

GM 24661

GEOLOGIST'S REPORT, JOHAN BEETZ AREA

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Énergie et Ressources
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Québec 

GEOLOGIST'S REPORT

NEW HARRICANA MINES LIMITED

JOHAN BEETZ AREA, QUEBEC

PROJECT 676

BY

JOHN REISER

FIELD GEOLOGIST

Ministère des Richesses Naturelles, Québec

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SERVICE DES GITES MINÉRAUX

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MAPS BOUND IN REPORT

General Location - 1" = 200 miles

General Geology - 1" = 1 mile

Claim Map - 1" = 1,320 feet

Aerial Spectrometer Map - 1" = 1,320 feet

MAPS IN POCKET

Structural Geology - 1" = 1,320 feet

Detailed Scintillometer Survey - 1" = 100 feet

Geology Map - 1" = 200 feet

GEOLOGIST'S REPORT
NEW HARRICANA MINES LIMITED
JOHAN BEETZ AREA, QUEBEC
PROJECT 676

INTRODUCTION

In February 1967, New Harricana Mines Limited acquired by means of staking a group of 50 contiguous claims located in the general area of Baie Johan Beetz, Electoral District of Duplessis, Province of Quebec. The purpose of this acquisition was to investigate and assess the potential offered by the pegmatite sills that cap a number of the hills within the boundaries of the staked area and which were believed to be similar and possibly belonging to the same system of pegmatite sills which had attracted the attention of uranium prospectors in the early 50's in the immediate vicinity of Johan Beetz, on the St. Lawrence North Shore.

DESCRIPTION OF THE PROPERTY

The Property consists of 50 contiguous unpatented mining claims numbered as follows:

<u>Prospector's License</u>	<u>Claim Numbers</u>
260371	1-5 inclusive
260372	1-5 inclusive
260583	1-5 inclusive
260589	1-5 inclusive
260590	1-5 inclusive
260591	1-5 inclusive
260592	1-5 inclusive
260593	1-5 inclusive
260594	1-5 inclusive
260595	1-5 inclusive

LOCATION OF PROPERTY

The property is contained in a rectangular area that covers a surface of approximately 2,000 acres in Desherbiers Township, Duplessis County. It is 32 air-miles northeasterly of the Town of Havre St. Pierre. The centre of the claim group is a distance of 10 air-miles, north 45° west from the little fishing community of Baie Johan Beetz on the North Shore of the Gulf of St. Lawrence.

Locally it is between the south end of Lac Ferland and the north portion of the west arm of Lac Turgeon and straddles, in a general north-south direction the Corneille River which flows south from Lac Ferland to Lac Turgeon, thence on to the St. Lawrence.

ACCESS

The property can be reached either by canoe from Johan Beetz or by air from Havre St. Pierre. The canoe route is impractical as the waterway is cut by a 170-foot waterfall three miles north of the village and additional portaging has to be done for at least 3,000 feet between Lac Turgeon and Petit Piashti Lake. Such a trip by canoe requires 2-3 hours from Lac Turgeon to the village of Johan Beetz.

In January 1968, a winter road was cut from Johan Beetz to the property but it is only accessible to track-type vehicles under good snow conditions. The present winter route is about the only practical means of moving in heavy equipment at this time. There is a winter road along the coast from Havre St. Pierre to Johan Beetz upon which snowmobiles and tractors can operate. Due to tidal conditions, many of the rivers

that enter the St. Lawrence between Havre St. Pierre and Johan Beetz cannot be crossed before mid-January.

CLIMATE

Experience during the winters of 1967 and 1968 indicate that the temperatures are never excessive due to the proximity of the St. Lawrence Gulf. Maximum temperature registered during the course of the summer of 1968 was 80°F. Minimum during the present winter has been -25°F. From October to December, the weather is usually unsettled with dominant easterly and southeasterly winds that bring in heavy fog and rain. Several gales were experienced with wind velocities up to 80 m.p.h. and caused extensive light damage to camp buildings. During November 1967, the number of flyable days amounted to ten.

Freezing up of the lakes in the fall is considerably slower than in most other parts of northern Quebec and stretches from the end of October well into December. Canoe travel was impossible after mid-November and the first landing of ski equipped aircraft on the frozen surface of Lac Turgeon did not take place until the third week of December. During this intermediate period, helicopters were the only means of transport and they operated from a base at Havre St. Pierre. Even with this type of aircraft the conditions for flying were extremely poor.

TOPOGRAPHY

The area in general can be considered as typical topography of a glacially eroded peneplain with the very apparent feature of "moutonnement" frequently found in granitic environments. There is

a gentle and progressive decrease in elevation towards the north and west of the property. Although elevations seldom exceed 300 feet above local lake levels the topography, due to evident faulting along general north-south and east-west directions is not one of gently rolling hills. On the contrary, it is rugged enough to prohibit the use of any type of powered vehicle in summer time. Steep scarps, often with rugged talus slopes and deep gorges, are partly filled with semi-fluid bog material that obviate the use of tracked vehicles.

TIMBER

Slopes and valleys produce a fairly dense and medium sized growth of spruce, balsam and occasional poplar and birch but vegetation is far too erratic and patchy to be considered as commercial. Hilltops are either barren or produce sparse clumps of stunted spruce that are seldom over four inches in diameter at the butt.

OVERBURDEN

On the New Harricana Mines Limited claims outcrop is estimated at 15-20% and the balance of the area has overburden in excess of 5 feet for not more than one-third of the total overburden area. The hillsides usually have a foot or two of feldspathic quartzose sand of variable grain size that is covered by a few inches of sphagnum moss.

FRESH WATER, DRAINAGE

About 15% of the property is covered by water, the main expanse being that of Arrowhead Lake which lies 1,500 feet due north of the west end of Lac Turgeon and which is an expansion of the Corneille River. Most of the property drains from east or west into this stream.

For diamond drilling purposes, there is no point on this property that is more than 2,000 feet from an adequate supply of drill water. Minor elevation problems can be expected in a few locations.

PREVIOUS WORK

During the summers of 1951 and 1952, Dr. Gerald E. Cooper mapped the general Johan Beetz area for the Quebec Department of Mines. This work was published as Geological Report No. 74 and map No. 1099.

In 1954, a certain amount of prospecting was performed on the shoreline of the Gulf in the immediate vicinity of Baie Johan Beetz. The search was for uranium at this time and the pegmatite dykes and sills of Lac Tanguay and Quetachu Bay were trenched and sampled. It is understood that encouraging values in uranium were obtained. Interest in this area soon faded due to the collapse of the uranium market at that time. We found no indications of any previous prospecting work being done in the immediate vicinity of the New Harricana property.

GENERAL GEOLOGY

The property is divided into two distinct units, each one retaining its own topographic and geologic entity.

AREA (1) -- The north half and west central portions of the claim group straddles a trough of sediments, metasediments and highly altered intrusive rock types. These strike in a general northeast-southwest direction and lie between Lac Ferland and Lac Turgeon granite batholiths. This trough varies from 1-1/4 to 1-1/2 miles in width.

The hills of the area are usually underlain by fine grained, grey impure quartzites that dip steeply to the north, northwest and

west. Also noted were large bodies of hybrid rock types which could be best described as quartz-hornblende-biotite schist; they are probably a phase of gabbroization of the older quartzites.

The extreme northerly part of the claim group is underlain by metagabbros, although pegmatites are noted rising as ridges along the north shore of Hatchet Lake on Claim 1, License 260372 and on both sides of the Corneille River. In this section they seem to be conformable with the sediments.

With the exception of the ridges that border the Corneille River on both sides, the topography is generally one of depression, heavily overburdened and containing more bogs and muskegs than the rest of the area.

AREA (2) - South half and east central portion of the property.

This sector of the claim group seems directly related to and probably forms part of the Lac Turgeon biotite granite batholith as described by Cooper. The most characteristic feature of this area is that is underlain by medium to fine grained pink granite, pink granite greisen, pink granitized metasediments (mostly quartzite) and white and pink pegmatites. These latter rocks seem to cap most of the hills and the gabbro, metagabbro and gabbroized sediments merely occur as inclusions within the main intrusive stock. However it should be noted that the New Harricana holdings which lie along the west bank of the Corneille River produce considerably more gabbroized metasediments and schists than has been seen on the east side of this river.

As a result of this, the topography of this part of the property is definitely elevated because of these erosion resistant rocks capping the hills. From the air one gets the impression of an assemblage of flat domed knolls or low hills with an east-west trend and roughly elliptical shapes. These low hills are often separated by fairly deeply incised narrow gullies that separate one row from the next. It could be an expression of local faulting that strikes normal to the major Corneille River fault. Speaking generally, the section could be considered as a minor plateau that has a gentle tilt to the north and west towards the metasedimentary trough of Area (1). Most of the creeks in this section will have a north-northeast trend because of the gentle slope.

From our field observations, it is believed that the structure in this specific area is generally a flat one with locally a certain amount of warping that may have been produced by intrusive effects of the granite into the older formations.

This structure is well evidenced on the claim 260590-4 approximately 150 feet due south of Beaverhouse Pond between Stations 12 E and 14 E along Line 2 N. Here a clean cut section of the geology is produced along the vertical plane of a 20-foot high scarp that overlooks the little lake.

Wherever vertical sections such as this are exposed on scarps or steep outcrops, it is noted that the quartzite beds usually show minor metamorphism or granitization and rarely exceed a few feet in thickness. They are generally underlain or interbedded by/with pink granite or white and pink pegmatite. This is a persistent feature

of the area. The general attitude of the beds will vary somewhat but generally speaking the dip is to the south and varies from west to east at angles from 20° to 50°.

It is unknown for sure whether such dips represent an average for the older sediments of the area or not, because they have usually been noted along the south sides of small scarps and east-west breaks that could be distorted by faulting. It would not be unreasonable to assume that certain deformations have been caused by local movements.

It was not firmly established in the field that the meta-gabbros and gabbroized sediments are persistent in their strike. These rocks belong to some of the older basic intrusives that Cooper refers to as hybrids. In most cases they appear to be variations of the quartz-hornblende-biotite schist, with the quartz content varying from zero to 80-85% and often containing a good deal of magnetite, some of which is in the form of well formed crystals up to 1-1/2 inches in diameter. A good exposure of these rocks is to be found north of Beaverhouse Pond between Lines 24 N and 10 N on the top of the hills in that area. Here they form flat-lying, somewhat tabular shaped bodies that have a general north-south orientation.

They have also been noted at a lower stratigraphic horizon on the sides of hills or along the faces of cliff walls where they appear as narrow sheets of very tightly schisted amphibole gneisses or highly sheared quartz-hornblende-biotite schist. On Claims 4 and 5 of License 260591, they appear to be squeezed between metaquartzite and pegmatite and give the impression of being pinched out and swelling with the sinuosities of the contact.

From results of diamond drilling performed on the property of Northern Canada Mines Limited, a short distance east of the east boundary of New Harricana ground, it is believed that in this general area metagabbro or gabbroized metasediments represent continuous horizons. They appear to be only locally disrupted by later injections of pegmatites and/or faulting. The overall picture gleaned from our field observations not only on New Harricana ground but on the adjacent properties indicates that the area to the west and directly north of Lac Turgeon is still within the periphery of the core of the Lac Turgeon batholith. All the rocks seem to show the effect of "lit-par-lit" granitic invasion, partial granitization and gradational pegmatization of the older sedimentary rocks.

ROCK TYPES

The major rock types encountered on the property are pegmatite, granite, granite gneiss, quartzite (and/or metaquartzite) and a series of gabbroized sediments or altered gabbro. These rocks vary in composition and structure from an amphibole gneiss or massive hornblende-biotite schist to quartz-rich biotite-hornblende schist.

(a) PEGMATITE - Most of the pegmatite seen in Area (2) occurs as sill-like bodies of medium to coarse grained material with the sodic (white) feldspar predominating over the potassic (pink) variety in the quartz-biotite pegmatite.

It is believed that both white and pink pegmatites belong to the same age and structural system and that they selectively replace some of the sediments. This has not been definitely established but in several locations the flat-lying sill-like bodies of pegmatite have been

noted to overlies quartzite and the two rock types appear to grade into one another without any visible contact. It is particularly noticeable in one variety of coarse grained quartzite or sandstone on the walls of the prospect trench cut across the side of the hill on Line 8+70 N around Station 23+10 E.

The two pegmatites have numerous physical features in common. The feldspar content is always high, quartz is minor and poorly distributed in rather coarse clumps. Biotite, even when very minor, is usually highly irregular in its distribution and occurs as coarse grained over-developed books. Zoning of both biotite and magnetite is occasionally noted in these pegmatites.

A third type of pegmatite has also been seen. It occurs as dykes and cuts the first variety in some locations. It has a uniform distribution of its constituent minerals and appears not unlike a very coarse grained granite. A mottled texture is common and it shows no sign of zoning.

(b) GRANITE - The most common granite is a fine to medium grained variety with a pink potassic feldspar content in the order of 65%. Quartz and biotite are evenly distributed minor constituents. It has not been definitely ascertained if the granite of the area is a true intrusive or a granitized sediment. Field specimens always seem to contain a certain percentage of rounded quartz grains that could suggest a sedimentary origin. Diamond drill cores on the adjacent Northern Canada property would suggest that true granite in the area lies at considerable depth and that before it is reached, it is necessary to pass through a variable thickness of granitized quartzite and sometimes granitized metagabbro.

(c) QUARTZITE - Most of the quartzite noted on the claims has surprisingly little granitization in evidence and also shows only very moderate deformation. Schistosity is often weak and the grains are usually quite small and the texture of the rock is generally friable. The general coloration of a freshly broken specimen of quartzite is grey with a bluish cast. Two or three percent biotite as very small flakes is commonly present in this rock.

(d) AMPHIBOLE GNEISS - Mr. C.T. Ritchie, Consulting Geologist, following his visit to the property in August 1967 reported an outcropping of amphibole gneiss at Line 13+35 N and 14+00 E. He describes it as containing about 70% amphibole, 20% biotite and no more than 10% plagioclase feldspar. It exhibited a very strong foliation and linear arrangement of the mineral constituents, a feature which Cooper in his government report attributed to deformation stress upon the sills, particularly at their contacts with metasediments, during the granite intrusion. The only occurrence reported by Cooper is said to be near Lac Turgeon.

(e) METAGABBRO - This is our terminology for the so-called "hybrid rock types" described by Cooper in his 1957 report, pages 32-33.

These rocks vary from a black, heavy, medium-grained type to a quartz rich hornblende biotite schist. In the first variety, there is almost no orientation of the dark minerals which are grouped in irregularly scattered clusters and quite often contain appreciable magnetite, as on the western shore of Beaver Pond Lake and the south shore of Long Lake. The schistose member is more acidic, the mafic minerals may run as low as 10-15% and are commonly very strongly laminated.

When quartzose, it appears to have a definite cataclastic texture.

Contacts between the hybrid rocks and the granites are always sharply defined and they appear to be little affected by granitization.

"Leopard Rock" - This is the more basic variety that has the mafic clusters distributed in such a fashion that it has a mottled or leopard texture. It is commonly schistose and usually contains disseminated chalcopyrite with minor pyrite and pyrrhotite. In places selected samples of this material will grade as high as 2% in copper. Visiting geologists from the Quebec Department of Natural Resources felt that all hybrids seen in the area are possibly altered phases of original gabbros. They also indicated that increased shearing and foliation occurred in close proximity of the contacts. Our own field examination would seem to bear out this contention.

STRUCTURAL GEOLOGY

Cooper in his Geological Report No. 74 did not believe there was much evidence of faulting in the area but suggested that bedding plane faults, difficult to recognize in the field, might be present. We do not entirely agree with this because shearing and mechanical brecciation has not been observed to any considerable degree; it should be taken into account that apart from the pegmatite capped hills there is actually very little rock exposed. Glaciation may also have worn off slickenside evidence.

We feel that the course of the Corneille River in Lac Ferland and Lac Turgeon represents the strike of a major break in the area.

This contention is supported by the following observations:

- (a) When flying over the Lac Turgeon area and across Arrowhead Lake, the west shoreline would suggest a fault scarp.
- (b) Suggestion with faulting and movement along this trough is evidenced by intense crenulation in the bordering rocks.
- (c) Plunge of the quartzite beds on either side of the Corneille River are reversed to one another.
- (d) The presence of more metagabbro exposures on the west side of the Corneille River would suggest that this area has been uplifted to expose a deeper stratigraphy than that evidenced on the east side.
- (e) Quartzite beds outcropping on either section of the river show divergent dips; southwest on the west side and to the southeast on the east side. This is exposed in reasonably good cliff face exposures.
- (f) About 1,000 feet south of the New Harricana south boundary and along the west arm of Lac Turgeon, there is an apparent discrepancy in the elevation of the contact between quartz-hornblende-biotite schist and granite. This is further evidence of a discordance in structure and could suggest the degree of uplift along the fault plane.

There is little evidence of lateral displacement or movement along the north-south fault plane.

On Line 23+45 E; 20 N a well defined mechanical breccia of metagabbro can be seen. This breccia pattern ties in with the system of slightly arcuate east-west oriented lineaments that are visible on the air photographs. The dominant one crosses Arrowhead Lake near its wide base and runs approximately between Lines 24 N and 26 N. The north wall of this break seems to be a massive body of fine to medium grained granite crisscrossed by narrow dykelets of coarse white pegmatite. The south wall, along its vertical section, shows an underlayering of different rock types and produces evidence of intense shearing striking 50° south of true west at Station 7+80 E, lying 23+80 N.

East-west shearing is also in evidence around Station 19 E on Line 14 N where a narrow shear zone skirts the south end of a small body of metagabbro included in white pegmatite. It carries an appreciable amount of sulphides amongst which is visible chalcopyrite. This small inclusion of metagabbro is believed to be a sheared sliver from a much larger mass of identical material that outcrops 15-20 feet to the west.

Evidence of east-west displacement or bedding faults is supplied along the shoreline contour of a small lake, located on the property of The Coniagas Mines Limited, 4,000 feet to the east. This pond straddles a very distinct east-west lineament and the northern half of the lake seems to have been shifted to the east a few hundred feet. Another east-west oriented lineament runs along Line 6 N between this line and 8 N. It crosses Beaverhouse Pond and can be traced for several thousand feet or more to the west. Mechanical breccia is seen outcropping on Line 10 N at 15+25 E. Strong intermittent sulphide development has been noted along this break but always confined to the hybrid gabbro rock type.

MINERALIZATION

Mineralization on the property is of two different types.

(a) URANIUM MINERALS - Radioactive minerals are consistently found in the pegmatites in two forms and discernible in the field in hand specimens. They are found in both the dykes and the sills. Uraninite occurs as variable sized grains ranging up to 3 mm. in diameter and also as black, pitchy thread-like veinlets that cut the host pegmatite.

The usual yellow oxidation products from radioactive disintegration occur as uranophane.

Field evidence would indicate that the uranium mineralization is of a hydrothermal origin. Alteration effects that always seem to be attendant to the uranium mineralization are mainly smokey or amethystine quartz. The grains of uraninite usually occur within microfractured or sheared areas of the host rock. The crystals are often distorted and show the effects of metamorphism.

Diamond drilling done on the neighbouring Northern Canada property definitely indicates an increase in uranium values as contacts are approached and in zones of shearing and fracturing.

Sections of pegmatite that carry a high percentage of biotite mica usually have an equivalent amount of uraninite mineralization. These biotite concentrations often show a definite alignment in the containing pegmatite and may represent a relic structure from the original sedimentary rock that has been replaced by the incoming pegmatite. The biotite invariably shows strong irridescence on its cleavage plates when uranium mineralization is present. Gas bubbles in the biotite plates is not uncommon. These are both considered to be effects of radiation of the biotite.

It is normal to find the uraninite grains concentrated along the fractures and joint planes although the general pattern is one of erratic distribution throughout the overall picture. The fractures that appear to be mainly affected by the uranium mineralization have a general trend ranging from N 20° to N 40° E. It must be admitted that it is possible for these concentrations to have been caused by downward working surface waters although no uranophane, the normal oxidation product, has been noted along these fault surfaces. The main areas for development of uranophane seems to be the biotite rich zones, particularly where the biotite books are coarsely developed.

Low, but consistent, values in molybdenite and other sulphides such as pyrite, pyrrhotite and chalcopyrite have been noted associated with the uranium rich biotite. Only occasionally has red hematite staining been in evidence on this property although it is noted elsewhere in the general area. No relationship has been established between the sulphides found in the pegmatites and the sulphide rich portions of the gabbroized rocks that we refer to as the "leopard" rock.

Thorium is a very minor constituent in these ores. The thorium content does seem to increase with the higher U_3O_8 content but the general average ratio is about one of thorium to every five uranium units. This ratio pretty well holds for the entire Johan Beetz camp.

DISTRIBUTION OF MINERALIZATION

Highly radioactive areas or "hot spots" within the pegmatite do occur. These are not only erratic in their distribution but are extremely irregular in shape and do not seem to have any visible structural control. They may vary in size from a few inches to several feet in diameter; they are usually dark blue-grey in colour and stand out against the white background of the sodic pegmatite. An alteration rim up to two inches in width of burnished brown colour usually can be noted and this is considered to be a radiation effect. Radial shattering of the containing host rock around individual discrete grains of uraninite is also thought to be caused by radiation.

(b) SULPHIDE MINERALIZATION - Underlying the sill-like bodies of pegmatite is altered gabbroic schist. At several locations, this basic rock carries values in copper with very minor associated nickel and silver. The copper sulphide is chalcopyrite. Pyrite and pyrrhotite are also often present, sometimes in noticeable amounts. The sulphides occur as fresh-looking fillings in fractures associated with injected quartz in the basic schist. The chalcopyrite-filled shears and cracks appear to have a definite alignment that possibly parallels the contact of the gabbro with the adjacent younger intrusive.

One such occurrence of visually good chalcópyrite mineralization in this basic rock has been picked up on the New Harricana claims for a 3,000 foot broken length along the Beaverhouse Pond fault. It is particularly noticeable between Lines 10 and 15 N of the survey grid. Particular attention should be paid to trenches at 7+60 N, 9+50 W, 12+70 N and 21+00 E. Selected samples within this mineralized horizon have yielded values as high as 0.82% nickel and 5.86% copper. The average copper content though would be less than 1%.

No definite continuity of this sulphide mineralization has been established as yet but mineralization of varying intensity of this type has been found in nearly all trenches. A considerable body of mineralized metagabbro and gabbroized metasediments could exist in the south and westerly portions of the New Harricana ground. The area is heavily overburdened and further prospecting would require geophysical methods.

FIELD WORK PERFORMED

AERIAL SURVEY - In June 1967, under the supervision of Dr. A. B. Baldwin, an airborne spectrometer survey was carried out over the property using a Grumman Goose aircraft equipped with a Sharpe SC-1 Scintillometer rented from Seigel Associates Limited of Toronto. A 4 x 5 inch Harshaw sodium iodide crystal and photo-multiplier assembly were used in the airborne detector head mounted in the extreme tail of the aircraft. The fully transistorized ratemeter and Moseley recorder were mounted in the main cabin.

The gamma ray spectrometer used the integral method of radio-metric detection integrating all energies in the spectrum above a pre-set threshold energy value. The threshold was set to catch only the dominant uranium (radium) and thorium peaks. The lower energy potassium radiation was below the threshold employed and hence, was not detected by the method used.

The instrumentation of this spectrometer is more fully described in a paper by R. H. Pemberton and H. O. Seigel (Airborne Radioactivity Tests - Elliot Lake Area, Ontario - Canadian Mining Journal, October 1966).

Twenty-five line miles were flown in a north-south direction at 1/8 mile intervals and at a mean terrain clearance of 100 feet. Fourteen anomalous areas were picked up with average readings varying from 1.5 to 1.8 times normal radiation background. Of these, fourteen anomalies all except three have now been confirmed on the ground and found to be caused by uranium (uraninite) mineralization of varying intensities.

GROUND SURVEYS

(a) LINE CUTTING - In order to provide ground control for the subsequent prospecting and geological investigation of the claims, a north-south base line was cut in the middle of the property and crosslines turned off at 200 foot intervals in the southern and central part of the property. Pickets were established at 100 foot intervals along the base lines and crosslines. A total of 24 miles and 4,295 feet was cut and chained (see map attached).

(b) PROSPECTING - During the months of July, August and September a systematic examination of outcrops on the property was made by prospectors Nicholas and Alyre Cormier using Geiger counters. This was in the south-central part of the property while the northern section was only given reconnaissance coverage.

The two most westerly anomalies in the south section were confirmed to be caused by a capping of radioactive pegmatite on top of the hill, a few hundred feet west of the Corneille River and approximately at 52+00 N. This is believed to correlate with the two airborne responses obtained in this section although some discrepancy is possible. In addition a great many new radioactive occurrences were uncovered during the ground exploration over and above what had been indicated by the airborne work.

It is felt that the overall mass of the Lac Turgeon and Lac Ferland granitic batholiths are radioactive to a certain degree. The airborne survey certainly suggested this and it is believed that the areas in which no response was obtained by the aircraft was probably because of overburden conditions. It is therefore believed that the aerial survey was essentially very useful in outlining intrusive areas as against the metasediments. It certainly indicates sections on which to concentrate ground investigation.

(c) DETAILED GEOLOGY - The writer carried out a detailed geological mapping programme from the survey line grid in the southern half of the property. This was between the east and west control lines and succeeded in bringing to light one additional mineralized occurrence.

(d) TRENCHING - A total of nineteen rock trenches were excavated between July and October 1967. These were mainly in the southern half of the property. Of these nineteen trenches, seven were cut across contacts between uraniferous pegmatites and quartz-biotite-hornblende schist. In addition to the uranium content, low but interesting values in copper, molybdenite and nickel were obtained. The total cubic feet of rock excavated during the summer on this property amounted to approximately 3,115 feet. Location and dimensions of the trenches are reported on the following page:

<u>Location</u>	<u>Claim No.</u>	<u>Rock Type</u>	<u>Dimensions</u>	<u>Volume Cu.Ft.</u>
52+00 N; 16+20 E	260371-4	White Pegmatite	170'x3'x1'	510
7+60 N; 9+50 W	260591-3	Pegmatite & Schist	20'x3'x4'	240
13+65 N; 14+00 E	260591-4	Pegmatite	35'x3'x4'	420
13+35 N; 14+00 E	260591-4	Pegmatite	18'x2'x3'	108
10+00 N; 16+35 E	260591-4	Pegmatite	7'x4'x1.5'	42
10+00 N; 23+65 E	260591-5	Pegmatite & Schist	15'x5'x3'	225
9+65 N; 23+65 E	260591-5	Pegmatite & Schist	22'x3'x2'	132
9+50 N; 23+65 E	260591-5	Pegmatite & Schist	16'x2'x2'	64
0+50 N; 15+00 E	260590-4	Pegmatite	90'x2'x2'	360
0+00; 14+00 E	260590-4	Pegmatite	5'x3'x2'	30
0+20 S; 13+60 E	260590-4	Pegmatite	3'x3'x2'	18
8+70 N; 23+25 E	260591-5	Pegmatite	17'x2'x2'	68
8+30 N; 23+10 E	260591-5	Pegmatite	8'x4'x2'	64
9+40 N; 14+80 E	260590-4	Pegmatite	18'x4'x3'	216
15+00 N; 19+37 E	260591-5	Pegmatite & Schist	18'x4'x2.5'	180
1+25 N; 30+70 E	260590-5	Pegmatite & Schist	70'x2'x2'	280
0+30 S; 30+00 E	260590-5	Pegmatite	5'x3'x2'	30
12+70 N; 21+00 E	260591-5	Pegmatite & Schist	12'x3'x2.5'	80
12+00 N; 21+00 E	260591-5	Pegmatite & Schist	8'x3'x2'	48
Total Cubic Feet				3,115

In addition to these definite trenches, a great number of blasts and "pop" shots have been put in on the property and particularly between Lines 12 N and 1 S from 22+35 E in order to break through the leached and often barren capping of the pegmatite in order to check on radioactivity in the fresh rock.

SAMPLING:

TRENCH 0+50 N; 15+00 E

U₃O₈ values ranging from 0.009% over 2.0' in sample N-66 to 0.008% across 1.1 feet in sample 76-A.

CROSSCUT E-1 at 10+00 N; 23+65 E

Averages across width of dyke:

23+65 E;	-	6.3'	-	0.11%	U ₃ O ₈	equivalent
23+62 E;	-	8.5'	-	0.23%	U ₃ O ₈	equivalent

CROSSCUT E-11 at 9+65 N; 23+60 E

Averages across width of dyke:

9+65 N	-	1.9'	-	0.052%	U ₃ O ₈	equivalent
9+63 N	-	1.2'	-	0.13%	U ₃ O ₈	equivalent
9+61 N	-	2.0'	-	0.076%	U ₃ O ₈	equivalent

CROSSCUT E-111 at 9+30 N; 23+60 E

Averages across width of dyke:

9+30 N	-	2.3'	-	0.10%	U ₃ O ₈	equivalent
9+28 N	-	2.0'	-	0.19%	U ₃ O ₈	equivalent
9+26 N	-	1.5'	-	0.24%	U ₃ O ₈	equivalent
9+24 N	-	1.5'	-	0.057%	U ₃ O ₈	equivalent
9+22 N	-	1.9'	-	0.022%	U ₃ O ₈	equivalent
9+20 N	-	1.9'	-	0.025%	U ₃ O ₈	equivalent
9+18 N	-	2.0'	-	0.17%	U ₃ O ₈	equivalent

(e) RADIOMETRIC GROUND SURVEY - A radiometric ground survey was performed between Lines 6 N and 15 N and 19+00 E and 27+00 E containing an area of roughly 720,000 sq. ft. In this section, higher than average radioactivity had been noted with the Geiger counters so it was thought advisable to endeavour to detail something in this section. This work was carried out by geophysical technician W. J. Sharpe of Toronto during

October 1967 using a probe type scintillometer. Holes were dug or rammed into the overburden with a prod and readings were taken at surface and at depth of approximately two feet in an effort to determine any increase in radioactivity in overburdened areas. These results are shown on the attached map.

This probe type survey confirmed an east-west structure to the north of the zone possibly expressed by the sulphide mineralized shear zone noticed between 19+00 E and 21+00 E on Line 14 N. In addition, it tended to outline the southwest-northeast Beaverhouse Pond fault zone.

CONCLUSIONS

The possibility of finding a medium sized low grade uranium ore body seems reasonable. An area containing approximately 350,000 sq. ft. has produced a large number of highly radioactive "hot spots" between Lines 12+00 N; 21+00 E and 8+70 N; 23+25 E in the south and in the north from 15+00 N; 19+37 E to 10+00 N; 23+65 E.

Partial stripping of this area has been done and it is believed that a continuation of this programme will indicate further radioactive hot patches that will warrant investigation.

The presence of copper and other base metal sulphides associated with the gabbroic type intrusives has had only little attention. Further work on this type of occurrence is desirable particularly in the neighbourhood of the intrusive contacts along the trough between the Lac Ferland and Lac Turgeon batholiths.

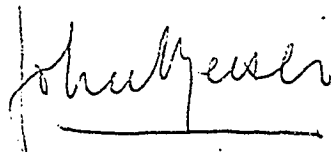
RECOMMENDATIONS

URANIUM - Further stripping in the area bounded by 8+00 N, 15+00 N and 19+00 E, 24+00 E should be done and a very detailed survey of the area made by means of a sensitive scintillometer equipped with probe.

Should additional radioactive patches be located, then two diamond drill holes, boring at 60° to the east, should be collared at each extremity of the outcropping of pegmatite dyke between Lines 10 N and 9 N. The purpose of this drilling would be to determine if this dyke structure widens down dip to the west. This is inferred from the persistent dip at surface where the dyke yielded consistent good values in three crosscuts. Any increase in width of this structure would add appreciably to the tonnage possibilities of the area.

COPPER - Ground magnetometer and electromagnetic surveys are recommended to determine the copper and base metal possibilities on both sides of the trough connecting Lac Ferland and Lac Turgeon batholiths. It would be necessary to extend the present coverage for this area with a basic line paralleling the strike of the metasediments.

Respectfully submitted,



John Reiser
Field Geologist

Toronto, Ontario
March 15, 1968

SAMPLE RECORD SHEET

PROPERTY-

NEW HARRICANA MINES LIMITED - Project 676

-HOLE

1 -PAGE

PROPERTY	NEW HARRIS CANADIAN MINES LIMITED - PROJECT 676								DESCRIPTIONS
	SAMPLE NO.	FROM	TO	LENGTH	ASSAYS				
				% U3O8 Equiv.	Lbs.	MR/hr. In place	In bag	Sample Weight	
676-A1			-	0.11	2.11	1.20	.048	3#	Grab sample from muck in trench of rusty area at bottom of trench near swamp where highest scint. readings encountered. Quartz-feldspar-biotite pegmatite(?). (Coarse grained granite) - black metallic non-magnetic specks disseminated throughout.
676-A2			-	0.035	0.70	0.9	.022	3-1/2#	Grab sample from wall of trench. Same white pegmatite but rust confined to areas around black specks. Radiating fractures around specks noted.
676-A3			-	0.090	0.18	0.9	.038	2#	Grab sample from wall of trench where yellow stain was most evident. Black specks disseminated throughout.
ALL THREE SAMPLES FROM TRENCH "A"									
PUBLIC Ministère des Richesses Naturelles, Québec SERVICE DES CITES MINÉRAUX No GM-24661									
Project 676									

SAMPLE RECORD SHEET

PROPERTY.. NEW HARRICANA MINES LIMITED - Project 676

1 -HOLE NO.
-PAGE

[illegible]

SAMPLE RECORD SHEET

PROPERTY-- NEW HARRICANA MINES LIMITED - Project 676

1 --HOLE
--PAGE

[illegible]

SAMPLE RECORD SHEET

676-66

-HOLE NO.

-PAGE

PROPERTY-

New Harricana Mines Limited - Project 676

[illegible]

SAMPLE RECORD SHEET

Project 676

-FILE NO.

--PAGE

PROPERTY- NEW HARRICANA MINES LIMITED - Project 676

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SAMPLE RECORD SHEET

PROPERTY- NEW HARRICANA MINES LIMITED - Project 676 - TRENCH "D" - HILL TOP SHOWING

-HOLE NO

-PAGE

SAMPLE NO.	FROM	TO	LENGTH	ASSAYS					DESCRIPTIONS
				% U ₃ O ₈ Equiv.	U ₃ O ₈ Chem.	Wt. Sample	MR/hr.	Estimate U ₃ O ₈	
676-73B			2.3'	.053	.049	1-3/4	.025	.05/.0	Sample 73B to 76B inclusive background .014
676-73C			1.0'	.010		1#	.025	.06	Very coarse feldspar quartz biotite
676-74A			3.0'	.009		1/3/4	.030	.05	pegmatite, center and west part of Trench
676-74B			3.0'	.013		1-1/2#	.016	.02	D - has considerably less biotite than
676-74C			4.0'	.040		2-3/4#	.025	.03/.0	east part. Entire trench shows as being
676-75A			4.0'	.027		1#	.020	.05	within shear zone. Shearing about
676-75B			2.0'	.025		1-1/4#	.025	.04	55-56° E of magnetic North. Cross jointing
676-75C			3.0'	.031		2-1/2#	.030	.03	seems barren of mineralization. Visible
676-76A			1.8'	.080		1#	.030	.08	disseminated minor uraninite and yellow
676-76B			4.5'	.042		2#	.022	.03	uranophane stain.
676-77A			3.5'	.045		1-1/2#	.015	.02	From 77A to 80A background .013
676-77B			2.0'	.026		3/4#	.017	.04	
676-78A			4.0'	.011		1-1/2#	.016	.02	
676-79A			4.0'	.018		1-1/2#	.019	.03	
676-80A			3.5'	.032		2-1/2#	.015	.01/.0	

SAMPLE RECORD SHEET

PROPERTY-

NEW HARRICANA MINES LIMITED - Project 676

TRENCH "E"

- HOLE NO

-PAGE

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Project 676

FORM 8009

SAMPLE RECORD SHEET

PROPERTY- NEW HARRICANA MINES LIMITED - Project 676 - TRENCH "D"

-HOLE NO

- PAGE

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SAMPLE RECORD SHEET

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New Harricana Mines Limited - Project 676

[illegible]

SAMPLE RECORD SHEET

PROPERTY- New Harricana Mines Limited - Project 676

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SAMPLE RECORD SHEET

PROPERTY-- New Harricana Mines Limited -- Project 676 Trench E₃. Area E. Location L 10 N/23+65E

--HOLE NO.

- PAGE

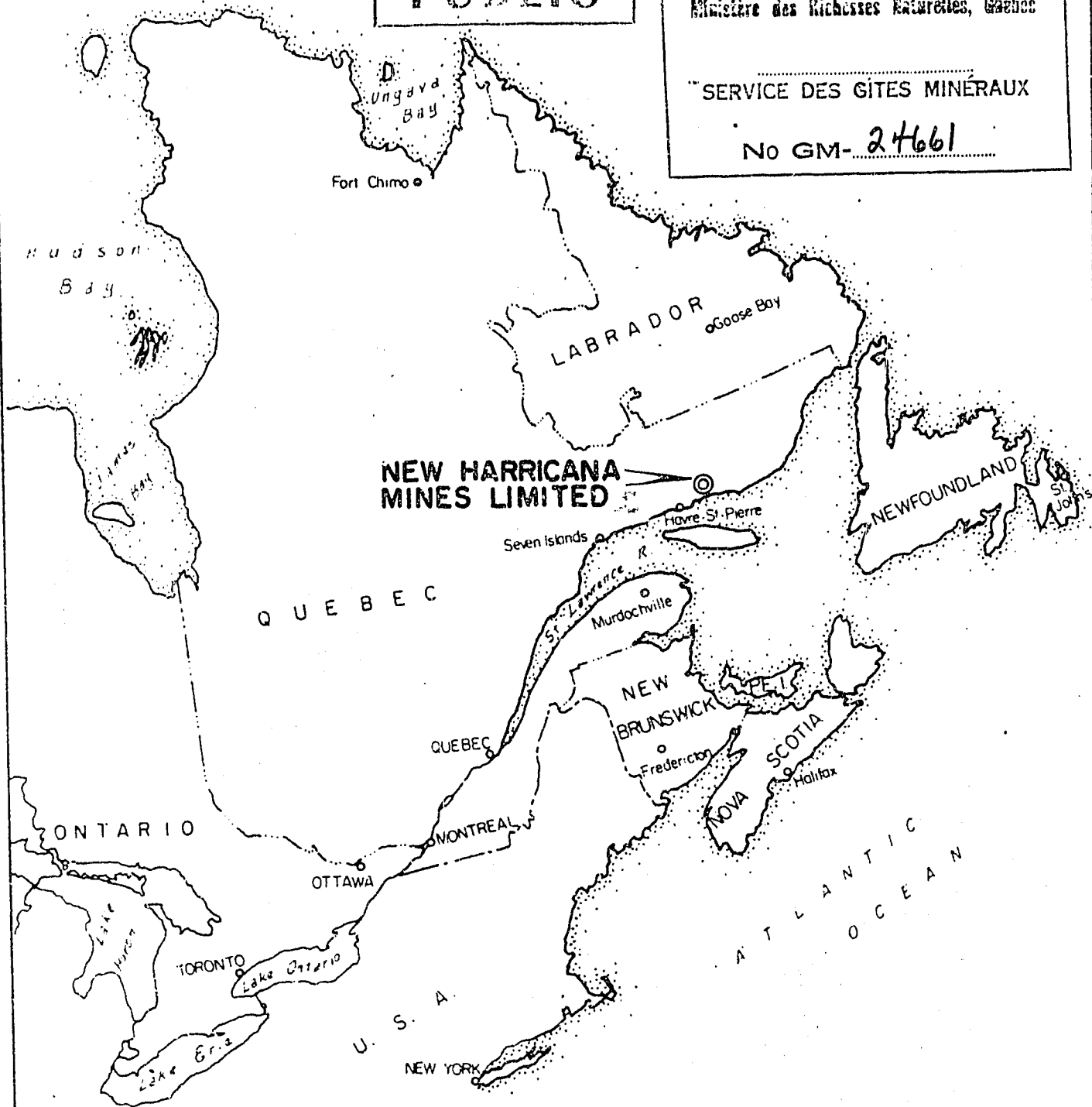
SAMPLE NO.	FROM	TO	LENGTH	Sample Equiv. ^{ANALYSES} Chemical					DESCRIPTIONS
				Weight	U ₃ O ₈	% U ₃ O ₈			
676-99	0	2.3	2.3	1.0	0.10				All samples chip channeled across width of N-S staking. W dipping pegmatite dyke running along face of West wall of E ₃ trench and at 2 feet intervals. 676-99 is northern most sample and located 8'S of 676-88 trench E ₂ .
676-93	0	2.0	2.0	0.75	0.19	0.184			
676-94	0	1.5	1.5	1.25	0.24				
676-95	0	1.5	1.5	1.25	0.057				
676-96	0	1.9	1.9	1.25	0.022				
676-97	0	1.9	1.9	2.25	0.025				
676-98	0	2.0	2.0	2.0	0.017				
				Sample Weight	% Ni.	% Cu.	Oz. Ag	Oz. Au	
676(Grab E ₃)		100		1.25	Tr	0.02	0.03	Tr	Biotite Schist. Hang mg Wall - 5 to 8% sulphides, fine grain, highly disseminated. Visible occasional chalco location right on top of 676-96

PUBLIC

Ministère des Richesses Naturelles, Québec

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No GM- 24661



MAP I

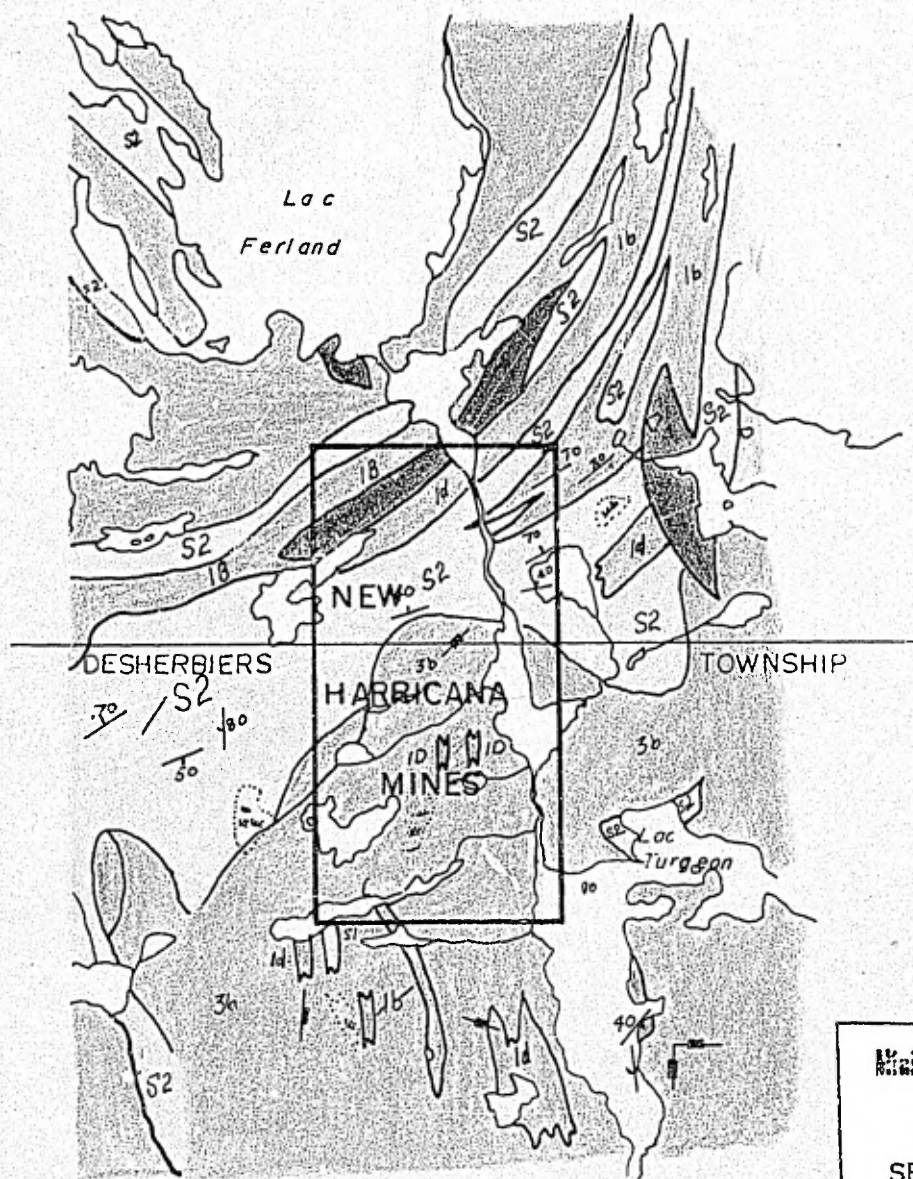
LOCATION MAP

NEW HARRICANA MINES LIMITED

DESHERBIERS TWP., JOHAN-BEETZ AREA
QUEBEC

Scale. 1" = 200m.

August 1967



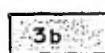
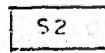
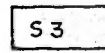
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Ministère des Richesses Naturelles, Québec

SERVICE DES GITES MINÉRAUX

No GM-24661

GEOLOGICAL LEGEND

-  Pegmatite
-  3b Biotite Granite medium grained
-  S2 Grey QUARTZITES Calcareous Quartzites
-  1a Hybrids
-  S3 Megmatite, Augen gneiss Banded gneiss
-  1b Amphibolite

-  Strike & dip of bedding, vertical
-  Strike & dip of shistosity, inclined
-  Strike & dip of joints

MAP 2

NFW HARRICANA MINES LIMITED

Desherbiers Township, Johan Beetz Area, Quebec

21095

GEOLOGICAL MAP GENERAL

Geology from D.O.M. map 1099

DRAWN
DGB

CHECKED
JLR

Scale
1" = 1mi

DATE
MAY 1968

PROJECT
676