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GEOPHYSICAL SURVEYS

for

ROSEVAL SILICA INCORPORATED

on the

PENHORWOOD PROPERTY

PHASE 1

in

2.14090

PENHORWOOD TOWNSHIP

PORCUPINE MINING DIVISION

DISTRICT OF COCHRANE

ONTARIO

RECEIVED

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MINING LANDS SECTION

by

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INTRODUCTION

Roseval Silica Incorporated holds or has optioned a large parcel of unpatented mining claims in the southwestern portion of Penhorwood Township, Porcupine Mining Division, District of Cochrane, Ontario. Previous work by the author and the work outlined by this report covers 14 contiguous mining claims in the northeastern part of the claim block and is Phase 1 of an on-going project.

The primary purpose of the geophysical investigation of Roseval Silica Incorporated Penhorwood Township property was to locate possible extension of the known high quality silica deposits of Site 2, Site 2a and Site 3, to identify favorable targets for additional silica deposits, lithological contacts, structural features and possible targets for precious and/or base metal mineralization.

The author completed the geological logging of the drill holes which tested the down dip extensions of the silica deposits at Site 2, Site 2a and Site 3 from October 2 to 4, 1989.

Preliminary geophysical testing was conducted by the author on October 25 and 26, 1989. Line profiles of total field magnetics, vertical magnetic gradient and VLF-EM surveys were completed over drill holes RS-89-04 and RS-89-05 at Site 2a, drill hole RS-89-08 and the main haulage ramp at Site 3 and the western end of Site 2 near the drill holes RS-89-01 and RS-89-09.

During January 15 to February 6, 1990, a total of 18.0 miles (28.97 km) of line cutting was completed of which 10.3 miles (16.57 km) was surveyed to establish a total of 621 magnetic readings. This survey was completed on the 14 contiguous unpatented mining claims known as the Penhorwood Property in the southwestern portion of Penhorwood Township and fulfilled the original requirements of the Ontario Mineral Incentive Program (OMIP) Designated Project OM89-015.

This report covers the completed geophysical investigation of Phase 1. The completed 18 miles (28.97 km) of grid was resurveyed with total field magnetics, and two station VLF-EM surveys. Approximately 3600 to 4200 data points were collected for the surveys.

The project area is located approximately 51.5 miles (82.9 km) west of Timmins, Ontario. Access to the project area is by Highway 101 west of Timmins for 35.73 mile (57.5 km) to the all weather gravel Kenogaming/Penhorwood Main logging roads. Travelling about 4.29 miles (6.9 km) in a southerly direction on the gravel road is the Penhorwood Main Road leading in a westerly the southwesterly direction for about 10.13 miles (16.3 km) to

the ballast pit of the Canadian National Railway. A new gravel road from the ballast pits lead west towards the Extender Mineral property. About 1.37 mile (2.2 km) along this road is Roseval Silica Pit No. 2 and an additional 0.68 miles (1.1 km) to Pit No. 3.

LOCATION AND ACCESS

The 14 contiguous unpatented mining claims covered by this report is on Phase 1 of the claim block consisting of 77 contiguous unpatented mining claims of Roseval Silica Incorporated. The claim group is located in the southwestern portion of Penhorwood Township, Porcupine Mining Division, District of Cochrane, Ontario as shown in Figure 1.

The project area is located approximately 51.5 miles (82.9 km) west of Timmins, Ontario. Access to the project area is by Highway 101 west of Timmins for 35.73 mile (57.5 km) to the all weather gravel Kenogaming/Penhorwood Main logging roads. Travelling about 4.29 miles (6.9 km) in a southerly direction on the gravel road is the Penhorwood Road leading in a westerly the southwesterly direction for about 10.13 miles (16.3 km) to the former ballast pit of the Canadian National Railway. A new gravel road from the ballast pits lead west towards the Extender Mineral property. About 1.37 mile (2.2 km) along this road is Roseval Silica Pit No. 2 and an additional 0.68 miles (1.1 km) to Pit No. 3. Figure 2 illustrates the access roads in Penhorwood Township and the Penhorwood Township property of Roseval Silica Incorporated. The project is located in NTS 42B/1 and approximately Latitude 48 05' and Longitude 82 09'.

PROPERTY

The Penhorwood Township property of Roseval Silica Incorporated covered by this report consists of 14 contiguous unpatented mining claims. The claims are held either by Roseval Silica Incorporated or under an option agreement, as shown in Figure 3, and consists of the following mining claims and recording dates:

P-986583 to P-986585	inclusively	June 22, 1987
P-986587		June 22, 1987
P-986589		June 22, 1987
P-995809		August 24, 1987
P-995810		September 1, 1987
P-994260 to P-994261	inclusively	September 17, 1987
P-984380		September 17, 1987
P-994114		September 17, 1987
P-995807 to P-995808	inclusively	October 8, 1987
P-1114596		August 28, 1989

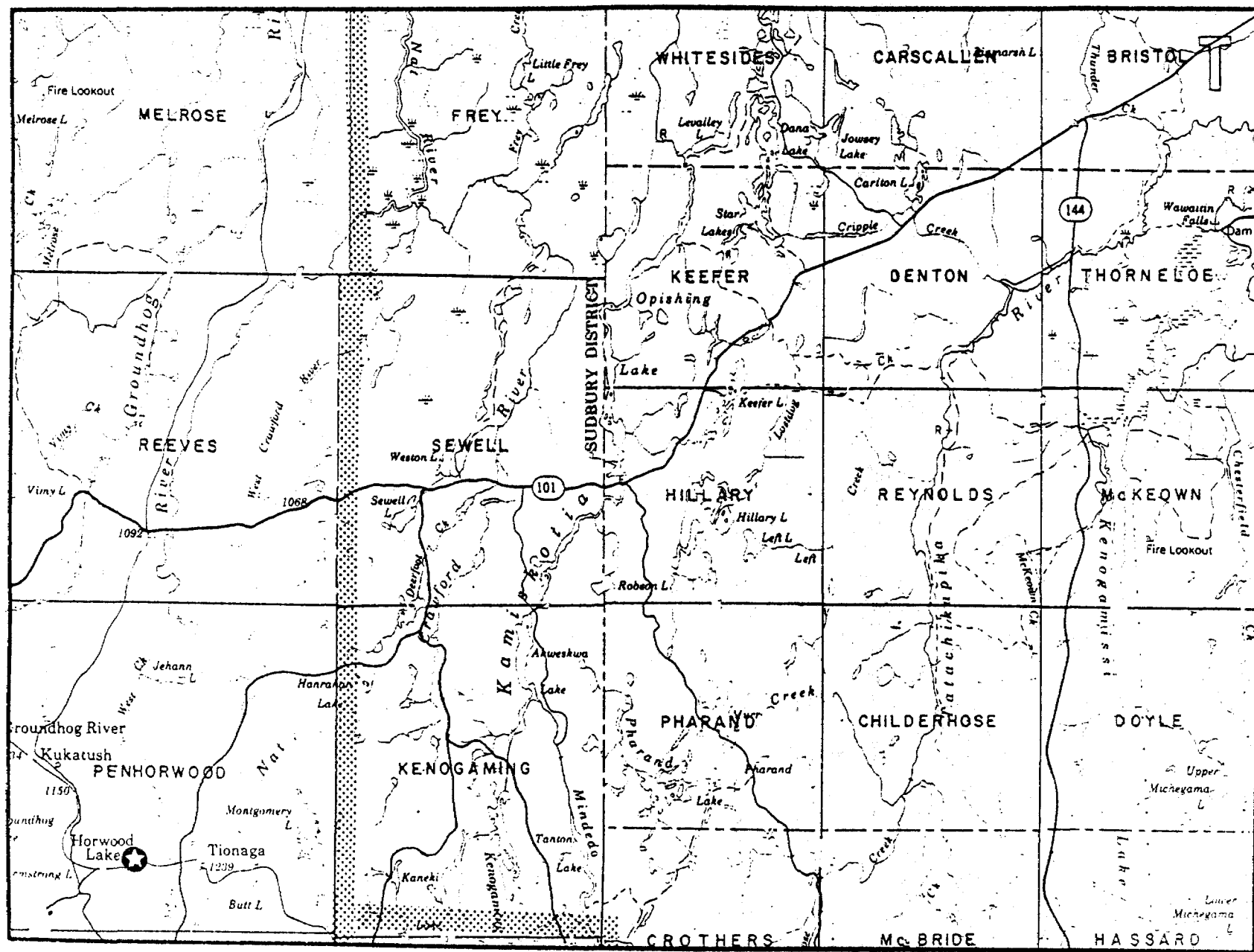


Figure 1: Location Map of the Roseval Silica Incorporated Penhorwood Property, Penhorwood Township, Porcupine Mining Division, Ontario. Scale: 1 inch to 4 miles.

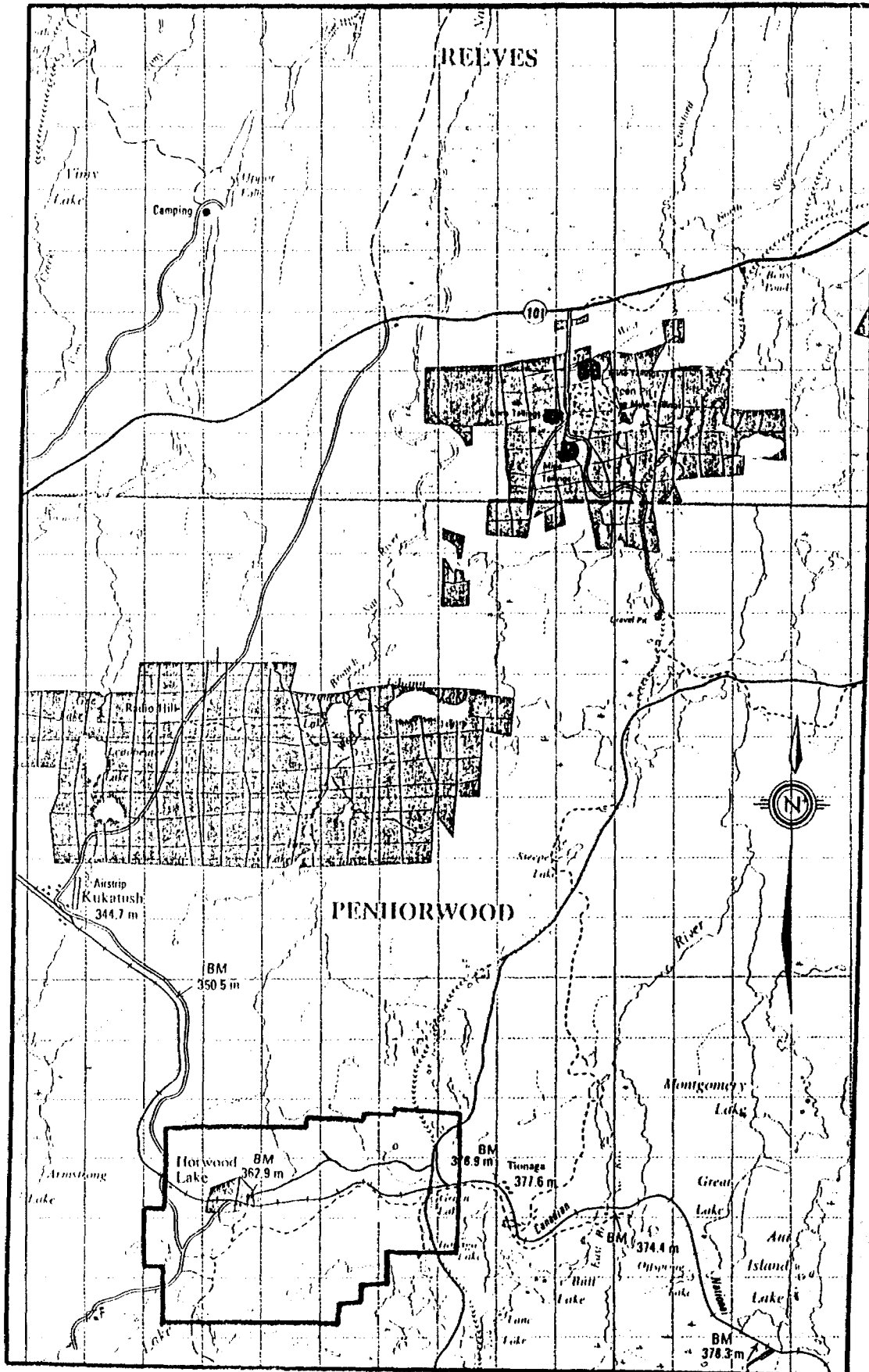


Figure 2: Access Roads to the Penhorwood Property, Penhorwood Township, Porcupine Mining Division, Ontario. Scale: 1:100 000.

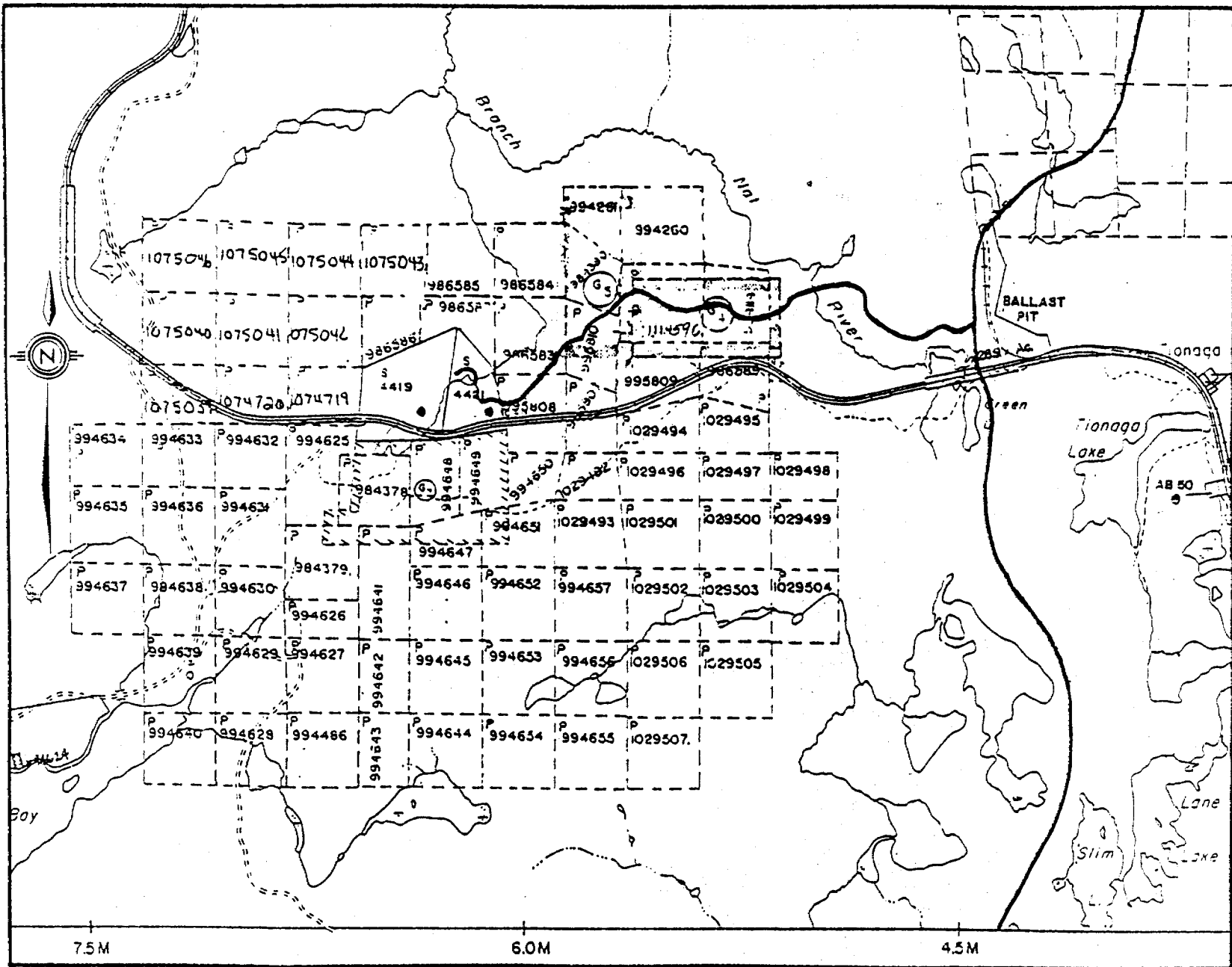


Figure 3: Claim Map and Property Location Map of the Roseval Silica Incorporated Penhorwood Property, with Phase 1 outlined, Penhorwood Township, Porcupine Mining Division, Ontario. Scale: 1 inch to 2640 feet.

GENERAL GEOLOGY

The rock units of Penhorwood Township consists of a complexly folded mass of mafic metavolcanics, pyroclastics and metasediments, cut by mafic, ultramafic and felsic igneous rocks. The units are intruded by granite to granodiorite intrusives. Intruding all the rock units are northerly trending diabase dikes.

The metavolcanic and metasediment sequence has a greenschist metamorphic facies except near the contacts of the granite contacts where it is an epidote-amphibolite facies. Carbonatization is common in the shear zones and at the contacts between the mafic and ultramafic intrusives.

Figure 4 illustrates the generalized geology of the Penhorwood Property. Based upon the published preliminary geological map of Penhorwood Township (Milne, V.G., 1967, P.419) the claim group is underlain by a 2500 to 3000 foot wide mafic metavolcanics trending approximately North 60 degrees East. The southeastern and northwestern flanks of the metavolcanics have exposures of biotite granodiorite gneiss and quartz porphyry to a granodiorite gneiss respectively. The extreme northwestern portion of the claim group is underlain by mafic metavolcanics which have been intruded by irregular shaped serpentinized ultramafic intrusives. The extreme northeastern portion and a 600 foot zone within the central mafic metavolcanics are late felsic intrusives of hornblende-biotite granodiorite and muscovite granite respectively. The central portion of the property contains northerly trending late intrusive diabase dikes.

GEOLOGY OF THE HIGH QUALITY SILICA DEPOSITS

The Penhorwood Township property of Roseval Silica Incorporated hosts at the present 3 deposits of high quality silica. Each silica deposit has its distinct characteristics.

Site 1 is located 300 feet south and 600 feet east of the C.N.R. Horwood Station. The quartz vein varies from 23 to 65 feet for a length of 2479 feet trending between N 015 E to N 040 E. The vein occurs at or near the contact between the late felsic intrusive and mafic metavolcanics.

Site 2 is located in the survey area and is approximately 50 to 125 feet wide for a length of about 300 to 350 feet trending N 065 E to N 068 E. The silica deposit is vertical to steeply dipping to the east. The southern contact is a chlorite schist of ultramafic metavolcanics, while the northern contact is a light to medium pink, medium grained felsic intrusive (granitic).

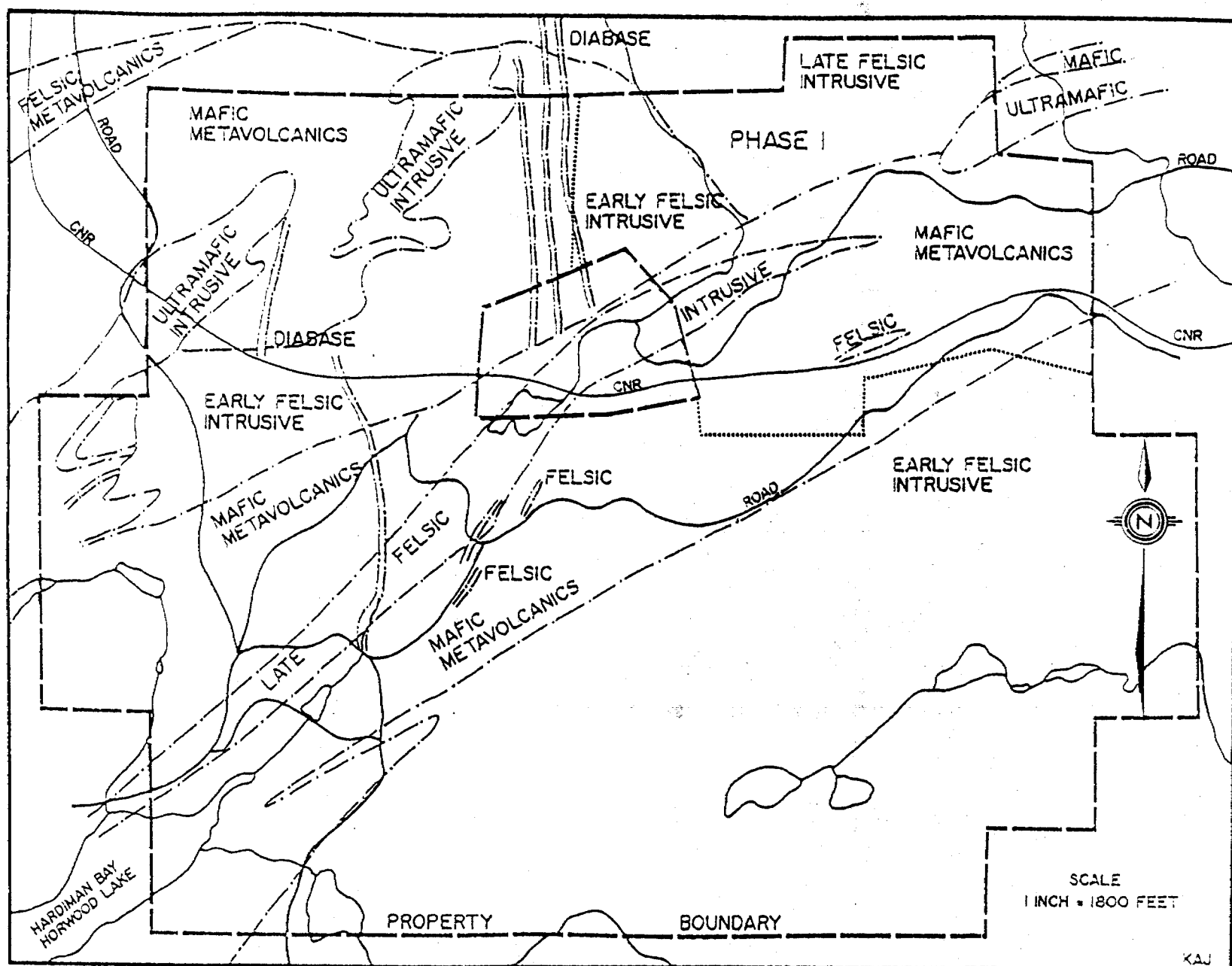


Figure 4: Generalized Geology of the Penhorwood Property of the Roseval Silica Incorporated Penhorwood Property, with Phase 1 outlined, Pennorwood Township, Porcupine Mining Division, Ontario. Scale: 1 inch to 1800 feet.

The extension of the Site 2 deposit has been traced by several pits and trenches for a distance of 700 feet in a westerly direction. The geological environment for this extension, Site 2a, is very similar to that of Site 2. Three diamond drill holes were drilled under Site 2a. The quartz vein is approximately 40 to 50 feet wide and dipping approximately 70 degrees to the northwest.

The last known silica deposit is located approximately 1450 feet north of Site 2. Site 3 has an approximate width of 100 to 150 feet for a length of about 300 feet trending approximately N 045 E. This site were drilled with 3 holes. The northwestern unit intersected was granite followed by mafic to ultramafic chlorite schist and two wide quartz veins separated by mafic metavolcanics. The southeastern wall of the open pit has exposures of chlorite schist.

PREVIOUS EXPLORATION ACTIVITIES

The two patented mining claims located in the center of the claim group has had extensive exploration work. In 1917, barite was discovered about 1600 feet east-northeast of Horwood Lake CNR station. Small tonnages of barite were shipped in 1923, 1933, and 1940. During 1965, Horwood Mining Limited shipped quartz chip from a vein located south of the train tracks.

The recent exploration activity involving parts of the claim group were completed by B.M. Arnoit who drilled 4 diamond drill holes. No dates were available on the drilling.

Canadian John Mansville on their Horwood Lake Group now the northwestern portion of the present property. The conducted a magnetic survey and geological mapping during 1956.

Roseval Silica Incorporated has completed stripping of quartz zones in June of 1987 and September 1988, and limited geological mapping and 1946 feet of drilling which was completed in 1987.

During 1989, stripping and trenching was completed at Site 2a. A limited 1866 foot diamond drill program was completed with 2 holes at Site 2, 3 holes at Site 2a, and 3 holes at Site 3. The author completed the geological logging of the drill holes which tested the down dip extensions of the silica deposits at Site 2, Site 2a and Site 3 from October 2 to 4, 1989.

Preliminary geophysical testing was conducted by the author on October 25 and 26, 1989. Line profiles of total field magnetics, vertical magnetic gradient and VLF-EM surveys were completed over drill holes RS-89-04 and RS-89-05 at Site 2a, drill hole RS-89-08 and the main haulage ramp at Site 3 and the western end of Site 2 near the drill holes RS-89-01 and RS-89-09.

GEOPHYSICAL SURVEY

INTRODUCTION:

The author conducted a geophysical test at the three silica sites within the present survey area during October 25 and 26, 1989. It was concluded that the total field magnetic and vertical magnetic gradient surveys were successful in locating the quartz veins provided their widths were within the station intervals. The tests in the areas with the quartz veins hosted in mafic to ultramafic metavolcanics were more detectable than those hosted within the granite or if one of the contacts of the vein was associated with the granite.

In only a few case, the VLF-EM survey was useful in the detection of the quartz veins. Its purpose in the tests and this survey was to locate concentration of sulphides with possible base metal and/or gold mineralization, and to assist in the location of structural features which may be important in the deposition of the silica deposits and quartz veins.

The Phase 1 of the geophysical investigation and surveying received approval on January 9, 1990. The line cutting was completed by Exsics Exploration Limited from January 15 to February 2, 1990. The initial total field magnetic surveying was completed on February 6, 1990, with station interval of 100 feet on the 400 foot grid lines.

This report covers the geophysical investigation of Phase 1 on the detail grid with a smaller station interval. The survey personnel and schedule is located in Appendix A.

A total of 18.0 miles (28.97 km) of line cutting was completed from January 15 to February 2, 1990. The base line trending on a bearing of North 60 degrees East, was established at the southeastern corner of the patented mining claim. The grid line separation was 400 feet with intermediate lines at 200 foot separation north of the base line for detail and fill-in surveying. Pickets were established at 50 foot intervals along the base line, Tie Line 22 North and all grid lines. Figure 5 illustrates the proposed grid layout for Phase 1 of the northeastern portion of the Penhorwood Property.

The integrated EDA OMNI PLUS VLF/Magnetometer system can collect the total field magnetic, vertical gradient magnetic, and up to 3 VLF-EM station data simultaneously. However, due to the density of the data and the power drain which allowed only 1000 feet to be collected per instrument per day, the initial survey interval was changed from 12.5 to 25 foot intervals. Also, to collect to maximum amount of data per day, the magnetic surveys and VLF-EM surveys were completed as two separate surveys.

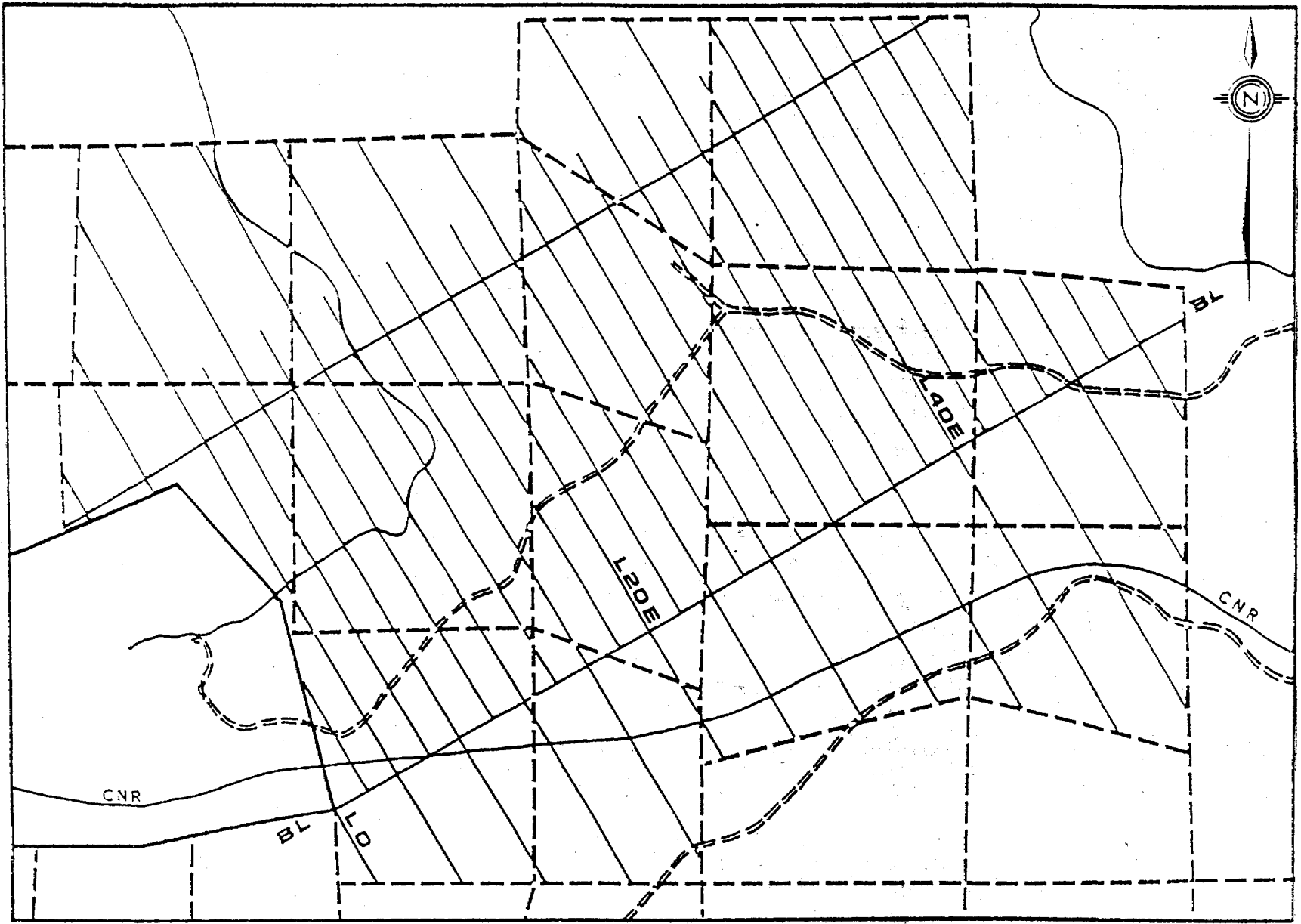


Figure 5: Grid Map of Phase 1, Penhorwood Property of the Roseval Silica Incorporated Penhorwood Property, Penhorwood Township, Porcupine Mining Division, Ontario.
Scale: 1 inch to 800 feet.

The instrument specifications for the EDA OMNI IV Magnetometer and the EDA OMNI PLUS VLF/Magnetometer are located in Appendix B.

TOTAL FIELD MAGNETIC SURVEY:

The total field magnetic survey was completed utilizing the EDA OMNI IV Magnetometer System and the EDA OMNI PLUS VLF/Magnetometer System. The EDA OMNI Base Station Magnetometer was used to correct the magnetic data for daily magnetic diurnals and drift. The base station was located on Line 10+00 East at 4+60 North with an average base value of 58,368.4 gammas. The permanent base station was established on the Base Line at Line 0+00 with an average base value of 58,407.3 gammas.

The Base Line, Tie Line 22+00 North, and all the grid lines were surveyed at 25 foot intervals. Several grid lines were initially surveyed at 12.5 foot intervals. These grid lines were Line 10+00 East from 0+00 to 4+00 North, Line 12+00 East from 0+00 to 11+50 South, Line 14+00 East from 3+975 North to 25+00 North, Line 16+00 East from 13+00 South to 21+75 North, Line 48+00 East from 12+00 South to 7+00 North, and Line 52+00 East from 5+00 South to 1+00 North.

The data was corrected for the daily magnetic diurnals and drift. A base level of 58,000 gammas has been removed from all the observed readings. A total of 4233 observations were recorded.

The total field magnetic surveys measures the total magnetic intensity which includes the remanent and induced magnetization. The remanent magnetism is the residual magnetism within the lithological unit at the time of forming and is imprinted with the geomagnetic field. The induced magnetism is the magnetic intensity and direction of the local geomagnetic field and the magnetic susceptibility of the lithological unit. The total magnetic field varies due to the amount and composition of the magnetic minerals within the lithological units and the distance or depth of burial between the magnetic sensor and the lithological unit.

The corrected data was plotted on a base map with a scale of 1 inch to 200 feet (1:2400). Figure 6 shows the corrected total field magnetic data and Figure 7 shows the total field magnetic data contoured at 20 gamma intervals.

VLF-EM SURVEY:

The Very Low Frequency Electromagnetic (VLF-EM) survey commenced after the completion of the magnetic surveys. The instruments utilized for the survey were 2 EDA OMNI PLUS VLF/Magnetometer systems.

The VLF transmitter stations used for the survey were Cutler, Maine, NAA (frequency 24.0 kHz.) and Annapolis, Maryland, NSS (frequency 21.4 kHz.). The Base Line, Tie Line 22+00 North, and all the grid lines were surveyed at 25 foot intervals. A total of 3816 observations were recorded for Annapolis, Maryland and a total of 3654 observations were recorded for Cutler, Maine.

The first set of data collected with each unit collecting both VLF stations was rejected due to a malfunction in the sensors. The data was re-collected with each VLF station collected on separate instruments.

Figure 8 illustrates the directions of these VLF stations with respect to the Penhorwood claim group. The stations produce a magnetic field horizontal and parallel to the ground and is perpendicular to the line connecting the survey area and the transmitter station while the electrical field is oriented vertically and is parallel to the line connecting the station and the survey area. For maximum coupling between the primary magnetic field and the conductor, the grid lines should be orientated in the direction of the station and perpendicular to the strike of the lithological units or conductors.

The two main components measured by the VLF surveys are the tilt of the major axis of the polarization ellipse which is equivalent to the in phase of the vertical component, and the ratio of the minor and major axis or the ellipticity which is equivalent to the out of phase part of the vertical component. The anomalies are generally identified by cross-overs, however, the overburden may mask and shift the cross-overs.

The total magnetic field or horizontal field strength can be measured. This measurement changes when the primary field intersects a conductive body and results in a higher values or a peak over the source of the anomaly.

An additional component is available which is the calculated ellipticity of the VLF magnetic field. This is calculated from the measurements of the In Phase and Quadrature values of all three components (X, Y and Z).

To assist in the interpretation process of the VLF-EM survey data, a low pass four point filter known as Fraser Filtering was used on the dip or in phase component. This filter produces

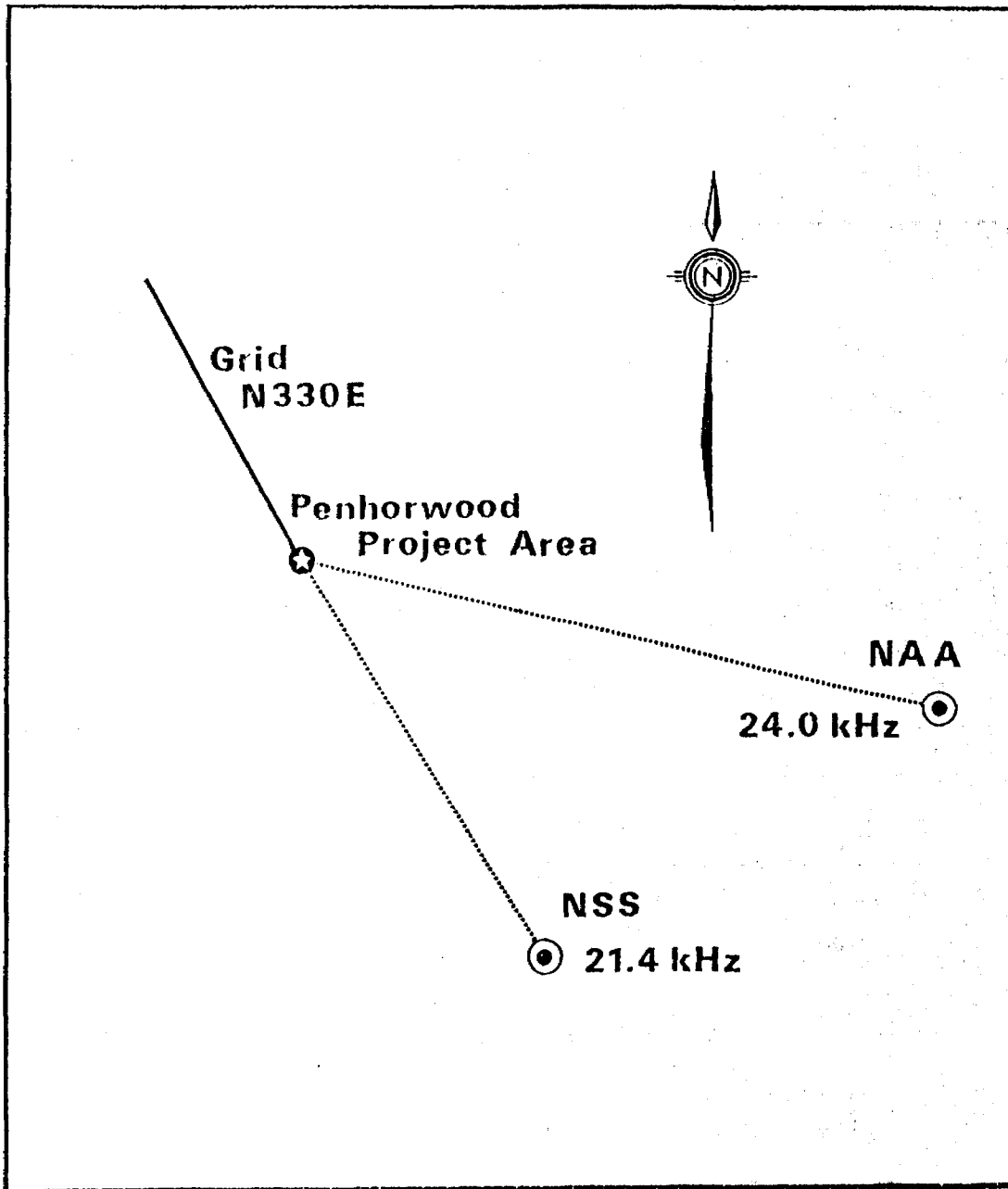


Figure 15: VLF-EM Transmitter Station Orientation Map of Cutler, Maine (NAA) and Annapolis, Maryland (NSS) with the Penhorwood Project Area, Penhorwood Township, Porcupine Mining Division, District of Cochrane, Ontario.

positive peaks over conductive bodies and negative values in non-conductive areas. Several sources in nature can cause anomalies, such as massive and disseminated sulphides, graphite, faults and shear zones, lithological contacts, changes in conductivity within lithological units, conductive overburden, shorelines and swamps. Generally, the high filter values can reflect conductors due to the overburden conditions and possible very near surface massive sulphides or graphitic deposits. The low filter values may reflect deep bedrock conductors such as sulphides and fault or shear zones.

The results of the surveys are presented on base maps with a scale of 1 inch to 200 feet (1:2400). The In Phase and Quadrature data values for Culter, Maine are shown in Figure 9, the profiles of the data are shown in Figure 10. The In Phase and Quadrature data values for Annapolis, Maryland are shown in Figure 11, the profiles of the data are shown in Figure 12.

DATA PROCESSING:

The first step in processing the various data collected by either the EDA OMNI IV or the EDA OMNI PLUS VLF/Magnetometer is to download the data to a PC computer with at least 640 K memory and a hard disk.

Once the data is in the computer, it must be converted into a form which the processing program package can recognize. The processing package used was the GEOPAK SYSTEMS, GP package. This has the conversion program to create files with the X and Y (Line Number and Station Number) and the various Z's (survey data). Separate data files were created for the Total Field Magnetic, the Vertical Magnetic Gradient, the data collected for each of the VLF-EM transmitter stations (Cutler, Maine and Annapolis, Maryland). The data was sorted and edited using WATFILE. The data plots have all the collected values. However, the profile maps and the contour maps have either the electromagnetic or magnetic interference from the C.N.R. tracks and the power line removed. This was required for a more accurate evaluation of the geophysical data collected and the tracing of anomalies either near or bisected by the railway tracks and power line.

The magnetic data was grided on a 6.25 foot interval while the electromagnetic data was grided on a 12.5 foot interval. The difference in gridding was due to the surveying interval.

The contour maps were subjected to a regional trend of 10 degrees to compensate for the difference between the grid orientation and the regional strike of the major lithological units.

The output files were either in the form of survey data, profile data or contour data. These output files were merged with the ACAD drawing file of Phase 1 for the claim group to produce the final maps which are located in the back folders.

INTERPRETATION:

The most striking magnetic features of the survey area are the areas of high magnetic values. The highest magnetic area is represented by an ellipsoidal anomaly of 1000+ gammas with a peak of 4000+ gammas, a calculated first derivative of 500 gammas per meter and a vertical gradient of 150 gammas per meter. This anomaly is located between Lines 29+00 East to 36+00 East and from 21+00 to 24+50 North, and less intense satellite anomalies to the west and northwest. This dipole magnetic anomaly may represent a plug of ultramafic intrusive metavolcanics.

To the east of the plug, a 1400 foot long, 150 to 175 foot wide has a magnetic anomaly of 900+ gammas to a peak of 1500+ gammas, a calculated first derivative up to 300+ gammas per meter and a vertical gradient of 25 to 100+ gammas per meter. The unit trends northeast and probably represents an ultramafic horizon probably intrusive. The difference in both magnetic intensity is probably due to the depth of burial.

A moderated total field magnetic anomaly of 500+ gammas, a calculated first derivative from 0 to 60 gammas per meter and a 10 to 25 gamma per meter vertical gradient is located from Line 28+00 East at 15+50 North trending northeast to Line 46+00 East at 16+00 North. This anomaly is probably due to a 100+ foot wide ultramafic metavolcanic extrusive flow.

The second highest magnetic area is a long, narrow magnetic band from Line 6+00 East to Line 52+00 East from approximately 3+00 North to 4+00 South, respectively. The total field magnetic ranges from 500 to 1000+ gammas, a calculated first derivative

ranging from 0 to 440 gammas per meter and a vertical gradient up to 50 gammas per meter. The central area from Line 24+00 East to Line 32+00 East, has vertical gradients of up to 100+ gammas. In the middle section of this long band, it appears that several parallel to sub-parallel anomalies exist and is probably due to either the pinching out of metavolcanic flows or a shallow depth of burial of the suspected ultramafic extrusive metavolcanics. The units trend from west-southwest to west to east-northeast. The change in general direction is probably due to minor folding and in several areas by North 20 to 30 degree East fault zones.

Another suspected ultramafic metavolcanic unit is located about 400 to 600 feet further to the southeast. This unit has magnetic and electromagnetic interference from the Canadian National Railway and the hydro transmission line.

A moderated total field magnetic anomaly of 500+ gammas, a calculated first derivative of up to 60 gammas per meter and a 5 to 10 gamma per meter vertical gradient is located from Line 4+00 East at 8+00 North trending northeast to Line 32+00 East at 10+00 North. This is probably caused by the late felsic intrusive into the mafic metavolcanic sequence.

The contact between the early felsic intrusives and the mafic to ultramafic metavolcanics is located in the northwestern portion of the survey area at approximately the 400 gamma total field magnetic contour line eastwards to the vicinity of Line 24+00 East.

South of the above contact, the rock units appear to be moderate magnetic mafic metavolcanics with higher magnetic ultramafic units. The contacts between the weak contract between the non-magnetic mafic metavolcanics and the altered felsic intrusives in the northeast of the property were difficult to distinguish.

Several diabase dikes were located trending from North 10 degrees West to about North 10 degrees East. These dikes appear to traverse all the lithological units and these dikes fill previous fault or shear zones.

The structural features of the survey area appear to be trending in at least three directions: 1) North 90 to 110 degrees East, 2) North 45 to 60 degrees East, and 3) North 20 to 30 degrees East. These features are shown on Figure 28.

The VLF-EM surveys located many anomalies which have been lettered on the Fraser Filter maps for both Cutler, Maine and Annapolis, Maryland. Generally, the anomalies are from weak to moderate in strength and appear to have limited strike length. This may indicate that the anomalies are a result of the overburden composition, and the low amplitude is probably due to the sandy resistive overburden in the southern portion of Phase 1. Several of the anomalies are related to the contacts of either individual flows or between felsic intrusives and the host mafic metavolcanics.

The following is a summary of the anomalies located by Cutler, Maine and Annapolis, Maryland:

CUTLER:

- A&B Interference from the CNR tracts. A may be related to the side of the north trending diabase dike and B may be related to shearing.
- C This good 1200 foot anomaly is related to the south side of the ultramafic flow.
- D Probably sulphide related good anomaly near the north contact of late felsic intrusive and mafic metavolcanic.
- E Probably related to the overburden composition.
- F The 1400 foot anomaly related probably to the southern contact of the late felsic intrusive and the overburden composition.
- G Correlates to magnetic low within the mafic metavolcanics and possibly due to sulphides.
- H Very broad anomaly related to the southern contact area of the late felsic intrusive and may indicate sulphides in the alteration zone.
- I This very broad, 2800 foot anomaly between the two suspected ultramafic metavolcanic flows possibly represent the sulphide contents within the alteration zone due to regional faulting.
- J This is related to the south side of the ultramafic flow and is similar to Cutler's "C".

ANNAPOLIS:

- A Very shallow deep, related to suspected fault zone marked by a high cliff.
- B Shallow to moderate depth, related to the contact of the late felsic intrusive and the mafic metavolcanics.
- C Correlates with the axis of a suspected ultramafic flow but has electrical interference.
- D Interference, may be related to late felsic intrusive
- E Contact margin with late felsic intrusive and metavolcanics.
- F Related to magnetic low south of late felsic intrusive contact.

- G Related to magnetic low between mafic metavolcanic, probably due to sulphides in alteration zone.
- H Appears on every other line. Related to the magnetic low on the north side of suspected ultramafic flow.
- I Related to north contact of ultramafic flow.
- J&K These are probably related to the ultramafic flow but has interference from the CNR tracts.
- L Related to magnetic low of mafic metavolcanic and alteration zone.
- M Has interference, related to north side of magnetic high.
- N Possible shearing within felsic intrusive.
- O Correlates to magnetic low between ultramafic metavolcanic and late felsic intrusive.
- P Possible shearing between the ultramafic complex and flows.
- Q Near the contact of the early felsic intrusive and the western extent of the ultramafic complex.
- R Possibly related to fault or shearing at the east end of ultramafic flows.

The magnetic lows near the mafic metavolcanic and felsic intrusive contacts may represent large bodies of silica emplacement and along the northern side of the ultramafic metavolcanics which traverses the Base Line at 28+00 East.

The priority targets are usually narrow from 25 to 75 feet. The secondary targets are generally broad geophysical anomalies which may be due to large amounts of silica veins or silification of the bedrock. Carbonatization may also be the cause of the secondary targets.

The 12 secondary targets for silica deposits are located in magnetic low areas, generally wider zones and have a greater strike length than the primary targets. The secondary targets can be group into two classes; related to primary target and isolated zones. These interesting zones are within the area west of Site 3, east and southwest of Sites 2 and 2a, respectively. All of these zones are within the mafic metavolcanics.

Three of the isolated secondary targets are located in the northern and south contact areas of the late felsic intrusive. The last zone is located on the south side of a ultramafic metavolcanics.

CONCLUSIONS

The total field magnetic survey was successful in locating the major lithological units of the early and late felsic intrusives in the northern to northwestern 30% of the survey area and the remainder of the area is underlain by mafic and ultramafic metavolcanic sequence.

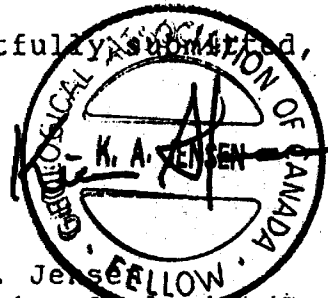
The structural features of the survey area appear to be trending in at least three directions: 1) North 90 to 110 degrees East, 2) North 45 to 60 degrees East, and 3) North 20 to 30 degrees East.

The primary objective of the survey was to locate potential areas of silica emplacements. A total of 9 Priority target areas and an additional 12 Secondary target areas were located generally within metavolcanics. The average width is approximately 50 feet.

The majority of the VLF-EM anomalies are related to either the overburden or contacts with a few anomalies related to suspected sulphide mineralization. The southern ultramafic metavolcanic flow has the strongest VLF-EM anomaly and warrants addition work.

The most useful exploration survey for the location of the silica deposits was the total field magnetic survey and vertical gradient. The Vlf_em survey located conductor which may have a potential for gold mineralization.

Respectfully submitted,



Kian A. Jensen
Consulting Geologist/Geophysicist

RECOMMENDATIONS

Based upon the results of the present survey and the available information, the author recommends geological mapping to locate surface showings of quartz and define the geophysical anomalies. The areas of the Priority targets should be trenched. If quartz is located, then the area should be stripped and sampled.

On completion on this work, a diamond drilling program should be completed to provide additional information on the width, depth, volume and quality of the silica deposits.

Several of the target areas of Phase 1 should be processed using a smaller area data base and contoured at either 1 or 5 gamma intervals as the present contour interval did not indicate the silica zone of Site 2a.

The geophysical surveys of Phase 1 was successful and Phases 2 and 3 should have a grid established and surveyed.

Dated at Timmins, Ontario
March 29, 1990

Respectfully submitted,



Kian A. Jensen
Consulting Geologist/Geophysicist

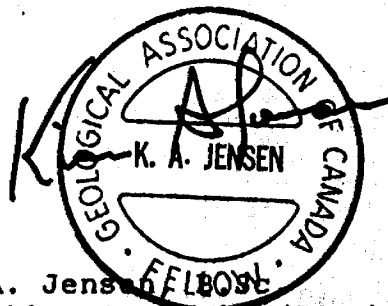
CERTIFICATE

With reference to my report and maps on the Magnetic Survey on the Penhorwood Property of Roseval Silica Incorporated Dated March 29, 1990.....

I, Kian A. Jensen, of the City of Timmins, Ontario, do hereby certify the following to be true and accurate to the best of my knowledge:

- 1) That I received an Honour B.Sc. degree in Earth Science, Geology Major, from the University of Waterloo,
- 2) That I have been employed as a geologist and/or geophysicist by various exploration companies and consulting companies since 1978,
- 3) That I have been and still am a member in good standing in the following associations:
 - a) Society of Exploration Geophysicists - Associate, 1981
 - b) Geological Association of Canada - Fellow, 1983
- 4) That I am the author of the corresponding report, and have been actively exploring and prospecting in the Timmins area since 1981,
- 5) That I have no interest directly or indirectly in the mining claims comprising the property described in this report or in the shares of any company or companies in this joint venture on this property or the surrounding properties, nor do I expect to receive any directly or indirectly.

Dated this 29th day of March, 1990
Timmins, Ontario



Kian A. Jensen
Consulting Geologist/Geophysicist

Qual 2.3969

REFERENCES

Milne, V.G. and assistants
1967 Preliminary Geology of Penhorwood Township, District of Sudbury; Ontario Department of Mines, Map No. P-419, scale 1 inch to 1/4 mile.

Milne, V.G.
1972 Geology of the Kukatush-Sewell Lake Area, District of Sudbury; Ontario Division of Mines, GR97, 116p.
Accompanied by Maps 2230, 2231; scale 1 inch to 1/2 mile.

Resident Geologist Assessment Files
T-495 Arnoit, B.M.
T-506 Canadian John Mansville
T-3237 Roseval Silica Incorporated

Vos, M.A., Abolins, T., McKnight, R.L.W., and Smith, V.
1987 Industrial Minerals of Northern Ontario;
Geological Survey, Mineral Deposits Circular 26, 272p.

APPENDIX A

SURVEY PERSONNEL

Line Cutting:

Exsics Exploration Limited

January 15 to February 2, 1990

Magnetic Survey:

Ray Meiko

February 6, 1990

Steve Anderson

February 6, 1990

Ed Brunet

February 6, 1990

Rob Mathews

February 9 to 28, 1990

Richard Mathews

February 9 to 28, 1990

Electromagnetic Survey:

Rob Mathews

February 9 to 28, 1990

Richard Mattews

February 9 to 28, 1990

March 2 to 4, 1990

March 19 to 26, 1990

John Pentainen

March 11, 1990

Ted Anderson

March 19 to 26, 1990

Geophysical Processing:

W.V.W. White and Associates Limited

**Data Reductions, Editing, Computer Plotting,
Interpretation and Report**

Kian A. Jensen

February 9 to March 29, 1990

APPENDIX B

OMNI PLUS VLF/Magnetometer System



Major Benefits of the OMNI PLUS

- Combined VLF/Magnetometer/Gradiometer System
- No Orientation Required
- Three VLF Magnetic Parameters Recorded
- Automatic Calculation of Fraser Filter
- Calculation of Ellipticity
- Automatic Correction of Primary Field Variations
- Measurement of VLF Electric Field



Specifications *

Frequency Tuning Range	15 to 30 kHz, with bandwidth of 150 Hz; tuning range accommodates new Puerto Rico station at 28.5 kHz
Transmitting Stations Measured	Up to 3 stations can be automatically measured at any given grid location within frequency tuning range
Recorded VLF Magnetic Parameters	Total field strength, total dip, vertical quadrature (or alternately, horizontal amplitude)
Standard Memory Capacity	800 combined VLF magnetic and VLF electric measurements as well as gradiometer and magnetometer readings
Display	Custom designed, ruggedized liquid crystal display with built-in heater and an operating temperature range from -40°C to $+55^{\circ}\text{C}$. The display contains six numeric digits, decimal point, battery status monitor, signal strength status monitor and function descriptors.
RS232C Serial I/O Interface	2400 baud rate, 8 data bits, 2 stop bits, no parity
Test Mode	A. Diagnostic Testing (data and programmable memory) B. Self Test (hardware)
Sensor Head	Contains 3 orthogonally mounted coils with automatic tilt compensation
Operating Environmental Range	-40°C to $+55^{\circ}\text{C}$; 0 - 100% relative humidity; Weatherproof
Power Supply	Non-magnetic rechargeable sealed lead-acid 18V DC battery cartridge or belt; 18V DC disposable battery belt; 12V DC external power source for base station operation only.
Weights and Dimensions	
Instrument Console	2.8 kg, 128 x 150 x 250 mm
Sensor Head	2.1 kg, 130 dia. x 130 mm
VLF Electronics Module	1.1 kg, 40 x 150 x 250 mm
Lead Acid Battery Cartridge	1.8 kg, 235 x 105 x 90 mm
Lead Acid Battery Belt	1.8 kg, 540 x 100 x 40 mm
Disposable Battery Belt	1.2 kg, 540 x 100 x 40 mm

Preliminary

EDA Instruments Inc.,
4 Thorncliffe Park Drive,
Toronto, Ontario
Canada M4H 1H1
Telex: 06 23222 EDA TOR,
Cables: Instruments Toronto
(416) 425-7800

In USA,
EDA Instruments Inc.,
5151 Ward Road,
Wheat Ridge, Colorado
U.S.A. 80033
(303) 422-9112

Printed In Canada



428015E0009 2.14090 PENHORWOOD

900

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Mining Lands Section
159 Cedar Street, 4th Floor
Sudbury, Ontario
P3E 6A5

Telephone: (705) 670-7264
Fax: (705) 670-7262

Your File: W. 9106.00072
Our File: 2.14090

June 28, 1991

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

Dear Sir/Madam:

RE: Notice of Intent dated May 28, 1991 for Geophysical
(Electromagnetic and Magnetometer) Surveys on mining
claims P. 984380 et al. in the Township of Penhorwood.

The assessment work credits, as listed with the above-mentioned
Notice of Intent have been approved as of the above date.

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

Yours sincerely,

Ron. C. Gashinski,
Provincial Manager, Mining Lands
Mines & Minerals Division

LJS
LJS/jl
Enclosure:

cc: La Societe de Gestion Maskours Inc.
Boucherville, Quebec

Mr. Kian A. Jensen
South Porcupine, Ontario

Resident Geologist
Timmins, Ontario

Roseval Silica Inc.
Boucherville Silica Inc.

✓ Assessment Files Office
Toronto, Ontario

Company Name: **Roseval Silica Incorporated/ La Societe de Gestion Maskours Inc.**

Location or Area: **Penhorwood**

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	
Electromagnetic _____ 40 _____ days	P.984380
Magnetometer _____ 40 _____ days	986583 to 585 incl.
Radiometric _____ days	986587
Induced polarization _____ days	994114
Other _____ days	994260-61
Section 77 (19) See "Mining Claims Assessed" column	995807 to 810 incl.
Geological _____ days	1114596
Geochemical _____ days	
Man days <input type="checkbox"/>	Airborne <input type="checkbox"/>
Special provision <input checked="" type="checkbox"/>	Ground <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Credits have been reduced because of partial coverage of claims.	
<input type="checkbox"/> Credits have been reduced because of corrections to work dates and figures of applicant.	

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

35 days credit electromagnetic and 40 days magnetometer: P.986589

No credits have been allowed for the following mining claims

not sufficiently covered by the survey Insufficient technical data filed

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 77(19) - 80.

DOCUMENT NO.
N 9308-00012

Report of Work **21409**
 (Geophysical, Geological and Geochemical Surveys)

Instructions
 - Please type or print.
 - Refer to Section 77, the Mining Act for assessment work requirements and maximum credits per survey and number of mining claims covered. Space on this form, attach a list.
 Technical Reports and maps in duplicate should be submitted to Mining Lands Section, Mineral Development and Lands Branch:

Type of Survey(s) MAGNETIC + ELECTROMAGNETIC	Mining Division PORCUPINE	Township or Area PENHORWOOD
Recorded Holder(s) ROSEVAL SILICA INCORPORATED	Prospector's Licence No. T-51717	T-4950
Address 150 de BRULLON, BOUCHERVILLE, QUEBEC, J4B 2J2		Telephone No.
Survey Company KIAN A. JENSEN EXPLORATION & CONSULTING SERVICES		
Name and Address of Author (of Geo-Technical Report) KIAN A. JENSEN, P.O. BOX 37, SOUTH PORCUPINE P0N 1H0		Date of Survey (from & to) 15 Day 1 Mo 1 Yr 29 Day 3 Mo 90 Yr

Credits Requested per Each Claim in Columns at right

Special Provisions	Geophysical	Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	- Electromagnetic	40
	- Magnetometer	40
	- Other	
For each additional survey: using the same grid: Enter 20 days (for each)	Geological	
	Geochemical	
Man Days	Geophysical	Days per Claim
Complete reverse side and enter total(s) here	- Electromagnetic	
	- Magnetometer	
	- Other	
	Geological	
	Geochemical	
Airborne Credits	Electromagnetic	Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Magnetometer	
	Other	
Total miles flown over claim(s).	Date	
	Recorded Holder or Agent (Signature)	

Mining Claims Traversed (List in numerical sequence)

Mining Claim		Mining Claim		Mining Claim	
Prefix	Number	Prefix	Number	Prefix	Number
P	986583	RECEIVED APR 17 1991 MINING LANDS SECTION			
P	986584				
P	986585				
P	986587				
P	986589				
P	995809				
P	995810				
P	994260				
P	994261				
P	984380				
P	994114				
P	995807				
P	995808				
P	1114596				

Total number of mining claims covered by this report of work. **14**

Certification Verifying Report of Work

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

Name and Address of Person Certifying
KIAN A. JENSEN, P.O. BOX 37, SOUTH PORCUPINE, ONTARIO

Telephone No. **(705) 268-0111** Date **March 6/91** Certified By (Signature) *Kian Jensen*

For Office Use Only

Total Days Cr. Recorded **1,001.50** Date Recorded **MAR 8/91** Mining Recorder *Robert Buley*

Date Approved as Recorded **"SEE REVISED WORK STATEMENT"** Provincial Manager, Mining Lands

Received Stamp

RECORDED
RECEIVED
MAR 8 1991
MAR - 8 1991

REFERENCE

AREAS WITHDRAWN FROM DISPOSITION

- M.R.O. - MINING RIGHTS ONLY
- S.R.O. - SURFACE RIGHTS ONLY
- M.+S. - MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
400 RESERVE			S.R.O.	35537
SEC 43/70	W 9172	27/02/72	S.R.O.	163006 V2
SEC 36/80		11/7/78	S.R.O.	05537
ORDER OF THE MINISTER #33/87 DATED MARCH 30/87 WITHDRAWS MINING AND SURFACE RIGHTS UNDER SECTION 36 OF THE MINING ACT R.S.O. 1980				

SAND AND GRAVEL

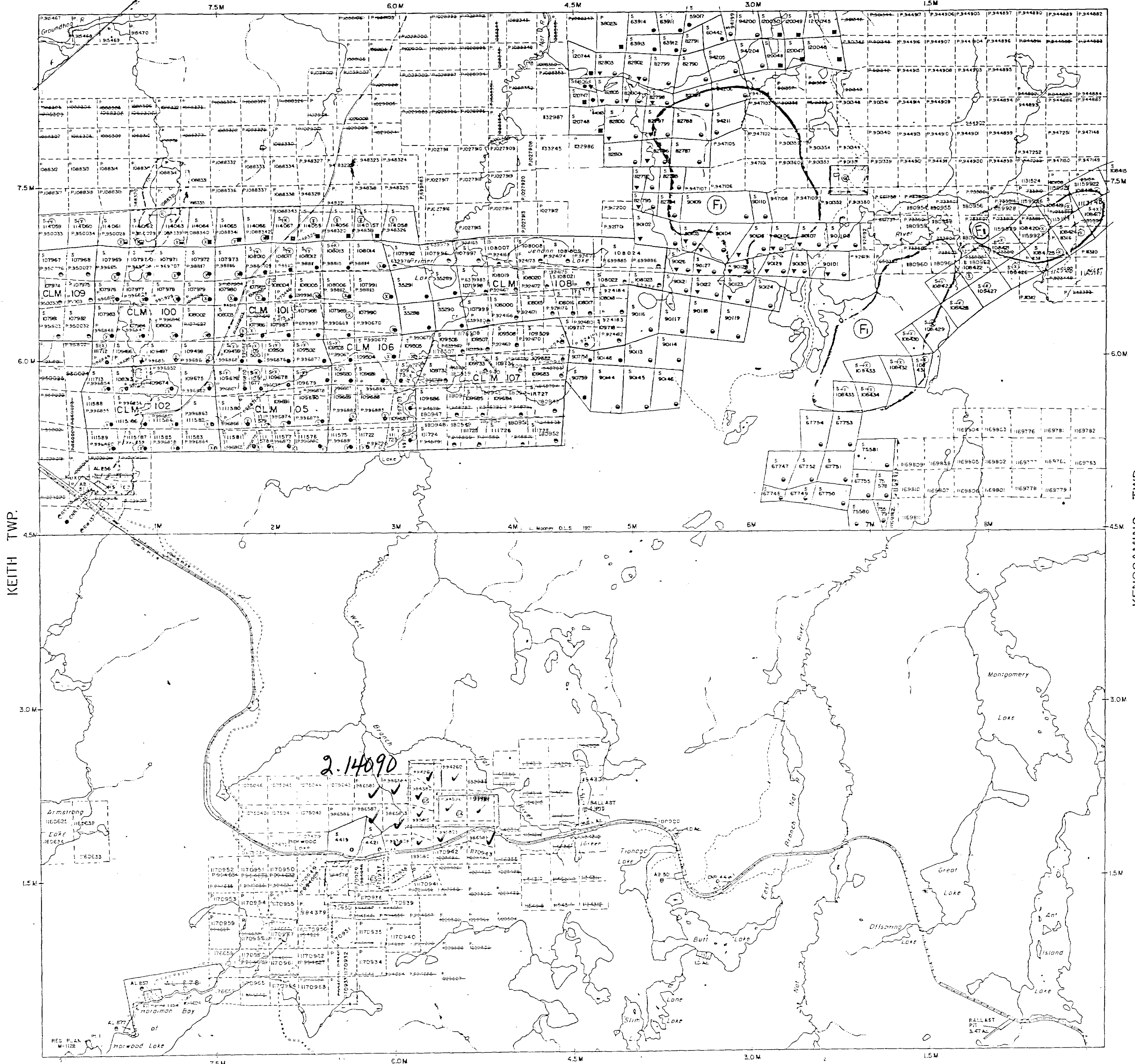
- GRAVEL FILE 38729
- GRAVEL PIT FILE 15555 V6
- GRAVEL FILE 106274
- QUARRY PERMIT #27805 ISSUED FOR THE REMOVAL OF THE QUARTZ JULY 1, 1987
- QUARRY PERMIT # 27806 ISSUED FOR THE REMOVAL OF QUARTZ APRIL 10, 1987
- CANCELLED PATENT AND LEASED CLAIMS

F- THIS TWP SUBJECT TO FOREST ACTIVITY IN 1991/92.
FURTHER INFORMATION AVAILABLE ON FILE.

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CON-



REEVES TWP.

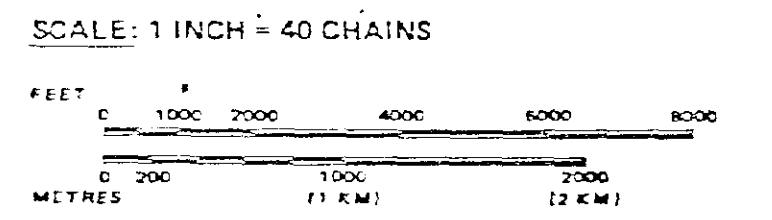


LEGEND

- HIGHWAY AND ROUTE No.
- OTHER ROADS
- TRAILS
- SURVEYED LINES:
 - TOWNSHIPS, BASE LINES, ETC.
 - LOTS, MINING CLAIMS, PARCELS, ETC.
- UNSURVEYED LINES:
 - LOT LINES
 - PARCEL BOUNDARY
 - MINING CLAIMS ETC.
- RAILWAY AND RIGHT OF WAY
- UTILITY LINES
- NON-PERENNIAL STREAM
- FLOODING OR FLOODING RIGHTS
- SUBDIVISION OR COMPOSITE PLAN
- RESERVATIONS
- ORIGINAL SHORELINE
- MARSH OR MUSKIE
- MINES
- TRAVERSE MONUMENT

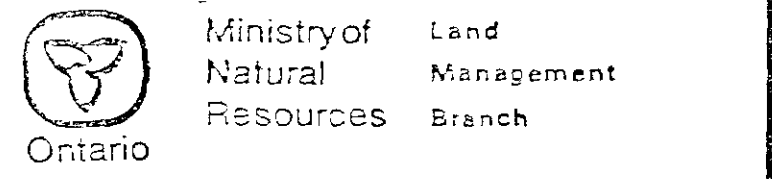
DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	
SURFACE RIGHTS ONLY	
MINING RIGHTS ONLY	
LEASE, SURFACE & MINING RIGHTS	
SURFACE RIGHTS ONLY	
MINING RIGHTS ONLY	
LICENCE OF OCCUPATION	
ORDER-IN-COUNCIL	
RESERVATION	
CANCELLED	
SAND & GRAVEL	
LAND USE PERMIT	



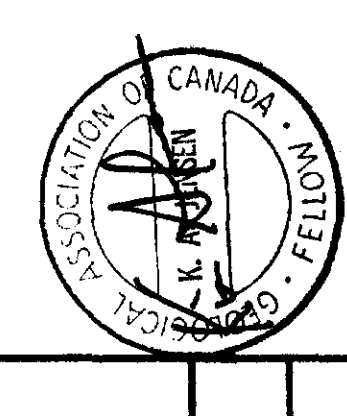
ACTIVATED JANUARY 30, 1990

TOWNSHIP
PENHORWOOD
M.N.R. ADMINISTRATIVE DISTRICT
CHAPLEAU
MINING DIVISION
PORCUPINE
LAND TITLES / REGISTRY DIVISION
SUDBURY



DATE MARCH 1995
Kensler
G-3244

HARDIMAN TWP.



SCALE 1:2400
 1 INCH = 200 FEET
 200 400 600 800
 SURVEY BY: KIM A. EISEN
 REVISION BY: KIM A. EISEN
 DATE: JAN. 15 - FEB. 9, 1990
 PROJECT NO.: 90-002
 FILE NO.:
 Kim A. Jensen
 Exploration and Consulting Services

PENHORWOOD TOWNSHIP
 PORCUPINE MINING DIVISION, **214090**

ROSEVAL SILICA INCORPORATED

VLF - EM IN PHASE & QUADRATURE VALUES
 CUTLER, MAINE

FIGURE 18

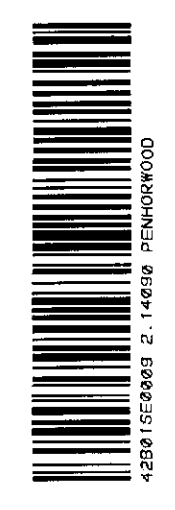
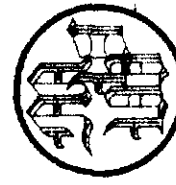
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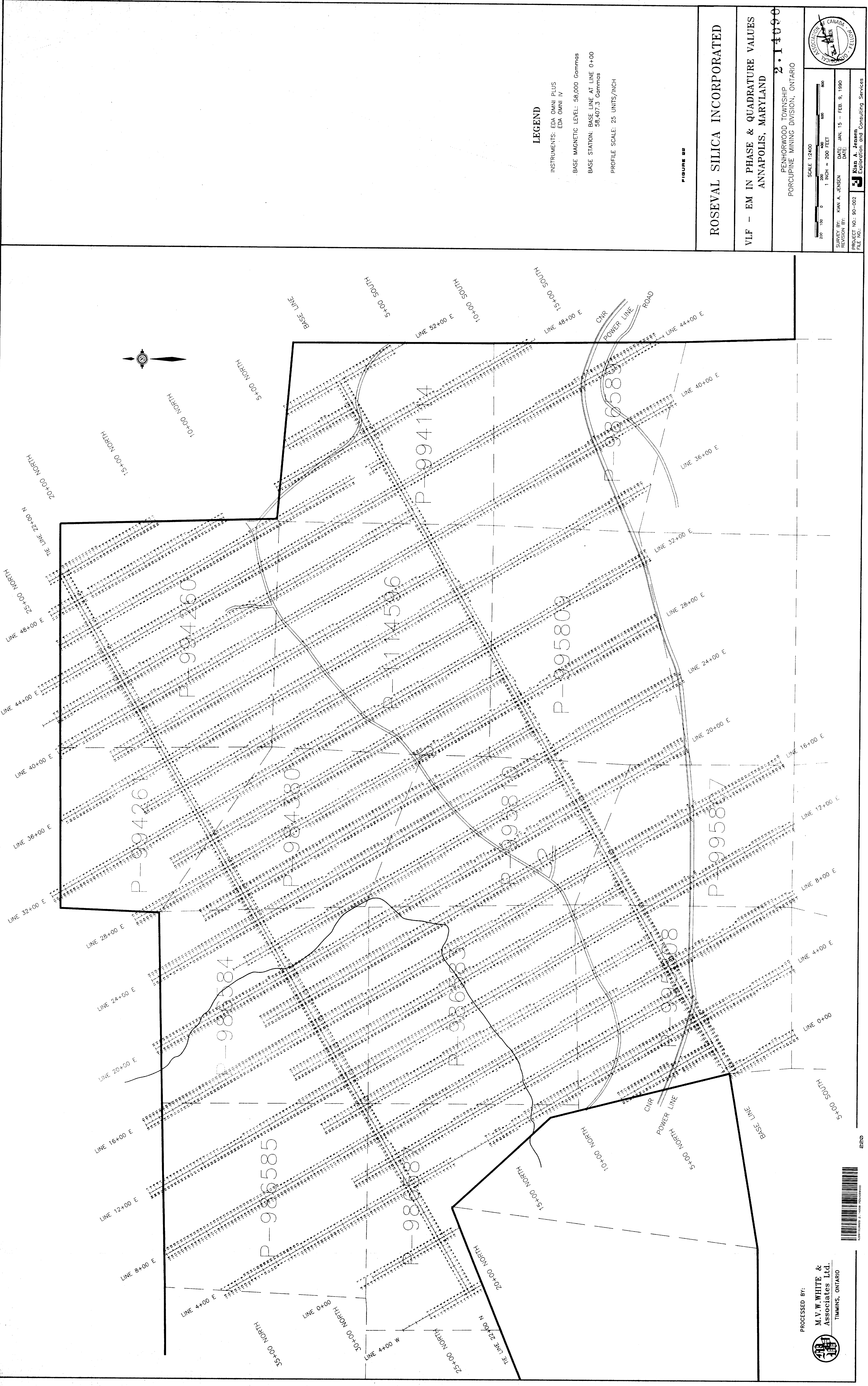
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 EDA OMNI IV
 BASE MAGNETIC LEVEL: 58,000 Gammas
 BASE STATION: BASE LINE AT LINE 0+00
 58,407.3 Gammas
 PROFILE SCALE: 25 UNITS/INCH



PROCESSED BY:

M.V. WHITE &
 Associates, Ltd.
 TIMMINS ONTARIO





LEGEND

INSTRUMENTS: EDA OMNI PLUS
EDA OMNI IV

BASE MAGNETIC LEVEL: 58,000 Gammmas

BASE STATION: BASE LINE AT LINE 0+00
58,407.3 Gammmas

PROFILE SCALE: 25 UNITS/INCH

FIGURE 82

ROSEVAL SILICA INCORPORATED

VLF - EM IN PHASE & QUADRATURE VALUES
ANNAPOLIS, MARYLAND

2.14090

PENHORWOOD TOWNSHIP
PORCUPINE MINING DIVISION, ONTARIO

SCALE 1:2400

1 INCH = 200 FEET

0 200 400 600 800

SURVEY BY: MIAN A. JENSEN DATE: JAN. 15 - FEB. 9, 1990

REVISION BY: DATE:

PROJECT NO.: 90-002

FILE NO.:

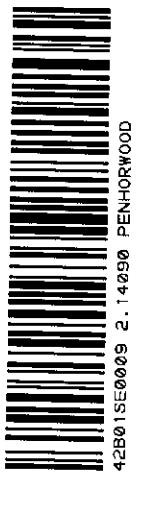
M. V. White & Associates Ltd.
TIMMINS, ONTARIO

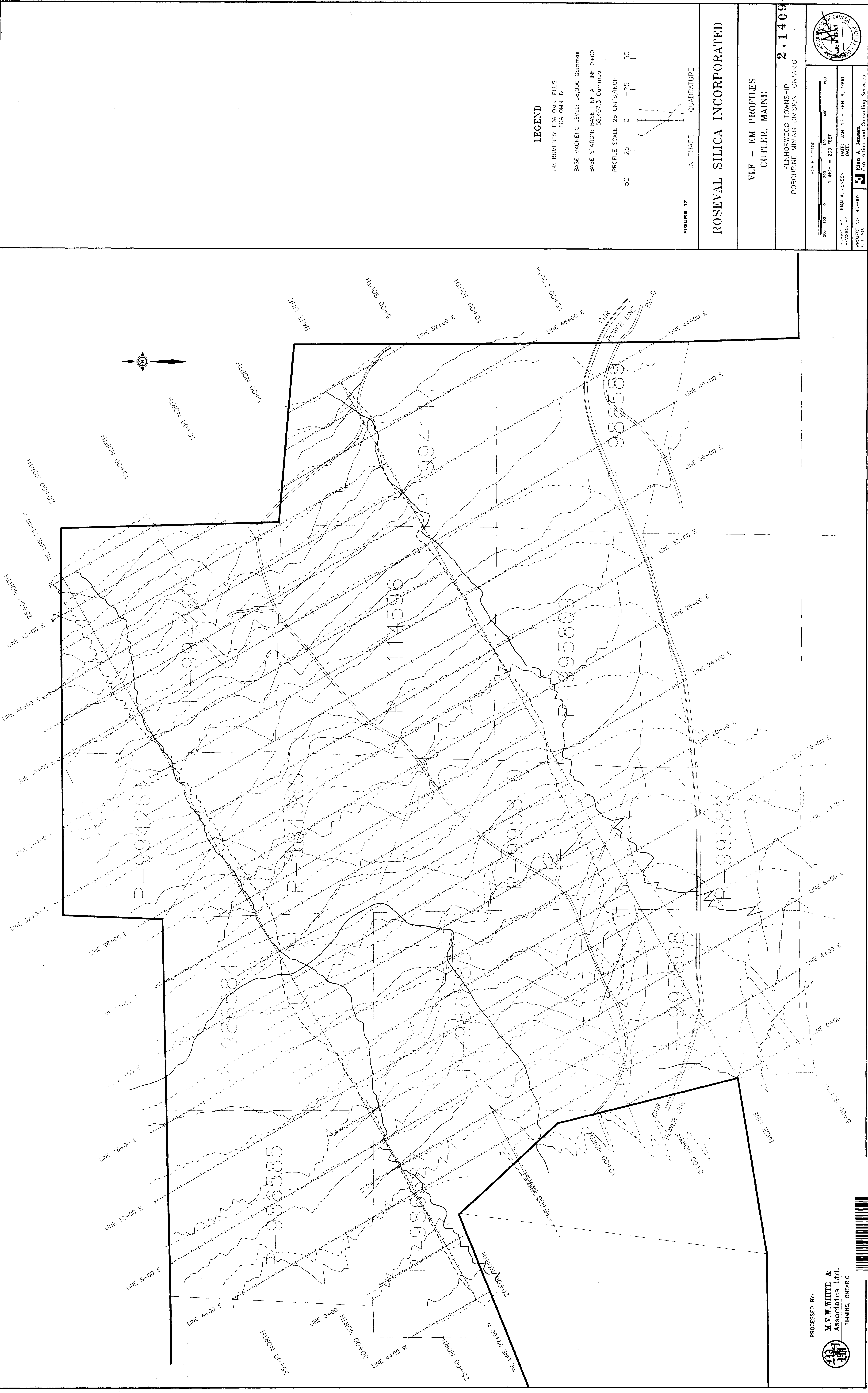
PROCESSED BY:

ASSOCIATION OF PROFESSIONAL ENGINEERS OF CANADA

PROCESSED BY:

M. V. White & Associates Ltd.
TIMMINS, ONTARIO





LEGEND

INSTRUMENTS: EDA OMNI PLUS
EDA OMNI IV

BASE MAGNETIC LEVEL: 58,000 Gammas

BASE STATION: BASE LINE AT LINE 0+00
58,407.3 Gammas

PROFILE SCALE: 25 UNITS/INCH

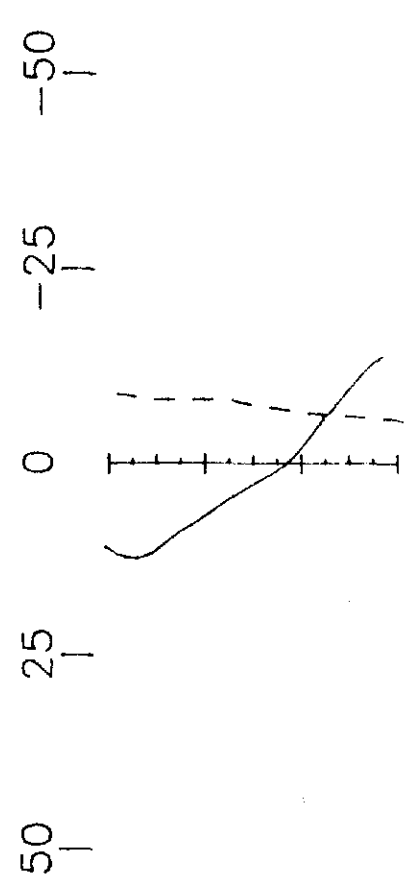


FIGURE 17 IN PHASE QUADRATURE

ROSEVAL SILICA INCORPORATED

VLF - EM PROFILES
CUTLER, MAINE

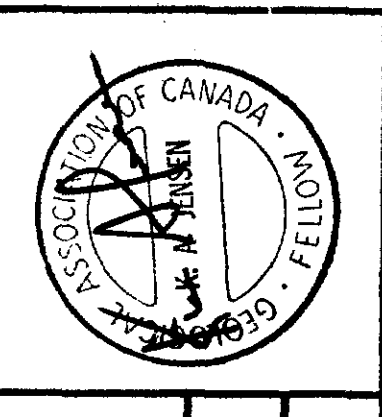
2.14090
PENHORWOOD TOWNSHIP
PORCUPINE MINING DIVISION, ONTARIO

SCALE 1:2400
200 400 0 200 400 800
1 INCH = 200 FEET

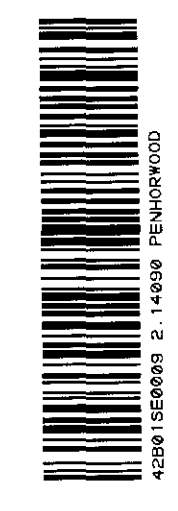
SURVEY BY: KIAN A. JENSEN
REVISION BY: DATE: JAN. 15 - FEB. 9, 1990

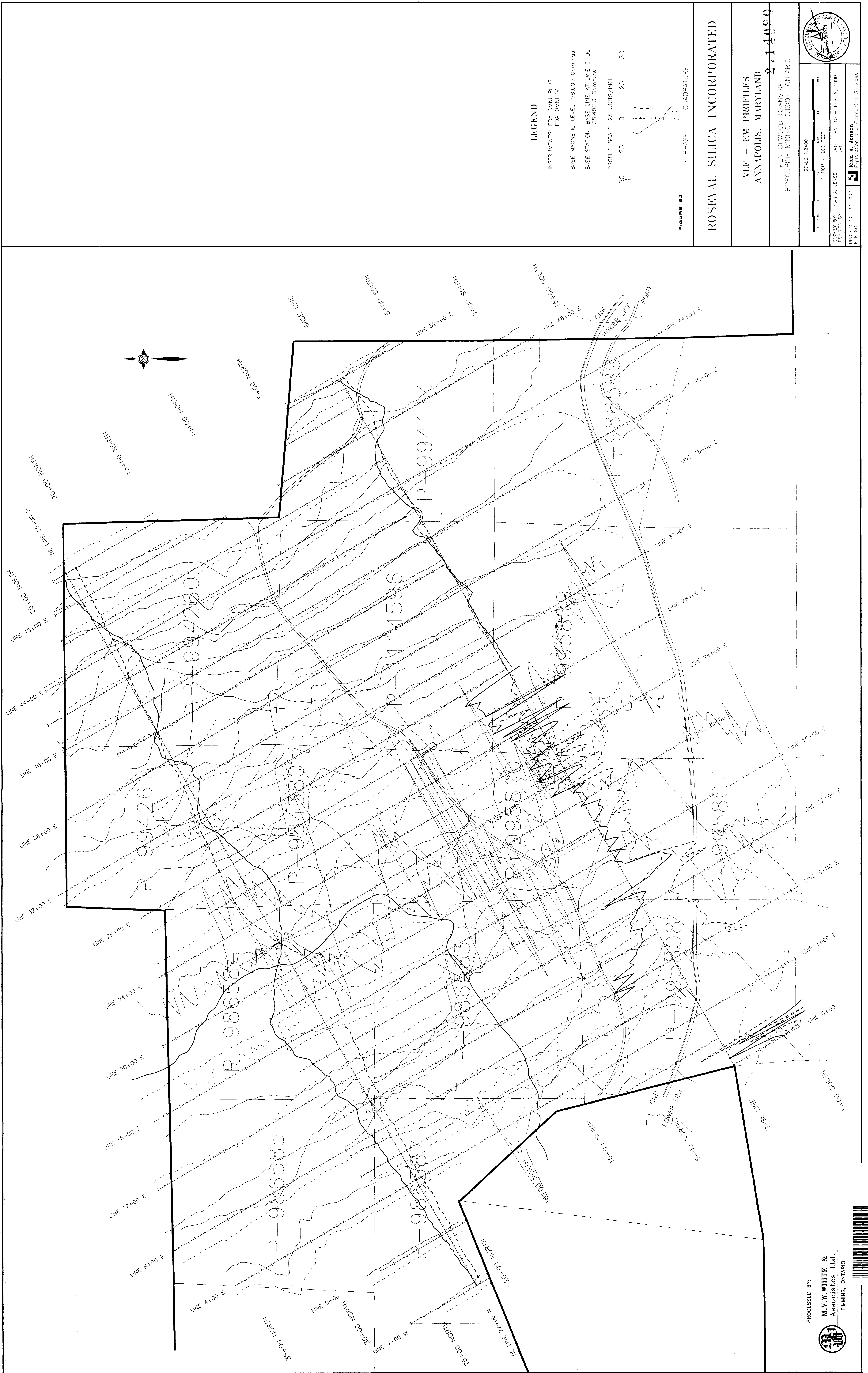
PROJECT NO.: 90-002
FILE NO.:

Kian A. Jensen
Exploration and Consulting Services



PROCESSED BY:
M.V. WHITE & Associates Ltd.
TIMMINS, ONTARIO





ROSEVAL SILICA INCORPORATED

VLF - EM PROFILES
ANNAPOLIS, MARYLAND

2-14-90
PENHORWOOD TOWNSHIP
PORCUPINE MINING DIVISION, ONTARIO

ASSOCIATION OF CANADA
REGISTERED PROFESSIONAL ENGINEER

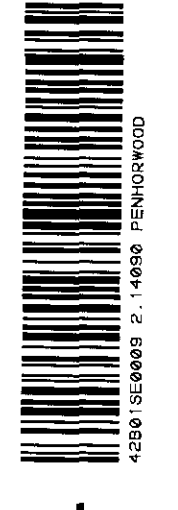
SCALE 1:2400
1 INCH = 200 FEET

DATE: JAN 15 - FEB 9, 1990

PROJECT NO: 90-002

PROCESSED BY: Kian A. Jensen
Exploration and Consulting Services

PROCESSED BY:
M.V.W. WHITE & Associates Ltd.
TIMMINS, ONTARIO





LEGEND

- INSURANCE FOR 2000-2005
- BASE VERTICAL LEVEL: 58,000 Gammis
- BASE STATION: BASE LINE AT LINE 0+00
- 58,400.0 Gammis
- SCALE: INTERVAL 20 GAMMIS
- 10 METRE CONTOUR INTERVAL
- 50 METRE CONTOUR INTERVAL

FIGURE 24

ROSEVAL SILICA INCORPORATED

FRASER FILTERED VLF - EM
ANNAPOLIS, MARYLAND

PENHORWOOD TOWNSHIP
POPUPINE MINING DIVISION, ONTARIO
2-14090

SCALE: HORIZONTAL
1:1000 = 300 FEET

DATE: JAN 15 - FEB 9, 1996
REVISION BY: K.A. JENSEN
PROJECT NO.: 98-002
FILE NO.: 2-14090

Klan A. Jensen
CONSULTING GEOLOGICAL SERVICES

PROCESSED BY:
M.V. WHITE & Associates Ltd.
TIMMINS, ONTARIO





LEGEND

INSTRUMENTS: EDA OMNI PLUS
EDA OMNI IV

BASE MAGNETIC LEVEL: 58,000 Gammas

BASE STATION: BASE LINE AT LINE 0+00
58,407.3 Gammas

CONTOUR INTERVAL: 20 GAMMAS

- 20 GAMMA CONTOUR INTERVAL
- 100 GAMMA CONTOUR INTERVAL
- 500 GAMMA CONTOUR INTERVAL

FIGURE 7

ROSEVAL SILICA INCORPORATED

CONTOURED TOTAL MAGNETIC FIELD

PENHORWOOD TOWNSHIP **2.14090**
PORCUPINE MINING DIVISION, ONTARIO

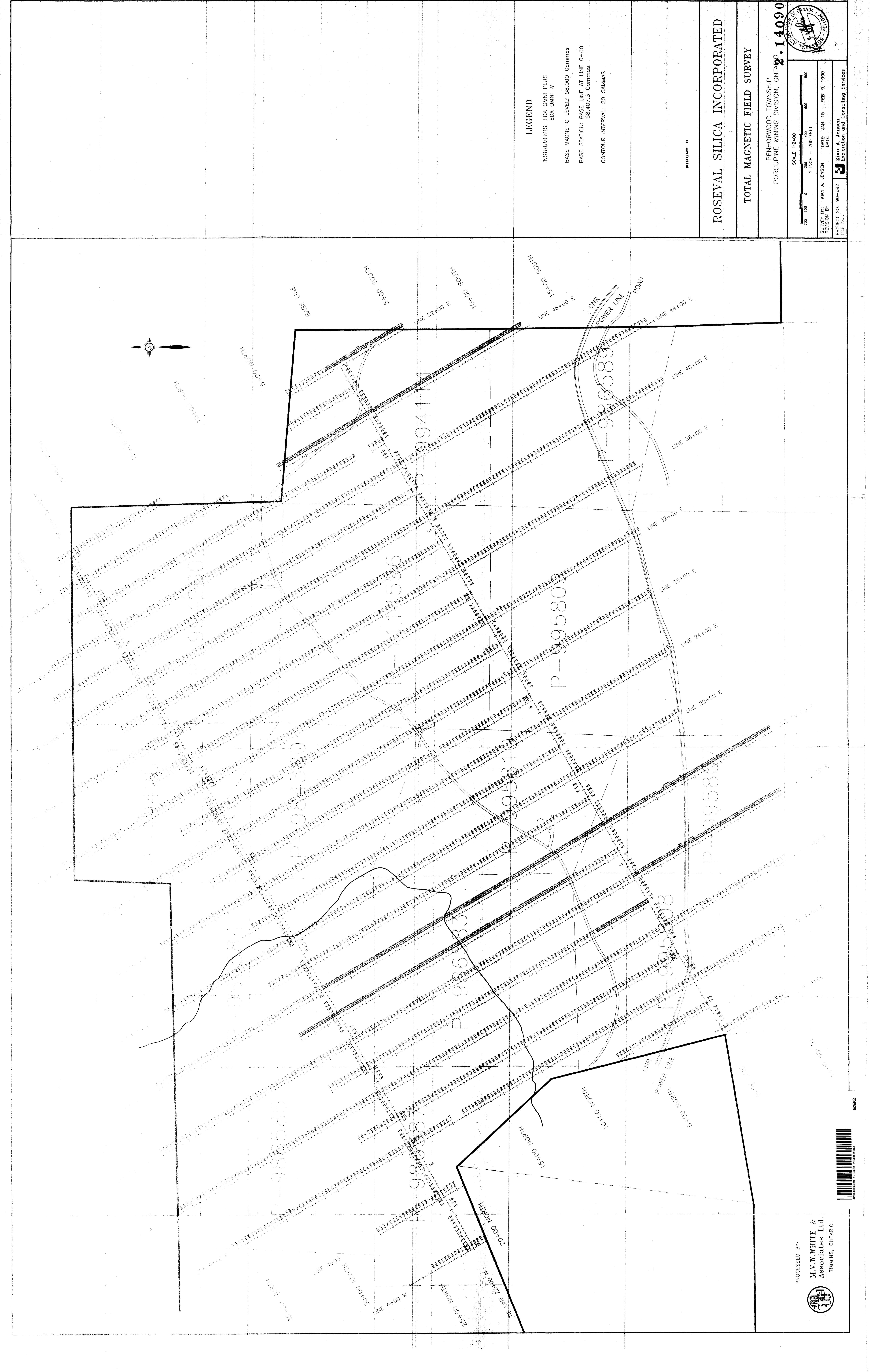
SCALE 1:2400
200' 400' 600' 800'
1" INCH = 200 FEET

DATE: JAN. 15 - FEB. 9, 1990
BY: KIAN A. JENSEN
PROJECT NO.: 90-002

Kian A. Jensen
Exploration and Consulting Services

ASSOCIATION OF CANADIAN
MAGNETIC
MAPPING
TECHNICIANS





LEGEND

INSTRUMENTS: EDA OMNI PLUS
 EDA OMNI IV
 BASE MAGNETIC LEVEL: 58,000 Gammas
 BASE STATION: BASE LINE AT LINE 0+00
 58,407.3 Gammas
 CONTOUR INTERVAL: 20 GAMMAS

FIGURE 6

ROSEVAL SILICA INCORPORATED

TOTAL MAGNETIC FIELD SURVEY

PENHORWOOD TOWNSHIP
 PORCUPINE MINING DIVISION, ONTARIO **2.14090**

SCALE 1:2400
 200' 100' 0' 1" INCH = 200 FEET
 SURVEY BY: KIM A. JENSEN DATE: JAN. 15 - FEB. 9, 1990
 REVISION BY: DATE:
 PROJECT NO.: 90-002
 FILE NO.:
 KIM A. JENSEN
 Exploration and Consulting Services

PROCESSED BY:

M.V. WHITE & ASSOCIATES LTD.
 TIMMINS, ONTARIO

