

HECLA/JACOLA/CYPRUS ANVIL JOINT VENTURE

PROGRESS REPORT - 1977

for

HECLA MINING CO. OF CANADA LTD.

JACOLA MINES LTD.

and

CYPRUS ANVIL MINING CORPORATION

by

D. S. Jennings, Ph. D. January 10, 1978

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Cyprus Anvil Mining Corporation

330, 355 Burrard Street Telex 04508594
Vancouver, British Columbia
V6C 2G8
Telephone (604) 687-2586

HECLA/JACOLA/CYPRUS ANVIL JOINT VENTURE

PROGRESS REPORT - 1977

SUMMARY

During 1977, exploration on the joint venture claim blocks was restricted to geological mapping at a scale of 1" = 1000' as part of a re-evaluation of the Rose and Anvil Creek valleys northwest of the Faro deposit. The claim blocks straddle the Unit 5B/3D contact known to host seven sulfide deposits in the Vangorda-Swim Lakes area. Faro Group rocks (Unit 1), host to the Faro deposit, are not exposed in the joint venture area. The absence of high or moderate priority geophysical anomalies restricts exploration to drill testing of structural/stratigraphic targets with lower priority geophysical back-up. An abbreviated review of the geology of map area D-6 is presented along with an update of geophysical compilations in the joint venture area. Recommendations for the 1978 program will follow. Field expenditures to 30, November, 1977 totalled \$18,480.

PREVIOUS WORK

Geological mapping in D-6 map area prior to 1977 was of a property nature only. As a consequence, a coherent understanding of geological relationships northwest of the producing Faro deposit was difficult. This inadequate mapping coverage led to the 1977 program of re-mapping from the Faro claim block northwest through Rose and Anvil Creek valleys. Results of the 1975 and 1976 geophysical and geochemical work (previously submitted) are appended at comparable scale. The 1975 geological mapping is included in and superceded by the 1977 mapping.

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CYPRUS ANVIL

1977 PROGRAM

Helicopter-supported, detailed, regional mapping was carried out by Cyprus Anvil geologists at a scale of 1" = 1000' (1:12,000) during parts of July and August. Standard foot traverse methods with "chopper hop" support were used. Results were compiled on 1" = 1000' orthophotographic base maps prepared for Cyprus Anvil in 1975.

GEOLOGY OF D-6 MAP AREA

A nearly complete upright, Paleozoic, stratigraphic section is preserved in the map area (Figure 1). This section is summarized in the following, provisional lithostratigraphic column (Figure 2). Inspection of this column reveals a dominantly pelitic metasedimentary pile with substantial (approximately 30%) interbanded metavolcanic rocks of demonstrably basaltic composition (within plate basalts) spanning the bulk of the Paleozoic.

Three "black shale" horizons are of principal exploration interest within this section. The lowermost horizon, Unit 1D, is host to the Faro deposit and is assigned a provisional Middle Cambrian age based on lead isotope dating. Unit 5A (not exposed in D-6 map area) has seven (FIRTH, GRUM, VANGORDA, DY, SWIM, SB and SEA) sulfide deposits spatially related to it and is tentatively assigned a Middle Ordovician to Lower Silurian age from regional stratigraphic correlations. The youngest horizon, Unit 7A, (of least interest) is the probable correlative to basal EARN GROUP siliceous clastic rocks. Its contained Middle to Middle Upper Devonian faunas (crinoids, conodonts) and black clastic lithology further suggests correlation with the regionally-developed, Devon-Mississippian "black clastic" sequence in Selwyn Basin, specifically the Canol Formation (and Gunsteel equivalents). At least two, sulfide deficient barite horizons, grossly similar to those of the Canol Formation, occur at the upper contact of Unit 7A and within overlying, varicoloured, phyllitic, ribbon cherts and siliceous phyllites of 7F. To date, there is no information to suggest these barite horizons are related to Anvil district or TOM/JASON type sulfide deposits.



Basaltic fragmental, flow and pillow lavas of Unit 6A might host volcanogenic massive sulfide deposits. Exploration to this point has not revealed significant sulfide mineralization in this unit on the south flank of Anvil Arch.

The main structural feature of the D-6 map area is a northeasterly verging, $\frac{1}{2}$ symmetry, southeasterly plunging, tight to isoclinal first phase fold (F_1) in the northwest-central part of the sheet. This fold is cored by Faro Group pelitic schists and in all probability is the northwesterly extension of a similar doubly plunging F_1 fold on the adjacent Faro map sheet (E-6). The polyphase structure of the D-6 map area is in every way similar to the rest of the Anvil belt with two periods of ductile folding related to regional metamorphic events followed by up to three periods of brittle folding. A detailed structural analysis of D-6 will be made upon final data compilation.

Toward the southern margin of the map area, ultramafic and related rocks of the Vangorda Creek allochthon (Vangorda Creek fault zone of Tempelman-Kluit (1972) G.S.C. Bulletin 208) form the core of the Rose Mountains. This large, probably allochthonous complex, has not been extensively explored (for possible ophiolite-related sulfide deposits). Structurally above the Vangorda Creek allochthon, basalts, basaltic graywackes, ribbon cherts, limestones (with Middle to Upper Triassic fauna) and graphitic pelites form a coherent package of rocks (Unit 10) which may represent an allochthonous magmatic arc assemblage. Both these postulated allochthonous packages were presumably emplaced in Upper Triassic time in response to the Tahltanian (?) D_1 (first deformation) event in Anvil Range. The Vangorda Creek and related allochthonous assemblages will form the subject of a technical paper in preparation and will not be considered further here.

EXPLORATION POTENTIAL IN JOINT VENTURE AREA

Inspection of the claim map (Figure 3) in conjunction with the geologic map (Figure 1) shows the joint venture area favorably situated with respect to the 5B/3D boundary (host to seven deposits elsewhere in the district). There is no outcrop or strong geophysical expression of Unit 5A graphitic phyllite development along this boundary as in the Vangorda and Swim Lakes areas

(Figure 4 and 5). Turam conductors are restricted to the upper portion of Unit 5 (Figure 5) and may represent unexposed Unit 5G, a graphitic phyllite several thousand feet up-section from 5A as seen in the Vangorda area. Amygdaloidal chloritic phyllites of Unit 6A show a typical turam response reflecting interbanded graphitic phyllites. Ground magnetic responses (Figure 4) agree well with the interpreted distribution of basaltic meta-volcanic units (3B, 5C, 6A) in the joint venture claim blocks.

In light of this data, exploration should be directed at refinement and/or drill testing of the 5B/3D contact for possible subsurface (below turam detection limits) development of 5A and associated sulfides. A specific recommendation toward this end will be forthcoming.

As the joint venture area is stratigraphically above Faro Group (>4000 feet), there is no potential for exploration within this horizon. Unit 6A affords limited potential for volcanogenic, massive sulfide exploration. Little has been done to date in this regard. Since the claim groups do not cover Unit 7A, there is no exploration potential in this unit.

SUMMARY AND CONCLUSIONS

In view of the geological and geophysical data, the 5B/3D contact affords the best exploration potential in the joint venture area. Clearly, this horizon provides relatively low priority structural/stratigraphic targets since Unit 5A does not seem to be present at the surface or near subsurface. A specific proposal to evaluate this contact in the third dimension will be presented shortly. A claims status summary (Appendix I) and cost summary (Appendix II) are enclosed.

Respectfully submitted,

D. S. JENNINGS, Ph.D.
Chief Geologist.

January 10, 1978.

APPENDIX I

CLAIMS STATUS SUMMARY

COMPANY CLAIM PROPERTY OWNERSHIP Cyprus Anvil 56%
 Hecla 34%
 Jacola 10% N.T.S.

Claim No.	Grant No.	No. of Claims	Staked by	Recording Date	Transfer Information		Due Date	Assessment Work and Remarks
					To	Date		
JOINT VENTURE AGREEMENT - JACOLA - HECLA - 105-K-5								
<u>FUBAR</u>					Cyprus Anvil	March 15, 1976		Assess. Work Filed Date: Feb. 1976 Amount: \$8,695.25 Type: Linecutting
23-24	Y20469-Y20470	2					Jan. 28, 1980	(Filed on optioned claims only)
<u>HECK</u>					Cyprus Anvil	March 15, 1976		
1-12	Y25554-Y25565	12					Jan. 28, 1980	
13-20	Y25570-Y25577	8					Jan. 28, 1980	Assess. Work Filed
21-24	Y25566-Y25569	4					Jan. 28, 1980	Date: Feb. 1976 Amount: \$7,044.01 Type: Geoph. survey
<u>LA</u>					Cyprus Anvil	March 15, 1976		(Filed on HEK claims)
30	Y29782	1					Jan. 28, 1980	
32	Y29784	1					Jan. 28, 1980	*****
<u>DEE</u>					Cyprus Anvil	March 15, 1976		Assess. Work Filed Date: Nov. 7, 1977 Amt. \$8,600 Type: Linecutting (Filed on Option claims only)
45-46	Y29785-Y29786	2					Jan. 28, 1980	
<u>DA</u>					Cyprus Anvil	March 15, 1976		CERTIFICATES OF WORK NOT RECEIVED
1-13	Y29769-Y29781	13					Jan. 28, 1980	
<u>HEK (Cyprus Anvil -100%)</u>								
1-8	Y93371-Y93378	8	S. Wolfe	April 11, 1975	Cyprus Anvil	May 31, 1976	April 11/80	
9-14	Y93379-Y93384	6	C. Carlson	April 11, 1975	"	"	April 11/80	

APPENDIX II

COST SUMMARY TO NOVEMBER 30, 1977

CYPRUS ANVIL MINING CORPORATION

HECLA PROJECT COSTS

FOR THE PERIOD JANUARY 1 to NOVEMBER 30, 1977.

Salaries and Wages	\$	3,600.00
Geophysical Surveys		480.00
Other Surveys		4,900.00
Rotary Wing		7,350.00
Property Maintenance		470.00
		<hr/>
		16,800.00
Administration 10%		1,680.00
		<hr/>
	\$	18,480.00
		<hr/> <hr/>

DISTRIBUTION:

	<u>Total</u>	<u>Contributions Received</u>	<u>Balance Due</u>
Hecla Mining 43.75%	8,085.00	8,085.00	-
Cyprus Anvil 56.25%	10,395.00	10,395.00	-
	<hr/>	<hr/>	<hr/>
	18,480.00	18,480.00	Ø

THIS IS YOUR INVOICE

NOTE: Preliminary figures only.
Subject to revision.



LEGEND

<p>CLAIM POSTS AND LEGAL SURVEYS (Shown in the Map)</p> <p>PRELIMINARY CLAIM POST AND LINE SURVEYS (Located in the Map)</p> <p>APPROXIMATE PLAN OF CLAIM POST LOCATIONS (See Inset in the Map)</p>	<p>MAP INDEX</p> <p>1 ANVIL MINE 2 AEX & VANGUARD 3 SWIM LAKES</p> <p>Scale: 1" = 10 Miles</p>	<p>ALL WEATHER ROADS</p> <p>SECONDARY ROADS</p> <p>TOTE TRAILS</p> <p>BRIDGES</p> <p>PRIMARY STREAMS</p> <p>SECONDARY STREAMS</p> <p>SWAMPS</p> <p>CAMP LOCATIONS</p> <p>DIAMOND D.H. SITES</p> <p>ROTARY DRILL SITES</p> <p>TRIANGULATION STATIONS</p> <p>SPOT ELEVATION IN FEET</p>
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This reference scale bar has been added to the original image. It will scale at the same rate as the map reference and can be used as a reference for the original size.

YUKON GEOLOGICAL SURVEY

CYPRUS ANVIL MINING CORPORATION

CLAIM SURVEYS

REVISED BY: _____

DATE: OCT. 25, 1976

N.T.S. 105-1-526
DRAWN BY: C.L.C.
DATE: OCT. 25, 1976

