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RAYROCK MINES LIMITED

006755

A REPORT ON THE 1975 DIAMOND DRILL PROGRAM
AT THE
LAFORMA PROPERTY
MT. FREEGOLD, YUKON

Toronto, Ontario
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LAFORMA PROJECT

A REPORT ON THE 1975 DIAMOND DRILL PROGRAM

INTRODUCTION

A program of diamond drilling was undertaken in 1975 at the LaForma Property under option from Discovery Mines Limited, at Mt. Freegold, 40 miles by road northwest of Carmacks, Yukon Territory, to test a number of gold and arsenic anomalies obtained in a geochemical soil survey of the property carried out in 1974. A total of 7,848 feet of drilling was completed.

The distribution of geochemical anomalies led to the division of the property into two areas of reference. Area I encompasses the western part of the property from the Rambler Zone on the east to the west boundary and includes the G-3 Zone, the previously developed and mined structure. Area II is the remainder of the property to the east boundary. This covers the large gold, silver and arsenic anomaly. The diamond drilling results will be discussed separately for these two areas.

AREA I

GENERAL

Exploration in this area was primarily directed towards locating a possible fault offset south extension to the G-3 Zone. The G-3 Zone is a strong shear zone in granodiorite. A band, up to eight feet wide, contains extensive clay alteration. Gold mineralization is in quartz lenses, quite often broken and crushed, within this shear zone. Parallel shear strands indicate that the total zone could be a braided structure up to 40 feet wide with quartz and gold showing a preference for the footwall strand.

Geochemical results indicated the possible presence of gold bearing zones parallel to the G-3 as well as the possibility that the Pal Fault contained gold mineralization. Fourteen holes totalling 3,679 feet were diamond drilled to test these geochemical anomalies.

DIAMOND DRILLING

The following holes were completed in Area I.

Hole No.	Latitude	Departure	Elev.	Bearing	Dip	Length	Objective
R75-01	5459.52N	8018.10E	4250	S60°E	-45°	402	D-7, Rambler Zone
R75-07	7149.14N	5808.05E	4076	S75°E	-45°	142	G-3 Zone
R75-08	6839.20N	5559.06E	4009	S75°E	-45°	487	G-3 Zone
R75-09	6726.21N	5005.30E	3865	N50°W	-45°	385	A-4
R75-10	6462.17N	4796.15E	3802	S65°W	-45°	276	Pal Fault
R75-11	6605.15N	4671.87E	3775	S65°W	-45°	252	Pal Fault
R75-12	6380.66N	4586.32E	3757	N50°W	-45°	105	A-5
R75-13	6205.96N	4341.53E	3696	S50°E	-45°	213	A-5
R75-14	6248.50N	4329.75E	3694	N50°W	-50°	200	A-5b
R75-15	5810.65N	4620.97E	3739	S55°E	-45°	402	A-6
R75-16	6375.46N	4140.88E	3645	S60°E	-45°	200	G-3 Offset
R75-17	6287.31N	4093.32E	3633	S60°E	-45°	200	G-3 Offset
R75-18	6409.18N	4082.42E	3621	S60°E	-51°	240	G-3 Offset
R75-19	5866.86N	4560.62E	3741	S60°E	-45°	175	A-6
Total						3,679	

Anomaly D-7 (Rambler Zone)

Previous work has indicated that the Rambler Zone is a branching structure with gold mineralization appearing to prefer the areas near junctions. One hole, R75-01, was drilled to test a possible junction point. There was four feet of snow on the ground when spotting the hole, and geochemical sample points could not be located for reference. The hole was spotted from trench locations. Subsequent surveying showed this to be about 60 feet south of the interpreted possible junction. The main

Rambler shear zone was intersected at a depth of 56.8 feet. A core length of 4.4 feet of oxidized, crushed, granodiorite and quartz assayed 0.15 ounces gold and 0.12 ounces silver per ton. This is the most northerly hole along the structure.

In earlier programs, ten holes had been drilled along the structure in a region of extensive trenching by old timers. Only very low gold values were encountered with a slight increase in Hole 10, the most northerly of that set. Later surface mapping showed this old drilling to be in a region of uniform granodiorite. More complex geological conditions were indicated in the area of the current drill hole, R75-01, and at the south end where the Rambler Zone nears the Pal Fault. The better values encountered in this hole indicate that these areas warrant further exploration for G-3 type mineralization.

Anomaly A-1 (G-3 Zone)

Two holes were drilled with the objective of testing this zone to the north of the underground workings. Hole R75-07 had to be abandoned when the hole caved in badly broken ground at 142.0 feet. The probable cause of this broken ground is a cross fault. Hole R75-08 was drilled 400 feet south of R75-07. A core length of 17.9 feet of crushed rock and quartz represented the G-3 Zone. Assays were low with the best section being 3.5 feet, averaging 0.034 oz/ton gold and 0.19 oz/ton silver. Later surveying showed that the 4 Level drift extended 100 feet north of this hole. In the drift the structure was strong and contained erratic gold values. Further exploration of the north extension of the G-3 Zone could probably best be done by underground drifting. *

Anomaly A-4

This anomaly is in the area of the Reo Vein surface showing. Two high arsenic, 400 and 500 ppm, anomalous samples 150 feet apart were tested by one hole, R75-09. The hillside slopes steeply to the west in this area, which restricted drill site locations. The hole had to be drilled towards the west, probably down the dip of the structures. Two intersections which explained the anomalies were obtained. In both cases these were silicified zones in granodiorite. The rocks were weakly brecciated, silicified, and contained minor pyrite and traces of arsenopyrite. Assays showed gold values to be negligible.

Anomaly A-3 (Pal Fault)

Holes R75-10 and R75-11 were drilled about 170 feet apart along the strike of the Pal Fault. These were located so as to cut the fault at right angles in an area of high arsenic and moderate gold geochemical results. The Pal Fault was intersected, with core lengths of 15.4 and 42.7 feet respectively, of highly crushed, altered, and oxidized granodiorite and andesite. Only traces of sulphides were observed and gold assays were negligible.

The high geochemical values were probably the result of the percolation of water down slope along this highly permeable fault zone carrying minerals in solution from the G-3 Zone junction.

Anomaly A-5

This anomaly was initially considered to have the best chance of representing the fault offset south extension of the G-3 Zone. Two holes were drilled. R75-12 was lost at 105 feet in badly broken ground. It may have been collared too close to the Pal Fault and encountered one of the fault strands. Hole R75-13 was about 200 feet to the south and drilled under an 1800 ppm arsenic, 80 ppb gold soil sample. A few narrow broken and crushed zoneswith weak mineralization were intersected but nothing which adequately explained the extremely high geochemical results. This may have been caused by float in the overburden, down slope from the G-3 Zone.

Anomaly A-5b

One soil sample, 200 feet to the west of anomaly A-5, returned the highest gold analysis (120 ppb) in the G-3 Zone area. Hole R75-14 was drilled to test this sample location. Steep slopes necessitatedthe drilling of this hole towards the west and thus down the dip of any structure. Core recovery was poor within a mineralized zone over a core length of 38.0 feet. The zone contained crushed granodiorite, quartz porphyry, some quartz and a silicified quartz-granodiorite breccia. One speck of visible gold was noted. A 25.2 foot section averaged 0.22 ounces gold per ton. The mineralization was very similar to some parts of the G-3 Zone.

This structure is believed to be an extension of the G-3 Zone which has been displaced along the Pal Fault, a horizontal distance of about 1400 feet to the west. Between the Pal Fault and the Camp Fault the structure has a potential strike length of 1500 feet.

Three additional holes were drilled to test the continuity of this structure. R75-16 was drilled towards the east in the same plane as R75-14 to intersect the structure at about the same elevation to get a better indication of width. R75-18 intersected the structure in the same plane about 100 feet below. Hole R75-17 was located 100 feet to the south and intersected the structure at the same elevation as R75-16. All three holes intersected a second zone at a shallower depth. Core recoveries on this zone were poor but it appears to be of the gash type, quartz veining with little alteration of the walls and no shearing or gouge. Considerable visible gold was noted in the few pebbles of quartz recovered in R75-16. The following are the significant assays.

Hole No.	Upper Zone			G-3 Extension		
	C.L.	Au oz/T	Ag oz/T	C.L.	Au oz/T	Ag oz/T
R75-16	5.0#	8.130	0.39	12.0	0.015	0.02
R75-17	7.0	0.005	0.02	5.8	0.005	0.04
R75-18	1.8	0.097	0.05	13.0	0.005	0.01

#4.5' lost

This drilling confirmed the continuity of a strong structure which is probably the fault offset extension of the G-3 Zone. In the small length tested, it did not contain any appreciable gold.

Anomaly A-6

Hole R75-15 was drilled to test this area of high arsenic geochemical values. The anomaly was caused by a weakly mineralized alaskite. Gold values were low. Unexpectedly, within the zone of surface oxidation, a core length of 0.7 feet of fractured quartz assayed 1.99 ounces gold and 0.42 ounces silver per ton. This was followed by a 5.0 foot core length from which only 0.5 feet of clay gouge material was recovered. This assayed 0.23 ounces gold and 0.16 ounces silver per ton.

To test for continuity to this zone, Hole R75-19 was drilled in the same plane to cut the structure about 75 feet below. This cut a core length of 5.5 feet of clay gouge with a few fragments of grey quartz and crushed granodiorite which assayed 0.058 ounces gold and 0.23 ounces silver per ton. This is believed to be a narrow gash vein along which faulting later occurred.

DISCUSSION

The locating of the fault offset south extension of the G-3 Zone is important. This extension has a potential length of 1500 feet between the Pal Fault and the Camp Fault which may contain gold bearing sections. In the small area tested this structure carried only low gold values although visible gold was noted in the discovery hole. Horizontal displacement along the Pal Fault was about 1400 feet. The 4th Level development of the main G-3 Zone required a 1200 foot crosscut adit to reach the Pal Fault-G-3 junction. This junction plunges steeply to the north while the surface has a moderate south slope. Further depth development by adit would be uneconomic. The G-3 south extension provides a favourable target which could be explored by a low level adit. This adit could be utilized for depth development of the main zone and may remove the necessity of a shaft.

The Pal Fault was found to be not mineralized. The gold within the fault, which was explored by trenching by the old timers, was probably from dragged portions of the G-3 Zone.

In all cases but one, diamond drilling intersected sufficient mineralization to explain the geochemical anomalies. No parallel strong fault structures were located. Two gash type veins were found. These are narrow quartz veins carrying erratic visible gold with little or no associated fault gouge or alteration of wall rock. It is quite probable that anomaly A-4 (the Reo Vein) is a similar occurrence, which, where intersected by the drill hole had changed to a silicified weakly brecciated and mineralized zone. These appear to be tension fractures, roughly parallel to the G-3 Zone, which occur within a zone 500 feet either side of the Pal Fault. This type of occurrence would explain a number of one line geochemical anomalies within Area I, which were not drilled. These gash type veins are quite small, although locally high grade; and while they do not provide a target for extensive exploration, might occasionally provide a small ore source should production be established on the G-3 Zone.

The Rambler Zone is another strong structure of the G-3 Zone type about 2500 feet to the east on the edge of Area II. Trenching by old timers located numerous quartz lenses, some containing visible gold. A later ten-hole diamond drilling program intersected a strong structure with negligible gold values. Geological mapping showed this drilling to be within an area of granodiorite. Both to the north and to the south of this section, there were indications of more complex geology with a number of quartz porphyry dykes. Also, numerous branches to the structure were indicated with quartz and gold mineralization appearing to prefer these areas. The 1975 drill hole intersected only low gold values but did confirm that these junction areas are more favorable for gold mineralization and warrant additional exploration.

AREA II

GENERAL

The extensive arsenic geochemical anomalies and associated erratic gold and silver anomalies could not be explained by anything in the little geological information available about this area. Diamond drilling was directed to finding a geological explanation for the anomalies and testing the higher gold anomalies for possible structural controls. A total of 4,169 feet were drilled in nine holes. Five of these were in one northwest-southeast line through the central part of the anomaly. This showed that the source of the anomaly is a porphyry type occurrence. One hole was drilled under the highest gold geochemical value and three holes at the south end of the anomaly where gold geochemical values were most consistent and a possible structure was indicated.

REGIONAL GEOLOGY

Recent geological studies in the Dawson Range have indicated that the Hayes Creek-Big Creek-Stoddard Creek lineament may be part of a major tectonic feature favorable for porphyry type copper deposits. The discovery of the Casino deposit led to a concentrated exploration effort in the area. Over a length of

75 miles to the northwest of LaForma, along this trend, at least eight porphyry occurrences have been discovered and explored over the past six years. Both breccia and stockwork types are known. The majority are within five miles of this lineament. Most are of the quartz monzonite type, the related quartz diorite or quartz feldspar porphyry, and are of Cretaceous-Tertiary Age. The LaForma property lies at the southeast end of the belt as presently known. Farther to the southeast the younger Carmacks Volcanics cover the intrusives.

DIAMOND DRILLING

The following holes were completed in Area II.

Hole No.	Latitude	Departure	Elev.	Bearing	Dip	Length
R75-02	5042.86N	8870.41E	4220	S65°E	-45°	580
R75-03	5037.06N	8874.40E	4219	N65°W	-45°	500
R75-04	4963.35N	8857.18E	4211	S30°E	-55°	252
R75-05	4673.87N	9500.80E	4187	S50°E	-45°	605
R75-06	4657.16N	9536.74E	4185	N50°W	-45°	608
R75-20	4333.82N	8422.71E	3833	S50°E	-50°	500
R75-21	4499.94N	8492.12E	3906	S50°E	-45°	550
R75-22	4362.32N	8437.76E	3847	N80°W	-45°	202
R75-23	4396.62N	9761.84E	4169	S60°E	-45°	372
			Total			4,169

Five of these holes were drilled in a west to east line in the following order R75-03, -02, -06, -05, -23. These showed that the source of the anomaly is a complex of igneous rocks and breccias, a porphyry type occurrence. The eastern contact was not defined. The farthest east hole, R75-23, bottomed within what is believed to be a breccia pipe, part of the porphyry complex. Rocks encountered appeared to be variations of similar chemical composition and included:

Quartz porphyry	
Quartz-feldspar porphyry	
Rhyolite	
Rhyolite breccia	(rhyolite matrix with rounded granodiorite fragments)
Intrusive breccia	(fine grained granodiorite matrix with rounded fragments of granodiorite, rhyolite and quartz porphyry)
Syenite	(coarse grained to porphyritic K-feldspar)
Breccia Pipe	(intensely leached boulders and fragments of all the above)

The syenite is somewhat unusual as it commonly contains abundant interstitial quartz. On other properties this rock has been called quartz-monzonite and quartz diorite. Examination by the Geological Survey of Canada has indicated that the quartz is a later addition and that the rock was originally a syenite. Monzonitic and dioritic phases do occur. Rock contacts are generally steep but in many cases are irregular. No structural pattern has been identified.

This complex of rocks has been intruded into medium grained granodiorite. Alteration in the granodiorite is primarily propylitic to argillic nearer the contact. Within the intrusive alteration is strongly argillic, with occasional short phyllic and potassic sections, and weakly phyllic within the breccia pipe.

Mineralization is primarily as disseminations throughout the intrusive and in both matrix and fragments in most of the breccias. Pyrite is pervasive but rarely exceeds 1%; arsenopyrite is common but varies greatly, occasionally up to 1% and on one occasion in an altered rhyolite section about 5%. There are scattered sections containing pyrrhotite and graphite and occasionally tetrahedrite and tourmaline have been noted. In addition, there is another, very fine, grey to blue black metallic mineral. At various places this was thought to be bornite or chalcocite, but positive identification has not been made. Pyrite veinlets occur sporadically. These are generally about 1/4-inch in width of massive pyrite and contain little or no quartz. The better gold values seem to occur where these veinlets are most common although no direct relationship has been confirmed. In general gold and silver values were low with the exception of R75-23 which intersected the breccia pipe and a substantially higher silver content. Seven samples from this hole were also assayed for tin. All assayed less than 0.001% Sn. Some significant intersections are:

Hole No.	From	To	C.L.	Gold oz/T	g/t	Silver oz/T
R75-02	76.3	580.0	503.7	0.018	.55	0.08
R75-05	45.0	113.0	68.6	0.067	2.3	0.34
	545.6	589.6	44.0	0.018	.55	0.35
R75-06	553.9	608.0	54.1	0.022	.75	0.13
R75-23	113.0	198.0	85.0	0.017	.60	0.96
	58.0	372.0	314.0	0.008	.25	0.58

Hole R75-04 was drilled to intersect a possible structure below the 8430 ppb gold geochemical sample. Rocks encountered were as above with strong argillic alteration. No strong structure was identified. The core was well mineralized with pyrite and some pyrrhotite and arsenopyrite. Gold values were low.

Three holes, R75-20, -21, -22, were drilled about 800 feet south of the above line, at the southern edge of the anomaly, where gold geochemical values were the most consistently high. These holes were in granodiorite with strong propylitic to weak argillic alteration, apparently near the porphyry contact. Mineralization was similar to that within the intrusive with the following variations. The sulphide content was considerably higher, approaching 5% in sections and averaging about 2%. The arsenopyrite content was lower and occasional chalcocite, bornite and chalcopyrite were noted. Veinlets of quartz and grey siliceous material were common, in places approaching a stockwork appearance. Significant intersections were:

Hole No.	From	To	C.L.	Gold oz/T	g/t	Silver oz/T	Copper %
R75-20	70.0	178.0	108.0	0.019	.65	0.066	0.020
	384.0	476.4	92.4	0.033	1.1	0.089	0.021
R75-21	22.0	550.0	528.0	0.019	.65	0.066	0.019
R75-22	128.0	202.0	74.0	0.062	2.1	0.116	0.039

CHECK ASSAYING

During the drilling program, all assaying was done by fire assay at the Whitehorse Assay Office. Assaying for gold content at the low levels involved is extremely difficult. For an initial check on results, 36 samples were selected from Area II drilling. Pulps and rejects were obtained from the assay office and new samples were taken from the rejects. Both pulps and reject samples were sent to Loring Laboratories in Calgary. Fire assay procedures were requested. Results for gold were considerably higher, +30% for the pulps and +47% for the reject samples. Silver assays were 18% lower. Correlation was poor, especially for silver.

The same samples were then sent to Swastika Laboratories in Ontario. Fire assay was again requested. Results were not as high as Loring, but still much better than Whitehorse. Golds were +16% for the pulps and +37% for the rejects. Correlation was good. The following table shows arithmetic averages for the 36 samples.

	Pulps			Rejects	
	Whitehorse	Loring	Swastika	Loring	Swastika
Gold oz/T	0.057	0.074	0.066	0.084	0.078
Silver oz/T	0.273	0.230	0.241	0.222	0.269

The significant increase in assays in the low range is considered of great importance. As can be seen in the following table, there is a definite shift of assays from the lowest groups into the next group upward. Since the majority of the original assays are in this lowest group, a shift in 24% of the samples, as indicated, would have a decided beneficial effect on the average grade. Further check assaying is necessary.

Number of Samples

Assay Range Gold oz/T	Pulps			Rejects	
	Whitehorse	Loring	Swastika	Loring	Swastika
0-0.030	21	9	15	9	15
0.035-0.060	4	16	10	12	10
0.065-0.100	4	4	2	6	2
0.105-0.200	5	5	7	5	4
0.205-0.350	2	2	2	4	5
	36	36	36	36	36

CLAIM STAKING

A total of 16 claims (BOP 1-16) were staked adjoining the east boundary of the LaForma Group. These were staked to protect possible extensions to the porphyry occurrence to the northeast and a possible second access to this portion of the property. These claims are subject to inspection by the Mining Recorder before they are granted.

DISCUSSION

The diamond drilling has established that the large arsenic-gold-silver geochemical anomaly was caused by a porphyry type occurrence. The facts that have been obtained can be compared with a published model of porphyry copper deposits built up by a compilation of the characteristics of the majority of known deposits in North America and some from other parts of the world. It must be recognized that no deposit exactly fits the typical model. Variations are numerous, but all deposits exhibit many of the typical characteristics. Reference should be made to the enclosed schematic sketches of typical alteration and mineralization patterns and to the description of alteration facies in porphyry deposits in the Dawson Range, Y.T.

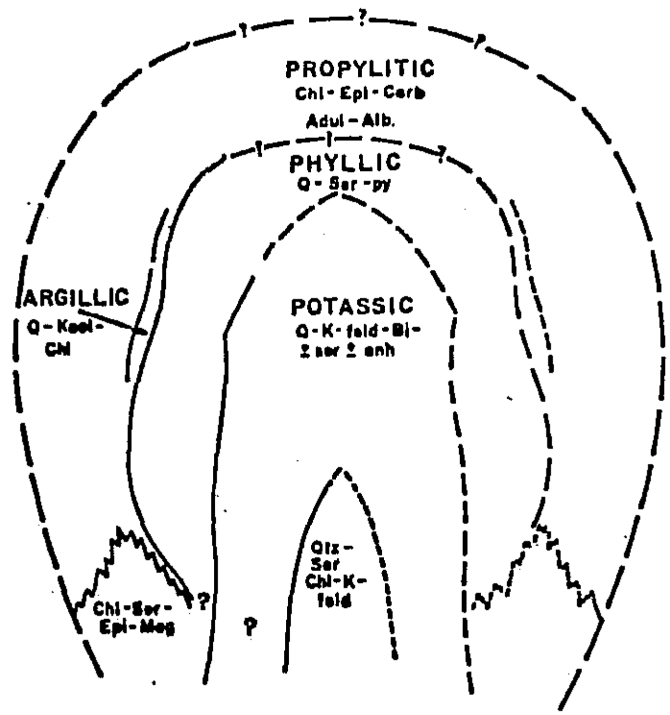

FIGURE 1 — Schematic drawing of alteration zoning in a typical porphyry ore deposit.

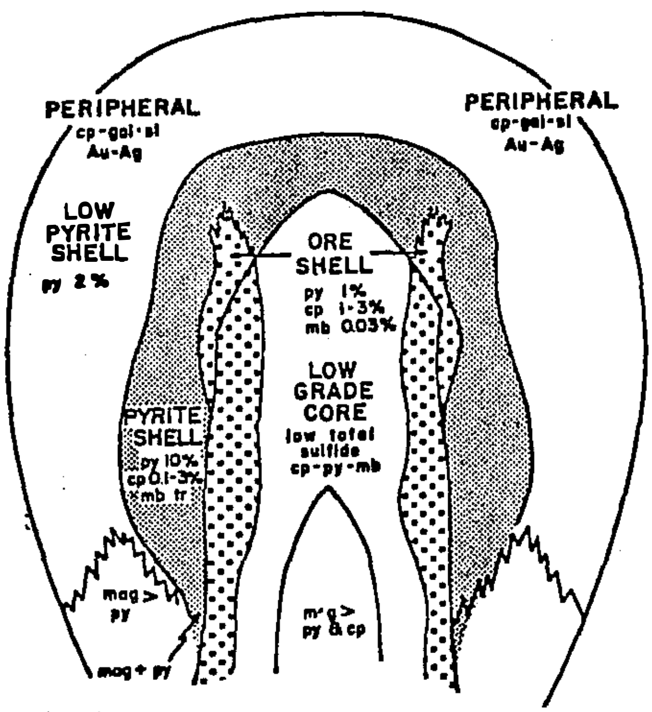

FIGURE 2 — Schematic drawing of mineralization zoning in a typical porphyry ore deposit.

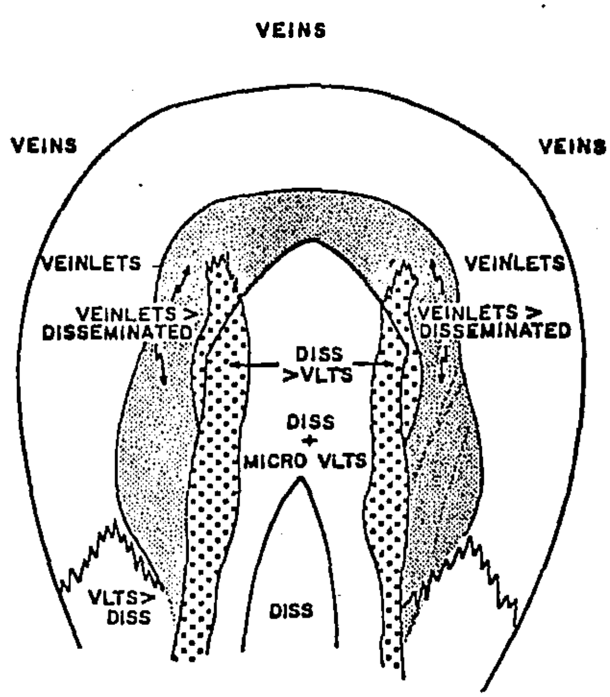

FIGURE 3 — Schematic drawing of sulphide-occurrence zoning in a typical porphyry ore deposit.

Reproduced from:

Lowell, J. D., and Guilbert, J. M., 1970, Lateral and vertical alteration—mineralization zoning in porphyry ore deposits; Economic Geology, Volume 65, pages 373-408.

ALTERATION FACIES IN PORPHYRY DEPOSITS IN THE DAWSON RANGE, Y.T.

Introduction

The following brief descriptions of alteration facies are based on Lowell and Guilbert's description of lateral and vertical zoning of alteration and mineralization in porphyry ore deposits (Lowell and Guilbert, 1970) and on Godwin's description of alteration in the Casino copper-molybdenum deposit, Y.T. (Godwin, 1975). The descriptions are given in order of increasing intensity of alteration.

Propylitic (1)

Propylitic alteration is the first evidence of hydrothermal alteration of fresh rock. It is characterized by the alteration of hornblende and/or biotite to actinolite or chlorite with accompanying carbonate and minor amounts of clay minerals, albite and epidote, occurring predominantly along fractures. Plagioclase is typically saussuritized, appearing light greyish-green in colour. Sulphides, mainly pyrite, commonly occur in veinlets.

Argillic (2,3)

Argillic alteration is characterized by a bleached appearance and abundant clay minerals. Minor amounts of carbonate and chlorite may be present. Quartz and sericite are absent. Sulphide minerals are dominantly pyrite but are not generally abundant. Argillic (2) facies is defined by the occurrence of swelling, montmorillonitic clays, commonly with associated carbonate. Argillic (3) is defined by the occurrence of white, kaolinitic clay. The distinction of argillic (2) and argillic (3) alteration may be difficult in hand specimens although the presence of clay minerals in general is indicated by their argillaceous odour and tackiness when dampened by the tongue. It may be possible in some instances to distinguish the montmorillonitic clays by their swelling characteristics when wet.

Phyllic (4, 5, 6)

Phyllic alteration facies are characterized by a bleached appearance and an abundance of quartz with sericite or muscovite. Tourmaline is abundant and magnetitie ± hematite content generally increases as the zone of potassic alteration is approached. Any presence of clay minerals is likely due to supergene alteration. The phyllic alteration zone typically contains a discontinuous, pyrite-rich halo which is generally found about the perimeter of major breccia occurrences. Highest copper and molybdenum values occur immediately inside this halo. Phyllic (4) facies is defined by the presence of potassium feldspar and the alteration of plagioclase to pale green sericite. Phyllic (5) contains abundant quartz and sericite formed by alteration of both potassium and plagioclase feldspars. Disseminations and veinlets of pyrite, chalcopyrite and less abundant molybdenite are common throughout this zone. Phyllic (6) is distinguished by extreme sericitization.

.../2

Potassic (7)

Potassic alteration is characterized by intense silicification and the complete destruction of original textures in the rock. The following minerals are typically present in order of decreasing abundance: biotite, quartz, potassium feldspar, sericite, magnetite $\pm$ hematite, tourmaline, ankerite and gypsum. Biotite typically has a felted texture or is pseudomorphic after hornblende. Potassium feldspar often appears to have been regenerated as secondary rims on previously existing potassium feldspar grains. Pale green sericite generally occurs as alteration after plagioclase. Total sulphide content is typically low, consisting mainly of pyrite with minor chalcopyrite and traces of sphalerite and bornite.

References

Godwin, C.I., 1975, Geology of Casino copper-molybdenum deposit, Dawson Range, Y.T.: unpublished Ph.D. thesis, University of British Columbia, 245 p.

Lowell, J.D. and Guilbert, J.M., 1970, Lateral and vertical alteration-mineralization zoning in porphyry ore deposits: Econ. Geol., V. 65, pp. 373-408.

The formation of a porphyry deposit is generally considered to involve a periodic buildup of vapour pressure of volatile components, their release by various mechanisms, sealing or healing, and re-establishment of growing pressures. The release can be explosive with the formation of breccia zones or breccia pipes, or there can be a leakage along faults and no buildup to the explosive stage. The location and nature of these conduits will affect both the distribution of alteration and mineralization and their zoning symmetry. At LaForma, Hole R75-23 appears to have intersected a breccia pipe. There is evidence of earlier brecciation in other holes, but this may have been a fault or intrusive effect.

Supergene argillic alteration is present throughout, but a pattern of primary alteration is noticible. In the line of holes drilled, the alteration changes from propylitic to argillic to phyllic from west to east. Occasional potassic sections can be related to faults. The propylitic alteration appears to be primarily in the surrounding granodiorite with all the intrusive in at least the argillic facies. A few later dykes which cut argillic rocks are fresh and unaltered. Phyllic alteration is especially noticible in Hole R75-23, what is probably a breccia pipe. It is common in Arizona deposits and has been found at Casino that these deposits can have a leached capping below which is a supergene enriched zone. At Casino, this leached cap was 200 to 300 feet deep. This may account for the lack of observed copper minerals at LaForma, although the mineralization here is quite different.

The mineralization encountered in drilling appears to fall within the low pyrite zone. In the model, this is usually in the propylitic section. In the three holes to the south the mineralization had more of a stockwork appearance and may be part of the pyrite shell. The contained minerals, other than pyrite, are somewhat unusual. In the south holes, the normally expected minerals are present--pyrite, chalcopyrite, bornite, and calcocite. Molybdenite is absent, and magnetite-hematite is rare. Occasional arsenopyrite and tetrahedrite are also present. In the line of holes across the intrusive, the arsenopyrite content is in many sections equal to the pyrite. Pyrrhotite, graphite, tetrahedrite and tourmaline are erratically present, occasionally up to 0.5%. Other copper minerals are rare and only one small rosette of molybdenite was seen. All are fairly common in small quantities in other porphyry deposits except for arsenopyrite, which is relatively rare. Where it has been noted, it is in very minor amounts.

Gold and silver have been found by assay to be present. This may be part of the expected gold-silver peripheral zone, but the content appears to be higher than average. There does appear to be a lower gold content within the breccia pipe where the highest silver assays were obtained. Within this breccia some small pebbles of altered rhyolite contained 5% fine grained tetrahedrite.

The size of this porphyry deposit is not known. The typical deposit is circular or oval in shape, sometimes distorted by faulting. The line of holes has defined the west boundary, in this area, and cross sectioned a 1400 foot width. The eastern-most hole bottomed within the breccia pipe. At least an additional 600 feet of width is indicated by a zinc geochemical anomaly. The south holes were 700 feet from the line and near the edge of the geochemical anomaly. The anomaly continues for 1000 feet north of the line and is open for extension over the full width. All evidence indicates this porphyry probably has an oval shape. The width is about 2000 feet and length undetermined but outlined for 1700 feet and probably at least double that, 3400 feet.

EXPLORATION POTENTIAL

"Ore grade mineralization most commonly occurs in the area of change from phyllic to potassic alteration zones. The potassic zone of alteration was not located at LaForma in the small portion explored. It may not exist here as the build up of vapour pressure may not have reached the intensity required for potassic alteration before explosive release was effected. Most of the porphyry remains to be explored. Deposits are rarely symmetrical and there can be more than one breccia pipe. The exploration completed may be of a fringe area. The location of the present surface in reference to the typical alteration pattern is not known. It may be that it is quite high in the section and that the potassic alteration zone and the ore shell are at depth.

The mineralization exposed to date does not appear to be of the copper-molybdenum deposit type. The copper minerals, which were identified, are mainly in the drill holes on the south edge. No molybdenum is present. The line of holes showed evidence of considerable leaching and supergene enrichment may have taken place. A zone of enrichment which may be of economic grade can be formed by this process from a very low grade source. This possibility requires further investigation at LaForma.

Gold and silver appear to occur in quantities greater than might be expected in the typical peripheral zone. Some of this, especially with gold, may be a residual surface enrichment, but there are sufficient deeper intersections to warrant further exploration for a possible area of concentration. It is also favorable in that should an area of copper mineralization be located, it might contain a substantial gold and silver content. The higher silver values intersected by R75-23 in the breccia pipe enhance the possibilities for the area immediately to the east. This was an area geochemically low in arsenic and gold, but highly anomalous in zinc and moderately anomalous in silver. In the drill hole the rocks were highly leached and oxidized. There may be a supergene enriched zone or the fresh rock may be considerably higher in grade. Certainly some of the pebbles in the breccia pipe contained abundant tetrahedrite. Should the source of these pebbles be located and be of sufficient size, it would definitely be economic as a silver deposit. Lead-zinc porphyry deposits are known. No testing for lead has been conducted at LaForma.

SUMMARY AND CONCLUSIONS

AREA I

A south extension to the G-3 Zone was located offset a horizontal distance of 1400 feet to the northwest along the Pal Fault. This structure has a potential length of about 1500 feet between the Pal Fault and the Camp Fault. Within the short strike length tested (100 feet) it contained low gold values. The location of this structure provides an exploration target which may be utilized in further depth development of the main G-3 Zone.

Mineralized structures were intersected which explained the geochemical results in each of the arsenic anomalies tested by diamond drilling. Gold values were negligible. Two gash type veins were located. These are representative of a possible series of gash type veins adjacent to the Pal Fault, which, should production be achieved, might provide additional small ore sources.

The one hole drilled on the Rambler Zone reinforced the theory that zones of geological complexity and possible branching structures are the more favorable areas for gold mineralization.

The main G-3 Zone, the offset south extension of the G-3

Zone and the Rambler Zone all contain potential for additional shear zone type gold mineralization. Mining would be difficult and high cost. The price of gold would have to stabilize at substantially higher prices before these targets would warrant additional exploration.

AREA II

A porphyry type deposit with characteristic rock types and alteration patterns was found to be the cause of the large arsenic-gold-silver soil geochemical anomaly. The drilling completed only served to confirm the existence of the porphyry and to give an indication of the mineralization contained. Little is known about the size of the deposit and, therefore, about the location of the line of drill holes in relation to the typical model.

Within the area tested, mineralization is somewhat unusual, as, after pyrite, arsenopyrite is the most common. Copper minerals were found in small quantities only in the host rocks at the south edge of the porphyry. Scattered tetrahedrite was noted and was most prominent in the breccia pipe. Gold and silver values are higher than normally found in the gold-silver peripheral zone. The higher silver values within the breccia pipe are especially interesting. R75-23, the drill hole which intersected this area, bottomed within the breccia pipe and at the edge of a zinc-silver soil geochemical anomaly. Leaching in the porphyry was quite strong, especially within the breccia pipe. A supergene enriched zone may have developed.

The results obtained within the porphyry are definitely encouraging. There are a number of possibilities with the potential for economic ore deposits. The typical copper-molybdenum mineralization may occur in another part of the porphyry or in this case, it may be a copper-gold-silver deposit. A silver-zinc zone may have developed. There are indications of this in the breccia pipe. Supergene enriched zones of either of these may have been formed. Parts of the gold-silver peripheral zone may be of a high enough grade to be economic. Further check assaying should be undertaken. To test these possibilities, an exploration program at an estimated cost of $150,000 is recommended for 1976.

RECOMMENDATIONS

An exploration program is proposed to establish the size of this porphyry deposit, to locate sulphide concentrations and to test for possible supergene enriched zones. The extension to the northeast lies under a gentle, basin-like, north facing slope. Snow remains in this basin until late June. The area is covered by geologically recent alluvium. Permafrost is extensive and may cause alterations to the program after test work.

Geophysics

Magnetometer and Induced Polarization surveys are recommended. Since the size of the porphyry is not known, the length of survey can only be estimated. The survey should start over the known portion and then proceed to the northeast until the end of the porphyry is located. Snow conditions will prevent the carrying out of this work until late June. Permafrost may render IP ineffective. Some testing will be necessary. Should this be the case, Self Potential will be considered.

Geochemistry

Soil sampling should be conducted in detail over favorable areas indicated by geophysics and at a reconnaisance scale over the remainder of the porphyry. In 1974, difficulty was encountered in obtaining good samples in permafrost areas. Test work to overcome this should be carried out to find an effective method before the survey is undertaken. It is expected that sampling will be much slower and more expensive than in 1974.

Diamond Drilling

Drilling is recommended as an immediate preliminary test of geophysical and geochemical indications since there is no rock outcrop. This would provide further information about the size and character of the porphyry and its alteration and mineralization. At least one more hole should be drilled in the breccia pipe to confirm and extend R75-23 and one deep hole to test for a possible supergene enriched zone. It is estimated that a total of 4,000 feet of drilling will be required.

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TA:p

COST ESTIMATE

1.	Geophysics: Magnetometer and Induced Polarization Surveys. Estimate 15 line miles at $1,000/mile	$ 15,000
2.	Geochemistry: Soil sampling and Analysis Estimate 1,000 samples at $15/sample	15,000
3.	Diamond Drilling: Including Supervision and Assaying. Estimate 4,000 feet at $22/foot	88,000
4.	Repair road to Carmacks.	5,000
5.	Check Assaying 1975 and 1976.	4,000
6.	Travel, Transportation, Camp, Servicing and Supplies.	5,000
		$132,000
	Contingencies	18,000
	TOTAL	$150,000