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Report
on the
Giant Copper Property,
New Westminster Mining Division,
Hope, British Columbia
for
G M Resources Limited,
Calgary, Alberta

January 28, 1980
Calgary, Alberta

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Summary

The Giant Copper property owned outright by G M Resources Limited, consists of 153 recorded mineral claims plus 8 Crown-granted mineral claims situated 37 kilometers southeast of Hope, some 205 kilometers from Vancouver. It is a copper-gold-silver-molybdenum prospect that was discovered in the early 1930's that has seen sporadic periods of intensive investigation tied to the economic conditions of the time and the price of copper, the property's dominant metal.

The history of the Giant Copper property is woven around two properties, the A.M. and the Invermay, which were under separate ownerships until 1956, at which time they were acquired by Canam Copper Company Ltd. (Canam). The claims, in particular the A.M. portion, were optioned to several major mining companies who operated the properties for short periods before relinquishing their option. In 1964, G M Resources Limited (GMR), then known as Giant Mascot Mines Limited, optioned the property and undertook a \$250,000 work program to confirm the reserves developed by previous operators with the objective of placing the A.M. sector in production. In 1966, GMR purchased the assets of Canam for 1,084,997 shares of Giant Mascot stock and assumed its liabilities. In the following eight years GMR carried out various programs consisting of geophysics, geochemistry, geologic mapping and diamond drilling in addition to underground mining operations including drifting, crosscutting, raising and sampling. From 1974 to 1979, no work was done on the property while metal prices, in particular copper, remained at an uneconomical figure. In 1979, GMR carried out a four hole diamond drill program on the property, the results of which verified previous indications of mineralization in certain areas of the A.M. and Invermay sections.

The A.M. property, on the southeast slopes of Silver Daisy Mountain, was the property that first attracted attention due to the extensive disseminated copper mineralization within a sedimentary breccia structure. Investigation of the property through a series of 9 adits (No.1 - 7 levels, No.10 level and No.15 level) extending through a vertical distance exceeding 457 meters (1,500 feet) has identified an oval breccia body with dimensions approximately 300 meters (1,000 feet) in a northwesterly direction and a width of approximately 180 meters (600 feet). Underground investigation employing ring diamond drilling from a raise in the northwest nose of the structure and diamond drilling and wall sampling on the levels has localized several areas of concentrated copper mineralization, principally in the northwest and south nose of the breccia body. Initially, the adjoining Invermay claims, on the western slopes of Silver Daisy Mountain, was explored for its silver-lead-zinc veins from which 97 tons of ore averaging 103.1 ounces of silver per ton, 10.9% lead and 11.8% zinc were shipped to the Cominco Smelter at Trail, British Columbia in two lots, the first in 1935 and the second in 1941. Later underground investigation of the Invermay quartz diorite intrusive, which is the host for the base and precious metal veins, revealed copper values which as yet are not fully evaluated, but are estimated to be in the 0.25 to 0.35% copper range.

Reserve estimates by company engineers, verified by a well recognized consultant placed the reserves in the northwest zone, at

some 2,778,000 tons of 1.35% copper, 0.017 ounces per ton gold, 0.72 ounces per ton silver and 0.033% molybdenum disulphide using a 0.8% copper cut-off after 15% dilution. No firm reserve estimates have been made on the south nose nor the central zones due, in part, to lack of sufficient information by way of diamond drilling. An in-house report by company engineers has estimated an indicated tonnage and grade to three zones on 10 level as follows: the north zone 8,000 tons per vertical foot grading 0.53% copper (this includes the previous reserve estimates on this level that is in the north-west nose area), central zone 29,700 tons per vertical foot of 0.224% copper and the south zone 7,800 tons per vertical foot of 0.473% copper. It is believed that the possibility for establishing a larger tonnage of lower grade copper material in the A.M. breccia as illustrated by these 10 level estimates, can be delineated by an intensive underground and surface drilling program, upon which the foundations for a combination open pit and underground block caving mining approach might be based.

It is also believed that the potential for a similar type of mining operation exists in the Invermay section, but its exploration is not as well advanced as the A.M. portion of the property.

To assess the results of the recommended underground drill program on the A.M. breccia requires the rehabilitation of the 6, 10 and 15 levels. This must be one of the first considerations.

Several other breccia bodies are known on the Giant Copper property but it is recommended, that unless conditions permit, the exploration of these structures be deferred for the present.

Similarly, a lead-silver-zinc geochemically and geophysically anomalous area known as 26 Mile Area requires further work but it is recommended that this work also be postponed.

Recommendations

The following exploration program is recommended to sample and test by diamond and percussion drilling the A.M. breccia and the Invermay stock in order to further explore with the intent of establishing tonnage and grade figures.

Prior operations on the A.M. breccia body have delineated the geometrical design of the structure and, in effect, have resulted in outlining a high grade copper section in the northwest nose of the oval body. Furthermore, intensive sampling on the 10 level has resulted in an extensive knowledge of mineralization throughout the breccia body as related to that level. Information is scarce or lacking from the 15 level to the 10 level and from the 10 level to surface in the central and south sections of the breccia and it is with the intent of filling this gap that recommendations are made. It is recommended that a grid style pattern of percussion drilling be undertaken on the surface at intervals of 30 meters across the central and south portions of the breccia plug with depth of the holes being carried to the 10 level elevation. It is further recommended that diamond drilling be carried out on a planned basis from the 10 level workings to evaluate where possible, without further development, the untested areas on 10 level and below.

In addition, it is recommended that a similar style of pattern drilling, or a modification thereof, be carried out from the surface of the Invermay breccia zone in order to evaluate its potential.

It is recognized that in order for the underground portion of the recommendation of both the A.M. and Invermay to be carried out the rehabilitation of the workings is essential, and as there are no camp facilities on the property, a camp capable of sustaining the operation for the appropriate time must be installed. Also, the access roads and bridges must be replaced or rehabilitated. In consequence of this, the program has been directed into two stages, with the first stage scheduled for commencement in late spring.

It is recommended that exploration of the remaining three breccia zones be postponed until a later date following the completion of the present recommended program. Similarly, it is recommended that exploration work on the anomalous 26 Mile Area be deferred. The present recommended program is principally concerned with the exploration for copper and precious metal mineralization presently indicated, whereas the 26 Mile Area is apparently associated with veins of silver, lead and zinc.

Stage I

This program would consist primarily of the rehabilitation of the underground workings, the rehabilitation and, if necessary, the relocation of specific sections of the camp road and installation of camp and camp facilities with the diamond drilling of the Invermay breccia to be commenced when the rehabilitation of the roads have been completed and the camp installed, providing weather conditions permit.

Stage II

This stage, implementing the primary recommendations of the report, in essence, the surface grid drilling by percussion machine(s) of the A.M. breccia and the underground diamond drilling of the 10 level would follow or in part could be carried out concurrently with the later phases of Stage I.

Stage III

This stage, which would largely depend on the success of Stages I & II, would in all probability involve further percussion and/or diamond drilling, trenching and underground exploration development which has not been laid out. It may also include some exploration of the other three known breccia zones and the 26 Mile Anomaly.

COST ESTIMATES

STAGE I

Capital Costs

Camp, power plant, mine-power plant	\$ <u>60,000</u>	\$ 60,000
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Direct Costs

Supervision, labour	131,800	
Catering	48,000	
Contract equipment rental, vehicles, compressors, camp units	68,000	
Administration and mobilization	37,000	
Miscellaneous Fuel Supplies	50,000	
Consulting and travel	20,000	
Rehabilitation of company equipment	15,000	
Road rehabilitation	65,000	
Diamond drilling 3,000 ft. @ \$25/ft.	75,000	
Assaying	<u>10,000</u>	<u>519,800</u>

TOTAL		\$579,800
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15% CONTINGENCY		<u>87,200</u>
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\$667,000

STAGE II

Direct Costs

Supervision, labour	\$ 132,500
Catering	58,000
Contract equipment rental:	
As per Stage I	68,000
Administration	12,000
Miscellaneous fuel supplies	50,000
Consulting and travel	50,000
Diamond drilling 14,650 @ \$25/ft.	366,250
Percussion drilling 19,600 @ \$15/ft.	294,000
Assaying	<u>85,000</u>
TOTAL	\$1,115,750
15% CONTINGENCY	<u>167,250</u>
	\$1,283,000
TOTAL STAGE I AND II	\$1,950,000

Respectfully submitted,

January 28, 1980
Calgary, Alberta

W. G. HAINSWORTH, P. ENG.
Consulting Geologist

Introduction

The writer was commissioned by G M Resources Limited to report and make an exploration recommendation on the Giant Copper property, a wholly owned subsidiary of G M Resources Limited (GMR).

The Giant Copper holdings of GMR in southern British Columbia consist of 153 recorded mineral claims and 8 Crown Granted claims which enclose two prospective copper showings that have seen various intensities of exploration since their original location in the early 1930's. There has been no copper production from either showing although the Invermay prospect which was originally investigated for its silver-lead-zinc potential did have two shipments, totalling 97 tons, of ore forwarded to the Trail smelter in British Columbia in the early life of the property. Investigation of both properties has been through a series of adits, with the AM breccia portion of the property being more advanced in the matter of lateral and vertical development which has resulted in the location of areas of concentrated copper mineralization.

There have been several mineral reserve estimates released on the AM productive capacity, with the estimates ranging from a low tonnage-high grade situation to a large tonnage-low grade potential.

The weak world price of copper has held back development of the property since the early 1970's. However, in view of the present price rise it is considered that the exploration of the Giant Copper property is warranted as does GMR.

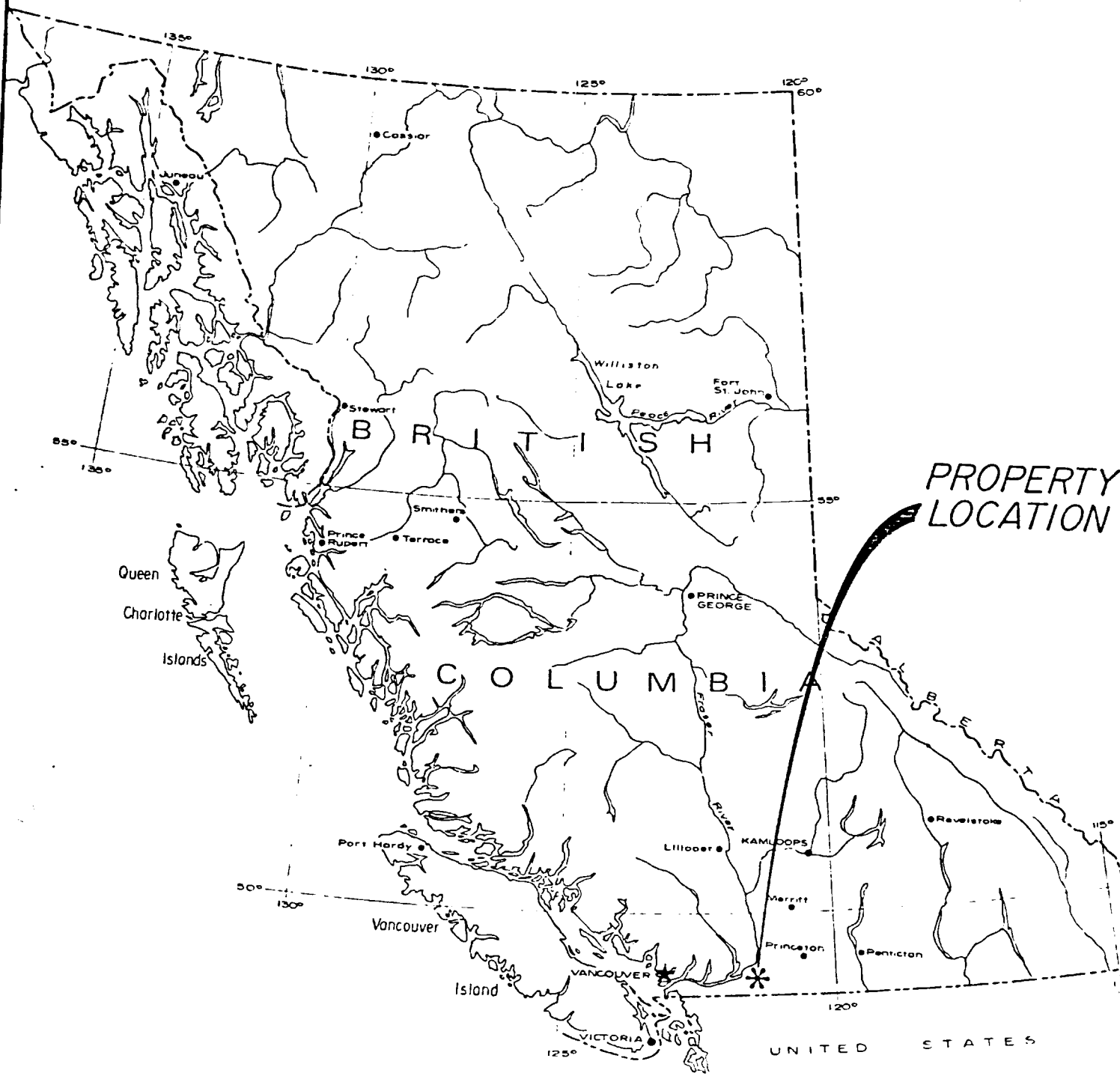
At the time of writing the federal government's metrification program is in operation. To conform with this changeover, all figures are given in meters with their equivalent footage.

Location and Access

The Giant Copper claims are located in southwestern British Columbia, approximately 205 kilometers from Vancouver and 37 kilometers southeast of the town of Hope. Manning Provincial Park lies flush along the northeast boundary of the property.

The property lies between elevations 1,310 meters (4,300 feet) and 1,980 meters (6,500 feet) above sea level, on the west and southeast slope of Silver Daisy Mountain.

Access is by major highway (South TransCanada Highway No.3) to a point 42 kilometers from Hope, then south on a 4-wheel drive gravel road for 5 kilometers to the 15 level portal at 1,323 meters (4,340 feet). From this elevation, mine roads lead to the portals of the A.M. and Invermay properties.



PROPERTY
LOCATION

GM RESOURCES LIMITED
GIANT COPPER PROJECT
LOCATION MAP



Property

The Giant Copper property holdings of G M Resources Limited consist of one hundred and fifty-three mineral claims held by location and eight Crown Granted mineral claims. The property adjoins the south western boundary of Manning Park.

All the mineral claims are in good standing. (See Appendix "A").

The claims form a solid block with a north to north west trend extending approximately 10 kilometers in this direction. The property encloses the west and south east slopes of Silver Daisy Mountain.

The property is in the New Westminster Mining Division of British Columbia. Reference N.T.S. 92 H/3.

History

The Giant Copper property consists of two main groups of claims, the A.M. and Invermay, which adjoin but were under separate ownership until 1956.

The A.M. group located on the east slope of Silver Daisy Mountain was staked in 1930 and the Invermay group on the west slope in 1933. Canadian Mining and Smelting Company of Canada Ltd. (Cominco) acquired the property in 1930 and actively explored it until 1938. During this time, the Invermay group was under the control of the Invermay Annex Mining Company Ltd. who actively exploited it until 1938. In the 40's the Invermay group was held by the Invermay Annex Skagit River Development Company Ltd. who retained it until 1956 at which time it was acquired by Canam Copper Company Ltd. and merged with the A.M. property.

The A.M. group was idle from 1938 until the late 1940's when it was acquired by J.W. Heffernan and Associates. This organization did some minor work on the property before turning it over in 1949 to an newly formed company, Canam Mining Corporation Ltd. Following another reorganization a new company was formed, Canam Copper Company Ltd. (Canam), who carried on development until 1954 when they optioned the group to the American Metal Company. In 1955, Canam optioned the group to Mogul Mining Company who dropped the option in 1957. During the next two years the property, which then included the Invermay group, was explored by Cominco. When Cominco withdrew in 1959, Canam undertook an exploration and development program until 1963.

In 1964, G M Resources Limited (GMR), then known as Giant Mascot Mines Limited, optioned the property and in 1966 purchased all the assets of Canam for slightly under 1.1 million shares.

Since the acquisition of the Giant Copper property by GMR several seasons of exploration and development work were carried out up to 1970. No work was done on the property until the fall of 1979 when a limited surface drilling program was carried out.

Property Development

Exploration and development of the Giant Copper property has been carried on intermittently from the 1930's to date. The following is a chronological summary of operations on the property:

- 1930 - The A.M. group, on the east side of Silver Daisy Mountain, was staked and optioned to Cominco. In the ensuing eight years, Cominco, who then held an interest in the group, collared 6 levels designated No.'s 1 to 6 and did 825 meters (2,700 feet) of lateral work.

- 1933 - The Invermay group, on the west side of Silver Daisy Mountain, was staked as the Norwegian group claims and acquired by Invermay Annex Mining Company Ltd. (Annex). This company, in the following 5 years, developed a narrow erratic shear vein on the claims by 4 main adits, No.'s 2 to 5, and 2 prospect adits, No.'s A & B. In 1935, the Annex built an aerial tramway from the junction of the Silver Daisy Creek and the Skagit River to No.5 adit to ship lead - zinc - silver ore. Stoping on the No.3 and No.4 adit levels resulted in 21 tons grading 0.01 ounce per ton gold, 175.3 ounces per ton silver and 13.6% lead and 19.8% zinc being shipped to Cominco's Trail smelter. The final work by Annex on the No.5 adit resulted in the discovery of copper mineralization in the host rock.

- 1938 - Activity on both the A.M. and Invermay groups ceased.

- 1941 - On the Invermay group mining was resumed and 76 tons of 83.2 ounces per ton silver, 10.2% lead and 9.6% zinc was shipped to the Trail smelter.

- 1947 - The A.M. group was acquired from Cominco by J.W. Heffernan and Associates who drilled 2 relatively short surface diamond drill holes totalling 295 meters (970 feet) before relinquishing it to a new company, Canam Mining Corporation.

- 1948 - The Invermay property which had reverted to the Crown, was acquired for payment of taxes by the Invermay Annex Skagit River Development Company Ltd. who did some scattered diamond drilling primarily to satisfy assessment requirements.

- 1949 - On the A.M. group, Canam Mining Corporation Ltd. continued the No.6 adit drive into what is termed the nose section. Simultaneously, the road from the main highway up to the main workings was upgraded.

- 1950 - Canam Copper Company Ltd. (Canam) was formed.

- 1951-52 Canam undertook additional drilling, drifting and cross-cutting on No.6 adit level to maintain assessment requirements.

- 1953 - During the summer operational period, Canam collared the No.7 and 10 levels and advanced No.3 level a short distance.

- 1954 - The A.M. group was optioned by The American Metals Company Ltd. who did some 760 meters (2,500 feet) of surface drilling and drove No.10 level ahead for 35 meters (120 feet) before dropping the option at the years end.
- 1955 - Mogul Mining, Toronto, optioned the A.M. and over the next two years organized a major program on the property with the objective of putting it in production. They constructed a 100 man camp complex including a combination cookhouse and bunkhouse and a separate bunkhouse at the 1,310 meter (4,300 feet) elevation and cleared the site for a concentrator. They also collared a main haulage adit, No.15 adit level, and advanced it for 1,460 meters (4,800 feet). In addition, a limited amount of underground and surface diamond drilling was carried out.
- 1956 - Canam acquired the adjoining Invermay group.
- 1957 - Copper prices fell and Mogul relinquished the Giant Copper property then known as the Canam property. In the same year, Cominco optioned the combined claim groups and in the following two years undertook drilling in the vicinity of the Invermay and A.M. workings. Most of their work was related to the Invermay breccia and the Camp and Pass breccia which are near the A.M. breccia, however, they dropped their option in 1959.
- 1961 - Canam advanced the No.15 level an additional 700 meters (2,300 feet) into the north nose sector part of the A.M. breccia. In addition, they collared a shaft raise and extended it 43 meters (141 feet).
- 1963 - Canam rehabilitated the No.15 level and carried out diamond drilling below the level. They also did 360 meters (1,185 feet) of surface drilling in the No.7 adit area.
- 1964 - Giant Mascot Mines Limited, now known as G M Resources Limited (GMR), entered into an option to earn a majority interest in the property by undertaking a \$250,000 work program on the A.M. breccia zone to prove the mineral reserves and electing, within a fixed period of time, to put the property into production. A ventilation raise was collared and driven 170 meters (555 feet) from 15 level towards 10 level and 5,820 meters (19,100 feet) of diamond drilling was done.
- 1965 - During this year, GMR continued their program and did some 380 meters (1,250 feet) of surface drilling in five holes and 2,660 meters (8,725 feet) of underground drilling in 53 holes.
- 1966 - GMR purchased all the assets and liabilities of Canam for 1,084,997 shares of Giant Mascot stock, plus assuming Canam's liabilities of some \$215,000. The property which to then had been called Canam was renamed Giant Copper. Little property work was done in this year.
- 1967 - No.10 level was rehabilitated and a crosscut was driven

towards the south zone of the A.M. breccia. In addition, the ventilation raise, started earlier from 15 to 10 level, was completed for its total distance of 230 meters (750 feet). The Company completed the planned 10 level drive to the south zone of the A.M. and crosscuts in it for a total distance of 348 meters (1,140 feet). In addition, the ventilation raise from 15 to 10 level was completed for a total inclined distance of 222 meters (728 feet). A 15 meter (50 feet) stub raise was started from the No.10 level crosscut towards 7 level in the south zone, but was discontinued because of poor ground conditions. Additionally, some 1,327 meters (4,352 feet) of underground drilling was done and geochemical and geophysical surveys were carried out on the surface.

- 1969 - The 1,4,6,7 and 10 levels and the ventilation raise were mapped and chip sampled. The main road to the workings was improved and in certain areas relocated. Some 1,220 meters (4,000 feet) of trenching was done by bulldozer. A new Atco camp to house 22 men was installed just off the main highway.
- 1970 - The 10 and 15 levels were rehabilitated and retimbered where necessary in cave areas. The 15 level was extended south into the south mineralized zone and a raise was advanced 7 meters (24 feet) towards 10 level. A minimum amount of drilling (63 meters - 207 feet) was undertaken below 15 level.
- 1971 - The extension of the 15 level into the south zone was sampled.
- 1972 - On the surface, the south end of the A.M. breccia received attention with some 1,860 meters (6,100 feet) of bulldozer trenching was done on the structure. Thirteen kilometers (8 miles) of new road construction consisting of a route to a lead-zinc geochemical anomaly on the southwest slope of the ridge and old road rehabilitation and repair, was carried out. Also, geophysical surveys were undertaken in the area of the 10 level portal to further delineate a geochemical, geophysical anomaly and 198 meters (651 feet) of diamond drilling was done to test this anomaly.
- 1974 - All the camp and plant facilities were removed.
- 1979 - Three surface drill holes totalling 292 meters (958 feet) were drilled in the southern A.M. breccia zone and 1 surface hole for 245.6 meters (805.5 feet) was put down on the Invermay breccia.

Areal Geology

The Giant Copper area of southwestern British Columbia lies within the influence of the Cascade Mountain system. These mountains consist of a north-northwest trending gneissic and granitic core flanked by belts of sedimentary and volcanic rock. It is one of these sedimentary belts that contains the Giant Copper.

Located in what is termed the Eastern Mesozoic Belt, the structural unit is confined on its western boundary by the Hozameen Fault and bounded by a poorly-defined Pasayten Fault along portions of its eastern flank.

A major north north-west striking syncline is evident in the north end of this belt and reportedly the axial plane strikes through the Gibson Pass area some 20 kilometers south of the Giant Copper property. Local mapping of the Giant Copper property has identified fold structures. Associated with the areal folding is large scale reverse faulting that dislocates and disrupts sections of the eastern fold limb.

Intrusive into the sediments are basic dikes and sills followed by granodiorite and quartz diorite discordant bodies of variable sizes.

The predominating formations within this belt are mostly marine with minor non-marine sediments, belonging to the Lower Cretaceous through the Lower Jurassic eras.

Local Geology

In the Giant Copper area, the geological model displays interbedded sedimentary formations of the Dewdney Creek and Ladner Groups. Underlying and separating them from the earlier Paleozoic sediments is the Hozameen Fault. This strong break extends north northwest from the International Boundary for some 95 kilometers (57 miles) and eventually is lost in the Fraser Canyon complex.

A chronological history of the geological sequences would likely have had the following pattern:

The sedimentary complex was uplifted, folded and moderately fractured prior to intrusive action into them in the form of small sills and dykes of mafic and ultramafic types which are considered to be the earliest intrusions in the area. The Invermay granodiorite stock was later emplaced with successive marginal phases resulting in offshoot dykes and sills of both granodiorite and quartz diorite composition.

Brecciation of the sedimentary zone then resulted and was followed by metamorphism both thermally and hydrothermally. It would appear that the brecciation, metamorphism and intrusive emplacement were all the result of a single agency - magmatic force. The breccia was probably localized due to structural controls, in this case, faults. The mineralizing solutions likely followed similar-type pathways (faults) into the A.M. and Invermay breccias, which are the main zones of mineralization on the property, and possibly into the other three known breccia zones.

Structure

Regionally, the Dewdney Creek - Ladner Group is contained within two fault structures, the Hozameen to the west and the Chuwanten to the east. Both faults are described as west - dipping thrust faults.

A synclinal fold pattern striking and plunging 35° to the north has been observed by government geologists trending through the A.M. portion of the property. Surface mapping has shown numerous folds and variations of the normally north striking beds around the fold noses.

Small scale rupturing is apparent on the surface of the property, whereas the underground workings show large gouge areas and shear structures which cut through the sediments and the intrusives. The gouge zones, may extend up to six meters in width with, in many cases, undetermined movement. The shear zones in the Invermay stock which range in width from three to thirty centimeters are often well mineralized.

Major fault structures recognized through surface and underground mapping are:

- 1) North 20° - 30° West - These are the regional trend structures as depicted by the Hozameen Fault and are pre-ore and pre-intrusive.
- 2) Northeast - These are considered pre-ore faults that were ideal conduits for mineral passage. These faults, which are the most prevalent, vary widely in thickness.
- 3) Eastwest to North 70° West - These are possibly the bounding faults within which the breccia (s) were localized and likely were instrumental in the mineral placement.

Rock Types

As mentioned earlier, the Giant Copper property is underlain by a sedimentary formation, with some uncertainty existing as to its age and, consequently, its classification. Regional mapping by the Geological Survey of Canada, has assigned the formation to the early Ladner group of sediments which formation, not unlike the Dewdney Creek group in lithology, has been verified by fossil identification. Other writers have identified the host formation as belonging to the Dewdney Creek group. Both groups are of Jurassic age with the Dewdney Creek, being the later of the two, assigned to the Upper Jurassic, whereas, the Ladner group has been classified as of Middle Jurassic age.

Ladner Group - This group consists of a sequence of pelites, occasional volcanic sandstone and minor conglomerates. The pelites, metamorphosed argillaceous formations, are most common with the fine to medium grained variety, slate, being the dominant formation in the general area. This dominance has lead to the usage of the term "Slate Belt" by Cairnes of the Geological Survey of Canada in his examination of the area in 1924.

The slate member of the group is usually dark grey to black in colour, with occasional light grey, greenish grey and green varieties. The presence of pyrite and/or pyrrhotite result in a rusty brown weathering appearance. The slates are finely laminated with cleavage planes generally coinciding with the bedding planes.

Interbedded with the slates are massive beds of sandstone.

Dewdney Creek Group - These are thin-bedded sediments, normally white to light grey or rusty on the weathered surface with the fresh rock exposing a cream to dark grey colour. They have a fine-grained texture with occasional medium grained or gritty beds running through a gradational bedding. The lighter beds, being siliceous, resemble chert, whereas, the darker, finer grained beds take on the appearance of an argillite and have often been referred to as siltstone. The beds strike northward and dip steeply to the east.

The group is reported to be no thicker than 300 meters (1,000 feet) in the general area of the Giant Copper but thickens up to 3,000 meters as it progresses northward. This thickening could be either a series of gradational rock units, assigned by some writers to separate formations, or a true swelling of a single unit with variable interbeds.

Intrusives

Quartz Diorite - The sediments have been intruded by scattered dykes and sills of quartz diorite and by the Invermay quartz diorite stock, a normally medium to coarse grained, light grey coloured rock. This equigranular stock is made up largely of pale grey feldspars and quartz with minor amounts of hornblendes or biotite and less commonly tourmaline. The mafics comprise no more than 10% and often much less, while quartz may range up to 25% of the total composition of the rock. Portions of the Invermay stock, near its southern contact, are banded and heavily tourmalinized.

The irruptive has been assigned to the Upper Cretaceous age.

Mafic Bodies - The Giant Copper property contains several small mafic dykes of dioritic/gabbro composition, which are probably off shoots from the main serpentine belt further to the east. In some instances, the basic intrusives are mineralized.

Metamorphism

Regional metamorphism is of a low order, but early deuteric action has introduced tourmaline in large amounts into the sediments and quartz diorite over a wide area.

On the local scale, alteration has had its effect in colour variations resulting from breakdown of primary minerals. The siltstones, in particular, show this development with the production of white mica through the feldspar breakdown giving the formation a light grey in contrast to the normal dark grey. This colour variation, or banding, is particularly noticeable on the Invermay property where chlorite and sericite have given the quartz diorite a peculiar effect akin to banding. The initial effect of this banding is to assume a horizontal structuring of the alteration.

This horizontal effect was noted and commented on by Cominco geologists in 1959, but they came to no definite conclusions. As the mineralization at the Invermay is tied into the alteration effect (more chlorite, less mafics, more mineralization) the disseminating mineralization may, in a rudimentary form, adopt a horizontal development.

In addition, the siltstones show a granitization effect in the vicinity of the quartz diorite intrusive bodies. The transition is gradual from one type to another due to the introduced material.

Mineralization

The sedimentary outcrops which form the surface showing of the A.M. breccia are distinctly rusty with minor pyrite, pyrrhotite or chalcopyrite occurring as scattered grains or concentrated along thin fractures or quartz veinlets. Local concentrations of mineralization occur in the A.M. breccia in the southeast and the northwest nose areas and in shear zones within the Invermay stock.

In the A.M. breccia, mineralization occurs primarily as pockets in the matrix adjacent to the fragments and, in other instances as veinlets cutting the matrix and fragments. A large gouge zone trending across the breccia contains lenses of massive arsenopyrite, pyrite and chalcopyrite. In addition to pyrite, pyrrhotite and chalcopyrite, other minerals reported are molybdenite, magnetite, uraninite, scheelite, sphalerite and galena.

In the Invermay plug, the mineralization is of two types. The primary type consisting of lenses and bands of quartz, sphalerite, galena and pyrite is localized along the walls of the shear zones. The other variety is the light and dark banded type containing pyrite, chalcopyrite, arsenopyrite and minor jamesonite. In addition, many vertical to sub vertical fractures have a thin lining of pyrite and, in some instances, chalcopyrite.

Breccia Zones

There are five known breccia areas on the property - The A.M., Invermay, Pass, Camp and New breccia zones. Of these, the A.M. has been explored the most intensely by surface and underground drilling, drifting, crosscutting and raising. However, some underground and surface drilling has been done to test the mineralization in the Invermay breccia but most of the work within this plug has been concentrated on exploring the lead-zinc-silver veins within the main shear zone. Only limited surface diamond drilling and stripping has been done on the other three known breccia zones.

A.M. Breccia

The A.M. breccia zone is a sedimentary breccia with lateral dimensions of some 300 meters (1,000 feet) northsouth and 180 meters (600 feet) eastwest that is located on the southern slope of Silver Daisy Mountain. It has an oval pipe-like form with apparently sharp, abrupt walls that in many localities are vertical.

In the A.M. breccia the fragments are oblong, light colored rock in a fine to medium grained matrix. These larger particles that range in size from 50 millimeters or more in length down to 1 millimeter in width consist mainly of fine to very fine-grained quartz which has been recrystallized plus sericite and clay minerals. The fine to medium grained matrix consists of epidote, amphibole, chlorite and tourmaline enveloping the fragments. As the transition zone of the breccia to the host sediments is approached the matrix takes on the color and appearance of dark siltstone or argillite, whereas, the fragments thin out and eventually disappear. Some fragments have been identified, albeit with difficulty, in the dark matrix background.

Large irregular masses of amphibolite intrude the southern portion of the breccia pipe. Locally, the amphibolite is massive, greenish black and medium grained, whereas, in other sections, it is light green, fine grained and carries numerous inclusions. On 10 level it has been noted that the amphibolite includes blocks of bedded sediment and breccia.

The origin of the breccia is not clear as its oval like shape tends to discount folding and single or multiple fault brecciation. Possibilities exist for diapirism origination or formation by gas explosion as postulated by Paul Kent in respect to special breccias associated with hydrothermal development in the Andes. Eastman of the British Columbia Department of Mines, who examined the property in 1965 and 1968, is inclined to concur that the "burst breccia" theory agrees with evidence exposed on 10 level in the southern end of the breccia body.

Historically, the A.M. breccia, because of the way in which it has been explored, is generally referred to as consisting of three sectors, the northern and southern nose zones and the central zone. Of these, the northern nose has been extensively developed from 15 level to the surface with two intermediate levels, the 6 and 10 and by a 222 meter (728 foot) ventilation raise. The south

zone has been mainly developed by drifts and crosscuts on 10 level and short drifts on 7 and 15 level and the center zone by crosscuts on 10 and 15 levels. Reference Figure 3.

During 1979, GMR located three diamond drill holes within the southeast nose area of the breccia with the intent of substantiating the continuity of previous copper and molybdenum assays from the 10 level to surface and additionally, to check the mineralization grade below the 10 level. All holes were vertical.

Hole 79-1 - Located close to No. 7 Adit. The hole cut primarily brecciated siltstones with a narrow dyke or quartz diorite being intercepted high in the hole. Copper and molybdenum mineralization improved below the dyke. At a depth of 35.4 meters (116 feet) cementing became necessary. The hole was re-drilled from 31.4 meters (103 feet) to 34.5 meters (113 feet) at which point the hole was abandoned due to the extent of the deviation.

Over all core recovery was 47.6%.

Assay Results:

<u>Footage</u>	<u>Type</u>	<u>Ounces per ton</u>		<u>Copper %</u>	<u>Molybdenite %</u>
		<u>Gold</u>	<u>Silver</u>		
0-35.4 meters	Core	0.01	0.85	0.558	0.072
3-33.5 meters	Sludge	0.009	0.775	0.80	0.139

Hole 79-2 - Located close to No. 3 Adit. The hole intersected a well mineralized sedimentary breccia formation to 84.8 meters (278 feet) at which point the hole passed through a fault structure into fresh unmineralized quartz diorite intrusive. The hole continued in the intrusive to 132.3 meters (434 feet) before being discontinued.

Overall core recovery was 64.4% with the initial 61 meters (200 feet) of mineralized material having a recovery of 49.1%.

Assay Results:

<u>Footage</u>	<u>Type</u>	<u>Ounces per ton</u>		<u>Copper %</u>	<u>Molybdenite %</u>
		<u>Gold</u>	<u>Silver</u>		
0-132.3 meters	Core	0.007	0.127	0.358	0.014
0-61.0 meters	Core	0.01	0.212	0.725	0.026
4.5-61.0 meters	Sludge	0.022	0.387	1.693	0.033

Hole 79-3 - Located 75 meters west of No. 3 Adit. The hole was drilled to a depth of 124.5 meters (408.5 feet) in badly broken ground that consisted of weakly mineralized sedimentary breccia cut by numerous narrow basic dykes that are, for the most part, unmineralized.

Over all core recovery was 72.8%.

Assay Results:

<u>Footage</u>	<u>Type</u>	<u>Ounces per ton</u>		<u>Copper %</u>	<u>Molybdenite %</u>
		<u>Gold</u>	<u>Silver</u>		
0-124.4 meters	Core	0.001	0.047	0.128	0.002

Invermay Breccia

The mineralization on the Invermay portion of the Giant Copper claims are associated with a large quartz diorite intrusive body, called the Invermay stock. This intrusive with its long axis extending over 3,300 meters (11,000 feet) in a north-south direction has widths varying from 400 meters (1,400 feet) to 1,900 meters (6,400 feet).

Associated with this large intrusive mass are northeast and north striking shear structures which, during their development, have likely contributed to the brecciation in their immediate vicinity. This brecciation plus the shearing has been the loci of mineralization.

The breccia appearance shows fresh, grey, angular fragments set in a matrix of the same composition with the addition of tourmaline and quartz. The east contact of the quartz diorite in the vicinity of "A" and "B" adits is marked by a well defined shear zone, and here the breccia bounding the shear takes on a strong horizontal banded appearance. This effect is made up of light bands of feldspar, quartz and minor tourmaline and dark bands largely of tourmaline with some quartz. The bands are vuggy.

Mineralization is of two types and is related to the brecciation phenomenon. The initially developed mineralization, that which was mined, was high grade silver-lead-zinc veins or shear structures. The other type is disseminated copper mineralization.

The silver-lead-zinc deposits are narrow erratic lenses in the vein structure varying from several centimeters up to 3/4 meter in width and are quite variable in length. For example, in the 4 level adit, vein mineralization extends over 200 meters (660 feet) of its 215 meter (700 feet) length. Some 30 samples cut along this structure by previous owners averaged 0.07 oz./t gold, 32.6 oz./t silver, 6.97% zinc and 3.12% lead. No.3 adit exposes two lenses 18 meters (60 feet) and 35 meters (120 feet) respectively through its 90 meter (290 feet) length. The minerals readily identified are pyrite, argentiferous galena, sphalerite and chalcopyrite. Some 97 tons of ore grade material were shipped from these two adits in 1935 and 1941.

The disseminated copper type of mineralization found in the Invermay has not been as thoroughly investigated as the copper mineralization in the A.M. Where noted, it occurs as scattered fine blebs of pyrite and chalcopyrite sometimes related to the tourmalinized rim structure of the fragments or as weak disseminated specks in the altered but unbrecciated quartz diorite. Some of the banded mineralization in the Invermay section consists of pyrite, chalcopyrite, arsenopyrite, minor jamesonite and molybdenite. Also pyrite and minor chalcopyrite occur as scattered grains and as pockets in some of the dark bands of the "banded" ore.

As part of its 1979 diamond drilling program, GMR was able to put one hole (79-4) into the Invermay intrusive before being forced to withdraw due to weather conditions. The intent of the drill hole was to gather geologic knowledge in this particular area and to substantiate the continuity of mineralization through the quartz diorite plug.

Hole 79-4 - Located about 17 meters south of the No. 4 portal and inclined -80° to the northeast. The hole was drilled from the surface to a depth of 245.6 meters (805.5 feet). Differentially chloritized quartz diorite breccia was cut for the complete depth with a notably banded structure being observed in the mineralization. The disseminated mineralization was confined principally to the lighter sections of the intrusive where the quantity of ferromagnesium minerals totalled less than 5%. The mineralized fractures lie generally parallel or sub parallel to the core axis. The two types of mineralization (disseminated and fracture-filling) are readily noticeable through the hole.

Over all core recovery was 97.5%.

Assay Results:

<u>Footage</u>	<u>Type</u>	<u>Ounces per ton</u>		<u>Copper %</u>	<u>Molybdenite %</u>
		<u>Gold</u>	<u>Silver</u>		
0-245.6	Core	0.011	0.297	0.184	0.005
0-70.1		0.009	0.426	0.245	0.006
70.1-106.7		0.006	0.098	0.067	0.002
106.7-112.8		0.034	0.675	0.295	0.026
112.8-137.2		0.008	0.014	0.081	0.004
137.2-245.6		0.013	0.320	0.207	0.004

Ore Reserves

Since 1961, a number of mineral reserve estimates have been made of the mineral reserves in the north nose section of the A.M. breccia. These estimates vary with the extent of the development and drilling and the purpose for which they were made which in some cases was for estimating the possibility of the high grade selective mining approach to a low grade block caving and surface open pit. The following reserve figures apply only to the A.M. sector of the property; the Invermay has, to the writer's knowledge, had no reserve estimates drawn up.

In 1961, the Canam Copper Company Ltd. estimated the reserve of potential ore as 2,069,500 tons, grading 1.4% copper, 0.026 ounces per ton gold and 1.00 ounce per ton silver whereas, when GMR first reviewed the property in August 1963, they estimated a reserve tonnage of 1,828,500 tons grading 1.35% copper, 0.03 ounces per ton gold and 0.81 ounces per ton silver.

In October 1965, following an extensive diamond drilling program by GMR, a preliminary report authored by L.P. Starck, P. Eng., put the reserve estimates at 2,777,984 tons of 1.35% copper, 0.017 ounces per ton gold, 0.72 ounces per ton silver and 0.033% molybdenum disulphide (using a 0.8% copper cut-off after 15% dilution).

A report issued by a company of independent engineers, Wright Engineers Limited, Vancouver, in 1966, gave the property 2,610,000 tons of reserve ore grading 1.28% copper, 0.015 ounces per ton gold, 0.65 ounces per ton silver and 0.031% molybdenum disulphide. In December of that same year, the figures were revised to 2,438,805 tons grading 1.49% copper, 0.017 ounces per ton gold, 0.80 ounces per ton silver and 0.037% molybdenum disulphide.

The reserves were reexamined by GMR in 1972 with the result the original figures as reported by L.P. Starck were reconfirmed. This analysis was verified by L.T. Postle, P. Eng., an independent consulting mining engineer, in August 1972.

The writer has seen the Company's original calculations and Mr. Postle's report proving the tonnage and grade and method of arriving at such and concurs with the Company and Mr. Postle in the figures.

No firm reserves have been estimated on the south and central section of the A.M. breccia, but in August, 1972, W.E. Clarke, P. Eng., estimated a potential on 10 level of 3,200 tons per vertical foot of 0.62% copper. He includes in his figure 1,500 tons per vertical foot of a higher grade 0.85% copper. In an elaboration of his figures Clarke breaks tonnages and grades down in the three main zones on the 10 level to north zone 8,000 tons per vertical foot grading 0.53% copper; central zone 29,700 tons per vertical foot of 0.224% copper and the south zone 7,800 tons per vertical foot of 0.473% copper. Reference Figure 2. There have been no further estimates on the south nose since the release of the above figures.

In March 1975, the writer, in an official capacity for a foreign mining company, reviewed the material and data supplied

by GMR and using the 2.8 million ton figure, calculated a low grade inner zone adjoining the high grade of 2,635,000 tons of 0.35% copper. The combined reserve figure and grade that the author arrived at was 5,412,984 tons of 0.86% copper with no consideration being given to the precious and other base metals values.

Reserve estimates in the north nose of the breccia are based on extensive diamond drill holes from the 15, 10 and 6 levels and ring drilling from a raise connecting the 15 with the 6 level. Economic features dictated the depth of the drill holes which in the majority of cases were stopped at the boundary of the breccia. One hole, No. 129, penetrated beyond the contact for some 30 meters (96 feet) into a basic formation, termed a gabbro, and averaged 0.95% copper.

The Invermay breccia zone has only had limited surface and underground drilling, therefore, no tonnage estimates can be made. However, there appears to be a reasonable possibility of developing appreciable tonnage of 0.25 to 0.35% copper mineralization with minor gold values.

GMR reopened and sampled some of the old adits on the Invermay in 1968. Their analysis showed the following: "A" adit - 5 samples representing 13.7 meters (45 feet) of both walls assaying 0.156% copper; "B" adit - 11 samples representing 28.5 meters (93.5 feet) of both walls assaying 0.098% copper; adit No. 2 - 1 wall sample of 6 meters (20 feet) which ran 0.04% copper; adit No. 3 was caved at the portal and could not be sampled; No. 4 adit - 6 samples were taken on the vein and averaged 0.02 ounces gold per ton, 6.4 ounces silver per ton, 0.58% lead and 2.7% zinc; No. 5 adit - 43 samples were taken along the walls of this adit and averaged 0.64% copper; No. 6 adit was not sampled.

In 1979, the only hole drilled by GMR in the Invermay breccia grades as follows over 245.5 meters (805.5 feet): 0.184% copper, 0.011 ounces gold per ton, 0.29 ounces per ton silver and 0.005% molybdenum disulphide.

Respectfully submitted,

January 28, 1980.
Calgary, Alberta.

W.G. Hainsworth, P. Eng.
Consulting Geologist

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CERTIFICATE

I, W.G. Hainsworth, P. Eng., of Calgary, Alberta do hereby certify:

- (1) That I am a Consulting Geologist residing at 2310 Carleton Street, S.W., Calgary, Alberta.
- (2) That I am a graduate of the University of Western Ontario, London, Ontario, Bachelor of Science Degree, Honours Geology.
- (3) That I have practiced my profession for 29 years.
- (4) That I have been a continuous member of the Association of Professional Engineers of British Columbia since 1965 and have recently received my Professional Geologist certification with the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
- (5) That I have no financial interest, direct or indirect, in the Giant Copper property of G M Resources Limited, and do not expect to obtain any such interest.
- (6) That the information contained in this report is based on examination of all pertinent maps, reports and other data relevant to the property including examination of the 1979 drill core and several visits to the operation during 1979.

W.G. Hainsworth, P. Eng. (B.C.)
P. Geol. (Alta.)

To accompany: Report on the
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New Westminster Mining Division,
Hope, British Columbia
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