OLD ROCK CODE

" LITHOSTRATIGRAPHIC 000480

CYPRUS ANVIL

VANGORDA PLATEAU

GRUM

LITHOSTRATIGRAPHIC CODE

SCA

ALBS [SCA]

Thursday

22,000

G 21000

$ 385

596,000

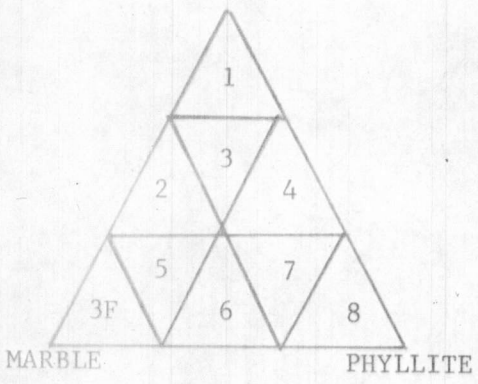
CONFORMABLE CONTACT

MT. MYE FORMATION

UNIT 3	912	3A	Transition zone with unit 1 NOT used often.
	946	3B	Chloritic phyllite/schist
	908	3C	Metabasite
	913	3D	Calc. silicate phyllite/schist
	963	3E	Graphitic phyllite/schist
	906	3F	Marble and silicated marble
	941	3G	Non-calcareous, muscovite chlorite ±biotite phyllite/schist, undifferentiated
	913	3H	Chloritic calc. silicate phyllite/schist (associated with 3D)
	916	3I	Graphitic quartzite in non-calcareous phyllite/schist

1. Siliceous
2. Non-calcareous
3. Calcareous
4. Altered, pyritic (white mica envelope)
5. Banded/laminated
6. Sulphide bearing (>2%)
7. Chlorite laminations
8. Chloritic
9. Carbonaceous
0. Normal

CALC. SILICATE PHASES



CONFORMABLE CONTACT

DY, GRUM & VANGORDA DEPOSITS

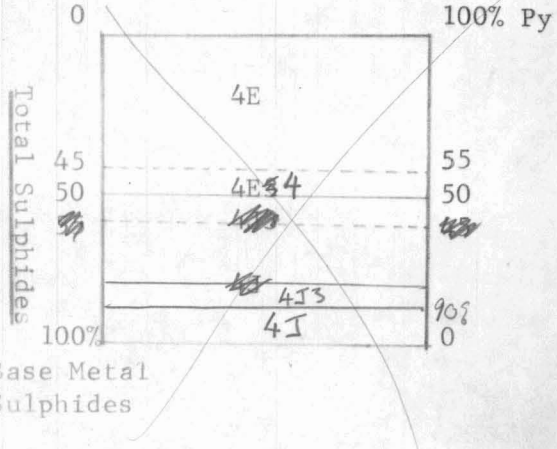
Unit 4	922	4A	Sulphide bearing, ribbon banded graphitic quartzite ([illegible] volume)
	915	4B	Pyrite free quartzite (<2% total sulphides)
	916	4C	Base metal poor, pyritic quartzite (>2% total sulphides) <5% Pb+Zn
	942	4D	Base metal bearing, pyritic quartzite (>5% Pb & Zn, qtz>$BaSO_4$) 4>10%
	918	4E	Massive pyritic sulphides (80% total sulphides) 80% 4E4>5% Pb & Zn Pyrite>50% of sulphides
	923	4F	Buckshot facies, massive sulphides (generally occurs only at Faro)
	928	4G	Baritic facies massive sulphides/sulphates >2% (>10% $BaSO_4$, $BaSO_4$>qtz) 4G4>10% Pb & Zn 4D46 <10% $BaSO_4$
	924	4H	Pyrrhotitic facies, massive sulphides (>80% sulphides, pyrrhotite>50% of sulphides)
	924	4J	Non-pyritic base metal bearing massive sulphides
	921	4K	Ankerite bearing massive pyritic sulphides (>1% ankerite) 4J3 <5% py not common

<2% altered material. No carbonaceous material.

1. Siliceous
2. Fine, porphyroblastic pyrite
3. Pyrite/marcasite bearing (>2% sulphides except as modified above) Now means Py>50% Qtz (hydrothermal) is $\frac{\text{py ratio}}{\text{Qtz}} = \frac{1}{2}$ not greater than 30%
4. ZnS and/or PbS bearing (>5% Pb & Zn sulphides except as modified above)
5. Carbonaceous
6. Barite bearing >2% <10%
7. Pyrrhotite bearing (>2%) <50%
8. Magnetite bearing
9. Chalcopyrite bearing (>0.2% Cu)
0. Normal
* Carbonate bearing (define in descriptive). Ank, Dol.,

4A, 4E >5% Pb+Zn

4D4, 4E4, 4G4 >10% Pb+Zn.



Unit 4 914 4L Bleached sericite>chlorite phyllite
(<2% sulphides, quartz predominantly cherty)

1. Siliceous
2. Sulphides>2%, pyrite>pyrrhotite
3. Talc bearing (white mica envelope)
4. ZnS and/or PbS bearing (>2% Pb & Zn)
5. Carbonate bearing
6. Chlorite>sericite
7. Sulphides>2% pyrrhotite>pyrite
8. Magnetite bearing
9. Chalcopyrite bearing (Cu>0.2%)
0. Normal

No samples > 2m where no core use K.A. breaks.

INTRUSIVE CONTACT

VANGORDA FORMATION

Unit 5	936	5A	Variably calcareous, graphitic phyllite
	920	5B	Calcareous muscovite, chlorite±biotite phyllite
	908	5C	Metabasite
	910	5D	Variably calcareous, chloritic phyllite
	904	5E	Phyllitic marble and silicated marble
	945	5F	Laminated, chloritic phyllite
	~~949~~	~~5G~~	~~Variably calcareous, graphitic phyllite (same as unit 5A—use discontinued)~~
OSMC Menzie Creek Fm.	911	5H	Amygdaloidal chloritic phyllite
	962	5I	Carbonaceous to graphitic argillite phyllite (Road River formation)

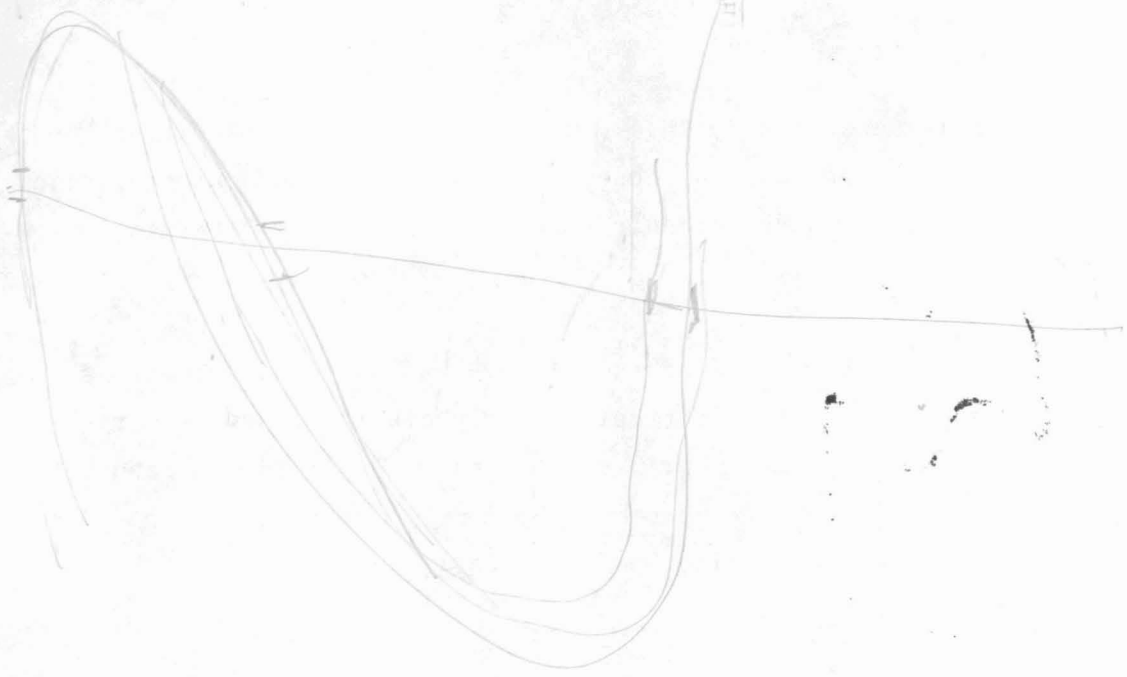
1. Siliceous
2. Carbonaceous
3. Calcareous
4. Altered (white mica envelope)
5. Banded/laminated
6. Non-calcareous
7. Chlorite banded
8. Chloritic
9. Sulphide bearing
0. Normal

* Dolomitic (define amt, dol Sd $BaCaCO_3$.)

TR
INCLUSIVE ROCKS

Unit 10	928	10A	Granodiorite (kspar plag, qtz 10%)
	929	10B	Adamellite (qtz monzonite)
	939	10C	Pegmatite
	956	10D	Quartz diorite (kspar plag, qtz 10%)
	934	10E	Diorite (kspar plag, qtz 10%)
	925	10F	Monzonite (kspar plag, qtz 10%)
	932	10G	Pyroxenite
	937	10H	Granite (kspar plag, qtz 10%)
	930	10J	Syenite (kspar plag, qtz 10%)
	938	10Q	Bull qtz veins/pods

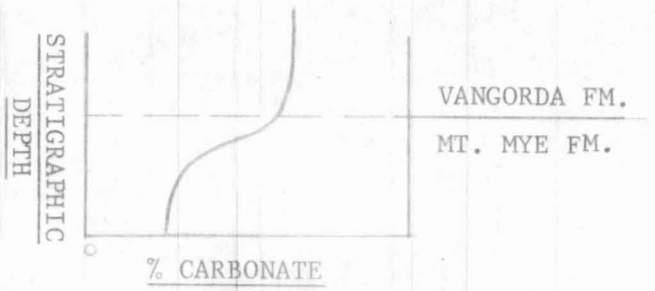
1. Foliated/lineated
2. Porphyritic
3. Aphanitic
4. Smokey qtz-bearing
5. Muscovite bearing
6. Kspar bearing
7. Biotite bearing
8. Amphibole bearing
9. Altered (kaolinite, montmorillonite)
0. Normal (equigranular)



NOTES ON THE APPLICATION of the VANGORDA PLATEAU LITHOSTRATIGRAPHIC CODE

GENERAL NOTES

1. The transition between the Mt. Mye formation (unit 3) and the Vangorda formation (unit 5) is positioned at the point where generally non-calcareous strata passes into generally calcareous strata.



Stratigraphically this contact occurs approximately at the top of the sulphide zone and conversely this contact forms the prime stratigraphic base metal exploration target in the Anvil district.

2. Many of the units of the Mt. Mye and Vangorda formations are similar or identical and only distinguished by stratigraphic position with respect to the sulphide horizon and generaly calcareous/non-calcareous transition.
These corresponding units are as follows:

5B0—3G3
5A——3E
5C——3C metabasite
5B6—3G0

3. Brackets are used in the comments column as follows:

() refers to minor interbands of a particular ore or rock type;

[] refers to an interpretive alternative, eg. 5B6 [3G]

4. In DY, Cu in many units generally increases to the southwest—possible direction to vent zone?

NOTES ON INDIVIDUAL UNITS

VANGORDA FORMATIONS

1. 5BO—5B6 distinction. These are gradational units so 5BO is pigeon-holed as that having an overall spontaneous reaction to 5% HCl even on a previously wetted acid surface. 5B6 may have locally calcareous zones. Note the importance of avoiding carbonate veins in the distinction.

2. 5B—5B2—5A gradation. The breaking points in this gradation have been defined based on a standard set of drill cores. In approximate terms:

   5B < 3% C by volume
   3% < 5B2 < 7% C
   5A > 7% C

3. In the DY area only units 5A, B, C and D are commonly encountered; 5B is the most widespread; 5A increases in abundance near the sulphide horizon and generally to the south; 5D is most common toward the north end of the deposit, immediately above the sulphide zone.

4. 5D comprises several types:

   1) Alteration around veins ✕ or fault zones.
   2) Massive foliated zones with sharp to diffuse contacts
   3) Is foliated, with contained carbonated clasts, suggesting a pyroclastic origin; contacts generally quite sharp in this case.
   4) 5D on the Grum refers to greenish, chloritic variably calcareous phyllite.
   5) 5F on the Grum refers to laminarly banded, variably calcareous, chloritic phyllite.

C.C. Where 4A phyllitic reaches stage where phyllitic partings ~~become~~ ~~dominate~~ ie ~~~~ regularly banded. > 5% described as 4A1 ; 4A13 ; + (3G12 ~~finely~~ interbanded)

UNIT 4

1. The normal Anvil cycle of sulphide layering is:

4GE	4K
4D	
4C	
4A	

This may have application in defining overturned stratigraphy. Units 4B–4K are generally gradational but 4A is distinctly different reflecting a different or mixed origin.

4A

2. 4A is bimodal with either a high abundance of pyrite or sphalerite–galena and rarely a balance of the two.

3. 4A4 often underlies highest grade (4C.) 4D.
→ 4A phyllitic has been called 4L14 (BVH, 5B19 (DIH)

4BCD

4. 4B, 4C, 4D distinction;

4B < 2% sulphides
4C > 2% sulphides < 5% Pb & Zn sulphides
4D > 2% sulphides > 5% Pb & Zn sulphides

5. 4A4, 4E4 modifier on the Grum refers to > 5% Pb, Zn sulphides. There is no 4C4 modifier. 4D4–4G4–4K4 on the Grum refers to > 10% Pb, Zn sulphides.

6. 4B5–4C5–4D5 is applied essentially to siliceous ore, sometimes with minor (< 0.5%) carbonaceous wisps. 4A is meant to be used for ores with an affinity for carbonaceous matter. Rare rock.

7. 4C is normally dominantly pyrite, often footwall pyrrhotite. Hangingwall magnetite is common if associated with 4E, K. Sometimes footwall chalcopyrite with associated Au (typically 1 ppm) is present.

5H19 (graph) → 4A (graph) transition 5A qtz is grey (due to enclosed C ie; sed regime dominates);
4A qtz is white (re hydrothermal regime dominates)

(?)

8. 4D is often laterally associated with 4G.

9. 4D6–4G1 distinction;

$$\frac{\text{4D6}}{\text{Qtz} > \text{BA}} \qquad \frac{\text{4G1}}{\text{BA} > \text{Qtz}}$$

4F

10. 4F buckshot pyrite is only associated with higher metamorphism at Faro. The modifier '2' is used for "baby" buckshot occurances at Vangorda and Grum.

birdshot ??

4G

11. 4G is usually >5% Pb & Zn sulphides. It characteristically burns black on core. 4G4, 4G48, 4G* are the most common types.

12. Towards center thickening of 4G layer magnetite and higher Pb:Zn ratios are found.

4J

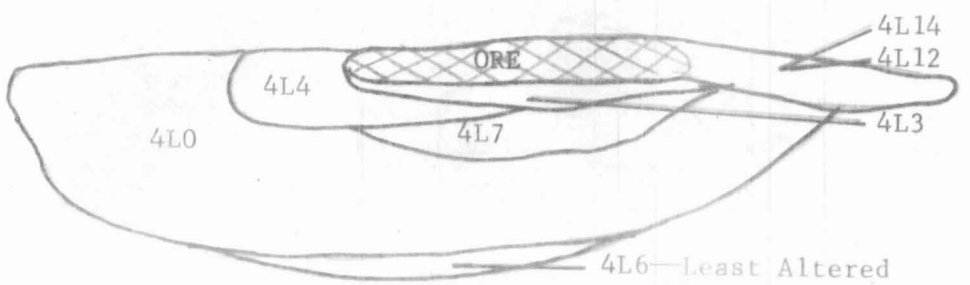
13. 4J is non-pyritic with >95% Pb & Zn sulphides.

4K

14. 4K typically contains 1–3% ankerite.

4L

15. Generalized zoning scheme



16. 5D–4L distinction. 5D lacks sericite, usually lacks sulphides, and quartz is granular not cherty as in 4L.

17. If the original 5D can be recognized through the alteration overprint, it should be labelled 5D4, if not 4L6.

18. 4L8 is generally not seen.

MT. MYE FORMATION

1. 3D, 3F, 3G Calc–silicate–marble–phyllite
Triangle used to separate these gradational phases.

INTRUSIVE ROCKS

1. 10D is the only common dike phase at DY.

GEOTECHNICAL CONSIDERATIONS OF ORE ZONES

To aid mine planning, in particular underground mine planning the nature of the hangingwall and footwall of the ore zones should be noted, eg: highly fractured, broken hangingwall; or competant hangingwall, etc.

KERR ADDISON/C.A.M.C.

ROCK TYPES

GRUM

COUNTRY ROCKS

S	=	5B/3G
S_G	=	5B2/3G9
S_C	=	3G8?? (uncertain)
S_K	=	5B0
SP	=	4A??/5A19?? (uncertain)
S_T	=	4L3
Ss	=	4L
S_b	=	4L
S_{bm}	=	mariposite
S_{bc}	=	chlorite 4L6
G	=	5A
G_K	=	5A3
G_Q	=	5A1
K	=	5B0
C	=	5D0
H	=	1D/1C

B = biotite
st = staurolite
gt = garnet
m = mariposite
c = chlorite

SULFIDES

M	=	4E
MV	=	4E
MB	=	4C/4E
MBV	=	4E
MI	=	4E1/4K
Mb	=	4G
MQ	=	4C/4D
P	=	4ABCD (general)
PB	=	4C/massive 4CE/4A
PF	=	4C/foliated 4A
PP	=	4C/granulose 4A
PG	=	4A

selvedge

RST

5C–5C3–5C*–5C*4–5C4*

5C mott. refers to the mottled 5C metabasite which texturally has the appearance of chloritic filled vesticulated flows. Where this rock is calcareous it should be labelled 5C3; and 5C* when there is another carbonate present. The carbonate present should be noted in the comments (eg. ankerite, dolomite).

5C*4 refers to the tan to buff coloured generally ankeritic±sericite±mariposite/fuchsite±chlorite rock which is variably mottled and occurs in proximity to the ore – though not exclusively.

This rock can be more altered to a more sericitic, siliceous and lighter colour than the typical tan-buff colour observed. This rock would be labelled 5C4*.

When this rock compositionally reaches the alteration stage where it should be labelled 4L, however retains the typical 5C*4 texture, it should be labelled 5C4* [4L5].

In summary:

Rock Type	Comments
5C	mott. (the mottling should be noted in the rocks below)
5C3	calcareous
5C*	(note: ankerite, dolomite etc.)
5C*4	N.B. any mariposite/fuchsite should be noted in all these rock types
5C4*	
5C4* [4L5]	
4L5	


NB 110 -130
4C
4A
5A
91 5A
146
175 mixed
or
180
180 ore
— ore
249
315
4L 5B