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HALLMARK RESOURCES LTD.

Report on Cronin Mine

L.S. Trenholme
March 1, 1976.

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T H E C R O N I N M I N E

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HALLMARK RESOURCES LTD.

OMINECA MINING DIVISION, B.C.

93L/15 W

by

L.S. Trenholme, M.Sc.

March, 1976

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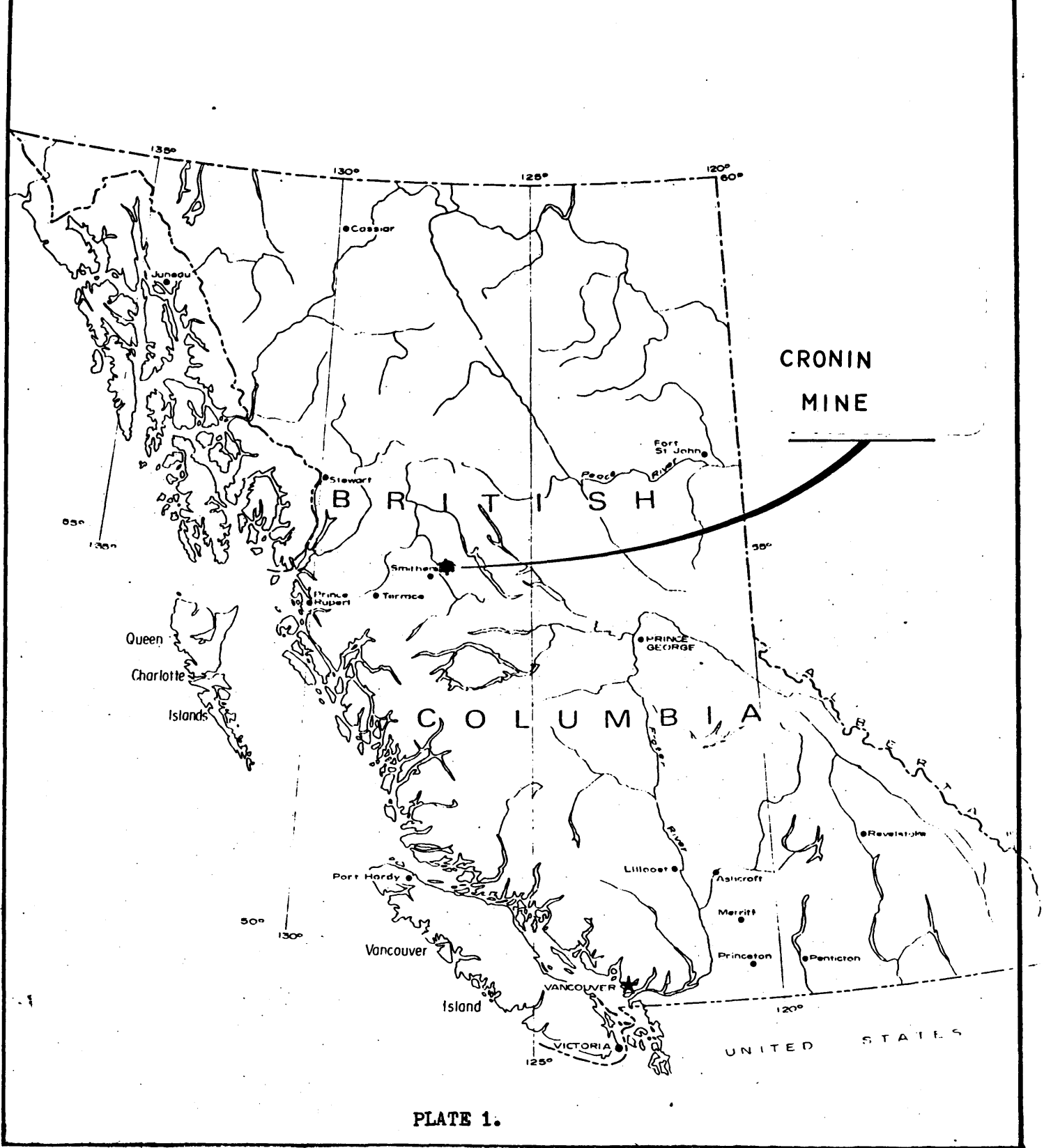


PLATE 1.

HALLMARK RESOURCES LTD.

General Location Map

Scale : 1 inch = $\frac{1}{2}$ mile

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INTRODUCTION

This report has been prepared at the request of Mr. John Wilson, President, Hallmark Resources, Ltd., who authorized the writer to analyze all relevant data and, if thought warranted, to make recommendations for renewed exploration and development.

As a result of a 5-week study of the records and a visit to the underground workings, it has been possible to deduce certain geological conditions which should serve as a general guide to confirming and extending known ore and to locating new ore reserves.

Except as noted, all tonnage and grade figures quoted herein are derived from company records and from the references attached hereto.

SUMMARY

The Smithers area property of Hallmark Resources Ltd. includes the workings of the Cronin Mine in addition to the former Wardell, Homestake and Eureka workings.

Smelter returns (Lead, Zinc, Silver) for the period 1952-1967 from the Cronin Mine, representing about 25,000 tons of ore mined, show the net recovered metals to have had a value of at least \$70.00 per ton when calculated at current metal prices.

In 1972 the company's engineer calculated 176,000 tons of "indicated" and "inferred" ore remaining in the vicinity of existing stopes and in still undeveloped portions of the principal veins nearby.

An extensive review of the data supports this estimate as being reasonable and it is also noted that a considerable number of mineralized veins, exposed at the surface and on which little or no work has been done, could add substantially to the lead-zinc-silver ore reserves.

Furthermore, gold assays up to 0.58 ounces per ton, from two outlying veins on the property, indicate additional intriguing possibilities.

An initial expenditure of \$75,000 is warranted to generally confirm existing reserve estimates. Contingent on the results of the foregoing, a second stage expenditure of \$100,000 should provide sufficient information on which to base a decision for commitment to major development and pre-production outlays.

PROPERTY, LOCATION AND ACCESS

The Cronin property of Hallmark Resources Ltd. (Plate 2) consists of eight (8) Crown Grants, twenty-eight (28) claims and one (1) fraction located under the old system, plus one claim of four (4) fractional units located under the new metric system.

The property is located 16 air miles northeast of Smithers, B.C., at Lat. 54° 56' N., Long. 126° 49' W. and is reached by 26 miles of government maintained road followed by 6 miles of rough bush road.

The mine camp is at elevation 1160 metres (3800 feet) and the upper workings are at elevation 1600 metres (5250 feet).

The area is rugged and well timbered in the lower portions, with ample local water supply.

HISTORY (After Livgard - 1972)

- 1905 - Discovery by prospectors from Hazelton.
- 1908 - Purchased by James Cronin
- 1908 - 1925 - Mine development by James Cronin.
 About 4000 feet of lateral workings
- 1928 - Babine Bonanza Metals Ltd. formed -
 Not much work was done.
- 1952 - New Cronin Babine Mines Ltd.
 Operated 50-ton mill; shut down because of low
 metal prices.
- 1956 - 1972 - Production resumed by New Cronin Babine Mines Ltd.
 followed by lessee, Mr. Paul Kindrat, who purchased
 property in 1970.

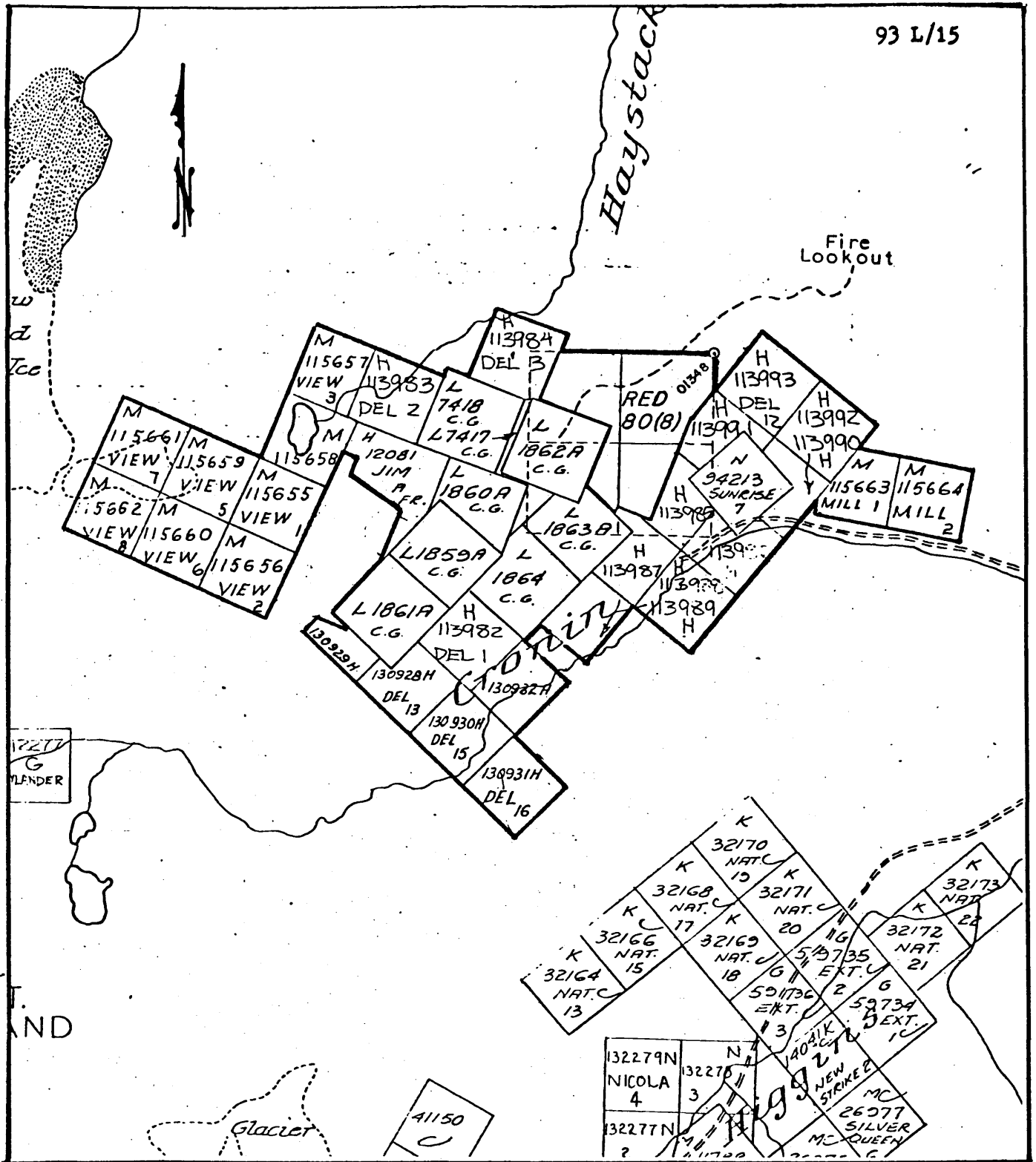


PLATE 2

HALLMARK RESOURCES LTD.

Cronin Claim Group

Scale : 1 inch = 1/2 mile

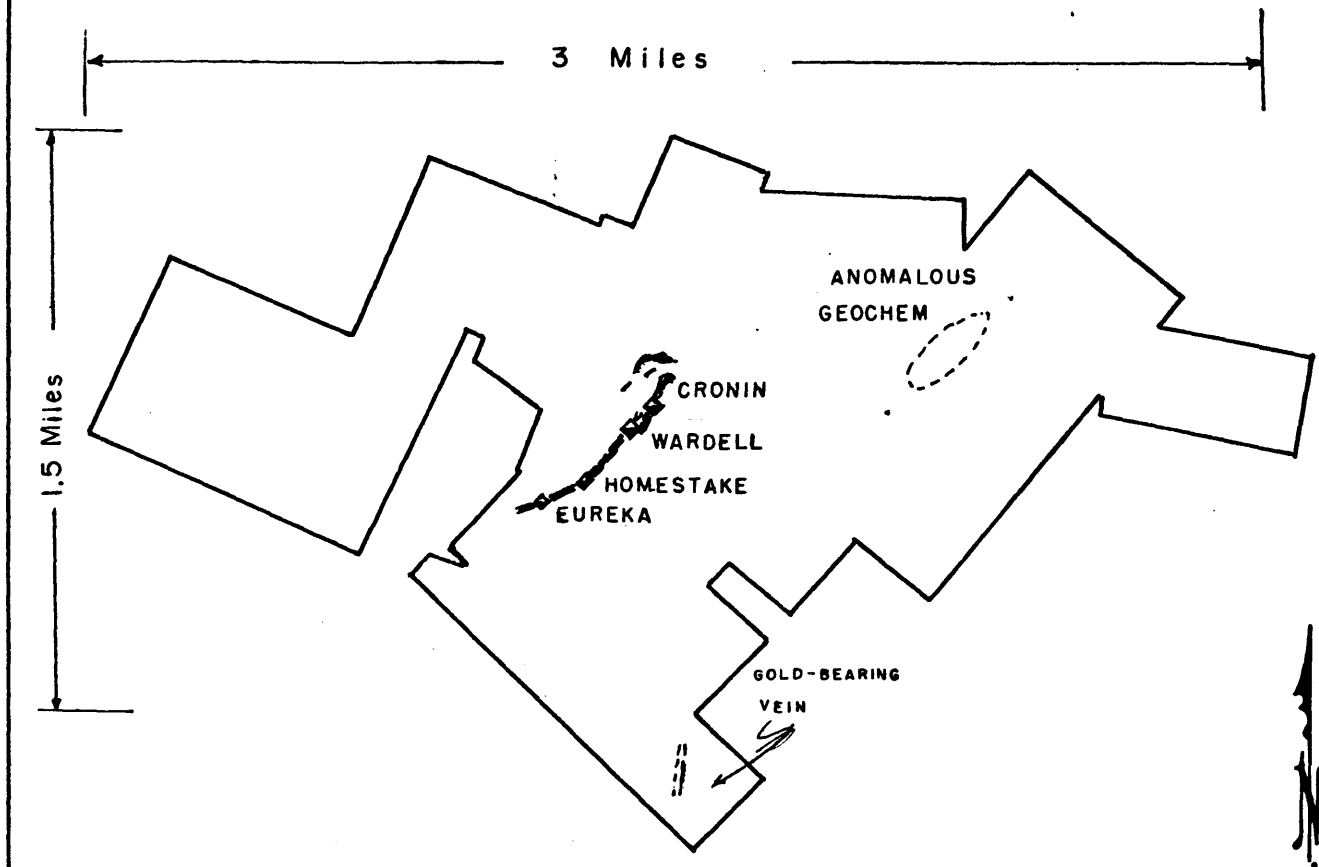


PLATE 3

HALLMARK RESOURCES, LTD.

Property and Principal Vein Structure

Scale : 1 inch = $\frac{1}{2}$ mile

- 1971 - Property optioned from Paul Kindrat by John Wilson, Frank Messner and Melvin Messner.
- 1972 - Option assigned to Hallmark Resources Ltd. Bulldozer stripping.
- 1973 - Construction, mine rehabilitation, bulldozer stripping.
- 1973 - Milled 1700 tons August - November. Prospecting found new veins.
- 1974 - Drifting No. 1 Level
- 1975 - Under Option to Coca Metals Ltd. Topographic and underground surveys. Ten surface diamond drill holes totalling 1,530 metres (5,018 feet) provided valuable structural information but did not confirm large open-pit potential. The option was terminated.

GENERAL GEOLOGY

A generally lenticular body of porphyritic rhyolite has been intruded into a clastic sedimentary sequence (Hazelton Group). Plate 4 shows the general relationships..

The intrusion is elongated roughly parallel to the regional fold axes and has surface dimensions within the map area of about 2800 feet (850 m.) by 1150 feet (350 m.), with a prominent lobe extending WNW.

The Cronin mine maps demonstrate that the northern part of the intrusion dips about 50° W. on its western contact whereas the northeastern contact is steep to vertical. The northern "nose" plunges about 40° NNW.

Plate 4 also shows the principal vein structure to be developed along the western contact of the main intrusion in a remarkably persistent trend of N.37° E. for at least 2,300 feet (700 m.) on surface.

To the southeast, the Homestake and Eureka portions of the vein system diverge from the main intrusion but are reported to be in or near smaller porphyry bodies, probably associated with the main body.

It is considered probable that the rhyolite porphyry was intruded into the sedimentary strata during regional folding and that folding-generated stresses continued after emplacement and crystallization of the intrusion. This hypothesis is supported to some extent by numerous outlying, sub-parallel, sills (?) of porphyry and by attenuated bands and shreds of sediments within the porphyry.

Vein material, mainly quartz, with metallic sulphides of lead, zinc, copper, silver and cadmium, plus some gold, may be genetically related to the rhyolitic intrusion or (less likely) may have been derived from the graphitic argillaceous sediments.

In any case, deposition occurred near the roof of the intrusion and is now exposed where erosion has removed the overlying sedimentary strata.

Veins diverging from the contact (e.g. No. 1 Vein) probably represent the roots of larger structures developed at or near the roof.

The widest orebodies known to date occur along the porphyry "nose" and plunge with it at about 40° NNW. Testholing in some of the old stopes is reported to have encountered ore widths in excess of 40 feet.

The orebodies are of two main structural types:

- a) Quartz veins with bands and fillings of heavy to massive sulphides.
- b) "Breccia" zones of quartz fragments in sheared porphyry and sediments with irregular sulphide replacement.

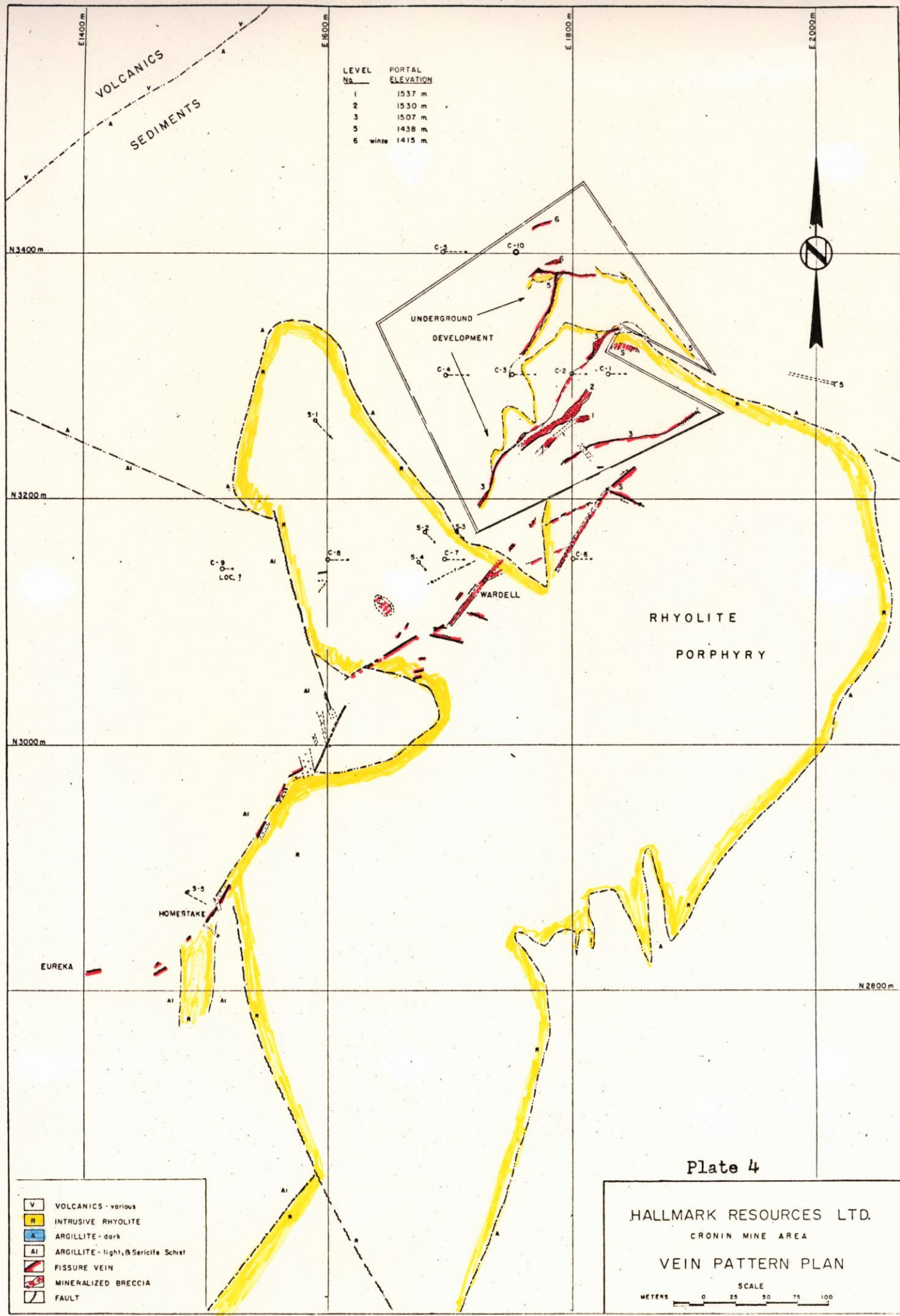
Other types, not yet demonstrated to be commercial, consist of fracture coatings and disseminated sulphides.

It has been noted that some wide (20 feet) steeply-dipping breccia veins of good grade have been sharply terminated between levels and appear on the lower level as narrow fissure veins following gouge seams. The inference here is that even very narrow, but well mineralized, "leads" in the various workings should be explored vertically, particularly up-dip.

METALLIC MINERALIZATION

"Sulphide mineralization occurs as dilation veins associated with quartz, in quartz stockwork, as coatings on dry fractures in the rhyolite and rhyolite porphyry, and as trace disseminations in the rhyolite. The most common minerals, in order of abundance, are: pyrite, sphalerite, galena, chalcopyrite, boulangerite and tetrahedrite." (Richards, 1975)

The contained valuable metals are silver, lead and zinc, with credit for gold, cadmium and copper.



"Fracture mineralization, although quite common, is not of sufficient intensity to make ore. This may be due in part to leaching of ore minerals from the fractures as leaching was observed in all drill holes right to the bottom, as much as 180 m. below surface."
(Richards 1975)

However, surface sampling suggests possible exception to the foregoing where good residual values, particularly in silver, may permit local open-cut mining of well mineralized fracture zones (e.g. Wardell area).

VEIN DESCRIPTION

No. 1 Vein

- i) Trench 100 feet between No. 1 and No. 2 Shafts
- ii) Sampled in No. 1 Shaft
- | | | |
|----------------|----|---------------|
| Slope distance | - | 64 feet |
| Average width | - | 3.5 feet |
| Grade: | Ag | - 12.2 oz/ton |
| | Pb | - 16.55% |
| | Zn | - 17.27% |
- iii) #312 Stope, above No. 1 Level
- | | | |
|--------|----|----------------|
| Length | - | 50 feet |
| Width | - | 2.9 feet |
| Grade: | Ag | - 23.24 oz/ton |
| | Pb | - 11.48% |
| | Zn | - 12.84% |
- iv) No. 3 Level - Drifted for 400 feet
- | | <u>Length</u> | <u>Width</u> | <u>Ag. oz/ton</u> | <u>% Pb.</u> | <u>% Zn</u> |
|----|---------------|--------------|-------------------|--------------|-------------|
| a) | 50' | 2.1' | 14.42 | 6.16 | 2.34 |
| b) | 70' | 3.3 | 14.10 | 7.51 | 16.47 |

No. 2 Vein

i) No. 1 Level - Two ore sections separated by dike

	<u>Length</u>	<u>Width</u>	<u>Silver</u>	<u>Lead</u>	<u>Zinc</u>
a) Open to N.E.	30'	8.7'	16.85 oz/ton	6.50%	7.90%
b) Open to S.W.	45'	10'	15.18 oz/ton	6.29%	7.45%

(Excluding lower grade hanging wall mineralization)

Comment:

Requires drift extensions NE and SW
Not drilled from surface.

- ii) Partially mined between No. 2 and No. 3 Levels, providing bulk of ore mined to date.
- iii) Some wide stoping above No. 5 Level
Requires additional testing of stope walls.
- iv) Drifted 50 feet on No. 6 Level
Traced 75 feet below level by drilling

Comment:

- i) Most productive to date and best known potential
- ii) Probably connects with Wardell Vein at some horizon.

"No. 2 Vein South"

Trenched on surface 400 feet, weathered, requires drill testing by surface holes.

No. 3 Vein

Drifted 20 feet on No. 6 Level, high zinc; assays not available.

May be same vein as that intersected in vertical Hole C-10 ("No. 4 Vein") which returned assays of 5.26 oz/ton in silver, 4% lead and 2.3% zinc over 9.8 feet.

Comment:

Test by underground drilling.

Wardell Vein

Exposed by trenching and an old pit for 300 feet. The principal vein is 10 - 12 feet wide with numerous mineralized offshoots and a broad zone of mineralized fracture fillings. There is a suggestion that the latter may constitute a flat-lying ore zone amenable to surface mining. Intermittent exposures show silver content of 7 - 10 oz/ton with much higher values in individual veins. The overall area is about 300' x 400' giving a suggested potential of about 12,000 tons per vertical foot. Livgard (1972) reports high assays from the trench and pit over a length of 70 feet and widths up to 23 feet.

Hole C-7 (1975) passed under the northern end of the zone and returned an intersection of 29.5 feet averaging 2.13 oz/ton silver, 1.24% lead and 1.08% zinc.

Old drill holes S-1, S-2 and S-4 appear to have been drilled below the fracture zone and may have stopped short of the principal vein set. In any case, the recorded low core recoveries make assessment difficult.

Comment:

After detailed mapping, this zone requires testing by diamond drilling, possibly preceded by percussion drilling, to define the limits of significant mineralization.

Homestake Vein

This vein has been traced intermittently for about 450 feet, including 80 feet of underground drifting. Samples taken by Livgard are reported as follows:

	<u>Location</u>	<u>Width</u>	<u>Silver oz/ton</u>	<u>Lead</u>	<u>Zinc</u>
i)	Dump	-	8.2	5.7%	3.9%
ii)	Drift	6.5'	12.7	4.0%	4.2%
	Drift	5.0	11.1	3.8%	1.5%
	Drift	5.0	47.9	29.6%	4.8%

Comment:

Additional sampling required.

Eureka Vein

Single exposure near an old shaft; defer exploration to Stage II or later.

Other Zones

- a) Wardell intersecting vein - 120' plus.
One sample assayed 17.5 oz. silver, 8.8% lead and 0.2% zinc over 4 feet.
- b) Gold-bearing veins in southeast part of property. Reported by John Wilson to have been chip-sampled across widths of 4 to 6 feet, they returned assays of 0.33 oz/ton and 0.58 oz/ton in gold.
- c) Paul and Eagle Veins
The precise location is not known but are said by Mr. Wilson to be about 1/4 mile southeast of the Wardell Zone. Samples recorded from these veins assayed up to 26 oz./ton in silver and 0.28 oz/ton in gold, plus 15% combined lead-zinc.
- d) Northeast Zone
An orientation soil sampling program in 1973 explored a topographical basin about 2,000 feet northeast of the mine.
High average values for lead, zinc and silver plus the observation of mineralized float led to the conclusion that a separate mineralized rhyolite plug might underlie this area.
For the present this can be considered as another "prospecting bet".

ORE RESERVES

Livgard (1972) estimates ore in place at 46,752 tons indicated and 129,506 tons inferred; having an average grade of:

Silver	-	12.52 oz/ton
Lead	-	7.11 %
Zinc	-	8.12 %
Gold	-	0.0165 oz/ton
Cadmium	-	0.11 %

The present writer has studied the maps prepared for estimating the tonnage figures and considers the estimates to be reasonable and conservative.

The grade calculated by Livgard is based on actual smelter returns from 3,000 tons of concentrates, using assumed mill recoveries of 80% for lead-silver and 75% for zinc. The main assumption here, of course, is that the ore still in place has a grade equivalent to that mined in the past.

The foregoing reserves are calculated to be mainly in the present mine area with lesser amounts assigned to vein segments to the south. An additional "potential reserve" of 286,000 tons in the immediate mine area is understood to be speculative pending future drilling and development.

The chief purpose of this report is to indicate the best means of attempting to confirm and expand the estimates to a point where systematic development for a viable mining operation can be undertaken.

CONCLUSIONS

1. Whereas the presently estimated reserves, if confirmed, would support a 100 ton-per-day operation for about 5 years and generate sales revenue of about \$12 million, the possibilities for the mine area and the property at large are thought to be much greater.
2. In addition to the lead-zinc-silver potential, the occurrence of significant gold values in some of the practically unexplored veins is particularly intriguing.
3. A sustained program of exploration and development is amply justified by the facts at hand.

RECOMMENDATIONS

1. The company is advised to defer any resumption of milling until the ore reserve situation has been more positively determined. Some of the mill equipment will be useful in reducing bulk samples for assay.
2. The first objective of a new program should be to generally confirm the present estimates of tonnage and grade. The second objective should be to firmly establish and, if possible, to expand the reserves to the point where a mill of 200 tons-per-day capacity, or greater, can be justified.
3. The following recommended program should be supervised by a competent geologist with authority to make tactical changes as circumstances require.

STAGE I

A. Advance No. 120 Drift	100 feet @ \$100	\$ 10,000
B. Surface Diamond Drilling	2175 feet @ \$ 20	43,500
C. Underground Diamond Drilling	1100 feet @ \$ 8	8,800
D. Roads & Camp		5,000
E. Supply, Supervision, Engineering.		<u>7,700</u>
TOTAL STAGE I		<u>\$ 75,000</u>

SURFACE DIAMOND DRILLING

	<u>Location</u>	<u>No. of Holes</u>	<u>Azimuth</u>	<u>Dip</u>	<u>Depth</u>	<u>Feet</u>	<u>Total Feet</u>
<u>WARDELL VEIN</u>	Tier 1	5	127°	-60°	75'	375	
	Tier 2	4	127°	-60°	150'	<u>600</u>	975
<u>No. 2 VEIN SOUTH</u>	Tier 1	5	127°	-60°	75'	375	
	Tier 2	3	127°	-60°	165'	500	
	Tier 3	2	127°	-60°	275	<u>275</u>	<u>1,150</u>
							<u>2,125</u>

UNDERGROUND DIAMOND DRILLING

<u>No. 1 VEIN</u>	No. 1 X-C	1	196°	0°	75'			
	No. 120 Drift	1	150°	0°	100'			
	No. 220 Drift	3	125°	0°		350		
	No. 5 Level	2	180°	0°	100'	<u>200</u>	725	
<u>No. 2 VEIN</u>	No. 5 Level South Face	1	180°	0°	120'	120	120	
	<u>No. 4(?) VEIN (Hole No.10)</u>	No. 5 Level						
	End of X-C	1	307°	0°	100'			
	Drift Jet	1	307° + 40°		<u>150'</u>	250	<u>250</u>	
TOTAL:								<u>1,095</u>

STAGE II

Assuming that Stage I drilling confirms the probability of developing at least 5 years' ore supply, additional proving up will be required by means of underground work, trenching and fill-in drilling.

The relative amounts of each of these operations cannot be forecast at present but the following tentative schedule should satisfy most of the requirements to proceed with advanced feasibility work.

STAGE II

A. Underground

i) Drifting - mainly No. 1 Level 500 feet @ \$100	\$ 50,000	
ii) Stope sampling muck, chip, test-hole	<u>2,500</u>	\$ 52,500

B. Surface

i) Diamond drilling 1500 feet @ \$20	\$ 30,000	
ii) Trenching	<u>7,500</u>	37,500

C. Supply, Supervision, Engineering 10,000

TOTAL STAGE II \$ 100,000

Respectfully submitted,

L.S. Trenholme

L.S. Trenholme, M.Sc.

Vancouver, B.C.

March 1, 1976.

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Feasibility Report on The Cronin Mine for
Hallmark Resources Ltd., N.P.L.,
October 27, 1972.

2. Livgard, Egil, B.Sc., P.Eng.
Hallmark Resources Ltd. (N.P.L.) Cronin Mine,
Proposed Development Program During 1974.
(December, 1973)

3. Richards, J.B., B.A.Sc., P.Eng.
Coca Metals Ltd.
Summary Report of 1975 Work Program on Mt. Cronin
Property
October 31, 1975.

CERTIFICATE

The undersigned certifies that:

1. He is a graduate geologist (M.Sc. 1939) and has practised his profession as an exploration and mine geologist continuously, (except 1942-1945) since graduation.
2. He is a member in good standing of the Association of Professional Engineers of the Province of British Columbia and conducts a consulting practice from his office at 516 - 850 West Hastings Street, in the City of Vancouver.
3. The attached report is based on an intensive study of company records and engineers' reports, and by a brief examination of the underground workings.
4. He does not now own, and he does not expect to receive, any shares in Hallmark Resources Ltd., and/or any other financial interest in any of the properties described herein.
5. Hallmark Resources Ltd. is hereby given permission to reproduce this report, or any part of it, for the purpose of a financial prospectus; provided, however, that no portion may be used out of context in such manner as to convey a meaning differing materially from that set out in the whole.

DATED at Vancouver, B.C. this 1st day of March, 1976.

L.S. Trenholme
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