CYPRUS ANVIL MINING CORPORATION INTEROFFICE CORRESPONDENCE

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Date May 6, 1981 C. W. Reno

Subject VANGORDA PIT DESIGN

The Vangorda block model was evaluated by a moving cone (dipper) program to aid in designing a Vangorda ultimate pit. The moving cone mined about 93% of the geologic reserves. A hand designed pit will normally not attain the same ore tonnage as the moving cone evaluation due to mining constraints that cannot be programmed. Additional rotary drilling southeast of the ultimate pit may increase minable reserves.

A hand drawn pit based on the dipper model mined about 87% of the geologic reserves. All figures within this report do not contain an adjustment factor. An initial pit was also designed. The relatively small size of the Vangorda pit dictated that the final ramp should be established during the initial mining phase. The ore appears to be higher in grade near the surface than at depth. The southeast portion of the deposit contains the shallowest ore and is the logical area for initial ore supply. Access to the mine would be via the 1121 meter elevation of Vangorda Creek. An 8% haul road from the proposed crusher site (1300 meter elevation) appears to be feasible without excessive cut or fill.

The specific gravity of the ore types should be tested based on whole core, rather than the crushed core as is now the case. The S.G. tests should also be carried out on Faro and Grum ore types. Additional shallow drilling to determine overburden depths is suggested in the NE and western portions of the ultimate pit. The dipper routine assumed the following recoveries and concentrate grades depending on ore type:

	Lead		Zinc		Silver		Gold	
Ore Type	Recovery %	Conc. Grade %	Recovery %	Conc. Grade %	Recovery %	Conc. Grade g/mt in Pb Conc.	Recovery %	Conc. Grade g/mt in Pb Conc.
4G	85	60	80	55	65	650	40	6
4GE	81	58	77	54	57	565	45	8
4EFH	77	54	75	53	50	480	50	10
4CE	80	55	77	53	50	490	45	6
4BCD	83	57	80	54	50	500	40	3
4A	80	50	80	54	55	600	55	25
	75	55	84	51	52	534	—	—

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A significant change in recoveries may alter the pit design; however, changes of ± 10% are not likely to affect the final pit design.

The material within the final pit is summarized below:

	4% Pb + Zn Cut-Off	3% Pb + Zn Cut-Off
Cubic Meters Overburden	2,425,400	2,425,400
Cubic Meters Rock Waste	5,116,200	4,882,100
Metric Tonnes Ore	4,520,500	5,323,400
% Pb	3.4	3.1
% Zn	4.5	4.1
Grams/mt Ag	49.0	45.4
Grams/mt Au	0.73	0.75

A 40° slope (excluding ramps) was used on NE, E and SE pit walls and a 45° slope (excluding ramps) was used on NW, W and SW pit walls. The overburden was mined at 32° (1.6:1). A 100 foot wide 8% ramp was used in the pit designs, except in the last four benches of the final pit where an 80 foot wide 10% ramp was used.

The ore distribution of the final pit was:

4G	27 %	(7.9 cubic feet/short ton)
4GE	27 %	(7.9-8.7 cubic feet/short ton)
4EFH	12 %	(8.3 cubic feet/short ton)
4CE	3 %	(8.9-9.2 cubic feet/short ton)
4BCD	13 %	(9.7-9.9 cubic feet/short ton)
4A	18 %	(11.4-11.6 cubic feet/short ton)

When the cut-off was lowered to 3%, an increased portion of 4BCD was present (increased to 20%) and 4G; 4GE portions were reduced.

The initial pit contained the following material:

	4% Pb + Zn Cut-Off	3% Pb + Zn Cut-Off
Cubic Meters Overburden	1,941,600	1,941,600
Cubic Meters Rock Waste	2,614,100	2,522,200
Metric Tons Ore	1,937,000	2,258,000
% Pb	3.3	3.1
% Zn	4.4	4.1
Grams/mt Ag	46.6	43.7
Grams/mt Au	0.73	0.76

The amount of pre-production stripping required will depend on the required daily ore production rate. Proper sequencing of the initial and final pits can be controlled by moving the northern boundary of the initial pit. A trial design should be made mining the north portion of the pit first.

Geologic (in place) reserves are tabulated below:

	4% Pb + Zn Cut-Off	3% Pb + Zn Cut-Off
Metric Tons	5,209,500	6,204,300
% Pb	3.3	3.0
% Zn	4.3	3.9
Grams/mt Ag	47.8	44.1
Grams/mt Au	0.74	0.76

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NBP/mm

VANGORDA PIT

QUANTITIES AND GRADES

(000's)

September 19, 1981

4.0% Pb + Zn Combined Cut-Off

	PHASE 1						PHASE 2						TOTAL					
	Waste	Ore		%	%	Ag	Waste	Ore		%	%	Ag	Waste	Ore		%	%	Ag
Bench	BCM	BCM	Tonnes	Pb	Zn	g/mt	BCM	BCM	Tonnes	Pb	Zn	g/mt	BCM	BCM	Tonnes	Pb	Zn	g/mt
1169	2						10						12					
1157	140						90						230					
1145	645						210						855					
1133	1,127						366						1,493					
1127	574	16	58	2.8	4.1	37.8	211						785	16	58	2.8	4.1	37.8
1121	469	47	172	3.6	4.5	49.2	244	3	11	5.3	7.8	79.2	713	50	183	3.7	4.7	51.0
1115	417	54	205	3.7	5.5	50.5	250	5	18	4.9	6.7	70.3	667	59	223	3.8	5.6	52.1
1109	292	69	247	3.5	5.0	48.4	242	27	82	2.7	3.8	41.2	534	96	329	3.3	4.7	46.8
1103	221	105	388	3.3	4.5	47.3	180	61	189	3.0	4.8	44.6	401	166	577	3.2	4.6	46.4
1097	182	55	219	3.4	4.5	50.3	184	67	216	3.0	3.9	41.2	366	122	435	3.2	4.2	45.8
1091	159	48	196	3.4	5.0	49.9	164	67	251	3.9	5.2	56.0	323	115	447	3.7	5.1	53.3
1085	113	43	175	3.3	4.0	43.3	168	43	170	4.1	5.6	62.6	281	86	345	3.7	4.8	52.8
1079	96	36	142	2.6	2.8	32.5	143	72	280	3.4	5.2	51.8	239	108	422	3.1	4.4	45.3
1073	77	14	57	3.1	2.9	44.2	86	109	425	4.0	5.3	59.5	163	123	482	3.9	5.0	57.7
1067	43	21	78	3.2	3.7	45.2	83	106	425	3.4	4.2	49.9	126	127	503	3.4	4.1	49.2
1061							94	69	271	3.0	3.4	44.0	94	69	271	3.0	3.4	44.0
1055							96	42	169	3.1	3.0	45.3	96	42	169	3.1	3.0	45.3
1049							76	4	15	2.5	2.2	32.5	76	4	15	2.5	2.2	32.5
1043							49	4	18	2.2	2.5	30.9	49	4	18	2.2	2.5	30.9
1037							27	6	19	2.4	2.7	35.7	27	6	19	2.4	2.7	35.7
1031							15	6	26	3.1	3.8	52.5	15	6	26	3.1	3.8	52.5
TOTAL	4,557	508	1,937	3.3	4.5	46.6	2,988	691	2,585	3.5	4.5	50.8	7,545	1,199	4,522	3.4	4.5	49.0