PRELIMINARY EVALUATION REPORT
ON THE
MEUNIER LANGMUIR/FALLON PROPERTY
LANGMUIR AND FALLON TOWNSHIPS
PORCUPINE MINING DIVISION
DISTRICT OF COCHRANE
ONTARIO, CANADA
FOR
TIMMINS NICKEL INC.

August 27, 1990

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Kevin D. Hicks
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INTRODUCTION

In June, 1989 Timmins Nickel Inc. entered into an agreement with Dave Meunier of Timmins, Ontario, to option the latter's 89 claim Langmuir/Fallon townships property 35 kilometres southeast of Timmins, Ontario. This report was prepared, at the request of Koos Schippers, Vice-President of Timmins Nickel Inc., to summarize previous and present exploration work on the property as well as the potential for economic Ni-Sulphide mineralization.

The property is located of the southeast flank of the Shaw Dome, within the southwestern part of the Abitibi Greenstone belt. It is underlain by ultramafic and mafic flows with minor pyroclastic rocks. A large granodiorite intrusion lies along the southeast portion of the property.

While much has been done on the property in the past, no known geophysical/geological targets which may be associated with Ni-sulphide mineralization occur on the property.
PROPERTY LOCATION AND ACCESS

The property is located in Langmuir and Fallon townships, Porcupine Mining Division, District of Cochrane, approximately 40 kilometres southeast of Timmins, Ontario, Canada (figs. 1,2).

Access to the property is gained by travelling south approximately 25 kilometres from South Porcupine along the Springer road which traverses the west end of the property. Several old trails leading from the Springer road provide access to the central and eastern portions of the property. Access to the eastern portion of the property can also be gained via the Night Hawk River.

PROPERTY DESCRIPTION

The Meunier Langmuir/Fallon property consists of 89 contiguous unpatented mining claims comprising 1376 hectares which straddle the Langmuir/Fallon township boundary line (fig. 3). Sixty-seven of the claims lie in Langmuir township and the remaining 19 lie in Fallon Township. D. Meunier (82 claims) and M. Wabano (7 claims), both of the city of Timmins, Ontario, are the recorded holders of the claims.

PHYSIOGRAPHY AND VEGETATION

Relief across the property is generally less than 25 metres and for the most part is low lying. The eastern and western portions are generally flat lying while areas of outcrop in the central portion are cut by numerous valleys. Several large ridges occur on the property, most notably at the southwest end of the property where a large erosional remnant of the Cobalt Series metasedimentary rocks outcrops. A second large ridge outcrops west of the Night Hawk River just north of the township line.

Pleistocene and recent deposits cover much of the claim group with approximately 5% outcrop. Spruce, balsam, poplar, and birch cover most of the area. Alders and cedar predominate in low lying areas.

Water drainage is to the north and is provided by the Forks and Night Hawk rivers as well as several tributaries which empty into them.
HISTORY AND PREVIOUS WORK

1910-

The first reported work on the property dates back to 7 claims covering a small barite deposit located just west of the Night Hawk river. The deposit underwent limited intermittent mining until 1949. During this time an adit was driven on the main vein for a distance of 160 feet and a vertical shaft sunk at its entrance to a depth of 130 feet. A level was established on the 60 foot level and 80 feet of drifting completed. A second shaft to 75 feet was sunk on a small adjacent vein 500 feet to the east. Up to the end of 1949, 1955 tons of barite had been mined by 4 different operators (Premier Langmuir Mines Ltd., 1911-1922; Canada Nighthawk Mines Ltd., 1923-1937; Canada Baryte Mines Ltd., 1938-1942; Woodhall Mines Ltd., 1943-1949 which became Norbarite Mines Ltd. in 1949). In 1962 the property was taken over by Northern Barite Development Company Ltd., followed by Peerless Canadian Explorations in 1964. The only record of diamond drilling is two holes completed by Woodhall Mines Ltd. in 1943. Both holes intersected the main vein at vertical depths of 500 and 420 feet with true width intersections of 5 and 4.5 feet.

1911-

The Porcupine Miracle Mining Company Ltd. acquired several claims near the west end of the property covering a small gold showing. Two 2-compartment shafts and several small exploration shafts were sunk in porphyry dikes which contained narrow quartz stringers and minor disseminated pyrite. Underground operations were carried out from 1912-1915 and a small mill constructed. No gold was reported recovered from the showing.

1958-

Three diamond drill holes totalling 120 feet were completed by Nicolet Asbestos Mines Ltd. on the Miller claims near the central portion of the property immediately north of the Langmuir/Fallon township line. The holes were put down to test a narrow shear zone for asbestos mineralization at depth. No good quality fibre was intersected in any of the holes.

In the same year the Canadian Johns-Manville Company optioned 9 claims in the central portion of the property. These claims tied on to the north and west boundaries of the Miller Claims mentioned above. An asbestos fibre showing was located at the east end of the property and was tested at depth by three diamond drill holes totalling 902 feet. The zone was intersected at depth, however poor fibre quality resulted in suspended operations.

1965-

Maybrun Mines Ltd. held 12 claims in the central portion of the property immediately north of the Langmuir/Fallon township line. These claims included the Miller claims and part of the ground previously held by Canadian Johns-Manville. Magnetic and electromagnetic surveys were completed with subsequent follow up diamond drilling. Three holes totalling 1498 feet were put down to
test 3 EM conductors. No significant mineralization was noted in any of the holes.

Peerless Canadian Explorations carried out an exploration program on the old barite deposit to investigate the nickel potential of the ultramafic rocks. Magnetic and electromagnetic surveys, and 5 drill holes totalling 2100 feet were completed at this time. Results of this program are unknown as no work was filed with the regional ministry office.

Magoma Mines Ltd. held 12 claims in Langmuir and Fallon townships immediately west of the property. Magnetic and electromagnetic surveys were completed and the claims allowed to lapse due to insignificant findings.

United Porcupine Mines Ltd. held 10 claims coinciding with the north-central portion of the property straddling the Night Hawk river. A magnetometer survey was completed during the winter and the claims allowed to lapse.

1970-1972

The International Nickel Co. of Canada Ltd. held up to 125 claims in the southeast corner of Langmuir township. These claims covered roughly one quarter of the Meunier property. Full coverage magnetic and electromagnetic surveys were completed over the claims. Thirteen holes totalling 14,597 feet, including two holes within the current property outline, were subsequently completed to test mag/EM anomalies. No record of assays or significant mineralization is available.

1982-1983

Mercier Explorations Ltd. held 8 claims straddling the Langmuir/Fallon township line near the centre of the property. These claims were staked to cover a Pb, Au, Ag showing on the township line 500 metres east of the 2 mile post. Magnetic, electromagnetic, radiometric and geological surveys were carried out over the property. Several EM conductors were outlined but never tested and the claims allowed to lapse.

1984-1986

The present property was held by Lac Minerals. Linecutting, mag and VLF surveys, and geological mapping were completed on two grids cut at the east and west end of the property. Several VLF and VLF/magnetic anomalies were identified. Subsequently, 250 overburden drill holes were completed to sample the basal till below the VLF-EM anomalies. No significant findings were noted and the source of the anomalies remained unexplained. 12 diamond drill holes totalling approximately 7600 feet were completed to further evaluate the VLF-EM anomalies with no significant results.

1989-

Limited VLF and Max-Min surveying by Timmins Nickel Inc. to locate and verify previously identified VLF anomalies.
REGIONAL GEOLOGY

The Meunier Langmuir/Fallon property lies along the southeast flank of the Shaw Dome within the Deloro volcanic complex of the Abitibi greenstone belt (Fig. 4). The supracrustal rocks are dominated by early Precambrian metavolcanic and metasedimentary rocks. The Metavolcanic rocks are comprised of two volcanic cycles represented by the older Deloro Group and younger Tisdale Group. Early Precambrian metasedimentary rocks are represented by the Porcupine Group which is time equivalent with the upper part of the Deloro Group and all of the Tisdale Group.

The Deloro Group is largely a calc-alkaline sequence approximately 4500 to 5000 m thick and is comprised mainly of basalt and andesite flows near its base, and dacitic flows and dacitic to rhyolitic pyroclastic rocks towards the top. Sulphide and lesser oxide Fe-formation is common at the top of the Deloro Group. The Deloro Group is overlain by the Tisdale group, marking a major change in volcanism for the area. The base of the Tisdale group is dominated by ultramafic and basaltic komatiites, which is in turn overlain by a thick package of tholeiitic basalts. The upper part of the group is dominated by calc-alkaline dacitic volcanoclastic rocks. The Tisdale Group is approximately 4000 m thick. The Porcupine Group is dominated by interlayered wacke, siltstone and conglomerates forming what is mainly a turbidite sequence.

Several large sill-like intrusions of medium to coarse grained dunite/herzolite were emplaced almost entirely within the Deloro Group (Fig 4). Differentiation of these bodies has produced narrow zones of pyroxenite and gabbro along the roofs of the sills.

Several small felsic stocks occur throughout the area. A small trondjhemite occurs in east-central Eldorado township. A large porphyritic granodiorite stock underlies much of Adams, Price and McArthur townships while a small porphyritic monzonite stock outcrops in southeast Langmuir and north-central Fallon townships. A large porphyritic granodiorite stock underlies much of Blackstock and Fasken townships. Small epizonal intrusions of quartz-feldspar porphyry intrude most of the metavolcanics. These are likely subvolcanic in origin.

Three generations of diabase are recognized in the area; early (N trending, quartz/olivine diabase), middle (NNW/NE trending, quartz diabase), and late Precambrian (ENE/NW trending, olivine diabase).

A major structural break, the Destor-Porcupine Fault Zone, strikes northeast across the northern part of the area. The main shear of the zone is 150 m wide and dips steeply to the north. South of the break, the Shaw Dome forms the major structural feature. The axis of the dome strikes east-west across the southern part of Shaw township. The origin of the dome may be due to superimposed east-west folding on earlier north-south folding or
### LEGEND

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<td>Fault</td>
<td>Fault.</td>
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<td>Line</td>
<td>Lineament.</td>
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<tr>
<td>Alt</td>
<td>Altitude in feet above mean sea level.</td>
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<td>Rail</td>
<td>Railway with station or flagstop.</td>
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<td>Prov</td>
<td>Provincial highway.</td>
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<td>Mot</td>
<td>Motor road.</td>
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<tr>
<td>Oth</td>
<td>Other road.</td>
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<td>Air</td>
<td>Aircraft landing facilities.</td>
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<td>Larger community.</td>
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<tr>
<td>Sm</td>
<td>Smaller community.</td>
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<td>Min</td>
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<td>Twns</td>
<td>Township boundary.</td>
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### SYMBOLS

#### CENOZOIC
- Pleistocene and Recent
  - Till, varved clay, sand, gravel, peat

#### MESOZOIC
- Early Paleozoic
  - Coal Formation; coal; sandstone; shale

#### PALEozoIC
- Lower and Middle Silurian
  - Thorrington Formation: limestone, dolomite, sandstone

- Middle and Upper Ordovician
  - Davison Point Formation: shale, Fine gravel: limestone, dolomite, sandstone

### PRECAMBRIAN
- Late Precambrian
  - Mafic Intrusive Rocks
    - Diabase dikes. | 10

- Mafic Intrusive Rocks*
  - Diabase; dikes. | 15

- Alkaline Intrusive Rocks
  - Syenite, nepheline syenite. | 14

### MAFIC INTRUSIVE ROCKS
- Syenite, monzonite, felsspar porphyry. | 16

#### METASEDIMENTS
- Conglomerate, greywacke, siltstone, slate, argillite. | 13

#### METAVOLCANICS
- Felsic Metavolcanics
  - Unsubdivided. | 12

- Intermediate and Mafic Metavolcanics
  - Unsubdivided. | 11

#### METAMORPHIC ROCKS
- Unconf ormity
  - Early Precambrian
    - Mafic Intrusive Rocks
      - Diabase; dikes. | 11

#### FELSIC INTRUSIVE ROCKS
- Unconf ormity
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      - Diabase; dikes. | 10

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- Intermediate and Mafic Intrusive Rocks
  - Unsubdivided. | 12

#### Intrusive Contact
- Felsic Intrusive Rocks
  - Unconf ormity
    - Early Precambrian
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- Felsic Intrusive Rocks
  - Conglomerate, greywacke, siltstone, slate, argillite. | 15

- Intermediate and Mafic Intrusive Rocks
  - Unsubdivided. | 12
due to the diapiric action of an underlying granitic intrusion. Numerous younger faults traverse the area including the Montreal River Fault and the Burrows-Benedict Fault which trend northwest and north-northwest, respectively. Both faults merge near the west-central Tisdale township boundary. A left-lateral displacement of 1500 m is observed where the Montreal River fault crosscuts the Destor Porcupine Fault Zone. Numerous sub-parallel structures also occur within the area.

Gold mineralization in the area occurs within quartz-carbonate veins within the metavolcanic and metasedimentary rocks. Many lie along anticlinal axes and are proximal to quartz-feldspar intrusions. Nickel mineralization occurs in ultramafic rocks near the base of the Tisdale Group.
PROPERTY GEOLOGY

The property is predominantly underlain by east-northeast trending peridotitic to basaltic komatiitic and mafic to intermediate tholeiitic rocks. Several quartz-feldspar and feldspar porphyry dykes have subsequently intruded the komatiitic and tholeiitic volcanic rocks. A small porphyritic monzonite stock underlies the southeastern to south-central flank of the property. North-south trending diabase dykes crosscut all Archean rocks in the area. Proterozoic Cobalt Group sedimentary rocks outcrop near the western end of the property.

Peridotitic komatiites predominate along the northern portion of the property. They are generally dark green to black, fine-medium grained, variably magnetic and weather orange to orangey brown. They range from 1 to tens of metres thick and commonly display spinifex textures and polygonal fracturing. They exhibit compositional variations ranging from 18.64-37.93% MgO (Table 1). Varying degrees of carbonate, serpentine and talc alteration are common, especially near the porphyry dykes. A 15-20 metre thick pillowed basaltic komatiite occurs within the ultramafic sequence near the west end of the property.

Mafic to intermediate tholeiitic rocks range from massive to pillowed flows to local thin tuffaceous units. Flows are generally aphanitic-fine grained and vary from dark greenish grey to black. They display variable degrees of chlorite alteration and contain numerous small quartz-carbonate veins with up to 1% pyrite.

Several subvertical feldspar and quartz-feldspar porphyry dykes trending 100-110° have intruded the ultramafic rocks near west end of the property. They range from 2-10 m in thickness and contain up to 2% disseminated pyrite. One whole rock sample from the old Miracle Mine displayed whole rock composition of a granodiorite/tonalite. They display variable chlorite, carbonate, and hematite alteration, particularly near zones of 1-3cm quartz-carbonate veins. Up to 5% pyrite and minor fuchsite? are noted in the veins.

Diabase occurs as north-south trending dykes up to 100 m thick. They are typically massive, dark greenish black in colour, moderately magnetic and weather to an orangey brown to brownish colour.

The metavolcanic rocks strike 040-050° and dip steeply to the south. Top directions are to the south. A foliation striking 020-040° and dipping steeply to the southeast overprints the metavolcanic units. Several north and north-northeast trending faults, most notably the Montreal River fault, transect the property which offset the north trending diabase dykes in a right lateral sense. The east-west striking ultramafic package is terminated by a north trending fault at the west end of the property.
# Table 1 - Whole Rock Geochemical Analyses

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<th>Colour:</th>
<th>Depth:</th>
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| Remarks:    |         |         |       |                               |             | Alteration: spinifex          |       |                               | Ni ppm: 2490 | Au ppb:  |
| SiO2        | Al2O3   | Fe2O3   | CaO   | MgO                           | Na2O        | K2O     | TiO2  | MnO                           | P2O5        | 1.0.1. Total |
|             |         |         |       |                               |             |         |       |                               |             | Ba ppm Sr ppm Zr ppm Y ppm Sc ppm |

## Geochemical Data

- **SiO2**: Silicon Dioxide content
- **Al2O3**: Aluminium Dioxide content
- **Fe2O3**: Iron Dioxide content
- **CaO**: Calcium Dioxide content
- **MgO**: Magnesium Dioxide content
- **Na2O**: Sodium Dioxide content
- **K2O**: Potassium Dioxide content
- **TiO2**: Titanium Dioxide content
- **MnO**: Manganese Dioxide content
- **P2O5**: Phosphorus Dioxide content

## Additional Data

- **Ore Zone**: Location of ore zones
- **Sr ppm, Zr ppm, Y ppm, Sc ppm**: Concentrations of strontium, zirconium, yttrium, and scandium, respectively
- **Ni ppm, Au ppb**: Concentrations of nickel and gold, respectively
- **MnO**: Manganese content
- **LOI**: Loss On Ignition
- **Total Ba ppm, Sr ppm**: Total concentrations of barium and strontium, respectively
- **Total Zr ppm, Y ppm, Sc ppm**: Total concentrations of zirconium, yttrium, and scandium, respectively
- **Colour**: Colour of the sample
- **Alteration**: Type of alteration (e.g., strongly foliated, serpentinitized)
- **Rock Type**: Type of rock (e.g., Ultramafic volcanic, olphonitic-fine)
<p>| Sample No. | Colour | Remarks | Alteration | SiO₂ | Al₂O₃ | Fe₂O₃ | CaO | MgO | Na₂O | K₂O | TiO₂ | MnO | P₂O₅ | L.O.I. | Total | Ba ppm | Sr ppm | Zr ppm | Y ppm | Sc ppm |
|-----------|--------|---------|------------|------|------|------|-----|-----|------|-----|------|-----|------|-------|-------|--------|--------|--------|--------|--------|--------|
| T-523-73  |        | olivine spinifex |           | 45.2 | 8.55 | 10.78 | 8.20 | 20.0 | 0.36 | 0.04 | 0.52 | 0.20 | 0.11 | 4.31  | 98.99 |
| T-518     |        |          |            | 44.66| 5.20 | 9.93  | 8.47 | 28.98|      |      |      |      |      |            |        |
| T-519     |        |          |            | 44.48| 5.12 | 9.93  | 5.92 | 31.52|      |      |      |      |      |            |        |
| T-520     |        |          |            | 43.00| 3.91 | 9.19  | 3.25 | 37.93|      |      |      |      |      |            |        |
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### Other Information

- **Alteration**: serpentine, carbonate stringers
- **Remarks**: spinifex, poly suturing
- **Alteration**: serpentine, carbonate stringers
- **Remarks**: spinifex
- **Alteration**: hematitization
- **Remarks**: soft, orangey weathering, fractured
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The north-south trending quartz-carbonate vein zones hosted by the east-west trending porphyry dykes contain up to 2% pyrite. The veins zones vary in width from 2 to 10 m containing up to 10-30% vein material. One sample assayed from an altered porphyry dyke returned a value of 50 ppb Au. Associated with this porphyry dyke/vein system is a wide zone of talc-carbonate-serpentine alteration within the ultramafic rocks. In 1911 the Porcupine Miracle Mining Company Ltd. sunk several shafts on the showing and constructed a small mill, however no gold was ever recovered.

Two barite veins trending 090-110° occur 200-400 m west of the Night Hawk river north of the Langmuir/Fallon township boundary. The larger southern vein extends for about 700 feet, however it is poorly exposed and locally pinches and swells. The average width of the vein is 2-2.5 feet reaching a maximum width of about 6 feet. The northern vein occurs along the cliff face approximately 400 feet east of the adit and shaft location on the main vein. This vein has a strike length of 400 feet and varies from 2.5-5 feet in width. Since its discovery in 1911, the deposit has seen intermittent production by several operators (see previous work) with combined production of 1955 tons of barite.

A small Ag-Au-Pb showing occurs on the Langmuir/Fallon township line in the central portion of the property. The showing consists of quartz-carbonate veins containing pyrite, galena, silver and gold hosted in massive to brecciated tholeiitic mafic volcanic rocks.

Numerous asbestos showings occur throughout the property as well as throughout Langmuir township. Many of these showings have been examined in the past and have proven to be of insufficient quantity or fibre quality.

No known significant nickel mineralization occurs on the property. Samples of ultramafic rocks from the property area collected by D.R. Pyke during his regional mapping of the Shaw Dome area returned values ranging from 750-2490 ppm Ni (Table I). Samples recently collected by the author from the same general area returned values ranging from 120-395 ppm Ni (Table I). These values are substantially lower than average background values for ultramafic rocks near the contact of the Deloro and Tisdale Groups.
GEOPHYSICAL WORK

PREVIOUS WORK

Magnetometer and VLF-EM surveys have been completed by Lac Minerals over most of the property, the only exception being 20 claims in the central core of the property. Eight of these claims were previously surveyed by Mercier Explorations Ltd. The remaining 12 claims have been subjected to various geophysical surveys in the past. The majority of the ground EM conductors have been tested by either overburden or diamond drilling with little success. Several airborne EM conductors were identified by a survey completed by the Ontario Geological Survey. Both conductors lie just west of the Night Hawk River.

The most significant anomalies on the property are the coincident VLF/Airborne (7-8, 9-10 channel) conductors. Overburden and diamond drill testing of the northernmost conductor indicated the anomaly to be due to interflow graphitic sediments within the ultramafic metavolcanics. A second coincident VLF/airborne (7-8, 11-12 channel) conductor lies between the barite deposit and the river. Surface examination of the area identified the conductor as a cultural response related to a railway line leading from the main adit at the barite deposit to the Night Hawk River. In addition to the double rail line, numerous steel culverts and several pieces of machinery also likely contributed to the anomaly.

Several untested VLF anomalies of various length remain on the property. Many of these conductors correspond to outcrop ridges, while the remainder likely represent conductive overburden.

PRESENT WORK

Recent geophysical surveying on the property included VLF and Max-Min surveys carried out near the west end of the property, the purpose of which was to locate and verify 3 VLF conductors identified by Lac Minerals. The work was contracted to Rayan Exploration of Timmins, Ontario, and carried out on the 16th of June, 1990. The results of these surveys are included in a pocket at the end of this report.

The recent VLF survey outlined four conductors in the area covered. One of anomalies correlates with an anomaly identified by Lac Minerals. This survey failed to locate the remaining 2 anomalies identified by Lac Minerals, however it did identify 3 conductors not previously known.

Testing of the VLF anomalies with Max-Mix (444, 1777 Hz) failed to outline any conductive zones. This suggests that all VLF conductors in the area are likely not related to massive sulphide mineralization. This is further suggested by an absence of airborne EM conductors in the area. The causes of the VLF anomalies may be very weakly disseminated sulphides, shear zones, contact zones or bedrock ridges.
Ni-sulphide deposits within the Timmins area occur predominantly in three geological environments including: 1) komatiite hosted deposits, 2) peridotite/dunite hosted deposits, and, 3) gabbro hosted Ni-Cu deposits.

Ni- (or Ni-Cu) sulphide deposits form when ultramafic of mafic silicate magma becomes sulphur-saturated leading to the separation of an immiscible sulphide melt, probably as droplets. Due to their chalcophile nature, Ni and Cu (PGE's also) partition preferentially into the sulphide melt. Ore grade deposits are formed near the base of flows/intrusions when gravitational or flow segregation concentration of the sulphide droplets occurs. The formation of these deposits is, therefore, not dependant upon the Ni (Cu) content of the silicate magma, but rather upon the availability of sufficient sulphur to achieve sulphur saturation.

1. KOMATIITE HOSTED Ni-SULPHIDE DEPOSITS

Examples of komatiite hosted Ni-sulphide deposits include the Kambalda area of western Australia and the Alexo, Langmuir, Redstone deposits near Timmins, Ontario.

These deposits are confined to the lowermost komatiitic flows forming shoots 150-200 metres in width and 1000-2500 metres in length. They typically display high Ni:Cu ratios and high Ni grades. The ore shoots are thought to have been localized by trough-like depressions, possibly formed by syn-volcanic fault activity or by thermal erosion of the underlying volcanic rocks. Laterally, these deposits typically pass into sediments with or without Ni mineralization. These sediments are thought to have provided the necessary sulphur to achieve sulphur saturation and subsequent separation of the Ni-sulphide melt. All known deposits are of Archean age.

Many of these deposits display spatial association with sulphide facies iron formation. In addition to supplying necessary sulphur to reach saturation, the introduction of large amounts of silica to ultramafic/mafic magma depresses the sulphur solubility of the silicate magma leading to earlier separation of the Ni-sulphide melt phase.

2. PERIDOTITE/DUNITE HOSTED Ni-SULPHIDE DEPOSITS

Examples of peridotite/dunite hosted Ni-sulphide deposits include the Dumont deposit near Amos, Quebec, the Texmont deposit south-southeast of Timmins, Ontario, and the Perseverence deposit of western Australia.

These deposits are typically very large (100 to 250 X 10^6 tonnes) and generally of low grade (0.6% Ni). They consist of finely disseminated sulphide in intrusive lenses which are interpreted to be sill-like bodies acting as feeders for komatiitic
volcanism. Zones of higher sulphide concentration are formed as stratiform cumulate layers within the intrusion.

3. GABBRO HOSTED Ni-Cu-SULPHIDE DEPOSITS

Gabbro hosted Ni-Cu-sulphide deposits include Montcalm deposit northwest of Timmins, Ontario.

These deposits are similar in nature to peridotite/dunite hosted Ni-sulphide deposits, i.e., stratiform layers of disseminated sulphide within the intrusive complex. Gabbro hosted deposits typically display higher Cu/Ni ratios and are often significantly enriched in precious metals. The host intrusions are generally medium sized (~100 km²), variably differentiated, and of Archean or Proterozoic age.
The Ni-sulphide deposits of the Shaw Dome area (Redstone, Langmuir 1 & 2, Hart and McWatters) represent typical komatiite hosted deposits. All deposits show spatial arrangements with sulphide facies Fe-formation horizons suggesting a genetic relationship between the two.

The deposits in the Shaw Dome area lie at the stratigraphic contact between the Deloro and Tisdale Groups, generally within the lowermost komatiite flows of the Tisdale Group. Some exceptions to this trend apply where Ni-sulphide has been remobilized by structural/hydrothermal activity following volcanism.

The komatiitic flows associated with these deposits display high MgO (40-48%) values with the more fractionated overlying flows typically displaying lower values. Samples from the Meunier property fall well below this range (19-32% MgO). Background Ni values are generally much lower in samples collected from the Meunier property.

The lack of any significant geophysical (both airborne and ground) targets on the Meunier property suggest that it is highly unlikely that significant Ni-sulphide mineralization occurs on the property. Furthermore, the lack of any conductors negates the occurrence of any sulphide facies Fe-formation on the property, while of no value themselves, show strong spatial (genetic?) relationships with economic Ni-sulphide mineralization. In addition, the property's distal location from the Deloro/Tisdale group contact zone suggests it is less likely to contain significant Ni-sulphide mineralization, based on current models for Ni-sulphide mineralization in similar areas (eg. Kambalda, Shaw Dome).

Based on all available data to date, no future exploration for Ni-sulphide deposits on the Meunier Langmuir/Fallon claims is recommended at this time.
CONCLUSIONS AND RECOMMENDATIONS

The Ni-sulphide deposits of the Shaw Dome area (Redstone, Langmuir 1 & 2, Hart and McWatters) represent typical komatiite hosted deposits. All deposits show spatial arrangements with sulphide facies Fe-formation horizons suggesting a genetic relationship between the two.

The deposits in the Shaw Dome area lie at the stratigraphic contact between the Deloro and Tisdale Groups, generally within the lowermost komatiite flows of the Tisdale Group. Some exceptions to this trend apply where Ni-sulphide has been remobilized by structural/hydrothermal activity following volcanism.

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The lack of any significant geophysical (both airborne and ground) targets on the Meunier property suggest that it is highly unlikely that significant Ni-sulphide mineralization occurs on the property. Furthermore, the lack of any conductors negates the occurrence of any sulphide facies Fe-formation on the property, while of no value themselves, show strong spatial (genetic?) relationships with economic Ni-sulphide mineralization. In addition, the property's distal location from the Deloro/Tisdale group contact zone suggests it is less likely to contain significant Ni-sulphide mineralization, based on current models for Ni-sulphide mineralization in similar areas (eg. Kambalda, Shaw Dome).

Based on all available data to date, no future exploration for Ni-sulphide deposits on the Meunier Langmuir/Fallon claims is recommended at this time.
CERTIFICATE

I, Kevin D. Hicks, of RR# 2 Laforest Road, Timmins, Ontario, do hereby certify that:

1) I am an exploration geologist employed by the firm M.V.W. White and Associates Limited of Timmins, Ontario.

2) I am a graduate of the University of Ottawa, Ottawa, Ontario with the degree of B.Sc. (geology) in 1986 and the degree of M.Sc (geology) in 1990.

3) I have been practising my profession since 1985 and full time since 1988.

4) I have based my conclusions and recommendations contained in this report on my knowledge of the area, my previous experience, and on the results of field work conducted on the property during 1990.

5) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the properties or securities of Timmins Nickel Inc., or any affiliate.

6) I consent to the use of this report in a Statement of Material Facts of the Company and for the preparation of a prospectus for submission to the Ontario Securities Commission and other regulatory authorities.

Kevin D. Hicks, M.Sc.

Timmins, Ontario
September 10, 1990
Ministry of
Northern Development
and Mines
Ontario

Report of Work Conducted
After Recording Claim

Mineral Act

Transaction Number
19260.00021

Personal information collected on this form is obtained under the authority of the M
this collection should be directed to the Provincial Manager, Mining Lands, Mini
Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

Instructions: - Please type or print and submit in duplicate.
- Refer to the Mining Act and Regulations for rec
Recorder.
- A separate copy of this form must be completed for each Work Group.
- Technical reports and maps must accompany this form in duplicate.
- A sketch, showing the claims the work is assigned to, must accompany this form.

Recorded Holder(s)

MIKE WARDEN & DAVID MEIKLE

Address
400 DOONE ST. RDB 124 SPENCER

Date Work Performed
From: JUNE 27-90
To: SEP 10-90

Work Performed (Check One Work Group Only)

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<td>Rehabilitation</td>
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Total Assessment Work Claimed on the Attached Statement of Costs $5600.00

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded
holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

Persons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)

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<th>Address</th>
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<tr>
<td>Steve Anderson</td>
<td>637 Discovery Blvd. Edp.</td>
</tr>
<tr>
<td>Ray Meikle</td>
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</tr>
<tr>
<td>Kevin Hicks</td>
<td>RR #2 Lodecrest Rd. Timmins 81</td>
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Certification of Beneficial Interest * See Note No. 1 on reverse side

I certify that at the time the work was performed, the claims covered in this work
report were recorded in the current holder's name or held under a beneficial interest
by the current recorded holder.

Name and Address of Person Certifying

Certification of Work Report

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after
its completion and annexed report is true.

For Office Use Only

Total Value Cr. Recorded FEB 3/92
$5600.00

Date Recorded        Mining Inspector         Received By
FEB 3/92             Whit                        FEB 8 992

Dated Approval Date          Date Approved
MAY 3/92                            

Date Notice for Amendments Sent

0341 (3999)
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**Total Number of Claims: 7**

**Total Value Work Done: 5600.00**

**Total Value Work Applied: 4800.00**

**Total Assigned From: 5600.00**

**Total Reserve: 800.00**

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**Note 1:** Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to mining claims.

**Note 2:** If work has been performed on patented or leased land, please complete the following:

1. [ ] Credits are to be cut back starting with the claim listed first, working backwards.
2. [ ] Credits are to be cut back equally over all claims contained in this report of work.
3. [ ] Credits are to be cut back as prioritized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Credits you are claiming in this report may be cut back in order to minimize the adverse effects of such deletions. Please indicate from which claims you wish to prioritize the deletion of credits. Please mark (X) one of the following:

1. [ ] Credits are to be cut back starting with the claim listed last, working backwards.
2. [ ] Credits are to be cut back equally over all claims contained in this report of work.
3. [ ] Credits are to be cut back as prioritized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

---

**Signature:**

---

**Date:**

---

**RECEIVED**

---

**MINING LANDS OFFICE**

---

1. [ ] Credits are to be cut back starting with the claim listed first, working backwards.
2. [ ] Credits are to be cut back equally over all claims contained in this report of work.
3. [ ] Credits are to be cut back as prioritized on the attached appendix.
**Statement of Costs**

for Assessment Credit

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<td><strong>Wages</strong></td>
<td>Labour</td>
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<tr>
<td>Supplier</td>
<td>Field Supervision Supervision sur le terrain</td>
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<td><strong>Contractor's and Consultant's Fees</strong></td>
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<td><strong>Supplies Used</strong></td>
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<td><strong>Equipment Rental Location du matériel</strong></td>
<td>Type</td>
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**Total Direct Costs**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Total Global</th>
</tr>
</thead>
</table>

**Filing Discounts**

1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.

2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

\[
\text{Total Value of Assessment Credit} \times 0.50 = \text{Total Assessment Claimed}
\]

**Certification Verifying Statement of Costs**

I hereby certify that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as [Recorded Holder, Agent, Position in Company] I am authorized to make this certification.

**Remises pour dépôt**

1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.

2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

\[
\text{Valeur totale du crédit d'évaluation} \times 0.50 = \text{Évaluation totale demandée}
\]

**Attestation de l'état des coûts**

J'atteste par la présente que les montants indiqués sont le plus exact possible et que ces dépenses ont été engagées pour effectuer les travaux d'évaluation sur les terrains indiqués dans la formule de rapport de travail ci-joint.

Et qu'à titre de [Recorded Holder, Agent, Position in Company] je suis autorisé à faire cette attestation.

Signature | Date
---|---
[Signature] | July 30/91

**Nota:** Dans cette formule, lorsqu'il s'agit de personnes, le masculin est utilisé au sens neutre.
December 16, 1991

Mining Recorder
Ministry of Northern Development and Mines
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

RE: GEOTECHNICAL SURVEY OVER MINING CLAIMS P1074257 ET AL. IN LANGMUIR AND FALLON TOWNSHIPS.

The deficiencies in this survey, as outlined in the Notice of Deficiency dated October 25, 1991, have not been rectified within the 45 day period specified in the Notice.

The Assessment credits have been reduced to $0.00 as outlined on the attached assessment work credit form. No credits will be approved for this Report of Work.

Please change your records accordingly.

If you require further information please contact Clive Stephenson at (705) 670-7251.

Yours sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Branch
Mines and Minerals Division

cc: Resident Geologist
Timmins, Ontario

Assessment Files Office
Toronto, Ontario
1) Assessment Credit for a Geotechnical submission in respect of work over mining claims:

P 1074257
P 1074258
P 1074259
P 1074260
P 1074261
P 1074262
P 1074263

Total Assessment Credit claimed: $ 5,600.00

Level of Assessment Credit Approved: $ 0.00
June 25, 1992

Mining Recorder
Ministry of Northern Development
and Mines
60 Wilson Avenue
Timmins, Ontario
P4N 1A2

Dear Sir:

RE: APPROVAL OF ASSESSMENT WORK ON MINING CLAIMS P 826280 et al. IN LANGMUIR AND FALLON TOWNSHIPS.

The Assessment Credits for other authorized work, section 18 of the Mining Act Regulations, as listed on the attached Assessment Work Credit Form, have been approved as of June 15, 1992. This Assessment Credit Form replaces the one filed as part of the original submission.

Please note the change in the approval section from Geotechnical to Section 18 (Other Authorized Work).

If you have any questions please contact Clive Stephenson at (705) 670-7251.

Yours sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Branch
Mines and Minerals Division

Enclosures:

cc: Assessment Files Office
Toronto, Ontario

Resident Geologist
Timmins, Ontario
ASSESSMENT WORK CREDIT FORM

FILE NUMBER: 2.14527
DATE: June 25, 1992
TRANSACTION NUMBER: W9260.00021
RECORDED HOLDER: Mike Wabano c/o David Meunier
CLIENT NUMBER: 205810
TOWNSHIP: Langmuir and Fallon

<table>
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<th>CLAIM NUMBER</th>
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<th>VALUE APPLIED TO THIS CLAIM</th>
<th>VALUE ASSIGNED FROM THIS CLAIM</th>
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<tr>
<td>TOTALS</td>
<td>$ 5,600.00</td>
<td>$ 5,280.00</td>
<td>$ 4,800.00</td>
<td>$ 320.00</td>
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REFERENCES

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

NOTES
THIS TOWNSHIP LIES WITHIN THE MUNICIPALITY OF THE CITY OF TIMMINS
FLOODING RIGHTS IN NIGHTHAWK LAKE TO THE CONTOUR ELEVATION 90' 5' RESERVED TO ONT. HYDRO.

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.

SCALE: 1 INCH = 40 CHAINS

TOWNSHIP
LANGMUIR
M.N.R. ADMINISTRATIVE DISTRICT
TIMMINS
MINING DIVISION
PORCUPINE
LAND TITLES/REGISTRY DIVISION
COCHRANE
MINING LANDS BRANCH

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT
PATENT, SURFACE & MINING RIGHTS
SURFACE RIGHTS ONLY
MINING RIGHTS ONLY
LEASE, SURFACE & MINING RIGHTS
SURFACE RIGHTS ONLY
MINING RIGHTS ONLY
LICENSE OF OCCUPATION
ORDER-IN-COUNCIL
RESERVATION
CANCELED
SAND & GRAVEL

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 5, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1877, CHAP. 380, SEC. 63, SUBSEC. 1.

Ontario
Ministry of Natural Resources
Land Management Branch

Received: March 1, 1965

G-3226
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...
PARAMETERS MEASURED: In Phase, Quadrature, Total Field Strength
INSTRUMENT: GEONICS EM-16
READING INTERVAL: 25 metres
TRANSMITTER STATION: NAA Cutler, Maine
FREQUENCY: 24.0 kHz
ALL READINGS TAKEN FACING NORTH

TIMMINS NICKEL INC.
MEUNIER PROPERTY

VLF - EM SURVEY
NAA Cutler Maine - 24.0 kHz

RAYAN EXPLORATION LTD.
CONTRACT/CONSULTING GEOPHYSICS
637 ALONGGUN BLVD E
TIMMINS, ONTARIO
**TIMMINS NICKEL INC.**
**MEUNIER PROPERTY**

**MAX-MIN SURVEY**

1777 Hz