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...JVIL MINING CORPORATION LIMIT

MEMORANDUM

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TO: W. Krats FROM: J. McLachlan

SUBJECT: STRIPPING RATIO - WEST SIDE OF ULTIMATE PIT DATE: February 22, 1973

In order to determine if the west wall of the pit can be stripped economically an investigation into the order of magnitude of various stripping ratios has recently been completed. Basis of the comparison was to analyze Case A against Cases B, C, D and E, all described below.

CASE A: This situation simply set up a hypothetical case which showed how much ore would be left remaining in the west wall if a 1:1 slope (toe-toe spacing of 40') were carried down from the presently existing slope of the wall. No measurement of waste or ore yardage to complete to this design was made since it was simply the difference between this case and the others that was of significance. (Drawing FX-7301).

It became readily apparent that the 3710 bench was controlling the shape of the west wall. A large rather sharp block of ore on this bench protrudes farther to the west than on any other bench. Most of the changes engineered in Cases B to E concerned the movement of the toe line in or out on this bench.

CASE B: All the ore on the extremities of the west side of the 3710 bench is 11% plus. It was thus essential that the placement of the final toe line on this bench mined a maximum of this material yet did not impose too high a stripping burden by "going after" sharp awkward corners. Quantities of ore mined in this case compared to that which would have been left in Case A plus the waste required to achieve this position are summarized in Table 1. Drawing reference is FX-7302 for this case.

CASE C: The second trial at reducing the stripping ratio centered around moving the 3710 toe line "in" a full 40' in one portion of the bench and gradually tapering the change into the previously established toe line in Case B. The object was to pull in all benches above this in the hope that the quantity of waste stripping would be significantly reduced. Results are summarized in Table 2. Drawing reference is FX-7303.

CASE D: Since the result in Case C did not decrease the stripping ratio, but only increased it (lost ore "faster" than waste) the next situation was to move the 3710 toe line out further. This, it was hoped, would gain ore "faster" than the increased load of waste stripping accompanying it. Results are summarized in Table 3. Drawing FX-7304 applies to this case.

CASE E: A further trial run was made with the presently designed ultimate pit to determine what its stripping ratio would be with the revised set of bench plans. Results are in Table 4.

In all cases ore on 3910 was not measured even though there appeared to be some remaining on the bench plans. This was not included because a visual inspection of the present west wall of 3910 bench does not reveal any ore remaining there.

Since the grade of ore and tonnage which any resultant stripping ratio is capable of supporting are closely tied together, Table 5 has been detailed to show the grade and tonnage on each bench in Case B and then averaged overall for the entire west side.

CONCLUSIONS: Results of this exercise have indicated the best possible stripping ratio on the west side to be of the order of 10:1. In order to more fully evaluate if this is economically practical, further work and cost investigations should be carried out on a break even stripping ratio related to grade of ore and market prices.

J. R. McLachlan
Planning Engineer

JRM/mm

Attach.

TABLE I

TRIAL ONE STRIPPING -- CASE B

Bench	Ht.	Total Yardage (O. & W.)	Waste (Yd.)	Ore (Yd.)	Ore (Tons)
4205	27'	48,750	48,750		
4170	44'	183,580	183,580		
4135	26'	188,360	188,360		
4100	39'	427,000	427,000		
4065	31'	338,930	338,930		
4030	35'	416,890	416,890		
3990	40'	469,560	469,560		
3950	40'	454,670	454,670		
3910	40'	447,780	447,780		
3870	40'	446,220	436,660	9,560	30,400
3830	40'	438,000	426,670	11,330	36,030
3790	40'	416,440	376,220	40,220	127,900
3750	40'	359,560	288,230	71,330	226,830
3710	40'	324,000	125,560	198,440	631,040
3670	40'	157,560	100,000	57,560	183,040
3630	40'	56,000	Ø	56,000	178,080
3590	40'	22,890	Ø	22,890	72,790
			4,728,860	467,330	1,486,110

Stripping Ratio $\frac{4,728,860}{467,330} = \frac{10.1}{1}$

TABLE 2

TRIAL TWO STRIPPING -- CASE C

3710 ORE "PULLED IN". MODIFICATION CARRIED UP TO SURFACE.

(INCREMENTAL CHANGE ONLY MEASURED)

DECREASE IN WASTE & ORE

BENCH	HT.	WASTE (Yd.)	ORE (Yd.)	ORE (Tons)
4205	27	10,500		
4170	44	28,600		
4135	26	20,370		
4100	39	33,800		
4065	31	26,520		
4030	35	30,140		
3990	40	38,890		
3950	40	35,560		
3910	40	36,220		
3870	40	29,330	19,080	60,670
3830	40	29,330	7,110	22,610
3790	40	23,560	22,440	71,360
3750	40	16,000	5,560	17,680
3710	40		14,890	47,350
		358,820	69,080	219,670

Stripping Ratio on Revision Itself $\frac{358,820}{69,080} = \frac{5.2}{1}$

New Ratio $\frac{4,728,860 - 358,820}{467,330 - 69,080} = \frac{4,370,040}{398,250} = \frac{11}{1}$

TABLE 3

TRIAL THREE STRIPPING -- CASE D

3710 ORE "PUSHED OUT". INCREMENT ONLY MEASURED.

INCREASE IN WASTE & ORE QUANTITIES

BENCH	HT.	WASTE (Yd.)	ORE (Yd.)	ORE (Tons)
4205	27	6,450		
4170	44	16,620		
4135	26	12,420		
4100	39	16,900		
4065	31	14,120		
4030	35	16,140		
3990	40	20,220		
3950	40	22,670		
3910	40	20,000		
3870	40	15,110	7,110	22,610
3830	40	24,440	-	-
3790	40	17,110	-	-
3750	40	11,780	7,780	24,740
3710	40	15,550	13,110	41,690
3670			2,670	8,490
		229,530	30,670	97,530

Stripping Ratio on Revision Itself $\frac{229,530}{30,670} = \frac{7.5}{1}$

New Ratio $\frac{4,728,860 + 229,530}{467,330 + 30,670} \quad \frac{4,958,390}{498,000} = \frac{10}{1}$

TABLE 4

CASE E -- STRIPPING RATIO WEST SIDE ULTIMATE

PIT USING REVISED BENCH PLANS

ORE AVAILABLE

BENCH	HT.	YARDS	TONS
3870	40'	20,670	65,730
3830	40'	10,890	34,630
3790	40'	44,890	142,750
3750	40'	80,890	257,230
3710	40'	216,220	687,580
3670	40'	52,880	168,160
3630	40'	64,440	204,920
3590	40'	23,110	73,490
		513,990	1,634,490

NOTE: Did not attempt a measure of the volume of waste stripping involved since the incremental increase in ore in Table 3 compared to Table 4 was very minimal. It appeared obvious that there would be a tremendous increase in stripping for only a small increase in ore. Hence, a final ratio was not calculated.

TABLE 5

CASE B

INDIVIDUAL GRADES & TONNAGES

BENCH	YD.	TONS	PB	ZN	COMB.
3870	8,717	27,720	2.70	5.40	8.10
3830	12,141	38,610	2.78	5.44	8.22
3790	44,928	142,870	2.58	4.76	7.34
3750	72,047	229,110	4.51	6.86	11.37
3710	200,553	637,760	4.21	6.91	11.12
3670	61,289	194,900	3.10	5.02	8.12
3630	44,896	142,770	4.79	6.93	11.72
3590	22,742	72,320	3.85	5.38	9.23
	467,313	1,486,060	3.92	6.31	10.23