

LOWER ANVIL CREEK JOINT VENTURE

Progress Report - 1976

CYPRUS ANVIL MINING CORPORATION

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Appendix iii	A Preliminary Report on a Gravity Survey, by P. E. Walcott.

MAPS - Scale 1" = 1,000'

CLAIM SURVEYS

GEOLOGICAL MAP

TURAM ELECTROMAGNETIC COMPILATION

RESIDUAL GRAVITY COMPILATION (pre-1976)

GROUND MAGNETIC COMPILATION (pre-1976)

AIRBORNE ELECTROMAGNETIC SURVEY

AIRBORNE MAGNETIC SURVEY

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SUMMARY

During 1976, line cutting and gravity surveys were undertaken over the 134 claims covering terrain underlain by favourable phyllitic horizons, on the northwest strike extent of the Anvil lead-zinc belt. A chain saw cut grid was utilized for 58 line miles of detailed gravity survey, over an area for which previous reconnaissance geology, Turam E.M., and magnetic survey data were available. An additional 17 miles of offset grid covering possible extensions of the Faro schist horizon was prepared for Turam and gravity surveys scheduled for early 1977. Preliminary profiles show one major (>1 mg/l.) and a number of minor (0.3 - 0.4 mg/l.) anomalies, of which two of the latter are associated with typical graphitic phyllite Turam responses. The larger anomaly probably reflects a massive folded greenstone body as interpreted from Turam response, and evidence from a short diamond drill hole put down in 1973.

The total field cost of operations in 1976 was \$72,472. This was about \$10,000 higher than anticipated, due to increases in the cost of gravity surveys over estimates by about \$100 per mile (15%), and rather more use of helicopter support than anticipated, as the surveys were run in poor weather conditions towards the end of the season.

Detailed refinement of gravity data and comparison with Turam is in progress and, together with some field verification of anomalies and completion of geophysical work over the potential Faro schist zone in 1977, will form the basis for drill target selection.

PROJECT DESCRIPTION

The Lower Anvil claim block comprises 134 full claims in an elongate rectangle astride Anvil Creek, located 12 miles northwest of the Faro orebodies in the Anvil lead-zinc belt.

From the discovery of the Faro Mine in 1964-65 to 1974, exploration generally was oriented toward discovery of suboutcropping massive sulphides responding to surface geochemical and shallow penetrating electromagnetic and magnetic search techniques. The recent discovery of the Grum (Kerr Addison - AEX) Deposit, deep extensions of the Faro ore horizons and deep sulphide zones at Swim Lake, together with erratic (0 - 250 feet) overburden, have led to the use of a deeper searching system of combined Turam and Gravity surveys, followed by drill testing of comparatively low order targets.

The Lower Anvil Creek claim block is underlain by a multi-deformed, metamorphic sequence of Cambrian to Devonian age, intruded by a young granite batholith. The mineralization at Faro is syngenetic in the sense that the sulphides were emplaced at the time of sedimentation, but some synvolcanogenic association is strongly implied.

The sequence at Faro comprises a lower, high-grade schist unit, subdivided into upper aluminous and lower quartzose members with minor graphitic horizons in the aluminous schist zone. These graphitic members appear to be closely associated with the Faro orebodies. The schists are overlain by a calc-silicate unit probably containing tuffaceous members but, as far as is known in the district, this unit contains no economic sulphide. The overlying phyllite and graphitic phyllite units are host to the Swim, Vangorda, Champ, Firth and Grum deposits and constitute a separate ore horizon to the Faro zone.

Although outcrop is poor, the Lower Anvil claims may be underlain by all three units with a preponderance of the phyllite unit. The Anvil belt orebodies are generally weak to moderate conductors with from fair to good excess mass response.

PREVIOUS WORK

Prior to carrying out the 1976 surveys, work had been carried out on the property by Dynasty Explorations Ltd. (amalgamated with Cyprus Anvil Mines in 1975). This work included reconnaissance geological mapping and prospecting, and ground magnetic and gravity surveys in 1971. The geophysical coverage was limited in area and aimed to define two airborne magnetic anomalies. Of the two gravity anomalies indicated by this work, the largest and most intense was drilled in late 1971. A 540-foot hole encountered 130 feet of unconsolidated overburden and a sequence of 410 feet of massive greenstone (amphibolite) with interbedded tuffaceous and chloritic meta-volcanic horizons. The relatively high density of the material and presence of sporadic amounts of pyrrhotite in the greenstone, led to the conclusion that the greenstone body was the cause of the magnetic-gravity anomaly. At a later date, Dynasty carried out a blanket Turam survey covering most of the claim area. This indicated a number of conductor zones indicative of graphitic horizons in the phyllitic pelites underlying the central part of the claim block. The current work is designed to complete gravity data over the area of Turam surveys, and a small offset grid in which the Faro schist horizon may emerge close to the Batholith margin.

REGIONAL EXPLORATION PARAMETERS

Current work in the Anvil belt has established a real stratigraphic sequence for the multi-deformed metamorphic pile, which is summarized as follows:

L	Anvil Batholith		
K	Basalt)	
		)	Anvil Range
J	Chert Unit	)	Group
I	Piswick Formation, inc. Graphitic Slates)	
		)	Blind Creek
H	Amygdaloidal Chloritic Phyllite, etc.	)	Group (Unit 7)
G	Calcareous Phyllite and Greenstone)	
		)	Vangorda
F	Graphitic Phyllite	)	Group
	- Swim/Sea	)	(Unit 5)
	- Vangorda-Grum-DY 185)	
E	Siliceous and Chloritic Phyllite)	
		)	Mt. Mye Group
D	Calc-silicate Phyllite, Schist and Marbles	)	(Unit 3)
C	Aluminous and Graphitic Pelitic Schist)	
	- Faro Orebody)	
B	Transition Zone)	
		)	Faro Group
		)	(Unit 1)
A	Quartzo-feldspathic and Pelitic Schist)	

The above stratigraphic section clearly indicates that the Faro and other distal volcanogenic sulphide horizons are widely separated in time, although perhaps not in mode and locus of origin, and that the phyllite-hosted deposits can be ascribed to at least two separate, although related, depositional events. Regardless of the validity of the above, one single fact emerges as a primary exploration parameter, which lies in the consistent association of graphitic pelites with sulphide deposition. This fact is the basis for continued exploration in the belt, and incidentally was the primary objective of the recent deep intersection of an extensive sulphide horizon on the DY claims by Cyprus Anvil, between the Vangorda and Swim deposits.

Because of the widespread and variable overburden, soil geochemical surveys and shallow penetrating geophysical methods, i.e. airborne, horizontal and vertical loops, C.E.M., etc., do not

give a clear overall picture of the bedrock response and, in our experience, Turam E.M., with a proven search depth of 400 feet plus on graphitic conductors, is the most reliable search tool presently available. This method has the added attraction of finger-printing a number of common rock types, in addition to graphitic members, particularly greenstones which, by virtue of their density and irregular pyrrhotite content, often emerge as gravity-magnetic anomalies. Target refinement of Turam conductors is achieved by direct comparison with known sulphide profiles and selected coverage by corrected gravity surveys. The presence of relatively low specific gravity, banded-sulphide zones in the phyllite sequences could, however, argue a case for systematic drill testing of complex conductor zones, even without significant gravity anomalies.

RESULTS OF 1976 SURVEYS

All previously available data is presented with this report in the form of 1" to 1,000' overlays on an orthophoto constructed topographic base. As can readily be ascertained from the reconnaissance geology map, there is small area possibly underlain by Faro schist horizon equivalents, and a much more extensive area underlain by calcareous phyllites with at least one graphitic phyllite zone, both horizons having ore potential in the Anvil belt.

In the Anvil belt, both the Mt. Mye Group and the Vangorda Group show an increase in carbonate content westwards from Swim Lake to the Lower Anvil Creek area. Thus in Lower Anvil Creek, all the observed phyllite outcrops are calcareous and by inference represent the section between the Mt. Mye Group and the Blind Creek Group. However, while this indicates lateral facies changes within the formations of interest, it does not preclude the presence of graphitic members or associated sulphides, both occurring in relatively close association with calcareous pelites in the Swim Lake and Vangorda areas.

As re-interpreted, there is some doubt as to the validity of some of the broad Turam conductor zones in the Lower Anvil Creek valley as indicators of underlying graphitic material. Where these broad conductors closely follow the deep overburden valley fill, they show an inphase-outphase response not normally characteristic of graphitic conductors. These zones have therefore been downgraded as target zones and graphitic zones on the geological map are restricted to more definitive conductors.

By comparison with the area immediately to the east, some up-grading of outcrop density can be anticipated in the Lower Anvil Creek area by more diligent geological mapping, particularly on the steep north slope of the valley where the Faro Group - Mt. Mye Group contact should be mappable. Due to the loss of one of our experienced geologists in a tragic accident last summer, it was not possible to do this work in 1976, but it is scheduled for the earliest opportunity in 1977.

The 1976 gravity data are presented as profiles of Bouguer gravity and surface elevations at a scale of 1" = 200', as contours of Bouguer and surface elevations at 1" = 400' and also as residual anomaly locations over-printed on the 1" = 1,000' Turam compilation map. The field techniques and interpretations of these results are included in a report by P. Walcott (Appendix iii to this report).

SUMMARY AND CONCLUSIONS

From Walcott's report (Appendix iii) and, in particular, the comparison of Turam, geology and gravity data, a number of anomalies are apparent.

On the basis of Turam profiles and evidence from the 1971 diamond drillhole, gravity anomalies A, B, C and D are most likely caused by extensive greenstone (metabasite) intrusive rocks and, as such, would not be considered as drill targets. Anomaly L may also be due to an underlying greenstone, but from its stratigraphic position at the base of the Vangorda Group cannot be written off with quite the same level of confidence.

Anomaly E, while corresponding closely with Turam effects indicative of underlying graphitic phyllite, is a weak gravity feature which may be due largely to local terrain effects as explained by Walcott.

Anomalies M, N and O are associated with good Turam responses, which are unlikely to result from conductive overburden. They may be more continuous than the present survey can define, occurring as they do at the extreme margins of the survey area. These anomalies are well situated stratigraphically over rocks correlative with the Vangorda graphitic phyllite horizon.

Of the other anomalies indicated, F, G and H may be worth further resolution, although the adjacent Turam effects in this case could be caused by conductive overburden infilling the Anvil Creek Valley.

Because of the location of the M, N O and F, G, H groups of anomalous gravity effects at the margins of the survey area, there is insufficient control to be certain of the extent, magnitude and closure of these anomalies.

It is recommended that additional lines, and line extensions be carried out to satisfactorily define the M, N O and F, G, H groups of anomalies. Because of the possibility of conductive overburden, particularly in the eastern section of the grid, an I.P. test line, using light portable equipment, would be a considerable aid in evaluating the Turam effects. Anomaly L could be further evaluated by a similar application.

The area of the Foto grid, by extrapolation from the adjacent area to the east, could be underlain by Faro schist ore zone

equivalents and the previously proposed Turam, and, if warranted, gravity follow-up is still recommended.

The proposed geophysical work would be carried out as soon as snow conditions allow, in late-May or early-June, together with more detailed geological mapping of the claims and surrounding areas. Final target selection can then be based on the best possible survey data for a drill program scheduled in June-July.

A best guess for drilling footage would be 700 to 1,000 foot holes on two or three selected gravity-Turam targets. The initial hole should be maintained to sufficient depth to allow accurate location within the Faro-Vangorda sequence.

Respectfully submitted,

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Exploration Manager

JGS/cb

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Appendix i

CLAIM STATUS

One year's assessment work was applied to each of the 134 claims based on line cutting as physical work. Claim summary sheets are attached and give all relevant details. Physical work, i.e. line cutting, trenching or drilling, to the value of \$13,400, will be required prior to 15 August, 1977, in order to retain the subject claims.

Appendix ii

PROPOSED BUDGET FOR 1977

01	Salaries and Wages	\$ 7,000
06	Surveys - Geophysical (including linecutting) (15 miles Turam - Gravity detail)	9,000
08	Drilling - 3,000' (at \$18.00/foot all-up estimate)	54,000
11	Assays and Analyses	1,000
12	Field Equipment and Supplies	1,000
14	Fuel	1,500
15	Rotary Wing	10,000
33	Property Maintenance	<u>3,000</u>
		\$86,500
60	Overhead and Administration - 10%	<u>8,650</u>
		<u>\$95,150 *</u>

* \$80,528 to be paid by Preussag, balance 60% Cyprus Anvil,
40% Preussag.