NTS 31L/11SE
Latitude: 46°30'54 "N
Longitude: 79°5'31" W

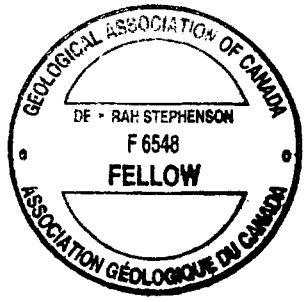
Assessment Report

on the Geology of the

VERMICULITE PROPERTY
BUTLER TOWNSHIP, ONTARIO

for

RICHLAND MINES INC.



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EXECUTIVE SUMMARY

Richland Mines Inc.'s vermiculite property is located in the Sudbury Mining Division, approximately 40 km northeast of the city of North Bay in Butler Township. The property consist of a contiguous block of three unpatented mining claims covering a total of 19 claim units. All claims are currently held by Richland Mines Inc.

From 1957 to 1971, the vermiculite property had been sporadically explored. During 1996 and 1997, a program of stripping and trenching was completed to expose the vermiculite zones at depth..

Vermiculite is a hydrated mica which forms from the weathering and alteration of primary micas. The vermiculite at the Butler Township property is of Type 3 and is formed from ultramafic metamorphic rocks such as biotite and amphibole schists in contact with pyroxenite or peridotite and cut by pegmatite. Vermiculite is characterized by the ability to exfoliate to up to 30 times its original volume when heated rapidly. In addition, vermiculite has exceptional thermal, chemical and acoustical insulation properties, making it valuable as a filler in lightweight concrete, agricultural products, insulation and construction materials.

The vermiculite property lies within the Grenville Structural Province of the Precambrian Shield, just southeast of the Grenville Front. The rock units on the subject property are a highly distorted and folded assemblage of paragneisses of dominantly sedimentary origin. The Grenville Province is host to numerous showings of industrial minerals including kyanite, nepheline syenite, vermiculite, garnet, graphite, and mica.

The Butler Township vermiculite property consists of two vermiculite showings or zones: B-Zone and the South Zone. Both showings exhibit an alteration zone from the migmatite to the amphibole + biotite schist. In contact with the migmatite, the amphibole + biotite schist is altered to a gneiss with quartz bands and quartz grains in the mafic bands. Further towards the core, the schist becomes an amphibole + biotite + epidote schist which upon weathering acquires a porphyritic texture as the biotite weathers into 5-10 mm round to subrounded masses. The biotite in the amphibole + biotite schist becomes vermiculitized by weathering processes. The vermiculite zones appear to be bounded by the amphibole + biotite schist and the amphibole + biotite + quartz schist/gneiss. Both of these units may make good marker horizons and aid in the tracing of the vermiculite zone.

Detail mapping at a scale of 1:200 revealed that a 3-5 m (10-16 ft) wide band of green vermiculite is present in each of the two zones and that a similar band of black vermiculite may also exist. The vermiculite band appears to be traceable for 130 m (426 ft) in the B-Zone, and 36 m (118 ft) in the South Zone. The depth extent of the vermiculite in each of the two zones was observed to be 0.5 to 1m. There is a good possibility the zones extend much deeper and this should be confirmed by diamond drilling of short holes.

A total of 18 samples were exfoliated from the B and South Zones. Results indicate that the green vermiculite exfoliated readily and produced material mainly of grade superfine

with bulk densities slightly heavier than market specifications. Excellent exfoliation results were obtained from samples of both the red and black vermiculite. This material exfoliated readily retaining its size for a market grade of medium and exhibited bulk densities superior to market requirements.

The Butler Township vermiculite property contains at least two zones of vermiculite which warrant further exploration to delineate the deposit. An exploration program of linecutting, stripping and trenching, diamond drilling, and sampling totaling $128,123 is recommended.

INTRODUCTION

This report was prepared for Richland Mines Inc. and is based on field work completed on their Vermiculite property in Butler Township, Ontario. In June, 1997 detailed geological mapping of the property began. The main objectives of the mapping were:

1) to confirm the presence of vermiculite on the property as shown on geology maps.

2) to determine the structure of the vermiculite zones

3) to give an estimate, in two dimensions, of the quantity of vermiculite on the property

4) to assess the quality of the vermiculite by testing small, 5 - 10 kg, samples

5) to investigate the relationships between the three colours of vermiculite (green, red and black) and the geology

6) to determine the controls on the formation of the vermiculite to aid in future expansion of the zones.

Detail geological mapping at a scale of 1:200 was completed on the two vermiculite zones (claim S 1214997) in order to further evaluate the Butler Township vermiculite property. In addition geological mapping was completed along the highway on claim S1214998. This report will serve to present the findings of the summer's field work and to make recommendations for future work.

PROPERTY LOCATION AND ACCESS

The Richland Mines Inc. vermiculite property is located in the Sudbury Mining Division, 40 km northeast of the City of North Bay (Figure 1), in Butler Township. The approximate geographic center of the property lies at latitude 46° 30′ 54 ″ north and longitude 79° 5′ 31″ west.

Access to the property is via Provincial Highway 63 northeast for 40 km to the junction with Highway 533 then southeast along Highway 533 for 5.5 km. The property is bisected by Highway 533 with smaller bush roads providing access to the northern part of the property.

The property consist of a contiguous block of three unpatented mining claims, which contain nineteen claim units of 16 hectares each (Figure 2). Claim abstracts and the Butler Township claim map are shown in Appendix 1. Richland Mines Inc. is the registered claim holder for all claims. Claim information is summarized in Table 1.

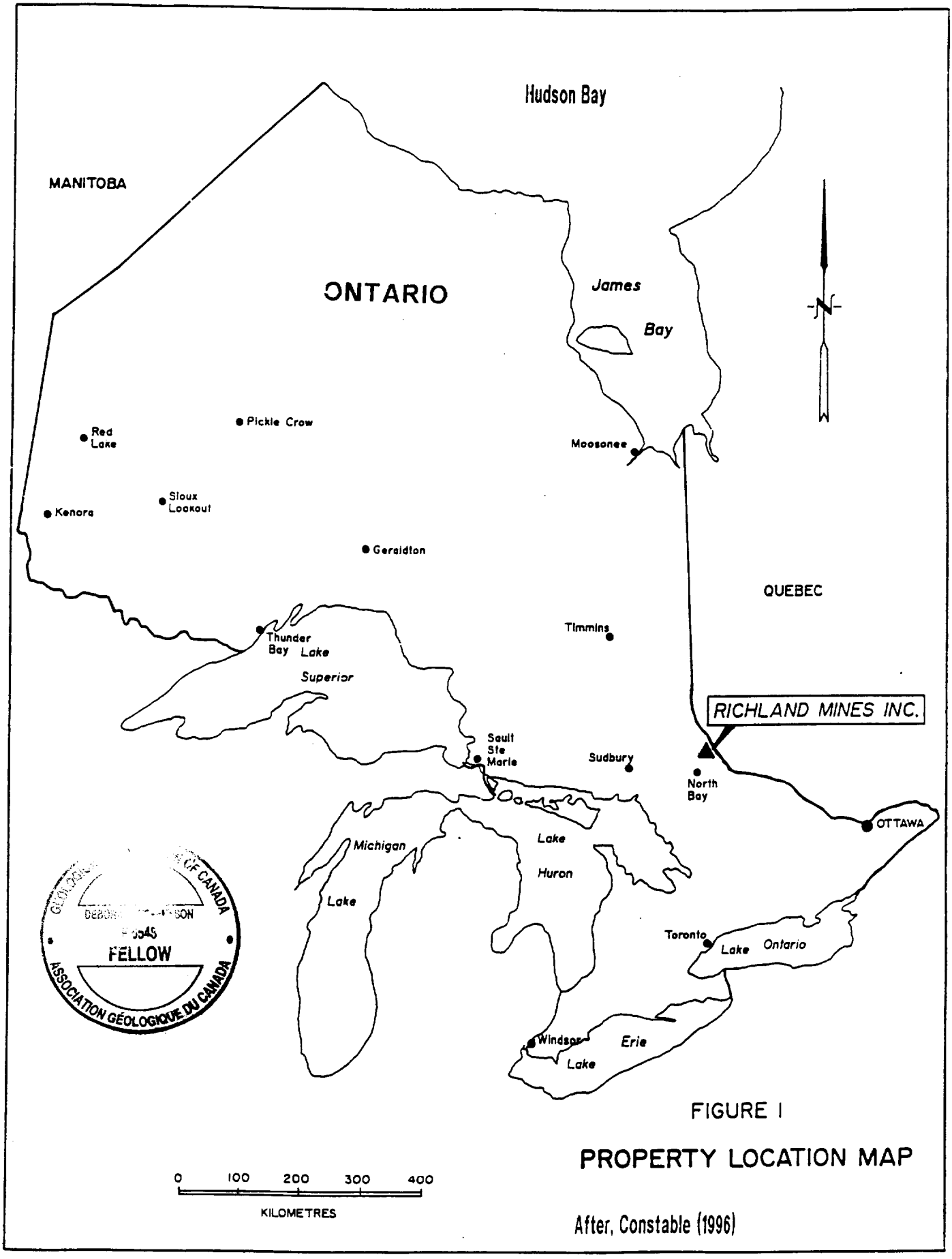


FIGURE 1

PROPERTY LOCATION MAP

After, Constable (1996)

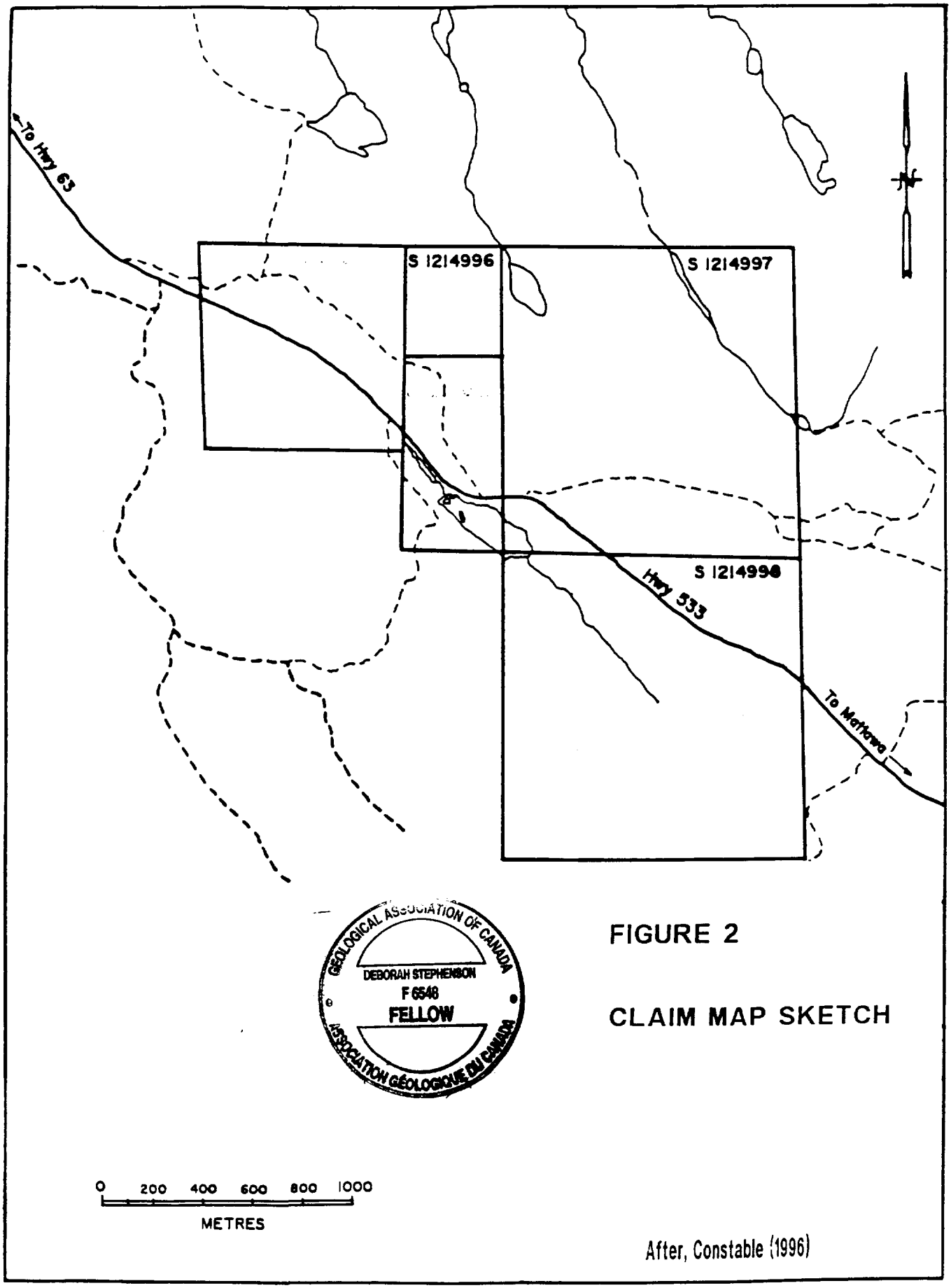


FIGURE 2

CLAIM MAP SKETCH

After, Constable (1996)

Table 1: Vermiculite Property Claim Information

Claim Number	Date Recorded	No. of Claim Units	Amount of Work Due	Due Date for Assessment Work
S 1214996	Aug. 13, 1996	1	$400	Aug. 13, 1998
S 1214997	Aug. 13, 1996	9	$3600	Aug. 13, 1998
S 1214998	Oct. 3, 1996	9	$3600	Oct. 3, 1998

PREVIOUS WORK

Vermiculite was first discovered in the Butler Township area in 1957 when construction crews building Highway 533 exposed several small showings. In 1957, T.A. Miron and M. MacWilliam staked and recorded two claims encompassing these showings. Milldale Uranium Mines Limited optioned the claims in 1958 and eventually staked another 148 claims in Butler and Antoine Townships.

Very little recorded work can be found in the assessment work files of the Ontario Ministry of Northern Development and Mines. The majority of the work completed on the vermiculite showings includes prospecting, trenching and diamond drilling. In August 1958, Milldale Uranium Mines Limited spotted a single drill hole on the north side of Highway 533 approximately 6.1 km east of Highway 63. This drill hole was located about 600 m (2000 ft) west of the B-Zone of the Richland Mines Inc. property. The hole was drilled to the northwest for 97.5 m (320 ft). The drill log describes 70 m (229 ft) of hornblendite followed by granitic units with minor mica and pegmatitic sections (Appendix II). The claims were allowed to lapse shortly thereafter.

The original stakers re-staked four claims from 1960 to 1961 and a vertical 32 m (104 ft) diamond drill hole was drilled in 1965. The hole encountered minor mica and vermiculite in a hornblendite unit.

In 1971, MacWilliam drilled three more vertical diamond drill holes on the property to depths of 9.75, 32, and 31 m (32, 106, and 103 ft). The first hole lost water after 9.75 m and was abandoned. The second and third holes encountered vermiculite over 0.60 m (2 ft) and 1.5 m (5 ft), respectively. The logs are shown in Appendix II.

There are no reports of additional work on the property from 1971 to 1996. In 1996, prospecting by Erana Mines identified an area of vermiculite on what is now the Richland Mines Inc. Butler Township property.

MINERALIZATION

Commercial vermiculite refers to a family of hydrated ferromagnesian aluminosilicate minerals which are formed by the near surface alteration of micas, namely biotite and phlogopite. Alteration involves the substitution of the inter-layer potassium ions by water and may occur as the result of hydrothermal alteration or by circulating meteoric waters (Roskill, 1988). Since the vermiculite deposits are formed by supergene alteration, deposits with depths of 60 m (200 ft) are considered exceptional (Harben and Bates, 1990). If alteration is incomplete, vermiculite may be interlayered with biotite or chlorite creating a detrimental effect on the quality of the deposit (Harben and Bates, 1990). Since most vermiculite is formed in rocks of Precambrian age this suggests slow weathering may be the most usual alteration process.

According to Harben and Bates (1990), there are three broad types of vermiculite deposits:

1) formed within large ultramafic intrusive masses, such as pyroxenite plutons that are cut by syenite or alkalic granite and by carbonatitic rocks and pegmatites;

2) associated with ultramafic intrusive bodies such as dunite, pyroxenite and peridotite, cut by pegmatite and syenitic or granitic intrusives; or

3) formed from ultramafic metamorphic rocks such as biotite schist and amphibole schist in contact with pyroxenite or peridotite and cut by pegmatite.

Most of the world's production of vermiculite comes from Type 1 deposits as found in Libby, Montana and Palabora, South Africa. Type 2 deposits are exemplified by deposits in the Blue Ridge Mountain area of North Carolina while Type 3 are typified by deposits in the Green Springs area of Virginia and in the Enoree District of South Carolina. The Richland Mines Inc. Vermiculite property is an example of the Type 3 deposit.

Vermiculite is very similar to the mica minerals in that it splits easily into thin, flexible flakes, has a hardness of 1.5 to 2.8 and a specific gravity of 2.5. Vermiculite can be bronze to yellowish brown, green, black or red in colour. The colour variation may reflect fluctuations of the water table, with oxidizing conditions producing a red colouration as fine-grained hematite precipitates in the space between the double layers in the mica sheet and reducing conditions producing a greenish colour (MacKinnon et. al., 1990). Exfoliated vermiculite is generally gold, golden brown, or bronze in color with a metallic luster.

The key characteristic of vermiculite is its ability to expand upon rapid heating. Exfoliation occurs when water molecules within the internal structure of the vermiculite transform into steam when heated to above 870°C (1.600 °F) and force the layers of vermiculite apart at right angles to the cleavage. Pure vermiculite may expand up to 30 times its original volume but most commercial material averages 8 to 12 times. The density of the unexfoliated material is generally 640 to 960 kg/m^3 (40 to 60 lbs/ft^3) but can be reduced to 62 to 192 kg/m^3 (3.5 to 12 lbs/ft^3) upon exfoliation (MacKinnon et. al., 1990).

Exfoliated vermiculite is lightweight, has good thermal and acoustic insulation, is chemically inert, and fire resistant. These properties make vermiculite ideal for use in building products such as lightweight aggregate, loose-fill insulation, fire-proof coatings, sodium silicate-based ceiling tiles, urea-formaldehyde laminated boards and in the horticultural industry in which it is used for fertilizer and litter (Harben, 1992).

Economic deposits can contain between 25% and 90% vermiculite but most deposits contain between 35% and 50%. Deposits with less than 35% are termed low grade and deposits with more than 50% are termed high grade (Roskill, 1988). Commercial vermiculite is graded by size as shown in Table 2 and Table 3 (Roskill, 1988).

Table 2: USA Commercial Grades of Vermiculite

Grade	Density lb/ft^3 (kg/m^3)	Tyler Mesh	Maximum Size (mm)
1 - large	4 -7 (64 -112)	3 - 10	6.7
2 - medium	4 - 8 (64 - 128)	8 - 14	2.4
3 - fine	5 - 9 (80 - 144)	10 - 35	1.6
4 - superfine	6 - 10 (96 - 160)	28 - 65	0.6
5	8 - 11 (128 - 176)	35 +	0.4

Table 3: South African Commercial Grades of Vermiculite

Grade	Designation	Density lb/ft^3 (kg/m^3)	Size Range (mm)
1	premium	3.5 - 4.5 (56 - 72)	-16 +8
2	large	4 - 5 (64 - 80)	-8 +4
3	medium	4.5 - 5.5 (72 - 88)	-4 +2
4	fine	5.5 - 7 (88 - 112)	-2 +1
5	superfine	6.5 - 9 (104 - 144)	-1 +0.5
6	micron	---	-0.5 +0.25

MacKinnon et. al. (1990) has listed the economic and quality criteria for a successful vermiculite deposit in Canada that would expect to compete with the USA or South African ores:

- grade more than 30% vermiculite, 20% if the deposit is of exceptional quality
- contain no more than 10% other micaceous material, e.g., biotite or phlogopite, to simplify separation

- be large enough to mine by open pit methods at a rate of 30,000 to 50,000 short tons per year
- contain predominantly large flake vermiculite, as small flake markets are already well supplied
- be located as close to user markets as possible
- have a bulk density of 64 to 160 kg/m^3 (4 to 10 lbs/ft^3) after exfoliation
- yield an expansion product that is not brittle and does not decrepitate during exfoliation
- have a sufficiently high absorptive property for use in horticulture
- become a product which is very pale in colour
- use as little energy for exfoliation as do existing crude vermiculites
- contain minimal amounts of fibrous or dusty materials in order to reduce possible health hazards

REGIONAL GEOLOGY

The vermiculite property lies within the Grenville Structural Province of the Precambrian Shield, just southeast of the Grenville Front. The Grenville Front represents the boundary between the older Precambrian rocks to the north and younger Precambrian rocks to the south. The rocks in this area consist of a highly distorted and folded assemblage of paragneisses of dominantly sedimentary origin. The Grenville Province is also the host to numerous showings of industrial minerals including kyanite, nepheline syenite, vermiculite, garnet, graphite and mica.

The geology of Butler Township is included on the map of the Tomiko Area (East Half) by S.B. Lumbers of the Ontario Department of Mines and Northern Affairs. In the area of the Richland Mines Inc. property, the geology includes a sequence of hornblende gneisses, migmatites and amphibolites all striking southeast and dipping moderately west. A major south plunging anticline occurs east of the property. Three occurrences of vermiculite are shown on the map and all are hosted by the hornblende gneiss unit.

PROPERTY GEOLOGY

The earliest reference to the vermiculite deposits in the Butler Township area is from a report by Guillet (1962) in which he describes the geology of the area as being characterized by a highly metamorphosed terrain of granites, syenites, schists, and gneisses typical of the Grenville Front. The vermiculite showing described by Guillet, the Mattawa Deposit, corresponds in part to the B-Zone of the Richland Mines Inc. property. According to Guillet (1962), biotite-vermiculite occurs in the dilation zones of minor folds of amphibolite on the west limb of a southerly plunging anticline. Guillet (1962) traced a 3 m (10 ft) vermiculite zone for about 9m (30 ft) along strike. From grab samples of this zone, Guillet documented values of 19% vermiculite.

Richland Mines Inc.'s Butler Township vermiculite property consists of two showings or zones: the B-Zone and the South Zone. The geology of each zone is complex but seems to embody the same rock units in varying proportions. Mapping control over the zones was by means of a surveyed baseline (130°) and lines every 10m at right angles to this line. Total line creation over both zones amounted to 2.5 km.

B-Zone

The B-Zone is located along Highway 533 approximately 6.5 km southeast of the intersection of Highway 63 and 533. The B-Zone consists of one trench approximately 190 m (623 ft) long by 10 m (33 ft) wide. The trench varies in depth from 2 to 8 m (6.5 to 26 ft) deep with 2-4 m (6.5-13 ft) of overburden.

Geology

The rock units of the B-Zone generally strike southerly and dip moderately to the west. The migmatite forms the base of the lithologic sequence with an alteration zone towards the amphibole + biotite schist. The migmatite is most prominent on the west side of the trench and is overlain by the amphibole + biotite + quartz schist/gneiss. Locally, the amphibole + biotite + quartz schist contains garnets at the contacts with the migmatite. The amphibole + biotite + epidote schist is very weathered throughout the trench and exhibits a porphyritic texture. This porphyritic schist overlies the amphibole + biotite schist which predominately occurs on the east side of the trench. The B-Zone corresponds to the eastern part of the Mattawa deposit described by Guillet (1962). According to Guillet's interpretation, the B-Zone trends parallel to the east limb of a syncline which folds over on itself to the west (Figure 3).

The green vermiculite zone appears to occur as a 3 m (9.8 ft) wide band that trends for approximately 130 m (426 ft) along the weathering zone of the amphibole + biotite + epidote schist as shown on Map 2. The exposure of amphibole + biotite schist is too sparse in the pit to delineate a possible black vermiculite zone. The trench floor is covered by a considerable amount of overburden mixed with unconsolidated material. In addition, three large flooded

areas make tracing the vermiculite zones across the trench very difficult. The green vermiculite zone may extend across the northernmost 60 m (197 ft) of the trench or may be folded to the west but the presence of a large body of water makes its trend uncertain.

Based on the proposed trend and dimensions of the vermiculite zone, the volume in the B-Zone is 390 m^3 (13,773 ft^3) representing approximately 312 tonnes (344 short tons) vermiculite.

Sampling Results

Nine 5-10kg samples of vermiculite were taken from the B-Zone trench. The results of exfoliation testing are shown in Table 5. The testing process was completed Dynasty TMT Corp. and Ecosource Garnet Inc. both of Lively, Ontario. The process involves the drying of the test material using a rotary drier, followed by the size screening of the material by means of mesh screens, exfoliation mill testing, and exfoliation percentage determination.

Table 4: Results of B-Zone Sampling

Sample #	Colour	Size (mesh)	Exfoliation %	Notes*
RMA - 001	green	10 m 20 m	6.0 29.1	3
RMA - 002	red	20 m	100	3
RMA - 003	green	20 m	63.5	3
RMA - 004	green	20 m	60.7	4
RMA - 005	green	20 m	64.0	4
RMA - 006	green	10 m 20 m	8.7 40.1	1 2
RMA - 007	red	20 m	82.5	4
RMA - 008	green	12 m 30 m	27.0 67.2	3 3
RMA - 009	black-green	too fine	nil	

*Notes:

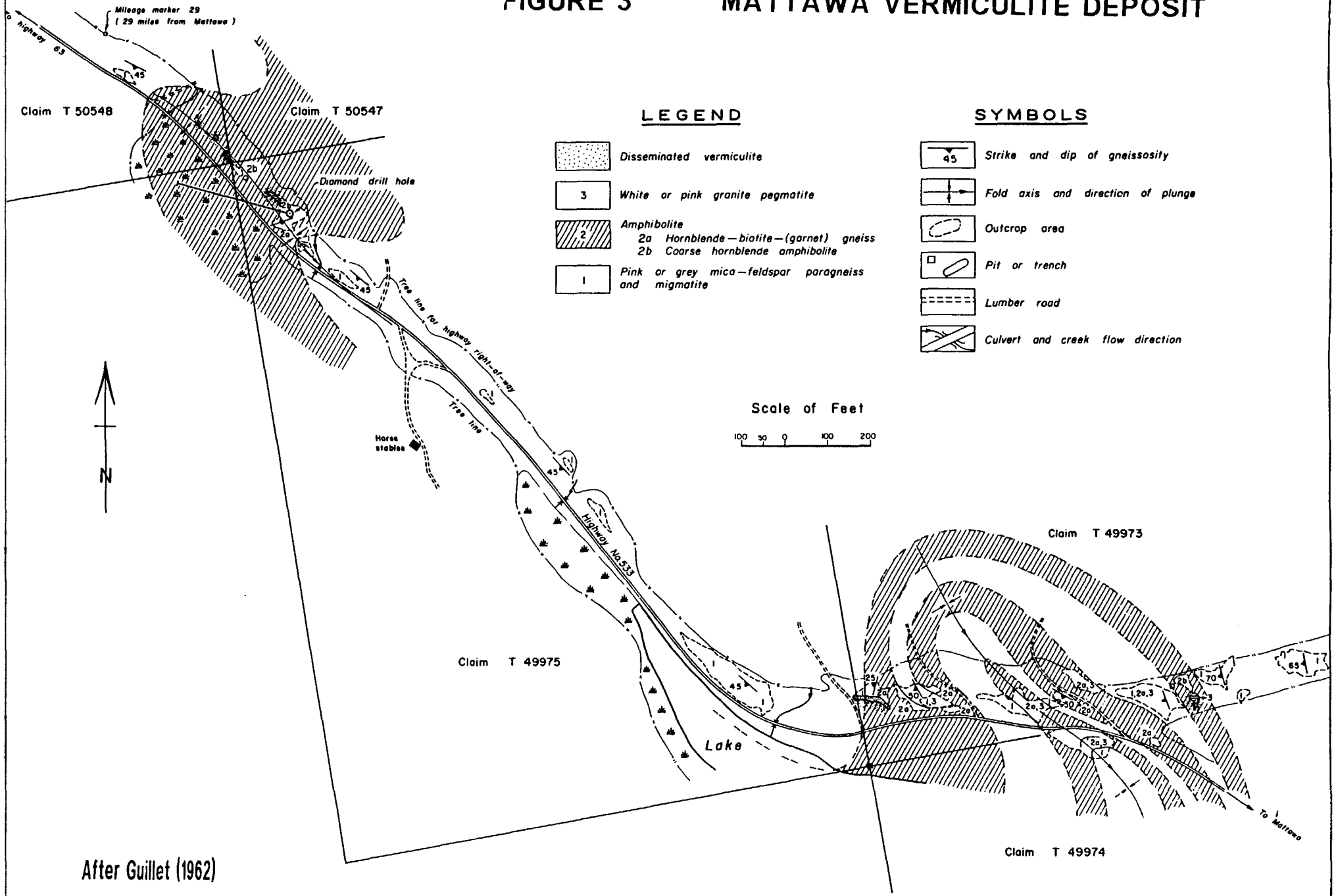
1 - Material exfoliated readily retaining its size for market grade of **medium**. Bulk density of exfoliated material is below market requirements (i.e. <6-7 lb/ft^3)

2 - Material exfoliated readily retaining its size for market grade of **fine**. Bulk density of exfoliated material is below or meets market requirements.

3 - Material exfoliated producing substantial fine material of grade **superfine** and below. Bulk density of exfoliated material is heavier than market requirements indicating exfoliation of material does not fully occur.

4 - Material exfoliated producing excessive fine material of grade **superfine** and below. Material readily comes apart upon exfoliation releasing fine waste material producing a high bulk density. Screening of this waste material does not bring the bulk weight into market specifications.

FIGURE 3 MATTAWA VERMICULITE DEPOSIT



After Guillet (1962)

The green vermiculite is a product of the vermiculitization by weathering of the amphibole + biotite + epidote schist. The majority of the samples submitted for testing from the B-Zone are green in colour and are generally fine grained (1-3 mm flake size). Field tests with a portable propane torch show the green vermiculite exfoliates readily but the majority is of a very fine size with some of the material decrepitating to super fine size. These characteristics were confirmed by the laboratory testing. Most of the green vermiculite tested produced substantial or excessive fine material upon exfoliation and had bulk densities greater than the industry standard.

Two samples of red vermiculite were sent for testing. While both samples exfoliated readily, they produced excessive fine material with bulk densities greater than market specifications.

Recommendations

1) All water should be drained from the trench in order to better trace the vermiculite zone.

2) As much as possible, overburden should be removed from the trench walls and floor in order to expose the bedrock and allow the vermiculite zone to be more precisely located.

3) Drilling of several short holes along strike of the proposed zone should be completed in order to establish the depth extent of the vermiculite and to verify its continuity across the trench.

South Zone

The South Zone is located on the south side of Highway 533 approximately 90 m (300 ft) southeast of the B-Zone and may be a continuation of the B-Zone (Photo 6). The South Zone consists of a main trench, 40 m (130 ft) by 10 m (33 ft) by 1m (3 ft) deep, and four other smaller trenches. Trench #2 is 25 m (82 ft) long by 2 m (6.5) wide by 1.5 m (5 ft) deep and has sparse outcrop. Trenches #3, 4, and 5 are all approximately 8 m (26 ft) by 2 m (6.5 ft) by 2m (6.5 ft) and are all filled with water and overburden.

Geology

The geology of Trench #1 is similar to that of the B Zone. Generally, rock units strike southerly and dip steeply to the west (Map 4). A 4 m (13 ft) wide band of bronze-green vermiculite appears to trend north-south along the bottom of the trench for approximately 36 m (118 ft). The vermiculite is bounded on the east by an alternating sequence of weathered amphibole + biotite + epidote schist and amphibole + biotite schist with patches of amphibole + biotite + quartz schist. An outcrop near Trench #2 suggests the migmatite lies further to the east. On the west side of the vermiculite zone is the amphibole + biotite + epidote schist and

the amphibole + biotite + quartz schist/gneiss. The alteration zone present in the other three zones is not as well defined here.

Sampling Results

A total of nine samples were sent for testing. The results are shown in Table 6.

Table 5: Results of South Zone Sampling

Sample #	Colour	Size (mesh)	Exfoliation, %	Notes*
RMA-031	red	12	42.4	1
		30	71.7	1
RMA-032	black	12	70.3	1
		30	52.7	1
RMA-033	red-black	12	65.2	2
		30	84.9	1
RMA-034	black	12	24.8	3
		30	22.6	4
RMA-035	green	12	51.2	1
		30	56.1	2
RMA-036	bronze-green	12	27.2	1
		30	65.7	2
RMA-037	green	nil	nil	nil
RMA-038	green-black	30	76.5	4
RMA-039	black	12	42.1	2
		30	67.3	1

*Notes:

1 - Material exfoliated readily retaining its size for market grade of **medium**. Bulk density of exfoliated material is below market requirements (i.e. <6-7 lb/ft^3)

2 - Material exfoliated readily retaining its size for market grade of **fine**. Bulk density of exfoliated material is below or meets market requirements.

3 - Material exfoliated producing substantial fine material of grade **superfine** and below. Bulk density of exfoliated material is heavier than market requirements indicating exfoliation of material does not fully occur.

4 - Material exfoliated producing excessive fine material of grade **superfine** and below. Material readily comes apart upon exfoliation releasing fine waste material producing a high bulk density. Screening of this waste material does not bring the bulk weight into market specifications.

As in the previous trenches, it appears that the red and black vermiculite exfoliates and maintains its size better than the green vermiculite. Although, there appears to be a good zone of bronze-green vermiculite trending along the center of the trench. The South Zone contains approximately 144 m^3 (472 ft^3) of vermiculite based on the proposed dimensions representing about 115 tonnes (127 short tons)of material.

Recommendations

1) A 1 m (3.3 ft) deep pond of water on the trench floor should be drained in order to better trace the vermiculite zone.

2) The trench floor contains a considerable amount of overburden material which should be removed in order to expose more bedrock and allow the vermiculite zone to be more precisely traced.

3) The depth extent of the zone should be tested by drilling several short holes.

CONCLUSIONS

Map 5 shows the spatial relationships among the two zones of the Butler Township vermiculite property. Both zones display an alteration zone from the underlying migmatite to the amphibole + biotite schist. In contact with the migmatite, the amphibole + biotite schist is altered to a gneiss with quartz bands and free quartz in the mafic bands. Further towards the core, the schist becomes an amphibole + biotite + epidote schist which upon weathering acquires a porphyritic texture as the biotite weathers into 5-10 mm round to subrounded masses. The biotite in the amphibole + biotite schist becomes vermiculitized by weathering processes. The vermiculite zones seem to be bounded by the amphibole + biotite schist and the amphibole + biotite + quartz schist/gneiss. Both of these units may make good marker horizons and aid in the tracing of the vermiculite zone.

The green vermiculite is the product of weathering of the altered amphibole + biotite + epidote schist and is generally fine grained (1-3 mm flake size). The black vermiculite is the product of vermiculitization of the biotite in the amphibole + biotite schist core. Field tests show the black vermiculite exfoliates readily and tends to be of a slightly larger flake size, (2-4 mm). The red vermiculite appears to be associated with pegmatite dykes and may be the product of recrystallization and hematization (iron staining) of the vermiculite forming a localized occurrence

Detail mapping of the Richland Mines Inc. vermiculite property indicates that a 3-5 m (10 - 16 ft) wide band of green vermiculite exists in at least two separate zones and there is good potential that a similar band of black vermiculite also exists. The vermiculite band appears to be traceable for 130 m (426 ft) in the B-Zone and 36 m (118 ft) in the South Zone. The depth extent of the vermiculite zones was observed to be 0.5 to 1m in the trenches of the four zones. There is a good possibility the zones extend much deeper and this should be confirmed by diamond drilling of short holes.

Excellent exfoliation results were obtained from samples of both the red and black vermiculite. This material exfoliated readily retaining its size for a market grade of medium

(8-14 mesh) and exhibited bulk densities superior to market requirements. For both zones, the green vermiculite exfoliated readily and mainly produced material of grade superfine (28-65 mesh) with bulk densities slightly heavier than market specifications.

Due to the sparse outcrop, it is difficult to correlate the vermiculite zones in the two showings. Continuity between zones needs to be examined further by extending the grid and completing detailed mapping between the zones. Within the zones, additional trenching and/or drilling is needed to confirm the proposed configuration of the vermiculite band in each zone.

RECOMMENDATIONS

1) Additional trenching along with deepening and dewatering of some of the existing trenches should be completed in order to expose the contact with the vermiculite and the host rock.

   Parts of the B-Zone and South Zone trenches are either filled with water, overburden, or wood debris or are too shallow to show the true nature of the vermiculite with the surrounding rock units.

2) Additional linecutting should be completed and a new grid established linking the two zones.

   In order to test any correlation or continuity between the two zones, the property must be mapped between the zones. Due to the highly folded and distorted nature of the rock units on the property, additional geological information will serve to predict the location of new zones and to better trace the existing zones.

3) A vermiculite mining expert should be consulted to evaluate the deposit before diamond drilling is begun.

   An individual who has expertise with the mining of vermiculite may be able to determine the commercial viability based on the two dimensional geology (structure and mineralization type), initial sampling results, and amount of waste or overburden before an expensive drill program is initiated.

4) If it is deemed warranted, diamond drilling of several short holes should be completed in order to test the depth extent and continuity of the vermiculite zones.

   The configuration of the vermiculite zones shown on each of the detail geology maps is proposed based on the limited geological information available and must be proved by testing the inferred boundaries between the known sections of vermiculite .

5) Bulk sampling should be completed especially in the B-Zone.

Once the zones have been delineated with greater certainty, 1 tonne bulk samples should be taken to test the average vermiculite content and percentage of exfoliation. Small 5-10 kg samples are useful for distinguishing between vermiculitized and unaltered material but since the degree of alteration can vary over a short distance, a large sample is needed in order to get a true picture of the grade of the zones.

6) Any additional stripping, trenching, or bulk sampling should be completed under the supervision of a Geologist.

A Geologist with a knowledge of the property will be able to recommend the best places for trenching and bulk sampling and will be able to direct these activities in the most efficient way to minimize disturbance to the geology.

COST ESTIMATES

Exploration Program:

Linecutting 15 km @ $265/km		$3975
Stripping and Trenching 25 days @ $800/day		$20,000
Diamond Drilling 20 holes x 50 m = 1000 m @ $75/m		$75,000
Sampling 25 samples @ $100/sample		$2500
Bulk Sampling 3 x 1 tonne samples @ $2000 each		$6,000
Supervision, Mapping, Logging, Report Writing 30 days @ $300/day		$9,000
	SUBTOTAL	$116,475
Contingency, 10%		$11,648
	TOTAL	**$128123**

REFERENCES

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Roskill

1988: The Economics of Vermiculite 1988, Fifth Edition, Roskill Information Services Ltd, London, 94 pp.

Certification

I, DEBORAH STEPHENSON, hereby certify that:

1. I am a consulting geologist retained by Strathclyde Geological Services which has a business office at 4441 Shirley Avenue, Val Therese, Ontario P3P 1S8.

2. I have an Honours Bachelor of Science degree in Geology (1987) from the University of Windsor and a Master of Science degree in Mineral Exploration (1992) from Queen's University.

3. I have been involved in mineral exploration and development activities for the past eleven years.

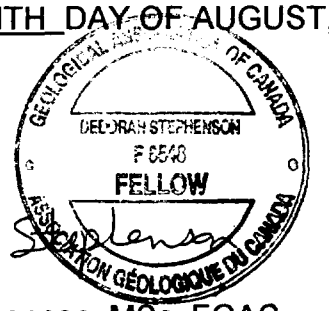
4. I am a Fellow of the Geological Association of Canada.

5. I have based this report on the data listed in the reference listing and fieldwork I completed during the summer of 1997.

6. I have no interest, direct or indirect, in the subject property of this report, nor do I expect to receive any. I have written this report as an independent consultant.

DATED IN VAL THERESE, ONTARIO THIS EIGHTEENTH DAY OF AUGUST, 1997.

Signature



Deborah Stephenson, MSc, FGAC

APPENDIX I

PROPERTY PHOTOGRAPHS

B-Zone, At South End Looking North

B-Zone, At 40m Looking North

South Zone, Looking East

APPENDIX II

CLAIM ABSTRACTS

SUDBURY
CLAIM ABSTRACT

Claim No: S 1214996
Status: Active

Due Date: 1998-AUG-13	Recorded: 1996-AUG-13
Work Required: 400	Staked: 1996-AUG-09 08:05
Total Work: 0	Description of Claim:
Total Reserve: 0	BUTLER (G-1722)
Present Work Assignment: 0	
Claim Bank: 0	Claim Units: 1
	Multiple Township: N

Claim Ownership

Percentage	Client#	Recorded Holder(s)
100.00	302778	RICHLAND MINES INC.

Type	Date	Dollars	Description	
STAKER	1996-AUG-13		RECORDED BY JEROME EDWARD ALBERT (C32301)	R9670.00252
STAKER	1996-AUG-13		JEROME EDWARD ALBERT (149068) RECORDS 100.00 % IN THE NAME OF ERANA MINES LIMITED (299712)	R9670.00253
TRAN	1997-APR-01		ERANA MINES LIMITED (299712) TRANSFERS 100.00 % TO RICHLAND MINES INC. (302778)	T9770.00011

Reservation :
01 400' surface rights reservation around all lakes and rivers
02 Sand and gravel reserved
03 Peat reserved
04 Other reservations under the Mining Act may apply
05 Including land under water

*** End of Abstract ***

Status of claim is based on information currently on record.

SUDBURY
CLAIM ABSTRACT

Claim No: S 1214997
Status: Active

Due Date: 1998-AUG-13	Recorded: 1996-AUG-13
Work Required: 3600	Staked: 1996-AUG-09 09:50

Total Work:	0	Description of Claim:
Total Reserve:	0	BUTLER (G-1722)
Present Work Assignment:	0	
Claim Bank:	0	Claim Units: 9
		Multiple Township: N

Claim Ownership Percentage	Client#	Recorded Holder(s)
100.00	302778	RICHLAND MINES INC.

Type	Date	Dollars	Description	
STAKER	1996-AUG-13		RECORDED BY JEROME EDWARD ALBERT (C32301)	R9670.00252
STAKER	1996-AUG-13		JEROME EDWARD ALBERT (149068) RECORDS 100.00 % IN THE NAME OF ERANA MINES LIMITED (299712)	R9670.00253
TRAN	1997-APR-01		ERANA MINES LIMITED (299712) TRANSFERS 100.00 % TO RICHLAND MINES INC. (302778)	T9770.00011

Reservation :
01 400' surface rights reservation around all lakes and rivers
02 Sand and gravel reserved
03 Peat reserved
04 Other reservations under the Mining Act may apply
05 Including land under water
06 Excluding road

*** End of Abstract ***

Status of claim is based on information currently on record.

SUDBURY
CLAIM ABSTRACT

Claim No: S 1214998
Status: Active

Due Date: 1998-OCT-03
Work Required: 3600

Recorded: 1996-OCT-03
Staked: 1996-OCT-02 09:50

Total Work:	0
Total Reserve:	0
Present Work Assignment:	0
Claim Bank:	0

Description of Claim:
BUTLER (G-1722)

Claim Units: 9
Multiple Township: N

Claim Ownership Percentage	Client#	Recorded Holder(s)
100.00	302778	RICHLAND MINES INC.

Type	Date	Dollars	Description	
STAKER	1996-OCT-03		RECORDED BY JEROME EDWARD ALBERT (C32301)	R9670.0046
STAKER	1996-OCT-03		JEROME EDWARD ALBERT (149068) RECORDS 100.00 % IN THE NAME OF ERANA MINES LIMITED (299712)	R9670.0046
TRAN	1997-APR-01		ERANA MINES LIMITED (299712) TRANSFERS 100.00 % TO RICHLAND MINES INC. (302778)	T9770.0001

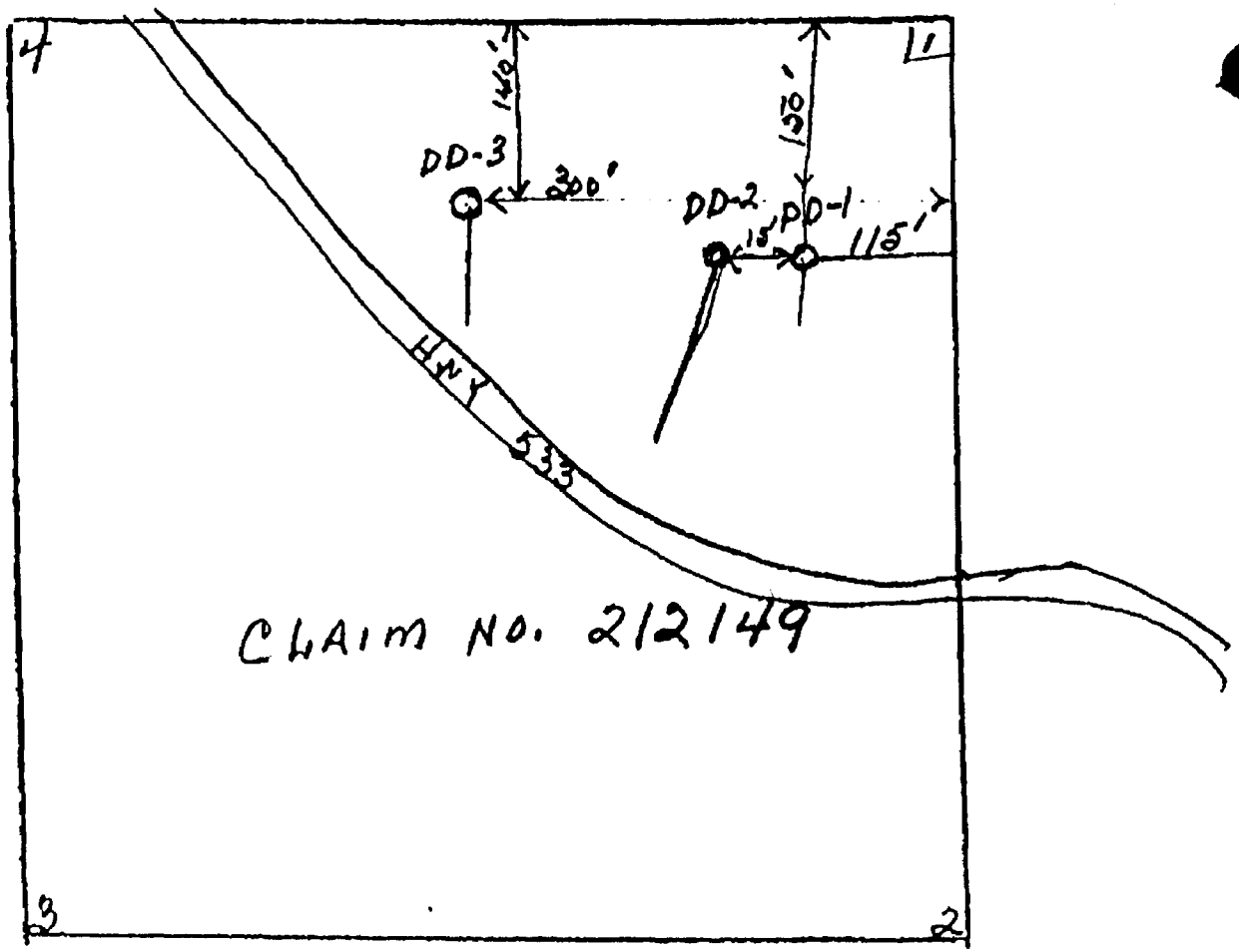
Reservation :
01 400' surface rights reservation around all lakes and rivers
02 Sand and gravel reserved
03 Peat reserved
04 Other reservations under the Mining Act may apply
05 Including land under water
06 Excluding road

*** End of Abstract ***

Status of claim is based on information currently on record.

APPENDIX III

DRILL LOGS FROM PREVIOUS WORK


4
1
3
2
140'
DD-3
300'
130'
DD-2
15'
DD-1
115'
HWY
533
CLAIM NO. 212149

Diamond Drilling

Township of BUTLER

Report Nº 15

Work performed by: Morris Macwilliam

Claim Nº	Hole Nº	Footage	Date	Note
L 212149	1	32.0'	Sept/71	
	2	106.0'	Sept/71	
	3	103.0'	Sept/71	
		3/241'		

Notes:

107/71

THE MINING ACT – DEPARTMENT OF MINES

DIAMOND DRILLING LOG

Start a new page for every new hole, but fill in top portion of form only on first page for each hole.

FILL IN ON EVERY PAGE ▶ HOLE NO. 1 PAGE NO. 1

DRILLING COMPANY		COLLAR ELEVATION	BEARING OF HOLE FROM TRUE NORTH: VERTICAL	TOTAL FOOTAGE: 32	DIP OF HOLE AT: collar VERTICAL; ft °; ft °; ft °; ft °
DATE HOLE STARTED: Sept 10th	DATE COMPLETED: Sept. 10th/71	DATE LOGGED: Sept. 15/71	LOGGED BY: Morris Macwilliam		
EXPLORATION CO., OWNER OR OPTIONEE: Morris Macwilliam		DATE SUBMITTED: Sept 24/71	SUBMITTED BY (Signature): J. Miron		

LOCATION OF HOLE IN RELATION TO A FIXED POINT ON THE CLAIM: 100' WEST 150' SOUTH OF #1 POST CLAIM # 21249

MAP REFERENCE NO.: 1 CLAIM NO.: 212149

LOCATION (Tp., Lot, Con. OR Lat. and Long.): BUTLER TWP.

PROPERTY NAME: VERMICULITE PROPERTY

FOOTAGE FROM	FOOTAGE TO	ROCK TYPE	DESCRIPTION (Colour, grain size, texture, minerals, alteration, etc.)	PLANAR FEATURE ANGLE °	CORE SPECIMEN FOOTAGE ÷	YOUR SAMPLE NUMBER	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE LENGTH	ASSAYS ÷
0'	24'	BIOTITE	COARSE GRAIN BLACK WITH MICA + VERMICULITE							
24	32.	GNEISS	PINK FELDSPATHIC FINER GRAINS OF MICA							
			ENCOUNTERD BROKEN ROCK AT 32' DRILL CORE BROKEN IN SMALL PEICES LOST OUR WATER STOPPED DRILLING.							

SEP 27

THE MINING ACT – DEPARTMENT OF MINES

DIAMOND DRILLING LOG

Start a new page for every new hole, but fill in top portion of form only on first page for each hole.

FILL IN ON EVERY PAGE — HOLE NO. 2 — PAGE NO. 2

DRILLING COMPANY: Rented drill	COLLAR ELEVATION:	BEARING OF HOLE FROM TRUE NORTH:	TOTAL FOOTAGE: 106'	DIP OF HOLE AT: 10° collar	LOCATION OF HOLE IN RELATION TO A FIXED POINT ON THE CLAIM: 115' WEST 150' SOUTH #1 POST CLAIM # 212149
DATE HOLE STARTED: Sept. 11th/71	DATE COMPLETED: Sept 13th/71	DATE LOGGED: Sept. 13/71	LOGGED BY: Morris Macwilliam	ft	MAP REFERENCE NO.: Hole # 2
EXPLORATION CO., OWNER OR OPTIONEE: Morris Macwilliam Sault St. Marie		DATE SUBMITTED: Sept 24/71	SUBMITTED BY (Signature): J. Miron	ft	CLAIM NO.: 212149
				ft	LOCATION (Tp., Lot, Con. OR Lat. and Long.): BUTLER TWP.
				ft	PROPERTY NAME: VERMICULITE PROPERTY

FOOTAGE FROM	FOOTAGE TO	ROCK TYPE	DESCRIPTION (Colour, grain size, texture, minerals, alteration, etc.)	PLANAR FEATURE ANGLE *	CORE SPECIMEN FOOTAGE +	YOUR SAMPLE NUMBER	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE LENGTH	ASSAYS +
0	22	BIOTITE	BLACK GRAIN 1/4 inch GOLD COLOURED VERMICULITE							
22	48	GNEISS	PINK FINE GRAIN FELDSPAR MICA + QUARTZ							
48	50	VERMICULITE	SOFT FINE GRAIN NO CORE GRAINS OF VERMICULITE FLOATED TO SURFACE IN DRILL SLUDGE							
50	73	BIOTITE	BLACK WITH FINE GRAIN MICA							
73	78	HORNBLENDE	GRAY + BLACK WITH MICA FLAKES							
78	97	BIOTITE	BLACK WITH PINK STRINGS OF FELDSPAR AND FLAKES OF MICA							
97	105	CLAY + MICA	BLACK + GOLD COLOURED FLAKES MICA + CLAY							
105	106	GNEISS	PINK + GREY GRANITE GNEISS.							

* For features such as foliation, bedding, schistosity, measured from the long axis of the core.

+ Additional credit available. See Assessment Work Regulations.

THE MINING ACT – DEPARTMENT OF MINES

DIAMOND DRILLING LOG

Start a new page for every new hole, but fill in top portion of form only on first page for each hole.

FILL IN ON EVERY PAGE — HOLE NO. 3 — PAGE NO. 3

DRILLING COMPANY: RENTED DRILL	COLLAR ELEVATION	BEARING OF HOLE FROM TRUE NORTH	TOTAL FOOTAGE: 103	DIP OF HOLE AT: collar | 90°	LOCATION OF HOLE IN RELATION TO A FIXED POINT ON THE CLAIM: 300' west 140' South #1 Post CLAIM #212149
DATE HOLE STARTED: Sept 14 — DATE COMPLETED: Sept 17/21	DATE LOGGED: Sept 17	LOGGED BY: Morris Macwilliam		ft | °	MAP REFERENCE NO. — CLAIM NO.: 212149
EXPLORATION CO., OWNER OR OPTIONEE: Morris Macwilliam Sault Ste Marie	DATE SUBMITTED: Sept. 22/21	SUBMITTED BY (Signature): J. Miron		ft | °	LOCATION (Tp., Lot, Con. OR Lot. and Long.): BUTLER TWP.
				ft | °	PROPERTY NAME: VERMICULITE PROPERTY

FOOTAGE FROM	FOOTAGE TO	ROCK TYPE	DESCRIPTION Colour, grain size, texture, minerals, alteration, etc.	PLANAR FEATURE ANGLE *	CORE SPECIMEN FOOTAGE +	YOUR SAMPLE NUMBER	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE LENGTH	ASSAYS +
0	12	GNEISS	PINK + GRAY WITH FLAKES OF MICA							
12	17	BIOTITE	BLACK + GRAY WITH SOME MICA							
17	40	GNEISS	PINK WITH SMALL QUARTZ VEINLETS + MICA							
40	45	VERMICULITE	VERY LITTLE SOLID CORE VERMICULITE AND MICA LIKE MUD + CLAY							
45	80	GRANITE	PINK WITH AMPHIBOLE + QUARTS VEINS-MICA							
80	103	BIOTITE	GREENISH BLACK + GRAY WITH SOME MICA FLAKES							

* For features such as foliation, bedding, schistosity, measured from the long axis of the core.

D.D.H. - 1

Property: Butler Twp., Millar Vermiculite
Location: 3.8 miles E from Hwy. 63 and on the N side of Hwy. 533, 50 ft. N from the centre line of Hwy. 533 in claim T 44503
Bearing: N 60°W approx.
Dip: -30°W
Depth: 320 ft.

Date Started: Aug. 15/58.
Date Complete: Aug. 18/58.
Drilled by: Haderski Diamond Drill Co., Timmins.
Logged by: P.C. Perry.
Size of Core: AXT 1 5/16 in.

0 - 5 Casing: Later reamed to 8 ft. due to caving conditions at 6 ft.. Initially a bed-rock set-up.

5 - 229 Hornblendite: A hornblende rich, hornblende-biotite gneiss. Dk. black-green colour, with xtals. up to 1/4 inch in diameter. Gneissossity is weak at approx. 60° to the core axis. The amount of mica varies from section to section. Rock is probably a basic layer within the granite gneiss country rock of the area.(Grenville)

42.5-49	Some shearing near parallel to the core axis. There is some hematite staining of a reddish colour + a very little white calcite filling.
54-74	Red patches 1/2 inch in diam., which are patches of hematite stain which occurs along cleavage planes and bulges out here and there to form the patches.
87-90	As 54-74
101-102	" "
111-153	Very dk. cse. xtalline. hornblende.
124-126	Soft and broken to xtal size - shear or fault doubtful.
143	A 2 in. vein of peach coloured calcite at 60° to c.a.
153-203	As at the top of the hole - perhaps not qite so dk. in colour.
203-229	Contact Zone - This section has been granitized to considerable extent and a good many brick red garnets have been developed which average 1/4 in. in diameter.

229 - 320 Granite: Pink granite gneiss with gneissossity approx. 60° to c.a. Fair amount of white mica as tiny flakes + a few short cse. pegmatite sections, which show indefinite contacts, probably due to the fact that they appear to be growth pegs. rather than intruded dikes.

Core recovery near 100%

Sections showing exfoliation qualities in the contained mica.

26-28	slight		
42-49	"	Heavy at 42.5 and at 49	
78	"		
80.5-88.5	"	173	Slight
92	"	199-203	"
130	"		
134-136	"		

P.C. Perry

APPENDIX IV

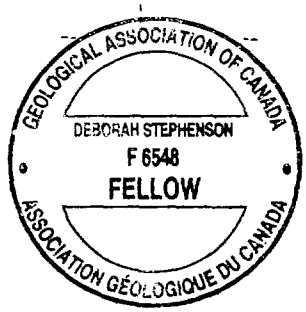
TESTING RESULTS OF VERMICULITE SAMPLES

Richland Vermiculite Samples

Sample ID	Size	Weight	Wt %	Wt Waste	Wt Exf.	Exf %
RM001	10 m	138	3.14	125.25	8.70	6.04
	20 m	1,208	27.49	804.00	330.00	29.10
	40 m	1,233	28.05	--	--	--
	Pan	1,816	41.32	--	--	--
RM002	10 m	167	4.70	--	--	--
	20 m	1,093	30.74	--	908.00	100.00
	40 m	779	21.91	--	--	--
	Pan	1,517	42.66	--	--	--
RM003	10 m	70	2.45	--	--	--
	20 m	469	16.40	203.00	354.00	63.55
	40 m	464	16.23	--	--	--
	Pan	1,856	64.92	--	--	--
RM004	10 m	247	4.54	--	--	--
	20 m	1,068	19.63	320.00	494.00	60.69
	40 m	709	13.03	--	--	--
	Pan	3,418	62.81	--	--	--
RM005	10 m	140	3.01	--	--	--
	20 m	714	15.34	213.00	378.00	63.96
	40 m	864	18.56	--	--	--
	Pan	2,936	63.09	--	--	--
RM006	10 m	769	14.97	694.00	66.71	8.77
	20 m	1,489	28.98	823.00	551.80	40.14
	40 m	824	16.04	--	--	--
	Pan	2,056	40.02	--	--	--
RM007	10 m	365	8.00	--	--	--
	20 m	1,233	27.02	145.00	681.00	82.45
	40 m	779	17.07	--	--	--
	Pan	2,189	47.91	--	--	--
RM008	8 m	709	10.80	--	--	--
	12 m	709	10.80	450.00	166.00	26.95
	30 m	1,589	24.30	440.00	902.00	67.21
	Pan	3,547	54.10	--	--	--

Sample ID	Size	Weight	Wt %	Wt Waste	Wt Exf.	Exf %
RM008	8 m	604	10.40	--	--	--
	12 m	554	9.50	--	--	--
	30 m	1,789	30.80	--	--	--
	Pan	2,860	49.30	--	--	--
RM031	8 m	454	8.50	--	--	--
	12 m	404	7.60	200.00	147.00	42.36
	30 m	1,970	36.80	447.00	1,130.00	71.66
	Pan	2,519	47.10	--	--	--
RM032	8 m	110	1.70	--	--	--
	12 m	223	3.40	60.00	142.00	70.30
	30 m	1,628	25.10	670.00	748.00	52.75
	Pan	4,530	69.80	--	--	--
RM033	8 m	280	5.70	--	--	--
	12 m	304	6.10	80.00	150.00	65.22
	30 m	954	19.10	120.00	674.00	84.89

Sample ID	Size	Weight	Wt %	Wt Waste	Wt Exf.	Exf %
	Pan	3,454	69.10	--	--	--
RM034	8 m	122	1.90	--	--	--
	12 m	166	2.60	112.00	37.00	24.83
	30 m	2,703	42.70	1,900.00	555.00	22.61
	Pan	3,336	52.80	--	--	--
RM035	8 m	38	0.70	--	--	--
	12 m	108	1.80	38.00	40.00	51.28
	30 m	900	15.70	345.00	440.00	56.05
	Pan	4,700	81.80	--	--	--
RM036	8 m	460	8.30	--	--	--
	12 m	474	8.60	272.00	102.00	27.27
	30 m	878	15.90	192.00	368.00	65.71
	Pan	3,726	67.20	--	--	--
RM037	8 m	340	5.70	--	--	--
	12 m	425	7.10	--	--	--
	30 m	1,702	28.30	--	--	--
	Pan	3,538	58.90	--	--	--
RM038	8 m	54	0.80	--	--	--
	12 m	75	1.20	Too fine	--	--
	30 m	843	13.20	135.00	440.00	76.52
	Pan	5,434	84.80	--	--	--
RM039	8 m	122	2.10	--	--	--
	12 m	140	2.40	66.00	48.00	42.11
	30 m	964	16.70	269.00	554.00	67.31
	Pan	4,560	78.80	--	--	--



Richland Sample Gradations

Sample RM001 - 040 Screen Analysis

Size Retention	8 mesh	9,707 grams	4.64%
	12 mesh	18,841 grams	9.02%
	30 mesh	50,488 grams	24.17%
	Pan	129,889 grams	62.17%

8 mesh - Exfoliation of this size was performed on sample RM006 - 015 - 018 only as they were the only samples to have flake present of this grade. Little of this flake retained its size structure to represent an overall recovery of 13.47% from the samples.

12 mesh - All samples responded somewhat to this size range with most exfoliating to much finer material while others having a poor exfoliation rate. There is a moderate recovery in this size range ranging from 3% to 70%.

30 mesh - The greatest abundance of marketable vermiculite occurs in this size range which, upon exfoliation, becomes associated with fine waste particles increasing the overall bulk weight. Screening after exfoliation will be required to bring bulk weight into line for market.

Richland Mines

Notes to Exfoliated Material Quality

1. Material exfoliated readily retaining its size for market grade of medium. Bulk weight of exfoliated material is below market requirements verifying exfoliation rate.

2. Material exfoliated readily retaining its size for market grade of fine. Bulk weight of exfoliated material is below or meets market requirements verifying exfoliation rate.

3. Material exfoliated producing substantial fine material of grade superfine and below. Bulk weight of exfoliated material is heavier than market requirements indicating exfoliation of material does not fully occur.

4. Material exfoliated producing excessive fine material of grade superfine and below. Material readily comes apart upon exfoliation releasing fine waste material producing a high bulk weight. Screening of this waste material does not bring the bulk weight into market specifications.

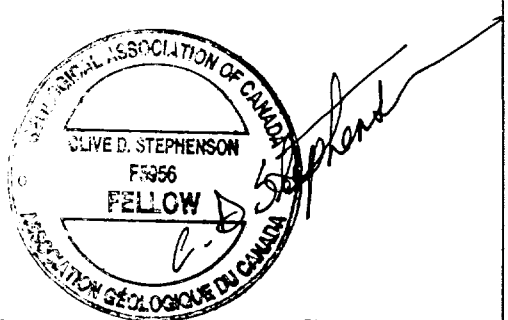
NTS 31L/11SE
Latitude: 46°30′54 ″N
Longitude: 79°5′31″ W

Assessment Report
on
Physical Work Performed
on the

VERMICULITE PROPERTY
BUTLER TOWNSHIP, ONTARIO

for

RICHLAND MINES INC.



Clive Stephenson, B.Sc., FGAC
Strathclyde Geological Services

Val Therese, Ontario
July 1998

CONTENTS

List of Figures:

INTRODUCTION

This report covers physical work completed for Richland Mines Inc. between November 25, 1996 and January 7, 1997. The work consisted of the removal of large timber stands and a stripping and trenching program over two zones of vermiculite mineralization.

PROPERTY LOCATION AND ACCESS

The Richland Mines Inc. vermiculite property is located in Butler Township, in the Sudbury Mining Division, 40 km northeast of the City of North Bay (Figure 1). The approximate geographic centre of the property lies at latitude 46° 30′ 54 ″ north and longitude 79° 5′ 31″ west.

Access to the property is by Provincial Highway 63, northeast from North Bay for 40 km to the junction with Highway 533 then southeast along Highway 533 for 5.5 km. The property is bisected by Highway 533 with smaller bush roads providing access to the northern part of the property.

The property consists of a contiguous block of three unpatented mining claims, which contain nineteen claim units of 16 hectares each (Figure 2). Richland Mines Inc. is the registered holder for all claims. Claim information is summarized in Table 1.

Claim Number	Date Recorded	No. of Claim Units	Amount of Work Due	Due Date for Assessment Work
S 1214996	Aug. 13, 1996	1	$400	Aug. 13, 1998
S 1214997	Aug. 13, 1996	9	$3600	Aug. 13, 1998
S 1214998	Oct. 3, 1996	9	$3600	Oct. 3, 1998

Table 1: Vermiculite Property Claim Information

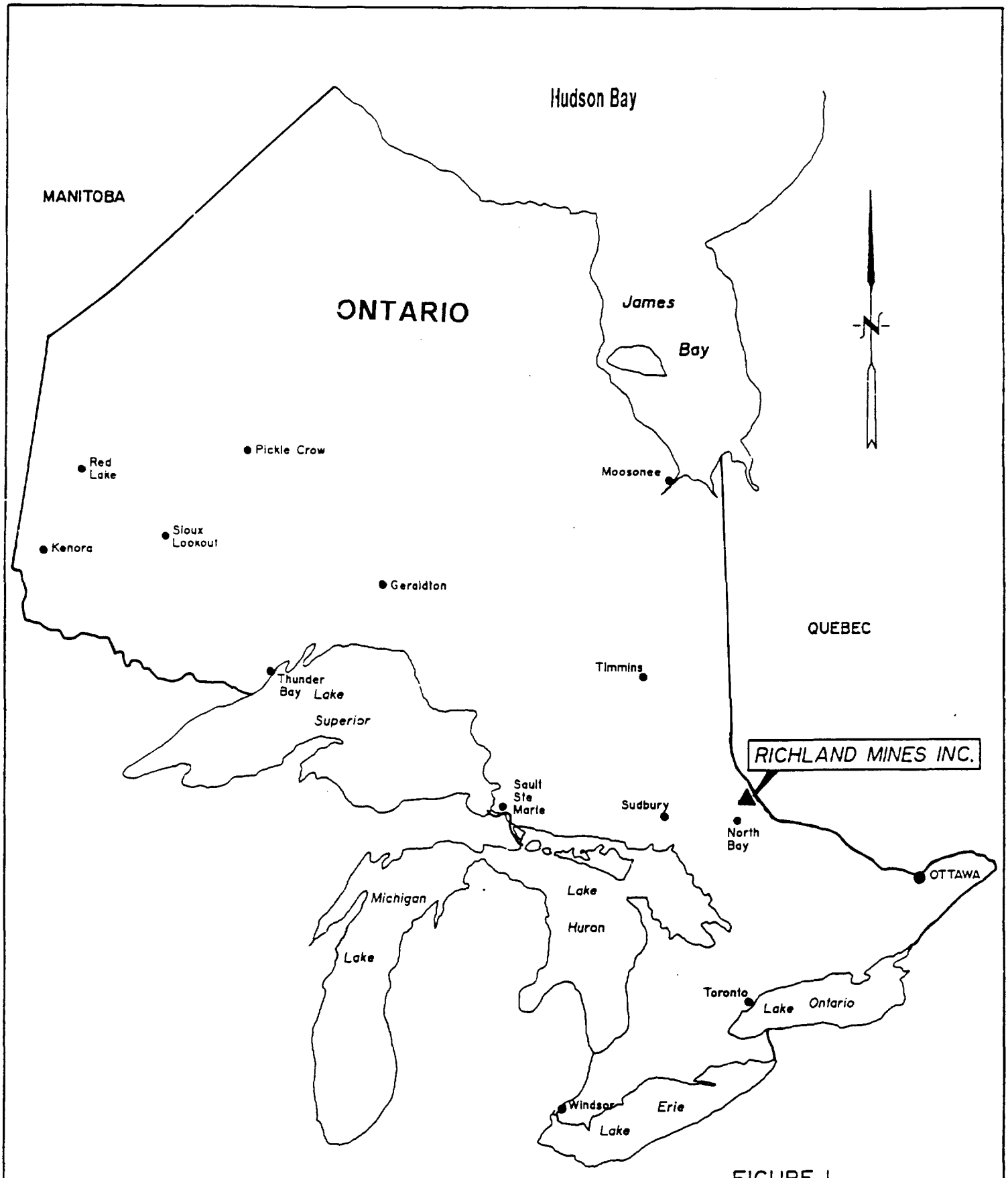


FIGURE 1

PROPERTY LOCATION MAP

After, Constable (1996)

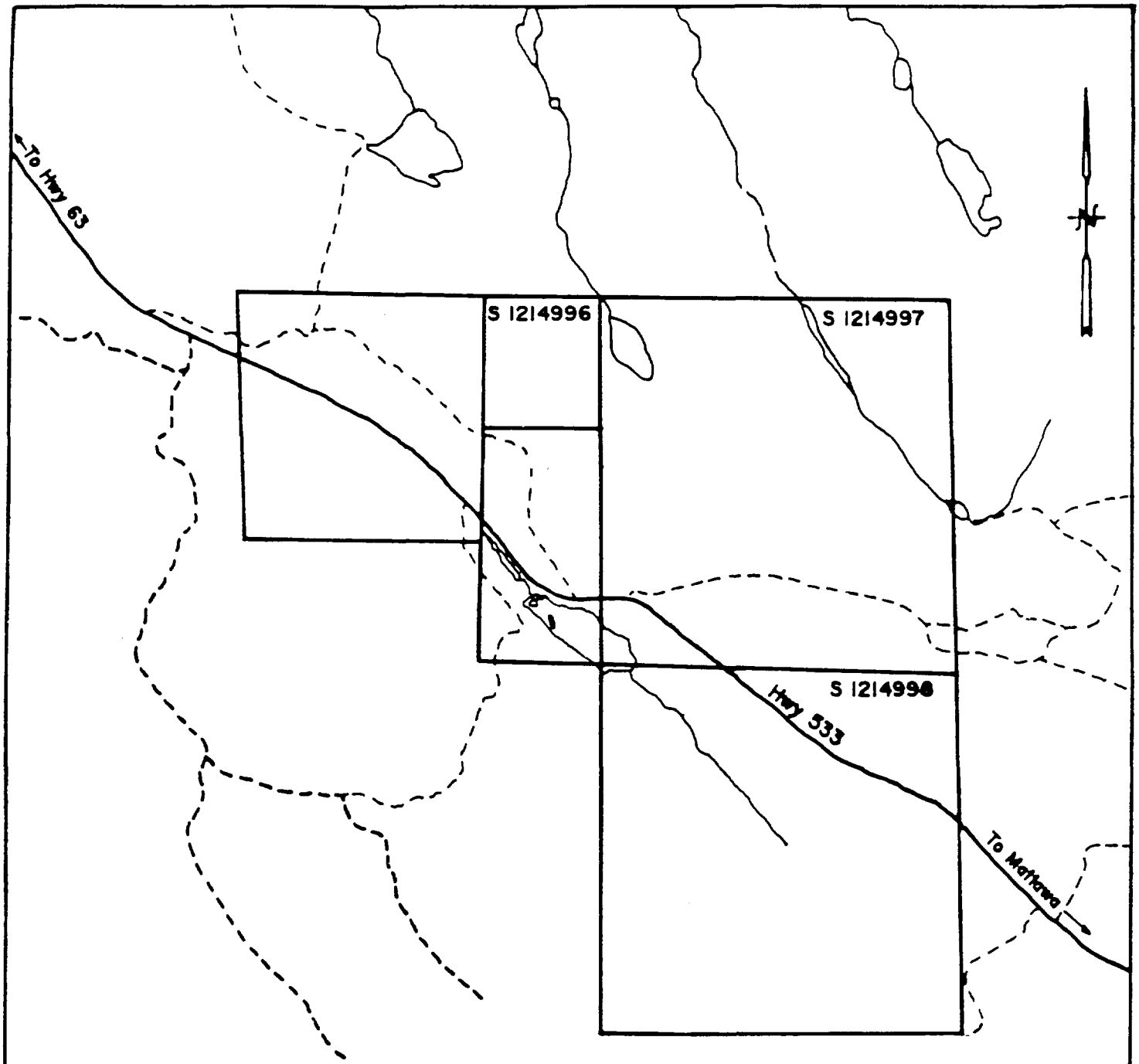


FIGURE 2

CLAIM MAP SKETCH

GEOLOGICAL ASSOCIATION OF CANADA
CLIVE D. STEPHENSON
F5936
FELLOW
ASSOCIATION GÉOLOGIQUE DU CANADA

0 200 400 600 800 1000
METRES

After, Constable (1996)

PREVIOUS WORK

Vermiculite was first discovered in the Butler Township area in 1957 when construction crews building Highway 533 exposed several small showings. In 1957, T.A. Miron and M. MacWilliam staked and recorded two claims encompassing these showings. Milldale Uranium Mines Limited optioned the claims in 1958 and eventually staked another 148 claims in Butler and Antoine Townships.

Very little recorded work can be found in the assessment work files of the Ontario Ministry of Northern Development and Mines. The majority of the work completed on the vermiculite showings includes prospecting, trenching and diamond drilling. In August 1958, Milldale Uranium Mines Limited spotted a single drill hole on the north side of Highway 533 approximately 6.1 km east of Highway 63. This drill hole was located about 600 m (2000 ft) west of the B-Zone of the Richland Mines Inc. property. The hole was drilled to the northwest for 97.5 m (320 ft). The drill log describes 70 m (229 ft) of hornblendite followed by granitic units with minor mica and pegmatitic sections (Appendix II). The claims were allowed to lapse shortly thereafter.

The original stakers re-staked four claims from 1960 to 1961 and a vertical 32 m (104 ft) diamond drill hole was drilled in 1965. The hole encountered minor mica and vermiculite in a hornblendite unit.

In 1971, MacWilliam drilled three more vertical diamond drill holes on the property to depths of 9.75, 32, and 31 m (32, 106, and 103 ft). The first hole lost water after 9.75 m and was abandoned. The second and third holes encountered vermiculite over 0.60 m (2 ft) and 1.5 m (5 ft), respectively. The logs are shown in Appendix II.

There are no reports of additional work on the property from 1971 to 1996. In 1996, a program of prospecting and power trenching by Erana Mines identified three separate areas of vermiculite on what is now the Richland Mines Inc. Butler Township property.

REGIONAL GEOLOGY

The Richland Mines Vermiculite Property lies within the Grenville Structural Province of the Precambrian Shield, just southeast of the Grenville Front. The Grenville Front represents the boundary between the older Precambrian rocks to the north and younger Precambrian rocks to the south. The rocks in this area consist of a highly distorted and folded assemblage of paragneisses of dominantly sedimentary origin. The Grenville Province is also the host to numerous showings of industrial minerals including kyanite, nepheline syenite, vermiculite, garnet, graphite and mica. In the area of the Richland Mines Inc. property, the geology includes a sequence of hornblende gneisses, migmatites and amphibolites all striking southeast and dipping moderately west. A major south plunging anticline occurs east of the property.

PROPERTY GEOLOGY

The earliest reference to the vermiculite deposits in the Butler Township area is from a report by Guillet (1962) in which he describes the geology of the area as being characterized by a highly metamorphosed terrain of granites, syenites, schists, and gneisses typical of the Grenville Front. The vermiculite showing described by Guillet, the Mattawa Deposit, corresponds in part to the B-Zone of the Richland Mines Inc. property. According to Guillet (1962), biotite-vermiculite occurs in the dilation zones of minor folds of amphibolite on the west limb of a southerly plunging anticline. Guillet (1962) traced a 3 m (10 ft) vermiculite zone for about 9m (30 ft) along strike. From grab samples of this zone, Guillet documented values of 19% vermiculite.

Richland Mines Inc.'s Butler Township vermiculite property consists of two showings or zones: the B-Zone and the South Zone. The geology of each zone is complex but seems to embody the same rock units in varying proportions. The geology of these zones is discussed in detail in the attached geological report.

PHYSICAL WORK

The B-Zone takes the form of a 190m by 10m by 2-8m deep trench and is part of a stripped area of approximately 180m by 300m. The South Zone lies to the south of the B-Zone, across the highway, and consists of a main trench 40m by 10m by 1m deep. There are also four smaller trenches in the South-Zone, each of approximately 8m by 2m by 2m deep.

The initial phase of the work involved the cutting and removal of large trees over the B-Zone and was completed by Woody's Fuelwood Supply of Redbridge, Ontario, at various times during the period December 2, 1996 to January 7, 1997. The work was completed over 15 days in this period for a total of 107 hours of work.

Stripping of the B-Zone over an area of 200m by 300m was completed by Erana Mines Limited of Lively, Ontario. Overburden ranged in depth from 2 to 4 m. A large trench was then excavated in an attempt to aid in the delineation of the vermiculite mineralization. The stripping and trenching of both the B and South Zones was completed on various dates over the period November 25, 1996 to December 20, 1996 with minor clean-up in the early summer of 1997. A total of 30 man days were spent on the stripping and trenching of both zones during this period. A total of 100 hours of stripping and trenching was completed using a 690E excavator at an hourly rental rate of $70. The equipment was operated by P. Hauser, with supervision by E. Blanchard.

The outline of the stripped areas and location and results of sampling are detailed in the geology report which is part of this assessment submission

REFERENCES

Constable, D.

1996: A Preliminary Report for Richland Mines Inc. on the Vermiculite Property, Butler Township, Constable Consulting Inc., October 18, 1996, 22 pp.

Guillet, G.R.

1962: "Vermiculite in Ontario with an appendix on Perlite", Industrial Mineral Report No. 7, Ontario Department of Mines, 39 pp.

Certification

I, CLIVE D. STEPHENSON, hereby certify that:

1. I am a consulting geologist operating as Strathclyde Geological Services and have a business office at 4441 Shirley Avenue, Val Therese, Ontario P3P 1S8.

2. I have a Bachelor of Science degree in Geology (1986) from Laurentian University, Sudbury, Ontario and have been involved in mineral exploration and development activities for the past fourteen years.

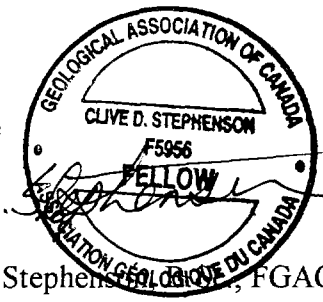
3. I have been a Fellow of the Geological Association of Canada since 1992.

4. I have based this report on the data listed in the reference listing and visits to the property the summer of 1997.

5. I have no interest, direct or indirect, in the subject property of this report nor do I expect to receive any. Furthermore I do not own, directly or indirectly, any securities of the issuer or any affiliate. I have written this report as an independent consultant.

DATED IN VAL THERESE, ONTARIO this TWENTY SEVENTH DAY OF JULY, 1998.

Signature



Clive D. Stephenson, B.Sc., FGAC.

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use)
W9870. 00517.
Assessment Files Research Imaging

31L11SE2001 2.18750 BUTLER

900

ctions 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, this work and correspond with the mining land holder. Questions about this collection t and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Instructions: - For work performed on Crown Lands before **recording** a claim, use form 0240.
- Please type or print in ink.

1. Recorded holder(s) (Attach a list if necessary) 2.18750

Name	Client Number
Richland Mines Inc.	302778
Address 625 Howe Street, Suite 522 Vancouver, British Columbia	Telephone Number (604) 488-0796 Fax Number (604) 488-0796
Name	Client Number
Address	Telephone Number
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☒ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☐ Physical: drilling stripping, trenching and associated assays ☐ Rehabilitation

Work Type	Office Use
Geological Mapping, Sampling and Testing, Linecutting	Commodity
	Total $ Value of Work Claimed 7303
Dates Work Performed From 12 (Day) June (Month) 1997 (Year) To 18 (Day) August (Month) 1997 (Year)	NTS Reference
Global Positioning System Data (if available) — Township/Area Butler	Mining Division Sudbury
M or G-Plan Number G1722	Resident Geologist District Sudbury

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name	Telephone Number
Deborah Stephenson, Strathclyde Geological Services	(705) 969-4853
Address 4441 Shirley Ave., Val Therese, Ontario, P3P 1S8	Fax Number (705) 969-4853
Name	Telephone Number
Address	Fax Number
Name	Telephone Number
Address	Fax Number

RECEIVED
AUG 12 1998
GEOSCIENCE ASSESSMENT OFFICE

4. Certification by Recorded Holder or Agent

I, Clive D. Stephenson, do hereby certify that I have personal knowledge of the facts set forth in
(Print Name)
this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent C.D. Stephenson		Date August 11th, 1998
Agent's Address 4441 Shirley Ave, Val Therese, Ontario, P3P 1S8	Telephone Number (705) 969-4853	Fax Number (705) 969-4853

0241 (03/97)

Deemed Noo 10/98

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

* Amendment W9870.00517

Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.		Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date
eg	TB 7827	16 ha	$26,825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8,892	$ 4,000	0	$4,892
1	S1214996	1	0	$ 400	0	0
2	S1214997	9	$ 7,003	$ 3,600	3,403	0
3	S1214998	9	$ 300	$ 3,303	0	0
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
	Column Totals	19	$ 7,303	$ 7,303	$ 3,403	0

I, Clive D. Stephenson, do hereby certify that the above work credits are eligible under
(Print Full Name)
subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing	Date
C.D. Stephenson	August 11th, 1998

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

cut backs are to be done with reference to the physical ROW (part of this submission) so that the annual assessment is met for the year.

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp	Deemed Approved Date	Date Notification Sent
	Date Approved	Total Value of Credit Approved
	Approved for Recording by Mining Recorder (Signature)	

0241 (03/97)

2.18750

For Office Use Only

Received Stamp

Deemed Approved Date	Date Notification Sent
Date Approved	Total Value of Credit Approved
Approved for Recording by Mining Recorder (Signature)	

0241 (03/97)

2.18750

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use)
W9870.00518
Assessment Files Research Imaging

Personal information collected on this form is obtained under the authority of subsections 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, this information is a public record. This information will be used to review the assesment work and correspond with the mining land holder. Questions about this collection should be directed to a Provincial Mining Recorder, Ministry of Northern Development and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Instructions: - For work performed on Crown Lands before **recording** a claim, use form 0240.
- Please type or print in ink.

2.18750

1. Recorded holder(s) (Attach a list if necessary)

Name	Client Number
Richland Mines Inc.	302778
Address 625 Howe Street, Suite 522	Telephone Number (604) 488-0796
Vancouver, British Columbia	Fax Number (604) 488-0796
Name	Client Number
Address	Telephone Number
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☐ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☒ Physical: drilling stripping, trenching and associated assays ☐ Rehabilitation

Work Type	Office Use
Stripping, Trenching	Commodity
	Total $ Value of Work Claimed 15,941
Dates Work Performed From 25 (Day) Nov (Month) 1996 (Year) To 07 (Day) Jan (Month) 1997 (Year)	NTS Reference
Global Positioning System Data (if available) — Township/Area Butler	Mining Division Sudbury
M or G-Plan Number G1722	Resident Geologist District Sudbury

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- *include two copies of your technical report.*

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name	Telephone Number
Strathclyde Geological Services	(705) 969-4853
Address 4441 Shirley Ave., Val Therese, Ontario, P3P 1S8	Fax Number (705) 969-4853
Name	Telephone Number
Address	Fax Number
Name	Telephone Number
Address	Fax Number

RECEIVED
AUG 12 1998
GEOSCIENCE ASSESSMENT OFFICE

4. Certification by Recorded Holder or Agent

I, Clive D. Stephenson, do hereby certify that I have personal knowledge of the facts set forth in
(Print Name)
this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent C. D. Stephenson		Date August 11th, 1998
Agent's Address 4441 Shirley Ave, Val Therese, Ontario, P3P 1S8	Telephone Number (705) 969-4853	Fax Number (705) 969-4853

0241 (03/97)

Deemed Nov 10/98

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

W9870.00518 * Amendment.

Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.		Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date
eg	TB 7827	18 ha	$26,825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8,892	$ 4,000	0	$4,892
1	S1214996	1	0	0	0	0
2	S1214997	9	$ 15,941	0	$ 297	$ 15,644
3	S1214998	9	0	$ 297	0	0
4						
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9						
10						
11						
12						
13						
14						
15						
	Column Totals	19	$ 15,941	$ 297	$ 297	$ 15,644

I, Clive D. Stephenson, do hereby certify that the above work credits are eligible under
(Print Full Name)
subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing	Date
C.D. Stephenson	August 11th, 1998

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp	Deemed Approved Date	Date Notification Sent
	Date Approved	Total Value of Credit Approved
	Approved for Recording by Mining Recorder (Signature)	

0241 (03/97)

2.18750

For Office Use Only

Received Stamp

Deemed Approved Date | Date Notification Sent

Date Approved | Total Value of Credit Approved

Approved for Recording by Mining Recorder (Signature)

0241 (03/97)

2.18750

RECEIVED
AM 1:30
AUG 12 1998
GEOSCIENCE ASSESSMENT OFFICE

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Transaction Number (office use) W9870.00517 /618

Personal information collected on this form is obtained under the authority of subsection 6 (1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, this information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to a Provincial Mining Recorder, Ministry of Northern Development and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Work Type	Units of work Depending on the type of work, list the number of hours/days worked, metres of drilling, kilometres of grid line, number of samples, etc.	Cost Per Unit of work	Total Cost
Geological Mapping, Compilation, Drafting, Report Writing	11 days	$ 300/day + GST	$ 3,531
Assistant for Geological Mapping	3 days	$ 150/day + GST	$ 482
Linecutting	2.5 km	$ 150/km + GST	$ 401
Sample Transportation, Preparation, Drying, Testing	19 samples		$ 1,612
Tree Removal (labour)	107 hours	$ 15/hr + GST	$ 1,717
Equipment Rental (690E Excavator)	100 hours	$ 70/hr + GST	$ 7,490
Labour/Operator/Supervision (stripping/trenching)	30 man days	$ 125/day + GST	$ 4,013
Report Writing (Physical)	1 day	$ 300/day + GST	$ 321
Associated Costs (e.g. supplies, mobilization and demobilization).			
Supplies for Geological Mapping			$ 131
mob/demob (stripping/trenching)			$ 500
Transportation Costs			
Travel for Geological Mapping			$1,016
Food and Lodging Costs			
Hotel, Food (geol)			$ 130
Food/Lodging (stripping/trenching)			$ 1,900
		Total Value of Assessment Work	**$ 23,244**

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

TOTAL VALUE OF ASSESSMENT WORK x 0.50 = Total $ value of worked claimed.

Note:
- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted.

Certification verifying costs:

I, **Clive D. Stephenson**, do hereby certify, that the amounts shown are as accurate as may reasonably
(please print full name)
be determined and the costs were incurred while conducting assessment work on the lands indicated on the accompanying Declaration of Work form as AGENT, I am authorized to make this certification. 2.18350
(recorded holder, agent, or state company position with signing authority)

RECEIVED
AUG 12 1998
GEOSCIENCE ASSESSMENT OFFICE

0212 (03/97)

Signature: C. D. Stephenson Date: August 11th, 1998

Ministry of Northern Development and Mines

Ministère du Développement du Nord et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (888) 415-9846
Fax: (877) 670-1555

Visit our website at:
www.gov.on.ca/MNDM/MINES/LANDS/mlsmnpge.htm

September 24, 1998

RICHLAND MINES INC.
789 WEST PENDER ST. SUITE 1588
VANCOUVER, BC
V6C-1H2

Dear Sir or Madam:

Submission Number: 2.18750

Subject: Transaction Number(s):		**Status**
	W9870.00517	Deemed Approval
	W9870.00518	Deemed Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice. Allowable changes to your credit distribution can be made by contacting the Geoscience Assessment Office within this 45 Day period, otherwise assessment credit will be cut back and distributed as outlined in Section #6 of the Declaration of Assessment work form.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact Steve Beneteau by e-mail at benetest@epo.gov.on.ca or by telephone at (705) 670-5855.

Yours sincerely,

ORIGINAL SIGNED BY
Blair Kite
Supervisor, Geoscience Assessment Office
Mining Lands Section

Correspondence ID: 12849

Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.18750

Date Correspondence Sent: September 24, 1998 **Assessor:** Steve Beneteau

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9870.00517	1214997	BUTLER	Deemed Approval	September 21, 1998

Section:
12 Geological GEOL

ONLY ONE WORK REPORT REQUIRED

Note: As a result of the centralization of assessment work on future submissions you may report both physical and geotechnical (prospecting) work together on only one form.

Duplicate copies of the Declaration of Assessment Work forms are no longer required.

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9870.00518	1214997	BUTLER	Deemed Approval	September 21, 1998

Section:
10 Physical PSTRIP
10 Physical PTRNCH

Correspondence to:

Resident Geologist
Sudbury, ON

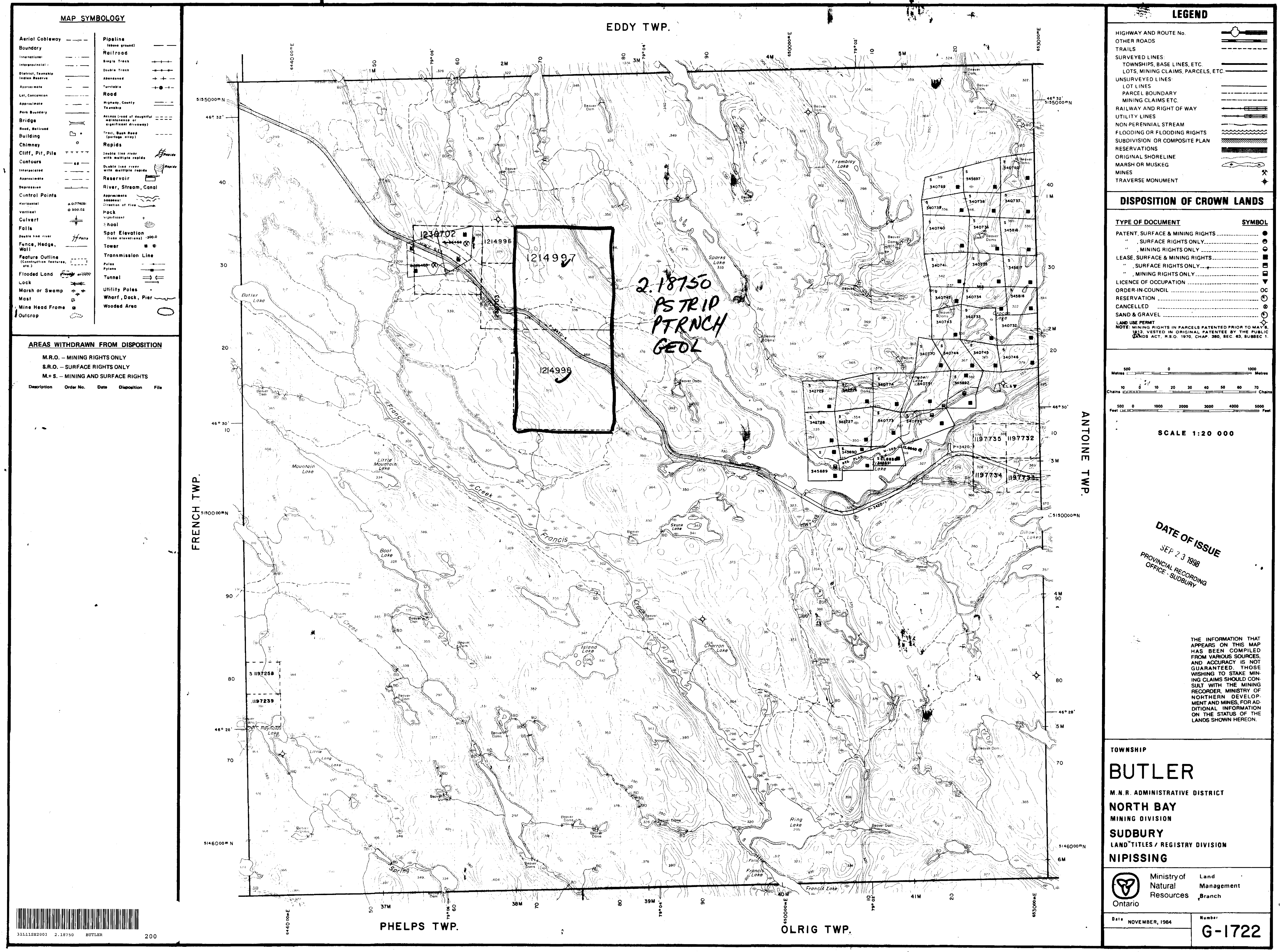
Assessment Files Library
Sudbury, ON

Recorded Holder(s) and/or Agent(s):

Deborah Stephenson
VL THERESE, ON

RICHLAND MINES INC.
VANCOUVER, BC

[redacted]



G-1722
BUTLER TWP.
MAP SYMBOLOGY
Aerial Cableway
Boundary
International
Interprovincial
District, Township Indian Reserve
Approximate
Lot, Concession
Approximate
Park Boundary
Bridge
Road, Railroad
Building
Chimney
Cliff, Pit, Pile
Contours
Interpolated
Approximate
Depression
Control Points
Horizontal
Vertical
Culvert
Falls
Double line river
Fence, Hedge, Wall
Feature Outline (Construction features, etc.)
Flooded Land
Lock
Marsh or Swamp
Mast
Mine Head Frame
Outcrop
Pipeline (above ground)
Railroad
Single Track
Double Track
Abandoned
Turntable
Road
Highway, County Township
Access (road of doubtful maintenance or significant driveway)
Trail, Bush Road (portage, alley)
Rapids
Double line river with multiple rapids
Reservoir
River, Stream, Canal
Approximate
Seasonal
Direction of flow
Rock
Significant
Shoal
Spot Elevation (lake elevations)
Tower
Transmission Line
Poles
Pylons
Tunnel
Utility Poles
Wharf, Dock, Pier
Wooded Area
AREAS WITHDRAWN FROM DISPOSITION
M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS
Description Order No. Date Disposition File
31L11SE2001 2.18750 BUTLER
200
EDDY TWP.
FRENCH TWP.
ANTOINE TWP.
PHELPS TWP.
OLRIG TWP.
1214997
1214998
1214996
1230702
2.18750
PSTRIP
PTRNCH
GEOL
1197735
1197732
1197734
1197733
S 1197258
1197239
Butler Lake
Mountain Lake
Little Mountain Lake
Boot Lake
Reynolds Lake
Little Long Lake
Spring
Francis Creek
Island Lake
Skunk Lake
Charron Lake
Ring Lake
Francis Lake
Sparks Lake
Tremblay Lake
Dillow Lakes
HWY 533
LEGEND
HIGHWAY AND ROUTE No.
OTHER ROADS
TRAILS
SURVEYED LINES:
TOWNSHIPS, BASE LINES, ETC.
LOTS, MINING CLAIMS, PARCELS, ETC.
UNSURVEYED LINES:
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC.
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON-PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT
DISPOSITION OF CROWN LANDS
TYPE OF DOCUMENT SYMBOL
PATENT, SURFACE & MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LEASE, SURFACE & MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LICENCE OF OCCUPATION
ORDER-IN-COUNCIL OC
RESERVATION
CANCELLED
SAND & GRAVEL
LAND USE PERMIT
NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. 63, SUBSEC 1.
SCALE 1:20 000
DATE OF ISSUE
SEP 23 1998
PROVINCIAL RECORDING OFFICE - SUDBURY
THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.
TOWNSHIP
BUTLER
M.N.R. ADMINISTRATIVE DISTRICT
NORTH BAY
MINING DIVISION
SUDBURY
LAND TITLES / REGISTRY DIVISION
NIPISSING
Ministry of Natural Resources
Land Management Branch
Ontario
Date NOVEMBER, 1984
Number G-1722

Legend

5 Unconsolidated material
- 5a Overburden, boulders, gravel, sand
- 5b unconsolidated wall rock
  number in brackets indicates type of unconsolidated material

4 Pegmatite

3 Vermiculite
- 3a Green
- 3b Red
- 3c Black

2 Amphibolite
- 2a Weathered, porphyritic Amphibole + Biotite + Epidote Schist
- 2b Amphibole + Biotite + Epidote Schist
- 2c Amphibole + Biotite Schist
- 2d Amphibole + Biotite + Quartz Schist
- 2e Amphibole + Biotite + Quartz + Garnet Schist

1 Migmatite

- • RMA-001 Sample location
- Slope, bars point downslope
- outcrop
- trench
- geological contact, observed
- geological contact, inferred
- claim post
- foliation with dip
- gneissocity with dip

0 2 4 6 8 10
Metres

2.18750

Strathclyde Geological Services

RICHLAND MINES INC.

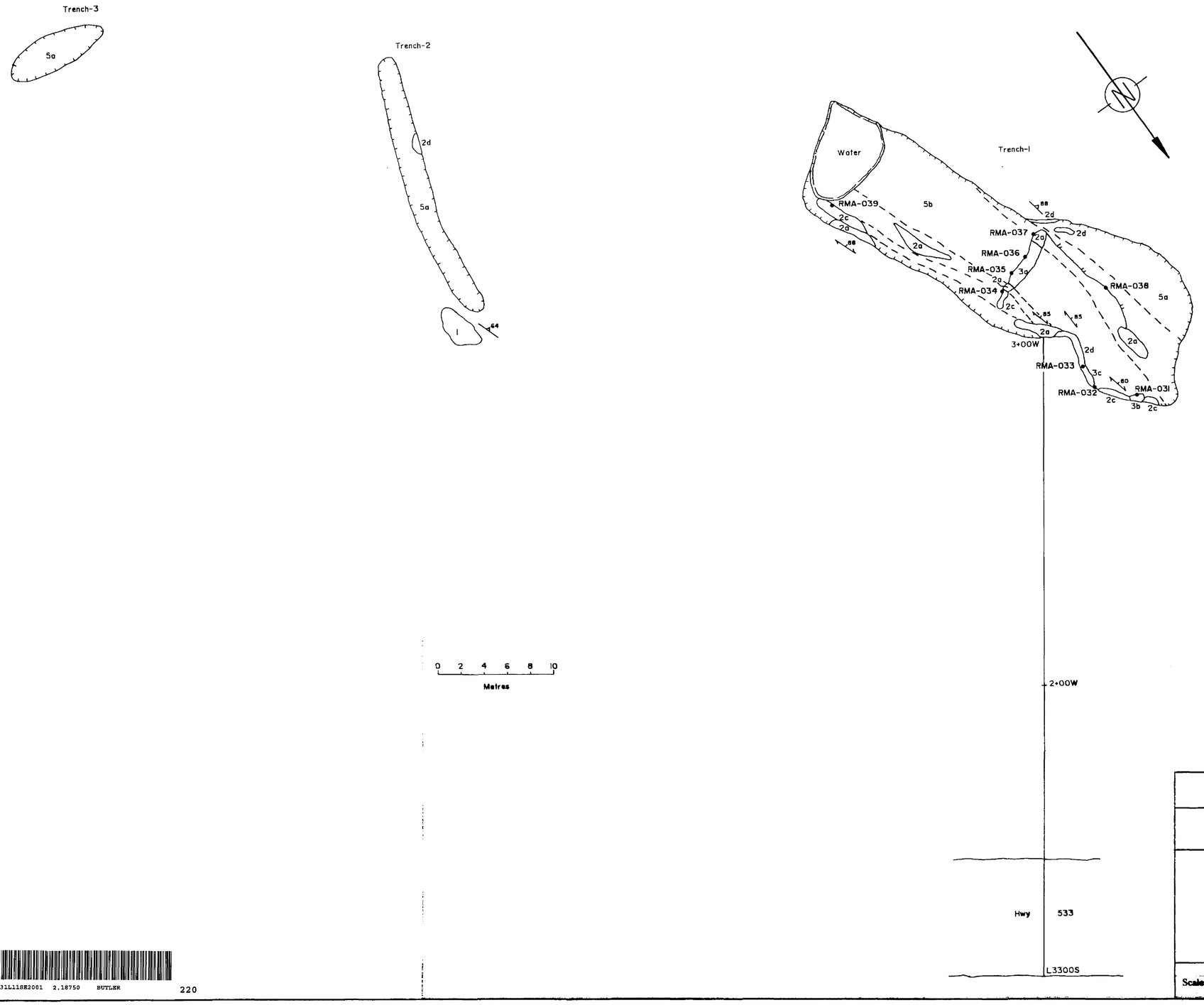
MAP 1

B Zone Detail Geology

GEOLOGICAL ASSOCIATION OF CANADA
DEBORAH STEPHENSON
F 6548
FELLOW
ASSOCIATION GÉOLOGIQUE DU CANADA

Scale: 1:200	Geology by: D. Stephenson	July, 1997

31L11SE2001 2.18750 BUTLER 210



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1 Migmatite

- • RMA-001 Sample location
- Slope, bars point downslope
- 2a outcrop
- trench
- geological contact, observed
- geological contact, inferred
- claim post
- 70 foliation with dip
- 70 gneissocity with dip

Strathclyde Geological Services

RICHLAND MINES INC.

GEOLOGICAL ASSOCIATION OF CANADA
DEE-RAH STEPHENSON
F 6548
FELLOW
ASSOCIATION GÉOLOGIQUE DU CANADA

MAP 2

South Zone Detail Geology

Scale: 1:200	Geology by: D. Stephenson	July, 1997

S 1210926

S 1214996

S 1214997

S 1210927

S 1214998

To Hwy 63

Bush Road

A Zone

BL

Bush Road

Bush Road

C Zone

B Zone

South Zone

Hwy 533

To Mattawa

BUTLER
TOWNSHIP

Legend

5 Unconsolidated material
- 5a Overburden, boulders, gravel, sand
- 5b unconsolidated wall rock
- number in brackets indicates type of unconsolidated material

4 Pegmatite

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- 2e Amphibole + Biotite + Quartz + Garnet Schist

1 Migmatite

- • RMA-001 Sample location
- Slope, bars point downslope
- Outcrop
- Trench
- Geological contact, observed
- Geological contact, inferred
- Claim post
- Foliation with dip
- Gneissocity with dip

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Map 3

VERMICULITE PROPERTY
BUTLER TOWNSHIP

Scale: 1:4800 | Geology by: D. Stephenson | July, 1997

1:4800

200 0 500 1000 Feet