**Evaluation Report** 

on the

Mountjoy and Cairo Properties

in the

Porcupine and Larder Lake Mining Divisions of the Districts of Cochrane and Timiskaming in the

Timmins Area, Province of Ontario

W.D. Beaton, Ph.D., P.Eng.
Westmount, Quebec
September 30, 1983

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#### SUMMARY

### Introductory Statement

Grand Saguenay Mines & Minerals Limited has acquired the option to earn 60 per cent working interest in two gold properties; one located in the Timmins area, the other in the Matachewan area of northeast Ontario. The properties together comprise 93 mining claims totaling approximately 3,720 acres. An exploration program has been proposed with expenditures totaling \$483,700.

#### Regional Geology and Exploration Priorities

The Timmins-Matachewan-Kirkland Lake area has been subject to extensive geological mapping and exploration since the discovery of gold in Timmins in 1909. These investigations have led to an understanding of the regional stratigraphy and structure. Of major importance is the recognition of two volcanic Supergroups, a Lower and Upper, each typically containing a basal komatilitic group, an overlying tholeitic group and an upper calc-alkalic group. The division between the two Supergroups marks a major change in volcanism and is the single most important stratigraphic marker in the area.

Regionally it appears that the contact of the two Supergroups is of special economic significance. Gold deposits are related to the komatiites and tholeiltes at the base of the Upper Supergroup. Furthermore, many quartz-feldspar porphyries

were emplaced along or near the Supergroup contact, and the sources for prophyries have been postulated 88 Indeed, one cannot avoid the observation that a mineralization. significant proportion of the producing mines, past producing mines and significant prospects in the Timmins-Matachewan area are spatially related to the contact of the two Supergroups. This general contact zone in conjunction with alteration and therefore played an important role in the structure has acquisition of these two properties by Grand Saguenay Mines & Minerals Limited for further exploration work.

# Properties on which further exploration work is proposed by Grand Saguenay Mines & Metals Limited

#### Mountjoy Property

The property consists of 79 mining claims in Mountjoy

Township. Grand Saguenay Mines & Minerals Limited has the option

to acquire 60 per cent working interest in the property.

Mountjoy Township is immediately west of Tisdale Township, which hosts the major deposits of the Timmins gold camp. The Township has received very minor exploration work as the area has previously been interpreted as being underlain almost entirely by sedimentary rocks. Outcrop is minimal and the area is largely one of farmland. Nevertheless, a compilation of previous exploration work in conjunction with exploration work by Comstate Resources (geological mapping) has revealed that a number of features suggestive of economic gold mineralization of the

Timmins-type are present on the property: (1) extensive, pervasive carbonatization, (2) a thick (greater than 2000 foot) sequence of carbonatized komatiitic volcanic rocks which are correlative with gold bearing stratigraphy in the Timmins camp, (3) presence of indicator minerals such as tourmaline, arsenopyrite, fuchsite and gold (0.03 ounces per ton over 30 feet), and (4) widespread intrusion of quartz feldspar porphyry; two areas underlain predominantly by porphyry appear to be of a size comparable to the porphyry intrusions in the Timmins gold camp.

Grand Saguenay has recommended an exploration program to consist of geophysical surveys, mechanized stripping, and diamond drilling. Total estimated cost is \$353,600.00.

#### 2) Cairo Property

The property consists of 14 mining claims in Cairo Township, and is located one mile east of the town of Matachewan. Grand Saguenay Mines & Minerals Limited has the option to acquire 60 per cent working interest in the property.

The property, two miles east of the past producing gold mines in Matachewan, is interpreted to be traversed by the Larder Lake Fault zone, a major break along which numberous gold mines show a spatial relationship extending from Val D'Or to Matachewan, a distance of 120 miles. The north half of the property is covered by Proterozoic sedimentary rocks, the south half is underlain by a variety of Archean rocks largely consisting of mafic flows, lesser felsic to intermediate

pyroclastic rocks and minor sulfide iron formation and komatitic volcanic rocks. Other than trenching, and the work by Comstate, no previous exploration work has been reported for the claims.

A program to consist largely of geophysical surveys, mechanized trenching and diamond drilling is recommended. Total estimated cost if \$130,000.00.

# EVALUATION REPORT ON THE PROPERTIES OF GRAND SAGUENAY MINES & MINERALS LIMITED IN THE PORCUPINE AND LARDER LAKE MINING DIVISION

#### General Statement

Grand Saguenay Mines & Minerals Limited has acquired the option to earn 60 per cent working interest in 93 claims in the general Timmins-Matachewan area, northeastern Ontario (Figure 1). The claims comprise 2 separate properties totalling approximately 3,720 acres.

This report deals firstly with the general history, geology and mineralization of the Timmins area; followed by a description of the Mountjoy property and secondly, a similar presentation of the Cairo property located in the Matachewan area.

- Note: In this report, assessment files are referred to as follows:
  - \* Ontario Geological Survey, Assessment Office, Timmins \*\* Ontario Geological Survey, Assessment Office, Toronto
- Note: Assessment credits for mining claims in the Province of Ontario are allotted on the basis of days work, over a period of five years immediately following the recording of the claim. For each type and amount of exploration work performed on a claim a prescribed number of days work is assigned in accordance with the Mining Act. During the five years, the minimum days work required per year to maintain a claim in good standing is 20, 40, 40, 40, and 60 respectively, for a total of 200 days, at which time the claim may be brought to lease.

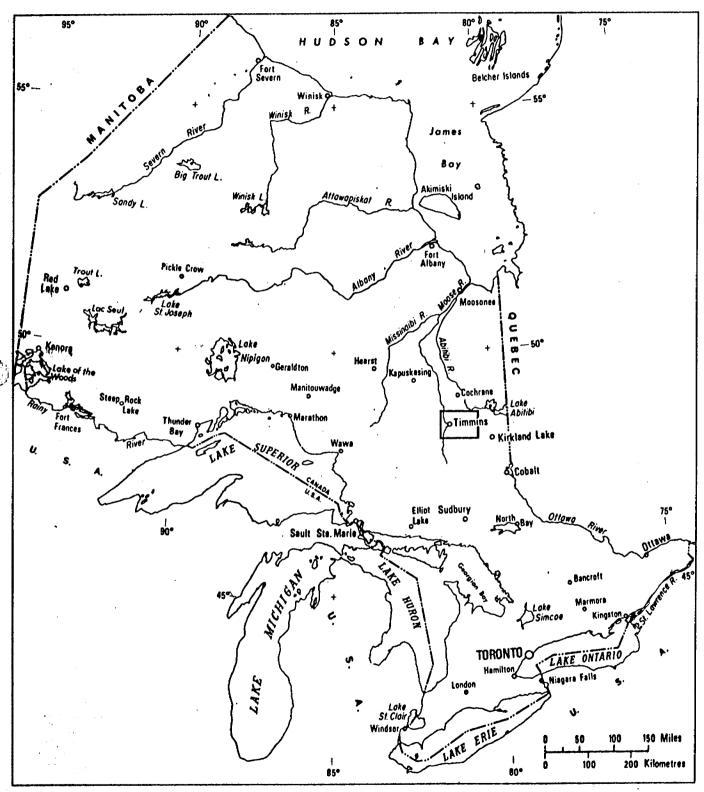


Figure 1 — LOCATION MAP SHOWING AREA OF GRAND SAGUENAY MINES & MINERALS LTD.
PROPERTIES IN THE TIMMINS & MATACHEWAN AREA, ONTARIO

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#### HISTORY OF THE TIMMINS AREA

#### Introduction

Economic gold deposits were first discovered in the Timmins area in 1909 (Figure 1). Since then, till 1981, some 27 deposits have produced a total of approximately 56 million ounces of gold, to rank Timmins as the largest gold mining camp in North America. Average grade of gold has been 0.254 ounces from the milling of 216 million tons of ore. Currently, seven mines are producing in the area, of which all but two, the Dome Mine and Owl Creek deposit, are controlled by Pamour Porcupine Mines Limited

Over the past three years ground acquisition and exploration activity have increased markedly in the Timmins area, largely due to the revived interest in gold. As a result of this work, four major discoveries have been made:

- Kidd Creek Mines Ltd. (formerly Texasgulf Incorporated)
   Hoyle Pond deposit, Hoyle Township, 2-3 miles north of Highway 101 in the City of Timmins (Northern Miner, 1980a).
- Kidd Creek Mines Ltd./Inco Limited Owl Creek deposit,
   Hoyle Township, 2-3 miles north of Highway 101 in the
   City of Timmins (Northern Miner, 1980a).
- Amax of Canada Ltd. Hoyle Township, two miles north of Timmins (Northern Miner, 1980b).
- Asarco Exploration Co. of Canada Nighthawk Lake area,
   20 miles east of Timmins (Northern Miner, 1980c)

All the past producing gold mines in the Timmins area were found as a direct result of surface showings. As glacial material mantles much of the bedrock in the area, it is likely that a number of ore deposits have yet to be discovered. In addition to a better understanding of the ore controls, new techniques in terms of geophysics, geochemistry, overburden drilling and stripping (backhoeing) can now be employed to look beyond the immediate rock exposures and into areas not previously accessible to exploration, other than by diamond drilling.

#### Mineralogy and Ore Controls

Virtually all the gold production from the Timmins area has quartz-carbonate veins in the metavolcanics and from metasediments north of the Destor-Porcupine Fault. Most of the auriferous quartz veins tend to be along anticlinal axes and many are in close proximity to stocks of quartz-feldspar porphyry (Ferguson et al, 1968). A number of sources have been postulated for the mineralization; most theories (Carter, 1948; Ferguson et al, 1968; Griffis, 1962) have implied derivation of the gold from small stocks of quartz-feldspar porphyry of subvolcanic origin. Others have postulated lateral secretion of the vein material from the nearby volcanics (Hurst, 1935) or derivation from the large granitic batholiths (George, 1967; Jones, 1948), generally considered to be of Kenoran Age. Recently, Pyke (1976) has suggested that the ultramafic volcanic rocks in the Timmins area provided the main "source bed" for the gold have may

mineralization, with the gold subsequently being mobilized, possibly in large part during carbonatization of the komatilitic rocks, and deposited in structurally favourable sites. Karvinen (1978) also favours a model invoking carbonatization as an important factor, but favours the quartz-feldspar porphyries as the source rock. More current models of Kerrich and Fryer (1979) and Fryer et al (1979) tend to favour a volcanic exhalatve origin for much of the ore.

The gold-bearing quartz veins in the Timmins area, which have a variety of shapes, follow a number of structures (Hurst, Mineralogically, there are two main types of veins in the 1935). quartz-ankerite and quartz-calcite. Timmins camp: come from the quartz-ankerite vein systems production has (Ferguson et al, 1968) and it is mainly these veins which are strongly associated with pyrite, both in the veins and adjoining wall rock. Quartz calcite veins are most common outside the main gold bearing zones, contain very little gold and have little associated pyrite. Other common accessories in the gold bearing sericite, tourmaline, albite, scheelite, galena, veins are sphalerite, chalcopyrite, tellurides and fuchsite. Silver is alloyed with the gold, the average gold to silver ratio being approximately 5 to 1 (Ferguson et al, 1968).

Most of the gold bearing veins are within the lower half of the Tisdale Group in the komatiitic and tholeitic volcanics. Less, but substantial ore also occurs in veins in sedimentary rocks and porphyries. Recent work in the Timmins area has demonstrated that three main factors, stratigraphy, carbonatization, and structure, are of special significance in the localization of gold deposits.

A number of deposits occur within one of two broad stratigraphic units (Karvinen, 1978) containing carbonatized metavolcanics (an upper unit consisting of carbonatized Mg- and Fe-tholeites, and a lower unit of carbonatized komatiites and Mg-tholeites). The Hollinger, McIntyre and Coniaurum Mines are examples of mines from the upper unit, whereas the Kenilworth, Delnite, Aunor, Buffalo Ankerite and Paymaster Mines are located in carbonatized portions of the lower stratigraphy.

The association of carbonatization and gold mineralization long been recognized in the Timmins-Kirkland Lake area - many of the mines and prospects are within or nearby areas of extensive carbonate alteration. Pyke (1976) has stressed the importance of the carbonatized lavas as being a possible source bed for the gold deposits, in particular the komatiitic lavas which are the most susceptible to carbonatization. As pointed out by Keays (1975), significant quantities of gold are released from a rock during carbonatization; such gold would then be Moreover, abundant available for secondary concentration. silica would be released during carbonatization of the lavas, providing not only a possible transporting agent for the gold, but much of the quartz in the associated veins and stockworks.

Karvinen (1978) and Fyon and Karvinen (1978) suggest that both the CO2 bearing solutions and the gold mineralization

emanated from the quartz porphyries in the area. Many, but not all of the deposits have a close spatial association with the porphyries, which numerous previous investigators also considered to be the source of the gold. Elsewhere, as at Kirkland Lake and Matachewan, some of the deposits are related to syenitic intrusions. It has also been suggested that the role of the intrusions is one of a remobilizer rather than a source (Pyke, 1981).

perhaps of the most important The third and one prerequisites for gold deposition is the availability of dilatant zones for yein formation. Many of the deposits in Timmins are in proximity to one or more of: (1) Destor-Porcupine Fault or subparallel fracture zones, (2) north to northwest trending cross faults or folds, (3) axial traces or noses of fold structures, related to possible quartz porphyry (4) fracture zones emplacement.

Regardless of ones biases as to the origin of the gold mineralization, the presence of favourable stratigraphy, carbonatization, faulting and fracturing and nearby quartz porphyry or syenite intrusions, would all appear to enchance the possibility of discovering economic gold concentrations.

#### Mountjoy Property

#### Location and Ownership

The property under option to Grand Saguenay Mines & Minerals

Limited from Comstate Resources Ltd., consists of 79 claims

covering parts of Concessions 1 to 6, inclusive, in Mountjoy Township, District of Cochrane, Porcupine Mining Division (Figures 2 and 3). Four of the claims (N.1/2, lot 8, Concession 4) were optioned by Comstate from Albert J. Ristimaki and Henry Gonzalez, of Timmins, Ontario; the mineral rights on the remaining 75 claims were acquired by Comstate through staking. The claim numbers, where applicable, and their corresponding lot and concession locations are given in the appended list.

Under terms of an agreement dated September 21, 1983, Grand Saguenay Mines & Minerals Limited can acquire a 60 per cent interest in the property by paying \$42,342. to Comstate and expending \$300,000. in exploration on the property by September 1, 1986.

#### Access

The claims are two to nine miles west and northwest of the main Timmins city centre, and are readily accessible via Highway 101 and gravel township roads extending north from the highway.

#### Previous Work

There has been little mapping in the Mountjoy Township area, other than that of Ferguson (1957). For convenience of discussion the claims comprising the property are divided into a north and south group with reference to the north boundary of Concession 3.

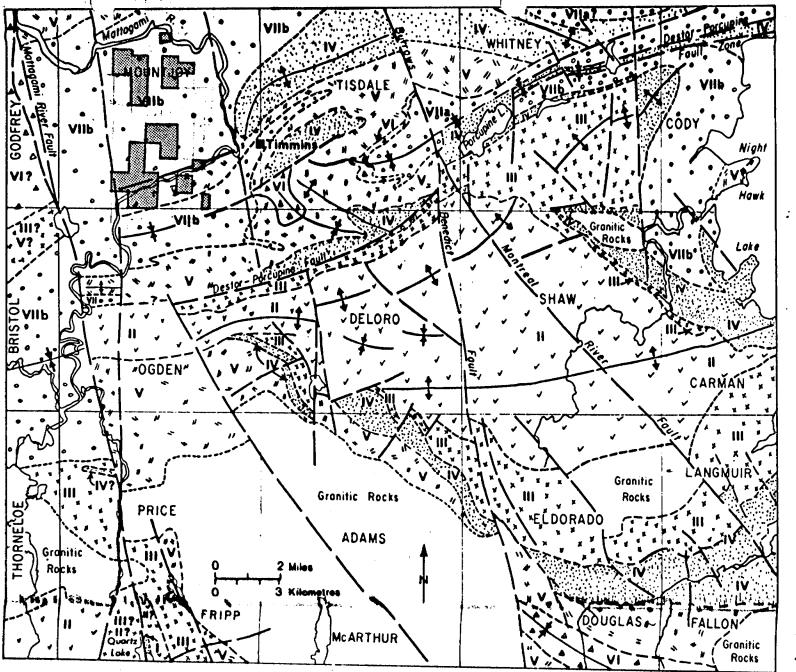


Figure 2 - Distribution of stratigraphic units in the Timmins area. After Pyke, (1980). SHOWING LOCATION OF THE MOUNTJOY PROPERTY

#### LEGEND

VII

## Porcupine Cu

- 4 Upper formations
- b Lower formations

#### Tisdale group

- VI Upper metavolcanic formation
  - Middle metavolcanic formation
- IV Lower metavolcanic formation

#### Deloro group

- Upper metavolcanic formation
- II Middle metavolcanic formation
  - Lower metavolcanic formation

#### SYMBOLS

Geological boundary

FAULL

Anticlinal axis

Synclinal axis

MOUNTJOY CLAIM GROUP

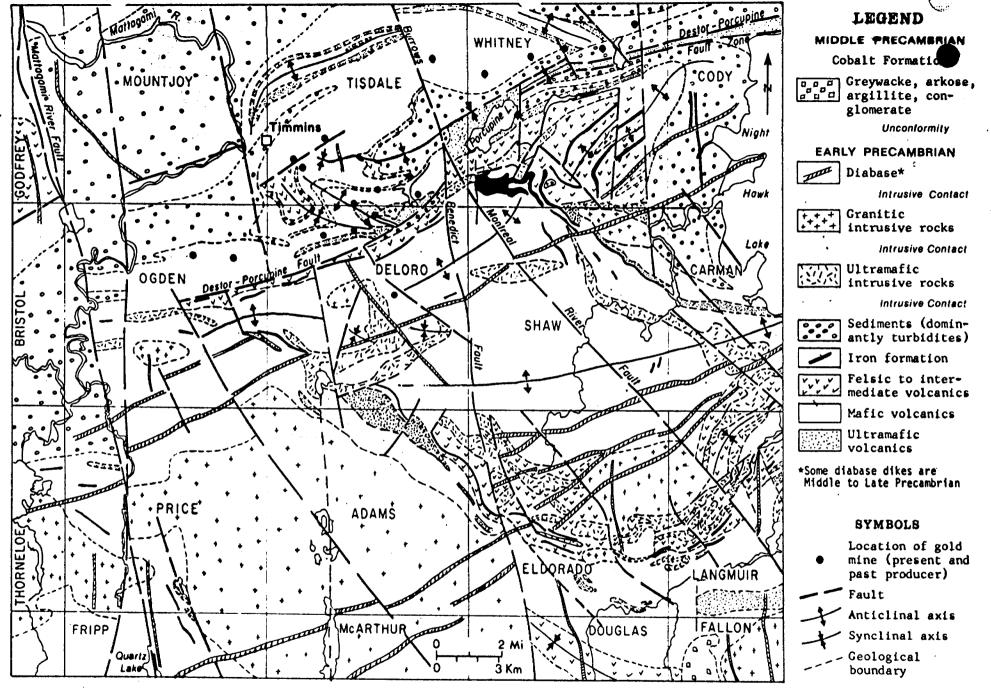


Figure - Geological map of the Timmins area. After Pyke, (1980).

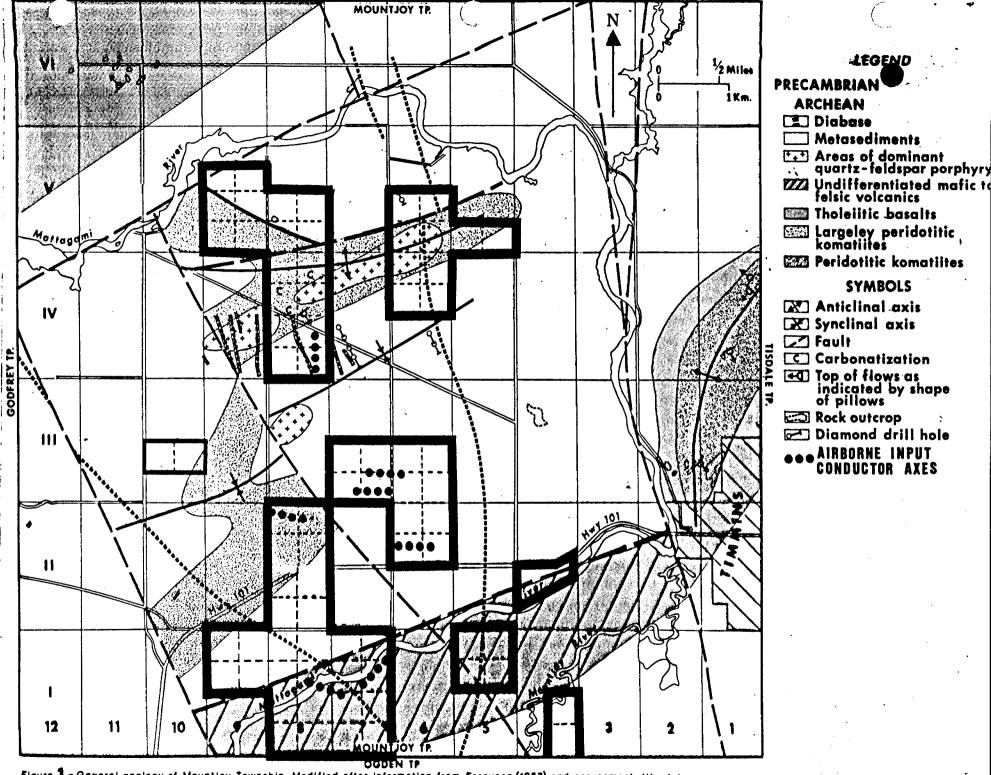


Figure 3 - General geology of Mountjoy Township, Modified after information from Ferguson (1967) and assessment file data.

#### North Claim Group

old gold showing occurs in the northwest corner of claim P568931 (Figure 4). In the early 1930's, Mineral Estates conducted geophysical (magnetic and electromagnetic) surveys and put down four diamond drill holes totalling 1405 feet in the vicinity the showing (File T-47)\*. Carbonatized lava, greywacke. and feldspar porphyry were intersected in the The best assay reported from the drilling was 0.08 drilling. ounces of gold over a two foot width of fine-grained massive pyrite containing a few blebs and stringers of quartz-carbonate. This forms part of a disseminated (3-5 per cent) pyrite zone 30 feet in width, in carbonatized volcanic rocks, over which eleven samples (generally 3 foot widths) averaged 0.03 ounces of gold per ton.

In 1964, Hollinger Consolidated Gold Mines Limited drilled two diamond drill holes, totalling 833 feet, near the above reported gold values and intersected greywacke sediments and feldspar porphyry (Diamond Drill Report #10, Mountjoy Twp.)\*; no assay results are given.

In 1974, Kerr Addison Mines Limited held a large block of claims in the north half of Mountjoy Township, including those currently held by Grand Saguenay Mines & Minerals Limited. Kerr Addison conducted a magnetic (Askania Gfz torsion magnetometer) survey over the area, and completed 87 overburden drill holes (20 on Grand Saguenay ground) and 13 diamond drill holes (7 on Grand Saguenay ground, totalling 3573 feet) (File 2-1689)\*\*.

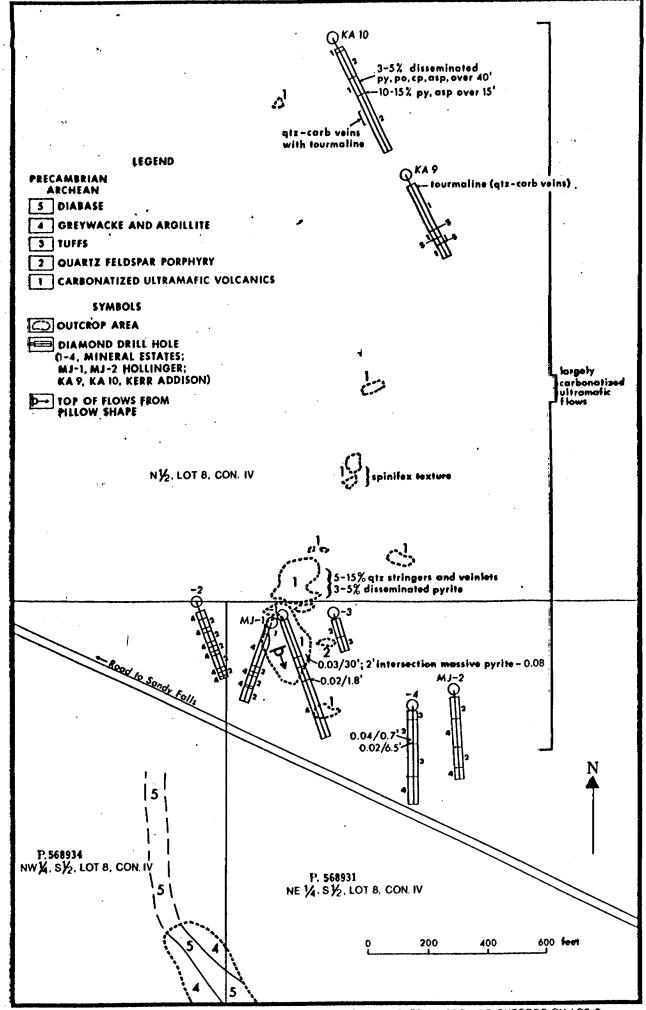


FIGURE4 - GEOLOGY AND LOCATION OF PREVIOUS DIAMOND DRILL HOLES IN AREA OF OUTCROP ON LOT 8, CON. IV, MOUNTJOY TOWNSHIP.

The overburden drilling, at quarter mile centres, was performed in order to sample both the bedrock and basal till. The till samples underwent heavy mineral separation and all samples were analyzed for gold, copper, arsenic and zinc. Two areas in which the basal till ran anomalous in gold (up to 190 ppb) were outlined - one area a quarter of a mile southeast of the Grand Saguenay property and one area roughly one-half mile south of the property.

The magnetic survey succeeded only in outlining a number of north-south striking diabase dikes.

The 13 diamond drill holes were put down to test the geochemical anomalies outlined by the basal till survey. Carbonatized sediments, quartz porphyry and diabase were reported from the holes drilled on Grand Saguenay ground. The best reported assay was 0.01 ounces of gold per ton over a core length of 10 feet.

In 1981 Comstate Resources Ltd. conducted a geochemical survey over the east half of the N.1/2, Lot 8, Concession 4. The survey entailed sampling of the humus (A°) horizon at 100 foot centres; a total of 319 samples were analyzed by neutron activation techniques for gold and arsenic. The humus was found to be poorly developed over much of the property and contained a considerable portion of clay. Only in the central part of the property, along a sandy moraine, was humus well developed, and correspondingly returned the highest gold values: 8 ppb to 28 ppb.

During the period April 1981 to January 1982, 192 overburden holes were drilled by Comstate, for a total of 6301 feet, utilizing a portable gasoline Cobra plugger, 25 mm thick rock, and a flow-through type sampler with a serrated cutting edge. Basal sediment samples were retrieved from 154 of these holes, and the minus 200 mesh fraction of 100 of these samples were analysed for Cu, Zn, Mo, Co, Ni, Az, Mn, Au, and As. The threshold for anomalous gold values is taken to be approximately 15 ppb (personal communication from W.O. Karvinen who's company Sixteen of the analyzed performed the work for Comstate). samples contained detectable gold (5 ppb or greater) and seven of these samples hold values of 15 ppb or greater. (The maxiumum 50 ppb). However, basal till suitable for use as a geochemical sampling medium does not appear to be wide spread on the property, as it accounts for no more than 30 per cent of the samples recovered. In most cases silt or clay forms the basal sediment overlying bedrock.

In May 1983, Questor Surveys Limited conducted an airborne INPUT and magnetic survey for Comstate Resources covering the western three quarters of Mountjoy Township. The magnetic data indicates a strong north-south fabric. This contradicts both the INPUT and known geological data which would support an east to northeast trend for the strata. The reason for this discrepancy appears to be the presence of north to northwest trending diabase dikes which tend to mask the strike of the enclosing rocks. The INPUT survey disclosed a number of conductor axes with a general

east-west trend across the township. However, cultural effects (roads, building, power lines, etc.) are numerous and tend to obscure true bedrock responses. Nevertheless, at least seven conductors on the property are interpreted as being of probable bedrock source. To the writer's knowledge none of these conductors have previously been tested by diamond drilling.

#### South Claim Group

The southern part of Mountjoy is entirely covered by overburden, and the records available to the writer indicate that only minor exploration work has been undertaken.

In 1922, Canadian Longyear Limited (File T-141)\* drilled 30 vertical diamond drill holes totalling 4400 feet in the southwest part of Mountjoy Township, only one of which was located on Grand Saguenay property. The holes appear to have been primarily designed to sample the subcrop; twenty-two of the holes reached bedrock, which was cored for an average depth of 17 feet. Nevertheless, the drilling was fundamental in defining the occurrence of volcanic rocks in the area south of the Mattagami River.

Drilling of a well in 1959 near the north boundary of Lot 7, Concession 1, encountered 158 feet of overburden and 72 feet of greywacke (File T-443)\*.

One diamond drill hole was sunk for a depth of 100 feet near the central portion of Lot 6, Concession 2 (File T-386)\*. The date of the drilling is unknown; the hole encountered 74 feet of

overburden and 26 feet of greywacke and argillite.

In 1974, Ecstall Mining Ltd. held 12 claims consisting of the N.1/2, Lot 6, Concession 2 and the S.1/2 of Lots 6 and 7, Concession 3 (Filed 2-1395)\*\*. Ecstall conducted magnetic and horizontal loop electromagnetic surveys on the property and concluded the claims were largely underlain by sedimentary rocks. No anomalous zones of conductivity were defined, although there was considerable interference from nearby power lines. No follow-up work is recorded.

#### Glacial Geology

An extensive cover of overburden, predominantly interbedded gravel, sand and clay, is present throughout most of Mountjoy Township. Overburden drilling in the northern part of Mountjoy Township indicated that the basal sediment overlying bedrock on much of the property is mainly silt and clay; lodgement till is rare. The basal sediments are overlain by thick varved clays. Overburden on the north claim group varies from 10 to 100 feet and averages approximately 40 feet; thicknesses on the south claim vary from approximately 70 to 200 feet and average approximately 130 feet.

#### Regional Geology

Outcrop is sparse, and any regional interpretation of the geology of Mountjoy Township is somewhat tenuous. Previously, the area has been considered as one underlain almost wholly by

sedimentary rocks (Ferguson, 1957; Pyke et al, 1973). However, examination of the outcrop in the area, together with the airborne magnetic data (0.D.M. - G.S.C., 1970a, 1970b), information accrued from the exploration program of Kerr Addison and the airborne INPUT and magnetic data of Comstate warrants a reinterpretation of the geology. Komatiitic volcanic rocks which outcrop in the north central part of the township are now known to underlie a much larger area than previously suspected, and appear to form part of an anticlinal structure as depicted in Figure 3. A complementary synclinal axis, offset by a northwest trending fault, is interpreted to lie south of the anticline and repeat the volcanic sequence on part of the southern claim group.

In the writer's opinion the komatiites in Mountjoy Township are almost certainly correlative with those in the Timmins gold camp. This interpretation is supported by the presence of abundant quartz-feldspar porphyry which in the Timmins Camp and on a more regional scale is almost entirely confined to the lower formations of the Tisdale Group (Pyke, 1982). In a regional context, this would correspond to the lower part of the Upper Supergroup.

In the south half of Mountjoy Township, an ENE trending fault adjacent and subparallel to the Mattagami River is interpreted to separate sedimentary rocks to the north from volcanic rocks to the south.

A major north trending fault, the Mattagami River Fault, traverses the eastern portion of the township.

# Property Geology

#### North Claim Group

The claims appear to be largely underlain by northeast trending ultramafic flows and sedimentary rocks (greywacke and siltstone). Abundant quartz-feldspar porphyry is known from drilling, however the confines of the porphyry are difficult to outline from available data. Nevertheless, at least two sizeable areas of dominant porphyry, one of which may be as large as 4000 by 1000 feet, appear to underlie the property area (Figure 3). The extent of the ultramafic flows is uncertain, as they only outcrop in part of Lot 8, Concession 4; however, this is over a width of at least 2000 feet.

An old gold showing occurs in quartz veins in carbonatized ultramafic flows near the north boundary of claim P568931. Diamond drilling by Mineral Estates (4 holes) and Hollinger Mines (2 holes) in this vicinity encountered carbonatized lava, greywacke and feldspar porphyry (Figure 4), commonly containing disseminated pyrite (2-5 per cent) and quartz veins and stringers. As previously mentioned, one diamond drill hole of Mineral Estates intersected a 2 foot section of massive pyrite that assayed 0.08 ounces of gold per ton. This was within a 30 foot zone of disseminated pyrite in carbonatized ultramafic flows; the entire zone assayed 0.03 ounces of gold per ton.

Minor tourmaline and arsenopyrite in quartz-carbonate veins are reported in diamond drill holes 9 and 10 of Kerr Addison, as

well as the extensive occurrence of disseminated pyrite. Kerr Addison, however, in this writer's opinion, have misinterpreted the carbonatized volcanic rocks in Lot 8, Concession 4, as being sediments (largely conglomerate), thus changing the correlations based on some of the drill data. For example, it is suspected all the conglomerate reportedly intersected in drill holes 9 and 10 may in fact be carbonatized ultramafic volcanic rocks. An outcrop of ultramafic volcanics occurs 300 feet west of the drill holes, and talcose zones are reported within the "conglomerate" intersected in the drill Therefore the geological map for the property area is necessarily generalized to accomodate contradictions in the data. Nevertheless, some very important features can be brought to light for the area as summarized in the conclusions.

#### South Claim Group

In the west part of Concessions 2 and 3, the faulted extension of a folded sequence of komatilitic volcanic rocks is interpreted to underlie a portion of the claim group. Further south, sedimentary rocks are interpreted to be in fault contact with volcanic rocks, largely confined to Concession 1. Drilling by Canadian Longuear indicated both massive and tuffaceous basalts with minor massive rhyolite and felsic schists.

#### Work Conducted by Grand Saguenay Mines & Minerals Limited

Grand Saguenay has not conducted any work on the property.

#### Conclusions

A number of features suggestive of economic gold mineralization of the Timmins-type are present in the property area.

- 1. Extensive, pervasive carbonatization.
- A thick (greater than 2000 foot) sequence of carbonatized volcanic rocks.
- 3. Presence of indicator minerals such as tourmaline, arsenopyrite, fuchsite and gold (0.03 ounces per ton over 30 feet).
- 4. Widespread intrusion of quartz-feldspar porphyry. Two areas underlain predominantly by porphyry appear to be of a size comparable to the porphyry intrusions in the Timmins gold camp.

In addition, disseminated pyrite mineralization (3 to 5 per cent) is common over an outcrop width of 50 to 100 feet near the north boundary of claim P568931. Abundant quartz stringers and veinlets (5 to 20 per cent) are within this zone of mineralization.

There is little doubt the geological setting for potential economic gold mineralization is present on the property - a thick sequence of carbonatized ultramafic volcanic rocks north of the Destor-Porcupine Fault which is intruded by abundant quartz-feldspar porphyry. Indeed, a setting not unlike the McIntyre, Hollinger, Dome and Paymaster deposits, yet there has

been little exploration work. This is perhaps in a large part due to the extensive drift cover, and the belief that the township was virtually entirely underlain by sediments. Yet, the property is within 5 miles of the main Timmins gold camp and is now known to contain the same stratigraphy that is present at many of the major producers.

#### Recommendations

#### Phase 1

- Consolidation of ground position by optioning the following patented claims: Lot 9, Concession 4; N.1/2 Lot 7, Concession 4; S.1/2 Lot 7, Concession 5; N.1/2 of S.1/2 Lot 5, Concession 5. This creates a contiguous group of claims covering virtually all the proposed volcanic stratigraphy from Lots 5 to 9.
- Induced polarization (I.P.) survey covering the consolidated area outlined above to delineate known disseminated sulphide zones and others that may be present.
- 3. Proton magnetometer survey covering the same area to further define areas of alteration and fault zones.
- 4. Max Min II electromagnetic and proton magnetometer

  profiling of airborne INPUT conductors to further determine
  the probable source and best method of follow-up if
  warranted.
- 5. Overburden stripping by means of a backhoe, initially in

the vicinity of outcrop areas in the N.1/2 of Lot 8, Concession 4. Objective is to geologically map subcrop and sample any mineralization and lodgement till, if present. The north side of outcrops would be the most likely area to encounter basal till.

- 6. Trenching of all mineralized zones.
- 7. A minimum of two diamond drill holes are warranted solely on the basis of previous work on the property. These holes would be drilled northwest of Mineral Estates #1 hole, to intersect the disseminated pyrite zone known from outcrops, and undercut the mineralized zone carrying gold values as reported. Contingent on the results additional holes should be drilled to test the extension of this mineralization.

# Costs

1.	Cost of acquisition from Comstate Resource Ltd.	\$ 43,000.
2.	Option payments for additional property acquisition	55,000.
3.	Linecutting 85 miles at \$300/mile	25,500.
4.	Geophysical surveys Induced polarization - 85 miles at \$1000/mile Proton magnetometer - 85 miles at \$ 150/mile Max Min II profiling - 10 days at \$ 500/day	85,000. 12,750. 5,000.
5.	Mechanical stripping Backhoe - 125 hrs at \$40/hr Road construction - 75 hrs at \$40/hr	5,000. 3,000.
6.	Trenching 10 days at \$200/day	2,000.
7.	Diamond Drilling Minimum 2,500 feet at \$25/ft.	62,500.
8.	Assays and analyses 200 samples at \$25. each	5,000.
9.	Geological supervision 25 days at \$400/day	10,000.
10.	Travel and sustinence	2,000.
11.	Final maps and report	5,000.
	TOTAL	\$320,750.
•	Administration 5%	16,000.
	Contingency 5%	\$336,750. 16,850.
	TOTAL ESTIMATED COST	\$353,600.

Property Name: Mountjoy
Property Number: 1

		<b>.</b>			•	Next
Claim	Description by	Date		ment Credits		Assessment
Number	Lot & Conc.	Recorded	Approved	Applied for	Work Done	Credits Due
P568931	L.8, C.4	16/06/80	60	40	Overburden drilling	
•					airborne mag and INPUT	16/06/84
P568934	L.8, C.4	16/06/80	60	40	11	16/06/84
P590505	L.8, C.2	16/06/82		40	airborne mag and INPUT	16/06/84
P590506	L.8, C.2	16/06/82		. 40	11	16/06/84
P590507	L.8, C.2	16/06/82	`	40	н , , , , , ,	16/06/84
P590508	L.8, C.2	16/06/82		40	<b>11</b>	16/06/84
P590509	L.6, C.3	16/06/82		40	11	16/06/84
P590510	L.6, C.3	16/06/.82		40	11	16/06/84
P590511	L.7, C.3	16/06/82		40	11	16/06/84
P590512	L.7, C.3	16/06/82		40	11	16/06/84
P590513	L.7, C.3	16/06/82		40	II .	16/06/84
P590514	L.7, C.3	16/06/82		40	` u į	16/06/84
P590515	L.6, C.2	16/06/82		40	н	16/06/84
P590516	L.6, C.2	16/06/82		40	H	16/06/84
P590517	L.6, C.2	16/06/82		40	11	16/06/84
P590518	L.6, C.2	16/06/82		40	11	16/06/84
P590519	L.6, C.3	16/06/82		40	11	16/06/84
P590520	L.6, C.3	16/06/82		40	II .	16/06/84
P591967	L.8, C.5	23/06/81	37	40	overburden drilling	20,00,01
	•	•	_		airborne mag and INPUT	23/06/84
P591968	L.8, C.5	23/06/81	37	40	11	23/06/84
P591969	L.6, C.5	23/06/81	47	40	11	23/06/84
P591970	L.6, C.5	23/06/81	47	40	11	23/06/84
P591971	L.6, C.5	23/06/81	47	40	11	23/06/84
P591972	L.6, C.5	23/06/81	47	40	. 11	23/06/84
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		Claim	Description by	Date	Assess	ment Credits	•	Assessment
		Number	Lot & Conc.	Recorded	Approved	Applied for	Work Done	Credits Due
		P591973	L.6, C.4	23/06/81	47	40	overburden drilling	
		,					airborne mag and INPUT	23/06/84 '
		P591974	L.6, C.4	23/06/81	47	40	"	23/06/84
		P591975	L.6, C.4	23/06/81	47	40		23/06/84
		P591976	L.6, C.4	23/06/81	47	40	11	23/06/84
		P591977	L.5, C.5	23/06/81	47	40	•	23/06/84
		P591978	L.5, C.5	23/06/81	47	40	H '	23/06/84
, 1		P624306	L.9, C.5	30/09/81	37	- 40	11	30/09/84
ı		P624307	L.9, C.5	30/09/81	37	40	n .	30/09/84
•		P624308	L.8, C.4	30/09/81	60	40	ıı ·	30/09/84
		P624309	L.8, C.4	30/09/81	60	40	, 11	30/09/84
		P651206	L.10, C.3	06/07/82		40	n .	06/07/84 ,
		P651207	L.10, C.3	06/07/82		40	n S	06/07/84
		P661523	L.8, C.5	28/09/82		40	11	28/09/84
		P661524	L.8, C.5	28/09/82		40	. п	28/09/84
		P642917	L.9, C.5	24/11/82		40		24/11/84
		P642918	L.9, C.5	24/11/82		40	11	24/11/84
		P642919	L.9, C.5	24/11/82		40	11	24/11/84
		P642920	L.9, C.5	24/11/82		40	ıı .	24/11/84
•		**	L.8, C.4		alf lot opt			• • •
			•		e Resources			•
		P651208	L.8, C.2	01/03/83	,	40	airborne mag & INPUT	01/03/85
-		P666125	L.8, C.1	03/03/83		40	11	03/03/85
-		P682126	L.8, C.2	01/03/83		40	31	01/03/85
		P682127	L.8, C.2	01/03/83		40	II	01/03/85
:		P682128	L.8, C.1	01/03/83		40	II .	01/03/85
		P682129	L.8, C.1	01/03/83		40		01/03/85
		P682130	L.9, C.1	01/03/83		40	II .	01/03/85
		P682131	L.9, C.1	01/03/83		40	11	01/03/85
		P682132	L.9, C.1	01/03/83		40	11	01/03/85
I		P682133	L.9, C.1	01/03/83		40	II .	01/03/85
			• • • •			,,		,,

Claim	Description by	Date	Assessment Credits	·	Next Assessment
Number	Lot & Conc.	Recorded	Approved Applied for	Work Done	Credits Due
<del></del>	******				2101200 000
•	•			• •	
P688684	L.8, C.1	01/03/83	40	airborne mag & INPUT	01/03/85
P698477	L.8, C.1	28/03/83	40	n ·	28/03/85
P700004	L.7, C.1	28/03/83	. 40	H ,	28/03/85
P700005	L.7, C.1	28/03/83	40	11	28/03/85
P700006	L.7, C.1	03/03/83	40	H	03/03/85
P700007	L.7, C.1	03/03/83	40	u .	03/03/85
P700091	L.8, C.1	03/03/83	、 40	11	03/03/85
P700092	L.8, C.1	03/03/83	40	11	03/03/85
P700093	L.8, C.1	03/03/83	40	n ·	03/03/85
P700099	L.7, C.1	03/03/83	40	. H	03/03/85
P700100	L.7, C.1	03/03/83	40	11	03/03/85
P700101	L.7, C.1	03/03/83	40	н 🤏	03/03/85
P700102	L.7, C.1	03/03/83	40	11	03/03/85
P700303	L.4, C.2	03/03/83	40	. 11	03/03/85
P700304	L.4, C.2	03/03/83	• 40	II	03/03/85
P708808	L.5, C.1	03/03/83	40	H	03/03/85
P708809	L.5, C.1	03/03/83	40	11	03/03/85
P708810	L.5, C.1	03/03/83	. 40	n	03/03/85
P708811	L.4, C.1	03/03/83	40	11	03/03/85
P708812	L.4, C.1	03/03/83	40	11	03/03/85
P709319	L.5, C.1	03/03/83	40	11	03/03/85
P709320	L.8, C.1	03/03/83	40	II .	03/03/85
P757647	L.6, C.6	08/04/83	40	11	08/04/85

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#### HISTORY OF THE MATACHEWAN AREA

In 1916, gold was discovered in the Matachewan area on two properties which subsequently became producing mines; the Young Davidson and Matachewan Consolidated. Production began in 1934 continued through 1956, during which time 9,663,472 tons of ore were mined to yield 956,117 ounces of gold and 265,699 ounces of silver; average grade was 0.10 ounces of gold per ton and 0.03 silver per ton (Lovell, 1967). The Matachewan οf ounces Consolidated Mine was briefly reactivated during 1979-81 by Pamour Mines Limited, during which time ore was trucked to the mill Timmins. Production was at the rate of Pamour in approximately 3500 tons per month, grading 0.08 ounces of gold per ton (Marmont and Colvine, 1981).

Gold-bearing mineralization is dominantly confined to quartz stringers and veins both within syenitic stocks and adjacent volcanic rocks. At the Young Davidson mine all the ore is confined to a small composite body of porphyritic syenite emplaced along a sedimentary-volcanic contact. A red coloured phase of the syenite, containing 2 per cent disseminated pyrite, hosts the gold mineralization which occurs along fine microscopic fractures with associated pyrite, minor chalcopyrite and galena and lesser molybdenite, scheelite, specularite, and tourmaline (North and Allen, 1948).

At the Matachewan Consolidated Mine, ore zones occur both in syenite porphyry and volcanic rocks, the latter forming the main

source of ore (Derry et al, 1948). Within the volcanic rocks the best ore was found in and adjacent to narrow quartz veins and stringers within pyritized flow tops or interflow tuffs near the south margin of a green carbonate schist forming the contact between the volcanic and sedimentary rocks (Derry et al, 1948). Auriferous zones in the porphyry occur along narrow fractures filled with quartz and pyrite; zones of intense fracturing yielded ore grade material.

Derry et al (1948), suggest that the ore zones at the Young Davidson and Matachewan Consolidated tend to be localized at cross folds along the volcanic-sedimentary contacts.

#### Cairo Property

#### Location and Ownership

The property consists of 14 claims situated immediately east of the village of Matachewan (Figure 5) in the southwest portion of Cairo Township, District of Timiskaming, Larder Lake Mining Division. The claims comprising the property are shown on the appended list.

Under terms of an agreement dated September 21, 1983, Grand Saguenay Mines & Minerals Limited can acquired a 60 per cent interest in the property by paying \$21,129 to Comstate Resources Ltd. and expending \$100,000 in exploration on the property by September 1, 1986.

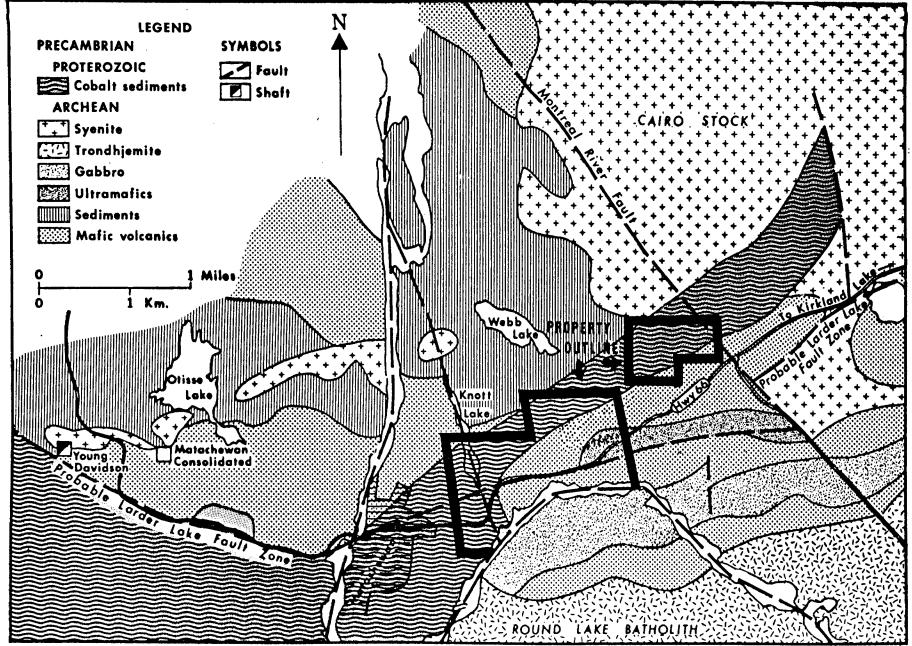


Figure 5 - General geology in the vicinity of Matachewan. SHOWING LOCATION OF CAIRO PROPERTY

### Access

Access is excellent, as the property is traversed by the main highway connecting Matachewan to the Trans Canada Highway, approximately 20 miles to the east.

## Previous Work

Following the discovery of gold in 1916, the Matachewan area was mapped by Burrows (1918, 1920), Cooke (1919) and subsequently by Dyer (1935) and Lovell (1967).

There are no current assessment records available to the writer concerning the nature or extent of any exploration work undertaken prior to Comstate acquiring the property in 1981 to 1983. However, Lovell (1967), indicates that most of the property was formerly held by the Matachewan Hub Pioneer Syndicate, who reportedly excavated a trench 110 feet long near the south central boundary of the claim group. The trench traversed a volcanic-diabase dike contact bearing white pyrite and minor magnetite contained within a quartz-carbonate matrix.

In May, 1981, Comstate Resources Ltd. conducted a geochemical (humus) survey on one of the claims located in the north central part of the claim group. A total of 114 samples were taken at 100 foot centres over the claim, and subsequently analyzed by neutron activation methods for gold and arsenic. Two areas containing 16 samples and 8 samples respectively contained gold values ranging from 6 to 11 parts per billion. At best these are extremely weak anomalies, being at the threshold of

background concentrations. One sample site on the west boundary of the claim yielded 200 parts per billion gold.

In June, 1983, Comstate Resources conducted proton magnetic, electromagnetic (VLF) and geological surveys over twelve of the claims. In September, 1983, a geological survey was completed over the northern two claims. The VLF survey outlined a number of ENE trending anomalies, three of which are interpreted to be of a bedrock source. The magnetic survey largely aided in delineating the extent of an ultramafic-mafic intrusive body near the east margin of the property.

## Regional Geology

The Matachewan area borders the northwest margin of the Round Lake Batholith, and is on the south limb of a major synclinorium, the axis of which trends westerly approximately 7 miles north of the area (Pyke et al, 1973). A large pluton of syenite, the Cairo stock, underlies the northeast portion of Volcanic rocks of komatiitic, tholeiitic and Cairo Township. calc-alkaline affinities trend westward across Cairo and Powell Townships, but have not as yet been mapped in sufficient detail to be accurately delineated. Intercalated with the volcanic rocks are thick sequences of sedimentry rocks. It is the contact of the more southerly sedimentary sequence with the underlying volcanics, in association with syenitic intrusions, which has formed the focal point for the known gold mines in the area.

The north trending Matachewan diabase dike swarm intrudes the Early Precambrian (Archean) rocks, and has been dated at 2485 million years (Fahrig and Wanless, 1963).

Flat-lying Proterozoic sediments of the Cobalt Group unconformably overlie the Archean rocks.

A number of major faults traverse the Matachewan area (Figure 5), notably the Larder Lake Fault zone and the Montreal River Fault. The easterly trending Larder Lake break is in proximity to numerous gold camps throughout its strike length - notably those of Kirkland Lake, Larder Lake, Noranda, Cadillac, Malartic and Val D'Or. The exact positioning of the fault through the Matachewan area is uncertain, but is believed to be as depicted in Figure 5. Furthermore, the Montreal River Fault, which traverses the Matachewan area, shows a spatial relationship to a number of mines or camps - for example: Kidd Creek, Timmins, Elk Lake. Numerous other northerly trending faults are known in the Matachewan area, many of which are filled by diabase dikes.

### Property Geology

About half the property is covered by Proterozoic sediments of the Cobalt Group, consisting largely of moderately well sorted polymitic conglomerates. Dips of 60 to 80 degrees are common and this together with the general linear distribution of the sediments (Figure 5) suggests the Cobalt was deposited within a fault structure which has later been reactivated. A north facing

assemblage of Archean metavolcanic rocks and associated intrusive equivalents underlie the southern portion of the property. This consists of a lower sequence of calc-alkaline rhyolitic flows and breccia and lesser andesite containing minor interflow cherty formation. This is overlain by massive and pillowed variolitic 'basalt containing numerous (15 per cent) narrow quartz veins with minor (5-10 percent) pyrite. A narrow zone of sheared komatiitic volcanics is enclosed by and in fault contact with the variolitic basalts. Within this fault zone the basalts are extensively bleached, silicified and highly fractured. Massive to pillowed tholeiitic basalt forms the upper part of the exposed narrow lense of serpentinite with minor stratigraphy. A associated gabbro extends into the east margin of the claim group.

The faulted komatific-variolitic basalt zone is interpreted to form part of the Larder Lake Break. In terms of the regional stratigraphy, this fault zone is proximal to the contact between the Lower and Upper Supergroup volcanic rocks (in this case the calc-alkaline and tholeitic volcanics) which can be demonstrated to be favorably located as regards economic mineralization in the general Timmins-Matachewan-Kirkland Lake area. To the east of the property the fault is taken to be coincident with the shear zone at the south margin of the Cairo stock (Lovell, 1967). To the west, the fault largely separates Archean and Proterozoic rocks. Here the volcanic rocks are intensely sheared near the Proterozoic-Archean contact; a drill hole in the Cobalt sediments

immediately south of the proposed Larder Lake fault zone (Figure 26) did not encounter the Archean basement till a depth of 1100 feet (Lovell, 1967).

The volcanic-sedimentary contact on the east side of Knott Lake appears to be the same contact zone along which the Young Davidson and Matachewan Consolidated mine occurred. If so, this contact may extend under the Cobalt sediments along the north margin of the claim group.

## Work Conducted by Grand Saguenay Mines & Minerals Limited

No work has been conducted on the property by Grand Saguenay Mines & Minerals Limited.

### Conclusions

- Part of the claim group could conveivably contain the same volcanic stratigraphy that is present at the former mines.

  If so, this would be on the north half of the property which is covered in part by overburden, and in part by Proterozoic sediments.
- 2. There is no record of there having been any exploration work on the claims other than pre-1967 trenching and the work conducted by Comstate Resources in 1981 and 1983.
- 3. The Larder Lake Break, most likely extends across the claim group. This fault zone is associated with numerous gold deposits extending from the Val D'Or to the Matachewan area.

## Recommendations

### Phase 1

- 1. I.P. (induced polarization) survey along and proximal to proposed Larder Lake fault zone; limited exposure indicates quartz veining and disseminated pyrite are associated with the faulting. Profile IP survey over VLF anomalies suspected of being of bedrock source.
- 2. Detailed magnetic survey to outline possible alteration zones adjacent to proposed fault zone.
- 3. Overburden stripping and trenching to better expose the outcroppings of quartz veins with associated pyritic mineralization adjacent to the fault zone in the komatiites-variolitic basalts.
- 4. Detailed geological mapping and sampling of outcroppings exposed by stripping and trenching.

### Phase II

1. Preliminary diamond drilling of selected targets.

## Costs

1.	Cost of acquisition from Comstate Resources Ltd.	\$ 23,000.
2.	Geophysical surveys Induced polarization - 14 miles at \$1000/mile Detailed proton magnetometer surveys - 4 days at \$500/day	14,000. 2,000.
3.	Mechanized stripping Backhoe - 225 hrs at \$40/hr Road construction - 25 hrs at \$40/hr	9,000. 1,000.
4.	Diamond drilling Minimum 2000 feet at \$25/ft.	50,000.
5.	Assays and analyses 200 samples at \$25. each	5,000.
6.	Geological supervision 20 days at \$400/day	8,000.
7.	Travel and sustinence	3,000.
8.	Final maps and report	3,000.
	TOTAL Administration 5%	\$118,000. 5,900.
	Contingencies 5%	\$123,900. 6,200.
	Total estimated cost	\$130,100.

Property Name: Cairo Property
Property Number: 2

Claim	Date	Acces	ment Credits	÷	Next Assessment
Number	Recorded	Approved	Applied for	Work Done	Credits Due
L561730	01/06/81	75	80	geophysic, geology, geochem	01/06/85
L650115	14/06/82		80	geophysic, geochem	14/06/85
L650116	14/06/82		80	11	14/06/85
L650117	14/06/82		80	11	14/06/85
L650118	14/06/82		80	11	14/06/85
L650130	14/06/82		80	11	14/06/85
L650131	14/06/82		80	***	14/06/85
L650132	14/06/82	•	80	11	14/06/85
L650133	14/06/82		80	<b>11</b>	14/06/85
L650134	14/06/82		80	11	14/06/85
L725180	15/07/83	N11	. N11	Ni1	15/07/84
L757832	13/04/83		80	geophysic, geochem	13/04/86
L757833	13/04/83		80	W.	13/04/86
L757834	13/04/83	N11	N11	Nil	13/04/84

## Summary of Proposed Expenditures

(1) Mountjoy Property \$353,600.

(2) Cairo Property 130,100.

Total proposed expenditure

\$483,700.

Respectfully submitted,

W.D. Beaton, Ph.D., P.Eng. September 30, 1983

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### CERTIFICATE OF QUALIFICATION

- I, WILLIAM D. BEATON, do hereby certify that:
- 1. I am a consulting geological engineer residing at 522 Victoria, Westmount, Quebec.
- 2. I am a graduate of McGill University in Economic Geology, with the degree of Doctor of Philosophy, 1970.
- 3. I am a member of the Corporation of Engineers of Quebec.
- 4. I have no interest, direct or indirect, in the properties described in this report, nor in the securities of Grand Saguenay Mines & Minerals Limited or any affiliate, and no expectation of receiving any.
- 5. The statements incorporated in the report are based on a personal examination of both properties. This is supplemented by a review of the relevant assessment files and published information.

Westmount, Quebec September 30, 1983 W.D. Beaton, Ph.D., P.Eng.



REPORT

on the

DIAMOND DRILL PROGRAM

for

# GRAND SAGUENAY MINES AND MINERALS LIMITED COMSTATE RESOURCES OPTION

Mountjoy Township
Timmins Area
Porcupine Mining Division Ontari

83-309

by

Nadia Caira, B. Sc.

Robert S. Middleton Exploration Services Inc.
P.O. Box 1637
Timmins Ontario P4N 7W8
November, 1985



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### INTRODUCTION

A diamond drill program consisting of two "BQ" diamond drill holes totalling 804 feet was conducted on the property optioned to Grand Saguenay Mines and Minerals Limited from Constate Resources Limited. Drilling commenced June 16, 1984 and was completed on June 21, 1984. The property is located within Mountjoy township on the west side of downtown Timmins.

The drilling program by Grand Saguenay IP anomalies, one of which is along strike from a carbonatized ultra-mafic rock anomalous in gold. This IP anomaly was tested by DOH GS-84-2. The drilling was carried out by Norex Drilling Limited of Porcupine Ontario. Drill core was logged and sampled by Roberta Bald, B.Sc., M.Sc. of Robert S. Middleton Exploration Services, Timmins, Ontario.

### DOH GS-84-1

Hole Depth 306 feet Azimuth 180° Dip -50°

Location Grid E, L50E, 9+75°N

Claim Number P591978

This hole was drilled entirely within metasedimentary rocks. These rocks were variably mineralized with traces of pyrite, pyrrhotite and chalcopyrite. One sludge sample returned very weakly geochemically anomalous (97 ppb Au).

### DDH GS-84-2

Hole Depth 498 feet Azimuth 180° Dip -50°

Location Grid D, L24E, 31S

Claim Number P568931

This hole intersected metasedimentary rocks bounded by feldspar porphyry (possible crystal tuff). The metasediments locally contain 1-2% disseminated pyrite and the feldspar porphyry is locally sericitized, silicified and contains 1-2% disseminated pyrite. A total of 75 samples of drill core were analyzed for gold but none were anomalous. One sludge sample (from a 10 foot run) taken from within the feldspar porphyry returned moderately anomalous (472 ppb Au). Drill core wihin this 10 foot interval was not sampled.

### SUMMARY

Given the lack of significant gold Assays and the fact that the IP anomalies were tested, no further work is recommended at this time.

Respectfully Submitted,

Madia Caira, B.Sc.

Please direct correspo to our mailing address

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P.O. Box 413, Station A, Doronto, Ostario M5W 192

oaguenay Mines & Minerals Limited

July 12, 198 MINISTRY OF NATURAL RESOURCES RECEIVED

Ministry of Natural Resources, Room 4650, Whitney Block, Queen's Park, Toronto, Ontario.

JUL 1 2 1985

THE DIRECTOR Mining Taxation & OMEP Office

Attention: Mr. R. B. Huggins, B.Sc

Dear Sir:

Re: Application for Grant or Certificate of Entitlement to Tax Credit - OM83-5-C-309

Enclosed please find technical reports of Mountjoy Township Property which were not available at time of filing.

Thank you for your consideration.

Yours truly.

GRAND SAGUENAY MINES & MINERALS LIMITED

Secretary-Treasurer

SLH/hc

S. L. Helfenbaum

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