



32D04SW0389 63.2535 PACAUD

A Report on
 Magnetometer, E-M, & Geological Surveys
 of the Property of
 Royalvalley Copper Mines Ltd.
 Pacaud Township
 Ontario

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INTRODUCTION

In order to evaluate the potential and intelligently direct a programme of future exploration, a series of surveys were performed on the 11 claim group held by Royalvalley Copper Mines Ltd. in Pacaud Township, Kirkland Lake area of Ontario.

This property was formerly known as the Amity Copper & Gold, and a shaft to a depth of 1,000 feet is on the claims. A second shaft, known as the Patterson shaft lies to the south east and is connected underground.

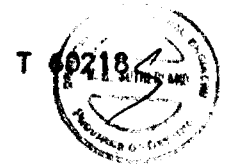
During the 1950's the property was high graded for copper to the 350 foot level.

PROPERTY

The property comprises 11 contiguous unpatented claims in Pacaud Township. The claim numbers are as follows:

- | | |
|---------|---------|
| T 58223 | T 60223 |
| T 58224 | T 60222 |
| T 58225 | T 60221 |
| T 58226 | T 60220 |
| T 58227 | T 60219 |

Staked on 3, 4, 15, & 16th, December, 1966 and
 August 20, 22, 23, & 24th 1967.



Cont. . .

LOCATION AND ACCESS

The claims are located in the north east portion of Pacaud Township just to the south of the town of Boston Creek. The shaft location lies 200 feet north of the road from Boston Creek and 400 feet north of the O.N.R. main line. Highway 564, connecting to Englehart, and highway 11 lies 1800 feet north. The town itself is 1000 feet to the west.

TOPOGRAPHY

The topography is typical of the pre-cambrian shield. Rounded hills and steep cliffs are present with maximum relief of about 200 feet. Because of the presence of the Boston Creek river valley, the relief is more extreme.

Bush comprises spruce, balsam, birch, poplar and slash, of medium density, with little swamp.

Outcrop is about 18% or less, with good exposure on hillside and cliff faces.

Power, rail, communication road and labour sources are present on the property.

GEOLOGY

The regional and structural geology was well covered in the qualifying report and will not be repeated herein; as well as the economic geology to 1960, and history.

While the area has been extensively mapped by the Ontario Department of Mines, and accurate maps are available, a geological mapping survey was taken in conjunction with the geophysical survey and is herein presented.

Cont. . .

SURVEY DATA

The property grid was outlined by cut and chained picket lines.

These lines were cut in a N.S. direction with 2 E.W. base lines and 4 E.W. tie lines. Line interval was 200 feet with 100 foot stations. Intermediate readings were used for detail with both the magnetometer and E.M., where a sufficiently anomalous reading indicated these were necessary.

The magnetometer survey was done with a McPhar M 700 fluxgate Magnetometer

A control grid was prepared in advance with check stations available for hourly checks and adjustments made to all readings for drift, temperature and diurnal variation, readings were then plotted and contoured.

The E.M. was conducted using a Crone Radem E.M. # that receives VLF radio signals from the many submarine radio guidance stations throughout the world. This signal is received much as from a normal E.M. transmitter and conductive materials are indicated by a signal differentiation. The signal used for this survey originated from the station at Cutler, Maine.

Readings were plotted in graphical manner with negative deflections shown on the left of the datum line with a scale of 40^o to the inch. Crossovers and indications of conductors are also shown on the map.



Cont. . .

Survey Data cont.

Geological and topographical features such as outcrop faults, shears, rock types, cliffs, creeks etc. were detailed in the traverse over the grid and shown on the map. All three maps were superimposed for interpretation.

E. M. RESULTS

The E. M. survey revealed a great many crossovers and inferred conductors. These have been identified by letters from A to X, with those conductors believed to be continuous structures, but shown with a break between zones numbered with a suffix of numbers - such as A-A₁. Those crossovers that are found on one line only are shown as X₁ etc.

Conductors are projected as follows, A, A₁, GC, C₁, X₅ basically unrelated to any magnetic expression. A and A₁ are inferred as the contact between acid tuffs and diorite zone. While no geological confirmation of G, C, C₁, X₅, as being the same structure is present, this specific area is low lying and covered with overburden and is presumed to be a similar condition.

Conductors K, K₁, M, L, X₂, R, R₁, T, T₁, V, B, J₂, J₃, B₁ are the expression of the Iron formation along which the copper values were located. Both shaft locations are on this structure and magnetic highs and lows are related. The area V and B are a prime target with strong magnetics and conductors.

The area of R₁ and T is also of great interest. Conductor S is a contact zone between acid tuff and syenite.



E. M. Results cont.

R₁ is indicative of a sulphide vein - geologically mapped and magnetically verified.

U, - U₁, probable shear or fault zone - wet - related partially to creek bed.

P, Q₁, Q are all related to magnetic highs, and are probably sulphides in fracture zone - secondary targets.

Conductors O, X, N have no magnetic correlation and again are believed to be contact zones between acid tuffs and porphyry - or a wet contact between outcrop and overburden. F is a cross fault zone or shear - water filled and indicated also by a stream course.

W - unexplained - probably due to surface contamination
ie. powerlines, machinery etc.

V - probable cross fracture

X₃ - surface contamination

X₆ - unknown - probably spurious

X₄ - cross fracture

Several conductors were located that bear definite relationship to magnetic anomalies or geologic and mineralized structures. These should be further investigated.

MAGNETIC SURVEY RESULTS

A number of magnetic anomalies were located, as well as magnetic lows and negatives.

These have been numbered from 1 to 23.

Cont.



Magnetic Survey Results cont.

The following numbers are assumed to be related to the iron and copper bearing formation and E.M. conductors found 15, 18, 11, 1, 2, 4, 5, 7, 8, 9. Those numbered 20, 21, 12, 13 and 23 are related to E.M. conductors and are considered very interesting.

The following are considered to be magnetic material of non economic value in either fault, shear or contact zones 22, 17, 24.

25 is believed to be a fracture or X fault related to 5.

3 is probably a pod of magnetic iron formation along the contact of the cherty tuff horizon. This is also a secondary target.

GEOLOGY

The geology is self explanatory and shown on the map supplied.

Two structures carrying sulphide mineralization were observed and much gossan.

Fault and shear zones were observed. Contacts are shown.

CONCLUSIONS

The surveys revealed that the mineralized iron formation structure is continuous and should be investigated further.

Several cross fractures or zones were also observed.

The zone in the south west corner indicated sulphide mineralization.

The surveys revealed several areas of prime interest and two of secondary interest. Both types are of sufficient importance to warrant further work.

Cont. .



Magnetic Survey Results cont.

The following numbers are assumed to be related to the iron and copper bearing formation and E.M. conductors found 11, 18, 11, 1, 2, 4, 5, 7, 8, 9. Those numbered 20, 21, 12, 13 and 23 are related to E.M. conductors and are considered very interesting.

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25 is believed to be a fracture or X fault related to 5,

3 is probably a pod of magnetic iron formation along the contact of the cherty tuff horizon. This is also a secondary target.

GEOLOGICAL SURVEY

The geological survey was performed over the grid cut for the geophysical survey. All outcrops were mapped and areas with less than 4 inches of obvious soil over outcrop was plotted as outcrop. Intermediate lines were run on a Brunton Compass.

GEOLOGY

The results of the mapping verified in the main the geology outlined in the report of K.D. Lawton, O.D.M. Vol. LXVI (66) part 5, 1957. This is condensed as follows:

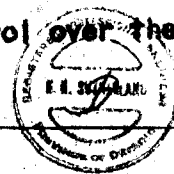
The country rock is predominantly Keewatin tuff or tuffaceous sediments that have been intruded by a large batholith of Algoman granite. The tuffs are thinly bedded, water-laid sediments now altered to hornblende-chlorite-epidote schists. A number of sill-like bodies of altered diorite occur in the tuffs; and the feldspar porphyry and lamprophyre, as dikes and sill-like masses, intrude both the granite and tuffs. A narrow horizon of



acid and cherty tuffs is intercalated with the main band of Kewatin tuffs. It is more siliceous in composition and is distinguished from the latter by a lighter-coloured, lighter-weathering appearance; it strikes northwesterly parallel to the contact of the granite batholith, at a distance of 100 to 200 feet northeast of it. Narrow layers of banded siliceous iron formation, ranging from 4 to 10 feet wide, occur on both sides of the acid tuff horizon along its contact with the more basic tuffs. The iron formation may be mineralized with sulphides, and surface exposures of this rock are often marked by rusty-weathering outcrops. The importance of the iron formation lies in the fact that it appears to have been the horizon most favourable to replacement by copper sulphides. The horizon of favourable iron formation extends westward from the village of Boston Creek to a cross-fault that strikes south through lot 6, concession VI, Pacaud township; in the south half of lot 6, concession VI, a band of rusty-weathering outcrops is believed to be the faulted extension of this horizon.

The tendency of iron formation to occur along contacts of acid tuff bands makes the country rock along the contact of the Round Lake batholith between Boston Creek and Round Lake favourable for copper prospecting. Considerable acid tuff is exposed in this area and the contacts of these bands could be prospected for possible associated iron formation favourable to copper-sulphide replacement.

Locally on the property the acid tuffaceous horizon, and the accompanying iron formation lies about 200 to 400 feet NE of the contact. The sulphide enrichment appears to be general along the tuffaceous contact, with erratic zones carrying high copper values. It was attempted to relate surface showings and geophysical variations between iron and copper bearing sections, but this was not possible. It was suggested however that a control over the



copper deposition might be caused by quartz vein injection and/or cross faulting striking N.E. S.W., with copper enrichment occurring at the intersections.

While this was not conclusively proven there was a strong inference of this theory being valid. It was not readily possible to trace all the intersecting structures from surface but might be so using the magnetic survey.

Indications are that the copper bearing structures are continuous to some depth, - although breaking up and rejoining in strngers was suggested. It is felt that many more copper bearing sections are present than were located, and parallel structures may be present.

CONCLUSIONS

The surveys revealed that the mineralized Iron formation structure is continuous and should be investigated further.

Several cross fractures or zones were also observed.

The zone in the south west corner indicated sulphide mineralization.

The surveys revealed several areas of prime interest and two of secondary interest. Both types are of sufficient importance to warrant further work.



RECOMMENDATIONS

In order to most effectively obtain economical information, a two pronged attack is suggested.

The prime targets should be diamond drilled using A core equipment.

An initial contract for 2,000 feet should be issued, with provisions for extensions.

Three series of holes will be shown

A - Immediate 2,000 ft.

B - follow up 2,000 ft.

C - secondary 2,000 ft.

Initially holes to be 400 feet at 45° and 70°.

During the course of this, further geophysical work should be undertaken to more closely detail the anomalies.

This would be vertical loop E.M. using a fixed transmitter, gasoline powered large unit, and further reconnaissance using the Radem on other stations. This should more economically than drilling, detail target areas for the B and C phases of drilling.

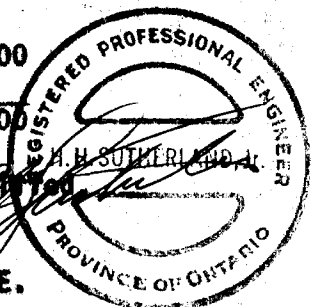
Estimated costs

Drilling phase A	\$10,000.00
Drilling phase B	10,000.00
Drilling phase C	10,000.00
Geophysical check	3,000.00
Engineering supervision, travel, contingency	2,000.00
Estimated Total	<u>\$35,000.00</u>

Toronto, Ontario
20th June, 1969

Respectfully submitted

H. H. Sutherland,
B.A.Sc., P.Eng., M.E.



Technical data required for survey submission

Township PACAUD

<u>Claim Numbers-</u>	T 58223	T 60223
	T 58224	T 60222
	T 58225	T 60221
	T 58226	T 60220
	T 58227	T 60219
		T 60218

Instrument used - CRONE RADEM
 McPHAR M700 FLUXGATE MAGNETOMETER
 VISUAL GEOLOGY

Line grid and direction= NORTH SOUTH
 200' LINE INTERVALS
 100' STATIONS

Number of miles of line cut- 20.1

Number of miles surveyed- 52.2

Date of work- MAY 19TH - JUNE 11TH

Certified correct

H.H. Sutherland, B.A.Sc., P.Eng., M.E.

Boston Twp.

THE TOWNSHIP
CLAIM OF MAP
PACAUD

DISTRICT OF
TIMISKAMING

LARDER LAKE
MINING DIVISION

SCALE 1-INCH=40 CHAINS

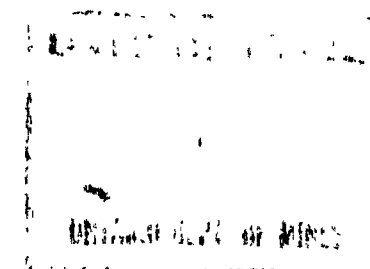
LEGEND

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	X
CANCELLED	C

NOTES

400' Surface rights reservation around all lakes and rivers

(P) S.R.O. shown thus



X - claims covered

● - claims covered

PLAN NO. - M. 380

DEPARTMENT OF MINES

— ONTARIO —

VI

V

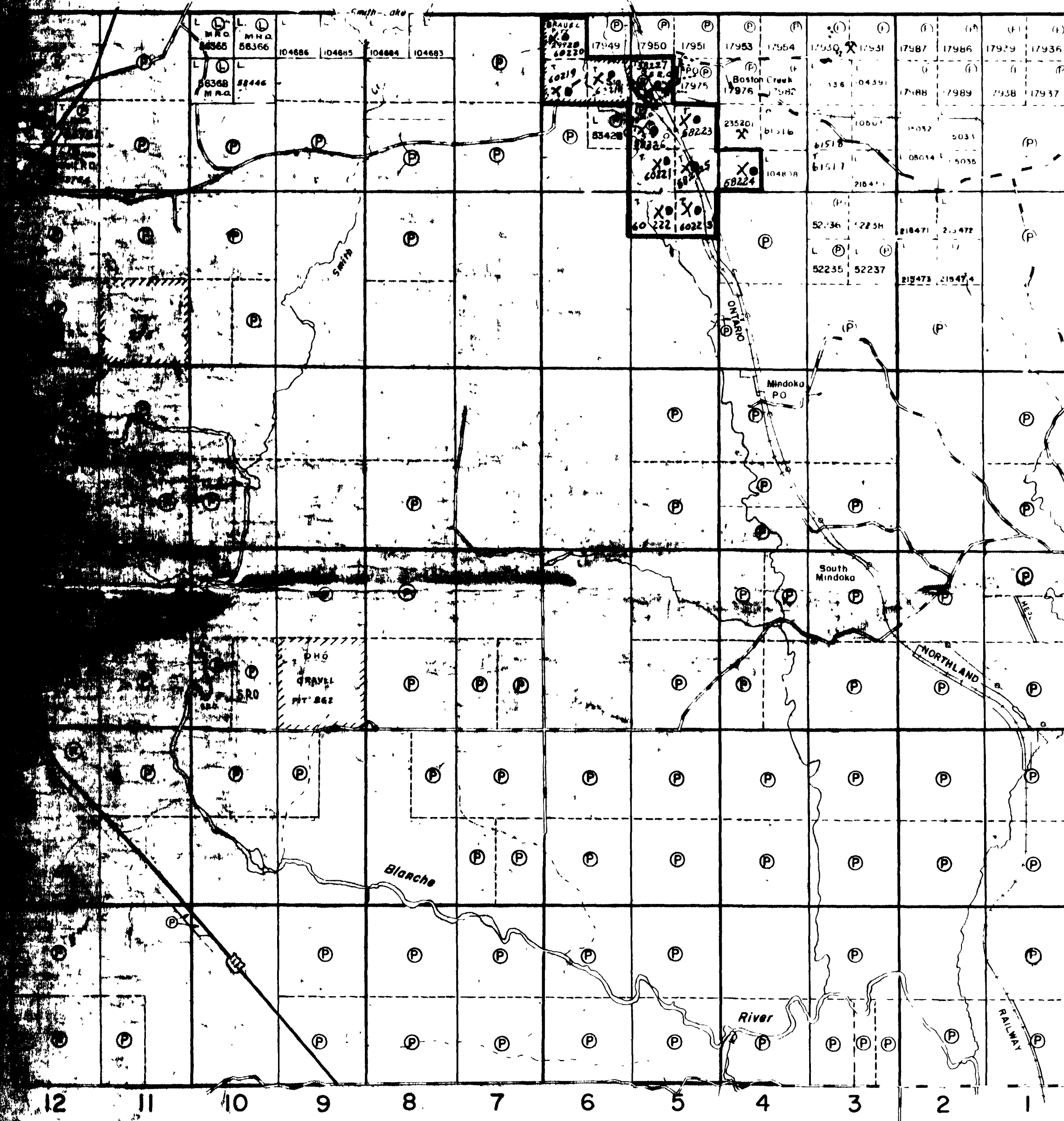
IV

III

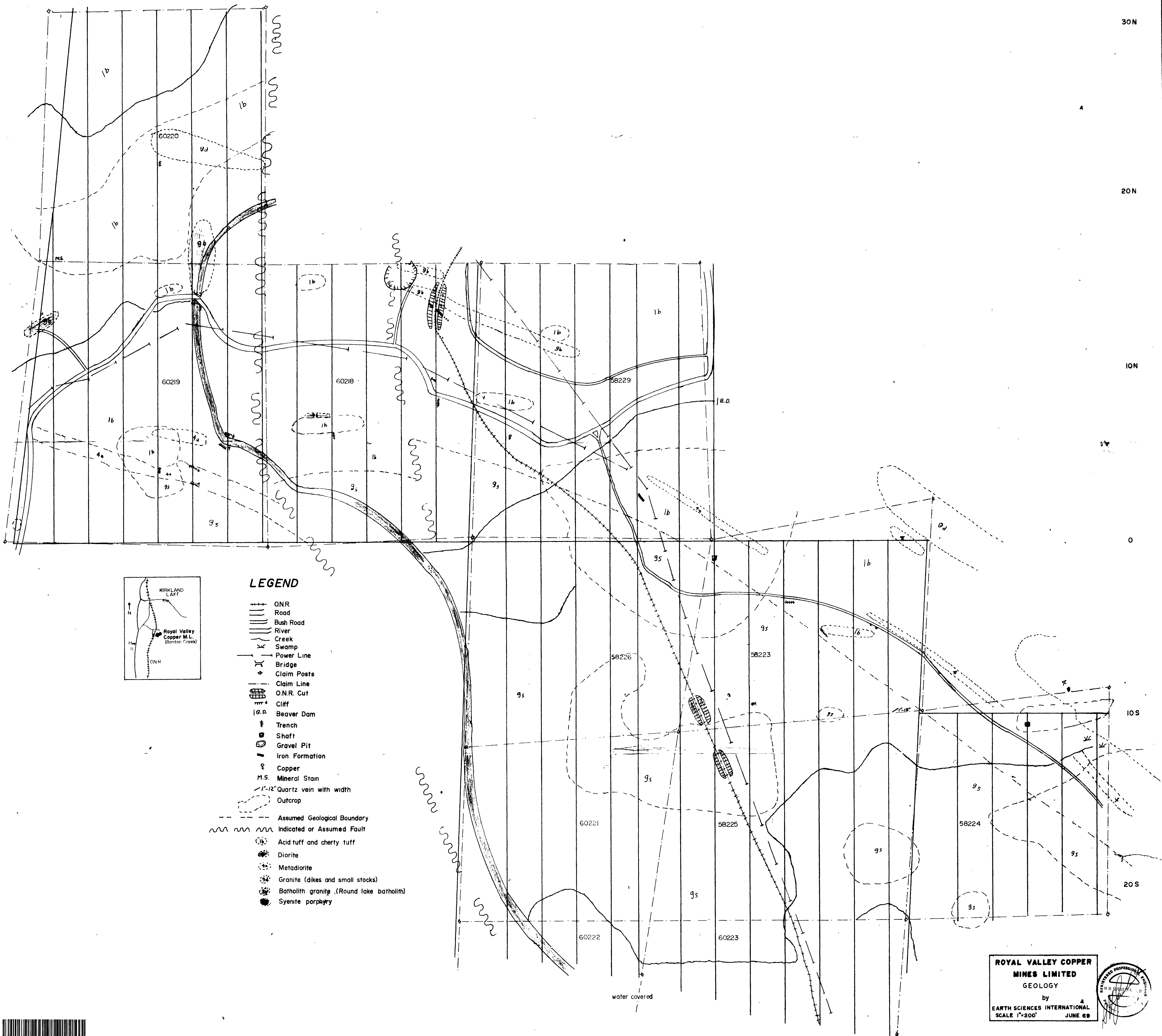
II

I

Catharine Twp.

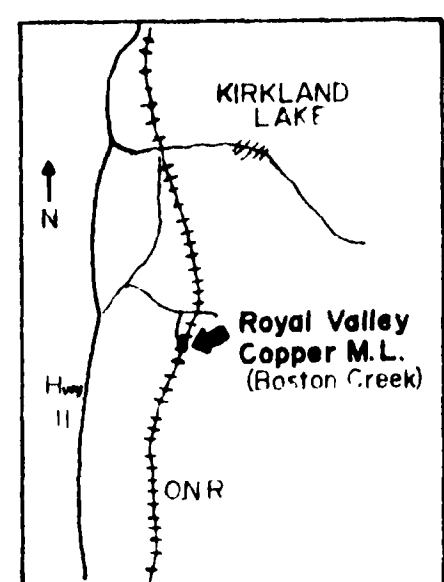


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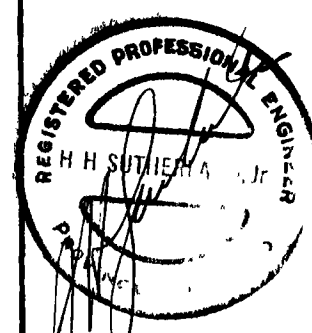


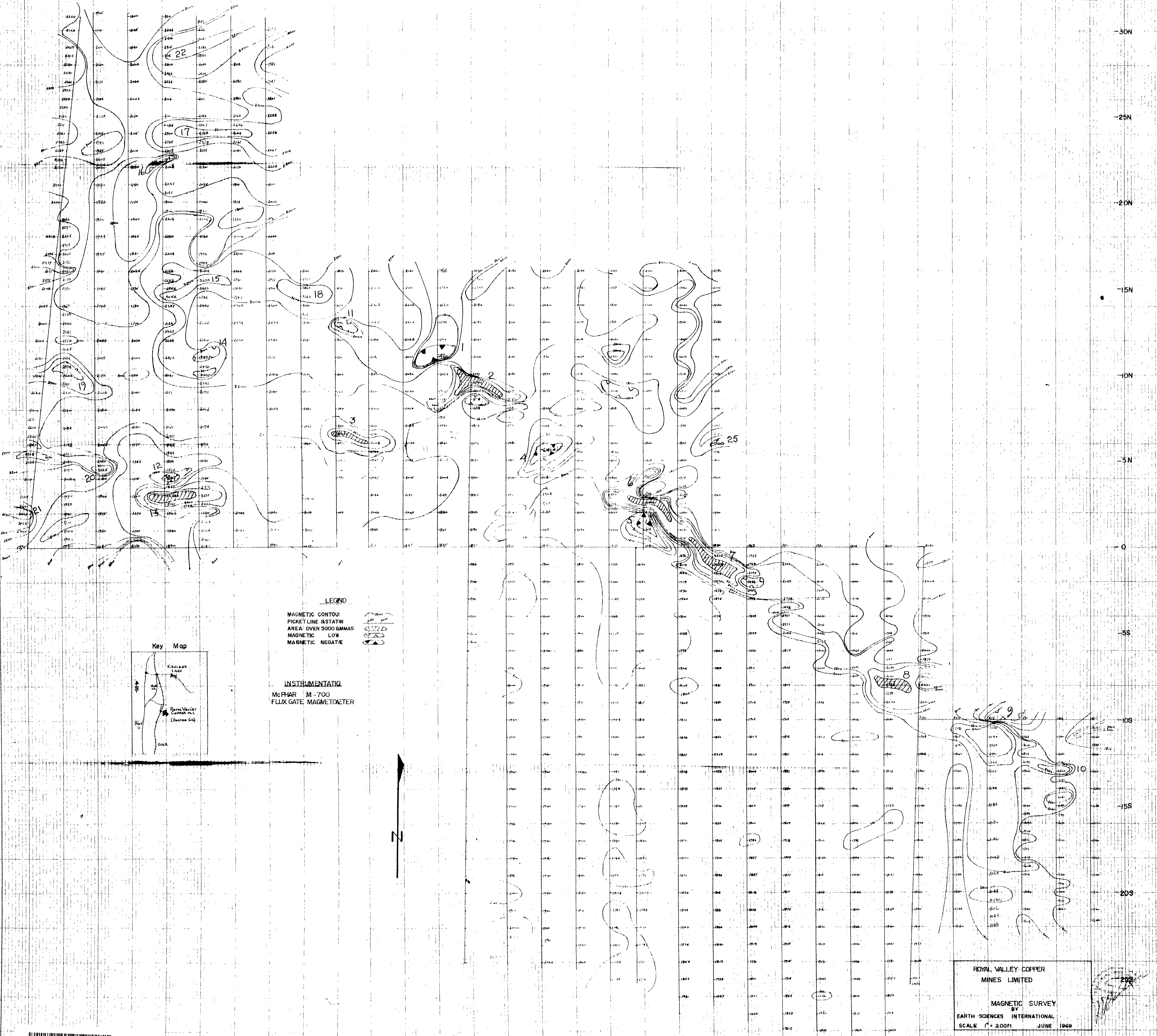
LEGEND

- ONR
- Road
- Bush Road
- River
- Creek
- Swamp
- Power Line
- Bridge
- Claim Posts
- Claim Line
- O.N.R. Cut
- Cliff
- Beaver Dam
- Trench
- Shaft
- Gravel Pit
- Iron Formation
- Copper
- M.S. Mineral Stain
- 1'-12" Quartz vein with width
- Outcrop
- Assumed Geological Boundary
- Indicated or Assumed Fault
- Acid tuff and cherty tuff
- Diorite
- Metadiorite
- Granite (dikes and small stocks)
- Batholith granite (Round lake batholith)
- Syenite porphyry

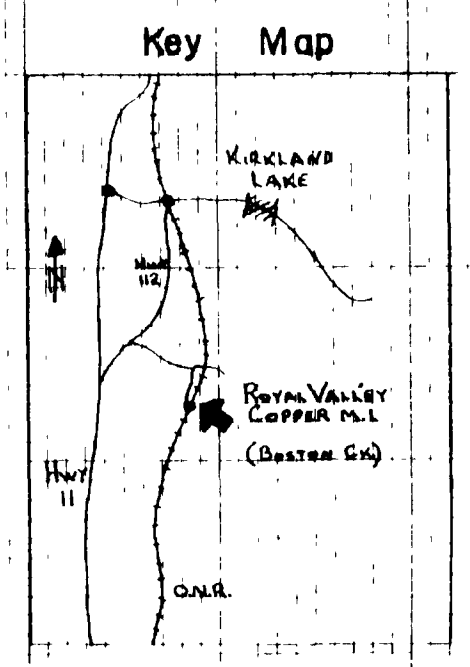


**ROYAL VALLEY COPPER
MINES LIMITED**
GEOLOGY
by
EARTH SCIENCES INTERNATIONAL
SCALE 1"=200' JUNE 69





LEGEND
MAGNETIC CONTOUR
PICKET LINE STATION
AREA OVER 5000 GAMMAS
MAGNETIC LOW
MAGNETIC NEGATIVE

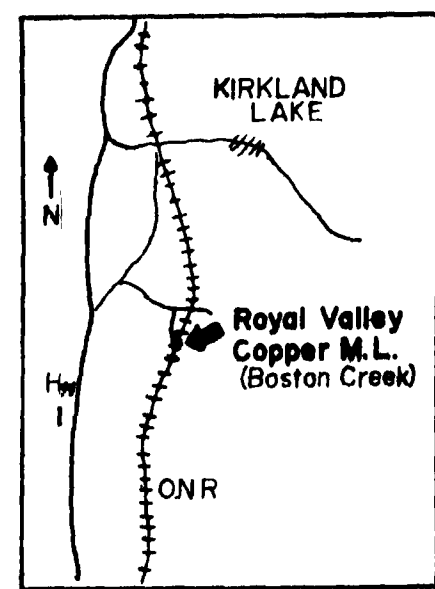
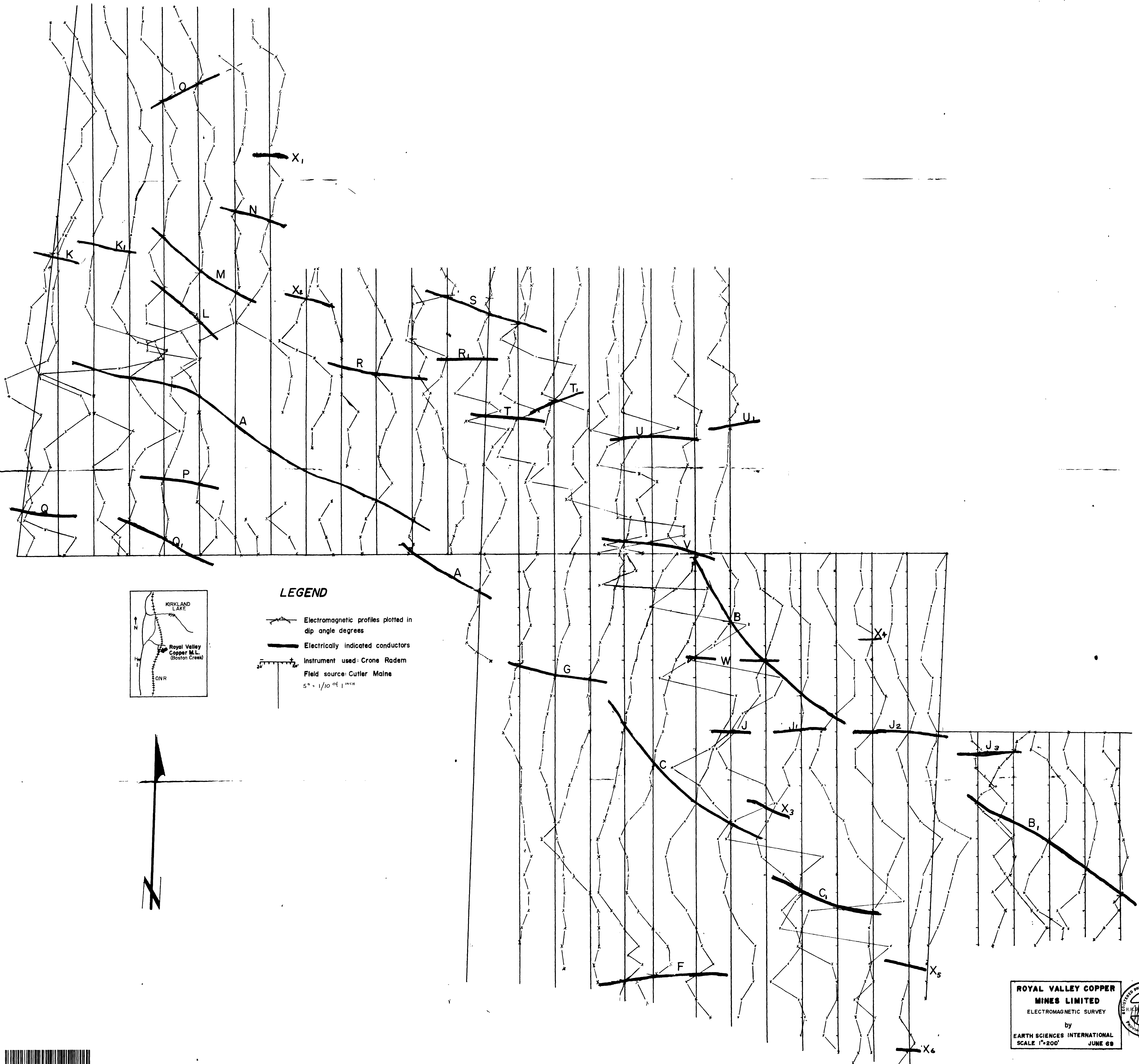


INSTRUMENTATION
McPHAR M-700
FLUX GATE MAGNETOMETER



ROYAL VALLEY COPPER
MINES LIMITED
MAGNETIC SURVEY
BY
EARTH SCIENCES INTERNATIONAL
SCALE 1" = 200ft. JUNE 1969





LEGEND

- Electromagnetic profiles plotted in dip angle degrees
- Electrically indicated conductors
- Instrument used: Crone Radem
- Field source: Cutler Maine
- 5" = 1/10" @ 1" = 1" = 1"



ROYAL VALLEY COPPER
MINES LIMITED
ELECTROMAGNETIC SURVEY
by
EARTH SCIENCES INTERNATIONAL
SCALE 1"=200' JUNE 68

