STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY 2000

			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		121854.7	1179210.						493391.8		1794456.
	LINES		369208.5	128803.8						456717.0		954729.4 2749186.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		6907217.							10853621		17760838
	WATR TRT		14142.47	57972.27						5848.080		77962.82
TOTAL			14946286	4234186.	278467.5	0	1131139.	1279218.	268820.9	11913073	0	34051193
			857439.3	242907.0	15975.14	0	64891.27	73386.30	15421.73	683429.8	0	1953450.
			209424.1	126786.0	2366.558	0	167933.0	12993.11	144500.3	0	247800.0	911803.2
TOTALS			16013149	4603879.	296809.2	0	1363963.	1365598.	428743.0	12596503	247800.0	36916447
OP COSTS	OP COST											
RD MNT	D&B		0.524837	0.145438	0.017928		0.051352	0.098432	0.001343			0.839332
	EL&H		0.234522	0.149403			0.065945		0.031939			0.481811
	MOBL CRUSH		0.050905	0.041039			0.016696					0.108641
POWR	PLANT		0.016038	0.453327			1.138224		0.500034			2.107624
CAMP	QRTRS		0.700967	0.143668							1.877272	2.721908
	WATR TRT		0.059275	0.027622					0.561382			0.648281
TOTALS			1.586546	0.960500	0.017928	0	1.272219	0.098432	1.094699	0	1.877272	6.907600

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM/PILLAR

TONS ORE/	2000	ROAD L KM	48
TONS WAST	200	TONS FILL/DAY	20000
TOTAL	2200	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

UG MINE

	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	30.40266	16.93446	18.34567	19.75687	5.159457	90.59913
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		24.59674	14.75804	4.919349	4.919349	49.19349
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		6.989631	5.591705	4.193778	9.785484	26.56059

MINE/MILL TOTAL 166.3532

TOTL 36916447. CONNCTD POWER REQ 6220.563

16780.203 AVERAGE DMND 4665.422

OF 6.9076004

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY 5000

		CASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	68902B.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			[illegible]
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		244028.8	2385214.						993888.2		3623131.
	LINES		548586.4	191382.4						678610.3		1418579. 5041711.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.[illegible]
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		12263766							19270607		31534374
	WATR TRT		18795.92	77047.53						7772.339		103615.8
SUBTOTAL			20609041	5521844.	278467.5	0	1131139.	1279218.	268820.9	21054374	0	50142907
[illegible]			113741B.	304752.0	15368.69	0	62427.87	70600.42	14836.29	1161996.	0	2767399.
			272757.8	192551.7	2366.558	0	296309.5	12993.11	280691.9		0 414707.6	1472378.
TOTALS			22019217	6019148.	296202.7	0	1489876.	1362812.	564349.1	22216370	414707.6	54382685
OP COSTS	OP COST											
RD MNT	D&B		0.209935	0.058175	0.007171		0.020541	0.039373	0.000537			0.335733
	EL&H		0.093809	0.059761			0.026378		0.012775			0.192724
	MOBL CRUSH		0.020362	0.016415			0.006678					0.043456
POWR	PLANT		0.009478	0.336268			0.844309		0.370914			1.560970
CAMP	QRTRS		0.469243	0.096175							1.256689	1.822108
	WATR TRT		0.023710	0.016693					0.466354			0.506758
TOTALS			0.826538	0.583490	0.007171	0	0.897907	0.039373	0.850581		0 1.256689	4.461752

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM/PILLAR

TONS ORE/	5000	ROAD L KM	48	
TONS WAST	500	TONS FILL/DAY	20000	UG MINE
TOTAL	5500	TONS FILL/KM	62400	

MANPOWER REQUIREMENTS

	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	57.73905	32.16099	34.84108	37.52116	8.157818	170.4201
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		38.89087	23.33452	7.778174	7.778174	77.78174
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		12.41009	9.928074	7.446055	17.37412	47.15835
					MINE/MILL TOTAL	295.3602

CAP TOTL 54382685. CONNCTD POWER REQ 12569.33

[illegible] 9887.7609 AVERAGE DMND 9427.002

OP 4.4617524

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY 10000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		412659.4	4064052.						1688164.		6164876.
	LINES		740180.8	258222.9						915615.6		1914019. 8078896.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		19029585							29902042		48931628
	WATR TRT		23367.26	95786.17						9662.640		128816.0
SUBTOTAL			27739656	7286262.	278467.5	0	1131139.	1279218.	268820.9	32618981	0	70602546
			1479457.	388602.9	14851.69	0	60327.80	68225.41	14337.20	1739689.	0	3765491.
			348631.1	275982.2	2366.558	0	462228.1	12993.11	467189.4		0 615027.4	2184418.
TOTALS			29567744	7950847.	295685.7	0	1653695.	1360437.	750347.6	34358670	615027.4	76552456
OP COSTS	OP COST											
RD MNT	D&B		0.104967	0.029087	0.003585		0.010270	0.019686	0.000268			0.167866
	EL&H		0.046904	0.029880			0.013189		0.006387			0.096362
	MOBL CRUSH		0.010181	0.008207			0.003339					0.021728
POWR	PLANT		0.006367	0.268257			0.673546		0.295896			1.244067
CAMP	QRTRS		0.347953	0.071315							0.931859	1.351128
	WATR TRT		0.011855	0.011405					0.405310			0.428570
TOTALS			0.528229	0.418154	0.003585	0	0.700345	0.019686	0.707862		0 0.931859	3.309724

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM PILLAR

TONS ORE/	10000	ROAD L KM	48
TONS WAST	1000	TONS FILL/DAY	20000
TOTAL	11000	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
UG MINE	93.79736	52.24569	56.59950	60.95330	11.53689	275.1327
	MILL OPERATRS		MAINTNCE	STAFF	MISC	
	55		33	11	11	110
	GENERAL POWER		SURF MNT	CAMP	ADMIN	
	19.25663		15.40531	11.55398	26.95929	73.17522
					MINE/MILL TOTAL	458.3079

CAP TOTL 76552456. CONNCTD POWER REQ 21399.37

N 6959.3142 AVERAGE DMND 16049.53

O. 3.3097246

TONS ORE / DAY 20000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
COSTS												
	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		697818.4	6924544.						2867424.		10489787
	LINES		998689.7	348407.6						1235395.		2582492.	13072280
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		29650813							46591655		76242468
	WATR TRT		29110.17	119327.2						12037.40		160474.8
SUBTOTAL			38910294	10260479	278467.5	0	1131139.	1279218.	268820.9	50810008	0	1.0E+08
E&C FEE			1998435.	526978.9	14302.11	0	58095.40	65700.77	13806.66	2609605.	0	5286924.
W CAP			462274.2	407169.2	2366.558	0	726950.6	12993.11	780958.7		0 915510.3	3308222.
TOTALS			41371004	11194627	295136.2	0	1916185.	1357912.	1063586.	53419613	915510.3	1.1E+08
OP COSTS	OP COST											
RD MNT	D&B		0.052483	0.014543	0.001792		0.005135	0.009843	0.000134			0.083933
	EL&H		0.023452	0.014940			0.006594		0.003193			0.048181
	MOBL CRUSH		0.005090	0.004103			0.001669					0.010864
R	PLANT		0.004277	0.214001			0.537320		0.236050			0.991650
P	QRTRS		0.258976	0.053079							0.693568	1.005623
	WATR TRT		0.005927	0.007792					0.352256			0.365976
TOTALS			0.350207	0.308461	0.001792	0	0.550720	0.009843	0.591635		0 0.693568	2.506229

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM/PILLAR

TONS ORE/	20000	ROAD L KM	48
TONS WAST	2000	TONS FILL/DAY	20000
TOTAL	22000	TONS FILL/KM	62400

CAP TOTL 111533577 CONNCTD POWER REQ 36432.56
PER TON 5069.7080 AVERAGE DMND 27324.42
OP/T MND 2.5062295

MANPOWER REQUIREMENTS

	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
UG MINE	152.3742	84.87338	91.94616	99.01894	16.31563	444.5283
		OPERATRS	MAINTNCE	STAFF	MISC	
MILL		77.78174	46.66904	15.55634	15.55634	155.5634
		POWER	SURF MNT	CAMP	ADMIN	
GENERAL		30.00459	24.00367	18.00275	42.00643	114.0174
MINE/MILL TOTAL						714.1093

TONS ORE / DAY 50000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
	OSTS											
	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		1397465.	14006431						5776137.		21180034
	LINES		1483897.	517679.4						1835605.		3837181. 25017216
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		53610475							84240548		1.4E+08
	WATR TRT		39038.56	160025.3						16142.90		215206.8
SUBTOTAL			64064740	17552336	278467.5	0	1131139.	1279218.	268820.9	91971930	0	1.8E+08
E&C FEE			3117571.	854146.4	13551.01	0	55044.45	62250.42	13081.58	4475614.	0	8591260.
W CAP			704627.5	702909.2	2366.558	0	1332976.	12993.11	1547886.	0	1557339.	5861099.
TOTALS			67886940	19109391	294385.1	0	2519160.	1354462.	1829788.	96447545	1557339.	1.9E+08
OP COSTS	OP COST											
RD MNT	D&B		0.020993	0.005817	0.000717		0.002054	0.003937	0.000053			0.033573
	EL&H		0.009380	0.005976			0.002637		0.001277			0.019272
	MOBL CRUSH		0.002036	0.001641			0.000667					0.004345
YR	PLANT		0.002528	0.158741			0.398572		0.175097			0.734939
P	QRTRS		0.176213	0.036116							0.471921	0.684251
	WATR TRT		0.002371	0.004709					0.292628			0.299708
TOTALS			0.213523	0.213002	0.000717	0	0.403932	0.003937	0.469056	0	0.471921	1.776090

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM PILLAR

TONS ORE/	50000	ROAD L KM	48
TONS WAST	5000	TONS FILL/DAY	20000
TOTAL	55000	TONS FILL/KM	62400

CAP TOTL 190999013 CONNCTD POWER REQ 73616.02
PER TON 3472.7093 AVERAGE DMND 55212.02
OP/T MND 1.7760906

MANPOWER REQUIREMENTS

UG MINE						
	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	289.3807	161.1868	174.6190	188.0512	25.79728	839.0351
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		122.9837	73.79024	24.59674	24.59674	245.9674
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		54.25013	43.40010	32.55007	75.95018	206.1505
						=========
				MINE/MILL TOTAL		1291.153

STEESE-WHITE PMSES STUDY

Infrastructure Models for Underground and Surface Mines

prepared by Burt Gosling

INTRODUCTION

The remote location of any possible mine or beneficiation site in the Steese-White study area in Central Alaska, necessitates major additional infrastructure costs in comparison to similar facilities in the lower 48 contiguous states. The principal items included in this category are construction and maintenance of access roads, camp facilities, and an on-site power plant.

Capacity and therefore capital and operating costs of the required facilities are determined by mining method. Generally it can be stated that surface mine and mill combinations will have lower manpower and electrical requirements than alternative underground mine and mill model combinations. In this initial work three models have been developed, one for surface mines and two for underground mines. The surface mine model is applicable to all such mines, large or small, as it is assumed that diesel shovels will be used in all instances. The underground models have been developed for characteristically low tonnage mine methods, such as cut-and-fill, and for high tonnage mine methods such as room-and-pillar.

METHODOLOGY

Operating and capital costs for each of the major items was determined through the Bureau of Mines cost estimation system with

modification as felt necessary by the evaluator. Each cost was divided into nine component parts, tabulated, and summed with the remaining items. Regional Alaska cost factors were used to increase the costs as appropriate. Examples worksheets are contained in the attached material.

Five cases were developed for each of the two underground models. The capacity of these ranged from 200 to 5000 tons ore per day for the cut and fill model and from 2000 to 50000tons per day for the room and pillar model. For the underground mine models it is assumed that waste equivalent to ten percent of the ore is also mined daily however cost are based on daily tons ore mined only. The daily operating rate for the mine and the mill are assumed to be equal. For the surface mine the cases ranged from 2 000 to 50 000 tons ore per day. Stripping ratios have automatically been considered in determination of the mine manpower requirements.

Following completion of the five cases for each of the models, regression analyses were completed to develop equations for each of the cost components. Seven component equations were developed for capital and six were developed for operating costs. This reduction from the original nine components resulted from combination of the "explosive" and the "tires" into one entitled "chemicals" and the lack of "timber" expenditures in either instance. Additionally, the "construction materials" component is not used in operating cost determinations.

During construction of the worksheets it was also necessary to determine additonal factors such as manpower and electrical requirements. These are shown at the bottom of each case, results sheet. The manpower requirements are delineated for mine, mill and general and are generally subdivided in each of these major categories into operators, maintenance, and staff. Electrical figures calculated include the power necessary for all connected devices and the average demand during operations.

To determine the total costs for given deposits the appropriate infrastructure model should be combined with the applicable mine and mill models and summed. If a surface operation is being considered either the small or large tonnage mine cost options should be selected, the surface infrastructure model , and the appropriate mill model. The cut and fill underground infrastructure model should be employed for all high cost mine methods such as shrinkage, cut and fill, and square set mining; and the room and pillar model should be employed for low cost high tonnage methods such as room and pillar, vertical crater retreat, and blockcaving.

COST EQUATIONS

The equations for the infrastructure models are tabled below. In every instance the dependent variable, X, is in tons ore mined per day. The resulting values are in dollars for the capital equations and in dollars per ton of ore mined for operating equations.

TABLE 1 - Underground mine infrastructure cost equations

	CUT AND FILL MODEL
Capital costs	
Labor	$2129495(X)^{0.29260}$
Equipment	$1279225(X)^{0.17444}$
Steel	$302285(X)^{-0.002652}$
Fuel	$999032(X)^{0.04359}$
Chemicals	$1343600(X)^{0.03981}$
Const mat	$148001(X)^{0.62585}$
Indust mat	$4292.13(X)^{0.573315}$
Operating costs	
Labor	$1068.92(X)^{-0.82958}$
Equipment	$242.33(X)^{-0.71203}$
Steel	$35.549(X)^{-0.99870}$
Fuel	$141.95(X)^{-0.60879}$
Chemicals	$29.153(X)^{-0.41649}$
Const mat	no equation
Indust mat	$65.437(X)-0.42728$

TABLE 2 - Underground infrastructure cost equations

ROOM AND PILLAR MODEL

Capital costs	
Labor	$494848(X)^{0.44971}$
Equipment	$145422(X)^{0.44301}$
Steel	$302657(X)^{-0.002548}$
Fuel	$305827(X)^{0.18914}$
Chemicals	$445122(X)^{0.17551}$
Const mat	$102131(X)^{0.63246}$
Indust mat	$3211.30(X)^{0.57107}$
Operating costs	
Labor	$171.10(X)^{-0.62260}$
Equipment	$31.92(X)^{-0.46663}$
Steel	$35.89(X)^{-1.00012}$
Fuel	$18.77(X)^{-0.28668}$
Chemicals	$10.354(X)^{-0.42894}$
Const mat	no equation
Indust mat	$48.66(X)-0.42894$

TABLE 3 - Surface mine infrastructure cost equations

	OPEN PIT MODEL
Capital costs	
Labor	$1360251(X)^{0.29569}$
Equipment	$145857(X)^{0.44477}$
Steel	$303896(X)^{-0.002045}$
Fuel	$213457(X)^{0.24396}$
Chemicals	$261.71(X)^{0.25107}$
Const mat	$165069(X)^{0.51652}$
Indust mat	$9951.05(X)^{0.44809}$
Operating costs	
Labor	$336.26(X)^{-0.74375}$
Equipment	$35.61(X)^{-0.50056}$
Steel	$36.51(X)^{-1.00051}$
Fuel	$16.44(X)^{-0.36147}$
Chemicals	$9.298(X)^{-0.28323}$
Const mat	no equation
Indust mat	$82.73(X)-0.55165$

CUT / FILL WORKSHEETS

CUT/FILL

-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY 200

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL	
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5		
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98		
CAP COSTS													
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.	
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.	
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8	
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.	
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2	
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		21278.56	200812.7						84896.93		306988.2	
	LINES		136493.8	47617.88						168845.0		352956.7	659944.9
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3	
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2	
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		2240525.							3520637.		5761163.	
	WATR TRT		8095.599	33185.16						3347.626		44628.38	
SUBTOTAL			9940256.	3149815.	278467.5	0	1131139.	1279218.	268820.9	3881223.	0	19928942	
E&C FEE			601634.1	190642.6	16854.25	0	68462.23	77424.74	16270.39	234911.1	0	1206199.	
M CAP			180602.5	76142.59	2366.558	0	74915.80	12993.11	31546.65	0	90263.09	468830.3	
			10722492	3416601.	297688.3	0	1274517.	1369636.	316637.9	4116134.	90263.09	21603972	
OP COSTS	OP COST												
RD MNT	D&B		5.248377	1.454380	0.179284		0.513527	0.984326	0.013432			8.393329	
	EL&H		2.345227	1.494036			0.659457		0.319396			4.818117	
	MOBL CRUSH		0.509050	0.410399			0.166964					1.086414	
POWR	PLANT		2.433269	1.788318			4.335490		1.162407			9.719486	
CAMP	QRTRS		2.553327	0.523324							6.838112	9.914765	
	WATR TRT		0.592754	0.097919					0.894662			1.585335	
TOTALS			13.68200	5.768378	0.179284	0	5.675440	0.984326	2.389897	0	6.838112	35.51744	

UNDERGROUND INFRASTRUCTURE MODEL CUT AND FILL

TONS ORE/	200	ROAD L KM	48
TONS WAST	20	TONS FILL/DAY	20000
TOTAL	220	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	12.10761	5.631450	6.476167	3.942015	1.631563	29.78881
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		7.778174	4.666904	1.555634	1.555634	15.55634
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		2.267258	1.813806	1.360354	3.174161	8.615591
					MINE/MILL TOTAL	53.96074

CAP TOTL 21603972. CONNCTD POWER REQ 1062.110

PER TON 98199.873 AVERAGE DMND 796.5829

OP/T MND 35.517449

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

; ORE / DAY 500

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		42612.90	406188.3						171016.3		619817.5
	LINES		202808.5	70752.75						250877.4		524438.7	1144256.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		3985010.							6261826.		10246837
	WATR TRT		10768.70	44142.65						4452.986		59364.34
SUBTOTAL			11775063	3389283.	278467.5	0	1131139.	1279218.	268820.9	6791668.	0	24913663
E&C FEE			696952.0	200607.6	16482.16	0	66950.79	75715.44	15911.19	401990.7	0	1474610.
W CAP			217577.0	103274.5	2366.558	0	127767.9	12993.11	58433.72		0	151297.4	673710.4
TOTALS			12689592	3693166.	297316.2	0	1325858.	1367927.	343165.8	7193659.	151297.4	27061984
;STS OP COST												
RD MNT	D&B		2.099351	0.581752	0.071713		0.205411	0.393730	0.005372			3.357331
	EL&H		0.938091	0.597614			0.263782		0.127758			1.927246
	MOBL CRUSH		0.203620	0.164159			0.066785					0.434565
POWR	PLANT		1.403140	1.375953			3.335777		0.894369			7.009242
CAMP	QRTRS		1.711937	0.350875							4.584771	6.647584
	WATR TRT		0.237101	0.059177					0.743217			1.039497
TOTALS			6.593242	3.129533	0.071713	0	3.871757	0.393730	1.770718		0 4.584771	20.41546

UNDERGROUND INFRASTRUCTURE MODEL CUT AND FILL

TONS ORE/	500	ROAD L KM	48
TONS WAST	50	TONS FILL/DAY	20000
TOTAL	550	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	22.99411	10.69493	12.29917	7.486456	2.579728	56.05441
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		12.29837	7.379024	2.459674	2.459674	24.59674
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		4.032558	3.226046	2.419534	5.645581	15.32372
					MINE/MILL TOTAL	95.97488

CAP TOTL 27061984. CONNCTD POWER REQ 2146.111

PER TON 49203.607 AVERAGE DMND 1609.583

OP/T MND 20.415468

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

ORE / DAY 1000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		72059.59	692084.8						290479.0		1054623.
	LINES		273639.6	95463.22						338496.6		707599.5 1762223.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		6191289.							9728651.		15919941
	WATR TRT		13396.09	54912.74						5539.443		73848.28
SUBTOTAL			14084247	3710660.	278467.5	0	1131139.	1279218.	268820.9	10466662	0	31219218
E&C FEE			815032.3	214729.8	16114.45	0	65457.18	74026.29	15556.22	605688.5	0	1806604.
W CAP			200232.3	101701.2	2366.558	0	111855.9	12993.11	88394.16		0 224633.2	742176.6
`LS			15099512	4027091.	296948.5	0	1308452.	1366238.	372771.3	11072350	224633.2	33767999
OP COSTS OP COST												
RD MNT	D&B		1.049675	0.290876	0.035856		0.102705	0.196865	0.002686			1.678665
	EL&H		0.469045	0.298807			0.131891		0.063879			0.963623
	MOBL CRUSH		0.101810	0.082079			0.033392					0.217282
POWR	PLANT		0.023874	0.568258			1.426797		0.626806			2.645736
CAMP	QRTRS		1.270867	0.260474							3.403534	4.934876
	WATR TRT		0.118550	0.040430					0.645933			0.804914
TOTALS			3.033824	1.540927	0.035856	0	1.694787	0.196865	1.339305		0 3.403534	11.24510

UNDERGROUND INFRASTRUCTURE MODEL CUT AND FILL

TONS ORE/	1000	ROAD L KM	48
TONS WAST	100	TONS FILL/DAY	20000
TOTAL	1100	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	37.35405	17.37397	19.98007	12.16178	3.648287	90.51817
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		17.39252	10.43551	3.478505	3.478505	34.78505
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		6.265161	5.012129	3.759096	8.771226	23.80761
					MINE/MILL TOTAL	149.1108

CAP TOTL 33767999. CONNCTD POWER REQ 3653.768

PER TON 30698.181 AVERAGE DMND 2740.326

OP/T MND 11.245100

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY		2000								
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98
		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		121854.7	1179210.						493391.8		1794456.
	LINES		369208.5	128803.8						456717.0		954729.4	2749186.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		9658434.							15176732		24835167
	WATR TRT		16698.28	68448.96						6904.939		92052.19
SUBTOTAL			17700059	4244663.	278467.5	0	1131139.	1279218.	268820.9	16237241	0	41139611
C FEE			996396.2	238946.4	15675.87	0	63675.66	72011.55	15132.83	914049.2	0	2315887.
CAP			241887.2	133439.6	2366.558	0	167933.0	12993.11	144500.3	0	334740.1	1037860.
TOTALS			18938342	4617049.	296509.9	0	1362748.	1364223.	428454.1	17151291	334740.1	44493359
OP COSTS	OP COST											
RD MNT	D&B		0.524837	0.145438	0.017928		0.051352	0.098432	0.001343			0.839332
	EL&H		0.234522	0.149403			0.065945		0.031939			0.481811
	MOBL CRUSH		0.050905	0.041039			0.016696					0.108641
POWR	PLANT		0.016038	0.453327			1.138224		0.500034			2.107624
CAMP	QRTRS		0.946899	0.194074						2.535909	3.676884
	WATR TRT		0.059275	0.027622					0.561382			0.648281
TOTALS			1.832479	1.010906	0.017928	0	1.272219	0.098432	1.094699	0	2.535909	7.862576

UNDERGROUND INFRASTRUCTURE MODEL CUT AND FILL

TONS ORE/	2000	ROAD L KM	48
TONS WAST	200	TONS FILL/DAY	20000
TOTAL	2200	TONS FILL/KM	62400

CAP TOTL 44493359. CONNCTD POWER REQ 6220.563

PER TON 20224.254 AVERAGE DMND 4665.422

OP/T MND 7.8625762

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	60.68183	28.22410	32.45772	19.75687	5.159457	146.2800
MILL	OPERATRS	MAINTNCE	STAFF	MISC		
	24.59674	14.75804	4.919349	4.919349	49.19349	
GENERAL	POWER	SURF MNT	CAMP	ADMIN		
	9.773675	7.818940	5.864205	13.68314	37.13996	
					MINE/MILL TOTAL	232.6134

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY 5000

		BASE	LABOR 1.41 / 1.09	EQUIP 1.5 / 1.05	STEEL 1.5 / 0.98	TIMBER 1.5 / 0.99	FUEL 1 / 0.58	EXPLOSV 1.5 / 1.02	TIRES 1.5 / 0.91	CONSTR M 2.3 / 1.05	INDUST M 1.5 / 0.98	TOTAL
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0
POWER	PLANT		244028.8	2385214.						993888.2		12885842
	LINES		548586.4	191382.4						678610.3		3623131.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			1418579.
	EL&H		114937.1	66564.65			29381.18		14230.24			5041711.
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		304807.3
CAMP	QUARTRS		17488725							27480820		225113.2
	WATR TRT		22409.76	91861.23						9266.703		47442.94
SUBTOTAL			25837613	5536658.	278467.5		0 1131139.	1279218.	268820.9	29266081	0 63598000	577363.5
E&C FEE			1392487.	298391.7	15007.68		0 60961.43	68942.00	14487.78	1577261.	0 3427539.	44969546
W CAP			330805.0	204448.9	2366.558		0 296309.5	12993.11	280691.9		0 570164.8	1697780.
TOTALS			27560906	6039499.	295841.7		0 1488410.	1361154.	564000.6	30843342	570164.8	68723320
OP COSTS	OP COST											
RD MNT	D&B		0.209935	0.058175	0.007171		0.020541	0.039373	0.000537			0.335733
	EL&H		0.093809	0.059761			0.026378		0.012775			0.192724
	MOBL CRUSH		0.020362	0.016415			0.006678					0.043456
POWR	PLANT		0.009478	0.336268			0.844309		0.370914			1.560970
CAMP	QRTRS		0.645144	0.132227						1.727772		2.505144
	WATR TRT		0.023710	0.016693					0.466354			0.506758
TOTALS			1.002439	0.619542	0.007171		0 0.897907	0.039373	0.850581		0 1.727772	5.144787

UNDERGROUND INFRASTRUCTURE MODEL CUT AND FILL

TONS ORE/	5000	ROAD L KM	48
TONS WAST	500	TONS FILL/DAY	20000
TOTAL	5500	TONS FILL/KM	62400

CAP TOTL 68723320. CONNCTD POWER REQ 12569.33

PER TON 12495.149 AVERAGE DMND 9427.002

OP/T MND 5.1447879

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	115.2435	53.60166	61.64191	37.52116	8.157818	276.1661
MILL	OPERATRS	MAINTNCE	STAFF	MISC		
	38.89087	23.33452	7.778174	7.778174	77.78174	
GENERAL	POWER	SURF MNT	CAMP	ADMIN		
	17.69739	14.15791	10.61843	24.77635	67.25009	
MINE/MILL TOTAL						421.1979

OPEN PIT

WORKSHEETS

.cESE-WHITE INFRASTRUCTURE MODEL FOR OPEN PIT MINES

OCT 20, 1987

TONS ORE / DAY 2000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		121854.7	1179210.						493391.8		1794456.
	LINES		369208.5	128803.8						456717.0		954729.4	2749186.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		4383792.							6888450.		11272243
	WATR TRT		11289.82	46278.82						4668.477		62237.12
SUBTOTAL			12420008	4222492.	278467.5	0	1131139.	1279218.	268820.9	7946723.	0	27546872
MC FEE			727776.5	247425.8	16317.39	0	66281.49	74958.52	15752.12	465654.9	0	1614166.
			292252.5	199680.0	4302.833	0	256892.7	23623.84	241447.7	0	299656.1	1317855.
TOTALS			13440037	4669598.	299087.7	0	1454313.	1377801.	526020.7	8412378.	299656.1	30478895
OP COSTS	OP COST											
RD MNT	D&B		0.524837	0.145438	0.017928		0.051352	0.098432	0.001343			0.839332
	EL&H		0.128987	0.149403			0.065945		0.031939			0.376276
	MOBL CRUSH		0.050905	0.041039			0.016696					0.108641
POWR	PLANT		0.014176	0.372942			0.936391		0.411366			1.734876
CAMP	QRTRS		0.466210	0.095553							1.248567	1.810331
	WATR TRT		0.032601	0.027622					0.561382			0.621607
TOTALS			1.217718	0.832000	0.017928	0	1.070386	0.098432	1.006032	0	1.248567	5.491066

OPEN PIT INFRASTRUCTURE MODEL

TONS ORE/	2000	ROAD L KM	48
TONS WAST	2000	TONS FILL/DAY	20000
TOTAL	4000	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

OP MINE						
D&B	LOAD	HAUL	MAINTNCE	STAFF	MISC	TOTAL
4.743416	6.957010	6.957010	6.957010	6.957010	6.957010	39.52847
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		24.59674	14.75804	4.919349	4.919349	49.19349
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		4.436098	3.548878	2.661658	6.210537	16.85717
					MINE/MILL TOTAL	105.5791

CAP TOTL 30478895. CONNCTD POWER REQ 4980.582

PER TON 7619.7237 AVERAGE DMND 3735.436

ND 5.4910663

STEESE-WHITE INFRASTRUCTURE MODEL FOR OPEN PIT MINES

OCT 20, 1987

YS ORE / DAY 5000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL	
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5		
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98		
CAP COSTS													
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.	
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.	
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8	
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.	
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2	
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		244028.8	2385214.						993888.2		3623131.	
	LINES		548586.4	191382.4						678610.3		1418579.	5041711.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3	
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2	
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		6931385.							10891596		17822981	
	WATR TRT		14166.97	58072.68						5858.209		78097.86	
SUBTOTAL			15272030	5502869.	278467.5	0	1131139.	1279218.	268820.9	12673449	0	36405996	
E&C FEE			870287.6	313585.0	15868.67	0	64458.80	72897.21	15318.95	722205.6	0	2074622.	
W CAP			350746.7	291196.7	4302.833	0	448905.3	23623.84	470881.6	0	451959.2	2041616.	
TOTALS			16493064	6107651.	298639.0	0	1644503.	1375739.	755021.4	13395654	451959.2	40522234	
JSTS OP COST													
RD MNT	D&B		0.209935	0.058175	0.007171		0.020541	0.039373	0.000537			0.335733	
	EL&H		0.051595	0.059761			0.026378		0.012775			0.150510	
	MOBL CRUSH		0.020362	0.016415			0.006678					0.043456	
POWR	PLANT		0.008378	0.276633			0.694577		0.305135			1.284724	
CAMP	QRTRS		0.281266	0.057647							0.753265	1.092179	
	WATR TRT		0.013040	0.016693					0.466354			0.496088	
TOTALS			0.584577	0.485327	0.007171	0	0.748175	0.039373	0.784802	0	0.753265	3.402693	

OPEN PIT INFRASTRUCTURE MODEL

TONS ORE/	5000	ROAD L KM	48
TONS WAST	5000	TONS FILL/DAY	20000
TOTAL	10000	TONS FILL/KM	62400

CAP TOTL 40522234. CONNCTD POWER REQ 10063.54

PER TON 4052.2234 AVERAGE DMND 7547.655

OP/T MND 3.4026939

MANPOWER REQUIREMENTS

OP MINE	D&B	LOAD	HAUL	MAINTNCE	STAFF	MISC	TOTAL
	7.5	11	11	11	11	11	62.5

MILL	OPERATRS	MAINTNCE	STAFF	MISC
	38.89087	23.33452	7.778174	7.778174
GENERAL	POWER	SURF MNT	CAMP	ADMIN
	7.014087	5.611269	4.208452	9.819722

77.78174

26.65353

MINE/MILL TOTAL 166.9352

ESE-WHITE INFRASTRUCTURE MODEL FOR OPEN PIT MINES

OCT 20, 1987

TONS ORE / DAY 10000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B ROWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		412659.4	4064052.						1688164.		6164876.
	LINES		740180.8	258222.9						915615.6		1914019. 8078896.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		9802458.							15403043		25205502
	WATR TRT		16821.20	68952.83						6955.768		92729.81
SUBTOTAL			18505983	7259428.	278467.5	0	1131139.	1279218.	268820.9	18117275	0	46840334
E&C FEE			1028332.	403388.7	15473.76	0	62854.66	71083.08	14937.72	1006732.	0	2602803.
W CAP			414007.0	406314.4	4302.833	0	697064.3	23623.84	786460.1		0 616752.9	2948525.
TOTALS			19948322	8069132.	298244.1	0	1891058.	1373925.	1070218.	19124008	616752.9	52391662
OP COSTS	OP COST											
RD MNT	D&B		0.104967	0.029087	0.003585		0.010270	0.019686	0.000268			0.167866
	EL&H		0.025797	0.029880			0.013189		0.006387			0.075255
	MOBL CRUSH		0.010181	0.008207			0.003339					0.021728
POWR	PLANT		0.005628	0.220679			0.554088		0.243416			1.023812
CAMP	QRTRS		0.191911	0.039333							0.513960	0.745205
	WATR TRT		0.006520	0.011405					0.405310			0.423236
TOTALS			0.345005	0.338595	0.003585	0	0.580886	0.019686	0.655383		0 0.513960	2.457104

OPEN PIT INFRASTRUCTURE MODEL

TONS ORE/	10000	ROAD L KM	48
TONS WAST	10000	TONS FILL/DAY	20000
TOTAL	20000	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

OP MINE						
D&B	LOAD	HAUL	MAINTNCE	STAFF	MISC	TOTAL
10.60660	15.55634	15.55634	15.55634	15.55634	15.55634	88.38834
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		55	33	11	11	110
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		9.919417	7.935533	5.951650	13.88718	37.69378
					MINE/MILL TOTAL	236.0821

CAP TOTL 52391662. CONNCTD POWER REQ 17132.88

PER TON 2619.5831 AVERAGE DMND 12849.66

P/T MND 2.4571047

EESE-WHITE INFRASTRUCTURE MODEL FOR OPEN PIT MINES

OCT 20, 1987

TONS ORE / DAY 25000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		826400.4	8220450.						3400637.		12447488
	LINES		1099793.	383679.1						1360462.		2843934. 15291423
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		15499048							24354350		39853398
	WATR TRT		21107.98	86525.02						8728.402		116361.4
SUBTOTAL			24980212	11558854	278467.5	0	1131139.	1279218.	268820.9	29227673	0	68724388
E&C FEE			1335882.	618140.3	14891.78	0	60490.67	68409.61	14375.90	1563027.	0	3675218.
CAP			534281.1	663555.3	4302.833	0	1265159.	23623.84	1559761.	0	930223.5	4980907.
ALS			26850376	12840550	297662.1	0	2456789.	1371252.	1842957.	30790701	930223.5	77380514
OP COSTS	OP COST											
RD MNT	D&B		0.041987	0.011635	0.001434		0.004108	0.007874	0.000107			0.067146
	EL&H		0.010319	0.011952			0.005275		0.002555			0.030102
	MOBL CRUSH		0.004072	0.003283			0.001335					0.008691
POWR	PLANT		0.003326	0.163691			0.411000		0.180556			0.758574
CAMP	QRTRS		0.115780	0.023730							0.310074	0.449585
	WATR TRT		0.002608	0.006892					0.336701			0.346202
TOTALS			0.178093	0.221185	0.001434	0	0.421719	0.007874	0.519920	0	0.310074	1.660302

OPEN PIT INFRASTRUCTURE MODEL

TONS ORE/	25000	ROAD L KM	48
TONS WAST	25000	TONS FILL/DAY	20000
TOTAL	50000	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

OP MINE						
D&B	LOAD	HAUL	MAINTNCE	STAFF	MISC	TOTAL
16.77050	24.59674	24.59674	24.59674	24.59674	24.59674	139.7542
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		86.96263	52.17758	17.39252	17.39252	173.9252
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		15.68397	12.54718	9.410385	21.95756	59.59910
				MINE/MILL TOTAL		373.2786

CAP TOTL 77380514. CONNCTD POWER REQ 34617.93

PER TON 1547.6102 AVERAGE DMND 25963.45

OP/T MND 1.6603023

:ESE-WHITE INFRASTRUCTURE MODEL FOR OPEN PIT MINES

OCT 20, 1987

TONS ORE / DAY 50000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		1397465.	14006431						5776137.		21180034
	LINES		1483897.	517679.4						1835605.		3837181. 25017216
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		21918963							34442252		56361216
	WATR TRT		25062.65	102735.8						10363.70		138162.1
SUBTOTAL			32359252	17495046	278467.5	0	1131139.	1279218.	268820.9	42167854	0	94979800
E&C FEE			1675400.	905806.2	14417.66	0	58564.76	66231.57	13918.20	2183241.	0	4917580.
CAP			664357.5	989508.8	4302.833	0	1999370.	23623.84	2627973.	0	1269402.	7578539.
TOTALS			34699011	19390361	297188.0	0	3189075.	1369074.	2910712.	44351096	1269402.	1.1E+08
OP COSTS	OP COST											
RD MNT	D&B		0.020993	0.005817	0.000717		0.002054	0.003937	0.000053			0.033573
	EL&H		0.005159	0.005976			0.002637		0.001277			0.015051
	MOBL CRUSH		0.002036	0.001641			0.000667					0.004345
POWR	PLANT		0.002234	0.130582			0.327868		0.144036			0.604721
CAMP	QRTRS		0.078998	0.016191							0.211567	0.306756
	WATR TRT		0.001304	0.004709					0.292628			0.298641
TOTALS			0.110726	0.164918	0.000717	0	0.333228	0.003937	0.437995	0	0.211567	1.263089

OPEN PIT INFRASTRUCTURE MODEL

TONS ORE/	50000	ROAD L KM	48
TONS WAST	50000	TONS FILL/DAY	20000
TOTAL	100000	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

OP MINE						
D&B	LOAD	HAUL	MAINTNCE	STAFF	MISC	TOTAL
23.71708	34.78505	34.78505	34.78505	34.78505	34.78505	197.6423
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		122.9837	73.79024	24.59674	24.59674	245.9674
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		22.18049	17.74439	13.30829	31.05268	84.28586
				MINE/MILL TOTAL		527.8956

CAP TOTL 107475921 CONNCTD POWER REQ 58936.02

PER TON 1074.7592 AVERAGE DMND 44202.01

P/T MND 1.2630899

ROOM/PILLAR WORKSHEETS

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY 2000

			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		121854.7	1179210.						493391.8		1794456.
	LINES		369208.5	128803.8						456717.0		954729.4 2749186.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		6907217.							10853621		17760838
	WATR TRT		14142.47	57972.27						5848.080		77962.82
[illegible]TOTAL			14946286	4234186.	278467.5	0	1131139.	1279218.	268820.9	11913073	0	34051193
			857439.3	242907.0	15975.14	0	64891.27	73386.30	15421.73	683429.8	0	1953450.
			209424.1	126786.0	2366.558	0	167933.0	12993.11	144500.3	0	247800.0	911803.2
TOTALS			16013149	4603879.	296809.2	0	1363963.	1365598.	428743.0	12596503	247800.0	36916447
OP COSTS	OP COST											
RD MNT	D&B		0.524837	0.145438	0.017928		0.051352	0.098432	0.001343			0.839332
	EL&H		0.234522	0.149403			0.065945		0.031939			0.481811
	MOBL CRUSH		0.050905	0.041039			0.016696					0.108641
POWR	PLANT		0.016038	0.453327			1.138224		0.500034			2.107624
CAMP	QRTRS		0.700967	0.143668							1.877272	2.721908
	WATR TRT		0.059275	0.027622					0.561382			0.648281
TOTALS			1.586546	0.960500	0.017928	0	1.272219	0.098432	1.094699	0	1.877272	6.907600

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM/P/[illegible]

TONS ORE/	2000	ROAD L KM	48
TONS WAST	200	TONS FILL/DAY	20000
TOTAL	2200	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

UG MINE						
	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	30.40266	16.93446	18.34567	19.75687	5.159457	90.59913
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		24.59674	14.75804	4.919349	4.919349	49.19349
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		6.989631	5.591705	4.193778	9.785484	26.56059
						=========
				MINE/MILL TOTAL		166.3532

[illegible] TOTL 36916447. CONNCTD POWER REQ 6220.563

16780.203 AVERAGE DMND 4665.422

OF [illegible] 6.9076004

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT~~ MINES

OCT 20, 1987

TONS ORE / DAY 5000

		CASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3336840.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0 12885842
POWER	PLANT		244028.8	2385214.						993888.2		3623131.
	LINES		548586.4	191382.4						678610.3		1418579. 5041711.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.[illegible]
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94 577363.5
CAMP	QUARTRS		12263766							19270607		31534374
	WATR TRT		18795.92	77047.53						7772.339		103615.8
SUBTOTAL			20609041	5521844.	278467.5	0	1131139.	1279218.	268820.9	21054374	0	50142907
[illegible]			1137418.	304752.0	15368.69	0	62427.87	70600.42	14836.29	1161996.	0	2767399.
			272757.8	192551.7	2366.558	0	296309.5	12993.11	280691.9		0 414707.6	1472378.
TOTALS			22019217	6019148.	296202.7	0	1489876.	1362812.	564349.1	22216370	414707.6	54382685
OP COSTS	OP COST											
RD MNT	D&B		0.209935	0.058175	0.007171		0.020541	0.039373	0.000537			0.335733
	EL&H		0.093809	0.059761			0.026378		0.012775			0.192724
	MOBL CRUSH		0.020362	0.016415			0.006678					0.043456
POWR	PLANT		0.009478	0.336268			0.844309		0.370914			1.560970
CAMP	QRTRS		0.469243	0.096175							1.256689	1.822108
	WATR TRT		0.023710	0.016693					0.466354			0.506758
TOTALS			0.826538	0.583490	0.007171	0	0.897907	0.039373	0.850581		0 1.256689	4.461752

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM/PILLAR

TONS ORE/	5000	ROAD L KM	48
TONS WAST	500	TONS FILL/DAY	20000
TOTAL	5500	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	57.73905	32.16099	34.84108	37.52116	8.157818	170.4201
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		38.89087	23.33452	7.778174	7.778174	77.78174
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		12.41009	9.928074	7.446055	17.37412	47.15835
					MINE/MILL TOTAL	295.3602

CAP TOTL 54382685. CONNCTD POWER REQ 12569.33

[illegible] 9887.7609 AVERAGE DMND 9427.002

OP [illegible] 4.4617524

STEESE-WHITE INFRASTRUCTURE MODEL ~~FOR OPEN PIT MINES~~

OCT 20, 1987

TONS ORE / DAY 10000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5	
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98	
CAP COSTS												
ROAD	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		412659.4	4064052.						1688164.		6164876.
	LINES		740180.8	258222.9						915615.6		1914019.	8078896.
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		19029585							29902042		48931628
	WATR TRT		23367.26	95786.17						9662.640		128816.0
SUBTOTAL			27739656	7286262.	278467.5	0	1131139.	1279218.	268820.9	32618981	0	70602546
			1479457.	388602.9	14851.69	0	60327.80	68225.41	14337.20	1739689.	0	3765491.
			348631.1	275982.2	2366.558	0	462228.1	12993.11	467189.4		0	615027.4	2184418.
TOTALS			29567744	7950847.	295685.7	0	1653695.	1360437.	750347.6	34358670	615027.4	76552456
OP COSTS	OP COST											
RD MNT	D&B		0.104967	0.029087	0.003585		0.010270	0.019686	0.000268			0.167866
	EL&H		0.046904	0.029880			0.013189		0.006387			0.096362
	MOBL CRUSH		0.010181	0.008207			0.003339					0.021728
POWR	PLANT		0.006367	0.268257			0.673546		0.295896			1.244067
CAMP	QRTRS		0.347953	0.071315							0.931859	1.351128
	WATR TRT		0.011855	0.011405					0.405310			0.428570
TOTALS			0.528229	0.418154	0.003585	0	0.700345	0.019686	0.707862		0 0.931859	3.309724

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM PILLAR

TONS ORE/	10000	ROAD L KM	48
TONS WAST	1000	TONS FILL/DAY	20000
TOTAL	11000	TONS FILL/KM	62400

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	93.79736	52.24569	56.59950	60.95330	11.53689	275.1327

MILL	OPERATRS	MAINTNCE	STAFF	MISC
	55	33	11	11

GENERAL	POWER	SURF MNT	CAMP	ADMIN	
	19.25663	15.40531	11.55398	26.95929	73.17522
				MINE/MILL TOTAL	458.3079

CAP TOTL 76552456. CONNCTD POWER REQ 21399.37

[illegible] 6959.3142 AVERAGE DMND 16049.53

[illegible] 3.3097246

TONS ORE / DAY 20000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL	
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5		
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98		
COSTS													
	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.	
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.	
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8	
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.	
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2	
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		697818.4	6924544.						2867424.		10489787	
	LINES		998689.7	348407.6						1235395.		2582492.	13072280
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3	
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2	
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		29650813							46591655		76242468	
	WATR TRT		29110.17	119327.2						12037.40		160474.8	
SUBTOTAL			38910294	10260479	278467.5	0	1131139.	1279218.	268820.9	50810008	0	1.0E+08	
E&C FEE			1998435.	526978.9	14302.11	0	58095.40	65700.77	13806.66	2609605.	0	5286924.	
W CAP			462274.2	407169.2	2366.558	0	726950.6	12993.11	780958.7	0	915510.3	3308222.	
TOTALS			41371004	11194627	295136.2	0	1916185.	1357912.	1063586.	53419613	915510.3	1.1E+08	
OP COSTS	OP COST												
RD MNT	D&B		0.052483	0.014543	0.001792		0.005135	0.009843	0.000134			0.083933	
	EL&H		0.023452	0.014940			0.006594		0.003193			0.048181	
	MOBL CRUSH		0.005090	0.004103			0.001669					0.010864	
'R	PLANT		0.004277	0.214001			0.537320		0.236050			0.991650	
.P	QRTRS		0.258976	0.053079							0.693568	1.005623	
	WATR TRT		0.005927	0.007792					0.352256			0.365976	
TOTALS			0.350207	0.308461	0.001792	0	0.550720	0.009843	0.591635	0	0.693568	2.506229	

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RM/PILLAR

TONS ORE/	20000	ROAD L KM	48	
TONS WAST	2000	TONS FILL/DAY	20000	UG MINE
TOTAL	22000	TONS FILL/KM	62400	

MANPOWER REQUIREMENTS

	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
UG MINE	152.3742	84.87338	91.94616	99.01894	16.31563	444.5283
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		77.78174	46.66904	15.55634	15.55634	155.5634
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		30.00459	24.00367	18.00275	42.00643	114.0174
MINE/MILL TOTAL						714.1093

CAP TOTL 111533577 CONNCTD POWER REQ 36432.56
PER TON 5069.7080 AVERAGE DMND 27324.42
OP/T MND 2.5062295

TONS ORE / DAY 50000

		BASE	LABOR	EQUIP	STEEL	TIMBER	FUEL	EXPLOSV	TIRES	CONSTR M	INDUST M	TOTAL	
			1.41	1.5	1.5	1.5	1	1.5	1.5	2.3	1.5		
			1.09	1.05	0.98	0.99	0.58	1.02	0.91	1.05	0.98		
COSTS													
	D&B		3673864.	1018066.	125499.3		359469.5	689028.7	9402.430			5875330.	
	EL&H		1805825.	1045825.			461620.0		223577.3			3536848.	
	MOBL CRUSH		356335.6	287279.3			116874.8					760489.8	
	D&B RDWAY		835058.1	242760.2	141934.7		84138.74	555738.7	4125.337			1863756.	
	EXCAV		244805.1	136793.7			54755.26		10309.09			446663.2	
	GRAVEL		301526.9	5010.931			2543.515		1056.358	92616.33		402754.0	12885842
POWER	PLANT		1397465.	14006431						5776137.		21180034	
	LINES		1483897.	517679.4						1835605.		3837181.	25017216
AIRSTRIP	D&B	507099.8	183693.2	51535.65	11033.46		17973.47	34451.43	6120.123			304807.3	
	EL&H		114937.1	66564.65			29381.18		14230.24			225113.2	
	MOBL CRUSH		17816.78	14363.96			4382.807			10879.38		47442.94	577363.5
CAMP	QUARTRS		53610475							84240548		1.4E+08	
	WATR TRT		39038.56	160025.3						16142.90		215206.8	
SUBTOTAL			64064740	17552336	278467.5	0	1131139.	1279218.	268820.9	91971930	0	1.8E+08	
E&C FEE			3117571.	854146.4	13551.01	0	55044.45	62250.42	13081.58	4475614.	0	8591260.	
W CAP			704627.5	702909.2	2366.558	0	1332976.	12993.11	1547886.		0	1557339.	5861099.
TOTALS			67886940	19109391	294385.1	0	2519160.	1354462.	1829788.	96447545	1557339.	1.9E+08	
OP COSTS	OP COST												
RD MNT	D&B		0.020993	0.005817	0.000717		0.002054	0.003937	0.000053			0.033573	
	EL&H		0.009380	0.005976			0.002637		0.001277			0.019272	
	MOBL CRUSH		0.002036	0.001641			0.000667					0.004345	
MR	PLANT		0.002528	0.158741			0.398572		0.175097			0.734939	
P	QRTRS		0.176213	0.036116							0.471921	0.684251	
	WATR TRT		0.002371	0.004709					0.292628			0.299708	
TOTALS			0.213523	0.213002	0.000717	0	0.403932	0.003937	0.469056		0 0.471921	1.776090	

UNDERGROUND INFRASTRUCTURE MODEL ~~CUT AND FILL~~ RMC PILLAR

TONS ORE/	50000	ROAD L KM	48
TONS WAST	5000	TONS FILL/DAY	20000
TOTAL	55000	TONS FILL/KM	62400

CAP TOTL 190999013 CONNCTD POWER REQ 73616.02
PER TON 3472.7093 AVERAGE DMND 55212.02
OP/T MND 1.7760906

MANPOWER REQUIREMENTS

UG MINE	MINERS	SERVCS	MAINTNCE	STAFF	MISC	TOTAL
	289.3807	161.1868	174.6190	188.0512	25.79728	839.0351
MILL		OPERATRS	MAINTNCE	STAFF	MISC	
		122.9837	73.79024	24.59674	24.59674	245.9674
GENERAL		POWER	SURF MNT	CAMP	ADMIN	
		54.25013	43.40010	32.55007	75.95018	206.1505
					MINE/MILL TOTAL	1291.153