REPORT ON GEOLOGICAL AND GEOPHYSICAL SURVEYS
BUDD LAKE GROUP OF CLAIMS
SOTHMAN TOWNSHIP
LARDER LAKE MINING DIVISION
PROVINCE OF ONTARIO.

by

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Introduction:

The following report describes the geological and geophysical surveys which were carried out during October and November, 1985, on eleven mining claims recorded in the name of Manville Canada Inc. and located in Sothman Township, Larder Lake Mining Division.

Cutting and chaining of the grid lines were contracted to Evergreen Enterprise of Timmins. This work was started on September 16th and completed in mid-October, 1985.

The geological mapping was conducted by R.F. Kaltwasser, Senior Fieldman, assisted by B. Haley, Junior Fieldman and geophysical operator - both Company employees. Examination of key outcrops, precious and base metals showings, and a study of suites of rock specimens were carried out by the writer.

Magnetometer surveying was conducted by B. Haley using a Fluxgate model MF-1 unit.

Electromagnetic surveying was carried out by R. Kaltwasser, assisted by B. Haley. A McPhar vertical loop unit was used for this work.

Radiometric surveying was completed by B. Haley using a Sharpe's G.I.S. - 2 Gamma Ray Integrating Spectrometer.

All survey work was carried out during the period October 18th to November 23rd, 1985.

Interpretation of the data and compilation of the report were the responsibility of the writer, Exploration Manager with Manville Canada Inc., based at Matheson, Ontario.

Property:

The claims surveyed are contiguous, are situated in Sothman Township and are numbered L-714610 - 11 - 16 - 17 - 22 to 25 incl., and 772582 - 88 - 89. Acreage totals approximately 440.

The eight claims of Block No. 1 were staked by Company employees M. Bruce, K. Gray and R. Kaltwasser on April 1st and recorded on April 7th, 1983. Transfer to Johns-Manville Canada Inc. was completed on April 13th, 1983. These claims were then transferred to Manville Canada Inc. on May 16th, 1983.

Property: (cont'd)

Staking of the three claims of Block No. 2 was carried out by K. Gray and R. Kaltwasser on June 28th, 1983 with recording on July 7th. These claims were transferred to Manville Canada Inc. on July 12th, 1983.

Location and Accessibility:

The Budd Lake claims are situated in the northwestern part of Sothman Township, to the south of Edleston Lake and adjacent to the Nursey Township boundary.

Access from Timmins is south along Pine Street, then by a gravelled secondary road to Papakomika Lake and continuing along an old logging road to Reading Lake. A narrow, partially grown-in, logging or drill road branches off to the west and provides ready access to the northern part of the property. Total distance from Timmins to the camp site on the west side of Budd Lake is 85 kilometres.

Although several cars were seen on the old logging road it is advisable to use a four-wheeled drive vehicle to reach the claims.

Topography:

The map area is mainly sand-covered with outwash plains and low rolling dunes intersected by narrow, discontinuous, northeasterly-trending swamps. In the central portion of the group the Cobalt sediments form a northerly-trending scarp with maximum relief in the order of 100 feet. Rugged terrain was also encountered along the north boundary of the claims where moderate hills are capped by these sediments. Scattered bedrock exposures have been mapped on all of the claims with the exception of L-772588 and 89 in the southeastern part of the property.

Drainage is to the south, through Budd Lake in the eastern part of the claims, and to the southwest along Edleston Creek in the extreme northwestern section of the group.

Second growth balsam, poplar, spruce and pine covers the Budd Lake claims. In many sections, traversing is difficult due to balsam windfalls caused by the spruce budworm and the extremely high winds of the past two summers. Poplar and pine-covered sections are park-like. Scattered spruce, cedar and alders grow in the narrow swampy sections.

Line Cutting and Chaining:

Base line No. 1 was started from the No. 3 post of claim L-714623 and was cut and chained to the east and west boundaries of the claims - a distance of 5,510 feet. The 0+00 point was established 600

Line Cutting and Chaining: (cont'd)

feet due east of the starting location. Base Line No. 2 was started on line 0+00 at 1,200 feet north of base line No. 1 and cut to the east for a length of 1,200 feet.

Right-angled offset lines, spaced at 400' intervals, have been cut and chained from these base lines to the north and south boundaries of the group. Marked pickets were established every 100' along all of the grid lines, by chainage.

In the north-central section of the property picket lines 4W, 8W and 12W strike slightly west of north while line 0+00 to the south of base line No. 1 trends to the southeast. These errors are apparently due to rugged topography. The wide gap between lines 0+00 and 4W will be filled in by an additional line to be established during the early field season of 1986.

Tie lines were established along the north boundary of the property and along the southern limit of claim L-714625. The ends of the picket lines were chained-in to increase the accuracy of the grid. The north tie line was started along the claim line in the west part of the group but due to its strike - N87°E - ended up north of the claims in the central and eastern parts, necessitating extending the picket lines beyond the limits of the group.

Total miles of base (1.27), tie (1.29) and picket lines (10.57) cut and chained for this program total 13.13.

Previous Work:

Sothman Township is briefly mentioned by T.L. Gledhill in the section on the Grassy River Area in Volume XXXVI, Part VI, published by the Ontario Department of Mines in 1926. More recently, in 1951, F.M. Abraham mapped Sothman Township and the results have been published in Volume LXII, Part VI, 1953 by the Ontario Department of Mines. Map No. 1953-3, on a scale of 1" = 1,000', accompanies this report.

Aeromagnetic Maps No. 286 (Rev.) on a scale of 1" = 1 mile and Nos. 8446G-8451G on a scale of 1" = 1/2 mile and entitled "Sinclair Lake" have been published jointly by the Ontario Department of Mines and the Department of Energy, Mines and Resources. These plans have been used extensively to interpret structural features and ground magnetic anomalies on the Budd Lake claims.

Map No. 2205, the Timmins-Kirkland Lake Sheet of the Geological Compilation Series, on a scale of 1" = 4 miles also covers the property.

The data listed in the following paragraphs was obtained from

Previous Work: (cont'd)

the files of the Resident Geologist, Ministry of Natural Resources in Kirkland Lake.

A geological report and map of the holdings of Buffalo Ankerite Gold Mines Ltd. prepared by W.E. Clarke in 1947 covers the major part of the Budd Lake claims. The results of the drilling of eleven core holes are shown in the report.

D. Sirola filed a report on the geology of his gold property in Sothman and Nursey Townships. This report is dated April 3rd, 1948.

A geological report and diamond drill logs, covering exploration carried out by Preston East Dome Mines on the Edleston Option was submitted in 1951-52. This block is the restaking of the former Buffalo Ankerite claims.

Watts, Griffis and McQuat Ltd. prepared reports on an electromagnetic survey and diamond drilling on the property of Dowa Mining Co. Ltd. in Sothman and Nursey Townships. Detailed geological and geophysical maps accompanied these reports which are dated 1973-74.

Ecstall Mining Ltd. conducted magnetic and electromagnetic surveys and filed a report and maps on a block of claims in the Budd Lake area in 1973.

Essex Minerals carried out geological mapping and electromagnetic surveying on a group at Edleston Lake, immediately to the north of the Manville claims, and submitted the work for assessment purposes.

Since acquisition of the claims in 1983, Manville Canada Inc. has completed reconnaissance-type geological mapping, prospecting, trenching, plugger work and diamond drilling of five Winkie holes for a total footage of 538. All of this exploration has been concentrated on claim L-714624.

The work described in the following sections of this report was carried out during the fall of 1985.

General Geology:

The geology of Sothman Township is described in the Sixty-Second Annual Report of the Ontario Department of Mines, being Vol. LXII, Part VI, compiled by E.M. Abraham and published in 1954. The following "Table of Formations" has been taken from Page 7 of this report.

General Geology: (cont'd)

Table of Formations

CENOZOIC	
Recent:	Windblown sand (dunes); organic accumulations; stream deposits.
Pleistocene:	Sand, gravel, and boulders; windblown sand (dunes).
	Great unconformity
PRECAMBRIAN	
Keweenawan:	Olivine diabase and porphyritic diabase.
	Intrusive contact
Huronian:	Conglomerate, greywacke, and argillite.
	Great unconformity
Algoman:	Granite; feldspar and quartz-feldspar porphyry; diorite.
	Intrusive contact
Haileyburian:	Diorite and quartz diorite; gabbro and diorite porphyry; gabbro, granophyre gabbro and diabase; pyroxenite; serpentinized dunite and peridotite; steatitized dunite and peridotite; hornblendite; lamprophyre.
	Intrusive contact
Keewatin:	(Basic volcanics: andesite, basalt, pillow lava and dioritic lava; fragmental lava; talc-chlorite and carbonate-chlorite schist; chloritized actinolitized and chloritized-carbonatized volcanics; amphibolitized volcanics.
	(Acidic to intermediate volcanics; amygdaloidal, porphyritic and massive lava; pillow lava; fragmental lava; agglomerate and black slate; sericite schist; cherty tuff; chloritized-actinolitized and chloritized-carbonatized volcanics.

Cobalt sediments cover the greater part of the map area and are exposed as prominent outcrops and scarp faces in the west-central, northern and extreme southern sections of the claims.

Keewatin greenstones occur as "windows" in the overlying sediments in the eastern part of the property to the west, northeast and south of Budd Lake. Basic and ultrabasic rocks intrude these volcanics.

Broad zones of extreme carbonatization occur to the south of Budd Lake and along the Edleston fault in the northwestern part of the group where the carbonate rock is in contact with feldspar porphyry intrusives.

Geological Survey:

Detailed geological mapping was conducted over outcrop areas on the Budd Lake claims during the fall of 1985 and the results of this

Geological Survey: (cont'd)

work are shown on the accompanying Geologic and Topographic Plan on a scale of 1" = 200'. Geophysical survey data (ground and air), regional geology, aerial photographs, etc., were studied prior to compilation of this report. Rock types, structures and economic geology are described in the following paragraphs.

Intermediate to acidic Archean metavolcanics are exposed on flat-lying outcrops in the northeast corner of the group, to the west and south of Budd Lake and in the north part of claim L-714625. Andesites of fragmental, spherulitic and pillowed types have been mapped on claims L-714623 - 24 and 25. These rocks are generally dark green in colour, medium to fine grained and commonly have been altered to talc-carbonate-chlorite schists. Pillows are squeezed and deformed with, on many outcrops, only relics remaining. Tops were not determined. Minor disseminated pyrite and occasional pyrrhotite mineralization was observed in hand specimens.

Dacitic flows, which predominate in the vicinity of Budd Lake, vary in colour but usually weather a light grey to buff with a pale green fresh surface. Similarly to the andesites these rocks are characterized by fragmental and spherulitic types in many instances altered to talc-carbonate-chlorite schists.

On claim L-772582 outcrops of rhyolite weather light grey to white and are porphyritic with the fresh surface showing sparse sulphide mineralization. An old trench has exposed a moderately oxidized shear zone mineralized with 5% to 10% disseminated pyrite. This rock appears to be a highly altered breccia. Narrow, altered, rhyolitic flows occur in the north parts of claims L-714624 and 25. Cherty tuff horizons have been mapped in contact with these volcanics on several outcrops.

To the west of Budd Lake old trenching over a series of narrow zones mineralized with pyrite, sphalerite, galena and chalcopyrite, has exposed a highly oxidized and sheared dacitic fragmental rock (agglomerate ?). Fragments are comprised of dacite, tuff, black carbonate, chert and nodular pyrite.

On claim L-772582 the acid volcanics strike N50°E and dip 80° to the southeast; to the west of Budd Lake strikes range from N60°W to N80°W with steep south to southwesterly dips; in the north part of claim L-714624 strikes vary from N80°W to N70°E with dips of 60° to 70° to the south and in the north part of claim L-714625 the strike is N40°E

Geological Survey: (cont'd)
with steep southeasterly dips.

Green carbonate (fuchsite) horizons, located in the north-central section of claim L-714624, were explored by trenching and Winkie diamond drilling during the 1983 field season. This rock weathers a light buff to reddish-brown and is pale to dark apple green on the fresh surface. Lenticular quartz and quartz-carbonate veins and stringers, in some instances mineralized with fine pyrite, were mapped in several of the trenches. Disseminated pyrite and occasional blebs of chalcopyrite occur in the carbonate rock. Shearing, minor drag folding and distorted pillow remnants were observed on scattered outcrops.

To the south of Edleston Lake, on claim L-714617, an exposure of green carbonate has been mapped. Lenticular and vuggy quartz-carbonate veinlets and veins, with and without sulphide mineralization, were mapped. A vein having a vertical attitude and a thickness of 3 feet is exposed along a scarp face in the central part of the claim.

Several, small, isolated dioritic and gabbroic bodies intrude the metavolcanics on claims L-714622-23 and 25. These rocks are massive, medium grained, weather a dark grey, and, in general, are quite fresh showing only minor carbonatization.

A narrow, northerly trending body of moderately to highly serpentinized peridotite apparently intrudes the metavolcanics to the west of Budd Lake. This ultrabasic is overlain to the north by the flat-lying Cobalt sediments. As shown by scattered outcrops and ground magnetometer survey data, this intrusive extends over a strike length of approximately 4,000 feet.

Surface weathering is a dull to dark brown with the fresh surface being dark green to black. Disseminations of magnetite occur in the rock and both magnetite and picrolite were noted along fracture planes. Pronounced talc-carbonate alteration zones occur along the east contact with the andesites and dacites.

A hornblendite dike, having a width of approximately 40 feet, intrudes the metavolcanics and diorites on claims L-714622-23 and 24 to the west of Budd Lake. Northeasterly trending cross structures offset this dike on claim L-714623. Weathering is dark grey to brown with a dark green to black fresh surface. Crystals of hornblende up to 1/2 inch in length comprise 50% of the rock. Contacts with the carbonatized

Geological Survey: (cont'd)

volcanics to the east have chilled borders.

Outcrops of feldspar porphyry were mapped in the north-central part of claim L-714617 and are probably derived from the huge granite batholith in Nursey Township. The porphyry occurs in a series of small, northeasterly-trending dikes which are in contact with the green carbonate rocks to the northwest. Weathering varies from pink to deep red in colour and the rock consists mainly of coarse feldspar crystals with minor quartz. Fractures, filled with quartz and mineralized with pyrite, were found in several exposures.

Cobalt sediments, which overlie the younger formations in the greater part of the map area, form northerly-trending ridges and hills and appear to have a maximum thickness of 100 feet over the ultrabasic to the west of Budd Lake. The beds dip gently to the southwest, plunge at 5° to the northwest and rest unconformably on the eroded underlying rocks.

These sediments are comprised of boulder-pebble conglomerates with thin beds - up to several feet in thickness - of argillite and greywacke, higher up in the sequence.

Structurally, several strong fault zones strike in northerly to northeasterly directions across the Budd Lake claims and are sharply defined topographically (both ground and aerial photographs) and, in several cases, geologically.

The Edleston fault, trending N40°E, is a major structure located in the northwestern part of claim L-714617. This break extends from English Township in the north to Sinclair Lake in Nursey Township to the south - a distance of approximately twelve miles. A broad zone of sheared, green carbonate rock with minor drag folding has been mapped immediately to the southeast of this fault.

A branch structure extends to the south from the Edleston fault through claims L-714616 and 10. This zone is sharply defined geologically and topographically in the south part of claim L-714610 and can be traced southwards to the narrows in Sinclair Lake. A southwesterly-trending branch fault passes through claim L-714611 and again is well defined by topographic features and geological mapping.

A northerly-trending fault is indicated along the sedimentary front on the west side of claims L-714623 and 714624 where cliffs up to 100 feet in height have been mapped. This strong break may have had

Geological Survey: (cont'd)

repeated movements and been the avenue for the intrusion of the ultrabasic. The highly serpentinized peridotite and andesitic-dacitic fragmental rocks to the east have been partially altered to talc-carbonate-chlorite schists.

A strong lineament trends in a northeasterly direction through Budd Lake. To the west of this structure in the north part of claim L-714624 the volcanics have been subjected to intense carbonatization with lesser silicification and pyritization. Pillows have been squeezed and elongated in a northeasterly direction.

Northerly and northwesterly-trending structures have been mapped in the block between the Budd Lake and sedimentary frontal faults. Both base and precious metals mineralization occur associated with these narrow fault and shear zones on claims L-714623 and 24.

Folding is indicated in the eastern part of the claims group by the strike changes in the intermediate and rhyolitic volcanics. However, no conclusions could be reached due to the paucity of outcrops and extensive cover of the Cobalt sediments.

During the late 1940's and early 1950's considerable exploration for precious metals mineralization was carried out in the northwestern section of Sothman Township. Buffalo Ankerite and Preston East Dome Mines were the principal Companies working on the claims now held by Manville Canada. As the result of a series of programs several interesting gold showings were discovered.

In the central part of claim L-714623, to the west of Budd Lake, four narrow shear zones, mineralized with pyrite, sphalerite, galena and minor chalcopyrite and containing low gold and silver values, were exposed in a series of trenches and pits. Diamond drilling in the showing area intersected quartz-carbonate veins in the dacitic fragmental rocks which gave isolated gold values up to 0.116 ozs/ton. A hole drilled to the east (towards Budd Lake) gave sludge sample assays up to 0.12 ozs of gold per ton.

Visible gold was panned from a zone in the green (fuschite) carbonate rocks in the north-central part of claim L-714624. Diamond drilling to the south of this occurrence intersected an 8.5 foot section which assayed 0.20 ozs of gold per ton. Surface sampling and Winkie diamond drilling by Manville during the 1983 field season gave gold

Geological Survey: (cont'd)

assays up to 0.11 zos/ton on surface and 0.12 ozs over 4.0 feet in drill core.

Surface pitting and trenching on the green carbonate rocks in the north-central part of claim L-714617 returned low gold values. Diamond drilling in this area intersected narrow sections assaying up to 0.02 ozs of gold per ton.

Gold values, up to 0.18 ozs, have also been reported from a trench excavated in sheared and silicified acid volcanics mineralized with finely disseminated pyrite on claim L-772582.

Electromagnetic Survey:

Electromagnetic surveying was conducted on the property by R. Kaltwasser assisted by B. Haley. Both men are employed by Manville Canada Inc. at Matheson, Ontario.

Field work was carried out during November, 1985, using a McPhar vertical loop reconnaissance electromagnetic unit operating on a frequency of 1,000 cycles per second.

The McPhar unit is suitable for use as both a reconnaissance and relatively detailed instrument. In this survey, the transmitter was held vertically at a distance of 200 feet from the receiver; the receiver was then tilted about the axis joining the two coils until a null was observed. Both transmitter and receiver were moved on the same picket line, 200 feet apart, and readings were recorded at 100' intervals. Under these operating conditions a depth penetration of 100 feet was attained. Note that the transmitter was stationed to the north of the receiver throughout the survey.

A total of 586 stations was recorded during the course of the survey.

The results of this work are shown on the accompanying Electro-Magnetic Profile Plan on a scale of one inch equals 200 feet. Profiles have been plotted on a scale of one inch equals 20°.

Scattered, weak, single line crossovers, in the order of +1, -1; +1, -2; +2, -1, have been outlined on the property and are shown in uncoloured, dashed lines on the accompanying plan. These occur over the metavolcanics, sediments, carbonate zones and in the overburden-covered sections in the eastern part of the claims, and are of no economic significance.

Electromagnetic Survey: (cont'd)

The series of weak, moderate and strong crossovers (+1, -1 to +9, -4) shown along lines 4W and 6W occur over the serpentinized peridotite and are typical of the results obtained from these magnetite-rich intrusives. However, further exploration, to test for nickel mineralization, is planned for several of the moderate to strong conductors.

Moderate crossovers, shown in dashed purple lines on the accompanying plan, have been recorded on the Budd Lake Group. These are described as follows;-

- in the northeast corner of claim L-714610 over the sediments - value +3, -2.
- in the southwest part of claim L-714622 in the metavolcanics between diorite and hornblendite dikes - value +3, -1.
- in the northwest part of claim L-714623 in the metavolcanics adjacent to a hornblendite dike and immediately to the north of the narrow sulphide zones - value +1, -4.
- in the south part of claim L-714623 and north part of 714624, in diorite, green carbonate rock and metavolcanics, adjacent to northerly and northeasterly-trending fault zones - values +2, -2; +4, -1; +2, -5 and +3, -1.
- in the northwest corner of claim L-772589, overburden-covered - value +4, -1.
- in the southeast corners of claims L-772588 and 772582, overburden-covered - values +2, -5; +2, -6; +3, -5 and +2, -3.
- in the northeast corner of claim L-772582, immediately to the north of rhyolite fragmentals - value +2, -3.

Further exploration work will be conducted over these moderate to strong conductors during the 1986 field season.

Magnetometer Survey:

A magnetometer survey was conducted on the claims by B. Haley during the early part of November, 1985. Readings were recorded using a Fluxgate Magnetometer - Model MF-1, Serial No. 409107, having sensitivities of 20, 50, 200, 500 and 2,000 gammas as per division for the corresponding scales.

Prior to the survey the instrument had been checked and adjusted so that a gamma value of 1220 corresponds closely with an absolute value of 57,599 $\pm$ 15. Munro-Beatty sill base station No. 2 was used for this purpose.

Magnetometer Survey: (cont'd)

Base control stations were established along base line No. 1 as follows; -

B.C.S. No. 1 at line 0+00 - value - 1,375 gammas

B.C.S. No. 2 at line 2W - value - 1,900 gammas

During the course of the survey the base control station was observed at two to three hour intervals as a check on the working condition of the instrument and to record the daily diurnal variation.

Stations were spaced at 50' and 25' intervals along the grid lines, depending upon the detail required, and a total of 1,239 was recorded during the course of this work.

The results of the survey are shown on the accompanying Geo-Magnetic Profile Plan on a scale of one inch equals 200 feet. Profiles have been plotted on a scale of one inch equals 4,000 gammas.

All available geological and geophysical data (listed previously) had been reviewed and air photos studied prior to compiling this report. Without the results of the geological mapping it would have been impossible to arrive at a reasonable interpretation based upon the magnetometer survey results.

Magnetic readings over the intermediate to acidic volcanics range in value from 1,100 to 2,575 gammas, however, the average falls within the limits of 1,200 to 1,750. On claim L-772582, over the rhyolite fragmental outcrops, values vary from 1,160 to 1,290 gammas. To the west of Budd Lake, over the altered intermediate volcanics, intensities are in the order of 1,300 to 1,800 gammas. Moderate anomalies, up to 2,575 gammas in this area, are believed due to disseminated magnetite associated with the northeasterly-trending hornblendite dike, however, pyrrhotite mineralization associated with galena, sphalerite, pyrite and chalcopyrite in the old showings may also account for these values.

Carbonate alteration zones in the north-central part of claim L-714624 and along the Edleston fault, as well as dioritic,gabbroic and feldspar porphyry intrusives, are indistinguishable from the meta-volcanic and sedimentary formations on the basis of the magnetic data.

The Cobalt sediments have magnetic intensities ranging from 740 to over 2,000 gammas. In the eastern part of the property values vary from 1,200 to 1,600, on the average, while to the west of the strong cross fault along line 4W values are markedly higher, ranging

Magnetometer Survey: (cont'd)

from 1,600 to 2,300 gammas. This difference may be due to a preponderance of basal conglomerate beds in the relatively shallow sediments on the east while in the thicker - up to 100' - formations to the west, horizons of greywacke mineralized with finely disseminated magnetite may occur in the upper sections.

Moderately anomalous values - up to 3,195 gammas - on line 20W in the east-central part of claim L-714617 may be caused by either a magnetite-rich greywacke or a thinly-covered ultrabasic intrusive. Readings along line 4W, to the north of the frontal fault, which range up to 2,290 gammas in value, are interpreted as being due to an extension of the northerly-trending ultrabasic intrusive overlain by shallow sedimentary beds.

The ultrabasic intruded along the frontal fault on lines 4W and 6W has magnetic intensities ranging from a low of 860 to a high of 8,430 gammas. Values over the more highly serpentinized, magnetite-rich sections vary from 3,000 to 8,430 gammas. Lower values are probably due to depth of overburden and/or the degree of talc-carbonate alteration.

A moderate dipole has been recorded on claim L-714623 where readings change abruptly from +3,045 to -1,905 gammas.

The anomaly in the southwest corner of claim L-772588, with values up to 3,040 gammas, may be due to either an ultrabasic or a greywacke horizon.

Radiometric Survey:

Radiometric surveying was conducted by R. Kaltwasser during mid-November, 1985. A Sharpe's GIS-2 Gamma Ray Integrating Spectrometer (Serial No. 710123) was used for this work.

Readings were recorded with the ratemeter set on the 10 scale range at an 8 second meter time constant. Counts per second were taken with the threshold control setting at 0.30 (0.30 MeV), 5.00 (1.7 MeV) and 7.65 (2.5 MeV). With the threshold control set to 0.30 nearly all the gamma rays are counted; if the control is set to 5.00 only those due almost entirely to Uranium and Thorium will be counted, and, finally, with the setting at 7.65 only those due to Thorium will be counted.

All three counts were recorded at each station and have been plotted on the accompanying Radiometric Plan on a scale of 1" = 200'.

Radiometric Survey: (cont'd)

Note that all pertinent topographic data has been marked on this map.

Stations were spaced at 50' intervals along the picket lines and a total of 3,492 readings was recorded with the probe at ground level.

In the overburden-covered areas on the three easternmost claims the total counts range from 3.0 to 7.0 c.p.s. with no appreciable change over the acid volcanic outcrops in the northeast section of claim L-772582. Values of U + Th vary from 0.03 to 1.5 with the average being in the order of 0.04 to 0.07. The Th values show a markedly similar pattern.

In the swampy areas around Budd Lake, in the south-central part of claim L-714611 and in the north-central part of claim L-714617 values drop to lows of 0.05 - 0.0 - 0.0 c.p.s. with isolated highs increasing to 4.0 - 0.05 - 0.02.

With only a few minor exceptions there is little difference in the readings over outcrop areas and the sand to light soil-covered sections of the Budd Lake claims. On line 24W at 1,800' north of base line No. 1, in a swampy area to the south of several feldspar porphyry outcrops, a reading of 10.0 - 1.5 - 0.08 c.p.s. was recorded. On line 4E at 900' north of base line No. 2, over an outcrop of Cobalt sediments, a reading of 10.0 - 2.0 - 1.5 c.p.s. was recorded.

Conclusions and Recommendations:

The results of previous work and exploration carried out by Manville Canada Inc., which comprised prospecting, trenching, geological-geophysical surveying, plugger work, diamond drilling, etc., outlined several scattered, interesting precious metals showings on the Budd Lake claims. Gold assays from surface sampling and split drill cores are as follows; -

1) 0.116 ozs/ton in drill core from a hole drilled to the west of Budd Lake.
2) 0.20 ozs/ton/8.5' in drill core from a hole drilled in the green carbonate zone to the south of Budd Lake.
3) 0.11 ozs/ton from surface sampling and 0.12/4.0' in drill core from the green carbonate zone of 2). This work was carried out by Manville.
4) 0.02 ozs/ton from holes drilled in the green carbonate alteration zon to the southeast of the Edleston fault.

Conclusions and Recommendations: (cont'd)

5) 0.18 ozs/ton from a trench in sheared and silicified acid volcanics on claim L-772582.

Electromagnetic surveying delineated several medium to strong crossovers over the ultrabasic intrusive and metavolcanics which warrant further exploration.

Magnetometer surveying outlined an intrusive body of moderately to highly serpentinized peridotite trending in a northerly direction through the central part of the map area.

Radiometric surveying failed to reveal any indications of uranium mineralization on the property.

On the basis of the encouraging results obtained from the work completed to date the following programs are recommended; -

1) acquisition of additional claims
2) detailed geochemical and geophysical surveying
3) detailed geological mapping, plugger work, sampling and assaying in the showing areas
4) diamond drilling using Company equipment.

Submitted: March 24th, 1986

by: F.J. Evelegh
Exploration Mgr.

Ministry of Natural Resources
Ontario

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

136,

41P14NW0008 2.9026 SOTHMAN

900

Type of Survey(s)	Township or Area
Geological & Geophysical	Sothman

Claim Holder(s)	Prospector's Licence No.
Manville Canada Inc.	T-1330

Address: P.O. Box 610, Matheson, Ontario POK 1NO

Survey Company	Date of Survey (from & to)	Total Miles of line Cut
same as above	16 9 85 (Day Mo. Yr.) 24 3 86 (Day Mo. Yr.)	13.13

Name and Address of Author (of Geo-Technical report): F.J. Evelegh, P.O. Box 610, Matheson, Ontario POK 1NO

Credits Requested per Each Claim in Columns at right

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

Man Days		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	

RECEIVED
APR 3 1986
MINING LANDS SECTION

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	714610	
	714611	
	714616	
	714617	
	714622	
	714623	
	714624	
	714625	
	772582	
	772588	
	772589	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

Total number of mining claims covered by this report of work: 11

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

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.

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
1100	APR 4 - 1986	
	Date Approved as Recorded: 86.4.18	Provincial Mining Director

Date	Recorded Holder or Agent (Signature)
Mar 24, 1986	

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: F.J. Evelegh Box 610 Matheson, Ont. POK 1NO

Date Certified	Certified by (Signature)
March 24,1986	

1362 (81/9)

Ontario

Ministry of Natural Resources

File_____

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) Geophysical & Geological

Township or Area Sothman

Claim Holder(s) Manville Canada Inc.

Survey Company same as above

Author of Report F.J. Evelegh

Address of Author Box 610, Matheson, Ont. POK 1NO

Covering Dates of Survey 16/9/85 to 24/3/86
(linecutting to office)

Total Miles of Line Cut 13.13

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

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

Magnetometer_____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: March 24,1986 SIGNATURE: F.J. Evelegh
Author of Report or Agent

Res. Geol._____ Qualifications 63.1067

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
L	714610
	714611
	714616
	714617
	714622
	714623
	714624
	714625
	772582
	772588
	772589

If space insufficient, attach list

RECEIVED
APR 14 1986
MINING LANDS SECTION

TOTAL CLAIMS 11

OFFICE USE ONLY

837 (5/79)

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations Mag - 1,239; E.M.-586; Rad-1,164 Number of Readings Mag-1,263; E,M.-594; Rad-3,492

Station interval 50' & 25'; 100' ; 50' Line spacing 400'

Profile scale E.M. - 1" = 20°; Mag - 1" = 4,000 g

Contour interval

MAGNETIC

Instrument Fluxgate Magnetometer, Model MF-1, Serial No. 409107

Accuracy – Scale constant see attached photocopy

Diurnal correction method All readings corrected to value of Base Station No. 1

Base Station check-in interval (hours) 2 & 3

Base Station location and value

B.C.S. No. 1 on base line No. 1 at picket line 0+00; value - 1,375 gammas
B.C.S. No. 2 " " " " " " " 20W; " - 1,900 "

ELECTROMAGNETIC

Instrument McPhar Dual Frequency Electromagnetic Unit, Serial No. 30-6507

Coil configuration vertical

Coil separation 200'

Accuracy

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

Frequency 1,000 cps (specify V.L.F. station)

Parameters measured dip angle & width of null

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 Sharpe's GIS-2 Gamma Ray Integrating Spectrometer

Values measured Total - Uranium + Thorium - Thorium, in counts/second

Energy windows (levels) 0.30 1.7 2.5 MeV

Height of instrument ground level Background Count 3.0 - 0.02 - 0.01

Size of detector 2" x 2" sodium iodide crystal

Overburden swamp, clay, sand, boulders
(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 _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

SPECIFICATIONS OF FLUXGATE MAGNETOMETER MODEL MF-1

Ranges:	Plus or minus — 1,000 gammas f. sc. 3,000 " 10,000 " 30,000 " 100,000 " Sensitivity 20 gammas/div. 50 " 200 " 500 " 2,000 "
Meter:	Taut-band suspension 1000 gammas scale 1⅞" long — 50 div. 3000 gammas scale 1 11/16" long — 60 div.
Accuracy:	1000 to 10,000 gamma ranges ± 0.5% of full scale 30,000 and 100,0000 gamma ranges ± 1% of full scale
Operating Temperature:	—40°C to +40°C —40°F to +100°F
Temperature Stability:	Less than 2 gammas per °C (1 gamma /°F)
Noise Level:	Total 1 gamma P-P
Long Term Stability:	± 1 gamma for 24 hours at constant temperature
Bucking Adjustments: (Latitude)	10,000 to 75,000 gammas by 9 steps of approximately 8,000 gammas and fine control by 10 turn potentiometer. Convertible for southern hemisphere or ± 30,000 gammas equatorial.
Recording Output:	1.7 ma per oersted for 1000 to 100,000 gamma ranges with maximum termination of 15,000 ohms.
Response:	DC to 5 cps (3db down)
Connector:	Amphenol 91-MC3F1
Batteries:	12 x 1.5V-flashlight batteries "C" cell type) (AC Power supply available)
Consumption:	50 milliamperes
Dimensions:	Instrument — 6½" x 3½" x 12½" 165 x 90 x 320 mm Battery pack — 4" x 2" x 7" 100 x 50 x 180 mm Shipping Container — 10" dia x 16" 254 mm dia. x 410 mm
Weights:	Instrument — 5 lbs. 12 oz. 2.6 kg. Battery Pack — 2 lbs. 4 oz. 1.0 kg. Shipping — 13 lbs. 6.0 kg.

SCINTREX LIMITED
79 Martin Ross Avenue, Downsview, Ontario, Canada

Mining Lands Section

File No 2.7026

Control Sheet

TYPE OF SURVEY

✓ GEOPHYSICAL

✓ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

A. Hurst

Signature of Assessor

April 18/86

Date

M EM Rad GL

2·9026

714610	✓	✓	✓	✓
11	✓	✓	✓	✓
16	✓	✓	✓	✓
17	✓	✓	✓	✓
22	✓	✓	✓	✓
23	✓	✓	✓	✓
24	✓	✓	✓	✓
25	✓	✓	✓	✓
772582	✓	✓	✓	✓
88	✓	✓	✓	✓
89	✓	✓	✓	✓

Semple Twp.- M.1100

Nursey Twp.- M.1031

Halliday Twp.- M. 910

Kemp Twp.- M.966

THE TOWNSHIP OF SOTHMAN

DISTRICT OF SUDBURY

LARDER LAKE 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 along the shores of all lakes and rivers.

Flooding Rights– L.O. 7191 File Nº 1162 vol. 4.

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

Order No.	File	Date	Disposition
R1	W.49/84	CLM 262	22/2/84	M.R.O.
R2	Waste Disposal Site Buffer Zone		2/9/81	
R3	W.89/81	188517	28/8/81	S.R.O.
R4	MNR GRAVEL RESERVE	3C37		

PLAN NO. M-1121

ONTARIO

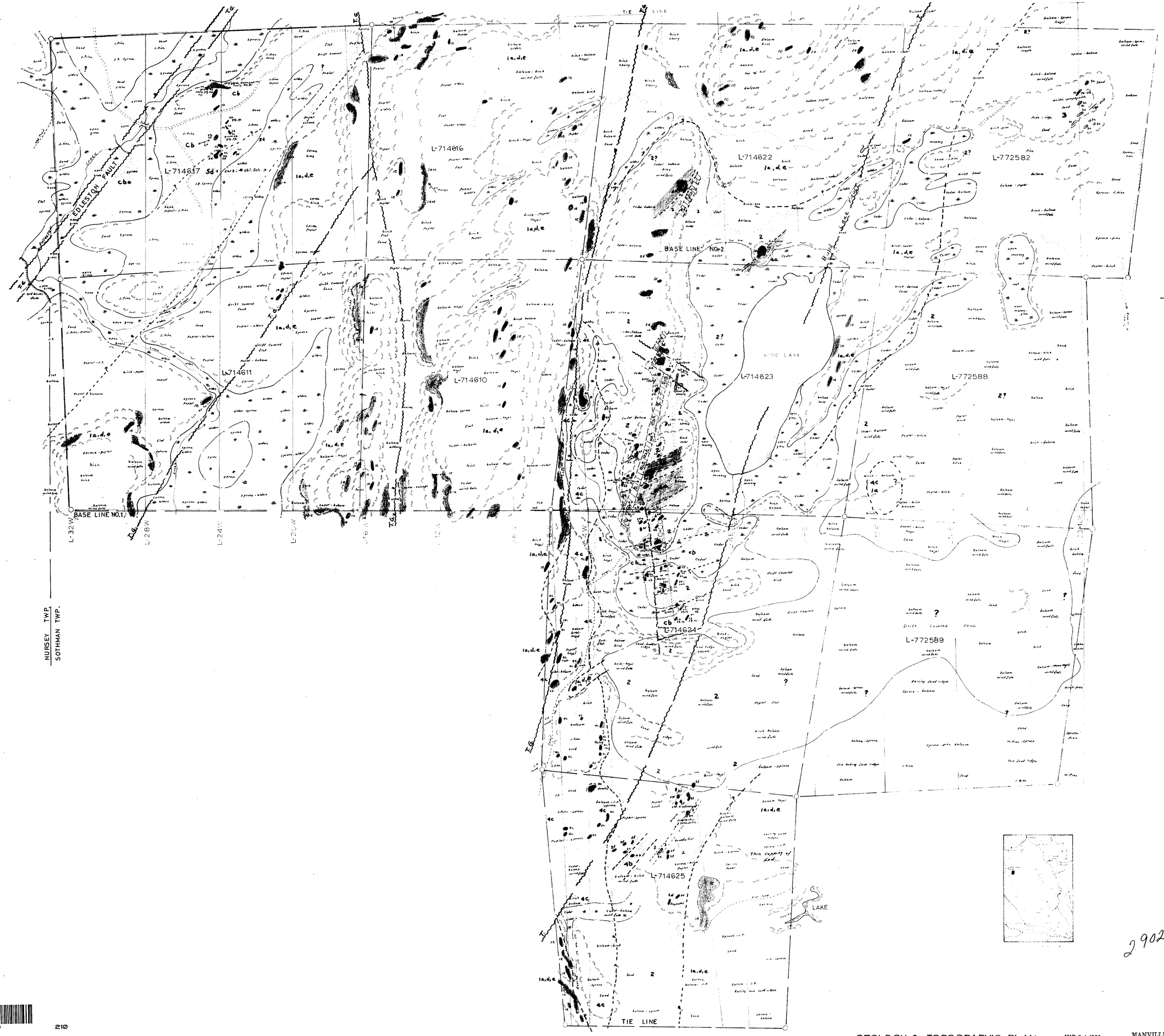
MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

41P14NW0008 2.9026 SOTHMAN

200

K. Kalamov



NURSEY TWP.
SOTHMAN TWP.

29026

GEOLOGY BY: R KALTWASSER

GEOLOGY & TOPOGRAPHIC PLAN
ONT. 1"=200' BUDD LAKE GR. SOTHMAN TWP.

MAR 24 1986

MANVILLE CANADA INC.

ELECTRO-MAGNETIC PROFILE PLAN
INSTRUMENT - McPHAR R.E.M. UNIT - SERIAL NO. 30-6507
INLINE METHOD - 200' SPACING - PROFILE 1"=20°
OPERATOR - R. KALTWASSER

2.9826

MANVILLE CANADA INC.

ONT. 1"=200' BUDD LAKE GR. SOTHMAN TWP.

L-32W

NURSEY TWP.

SOTHMAN TWP.

EDLESTON FAULT

BASE LINE NO.1

BASE LINE NO.2

B.C.S. #2

B.C.S. #1

L-714617

L-714611

L-714616

L-714610

L-714622

L-714623

L-714624

L-714625

L-772582

L-772588

L-772589

1a, d, e

cb

5d

4c

4a

4b

2

2?

?

T.G.

LAKE

TIE LINE

N

2 9026

GEO-MAGNETIC PROFILE PLAN

INSTRUMENT - MF-1 FLUXGATE MAGNETOMETER
SERIAL NO. 409107
OPERATOR - B. HALEY - PROFILE - 1" = 4000 g.

MAR 24 1986

MANVILLE CANADA INC.

ONT. 1" = 200'

BUDD LAKE GR. SOTHMAN TWP.

41P14NW0088 2.9026 SOTHMAN

230

NURSEY TWP.
SOTHMAN TWP.

L-714617
L-714611
L-714616
L-714610
L-714622
L-714623
L-772582
L-772588
L-714624
L-772589
L-714625

BASE LINE NO.1
BASE LINE NO.2
TIE LINE
TIE LINE

L-32W L-28W L-24W L-20W L-16W L-12W L-8W L-4W L-0 L4E L8E L12E L16E L20E L23HOE

OUTCROP AREA
HILL
SAND
SAND RIDGE
RAVINE
BUDD LAKE
LAKE
Rolling Sand Ridges

N

2.9026

RADIOMETRIC SURVEY PLAN

INST-GIS2 SHARPE SERIAL NO.-710123

READINGS IN C.P.S.

TOTAL	U-TH	TH
7	0.06	0.05

OUTCROP AREA

MAR 24 1986

MANVILLE CANADA INC.

ONT. 1:200 BUDD LAKE GR. SOTHMAN TWP.

41P14NW0086 2.9026 SOTHMAN

240

OPERATOR B. HALEY

GEOL. LEGEND

6 Quartz diabase, diabase.

5 Granite 5a, Syenite 5b, Feldspar porphyry 5c, Quartz feldspar 5d, Felsite 5e, Lamprophyre 5f.

4 Diorite 4a, Gabbro diabase 4b,
Breccia 4e
4c Peridotite & Dunite (Serpentinized)
(Asb. - Asbestos recognized

4f Hornblendite
4d Pyroxenite 4d.

3 Rhyolite, fragmental lava 3a

2 Andesite-basalt, pillow lava 2a, dacite
Diabasic lava 2b, Spherulitic lava 2c,
Fragmental lava 2d, Tuff & chert 2e,
Talc-chlorite schist 2f.

1 Greywacke 1a, Arkose 1b, Quartzite 1c,
Argillite or shale 1d, Conglomerate 1e,
Iron formation 1f, Chlorite schist 1g.

Cb Carbonate rock

Quartz veins

GEO-MAG SYMBOLS

Contour interval 500 gammas

BCS#1 Magnetic Base Control Station

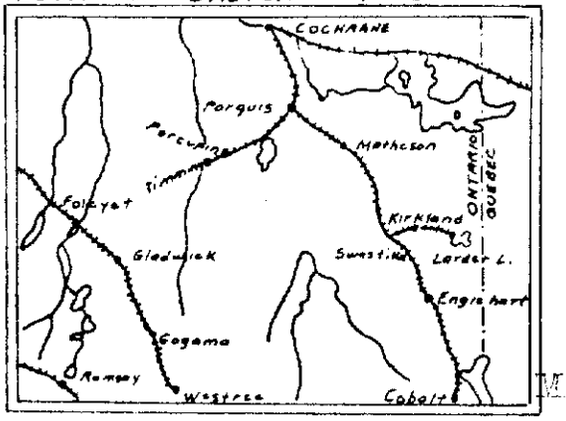
Geological Contact

Fault Zone G- Geological
M- Magnetic
T- Topographic

Mag. Profile

250

LOCATION SKETCH - 1" = 50 Miles



TOPO-SYMBOLS

Outcrop

Higher ground

Scarp

Muskeg or Swamp

Creek

Drill hole

Bush road

Direction in which lava flows face, indicated by shape of pillows

Strike - Dip of Schistosity

ELECTRO-MAG SYMBOLS

GEONICS IS UNIT

Conductive Zone (Red)
Magnetic Conductor (Blue)
Nil
Scale - 20 units = 1 inch
West & South - Pos. (Red)
East & North - Neg. (Blue)

Scale - 40 units = 1 inch

Conducting Zone - S - Strong
M - Medium
W - Weak

RONKA H.L. UNIT

In phase curve

Out phase curve

NPCS Not proper coil spacing

East - Positive. West - Negative

McPHAR V.L. UNIT

Dip angle profile

North & East - Positive
South & West - Negative

Geol. Survey by-
Mag. Survey by -
E.M. Survey by -

LEGEND SHEET
PROVINCE OF ONTARIO