

SUMMARY OF UNDILUTED MINERAL INVENTORY

GRUM JOINT VENTURE

Grum Joint Venture (Kerr Option)

<u>Category (Pb + Zn)</u>		<u>Metric Tonnes</u>	<u>% Pb</u>	<u>% Zn</u>	<u>Ag (gms/m. t.)</u>
<u>Drill Proven</u>	+10%	11,904,000	5.5	9.0	83
	+ 6%	18,567,000	4.6	7.4	70
	+ 4%	23,425,000	4.1	6.5	62
<u>Drill Indicated</u>	+10%	637,000	5.1	8.4	79
	+ 6%	1,354,000	4.0	6.4	61
	+ 4%	1,679,000	3.6	5.8	55
<u>Total Drill Proven &amp; Drill Indicated</u>	+10%	12,541,000	5.5	9.0	83
	+ 6%	19,920,000	4.6	7.4	69
	+ 4%	25,103,000	4.0	6.5	61

Grum Joint Venture (Vangorda Option)

<u>Category (Pb + Zn)</u>		<u>Metric Tonnes</u>	<u>% Pb</u>	<u>% Zn</u>	<u>Ag (gms/m. t.)</u>
<u>Drill Proven</u>	+10%	542,000	7.0	8.0	95
	+ 6%	769,000	5.9	6.8	79
	+ 4%	980,000	5.1	6.0	69

TOTAL RESERVES - Kerr and Vangorda Options

<u>Category (Pb + Zn)</u>		<u>Metric Tonnes</u>	<u>% Pb</u>	<u>% Zn</u>	<u>Ag (gms/m. t.)</u>
	+10%	13,083,000	5.5	9.0	83
	+ 6%	20,689,000	4.6	7.3	69
	+ 4%	26,083,000	4.1	6.4	62

pp. 22 & 25 combined

	<u>Tons (metric)</u>	<u>% Pb</u>	<u>% Zn</u>	<u>gms Ag</u>
<u>Section 62W</u>				
+12%	138,000	7.3	14.3	
+10%	192,000	6.3	12.1	
+8%	302,000	5.3	9.6	
+6%	414,000	4.7	8.0	
+4%	630,000	3.9	6.0	

<u>Section 64W</u>				
+12%	520,000	6.2	10.4	
+10%	614,000	6.0	9.8	
+8%	635,000	5.9	9.7	
+6%	823,000	5.2	8.4	
+4%	1,165,000	4.3	6.7	

<u>Section 66W</u>				
+12%	388,000	6.1	9.9	
+10%	580,000	5.6	8.6	
+8%	879,000	6.2	8.4	
+6%	1,023,000	5.8	7.8	
+4%	1,378,000	4.8	6.6	

<u>Section 68W</u>				
+12%	1,035,000	6.4	11.0	
+10%	1,290,000	6.1	10.0	
+8%	<del>1,607</del> 1,607,000	5.8	9.0	
+6%	1,987,000	5.2	8.1	
+4%	2,311,000	4.8	7.4	

Dec MIF  
1977

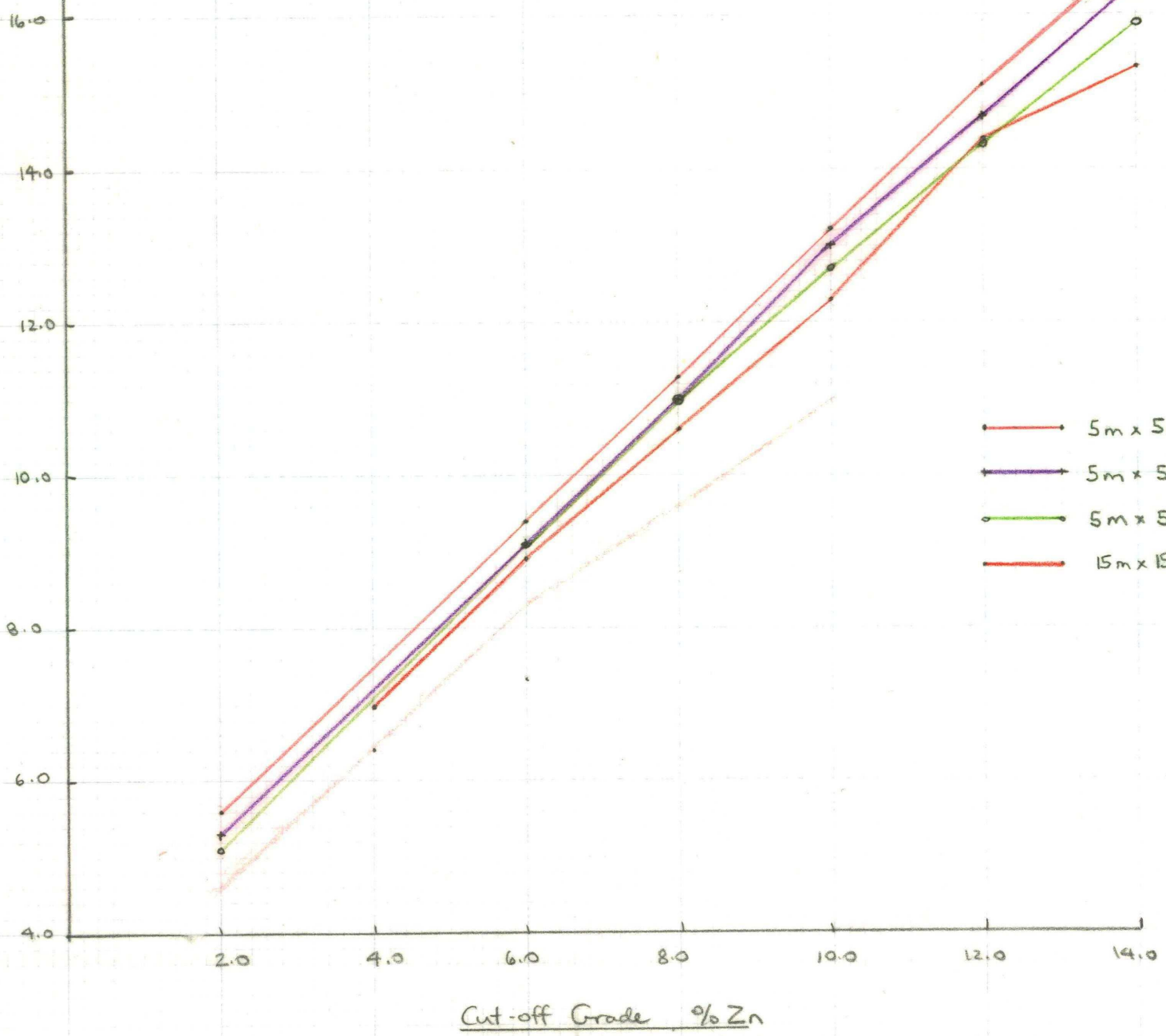
SHEET NO. OF  
JOB NO.

SUBJECT

BY DATE  
CHKD. BY DATE

N  
15

Avg. Grade Above given Cut-off, % Zn

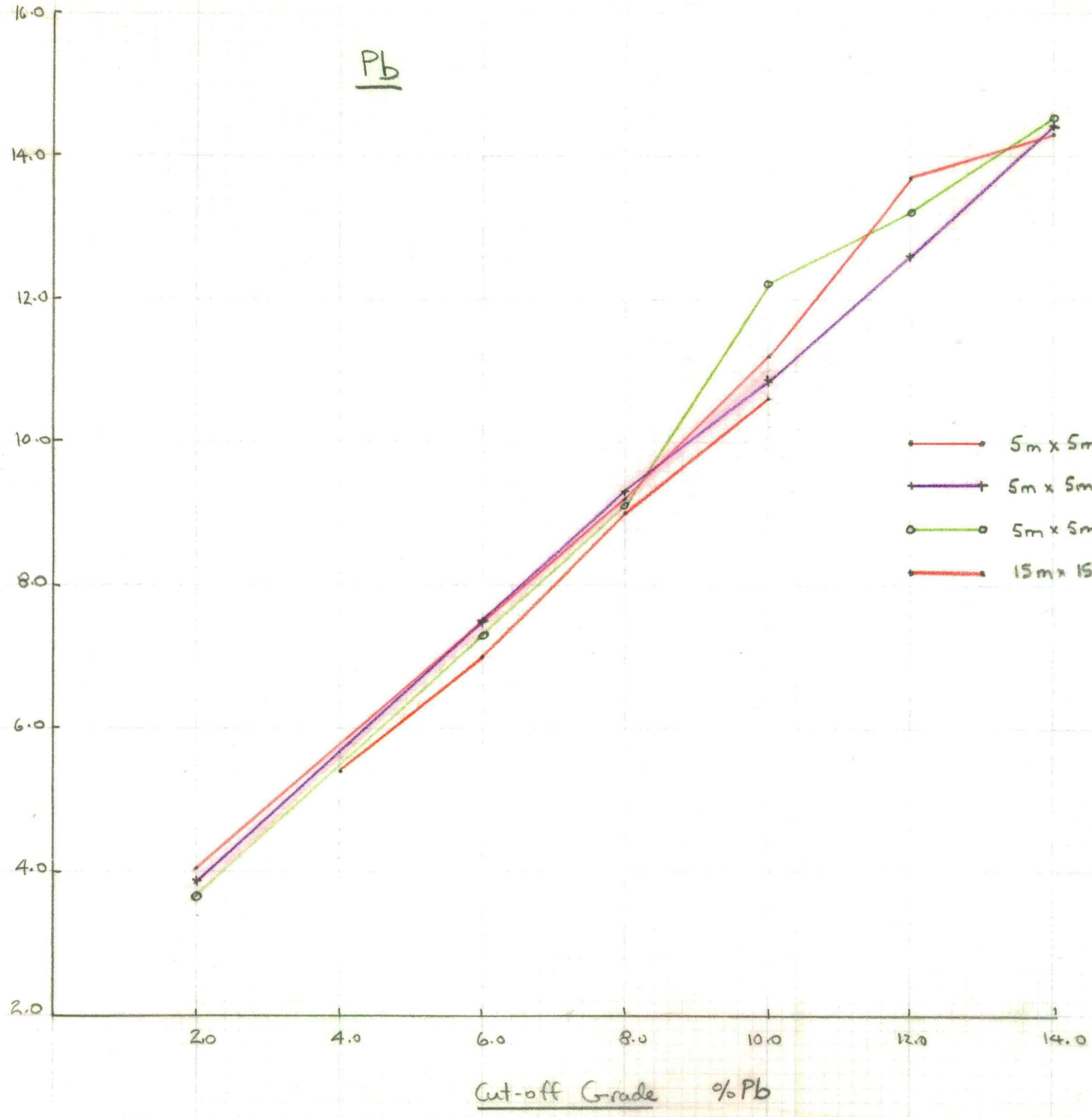


- 5m x 5m x 3m Blocks
- 5m x 5m x 6m Blocks
- 5m x 5m x 9m Blocks
- 15m x 15m x 9m Blocks

BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_  
 SUBJECT \_\_\_\_\_  
 SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
 JOB NO. \_\_\_\_\_

Pb

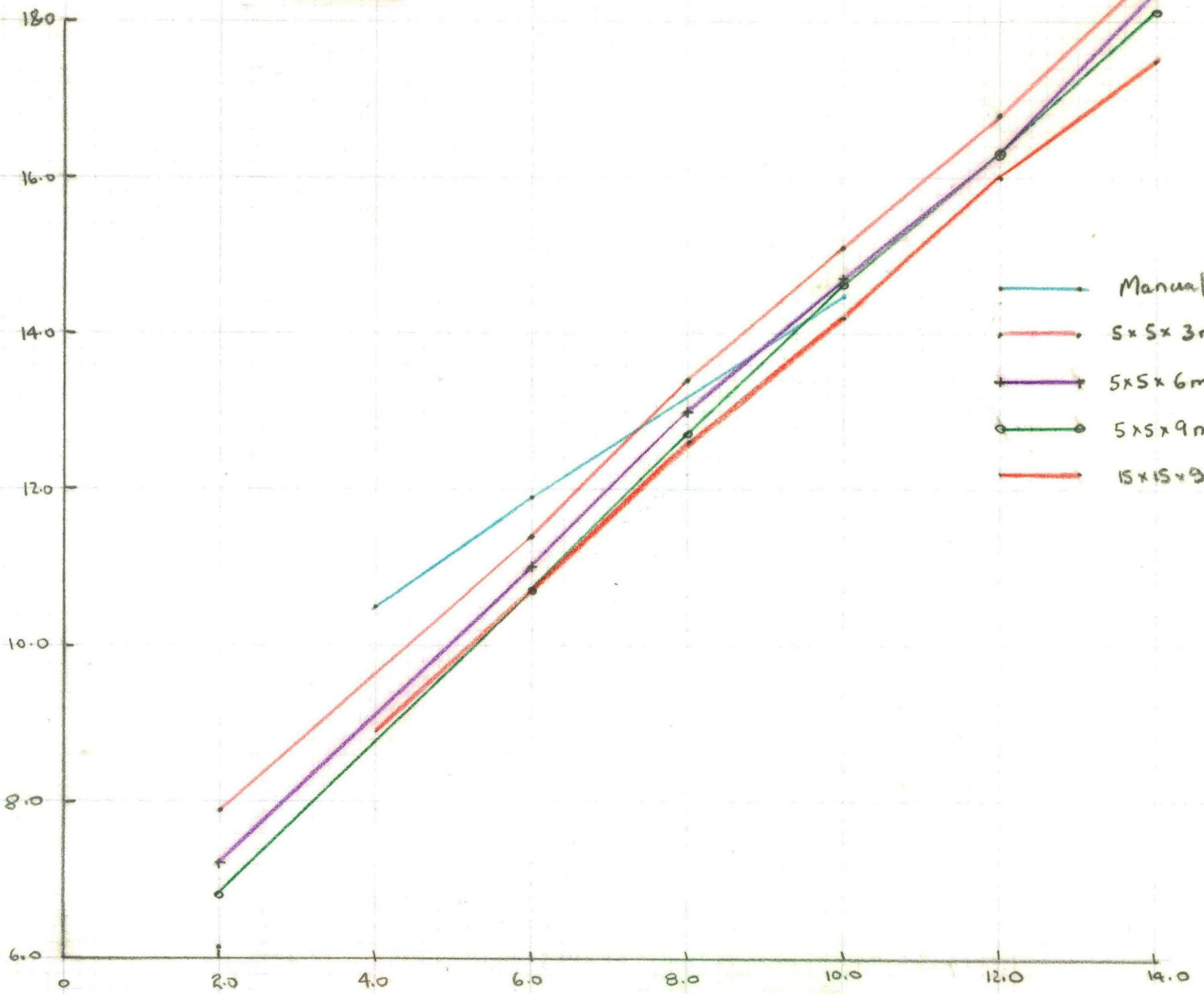
Avg. Grade above Given Cut-off % Pb



BY \_\_\_\_\_ DATE \_\_\_\_\_  
CHKD. BY \_\_\_\_\_ DATE \_\_\_\_\_  
SUBJECT \_\_\_\_\_  
SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
JOB NO. \_\_\_\_\_

Avg. Grade above given Cut-off, %Zn+Pb

% Pb+Zn



- Manual MIF
- 5x5x3m blocks
- 5x5x6m blocks
- 5x5x9m blocks
- 15x15x9m blocks

Cut-off Grade, % Pb+Zn

ManualMIF62W

	<u>Tons</u>	<u>% Pb</u>	<u>% Zn</u>	<u>Tons</u>	<u>% Pb</u>	<u>% Zn</u>
+12%	138,000	7.3	14.3	127,000	5.9	11.3
+10%	192,000	6.3	12.1	160,000	5.5	10.6
+8%	302,000	5.3	9.6	192,000	5.1	9.8
+6%	414,000	4.7	8.0	244,000	4.6	8.8
+4%	630,000	3.9	6.0	385,000	3.6	6.6

64W

+12%	520,000	6.2	10.4	336,000	5.2	9.9
+10%	619,000	6.0	9.8	485,000	4.9	8.9
+8%	635,000	5.9	9.7	506,000	4.9	8.7
+6%	823,000	5.2	8.4	631,308	4.4	7.8
+4%	1,165,000	4.3	6.7	1,056,000	3.6	5.7

66W

+12%	388,000	6.1	9.9	341,000	6.1	8.1
+10%	580,000	5.6	8.6	351,000	6.0	8.0
+8%	879,000	6.2	8.4	492,000	5.5	7.1
+6%	1,023,000	5.8	7.8	733,000	4.6	6.1
+4%	1,378,000	4.8	6.6	1,285,000	3.6	4.7

MIT

62

			Pb	Zn
4	32 100		3.59	6.58
6	20 318		4.57	8.79
8	16 009		5.11	9.79
10	13 309		5.51	10.55
12	10 609		5.88	11.28

64

4	88,009		3.60	5.68
6	52609		4.44	7.78
8	42 191		4.89	8.74
10	40 391		4.93	8.90
12	28 009		5.22	9.90

65

4	107 095		3.60	4.70
6	61 118		4.62	6.05
8	41 018		5.46	7.13
10	29 291		6.03	8.03
12	28 391		6.11	8.08

Dec 5/77

Sec. 66

n<sup>3</sup>

n<sup>9</sup>

Pb      Z<sub>0</sub>

74	1,173,000	3.12	4.26	1,133,000	3.29	4.50
6	621,000	3.99	5.44	658,000	4.10	5.56
8	354,000	4.86	6.50	393,000	4.95	6.62
10	238,000	5.40	7.17	257,000	5.60	7.43
12	122,000	6.08	7.94	164,000	6.23	7.92

5x5

5x5

3 m

6 m

	<u>Pb</u>	<u>Zn</u>	<u>Pb+Zn</u>		<u>Pb</u>	<u>Zn</u>	<u>Pb+Zn</u>
>2	4.05	5.60	7.86		3.87	5.26	7.22
>6	7.50	9.37	11.44		7.47	9.11	11.04
>8	9.24	11.26	13.40		9.29	10.97	12.97
>10	11.20	13.22	15.08		10.85	12.98	14.73
>12	13.69	15.11	16.81		12.63	14.71	16.31
>14	14.30	16.83	18.68		14.44	16.41	18.4

9 m 5x5

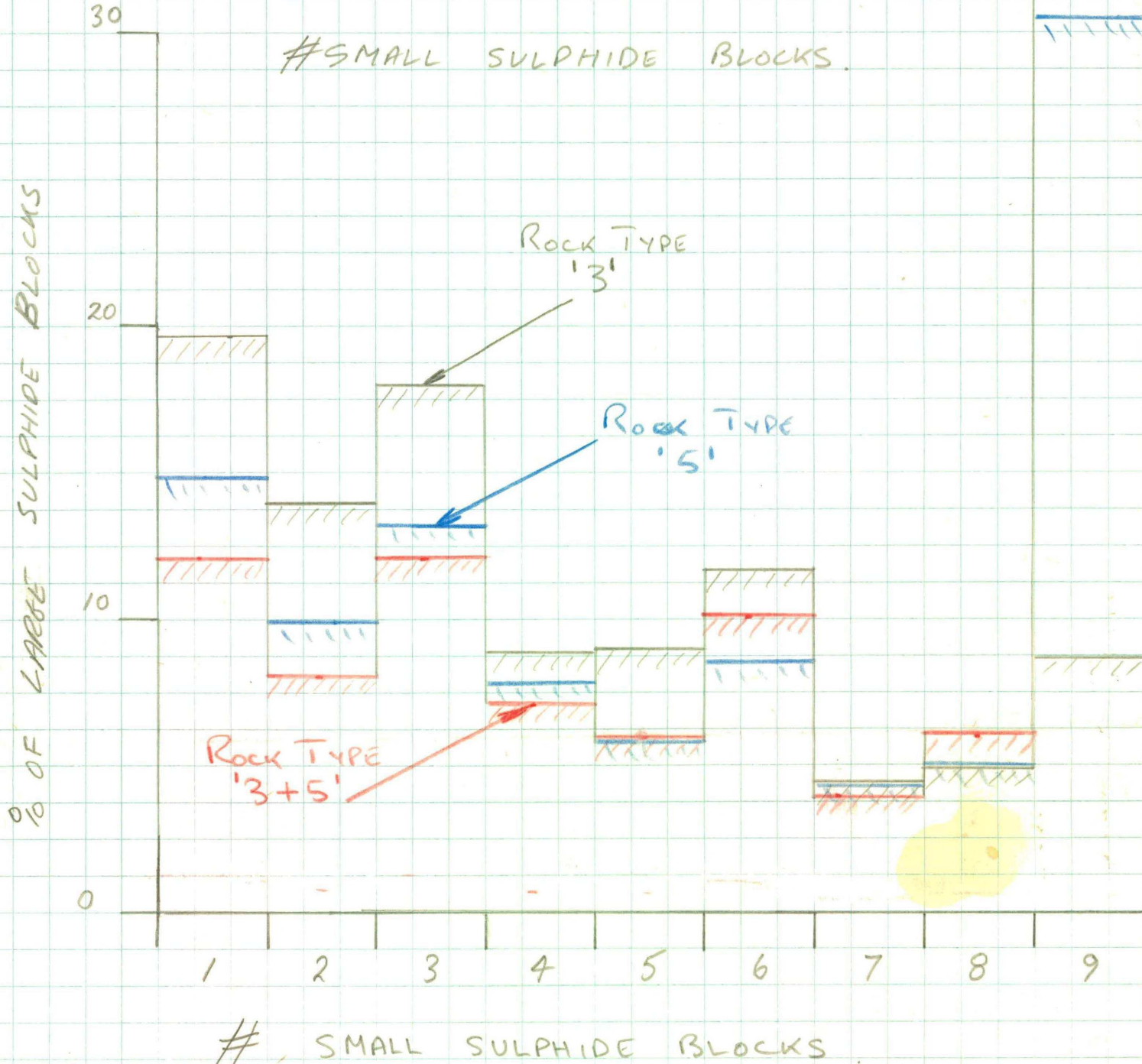
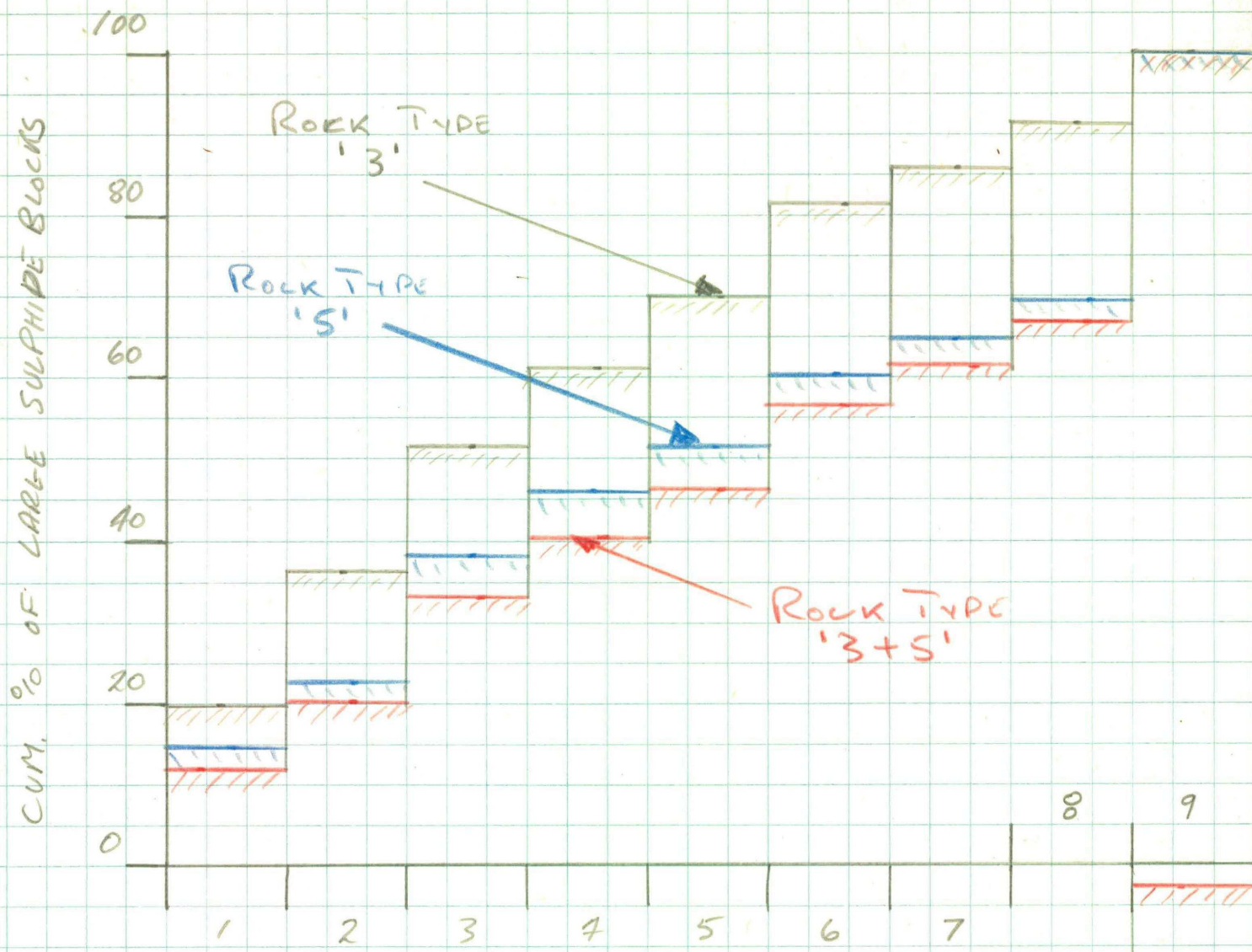
15x15x9 (Manual)

	<u>Pb</u>	<u>Zn</u>	<u>Pb+Zn</u>		<u>Pb</u>	<u>Zn</u>	<u>Pb+Zn</u>
>2	3.71	5.06	6.82	> 2	3.72	4.83	6.09
6	7.25	9.08	10.72	4	5.58	6.40	7.86
8	9.12	11.04	12.68	6	7.41	8.28	9.53
10	12.18	12.73	14.57	8	9.2	9.04	11.26
12	13.16	14.30	16.31	10	11.0	11.0	12.99
14	14.49	15.90	18.17	12			14.31
				14			15.62

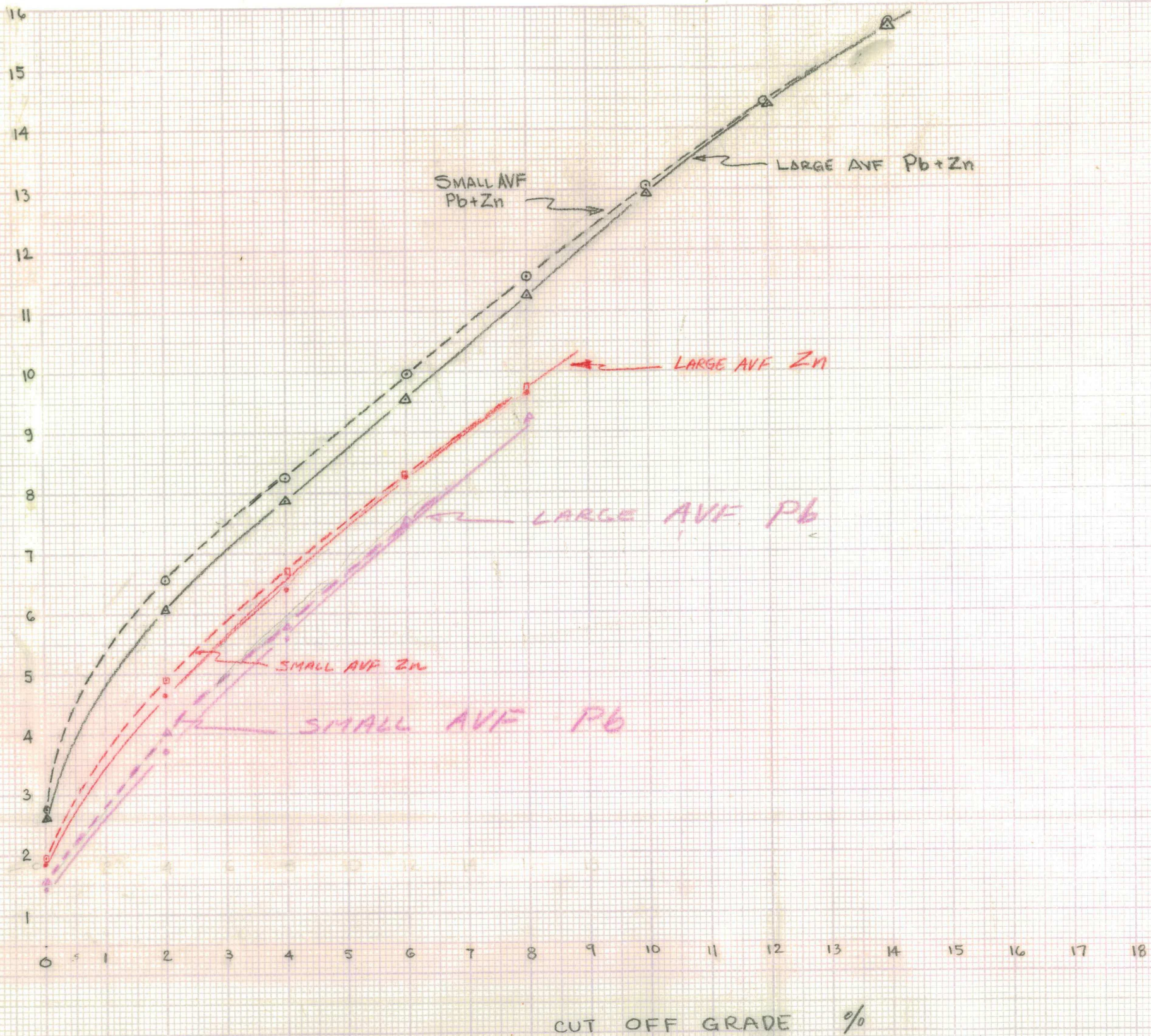
15x15x9 (computer - based on ~~not the~~ 5x5 data set)

	<u>Pb</u>	<u>Zn</u>	<u>Pb+Zn</u>
>4	5.4	7.0	8.9
6	7.0	8.9	10.7
8	9.0	10.6	12.6
10	10.6	12.3	14.2
12		14.4	16.0
14		15.3	17.5

Grade	5x5x9 m blocks			5x5x6 m blocks			5x5x3 m blocks.		
	Zn	Pb	Combined	Zn	Pb	Combined	Zn	Pb	Combined
0-2	74.48	80.90	<del>66</del> 83	74.76	81.03	68.02	75.75	81.19	69.94
2-4	11.74	12.06	10.08	11.30	11.67	9.17	10.03	11.04	7.44
4-6	5.96	4.76	7.56	5.80	5.04	7.15	5.86	4.95	6.91
6-8	3.63	1.77	4.87	3.71	1.63	4.81	3.67	1.95	4.70
8-10	1.89	.45	3.33	2.16	.46	3.22	2.15	.65	2.97
10-12	1.04	.01	2.32	1.03	.12	2.25	1.13	.16	2.35
12-14	.66	.01	1.71	.56	.02	1.97	.60	.01	1.85
14-16	.32	.02	1.15	.36	.02	1.27	.33	.03	1.31
16-18	.12		0.66	.14		0.67	.23		0.81
18-20	.08		0.63	.12		0.58	.14		0.60
20-22	.05		0.35	.04		0.29	.08		0.33
22-24	.03		0.18	.02		0.23	.03		0.25
24-26			0.10			0.13			0.20
26-28			0.10			0.10			0.15
28-30			0.06			0.08			0.08
30-32			0.03			0.04			0.06



ARITHMETIC MEAN %



LARGE AVF = FULL LINE  
Blocks are 15x15x9

SMALL AVF = BROKEN LINE  
Blocks are 5x5x9

DEVIATIONS IN GRADE USING TWO DIFFERENT SIZE MINING BLOCKS

# Pb - large block

G-I	(f) No. of Values	Σ	M.P.	f x M.P.
0-2	3797	3797	1.0	3797
2-4	561	4358	3.0	1683
4-6	167	4525	5.0	835
6-8	43	4568	7.0	301
8-10	9	4577	9.0	81
10-12	1	4578	11.0	11
12-14	0			
14-16				
16-18	4578			
	(N)			

6708.

G-I	(f)	Σ
2-4	561	3.0
4-6	167	5.0
6-8	43	7.0
8-10	9	9.0
10-12	1	11.0
	<u>781</u>	

C.O 2  
 Mean =  $\frac{294}{781} = 3.72\%$   
 1.72%

G-I	(f)	Σ
4-6	167	5.0
6-8	43	7.0
8-10	9	9.0
10-12	1	11.0
	<u>220</u>	

C.O 4  
 Mean =  $\frac{1228}{220} = 5.58$

C.O = 0  
 Mean =  $\frac{6708}{4578} = 1.47\% \text{ Pb.}$

(6) 53	393	(8) 10	f x m
			92
	<u>7.41</u>		<u>9.2</u>
(10)	11%		

Pb SMALL AVF

G.I	No. of Blcks	$\Sigma$	MP	f x MP
0-2	5266	5266	1	5266
2-4	785		3	2355
4-6	310		5	1550
6-8	115		7	805
8-10	29		9	261
10-12	1		11	11
N	6506			10248

Zn LARGE AVF

G.I	f	M.P	f x MP
0-2	3490	1	3490
2-4	554	3	1662
4-6	292	5	1460
6-8	113	7	791
8-10	72	9	648
10-12	34	11	374
N	4555		8425

Zn SMALL AVF

f	MP	f x MP
4848	1	4848
764	3	2292
388	5	1940
234	7	1652
123	9	1107
68	11	748
6427		12587

C.O = 0 GRADE: 1.57 ✓

C.O = 2  $4982/1240 = 4.02$  ✓

C.O = 4  $2627/455 = 5.77$  ✓

C.O = 6  $1077/145 = 7.42$  ✓

C.O = 8  $272/30 = 9.06$  ✓

C.O = 10  $11/1 = 11.0$  ✓

C.O = 0 = 1.84 ✓

2 =  $4935/1065 = 4.63$  ✓

4 =  $3273/511 = 6.40$  ✓

6 =  $1813/219 = 8.28$  ✓

8 =  $1027/106 = 9.64$  ✓

10 = 11. ✓

C.O = 0 = 1.95

2 =  $7739/1579 = 4.90$  ✓

4 =  $5477/815 = 6.68$  ✓

6 =  $3507/427 = 8.21$  ✓

8 =  $1855/191 = 9.71$  ✓

10

TOTAL Pb + Zn

LARGE AVF

0-2	3085	1	3085	2.64
2-4	531	3	1593	$5923/1463 = 6.09$ ✓
4-6	343	5	1715	$7330/932 = 7.86$ ✓
6-8	239	7	1673	$5615/589 = 9.53$ ✓
8-10	149	9	1341	$3942/350 = 11.26$ ✓
10-12	86	11	946	$2601/201 = 12.94$ ✓
12-14	54	13	702	$1655/115 = 14.39$ ✓
14-16	42	15	630	$953/61 = 15.62$
16-18	19	17	323	$323/19 = 17$
	4548		12008	

SMALL AVF

4350	1	4350	2.79 ✓	-0.15
656	3	1968	$13560/2062 = 6.57$ ✓	-0.48 ✓
492	5	2460	$11592/1406 = 8.24$ ✓	-0.38 ✓
317	7	2219	$9132/914 = 9.99$ ✓	-0.46 ✓
217	9	1953	$6913/597 = 11.58$ ✓	-0.32 ✓
151	11	1661	$4960/380 = 13.05$ ✓	-0.11 ✓
111	13	1443	$3299/229 = 14.40$	-0.01 ✓
75	15	1125	$1856/118 = 15.73$	-0.11 ✓
43	17	731		
6412		17910		

SMALL BLOCKS / LG BLOCK

	3		5		T (3+5)	CUM.	AC	CUM	
0									
1	.20	197	197	178	178	225	225	0.12	.12
2		140	337	119	297	151	376	0.08	.20
3		180	517	158	455	227	603	0.12	.33
4		89	606	93	598	128	731	0.07	.40
5		91	697	70	618	114	845	0.06	.46
6		117	814	102	720	194	1039	0.10	.56
7		43	857	52	772	82	1121	0.04	.61
8		59	916	63	835	108	1229	.06	.67
9		87	1003	365	1200 <sup>30</sup>	619	1848	.33	1.00

BLOCK HISTOG

D LIM

NOV 2ND 10AM.

Gas,

The "out of range" values for  
rock types 1, 7, + 3, 4, 5, 6 are  
printed for 15 m blocks.

The GRS 070 for sections 62, 64, 66

is based on 5 m blocks; most  
recent rock type coding +

is on on either side of the  
line of drill holes as best I  
could measure them from the  
map.

Bob-

P.S. I'll be in about  
church time

24005 BDCNR / 70 BDCN

2.00/yd<sup>3</sup>

2.76 m<sup>3</sup>

$$R = \frac{rF - b - c}{a}$$

a: cost of stripping unit of waste.

b = cost " mining ore

c = " " milling.

rF = revenue.

10.5% Zn + Pb + Ag

4.1% Pb

6.4% Zn

62 gm Ag.

Pb  $4.1 \times 20 \times .8 \times .149 \times 1.1 = 10.75$  /MT.

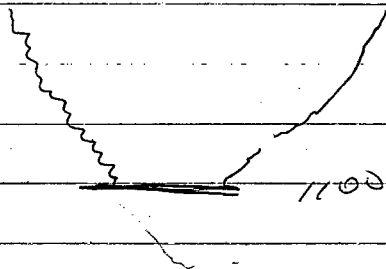
Zn  $6.4 \times 20 \times .85 \times .128 \times 1.1 = 15.32$

Ag  $2.9 \times .7 \times 4.04 = 5.66$

$\$ 31.73$  /MT.

$$R = \frac{31.73 - 16.65}{.85}$$

17.7



6/1

GRUM PIT - TONS OF

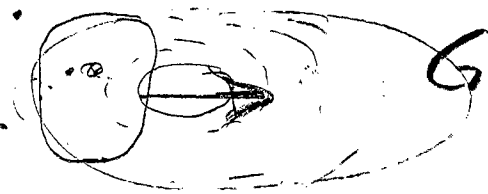
Section No	OB	Waste	Sulph
62 W	1 106 616.3 2 040 603	9 33 987	167 445 1:12.1 ✓
64 W	1 415 276.3 1833 736	4 18 460	332 145 1/5.5 ✓
66 W	1 742 878 4,754 673	2 811 795	647 820 1/7.2 ✓
68 W	1 901 065 6265 005	4 363 946	790 560 1/7.9 ✓
70 W	1 785 317 6345 677	4 560 360	1 600 335 1/3.9 ✓
72 W	1 534 531 7544 983	6 010 452	1 732 095 1/4.3 ✓
74 W	1 587 845 10 175 669	8 587 824	2 533 635 1/4.0 ✓
76 W	1 166 945 10 141 631	8 974 686	1 800 171 1/5.6 ✓
78 W	762 530.5 10 889 970.5	10 128 440	1 779 858 1/6.1 ✓
80 W	892 658 12 534 813	11 642 155	1 918 755 1/6.5 ✓

total Tons

62-80 W (Forms): 14 095 662.1 + 58 432 099 = 13 302 819 = 85,830,580,

(OB + Waste = 72 527 761) : (13,302,819)

1:5.4



# GRUM PIT

TONS OF

Section No	<u>OB</u>	<u>Waste</u>	<u>Sulph</u>
62 W	1 106 616.3	933 987	107 445
64 W	1 415 276.3	418 460	332 145
66 W	1 942 878	2 811 795	647 820
68 W	1 901 065	4 363 946	790 560
70 W	1 785 317	4 520 360	1 600 335
72 W	1 534 531	6 010 452	1 732 095
74 W	1 587 845	8 587 824	2 533 635
76 W	1 166 945	8 974 626	1 800 171
78 W	762 530.5	10 128 440	1 779 858
<u>80 W</u>	892 658	11 642 155	1 918 755

62-80 W (Total): 14 095 662.1 + 58 432 099 + 13 302 819 = <sup>total Tons</sup> 85,830,580

$$\left( \frac{\text{OB} + \text{Waste}}{\text{Sulph}} = 72\,527\,761 \right) : (13,302,819)$$

1 : 5.4