141

GEOPHYSICAL REPORT ON

THE D. M. GROUP OF CLAIMS

FOR

GRAHAM BOUSQUET GOLD MINES
KAMLOOPS, B. C.

92I/10E

Claims Surveyed

| Claim Names | Record Nos. |
|---|---|
| DM 1-DM 44 incl. | 18706B-18749B incl. |
| DM 45 | 18075A |
| DM 46 | 18750B |
| DM 47 | 18076A |
| DM 48 | 18751B |
| DM 49-DM 54 incl. | 18077A-18082A incl. |
| DM 55-DM 62 incl. | 18189A-18196A incl. |
| DM 63-DM 70 incl. | 18089A-18096A incl. |
| DM 71-DM 100 incl. | 18752B-18781B incl. |
| DM 101-DM 108 incl. | 19501B-19508 incl. |
| DM 109-DM 116 incl. | 24955-24962 incl. |
| DM 117-DM 118 incl. | 24987-24988 incl. |
| Afton No. 1-4 incl. | 11508N-11511N incl. |
| Afton No. 5-7 incl. | 11696-98E incl. |
| Afton Fr. | 11736E |

Location of the D. M. group would place it northeast of longitude 120°, latitude 50°, and 7 miles southwest of Kamloops in the Sugar Loaf Hill area, B.C.

50° 120° NE

The work was carried out during the period of August 29th to December 15th, 1956, under the direction of the writer.

92I/10E

Prepared by:

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# I N D E X


| | page |
|---|---|
| Introduction..... | 1 |
| Summary and Recommendations..... | 1 - 4 |
| Property..... | 4 - 5 |
| Location and Access..... | 5 |
| Topography..... | 5 - 6 |
| General Geology..... | 6 - 9 |
| Field Operations..... | 9 - 11 |
| Explanation of Electrical Resistivity Method..... | 11 - 12 |
| Explanation of Electro-Magnetic Survey Method..... | 12 - 14 |
| Explanation of Magnetometer Survey Method..... | 14 - 15 |
| Interpretation of the Geophysical Surveys..... | 15 - 16 |
| Block A..... | 16 - 18 |
| Block B..... | 18 - 21 |
| Block C..... | 21 - 23 |
| Block D..... | 23 - 26 |
| Survey Data..... | 26 |
| Personnel Employed on Geophysical Survey..... | Appendix |

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#1 Plan No. 1.....Electrical resistivity contours, electro-magnetic check survey data, geological data and interpretation - 'A' Block of property. (Drawing ref. #173-12-56)

#2 Plan No. 2.....Profiles of electro-magnetic survey data, in part iso dynamic contours of magnetic intensities and geological interpretation - 'B' Block of property. (Drawing ref. #174-12-56)

#3 Plan No. 3.....Profiles of electro-magnetic survey data and geological interpretation - 'C' Block of property. (Drawing ref. #175-12-56)

#4 Plan No. 4.....Profiles of electro-magnetic survey data and geological interpretation - 'D' Block of property. (Drawing ref. #176-12-56)

Graham Bousquet Gold Mines Limited,
Suite 1600,
100 Adelaide Street West,
TORONTO, Ontario.

Gentlemen,

The following report describes the results and interpretations of the geophysical surveys carried out over the D. M. Group of claims held by Graham Bousquet Gold Mines Ltd., and located 7 miles southwest of Kamloops, B. C.

The electrical resistivity, magnetometer and electromagnetic surveys carried out over the property were conducted by Geo-Technical Development Company, 24 Wellington Street, West, Toronto, Ontario, during the period of August 29th to December 15th, 1956. Mr. E. B. Nicholls supervised the field work and the results of the various geophysical surveys are depicted on Plans 1, 2, 3 and 4 accompanying this report.

SUMMARY AND RECOMMENDATIONS

The geophysical surveys carried out over the D. M. Group of claims indicate numerous anomalous conditions. One of these anomalies was found on Block "A", Plan 1. This part of the property was surveyed using the electrical resistivity method, and this conducting zone is identified by the letter R-1. An electromagnetic check survey over part of this block gave two conducting axes "1-A" and "2-A". A further ninety-four conducting axes were located by the electromagnetic survey which was conducted over most of the claims group. These conducting zones are designated on the accompanying maps as follows:-

Block B, thirty-four conducting axes numbered "1-B" to "34-B" inclusive.
Block C, forty-nine conducting axes numbered "1-C" to "49-C" inclusive.
and
Block D, eleven conducting axes numbered "1-D" to "11-D" inclusive.

The resistivity readings and the changes in the angles of dip are similar to those expected of mineralized or graphitic bodies.

The magnetometer survey, which was carried out over that portion of the property located under the high tension power line, because it was impracticable to use the electromagnetic or resistivity method in this area, gave no anomalous conditions. It only indicated an area of fairly uniform magnetic intensity.

The shafts and trenches that are found throughout the property and the immediate area indicate the widespread distribution of mineralization. Although no major sulphide body has been found in this region as yet, two small mining operations are in progress approximately two miles to the east of the D. M. Group. These two properties are the Makoo Development Co. and the Kamloops Copper Company. The mineralization found throughout the area is located in shattered or fractured zones in the diorite.

It will be noted that the electromagnetic conducting axes are closely related to the pits and shafts that are found throughout the property. Of the conductors and conducting axes observed during the survey the following zones appear to be the most significant.

Block B - conducting axes "2-B" and "4-B"

Block C-conducting axes "1-C", "2-C", "7-C", "14-C" and "15-C"

Block D-conducting axes "1-D", "3-D" and "5-D"

Until recently Kennecott Copper held the Afton group of claims, and also the southern part of D. M. claims group surrounding the Afton group. They completed an Electromagnetic survey indicating several conducting zones, most of which have been picked up again by the present survey. The Electromagnetic survey by Kennecott was followed up by diamond drilling, the results of which are reported as having been very encouraging.

On the Northern portion of the property a geological survey was carried out. This survey showed that the area is occupied by volcanic and sedimentary rocks; the uppermost rocks are sandstones, shales, tuffs and conglomerates which are probably part of the Tranquille beds, some of which are quite soft and friable. Intrusive rocks of the Iron Mask Batholith outcrop south of the Trans-Canada Highway. Unfortunately the weather brought the survey to a halt, when snow began falling, and the remainder of the property was not touched.

The most significant conducting zones mentioned above are worthy of further investigation. However, the presence of wide spread mineralization that is known to be in the area would tend to indicate that many of the numerous conductors when drilled may prove to be only weakly mineralizated.

It is therefore recommended that only the ten important zones be investigated first by diamond drilling.

Before carrying out a drilling program, to aid in the interpretation of these anomalies and to save needless drilling, short traverses should be made across these conducting zones with a gravimeter. By this means it would be possible to tell whether or not the zone was mineralized. It is also recommended that the geological survey be extended to cover the rest of the property as soon as weather permits, and that as the overburden is shallow, trenching and bulldozing be carried out as part of the same program. The trenching and bulldozing should be used to investigate the conducting axes. Should this extra-exploratory work prove of interest, then the above mentioned drilling program should be carried out.

Locations of the proposed diamond drill holes are indicated on the plans accompanying this report. Further drilling of the other anomalies should be held in abeyance until the results of the above mentioned diamond drilling program are known.

PROPERTY

The D. M. Group of claims consisting of 108 mineral claims is held by Graham Bousquet Gold Mines Limited. A further ten claims were staked and added to the D. M. group, as open ground was found inside the property boundaries during the survey. The full claims group is described as follows:-

| Claim Names | Record Nos. |
|---|---|
| DM 1-DM 44 incl. | 18706B-18749B incl. |
| DM 45 | 18075A |
| DM 46 | 18750B |

| Claim Names (c't'd.) | Record Nos. |
|---|---|
| DM 47 | 18076A |
| DM 48 | 18751B |
| DM 49-DM 54 | 18077A-18082A incl. |
| DM 55-DM 62 incl. | 18189A-18196A incl. |
| DM 63-DM 70 incl. | 18083A-18096A incl. |
| DM 71-DM 100 incl. | 18752B-18781B incl. |
| DM 101-DM 108 incl. | 19501B-19508 incl. |
| DM 109-DM 116 incl. | 24955-24962 incl. |
| DM 117-DM 118 incl. | 24987-24988 incl. |

An additional eight mineral claims called the Afton group, located in the centre of the DM group were also surveyed. These claims are further described as follows:-

| Claim Names | Record Nos. |
|---|---|
| Afton No. 1-4 incl. | 11508N-11511N incl. |
| Afton No. 5-7 incl. | 11696-98E incl. |
| Afton Fr. | 11736E |

## LOCATION AND ACCESS

The properties lies 7 miles southwest of Kamloops, B.C. in the Kamloops Mining Division. The Canadian Pacific Railway and the Canadian National Railway pass through the town of Kamloops which is approximately 280 miles northeast of Vancouver. The Trans-Canada Highway passes through the northern section of the property, hence the property is readily accessable by a good highway from Kamloops.

## TOPOGRAPHY

The area in general has fairly rugged topography.

The elevation varies from 2,400 feet at the highway to 3,700 feet at the summit of Sugar Loaf Mountain. As the property is located in the interior dry belt most of the area is covered by sage brush. However, the southern part of the property in the vicinity of Sugar Loaf Mountain is well timbered, as is the west side of the property.

GENERAL GEOLOGY

The general geology of the area is shown on Map No. 886A accompanying Memoir 249, Geology and Mineral Deposits of Nicola Map-Area, British Columbia, by W. E. Cockfield, published by the Department of Mines and Resources.

The property discussed in this report lies within an area underlain by the Iron Mask Batholith. This diorite complex, some 12 miles by 3 miles in area, strikes northwesterly and is found to be the main ore host. To the north this batholith is bounded by volcanics, and to the south by the Nicola volcanics with some sediments. The batholith varies in composition from syenite to ultrabasic types, all of which are deficient in quartz, but magnetite and apatite are present in most of the rocks. This batholith has been subjected to considerable movement and shows extensive fracturing. Shearing is found to be maximum in the area of any major peridotite inclusions.

All points in the intrusive are favourable for ore occurrence. Showings have been found in the following groups, Iron Cap, Lucky Strike, Evening Star, Iron Mask, Erin, to mention but a few.

The volcanics are also common hosts to ore-filled

shears which are not too far from the intrusive. An indefinite contact is located between the altered volcanics and the intrusive. There appears to be close association between the copper deposits and certain veins of magnetite within the rocks of the batholith. However, this association of copper and magnetite is not general throughout the area.

Numerous small mining operations have been carried out in the vicinity of this batholith. The principal producer was the Iron Mask Mine which between 1901 and 1928 produced from 18,230 tons of ore a total of 3,630 ounces of gold, 41,292 ounces silver and 5,194,871 pounds copper.

Other mines in the immediate area that produced are the Evening Star Group, Copper King Python group and Iron Cap. However, the most interesting occurrence of mineralization in the DM area is the old Pot Hook showing, which is now actually part of the Afton group of claims. A shaft was sunk to a depth of 330 feet on this showing, bornite and chalcocite are reported to have been obtained from the old workings.

Throughout the property a number of other shafts and pits are to be found which have been sunk on mineralized shear zones. The main mineralization is chalcopyrite with bornite, magnetite and pyrite are common, heamatite less so. The location of so many mineralized shears, and the fact that one has been mined in the immediate vicinity gives the DM. group of claims a good opportunity of having an ore body located within its boundaries.

GEOLOGY OF THE NORTHERN PORTION OF DM GROUP BELOW

A geological survey was made of the northern portion of the claims group by Mr. C. J. Cryderman under the supervision of the writer. This survey was in the form of a reconnaissance. The area mapped straddles the north contact of the Iron Mask Batholith and the enclosing rocks of the Kamloops group. The terrain is fairly rugged on that portion of the ground that is outside of the Iron Mask Batholith, having differences in elevation up to several hundreds of feet, with single escarpments and cut banks of over one hundred feet. There is only a sparse growth of scrubby pine on the upper slopes of the mountains. That portion of the property which extends over the Iron Mask Batholith is rolling with more gentle slopes, and is devoid of trees, the soil supporting only sage brush and grass. This location lies within a dry belt and no source of water was observed on this portion of the property.

The northern portion of the property is occupied by volcanic and sedimentary rocks. The uppermost rocks are sandstones, shales, tuffs and conglomerates which are probably part of the Tranquille Beds, some of which are quite soft and friable and have been deeply eroded thus producing the rugged terrain referred to above. These rocks appear to overlay some harder, more massive rhyolite tuff which contains phenocrysts of what appears to be secondary feldspars.

Intrusive rocks of the Iron Mask Batholith outcrop south of the Trans Canada Highway and are quite abundant north east of the north base line. These rocks vary somewhat in appearance.

The rocks of the batholith near the contact appear to be syenite, reddish in colour, medium grained, and no visible quartz.

From the intersection of line 20/-00 E to the eastern boundary of the property there are numerous pits and trenches which have fallen in, but from what could be seen of the walls and dumps it would appear that this work was done to investigate occurrences of gossen, magnetite, and copper minerals. The copper minerals observed were malachite and chalcopyrite which seems to occur in fractures. About 200' north of the base line and several tens of feet east of line 20/00 E there is scant disseminated chalcopyrite in the red syenite that appears to be brecciated.

Due to the sloughing of the old workings and the depth of weathering of rocks in place, the writer was unable to determine the extent of the copper mineralization other than that which is shown on the preliminary map.

The work done in the past on these mineral showings was probably done by hand, and as a result the pits and trenches are confined to exploring very small areas of the mineralized rocks. In many places the overburden is quite shallow and much could be learned from stripping with bulldozers.

FIELD OPERATIONS

A base line was established in a direction N 60° W and was located so as to pass through the south east corner of mineral claim DM 94 and the north west corner of DM 78. This was called the North Base line. The line 0/00 was then turned off at right angles to this base line and was cut and picketted

to the north and south boundaries of the property. At a point 6,000 feet south of the north base line on line 0/00 the centre base line was turned off. This base line was extended to the east and west boundaries of the property, and was parallel to the north base line. A further 6,000 feet south on line 0/00 another base line was turned off. This third base line was called the South Base line.

All base lines were laid out by transit and picketted to the property boundaries.

Picket lines were then turned off at right angles to these base lines at 400 foot intervals; all lines were laid out by a transit and were picketted every 100 feet. The final layout of the picket lines and base lines are shown on the four plans accompanying this report.

All major topographic features were noted and wherever possible, claim posts were located; these are also plotted on the accompanying plans.

To aid the field operations and interpretations, the area was divided into four blocks, and is presented as such on the plans. Over these areas electrical resistivity, magnetometer and electro-magnetometer surveys were conducted. The electrical resistivity survey was carried out over the northern block of the D.M. group of claims, readings being taken every 50 feet along the traverse lines. This area was also mapped geologically and the result of this mapping is shown on the accompanying plan.

An electro-magnetic survey was carried out over the remainder of the property, readings being taken every 100 feet along the traverse lines.

Under the power line, however, it was found impossible to take electro-magnetic readings, so a magnetometer survey was conducted over this small part of the property.

For the electrical resistivity survey a sensitive vacuum tube voltmeter, capable of measuring to 0.01 millivolts was used; for the magnetometer survey a Sharpe magnetometer Model "A-2" with a sensitivity of 24.8 gammas scale division was used; for the electro-magnetic survey, a vertical loop type of electro-magnetic unit operating on 1000 c.p.s. was used. A more detailed discussion of the survey methods is given in the following paragraphs.

A reconnaissance geological survey was conducted over the northern portion of the property.

Explanation of Electrical Resistivity Method

The method used by Geo-Technical Development Company Limited is a form of the early resistivity survey or "mapping" methods, modified by some ten years' experience in the field.

In short, a known current is introduced into the ground by means of two screen contacts, which are separated by a distance approximately equal to three times the width of the property, with a spread line drawn through the centre of the property at right angles to the base line. The contacts are spaced equidistant from the central base line. Readings are then taken at

50 foot intervals along the picket lines by means of a sensitive vacuum tube voltmeter which measures the potential drop across the interval. The apparent resistivity is then calculated from the potential readings and current in terms of ohm-centimeters.

Shear and fracture zones are relatively good conductors due to their high water content. This is true also of porous unconsolidated sediments. Extreme low resistivity readings may be due to graphite or to sulphide mineralization, and there is no way to distinguish between sulphide and graphite from the results obtained. Graphite is suspected as cause of an anomaly when there are occurrences of this mineral within schists or shear zones in the immediate vicinity. Sulphide mineral deposits have also been discovered in areas of high resistivity contrasts which did not register extremely low readings.

EXPLANATION OF ELECTRO-MAGNETIC SURVEY METHOD

The electro-magnetic method of geophysical exploration is based on the use of two fundamental phenomena, electricity and magnetism. An alternating current flowing in a loop of wire suspended above the earth's surface will cause current to flow within sub-surface conductors. The process by which this takes place is called "induction". The steps in the process are as follows:

1. The alternating current flowing in the loop creates an alternating magnetic field (primary magnetic field) which can be measured at the surface of the earth.

2. This primary alternating magnetic field will induce an alternating current in any sub-surface conductor. This current will in turn create an alternating secondary magnetic field. The device used to measure the magnetic fields in the electro-magnetic method consists of a search coil connected to a pair of ear-phones. The intensity of the magnetic field cutting the search coil is indicated by loudness of signal in the ear-phones.

In the technique employed on your property, a coil of wire of fifty turns was suspended in a vertical plane on a tripod and frame. A strong alternating current was passed through this coil, which created an alternating primary magnetic field which is effective over an approximate area of 1,500 feet square. If a highly conductive mass, such as a massive sulphide body, lies within the effective area of the primary field, currents will be induced in this mass. Induced currents flowing in the conductor will in turn create another alternating secondary magnetic field. The secondary magnetic field distorts the primary magnetic field and this distortion can be measured in terms of "dip angles". The dip angle may be described as being the angle between the resultant of the primary and secondary fields and the horizontal.

Over barren ground the dip angles are practically zero. The approach to a conductor is marked by increasing dip angles which, in turn, decrease to zero directly over the con-

ductor, then increase in opposite sense beyond the conductor until far enough away from it they reduce to zero again.

To overcome distortion of dip angles arising from topography and elevation effects, the plane of the transmitting coil is oriented for each reading so as to point toward the station occupied by the search coil. If the location of transmitting coil relative to the search coil is known accurately, the transmitter coil can be oriented so as to make errors negligible; hence, dip angle profiles are directly interpretable and require no topography or elevation correction.

It must be pointed out that the electro-magnetic method gives very little response from swamps or topographic features when the survey is conducted with a frequency of 1,000 cycles per second. Graphitic shears and sedimentary horizons are frequently the cause of electro-magnetic anomalies. The 1,000 cycles per second does not map contacts between two rock types, unless one or the other of the two is an excellent conductor, or unless a good conductor, such as sulphide, magnetite or graphite, lies along the contact. Thus, the 1,000 cycles per second method does not map structure in the manner of a resistivity method, unless these good conductors follow structural trends. Occasionally, the 1,000 cycles per second will detect faults.

EXPLANATION OF MAGNETOMETER SURVEY METHOD

The magnetometer readings observed on the D. M. Group of claims were tied in to the base control station previously

established on the adjoining "Borup" group of claims. This control station was given a value of 1500 gammas and all other readings are relative to this point.

At various points subsidiary control stations were established using the method that is general in setting up control stations for magnetic and gravimetric work. Readings were then taken at these control stations every two or three hours so that the diurnal variation could be accounted for.

All readings taken during the survey were converted to gammas and all variations were allowed for. The resulting readings were then plotted on the map accompanying this report.

INTERPRETATION OF THE GEOPHYSICAL SURVEYS

The results of the surveys conducted over the D. M. group of claims, held by Graham Bousquet Gold Mines are depicted on Plans Nos. 1, 2, 3 and 4 accompanying this report.

For convenience the group of claims is divided into four blocks which are described as follows:-

BLOCK A - The area north of the north Base line - results of this block are shown on Plan No. 1.

BLOCK B - The area between the north and Centre Base Line - results of this block are shown on Plan No. 2.

BLOCK C - the area between the centre and south Base Line - the results of this block are shown on Plan No. 3.

BLOCK D - The area south of the South Base Line - the results of this block are shown on Plan No. 4.

An electrical resistivity survey was conducted over Block A with a limited amount of electro-magnetic check work, and an electro-magnetic survey was carried over the remaining three blocks. However a power line located along the north boundary of the property prevented the use of an electrical survey method within its immediate vicinity, so in order to cover this area a magnetometer survey was carried out.

The relative merits of the anomalies located are discussed in the following paragraphs by taking each block of the property in turn.

B L O C K A - located north of the north base line

The results obtained over this section of the property are shown on Plan No. 1.

The electrical resistivity readings are expressed in ohm-centimeters x $10^3$ and are plotted to the east of the traverse lines. One anomaly was indicated by the electrical resistivity survey. This is identified on the accompanying plan by the letter "R-1". On the whole, this block shows as a poor conducting area, as the readings obtained indicate high resistivity.

Anomaly "R-1" coincides with a dry lake bed which is rich in sodium sulphate and sodium chlorite. The anomaly may, therefore, be due to the presence of this salt deposit.

From the geological mapping it will be noted that rocks of the Iron Mask Batholith lie south of the Trans-Canada

Highway, also numerous showings and old workings are found in this area. The contact of the volcanics and the batholith occurs fairly close to the dry lake bed and it is therefore possible that the "R-1" anomaly is due to mineralization, as the deposits of the Iron Mask Batholith usually occur in fractures near to the volcanic-batholithic contact. On completion of the resistivity survey on Block "A", a limited amount of electro-magnetic check work was carried out over that portion contained between the north base line and the Trans-Canada Highway. Two very weak conducting axes were observed and these are identified on the accompanying plan as "1-A" and "2-A". The survey could not be extended to cover the anomaly "R-1" given by the electrical resistivity survey due to the interference of the power line.

On completion of the claims group contained in the 'A' Block, it was decided to carry out an electro-magnetic survey over the rest of the property.

The electro-magnetic readings are expressed as "Angles of Dip", and a conducting zone is indicated by this type of survey when the "Angles of Dip" change from a north dip through zero to a south dip. These cross-overs, as they are called, are plotted on the accompanying maps.

Although primarily we are interested in sulphides, there are other conductors which will be encountered in electro-magnetic work. However, the three most common conductors found are graphite, sulphides (expect sphalerite) and massive magnetite.

In certain areas, ground water may be quite conductive, the water flowing along shears or other structural weaknesses may show up as a series of conductors.

The absolute conductivity as well as the conductivity contrast is of importance in an electro-magnetic survey. There is only a small range of conductivities which actually affects the size of the dip angle. Thus, small angles of dip will not always be due to the conductivity of the body, but could be caused by the shape and position of the conductor.

B L O C K  B - located between the north and centre base lines

This block was surveyed using an electro-magnetic method. However, interference in the receiver made it impossible to take readings within 1,000 feet of the power line that runs across the north boundary of the property. It was therefore decided to carry out a magnetometer survey over the portion missed by the electro-magnetic survey.

From the results of the electro-magnetic survey over this block, it will be noted that twelve well defined conducting axes are indicated. They are identified on the accompanying Plan No. 2 by the letters "1-B" to "10-B" and "20-B" and "30-B". Twenty-two other isolated cross-overs were indicated in this block; these are designated by the letters "11-B" to "34-B". Of all these anomalies the most significant appears to be those identified as follows: "1-B" to "5-B" and "30-B". These six conducting zones are located in the vicinity of old showings, pits, trenches and shafts.

It is to be noted that these conducting axes form two parallel zones, one being composed of conductors "1-B", "3-B" with "33-B", "32-B" and "31-B", whilst the other is made up of "2-B", "5-B" and "30-B". It is possible that these conducting areas as indicated by the electro-magnetic survey, represent shear or fracture zones within the batholith and that these zones carry mineralization at various places along the shear. It will be noted that certain other conducting zones can be lined up as representing shear or fracture zones.

The above mentioned conducting zones are located within the neighbourhood of the old Pothook shaft and workings. The Pothook claim has been renamed and is now part of the Afton group of claims and is located 500 feet north of the centre base line on Line 12+00 E. Reports of the old workings show that the mineralized zones strike in an easterly direction with a vertical dip. This information shows that the conducting areas located by the survey are in the same general direction as the known shear zones.

Anomaly "2-B" is located across five lines, giving it a length of some 1600 feet. This anomaly is found 2,200 feet north of the centre base line across lines 8+00 to 24+00 E. This is by far the best conducting axis located in Block B.

Anomaly "4-B", located across lines 24+00 W to 32+00 W indicates a relatively good conducting zone. The "angles of dip" recorded in this zone represent a fairly good conductor.

To the west of line 36400 N, two old pits were found which had been sunk on a rusty showing. These pits are along the same line as anomaly "4-B". This conducting axis may be part of the same shear zone which forms anomaly 1-B.

The above mentioned conducting axes are worthy of further investigation in the form of geological mapping, trenching and possibly diamond drilling.

Of the remaining conducting axes located during the survey of this block, "20-B" may form part of the same shear zone as "2-B". Anomaly "6-B" may be due to the influence of the wire fence. However, this influence has not been noted at any other point of the survey.

A third shear zone may be represented by conducting axes "10-B", "22-B", "7-B", "8-B", "25-B" and "27-B". Numerous minor conducting axes are located throughout the block, but these are confined to a cross-over on one line only, and would only warrant further investigation after the other zones have been completely examined.

Kennecott Copper controlled the Pothook until recently, and also part of the ground that is now the D. M. group. They carried out an E-M survey over their property and drilled some of the showings. A plan of this survey shows E-M conducting axes lying in approximately the same position as those observed during the present survey and one of these zones is indicated by the 1-B conducting axes.

The magnetometer survey conducted over the portion of the ground that was not covered by the electro-magnetic survey indicated an area of fairly uniform intensity. No anomalous conditions were indicated by this survey, the small changes that are indicated follow the direction of the power line and reveal nothing of importance in this area. However, the uniformity of the readings indicate that this portion of the property is probably lying within the volcanics.

B L O C K C - located between the Centre and South Base Lines

The results obtained during the electro-magnetic survey indicated twenty good conducting zones which extend across three or more traverse lines. These conducting axes are identified on the accompanying plan No. 3 by the letters "1-C" to "20-C". It is to be noted that the anomalies indicated over this portion of the property run parallel to those on Block B and may represent parallel shearing or fracturing within the Batholith.

Angles of dip observed over the conducting axes "1-C" and "2-C" indicate the zone to be a good conductor. Similar angles of dip are observed on conducting zone "3-C" which appears to strike in a north-easterly direction and may intersect the zone as indicated by "1-C" and 2-C". It is possible that these three zones form part of the same shear or fracture pattern as the one indicated by "1-B" and "3-B" on Block B.

Fairly good conducting zones are indicated by anomalies "4-C", "5-C", "13-C" and "19-C". However, these zones

appear to be not as strong as the above-mentioned as their angles of dip are smaller. The "angles of dip" vary, of course, with the depth and shape of the conducting zone. These four conducting axes together with "20-C" are worthy of further investigation. Owing to the rugged nature of the terrain it is possible that some of the weaker cross-overs are due not entirely to a conducting body but more to the nature of the topography, although this effect should be small.

In the western portion of the block more good conducting zones are indicated. Conducting axes "6-C" and "7-C" appear to be fairly strong conductors, the cross-overs are very clearly defined. The western extremity of "7-C" may be affected by the wire fence that crosses the traverse at the point of the cross-over. It is possible that "17-C" forms part of the same zone as "7-C" - this anomaly "17-C" becomes weaker towards the west.

Three strong electro-magnetic axes, which probably form part of the same zone, are identified by letters "14-C", "15-C" and "16-C". Anomaly "14-C" is located in Hughes Lake. It is noted that the zone is stronger towards the east; that is, "14-C" indicates a stronger conductor than "C-16". Two other anomalous zones are located in the same area; these are identified by the letters "12-C" and "17-C" and show weaker intensities. Anomaly "12-C" is located close to a wire and parallels the fence for a distance. It is possible that this conducting axes is

influenced by the fence. The other zone "17-C" may be affected by the topography - a cliff edge - although the "angle of dip" indicates a fairly strong conductor to the east.

Four other anomalies of significance are to be found on this block of the property. They are "8-C", "9-C", "10-C" and "11-C" located slightly north of the south base line. These conducting axes could possibly be indications of the same shear or fracture zone. The four zones whilst indicating fairly good conducting zones, show that the strength of each zone varies from line to line.

A further twenty-nine conducting axes were indicated by the electro-magnetic survey on this portion of the claims group. These zones are designated by the letters "21-C" to "49-C" inclusive. The majority of these anomalies are located on one line only. However, "24-C" to "27-C" indicate a zone of fairly good conductivity which may form part of the same zone. Anomalies "23-C" and "34-C" are also indicative of good conducting areas. Owing to the widespread mineralization that is found in this area, it is possible that all these anomalies are caused by minor concentrations of sulphides. The conductors located during the electro-magnetic survey of Kennecott Copper agree very closely with the zones indicated by the present survey.

B L O C K D - located between the south base line and the south boundary of the property

The results obtained during the electro-magnetic survey of this portion of the property indicated eleven conducting

axes of varying intensities. These axes of good conductivity are identified on the accompanying map by the letters "1-D" to "11-D". It will be noted that the anomalies indicated over this part of the property follow the same strike trend as those conducting axes observed on Blocks B and C.

The most significant zones indicated by the survey are identified by conducting axis "1-D", "2-D","3-D" and "4-D", which extend over at least five traverse lines. The strongest of these zones are "1-D" and "3-D" anomalies which show the greatest changes in the "angles of dip", hence indicating the best conducting zones. Anomalies "2-D" and "6-D" parallel a fence, hence it is possible that the wire fence is the cause of these two zones.

Conducting axes "4-D" shows as an excellent conductor to the west, but weakening to the east.

Of the other anomalies, "5-D" and "10-D" give large changes in the "angles of dip" and both of these zones stand out as fairly good conductors.

The remaining zones, 7-D, 8-D, 9-D and 11-D are only very weak conducting zones and would warrant further investigation only after the other zones had been explored.

The geophysical results obtained over the D. M. group of claims show a series of conducting axis which vary considerably in strength. The general strike trend of these anomalies is in an east-west direction which is the regional trend

for any shear or fracture zone. All the anomalies appear to be within the Iron Mask Batholith. Shafts and small prospecting trenches, indications of earlier prospecting, show many mineralized zones in the shattered diorite. These shafts and trenches are plotted on the accompanying maps and are in general located close to electro-magnetic anomalies.

In conclusion, of the ninety-four conducting zones indicated by the electro-magnetic survey over Blocks B, C and D, twenty-three are worthy of further investigation. These are as follows:-

1, 2, 3 and 4-B

1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 14, 15, 17, 18-C

1, 3, 4, 5, 10-D

Of these main conducting axes, the following appear to be the most significant and should be investigated first:-

1, 3, 5-D

2, 7, 14, 15-C

2, 4-B

All these conducting zones show varying intensities, indicating that the cause of the various anomalies differ in position and conductivity. It must also be remembered that electrical surveying methods have no means of identifying the possible mineralization in the anomalous areas; they can only point out the best conducting zones. These areas of high conductivity creating the anomalies can be due to sulphide bodies, graphite

shears or fractures. The intensity of such anomalies vary considerably with extent and depth.

SURVEY DATA

A total of 118.3 miles of base lines and traverse lines were chained and picketted. Electrical resistivity readings were taken every 50 feet along traverse lines over the northern portion of the property; a total of 11.98 miles was covered by this method.

A magnetometer survey was carried out over the area under the power lines; a total of 7.25 miles of line, requiring 384 station readings was taken at 100 foot intervals.

The remainder of the property was covered by an electro-magnetic survey which gave a total of 87.52 miles of line, requiring 4632 station readings taken at 100 foot intervals and 136 transmitter set-ups.

A reconaissance geological survey was carried out over the northern portion of the property.

Respectfully submitted,

GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED,

E.B. Nicholls, B.Sc., A.Inst.P.,
Geophysicist.

Toronto, Ontario.
8th January, 1957.

EBN:mm

## LIST OF PERSONNEL EMPLOYED ON

## GEOPHYSICAL SURVEY

| | |
|---|---|
| E. B. Nicholls | - Geophysicist |
| W. Konkin | - Party Chief |
| E. M. Hall<br>J. R. Needham<br>W. Meyer | ) - Geophysical Operators |
| C. Puff<br>D. Connautin<br>R. Whieldon<br>E. Konkin | ) - Assistant Geophysical Operators. |
| R. J. Harding<br>R. Guenther | ) - Surveyors |
| C. J. Cryderman | - Conducted the geological survey. |
| A. Decaire<br>G. Grandin<br>J. P. Decaire<br>M. Gratton<br>C. Allaire<br>R. St. Amour | ) - Line cutters |

## CERTIFICATE

I, E. B. Nicholls, of the City of Toronto, Ontario do hereby certify:

1. That I am a Geophysicist employed by Geo-Technical Development Company Limited, of 24 Wellington Street West, Toronto, Ontario, and that I reside at 39 Addison Crescent, Don Mills, Ontario.

2. That I am a graduate of London University, England (B.Sc. 1947) majoring in physics.

3. That I am an Associate of the Institute of Physics, London, England.

4. That I have been practising my profession since 1947.

E. B. Nicholls.

Dated at Toronto, Ontario
this 8th day of January, 1957

GRAHAM BOUSQUET GOLD MINES LIMITED

D. M. 100 GROUP
KAMLOOPS BRITISH COLUMBIA

Statement of Expenditures August 29, 1956 to December 15, 1956

| | | |
|---|---|---|
| **Salaries** | | |
| D. Connauton | 87.66 | |
| C. J. Cryderman | 300.00 | |
| E. M. Hall | 1,151.79 | |
| R. J. Harding | 77.70 | |
| R. Guenther | 189.52 | |
| E. Konkin | 673.74 | |
| W. Konkin | 1,666.83 | |
| W. Meyer | 737.96 | |
| J. R. Needham | 112.35 | |
| E. B. Nicholls | 870.85 | |
| C. Puff | 87.66 | |
| R. Whieldon | 87.68 | 6,043.74 |
| **Other Expenditures** | | |
| Line Cutting (6 men) | 5,515.00 | |
| Hotel & Meals | 1,328.32 | |
| Travel | 763.62 | |
| Food Supplies | 895.33 | |
| Camp Supplies | 582.18 | |
| Transportation Equipment & Rentals | 322.21 | |
| Telephone, Telegram & Postage | 260.63 | |
| Truck Expenses | 211.92 | |
| Survey Prints | 45.80 | |
| Miscellaneous | 45.45 | |
| Grouping & Recording | 28.50 | 9,998.96 |
| | | 16,042.70 |

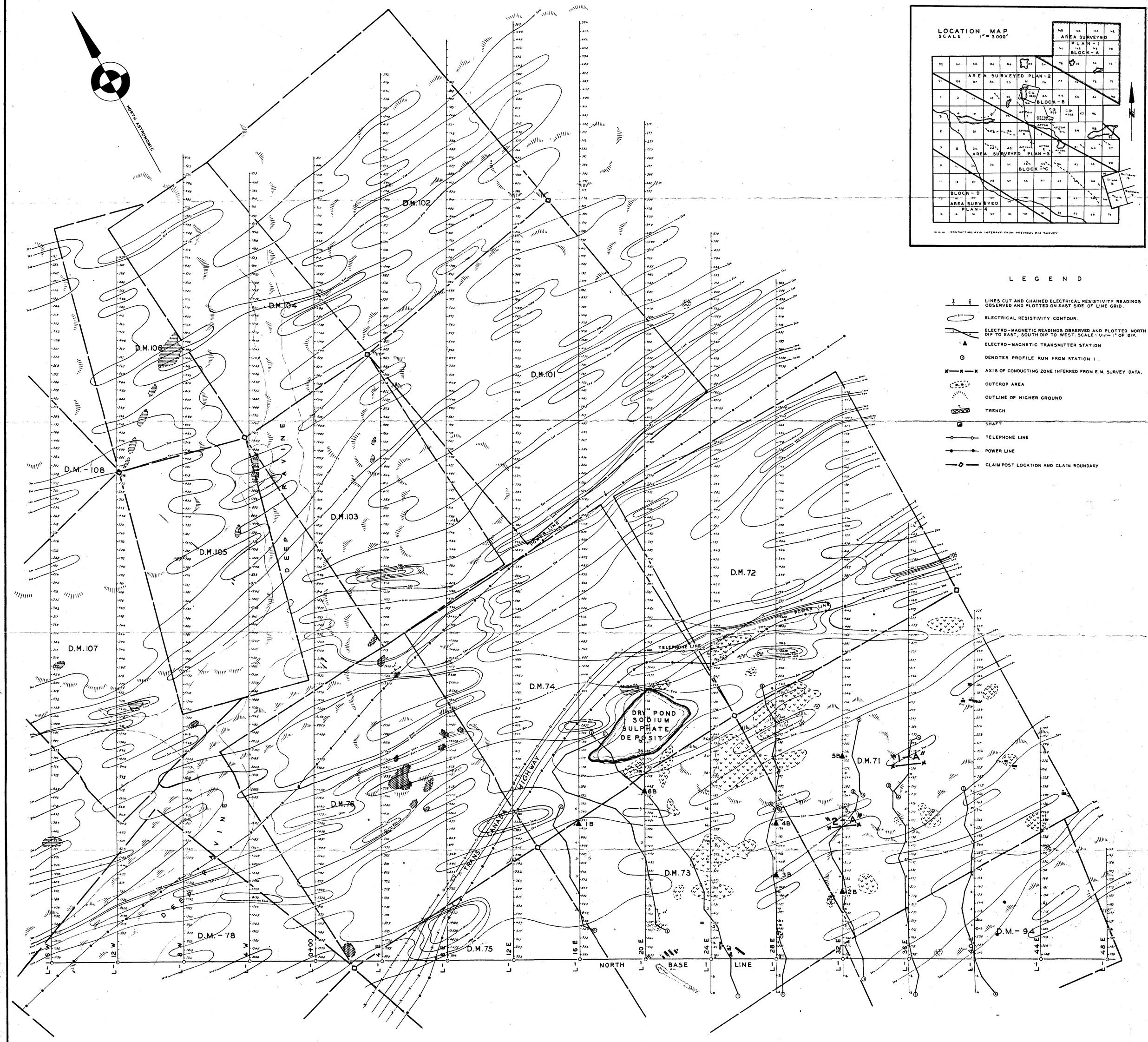
Note -

The above expenditures to be applied against Assessment work on the D. M. Group of claims property, Graham Bousquet Gold Mines Limited located in British Columbia.

Certified Correct as per the cost records of Geo-Technical Development Company Limited.

C. A. Flack

C. A. Flack, Accountant.




LOCATION MAP
SCALE : 1" = 3000'




CONDUCTING AXIS INFERRED FROM PREVIOUS E.M. SURVEY

## LEGEND

- LINES CUT AND CHAINED ELECTRICAL RESISTIVITY READINGS OBSERVED AND PLOTTED ON EAST SIDE OF LINE GRID.
- ELECTRICAL RESISTIVITY CONTOUR.
- ELECTRO-MAGNETIC READINGS OBSERVED AND PLOTTED NORTH DIP TO EAST, SOUTH DIP TO WEST. SCALE : 1/10" = 1° OF DIP.
- ELECTRO-MAGNETIC TRANSMITTER STATION
- DENOTES PROFILE RUN FROM STATION 1.
- AXIS OF CONDUCTING ZONE INFERRED FROM E.M. SURVEY DATA.
- OUTCROP AREA
- OUTLINE OF HIGHER GROUND
- TRENCH
- SHAFT
- TELEPHONE LINE
- POWER LINE
- CLAIM POST LOCATION AND CLAIM BOUNDARY

GEOPHYSICAL SURVEY DATA OVER "A" BLOCK PROPERTY

# GRAHAM - BOUSQUET GOLD MINES LIMITED

(D.M.-GROUP)

ELECTRICAL RESISTIVITY CONTOURS
IN PART
ELECTRO - MAGNETIC CHECK SURVEY
AND
GEOLOGICAL DATA AND INTERPRETATION

KAMLOOPS
BRITISH COLUMBIA

## LEGEND

- SEDIMENTS - SANDSTONE, SHALE, CONGLOMERATE, TUFF
- VOLCANICS - ACID TUFF
- INTRUSIVE - SYENITE, DIORITE
- HORIZONTAL SEDIMENTARY BEDS
- ATITUDE OF SCHISTOSITY
- CU — CHALCOPYRITE OR MALACHITE OR BOTH
- Fe — MAGNETITE

## LEGEND

OHM - CM X $10^3$

| | | | |
|---|---|---|---|
| 0 | - | 100 | |
| 100 | - | 200 | |
| 200 | - | 500 | |
| 500 | - | 1000 | |
| 1000 | - | 2000 | |
| 2000 | - | 5000 | |
| 5000 | - | UP | |



GEOPHYSICAL SURVEY BY:

GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED

PLAN NO - 1

DECEMBER - 1956

SCALE : 1" = 200'

GEOPHYSICAL SURVEY DATA OVER "B" BLOCK AREA

# GRAHAM - BOUSQUET GOLD MINES LIMITED

(D. M. GROUP)

PROFILES OF ELECTRO-MAGNETIC SURVEY DATA
IN PART
ISO-DYNAMIC CONTOURS OF MAGNETIC INTENSITIES
AND
GEOLOGICAL INTERPRETATION

KAMLOOPS
BRITISH COLUMBIA

GEOPHYSICAL SURVEY BY:

## GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED

PLAN NO-2

SCALE: 1" = 200'

DECEMBER - 1958



LEGEND

- LINES CUT AND CHAINED. ELECTRO-MAGNETIC READINGS OBSERVED AND PLOTTED NORTH END TO WEST, SOUTH END TO EAST. SCALE: 1 INCH EQUALS 100'
- ELECTRO-MAGNETIC TRANSMITTER STATION.
- DENOTES PROFILE RUN FROM STATION 7.
- AXIS OF CONDUCTING ZONE INTERPRETED FROM E.M. SURVEY DATA.
- MAGNETIC READINGS OBSERVED AND PLOTTED ON WEST SIDE OF LINE GRID.
- MAGNETIC CONTOUR.
- MAGNETIC CONTROL STATION.
- OUTLINE OF HIGHER GROUND.
- CLIFF.
- OUTCROP.
- FENCE.
- POWER LINE.
- SHAFT.
- PIT.
- TRENCH.
- CLAIM POST LOCATION AND CLAIM BOUNDARY.
- PROPOSED DIAMOND DRILL HOLE.

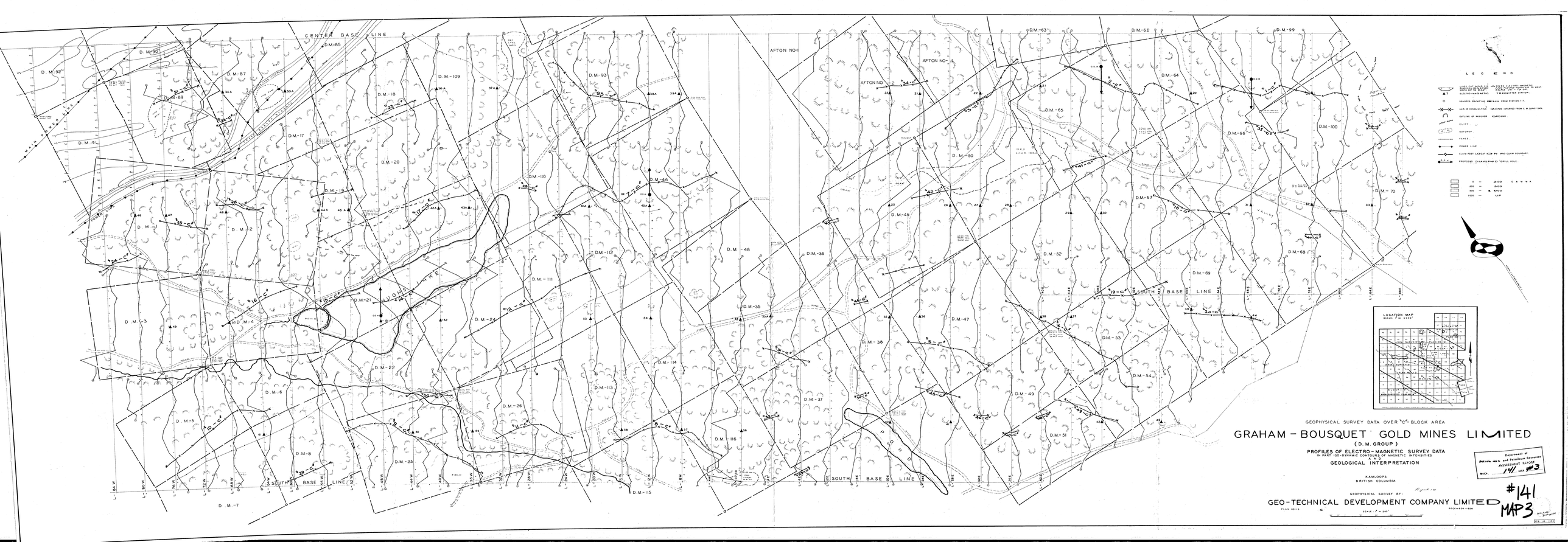
0 — 100 GAMMA
100 — 200
200 — 500
500 — 1000
1000 — UP

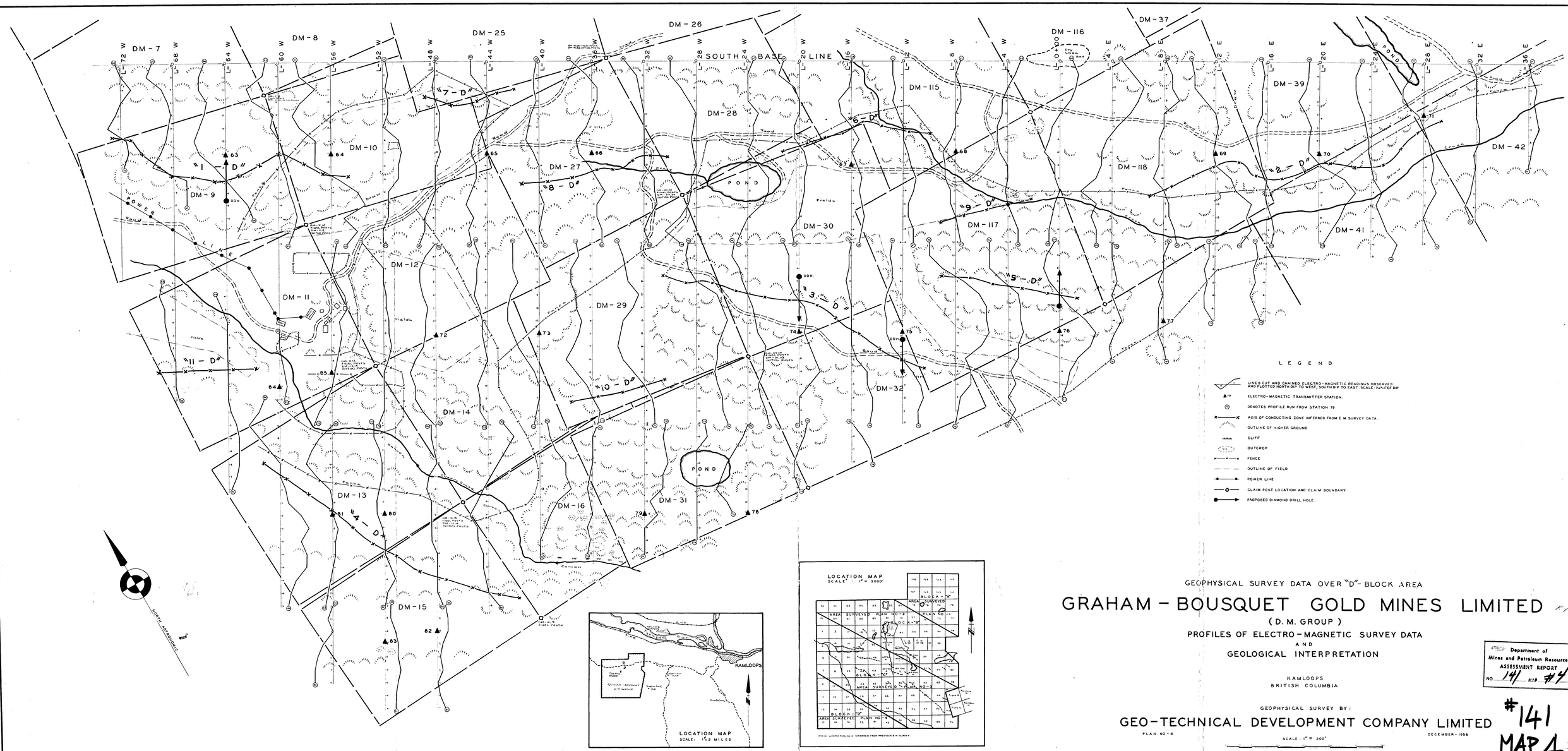
LOCATION MAP
SCALE: 1" = 2000'

BLOCK "B"
GRAHAM - BOUSQUET GOLD MINES LIMITED
AREA SURVEYED PLAN NO. 2

D.M. - 76
D.M. - 73
D.M. - 94
NORTH BASE LINE
D.M. - 75
D.M. - 78
D.M. - 56
D.M. - 77
D.M. - 80
D.M. - 95
D.M. - 55
D.M. - 96
D.M. - 82
D.M. - 79
D.M. - 57
D.M. - 58
D.M. - 44
DRY LAKE BED
D.M. - 84
D.M. - 59
D.M. - 97
D.M. - 81
D.M. - 43
D.M. - 60
D.M. - 83
D.M. - 86
D.M. - 61
D.M. - 98
AFTON - 3
D.M. - 34
D.M. - 88
D.M. - 85
D.M. - 33
AFTON - 1
D.M. - 63
D.M. - 62
D.M. - 90
D.M. - 92
CENTER BASE LINE
D.M. - 89
D.M. - 87
D.M. - 93
AFTON - 2
AFTON - 4

#141
MAP 2


CENTER BASE LINE
SOUTH BASE LINE
SOUTH BASE LINE
AFTON NO-1
AFTON NO-2
AFTON NO-4
D.M-1
D.M-2
D.M-3
D.M-4
D.M-5
D.M-6
D.M-7
D.M-8
D.M-9
D.M-17
D.M-18
D.M-19
D.M-20
D.M-21
D.M-22
D.M-24
D.M-25
D.M-26
D.M-35
D.M-36
D.M-37
D.M-38
D.M-45
D.M-46
D.M-47
D.M-48
D.M-49
D.M-50
D.M-51
D.M-52
D.M-53
D.M-54
D.M-62
D.M-63
D.M-64
D.M-65
D.M-66
D.M-67
D.M-68
D.M-69
D.M-70
D.M-85
D.M-87
D.M-89
D.M-90
D.M-92
D.M-93
D.M-99
D.M-100
D.M-109
D.M-110
D.M-111
D.M-112
D.M-113
D.M-114
D.M-115
D.M-116
LOUGHEED LAKE
POND
L-56W
L-60W
L-76W
L-72W
L-68W
L-64W
L-52W
L-48W
L-44W
L-40W
L-36W
L-24W
L-28W
L-24W
L-20W
L-8W
L-4E
L-8E
L-12E
L-16E
L-20E
L-24E
L-28E
L-32E
L-36E
L-40E
L-44E
L-48E
L-52E
L-56E
L-60E
L-64E
L-68E
L-72E
L-76E
L-80E
LEGEND
LOCATION MAP
SCALE 2" = 1000'
GEOPHYSICAL SURVEY DATA OVER "C" BLOCK AREA
GRAHAM - BOUSQUET GOLD MINES LIMITED
(D.M. GROUP)
PROFILES OF ELECTRO-MAGNETIC SURVEY DATA
IN PART 100-DYNAMIC CONTOURS OF MAGNETIC INTENSITIES
GEOLOGICAL INTERPRETATION
KAMLOOPS
BRITISH COLUMBIA
GEOPHYSICAL SURVEY BY:
GEO-TECHNICAL DEVELOPMENT COMPANY LIMITED
PLAN NO. 5
SCALE 1" = 200'
DECEMBER 1956
Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 141 MAP #3
#141
MAP3




GEOPHYSICAL SURVEY DATA OVER "D" - BLOCK AREA

# GRAHAM - BOUSQUET GOLD MINES LIMITED

(D. M. GROUP)

PROFILES OF ELECTRO - MAGNETIC SURVEY DATA

AND

GEOLOGICAL INTERPRETATION

KAMLOOPS
BRITISH COLUMBIA

GEOPHYSICAL SURVEY BY:

GEO - TECHNICAL DEVELOPMENT COMPANY LIMITED

PLAN NO - 4

SCALE: 1" = 200'

DECEMBER - 1956



#141
MAP 4

176-12-58