BED WITH CHANNELS
SAND: ABOVE, IN WATER
STRING BOG
TUNDRA: PONDS, POLYGONS
RAPIDS, FALLS, RAPIDS
FORESHORE FLATS
ROCK
DAM
WHARF
DITCH

RELIEF FEATURES
CONTOURS
APPROXIMATE CONTOUR
DEPRESSION
ESKER
PINGO
SAND, SAND DUNES
PALSA BOG
WOODED AREA
CLEARED AREA

ROUTES ET OUVRAGES CONNEXES
SURFACE DURE, TOUTES SAISONS
GRAVIER
CHEMIN DE TERRE, D'HIVER OU CHEMIN EN CONSTRUCTION
SENTIER, PERCÉE, PORTAGE
AGGLOMÉRATION
CHEMIN DE FER, VOIE D'ÉVITEMENT, GARE, ARRÊT
PONT
HYDROAÉROPORT, MOUILLAGE

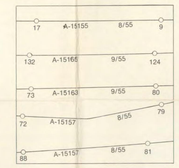
POINTS DE REPÈRE
MAISON, GRANGE
ÉGLISE, ÉCOLE
BUREAU DE POSTE
LIEU HISTORIQUE
TOURS: FEU, RADIO
PUITS: PÉTROLE, GAZ
RÉSERVOIR: PÉTROLE, ESSENCE, EAU
LIGNE TÉLÉPHONIQUE
LIGNE DE TRANSPORT D'ÉNERGIE
MINE
TRANCHÉE, REMBLAI
FOSSE DE GRAVIER

FRONTIÈRES ET POINTS DE RÉFÉRENCES
INTERNATIONALE, PROVINCIALE, BORNE FRONTIÈRE
COMTÉ, DISTRICT
CANTON, PAROISSE - ARPENTÉ, NON ARPENTÉ
CANTON, D.L.S - ARPENTÉ NON ARPENTÉ - SECTION ANGULAIRE
MUNICIPALITÉ
RÉSERVE INDIENNE, PARC, ETC.
REPÈRE PLANIMÉTRIQUE
REPÈRE DE NIVELLEMENT
POINT COTÉ, ÉLÉVATION APPROXIMATIVE

DRAINAGE ET OUVRAGES CONNEXES
COURS D'EAU, RIVIÈ, IMPRÉCISE
DIRECTION DU COURANT
LAC, LAC INTERMITTENT
TERRAIN INONDÉ
MARAIS, MARÉCAGE (BOISÉE)
LIT DE COURS D'EAU TARI AVEC CHENAUX
SABLE, AU DESSUS, DANS L'EAU
MARÉCAGES EN ENFILADE
TOUNDRA: ÉTANGS, SOLS POLYGONAUX
RAPIDES, CHUTES, RAPIDES
ESTRANS
ROCHE
BARRAGE
QUAI
FOSSE

RELIEF
COURBE DE NIVEAU
COURBE DE NIVEAU APPROXIMATIF
COURBE DE CUVETTE
ESKER
PINGO
SABLE, DUNES
PALSE
RÉGION BOISÉE
RÉGION DÉBOISÉE

PHOTOGRAPHY COMPILATION



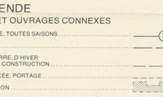
PHOTOGRAPHIE RESTITUTION

REVISION RÉVISION

GRID ZONE DESIGNATION
DÉSIGNATION DE LA ZONE OU QUADRILLAGE
12V

100,000 M. SQUARE IDENTIFICATION
IDENTIFICATION DU CARRÉ DE 100,000 M.
WA

EXAMPLE OF METHOD USED TO GIVE A REFERENCE TO NEAREST 100 METRES
EXEMPLE DE LA MÉTHODE EMPLOYÉE POUR FIXER DES REPÈRES À 100 MÈTRES PRÈS



REFERENCE POINT — CHURCH — ÉGLISE (as above) (ci-dessus)

EASTING: Read number on grid line immediately to left of point:
LONGITUDE EST: Noter le chiffre de la ligne du quadrillage immédiatement à gauche du repère: 97
Estimate tenths of a square from this line eastward to point:
Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction est: 5
975

NORTHING: Read number on grid line immediately below point:
LATITUDE NORD: Noter le chiffre de la ligne du quadrillage immédiatement en-dessous du repère: 98
Estimate tenths of a square from this line northward to point:
Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction nord: 4
9984

GRID REFERENCE SAMPLE
EXEMPLE DU QUADRILLAGE 9759984

Nearest similar grid reference 100,000 metres (about 62 miles)
La prochaine référence similaire est à 100,000 mètres (environ 62 milles)

ONE THOUSAND METRE
UNIVERSAL TRANSVERSE MERCATOR GRID
ZONE 12
QUADRILLAGE DE MILLE MÈTRES
UNIVERSEL TRANSVERSE DE MERCATOR

74 M/6	74 M/7	74 M/8
74 M/3	74 M/2	74 M/1
74 L/14	74 L/15	74 L/16

The 1973 MAGNETIC BEARING is 25°55′ (461 mils) EAST of GRID NORTH.

ANNUAL CHANGE DECREASING 4.1′

GRID NORTH is 0°13′ (4 mils) EAST of TRUE NORTH for centre of map.

Le RIPÈRE MAGNÉTIQUE en 1973 est à 25°55′ (461 mils) EST du NORD DU QUADRILLAGE.

VARIATION ANNUELLE DÉCROISSANTE 4.1′

NORD DU QUADRILLAGE est 0°13′ (4 mils) à l'est du NORD GÉOGRAPHIQUE au centre de la carte.

CONVERSION SCALE FOR ELEVATIONS
ÉCHELLE DE CONVERSION DES ÉLÉVATIONS

Metres 30 20 10 0 50 100 150 200 250 300 Mètres
Feet 100 50 0 100 200 300 400 500 600 700 800 900 1000 Pieds

PRODUCED BY SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA, 1973.

CONTOUR INTERVAL ..... 50 FEET

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NORTH AMERICAN DATUM 1927

TRANSVERSE MERCATOR PROJECTION

ALBERTA

WEST OF FOURTH MERIDIAN - OUEST DU QUATRIÈME MÉRIDIEN

Scale 1:50,000 Échelle

Miles 1 0 1 2 3 Milles
Metres 1000 0 1000 2000 3000 4000 Mètres
Yards 1000 0 1000 2000 3000 4000 Verges

19800006

CES CARTES SONT EN VENTE AU BUREAU DE DISTRIBUTION DES CARTES, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA.

SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927

PROJECTION TRANSVERSE DE MERCATOR

ÉTABLIE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA, EN 1973.

ÉQUIDISTANCE DES COURBES ..... 50 PIEDS

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CARTER MAPPING LIMITED
516-5 Street S.W., Calgary, Alberta
T2P 1N6
264-1230

74 M/2
EDITION 1

59°45'N

19800006

POTTS LAKE

McINNES LAKE

WHALEBACK LAKE

CHERRY LAKE

WEEKES LAKE

LISTER LAKE

ST. AGNES LAKE

GOVERNOR LAKE

SASKATCHEWAN ALBERTA

FOURTH MERIDIAN

19800006

74M/9

COLIN LAKE

WOODMAN LAKE

COLIN RIVER

BELYEA LAKE

110°30'W

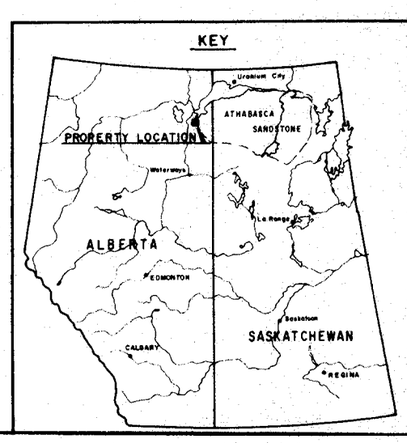
59°30'N

L-39+00S
L-40+50S
L-42+00S
L-43+50S
L-45+00S
L-46+50S
L-48+00S
L-49+50S
L-51+00S
L-52+50S
L-54+00S
L-55+50S
L-57+00S

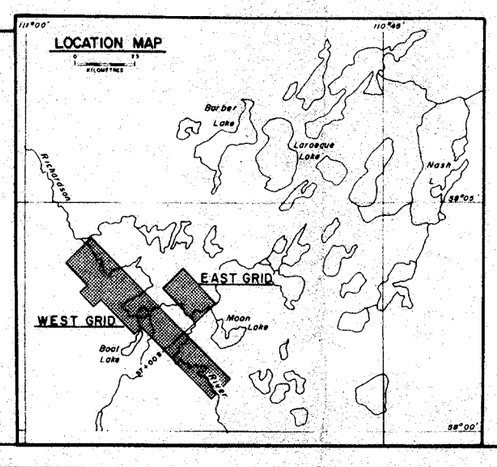
BASELINE (Az 136°)
2+00W
4+00W
6+00W
8+00W
10+00W
12+00W
14+00W

A
B
C
C'
Oddh RR 2
RICHARDSON RIVER

KEY



LOCATION MAP



LEGEND

- HORIZONTAL LOOP
- 1777 DATA BASE
- CONDUCTOR
- POSSIBLE STRUCTURE
- INTERPRETED FAVOURABLE STRUCTURE
- EXPLORANIUM GEOMETRICS (MODEL G-816)
- 60450 MAGNETIC VALUES IN GAMMAS (CORRECTED)
- 60500 MAGNETIC CONTOURS
- CONTOUR INTERVAL 10 GAMMAS
- MAGNETIC LOW
- FAULT INTERPRETED FROM MAGNETICS

N

0 100 200
METRES

NORCEN ENERGY RESOURCES

RICHARDSON RIVER AREA, ALBERTA
PERMIT No. 6876120005

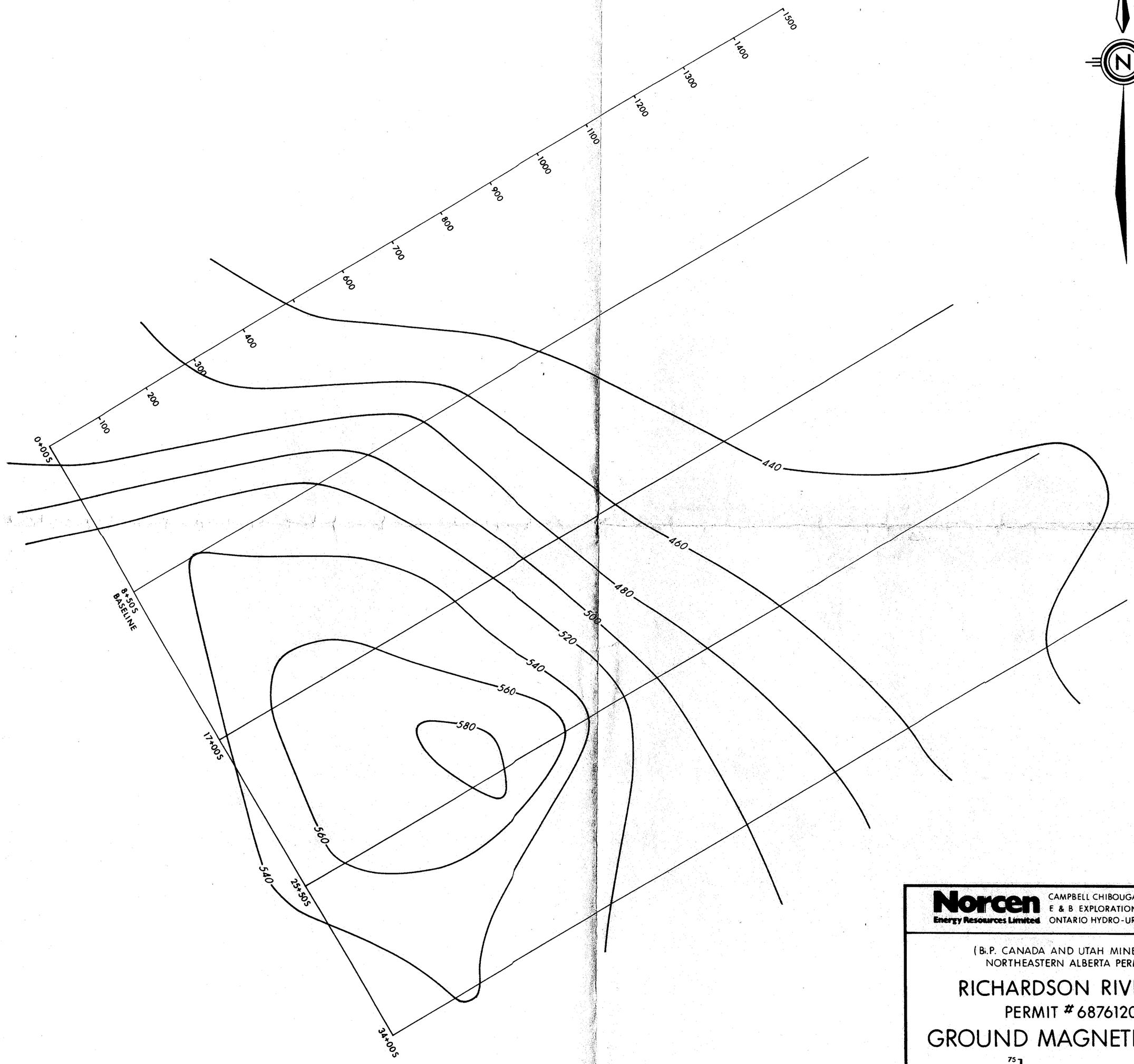
COMPILATION MAP

EAST GRID

Project No: C-358	By: D. Jones
Scale: 1:5000	Drawn: gmes
Drawing No: 1	Date: May, 1979

MPH Consulting Limited

19790010 Map # 3B (51)



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(B.P. CANADA AND UTAH MINES OPTION)
NORTHEASTERN ALBERTA PERMIT AREAS

RICHARDSON RIVER AREA

PERMIT # 6876120002

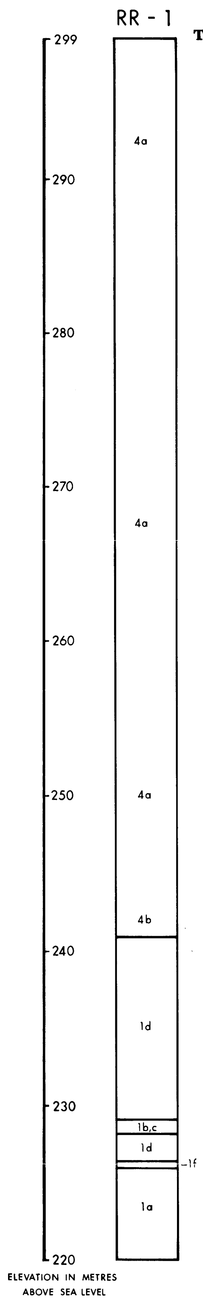
GROUND MAGNETICS SURVEY

SCALE IN METRES
75 50 25 0
100 200 300 400 500 600 700 800

NTS 74 L

JULY, 1979

Map #4



LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz ± Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz + Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~~ Unconformity
xxxxx Brecciation

sec A

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RICHARDSON RIVER PERMITS, N.E.-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1 : 200

NTS 74-L-2,3,6,7

May, 1979
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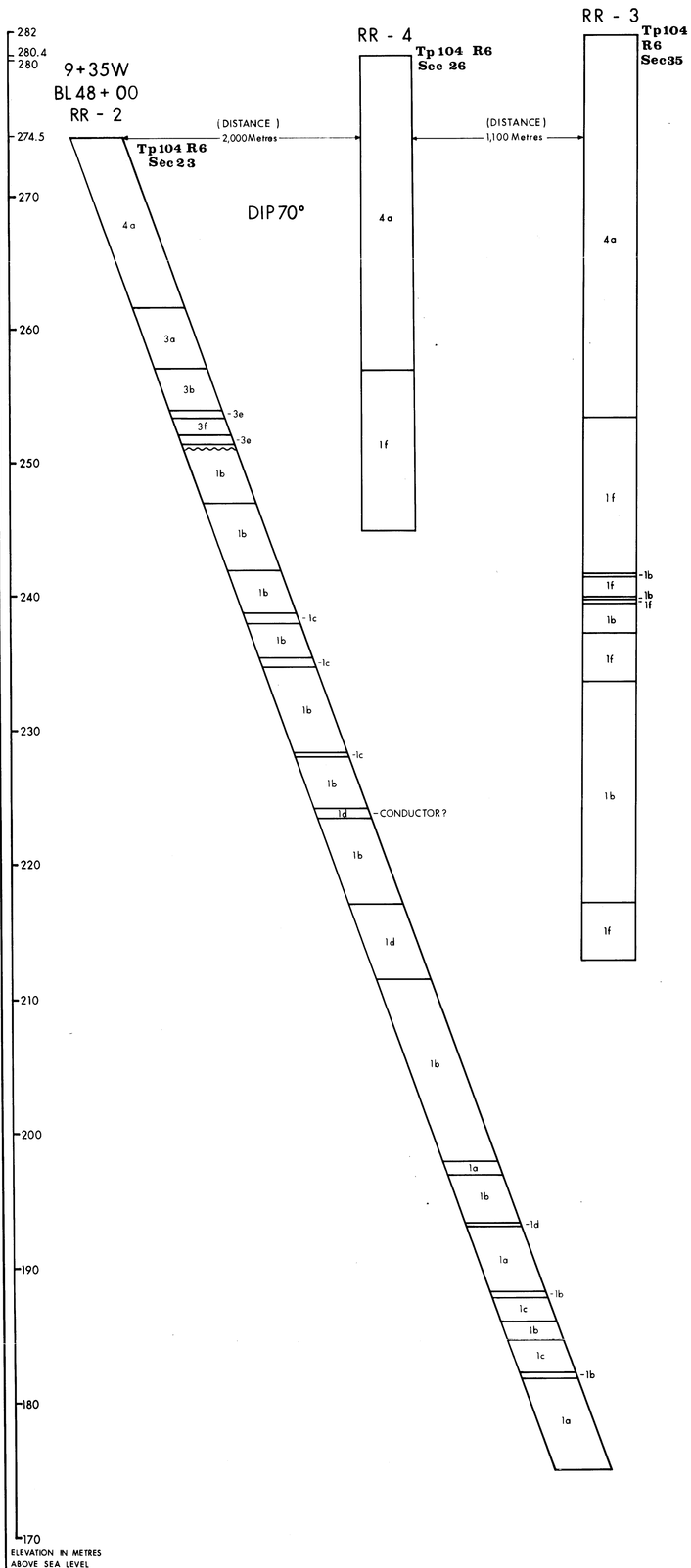

LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz ± Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz ± Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
××××× Brecciation

SecB

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RICHARDSON RIVER PERMITS, N.E-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1 : 200

NTS 74-L-2,3,6,7

May, 1979

55
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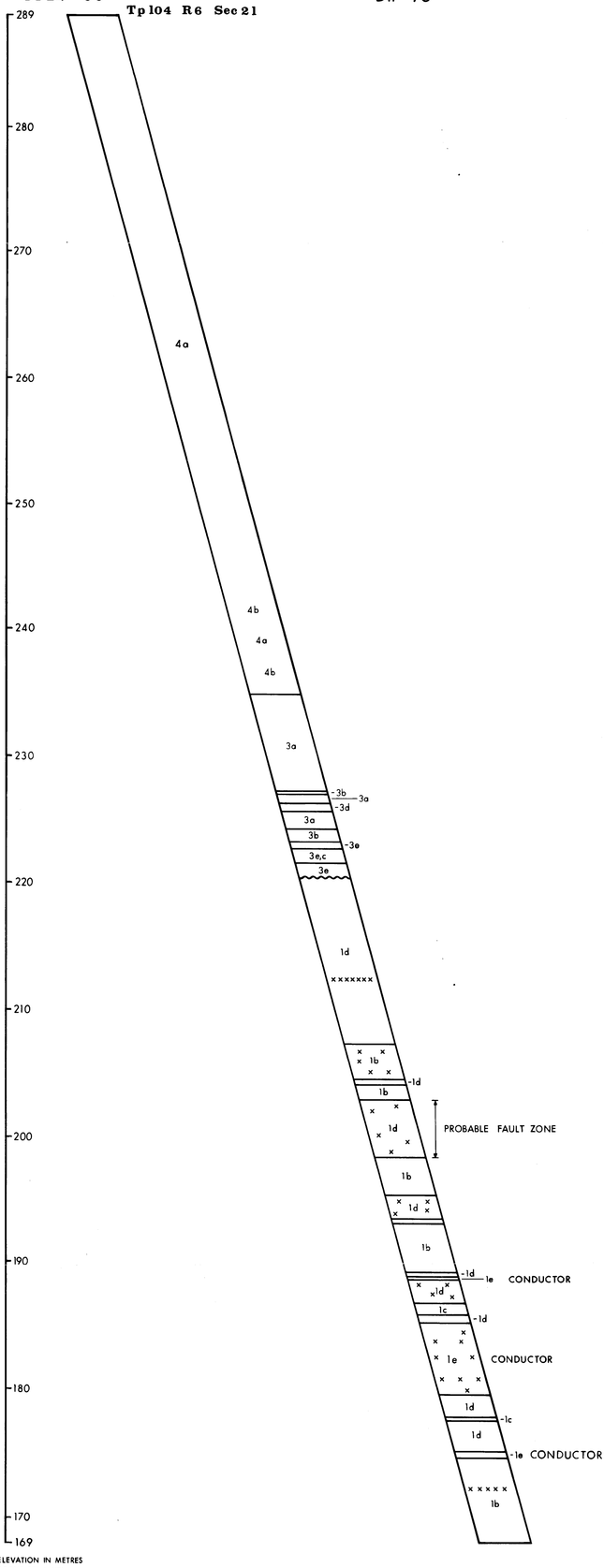
RR-5
2+60E
BL 24+00

DIP -75°

Tp 104 R6 Sec 21



ELEVATION IN METRES
ABOVE SEA LEVEL

LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC ARCHAEAN BASEMENT ROCK
- 1a Feldspar - Quartz ± Biotite Paragneiss
- 1b Chlorite - Feldspar - Quartz ± Biotite Paragneiss
- 1c Feldspar - Quartz - Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
××××× Brecciation

sec C

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RICHARDSON RIVER PERMITS, N.E.-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1:200

NTS 74-L-2,3,6,7

May, 1979

52
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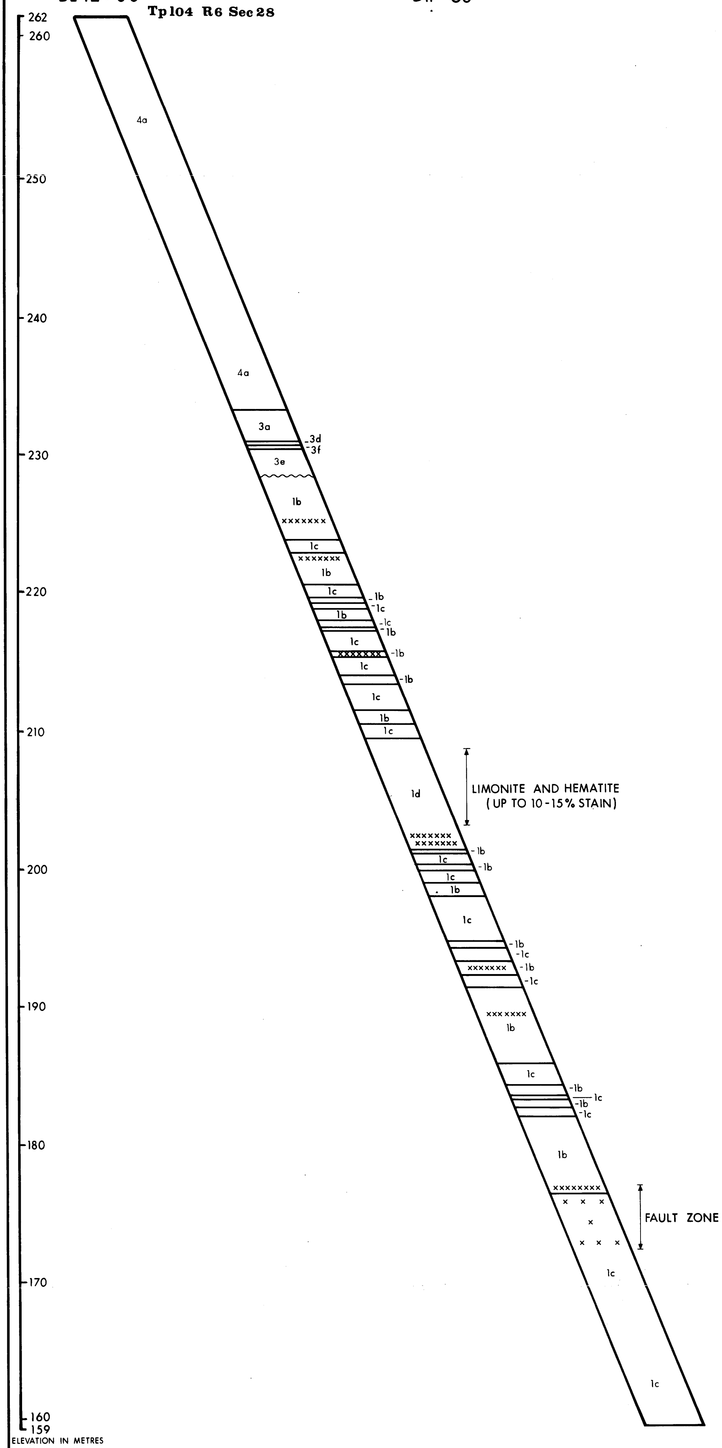
RR-6
6+50E
BL 12+00

DIP-68°

Tp104 R6 Sec28



LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz + Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz ± Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
xxxxxx Breciation

sec D

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RICHARDSON RIVER PERMITS, N.E.-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1:200

NTS 74-L-2,3,6,7

May, 1979
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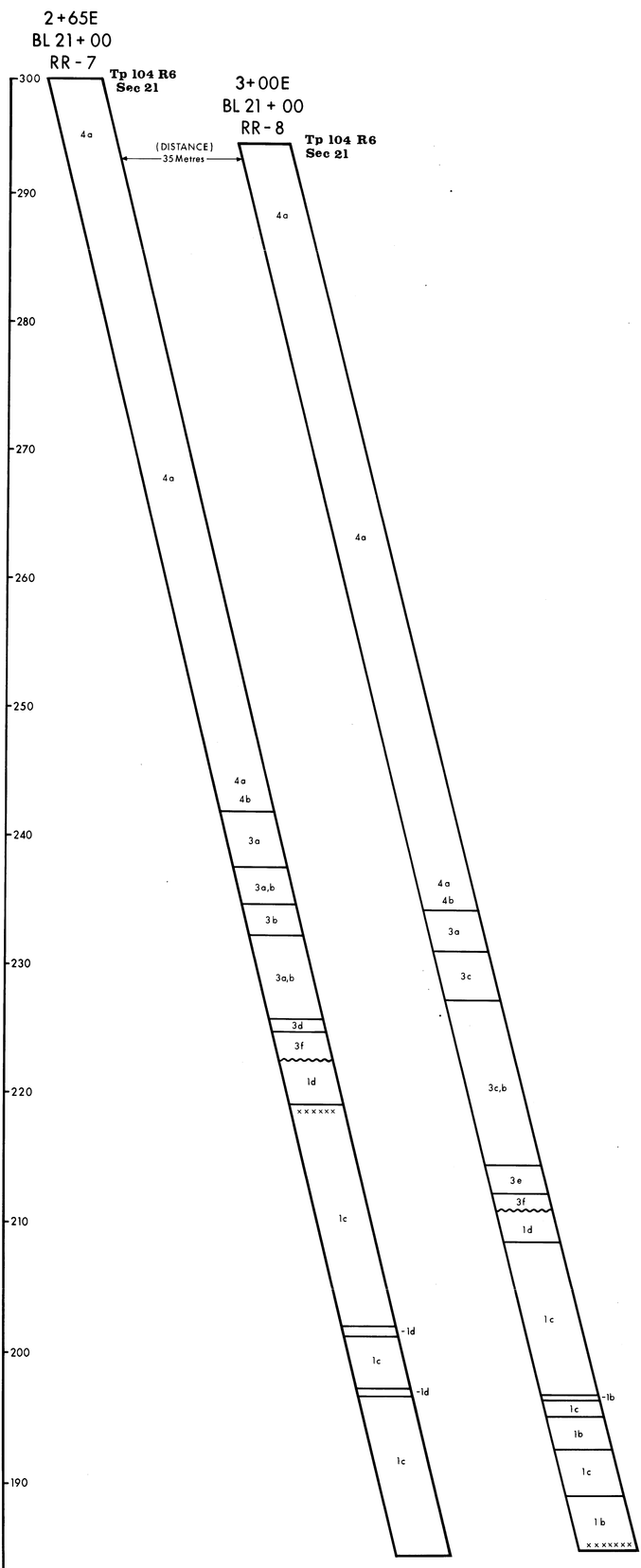

LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz ± Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz ± Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite + Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
xxxxx Brecciation

sec E

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DIAMOND DRILLING SECTIONS

Scale 1:200

NTS 74-L-2,3,6,7

May, 1979
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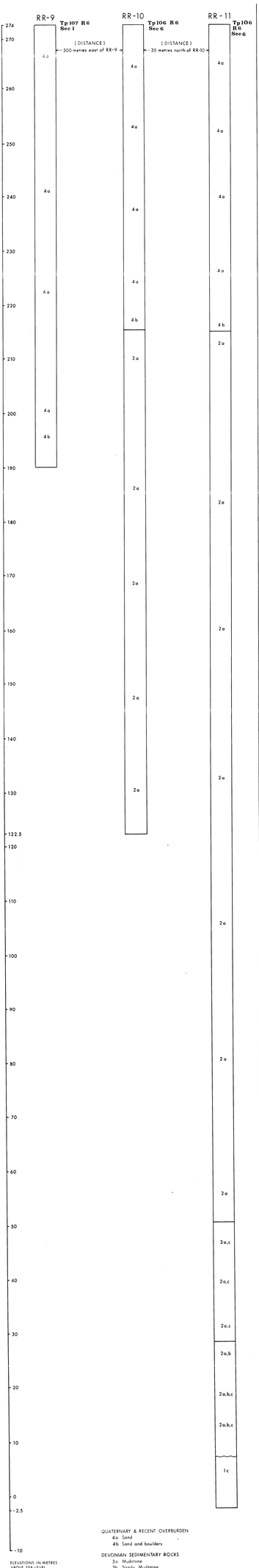

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith [La Loche Formation]

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone, Siltstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz ± Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz ± Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite + Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
xxxxx Brecciation

Sec 9

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RICHARDSON RIVER PERMITS, NE-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1:200

NTS 74-L 2,3,6,7

July, 1979

57
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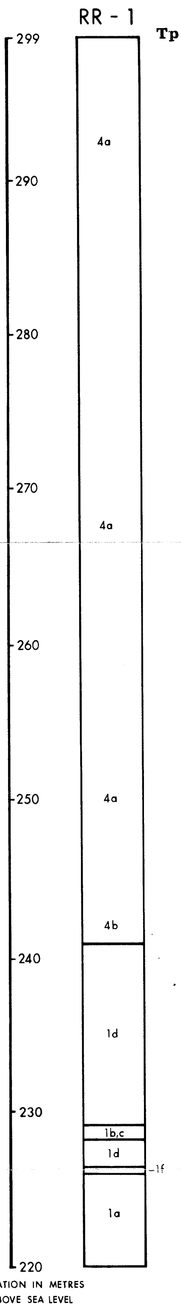

LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz ± Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz + Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
xxxxx Brecciation

sec A

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RICHARDSON RIVER PERMITS, N.E.-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1 : 200

NTS 74-L-2,3,6,7

May, 1979
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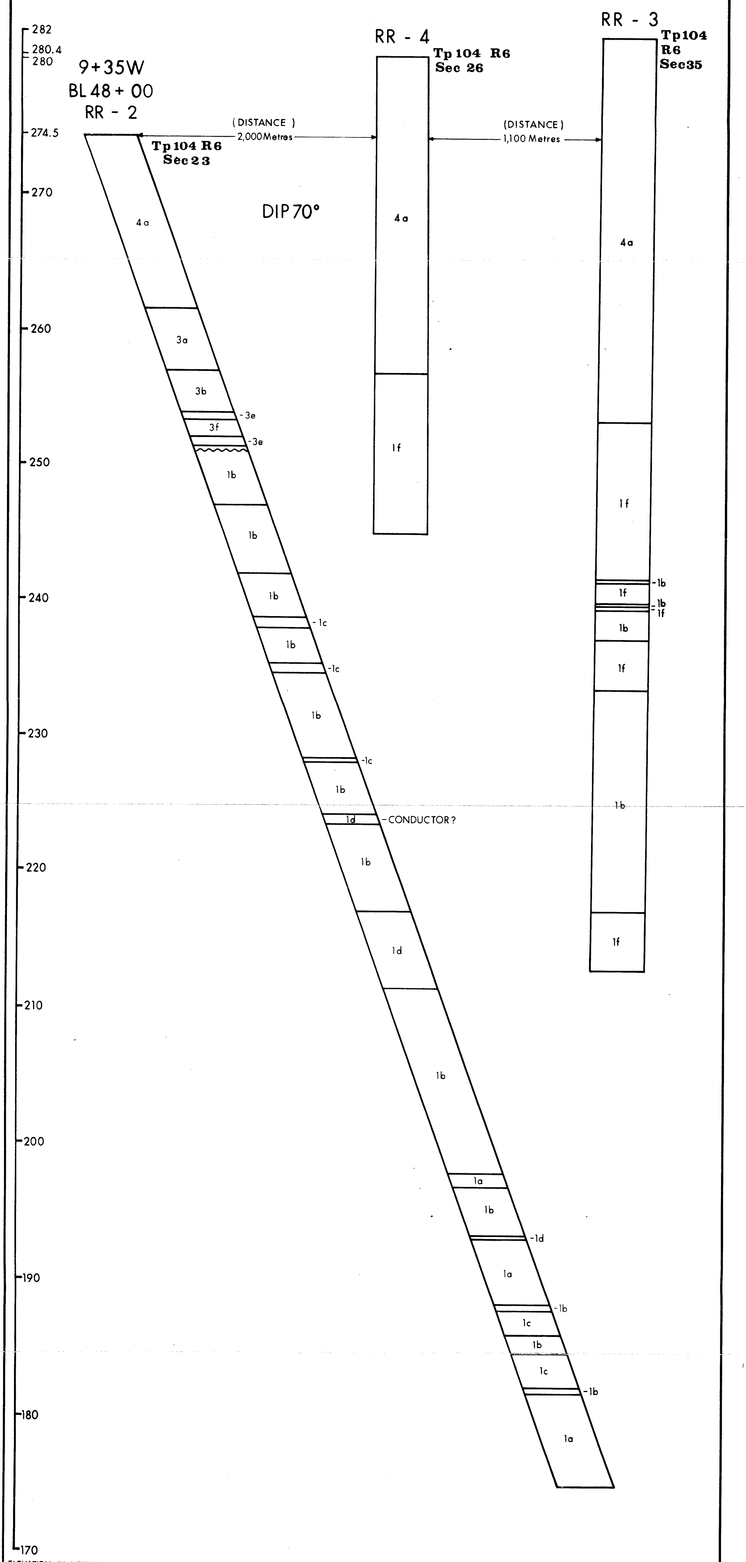

LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz ± Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz ± Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
×××× Brecciation

SecB

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RICHARDSON RIVER PERMITS, N.E.-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1 : 200

NTS 74-L-2,3,6,7

May, 1979

(55)
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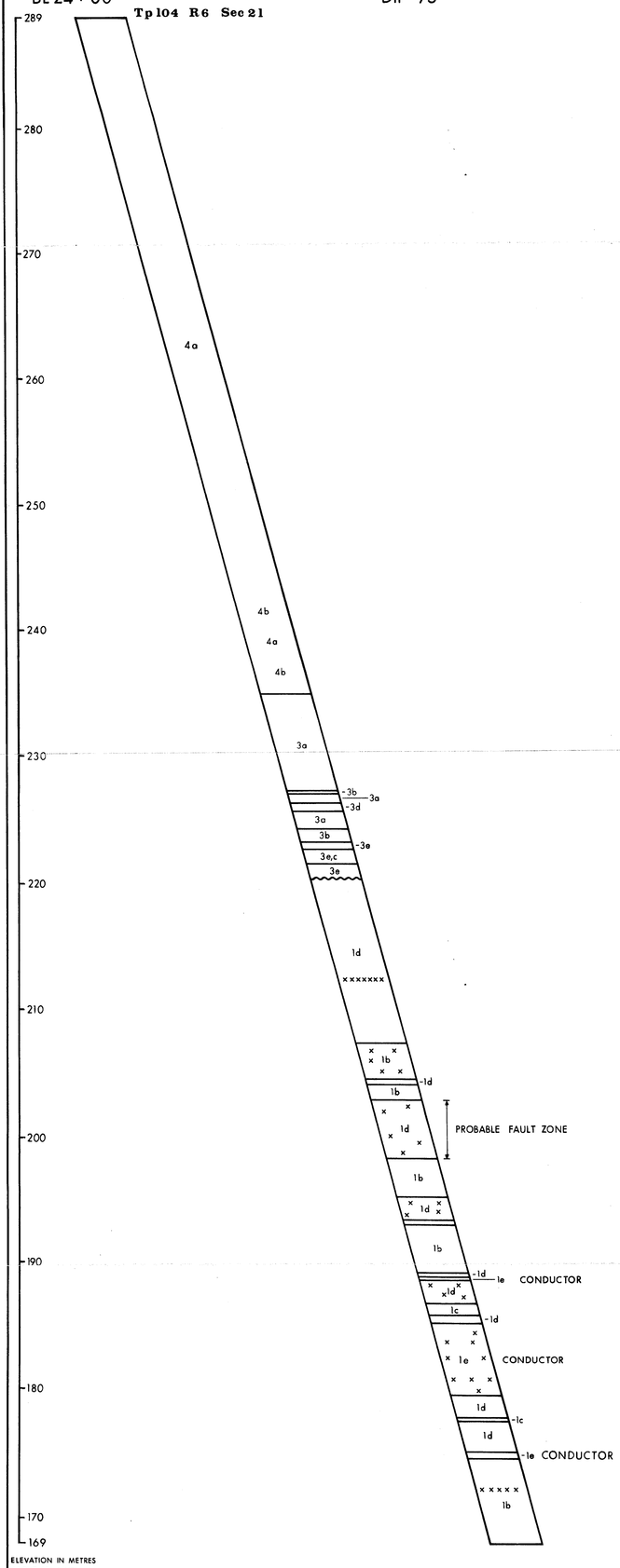
RR-5
2+60E
BL 24+00

DIP-75°

Tp 104 R6 Sec 21



ELEVATION IN METRES
ABOVE SEA LEVEL

LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC ARCHAEAN BASEMENT ROCK
- 1a Feldspar - Quartz ± Biotite Paragneiss
- 1b Chlorite - Feldspar - Quartz ± Biotite Paragneiss
- 1c Feldspar - Quartz - Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
×××× Brecciation

sec C

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RICHARDSON RIVER PERMITS, N.E.-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1:200

NTS 74-L-2,3,6,7

May, 1979

(SH)
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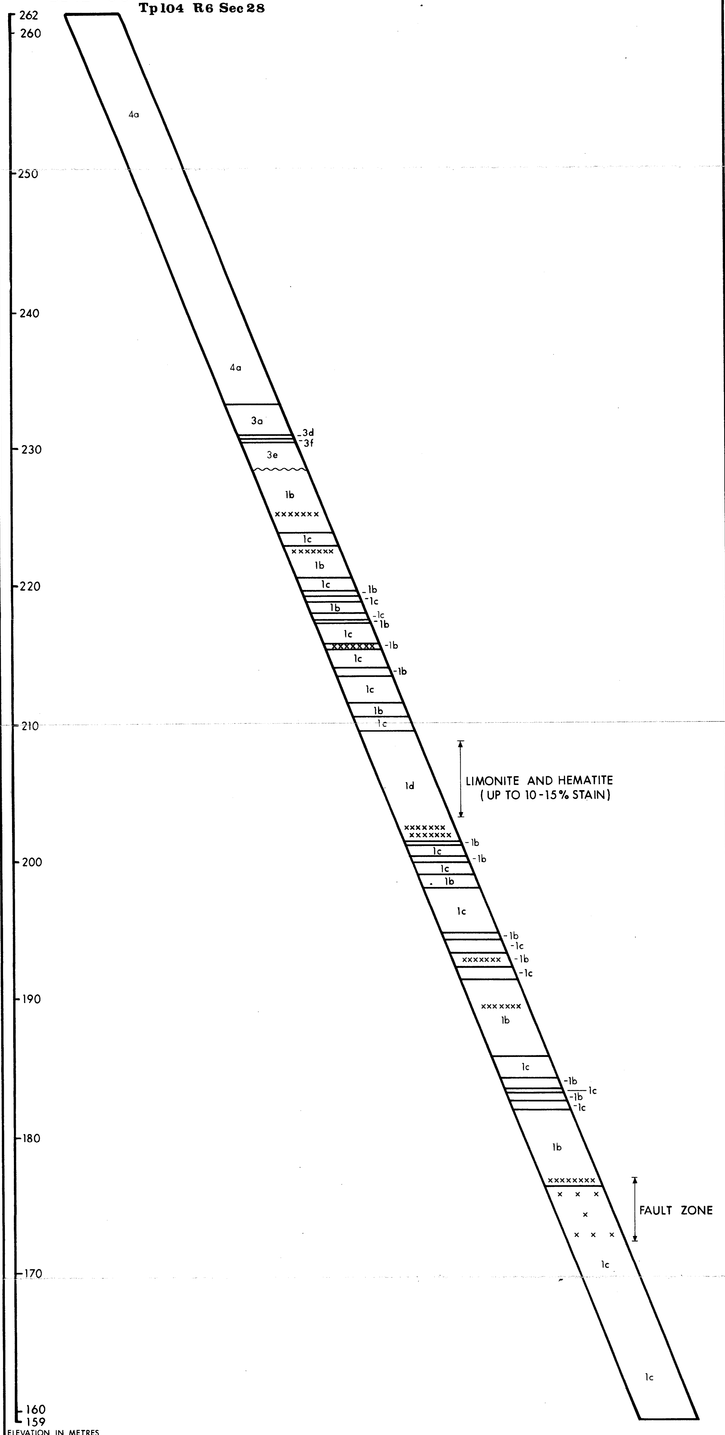
RR-6
6+50E
BL 12+00

DIP-68°

Tp104 R6 Sec28



LEGEND:

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz + Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz ± Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite ± Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
xxxxxx Breciation

sec D

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RICHARDSON RIVER PERMITS, N.E.-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1:200

NTS 74-L-2,3,6,7

May, 1979
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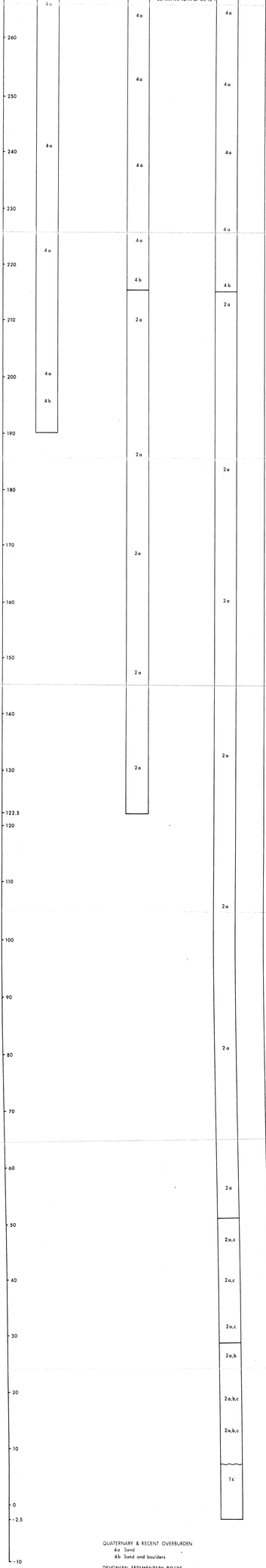

ELEVATIONS IN METRES
ABOVE SEA LEVEL

QUATERNARY & RECENT OVERBURDEN
- 4a Sand
- 4b Sand and boulders

DEVONIAN SEDIMENTARY ROCKS
- 3a Mudstone
- 3b Sandy Mudstone
- 3c Sandstone
- 3d Muddy Sandstone
- 3e Conglomerate
- 3f Regolith (La Loche Formation)

PROTEROZOIC ATHABASCA FORMATION
- 2a Sandstone
- 2b Mudstone, Siltstone
- 2c Conglomerate
- 2d Regolith

PROTEROZOIC OR ARCHAEAN BASEMENT ROCK
- 1a Feldspar + Quartz ± Biotite Paragneiss
- 1b Chlorite + Feldspar + Quartz ± Biotite Paragneiss
- 1c Feldspar + Quartz + Chlorite ± Biotite Paragneiss
- 1d Chlorite + Biotite Schist
- 1e Graphite Schist
- 1f Granite

~~~ Unconformity
xxxxx Brecciation

sec 7

Norcen Energy Resources Limited
CAMPBELL CHIBOUGAMAU MINES LTD.
E & B EXPLORATIONS LTD.
ONTARIO HYDRO URANIUM JOINT VENTURE

(B.P. CANADA LTD. & UTAH MINES LTD. OPTION)

RICHARDSON RIVER PERMITS, NE-ALBERTA

DIAMOND DRILLING SECTIONS

Scale 1:200

NTS 74-L 2,3,6,7

July, 1979

(67)
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R.9 R.8 R.7 R.6 R.5 W.4 R.4 W.4

T.107 T.106 T.105 T.104 T.103

58°15' 58°00' 111°15' 111°00' 110°37'

PERMIT NO. 6876120002

PERMIT NO. 6876120004

PERMIT NO. 6876120005

PERMIT NO. 216

BP & UTAH PERMIT NO. 230

BP & UTAH PERMIT NO. 229

ELDORADO NUCLEAR

RICHARDSON FAULT

Richardson River

Marbelle River

Athabasca River

Embarras

KEANE CREEK

SCOT LAKE

PAXTON LAKE

BARBER LAKE

LAROCQUE LAKE

NASA LAKE

MAYBELLE RIVER

CURRIE LAKE

MOON LAKE

BOAT LAKE

ROAD FROM EMBARRAS

ROAD FROM RICHARDSON TOWER

N-1
OB 43.3 M
DS 83.9 M
BC 93.0 M

N-2
OB 33.6M
DS 56.1 M
BC 59.2M

N-4
OB 65.2M
DS 97.6 M
BC 102.8M

N-5
OB 35.1M
AF 252M

N-6
OB 120.8M
AF 220.1M
BC 223.9M

KDH-1
OB 58.8M
AF 306.9M

EN 508-12
OB 20.1M
AF 112.1M

EN 508-10
OB 36.9 M
DS 84.0M
AF 115.2M

EN-508-1
OB 27.7M
DS 33.2M
AF 133.3M
BC 181.7M

RR-1 OB 58.5 M
DS 73.3 M
BC 79.5 M

RR-2 OB 12.8 M
DS 23.5 M
BC 99.6 M

RR-3 OB 28.6 M
BC 69.2 M

RR-4 OB 23.7 M
BC 35.6 M

RR-5 OB 54.2 M
DS 68.6 M
BC 121.0 M

RR-6 OB 29.0 M
DS 33.0 M
BC 102.2 M

RR-7 OB 59.4 M
DS 78.0 M
BC 117.5 M

RR-8 OB 61.0 M
DS 83.5 M
BC 111.9 M

RR-9 OB 83.8 M

RR-9A OB 46.9 M

RR-10 OB 58.8 M
AF 151.5 M

RR-11 OB 58.2 M
AF 273.4 M
BC 276.5 M

LOCATION MAP

Fort Chipewyan
Lake Athabasca
Fort McMurray
150 Km
6876120002
6876120004
6876120005
Alberta Saskatchewan Boundary
Norcen Joint Venture Land Holdings
0 5 10 15 Km.

OB - OVERBURDEN
DS - DEVONIAN SEDIMENTS
AF - ATHABASCA FORMATION
BC - BASEMENT COMPLEX

LEGEND

- AIRBORNE ELECTROMAGNETIC CONDUCTOR
- GEOPHYSICAL GRID LINES
- N4 1977 DRILL HOLE LOCATIONS (NORCEN ET AL)
- RR1 1979 DRILL HOLE LOCATIONS (NORCEN ET AL)
- EN 1978 DRILL HOLE LOCATIONS (ELDORADO NUCLEAR)
- KDH 1978 DRILL HOLE LOCATIONS (BP & UTAH)
- FAULT OR ASSUMED FAULT
- WESTERN MARGIN OF ATHABASCA FORMATION
- INTRUSIVE ROCK OUTLINED ON AEROMAGNETIC MAPS
- ×0.8 URANIUM IN SILT ppm (1976)

Norcen Energy Resources Limited
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F & B EXPLORATIONS LTD.
ONTARIO HYDRO-URANIUM JOINT VENTURE

(B.P. CANADA AND UTAH MINES OPTION)
NORTHEASTERN ALBERTA PERMIT AREAS

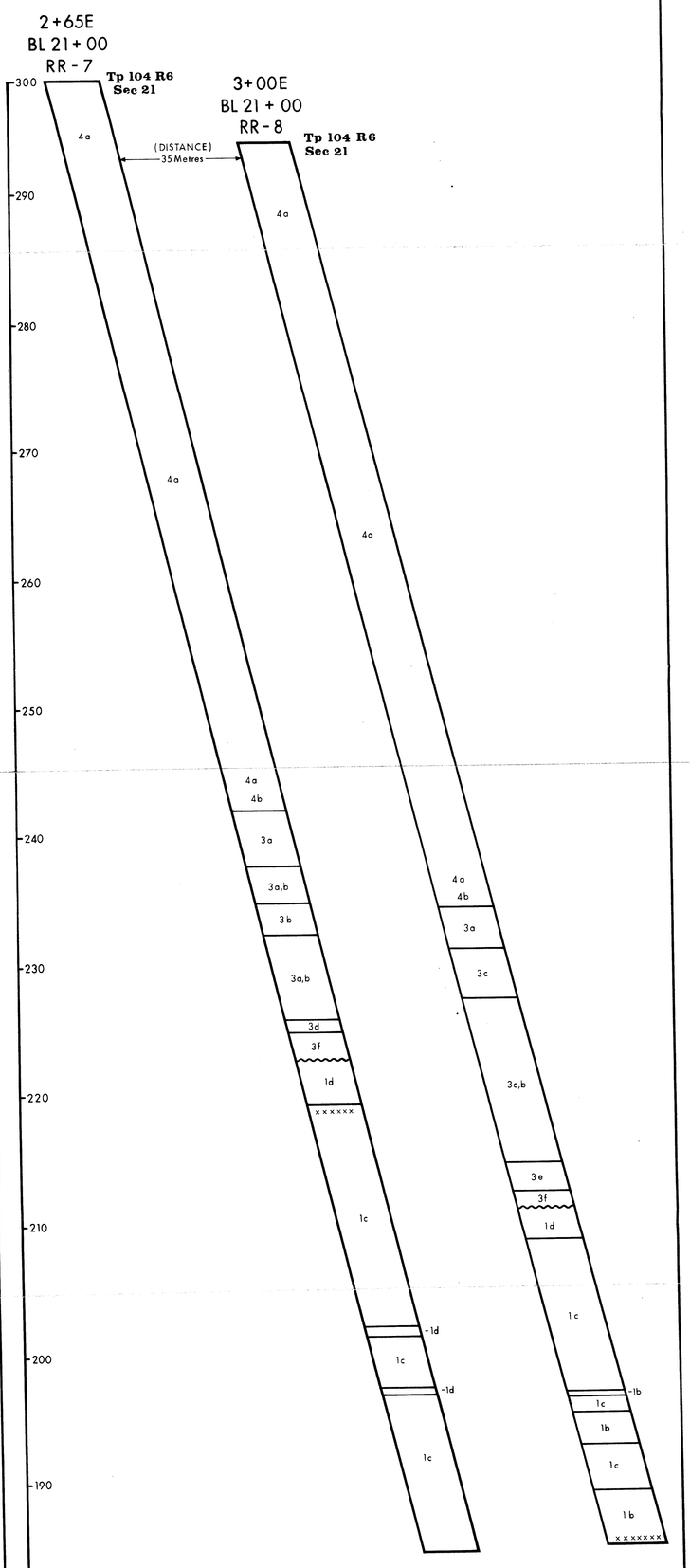
COMPILATION MAP
RICHARDSON RIVER AREA

0 1000 2000 3000 meters
Scale 1: 50,000

Sept., 1979

Map #81

16-79-0010



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~~~ Unconformity
xxxxx Brecciation

sec E

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