013626

LAD MINERAL CLAIM GROUP

REPORT ON 1968 FIELD WORK (GEOLOGICAL, GEOCHEMICAL, GEOPHYSICAL)

LAD CLAIMS 3-12, 19-34, 45-62, 65-228

Mayo Mining District
Yukon Territory

Longitude : 132° 14' W. (Approx.)
Latitude : 62° 56' N. (Approx.)

N.T.S. 105-K-16

Field work done in period
July 23 - Sept. 28, 1968

By:

THOMAS J. ADAMSON

ATLAS EXPLORATIONS LIMITED

January 9, 1969

LIST OF CLAIMS

Claim Number	Grant Number	Date Recorded
Lad 3-12	Y14068-Y14077	Oct. 11, 1967
Lad 19-24	Y14136-Y14141	Nov. 3, 1967
25-34	Y14078-Y14087	Oct. 11, 1967
45-48	Y14218-Y14221	Nov. 6, 1967
49-62	Y14142-Y14155	Nov. 3, 1967
65-102	Y31259-Y31296	Sept. 10, 1968
103-168	Y31310-Y31375	Sept. 17, 1968
169-188	Y31437-Y31456	Oct. 4, 1968
189-228	Y31461-Y31500	Oct. 16, 1968

132° 14'

62° 56'

MOTO CREEK

CLEARWATER CREEK

HUGO CREEK

EAST CREEK

SHOWING J CREEK

BL. 1

BL. 2

24W 16W 8W 0 8E 16E 24E 32E 40E 48E 56E 64E 72E 80E 88E 96E 104E 112E 120E 128E 136E 144E 152E 160E 168E 176E 184E 192E 200E 208E 216E 224E 232E 240E

24W 16W 8W 0 8E 16E 24E 32E 40E 48E 56E 64E 72E 80E 88E 96E 104E 112E 120E 128E 136E 144E 152E 160E 168E 176E 184E 192E 200E 208E 216E 224E 232E 240E

MT - SELOUS (7138') : 8.25 MILES

NOTES: ONLY 800' SPACED GRID LINES SHOWN (INTERMEDIATE FILL-IN LINES NOT SHOWN)

LAD # 1 GRID AREA LINE 16W TO 96E, 55S TO 50N

LAD " EAST GRID AREA LINE 104E TO 240E

LAD " NORTH GRID AREA LINE 24W TO 24E, 40N TO 105N

105-K-16

ATLAS EXPLORATIONS LIMITED

ROSS RIVER (Y.T.)

HESS REGION

LAD MINERAL CLAIM GROUP

KEY MAP OF CLAIMS AND GRID

PARTY CHIEF: T. ADAMSON

DRAWN BY: T.A & P.V.

DATE: DEC. 4/1968

1320 0 1320 2640

SCALE IN FEET

inches 0 1 2

centimetres 0 1 2 3 4 5

YUKON GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

fig. 1

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LAD MINERAL CLAIM GROUP
REPORT ON 1968 FIELD WORK
(Geological, Geochemical, Geophysical)
Lad Claims 3-12, 19-34, 45-62, 65-228

INTRODUCTION

The original Lad Group Claims (Lad 3-12, 19-34, 45-62) were staked in September and October, 1967, to cover the area of three Cu, Pb, Zn,Ag mineral showings, a number of sulphide float occurrences, and high lead results from reconnaissance soil and gossan sampling.

A large number of claims contiguous to the original Lad Group were staked during the 1968 field season. These claims cover mineral showings and geochemical anomalies that were discovered and defined in the course of the 1968 field program.

A total of 208 claims are now held (Fig.1). The original claims staked in 1967 have been common dated to March 1, and representation work sufficient to hold the claims for 4 years has been filed. For groups Lad 65-102 and Lad 103-168, enough representation work was filed to hold the claims for one year from the recording date (coming due September 10 and September 17, 1970, respectively). The value of the work done was not sufficient to be able to common date these claims to March 1. Groups Lad 169-188 and Lad 189-228 were staked at the end of the field season and no work was done on them. For this reason no representation work could be filed for these claims. These groups come due October 4, 1969 and October 16, 1969, respectively.

A property evaluation crew, ranging in numbers from 5 to 15 men, spent from July 23 to September 28, 1968 on the Lad Group. The work done in this period consisted of linecutting, geological mapping and prospecting, geochemical surveying, geophysical surveying (ground and airborne), hand trenching and assay sampling.

LOCATION AND ACCESS

The Lad Group is located on the SE slope of the Mt. Selous complex, in the north-central portion of claim sheet 105-K-16. Ross River, Y.T., the nearest settlement, is located about 65 air miles south of the claim group. The Canol Road, running to the northeast of Ross River, Y.T., comes to within 38 miles of the Lad Group at the point where the road adjoins the south-east end of Dragon Lake.

Access to the property can be made by float-equipped fixed-wing aircraft to "Van Lake", about 7 miles east of the claims. Helicopter support is required from this lake to the property.

LINECUTTING

All geological mapping, geochemical surveying and ground geo-physical surveying was done in reference to a grid cut over the Lad Claims (Fig.1). This grid is made up of 449,800 ft. (85.2 miles) of cut line. The grid was controlled by chain and compass methods. Stations were established at 100 ft. intervals on all lines. The grid has two base lines, both trending 135° (B.L. 1 at 0 N, 25,600 ft. long, and B.L. 2 at approximately 85 N, 4800 ft. long). Cross lines run at 045°. Cross lines were originally cut at a spacing of 800 ft., but this was reduced to 400 ft. or 200 ft. in areas where more detail was required. The grid has been divided into three sections. The section referred to as the #1 Grid Area includes lines 16W to 96E, 55S to 40N.

The Lad East Grid Area includes all of lines 104E to 240E.
The Lad North Grid Area includes lines 24W to 24E, 40N to 105N.

TECHNICAL SURVEYS

Section I - Geological Surveys (Mapping, Prospecting, Hand Trenching, Assay Sampling)

Regional Geologic Setting

The Lad Group lies northeast of a major northwest-southeast trending lineament along the South Macmillan River. This lineament resembles the Tintina Fault to the southwest. The area is underlain by northwesterly trending open to moderately tightly folded rocks.

A northwest-southeast trending intrusive belt consisting of two large granodiorite to quartz dioritic plutons (Mt. Armstrong and Mt. Selous) and numerous smaller marginal plutons is located just northeast and parallel to the South Macmillan lineament. The contact of the Mt. Selous pluton is about 2 miles west of the Lad Group.

Two major stratigraphic levels occur in the area: Proterozoic and Devonian-Mississippian. The Proterozoic rocks, mainly quartzites, phyllites and limestones occur in a Proterozoic arch trending along the Mt. Armstrong - Mt. Selous axis. The Devonian-Mississippian section is composed mainly of low grade, usually graphitic, metasediments. The most abundant rock types are graphitic cherts, shales and slates, and chert pebble conglomerate (Fig.2).

Table of Geologic Formations

Cretaceous		
11		Granitic Intrusives
	---------- Intrusive Contact ----------	
Devonian-Mississippian (?)		
3	3h	Chert; finely laminated, green and white chert and associated slates, green chert (Upper Devonian?)
	3g	Red and green slates
	3f	Grey bedded chert (Upper Devonian?)
	3e	Alkalic basalt (?)
	3d	Chert-pebble conglomerate, minor quartzite (Upper Devonian?)
	3c	Phyllite, grey to green, indurated slates
	3b	Calcareous rocks; limestone, crystalline and argillaceous; calcareous argillite, chert-pebble limestone, minor dolomite.
	3a	Carbonaceous rocks; graphitic slates; black chert; graphitic argillite; poorly sorted feldspathic quartzites (graphitic greywacke) (Mississippian (?) in part; clastic unit).
--------- Unconformity or Fault Contact ---------		
Proterozoic		
1	1e	Chloritic schists, biotite quartzite, phyllite with interbeds of buff sandstone and quartzite.
	1d	Conglomerate; massive, quartz pebbles.
"Yukon Group"	1c	Phyllite and serecitic schists; occasionally gritty.
*Bostock	1b	Limestone; finely crystalline, banded to massive; minor quartz-pebble limestone.
	1a	Quartzite, feldspathic quartzite, minor serecite schist, phyllite and slate.

Note: Alphabetical designations ascribed to the various rock-units have no time or sequential significance.

Geology of Claim Group Area (Fig.3)

Outcrop is very limited in the grid area, except in the creek beds. The area is underlain mainly by a succession of Proterozoic rocks striking at about 120° to 150°, and dipping from 40° to 90°, generally to the northeast, but in some cases to the southwest. Proterozoic quartzite, of unit 1a, is by far the most abundant rock type in the Lad Group area. Unit 1a grades from clean, blocky, massive quartzite to well bedded feldspathic micaceous quartzite to quartzose serecite schist. Some Proterozoic limestone and phyllite is also found in the claim group area.

Some Devonian-Mississippian rocks have been infolded (?) into the Proterozoic section. These rocks consist mainly of graphitic slate and shale, graphitic chert, and chert pebble conglomerate.

A small pluton of granitic orthoclase porphyry outcrops on the grid at about L80E, 28N. A narrow dyke (≤ 10 ft. thick) of quartz-orthoclase porphyry outcrops in Hugo Creek at 33E, 22S.

No detailed geological mapping has yet been done in the East Grid area. However, by extending known geology, and from brief observations in this area, it is thought that the geology here is similar to that to the northwest. That is, a steeply dipping section of Proterozoic rocks, mainly quartzite, into which have been infolded a number of narrow wedges of graphitic Devonian-Mississippian rocks.

Description of Mineral Showings

A number of sulphide mineral showings have been found in the claim group area. The mineralization occurs in vein

fracture zones and shear zone impregnations.

Showing A — Located in Hugo Creek, at 38E, 23S. It consists of galena, sphalerite, pyrite, and quartz as fracture fillings in a shear breccia. The shear (155/20S) cuts across quartz serecite schist (130/20S). The width of the mineralized zone is less than 1 ft. and is exposed for a strike length of 4 ft. in the creek bed. A grab sample assayed:

.32 oz./T. Ag
.11% Pb
.10% Zn
.5% Cu

Showing B — Located in Hugo Creek at 51E, 24S. Disseminated chalcopyrite, pyrrhotite, galena, sphalerite and pyrite in a shear zone. The shear zone (015/20E) is 3-5 ft. wide, but is only mineralized for about 1 ft. to 2 ft. along the footwall. The zone is exposed for about 30 ft. in the creek banks. A grab sample of the best mineralized material assayed:

49.68 oz/T. Ag
15.3% Pb
3.1% Zn
4.40% Cu.

Showing C — This showing is located in Hugo Creek at 56+50E, 25+50S. It is a small quartz-galena-chalcopyrite vein (width 4"-8", mineralization not continuous). The vein (150/20S) cuts across quartzite (135/30S).

Showing D — Located in Hugo Creek at 57E, 26S. It consists of a shear zone (030^{o}/90, width about 3 ft.) cutting across quartzite, and containing a number of small irregular lenses and pods of pyrite, and very minor pyrrhotite and arsenopyrite.

Showing E — This showing is seen in the northwest bank of Clearwater Creek at 11E, 4+50 N. It consists of two narrow (3" and 5") quartz-pyrite-very minor chalcopyrite veins in conformable shears in quartz-serecite schist.

Showing F (Figs. 4, 5,6)

Showing F is located at about L0E, 81N. The main part of this showing, on the west side of Clearwater Creek, consists of two parallel, closely spaced, sulphide vein systems with skarn type mineralization. These veins are within a narrow limestone unit (35 ft.) bordered on both sides by quartzite. The sulphide zones, each varying in width from about 1 ft. to 10 ft., but averaging about 5 ft., have an average assay across each of them of about:

6 oz/T. Ag
6% Pb
3% Zn
2% Cu.

Grab samples of the best mineralization assay up to:

37 oz./T. Ag
18% Pb
17% Zn
4.5% Cu.

The structure is open to the west (overburden covered) and is covered by talus towards Clearwater Creek. The structure does not, however, seem to cross Clearwater Creek. There is no sign of the limestone unit east of the creek, although in this area there are a number of quartz veins and shears in the quartzite carrying minor galena and chalcopyrite.

On both sides of Clearwater Creek, in this area, there occurs much fracturing and shearing in many different directions.

T. Skonseng, prospector, and an assistant, hand trenched and assay sampled the sulphide zones in the Showing F area. All assay samples, except for grab samples, were continuous chips taken across the structure. These samples were sent to either

Coast Eldridge Ltd., or the Whitehorse Assay Office, and were assayed by standard methods. For the assay results of the Showing F area, see Fig. 6.

Showing G (Fig.7) Lad Showing G is located on a small easterly tributary of Clearwater Creek, about 800 ft. up Clearwater Creek from Showing F. This showing consists of copper-lead-zinc-silver mineralization in and adjacent to shears in a skarny siliceous limestone unit. This showing also was further exposed, by hand trenching, and sampled by T. Skonseng and an assistant. For the assaysand geology of Showing G see Fig. 7.

Showing H (Fig.8) Lad Showing H, located at L16E, 42N, is a very minor occurrence. It consists of a 1 ft. thick skarny limestone unit, with disseminated chalcopyrite, galena and sphalerite. This unit is only seen for a strike length of about 6 ft., being terminated on both ends by faulting (See Fig.8).

Showing I This showing is located at about 148E, 30+00N. It consists of a very narrow (<1 ft.), discontinuous, galena-quartz vein in siliceous argillite. Grab samples of this material assay about: 19 oz/T. Ag
20% Pb.

Showing J Showing J is located at L176E, 29S. It is a galena-quartz-calcite fracture filling situation. The host rock is quartzite. The showing is poorly exposed in a steep talus slide. Blocks of galena up to 1 ft. in diameter have been found in the talus. Assays of representative grab samples of this material have run:

(1.02 Oz/T Ag
(83.8% Pb

(4.0 oz/T Ag
(85.96 oz Pb

(3.5 oz/T Ag
(76.98% Pb

Showing K — Showing K is located at L28E, 40N. The showing is a poorly exposed, mineralized, cross-cutting, shear zone (?), containing disseminated galena, chalcopyrite, sphalerite, and pyrite across about 5 ft. Two continuous chip samples across this zone assay:

0.44 oz/T. Ag 2.57% Pb 1.01% Zn .07% Cu	across 4 ft.
0.53 oz/T. Ag 5.01% Pb .28% Zn .07% Cu	across 5 ft.

Mineralized (galena and galena-sphalerite) float has been found in creek gravels at 136E, 23S, and 192E, 18N. Much sulphide float has also been found in Hugo Creek (from Showings A, B, C, D). No mineralized material has been noted upstream from Showing D. A piece of galena float found in a gossan at 80E, 23 north assayed:

29.6 oz/T. Ag
24.4% Pb

Section II - Geochemical Surveys

Topography and Ground Conditions

Elevations in the Lad Group range from about 3500 ft. to 5500 ft. Slopes vary from moderate to steep in this area. The slopes are disected by streams which have cut steep precipitous valley and canyons down to and into bedrock. Away from the creeks, the slopes are generally quite regular.

Timber line is at about the 4500-5000 ft. elevation. Below timber line, vegetation is moderately to very thick, consisting mainly of spruce, dwarf birch, and mountain alder.

The "A" soil horizon is thin over most of the area, except in small local swampy sections. A layer of volcanic ash is found just below the "A" horizon or very near the top of the "B" horizon. All soil sampling was done from the top of the "B" horizon, but below the ash layer.

Survey Methods

Soil samples were collected at 100 ft. intervals, where possible,on all grid lines.

Silt samples were taken from all major drainages and from minor drainages in areas of interest. An attempt was made to collect only active silts from as close to the centre of the drainage as possible.

All samples were analyzed for Cu, Pb and Zn trace element content. From the start of the season to the end of August, this testing was done at Atlas Explorations' complete geochemical laboratory at Ross River, Y.T. This lab was forced to close at this time because of the return to university of the student personnel. From September 1 to the end of the field season, all samples were analyzed at Chemex Labs Ltd., North Vancouver, British Columbia.

Each soil sample was dried in its kraft bag container, then screened to -80 mesh. To .2 grams of the -80 mesh material was added .5 ml. of concentrated hydrochloric acid and 1.5 ml. of concentrated nitric acid. The solution was let stand for one hour to decompose organics and then heated on a sand bath for two hours to complete the digestion. The solution was then diluted to 10 ml. with the addition of 8 ml. of water.

The samples were then run on an atomic absorption spectrophotometer unit, using prepared standard solutions for comparison.

Silt samples were treated in much the same way, the only difference being that sample digestion was in hot hydrochloric acid rather than in hot aqua regia.

The geochemical results (expressed in ppm) of each soil sample were plotted on a single grid plan (1":400'). Separate geochemical contour maps were drawn for each of copper, lead and zinc.

Geochemical anomalies were defined by means of the frequency distribution of the concentrations. Because of the positively skewed frequency distribution of the populations we are dealing with, the median was chosen as the best measure of geochemical background. The concentration at the cumulative frequency of 90% is taken as the threshold of significantly anomalous values. On the basis of the above, the following values were calculated (using all soil sample results from the Lad Grid as the population for soil, and all silt sample results from map sheet 105-K-16 as the population for silt):

		Background	Threshold
Soils			
	Cu	20 ppm	55 ppm
	Pb	18 ppm	75 ppm
	Zn	72 ppm	240 ppm
Silts			
	Cu	23 ppm	49 ppm
	Pb	24 ppm	62 ppm
	Zn	92 ppm	349 ppm

Geochemical Results and Interpretation - Soils

Soil results and interpretation are discussed in three groups:

#1 Grid Area	(Fig. 9-16)
East Grid Area	(Fig. 17-20)
North Grid Area	(Fig. 9-12)

#1 Grid Area - Soil Results

Copper (Fig. 10)

A large oval shaped copper anomaly is located in the western grid area between L16W and L16E, 0-21S.

A strong anomalous copper zone exists between L16E and 20E, 35N.

Small, but high valued, anomalies are centred at L80E, 23N, and L28E, 40N.

An elongate southeast trending moderately valued zone extends from L0 to L24E, 22N.

A strong copper zone is found between L44E and L50E, 19S.

Other smaller, lower valued, copper zones are centred at:

L8E, 12N	L58E, 24S
L8E, 31N	L44E, 30S
L32E, 28N	L32E, 10S
L88E, 3N	L24E, 30S
L96E, 30N	L24E, 39S
L64E, 22S	L8E, 42S
L60E, 34S	L8E, 29S

Lead (Fig. 11)

Anomalous lead results are scattered over the entire grid area.

A large anomaly stretches from line 84 to 68E, 23N, with a peak value of 35,500 ppm lead. Another large zone on strike with the first is located between lines 36 to 64E. This zone has a maximum value of 700 ppm lead.

A narrow sinuous lead anomaly stretches from L8 to 32E, 35N with a peak value of 1950 ppm lead.

A strong single value anomaly is found at L28E, 40N (35,000 ppm).

An anomaly trending northerly and with a maximum lead value of 500 ppm extends from L0, 21S to L8W, 8S.

Between L24E to 48E, 24S is found a large southeast trending strong anomaly.

A 3000 ft. long east-west trending zone has peaks at L46E, 34S (2875 ppm), L56E, 28S (1270 ppm) and L64E, 23S (300 ppm)

Centred at L60E, 52S is a large irregular anomalous lead zone.

Smaller, lower valued, lead anomalies are located at:

L20E, 12S to L28E, 6S
L56E, 26N
L60E, 8S
L52E, 22S
L32E, 34S
L16E, 19S
L8W, 2N
L28E, 40N

Zinc (Fig. 12)

At L80E, 23N is centred a 1200 ft. long high valued zinc anomaly.

In the western grid area, an anomaly with a peak value of 600 ppm zinc, extends from L0 to L7E, 3S.

In the same area, a large anomaly, also with a maximum value of 600 ppm runs from L6W, 16S to L5E, 8S.

A southeast trending zinc zone is found between L32E and L52E, 6S.

In the area L36 to 48E, 30-37S, is found a strong zinc anomaly with a peak value of 1200 ppm.

Other smaller zinc anomalies are located at:

L28E, 14S
L16E, 19S
L16E, 10N
L16E, 20N
L16E, 29N
L20E, 35N

Interpretation of Soil Results #1 Grid Area

Lead anomalies are found to coincide with zinc anomalies at the following locations:

L4W, 18S
L20, 24E, 36N
L28E, 40N
L16E, 10N
L80E, 23N
L46E, 34S
L64E, 23S
L42E, 22S
L16E, 19S
L3E, 3S
L16E, 10N
L20E, 35N

Lead anomalies are found to coincide with high copper results at the following locations:

L4W, 18S
L20E, 34N
L28E, 40N
L80E, 23N
L96E, 50N
L46E, 39S
L56E, 27S
L60E, 32S
L64E, 23S
L50E, 20S
L3E, 3S
L16E, 10N
L20E, 35N

High copper and zinc values coincide at:

L0, 12S
L16E, 20N
L28E, 40N

No significance has been attributed to the coincidence, or lack of it, between copper, lead and zinc in the grid area.

In Hugo Creek, the known showings are located in geochemically anomalous zones. The large copper-lead-zinc anomaly centred at L80E, 23N coincides with a gossan in which some galena containing 30 oz/ton silver has been found.

The high Cu-Pb-Zn values obtained at L28E, 40N are in the immediate vicinity of Showing K. For this reason, additional soil samples were taken on a small grid laid out southwest of the showing (referred to as the Showing K Grid, see Figs. 13-16). The line spacing is 100 ft. or 200 ft. and sample spacing on the lines is 50. The results were plotted on a values map and contoured, on separate maps, for copper, lead and zinc. These results showed an anomalous trending zone extending in a generally southwest direction from the showing.

The lead anomaly is most pronounced, with peaks of 35,000 ppm at the showing (40N, 28E), 610 ppm at 39N, 27E; 510 ppm at 37N, 28E and 415 ppm at 36N, 28E. At line 34 north, the 50 ppm contour is still open to the SW. A small single value anomaly (320 ppm) is located at 36N, 25+50E.

The anomalous copper results are coincident with the anomalous lead results, with the exception that only background copper results were obtained on L38N.

The zinc results showed only a single value high (1240 ppm) in the showing area, and a small anomalous zone (100 ft. by 200 ft.) with a peak of 600 ppm at 36N, 27E.

It would appear that the anomalies extending to the southwest from Showing K reflect the overburden covered continuation of the mineralized zone. Overburden cover in this area is quite thin.

Magnetic anomalies coincident with lead geochemical anomalies are located at:

L80E, 29S
L80E, 30-40N
L86E, 20N
L32E, 5N
L24E to L48E, 22S
L24E, 35N

The magnetics are thought to be related to intrusive activity and associated shear zones. Although we have little geological information because of overburden cover over much of the area, it is thought that the geochemical anomalies are reflecting vein-type sulphide mineralization in the above shear zones.

East Grid Area - Soil Results (Figs. 17-20)

Copper (Fig.18)

The copper results were contoured above 50 ppm. A zone of about 800 ft. x 800 ft. of anomalous copper value is centred at 172E, 6N. The peak value is 585 ppm. However, there is only one value of this magnitude, the next highest value being about 130 ppm. Anomalous values are found on L120E, 2 to 25N. This anomaly is closed to the NW, but open to the SE, because it trends towards lines 128E and 136E which have not yet been sampled.

A E-SE trending anomalous zone of up to 150 ppm copper is centred at L176E, 17S. This zone varies from 100 ft. to 500 ft. wide and is about 1600 ft. long.

A similar trending narrow sinuous anomaly extends from L176E, 29S to L200E, 18S, with a maximum value of 200 ppm copper.

A large, roughly SE trending, very interesting, flattened oval shaped anomaly is centred at L224E, 7N. This zone is about 3600 ft. long, from 300 to 700 ft. wide, and is still somewhat open to the SE. Values are up to 200 ppm. Smaller,

less significant, copper anomalies are centred at:

144E, 38N
216E, 22S
240E, 14S

Lead (Fig.19)

A SE trending anomaly, in size about 1600 ft. x 300 ft., with peak value of 200 ppm is centred at L160E, 27N.

Three anomalous areas of similar size (about 800 ft. x 500 ft.) and magnitude (highest contour enclosing any appreciable area, 200 ppm),and with only a single very high value in each case (445 ppm, 665 ppm, 1050 ppm) are centred at 164E, 8N; 164E, 2S; and 196E, 8S.

A long narrow sinuous anomaly, open to the SE, extends from L240E, 21S (5500 ppm) to L216E, 14S.

A large, very irregular, high magnitude, multi-peaked anomalous lead zone exists in the area between L152E and L200E, and from 12S to 34S. Some of the peak values in this area are 16,500 ppm, 1875 ppm, 1050 ppm and 3225 ppm lead.

Zinc (Fig.20)

A strong anomaly, 300 to 400 ft. wide, extends NE from BL168 to 7N and then SE to L176E, 5N. Peak values in this zone are 3200 ppm and 2100 ppm zinc.

Southwest of the above, an anomalous zone extends from L168, 8S to L200, 8S. The width of the zone varies from 400 ft. in the NW to 800 ft. in the SE.

A large irregular high magnitude zinc anomaly extends, in a general SE direction, from L168E, 28S to L200E, 20S.

The width of the anomalous zone varies from 800 ft. to 2000 ft. An area of about 500 ft. x 3200 ft. has values of above 1000 ppm, with peak values within this area of 40,000 ppm, 17,000 ppm, 7,700 ppm and 4,700 ppm.

Anomalous values are found between 13S and 22S on L240E. This anomaly closes to the northwest, but is open to the southeast.

Interpretation of Soil Results - East Grid Area

In virtually every instance, anomalous lead and zinc results are coincident. Copper anomalies that coincide with lead and zinc highs are centred at:

L168E, 7N
L176E, 17S
L176E, 29S
L240E, 14S and 21S

There are only random single value lead and zinc highs corresponding with the open copper anomaly on L120E, 2-25N.

The large, well defined, copper anomaly centred at L224E, 7N, does not have any corresponding lead and zinc highs associated with it.

Because of the lack of geological information from this area, the significance of the correspondence, or the lack of it, between copper and lead-zinc highs is not yet known.

The general trend of individual anomalies seems to be in a SE direction. However, it is interesting to note that in the central grid area, a substantial number of the peaks of copper, lead and zinc anomalies lie on a remarkably straight N-NE trending line extending roughly from L176, 30S to L160, 27N. Again, the lack of geological information prevents drawing any concrete conclusions from this observation. It is possible that this may reflect mineralization associated with a transverse shear zone.

The sulphide showing at L176E, 29S is the peak of strong copper, lead and zinc geochemical anomalies. The E-SE extension of these anomalies could reflect either a subsurface continuation of the sulphide zone, or could be simply downslope migration of the metal ions from the known showing areas.

No significant geochemical results were obtained from around the other small sulphide showings, or in the area of sulphide float discoveries.

North Grid Area - Soil Results (Figs. 9-12)

Copper (Fig.10)

A small, but strong, copper anomaly is centred at L0, 80-81N (peak 2100 ppm). This zone extends for about 800 ft. to the north (50 ppm contour only). A strong (1040 ppm Cu) single value anomaly is located at L0, 76N. Other small strong copper anomalies are centred at L8E, 66N and L20E, 74N. There are numerous large irregular zones enclosed by the 50 ppm contour only scattered throughout the area.

Lead (Fig.11)

The largest anomaly in this area is centred at L0, 80-81N (7500-6500 ppm). This zone, about 300 ft. wide, extends 400 ft. to the southwest to L0E, 76N (2650 ppm) and 600 ft. to the north, to a peak of 250 ppm at L4W, 83N.

A narrow northerly trending zone extends from L4E, 70N to L8E, 66N (1090 ppm). Another narrow north trending zone (100 ft. by 800 ft.) is centred at L20E, 74N (4150 ppm).

Two narrow, parallel, southeast trending, moderately valued zones are found in the western corner of the area

in question. Both are about 150 ft. wide and 1200 ft. long. One extends from L16W, 56N to L4W, 54N, and the other from L20W, 50N to L8W, 48N.

Smaller lead anomalies are centred at:

L16W, 90N
L16W, 97N
L8W, 93N
L24E, 82N
L20W, 44N
L8W, 58N
L8W, 41N
L0 , 63N
L4E, 61N
L12E, 62N
L16E, 54N

Zinc (Fig.12)

A small very high valued zinc anomaly is centred at L0, 80-81N (at these two stations, zinc values are $>$ 20,000 ppm). This anomaly extends for about 600 ft. to the north, but with much lower value than those on line zero.

A very high (21,000 ppm) single value result was obtained at L0, 76N.

Large irregular low magnitude anomalies are centred at L8E, 65N and L16E, 57N.

Smaller anomalies are found at L20E, 73N and L8W, 64N.

Interpretation of Soil Results - North Grid Area

Generally, in this area, copper, lead and zinc anomalies are superimposed upon one another.

The coincident copper-lead-zinc anomaly centred at L0, 80-81N, has its peak directly over Showing F. The northern and southwestern extensions of this anomaly are overburden

covered, and warrant further work.

The anomalies centred at L8E, 66N cover the area of Showing G. Again, further work should be done in the overburden covered portions of the anomalous area.

There is no outcrop in the area of any of the other strong geochemical anomalies, but because of the excellent correlation between geochemical anomalies and sulphide mineralization in areas of some outcrop exposure, all of the anomalies in areas of overburden cover warrant further investigation.

Geochemical Results and Interpretation - Silts

Approximately 625 silt samples were taken on claim sheet 105-K-16, both on and off the claim block.

Most second and third order drainages on claim sheet 105-K-16 were silt sampled (i.e. taking Clearwater Creek as a second order drainage). (Fig. 21).

In addition, samples were taken from a number of very minor drainages, on Grid #1, between L44 - 88E, 12 - 36N, in the vicinity of the large soil geochemical anomaly. (Fig. 22). In this area, the results obtained from silt sampling generally reflected those obtained from soil sampling. No anomalous silt results were obtained, from this minor drainage sampling, from drainages that did not have within the drainage basin a corresponding soil anomaly. However, not every creek draining an area of high soil values gave anomalous silt results. The reason for this irregular correspondence between soil and silt results is not yet understood because of a lack of geological information, due to overburden cover in the area in question.

The Cu-Pb-Zn results (in ppm) of the regional silting (105-K-16) were plotted on a single plan (Fig. 21). On the basis of frequency distribution of each element, the concentrations at the cumulative frequency of each of 90% (threshold), 95% and 98% were calculated. A separate anomaly map for each element was drawn, with the drainages marked, where applicable, with different symbols representing the concentration in the cumulative frequency ranges of 90-95%, 95-98%, > 98%. (Figs. 23,24,25).

Anomalous Cu-Pb-Zn results were obtained from Hugo Creek (draining area of Showings A,B,C,D) and in the east flowing creek draining the area of Showing J. Only anomalous lead results were obtained in Clearwater Creek immediately downstream from Showing F.

Cu-Pb-Zn anomalies in southern tributaries of Showing J creek must be investigated.

Numerous copper, lead and zinc anomalies in west flowing streams east of East Creek provide targets for further prospecting.

A strong coincident Cu-Pb-Zn anomaly in the headwaters of the southern tributary of Clearwater Creek, immediately upstream from Hugo Creek, deserves a close investigation, as do the copper and lead anomalies in Moto Creek, the extreme northwest grid area.

A number of interesting anomalous zones are found in the east-flowing creek on the northern edge of the map sheet.

Further work is necessary in the area of high zinc values in the south-flowing streams, just north of the South Macmillan River, just west of centre on the map sheet.

Section III - Geophysical Surveys

Ground Geophysical Surveys

Instruments Used

For the magnetometer survey, a Sharpe MF-1 magnetometer was used. This is a hand held fluxgate magnetometer which measures the vertical magnetic component. The range of this instrument is 0 to 100,000 gammas over five sensitivity ranges, the lowest being 10 gammas per scale dimension. The instrument reads directly in gammas. No conversion factor is necessary.

The electromagnetic survey was carried out with a Crone JEM dual frequency unit. The Crone JEM is of the inductive type and may be either used as a horizontal or vertical loop apparatus. Measurements are made of the resultant dip angle of the field and the width of null or out of phase component. It is designed to be operated with a maximum coil spread of 300 ft. for a horizontal conductor and 100 ft. for a vertical conductor. The effective lateral coverage is a direct function of the spread under ideal conditions. The equipment was chosen in order to give reliable information on the attitude and configuration of a conductor, the physical properties of the host rock, dimensions of the conductor, and results free from error due to topographic relief.

Survey Method

Ground Magnetometer Survey

Results (Fig.26)

Approximately 200,000 ft. of ground magnetometer survey was conducted over the Lad Group on grid lines of 800 ft. spacing, with 400 ft. spaced "fill in" lines over areas of anomalous interest. The magnetic survey was not conducted over the East Grid Area.

Magnetic readings, after being corrected for diurnal drift, were plotted on a grid plan (1":400') and then contoured.

Background is in the order of 1700 gammas with maximum peak values of 2800 gammas being obtained in specific and localized areas on the grid.

Isomagnetic contouring of gamma values reveals a general northwest-southeast magnetic trend over the survey area. Within this trend, numerous discordant and localized magnetic highs are apparent with relief from 500 to 1000 gammas above background.

Three major magnetic expressions have been outlined in the #1 Grid and North Grid areas:

72E to 96E, 25N to 50N	(Eastern Anomaly)
16E to 40E, 20S to 45S	(Western Anomaly)
8E to 24E, 75N to 85N	(Northern Anomaly)

These anomalies are characterized by an 1800 gamma closure (2000 gammas in the case of the Northern anomaly) around numerous isolated spot highs contributing to a discontinuous array of magnetic anomalies within the overall expression.

Other magnetic highs are of a more northwest-southeast en echelon trending nature and are sinuous and discordant in character. Peaks of these anomalies are located at:

L64E, 38S
L64E, 7S
L40E, 12S
L32E, 38N
L8W, 58N

A strong localized negative magnetic response is located at L24E, 35N.

Magnetic anomalies coincident with lead geochemical anomalies are located at:

L80E, 29S
L80E, 30-40N
L86E, 20N
L32E, 5N
L24E to L48E, 22S,
L24E, 35N
L8W, 58N

Interpretation

The area described as the 'eastern anomaly' is probably associated with a granitic orthoclase porphyry that outcrops in several locations in this vicinity. The irregular magnetics can be attributed to varying susceptibilities within the intrusive mass. The 'western and northern anomalies' which are similar in character to the 'eastern anomaly' could also be due to similar underlying intrusives, although no outcrop was noted in these areas.

Quartzite with minor disseminated pyrrhotite was found close to the peak of the magnetic high centred at L64E, 34S. There is little or no outcrop near the other magnetic peaks.

From limited outcrop and float locations as well as sulphide occurrences noted over the survey grid, there is little direct evidence that can be attributed to causing the numerous magnetic anomalies. In many instances, lead geochemistry is coincident with magnetic expressions and it is thought that the irregular magnetics could be associated with intrusive action and related faulting and shearing that contains sulphide mineralization.

Half width calculations show most causative structures to be close to surface (within 50 ft.). Test pits sunk on the negative magnetic anomaly (L24E, 35N) uncovered

gossan-like float containing minor galena.

The sulphide occurrences in Hugo Creek and Showing G are within magnetic lows. Showings E, F, and K are in areas of magnetic background.

Ground Electromagnetic Survey

Results (Fig.27)

A total of 14,500 ft. of line was surveyed with the Crone JEM horizontal loop to detect any conductive zones coincident with magnetic and lead geochemical anomalies. Experimental profiles were run over selected portions of magnetic and geochemical anomalies on lines 4W, 0, 4E, 20E, 24E, 32E, 40E, 48E, 56E, 64E and 80E. No EM has yet been run in the East Grid Area.

All profiles (See Fig.27) are of a flat nature and do not show relief exceeding -4 and +2 degrees resultant dip.

Significant responses were obtained on lines 40E, 25S and 48E, 23S, where positive resultant dips of +2 degrees were obtained on both 1800 and 480 cps frequencies. These values were obtained on single stations only.

On line 0, positive resultant dips were obtained at two stations: (+1, +2) (1800 cps, 480 cps) at 81N and (+2, +2) at 77N.

Interpretation of Ground EM Results

The easterly trending conductor traced over lines 40E and 48E is of vertical or near vertical attitude and limited in width (probably less than 10 ft.). The electromagnetic response is not strong and conductivity cannot be attributed to a definite source, a vein structure

of disseminated sulphides or a vertical shear zone would be a plausible explanation of the causative structure.

The anomalous result at L0, 81N is directly over Showing F.

The anomalous result at L0, 77N is in an area of overburden cover but is coincident with a lead geochemical anomaly. Again, a narrow vein structure of disseminated sulphides would be a plausible explanation of the causative structure.

Except for the above cases, electromagnetic results were not conclusive in outlining conductors associated with geochemical and magnetic anomalies.

Airborne Mag -EM Survey

Introduction

An Airborne Magnetometer - Electromagnetometer (Mag-EM) Survey was carried out over the Lad Mineral Claims and immediate surrounding area during the period September 13th to September 24th. It was hoped that airborne geophysical data would aid in geologic mapping and interpretation of geochemical anomalies on the Lad Group.

Survey Method

Instrumentation

A Gulf Fluxgate Magnetometer Mark III and a Mark III electromagnetic unit, consisting of a vertical coaxial transmitter and receiver coils mounted on a thirty-foot boom, were used for the entire survey. The instruments and operator were provided under a contract agreement with Lockwood Survey Corporation. The survey was conducted with a Bell 206 helicopter

as fixed-wing aircraft were judged to be unsuitable for some of the regions of more rugged terrain.

For the electromagnetic apparatus, amplitudes of in-phase and out-of-phase response of the resultant field are measured in parts per million of the primary field, the frequency of the primary current is 4000 cycles per second.

The magnetometer has a sensitivity of 1200 gammas and measures total magnetic field.

Survey Procedure

The geophysical instruments were towed to a mean terrain clearance of 100 ft. over flight lines of 1000 ft. spacing. Effective ground control was maintained by the use of aerial photographs with pre-located flight lines for navigational purposes. The helicopter was equipped with APN-1 radio altimeter and stop motion 35 mm. camera for further ground control and recording of fiducial points. All flight lines were oriented approximately orthogonal to geologic strike.

Plotting of Results

Flight records were processed by the staff of Atlas Explorations, as no plotting of results was done by the contractor during the actual survey. All airborne information was plotted on plastic overlaps showing flight lines, fiducial points, drainage and major topographic expressions to a scale of one inch to one-quarter mile. Magnetic data was contoured for

all results corrected and derived from flight records. Isomagnetic contour interval of 100 gammas was used.

Electromagnetic data was presented on a separate sheet by contoured in-phase response. Contours represent amplitude of in-phase response of the resultant expressed in parts per million of the primary field. Relative conductivity is also expressed by a ratio of amplitude in -phase component over quadrature component.

Results

Magnetic

Incomplete coverage due to excessively steep terrain and survey operational problems contribute to lack of detail on some anomalies and anomalous magnetic trends.

Two broad regions of anomalies exist with aeromagnetic patterns of small low-amplitude but well defined local anomalies superimposed on them. Regional strike cannot accurately be determined due to limited survey coverage, however a northwesterly trend has been assumed for broader anomalies, especially the western expression.

Examination of the centrally located magnetic response reveals 21 low-amplitude peaks within the overall expression. These peaks appear to have a spatial relationship somewhat annular in appearance. Local responses do not exceed 400 gammas above the anomaly background.

The western anomaly has a more definite strike direction and its superimposed high peaks creat a combined

effect of sinuous shaped northwesterly trending expressions. This anomaly is different in character from the central zone.

Electromagnetic

Little emphasis can be placed on the electromagnetic data due to its shallow depth of field penetration and varying thicknesses of overburden cover.

Three major areas of conductivity have been outlined at the northeast corner of the survey area, the western limit and central survey area. Responses other than those within the central area are indicative of large conductive zones of some structural or stratigraphic uniformity. In general relative conductivity within these zones exceeds unity. Magnetic correlation is apparent with the larger conductive zones, however peak in-phase response appears to favour magnetic lows.

Within the central survey area about 14 distinct low amplitude, low conductivity (less than unity) in-phase responses are recorded. Attitudes are random as is magnetic correlation. In general, the elctromagnetic anomalies could be considered in annular array and coincident with magnetic lows.

Interpretation and Recommendations

1. Actual positive in-phase electromagnetic anomalies adjacent to negative anomalies may be pyritic or graphitic conductors.
2. Topographic relief or small local variations in magnetic susceptibility of intrusives may cause many small magnetic highs and lows. Larger contrasting tectonic units such as faulted blocks produce broader and larger highs and lows.

3. Electromagnetic anomalies representative of near surface sulphide mineralization should have a conductivity ratio of at least 1 and limited strike length.

The centrally located magnetic and electromagnetic anomalies are considered to be of the most interest as they do not appear to reflect larger units as do the combined anomalies to the west and northeast.

In general, the conductors are not coincident with the localized magnetic peaks but fall between them. The conductors are related to the margins of the broad central magnetic anomaly.

An interpretation of this area would suggest that the broad magnetic anomaly represents an area of uplift and basement disturbance. The near surface magnetic expressions are represented as isolated peaks and are probably due to near surface intrusions, their spatial relationship suggests local plug or dike type structures. Between these structures are conductive zones that are interpreted as radial faults related to the area of uplift.

A geologic setting such as described above would favour vein-type mineralization near magnetic gradient and conductor coincidences.

One area of anomalous in-phase and negative magnetics should be investigated near the south end of the survey area on 'Showing J' Creek.

CONCLUSIONS AND RECOMMENDATIONS

Geological mapping and prospecting was severely hampered by a lack of outcrop in most of the grid area, except in the creek beds and banks. It is significant that despite the small percentage of outcrop, a substantial number of sulphide mineral showings have been observed. Showings A, C, D, E, H and I are very small and only of minor interest. At this time Showings B, F, G, J and K would seem to be the most favourable. The limits of the above mineral showings have not yet been defined because of overburden cover.

Soil sampling on the Lad grid has outlined a large number of strong geochemical anomalies. In almost every case, zones of anomalous soil results are found over the known sulphide mineral showings. Because of the excellent correlation between geochemical anomalies and sulphide mineralization in areas of some outcrop exposure, all of the strong geochemical anomalies in areas of overburden cover warrant further investigation.

Numerous areas for further prospecting have been defined on claim sheet 105-K-16 by the reconnaissance silt sample results from this area.

It is difficult to draw any definite conclusions from the ground magnetometer survey run on the Lad Group. The three large magnetic anomalies ('eastern' 'western' and 'northern' anomalies) are probably associated with intrusive plugs. From limited outcrop and float locations, as well as sulphide occurrences noted over the survey grid, there is little direct evidence that can be attributed to causing the numerous smaller magnetic anomalies. In many instances, anomalous lead geochemistry is coincident with magnetic expressions and it is thought that the irregular magnetics could be associated with

intrusive action and related faulting and shearing that contains sulphide mineralization.

The ground electromagnetic survey gave marginally significant resultant dips ($+1^{o}$, $+2^{o}$) directly over Showing F. Similar results were obtained in areas of overburden cover at L0, 77N, and between L40E, 25S and L48E, 23S. The conductivity of the overburden covered examples above cannot be attributed to a definite source. A vein structure of disseminated sulphide or a vertical shear zone would be a plausible explanation of the causative structure. Generally, electromagnetic results were not conclusive in outlining conductors associated with geochemical and magnetic anomalies.

An Airborne Mag-EM Survey was carried out over the Lad Mineral Claims area and the immediate surrounding area. The magnetic and electromagnetic anomalies in the west and northeast survey area appear to reflect large zones of some structural or stratigraphic uniformity. The central magnetic anomalies are probably due to near surface intrusions in an area of uplift and basement disturbances. Conductive zones between the magnetic peaks are interpreted as radial faults related to the area of uplift.

The 1969 field program on the Lad Group will concentrate on further exposing, sampling and mapping the known showings, and also attempting to explain all strong geochemical anomalies. For the above work, a D7-E bulldozer will be used for trenching and stripping operations. Detailed mapping, "fill-in" soil sampling, and possibly some ground geophysical surveying should be done on the East Grid prior to cat trenching in that area. Mapping and prospecting off of the claim block will be aimed

primarily at following up anomalous silt and airborne geophysical survey results.

Respectfully submitted,

T. J. Adamson,
Geologist

Appendix I

LIST OF PERSONNEL - LAD M. C. GROUP
1968 FIELD PROGRAM

T. Adamson	Geologist (Party Chief)	Vancouver, B.C.
T. Coates	Geologist	Vancouver, B.C.
K. Heinanen	Geologist	Helsinki, Finland
M. Simpson	Geophysical Operator	Vancouver, B.C.
T. Brock	Geological Assistant	Vancouver, B.C.
T. Skonseng	Prospector	Ross River, Y.T.
H. Brodell	Prospector	Watson Lake, Y.T.
C. Marcoux	Cook	Quebec, P.Q.
R. Etzel	Prospector"s Assistant	Ross River, Y.T.
F. Charlie	Linecutter-Geochem Sampler	Ross River, Y.T.
T. Charlie	Linecutter-Geochem Sampler	Ross River, Y.T.
A. Charlie	Linecutter-Geochem Sampler	Ross River, Y.T.
M. Acklack	Linecutter-Geochem Sampler	Ross River, Y.T.
J. Acklack	Linecutter-Geochem Sampler	Ross River, Y.T.
G. Johnny	Linecutter-Geochem Sampler	Ross River, Y.T.
J. Dick	Linecutter-Geochem Sampler	Ross River, Y.T.
E. Dick	Linecutter-Geochem Sampler	Ross River, Y.T.
M. Ladue	Linecutter-Geochem Sampler	Ross River, Y.T.
W. Atkinson	Linecutter-Geochem Sampler	Ross River, Y.T.
J. Olie	Linecutter-Geochem Sampler	Ross River, Y.T.

O T-2
:R

SHOW: J

26=S

GOSSAN
(7)=V

5B=O

34=N