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GEOLOGY AND GOLD DEPOSITS

MURGOLD RESOURCES

GOGAMA AREA

by

NORMINEX LIMITED

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Sudbury, Ontario

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INTRODUCTION

The property consists of 295 claims situated in Chester, Benneweiss and St. Louis townships about midway between Sudbury and Timmins. Convenient access to the area is provided by provincial highway 144. The claim group constitutes the eastern extension of the Swaze "greenstone belt".

Geological mapping at a scale of 1 inch to 400 feet was carried out from May to September, 1981. Vertical aerial photographs originally at 1 inch to ¼ mile but enlarged to 1 inch to 400 feet provided the basic control for mapping. Surveyed township lines, highway 144, power lines, bush roads, and base lines established by Murgold Resources provided additional controls. Rock outcrops were examined along and on either side of lines spaced 300 to 600 feet apart. The entire property was covered in this manner even though large areas lacked rock exposure. Geological interpretation of such areas was greatly assisted by using filtered aeromagnetic data and air photo examination.

Chester and Benneweiss townships lie just north of the height of land marking the boundary between the Arctic and Atlantic watersheds. Although the area is topographically high and relief commonly exceeds 100 feet, large expanses of well-exposed bedrock are not common. Most of the high ground consists of glacial debris through which only small rock knolls protrude. Even these are usually covered by a thin veneer of dirt and moss. Much of the overburden consists of boulder till and glacial outwash, sand and gravel. The glacial deposits may range in thickness from a few feet to more than 100 feet in areas that were topographically low at the time the ice melted. A typical example of thick and extensive glacial deposits is the area bordering Mesomikenda Lake which occupies a fracture-controlled linear depression trending NNW. The shores of this lake are characterized by steep high bluffs of boulders, gravel and sand. The shores of the lake and the terrain for several hundred feet on either side of the lake are almost devoid of outcrop.

The only published geological report of the area encompassing the Murgold property is that by H. C. Laird, Geology of the Three Ducks Lake Area, being part III of the 41st annual report of the Ontario Department of Mines for 1932. Laird's mapping at 1 inch to 3/4 mile was done shortly after the original discovery of gold in Chester township.

The results of the current geological survey are presented on 3 sheets. Sheets 1 and 3 cover the northern parts of Chester and Benneweiss townships; sheet 2 covers that part of the property immediately south of the other two sheets.

Aeromagnetic map and aerial photos of the property provided much useful geological information. For example, a number of linear magnetic highs trending about 165° are clearly visible on the total field aeromagnetic maps. It has been determined that these are caused by magnetite-bearing diabase dykes whose magnetism permits them to be traced across areas lacking rock exposure. In addition to this common 165° trend a prominent and persistent magnetic feature (also caused by diabase) trends at 110° from the NW corner of the property to the western shore of Mesomikenda Lake (sheet 2). Across the lake, on the east shore the magnetic high (and the diabase) re-appear some 4500' southward. A narrower dyke lies north of and trends parallel to the larger diabase. This 110° trend is also a common direction for quartz veins in the area.

About 4000' south of Arethusa Lake (bottom of sheet 1) is an easterly trending unnamed lake (top of sheet 2) through which an easterly trending aeromagnetic feature passes. This apparently represents a structure along which shearing occurs in at least two places: 1) on the north shore of the above-mentioned lake and 2) near the west shore of Mesomikenda Lake (Southcamp Bay).

A computer filtering technique described in a separate report was applied to the aeromagnetic data for Chester township. This technique separates the total field magnetism into a residual portion representing near-surface magnetism and a regional portion representing deeper magnetism. The report on this procedure was completed prior to compilation of the geological mapping and the significance of the residual magnetism was not fully understood until the geology was being compiled. It is now apparent that residual magnetic values greater than 0 (and up to several hundred) gammas represent areas of gabbro-diorite, as contrasted with more granitic rocks which yield negative residual values. For example, the boundaries of the large irregular gabbro-diorite mass trending south from Mill Pond (see sheets 1 and 2) coincide remarkably well with the 0 contour of the residual magnetic map. This observation has permitted the delineation of gabbro as contrasted with granodiorite in the largely overburn-covered area immediately west of Southcamp Bay (sheets 1 and 2) and of the gabbroic body in the southwestern part of the property (sheet 2).

Air photo interpretation was useful in revealing structural features even in areas where little bedrock is exposed. For example, fracture systems through Mill Pond and Arethusa Lake are well-defined. Both NNW and ESE shear and fracture zones are visible in the vicinity of the small lake 4000' south of Arethusa Lake. Less clearly defined but nonetheless visible is a fine "grain" in the vegetation trending at 110°. When first noted, this "grain" appeared to be a shadow effect. However, the shadows trend at about 255°. The 110° grain probably reflects small-scale pervasive foliation parallel to the larger 110° fractures and veins. Large 110° lineaments, the fine 110° "grain" and a series of NNW lineaments are visible on photo 45-191. Only the most prominent of the lineaments are shown on the geological map.

GEOLOGY OF THE PROPERTY

The property is underlain largely by intrusive igneous rocks ranging in composition from gabbroic to granitic and in texture from fine-grained to coarse-grained. The dominant feature in the western part of the property (sheets 1 and 2) where most of the known gold-bearing quartz veins occur, is a more or less rectangular but irregular northerly trending strip of gabbro to diorite sandwiched between a coarse-grained quartz-eye granodiorite on the east and a fine- to medium-grained alaskite granite on the west. Both of the granitoid bodies are intrusive into the gabbro-diorite. The outline of this gabbro-diorite coincides with the 0 contour on the residual magnetic field map. Similar mafic igneous rocks occur south and west of the west end of Benneweiss Lake and immediately west of Southcamp Bay on Mesomikenda Lake.

The diorite and gabbro and both types of granitoid rocks are intrusive into rhyolitic volcanic and greywacke-type sedimentary rocks. The rhyolites and greywacke, with associated conglomerates, occur along the northern edge of the property (Sheets 1 and 3) and in the area of Benneweiss Lake.

Irregular zones of hybrid material named hybrid felsite are found in a few places near the contacts of granitoid intrusions and older rocks.

The youngest and freshest rocks on the property are diabase dykes, occupying well-defined fracture zones trending approximately north and a little north of west. The various lithologies are briefly described below along with their most important petrographic features. More complete thin-section descriptions are included in the Appendix to this report.

RHYOLITE, RHYOLITE PORPHYRY

Fine-grained, in part porphyritic, light-coloured felsic rocks associated with and assumed to underlie the greywacke-conglomerate are either massive or foliated,in some places well banded. These rocks are classified as rhyolite but may more correctly be called rhyolitic crystal tuffs in cases where they are banded as along highway 144 near the top of Chester township (sheet 1). These rhyolitic rocks are hard, dense and weathered to a light cream colour. They commonly contain small rounded clear quartz grains and feldspar laths in a fine quartzo-feldspathic matrix. The rhyolites consist of 75% or greater quartz and feldspar accompanied by fine muscovite (sericite), chlorite, epidote, biotite and minor sphene.

GREYWACKE, CONGLOMERATE

Grey to greyish green well-bedded sedimentary rocks along the northern boundary of the property and around Benneweiss Lake are largely greywacke in composition. They are fine to medium grained and occur in beds an inch or so thick. Dips are generally near vertical. Beds of conglomerate containing mafic to felsic pebbles are present in places.

The greywacke is poorly sorted with grain size ranging from $\frac{1}{2}$ mm to 2 mm or more. They consist of angular to rounded clasts of quartz and feldspar in a matrix of finer quartz, chlorite, biotite, muscovite and sericite. The flaky minerals are generally aligned and impart a weak to strong schistosity to the rock.

GABBRO, DIORITE

The central part of Chester township (sheets 1 and 2) is underlain by a northerly trending complex of gabbro, diorite and quartz diorite intruded on the east by quartz-eye granodiorite and on the west by alaskite. A similar mafic complex occurs in the northeast part of Chester township and west and south of the west end of Benneweiss Lake. Various phases of this unit grade into one another without well-defined contacts. They range from medium to dark green in colour, from fine to coarse grained in texture and from massive to schistose in structure. Some of the fine-grained chloritic phases resemble basalts but no well-defined flow features were noted; these basaltic looking phases are distributed in an irregular manner throughout the gabbroic phases and it is assumed that they are a part of the gabbro-diorite complex.

The various phases of this complex, in part at least, are a result of alteration. The least altered material is typically gabbroic and consists dominantly of plagioclase tablets with coarse interstitial hornblende and a little quartz. The plagioclase is altered to fine epidote and the amphibole displays minor alteration to chlorite. In more altered phases the amphibole is almost completely altered to chlorite. In phases which appear chloritic the plagioclase becomes altered to epidote and chlorite and the matrix contains abundant biotite with a few remnants of chlorite from which it was derived. The more altered phases may also contain greater than 10% quartz occurring as introduced grains containing fluid (aqueous) inclusions.

Quartz-bearing phases are secondary quartz diorites. The alteration of these mafic rocks has been sequential and progressive in the sense that amphibole first alters to chlorite and plagioclase to epidote. This involves the addition of water. Chlorite then alters to biotite by the addition of further water and potash. This sequence is of some practical interest as it is the same sequence of alteration that occurs in wallrocks around quartz veins although in this case the alteration is even more intense, involving the production of chlorite and biotite schists and the introduction of numerous large opalescent quartz eyes into the mafic host rock.

The mafic rocks discussed above are important hosts to many of the gold-bearing quartz veins on the property, particularly near the contacts of the gabbro-diorite with the quartz-eye granodiorite and alaskite. Because of this it is important to outline the distribution of the gabbro-diorite, particularly in areas where rock outcrops are scarce. The filtered aeromagnetic data (residual magnetism) has been useful in this regard.

HYBRID FELSITE

Some granitized, feldspathized and silicified rocks of mixed character have been placed in this category, hybrid felsite. They occur mainly in two localities, one around the #20 vein system (sheet 1) and east of Three Ducks Lake (sheet 2). The hybrid rocks are of two types. One type consists of fine grained granitic material containing irregular inclusions of gabbro-diorite or "ghost-like" altered remnants of these rocks. The other type, which forms the bulk of this unit is a dense hard massive felsite, also containing "ghost-like" darker areas. The felsite consists of fine granular quartz and feldspar with variable amounts of biotite and muscovite. In places minute phenocrysts of plagioclase are visible on the weathered surface. The felsite represents silicified and feldspathized pre-existing rock or a fine border phase of the granitic rocks. Somewhat similar material, regarded as a border phase of the alaskite, occurs around the #3 vein system. Some of the rhyolite south of Benneweiss Lake is also similar to the felsite and it is possible that some or all of that rhyolite may indeed be felsite.

ALASKITE

The granitic rocks exposed in the western part of the property are fine- to medium-grained grey massive alaskite generally containing less than 10% dark minerals. The alaskite intrudes the sedimentary rocks and the gabbro-diorite complex. The alaskite consists of about 45% each of plagioclase and quartz, about 1 mm in size and about 10% fine sericite, biotite, chlorite, epidote and carbonate. In places fine disseminated pyrite is present even though the rock is massive.

QUARTZ-EYE GRANODIORITE

The granitoid rocks intruding the gabbro-diorite complex in the area of Mesomikenda Lake and eastward are coarse grained granodiorites containing prominent bluish opalescent quartz eyes. The rock varies from massive to faintly foliated and from light grey to orange-pink on the weathered surface.

The granodiorite consists of about equal amounts of plagioclase, orthoclase and quartz, totalling from 75% to 90% of the rock and in grains from 3 to 4 mm across. The remaining minerals are interstitial biotite, chlorite, muscovite, epidote and accessory sphene, apatite, and zircon. The most striking feature of the rock is the presence of prominent bluish quartz eyes consisting of either single large grains or round mosaics of smaller individual grains. Generally the "eyes" are unstrained and are crowded with abundant minute fluid (aqueous) inclusions. It is these fluid inclusions which impart the bluish opalescence to the quartz eyes. The fact that the quartz eyes are unstrained and retain their fluid inclusions even though the matrix in which they occur may be foliated, even schistose in places, indicates that they are late metasomatic and hydrothermal. This conclusion and the fact that many of the quartz veins in gabbro-diorite occur in proximity to the quartz-eye granodiorite and, furthermore, the observation that secondary opalescent quartz eyes occur in the gabbro-diorite wallrocks hosting veins suggests a direct genetic association between the granodiorite and gold mineralization. Certainly the abundance of aqueous inclusions in the quartz eyes attests to widespread hydrothermal activity.

DIABASE, TRAP

Medium-grained brown weathering diabase dykes 100 feet or more wide intrude all other rocks on the property. Narrower dykes, a foot or so wide, and the borders of the coarser diabase are fine-grained trap. Most of the diabase dykes trend in a northerly direction but a few trend slightly south of east.

The diabase is generally fresh undeformed and unaltered. In places, however, a foliation is developed. Fresh massive diabase consists of about 45% each of randomly oriented plagioclase laths and interstitial augite. Up to 10% magnetite is present, accounting for the pronounced magnetism of the diabase.

STRUCTURE

Most of the rocks are intrusive and fold structures, therefore, are generally obscure. Within the sedimentary sequence there is some suggestion that tops face north and that the greywacke-conglomerate stratigraphically overlie the rhyolitic rocks. The sedimentary rocks, both at Benneweiss Lake and in the northern part of the property, may occupy synclinal troughs.

The most prominent and significant structural elements are fracture and shear systems, some of which are occupied by diabase dykes. Although most of the dykes trend in a NNW or northerly direction, a second important trend is at 110°. Two parallel dykes trend in this direction across the property (sheet 1) and most of the gold-bearing quartz veins occur in fractures and shears striking at about 110°. There is clear evidence that repeated or prolonged deformation, pre-dating, contemporary with, and post-dating vein formation, has taken place along this direction. This temporally persistent fracturing, therefore, appears to have been important in "ground preparation" and in providing access for mineralizing fluids. Some of the evidence for repeated deformation is summarized below.

The earliest recognizable deformation involved development of schistosity in parts of the gabbro diorite and the conversion of amphibole to chlorite. This foliation trends at about 110° and may have preceded or have been contemporary with intrusion of granitoid rocks. Some phases of the quartz-eye granodiorite display a pervasive foliation at 110° that is characterized by parallel films of chlorite and biotite. This foliation must have developed after the granodiorite was solidified, but prior to complete consolidation, as the blue quartz eyes are unstrained and have not lost their fluid inclusions. Fracturing, with 110° trend, continued after consolidation of both the quartz-eye granodiorite and alaskite, and both these rock types contain gold-bearing quartz veins. In some veins the quartz is banded, indicative of re-opening and healing of fractures during vein formation. Finally the diabase striking at 110° north of the #10 vein, and which is younger than the granitoid rocks and the veins, is itself foliated in places.

Northerly trending fractures and diabases are also structurally important. Some of these clearly cut the quartz veins. However, whether or not they have displaced the veins is uncertain. The veins between Mill Pond and Arethusa Lake appear to pass uninterrupted across northerly trending diabase dykes.

On the other hand, the NNW fracture occupied by Mesomikenda Lake appears to have displaced the sedimentary rocks in a left hand manner (east side northward). Displacement of the gabbro-granodiorite contacts may be in a similar left-handed sense. The two diabase dykes at 110° north of #10 vein, however, appear to have been displaced in a right-handed manner. This apparent displacement of the 110° dykes may not be real. It is equally likely that the 110° dykes and the NNW fractures along Mesomikenda Lake are conjugate and formed at the same time.

Besides the two shear-fracture directions discussed above some more easterly trending shears are present, for example through the lake at the top of sheet 2. Parts of the #20 vein system also trend about 090°. Other shear-fractures strike about 045°, for example north of the #10 vein.

GOLD DEPOSITS

Of the various fracture directions, at 045°, 090°, 110° and 165°, those trending at 110° are most commonly occupied by quartz veins. Although many of the veins first discovered in the early 1930's appeared to be individual isolated occurrences, it is now apparent that in many cases they occupy long persistent shear-fracture zones, the entire length of which have potential for further development. The shear-fractures tend to pinch and swell along strike and quartz veins occur in the wider portions of these zones. The rectangular area between Mill Pond, Arethusa Lake and the #10 vein is typical of this type of occurrence, where a series of parallel fractures at 110° contain numerous gold-bearing veins.

Although the importance of the 110° shear-fractures is obvious, those trending at 045°, 090° and 165° may also have potential for gold mineralization. The long east-west shear east of Southcamp Bay (top of sheet 2) contains quartz veins in at least two places. Similarly the #20 vein system consists of veins and shears at 090° as well as 110°.

Although the shear-fracture zones cut through the granodiorite and alaskite, as well as the gabbro-diorite, most of the known veins occur within the gabbro-diorite or in the peripheral parts of the major granodiorite and alaskite intrusions. Dyke-like protuberances or "noses" of granodiorite and alaskite invading gabbro-diorite are present at several vein locations.

The veins and fractures pinch and swell and may range from a few inches to 4 feet or more in width. Generally they are wider in the gabbro-diorite and, on passing into the granitoid rocks or hybrid felsite, they tend to narrow down abruptly or break up into numerous small separate shear-fractures an inch or so wide. The physical difference between gabbro-diorite, on the one hand, and the granitoid rocks, on the other, may be responsible for the different character of the shears and fractures in the two rock types. In addition, it is probable that deformation was initiated earlier and persisted longer in the gabbro-diorite than in the granodiorite and alaskite.

The types and degree of alteration associated with mineralization differ around veins in the gabbro-diorite and granitic rocks. In the granitic rocks the only notable alteration is silicification and development of muscovite or sericite adjacent to the veins. In gabbroic rocks the alteration is much more widespread, zoned and of different mineralogy.

Adjacent to the veins in gabbro and diorite,biotite is developed at the expense of chlorite and in some instances lenses of biotite schist ranging from a few inches to several feet wide are present. This biotite alteration resembles lamprophyre in places. Further outward from the vein both biotite and chlorite are present. In some cases, for example at #20 vein, prominent bluish opalescent quartz eyes have been introduced into the altered gabbro-diorite of the outer alteration zone. These are particularly abundant in altered gabbro adjacent to the quartz-eye granodiorite that intrudes the gabbro-diorite.

The alteration is clearly sequential, with amphibole first altered to chlorite and chlorite subsequently altered to biotite. The process involves addition of water and potash to the gabbro. This, along with the introduction of opalescent quartz eyes into the gabbro suggests a genetic link between the alteration and the blue quartz-eye granodiorite, which is a probable source of water (as evidenced by the abundant fluid inclusions in the quartz eyes) potash and silica. This suggestion is in accord with the presence of granodiorite in proximity to many veins. In any event, as documented below, there appears to be a positive correlation between the amount and intensity of alteration and the gold content of the vein zones.

The veins consist of white to grey glassy to sugary quartz containing various sulfides and metallic oxides. Chalcopyrite and pyrite are the dominant sulfides in all veins. Some also contain pyrrhotite, sphalerite and molybdenite. Rutile and ilmenite are generally present in minor amounts. A striking component of some veins is manganese, occurring as colloform masses of pyrolusite, psilomelane and manganite (?) along with probable alabandite (MnS). The manganese minerals are usually closely associated with chalcopyrite. These minerals weather readily and are undoubtedly the source of pronounced Mn anomalies detected in the geochemical test survey (separate report).

Sulfides are not restricted to the vein material but are also present in stringers and disseminations in the schist and altered wall-rocks around the veins. In altered rock containing introduced quartz eyes the sulfides commonly occur as rims around the quartz, another indication of a genetic link between mineralization and the quartz-eye granodiorite.

Although there is a clear association between gold and sulfides, especially chalcopyrite, the gold does not occur directly with or bound up in the sulfide minerals. Instead, visible grains of free gold occur in the quartz gangue. Tellurides have also been reported from veins in this area but none were observed in the polished sections examined. Gold is not confined to the quartz but also occurs in the altered rock around the vein. Consequently where shearing and alteration are widespread the width of the gold-bearing zone may be much greater than the width of individual narrow quartz stringers.

A relationship between quartz veins and the quartz-eye granodiorite has been discussed. However, mineralization also seems to be associated with the alaskite that occurs west of the main gabbro-diorite bodies. Examples are the #3 vein, and parts of the west end of the #1 vein system (and the adjacent #17 zone). These occur in part or entirely in alaskite and the mineralization consists not only of quartz vein, but in large part as heavily disseminated pyrite, chalcopyrite and pyrrhotite in alaskite, much like a porphyry copper. Whether the alaskite was the source of the mineralization or whether it serves merely as its host is not clear. The problem is compounded by lack of any positive data indicating the age relationship between the alaskite and the quartz-eye granodiorite; it is assumed that the granodiorite is the younger, in which case it may also be the source of mineralization in the alaskite.

Some, but not all, of the veins are described below, mainly to illustrate the main features associated with the gold occurrences and which may serve as an aid in continued exploration of the property. Assay results quoted are from previous Murgold reports or from current files on material collected by Norminex Limited and by Mr. H. Kenty of Murgold Resources.

DESCRIPTION OF VEINS

The Strathmore (#10) vein illustrates many of the general features common to gold mineralization on the property. The vein occupies a shear trending 110° and dipping north in gabbro-diorite and a "nose" of quartz-eye granodiorite intruding gabbro-diorite. A diabase dyke trending NNW cuts the vein east of the shaft. A small dyke of fine granodiorite (too small to show on the map) cuts the gabbro-diorite northwest of the shaft. The level plan (facing south) at 1" = 10' illustrates the zoned nature of the alteration in diorite in the west drift. The alteration ranges from biotite schist adjacent to the main shear through chlorite-carbonate schist to less altered but silicified diorite.

In the east drift the alteration is less intense and less extensive; the east drift lacks the intensely altered biotite schist but contains only chloritic schist. The main shear passes eastward into quartz-eye granodiorite which is little altered. This granodiorite is much coarser-grained than the narrow dyke on surface.

There is a distinct relationship between the extent and intensity of alteration and the gold content of the different parts of the vein zone. Average gold values in the west drift where alteration in diorite is intense (biotite schist) are 1.03 oz./ton (channel samples) or 0.62 oz./ton (bulk samples). By comparison average gold values in the east drift, where alteration is less intense (chloritic) and where granodiorite is the dominant host rock, are 0.19 oz./ton (channel) or 0.18 oz./ton (bulk). In detail the correlation between alteration is even more striking. In the west drift a 70-foot section of vein with biotite alteration averages 1.38 oz./ton (channel) compared to a 30-foot section with only chlorite alteration which averages 0.16 oz./ton. Similarly in the east drift a 55-foot section with chloritic alteration averages 0.28 oz./ton compared to a 30-foot section in granodiorite with little alteration which averages 0.01 oz./ton.

The #20 vein zone, discovered during the summer of 1981 consists of a number of branching shears trending in a general easterly direction and dipping both north and south along a length of about 520 feet and across a width of 100 to 250 feet (for the whole zone, not all of which is sheared or mineralized). The shears occur in altered diorite, in diorite-granodiorite breccia, and in silicified and feldspathized rock, hybrid felsite. The diorite is intruded from the east by a dyke-like body of quartz-eye granodiorite and from the west by alaskite. The diorite country rock hosting the shears is altered to chlorite and biotite and impregnated with prominent bluish quartz eyes. The shears range from a few inches to several feet in width and consist of biotite schist containing about 40% biotite, 25% muscovite and 15% quartz crowded with fluid inclusions. Individual quartz veins, 1" to 5" or 6" wide occupy the shears. The veins contain pyrite, chalcopyrite, pyrrhotite and manganese oxides. Assays from well-mineralized grab samples contain in excess of 2 oz./ton gold. Eastward the mineralized zone passes from altered diorite, through diorite-granodiorite breccia into fine dense hybrid felsite. The shears, alteration and mineralization appear to weaken eastwards.

The #3 vein north of Arethusa Lake occurs in a very fine-grained border phase of the alaskite that somewhat resembles the hybrid felsite at the eastern part of the #20 zone. The shear- fracture at the #3 occurrence varies from a few inches to about 4 feet in width and is occupied by a relatively narrow quartz vein containing pyrite and chalcopyrite along a length of about 300 feet. Alteration is not widespread nor intense and consists mainly of silica and muscovite that is confined to the shear itself. Although the eastern end of the vein and the fracture pinch out next to a diabase dyke, the strike extension of the #3 zone aligns with the #10 vein further east. Gold assays from the #3 vein range from 0.04 to more than 3 oz./ton.

North of and parallel to the #3 vein is the #2 vein occurring in altered gabbro-diorite. It has been exposed for about 600 feet east from the road leading to Arethusa Lake. The same zone appears to extend westward, perhaps not as a continuous zone, for 2400 feet to the south shore of Mill Pond.

The #1 vein (original Gomac vein discovered in the early 1930's) has been exposed intermittently by trenching and stripping for about 2500 feet in an ESE direction. The western part of this zone occurs in diorite intruded by alaskite. Parts of the diorite are altered to chloritic and biotitic schist. Grab samples from the western end of the vein range from trace to 2.4 oz./ton in gold. Also near the western part of this zone are lenses of alaskite containing abundant disseminated sulfides, both chalcopyrite and pyrite with pyrrhotite in places. One such occurrence, just south of the #1 vein and designated the #17 zone contains mainly pyrite where exposed.

The other, just north of the #1 vein carries abundant disseminated chalcopyrite.

The central part of the #1 system is located at the Gomac shaft and averages about 3 feet wide with gold values ranging from about 0.01 to 1.2 oz./ton. The eastward extension was uncovered by stripping in 1980. The mineralized zone there varies from a little more than a foot to 10 feet or more in width, although not entirely mineralized across this width. Sulfides present include pyrite, chalcopyrite, molybdenite, sphalerite, pyrrhotite along with visible gold. Assays run into the ounces per ton in selected grab samples.

The #15 "vein" consists of disseminated pyrite and chalcopyrite in quartz-eye granodiorite. The mineralized zone, unlike many of the veins on the property trends NE. Assays up to 0.4 oz./ton Au have been obtained from this zone.

The #16 vein lies close to and parallel to the major diabase dyke which trends at 110 across the property (sheet 1). It has been exposed for over 700 feet and consists of a shear and quartz stringers in silicified and feldspathized diorite. The mineralized zone contains pyrite and chalcopyrite. Gold assays up to 2.9 oz./ton have been obtained from grab samples. A large barren quartz-carbonate vein occurs just north of and parallel to the #16 zone. The occurrence, in close proximity to one another, of the #16 vein proper, the adjacent quartz carbonate vein and the large fracture occupied by the diabase a few hundred feet to the south suggest the possibility that this general area may be one of extensive fracturing suitable for the occurrence of further veins.

DISCUSSION OF CONTROLS ON MINERALIZATION

The vein systems discussed above all occur on that part of the property, covered by sheet 1 of the geological map, where most of the exploratory work has been done to date. The general conditions apparently favourable for mineralization in that part of the property are:

1. Suitable shear-fracture zones. Most of these trend about 110° but others, at 090° and 045° are also favourable.
2. Presence of host gabbro-diorite. Veins and mineralization also occur in the granitoid rocks but these generally do not support structures as strong as those in gabbro-diorite; nor have the granitoid rocks the alteration that appears to accompany better gold mineralization.
3. Presence of chlorite and, in particular, biotite alteration. The presence of secondary opalescent quartz eyes in diorite-gabbro may indicate proximity to mineralization as may areas of fine dense silicified and feldspathized rock, hybrid felsite.
4. Proximity to dyke-like masses, "noses" and protuberances of granodiorite or alaskite invading the gabbro-diorite.

According to the above guidelines the entire block of gabbro-diorite around Mill Pond, Arethusa Lake and the #10 vein merits intensive detailed exploration. It is apparent that at least 4 parallel fracture systems are present there and gold-bearing veins probably occur elsewhere along these structures or between them. Similar favourable conditions appear to be present in the southward continuation of the gabbro-diorite (sheet 2). NNW, ESE and E-W fractures are present in gabbro-diorite in that area. Some quartz veins and mineralization are also present.

The gabbro diorite occurring immediately west of Southcamp Bay (Mesomikenda Lake, Sheets 1 and 2) is not well exposed but in two places the long easterly fracture (top of sheet 2) contains quartz veins, one in the central gabbro-diorite and one in the gabbro-diorite near Southcamp Bay.

Quartz veins and shears are present in several places in gabbro-diorite east of Mesomikenda Lake. Along highway 144 (Southeast corner of sheet 1) two small shears occur just south of where the diabase crosses the highway.

The most northerly shear yielded trace in gold and the southerly one gave 0.01 oz./ton gold. Some 1200 feet further south along the highway a quartz vein occurring in altered diorite yielded 0.20 oz./ton gold. Still further south (sheet 2) a number of veins are exposed in road cuts along the highway east of Southcamp Bay. Grab samples contained trace amounts of gold. East of this locality and west of Robitaille Lake, at the eastern boundary of the property, a poorly exposed shear occurs in gabbro-diorite. Two grab samples yielded trace and two others yielded 0.01 oz./ton gold.

The area west and south of the west end of Benneweiss Lake is underlain in part by gabbroic rocks. Although no veins were encountered during mapping, chlorite-carbonate schists are developed in places and this area is considered favourable for the occurrence of quartz veins.

Little is known about the mineral potential of the greywacke suite sedimentary rocks on the property. These should be structurally favourable for vein occurrence. In places, as along the east shore of Mesomikenda Lake (top of sheet 1) they appear heavily sheared. The former Jerome gold mine in Osway township to the west occurred in similar sedimentary rocks. The greywacke-like sedimentary rocks along the north shore of Benneweiss Lake are heavily sheared in places and sulfides with quartz are present in several places. Although there is little positive indication of their potential the greywacke-conglomerate should be thoroughly prospected.

Large parts of the property are underlain by monotonous expanses of quartz-eye granodiorite and alaskite. Veins occur in the border phases of these rocks and in offshoots from the larger bodies intruding the gabbro-diorite. Within the interiors of the large alaskite and granodiorite intrusions there is little indication of gold mineralization. In places, foliated phases of both these granitoid types contain finely disseminated pyrite but little else.

In terms of lithology rock types may be rated from apparently most favourable to apparently least favourable as follows:

1. Gabbro-diorite
2. Border phases and offshoot of the granodiorite and alaskite invading gabbro-diorite
3. Greywacke-conglomerate
4. Interiors of alaskite and granodiorite batholiths.

Accordingly, there remain large areas of structurally and lithologically favourable rocks on the property which warrant further exploration.

September 24, 1981

J.F. Davies, Ph.D

NORMINEX LIMITED

MINERAL EXPLORATION & RESEARCH

R. A. Cameron, Ph.D., P.Eng.
J. F. Davies, Ph.D., P.Eng.
R. E. Whitehead, Ph.D.

I, J. F. Davies, vice-president, Norminex Limited of the City of Sudbury in the Province of Ontario, do hereby certify:

1. That I am a graduate in geology of the University of Manitoba (B.Sc., M.Sc.) and the University of Toronto (Ph.D.).

2. That I have spent 35 years in the practise of geology.

3. That I am a Fellow of the Geological Association of Canada, a member of the Society of Economic Geologists, a member of the Canadian Institute of Mining and Metallurgy and a Fellow of the Mineralogical Association of Canada.

4. That I did personally map and supervise geological investigations of the Murgold Property and did prepare the the geological maps and write the report dated September 1981.

5. That I have no interest, direct or indirect, in Murgold Resources Inc.

Dated at Sudbury
this 5 day of March, 1983

J. F. Davies, Ph.D.

THIN SECTION .

D-5

Fine light cream weathering quartzo-feldspathic with small quartz "eyes"

Quartz	60%	Muscovite-sericite	20%
Plagioclase	20%	Carbonate	

Fine to medium quartz and larger quartz eyes (1-2mm) Plagioclase remnants, now largely altered to epidote and sericite.

Name: Rhyolite

D-7

Medium-grained quartzo-feldspathic light cream weathering.

Quartz	70%	Muscovite	30%
Fedlspar		Biotite	

Mosaic of fresh interlocking quartz and plagioclase with randomly oriented micas. Common large quartz "eyes" 1 to 2 mm.

Name: Rhyolite

D-6

Light cream weathering, grey fresh surface, fine quartzo-feldspathic. Power line, South Benneweiss

Quartz	60%	Epidote	5%
Sericite	20%	Chlorite	5%
Biotite	10%		

Fine mosaic of quartz grain and aligned flakes of Mica. No feldspar identified but may be present mixed with fine quartz. Several larger fresh unstrained quartz grains.

Name: Rhyolite

JF-66

Fine light cream quartzo-feldspathic. South of power line, south of Benneweiss.

Quartz	32%	Chlorite	32%
Sericite	32%	Sphene	3%

Fine-grained mixture of quartz and aligned flakes of mica and chlorite. Some larger euhedral unstrained quartz.

Name: Rhyolite

RW-7

"Porphyritic" light cream weathering fine-grained

Quartz, Plagioclase } 90%	Chlorite, Muscovite } 10%

Fine interlocking mosaic of fresh clear quartz and feldspar. Many phenocrysts of feldspar up to 3 mm.

Name: Rhyolite porphyry

B-3

Fine-medium grey granular sedimentary
West of Weeduck Lake

Quartz	Chlorite
Feldspar	Biotite
Epidote	Sphene

Rounded clasts of altered feldspar $<$ 1 mm in matrix of fine quartz, chlorite, biotite and epidote. Feldspars are altered to epidote. Some round areas consisting of mosaics of quartz and coarse epidote.

Name: Greywacke

D-13

Sedimentary rock   East of Weeduck Lake

Feldspar
Quartz
Biotite
Epidote
Chlorite
Carbonate

Irregular clasts of quartz and feldspar up to 1 mm in fine quartzo-feldspathic matrix with abundant aligned flakes of biotite and chlorite and irregular grains of epidote. Unsorted.

Name: Greywacke

Y-1

Grey-green foliated sedimentary, Hwy 144

Feldspar
Quartz
Chlorite
Sericite
Carbonate

Very irregular grain size, unsorted, from ¼ mm to 1 - 2 mm. Larger grains are angular to sub-rounded feldspar and quartz. Chlorite in moderately large flakes; large masses of extremely fine sericitic material.

Name: Greywacke

A-10

Gabbro, South of B.L. 150 S

Plagioclase	50%	Chlorite	10%
Amphibole	30	Biotite	
Quartz	10	Epidote	
		Sericite	

Coarse (>3mm) partly zoned plagioclase with fresh interstitial amphibole. Rock is massive.

Name: Gabbro

M-12

Gabbro, south of Strathmore

Plagioclase	45%	Quartz	10
Amphibole	30	Chlorite	5
Epidote	10		

Coarse highly epidotized plagioclase and interstitial amphibole and quartz. Some chlorite alteration of amphibole.

Name: Gabbro

F-105

Diorite south of Arethusa Lake

Plagioclase	50%	Chlorite, Epidote, Sphene, Opaque	20%
Biotite	20%		
Quartz	10%		

Coarse (>2 mm) highly epidotized and chloritized plagioclase. Interstitial biotite with some remnant chlorite. Interstitial quartz. Rock is massive but highly altered.

Name: Gabbro-Diorite

JF-100

"Diorite" between Three Ducks and Mesomikenda, South of B.L. 150 S.

Plagioclase	Biotite
Horneblende	Opaque
Epidote	
Quartz	

Large euhedral but altered (epidote) tablets of plagioclase with interstitial hornblende. Granular epidote in matrix. Quartz corrodes hornblende. Biotite closely associated with quartz and biotite contains remnants of hornblende. Quartz crowded with fluid inclusions.

Name: Diorite-gabbro

X-1

Quartz-eye granodiorite, Hwy 144

Plagioclase Orthoclase Quartz	70%	Chlorite Sericite Carbonate	30%

Coarse feldspars and quartz with irregular areas and stringers of fine granular quartz mixed with schistose chlorite and/or sericite and carbonate. Large quartz eyes are slightly strained but contain fluid inclusions.

Name: Quartz-eye granodiorite

JF-132

Massive quartz-eye granodiorite from Benneweiss Twp.

Plagioclase	30%	Epidote Biotite Muscovite	10%
Orthoclase	30%		
Quartz	30%		

Coarse plagioclase and orthoclase (to 4 mm) and rounded quartz grains that are slightly strained but contain abundant fluid inclusions. Interstitial mica and granular epidote

Name: Quartz-eye granodiorite

D-46

Massive blue quartz-eye granodiorite

Quartz	40%	Chlorite	8%
Plagioclase	40%	Sericite	
Orthoclase		Sphene	
Biotite	12%	Apatite	

Interlocking quartz and feldspars which are partly sericitized. Quartz crowded with fluid inclusions. Biotite interstitial.

Name: Granodiorite

J-43

Rusty weathering quartz-eye granodiorite, east of Hwy 144

Quartz	35%	Biotite	3%
Plagioclase	30%	Carbonate	5%
Orthoclase	20%	Zircon	
Muscovite	5%	Pyrite	

Coarse (to 4-5 mm) interlocking quartz and feldspar Quartz slightly strained and packed with fluid inclusion. Biotite and muscovite in interstitial foliated masses.

Name: Quartz-eye granodiorite

D-11

Fine - med. granular granitic, east of Weeduck Lake

Quartz	45%	Sericite	15%
Plagioclase (albite-oligoclase)	40%	Biotite	
		Carbonate	
		Epidote	
		Chlorite	

Round interlocking quartz grains and plagioclase laths average 1 mm. Feldspars are sericitized. Minor interstitial biotite chlorite, sericite and carbonate. Massive granular

Name: Alaskite granite

D-12

Fine-grained light grey granitic rock
North of Weeduck

Quartz	45%	Sphene
Plagioclase	45%	Sericite
Chlorite		
Biotite		

Mass of interlocking quartz and slightly sericitized plagioclase. Plagioclase is part corroded by granular quartz. Grain size generally $<$ 1 mm. Massive.

Name: Alaskite

A-34

Fine-medium granitic

Plagioclase	47%	Biotite Sericite Pyrite	8%
Quartz	45%		

Fine (<1 mm) interlocking quartz and feldspar; minor interstitial biotite. Granular massive

Name: Alaskite

JF-12

Fresh medium-grained diabase

Plagioclase	45%	Magnetite	8%
Augite	45%	Quartz	2%

Randomly oriented fresh laths of plagioclase with interstitial augite. Prominent magnetite grains. Minerals fresh and unaltered.

Name: Diabase.

THIN SECTIONS FOR #10 VEIN   STRATHMORE DEPOSIT

Four sections from underground characterize the rock types and alteration associated with the gold-bearing quartz vein.

J.F.-1

Altered diorite-gabbro

Plagioclase	40%	Carbonate 10%
Quartz	25%	Sericite
Chlorite	20%	Opaque (sulfide)

Highly altered plagioclase tablets replaced by chlorite and lesser carbonate and sericite. Quartz occurs in two modes: 1) as large grains with rows of secondary fluid inclusions and 2) as mosaics of polygonal or lamellar grains, commonly intergrown with chlorite. The coarse quartz replaces plagioclase in part. Carbonate is late and in places forms veinlets cutting all other minerals. Quartz and carbonate are metasomatic and introduced.

Name: Altered Gabbro-diorite

J.F.-4

Silicified gabbroic

Plagioclase	40%	Epidote 5%
Quartz	30%	Carbonate
Chlorite	15%	Zircon
Amphibole	5%	Sulfide

Plagioclase corroded by later quartz. Plagioclase also alters to fine granular epidote (saussurite)
Chlorite is remnant after amphibole

Name: Silicified Gabbro-diorite

J.F.-2

Biotite schist

Green biotite White muscovite	65%	Quartz	25%
		Rutile-leucoxene	
Green chlorite	10%	Sulfide	

Set in a fine highly schistose matrix of micas and chlorite are fresh undeformed quartz grains which abut against the micas. The micas are alteration products of chlorite. The quartz contains abundant small fluid inclusions. Biotite schist containing introduced quartz.

Name: Biotite schist

J.F.-3

Blue quartz-eye granodiorite

Plagioclase Orthoclase	50%	Chlorite Carbonate
Quartz	35%	Zircon
Sericite		Pyrite

Coarse-grained (3-4 mm) feldspars and quartz. Feldspars are sericitized and difficult to determine composition. Untwinned feldspars probably orthoclase. Quartz occurs in mosaics of coarse grains exhibiting only slight deformation extinction. Quartz contains abundant fluid inclusions. Some feldspars are broken and cut by vein-like masses of chlorite and/or carbonate. Quartz "eyes" replace plagioclase.

Name: Granodiorite

THIN AND POLISHED SECTIONS #20 VEIN

These sections reveal some important relationships between alteration and mineralization.

Section #20-T-1 is a dark grey coarse dioritic rock similar to the surrounding diorite-gabbro mass, but containing prominent bluish white quartz eyes.

Sections #20-T-2a to #20-T-2c characterize a biotite alteration envelope around a quartz-sulfide stringer. #20-T-5 is biotite schist, an intense alteration product along shears.

#20-T-1

Dark grey coarse diorite with bluish white quartz eyes

Plagioclase	40%	Carbonate	5%
Quartz	30%	Epidote -	minor
Chlorite	12%	Sulfides	2%
Biotite	12%		

Subhedral plagioclase 1-2 mm in various stages of replacement by chlorite and quartz. Quartz, $>$ 2 mm in rounded "eyes" crowded with fluid inclusions. Carbonate medium-grained interstitial. Chlorite randomly oriented and distributed throughout. Biotite almost invariably occurs as alteration of chlorite. The sulfides are intimately associated with biotite and chlorite.

K^+ metasomatism of chlorite and metasomatic quartz eyes.

20-T-2a

Fine dark schistose adjacent to quartz-sulfide stringer

Quartz / Plagioclase	50%	Carbonate	5%
Biotite	20%	Epidote	8%
Chlorite	10%	Sulfides	8%

Aligned foliated flakes of biotite and chlorite in a fine - medium matrix of quartz and plagioclase grains, most of which are elongated. Some larger quartz eyes are slightly strained but generally younger than the biotite and chlorite against which they abut. Biotite exceeds chlorite and is a product of chlorite alteration. Sulfides intimately associated with biotite.

Name: Biotite schist

20-T-2B

Section is 1.5" from veinlet and marks the outer edge of the biotite envelope which is in contact with a coarse grained lighter material.

Fine dark biotitic		Coarser light	
Plagioclase	20%	Plagioclase	50%
Quartz	30%	Quartz	12%
Chlorite	20%	Chlorite	12%
Biotite	20%	Biotite	12%
Carbonate	5%	Carbonate	10%
Sulfide	7%	Sulfide	5%
Epidote	Tr	Epidote	Tr
Sphene	Tr	Sphene	Tr

Biotite envelope is similar to #20-T-2a. Coarser light is similar to #20-T-2c. Sharp contrast in grain size and fabric. The schist is foliated whereas the lighter phase(diorite) has randomly oriented larger plagioclase and quartz.

20-T-2c

Medium-grained grey massive diorite, 4" from quartz-sulfide stringer and 1" from outer edge of biotite alteration envelope.

Plagioclase	50%	Biotite	5%
Quartz	20%	Carbonate	5%
Chlorite	15%	Sulfides	5%

Randomly oriented plagioclase 1 - 2 mm with interstitial quartz, carbonate and chlorite. Fine chlorite also replaces some plagioclase. Quartz grains contain fluid inclusions and are metasomatic. Some chlorite beginning to alter to biotite. Also some discrete flakes of biotite. Note that compared to the biotite schist envelope (#20-T-2a) this rock contains less total chlorite plus biotite and of these two minerals chlorite far exceeds biotite. The total plagioclase plus quartz is also somewhat greater in #20-T-2c (diorite).

Name: Slightly altered diorite

20-T- 5

Biotite schist, #20 vein, occurs as narrow zones along shear in altered diorite- abbro.

Biotite	40%	Epidote	8%
Quartz	15%	Sulfides	8%
Muscovite	25%	Chlorite	4%

Fine foliated mass of biotite and muscovite with a few small flakes of chlorite. Dotted throughout are small anhedral unstrained quartz grains and subhedral epidote. Both the micas and quartz are crowded with fluid inclusions.

Name: Biotite schist (alteration)

POLISHED SECTIONS

G1 -1

Gomac vein #1 - east of Mill Pond

Megascopic: Chalcopyrite and pyrite in fine sugary quartz with small brownish metallic grains, possibly pyrrhotite. Chalcopyrite dominant.

Microscopic:

- Pyrite
- Chalcopyrite
- Pyrrhotite
- Molybdenite
- Sphalerite
- Ilmenite & rutile

Sulfides occur as separate and isolated grains or clusters of grains interstitial to gangue. Some of the chalcopyrite and molybdenite are intergrown, pyrrhotite and chalcopyrite also occur as intergrowths. Ilmenite and rutile are invariably intergrown with one another. No native gold or tellurides were observed.

S-1

Strathmore underground, west drift, at face

Chalcopyrite	
Pyrite	
Pyrrhotite	- minor
Sphalerite ?	- minor small grain
Gold	- 1 small grain

Chalcopyrite occurs as large irregular grains and as stringers of small grains cutting the gangue. Pyrite is cubic and in part replaced by chalcopyrite.

Gold occurs "free" in gangue and not with sulphides.

S-2

Strathmore underground, west drift at face.

Pyrite
Chalcopyrite
Pyrrhotite
Sphalerite - minor
Rutile

Pyrite cubic and skeletal. Chalcopyrite in irregular grains and with associated pyrrhotite. Minor sphalerite and rutile. No gold visible in section.

20-P-1

#20 vein, west pit

Pyrite
Chalcopyrite
Pyrrhotite
Alabandite
Pyrolucite and/or psilomelane

Section dominantly irregular grains of chalcopyrite with lesser cubic and skeletal pyrite and minor pyrrhotite.
Common alabandite (MnS) and colloform alteration products, dominantly psilomelane but some pyrolusite in oriented cleavage-like masses. Some replacement of Mn minerals by fine rims of pyrite.

20-P-2

#20 vein, west pit
"Mineralized" altered diorite containing opalescent quartz "eyes"

Chalcopyrite
Pyrrhotite
Pyrite

Rutile
Ilmenite

Disseminated grains of chalcopyrite, some containing cores of pyrrhotite. Minor very fine pyrite grains.

The sulfides commonly occur as rims around the opalescent "blue" quartz eyes.

20-P-3

#20 vein, west pit

Chalcopyrite
Alabandite
Pyrolucite
Psilomelane
Pyrrhotite
Rutile
Pyrite

Section dominantly large grains of chalcopyrite intimately associated with large irregular and colloform masses of manganese minerals. Minor pyrrhotite and pyrite as discrete grains, but also considerable fine pyrite replacing alabandite.

Chester Twp.

41P12SW0004 2.4889 ST. LOUIS

900

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

#250

The Mining Act

Note:
- If number of mining claims traversed exceeds space on this form, attach a list.
- Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
- Do not use shaded areas below.

Type of Survey(s): Geology
Township or Area: Chester Twp.
Claim Holder(s): Meridian Resources Inc.
Prospector's Licence No.: T-9[illegible]
Survey Company: [illegible] Linecutting
Survey Dates (linecutting to office): 19 5 81 – 30 8 81 (Day | Mo. | Yr.)
Total Miles of line Cut: [illegible]
Name and Address of Author (of Geo-Technical report): J.J. [illegible] R. Cameron [illegible] University

Special Provisions Credits Requested

Instructions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	40
	Geochemical	

Man Days

Instructions		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Airborne Credits

		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

Expenditures (excludes power stripping)

Type of Work Performed:

Performed on Claim(s):

RECORDED June 29 ~~MAY 2~~ 1982 Receipt No. ....

Calculation of Expenditure Days Credits

Total Expenditures $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Mining Claims Traversed (List in numerical sequence)

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
P	see attached list.				

RECEIVED JUL 14 1982 MINING LANDS SECTION

RECEIVED MAY 30 1982 AM 7,8,9,10,11,12,1,2,3,4,5,6 PM

50 [illegible]

Total number of mining claims covered by this report of work: 291

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
11,640	June 29/82	[signature]
	Date Approved as Recorded	Regional/Branch Director

Regional Mining Recorder

Report Completed

Date of Report	Recorded Holder or Agent (Signature)
May 28/82	Harold A. Kemley

Certification Verifying Report of Work

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

Name and Postal Address of Person Certifying
Harold A. Kemley
c/o Meridian Resources Inc. Box 229 Cobalt, Ont. P0J-1C0

Date Certified: May 28/82
Certified by (Signature): Harold A. Kemley

1362 (81/2)

(2) [illegible]

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Total 91
Page 1 - 206
Total 297

unpatented claims 203
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297 x 10 = 29.40
Tax = 2.08
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Total 206.

Ministry of Natural Resources
Ontario

Geotechnical Report Approval

File 2.4889

Mining Lands Comments

☐ To: Geophysics

Comments

☐ Approved ☐ Wish to see again with corrections

Date	Signature

☑ To: Geology - Expenditures Mr Kustra.

Comments

☑ Approved ☐ Wish to see again with corrections

Date	Signature
March 30/83	Kustra

☐ To: Geochemistry

Comments

L.D.

☐ Approved ☐ Wish to see again with corrections

Date	Signature

☐ To: Mining Lands Section, Room 6462, Whitney Block. (Tel: 5-1380)

1593 (81/10)

File ____________

Ontario

Ministry of Natural Resources

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Geology and [illegible]

Township or Area [illegible] Township

Claim Holder(s) [illegible] Inc.

Survey Company [illegible] Ltd.

Author of Report [illegible]

Address of Author Laurentian University Sudbury Ont.

Covering Dates of Survey May 19/81 – Sept 15/81 (linecutting to office)

Total Miles of Line Cut 41.6

SPECIAL PROVISIONS CREDITS REQUESTED		DAYS per claim
	Geophysical	
ENTER 40 days (includes line cutting) for first survey.	--Electromagnetic	
	--Magnetometer	
	--Radiometric	
ENTER 20 days for each additional survey using same grid.	--Other	
	Geological	40
	Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer ______ Electromagnetic ______ Radiometric ______
(enter days per claim)

DATE: May 28/82 SIGNATURE: [illegible]
Author of Report or Agent

Res. Geol. ____________ Qualifications ____________

Previous Surveys

File No.	Type	Date	Claim Holder
			RECEIVED
			JUN - 3 1982
			MINING LANDS SECTION

OFFICE USE ONLY

MINING CLAIMS TRAVERSED List numerically	
(prefix)	(number)
see attached claim list	

TOTAL CLAIMS ____________

If space insufficient, attach list

837 (5/79)

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey

Number of Stations ____________________ Number of Readings ____________________

Station interval ____________________ Line spacing ____________________

Profile scale ____________________

Contour interval ____________________

MAGNETIC

Instrument ____________________

Accuracy – Scale constant ____________________

Diurnal correction method ____________________

Base Station check-in interval (hours) ____________________

Base Station location and value ____________________

ELECTROMAGNETIC

Instrument ____________________

Coil configuration ____________________

Coil separation ____________________

Accuracy ____________________

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency ____________________ (specify V.L.F. station)

Parameters measured ____________________

GRAVITY

Instrument ____________________

Scale constant ____________________

Corrections made ____________________

Base station value and location ____________________

Elevation accuracy ____________________

INDUCED POLARIZATION / RESISTIVITY

Instrument ____________________

Method ☐ Time Domain ☐ Frequency Domain

Parameters – On time ____________________ Frequency ____________________

– Off time ____________________ Range ____________________

– Delay time ____________________

– Integration time ____________________

Power ____________________

Electrode array ____________________

Electrode spacing ____________________

Type of electrode ____________________

SELF POTENTIAL

Instrument ______________________ Range ______________________

Survey Method ______________________

____

Corrections made ______________________

____

RADIOMETRIC

Instrument ______________________

Values measured ______________________

Energy windows (levels) ______________________

Height of instrument ______________________ Background Count ______________________

Size of detector ______________________

Overburden ______________________

(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey ______________________

Instrument ______________________

Accuracy ______________________

Parameters measured ______________________

____

Additional information (for understanding results) ______________________

____

____

AIRBORNE SURVEYS

Type of survey(s) ______________________

Instrument(s) ______________________

(specify for each type of survey)

Accuracy ______________________

(specify for each type of survey)

Aircraft used ______________________

Sensor altitude ______________________

Navigation and flight path recovery method ______________________

____

Aircraft altitude ______________________ Line Spacing ______________________

Miles flown over total area ______________________ Over claims only ______________________

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken __________

Total Number of Samples __________

Type of Sample __________ (Nature of Material)

Average Sample Weight __________

Method of Collection __________

Soil Horizon Sampled __________

Horizon Development __________

Sample Depth __________

Terrain __________

Drainage Development __________

Estimated Range of Overburden Thickness __________

SAMPLE PREPARATION

(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis __________

General __________

ANALYTICAL METHODS

Values expressed in: per cent ☐ p. p. m. ☐ p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others __________

Field Analysis (__________ tests)

Extraction Method __________

Analytical Method __________

Reagents Used __________

Field Laboratory Analysis

No. (__________ tests)

Extraction Method __________

Analytical Method __________

Reagents Used __________

Commercial Laboratory (__________ tests)

Name of Laboratory __________

Extraction Method __________

Analytical Method __________

Reagents Used __________

General __________

(2)

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528680 1

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Total 91
page 1 - 206
Total 297

unpatented claims 203
91
294

297 x10 → 29.70
TAX → 2.08
31.78

140
66
2.06

(1)

19992
20009
121594 — 3 pat.
471952
471953
471954
471955 — 4
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471957
471958
473092
473102 — 2
473667
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1982 11 04

Mr. William L. Good
Mining Recorder, Timmins

File No. 2.4889

As you requested, enclosed are the geological survey maps (in duplicate) covering 295 mining claims in Chester, Benneweis and St. Louis Townships Nos P 471952 et al.

Before these plans may be examined for assessment work credits they must have the following information added:

1. The location of all geological traverse lines must be indicated.
2. The Mining claim numbers and boundaries must be shown.
3. Each map should show a north direction and a key map.
4. Each map should be signed and dated by the author of the report Mr. R.A. Cameron.

As we have no record of Mr. Cameron having previously submitted a geological report it will be necessary for him to provide a statement of his qualifications including his education background and work history.

In the event that Mr. Cameron is no longer available, another qualified geologist may sign the maps provided he furnishes a declaration or affidavit to the effect that he accepts responsibility for the contents of the maps and report.

I understand that you will be contacting a representative of the holder of the mining claims with respect to clearing up this matter.

E.F. Anderson
Director
Land Management

Whitney Block, Room #6450
Queen's Park, Toronto
Telephone: 416/965-1380

F.W. Matthews:sc

CHARLES L. McALPINE, C.A.

Suite 2308, 120 Adelaide Street West,
Toronto, Canada M5H 1T1
Telephone Bus. (416) 363-8046
Res. (416) 483-9390
Telex 06523873

DELIVERED

March 28, 1983

Mining Land Section,
Lands Management Branch,
Ministry of Natural Resources,
Room 6450, Whitney Block,
Parliament Buildings,
Toronto, Ontario M7A 1W3

Attention: Mr. Fred W. Matthews

Re: Murgold Resources Inc.

Dear Sir:

It is my understanding that the original Geological Report, prepared by Norminex Limited for Murgold's assessment work purposes, had certain deficiencies and was rejected.

I have now had Norminex revise their report and make the necessary corrections. Two copies of this revised report are enclosed herewith.

I trust that the revised report will be acceptable, and I should appreciate it if you could advise me when you have made your review.

Yours truly,

C. L. McAlpine

C. L. McAlpine

per jac

CLM/jac:
Encls.

RECEIVED

MAR 28 1983

MINING LANDS SECTION

2.4889

#250

2.4889

1983 07 28

Mr. William L. Good
Mining Recorder
Ministry of Natural Resources
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

RE: Geological Survey on Mining Claims P 19992 et al
in the Townships of Chester, Benneweis and St. Louis

The Geological Survey assessment work credits as listed with my Notice of Intent dated July 7, 1983 have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-1380

D. Kinvig:mc

cc: Murgold Resources Inc.
Suite 2308
120 Adelaide Street West
Toronto, Ontario
M5H 1T1

cc: Resident Geologist
Timmins, Ontario

Ontario — Ministry of Natural Resources

Technical Assessment Work Credits

File: 2.4889

1983 07 07

Recorded Holder	MURGOLD RESOURCES INC.
Township or Area	CHESTER, BENNEWEIS AND ST. LOUIS TOWNSHIPS

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed	
Geophysical	P 19992	P 539404 to 14 inclusive
Electromagnetic ______ days	20009	539416 to 21 inclusive
Magnetometer ______ days	121594	543820 to 24 inclusive
Radiometric ______ days	471953 to 58 inclusive	543827
Induced polarization ______ days	473667 to 69 inclusive	543993
Section 77(19) ______ days	473672 to 95 inclusive	543995 - 96
Geological 40 days	473698 - 99	546981 to 7000 inclusive
Geochemical ______ days	473704 to 08 inclusive	548092
Man days ☐ Airborne ☐	473710 to 15 inclusive	549001 - 02
Special provision ☒ Ground ☐	473718 to 42 inclusive	549004 to 14 inclusive
☒ Credits have been reduced because of partial coverage of claims.	507667 to 69 inclusive	549016 to 19 inclusive
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	515048 to 58 inclusive	549108 to 17 inclusive
	515328 to 30 inclusive	549294
	515335 - 36	
	528055 to 59 inclusive	
	528680	
	538082	
	538523 to 25 inclusive	
	539105 to 29 inclusive	
	539136 to 55 inclusive	
	539181 to 83 inclusive	
	539279 to 98 inclusive	
	539308	
	539310 to 12 inclusive	
	539314 to 17 inclusive	
	539319 to 22 inclusive	
	539324 to 28 inclusive	

Special credits under section 77(16) for the following mining claims

20 days Geological

P 473696 -97
473700 to 03 inclusive
473716 - 17
473743 to 46 inclusive
538087
538089

P 539309
539313
539323
543818 - 19
543994

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ Insufficient technical data filed

P 471952
473092
473102
473670 - 71
473709
515059
538085 - 86

P 538088
539318
539415
546980
549003
549015

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 86(18)-60: 77(19)

828

Ministry of
Natural
Resources
Ontario

July 28/83

Your file:

1983 07 07

Our file: 2.4889

Mr. William L. Good
Mining Recorder
Ministry of Natural Resources
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.

For further information, if required, please contact Mr. F.W. Matthews at 416/965-1380.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1316

D. Kinvig:mc

cc: Murgold Resources Inc
Gogama, Ontario

Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Encls:

Ministry of Natural Resources

Ontario

Notice of Intent for Technical Reports

1983 07 07

2.4889

An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the "Special Provision-Performance and Coverage" method and you are of the opinion that a re-appraisal under the "Man-days" method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Lands Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.

1982 07 05 2.4889

Mining Recorder
Ministry of Natural Resources
199 Larch Street
Sudbury, Ontario
P3E 5P9

Dear Sir:

We have received reports and maps for a Geological survey submitted under Special Provisions (credit for Performance and Coverage) on mining claims S 471952 et al in the Townships of Chester/Benneweis.

This material will be examined and assessed and a statement of assessment work credits will be issued.

Yours very truly,

E.F. Anderson
Director
Land Management Branch

Whitney Block, Room 6450
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: 416/965-1316

J. Skura/sc

c.c. Norminex Limited
Sudbury, Ontario
Attn: R.A. Cameron

c.c. Murgold Resources Inc
Gogama, Ontario

Musgrave Resources Inc.
[illegible]
Ontario
June 4/82

Land Claims Branch
Mining Lands Section
Att. Mr. Fred Matthews.

Dear Sir:

Regarding the assessment work submitted to your office last week (Geology and Geophysical Reports) named "Arthur," please delete claim numbers [illegible] and [illegible] from the claim list of each report as these claims do not belong to the Musgrave Company.

Thank you.

Yours truly,

Harold J. Kirby

NORMINEX LIMITED

MINERAL EXPLORATION & RESEARCH

R. A. Cameron, Ph.D., P.Eng.
J. F. Davies, Ph.D., P.Eng.
R. E. Whitehead, Ph.D.

1274 Hastings Crescent
Sudbury, Ontario, Canada
P3A 2R5

Geology

October 28, 1981

Murgold Resources Inc.,
C/o Mr. H. Kenty,
Gogama, Ontario

Dear Harold:

The following list will provide you with the amount of time spent on the Murgold Gogama property.

John Fonji	May 19 to Aug 31, 1981	105
Bruce Miller	May 19 to Aug 28, 1981	102
Peter Jurenovskis	May 19 to Aug 30, 1981	104

R. Whitehead, R. Cameron and J. F. Davies: 58 days in field 3×58 — 174

J. F. Davies: 19 days map preparation and report writing 19

604 × 7 = 3528 days

I hope this will be satisfactory.

Yours truly,

Bob W

R. Whitehead

RW/mw

The following list of Employees time was spent on Geophysical Survey in 1981.

Line Cutting

			Total days
Robert Scott	May 18	June 6th	20
Richard Wright	May 19	June 30th	43
Joe Moore	May 19	July 22nd	64
Leonard Crait	June 7	July 22.	45

Total days - 172 days

Geophysical Instrument work & Drafting

Ward Tomlinson	May 19	Aug 4.	63
Dennis Palas.	May 19	Aug 4. + 3 days O.T.	66
Ken Riley.	May 22	June 25	35
Ken J. Gibbs	May 22	June 25.	35
R. Lemory.	July 9	Aug 7.	30
H. Thomas	July 9.	Aug 15.	38
H. Luterel	July 1	July 15	10
	" 15	(193 hrs)	24

Total 301 days

Total - 172.
301 x 7 = 2107
2279 days.

WORKSHEET

2.4889

19090 ✓
(20009)
(12[illegible]94)
P 471952
471953
471954
471955 — 1
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~~473092~~
DELETE AS PER LETTER — 7
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3 part.

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D.4889

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Total 91
page 1 - 206
Total 297

unpatented claims 203
91
294

297 x 10 → 29.40
Tax → 2.08
31.78

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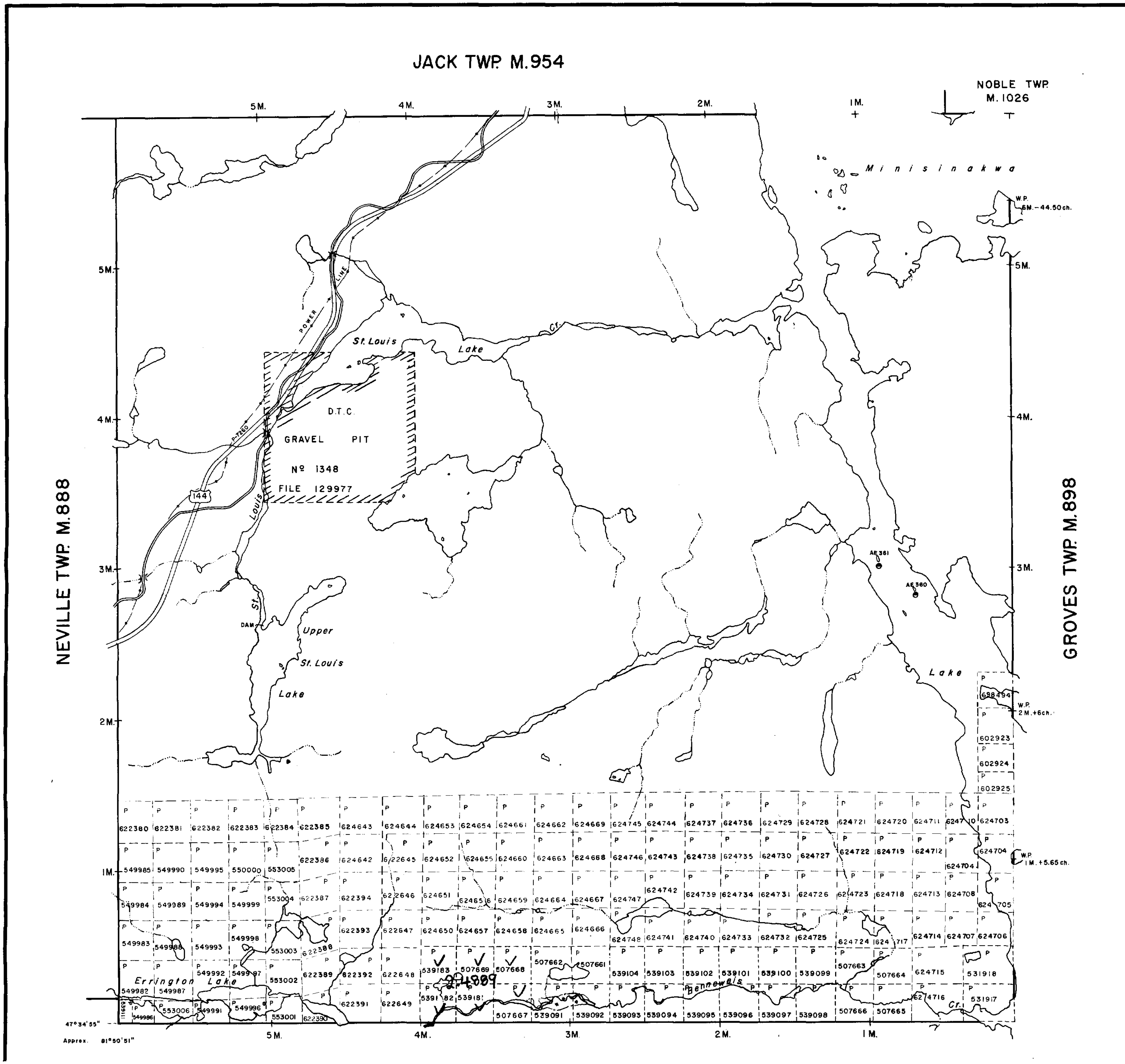
2.06

D.K



NOTES

400' surface rights reservation along the shores of all lakes and rivers.

DATE OF ISSUE
APR 19 1983
Ministry of Natural Resources
TORONTO

LEGEND

PATENTED LAND	Ⓟ or ●*
PATENTED FOR SURFACE RIGHTS ONLY	●*
LEASE	Ⓛ
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALES	C.S.
LOCATED LAND	Loc.
CANCELLED	C.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
HIGHWAY & ROUTE NO.	17
ROADS	
TRAILS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	⚒

*used only with summer resort locations or when space is limited

TOWNSHIP OF

ST. LOUIS

DISTRICT OF
SUDBURY

PORCUPINE
MINING DIVISION

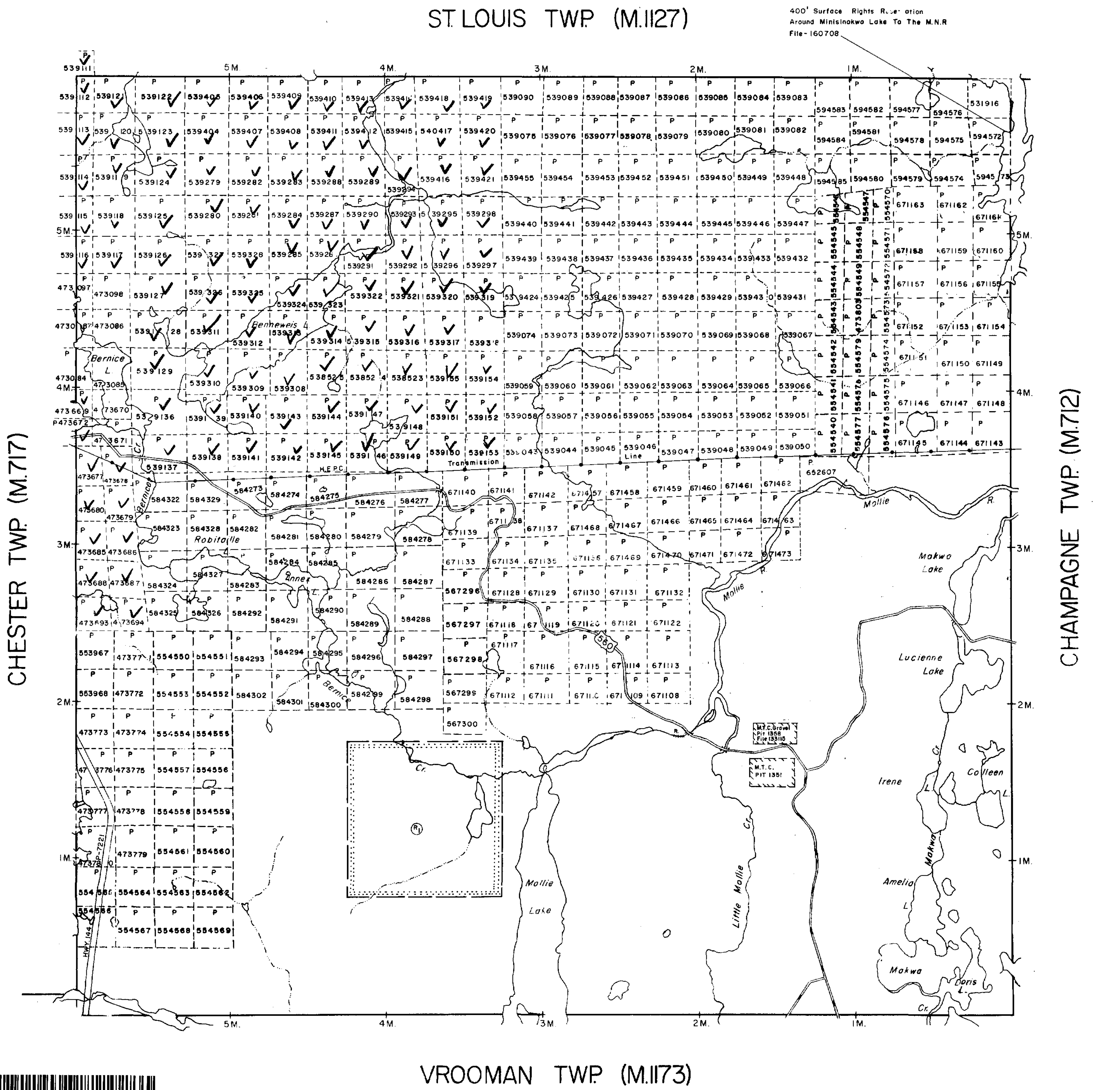
SCALE : 1 INCH -- 40 CHAINS (1/2 MILE)

DR. K.K.I.
DATE JAN. '72
PLAN NO. M.1127

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

41P12SW0004 2.4889 ST. LOUIS

200



THE TOWNSHIP OF

BENNEWEIS

DISTRICT OF

SUDBURY

PORCUPINE

MINING DIVISION

SCALE: 1-INCH 40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	⚒
CANCELLED	C

NOTES

400' Surface rights Reservation around all Lakes and Rivers.

Areas withdrawn from staking under Section 43 of the Mining Act (R.S.O. 1970)

Order Nº	File	Date	Disposition
Ⓡ1 NR.W.2/78	133115	19/10/78	S.R.O.

DATE OF ISSUE

APR 19 1983

Ministry of Natural Resources TORONTO

PLAN NO. M.658

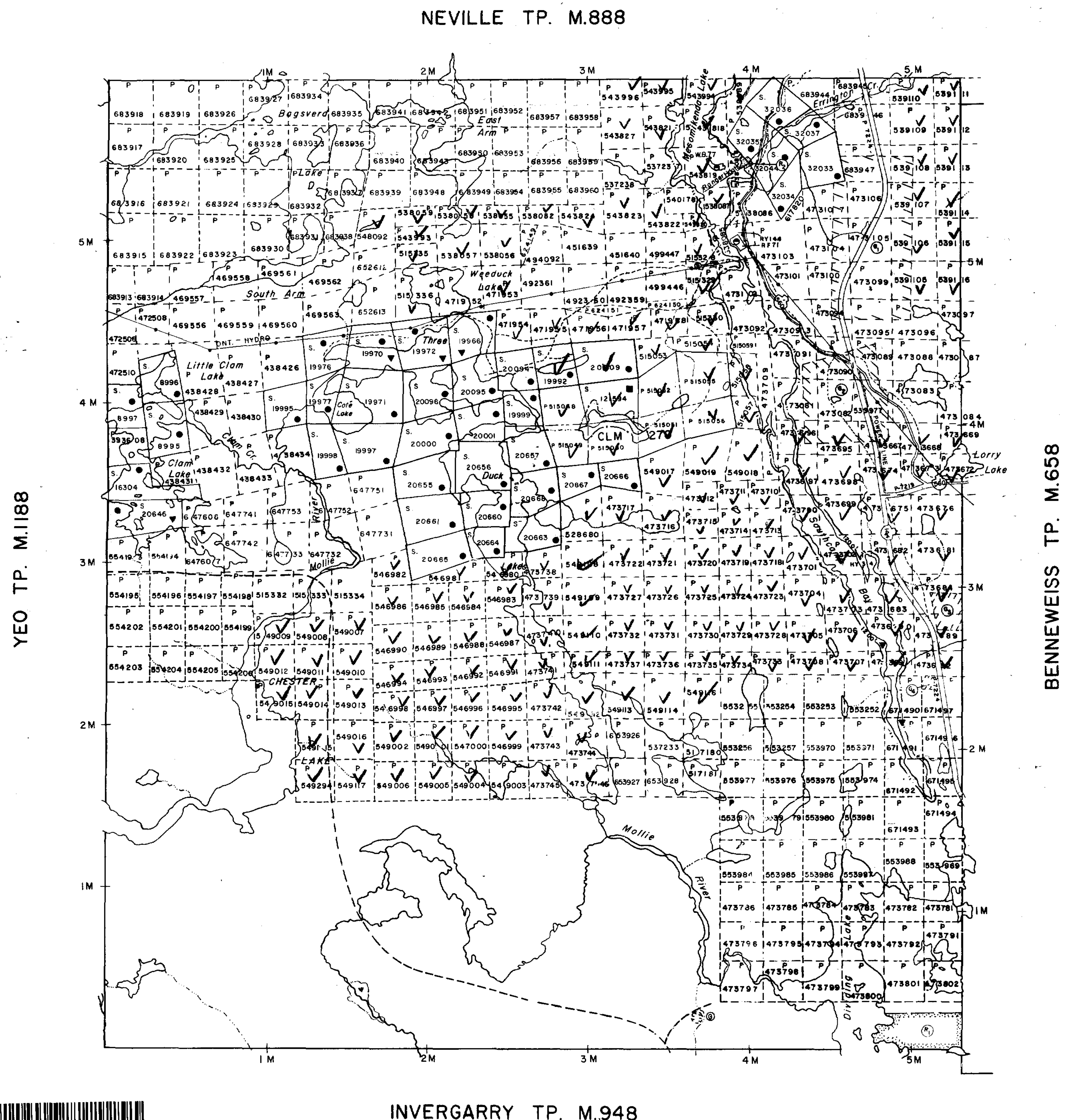
ONTARIO

MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

41P12SW0004 2.4889 ST. LOUIS

210



THE TOWNSHIP OF CHESTER

DISTRICT OF SUDBURY

PORCUPINE MINING DIVISION

SCALE: 1-INCH=40 CHAINS

DISPOSITION OF CROWN LANDS

PATENT, SURFACE AND MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LEASE, SURFACE AND MINING RIGHTS
" , SURFACE RIGHTS ONLY
" , MINING RIGHTS ONLY
LICENCE OF OCCUPATION
ROADS
IMPROVED ROADS
KING'S HIGHWAYS
RAILWAYS
POWER LINES
MARSH OR MUSKEG
MINES
CANCELLED C.

NOTES

400' Surface Rights Reservation along the shores of all lakes and rivers.

Flooding rights to 1200' contour reserved to Ont. Hydro ▼7543, Loc HY34 file 10621

SAND & GRAVEL

(1) M.T.C. Pit No. 1349
(2) " Gravel Pit No. 1649
(3) " " " No. 1385
(4) " " " 3C-17
(Q) QUARRY PERMIT

AREAS WITHDRAWN FROM STAKING

S.R. - SURFACE RIGHTS   M.R. - MINING RIGHTS

DESCRIPTION	ORDER No	DATE	DISPOSITION	FILE
(R1) SEC. 43	W.77/80	19/2/80	S.R.	171509
(R2)		25/8/77	S.R.	183096

DATE OF ISSUE
APR 18 1983
Ministry of Natural Resources
TORONTO

PLAN NO.- M.717

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

41P12SW0004 2.4889 ST. LOUIS

220

LOCATION MAP
Scale 1:1,013,760
48°00' N
82°00' W
Gogama
Murgold Resources Claim Group
Westree
Biscotasing
47°00' N
Neville Twp.
Chester Twp.
Benneweiss Twp
EAST
ARM
THREE
DUCKS
LAKE
MESOMIKENDA
LAKE
WEEDUCK LAKE
MILL POND
ARETHUSA LAKE
SOUTHCAMP
BAY
HWY 144
B.L. 265
B.L. 355
B.L. 625
B.L. 62+50 S
B.L. 915
B.L. 1205
B.L. 353
Aeromagnetic Interpretation
MURGOLD RESOURCES INC
Diabase, trap
Quartz vein
6 Hybrid felsite
5 Quartz-eye granodiorite
4 Alaskite
3 Gabbro - diorite
2 Greywacke, conglomerate
1. Rhyolite, rhyolite porphyry
Contact (defined, approximate)
Shear, fracture zone
Bedding (inclined, vertical)
Claim line and post
Geological traverse line
Base line
Index to sheets
Scale 1" = 400'
Prepared by Norminex Ltd
September, 1981

MURGOLD RESOURCES INC
Diabase, trap
Quartz vein
Hybrid felsite
Quartz-eye granodiorite
Alaskite
Gabbro - diorite
Greywacke, conglomerate
Rhyolite, rhyolite porphyry
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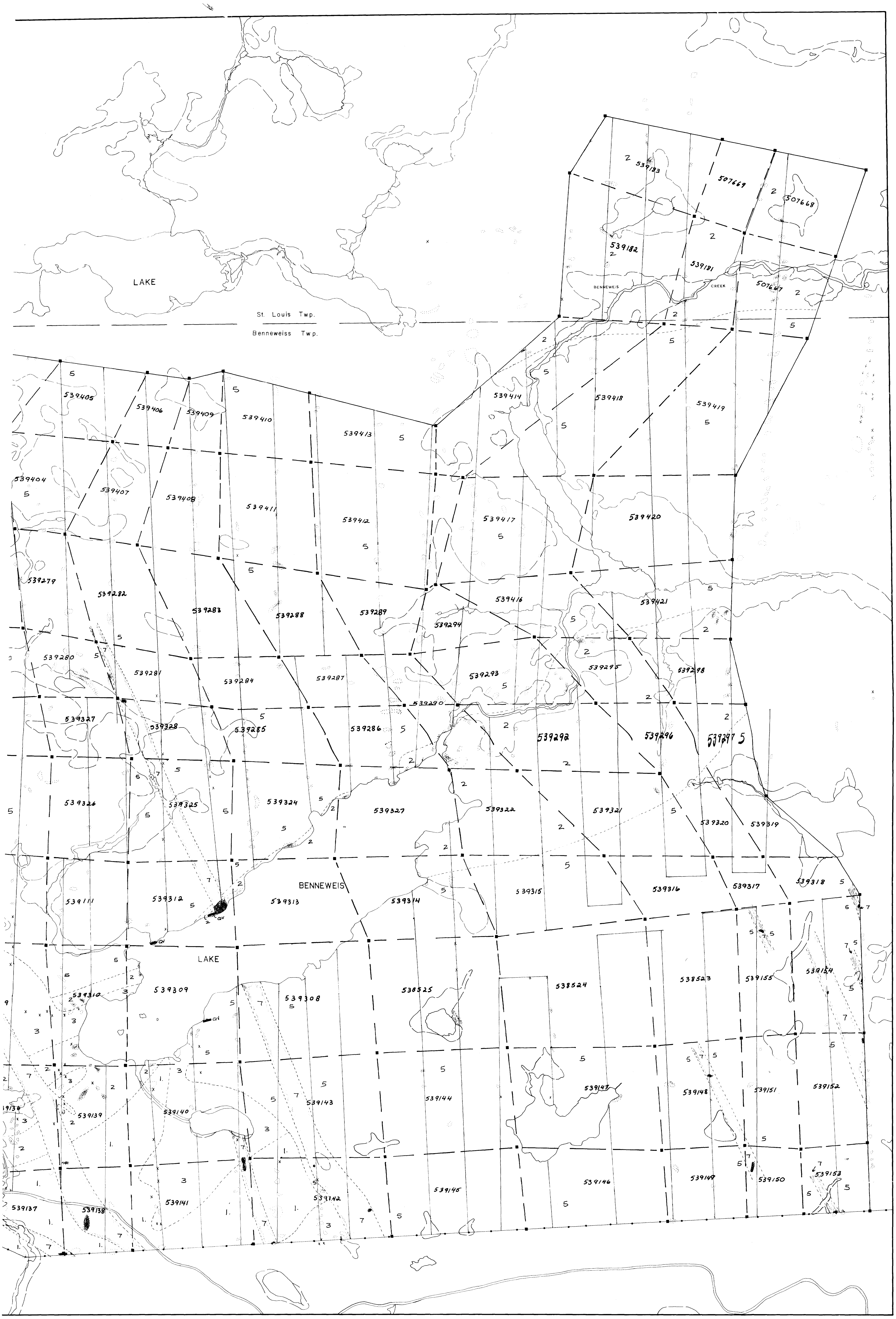
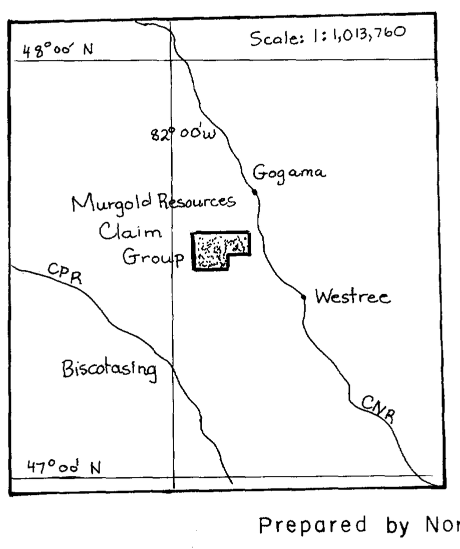
September, 1981
LOCATION MAP
Gogama
Murgold Resources Claim Group
Westree
Biscotasing
CLAM LAKE
THREE DUCK LAKES
SOUTHCAMP BAY
ROBITAILLE LAKE
ROUND LAKE
TWIN LAKES
CHESTER LAKE
Benneweiss Twp.
Chester Twp.
Hwy 144
Aeromagnetic Interpretation



MURGOLD RESOURCES INC

LOCATION MAP



Prepared by Norminex Ltd
September, 1981

Diabase, trap

Quartz vein

Hybrid felsite

Quartz-eye granodiorite

4 Alaskite

3 Gabbro - diorite

2 Greywacke, conglomerate

Rhyolite, rhyolite porphyry

Claim line and post

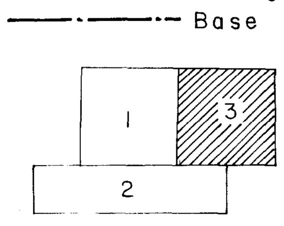
Contact (defined, approximate)

Shear, fracture zone

Bedding (inclined, vertical)

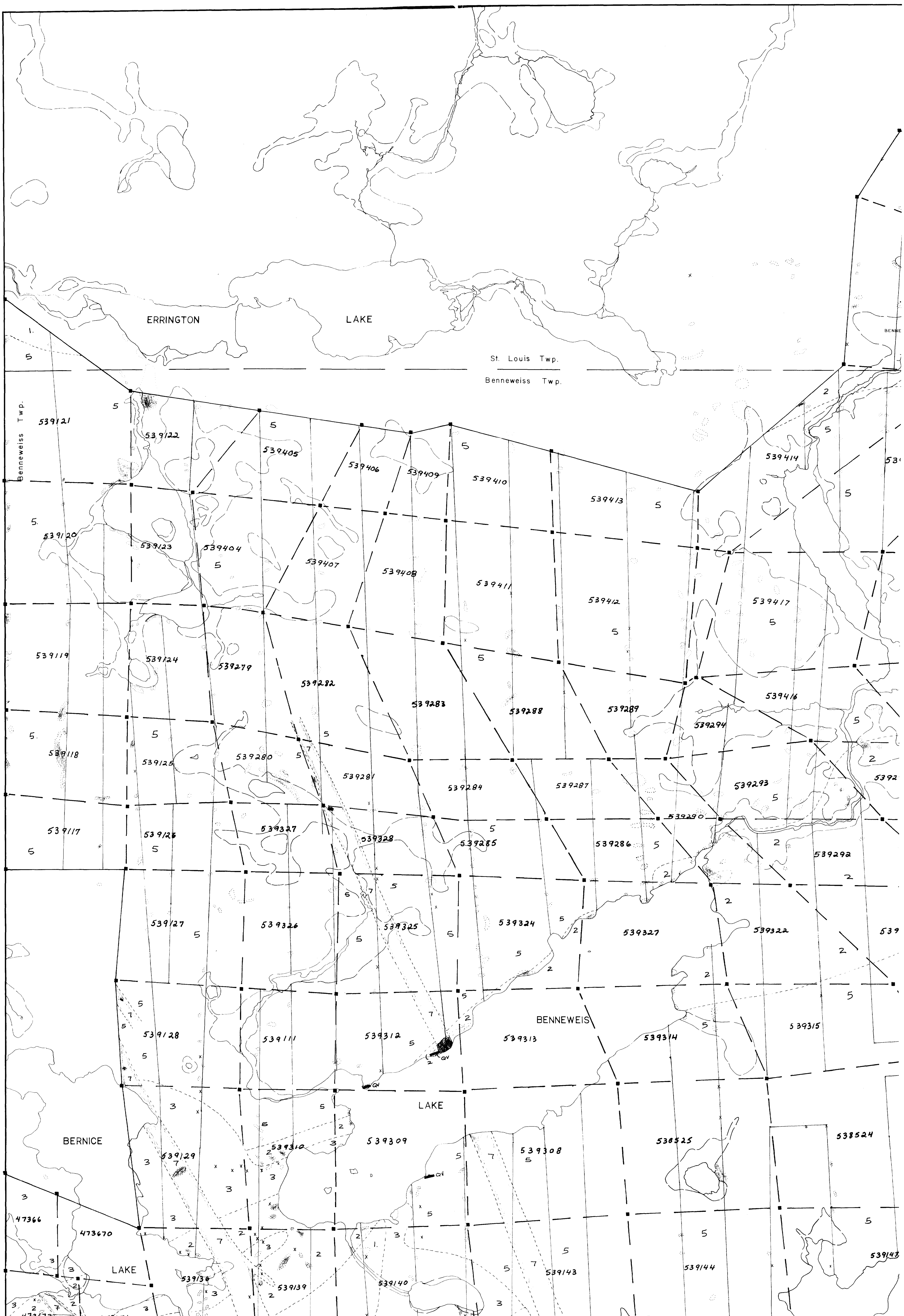
Geological traverse line

Base line



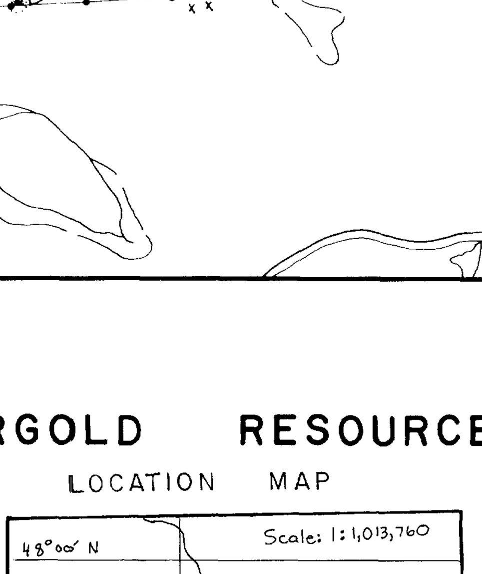
Index to sheets

Scale 1" = 400'



MURGOLD RESOURCES INC

LOCATION MAP



Prepared by Norminex Ltd
September, 1981

7 Diabase, trap
QV Quartz vein
6 Hybrid felsite
5 Quartz-eye granodiorite
4 Alaskite
3 Gabbro - diorite
2 Greywacke, conglomerate
1. Rhyolite, rhyolite porphyry

250