

TABLE 2.2: VANGORDA RESERVES BY ROCKTYPE WITHIN THE ULTIMATE VANGORDA PIT

GREATER THAN 6% (Pb + Zn)

ROCK TYPE	VOLUME (bcm)	TONNES	SG	LEAD (%)	ZINC (%)	SILVER (%)	GOLD (g/t)	LEAD PLUS ZINC (%)	% OF TOTAL ORE TYPES	% OF TOTAL METAL
4A	94,900	277,920	2.929	2.891	4.224	39.141	0.652	7.115	5.0%	3.6%
4BCD	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%
4EC	8,810	34,980	3.970	5.097	3.540	65.659	0.782	8.637	0.6%	0.6%
4EG	1,243,300	5,183,330	4.169	4.373	5.581	62.123	0.795	9.954	93.8%	95.1%
4H	7,820	30,460	3.895	6.491	6.191	85.909	0.337	12.682	0.6%	0.7%
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TOTAL	1,354,830	5,526,690	4.079	4.315	5.503	61.121	0.785	9.818	100.0%	100.0%
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GREATER THAN 4% (Pb + Zn)

4A	304,250	887,650	2.918	2.214	3.479	30.893	0.520	5.692	13.9%	8.6%
4BCD	14,670	51,610	3.518	2.651	1.709	29.268	0.978	4.361	0.8%	0.4%
4EC	31,680	126,250	3.985	3.185	2.595	41.118	0.868	5.781	2.0%	1.2%
4EG	1,274,370	5,303,570	4.162	4.324	5.511	61.464	0.791	9.836	82.9%	89.1%
4H	7,820	30,460	3.895	6.491	6.191	85.909	0.337	12.682	0.5%	0.7%
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TOTAL	1,632,790	6,399,540	3.919	4.006	5.144	56.679	0.754	9.151	100.0%	100.0%
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LESS THAN 4% (Pb + Zn)

4A	151,620	436,570	2.879	1.155	1.822	18.706	0.480	2.977	14.0%	18.6%
4BCD	253,030	875,250	3.459	1.051	1.234	18.135	0.674	2.286	28.2%	28.7%
4EC	462,680	1,772,770	3.832	0.955	1.073	20.519	0.967	2.029	57.0%	51.5%
4EG	6,530	24,600	3.767	1.535	1.747	24.346	0.596	3.282	0.8%	1.2%
4H	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.0%	0.0%
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TOTAL	873,860	3,109,190	3.558	1.015	1.229	19.624	0.813	2.244	100.0%	100.0%
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* no adjustments for dilution have been made

TABLE 2.3: GRUM RESERVES BY ROCKTYPE WITHIN THE ULTIMATE GRUM PIT

GREATER THAN 6% (Pb + Zn)

ROCK TYPE	VOLUME (bcm)	TONNES	SG	LEAD (%)	ZINC (%)	SILVER (%)	GOLD (g/t)	LEAD PLUS ZINC (%)	% OF TOTAL ORE TYPES	% OF TOTAL METAL
4A	2,487,500	7,733,470	3.11	2.91	5.21	49.4	0.87	8.11	44.7%	34.6%
4CD	762,400	2,480,000	3.25	3.80	6.74	62.4	0.90	10.54	14.3%	14.4%
4E	1,127,710	4,436,980	3.93	5.18	8.63	86.8	1.24	13.81	25.6%	33.8%
4G	540,390	2,206,380	4.08	5.03	7.43	84.9	1.05	12.46	12.8%	15.2%
4H	8,640	32,520	3.76	5.19	10.02	106.5	1.32	15.21	0.2%	0.3%
4L	136,620	413,140	3.02	2.75	4.95	48.3	0.68	7.70	2.4%	1.8%
										
TOTAL	5,063,260	17,302,490	3.42	3.89	6.59	65.5	0.99	10.48	100.0%	100.0%
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GREATER THAN 4% (Pb + Zn)

4A	3,766,170	11,608,820	3.08	2.55	4.53	43.77	0.83	7.08	50.8%	39.4%
4CD	985,340	3,154,930	3.20	3.35	5.95	55.63	0.83	9.30	13.8%	14.1%
4E	1,233,670	4,847,850	3.93	4.93	8.14	83.01	1.23	13.07	21.2%	30.3%
4G	540,390	2,206,380	4.08	5.03	7.43	84.94	1.05	12.46	9.7%	13.2%
4H	8,640	32,520	3.76	5.19	10.02	106.45	1.32	15.21	0.1%	0.2%
4L	335,340	998,240	2.98	2.17	3.75	36.82	0.62	5.91	4.4%	2.8%
										
TOTAL	6,869,550	22,848,740	3.33	3.39	5.74	57.50	0.93	9.13	100.0%	100.0%
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LESS THAN 4% (Pb + Zn)

4A	537,390	1,599,270	2.98	1.26	2.03	23.56	0.70	3.29	53.4%	61.1%
4CD	219,030	707,380	3.23	1.06	1.58	21.60	0.57	2.64	23.6%	21.6%
4E	55,010	167,260	3.04	0.34	0.48	6.85	0.02	0.82	5.6%	1.6%
4G	17,280	49,250	2.85	0.00	0.00	0.00	0.00	0.00	1.6%	0.0%
4H	4,320	12,310	2.85	0.00	0.00	0.00	0.00	0.00	0.4%	0.0%
4L	159,840	460,200	2.88	1.30	1.65	19.85	0.50	2.94	15.4%	15.7%
										
TOTAL	992,870	2,995,670	3.02	1.14	1.74	21.11	0.58	2.88	100.0%	100.0%
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* no adjustments for dilution have been made

TABLE 2-10B : Relative Proportions of Sulphide Waste In Grum Pit By Stages

swell factor: 25%										
	Total Sulphide Waste In Model (tonnes)	Un-Interpol. Blocks Included Total (tonnes)	Extra Sulphides Not In Model (tonnes)	Grand Total Sulphide Waste (tonnes)	Total Sulphide Waste In Model (bcm)	Extra Sulphides Not In Model (bcm)	Grand Total Sulphide Waste (bcm)	Total Sulphide Waste In Model (lcm)	Extra Sulphides Not In Model (lcm)	Grand Total Sulphide Waste (lcm)
Stage 1	821,940	176,170	1,447,656	2,269,596	271,410	536,169	807,579	339,263	670,211	1,009,474
Stage 2	1,514,240	159,800	1,134,019	2,648,259	501,820	420,007	921,827	627,275	525,009	1,152,284
Stage 3	586,400	17,910	842,539	1,428,939	195,650	312,051	507,701	244,563	390,064	634,627
Total Pit	2,922,580	353,880	3,424,214	6,346,794	968,880	1,268,228	2,237,108	1,211,100	1,585,284	2,796,384
Total Dumped In Pit	886,400	317,910	1,142,539	1,728,939	295,650	412,051	607,701	369,563	515,064	759,627
Total Dumped Out Of Pit	2,036,180	35,970	2,281,676	4,617,856	673,230	856,176	1,629,406	841,538	1,070,220	2,036,758

Notes:

- 1: Distribution of sulphide waste to the dumps is based on the fact that there is room in the pit for all stage III sulphide waste and 300,000 tonnes of material in the stage II pit for ramp construction. The rest of the waste must be dumped outside of the pit.
- 2: "Un-interpolated sulphides" are blocks in the model coded as sulphide but for which there was inadequate data to reliably predict a metal content. This material is included in the reserves as waste but may actually prove to be ore.
- 3: The meaning of "extra sulphide waste" and method used to estimate it is given in Table A-65_.

TABLE 2-12 : Relative Proportion of Waste Types in Vangorda and Grum Pits

	Rock Types	Vangorda Pit	Grum Pit	Description	Vangorda Pit		Grum Pit	
		Percent of Total Waste	Percent of Total Waste		Tonnes	Effective Neutraliz. Kg CaCO ₃ /t	Tonnes	Neutraliz. Kg CaCO ₃ /t
VANGORDA FORMATION	5B0 and 5B6	1.1%	77.6%	80% calcareous phyllite (5B0) and 20 % non-calcareous phyllite (5B6), minor calcareous chlorite phyllite (5D0)	88,560	167.3	116,105,785	103.6
	5A	4.6%	3.7%	carbonaceous phyllite, locally calcareous or dolomitic	366,660	-23.4	5,527,763	-19.5
MT. HYE FORMATION	3G & 5B6	37.7%	13.0%	non-calcareous medium grey chlorite + muscovite phyllite, includes some weakly altered phyllites (3G4 or 4L6)	3,030,480	-12.5	19,465,589	16.9
ALTERED PHYLLITES	4L	23.8%	1.4%	altered, white to light beige, muscovite + chlorite phyllite with minor disseminated sulphides (4L1,2,3,4,7,9 but not 4L6)	1,914,300	-82.9	2,162,843	-35.0
SULPHIDE WASTE	4A	4.6%	1.0%	banded graphitic pyritic quartzite, 2 to 30% pyrite, locally to 60%	370,830	-259.6	1,559,810	-241.6
	"extra" 4A	0.0%	2.3%	as above but not included in reserve calculations as not shown on x-sections, tends toward low total sulphide end of range of total sulphide contents	0	-259.6	3,424,214	-241.6
	4C	9.2%	0.8%	pyritic quartzite, 2 to 40% pyrite, locally to 60%	741,660	-732.2	1,146,030	-732.2
	4E and 4EC	18.9%	0.1%	massive to semi-massive pyrite, 60 to 100% pyrite	1,520,140	-991.5	192,980	-1367.0
					8,032,630	-290.9	149,585,014	65.9

Notes:

Waste types are not normally carried in each mine model thus the above quantities had to be estimated; the methodologies used are summarized below. The percentages quoted are approximate but should be reasonably close to the actual quantities.

- 1: Vangorda quantities were determined by summing the length of core of each rock type within the pit limits for each hole in the deposit and calculating the total length of each rock type as a percentage of the total length of core in rock within the pit to arrive at average quantities
- 2: Grum quantities were determined by estimating the areal percent of each rock type within the pit limit on each cross section and distributing the waste quantities for each section on the basis of those percentages.
- 3: The meaning of "extra" sulphide waste is explained in Table A-65.

TABLE 2-13 : Vangorda and Grum Sulphide Waste by Material Type

Swell Factor 25%						
VANGORDA PIT						
Material Type	Description	In-Situ Volume (bcm)	Tonnage (tonnes)	Swelled Volume (lcm)	In-Situ Density (tn/bcm)	Percent Of Total Waste
4A	banded graphitic pyritic quartzite	152,030	437,780	190,037	2.88	14.1%
4C	pyritic quartzite	253,440	876,670	316,800	3.46	28.2%
4E and 4EC	massive and semi-massive sulphides	469,210	1,797,370	586,513	3.83	57.8%
Question: Is volume figure 22?		874,680	3,111,820	1,093,350	3.56	
		910,000	2,630,000			
GRUM PIT						
Material Type	Description	In-Situ Volume (bcm)	Tonnage (tonnes)	Swelled Volume (lcm)	In-Situ Density (tn/bcm)	Percent Of Total waste
4A	banded graphitic pyritic quartzite	524,230	1,559,810	655,288	2.98	24.7%
extra 4A *	4A not on sections or in reserves	1,268,228	3,424,214	1,585,284	2.70	54.2%
4C	pyritic quartzite	339,720	1,146,030	424,650	3.37	18.1%
4E and 4EC	massive and semi-massive sulphides	64,120	192,980	80,150	3.01	3.1%
		2,196,298	6,323,034	2,745,372	2.88	

* very uncertain quantity, may be significantly over estimated, see Table A-65 for details of estimate and an explanation of the methods used.

TABLE 2.14a : Neutralization Potential and Metal Content of Selected Vangorda and Grum Waste Types

	Vangorda		Grum	
	Altd. Phy. 4L	Sulphides 4A,C,E	Altd. Phy. 4L	Carb. Phy 5A
Total Sulphur (%)	2.92	20.60	1.87	1.54
Neutraliz. Potential	-82.9	-595.0	-35.0	-19.5
Zinc (%)	0.12	0.51	0.25	NA
Cu+Pb+Zn (%)	0.34	NA	0.38	NA

TABLE 2.14b : Neutralization Potential and Metal Content as above but without including the 4L sample with the highest total sulphur readings from each pit

	Vangorda		Grum	
	Altd. Phy. 4L	Sulphides 4A,C,E	Altd. Phy. 4L	Carb. Phy 5A
Total Sulphur (%)	2.01	20.60	1.02	1.54
Neutraliz. Potential	-54.4	-595.0	-7.4	-19.5
Zinc (%)	0.14	0.51	0.02	NA
Cu+Pb+Zn (%)	0.36	NA	0.04	NA

TABLE 2.14c : Neutralization Potential and Metal Content as above but without including the two 4L samples with the highest total sulphur readings from each pit

	Vangorda		Grum	
	Altd. Phy. 4L	Sulphides 4A,C,E	Altd. Phy. 4L	Carb. Phy 5A
Total Sulphur (%)	1.33	20.60	0.94	1.54
Neutraliz. Potential	-33.61	-595.0	-4.19	-19.5
Zinc (%)	0.15	0.51	0.19	NA
Cu+Pb+Zn (%)	0.30	NA	0.04	NA

NA = Not Available

TABLE 2.17 : RESULTS OF THE FREEZE THAW CYCLE TESTING

[illegible]

Legend

ox	oxidized or an increase in oxidation noted
bf	broken into two or more separate pieces
cr	cracked but not broken into separate pieces
fl	flaking along the micaceous foliation
Ncr	cracked in N places

TABLE 2.18 : RESULTS OF WET DRY CYCLE TESTING

[illegible]

LEGEND

stox	strong oxidation noted
ox	oxidation or increase in oxidation noted
oxfr	oxidation along fractures noted
cr	development or widening of a crack noted, but core not yet broken
br	breakage of core into two or more separate pieces noted
fl	flaking of core along micaceous foliation noted

TABLE 2.19 . EXTRACTION TEST RESULTS ON WEATHERED ROCK

Sample*	Drill Hole	Depth, m.	Weather Index**	Core Type	Description	pH	Acidity mg/l CaCO ₃	SO ₄ ppm	Dissolved Cu, ppm	Dissolved Zn, ppm	Dissolved Fe, ppm	Dissolved Mn, ppm
1A	79V095R	30.6 - 32.9	2	3G42 & 1	non-calcareous muscovite	3.82	158.8	144	.024	19.8	46	0.52
1B					phyllite/schist	4.34	135.2	160	.018	32.5	41.5	0.65
8A	79V095R	32.9 - 34.7	1	4L4 & 1	altered phyllite	6.23	7.8	.005	.005	.24	.09	0.33
8B					muscovite quartz phyllite, siliceous	6.43	17.6	20	.004	2.65	0.08	1.15
3A	79V035R	22.6 - 23.0	2	3G0 & 2	non-calcareous muscovite,	4.38	66.6	181	0.005	10.7	11.8	6.25
3B					phyllite/schist	6.10	58.7	238	0.002	18.5	0.95	5.65
4A	79V035R	23.0 - 23.5	2	3G0 & 2	non-calcareous muscovite,	5.61	25.4	36	0.002	1.08	5.1	1.28
4B					phyllite/schist	4.39	80.3	125	0.011	4.1	32.5	3.6
10A	79V035R	23.5 - 24.4	1	3G09	non-calcareous muscovite,	4.51	47.0	51	0.005	6.3	7.25	2.3
10B					phyllite/schist	5.92	19.5	29	0.002	2.5	3.2	1
2A	79V049R	47.1 - 49.5	2	4L3 & 1	altered phyllite	4.15	131.2	283	0.006	11.5	37	12.6
2B					muscovite quartz talc/Kaolinite	6.45	27.4	113	0.002	13.5	0.14	4.9
5A	79V133R	9.8 - 11.0	2	3G46	non-calcareous muscovite, slightly altered	4.87	43.0	51	0.009	2.02	11.7	1.5
5B					phyllite/schist	6.68	- 2.0	25	0.002	0.22	0.1	1.02
6A	79V314	18.8 - 20.1	1	5B62	non-calcareous muscovite, phyllite	6.84	- 2.0	27	0.003	0.285	0.105	0.265
6B					carbonaceous	6.91	- 7.9	13	0.011	0.565	0.025	0.235
7A	79V053R	38.7 - 40.6	1	3G48	slightly altered non-calcareous muscovite	7.02	- 6.0	10	0.002	0.8	0.06	1.19
7B					phyllite/schist	6.83	- 0.1	6	0.004	0.155	0.06	0.055
9A	79V096R	35.7 - 37.8	1	5B76	non-calcareous muscovite	4.48	84.2	95	3.6	27	11.2	0.29
9B					phyllite, chlorite	5.92	11.7	12	0.115	3.25	0.135	0.68
11A	79V307	16.9 - 18.6	1	5B649	non-calcareous muscovite	3.55	262.6	271	0.046	6.8	102	3.65
11B					phyllite, sulphide bearing	4.10	103.8	128	0.009	5.05	3.6	3.1
12A	79V319	15.8 - 18.3	1	5B62	non-calcareous muscovite	5.51	58.7	105	0.004	20.5	10.7	2.5
12B					phyllite, carbonaceous	5.27	47.0	101	0.004	5.65	14.8	2.35

Notes: A is subsample of one piece of mostly oxidized core from Composite in B.

B is composite sample crushed to 4-inches and sub sampled.

* negative acidity represents excess alkalinity

** 2 indicates most weathered

1 indicates slightly weathered

0 indicates no weathering.

TABLE 2.20 COMPOSITE SAMPLES OF ALTERED PHYLLITES
FOR HUMIDITY CELL TEST

Drill Hole	Sample Interval		Interval (m)	Weather Index	Unit
	From (m)	To (m)			
79V046R	38.1	41.8	3.7	0	3G048 stringered Minor
79V046R	41.8	44.5	2.7	0	4L17
79V046R	44.5	47.5	3.0	0	3G48 &6 (po) &2 calc-silicaty [Tr. Calcite]
79V046R	47.5	49.1	1.5	0	3G0948 &6 (po) Minor []
79V046R	49.1	52.4	3.4	0	3G48 stringered (4L0) 80:20 [6% Fe]
79V046R	52.4	53.9	1.5	0	3G46 [Dolomite]
79V046R	53.9	55.7	1.7	0	4L124 []
79V046R	55.7	56.4	0.7	0	10Q09 (py)
79V046R	56.4	60.3	3.9	0	3G48 stringered [4% Fe Dolomite]
79V046R	60.3	62.2	1.9	0	4L07 &1 -> (3G48 stringered) 90:10
79V049R	47.1	49.5	2.4	2	4L3 &1 Weathered
79V049R	49.5	56.2	6.6	0	5B67 &9 &4 (3G48 stringered) [5% Fe Dolomite]*
79V049R	56.2	56.8	0.6	0	5C*
79V049R	56.8	58.7	1.9	0	5B6 &4 Minor
79V049R	58.7	59.8	1.1	0	5B23
79V049R	59.8	61.6	1.8	0	4L7 (3G46) (5C*) Minor
79V049R	61.6	63.9	2.3	0	5B6 &4 &9 (po) [5% Fe Dolomite]
79V049R	63.9	65.7	1.8	0	5B26 &0
79V049R	65.7	67.4	1.7	0	4L67 (3G48 spotted/stringered) [1% Fe Dolomite]*
79V053R	64.3	65.8	1.5	0	4L0 ? (5D0)?
79V053R	65.8	67.4	1.5	0	5B648 (3G48) [4L6] [2% Fe Dolomite]
79V053R	67.4	69.8	2.4	0	5B26 (5D*)
79V053R	69.8	72.2	2.4	0	5B62 &48 minor
79V053R	72.2	75.3	3.0	0	5B62 (5A6)
79V053R	75.3	78.2	2.9	0	4L06 weak (4K48)
79V053R	78.2	81.4	3.2	0	3G48 &9 [15% Fe Dolomite]*
TOTAL			61.4		* possibly Ankerite

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Note: Petrography of samples are shown in square brackets.

TABLE 5.8

PRELIMINARY RESULTS OF VANGORDA CREEK AND TOWN WATER
WELL WATER QUALITY SAMPLING PROGRAM

PARAMETER	March 10 ³		May 27 ⁴	
	Creek ¹	Well ²	Creek	Well
pH	8.0 ^L	7.7 ^L	8.16 ^F	7.74 ^F
temperature (degrees C)	-	-	5.4	6.2
alkalinity (mgCaCO ₃ /L)	211 ^L	199 ^L	79.8 ^F	175.4 ^F
bicarbonate alkalinity (mgCaCO ₃ /L)	100 ^L	95 ^L		
suspended solids (mg/L)	1	<1	3	<1
total diss solids (mg/L)	380	363	127	325
hardness (mgCaCO ₃ /L)	381	341	102	246
ammonia (mg N/L)	0.060	0.012	0.017	0.014
nitrate (mg N/L)	0.206	0.204	0.012	0.146
sulphate (mg/L)	118	102	23	82
chloride	1.9	1.9	0.46	1.94
calcium (mg/L)	95	90	26	59
magnesium (mg/L)	35	29	9.1	24
sodium (mg/L)	4.05	3.63	1.5	3.0
potassium (mg/L)	1.24	1.04	0.50	0.77
total Cu (mg/L)	0.0014	0.028	0.0030	0.014
total Fe (mg/L)	0.041	0.008	0.17	0.024
total Mn (mg/L)	0.035	<0.001	0.0092	<0.001
total Pb (mg/L)	<0.001	<0.001	<0.001	<0.001
total Zn (mg/L)	0.010	0.0033	0.0040	0.0048

Notes:

^L = Laboratory measurement^F = Field measurement¹ = Vangorda Creek above Foot Bridge² = Town Water Well No. 1³ = Low flow, 0.6 m ice at sampling point⁴ = High flow associated with spring melt.