MAR 19690019: STONE POINT

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Permit 73

Confidential until Dec 11, 1972

GEOLOGICAL RECONNAISSANCE AND PRACTICAL PROSPECTING REPORT

ON

PACIFIC SILVER MINES & OILS LTD. PERMIT #73

STONE POINT AREA

LAKE ATHABASCA, ALBERTA

Prepared For

Columbian Northland Fxploration Ltd.

Calgary, Alberta

Prepared By

Angus G. MacKenzie Mining Consultants Ltd.

Calgary, Alberta

October, 1969

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Figure 3 is missing from the report.
S. Sciarra
6-April-06

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PROFESSIONAL ENGINEER ALBERTA
A. G. MacKENZIE

AUTHORITY

A Proposal and Estimate of costs for a geological reconnaissance and practical prospecting of Pacific Silver Mines & Oils Ltd. Permit #73 was submitted to Pacific Silver Mines & Oils Ltd. at their request on July 18, 1969. After discussion with Mr. R. Bell, President of Pacific Silver and Mr. J. Wahl and Mr. H. Cowan of Columbian Northland Exploration Ltd., a tentative agreement dated July 25, 1969, was signed for the regional reconnaissance geological and prospecting exploration of Pacific Silver Mines & Oils Ltd. Permit #73, comprising some 75 square miles, during the month of September, 1969. The Agreement was based on the general Terms of Reference as contained in the Proposal of July 15 with some minor modifications.

The project was initiated on August 25, 1969, when a field party, composed of one geologist, one geological assistant and a pilot, left Nordbye Lake camp for Uranium City which was used as a base for the project. The same Cessna 180 aircraft was used as air support for this work.

Air photo interpretation was previously done in Calgary.

The project was completed on August 30, 1969.

INTRODUCTION

This report covers the geological reconnaissance and practical prospecting of Pacific Silver Mines & Oils Ltd. Permit #73, located on the south side of Lake Athabasca along the southern extension of the Beaverlodge trend in the province of Alberta.

PROFESSIONAL ENGINEER A. G. MacKENZIE ALBERTA

Approximately 75 square miles are contained in the Permit area, a fair part of which is occupied by lakes and shallow rivers.

The field work was undertaken from Uranium City because of the limited time available and the bad weather conditions that persist in the area at this time of year.

The personnel involved in the project were:

Angus G. MacKenzie, P. Eng., MCIM, Mining Engineer-Mining Geologist - In Charge

E. R. L. Kintanar, B. Sc. Geol., MCIM - Party Chief (Also photo-geology and aeromagnetic interpretation pre-field)

R. Dedora - Geological Assistant

D. Seymour - Pilot

LOCATION AND ACCESSIBILITY

Location

Pacific Silver Mines & Oils Ltd. Permit #73 encompasses the following Townships of Alberta:

Twp. 113, Range 1 W4M, Sections 1-36 inclusive

Twp. 113, Range 2 W4M, Sections 1-29 and 32-36 inclusive

Twp. 113, Range 3 W4M, Sections 1, 2, 11, 12, 13

Accessibility

The property may be reached by float equipped aircraft from Uranium City, Saskatchewan or Fort Chipewyan, Alberta. It is also accessible from both places by chartered boat. It is, however, more advisable to use an aircraft

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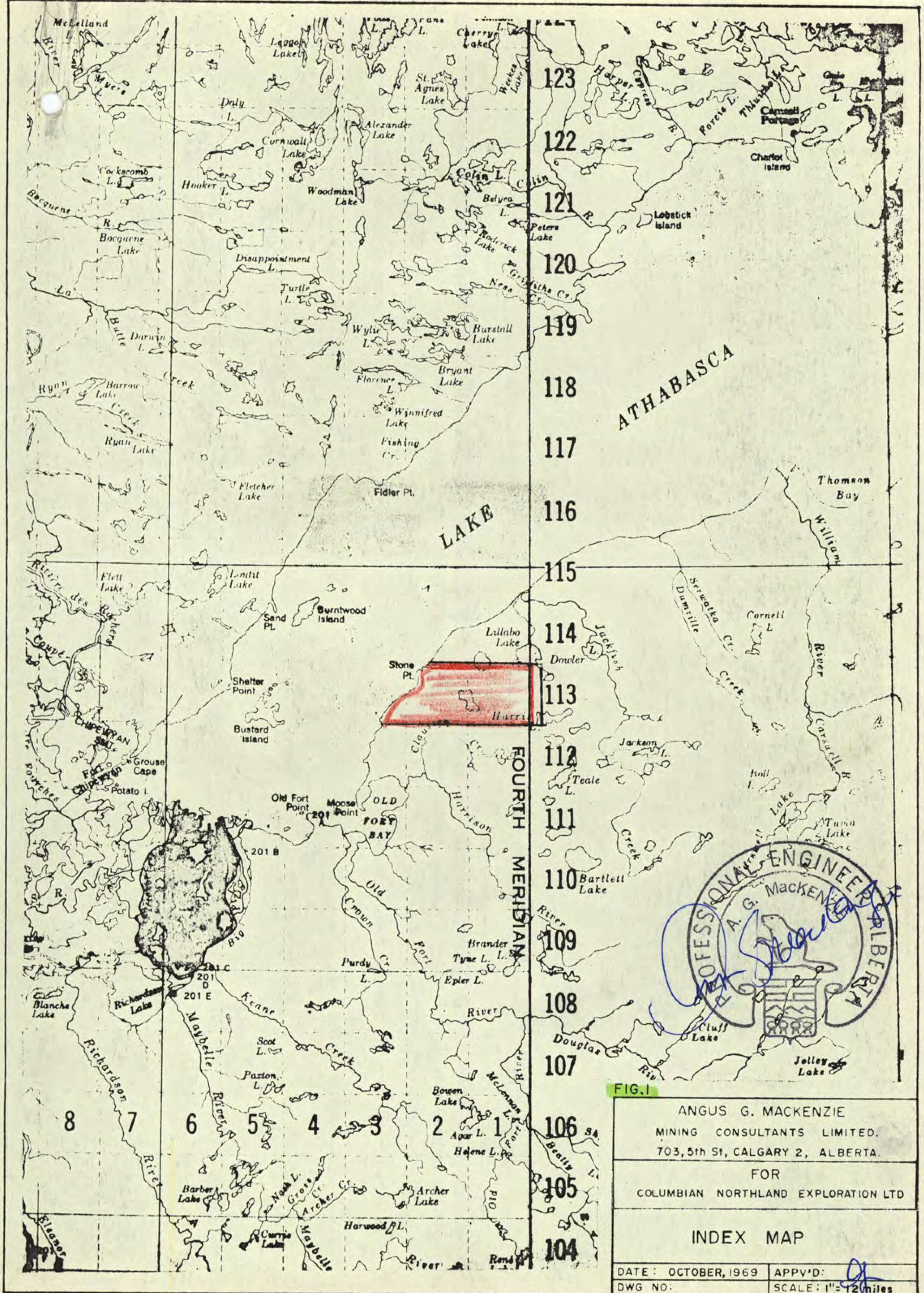

FIG. I

ANGUS G. MACKENZIE
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703, 5th St, CALGARY 2, ALBERTA.

FOR
COLUMBIAN NORTHLAND EXPLORATION LTD

INDEX MAP

DATE: OCTOBER, 1969	APPV'D:
DWG NO:	SCALE: 1"= 12 miles

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and land in the inland lakes because Lake Athabasca is generally rough and there is no shelter along the shoreline.

Commercial airline flights connect Uranium City and Fort Chipewyan with Edmonton, Alberta.

CLIMATE

No specific data for the climate of the Permit area is available. The climatic condition here discussed is mainly for the Beaverlodge Area in the vicinity of Uranium City and Stony Rapids. The Beaverlodge Area is on the north side of Lake Athabasca, whereas the Permit area is on the south side. The weather pattern in the Permit area is reasonably similar to that of the Beaverlodge area.

The climate of the Beaverlodge area is of the continental type with extremes of temperatures and very little precipitation. On some days during summer the temperatures may rise up to 100 degrees, whereas in winter they may go down to 50 or 60 degrees below zero. The annual precipitation is about 13 inches. Break-up of ice on the lakes usually comes late in May or early June and freeze-up starts about the middle of October. Snowy showers may be encountered as late as mid-June and as early as mid-September. The summer months are generally very pleasant for field work. The average, good field season is about 100 days with about 60 per cent of them sunny and bright and the rest cloudy, although most of the cloudy days are still suitable for field work. About 5 per cent of the time is lost, however, because of heavy

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precipitation with high winds and this usually comes about near the end of August and on into September. June has an average temperature of about 65 degrees and August is much the same. The first three weeks of July appear to be the warmest part of the summer.

COMMUNICATIONS

If a base camp had been set up on the Permit area itself, an adequate communication system would have been necessary; by basing out of Uranium City this was eliminated and time and equipment costs were saved on the project.

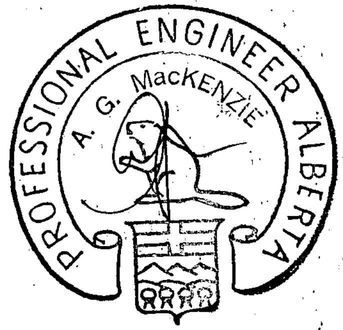
Telephone and telegram are available at Uranium City.

PHYSIOGRAPHY AND TOPOGRAPHY

The area is part of the Canadian Shield Peneplain and, as such, is generally gently undulating. On the property the only relief is due to sand dunes, sandy ground moraine and rounded eskers; otherwise the property is flat. Muskegs generally cover the flats and thin and thick spruce and birch or poplar trees grow on the ground moraine covered area and on the flanks of eskers.

Topography is controlled mainly by glacial deposits. Streams are almost stagnant and follow lows between eskers and sand dunes.

The general trend of these dunes is northwest and they more or less completely cover the bedrock trend, which is northeast.



Only two outcrops were noted on the property. The rest is covered by glacial deposits and/or sand.

OPERATIONAL LOGISTICS

The area is mostly covered with glacial debris, sand, and muskeg making it most difficult to do surface geological mapping.

The area was flown at low altitude (100 feet above treetops) to check for outcrops. After a diligent search, two were located on the property and ground traverses were run to them.

A float equipped aircraft, a Cessna 180 (Athabaska Airways IXA), was used to fly to and from the property from Uranium City.

An airborne radiometric survey was flown, criss-crossing the property to pick up any anomalous areas to be checked on the ground. This survey was flown at 50 to 65 feet above treetops at 90 miles per hour. The scintillometer operator read out the scintillometer counts as fast as possible and an assistant wrote them down. The pilot called out ground control or check points to tie in flight line locations.

Traversing was done by pace and compass. The party was equipped with pocket size geiger counters and a GIS-2 scintillometer. In addition, a geochemical kit and other essential field equipment were available.

As time permitted some of the anomalies picked up in the airborne survey were ground checked in a reconnaissance manner.

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SCOPE OF THE REPORT

Geological Mapping

An area of approximately 75 square miles was examined during the period August 25 to 30, 1969, either on the ground or by low altitude flying. The two outcrops on the property were field checked and sampled. The balance of the area is covered and very little field mapping could be accomplished.

Petrographic Work

A representative sample of the Athabasca Sandstone (the only outcrop on the property) was cut for thin section and studied microscopically. The thin section was studied under polarized light and a visual estimate was made of the relative amounts of the various minerals. The observations and inferences are included with the description of the lithological unit.

Geophysics

In the course of field work, scintillometer (CPS - counts per second) and geiger counter (CPM - counts per minute) readings were taken over outcrops, and covered ground as well, especially where airborne anomalies were indicated. Readings were taken at 500 foot intervals as a rule; closer spaced readings were taken in suspected anomalous areas.

A summary of a seismic survey made by the Geological Survey of Canada of the Athabasca Sandstone outcrop area is included in this report. Further discussion on this is covered in the Geophysics section of this report.

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GENERAL GEOLOGY

General Statement

The two outcrops found on the property are Athabasca Sandstone. Because of the limited exposures on the Permit area, the relationship of the Athabasca with older rocks cannot be determined. We felt therefore that work in the vicinity of the Permit done by the Geological Survey of Canada could give important data in the evaluation of the Permit.

Most of the data following have been extracted from reports of others having pertinent bearing on this area.

The three important units are the Tazin Group, Martin Formation and the overlying Athabasca Formation. The Tazin and Martin formations host uranium bearing minerals in the Beaverlodge area, although some sedimentary deposits of the reworked Martin Formation, containing uranium bearing minerals, have been noted in the Athabasca area.

Athabasca Formation

The Athabasca formation is exposed mainly on the south side of Lake Athabasca. It is composed almost entirely of sandstone which ranges from thinly bedded to very thickly bedded, and a massive siliceous variety is common. It is fine to coarse grained and a basal conglomeratic facies is present. Generally however, it is fine to medium grained. The grains are mainly sub-angular to rounded quartz. It is often fair to well sorted.

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The weathered surface of the rock ranges in colour from white to pinkish. Within the Permit it is banded purple and pinkish; the weathered surface is buff coloured.

The rock looks hard but when broken it is quite friable. Where bedding planes are evident the rock breaks into slabs. Torrential cross-bedding was observed in the outcrops on the permit.

Under the microscope, the quartz grains have locally developed, secondary facets and sutured boundaries are common.

The main area of Athabasca Sandstone, south of Lake Athabasca, was thought to be flat lying. In the outcrops noted on the permit, one had an attitude of N 80 E, dipping 18° SE and the other N 10 E, dipping 5° SE. Other workers have noted areas where the strata have been folded. Generally speaking, dips noted are quite low, probably the result of deposition on a slightly inclined basement.

The age of the Athabasca Formation has been placed by some writers in the Paleozoic which suggests Cambrian, and by others Precambrian since no fossils are present in the sandstone. After weighing the data available, we are of the opinion that it is more probably Precambrian.

The contact of the Athabasca Sandstone with the underlying rock is an angular unconformity of great time break.

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Underlying Rocks

In the permit area it is not known what underlies the Athabasca cover. A general description of both the Tazin Group and the Martin Formation is summarized here. These rock units underly the Athabasca in other localities to the north of Lake Athabasca. A Table of Formations possibly underlying the Athabasca Sandstone, taken from G.S.C.'s Memoir 367, "Geology of the Beaverlodge Mining Area, Saskatchewan" by C. P. Tremblay is as follows: (modified)

TABLE OF FORMATIONS

EON	ERA	EPOCH	
	Cenozoic	Recent Pleistocene	Morainic material, gravel, sand, silt, and clay
			Athabasca Sandstone
PRECAMBRIAN			Unconformity
	Proterozoic		GABBRO and BASALT DYKES and SILLS; in part porphyritic and amygdaloidal
			Intrusive Contact
	Proterozoic and Archaean (?)		MARTIN FORMATION SILTSTONE, arkose, conglomerate UPPER ARKOSE, siltstone, conglomerate CONGLOMERATE INTERBEDS, arkose BASALT FLOWS, GABBRO SILLS, amygdaloidal and porphyritic LOWER ARKOSE, siltstone, conglomerate BASAL CONGLOMERATE and BRECCIA, siltstone and arkose
			Unconformity

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EON	ERA	EPOCH		
			GRANITE and PEGMATITE DYKES and SILLS	
			Intrusive Contact	
			TAZIN GROUP METASOMATIC granite, quartz monzonite, monzonite, granodiorite, quartz diorite	
			EASTERN AREA	**WESTERN AREA**
			Murmac Bay Formation; Quartzite, amphibolite, garnetiferous quartz-feldspar-biotite gneiss, crystalline dolomite and limestone	Uranium City amphibolite, some quartzite
PRECAMBRIAN	Archaean and/or Proterozoic (?)		Buff quartzite, impure quartzite, chlorite-sericite schist, argillite	Cayzor Unit; Quartzite, impure quartzite, chlorite schist, quartzo-feldspathic gneiss
			Argillite, slate, and quartzite; hornblende-schist, amphibolite, chlorite-epidote rock	
			Intrusive Contact	
			Quartzite, chlorite-sericite schist	Lynn Lake amphibolite
	Archaean and/or Proterozoic		Donaldson Lake Gneiss, quartzo-feldspathic gneiss, quartzite, amphibolite	Rix Unit; Quartzo-feldspathic gneiss, quartzite, mafic schist, and gneiss

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EON	ERA	EPOCH		
				Chance Lake Unit; amphibolite, quartzite, schist and gneiss
			Foot Bay Gneiss, quartzo-feldspathic gneiss, amphibolite	
				Quartzo-feldspathic gneiss; some amphibolite, quartzite
PRECAMBRIAN				Power Line Creek Belt; garnetiferous feldspathic quartzite, amphibolite
				Quartzo-feldspathic gneiss, amphibolite, quartzite

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Tazin Group

The rocks of the Tazin Group are the oldest in the area and may be Archean age. The Tazin Group is made up of metamorphosed, sedimentary, tuffaceous and volcanic rocks; of quartzo-feldspathic gneisses in all stages or degrees of granitization; and of metasomatic granites. The Tazin Group is estimated to have reached a possible thickness of more than 30,000 feet. Its rocks are cut by granite and pegmatite dykes and sills which represent the molten and mobile parts of the metasomatic granites. They are all intensely folded, faulted, jointed and fractured. Large areas of them are also intensely brecciated and mylonitized and some are hydrothermally altered.

Which portion of the Tazin Group is underlying Athabasca in the permit area is not known. It may not even be in contact with the Athabasca if the Martin Formation completely covers it.

Martin Formation

The Martin Formation is probably Aphebian to Helikian (lower to middle Proterozoic), and it overlies uncomformably the rocks of the Tazin Group. This formation is made up of a basal conglomerate, arkose, basaltic and gabbroic rock, a few conglomerate interbeds and siltstone, altogether forming a unit about 15,000 feet thick. These rocks are gently folded but intensely faulted, jointed and fractured. They are relatively unmetamorphosed and unaltered compared to the underlying Tazin Group. The Martin Formation probably underlies the Athabasca Sandstone in the permit area since, to the north of the Lake, they form a widespread blanket over the Tazin Group.

Basic Intrusives

The gabbro and basalt dykes are probably also of Proterozoic age. They cut rocks of both the Tazin Group and the Martin Formation below the volcanic rocks. They are not known to cut the volcanics and the rocks above them. Gabbro dykes trend mainly west-northwesterly.

STRUCTURAL GEOLOGY

As already mentioned, the area is mostly covered. No surface structural evidence is observable on the surface. However, a seismic survey of the Geological Survey of Canada includes the map area; this survey shows subsurface structures which will be discussed under the Geophysics section of this report.

GEOPHYSICS

Aeromagnetics

No aeromagnetic anomalies are indicated on the aeromagnetic map, (Stone Point Map 28686) published by the Geological Survey of Canada, within the Permit area. However, highs are shown to the southwest and to the north; both

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are in water. Two lows are indicated off Point Burle. In the Permit area they show a slow rise eastward. A kink in the contours is shown in the vicinity of Stone Point and could be a reflection of a sub-surface fault. It may be an extension of the Black Bay fault on the north side of the lake.

Airborne Scintillometer

An airborne scintillometer was flown over the area. The flight lines are shown in Figure 7 and the profile of the results is shown in Figure 3.

The background used was between 10 and 14 counts per second. With this background setting anomalous areas were delineated and some of the larger ones were ground checked. Unfortunately the scintillometer went haywire before all airborne anomalies could be ground checked. However, the major anomaly, No. 3, was proved on ground check whereas anomalies No. 1 and No. 2 may be questionable. Anomaly No. 3 gave 27 CPS when background was about 8 to 9 CPS.

It should be noted that all these anomalies fall on a line which approximates the extension of the Black Bay fault (discussed under Seismic).

Seismic Work

This portion of the report was taken from a published seismic reconnaissance survey of the Athabasca Formation, Saskatchewan (Map 2-1969) done by the Geological Survey of Canada and interpreted by George D. Hobson and H. A. MacAulay as follows: (modified)

DESCRIPTIVE NOTES

A seismic team of the Geological Survey of Canada was sent into the Athabasca Formation area first during the summer of 1962, again in 1963 and more recently in 1968 to explore the sub-surface composition of the Athabasca Formation, the thickness of the formation, the nature of the Carswell Lake structure and the topography of the pre-Athabasca surface. The program in 1968 was carried out as a cooperative venture with the Saskatchewan Department of Mineral Resources.

The seismic refraction technique was generally used throughout these investigations in a modified reversed profile manner. Seismic lines were extended until an interface was detected that transmitted seismic compressional wave energy at approximately 19,000 feet per second.

Seismic velocities through drift range from 1,200 to 8,100 feet per second. The sandstones of the Athabasca Formation display a wide velocity range, from 8,600 to possibly 16,500 feet per second with an average value of 13,300 feet per second. Velocities in the range 16,000 to 21,000 feet per second are assigned to the rocks of the pre-Athabasca basement complex.

Pre-Athabasca Topography

Figure 4 shows the general configuration of the pre-Athabasca surface topography referred to sea level. The lowest calculated elevation, 3,964 feet below sea level, is located beneath profile 92 at Pasfield Lake. A surface elevation at this profile of 1,347 feet above sea level indicates a total thickness of 5,260 feet of Athabasca Formation.

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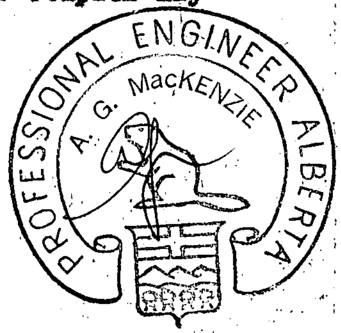
The geological implications of the seismic data are suggested in Figure 5. Lineaments, suggested by sharp changes in direction of contour lines on Figure 4, may be faults in the pre-Athabasca basement complex. A graben may be present to the southeast of an extension of the Black Bay fault which is coincident with the Black Bay shoreline of the Crackingstone Peninsula on the north shore of Lake Athabasca. An extension of the Black Lake fault in the northeastern portion of the area appears to coincide with a nosing feature on the pre-Athabascan surface and is suggested to indicate a horst. These fault extensions cannot be traced in detail with the seismic control available. These grabens could be infilled with Martin Formation.

Athabasca Formation

Figure 6 is an isopach map of the Athabasca sedimentary basin. The isopach indicates the thickness of the Athabasca Formation along with the possible underlying formations (Martin?) and local drift cover. The cross-sections of Figure 7 indicate the thickness of the Athabasca Formation and, in a regional sense, the relief of the pre-Athabascan surface.

Martin Formation

The Martin Formation may underlie the Athabasca Formation in some parts of the sedimentary basin south of Lake Athabasca. If the Martin Formation does exist south of the lake it most likely will be found in the basement lows. No seismic velocity data have been obtained over Martin Formation outcrops. Some of the observed velocities that are intermediate to those confidently assigned to either the Athabasca Formation or the basement complex may be associated with Martin rocks.



Drift

Drift thickness at most locations investigated is generally less than 60 feet. Drift thicknesses greater than 100 feet were calculated at nine locations with two of these in excess of 200 feet.

Conventional Reflection Surveys

Events with normal but small moveouts were recorded at profiles 93 and 99. These events were recorded only from long offset shots and have two-way travel times in excess of three seconds. If these events are primary events they must originate from within the basement complex. They may also be multiples of primary reflections from the pre-Athabascan surface, the primary events not being recognized on these long offsets because they might be obscured by the arrival of refracted energy at the detectors at the same time. In short, the survey was not successful in recording reflections from the pre-Athabascan surface although efforts were made at 10 locations during April 1968.

Conclusions

Seismic methods have been used to determine the thickness of the Athabasca Formation; if applied in detail, the topography of the pre-Athabascan surface could probably be defined. The seismic method should be considered in exploration programs in this area because of the good velocity contrast between the Athabasca Formation and the pre-Athabasca group of rocks.

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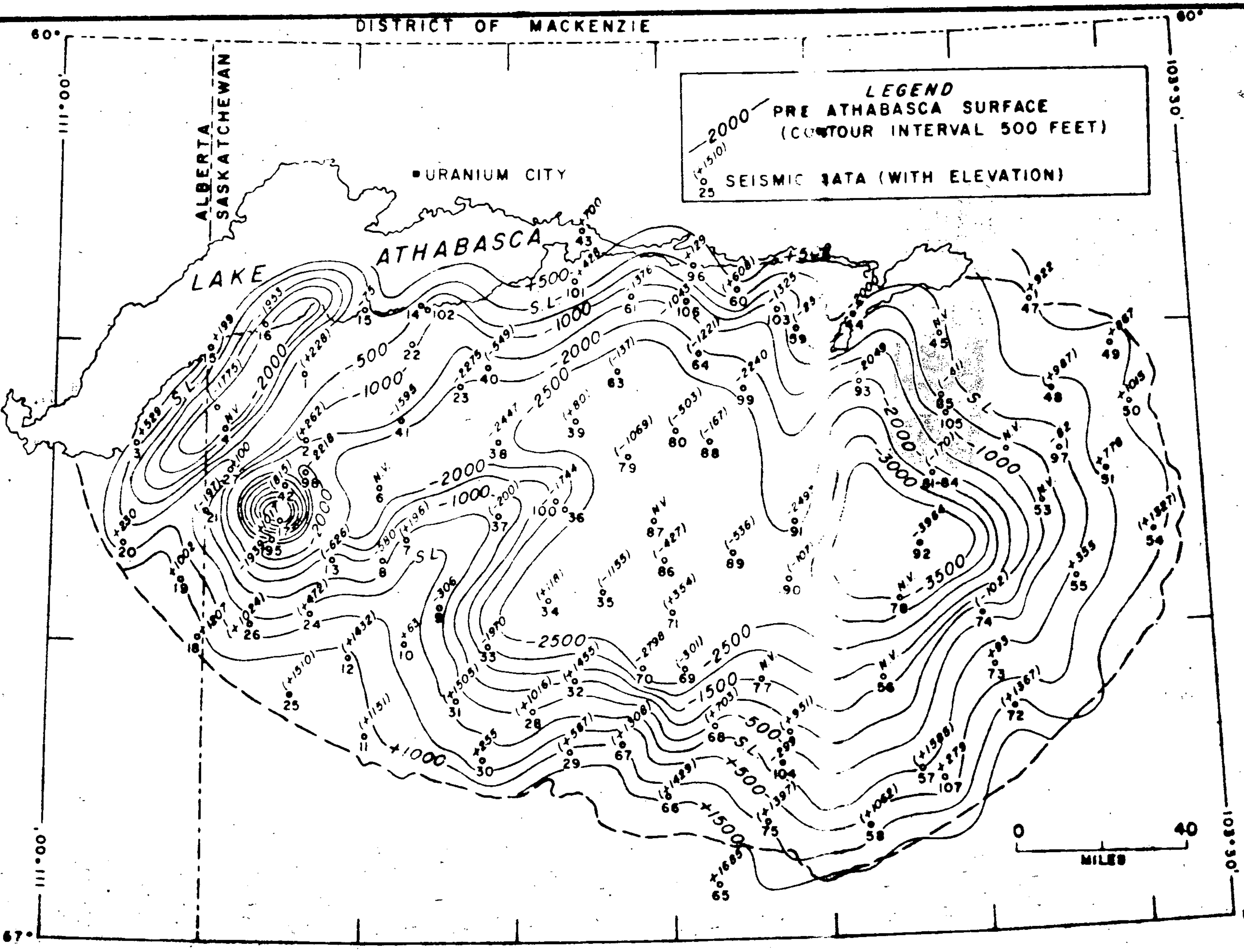

Pre-Athabascan topography, contour interval 500 feet, showing seismic locations and elevation of pre-Athabascan surface relative to sea level. Bracketed values of elevation are minimal values – the pre-Athabascan surface is probably deeper.

FIG.4

From G.S.C. map 2-1969 by G D. Hobson and H A. MacAulay.

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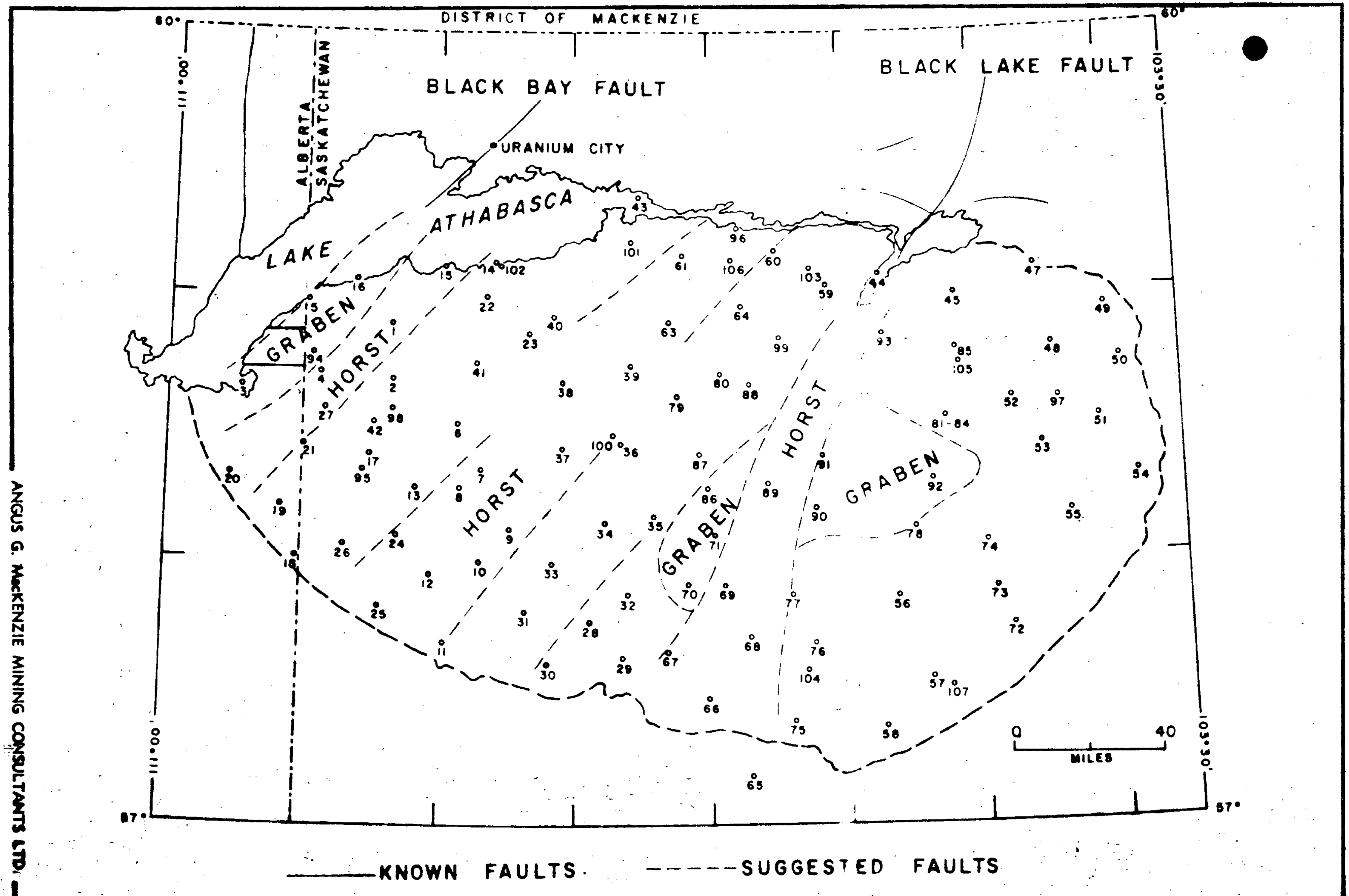

FIG. 5 **Geological implications of the seismic data, Athabasca Formation area.**

From G.S.C map 2-1969 by G.D. Ho... and H A. MacAulay.

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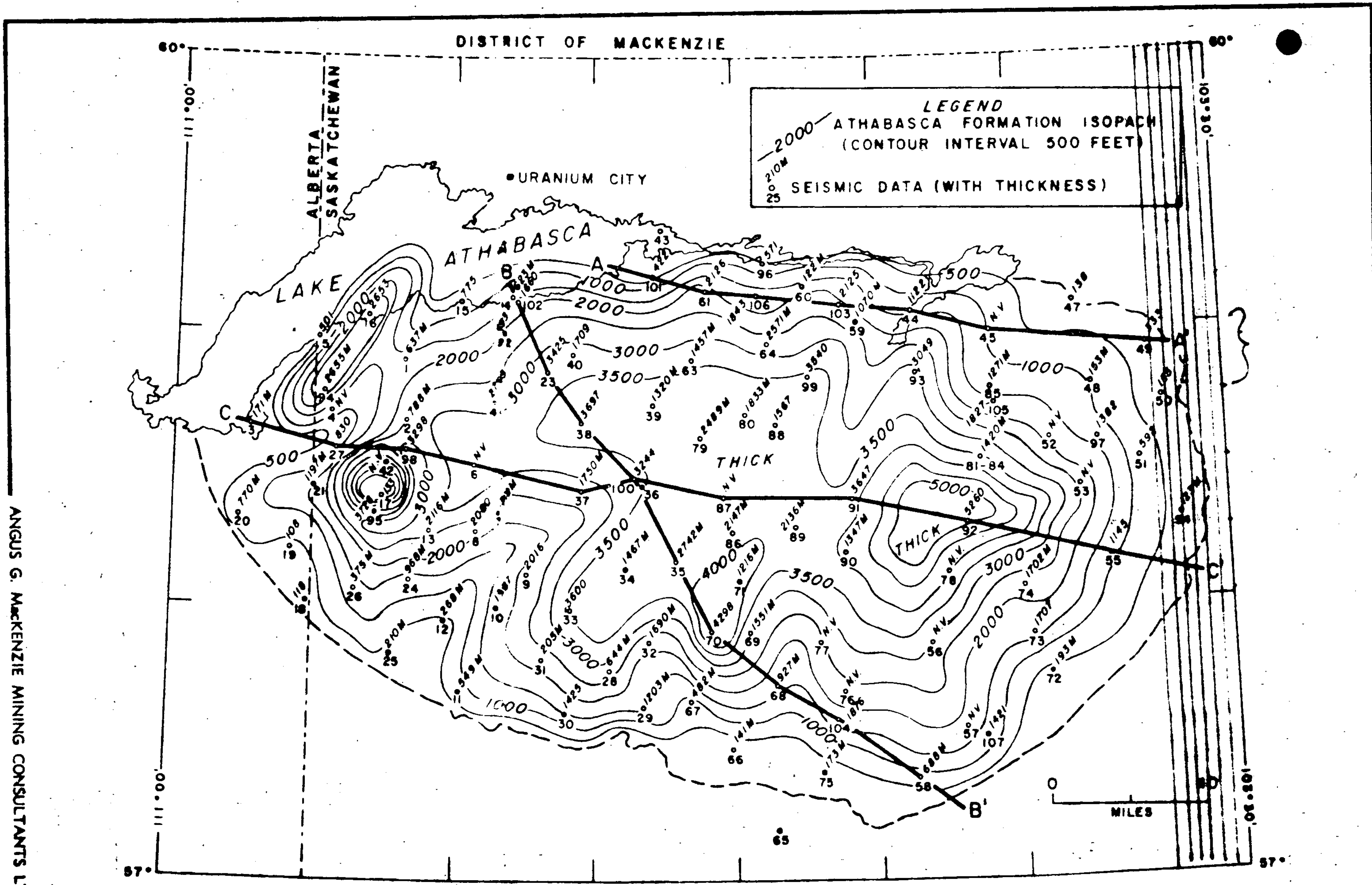

Thickness of Athabasca Formation, contour interval 500 feet, showing seismic locations and thickness of sandstone. M indicates computation of a minimum thickness.

FIG.6

From G.S.C map 2-1969 by G D. Hobson and H A. MacAulay.

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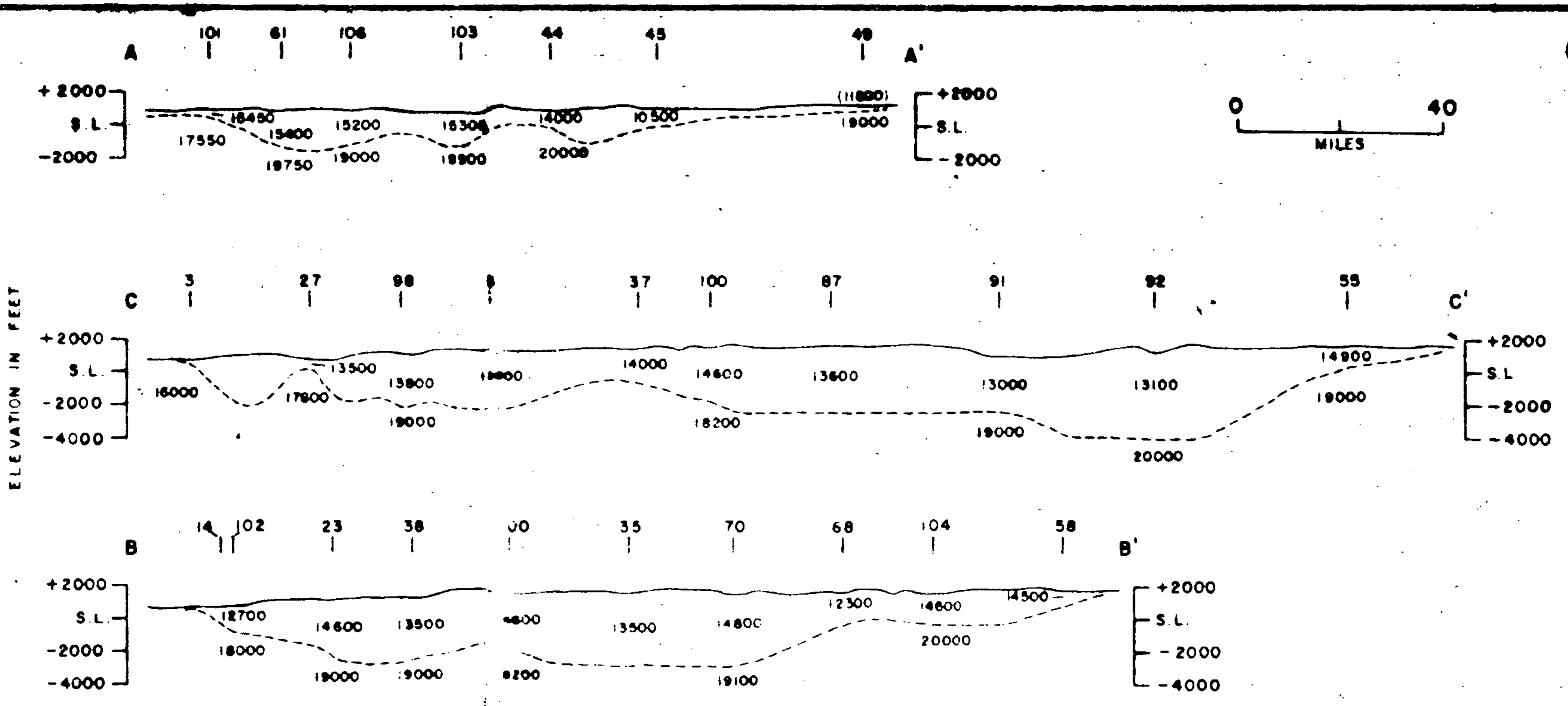
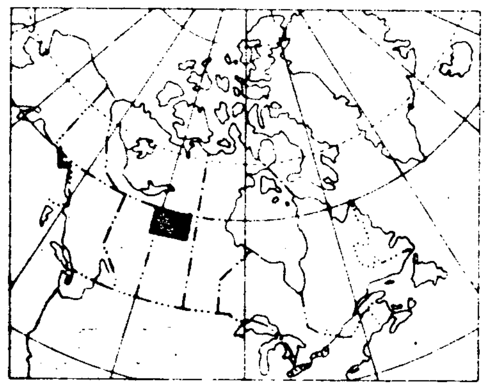


Cross-sections across Athabasca Formation.



INDEX MAP

FIG. 7

From G.S.C map 2 – 1969 by G D. Hobson and H A. MacAulay.

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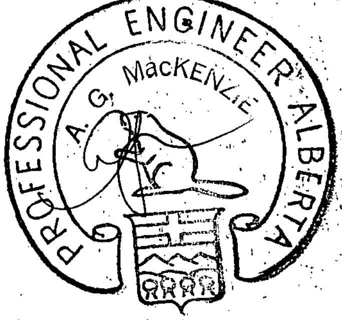
ECONOMIC GEOLOGY

No rocks of economic value were noted in the permit area since only the Athabasca Sandstone outcrops. However, the underlying units and the Athabasca Sandstone contact with them are the areas of interest for uranium and other metals.

The seismic survey of the Geological Survey of Canada shows the extension of the Black Bay fault crossing the property. It can be considered as one side of a set of faults forming a graben. This fault coincides with the trend of anomalous areas indicated by our airborne scintillometer survey. It also coincides with a defined kink in the aeromagnetic survey. With this data in mind, plus the fact that the expected underlying rocks are either Tazin Group or Martin Formation, the permit is well located structurally and mineralogically. The Tazin and the Martin host uranium and other metallic deposits to the north of Lake Athabasca.

The thickness of Athabasca Sandstone in the permit area ranges from a few hundred feet to the west to about 2,000 feet at the graben, thinning to the horst area on the east. The thicknesses involved, expecially in the Black Bay fault extension area, are not considerable and therefore it should be fairly economical to drill through the Athabasca to test the underlying rocks.

The erosional contact between the Athabasca and the underlying units has been found to have radioactive reworked materials. In the Middle Lake area the radioactivity was found in sandstone beds and conglomerate anywhere from the unconformity to the top of the scarp. It was generally concentrated in the basal layers and the underlying regolith. In many places the underlying

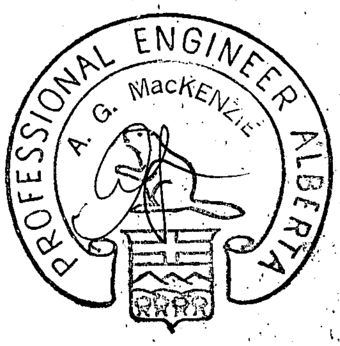


Tazin type rocks contained some uranium mineralization but not below the zone of weathering. Most of the radioactivity was due to Autunite, a secondary mineral thought to be derived from Uraninite and/or pitchblende from which some of the uranium has been leached, carried by ground water and concentrated in the clay material of the regolith. Thus the unconformity between the Athabasca Sandstone and the underlying rocks controls the deposit. The permit area where a graben is indicated by the seismic work is therefore a very favourable loci for such a type of concentration. This type of deposit, although not found to be commercial in the Middle Lake area may very well be in the permit area because of the nature of the pre-Athabasca topography which favours deposition of leach material in the graben basin. These types of deposits should be closely watched if a drilling program were initiated.

CONCLUSIONS

The Permit area is believed to be completely covered with the Athabasca Sandstone which in not known to host any kind of mineral deposit. The Athabasca Sandstone is likewise covered by glacial deposits and muskegs making surface investigations very difficult.

The underlying rocks are either the Tazin Group or the Martin Formation and both are known hosts of mineral deposits to the north of Lake Athabasca. No exposures of the underlying units are present on the property but they are strongly indicated to be about 200 to 2,000 feet under the surface from a seismic survey of the Geological Survey of Canada.



The extension of the Black Bay fault is strongly indicated by seismic methods and suggested by aeromagnetics. This fault extension falls along a definitive trend of radiometric anomalies.

The permit area could be worked year round if necessary.

RECOMMENDATIONS

Because of the glacial deposits and muskeg cover over most of the permit area, and the extent of the Athabasca Sandstone blanket, no further surface geological work is recommended.

A closely spaced ground scintillometer survey should be undertaken, however, to pin down anomalous areas along the Black Bay fault extension. When such areas are closely delineated a drilling program would be necessary to test them. A diamond drilling program could then be laid out from the results of the scintillometer survey. The first hole should be cored from top to bottom for control but the succeeding holes would not need to be cored for most of the thickness of the Athabasca Sandstone. We would recommend B. Q. Wireline equipment.

We would also recommend that the permit area be flown and photographed in false colour infra-red. This new exploration tool has proved to be very successful in known areas of extensive and deeply buried mineralization, such as the Kimberley area, B. C., Brenda Mines area, and others. This should be flown prior to any field work.

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Angus G. MacKenzie, P. Eng., P.Geol.
Consulting Mining Engineer - Mining Geologist

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THE ASSOCIATION OF PROFESSIONAL ENGINEERS OF ALBERTA
PERMIT NUMBER
P 502
ANGUS G. MacKENZIE MINING CONSULTANTS LTD

Calgary, Alberta.
October 23, 1969.

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DECLARATION OF QUALIFICATIONS

OF

ANGUS G. MACKENZIE, P. ENG., MCIM

1. I, Angus G. MacKenzie, hereby certify that I am a Consulting Mining Engineer - Mining Geologist. I am a graduate (B. E.) in Mining and Metallurgy of Nova Scotia Technical College, Halifax, N. S. and I have taken post-graduate economic geology at Dalhousie University.

2. I have spent the past thirty years in the Mineral Industries as a Mining Engineer and/or Mining Geologist and have maintained responsible positions in these fields at mining properties in Newfoundland, Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia, the Yukon and Northwest Territories. I have also had considerable experience in the U.S.A. and Mexico.

3. I am a Registered Professional Engineer in the Province of Alberta and Manitoba and am licensed to practise in Saskatchewan and British Columbia. I have been registered in Nova Scotia, Quebec and in the State of Colorado, U.S.A.

4. I have no personal interest directly or indirectly in the property herein reported on, nor in the securities of Columbian Northland Exploration Ltd. or any of its associated companies, nor do I expect to receive any such interest.

PROFESSIONAL ENGINEER ALBERTA
A. G. MacKENZIE

5. This report is the direct result of a personal examination, by myself and our company's Senior Geologist over a period of six days field work, on Pacific Silver Mines & Oils Permit #73, and a review of all pertinent literature for the area.

6. I have made this geological reconnaissance and practical prospecting report at the request of Mr. J. Wahl, President of Columbian Northland Exploration Ltd., 910 Aquitaine Tower, 540 - 5th Avenue S. W., Calgary 1, Alberta.

Angus G. MacKenzie, P. Eng., MCIM,
Consulting Mining Engineer - Mining Geologist

PROFESSIONAL ENGINEER
A. G. MacKENZIE
ALBERTA

Calgary, Alberta.
October 23, 1969.

THE ASSOCIATION OF
PROFESSIONAL ENGINEERS
OF ALBERTA
PERMIT NUMBER
P502
ANGUS G. MacKENZIE
MINING CONSULTANTS LTD.

PLATE I

19690019

OUTCROPS OF ATHABASCA SANDSTONE ARE LOW AND ROUNDED, MAKING IT HARD TO SPOT FROM THE GROUND. OUTCROPS ARE BEST SPOTTED FROM THE AIR AND THEN GROUND CHECKED.

TYPICAL GLACIAL DEPOSIT COVERED GROUND. SCATTERED BIG BOULDERS MAY BE MISTAKEN FOR OUTCROPS.

PROFESSIONAL ENGINEER ALBERTA
A. G. MacKENZIE

PLATE II

19690019

GEOLOGIST CHECKING LOCATION OF

ATHABASCA SANDSTONE IN AIR

PHOTOGRAPH WITH POCKET STEREOSCOPE.

GEOLOGICAL ASSISTANT TAKING

GEIGER COUNTER READING ON

THE SAME OUTCROP.

PROFESSIONAL ENGINEER
A. G. MacKENZIE
ALBERTA

19690019

PLATE III

GEOLOGIST TAKING GEIGER COUNTER
READING FROM ANOTHER OUTCROP,
ALSO ATHABASCA SANDSTONE.

GEOLOGICAL ASSISTANT TAKING
GEIGER COUNTER READING OVER
COVERED GROUND. BOULDERS
AROUND ARE ATHABASCA SANDSTONE.

PROFESSIONAL ENGINEER ALBERTA
A. G. MacKENZIE

Permit 19690019

LEGEND

- Joints vertical, bedding inclined.
- Approximate limit of outcrop.
- Broad anomalous zone.
- Restricted anomalous zone.
- MARK 2 Ground check point.
- Muskeg.
- ·10 cps Counts per second with scintillometer.
- ·cpm Counts per minute with Gieg-610 counter.
- +2205 Sample location.
- Flight line.

SCALE IN MILES

½ ¼ 0 ½ 1 1½ 2 2½

FIG. 2

PROFESSIONAL ENGINEER A. G. MacKENZIE ALBERTA

ANGUS G. MACKENZIE
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703, 5th St, CALGARY 2, ALBERTA
FOR
COLUMBIAN NORTHLAND EXPLORATION LTD.

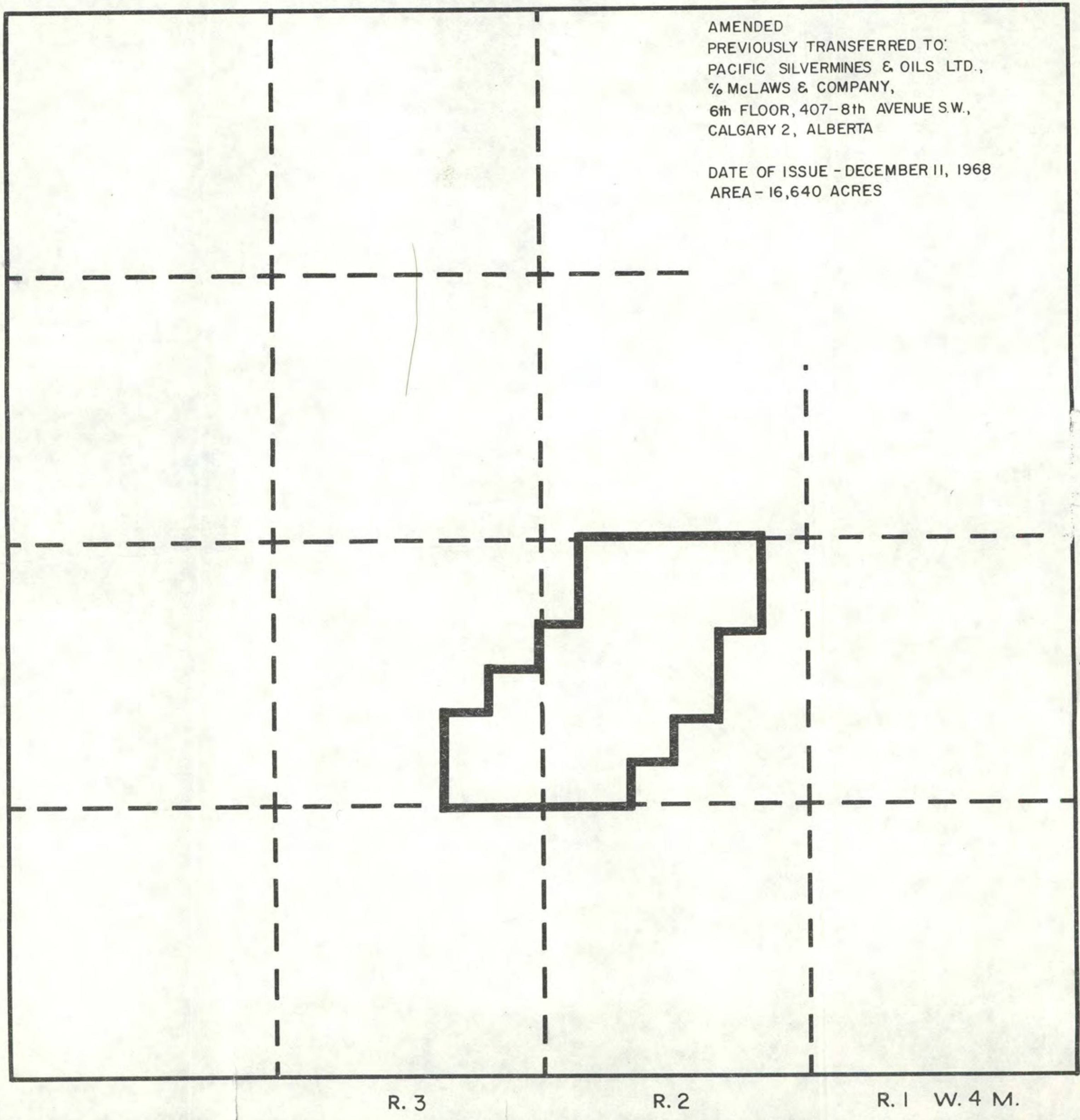
RECONNAISSANCE GEOLOGICAL SURVEY
COLUMBIAN NORTHLAND EXPLORATION LTD. PERMIT NO. 73

DATE: OCTOBER, 1969	DRAWN BY: D.J. RANDALL	APPROVED:
REV DATE:	SCALE: 1" = ½ mile	DWG NO: 104

19690019

19690019

QUARTZ MINERAL EXPLORATION PERMIT No. 73 (1)



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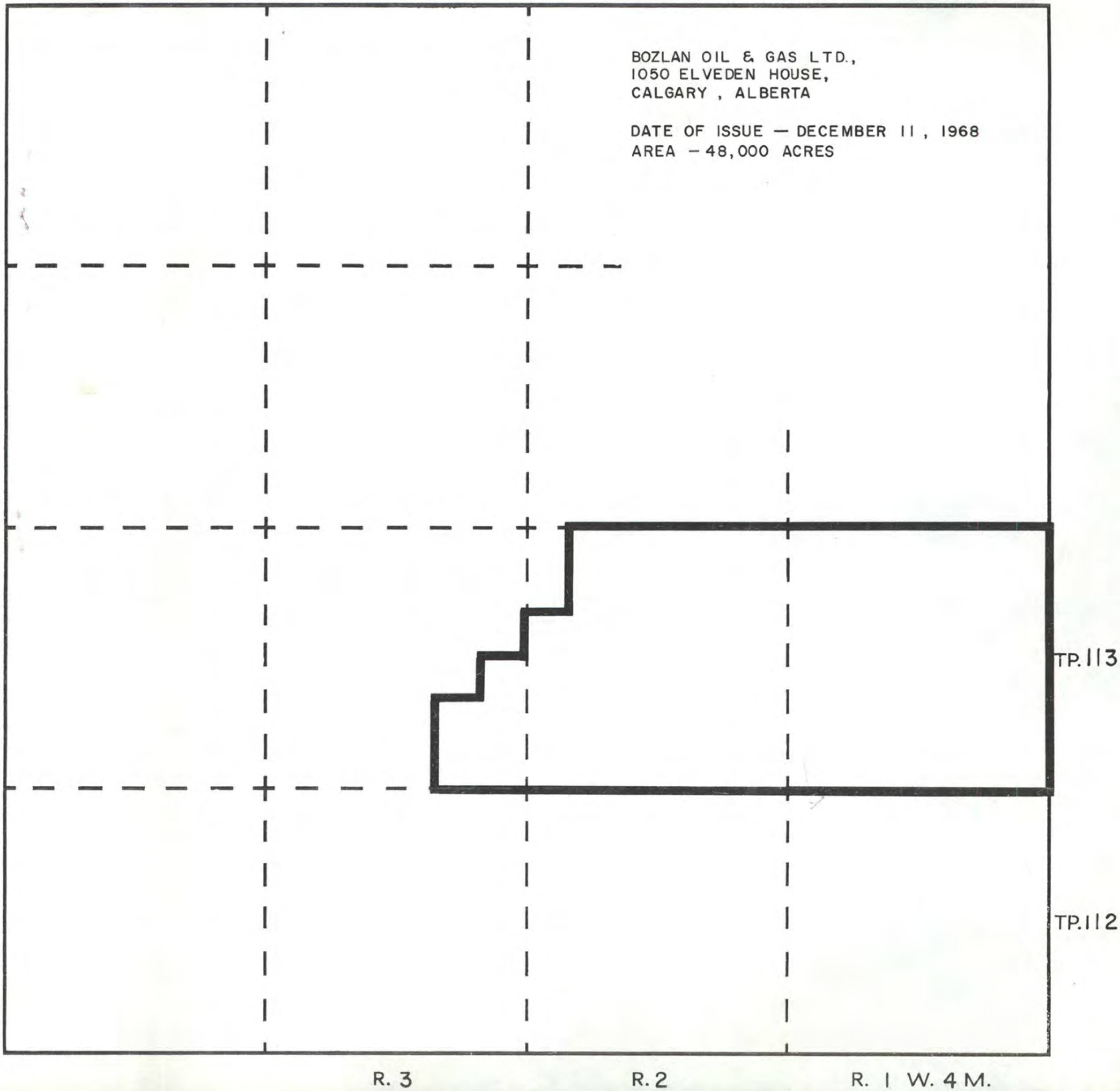

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