Since the required daily capacity of the mill was increased to 625 tpd because of the addition of mine dilution, Behre Dolbear made another estimate of the mill capital costs. A scaling-factor appropriate for the type and capacity of mill was used and the estimated capital cost of the larger mill with the purchase of used equipment (and the 13 percent savings assumed by AMI) was determined to be approximately $6,284,200.

In substantiation of AMI's estimated costs for the mill, AMI obtained a letter from MINPROC Engineers, Inc., (Minproc) in which Minproc stated that the plant could be built for $5,000,000 if some undefined contractual commitments were agreed to by AMI. Rothschild requested, that Behre Dolbear use, the $5,000,000 capital cost figure supplied by Minproc in the cash flow analyses. A copy of Minproc's letter is appended as Appendix 3.

5.2 OPERATING COSTS

Behre Dolbear's estimated direct operating costs for the 500 tpd capacity plant to be $12.03 per ton, a figure in close agreement with the $12.09 per ton cost in AMI's study. Behre Dolbear estimated a slightly higher unit cost of $12.38 per ton during the first year of operation to account for what is felt to be the probability of higher maintenance costs with used equipment during that period. The comparative unit milling costs of the AMI and Behre Dolbear estimates for the 500 tpd mill are presented in Table 5.1. A comparison of total labor requirements for the entire Gold Road Project is presented in Table 5.2. For the determination of the operating costs for the 625 tpd mill, unit costs for all items including operating supplies, electricity and fuel were kept constant. There was no required increase in labor which was prorated downward on the basis of the increased tonnage, i.e., the ratio of 500/625.

TABLE 5.1 COMPARATIVE MILLING COSTS 500-TPD MILL $ PER TON		
	Addwest	**Behre Dolbear**
Labor	4.59	4.75
Equipment	0.31	0.48
Materials & Supplies	3.72	3.55
Electric Power	2.30	2.16
Services	0.07	-
Subtotal	10.99	10.94
Contingency @ 10%	1.10	1.09
TOTAL	**$12.09**	**$12.03**

Behre Dolbear reviewed the metallurgical and mineral dressing data which included the recent study by ICT, the earlier study completed by the Booth Company for Sharon Steel in 1981, and historical data contained in the AMI study. The historical data from the 1937-1942 period comprised excerpts from the Taggart Handbook of Mineral Dressing that referred to the operating performance at the Gold Road Mine between 1937 and 1942.

Behre Dolbear concluded that the anticipated reagent consumption and a recovery of 95 percent are consistent with a grade of 0.31 opt or greater. Insufficient information was available to make an exact judgement of the anticipated recoveries at lower grades. On the basis of the loss to tailings determined in the metallurgical study, an estimate was made of the decreased loss expected at lower grades of mill feed. The adjusted recoveries depending on the grade of mill feed during each quarter, varied from 93 percent to 96 percent with an overall average for the 12 quarters, of 94 percent. The adjusted recoveries were applied in Behre Dolbear's cashflows.

6.0 ENVIRONMENTAL

Behre Dolbear assessed the environmental aspects of the Gold Road Project by conducting a site visit, reviewing available documentation, and interviewing appropriate regulatory officials by telephone. Behre Dolbear concludes that the project has no fatal flaws from an environmental viewpoint. Permitting requirements are straightforward, and there are no significant environmental liabilities associated with the property.

The project's permitting status is greatly simplified by the fact that proposed activities are on patented land. Two major permits are required, both from Arizona state agencies:

- Aquifer Protection Plan; and
- Air Quality Permit.

The Aquifer Protection Plan permit application has been filed and is currently under review by the state. The officials reviewing the application do not anticipate difficulties and approval is expected during November 1993. As part of the application, ore and waste rocks were geochemically characterized with respect to acid generating potential and other toxicity characteristics. Neither the ore nor the waste is acid-generating and neither exhibits significant toxicity characteristics. The permit will require ground water monitoring and establishment of background levels. The necessary monitoring wells should be installed as soon as reasonable to begin collection of background data. AMI management has stated that they plan to install the wells during the fall of 1993. The costs of compliance with this permit should be nominal.

The Air Quality Permit is expected to be straightforward. The principal requirement, in Behre Dolbear's opinion, will be dust suppression equipment in the mill and possibly on the haul road. Costs associated with compliance should be minimal in Behre Dolbear's opinion.

Two wilderness areas occur on BLM land in the region, but it is not expected that these will cause a problem for the proposed project as the project will not have visual, noise, or air quality impacts on wilderness areas. Nonetheless, coordination of project activities with the BLM would be prudent and Behre Dolbear confirmed that this is being pursued by AMI.

No significant environmental liabilities from previous operations appear to be associated with the property. Existing tailings appear to be geochemically innocuous. The presence of several open stopes might be considered a minor potential environmental liability due to possible safety issues and visual impact, but this is not considered a significant liability by Behre Dolbear.

7.0 PROJECT ECONOMICS AND SENSITIVITIES

Behre Dolbear has determined that the average life of mine direct cash operating cost will be $55.52 per ton as presented in Table 7.1. The cash cost to produce an ounce of recoverable gold is $212.58. The table includes further adjustments to AMI's costs for property and severance taxes.

TABLE 7.1
DIRECT OPERATING COSTS SUMMARY
722-TPD

	$/ROM Ton
Mining	
Labor	19.90
Equipment Repair	1.62
Materials & Supplies	11.65
Subtotal	33.17
Contingency @ 10%	3.32
Total	**36.49**
Milling (After Year 1)	
Operative Labor	3.31
Maintenance Labor	0.92
Electrical Power	2.16
Operating Supplies	2.95
Maintenance Supplies	1.15
Fuel	0.50
Subtotal	10.99
Contingency @ 10%	1.10
Totals	**12.09**
Administration	
Labor	0.95
Equipment	0.08
Site Reclamation	0.40
Supplies	0.32
Services	0.50
Indirects	0.54
Subtotal	2.79
Contingency @ 10%	0.28
Total	**3.07**
PROPERTY AND SEVERANCE TAXES	**3.87**
TOTAL	**55.52**

Behre Dolbear appreciates that the cash cost of $213 per ounce appears to be low for an underground mine, even in comparison to some surface mines. Behre Dolbear believes, nevertheless, that the figure is reliable based upon the analysis of costs performed for this study.

7.1 CASH FLOW SCENARIOS

Behre Dolbear estimated project cash flows based on three scenarios determined by joint dicussions between Behre Dolbear and Rothschild personnel:

- Case 1 - Mine productivity and the operating efficiency of the mill reaches design criteria at the start up of the operation. The minable reserves are based on an average direct operating cost of $55.52 per ton;

- Case 2 - Mine productivity and operating efficiency of the mill is reduced at start up of the project. A start-up period of three quarters was anticipated by Behre Dolbear during which time the project could expect lower than design productivity on both the mine and the mill. Due to increased costs during start up, the minable reserves for this case is based on an average direct operating cost of $58.06 per ton; and

- Case 3 - Mine productivity and operating efficiency of the mill is reduced at start up identically to Case 2, but the mining schedule uses the reserves calculated in case 1 which are based on an average direct operating cost of $55.52 per ton.

Case 2 was requested by Rothschild after discussion with Behre Dolbear and it represents what both Behre Dolbear and Rothschild believe to be the most realistic scenario for the project's development and operation. Case 2 is based on the fact that typical mining and

milling operations usually realize reduced productivity and mill recovery during the initial period of operation. The initial inefficiencies are due to the operation having to hire and train a new work force. Additionally, the uniqueness of the ore or ground conditions within any given mining and milling operation results in a learning period for most operations regardless of the level of experience of the new work force. Behre Dolbear therefore feels that the effects of reduced productivity and reduced mill recovery during the start up of an operation is an important consideration in any mining venture and should be modeled in the project's economic analysis. The assumptions special to Cases 2 and 3 are:

- The start up production for the mine was assumed by Behre Dolbear to average 50 percent of the target production of 46,725 tons in the first quarter, 75 percent of the target in the second quarter, 90 percent in the third quarter, and 100 percent of the target in each subsequent quarter;

- The start up recoveries for the mill were reduced by taking the estimated recovery and subtracting 4 percent in the first quarter, 2 percent in the second quarter, 1 percent in the third quarter and no deduction in each subsequent quarter;

- Mining and milling labor requirements during start up were assumed to be 75 percent during the first quarter, 85 percent during the second quarter, and 100 percent during subsequent quarters. Labor costs for the mine and mill were prorated at these percentages;

- Consumables for the mine and mill were prorated by the tonnage produced during the quarter; and

- G&A operating costs were not prorated by tonnage during start up.

Other assumptions utilized in all cases are:

- The quarterly grade and tonnage figures used for cash flow analysis were determined from the Behre Dolbear mining plan as presented in Appendix 2. Behre Dolbear used the same stoping sequence and stope production rates as determined by AMI's engineers. Behre Dolbear adjusted the contained tonnage and grade of each stope to reflect Behre Dolbear's adjustments to the minable reserve statement;

- The mill recovery for each quarter was estimated from the projected average mill head grades for that quarter;

- The average price of gold was calculated using a $350.00 per ounce contango rate of 2.5 percent per annum price scheme for hedging of project costs at Rothschild's request. The rest of the recoverable gold was sold at a spot price of $350 per ounce;

- The average price of silver was assumed to be $4.50 per ounce;

- The operating costs were estimated by Behre Dolbear engineers;

- One percent of the gold plus silver value was used for cost of sales, transportation, insurance, etc. of the milled product;

- A 3.5 percent royalty was utilized;

- Property taxes were estimated using the same method as the AMI feasibility study due to a recent court case which has required the State of Arizona to change their method of assessing value to mineral properties. Behre Dolbear personnel could not get an opinion from Arizona as to what changes would be forthcoming;

- Silver recovery was estimated at 50 percent of the recovered gold;

- Behre Dolbear calculated severance taxes using the estimated weighted mineral value from the actual ratio of the operating cost of the mine divided by total operating costs;

- The cash flow analysis was conducted before state and federal income taxes at the request of Rothschild; and

- Capital costs for the project were supplied by AMI with the estimate for the mill supplied by Minproc at the request of Rothschild.

The results of the cash flows are presented in Table 7.2. Net present values range from $4.67 million to $8.95 million and internal rates of return range from 45.1 to 62.3 percent. The detailed cash flows are presented as Appendix 4.

TABLE 7.2
GOLD ROAD PROJECT - ECONOMIC PERFORMANCE

	CASE 1	CASE 2	CASE 3
NPV @ 15%	$6,348,590	$4,984,348	$4,667,145
NPV @ 10%	$7,565,404	$6,187,660	$5,871,250
NPV @ 5%	$8,954,310	$7,562,372	$7,252,010
IRR, %	62.3	47.7	45.1

7.2 SENSITIVITIES

Behre Dolbear performed sensitivity analyses on the project to determine the performance variability as a function of the following parameters:

- Reserves versus gold price;
- Reserves versus operating costs;
- Change in capital costs +15 percent to -10 percent;
- Change in operating costs +15 percent to -10 percent; and
- Change in spot gold price from $330 per ounce to $425 per ounce.

The results of the sensitivity analyses are presented in Table 7.3 through 7.6. The sensitivities indicate:

- Reserves are sensitive to direct operating costs. An increase of the direct operating cost from $55.52 per ton (Case 1 and 3 reserves) by 1 percent to $56.00 per ton will reduce the minable reserves from 156,398 ounces of gold to 149,557 ounces, a 4 percent reduction. An increase in direct operating costs by 10 percent to $60.00 per ton will reduce the minable reserves to 141,705 ounces of gold, a 10 percent reduction;

- At a given reserve assumption the project's economic performance is more sensitive to changes in operating costs than capital costs. An increase in operating costs by 15 percent will reduce the project's NPV at 5 percent by 38 percent in Case 1, 42 percent in Case 2, and 44 percent in Case 3. An increase in capital costs by 15 percent only reduces the NPV at 5 percent by 17 percent in Case 1, 20 percent in Case 2, and 19 percent in Case 3.

- Using the hedging program designed by Rothschild, a reduction in the spot price of gold by 5 percent will reduce the project's economic performance by 14 percent in Case 1, 16 percent in Case 2, and 16 percent in Case 3.

TABLE 7.3
GOLD ROAD PROJECT
SENSITIVITY OF RESERVES TO GOLD PRICE

Case 1 & 3 - Direct Operating Costs = $55.52/Ton			Case 2 - Direct Operating Costs = $58.06/Ton		
Gold Price	**Ounces**	**Tons**	**Gold Price**	**Ounces**	**Tons**
$350	147,100	461,055	$350	132,805	380,520
$375	156,398	517,937	$375	147,716	464,668
$400	158,913	533,729	$400	158,696	532,303

TABLE 7.4
GOLD ROAD PROJECT
SENSITIVITY OF RESERVES TO DIRECT OPERATING COSTS

DIRECT OPERATING COST	MINABLE OUNCES - GOLD	MINABLE TONS
$50.00	160,478	544,234
$51.00	159,982	540,868
$54.00	158,696	532,303
$55.00	156,398	517,937
$56.00	149,557	475,872
$57.00	147,716	464,668
$59.00	147,100	461,055
$60.00	141,704	430,024
$65.00	130,591	368,509
$70.00	127,279	351,452

TABLE 7.5
GOLD ROAD PROJECT
SENSITIVITY TO CHANGES IN CAPITAL AND OPERATING COSTS

	Change in Capital Costs			Change in Operating Costs		
	+15%	Base	-10%	+15%	Base	-10%
CASE 1						
NPV @ 15%	$4,980,387	$6,348,590	$7,260,725	$3,565,115	$6,348,590	$ 8,186,347
NPV @ 10%	$6,165,462	$7,565,404	$8,498,699	$4,510,157	$7,565,404	$ 9,582,704
NPV @ 5%	$7,521,195	$8,954,310	$9,909,721	$5,591,814	$8,954,310	$11,174,598
IRR, %	48.5	62.3	73.4	43.5	62.3	73.6
CASE 2						
NPV @ 15%	$3,659,473	$4,984,348	$5,867,597	$2,376,661	$4,984,348	$6,706,055
NPV @ 10%	$4,838,441	$6,187,660	$7,087,139	$3,323,972	$6,187,660	$8,078,448
NPV @ 5%	$6,188,753	$7,562,372	$8,478,119	$4,409,533	$7,562,372	$9,644,143
IRR, %	36.9	47.7	56.2	31.6	47.7	57.4
CASE 3						
NPV @ 15%	$3,342,270	$4,667,145	$5,550,394	$2,081,827	$4,667,145	$6,374,202
NPV @ 10%	$4,522,032	$5,871,250	$6,770,729	$3,025,469	$5,871,250	$7,750,349
NPV @ 5%	$5,878,390	$7,252,010	$8,167,756	$4,111,442	$7,252,010	$8,325,827
IRR, %	34.6	45.1	53.4	29.3	45.1	54.6

TABLE 7.6
GOLD ROAD PROJECT
SENSITIVITY TO CHANGES IN SPOT PRICES

	SPOT PRICE				
	$330	$350	$375	$400	$425
CASE 1					
NPV @ 15%	$5,311,377	$6,348,590	$ 7,645,107	$ 8,941,624	$10,238.140
NPV @ 10%	$6,438,764	$7,565,404	$ 8,973,704	$10,382,003	$11,790,303
NPV @ 5%	$7,727,446	$8,954,310	$10,487,891	$12,021,471	$13,555,051
IRR, %	55.0	62.3	71.2	79.9	88.4
CASE 2					
NPV @ 15%	$3,986,787	$4,984,348	$6,231,298	$ 7,478,248	$ 8,725,198
NPV @ 10%	$5,094,159	$6,187,660	$7,554,535	$ 8,921,411	$10,288,287
NPV @ 5%	$6,360,697	$7,562,372	$9,064,467	$10,566.561	$12,068,655
IRR, %	41.7	47.7	54.9	61.7	68.4
CASE 3					
NPV @ 15%	$3,688,011	$4,667,145	$5,891,061	$ 7,114,978	$ 8,338,895
NPV @ 10%	$4,796,076	$5,871,250	$7,215,218	$ 8,559,185	$ 9,903,152
NPV @ 5%	$6,068,246	$7,252,016	$8,731,714	$10,211,419	$11,691,123
IRR, %	39.3	45.1	52.1	58.8	65.3

APPENDIX 1

DETAILED ORE RESERVE CALCULATIONS

Phase I - 24.6 Percent Dilution

(No start up loss)
Cases 1 and 3

	GOLD												SILVER							
	Reserves			Dilution			Diluted Tons			Recoverable	Price	Value	Recoverable	Price	Value	Royalty & Sales (4.5%)	Mining Mill, etc.	Total Cost/ton	Stope Value	Oz Mined Gold
Block	Tons	Grade	Ounces	Tons	Grade	Ounces	Tons	Grade	Ounces	Ounces	$/oz		Ounces	$/oz		$/ton	$/ton			
MD/54	15210	0.773	11757	3742	0.027	101	18952	0.626	11858	11265	375	$4,224,539	5633	4.50	$25,347	10.09	55.52	65.61	$3,006,445	11858
MD/52	4330	0.512	2217	1065	0.027	29	5395	0.416	2246	2133	375	$800,038	1067	4.50	$4,800	6.71	55.52	62.23	$469,080	2246
MD/51	6440	0.251	1616	1584	0.027	43	8024	0.207	1659	1576	375	$591,095	788	4.50	$3,547	3.33	55.52	58.85	$122,377	1659
350/38	6640	0.223	1481	1633	0.027	44	8273	0.184	1525	1449	375	$543,218	724	4.50	$3,259	2.97	55.52	58.49	$82,545	1525
350/31	5340	0.239	1276	1314	0.027	35	6654	0.197	1312	1246	375	$467,303	623	4.50	$2,804	3.18	55.52	58.70	$79,542	1312
350/30	3900	0.192	749	959	0.027	26	4859	0.159	775	736	375	$275,988	368	4.50	$1,656	2.57	55.52	58.09	($4,644)	0
350/26	10980	0.158	1735	2701	0.027	73	13681	0.132	1808	1717	375	$644,018	859	4.50	$3,864	2.13	55.52	57.65	($140,846)	0
350/25	28470	0.196	5580	7004	0.027	189	35474	0.163	5769	5481	375	$2,055,284	2740	4.50	$12,332	2.62	55.52	58.14	$5,077	5769
350/21	7254	0.210	1523	1784	0.027	48	9038	0.174	1572	1493	375	$559,854	746	4.50	$3,359	2.80	55.52	58.32	$36,052	1572
350/14	17230	0.292	5031	4239	0.027	114	21469	0.240	5146	4888	375	$1,833,121	2444	4.50	$10,999	3.87	55.52	59.39	$569,198	5146
350/04	16390	1.204	19734	4032	0.027	109	20422	0.972	19842	18850	375	$7,068,863	9425	4.50	$42,413	15.67	55.52	71.19	$5,657,443	19842
350/03	29998	0.473	14189	7380	0.027	199	37378	0.385	14388	13669	375	$5,125,832	6834	4.50	$30,755	6.21	55.52	61.73	$2,849,341	14388
100/01A	15240	0.339	5166	3749	0.027	101	18989	0.277	5268	5004	375	$1,876,577	2502	4.50	$11,259	4.47	55.52	59.99	$748,612	5268
100/01B	17480	0.339	5926	4300	0.027	116	21780	0.277	6042	5740	375	$2,152,399	2870	4.50	$12,914	4.47	55.52	59.99	$858,644	6042
100/02	19430	0.430	8355	4780	0.027	129	24210	0.350	8484	8060	375	$3,022,409	4030	4.50	$18,134	5.65	55.52	61.17	$1,559,592	8484
100/11	3820	0.306	1169	940	0.027	25	4760	0.251	1194	1135	375	$425,467	567	4.50	$2,553	4.05	55.52	59.57	$144,499	1194
100/12&13	5490	0.216	1186	1351	0.027	36	6841	0.179	1222	1161	375	$435,446	581	4.50	$2,613	2.88	55.52	58.40	$38,559	1222
100/20	2410	0.825	1988	593	0.027	16	3003	0.667	2004	1904	375	$714,017	952	4.50	$4,284	10.76	55.52	66.28	$519,258	2004
100/19	8350	0.233	1946	2054	0.027	55	10404	0.192	2001	1901	375	$712,860	950	4.50	$4,277	3.10	55.52	58.62	$107,230	2001
100/24	11200	0.157	1758	2755	0.027	74	13955	0.131	1833	1741	375	$652,932	871	4.50	$3,916	2.12	55.52	57.64	($147,502)	0
100/28	2390	0.180	430	588	0.027	16	2978	0.150	446	424	375	$158,914	212	4.50	$953	2.42	55.52	57.94	($12,662)	0
100/29	5290	0.196	1037	1301	0.027	35	6591	0.163	1072	1018	375	$381,892	509	4.50	$2,291	2.62	55.52	58.14	$943	1072
100/36	2390	0.115	275	588	0.027	16	2978	0.098	291	276	375	$103,571	138	4.50	$621	1.57	55.52	57.09	($65,832)	0
100/37	12320	0.169	2082	3031	0.027	82	15351	0.141	2164	2056	375	$770,893	1028	4.50	$4,625	2.27	55.52	57.79	($111,652)	0
	257992		98206	63466		1714	321458		99920	94924		$35,596,527.38	47462		$213,579				$16,351,302	92604

Phase II - 24.6 Percent Dilution

	GOLD												SILVER			Royalty &	Mining	Total	Stope	Oz
	Reserves			Dilution			Diluted Tons			Recoverable	Price	Value	Recoverable	Price	Value	Sales (4.5%)	Mill, etc.	Cost/ton	Value	Mined
Block	Tons	Grade	Ounces	Tons	Grade	Ounces	Tons	Grade	Ounces	Ounces	$/oz		Ounces	$/oz		$/ton	$/ton			Gold
500/32	2900	0.206	597	713.4	0.027	19	3613	0.171	617	586	375	$219,686	293	4.50	$1,318	2.75	55.52	58.27	$10,443	617
500/21	17650	0.210	3707	4341.9	0.027	117	21992	0.174	3824	3633	375	$1,362,204	1816	4.50	$8,173	2.80	55.52	58.32	$87,720	3824
500/16	6230	0.287	1788	1532.58	0.027	41	7763	0.236	1829	1738	375	$651,720	869	4.50	$3,910	3.80	55.52	59.32	$195,149	1829
500/15	4730	0.302	1428	1163.58	0.027	31	5894	0.248	1460	1387	375	$520,081	693	4.50	$3,120	3.99	55.52	59.51	$172,446	1460
500/06	6960	0.354	2464	1712.16	0.027	46	8672	0.289	2510	2385	375	$894,212	1192	4.50	$5,365	4.67	55.52	60.19	$377,618	2510
500/05	15385	0.442	6800	3784.71	0.027	102	19170	0.360	6902	6557	375	$2,458,965	3279	4.50	$14,754	5.81	55.52	61.33	$1,298,099	6902
600/27	7630	0.193	1473	1876.98	0.027	51	9507	0.160	1523	1447	375	$542,664	724	4.50	$3,256	2.58	55.52	58.10	($6,474)	0
700/33	5480	0.272	1491	1348.08	0.027	36	6828	0.224	1527	1451	375	$543,979	725	4.50	$3,264	3.61	55.52	59.13	$143,522	1527
700/22	24440	0.219	5352	6012.24	0.027	162	30452	0.181	5515	5239	375	$1,964,608	2619	4.50	$11,788	2.92	55.52	58.44	$196,750	5515
700/18	2410	0.262	631	592.86	0.027	16	3003	0.216	647	615	375	$230,646	308	4.50	$1,384	3.48	55.52	59.00	$54,870	647
700/17	3910	0.294	1150	961.86	0.027	26	4872	0.241	1176	1117	375	$418,776	558	4.50	$2,513	3.89	55.52	59.41	$131,845	1176
700/08	9940	0.322	3201	2445.24	0.027	66	12385	0.264	3267	3103	375	$1,163,762	1552	4.50	$6,983	4.25	55.52	59.77	$430,433	3267
700/07	22933	0.390	8944	5641.518	0.027	152	28575	0.318	9096	8641	375	$3,240,518	4321	4.50	$19,443	5.13	55.52	60.65	$1,526,806	9096
700/35	7340	0.370	2716	1805.64	0.027	49	9146	0.302	2765	2626	375	$984,872	1313	4.50	$5,909	4.88	55.52	60.40	$438,430	2765
700/43	5230	0.274	1433	1286.58	0.027	35	6517	0.225	1468	1394	375	$522,889	697	4.50	$3,137	3.63	55.52	59.15	$140,554	1468
700/45	3590	0.345	1239	883.14	0.027	24	4473	0.282	1262	1199	375	$449,728	600	4.50	$2,698	4.55	55.52	60.07	$183,719	1262
	146758		44413	36102		975	182860		45388	43118		$16,169,310	21559		$2,698				$5,381,928	43864

Phase III - 24.6 Percent Dilution

BEHRE DOLBEAR & COMPANY, INC.

	GOLD												SILVER			Royalty &	Mining	Total	Stope	Oz
	Reserves			Dilution			Diluted Tons			Recoverable	Price	Value	Recoverable	Price	Value	Sales (4.5%)	Mill, etc.	Cost/ton	Value	Mined
Block	Tons	Grade	Ounces	Tons	Grade	Ounces	Tons	Grade	Ounces	Ounces	$/oz		Ounces	$/oz		$/ton	$/ton			Gold
900/44	572	0.390	223	141	0.027	4	713	0.318	227	216	375	$80,826	108	4.50	$485	5.13	55.52	60.65	$38,082	227
900/34	9800	0.214	2097	2411	0.027	65	12211	0.177	2162	2054	375	$770,316	1027	4.50	$4,622	2.86	55.52	58.38	$62,122	2162
900/23	4436	0.163	723	1091	0.027	29	5527	0.136	753	715	375	$268,089	357	4.50	$1,609	2.20	55.52	57.72	($49,312)	0
900/10	1800	0.154	277	443	0.027	12	2243	0.129	289	275	375	$103,012	137	4.50	$618	2.08	55.52	57.60	($25,554)	0
900/09	2701	0.177	478	664	0.027	18	3365	0.147	496	471	375	$176,706	236	4.50	$1,060	2.38	55.52	57.90	($17,083)	0
900/46	1144	0.183	209	281	0.027	8	1425	0.152	217	206	375	$77,289	103	4.50	$464	2.45	55.52	57.97	($4,886)	0
900/47	5896	0.431	2541	1450	0.027	39	7346	0.351	2580	2451	375	$919,245	1226	4.50	$5,515	5.66	55.52	61.18	$475,273	2580
900/48	2748	0.259	712	676	0.027	18	3424	0.213	730	693	375	$260,057	347	4.50	$1,560	3.44	55.52	58.96	$59,744	730
900/49	3360	0.155	521	827	0.027	22	4187	0.130	543	516	375	$193,485	258	4.50	$1,161	2.09	55.52	57.61	($46,551)	0
900/53	1924	0.121	233	473	0.027	13	2397	0.102	246	233	375	$87,489	117	4.50	$525	1.65	55.52	57.17	($49,045)	0
900/55	1628	0.261	425	400	0.027	11	2028	0.215	436	414	375	$155,204	207	4.50	$931	3.46	55.52	58.98	$36,503	436
900/56/57	2010	0.443	890	494	0.027	13	2504	0.361	904	859	375	$321,972	429	4.50	$1,932	5.82	55.52	61.34	$170,280	904
900/58/59	4820	0.689	3321	1186	0.027	32	6006	0.558	3353	3185	375	$1,194,504	1593	4.50	$7,167	9.00	55.52	64.52	$814,159	3353
900/60/61	3000	0.223	669	738	0.027	20	3738	0.184	689	654	375	$245,430	327	4.50	$1,473	2.97	55.52	58.49	$28,258	689
900/62	7850	0.280	2198	1931	0.027	52	9781	0.230	2250	2138	375	$801,612	1069	4.50	$4,810	3.71	55.52	59.23	$227,086	2250
900/63	4584	0.284	1302	1128	0.027	30	5712	0.233	1332	1266	375	$474,633	633	4.50	$2,848	3.76	55.52	59.28	$138,882	1332
900/64/65	7620	0.270	2057	1875	0.027	51	9495	0.222	2108	2003	375	$750,979	1001	4.50	$4,506	3.58	55.52	59.10	$194,353	2108
900/66	8992	0.198	1780	2212	0.027	60	11204	0.164	1840	1748	375	$655,550	874	4.50	$3,933	2.65	55.52	58.17	$7,759	1840
900/68	3340	0.180	601	822	0.027	22	4162	0.150	623	592	375	$222,081	296	4.50	$1,332	2.42	55.52	57.94	($17,695)	0
900/69	2220	0.587	1303	546	0.027	15	2766	0.476	1318	1252	375	$469,497	626	4.50	$2,817	7.68	55.52	63.20	$297,485	1318
	80445		22562	19789		534	100234		23096	21941		$8,227,976.79	10971		$49,368				$2,339,862	19929

Total all Phases 156398

Phase I - 24.6 Percent Dilution

(Sartup Included)

Case 2

	GOLD												SILVER							
	Reserves			Dilution			Diluted Tons			Recoverable	Price	Value	Recoverable	Price	Value	Royalty & Sales (4.5%)	Mining Mill, etc.	Total Cost/ton	Stope Value	Oz Mined Gold
Block	Tons	Grade	Ounces	Tons	Grade	Ounces	Tons	Grade	Ounces	Ounces	$/oz		Ounces	$/oz		$/ton	$/ton			
MD/54	15210	0.773	11757	3742	0.027	101	18952	0.626	11858	11265	375	$4,224,539	5633	4.50	$25,347	10.09	58.07	68.16	$2,958,118	11858
MD/52	4330	0.512	2217	1065	0.027	29	5395	0.416	2246	2133	375	$800,038	1067	4.50	$4,800	6.71	58.07	64.78	$455,322	2246
MD/51	6440	0.251	1616	1584	0.027	43	8024	0.207	1659	1576	375	$591,095	788	4.50	$3,547	3.33	58.07	61.40	$101,915	1659
350/38	6640	0.223	1481	1633	0.027	44	8273	0.184	1525	1449	375	$543,218	724	4.50	$3,259	2.97	58.07	61.04	$41,447	1525
350/31	5340	0.239	1276	1314	0.027	35	6654	0.197	1312	1246	375	$467,303	623	4.50	$2,804	3.18	58.07	61.25	$62,575	1312
350/30	3900	0.192	749	959	0.027	26	4859	0.159	775	736	375	$275,988	368	4.50	$1,656	2.57	58.07	60.64	($17,035)	0
350/26	10980	0.158	1735	2701	0.027	73	13681	0.132	1808	1717	375	$644,018	859	4.50	$3,864	2.13	58.07	60.20	($175,733)	0
350/25	28470	0.196	5580	7004	0.027	189	35474	0.163	5769	5481	375	$2,055,284	2740	4.50	$12,332	2.62	58.07	60.69	($85,380)	0
350/21	7254	0.210	1523	1784	0.027	48	9038	0.174	1572	1493	375	$559,854	746	4.50	$3,359	2.80	58.07	60.87	$13,004	1572
350/14	17230	0.292	5031	4239	0.027	114	21469	0.240	5146	4888	375	$1,833,121	2444	4.50	$10,999	3.87	58.07	61.94	$514,454	5146
350/04	16390	1.204	19734	4032	0.027	109	20422	0.972	19842	18850	375	$7,068,863	9425	4.50	$42,413	15.67	58.07	73.74	$5,605,367	19842
350/03	29998	0.473	14189	7380	0.027	199	37378	0.385	14388	13669	375	$5,125,832	6834	4.50	$30,755	6.21	58.07	64.28	$2,754,029	14388
100/01A	15240	0.339	5166	3749	0.027	101	18989	0.277	5268	5004	375	$1,876,577	2502	4.50	$11,259	4.47	58.07	62.54	$700,190	5268
100/01B	17480	0.339	5926	4300	0.027	116	21780	0.277	6042	5740	375	$2,152,399	2870	4.50	$12,914	4.47	58.07	62.54	$803,105	6042
100/02	19430	0.430	8355	4780	0.027	129	24210	0.350	8484	8060	375	$3,022,409	4030	4.50	$18,134	5.65	58.07	63.72	$1,497,857	8484
100/11	3820	0.306	1169	940	0.027	25	4760	0.251	1194	1135	375	$425,467	567	4.50	$2,553	4.05	58.07	62.12	$132,362	1194
100/12&13	5490	0.216	1186	1351	0.027	36	6841	0.179	1222	1161	375	$435,446	581	4.50	$2,613	2.88	58.07	60.95	$21,116	1222
100/20	2410	0.825	1988	593	0.027	16	3003	0.667	2004	1904	375	$714,017	952	4.50	$4,284	10.76	58.07	68.83	$511,601	2004
100/19	8350	0.233	1946	2054	0.027	55	10404	0.192	2001	1901	375	$712,860	950	4.50	$4,277	3.10	58.07	61.17	$80,700	2001
100/24	11200	0.157	1758	2755	0.027	74	13955	0.131	1833	1741	375	$652,932	871	4.50	$3,918	2.12	58.07	60.19	($183,088)	0
100/28	2390	0.180	430	588	0.027	16	2978	0.150	446	424	375	$158,914	212	4.50	$953	2.42	58.07	60.49	($20,256)	0
100/29	5290	0.196	1037	1301	0.027	35	6591	0.163	1072	1018	375	$381,892	509	4.50	$2,291	2.62	58.07	60.69	($15,864)	0
100/36	2390	0.115	275	588	0.027	16	2978	0.098	291	276	375	$103,571	138	4.50	$621	1.57	58.07	59.64	($73,426)	0
100/37	12320	0.169	2082	3031	0.027	82	15351	0.141	2164	2056	375	$770,893	1028	4.50	$4,625	2.27	58.07	60.34	($150,797)	0
	257992		98206	63466		1714	321458		99920	94924		$35,596,527.38	47462		$213,579				$15,531,584	85763

Phase II - 24.6 Percent Dilution

	GOLD												SILVER							
	Reserves			Dilution			Diluted Tons			Recoverable	Price	Value	Recoverable	Price	Value	Royalty & Sales (4.5%)	Mining Mill, etc.	Total Cost/ton	Stope Value	Oz Mined Gold
Block	Tons	Grade	Ounces	Tons	Grade	Ounces	Tons	Grade	Ounces	Ounces	$/oz		Ounces	$/oz		$/ton	$/ton			
500/32	2900	0.206	597	713.4	0.027	19	3613	0.171	617	586	375	$219,686	293	4.50	$1,318	2.75	58.07	60.82	$1,229	617
500/21	17650	0.210	3707	4341.9	0.027	117	21992	0.174	3824	3633	375	$1,362,204	1816	4.50	$8,173	2.80	58.07	60.87	$31,641	3824
500/16	6230	0.287	1788	1532.58	0.027	41	7763	0.236	1829	1738	375	$651,720	869	4.50	$3,910	3.80	58.07	61.87	$175,354	1829
500/15	4730	0.302	1428	1163.58	0.027	31	5894	0.248	1460	1387	375	$520,081	693	4.50	$3,120	3.99	58.07	62.06	$157,417	1460
500/06	6960	0.354	2464	1712.16	0.027	46	8672	0.289	2510	2385	375	$894,212	1192	4.50	$5,365	4.67	58.07	62.74	$355,504	2510
500/05	15385	0.442	6800	3784.71	0.027	102	19170	0.360	6902	6557	375	$2,458,965	3279	4.50	$14,754	5.81	58.07	63.88	$1,249,216	6902
600/27	7630	0.193	1473	1876.98	0.027	51	9507	0.160	1523	1447	375	$542,664	724	4.50	$3,256	2.58	58.07	60.65	($30,716)	0
700/33	5480	0.272	1491	1348.08	0.027	36	6828	0.224	1527	1451	375	$543,979	725	4.50	$3,264	3.61	58.07	61.68	$126,110	1527
700/22	24440	0.219	5352	6012.24	0.027	162	30452	0.181	5515	5239	375	$1,964,608	2619	4.50	$11,788	2.92	58.07	60.99	$119,097	5515
700/18	2410	0.262	631	592.86	0.027	16	3003	0.216	647	615	375	$230,646	308	4.50	$1,384	3.48	58.07	61.55	$47,212	647
700/17	3910	0.294	1150	961.86	0.027	26	4872	0.241	1176	1117	375	$418,776	558	4.50	$2,513	3.89	58.07	61.96	$119,421	1176
700/08	9940	0.322	3201	2445.24	0.027	66	12385	0.264	3267	3103	375	$1,163,762	1552	4.50	$6,983	4.25	58.07	62.32	$398,851	3267
700/07	22933	0.390	8944	5641.518	0.027	152	28575	0.318	9096	8641	375	$3,240,518	4321	4.50	$19,443	5.13	58.07	63.20	$1,453,941	9096
700/35	7340	0.370	2716	1805.64	0.027	49	9146	0.302	2765	2626	375	$984,872	1313	4.50	$5,909	4.88	58.07	62.95	$415,109	2765
700/43	5230	0.274	1433	1286.58	0.027	35	6517	0.225	1468	1394	375	$522,889	697	4.50	$3,137	3.63	58.07	61.70	$123,937	1468
700/45	3590	0.345	1239	883.14	0.027	24	4473	0.282	1262	1199	375	$449,728	600	4.50	$2,698	4.55	58.07	62.62	$172,312	1262
	146758		44413	36102		975	182860		45388	43118		$16,169,310	21559		$2,698				$4,915,634	43864

Phase III - 24.6 Percent Dilution

	GOLD												SILVER			Royalty &	Mining	Total	Stope	Oz
	Reserves			Dilution			Diluted Tons			Recoverable	Price	Value	Recoverable	Price	Value	Sales (4.5%)	Mill, etc.	Cost/ton	Value	Mined
Block	Tons	Grade	Ounces	Tons	Grade	Ounces	Tons	Grade	Ounces	Ounces	$/oz		Ounces	$/oz		$/ton	$/ton			Gold
900/44	572	0.390	223	141	0.027	4	713	0.318	227	216	375	$80,826	108	4.50	$485	5.13	58.07	63.20	$36,265	227
900/34	9800	0.214	2097	2411	0.027	65	12211	0.177	2162	2054	375	$770,316	1027	4.50	$4,622	2.86	58.07	60.93	$30,985	2162
900/23	4436	0.163	723	1091	0.027	29	5527	0.136	753	715	375	$268,089	357	4.50	$1,609	2.20	58.07	60.27	($63,406)	0
900/10	1800	0.154	277	443	0.027	12	2243	0.129	289	275	375	$103,012	137	4.50	$618	2.08	58.07	60.15	($31,273)	0
900/09	2701	0.177	478	664	0.027	18	3365	0.147	496	471	375	$176,706	236	4.50	$1,060	2.38	58.07	60.45	($25,665)	0
900/46	1144	0.183	209	281	0.027	8	1425	0.152	217	206	375	$77,289	103	4.50	$464	2.45	58.07	60.52	($8,521)	0
900/47	5896	0.431	2541	1450	0.027	39	7346	0.351	2580	2451	375	$919,245	1226	4.50	$5,515	5.66	58.07	63.73	$456,540	2580
900/48	2748	0.259	712	676	0.027	18	3424	0.213	730	693	375	$260,057	347	4.50	$1,560	3.44	58.07	61.51	$51,012	730
900/49	3360	0.155	521	827	0.027	22	4187	0.130	543	516	375	$193,485	258	4.50	$1,161	2.09	58.07	60.16	($57,226)	0
900/53	1924	0.121	233	473	0.027	13	2397	0.102	246	233	375	$87,489	117	4.50	$525	1.65	58.07	59.72	($55,158)	0
900/55	1628	0.261	425	400	0.027	11	2028	0.215	436	414	375	$155,204	207	4.50	$931	3.46	58.07	61.53	$31,331	436
900/56/57	2010	0.443	890	494	0.027	13	2504	0.361	904	859	375	$321,972	429	4.50	$1,932	5.82	58.07	63.89	$163,894	904
900/58/59	4820	0.689	3321	1186	0.027	32	6006	0.558	3353	3185	375	$1,194,504	1593	4.50	$7,167	9.00	58.07	67.07	$798,844	3353
900/60/61	3000	0.223	669	738	0.027	20	3738	0.184	689	654	375	$245,430	327	4.50	$1,473	2.97	58.07	61.04	$18,726	689
900/62	7850	0.280	2198	1931	0.027	52	9781	0.230	2250	2138	375	$801,612	1069	4.50	$4,810	3.71	58.07	61.78	$202,144	2250
900/63	4584	0.284	1302	1128	0.027	30	5712	0.233	1332	1266	375	$474,633	633	4.50	$2,848	3.76	58.07	61.83	$124,318	1332
900/64/65	7620	0.270	2057	1875	0.027	51	9495	0.222	2108	2003	375	$750,979	1001	4.50	$4,506	3.58	58.07	61.65	$170,142	2108
900/66	8992	0.198	1780	2212	0.027	60	11204	0.164	1840	1748	375	$655,550	874	4.50	$3,933	2.65	58.07	60.72	($20,811)	0
900/68	3340	0.180	601	822	0.027	22	4162	0.150	623	592	375	$222,081	296	4.50	$1,332	2.42	58.07	60.49	($28,307)	0
900/69	2220	0.587	1303	546	0.027	15	2766	0.476	1318	1252	375	$469,497	626	4.50	$2,817	7.68	58.07	65.75	$290,431	1318
	80445		22562	19789		534	100234		23096	21941		$8,227,976.79	10971		$49,368				$2,084,265	18089

Total all Phases 147716

APPENDIX 2

PRODUCTION SCHEDULES, BASE CASES 1, 2, AND 3

Behre Dolbear & Company, Inc.

Production Schedule
AddWest Minerals, Inc. - Gold Road
$375.00 Reserves
Case I - $350 Hedge Programme with No start up loss and 156398 oz Reserves

Block	Gold Diluted Tons Tons	Grade	Ounces	Stope Production TPD	Max Quaterly Production	Stope Production (tons) Quarter 1	2	3	4	5	6	7	8	9	10	11	12	Stope Production (oz gold) Quarter 1	2	3	4	5	6	7	8	9	10	11	12
MD/54	18952	0.626	11858	172	11180	11180	7772	0	0	0	0	0	0	0	0	0	0	6996	4863	0	0	0	0	0	0	0	0	0	0
MD/52	5395	0.416	2246	118	5395	5395	0	0	0	0	0	0	0	0	0	0	0	2246	0	0	0	0	0	0	0	0	0	0	0
MD/51	8024	0.207	1659	136	8024	8024	0	0	0	0	0	0	0	0	0	0	0	1659	0	0	0	0	0	0	0	0	0	0	0
350/36	8273	0.184	1525	150	8273	8273	0	0	0	0	0	0	0	0	0	0	0	1525	0	0	0	0	0	0	0	0	0	0	0
350/31	6654	0.197	1312	146	6654	6654	0	0	0	0	0	0	0	0	0	0	0	1312	0	0	0	0	0	0	0	0	0	0	0
350/30	0	0.159	775	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350/26	0	0.132	1808	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350/25	35474	0.163	5769	164	10660	7199	10660	10660	6955	0	0	0	0	0	0	0	0	1171	1734	1734	1131	0	0	0	0	0	0	0	0
350/21	9036	0.174	1572	121	7865	0	7865	1173	0	0	0	0	0	0	0	0	0	0	1367	204	0	0	0	0	0	0	0	0	0
350/14	21469	0.240	5146	164	10660	0	10660	10660	149	0	0	0	0	0	0	0	0	0	2555	2555	36	0	0	0	0	0	0	0	0
350/04	20422	0.972	19842	159	10335	0	9768	10335	319	0	0	0	0	0	0	0	0	0	9491	10042	310	0	0	0	0	0	0	0	0
350/03	37378	0.385	14388	159	10335	0	0	10335	10335	10335	6373	0	0	0	0	0	0	0	0	3978	3978	3978	2453	0	0	0	0	0	0
100/01A	18989	0.277	5268	143	9295	0	0	3562	9295	6133	0	0	0	0	0	0	0	0	0	988	2578	1701	0	0	0	0	0	0	0
100/01B	21780	0.277	6042	143	9295	0	0	0	9295	9295	3190	0	0	0	0	0	0	0	0	0	2578	2578	885	0	0	0	0	0	0
100/02	24210	0.350	8484	170	11050	0	0	0	10378	11050	2782	0	0	0	0	0	0	0	0	0	3637	3872	975	0	0	0	0	0	0
100/11	4760	0.251	1194	121	4760	0	0	0	0	4760	0	0	0	0	0	0	0	0	0	0	0	1194	0	0	0	0	0	0	0
100/12&13	6841	0.179	1222	132	6841	0	0	0	0	5153	1688	0	0	0	0	0	0	0	0	0	0	921	302	0	0	0	0	0	0
100/20	3003	0.667	2004	76	3003	0	0	0	0	0	3003	0	0	0	0	0	0	0	0	0	0	0	2004	0	0	0	0	0	0
100/19	10404	0.192	2001	137	8905	0	0	0	0	0	8905	1499	0	0	0	0	0	0	0	0	0	0	1713	288	0	0	0	0	0
100/24	0	0.131	1833	141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/28	0	0.150	446	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/29	6591	0.163	1072	138	6591	0	0	0	0	0	6591	0	0	0	0	0	0	0	0	0	0	0	1072	0	0	0	0	0	0
100/36	0	0.098	291	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/37	0	0.141	2164	164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500/32	3613	0.171	617	60	3613	0	0	0	0	0	3613	0	0	0	0	0	0	0	0	0	0	0	617	0	0	0	0	0	0
500/21	21992	0.174	3824	159	10335	0	0	0	0	0	10335	10335	1322	0	0	0	0	0	0	0	0	0	1797	1797	230	0	0	0	0
500/16	7763	0.236	1829	134	7763	0	0	0	0	0	245	7518	0	0	0	0	0	0	0	0	0	0	58	1772	0	0	0	0	0
500/15	5894	0.248	1460	138	5894	0	0	0	0	0	0	5894	0	0	0	0	0	0	0	0	0	0	0	1460	0	0	0	0	0
500/08	8672	0.289	2510	118	7670	0	0	0	0	0	0	7670	1002	0	0	0	0	0	0	0	0	0	0	2220	290	0	0	0	0
500/05	19170	0.360	6902	180	11700	0	0	0	0	0	0	11700	7470	0	0	0	0	0	0	0	0	0	0	4213	2689	0	0	0	0
600/27	0	0.160	1523	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700/33	6828	0.224	1527	45	2925	0	0	0	0	0	0	2110	2925	1793	0	0	0	0	0	0	0	0	0	472	654	401	0	0	0
700/22	30452	0.181	5515	164	10660	0	0	0	0	0	0	0	10660	10660	9132	0	0	0	0	0	0	0	0	0	1930	1930	1654	0	0
700/18	3003	0.216	647	66	3003	0	0	0	0	0	0	0	3003	0	0	0	0	0	0	0	0	0	0	0	647	0	0	0	0
700/17	4872	0.241	1176	114	4872	0	0	0	0	0	0	0	4872	0	0	0	0	0	0	0	0	0	0	0	1176	0	0	0	0
700/08	12385	0.264	3267	166	10790	0	0	0	0	0	0	0	10790	1595	0	0	0	0	0	0	0	0	0	0	2846	421	0	0	0
700/07	28575	0.318	9096	228	14820	0	0	0	0	0	0	0	4682	14820	9073	0	0	0	0	0	0	0	0	0	1490	4718	2888	0	0
700/35	9146	0.302	2765	166	9146	0	0	0	0	0	0	0	-0	9146	0	0	0	0	0	0	0	0	0	0	-0	2765	0	0	0
700/43	6517	0.225	1468	134	6517	0	0	0	0	0	0	0	0	6517	0	0	0	0	0	0	0	0	0	0	0	1468	0	0	0
700/45	4473	0.282	1262	108	4473	0	0	0	0	0	0	0	0	2194	2279	0	0	0	0	0	0	0	0	0	0	619	643	0	0
900/44	713	0.318	227	123	713	0	0	0	0	0	0	0	0	0	713	0	0	0	0	0	0	0	0	0	0	0	227	0	0
900/34	12211	0.177	2162	178	11570	0	0	0	0	0	0	0	0	0	11570	641	0	0	0	0	0	0	0	0	0	0	2049	113	0
900/23	0	0.136	753	171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/10	0	0.129	289	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/09	0	0.147	496	134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/46	0	0.152	217	137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2306	274	0
900/47	7346	0.351	2580	101	6565	0	0	0	0	0	0	0	0	0	6565	781	0	0	0	0	0	0	0	0	0	0	730	0	0
900/48	3424	0.213	730	86	3424	0	0	0	0	0	0	0	0	0	3424	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/49	0	0.130	543	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/53	0	0.102	246	80	0	0	0	0	0	0	0	0	0	0	2028	0	0	0	0	0	0	0	0	0	0	0	436	0	0
900/55	2028	0.215	436	61	2028	0	0	0	0	0	0	0	0	0	1941	564	0	0	0	0	0	0	0	0	0	0	700	203	0
900/56/57	2504	0.361	904	60	2504	0	0	0	0	0	0	0	0	0	0	6008	0	0	0	0	0	0	0	0	0	0	0	3353	0
900/58/59	6006	0.558	3353	100	6006	0	0	0	0	0	0	0	0	0	0	3738	0	0	0	0	0	0	0	0	0	0	0	689	0
900/60/61	3738	0.184	689	100	3738	0	0	0	0	0	0	0	0	0	0	9781	0	0	0	0	0	0	0	0	0	0	0	2250	0
900/62	9781	0.230	2250	190	9781	0	0	0	0	0	0	0	0	0	0	5712	0	0	0	0	0	0	0	0	0	0	0	1332	0
900/63	5712	0.233	1332	190	5712	0	0	0	0	0	0	0	0	0	0	9495	0	0	0	0	0	0	0	0	0	0	0	2106	0
900/64/65	9495	0.222	2108	150	9495	0	0	0	0	0	0	0	0	0	0	10008	1196	0	0	0	0	0	0	0	0	0	0	1644	196
900/66	11204	0.164	1840	180	11204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/68	0	0.150	623	180	0	0	0	0	0	0	0	0	0	0	0	-0	2766	0	0	0	0	0	0	0	0	0	0	-0	1318
900/69	2766	0.476	1318	75	2766	0	0	0	0	0	0	0	0	0	0	0	0	3962	14908	20010	19501	14248	14245	11875	12221	11953	12321	11633	11967	1514
						46725	46725	46725	46725	46725	46725	46725	46725	46725	46725	46725													

Stope production rates were calculated by AddWest except,
BD accelerated production from last 8 stopes over Addwest's figures
to maintain production in the last quarter

Behre Dolbear & Company, Inc.

Production Schedule
AddWest Minerals, Inc. - Gold Road
$375.00 Reserves
Case 2

	Gold			Stope Production	Max Quaterly	Stope Production (tons) Quarter											Stope Production (oz gold) Quarter										
	Diluted Tons																										
Block	Tons	Grade	Ounces	TPD	Production	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	10	11
MD/54	18952	0.626	11858	172	11180	11180	7772	0	0	0	0	0	0	0	0	0	6996	4863	0	0	0	0	0	0	0	0	0
MD/52	5395	0.416	2246	118	5395	5395	0	0	0	0	0	0	0	0	0	0	2246	0	0	0	0	0	0	0	0	0	0
MD/51	8024	0.207	1659	138	8024	6787	1237	0	0	0	0	0	0	0	0	0	1403	256	0	0	0	0	0	0	0	0	0
350/38	8273	0.184	1525	150	8273	0	8273	0	0	0	0	0	0	0	0	0	0	1525	0	0	0	0	0	0	0	0	0
350/31	6654	0.197	1312	146	6654	0	6654	0	0	0	0	0	0	0	0	0	0	1312	0	0	0	0	0	0	0	0	0
350/30	0	0.159	775	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350/26	0	0.132	1808	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350/25	0	0.163	5769	164	0	0	0	0	0	0	0	0	0	0	0	0	0	1367	204	0	0	0	0	0	0	0	0
350/21	9038	0.174	1572	121	7865	0	7865	1173	0	0	0	0	0	0	0	0	0	777	2555	1813	0	0	0	0	0	0	0
350/14	21469	0.240	5146	164	10660	0	3243	10660	7565	0	0	0	0	0	0	0	0	0	10042	9801	0	0	0	0	0	0	0
350/04	20422	0.972	19842	159	10335	0	0	10335	10087	0	0	0	0	0	0	0	0	0	3978	3978	3978	2453	0	0	0	0	0
350/03	37378	0.385	14388	159	10335	0	0	10335	10335	10335	6373	0	0	0	0	0	0	0	2578	2578	111	0	0	0	0	0	0
100/01A	18989	0.277	5268	143	9295	0	0	9295	9295	399	0	0	0	0	0	0	0	0	70	2578	2578	814	0	0	0	0	0
100/01B	21780	0.277	6042	143	9295	0	0	254	9295	9295	2936	0	0	0	0	0	0	0	0	52	3872	3872	688	0	0	0	0
100/02	24210	0.350	8484	170	11050	0	0	0	148	11050	11050	1962	0	0	0	0	0	0	0	0	1194	0	0	0	0	0	0
100/11	4760	0.251	1194	121	4760	0	0	0	0	4760	0	0	0	0	0	0	0	0	0	0	1222	0	0	0	0	0	0
100/12&13	6841	0.179	1222	132	6841	0	0	0	0	6841	0	0	0	0	0	0	0	0	0	0	2004	0	0	0	0	0	0
100/20	3003	0.667	2004	76	3003	0	0	0	0	3003	0	0	0	0	0	0	0	0	0	0	201	1713	88	0	0	0	0
100/19	10404	0.192	2001	137	8905	0	0	0	0	1043	8905	456	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/24	0	0.131	1833	141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/28	0	0.150	446	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/29	0	0.163	1072	138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/36	0	0.098	291	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/37	0	0.141	2164	164	0	0	0	0	0	0	3613	0	0	0	0	0	0	0	0	0	0	617	0	0	0	0	0
500/32	3613	0.171	617	60	3613	0	0	0	0	0	10335	10335	1322	0	0	0	0	0	0	0	0	1797	1797	230	0	0	0
500/21	21992	0.174	3824	159	10335	0	0	0	0	0	3513	4250	0	0	0	0	0	0	0	0	0	828	1001	0	0	0	0
500/16	7763	0.236	1829	134	7763	0	0	0	0	0	0	5894	0	0	0	0	0	0	0	0	0	0	1460	0	0	0	0
500/15	5894	0.248	1460	138	5894	0	0	0	0	0	0	7670	1002	0	0	0	0	0	0	0	0	0	2220	290	0	0	0
500/06	8672	0.289	2510	118	7670	0	0	0	0	0	0	11700	7470	0	0	0	0	0	0	0	0	0	4213	2690	0	0	0
500/05	19170	0.360	6902	180	11700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600/27	0	0.160	1523	150	0	0	0	0	0	0	0	2925	2925	978	0	0	0	0	0	0	0	0	654	654	219	0	0
700/33	6828	0.224	1527	45	2925	0	0	0	0	0	0	1533	10660	10660	7599	0	0	0	0	0	0	0	278	1930	1930	1376	0
700/22	30452	0.181	5515	164	10660	0	0	0	0	0	0	0	3003	0	0	0	0	0	0	0	0	0	0	647	0	0	0
700/18	3003	0.216	647	66	3003	0	0	0	0	0	0	0	4872	0	0	0	0	0	0	0	0	0	0	1176	0	0	0
700/17	4672	0.241	1176	114	4872	0	0	0	0	0	0	0	10790	1595	0	0	0	0	0	0	0	0	0	2846	421	0	0
700/08	12385	0.264	3267	166	10790	0	0	0	0	0	0	0	4682	14820	9073	0	0	0	0	0	0	0	0	1490	4718	2888	0
700/07	28575	0.318	9096	228	14820	0	0	0	0	0	0	0	-0	9146	0	0	0	0	0	0	0	0	0	-0	2765	0	0
700/35	9146	0.302	2765	166	9146	0	0	0	0	0	0	0	0	6517	0	0	0	0	0	0	0	0	0	0	1468	0	0
700/43	6517	0.225	1468	134	6517	0	0	0	0	0	0	0	0	3009	1464	0	0	0	0	0	0	0	0	0	849	413	0
700/45	4473	0.282	1262	108	4473	0	0	0	0	0	0	0	0	0	713	0	0	0	0	0	0	0	0	0	0	227	0
900/44	713	0.318	227	123	713	0	0	0	0	0	0	0	0	0	11570	641	0	0	0	0	0	0	0	0	0	2049	113
900/34	12211	0.177	2162	178	11570	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/23	0	0.136	753	171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/10	0	0.129	289	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/09	0	0.147	496	134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/46	0	0.152	217	137	0	0	0	0	0	0	0	0	0	0	6555	781	0	0	0	0	0	0	0	0	0	2306	274
900/47	7346	0.351	2580	101	6565	0	0	0	0	0	0	0	0	0	3424	0	0	0	0	0	0	0	0	0	0	730	0
900/48	3424	0.213	730	86	3424	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/49	0	0.130	543	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/53	0	0.102	246	80	0	0	0	0	0	0	0	0	0	0	2028	0	0	0	0	0	0	0	0	0	0	433	0
900/55	2028	0.215	436	61	2028	0	0	0	0	0	0	0	0	0	2504	0	0	0	0	0	0	0	0	0	0	904	0
900/56/57	2504	0.361	904	60	2504	0	0	0	0	0	0	0	0	0	1785	4221	0	0	0	0	0	0	0	0	0	997	2356
900/58/59	6006	0.558	3353	100	6006	0	0	0	0	0	0	0	0	0	0	3738	0	0	0	0	0	0	0	0	0	0	689
900/60/61	3738	0.184	689	100	3738	0	0	0	0	0	0	0	0	0	0	9781	0	0	0	0	0	0	0	0	0	0	2250
900/62	9781	0.230	2250	190	9781	0	0	0	0	0	0	0	0	0	0	5712	0	0	0	0	0	0	0	0	0	0	1332
900/63	5712	0.233	1332	190	5712	0	0	0	0	0	0	0	0	0	0	9495	0	0	0	0	0	0	0	0	0	0	2108
900/64/65	9495	0.222	2108	150	9495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/66	0	0.164	1840	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/68	0	0.150	623	180	0	0	0	0	0	0	0	0	0	0	0	2766	0	0	0	0	0	0	0	0	0	0	1318
900/69	2766	0.476	1318	75	2766	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						23363	35044	42053	45725	46725	45725	46725	46725	46725	46725	37134	10645	10100	19428	20801	15161	12094	12398	11953	12369	12325	10442

Stope production rates were calculated by AddWest except,
BD accelerated production from last 8 stopes over Addwest's figures
to maintain production in the last quarter

Behre Dolbear & Company, Inc.

Production Schedule
AddWest Minerals, Inc. - Gold Road
$375.00 Reserves
Case 3 - $350 Hedge Program with Start Up using 156398 oz reserves

	Gold			Stope Production	Max Quaterly	Stope Production (tons) Quarter												Stope Production (oz gold) Quarter											
	Diluted Tons																												
Block	Tons	Grade	Ounces	TPD	Production	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
MD/54	18952	0.626	11858	172	11180	11180	7772	0	0	0	0	0	0	0	0	0	0	6996	4863	0	0	0	0	0	0	0	0	0	0
MD/52	5395	0.416	2246	118	5395	5395	0	0	0	0	0	0	0	0	0	0	0	2246	0	0	0	0	0	0	0	0	0	0	0
MD/51	8024	0.207	1659	138	8024	6787	1237	0	0	0	0	0	0	0	0	0	0	1403	256	0	0	0	0	0	0	0	0	0	0
350/38	8273	0.184	1525	150	8273	0	8273	0	0	0	0	0	0	0	0	0	0	0	1525	0	0	0	0	0	0	0	0	0	0
350/31	6654	0.197	1312	146	6654	0	6654	0	0	0	0	0	0	0	0	0	0	0	1312	0	0	0	0	0	0	0	0	0	0
350/30	0	0.159	775	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350/26	0	0.132	1808	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1734	1734	1734	568	0	0	0	0	0	0	0
350/25	35474	0.163	5769	164	10660	0	10660	10660	10660	3494	0	0	0	0	0	0	0	0	78	1367	126	0	0	0	0	0	0	0	0
350/21	9038	0.174	1572	121	7865	0	448	7865	725	0	0	0	0	0	0	0	0	0	0	2555	2555	36	0	0	0	0	0	0	0
350/14	21469	0.240	5146	164	10660	0	0	10660	10660	149	0	0	0	0	0	0	0	0	0	10042	9801	0	0	0	0	0	0	0	0
350/04	20422	0.972	19842	159	10335	0	0	10335	10087	0	0	0	0	0	0	0	0	0	0	975	3978	3978	3978	1478	0	0	0	0	0
350/03	37378	0.385	14388	159	10335	0	0	2533	10335	10335	10335	3840	0	0	0	0	0	0	0	0	1181	2578	1508	0	0	0	0	0	0
100/01A	18989	0.277	5268	143	9295	0	0	0	4258	9295	5436	0	0	0	0	0	0	0	0	0	0	2578	2578	885	0	0	0	0	0
100/01B	21780	0.277	6042	143	9295	0	0	0	0	9295	9295	3190	0	0	0	0	0	0	0	0	0	3872	3872	739	0	0	0	0	0
100/02	24210	0.350	8484	170	11050	0	0	0	0	11050	11050	2110	0	0	0	0	0	0	0	0	0	780	414	0	0	0	0	0	0
100/11	4760	0.251	1194	121	4760	0	0	0	0	3108	1652	0	0	0	0	0	0	0	0	0	0	0	1222	0	0	0	0	0	0
100/12&13	6841	0.179	1222	132	6841	0	0	0	0	0	6841	0	0	0	0	0	0	0	0	0	0	0	1412	592	0	0	0	0	0
100/20	3003	0.667	2004	76	3003	0	0	0	0	0	2116	887	0	0	0	0	0	0	0	0	0	0	0	1713	288	0	0	0	0
100/19	10404	0.192	2001	137	8905	0	0	0	0	0	0	8905	1499	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/24	0	0.131	1833	141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/28	0	0.150	446	115	0	0	0	0	0	0	0	6591	0	0	0	0	0	0	0	0	0	0	0	1072	0	0	0	0	0
100/29	6591	0.163	1072	138	6591	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/36	0	0.098	291	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100/37	0	0.141	2164	164	0	0	0	0	0	0	0	3613	0	0	0	0	0	0	0	0	0	0	0	617	0	0	0	0	0
500/32	3613	0.171	617	60	3613	0	0	0	0	0	0	10335	10335	1322	0	0	0	0	0	0	0	0	0	1797	1797	230	0	0	0
500/21	21992	0.174	3824	159	10335	0	0	0	0	0	0	7254	509	0	0	0	0	0	0	0	0	0	0	1709	120	0	0	0	0
500/16	7763	0.236	1829	134	7763	0	0	0	0	0	0	0	5894	0	0	0	0	0	0	0	0	0	0	0	1460	0	0	0	0
500/15	5894	0.248	1460	138	5894	0	0	0	0	0	0	0	7670	1002	0	0	0	0	0	0	0	0	0	0	2220	290	0	0	0
500/06	8672	0.289	2510	118	7670	0	0	0	0	0	0	0	11700	7470	0	0	0	0	0	0	0	0	0	0	4213	2690	0	0	0
500/05	19170	0.360	6902	180	11700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600/27	0	0.160	1523	150	0	0	0	0	0	0	0	0	2925	2925	978	0	0	0	0	0	0	0	0	0	654	654	219	0	0
700/33	6828	0.224	1527	45	2925	0	0	0	0	0	0	0	6193	10650	10660	2939	0	0	0	0	0	0	0	0	1122	1930	1930	532	0
700/22	30452	0.181	5515	164	10660	0	0	0	0	0	0	0	0	3003	0	0	0	0	0	0	0	0	0	0	0	647	0	0	0
700/18	3003	0.216	647	66	3003	0	0	0	0	0	0	0	0	4372	0	0	0	0	0	0	0	0	0	0	0	1176	0	0	0
700/17	4872	0.241	1176	114	4872	0	0	0	0	0	0	0	0	10790	1595	0	0	0	0	0	0	0	0	0	0	2846	421	0	0
700/08	12385	0.264	3267	166	10790	0	0	0	0	0	0	0	0	4682	14820	9073	0	0	0	0	0	0	0	0	0	1490	4718	2888	0
700/07	28575	0.318	9096	228	14820	0	0	0	0	0	0	0	0	-0	9146	0	0	0	0	0	0	0	0	0	0	-0	2765	0	0
700/35	9146	0.302	2765	166	9146	0	0	0	0	0	0	0	0	0	6517	0	0	0	0	0	0	0	0	0	0	0	1468	0	0
700/43	6517	0.225	1468	134	6517	0	0	0	0	0	0	0	0	0	3009	1464	0	0	0	0	0	0	0	0	0	0	849	413	0
700/45	4473	0.282	1262	108	4473	0	0	0	0	0	0	0	0	0	0	713	0	0	0	0	0	0	0	0	0	0	0	227	0
900/44	713	0.318	227	123	713	0	0	0	0	0	0	0	0	0	0	11570	641	0	0	0	0	0	0	0	0	0	0	2049	113
900/34	12211	0.177	2162	178	11570	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/23	0	0.136	753	171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/10	0	0.129	289	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/09	0	0.147	496	134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/46	0	0.152	217	137	0	0	0	0	0	0	0	0	0	0	0	6565	781	0	0	0	0	0	0	0	0	0	0	2306	274
900/47	7348	0.351	2580	101	6565	0	0	0	0	0	0	0	0	0	0	3424	0	0	0	0	0	0	0	0	0	0	0	730	0
900/48	3424	0.213	730	86	3424	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/49	0	0.130	543	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/53	0	0.102	246	80	0	0	0	0	0	0	0	0	0	0	0	2028	0	0	0	0	0	0	0	0	0	0	0	436	0
900/55	2028	0.215	436	61	2028	0	0	0	0	0	0	0	0	0	0	2504	0	0	0	0	0	0	0	0	0	0	0	904	0
900/56/57	2504	0.361	904	60	2504	0	0	0	0	0	0	0	0	0	0	6006	0	0	0	0	0	0	0	0	0	0	0	3353	0
900/58/59	6006	0.558	3353	100	6006	0	0	0	0	0	0	0	0	0	0	439	3299	0	0	0	0	0	0	0	0	0	0	81	608
900/60/61	3738	0.184	689	100	3738	0	0	0	0	0	0	0	0	0	0	0	9781	0	0	0	0	0	0	0	0	0	0	0	2250
900/62	9781	0.230	2250	190	9781	0	0	0	0	0	0	0	0	0	0	0	5712	0	0	0	0	0	0	0	0	0	0	0	1332
900/63	5712	0.233	1332	190	5712	0	0	0	0	0	0	0	0	0	0	0	9495	0	0	0	0	0	0	0	0	0	0	0	2108
900/64/65	9495	0.222	2108	150	9495	0	0	0	0	0	0	0	0	0	0	0	11204	0	0	0	0	0	0	0	0	0	0	0	1840
900/66	11204	0.164	1840	180	11204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900/68	0	0.150	623	180	0	0	0	0	0	0	0	0	0	0	0	0	2766	0	0	0	0	0	0	0	0	0	0	0	1318
900/69	2766	0.476	1318	75	2766	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						23363	35044	42053	46725	46725	46725	46725	46725	46725	46725	46725	43678	10645	9767	16673	19375	14391	14986	10602	11674	11953	12369	13918	9844

Stope production rates were calculated by AddWest except,
BD accelerated production from last 8 stopes over Addwest's figures
to maintain production in the last quarter

APPENDIX 3

MINPROC ENGINEERS, INC.'S LETTER TO AMI RELATIVE TO ESTIMATED MILL CAPITAL COSTS

SUITE 8300
5600 S. QUEBEC STREET
ENGLEWOOD, CO 80111
OFFICE: (303) 721-9111
FAX: (303) 721-9009

MINPROC ENGINEERS INC.

MINPROC

September 9, 1993

file

Mr. Charles S. Williams
President
Addwest Minerals, Incorporated
5460 Ward Road, Suite 370
Arvada, Colorado 80002

Dear Charlie,

This letter is to address some of the concerns that were raised both at the meeting this morning and the subsequent telephone conversation that you had with Dave Robinson this afternoon.

Firstly, on the issue of whether our Project Definition Document would result in a $5,000,000 or less project, I can understand your concern about going down the road for four weeks with Minproc and possibly ending up with a price that is greater than $5,000,000. We are prepared to state unequivocally today that based upon the information in the RFP and the Feasibility Study Document, we can build a project for $5,000,000 or less. The unresolved issues of course revolve primarily around the necessity for one or two mills in the grinding circuit.

The second issue is the sharing of the savings on using used equipment. If for example our Project Definition Document showed that a plant with all new equipment could be built for $5,000,000 and provide Minproc with the opportunity to earn a reasonable profit commensurate with the resources that we would dedicate to the project and the risks that we would accept, we suggest a sharing of the savings on used equipment of something like 80/20 or 90/10, the lower number obviously being Minproc's share. If in another example the Project Definition Document indicated that in order to come in under $5,000,000 certain used equipment would have to be used, then the sharing on the used equipment would have to be in a different ratio.

We firmly believe that Minproc and Addwest can work together in a completely open negotiation and arrive at a contractual basis that is fair and rewarding to both companies. We have the people, experience, and commitment to make this a successful venture.

If you wish to discuss this again early tomorrow morning before you commit to meeting with the bidders, I would be pleased to do so. If you would like to talk tonight, then call me at my home number 393-0779.

Best regards,

Steve C. Brady
Vice President - Marketing

AddWest Minerals, Inc. - Gold Road
Case I - $350 Hedge Programme with No start up loss and 156398 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Cash Flow

Item		Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	Totals
1	Project Revenue	T-I	$0	$0	$0	$5,034,429	$6,832,043	$6,669,413	$4,807,742	$4,820,423	$4,024,387	$4,135,460	$4,061,435	$4,195,655	$3,983,609	$4,093,189	$512,074	$53,169,859
2	Royalty	0.035*1	$0	$0	$0	$176,205	$239,122	$233,429	$168,271	$168,715	$140,854	$144,741	$142,150	$146,848	$139,426	$143,262	$17,923	$1,860,945
	Sales, Transportation, Insurance etc.	0.01*1				$50,344	$68,320	$66,694	$48,077	$48,204	$40,244	$41,355	$40,614	$41,957	$39,836	$40,932	$5,121	$531,699
3	Operating Costs	T-II	$0	$0	$0	$2,429,212	$2,429,212	$2,429,212	$2,429,212	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$204,632	$26,814,467
4	Property Tax	T-III		$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$1,102,500
5	Severence Tax	T-III	$0	$0	$0	$93,872	$127,391	$124,358	$89,645	$90,513	$75,565	$77,651	$76,261	$78,781	$74,800	$76,857	$9,615	$995,311
6	Net After Costs	1-2-3-4-5		($78,750)	($78,750)	$2,206,046	$3,889,249	$3,736,969	$1,993,786	$2,020,957	$1,275,690	$1,379,679	$1,310,375	$1,436,035	$1,237,513	$1,340,104	$196,034	$21,864,937
	Cost/ton (inc. Royalty, Prop Tax, Sev. Tax)					$60.53	$62.98	$62.76	$60.22	$59.91	$58.83	$58.98	$58.88	$59.06	$58.77	$58.92	$79.77	$60.44
	Cost/ Rec. oz of gold					$199.71	$153.19	$156.64	$210.10	$209.06	$248.90	$242.46	$247.48	$240.83	$253.83	$247.36	$217.40	$212.58
7	Capital Expenditures	T-IV	$0	$2,916,647	$6,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	$0	($500,000)	$9,305,598
8	Actual Exp & Dev	Addwest	$0	$0	$0	$0	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$0	$2,015,500
9	Working Capital	T-IV	$0	$0	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($1,000,000)	$0
10	Cash Flow	6-7..9	$0	($2,995,397)	($7,435,701)	$2,206,046	$3,487,699	$3,535,419	$1,792,236	$1,819,407	$742,140	$1,178,129	$1,108,825	$1,234,485	$1,035,963	$1,138,554	$1,696,034	$10,543,839
11	Cum Cash		$0	($2,995,397)	($10,431,098)	($8,225,052)	($4,737,353)	($1,201,935)	$590,301	$2,409,709	$3,151,849	$4,329,978	$5,438,803	$6,673,289	$7,709,251	$8,847,806	$10,543,839	
	NPV CALCULATIONS																	
12	NPV @ 15%		$0	ERR	($9,795,024)	($7,819,646)	($4,809,507)	($1,868,471)	($431,439)	$974,651	$1,527,468	$2,373,331	$3,140,661	$3,964,072	$4,630,091	$5,335,610	$6,348,590	
13	NPV @ 10%		$0	ERR	($9,999,746)	($7,951,213)	($4,791,530)	($1,666,735)	($121,295)	$1,409,309	$2,018,418	$2,961,779	$3,827,992	$4,768,848	$5,539,144	$6,365,075	$7,565,404	
14	NPV @ 7%		$0	ERR	($10,126,006)	($8,031,839)	($4,777,961)	($1,536,291)	$78,769	$1,690,116	$2,336,083	$3,343,903	$4,276,124	$5,296,141	$6,137,403	$7,046,073	$8,376,383	
15	NPV @ 5%		$0	ERR	($10,211,654)	($8,086,309)	($4,767,679)	($1,445,173)	$218,335	$1,886,215	$2,558,148	$3,611,655	$4,590,948	$5,667,762	$6,560,253	$7,529,018	$8,954,310	
16	IRR			-400.0	-400.0	-292.9	-108.9	-19.6	8.2	28.2	34.5	42.3	48.0	53.0	56.2	59.0	62.3	

AddWest Minerals, Inc. - Gold Road
Case I - $350 Hedge Programme with No start up loss and 156398 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Gross Revenue (Table T-I)

Item		Calculation	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	Totals/Ave
1	Tons Mined	Addwest	0	0	0	46,725	46,725	46,725	46,725	46,725	46,725	46,725	46,725	46,725	46,725	46,725	3,962	517,937
2	Gold Grade (oz/ton)	Data				0.3191	0.4283	0.4174	0.3049	0.3049	0.2541	0.2616	0.2558	0.2637	0.2490	0.2561	0.3822	0.3020
	Contained Oz	1*2				14,908	20,010	19,501	14,248	14,245	11,875	12,221	11,953	12,321	11,633	11,967	1,514	156,398
3	Recovery - Gold %	Data				0.95	0.96	0.96	0.94	0.94	0.93	0.93	0.93	0.93	0.93	0.93	0.96	0.94
4	Gold Produced (oz)	1*2*3	0	0	0	14,162	19,210	18,721	13,393	13,391	11,044	11,366	11,116	11,459	10,818	11,130	1,454	147,264
	Cum. Oz		0	0	0	14,162	33,372	52,093	65,486	78,877	89,920	101,286	112,403	123,862	134,680	145,810	147,264	
5	Ave Gold Price ($/oz)	Data	$0	$0	$0	$353	$353	$354	$357	$358	$362	$362	$363	$364	$366	$366	$350	
6	Revenue - Gold	4*5	$0	$0	$0	$5,002,564	$6,788,821	$6,627,291	$4,777,607	$4,790,294	$3,999,539	$4,109,887	$4,036,423	$4,169,872	$3,959,267	$4,068,147	$508,803	$52,838,516
7	Silver Grade (oz/ton)	2				0.3191	0.4283	0.4174	0.3049	0.3049	0.2541	0.2616	0.2558	0.2637	0.2490	0.2561	0.3822	
8	Recovery - Silver %	Addwest				0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
9	Silver Produced (oz)	4*8	0	0	0	7,081	9,605	9,360	6,697	6,695	5,522	5,683	5,558	5,729	5,409	5,565	727	73,632
10	Silver Price ($/oz)	Data	$0.00	$0.00	$0.00	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	
11	Revenue - Silver	9*10	$0	$0	$0	$31,865	$43,222	$42,122	$30,135	$30,129	$24,848	$25,573	$25,012	$25,783	$24,342	$25,042	$3,271	$331,343
12	Total Gross Revenue	6+11	$0	$0	$0	$5,034,429	$6,832,043	$6,669,413	$4,807,742	$4,820,423	$4,024,387	$4,135,460	$4,061,435	$4,195,655	$3,983,609	$4,093,189	$512,074	$53,169,859

** Hedging Programme for Gold Price Assumed
$350 Hedge Price
$350 Spot Price
2.5% Contango with operating costs hedged

AddWest Minerals, Inc. - Gold Road
Case I - $350 Hedge Programme with No start up loss and 156398 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Operating Costs (Table T-II)

	Item	Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	Totals
	Tonnage		0	0	0	46725	46725	46725	46725	46725	46725	46725	46725	46725	46725	46725	3962	517,937
	GENERAL & ADM	Data																
1	Labor	BD				$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$3,764	
2	Equip Maint	BD				$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$317	
3	Supplies	BD				$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$1,268	
4	Reclamation	BD				$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$1,585	
5	Services	BD				$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$1,981	
6	Indirect	BD				$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$2,140	
	Cont. @ 10%	BD				$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$1,105	
7	Subtotal					$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$12,160	$1,589,564
	Allocated to Mining	7*12/(12+20)				$106,954	$106,954	$106,954	$106,954	$107,705	$107,705	$107,705	$107,705	$107,705	$107,705	$107,705	$9,133	
	Allocated to Milling	7*20/(12+20)				$36,446	$36,446	$36,446	$36,446	$35,696	$35,696	$35,696	$35,696	$35,696	$35,696	$35,696	$3,027	
	MINING	Data																
8	Labor	BD				$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$78,844	
9	Equip Maint	BD				$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$6,418	
10	Materials & Supplies	BD				$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$46,157	
11	Cont @ 10%	BD				$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$13,142	
12	Subtotal					$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$144,562	$18,897,964
	MILLING	Data																
13	Labor	BD				$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$13,125	
14	Maint. Labor	BD				$49,433	$49,433	$49,433	$49,433	$42,987	$42,987	$42,987	$42,987	$42,987	$42,987	$42,987	$3,645	
15	Equip Maint	BD				$61,594	$61,594	$61,594	$61,594	$53,559	$53,559	$53,559	$53,559	$53,559	$53,559	$53,559	$4,542	
16	Supplies	BD				$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$11,705	
17	Utilities	BD				$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$8,558	
18	Fuel	BD				$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$1,981	
19	Cont. @ 10%	BD				$52,814	$52,814	$52,814	$52,814	$51,366	$51,366	$51,366	$51,366	$51,366	$51,366	$51,366	$4,356	
20	Subtotal					$580,957	$580,957	$580,957	$580,957	$565,029	$565,029	$565,029	$565,029	$565,029	$565,029	$565,029	$47,911	$6,326,939
21	Total Operating Costs to CF	1+..+3	$0			$2,429,212	$2,429,212	$2,429,212	$2,429,212	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$204,632	$26,814,467

AddWest Minerals, Inc. - Gold Road
Case I - $350 Hedge Programme with No start up loss and 156398 oz Reserve
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Direct Operating Cost Summary

		Quarter												Total
		1	2	3	4	5	6	7	8	9	10	11	12	
$/ton	G&A	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	
	Mining	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	
	Milling	12.43	12.43	12.43	12.43	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	
	Subtotal	51.99	51.99	51.99	51.99	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	
	Prop+Sever Tax	3.69	4.41	4.35	3.60	3.62	3.30	3.35	3.32	3.37	3.29	3.33	22.30	
		172622	206141	203108	168395	169263	154315	156401	155011	157531	153550	155607	88365	$1,940,311
	Total	55.68	56.40	56.34	55.59	55.27	54.95	55.00	54.97	55.02	54.93	54.98	73.95	55.52

AddWest Minerals, Inc. - Gold Road
Case I - $350 Hedge Programme with No start up loss and 156398 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Misc. AZ Taxes (Table T-III)

	Item	Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	Totals
PROPERTY TAX																		
1	Cash Value	See Note		$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	
2	Assessment Ratio	0.3																
3	County Tax rate	0.105																
4	Property Tax to CF			$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$1,102,500
SEVERENCE TAX																		
5	Gross Income	T-I	$0	$0	$0	$5,034,429	$6,832,043	$6,669,413	$4,807,742	$4,820,423	$4,024,387	$4,135,460	$4,061,435	$4,195,655	$3,983,609	$4,093,189	$512,074	
6	Operating Costs	T-II	$0	$0	$0	$2,429,212	$2,429,212	$2,429,212	$2,429,212	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$204,632	
7	Mine Oper	T-II	$0	$0	$0	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$144,562	
8	Mine G&A	T-II	$0	$0	$0	$106,954	$106,954	$106,954	$106,954	$107,705	$107,705	$107,705	$107,705	$107,705	$107,705	$107,705	$9,133	
9	Total Mine Oper	7+8	$0	$0	$0	$1,811,809	$1,811,809	$1,811,809	$1,811,809	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$153,694	
10	Weighted Mineral Value	5*9/6	$0	$0	$0	$3,754,890	$5,095,626	$4,974,329	$3,585,817	$3,620,504	$3,022,620	$3,106,044	$3,050,446	$3,151,256	$2,991,993	$3,074,296	$384,607	
11	Severence Tax	10*.025	$0	$0	$0	$93,872	$127,391	$124,358	$89,645	$90,513	$75,565	$77,651	$76,261	$78,781	$74,800	$76,857	$9,615	$995,311
																		$2,097,811

Note – Cash Value should decrease over the life of the property however, insufficient information was given by AddWest to estimate cash value. It was assumed that Cash Value = installed cost over the life of the property DB used this method to compute property tax in Arizona since recent court rulings have left many uncertainties of their future handling of their Ad Valorem taxes for insitu reserves

AddWest Minerals, Inc. - Gold Road
Case I - $350 Hedge Programme with No start up loss and 156398 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Capital Expenditures (Table T-IV)

	Item	Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	Totals
																		$3,333,296
1	Mine	Addwest		$1,616,647	$1,716,649												($500,000)	$4,500,000
2	Mill	MinProc		$1,250,000	$3,750,000						$332,000							$1,117,302
3	Tailings	Addwest			$785,302													$35,000
4	Power Line & Sub	Addwest		$35,000														$30,000
5	Permitting	Addwest		$15,000	$15,000													$290,000
6	Land Payments	Addwest			$90,000		$200,000											$9,305,598
7	SUBTOTAL		$0	$2,916,647	$6,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	$0	($500,000)	
																	($1,000,000)	
9	Working Capital to CF	Addwest			$1,000,000													
															$0	$0	($1,500,000)	$9,305,598
10	Total Capital	6+7+8	$0	$2,916,647	$7,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	$0	$9,305,598	
	Cum Capital			$2,916,647	$10,273,598	$10,273,598	$10,473,598	$10,473,598	$10,473,598	$10,473,598	$10,805,598	$10,805,598	$10,805,598	$10,805,598	$10,805,598	$10,805,598		

Mill Capital estimated by MinProc

dWest Minerals, Inc. - Gold Road
Case 2 - $350 Hedge Program with Start Up and 147716 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Cash Flow

Item		Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals
1	Project Revenue	T-I	$0	$0	$0	$3,447,936	$3,296,562	$6,572,664	$7,122,855	$5,177,012	$4,096,196	$4,193,389	$4,061,435	$4,211,297	$4,210,276	$3,449,293	$49,838,914
2	Royalty	0.035*1	$0	$0	$0	$120,678	$115,380	$230,043	$249,300	$181,195	$143,367	$146,769	$142,150	$147,395	$147,360	$120,725	$1,744,362
2a	Sales, Transportation, Insurance etc.	0.01*1				$34,479	$32,966	$65,727	$71,229	$51,770	$40,962	$41,934	$40,614	$42,113	$42,103	$34,493	$498,389
3	Operating Costs	T-II	$0	$0	$0	$1,898,501	$2,155,881	$2,310,310	$2,413,262	$2,413,262	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$1,917,935	$25,175,570
4	Property Tax	T-III		$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$1,023,750
5	Severence Tax	T-III	$0	$0	$0	$66,982	$62,834	$124,107	$133,746	$97,209	$76,914	$78,739	$76,261	$79,075	$79,056	$64,767	$939,690
6	Net After Costs	1-2-3-4-5		($78,750)	($78,750)	$1,248,546	$850,752	$3,763,728	$4,176,568	$2,354,825	$1,342,920	$1,433,914	$1,310,375	$1,450,680	$1,449,724	$1,232,622	$20,457,153
	Cost/ton (inc. Royalty, Prop Tax, Sev. Tax)					$94.14	$69.79	$66.80	$63.06	$60.40	$58.93	$59.06	$58.88	$59.08	$59.08	$59.69	$63.23
	Cost/ Rec. oz of gold					$227.05	$266.11	$152.19	$147.54	$195.94	$244.79	$239.32	$247.48	$239.98	$240.84	$228.27	$212.48
7	Capital Expenditures	T-IV	$0	$2,916,647	$6,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	($500,000)	$9,305,598
8	Actual Exp & Dev	Addwest	$0	$0	$0	$0	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$2,015,500
9	Working Capital	T-IV	$0	$0	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($1,000,000)	$0
10	Cash Flow	6-7..9	$0	($2,995,397)	($7,435,701)	$1,248,546	$449,202	$3,562,178	$3,975,018	$2,153,275	$809,370	$1,232,364	$1,108,825	$1,249,130	$1,248,174	$2,531,072	$9,136,055
11	Cum Cash		$0	($2,995,397)	($10,431,098)	($9,182,552)	($8,733,350)	($5,171,173)	($1,196,155)	$957,121	$1,766,490	$2,998,854	$4,107,679	$5,356,809	$6,604,983	$9,136,055	
	NPV CALCULATIONS																
12	NPV @ 15%		$0	ERR	($9,795,024)	($8,677,029)	($8,289,334)	($5,326,038)	($2,138,830)	($474,717)	$128,178	$1,012,980	$1,780,310	$2,613,489	$3,415,939	$4,984,348	
13	NPV @ 10%		$0	ERR	($9,999,746)	($8,840,347)	($8,433,392)	($5,284,946)	($1,857,301)	($45,825)	$618,462	$1,605,251	$2,471,464	$3,423,481	$4,351,568	$6,187,660	
14	NPV @ 7%		$0	ERR	($10,126,006)	($8,940,780)	($8,521,693)	($5,255,488)	($1,673,430)	$233,605	$938,089	$1,992,305	$2,924,526	$3,956,642	$4,970,232	$6,990,259	
15	NPV @ 5%		$0	ERR	($10,211,654)	($9,008,782)	($8,581,355)	($5,233,702)	($1,544,191)	$429,751	$1,162,553	$2,264,559	$3,243,852	$4,333,439	$5,408,752	$7,562,372	
16	IRR			-400.0	-400.0	-336.9	-273.0	-87.2	-14.0	9.5	16.4	25.0	31.2	36.7	41.0	47.7	

AddWest Minerals, Inc. - Gold Road
Case 2 - $350 Hedge Program with Start Up and 147716 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Gross Revenue (Table T-I)

Item		Calculation	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals/Ave
1	Tons Mined	Addwest	0	0	0	23,363	35,044	42,053	46,725	46,725	46,725	46,725	46,725	46,725	46,725	37,134	464,668
2	Gold Grade (oz/ton)	Data				0.4556	0.2882	0.4620	0.4452	0.3245	0.2588	0.2653	0.2558	0.2647	0.2638	0.2812	0.3179
	Contained Oz	1*2				10,645	10,100	19,428	20,801	15,161	12,094	12,398	11,953	12,369	12,325	10,442	147,716
3	Recovery - Gold %	Data				0.91	0.91	0.95	0.96	0.95	0.93	0.93	0.93	0.93	0.93	0.93	0.94
4	Gold Produced (oz)	1*2*3	0	0	0	9,687	9,191	18,457	19,969	14,403	11,247	11,530	11,116	11,503	11,462	9,711	138,277
	Cum. Oz		0	0	0	9,687	18,878	37,334	57,303	71,706	82,954	94,484	105,601	117,104	128,566	138,277	
5	Ave Gold Price ($/oz)	Data	$0	$0	$0	$354	$356	$354	$354	$357	$362	$361	$363	$364	$365	$353	
6	Revenue - Gold	4*5	$0	$0	$0	$3,426,141	$3,275,883	$6,531,137	$7,077,924	$5,144,605	$4,070,889	$4,167,446	$4,036,423	$4,185,414	$4,184,486	$3,427,444	$49,527,791
7	Silver Grade (oz/ton)	2				0.4556	0.2882	0.4620	0.4452	0.3245	0.2588	0.2653	0.2558	0.2647	0.2638	0.2812	
8	Recovery - Silver %	Addwest				0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
9	Silver Produced (oz)	4*8	0	0	0	4,843	4,595	9,228	9,984	7,202	5,624	5,765	5,558	5,752	5,731	4,855	69,139
10	Silver Price ($/oz)	Data	$0.00	$0.00	$0.00	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	
11	Revenue - Silver	9*10	$0	$0	$0	$21,795	$20,680	$41,528	$44,930	$32,407	$25,307	$25,943	$25,012	$25,883	$25,790	$21,849	$311,124
12	Total Gross Revenue	6+11	$0	$0	$0	$3,447,936	$3,296,562	$6,572,664	$7,122,855	$5,177,012	$4,096,196	$4,193,389	$4,061,435	$4,211,297	$4,210,276	$3,449,293	$49,838,914

** Hedging Programme for Gold Price Assumed
$350 Hedge Price
$350 Spot Price
2.5% Contango with operating costs hedged

AddWest Minerals, Inc. - Gold Road
Case 2 - $350 Hedge Program with Start Up and 147716 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Operating Costs (Table T-II)

	Item	Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals
	Tonnage		0	0	0	23363	35044	42053	46725	46725	46725	46725	46725	46725	46725	37134.26111	464,668
	GENERAL & ADM	Data															
1	Labor	BD				$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$35,278	
2	Equip Maint	BD				$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$2,971	
3	Supplies	BD				$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$11,883	
4	Reclamation	BD				$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$14,854	
5	Services	BD				$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$18,568	
6	Indirect	BD				$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$20,053	
	Cont. @ 10%	BD				$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$10,361	
7	Subtotal					$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$113,966	1,547,970
	Allocated to Mining	7*12/(12+20)				$111,432	$109,330	$108,309	$107,706	$107,706	$107,705	$107,705	$107,705	$107,705	$107,705	$85,597	
	Allocated to Milling	7*20/(12+20)				$31,969	$34,070	$35,091	$35,695	$35,695	$35,696	$35,696	$35,696	$35,696	$35,696	$28,369	
	MINING	Data															
8	Labor	BD				$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$738,971	
9	Equip Maint	BD				$37,848	$56,771	$68,126	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$60,158	
10	Materials & Supplies	BD				$272,173	$408,260	$489,911	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$432,614	
11	Cont @ 10%	BD				$123,985	$139,486	$148,786	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$123,174	
12	Subtotal					$1,363,832	$1,534,344	$1,636,650	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,354,918	$17,823,727
	MILLING	Data															
13	Labor	BD				$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$123,016	
14	Maint. Labor	BD				$42,967	$42,967	$42,967	$42,967	$42,967	$42,987	$42,987	$42,987	$42,987	$42,987	$34,164	
15	Equip Maint	BD				$26,780	$40,169	$48,203	$53,559	$53,559	$53,559	$53,559	$53,559	$53,559	$53,559	$42,566	
16	Supplies	BD				$69,020	$103,530	$124,237	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$109,706	
17	Utilities	BD				$50,463	$75,695	$90,833	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$80,210	
18	Fuel	BD				$11,681	$17,522	$21,026	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$18,567	
19	Cont. @ 10%	BD				$35,570	$43,467	$48,205	$51,364	$51,364	$51,366	$51,366	$51,366	$51,366	$51,366	$40,823	
20	Subtotal					$391,268	$478,137	$530,259	$565,007	$565,007	$565,029	$565,029	$565,029	$565,029	$565,029	$449,051	$5,803,872
21	Total Operating Costs to CF	1+..+3	$0			$1,898,501	$2,155,881	$2,310,310	$2,413,262	$2,413,262	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$1,917,935	$25,175,570

AddWest Minerals, Inc. - Gold Road
Case 2 - $350 Hedge Program with Start Up and 147716 oz Re
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Direct Operating Cost Summary

		Quarter											Total
		1	2	3	4	5	6	7	8	9	10	11	
$/ton	G&A	6.14	4.09	3.41	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	
	Mining	58.38	43.78	38.92	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	
	Milling	16.75	13.64	12.61	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	
	Subtotal	81.26	61.52	54.94	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	
	Prop+Sever Tax	6.24	4.04	4.82	4.55	3.77	3.33	3.37	3.32	3.38	3.38	3.86	
		145732	141584	202857	212496	175959	155664	157489	155011	157825	157806	143517	$1,805,940
	Total	87.50	65.56	59.76	56.20	55.41	54.98	55.02	54.97	55.03	55.03	55.51	58.07

AddWest Minerals, Inc. - Gold Road
Case 2 - $350 Hedge Program with Start Up and 147716 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Misc. AZ Taxes (Table T-III)

Item		Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals
PROPERTY TAX																	
1	Cash Value	See Note		$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	
2	Assessment Ratio	0.3															
3	County Tax rate	0.105															
4	Property Tax to CF			$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$1,023,750
SEVERENCE TAX																	
5	Gross Income	T-I	$0	$0	$0	$3,447,936	$3,296,562	$6,572,664	$7,122,855	$5,177,012	$4,096,196	$4,193,389	$4,061,435	$4,211,297	$4,210,276	$3,449,293	
6	Operating Costs	T-II	$0	$0	$0	$1,898,501	$2,155,881	$2,310,310	$2,413,262	$2,413,262	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$1,917,935	
7	Mine Oper	T-II	$0	$0	$0	$1,363,832	$1,534,344	$1,636,650	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,354,918	
8	Mine G&A	T-II	$0	$0	$0	$111,432	$109,330	$108,309	$107,706	$107,706	$107,705	$107,705	$107,705	$107,705	$107,705	$85,597	
9	Total Mine Oper	7+8	$0	$0	$0	$1,475,264	$1,643,674	$1,744,960	$1,812,560	$1,812,560	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,440,515	
10	Weighted Mineral Value	5*9/6	$0	$0	$0	$2,679,280	$2,513,345	$4,964,284	$5,349,856	$3,888,367	$3,076,554	$3,149,554	$3,050,446	$3,163,004	$3,162,237	$2,590,681	
11	Severence Tax	10*.025	$0	$0	$0	$66,982	$62,834	$124,107	$133,746	$97,209	$76,914	$78,739	$76,261	$79,075	$79,056	$64,767	$939,690
																	$1,963,440

Note -- Cash Value should decrease over the life of the property however, insufficient information was given by AddWest to estimate cash value. It was assumed that Cash Value = installed cost over the life of the property DB used this method to compute property tax in Arizona since recent court rulings have left many uncertainties of their future handling of their Ad Valorem taxes for insitu reserves

AddWest Minerals, Inc. - Gold Road
Case 2 - $350 Hedge Program with Start Up and 147716 oz Reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Capital Expenditures (Table T-IV)

Item		Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals
1	Mine	Addwest		$1,616,647	$1,716,649												$3,333,296
2	Mill	MinProc		$1,250,000	$3,750,000												$4,500,000
3	Tailings	Addwest			$785,302						$332,000					($500,000)	$1,117,302
4	Power Line & Sub	Addwest		$35,000													$35,000
5	Permitting	Addwest		$15,000	$15,000												$30,000
6	Land Payments	Addwest			$90,000		$200,000										$290,000
7	SUBTOTAL		$0	$2,916,647	$6,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	($500,000)	$9,305,598
9	Working Capital to CF	Addwest			$1,000,000												
																($1,000,000)	
10	Total Capital	6+7+8	$0	$2,916,647	$7,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	($1,500,000)	$9,305,598
	Cum Capital			$2,916,647	$10,273,598	$10,273,598	$10,473,598	$10,473,598	$10,473,598	$10,473,598	$10,805,598	$10,805,598	$10,805,598	$10,805,598	$10,805,598	$9,305,598	

Mill Capital estimated by MinProc

AddWest Minerals, Inc. - Gold Road
Case 3 - $350 Hedge Program with Start Up using 156398 oz reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Cash Flow

Item		Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals
1	Project Revenue	T-I	$0	$0	$0	$3,479,317	$3,184,938	$5,650,745	$6,640,740	$4,868,703	$5,148,988	$3,567,822	$4,035,346	$4,075,063	$4,224,762	$4,623,607	$49,520,408
2	Royalty	0.035*1	$0	$0	$0	$121,776	$111,473	$197,776	$232,426	$170,405	$180,215	$124,874	$141,237	$142,627	$147,867	$161,826	$1,733,214
2a	Sales, Transportation, Insurance etc.	0.01*1				$34,793	$31,849	$56,507	$66,407	$48,687	$51,490	$35,678	$40,353	$40,751	$42,248	$46,236	$495,204
3	Operating Costs	T-II	$0	$0	$0	$1,578,136	$1,964,691	$2,308,254	$2,413,262	$2,413,262	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$27,413,231
4	Property Tax	T-III		$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$1,102,500
5	Severence Tax	T-III	$0	$0	$0	$66,704	$60,201	$106,699	$124,694	$91,420	$96,682	$66,993	$75,771	$76,517	$79,328	$86,817	$932,209
6	Net After Costs	1-2-3-4-5		($78,750)	($78,750)	$1,599,157	$937,974	$2,902,759	$3,725,201	$2,066,179	$2,328,568	$848,243	$1,285,950	$1,323,134	$1,463,286	$1,836,694	$17,844,050
	Cost/ton (inc. Royalty, Prop Tax, Sev. Tax)					$80.48	$64.12	$65.35	$62.40	$59.98	$60.36	$58.20	$58.84	$58.90	$59.10	$59.65	$61.16
	Cost/ Rec. oz of gold					$191.99	$252.82	$173.49	$156.75	$207.17	$198.10	$278.82	$248.99	$247.55	$240.06	$215.30	$216.51
7	Capital Expenditures	T-IV	$0	$2,916,647	$6,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	($500,000)	$9,305,598
8	Actual Exp & Dev	Addwest	$0	$0	$0	$0	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$201,550	$2,015,500
9	Working Capital	T-IV	$0	$0	$1,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($1,000,000)	$0
10	Cash Flow	6-7..9	$0	($2,995,397)	($7,435,701)	$1,599,157	$536,424	$2,701,209	$3,523,651	$1,864,629	$1,795,018	$646,693	$1,084,400	$1,121,584	$1,261,736	$3,135,144	$6,522,952
11	Cum Cash		$0	($2,995,397)	($10,431,098)	($8,831,941)	($8,295,517)	($5,594,308)	($2,070,657)	($206,027)	$1,588,991	$2,235,684	$3,320,084	$4,441,668	$5,703,404	$8,838,547	
	NPV CALCULATIONS																
12	NPV @ 15%		$0	ERR	($9,795,024)	($8,363,078)	($7,900,104)	($5,653,029)	($2,827,731)	($1,386,692)	($49,592)	$414,716	$1,165,142	$1,913,248	$2,724,416	$4,667,145	
13	NPV @ 10%		$0	ERR	($9,999,746)	($8,514,769)	($8,028,796)	($5,641,321)	($2,602,887)	($1,034,239)	$439,016	$956,841	$1,803,973	$2,658,782	$3,596,953	$5,871,250	
14	NPV @ 7%		$0	ERR	($10,126,006)	($8,607,950)	($8,107,488)	($5,630,716)	($2,455,404)	($804,007)	$758,398	$1,311,606	$2,223,292	$3,150,022	$4,174,624	$6,676,755	
15	NPV @ 5%		$0	ERR	($10,211,654)	($8,670,996)	($8,160,576)	($5,622,042)	($2,351,477)	($642,142)	$983,065	$1,561,351	$2,519,073	$3,497,405	$4,584,401	$7,252,010	
16	IRR			-400.0	-400.0	-320.4	-255.3	-102.2	-26.0	-2.2	14.5	19.2	25.9	31.4	36.3	45.1	

AddWest Minerals, Inc. - Gold Road
Case 3 - $350 Hedge Program with Start Up using 156398 oz reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Gross Revenue (Table T-I)

Item		Calculation	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals/Ave
1	Tons Mined	Addwest	0	0	0	23,363	35,044	42,053	46,725	46,725	46,725	46,725	46,725	46,725	46,725	46,725	517,937
2	Gold Grade (oz/ton)	Data				0.4556	0.2787	0.3965	0.4147	0.3080	0.3207	0.2269	0.2541	0.2558	0.2647	0.2979	0.3020
	Contained Oz	1*2				10,645	9,767	16,673	19,375	14,391	14,986	10,602	11,874	11,953	12,369	13,918	156,398
3	Recovery - Gold %	Data				0.92	0.91	0.95	0.96	0.94	0.95	0.92	0.93	0.93	0.93	0.93	0.94
4	Gold Produced (oz)	1*2*3	0	0	0	9,793	8,888	15,839	18,600	13,528	14,237	9,754	11,042	11,116	11,503	12,944	146,302
	Cum. Oz		0	0	0	9,793	18,681	34,520	53,120	66,648	80,885	90,639	101,681	112,798	124,301	137,245	
5	Ave Gold Price ($/oz)	Data	$0	$0	$0	$353	$356	$355	$355	$358	$359	$364	$363	$364	$365	$355	
6	Revenue - Gold	4*5	$0	$0	$0	$3,457,282	$3,164,941	$5,615,107	$6,598,890	$4,838,265	$5,116,955	$3,545,875	$4,010,500	$4,050,051	$4,198,879	$4,594,482	$49,191,229
7	Silver Grade (oz/ton)	2				0.4556	0.2787	0.3965	0.4147	0.3080	0.3207	0.2269	0.2541	0.2558	0.2647	0.2979	
8	Recovery - Silver %	Addwest				0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
9	Silver Produced (oz)	4*8	0	0	0	4,897	4,444	7,920	9,300	6,764	7,119	4,877	5,521	5,558	5,752	6,472	73,151
10	Silver Price ($/oz)	Data	$0.00	$0.00	$0.00	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	
11	Revenue - Silver	9*10	$0	$0	$0	$22,034	$19,997	$35,638	$41,850	$30,437	$32,034	$21,946	$24,845	$25,012	$25,883	$29,124	$329,179
12	Total Gross Revenue	6+11	$0	$0	$0	$3,479,317	$3,184,938	$5,650,745	$6,640,740	$4,868,703	$5,148,988	$3,567,822	$4,035,346	$4,075,063	$4,224,762	$4,623,607	$49,520,408

** Hedging Programme for Gold Price Assumed
$350 Hedge Price
$350 Spot Price
2.5% Contango with operating costs hedged

AddWest Minerals, Inc. - Gold Road
Case 3 - $350 Hedge Program with Start Up using 156398 oz reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Operating Costs (Table T-II)

tem		Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	Totals
	Tonnage		0	0	0	23363	35044	42053	46725	46725	46725	46725	46725	46725	46725	46725	43678	517,937
	GENERAL & ADM	Data																
1	Labor	BD				$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$44,389	$41,495	
2	Equip Maint	BD				$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,738	$3,494	
3	Supplies	BD				$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$14,952	$13,977	
4	Reclamation	BD				$9,345	$14,018	$16,821	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$18,690	$17,471	
5	Services	BD				$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$21,840	
6	Indirect	BD				$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$25,232	$23,587	
	Cont. @ 10%	BD				$12,102	$12,569	$12,850	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$13,036	$12,186	
7	Subtotal					$133,121	$138,261	$141,345	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$143,400	$134,050	1,693,979
	Allocated to Mining	7*12/(12+20)				$102,086	$104,536	$106,756	$107,706	$107,706	$107,705	$107,705	$107,705	$107,705	$107,705	$107,705	$100,682	
	Allocated to Milling	7*20/(12+20)				$31,035	$33,725	$34,588	$35,695	$35,695	$35,696	$35,696	$35,696	$35,696	$35,696	$35,696	$33,368	
	MINING	Data																
8	Labor	BD				$697,370	$790,353	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$929,827	$869,197	
9	Equip Maint	BD				$37,848	$56,771	$68,126	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$75,695	$70,759	
10	Materials & Supplies	BD				$272,173	$408,260	$489,911	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$544,346	$508,851	
11	Cont @ 10%	BD				$100,739	$125,538	$148,786	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$154,987	$144,881	
12	Subtotal					$1,108,130	$1,380,922	$1,636,650	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,593,688	$19,358,229
	MILLING	Data																
13	Labor	BD				$116,090	$131,569	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$154,787	$144,694	
14	Maint Labor	BD				$32,225	$36,522	$42,967	$42,967	$42,967	$42,987	$42,987	$42,987	$42,987	$42,987	$42,987	$40,184	
15	Equip Maint	BD				$26,780	$40,169	$48,203	$53,559	$53,559	$53,559	$53,559	$53,559	$53,559	$53,559	$53,559	$50,067	
16	Supplies	BD				$69,020	$103,530	$124,237	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$138,041	$129,040	
17	Utilities	BD				$50,463	$75,695	$90,833	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$100,926	$94,345	
18	Fuel	BD				$11,681	$17,522	$21,026	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$23,363	$21,839	
19	Cont. @ 10%	BD				$30,626	$40,501	$48,205	$51,364	$51,364	$51,366	$51,366	$51,366	$51,366	$51,366	$51,366	$48,017	
20	Subtotal					$336,886	$445,508	$530,259	$565,007	$565,007	$565,029	$565,029	$565,029	$565,029	$565,029	$565,029	$528,185	$6,361,023
21	Total Operating Costs to CF	1+..+3	$0			$1,578,136	$1,964,691	$2,308,254	$2,413,262	$2,413,262	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,255,923	$27,413,231

AddWest Minerals, Inc. - Gold Road
Case 3 - $350 Hedge Program with Start Up using 156398 oz r
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Direct Operating Cost Summary

		Quarter											Total
		1	2	3	4	5	6	7	8	9	10	11	12	
$/ton	G&A	5.70	3.95	3.36	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	
	Mining	47.43	39.41	38.92	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	36.49	
	Milling	14.42	12.71	12.61	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	12.09	
	Subtotal	67.55	56.06	54.89	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	51.65	
	Prop+Sever Tax	6.23	3.97	4.41	4.35	3.64	3.75	3.12	3.31	3.32	3.38	3.54	1.81	
		145454	138951	185449	203444	170170	175432	145743	154521	155267	158078	165567	79133	$1,877,209
	Total	73.78	60.03	59.30	56.00	55.29	55.40	54.77	54.96	54.97	55.03	55.19	53.46	56.55

AddWest Minerals, Inc. - Gold Road
Case 3 - $350 Hedge Program with Start Up using 156398 oz reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Misc. AZ Taxes (Table T-III)

	em	Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	Totals
PROPERTY TAX																		
1	Cash Value	See Note		$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	$10,000,000	
2	Assessment Ratio	0.3																
3	County Tax rate	0.105																
4	Property Tax to CF			$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$78,750	$1,023,750
SEVERENCE TAX																		
5	Gross Income	T-I	$0	$0	$0	$3,479,317	$3,184,938	$5,650,745	$6,640,740	$4,868,703	$5,148,988	$3,567,822	$4,035,346	$4,075,063	$4,224,762	$4,623,607	$20,378	
6	Operating Costs	T-II	$0	$0	$0	$1,578,136	$1,964,691	$2,308,254	$2,413,262	$2,413,262	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,413,284	$2,255,923	
7	Mine Oper	T-II	$0	$0	$0	$1,108,130	$1,380,922	$1,636,650	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,704,855	$1,593,688	
8	Mine G&A	T-II	$0	$0	$0	$102,086	$104,536	$106,756	$107,706	$107,706	$107,705	$107,705	$107,705	$107,705	$107,705	$107,705	$100,682	
9	Total Mine Oper	7+8	$0	$0	$0	$1,210,215	$1,485,458	$1,743,407	$1,812,560	$1,812,560	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,812,559	$1,694,370	
10	Weighted Mineral Value	5*9/6	$0	$0	$0	$2,668,162	$2,408,059	$4,267,965	$4,987,748	$3,656,801	$3,867,281	$2,679,705	$3,030,851	$3,060,682	$3,173,117	$3,472,680	$15,305	
11	Severence Tax	10*.025	$0	$0	$0	$66,704	$60,201	$106,699	$124,594	$91,420	$96,682	$66,993	$75,771	$76,517	$79,328	$86,817	$383	$931,826
																		$1,955,576

Note -- Cash Value should decrease over the life of the property however, insufficient information was given by AddWest to estimate cash value. It was assumed that Cash Value = installed cost over the life of the property DB used this method to compute property tax in Arizona since recent court rulings have left many uncertainties of their future handling of their Ad Valorem taxes for insitu reserves

AddWest Minerals, Inc. - Gold Road
Case 3 - $350 Hedge Program with Start Up using 156398 oz reserves
$375 reserves - 24.6% Dilution

Behre Dolbear & Company, Inc.
Capital Expenditures (Table T-IV)

	Item	Source	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	Totals
1	Mine	Addwest		$1,616,647	$1,716,649												$3,333,296
2	Mill	MinProc		$1,250,000	$3,750,000											($500,000)	$4,500,000
3	Tailings	Addwest			$785,302						$332,000						$1,117,302
4	Power Line & Sub	Addwest		$35,000													$35,000
5	Permitting	Addwest		$15,000	$15,000												$30,000
6	Land Payments	Addwest			$90,000		$200,000										$290,000
7	SUBTOTAL		$0	$2,916,647	$6,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	($500,000)	$9,305,598
9	Working Capital to CF	Addwest			$1,000,000											($1,000,000)	
10	Total Capital	6+7+8	$0	$2,916,647	$7,356,951	$0	$200,000	$0	$0	$0	$332,000	$0	$0	$0	$0	($1,500,000)	$9,305,598
	Cum Capital			$2,916,647	$10,273,598	$10,273,598	$10,473,598	$10,473,598	$10,473,598	$10,473,598	$10,805,598	$10,805,598	$10,805,598	$10,805,598	$10,805,598	$9,305,598	

Mill Capital estimated by MinProc

DATE:20/07/95 TIME: 18:21:31

SELECTION CRITERIA: Table	Field	Lower Bnd		Upper Bnd	Matching
HEADER	HOLE-ID	10.00<=	VALUE	<=11.00	
HEADER	LOCATION	4500.00<=	VALUE	<=4682.00	[EAST]
ASSAYS	AU	-9.00<=	VALUE	<=100.00	
ASSAYS	LENGTH	0.00<=	VALUE	<=100.00	

HOLE-ID	LOCATION [EAST]
10.45	4501.3

AU	LENGTH
0.012	5

10.452	4516.5

AU	LENGTH
0.654	0.5
0.088	4
0.019	0.5

4.5 C .15

10.455	4552.8

AU	LENGTH
0.223	4.9

10.464	4640.3

AU	LENGTH
0.277	4.6

DATE:20/07/95 TIME: 18:22:07

DATABASE:

SELECTION CRITERIA:

Table	Field	Lower Bnd		Upper Bnd	Matching
HEADER	HOLE-ID	1000.00<=	VALUE	<=1001.00	
HEADER	LOCATION	4500.00<=	VALUE	<=4682.00	[EAST]
ASSAYS	AU	-9.00<=	VALUE	<=100.00	
ASSAYS	LENGTH	0.00<=	VALUE	<=100.00	

HOLE-ID	LOCATION [EAST]
1000.353	4502.99

AU	LENGTH
0.1	3.3

HOLE-ID	LOCATION [EAST]
1000.354	4508.18

AU	LENGTH
0.48	2.5

HOLE-ID	LOCATION [EAST]
1000.355	4513.68

AU	LENGTH
1.32	4.1

HOLE-ID	LOCATION [EAST]
1000.356	4519.2

AU	LENGTH
0.48	4.1

HOLE-ID	LOCATION [EAST]
1000.357	4524.27

AU	LENGTH
0.4	3.3

HOLE-ID	LOCATION [EAST]
1000.358	4529.36

AU	LENGTH
0.28	3.2

HOLE-ID	LOCATION [EAST]
1000.359	4533.8

AU	LENGTH
0.28	3.3

HOLE-ID	LOCATION [EAST]
1000.36	4538.46

AU	LENGTH

0.02 3

1000.361 4543.76

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AU LENGTH
0.08 3.3

1000.362 4548.96

AU LENGTH
0.2 3.8

1000.363 4553.86

AU LENGTH
0.24 3.8

1000.364 4558.42

AU LENGTH
0.14 3.3

1000.365 4563.31

AU LENGTH
0.16 4.1

1000.366 4568.31

AU LENGTH
0.28 3.3

1000.367 4573.72

AU LENGTH
0.56 4.1

1000.368 4578.37

AU LENGTH
0.6 4

1000.369 4583.68

AU LENGTH
0.36 4.1

1000.37 4587.82

AU LENGTH
0.52 4.1

1000.371 4593.18

AU LENGTH
0.56 4

DATE:20/07/95 TIME: 18:22:16

HOLE-ID LOCATION
[EAST]
1000.372 4598.99

AU LENGTH
0.1 5

1000.373 4603.77

AU LENGTH
0.54 5

1000.374 4608.42

AU LENGTH
0.24 3.1

1000.375 4612.56

AU LENGTH
0.16 3

1000.376 4617.36

AU LENGTH
0.32 3

1000.377 4623.41

AU LENGTH
0.36 2.5

1000.378 4627.76

AU LENGTH
0.32 2

1000.379 4632.66

AU LENGTH
0.04 1.6

1000.38 4637.87

AU LENGTH
0.4 2

1000.381 4642.61

AU LENGTH
0.4 2.5

1000.382 4648.41
DATE:20/07/95 TIME: 18:22:16

HOLE-ID LOCATION
[EAST]

AU LENGTH
0.6 3.3

1000.383 4652.81

AU LENGTH
0.31 3.3

1000.384 4658.36

AU LENGTH
0.6 3.6

1000.385 4663.15

AU LENGTH
0.12 4

1000.386 4668.1

AU LENGTH
0.56 4

1000.387 4674.17

AU LENGTH
0.52 4

1000.388 4679.28

AU LENGTH
0.36 3

String

DATE:20/07/95 TIME: 18:22:48

DATABASE:

SELECTION CRITERIA:	Table	Field	Lower Bnd		Upper Bnd	Matching
	HEADER	HOLE-ID	3500.00<=	VALUE	<=3501.00	
	HEADER	LOCATION	4425.00<=	VALUE	<=4665.00	[EAST]
	ASSAYS	AU	-9.00<=	VALUE	<=100.00	
	ASSAYS	LENGTH	0.00<=	VALUE	<=100.00	

HOLE-ID	LOCATION [EAST]
3500.368	4426.1

AU	LENGTH
0.48	1.5 } 6.3
0.19	4.8

3500.369	4431.55

AU	LENGTH
0.2	4
0.1	1.1

3500.37	4436.19

AU	LENGTH
0.51	1.3 } 6.3
0.15	5

3500.371	4440.38

AU	LENGTH
0.19	1.4
0.11	5.4

3500.372	4445.18

AU	LENGTH
6.35	1.9 } 7.2
0.21	2.7
0.15	2.6

3500.373	4450.83

AU	LENGTH
0.29	0.9
0.1	2.7
0.13	2.4

3500.374 4454.46

AU LENGTH
0.09 3.7
DATE:20/07/95 TIME: 18:22:55

AU LENGTH
0.16 2.7

3500.375 4459.65

AU LENGTH
0.31 3.7
0.05 1.7

3500.376 4464.59

AU LENGTH
0.05 3.3
0.48 2

3500.377 4469.48

AU LENGTH
0.06 5.3

3500.378 4474.82

AU LENGTH
0.25 5

3500.379 4479.76

AU LENGTH
0.16 1.6
0.15 3.5

3500.38 4485.01

AU LENGTH
0.43 2.6
0.03 2.6

3500.381 4489.19

AU LENGTH
0.09 1.7
0.23 3.3

3500.382 4494.19

AU	LENGTH
0.15	2
0.16	3.4

3500.383 4499.48

AU	LENGTH
0.14	1.7

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AU	LENGTH
0.38	4.4

3500.384 4503.82

AU	LENGTH
1.22	1.3
0.38	4.3
0.39	1

3500.385 4508.76

AU	LENGTH
0.14	3
0.16	3.1

3500.386 4513.8

AU	LENGTH
0.46	0.8
0.46	4.4
0.17	1.3

3500.387 4519.3

AU	LENGTH
0.55	1.4
0.47	4.3

3500.388 4524.89

AU	LENGTH
0.13	1.4
0.55	4.3

3500.389 4529.23

AU	LENGTH
0.16	1.6
0.26	4.4

3500.39 4533.31

AU	LENGTH
0.35	2.5
0.37	3

5.3

3500.391 4537.6

AU	LENGTH
0.03	2
0.2	2.2
0.19	2.3

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3500.392 4543.04

AU	LENGTH
0.13	1
0.26	1.5
0.5	2.2
0.05	1.6

3500.393 4547.93

AU	LENGTH
0.49	1.8
0.22	2.1
0.48	2.3

3500.394 4553.23

AU	LENGTH
0.16	1.2
1	0.8
0.1	1
0.21	1.8
0.08	1

3500.395 4558.22

AU	LENGTH
0.01	1
0.21	1.9
0.24	1.3
0.03	1.6

3500.396 4563.01

AU	LENGTH
0.08	1.2

0.71	2.1
0.07	1
0.09	1.2

3500.397 4567.9

AU	LENGTH
0.24	3.1
0.12	2

3500.398 4573.14

AU	LENGTH
0.05	1.5
0.08	1.5
0.41	2.2

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AU	LENGTH
0.06	1

3500.399 4578.43

AU	LENGTH
0.08	1
0.45	3
0.05	2

3500.4 4583.57

AU	LENGTH
0.04	2.2
0.45	1.5
0.07	2

3500.401 4588.87

AU	LENGTH
0.02	1.3
0.15	2.2
0.38	1.2

3500.402 4592.88

AU	LENGTH
0.03	1.2
0.45	1.4
0.62	2.4

3500.403 4597.62

AU	LENGTH
0.1	1.2
0.12	1
0.33	2.9
3500.404	4602.92

AU	LENGTH
0.03	1.9
0.16	1.5
0.05	1.6
0.87	0.9
3500.405	4607

AU	LENGTH
0.24	2.9
1.08	2.7
3500.406	4612.6

DATE:20/07/95 TIME: 18:22:56

HOLE-ID	LOCATION [EAST]

AU	LENGTH
0.07	3.3
0.75	2.2
0.21	1.3
3500.407	4617.94

AU	LENGTH
0.07	2.2
1.11	3.4
3500.408	4624.45

AU	LENGTH
0.43	1.7
1.62	1.5
0.12	2.4
3500.409	4629.84

AU	LENGTH
0.98	2.7
0.17	2.4
3500.41	4634.08

AU	LENGTH
1.13	1.5
0.12	1.3
0.15	1.8
0.48	1.3

3500.411 4638.41

AU	LENGTH
0.91	1.7
0.15	5.5

3500.412 4642.55

AU	LENGTH
0.06	1.8
0.63	2.2
0.03	1

3500.413 4648.65

AU	LENGTH
0.05	1.8
0.81	1

DATE:20/07/95 TIME: 18:22:56

AU	LENGTH
0.02	2

3500.414 4653.94

AU	LENGTH
0.55	1.5
0.06	4.2

3500.415 4659.99

AU	LENGTH
0.05	2.2
0.57	0.8
0.02	2.6

DATE:20/07/95 TIME: 18:23:23

DATABASE:

SELECTION CRITERIA:

Table	Field	Lower Bnd		Upper Bnd	Matching
HEADER	HOLE-ID	3500.00<=	VALUE	<=3501.00	
HEADER	LOCATION	4560.00<=	VALUE	<=4665.00	[EAST]
ASSAYS	AU	-9.00<=	VALUE	<=100.00	
ASSAYS	LENGTH	0.00<=	VALUE	<=100.00	

HOLE-ID	LOCATION [EAST]
3500.396	4563.01

AU	LENGTH
0.08	1.2
0.71	2.1
0.07	1
0.09	1.2

3500.397	4567.9

AU	LENGTH
0.24	3.1
0.12	2

3500.398	4573.14

AU	LENGTH
0.05	1.5
0.08	1.5
0.41	2.2
0.06	1

3500.399	4578.43

AU	LENGTH
0.08	1
0.45	3
0.05	2

3500.4	4583.57

AU	LENGTH
0.04	2.2
0.45	1.5
0.07	2

3500.401	4588.87

AU	LENGTH
0.02	1.3
0.15	2.2
0.38	1.2

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3500.402 4592.88

AU	LENGTH
0.03	1.2
0.45	1.4
0.62	2.4

3500.403 4597.62

AU	LENGTH
0.1	1.2
0.12	1
0.33	2.9

3500.404 4602.92

AU	LENGTH
0.03	1.9
0.16	1.5
0.05	1.6
0.87	0.9

3500.405 4607

AU	LENGTH
0.24	2.9
1.08	2.7

3500.406 4612.6

AU	LENGTH
0.07	3.3
0.75	2.2
0.21	1.3

3500.407 4617.94

AU	LENGTH
0.07	2.2
1.11	3.4

3500.408 4624.45

AU	LENGTH

0.43	1.7
1.62	1.5
0.12	2.4

3500.409 4629.84

AU	LENGTH
0.98	2.7

DATE:20/07/95 TIME: 18:23:30

AU	LENGTH
0.17	2.4

3500.41 4634.08

AU	LENGTH
1.13	1.5
0.12	1.3
0.15	1.8
0.48	1.3

3500.411 4638.41

AU	LENGTH
0.91	1.7
0.15	5.5

3500.412 4642.55

AU	LENGTH
0.06	1.8
0.63	2.2
0.03	1

3500.413 4648.65

AU	LENGTH
0.05	1.8
0.81	1
0.02	2

3500.414 4653.94

AU	LENGTH
0.55	1.5
0.06	4.2

3500.415 4659.99

AU	LENGTH
0.05	2.2

0.57	0.8
0.02	2.6

DATE:20/07/95 TIME: 18:23:55

DATABASE:

SELECTION CRITERIA:

Table	Field	Lower Bnd		Upper Bnd	Matching
HEADER	HOLE-ID	5000.00<=	VALUE	<=5001.00	
HEADER	LOCATION	4600.00<=	VALUE	<=4683.00	[EAST]
ASSAYS	AU	-9.00<=	VALUE	<=100.00	
ASSAYS	LENGTH	0.00<=	VALUE	<=100.00	

HOLE-ID	LOCATION [EAST]
5000.378	4601.19

AU	LENGTH
0.26	4
0.1	1

HOLE-ID	LOCATION [EAST]
5000.379	4605.65

AU	LENGTH
0.08	2.4
0.08	1.6
0.02	1.4

HOLE-ID	LOCATION [EAST]
5000.38	4610.78

AU	LENGTH
0.04	1.4
0.06	1.8
0.05	2

HOLE-ID	LOCATION [EAST]
5000.381	4614.62

AU	LENGTH
0.01	3.4
0.04	2

HOLE-ID	LOCATION [EAST]
5000.382	4616.79

AU	LENGTH
0.12	3
0.45	3

HOLE-ID	LOCATION [EAST]
5000.383	4619.43

AU	LENGTH
0.07	1
0.49	3.2
0.08	1.6

5000.384 4624.16

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AU	LENGTH
0.07	1.4
0.47	1.8
0.08	2

5000.385 4629.11

AU	LENGTH
0.19	2.9
0.07	1.4
0.12	1.5

5000.386 4633.99

AU	LENGTH
0.06	1
0.31	2.2
0.08	2.2

5000.387 4638.11

AU	LENGTH
0.2	1.7
1.2	2
0.05	2

5000.388 4644.33

AU	LENGTH
0.22	1.5
0.36	2.2
1.63	1

5000.389 4648.52

AU	LENGTH
0.24	3
0.3	3

5000.39 4654.91

AU	LENGTH
0.03	5.1

5000.391 4661.14

AU	LENGTH
0.1	4.6

5000.392 4665.5

AU	LENGTH
0.08	1.2

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AU	LENGTH
0.54	3.9

5000.393 4671.37

AU	LENGTH
0.11	3.7
0.35	4

5000.394 4676.02

AU	LENGTH
0.4	1.5
0.07	1.2
0.24	1.2
0.4	3.9

5000.395 4680.84

AU	LENGTH
0.04	1.4
0.4	3
0.02	1.5

DATE:20/07/95 TIME: 18:24:45

DATABASE:

SELECTION CRITERIA:

Table	Field	Lower Bnd		Upper Bnd	Matching
HEADER	HOLE-ID	3500.00<=	VALUE	<=3501.00	
HEADER	LOCATION	4425.00<=	VALUE	<=4560.00	[EAST]
ASSAYS	AU	-9.00<=	VALUE	<=100.00	
ASSAYS	LENGTH	0.00<=	VALUE	<=100.00	

HOLE-ID	LOCATION [EAST]
3500.368	4426.1

AU	LENGTH
0.48	1.5
0.19	4.8

3500.369	4431.55

AU	LENGTH
0.2	4
0.1	1.1

3500.37	4436.19

AU	LENGTH
0.51	1.3
0.15	5

3500.371	4440.38

AU	LENGTH
0.19	1.4
0.11	5.4

3500.372	4445.18

AU	LENGTH
6.35	1.9
0.21	2.7
0.15	2.6

3500.373	4450.83

AU	LENGTH
0.29	0.9
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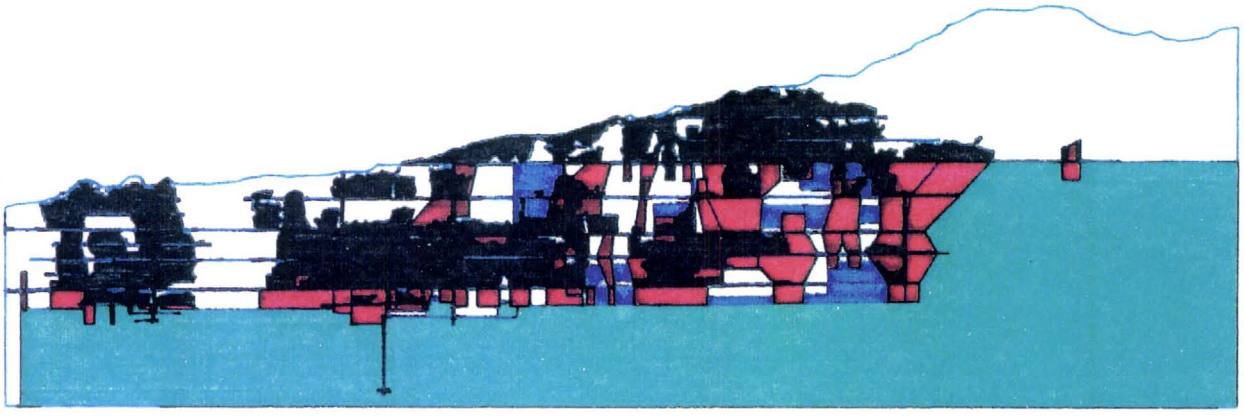
ADDWEST MINERALS, INC.

GOLD ROAD PROJECT

MOHAVE COUNTY, ARIZONA

FEASIBILITY STUDY



June, 1993

ADDWEST MINERALS, INC.

GOLD ROAD PROJECT

MOHAVE COUNTY, ARIZONA

FEASIBILITY STUDY

DWIGHT S. JURAS, PH.D.

REGISTERED PROFESSIONAL GEOLOGIST

EXPLORATION AND MINE EVALUATION

SPECIALTY: STRUCTURAL ORE CONTROL ANALYSIS

3039 VIA DEL SOL
SAN JOSE, CA 95132

(408) 945-0943
CALL TO FAX

June, 1993

GOLD ROAD MINE PROJECT SUMMARY

INTRODUCTION

Addwest Minerals, Inc. (Addwest) plans to bring into production the Gold Road gold mine in Mohave County, Arizona. The project will incorporate underground mining and a mill facility using cyanide extraction to process 500 tons of ore per day. The operation will produce an average of 50,000 ounces of gold per year from 150,000 tons of ore. The Gold Road Project represents a unique opportunity to rapidly bring into production a gold mine that can earn 8 to 9 million dollars (@ $375/oz. of Au) of pre-tax profit per year for up to 15 years.

RESERVES OF THE GOLD ROAD MINE

Addwest Minerals, Inc.
Gold Road Project

In Situ Potential Minable Resource

Classification Reserve/Resource	Tonnage	Diluted Grade [OPT]	Ounces
Proven\Probable (0.15 Cutoff)	**486,190**	**0.355**	**172,600**
(0.10 Cutoff)	(579,470)	(0.318)	(184,138)
Possible-Inferred	**188,762**	**0.355**	**67,010**
Inferred	**1,970,000**	**0.355**	**700,000**
Total	**2,644,952**	**0.355**	**939,610**

LOCATION AND ACCESS

The Gold Road Mine property is located in the Oatman (also known as the San Francisco District) Mining District in Mohave County, Arizona in Township 19 North, Ranges 19 and 20 West. The property is adjacent to a paved state highway approximately 25 miles southwest of Kingman, Arizona and two road miles north of the village of Oatman (Figure 1.1). The mine area is characterized by arid rugged hills between 2800 and 4000 feet above sea level.

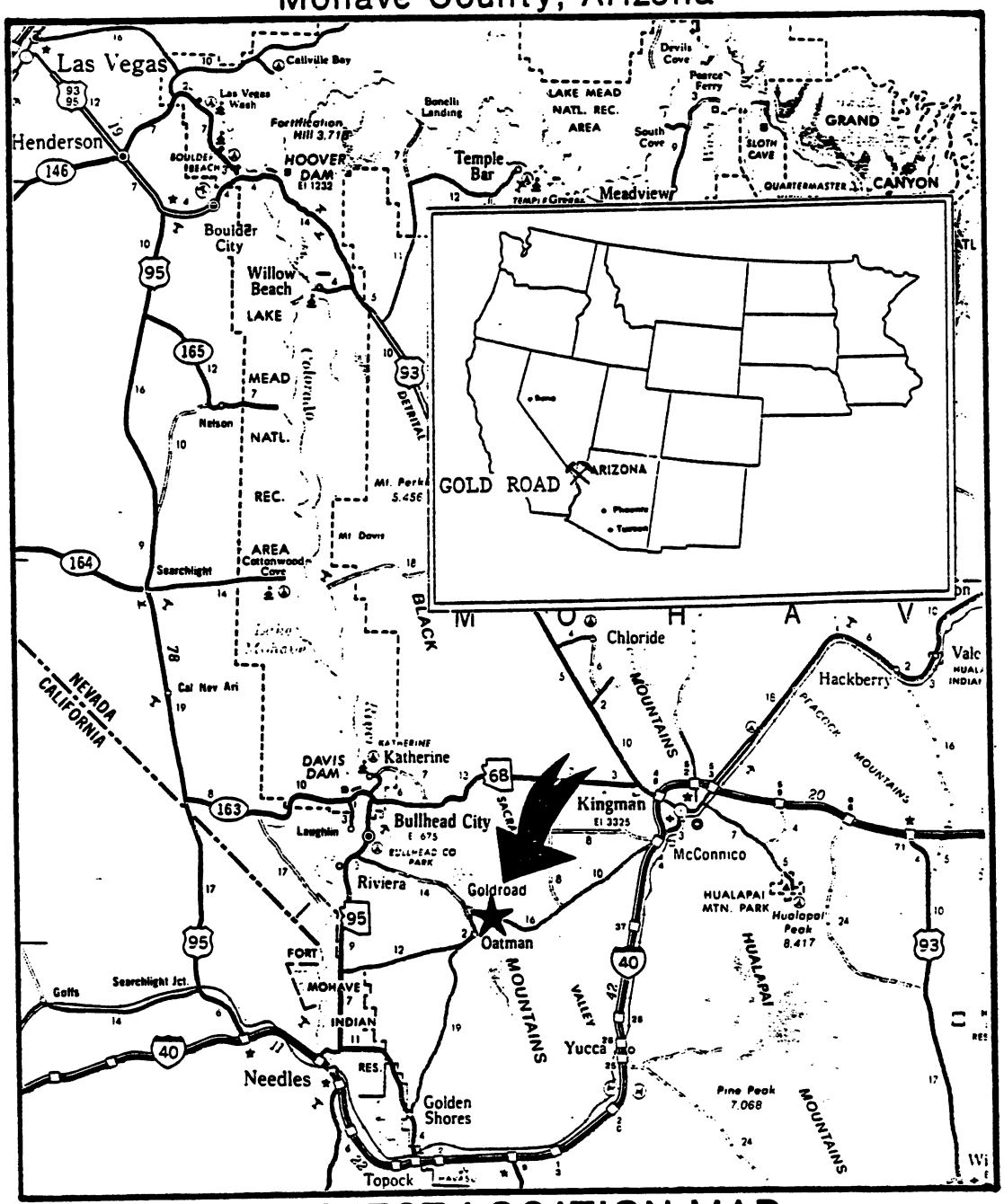
PROPERTY DESCRIPTION

The Gold Road property consists of 2145 acres of mostly contiguous claims centered on the Gold

Addwest Minerals, Inc.

Gold Road Project

Mohave County, Arizona



PROJECT LOCATION MAP

Figure 1.1

Road Mine as depicted in Figure 1.2. The property includes 18 patented lode claims (272 acres) and 93 unpatented lode mining claims (1824 acres). The proposed mill, tailings disposal pond and mine, as projected, will all be located on the patented ground. Also included in the property package are four patented and six unpatented millsites totaling 49 acres. The millsites include deeded water rights.

Addwest has acquired the Gold Road Property through purchase agreements and by staking additional mining claims. The 18 patented, 25 unpatented lode claims, the millsites, and the water rights (a total of 821 acres) were acquired under an Option to Purchase Agreement with Amwest Exploration Company (Amwest) and the George W. Parfet Estate, Inc.

Under the Option to Purchase Agreements, Addwest can own the property package by paying a total of $1,187,500, of which $887,000 are advanced production royalties, in scheduled payments over five years as follows:

[a]	1992	$57,500 (paid)
[b]	1993	$140,000 ($50,000 paid)
[c]	1994	$290,000
[d]	1995	$350,000
[e]	1996	$350,000

A total Net Smelter Royalty (NSR) of 3.5% underlies the claims covered by these agreements.

PERMITTING

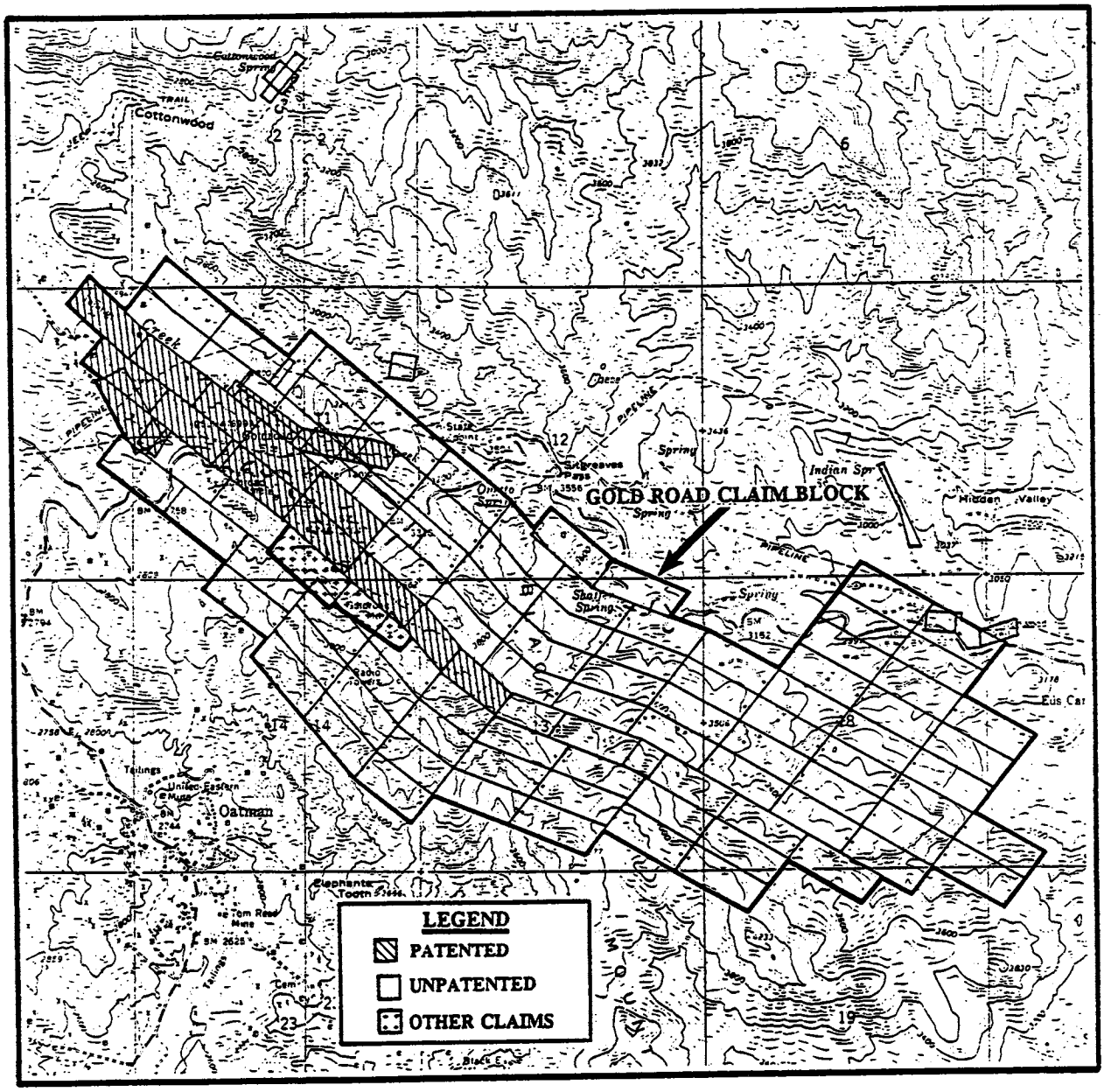
Since all of the mill and planned mine facilities are located on private property, the required permits consist of a State of Arizona Department of Environmental Quality (ADEQ) Aquifer Protection Permit and an Air Quality Permit from that same agency. Applications for these permits have been submitted and approval is anticipated by the end of 1993. The ADEQ has approved Addwest's waste rock removal plan and underground development can begin at any time. The Arizona State Historical Preservation Office and the U.S. Army Corps of Engineers have been informed of Addwest's activity and plans. No other Federal or local permits or approvals are required at this time, so mill and tailings facility construction can begin as soon as the State of Arizona permits are granted.

PROJECT HISTORY

The Gold Road Mine was discovered in 1900. United States Smelting Refining and Mining Company (USSRM) acquired the property in 1911. USSRM and lessees produced the property through 1942 when the mine was forced to close by Government Order L-208. Total recorded production of the Gold Road Mine through 1942 was 611,865 ounces of gold from 1,691,433 tons of ore averaging 0.362 OPT Au.

In late 1991, Addwest began evaluation of the property and in August of 1992, signed the Option

Addwest Minerals, Inc.
Gold Road Project
Mohave County, Arizona



GENERALIZED CLAIM LOCATION MAP

Figure 1.2

to Purchase Agreement with Amwest. Subsequently, Addwest has staked additional claims, conducted limited surface exploration and testing, and rehabilitated some of the underground workings and conducted an underground confirmation sampling program. Mine and mill plans have been completed and permitting is in progress.

GEOLOGY

The Gold Road Mine is located in the Oatman Mining District. The geology of the district consists of easterly-dipping Tertiary volcanics overlying Precambrian basement rocks. Northwest-trending normal faults, some of which are mineralized, are the dominant structural feature of the district.

The Gold Road vein occupies a strong northwest-southeast normal fault fissure that dips steeply to the northeast. The vein traverses the Oatman andesite, the Gold Road latite and the Sitgreave tuff in ascending order. The vein averages approximately five feet wide but may be up to 30 feet wide in ore pockets. Ore has been mined and blocked out for over 6,000 feet of strike length and over 1,000 feet of vertical extent.

The vein consists mostly of quartz with local concentrations of calcite. Gold is the most valuable metal in the ore and is usually alloyed with silver at a ratio of approximately one to one. Sulfides and other metals are rare within the vein. Fluorine may be present in the quartz-calcite ore at concentrations averaging 300 to 500 ppm. The gold is very fine-grained free gold and only visible in the most high grade ore.

METALLURGY

The Gold Road ore is quartz-calcite ore containing very fine-grained gold-silver alloy. Cyanidation and grind tests performed by I.C. Technologies indicate that 95% of the gold and 50% of the silver can be extracted from the ore by grinding to -325 mesh and consuming one pound or less of sodium cyanide and two pounds of lime per ton of ore. No significant sulfides or heavy metals are present in the ore.

PREVIOUS EXPLORATION AND DEVELOPMENT WORK

The Gold Road Mine was developed by five shafts, one main adit and numerous levels. Since the mine closed in 1942, USSRM's activity consisted of assessment work and periodic economic evaluations of the property. The assessment work included drilling two diamond core holes which intersected 4.8 feet of vein that assayed 0.28 OPT Au and 4.0 feet of vein that assayed 0.125 OPT Au at 500 and 1000 feet southeast of the end of the 500 level drift, respectively.

MINING PLAN

The Gold Road deposit consists of very steeply-dipping quartz and calcite ore within competent andesite wallrock. These parameters make it a good candidate for sublevel longhole shrinkage, which offers some of the advantages of bulk mining methods.

A total workforce of 108 personnel, including mine, mill, maintenance, and administration will be needed for the total project. Seventy five people, above and below ground, will be required for the mining portion of the operation. This will allow for up to 750 tons per day of production from the mine (averaging 580 TPD) at an average total mine operating cost of $33.51 per short ton.

Mine production will be done through a decline with a portal at the millsite. The old #3 shaft will be rehabilitated so as to initially give secondary access. Pre-production construction and development in the mine, above and below ground, will take approximately eight months and will require $3,333,295 in pre-production capital costs. After three months of development, some production can begin and 500 tons per day production should be sustainable after approximately six months.

MILL AND PROCESS DESCRIPTION

The Gold Road Project plans to install a mill capable of processing 500 tons of ore per day, seven days per week. The process technology to be implemented for the project consists of a modern cyanide leaching and activated carbon absorption process. Under this process, the ore is crushed, pulverized and mixed with an alkaline solution of sodium cyanide. The ore is contacted with this solution for approximately 24 hours to dissolve most of the contained gold and approximately half of the silver which is then removed from the solution by absorption on activated carbon. The carbon is removed from the system and delivered to the desorption process where the precious metals are deposited on a stainless steel cathodic screen in an electroplating process. Gold sponge is washed from the screens, filtered, dried, smelted and cast into bars.

The processed tailings will be scrubbed and treated with an alkaline chlorination to convert any remaining cyanide to less toxic cyanates. Lime will also be introduced to precipitate any heavy metals from the solution. The treated tailings will then be slurried to a synthetically lined tailings facility, designed by Knight Piesold and Co., located within the historical tailings disposal area.

Total capital cost for the mill is expected to be $4,280,000 and the operating cost per ton at the mill will be $12.10. The tailings disposal facility will cost an additional $800,000. The mill is expected to employ 19 people.

ECONOMIC SUMMARY

Total pre-production capital cost for the base case Gold Road Project is expected to be $9,553,597 including property payments. The total pre income-tax operating cost of the entire operation, including royalties, taxes, and capital costs will be $78.05 per ton or $241 per ounce.

Producing 500 tons per day with prices of $375.00 per ounce for gold and $4.50 per ounce for silver provides an annual cash flow of between $7 and $9 million. The cumulative cash flow mining an initial tonnage of 583,500 tons, will be $27,132,151 and the Net Present Value of the property using a discount rate of 10% is $20,605,623 with an Internal Rate of Return of 108.82%.

A second case mining plan exploiting approximately 50% of the possible and inferred resource along with the proven/probable reserves, to bring the cumulative tonnage mined to 1,500,000 tons, results in a total cumulative cash flow of $88,168,119 and a Net Present Value at 10% of $50,070,649.

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Section 1
INTRODUCTION

1.1 GENERAL

In June of 1992 Addwest Minerals, Inc. (Addwest) entered into an agreement to purchase the Gold Road Property from Amwest Exploration Company (Amwest). The property consists of an underground gold mine which will produce approximately 50,000 ounces of gold per year from 150,000 tons of production. Reserves are currently inventoried at 486,190 tons of proven and probable minable ore (using a 0.15 OPT cut-off, over 579,000 tons using 0.10 OPT cut-of) with additional possible resources of over 2,000,000 tons.

The ore reserves that have been blocked out equal 3.75 years of production. The possible resources delineated indicate an additional 7 to 13 years of production can be expected from the Gold Road vein. Production costs per ounce of gold total $241 and include all operating and capital costs. Total pre-production capital required to bring the property into production is $9,553,597 including $1,000,000 for working capital.

The ore will be mined by long hole shrinkage methods and transported by rubber-tired vehicles up declines to the mill site. The ore will then be crushed and ground, then agitated in tanks using sodium cyanide solution. Processing will continue using activated carbon columns, electrowining and smelting to extract the gold. One hundred and eight personnel are expected to be employed full time at the project site.

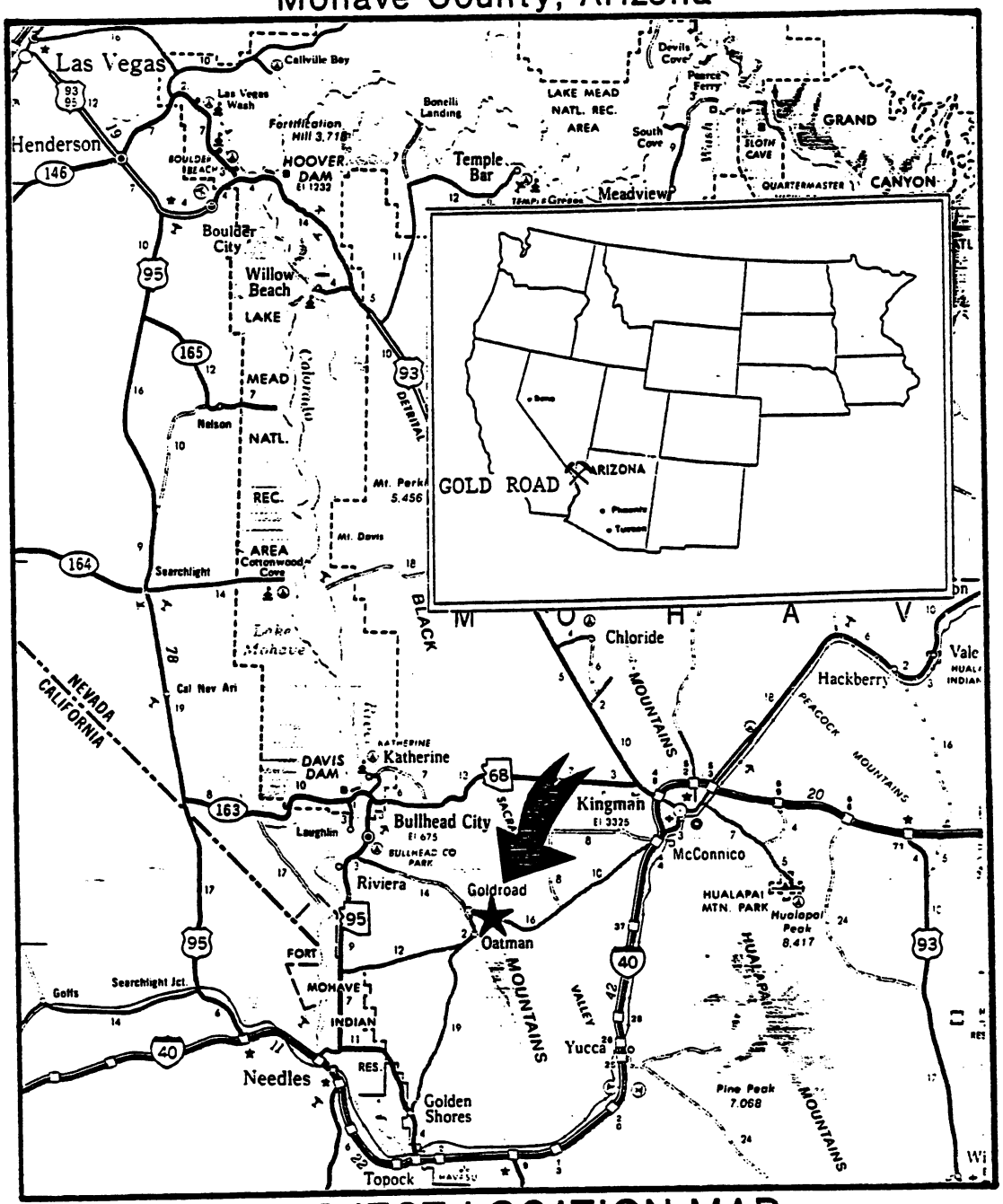
1.2 SCOPE OF THE DOCUMENT

This manuscript summarizes several pertinent documents prepared by independent engineering firms and Addwest for the purpose of preparing the Gold Road Mine for production and obtaining the necessary financing to achieve that end. The minable reserves were evaluated by Western Services Engineering, Inc. The processing evaluation and description were compiled by Gerald Jergenson, P.E. and ICT,Inc. Mining methods were determined by Addwest personnel and consulting engineers Douglas Christopherson and Kevin Wright.

1.3 LOCATION AND ACCESS

The Gold Road Property is located in the San Francisco Mining District in Mohave County, Arizona in Township 19 North, Range 19 and 20 West. The property is adjacent to paved state highway (old U.S. Route 66) and is approximately 25 miles southwest of Kingman, Arizona and approximately 2 road miles north of the village of Oatman (Figure 1.1). The mine area is characterized by rugged hills between 3,000 and 4,000 feet above sea level. The climate is hot

Addwest Minerals, Inc.
Gold Road Project
Mohave County, Arizona



PROJECT LOCATION MAP

Figure 1.1

and arid with annual precipitation averaging approximately 11 inches, most of which occurs in short duration thunder storms in the summer and fall.

1.4 PROPERTY DESCRIPTION

The Gold Road Property consists of a total of 2,145 acres of mostly contiguous claims centered on the Gold Road Mine area as depicted in Figure 1.2 and Plate I. A list of claims and complete property description are included in Appendix A; Property Description. The property includes 18 patented lode claims (272 acres) and 93 unpatented lode claims (1824 acres). Also included in the property package are four patented millsites (19 acres) and six unpatented millsites (30 acres) totaling 49 acres. Water rights are included with some of the millsites.

1.5 PURCHASE AGREEMENT

Addwest has acquired the Gold Road Property through purchase agreements and by staking additional mining claims. The patented mining claims, 25 unpatented mining claims, and the millsites and water rights (a total of 821 acres) were acquired under an Option to Purchase Agreement with Amwest Exploration Company (Amwest), a wholly owned subsidiary of Arava Resources (Arava), which is a wholly owned subsidiary of Mueller Industries, Inc. Under this agreement, Addwest can purchase this portion of the property package by paying Amwest a total of $1.0 million in scheduled payments over four years as follows:

[a]	June 10, 1992	$50,000 (paid)
[b]	July 10, 1993	$50,000 (paid)
[c]	July 10, 1994	$200,000

(Exercise of Option: Addwest signs promissory notes in two equal amounts of $350,000, representing advanced royalty payments due July 10, 1995 and July 10, 1996.)

Amwest will retain a 2% Net Smelter Royalty (NSR) on all production from the claims covered by this agreement which include the unpatented claims of the Red Top-Parfet Agreement, outlined below.

Addwest can purchase the Red Top Claim Group (four unpatented lode claims totaling 70 acres) by making advanced royalty payments of $80,000 on November 1, 1993 and November 1, 1994 for a total of $160,000. In addition, to purchase the Red Top Claims, Addwest must pay the George W. Parfet Estate, Inc., under a consulting agreement as follows:

[a]	April 30,1992	$7,500 (paid)
[b]	November 1, 1993	$10,000
[c]	November 1, 1994	$10,000

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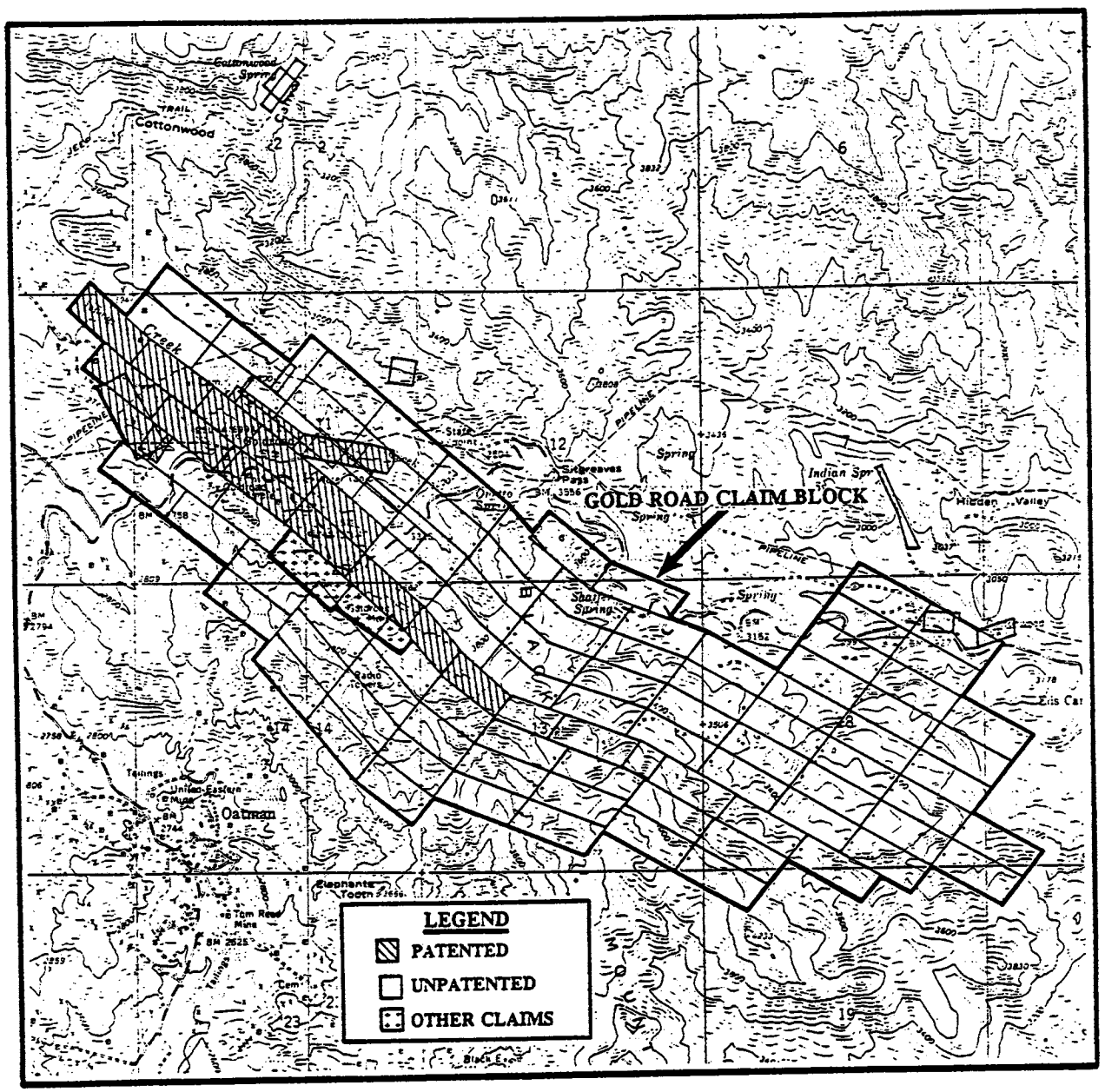
Gold Road Project
Mohave County, Arizona



GENERALIZED CLAIM LOCATION MAP

Figure 1.2

The Geo. W. Parfet Estate payments also retain a 1.5% Net Smelter Return on the Red Top Claims and the portion of the Gold Road Property covered by the option agreement with Amwest. Thus, the total royalty burden on the portion of the property covered by the Option To Purchase Agreement is 3.5% NSR.

In addition, Addwest has staked 64 unpatented lode mining claims totaling 1,254 acres adjacent to those under the above described agreements. These unpatented claims are not subject to any underlying royalties nor are they subject to the royalties underlying the optioned portions of the property. Plate I is a property map illustrating the property status of the Gold Road Property. Copies of the above described agreements are included in Appendix B, Option To Purchase Agreements, at the end of this report.

1.6 Permitting

Since all of the mill and planned mine facilities are located on private property, the required authorizations to put the Gold Road Project into operation consist of a State of Arizona Department of Environmental Quality (DEQ) Aquifer Protection Permit and an Air Quality Permit from the same agency. Applications for these permits have been submitted in May of 1993 and approval is anticipated by the end of 1993. Copies of the Aquifer Protection Permit Application (AQUIFER PROTECTION PERMIT APPLICATION GOLD ROAD PROJECT MOHAVE COUNTY, ARIZONA), the Air Quality Permit Application, and other statements of approval of Addwest's plans to open the Gold Road Mine, as referred to below, are available at Addwest's Arvada, Colorado office.

The State of Arizona DEQ has approved Addwest's waste rock removal plan and underground development can begin at any time. Addwest will have the right to appropriate water, up to the 72,000 gallons per day needed for mill operations, from wells or from water that is currently stored in the mine. Application has also been made with the Arizona DEQ to appropriate runoff from the Silver Creek drainage headwaters to fill the fresh water storage pond to a capacity of 21.7 acre feet. The Arizona State Historical Preservation Office has been informed of Addwest's activities and has found no problems with the proposed plans. The U.S. Army Corps of Engineers has been informed of the proposed operation and they are expected to rule that the operation will not cause any damage to United States waters.

No other Federal or local permits or approvals are required at this time, so mill and tailings facility construction can begin as soon as the State of Arizona permits are granted. Certain county and local groups, as well as the U.S. Bureau of Land Management, that have no jurisdiction over the project have been informed of Addwest's activities. These groups will periodically be kept abreast of activities as the project proceeds for purposes of public relations.

Section 2

PROJECT HISTORY AND GEOLOGY

2.1 GENERAL

For completeness, and to facilitate the understanding of the geology and minability of the Gold Road Project, a summary of the geology and historical production is presented in this section. This summary is a compilation of published and unpublished reports on the Gold Road Mine and the Oatman District. Surface and underground mapping and sampling as well as drilling done by Addwest were also used for the geologic interpretation.

2.2 PROJECT HISTORY

Prospecting in the San Francisco Mining District (also referred to as the Oatman District) began in the 1860's. Only limited mining, particularly at the Moss Mine, was conducted until the discovery of the Gold Road and other mines in the Oatman area after the turn of the century.

The initial claim on the Gold Road vein was located in 1902. The property was acquired by the United States Smelting Refining and Mining Company (USSRM) in 1911 and was operated by them until 1916. Lessees operated the mine from 1917 to 1922. Through the 1920's, the property was produced alternately by USSRM and lessees operating in the upper levels of the mine.

Because of the increase in the price of gold in 1932 from $20.67 to $32.00 per ounce, USSRM decided to rehabilitate the mine and conduct exploration on the property. By 1937, a new mill had been erected and was operational and the mine was producing from several levels. During 1941, the last full year of operation, the mill was processing an average of 423 tons daily.

After closure in 1942 due to Government Order L-208, the mining and milling installations and equipment were removed to USSRM's Bayard, New Mexico mine and modified to produce zinc ore which was considered necessary for the war effort. All other portions of the plant and support facilities were removed by 1954.

All information available indicates that USSRM fully intended to reopen the Gold Road Mine immediately after World War II ended. However, the shortage of skilled manpower and the resulting higher wages along with other higher costs, and the continued controlled gold price, made the mine uneconomic. Activity since the end of the war has consisted of assessment work and periodic reviews to consider reopening the mine. The economic assessments were not attractive until more recent years when gold prices rose considerably, but by then the successor company to USSRM was in financial difficulties.

Since the closure of the Gold Road Mine, USSRM became UV Industries (Sharon Steel) which, in turn, entered bankruptcy and emerged as Mueller Industries (Mueller). Mueller's mining subsidiary (from whom Addwest has optioned the Gold Road Property) is known as Arava Resources which operates through its Amwest Exploration division.

TABLE 2.1 summarizes the historical production at the Gold Road Mine. The total recorded mined ounces from the historical underground operation is estimated to be over 611,000 ounces from approximately 1.7 million tons of ore grading 0.36 ounces per ton (OPT).

TABLE 2.1

Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

GOLD ROAD MINE HISTORICAL PRODUCTION

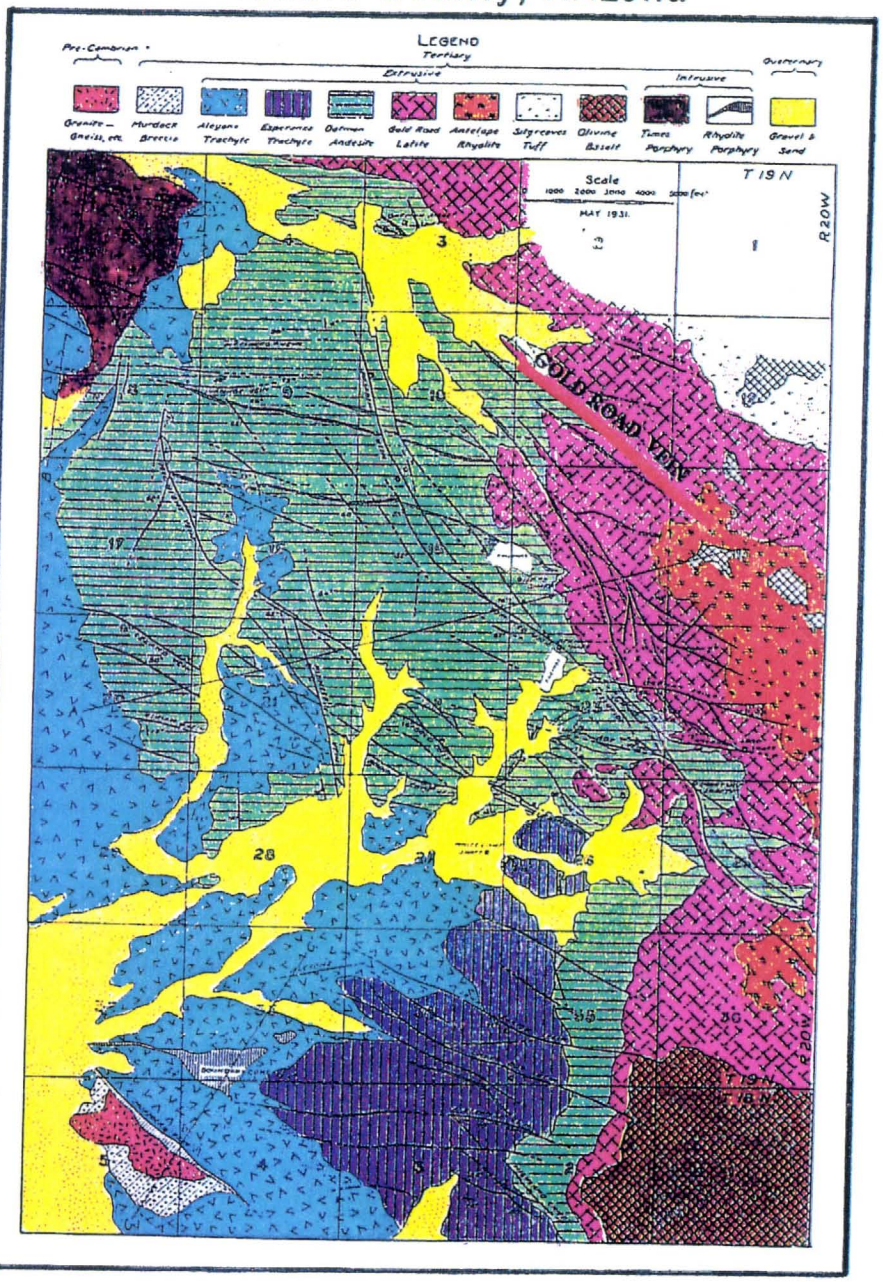
Owner Operator	Production Period [Years]	Total Production [Tonnage]	Average Gold Grade [OPT]	Total Ounces Mined
GRM&E Co.*	1903-11	327,165	0.60	196,299
USSRM	1911-16	500,104	0.37	185,038
Lessees	1917-22	352	0.44	155
USSRM	1923-25	60,965	0.60	36,579
Lessees	1925-28	2,847	0.63	1,794
USSRM	1935-42	800,000	0.24	192,000
Total		**1,691,433**	0.362	611,865

*GRM&E Co. is the Gold Road Mining and Exploration Company

2.3 REGIONAL GEOLOGY-GEOLOGY OF THE OATMAN DISTRICT

The Oatman District lies on the western flank of the Black Mountains, a fault bounded Tertiary volcanic sequence composed of trachyte, andesite, latite, rhyolite and basalt situated at the end of the Basin and Range Province. These flows, tuffs, and agglomerates accumulated to a total thickness ranging from 4,000 to 5,000 feet. Evidence strongly suggests the volcanic center is in the Oatman area. Figure 2.1 is a generalized geologic map of the Oatman District.

Addwest Minerals, Inc.
Gold Road Project
Mohave County, Arizona



GEOLGICAL MAP - SAN FRANCISCO DISTRICT

Figure 2.1

The lowermost rocks of the volcanic sequence, which overlay Precambrian granites and metamorphic, have been divided into three parts consisting of the Alcyone trachyte, the Oatman andesite and the Gold Road latite. These three units are probably differentiates of the same magma source, since they are chemically and mineralogically very similar. They have been described separately to facilitate geologic mapping because they, particularly the Oatman andesite and the Gold Road latite, are the most important ore hosts in the district. The designation of the Oatman and Gold Road units as andesite and latite are miners' terms and may not reflect the true petrology of the rocks. Both units are made up of several andesitic to latitic subunits with the Oatman andesite being dominantly green and the Gold Road latite being mostly red-brown to grey. Figure 2.2 illustrates the generalized geologic section in the area of the Gold Road Mine.

Continued Tertiary volcanic activity in the region produced rhyolitic and other latitic lavas and tuffs including the Sitgreaves tuff which overlies the Gold Road Latite. It is interpreted that the gold mineralization occurred subsequent to these eruptions and was followed by an eruptive capping of basalt, which probably originated some miles east of the Oatman District.

Generally north-south trending faults have elevated the area after cessation of volcanic activity. This faulting has also caused a generally easterly dip to the volcanic units. The general strike of the major faults of the district is northwest-southeast (Figure 2.1). It is northwest trending structures that contain the productive veins of the Oatman District. These faults have normal offsets of varying displacement. The Tom Reed and the Gold Road structures have up to 500 feet of vertical displacement in the mined areas. The dip direction varies, with the Tom Reed structure and those to the east of it, including the Gold Road structure, having a northeasterly dip, while those in the western and southern parts of the district predominantly dip to the southwest.

There are 23 identified vein systems in the seven mile north-south extent of the Oatman District. Of these, the Gold Road and the Tom Reed vein have been the only major producers (the United Eastern Mine actually exploits a portion of the Tom Reed vein). TABLE 2.2 summarizes the known production from the Oatman District.

TABLE 2.2
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

OATMAN DISTRICT HISTORICAL MINE PRODUCTION

District Mine	Tonnage	Gold Grade [OPT]	Total Ounces Mined
Tom Reed	1,186,215	0.64	759,178
United Eastern	550,000	1.12	616,000
Gold Road	1,691,433	0.362	611,865
Others	222,352	0.50	111,760
Total	**3,650,000**	**0.575**	**2,098,803**

The veins of the Oatman District can be simple structures consisting of quartz and calcite with well defined contacts. Most of the ore deposits however, are lodes which consist of many variable width stringers separated from each other by barren rock. In addition to quartz and calcite, the vein gangue may include lesser amounts of adularia and fluorite.

2.4 GEOLOGY OF THE GOLD ROAD MINE

The Gold Road vein occupies a strong normal fault fissure, typical of the Oatman District. This structure was formed by several separate movements; before, during and possibly after the auriferous mineralization. The strike of the sinuous vein varies from N50°W to N60°W and usually dips 65° to 85° to the northeast, though locally the vein can be vertical or even dip slightly to the southwest. Most of the ore has been mined in lenses within the wider zones of the vein. There is a school of thought that the wider portions of the vein are related to areas of concavity along the sinuous structure.

The Gold Road Vein is really a "braided" vein system within the Gold Road fault structure. The fault structure can be over 100 feet wide and the quartz vein or veins can include one, two, three or even more strands within the fault structure. The vein strands usually occupy the footwall, hanging wall or central portion of the structure, but strands may occur in two or all of these positions. Where the fault zone is narrow, vein material may fill the entire structure. The fault structure itself can also be splayed and these fault splits can be mineralized .

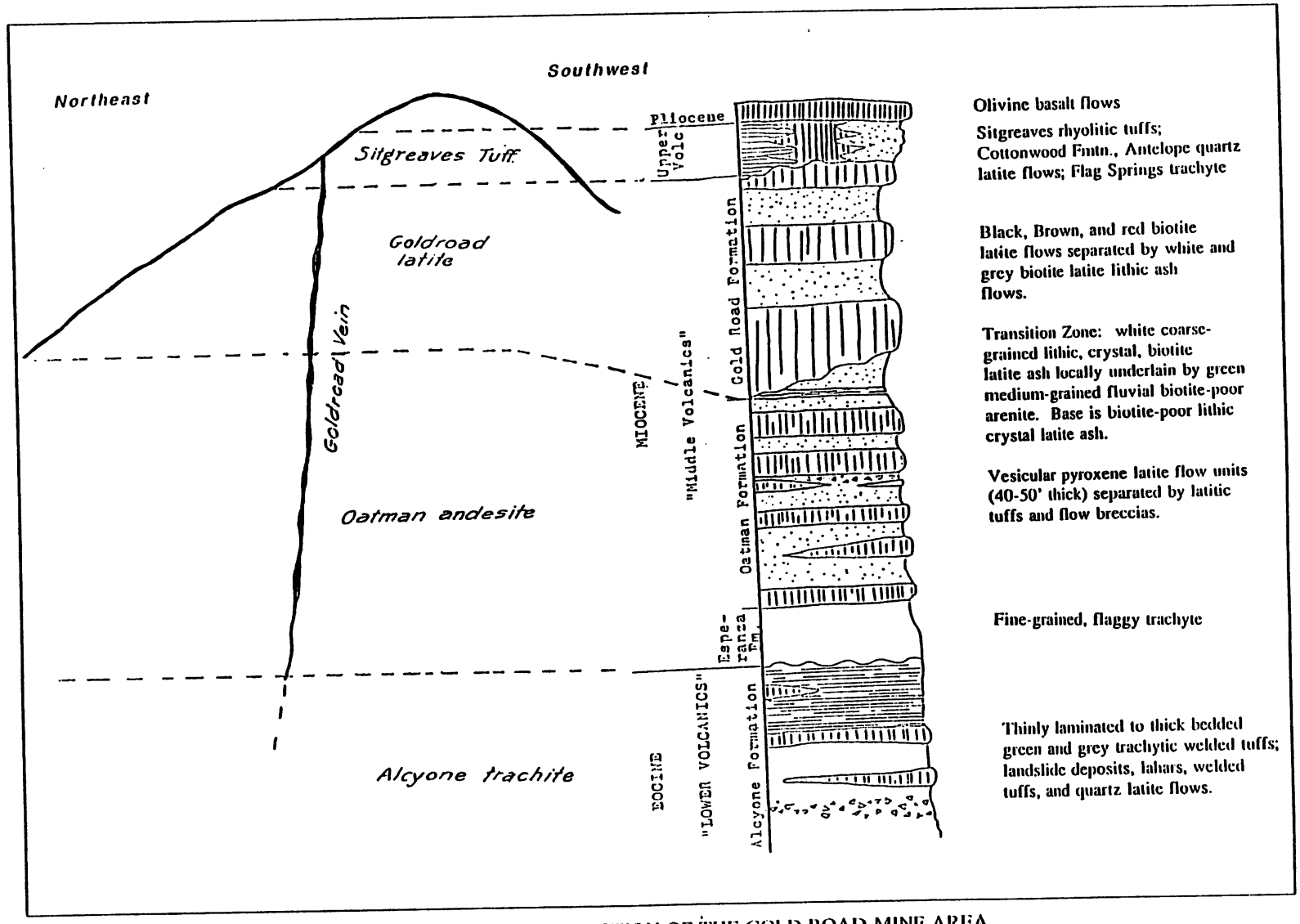
Alteration of the Gold Road latite surrounding the Gold Road vein is poorly developed, except for silicification which is coincident with the vein itself. There is some phyllic alteration a few feet into the country rock where the vein enters the upper volcanics. Beneath the Gold Road latite there is some phyllic alteration in the Oatman andesite, but this can be difficult to see in hand specimens. Clay gouge can be present locally where larger cross faults, particularly one called the Sharp Fault, cut the vein.

The Gold Road vein, as it has been mapped, traverses three formations (Figure 2.2). The Oatman andesite is the lowest, overlain by the Gold Road latite, followed by the Sitgreaves tuff. The Oatman andesite is made up of vesicular porphyritic pyroxene latite flow units, mostly grey-green in color, 40 to 50 feet thick separated by latitic tuffs and breccias. The Gold Road latite is dominantly black, brown, and red biotite latite flows separated by white and grey biotite latite lithic ash flows. The Oatman andesite and the Gold Road latite can be separated by a zone of volcanic sediments and lithic crystal ash falls. The Sitgreaves tuff consists of brown rhyolite tuffs and agglomeratic units.

There is no abrupt change in the vein size at the contacts between the three units that contain mineralization, but there is an apparent gradual narrowing of the vein or veins upward, from a maximum of 30 feet of mined width in the Oatman andesite to only a few inches wide in the Sitgreave tuff at the surface. Ore has been mined from the vein where it is within both the Oatman andesite and the Gold Road latite.

A ±200 foot layer in the upper portion of the Gold Road latite, known to the miners as the "Red

ADDWEST MINERALS, Inc.
Gold Road Project - Mohave Co., Arizona



GENERAL GEOLOGIC SECTION OF THE GOLD ROAD MINE AREA

Scale Approx. 1 Inch = 1,000 Feet

FIGURE 2.2

Sill", has established an upper limit to historical mining. This "sill" is reported to rake approximately 25° to the southeast. The Gold Road latite and other units overlying the "Red Sill" have been sparsely prospected but may have considerable ore potential as illustrated by a raise in the eastern end of the Line Road Tunnel which encounters ore grade mineralization.

Despite the varying vein widths, a realistic average vein width of 4.7 feet was encountered in the mine, though minable stopes average over 5 feet.

A cross-fault appears to offset the Gold Road vein in the northwest end of the mine where the ore and workings abruptly end. The offset portion of the vein has not been located indicating that additional exploration in that direction is warranted.

The mineralogy of the Gold Road vein is typical of the district. The deposit is interpreted to be epithermal in origin. The vein consists mostly of quartz with local concentrations of banded calcite. There are at least 5 stages of quartz emplacement that make up the vein. The last two stages of quartz, which consist of banded yellow-green very fined grained silica and breccia, appear to have introduced most of the ore grade gold to the vein.

Individual ore bodies in the Gold Road Mine range in size from 50,000 to 500,000 tons and range from three to thirty feet wide and extend 100 to 1,600 feet along strike. Minable ore bodies can extend from 200 to 1,000 feet vertically.

The lowermost delineated ore of the Gold Road Mine was assayed on the 800 level. This corresponds to an approximate elevation of 2200 feet above sea level. The other principle mines of the district, the United Eastern and the Tom Reed, were mined between 1500 feet and 2800 feet of elevation (FIGURE 2.3). Since all these orebodies are thought to be of like origin, i.e, derived from the same epithermal ore source and have the same time period of emplacement, there is a strong possibility that the Gold Road vein could extend at least to 1500 feet above sea level, or to the 1500 level of the mine. Data is vague, but there are reports that a winze and crosscut excavated in 1916 may have encountered the Gold Road structure at a depth of 1450 feet below the surface. No access has been available to this winze since 1916.

Gold is the most valuable constituent of the ore and, in fact, very little if any other metals exist in the known portions of the vein. Sulfides are rare in the ore. Fluorine, averaging 300 to 500 ppm, is present locally in the quartz-calcite ore. The gold is alloyed with silver at an average ratio of approximately one to one. High grade ore frequently contains very fine grained free gold in thin quartz bands. Coarse gold has rarely been observed in the mine.

2.5 PREVIOUS EXPLORATION AND DEVELOPMENT WORK

The Gold Road vein was developed by 5 shafts, one main adit and numerous levels along a total strike length of over 6,000 feet and over a vertical range of 1,000 feet (Plate 1). Ore shoots were generally mined to the 700 level, but may be trending deeper, particularly in the southeastern area of the historical mine. Ore shoots, raises and sublevels were developed on certain of the ore blocks in anticipation of immediately mining these blocks when the mine reopened after the war.

Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

OATMAN DISTRICT
VERTICAL DISTRIBUTION OF MINED ORE

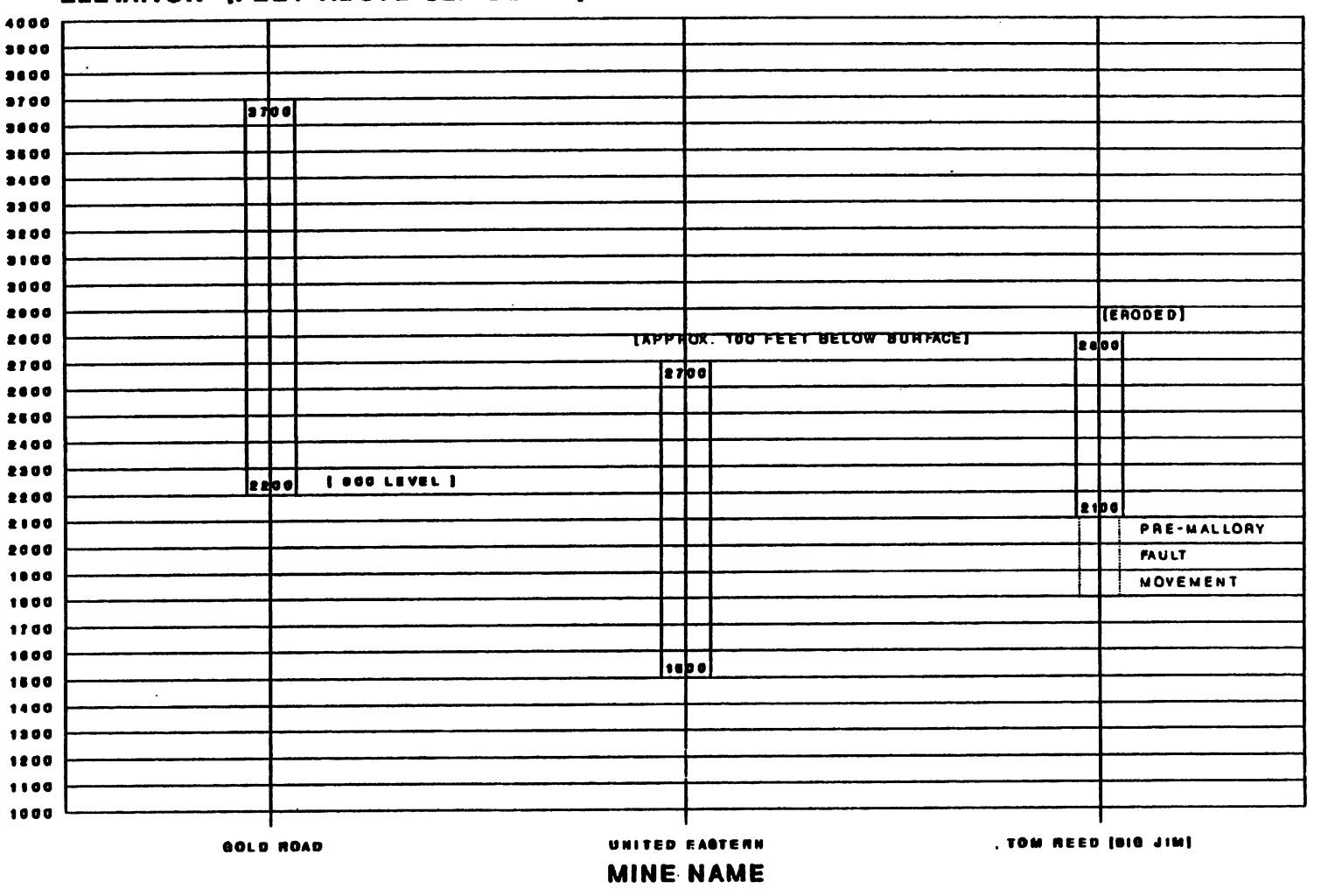


FIGURE 2.3

Since the Gold Road Mine was closed in 1942, USSRM's activity consisted of assessment work, including road and drill site preparation and a limited amount of surface diamond drilling. This drilling consisted of three angled diamond core holes drilled in the early 1980's to intersect the eastern extension of the Gold Road vein. One of these drill holes, DH-GR2, intersected 4.8 feet of vein assaying 0.28 OPT Au 500 feet southeast of the face of the 500 level of the mine. Another of these drill holes, DH-GR1, 500 feet further southeast beyond DH-GR2 at approximately the same level, intersected 4.2 feet of quartz assaying an average grade of 0.125 OPT Au. The third hole was collared over 1500 further southeast than DH-GR1, but was abandoned after only drilling a few hundred feet when enough money was spent to cover assessment costs. The projected ore intersection for this hole would have been at approximately 1500 feet.

2.6 CURRENT CONDITION OF THE MINE WORKINGS

The Line Road Adit was excavated and rehabilitated by Addwest in 1992. A lockable metal door was installed at the portal. The Line Road Drift is accessible for approximately 1400 feet to the east, after which caving has closed the passage. Addwest installed ladderways in the #3 Shaft down to the 100 level allowing for access of personnel, but not heavy equipment. Minor caves on the 100 level have been mucked and lagged so that access to the end of that drift has been established. Ladders are in place in the 4975 raise providing access down to the water level of the mine.

Water had filled the mine to approximately the 320 level in late 1992. This calculates to approximately 85,000,000 gallons which should be very useful for milling during the first years of operation. Heavy rains had raised the water level somewhat in early 1993.

Section 3
METALLURGY

3.1 SUMMARY

The Gold Road ore is quartz-calcite ore containing very fine-grained gold-silver alloy. Very little sulfide material or other metals are present in the ore. Cyanidation and grind tests performed by I C Technologies, Inc. indicate that 95% of the gold and 50% of the silver can be extracted from the ore in 24 hours by grinding to -325 mesh and consuming one pound or less of sodium cyanide and two pounds of lime per ton of ore.

3.2 GENERAL AND HISTORICAL

The Gold Road ore has traditionally been treated by cyanidation. Prior to 1911, a dry crushing mill operated by a gasoline engine was used, but it proved unsatisfactory and a sliming plant was installed. In this mill, crushing was done by eight batteries of five stamps each; the ore being stamped in a cyanide solution. Ensuing processing involved two classifiers, tube mills, three Pachuca tanks, Butters filters, precipitation tanks and a pressure filter. This was a straight cyanide process; no attempt was made to recover values by amalgamation.

The property was taken over by USSRM in July of 1911 and operated with the existing mill intermittently through the late 1920's when the mine closed and the existing mill was dismantled. When they reopened the Gold Road Mine in 1937, USSRM built a mill that processed ore through an agitated cyanide leach and a continuous counter-current decant system, followed with Merrill-Crowe precipitation of metals. This plant, which operated from 1937 through September of 1942, averaged 92% recovery of gold and 50% recovery of silver from material which was approximately 80% -200 mesh. Cyanide consumption averaged 1.4 pounds per ton. The lower silver recovery was believed to be the result of the ore containing argentojarosite which is insoluble in cyanide.

TABLE 3.1 shows the metallurgical operating results for the period 1937 through 1941 (the last full year of operation). TABLE 3.2 is a compilation of the mill consumable supplies and materials from the same period of operation.

The milled grades for the last few years of production are somewhat lower than the grades produced during previous years. During this period of production access and haulage was done through drifts along the vein. Low grade drift muck was run through the mill. This had the effect of lowering the overall grade. Also, existing coarse tailings from the early operation period of the mine (the so-called "French Tailings") which averaged 0.07 to 0.08 OPT Au, were occasionally processed to maintain the mill production levels.

TABLE 3.1
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

GOLD ROAD MINE 1937-1941
METALLURGICAL DATA OPERATING RESULTS

YEAR:	1937	1938	1939	1940	1941	TOTALS	AVERAGE
TONS CRUSHED:	102,830	125,531	121,610	153,284	154,327	657,582	131,516
DISCARDED TONS:	2,527	9,888	11,018	8,970	7,004	39,407	7,881
RECLAIMED TAILINGS:		15,769	20,044	128	96	36,037	9,009
MILLED TONS:	100,303	131,412	130,636	144,442	147,419	618,175	130,842
HEAD Au(OPT): ASSAY AG:	0.205 0.254	0.207 0.283	0.194 0.260	0.186 0.228	0.212 0.225		0.201 0.250
TAIL Au: ASSAY Ag:	0.016 0.138	0.018 0.184	0.020 0.169	0.021 0.143	0.021 0.128		0.019 0.152
UNDISSOLVED Au LOSS:	0.014	0.016	0.017	0.019	0.019		0.017
DISSOLVED Au LOSS:	0.006	0.002	0.002	0.002	0.002		0.003
% RECOVERY HEAD ASSAY	92.48%	91.53%	91.58%	92.46%	91.72%		91.95%
% RECOVERY CALC. ASSAY:	92.46%	90.95%	89.45%	89.40%	90.36%		90.52%

TABLE 3.2
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

GOLD ROAD MINE 1937-1941 CONSUMABLE DATA

YEAR:	1937	1938	1939	1940	1941	AVERAGE
CYANIDE lb/Ton	1.67	1.88	1.49	0.96	1.02	1.404
LIME lb./Ton	7.83	8.03	7.52	7.18	6.81	7.474
GRINDING Balls/Ton	5.95	6.27	6.07	7.24	6.76	6.458
KW HR/Ton CRUSHING	1.76	1.88	1.91	1.83	1.81	1.840
KW HR/Ton GRINDING	23.84	22.07	24.33	23.84	23.73	23.562

3.3 PREVIOUS METALLURGICAL TEST WORK

In 1981, Sharon Steel authorized The Booth Company of Salt Lake City to perform flotation and cyanide leach tests on ore samples from the Gold Road Mine. Results of that test indicate that concentration of the ore is possible with flotation, but the loss to tails by flotation indicates that a cyanide mill would result in economic gain over flotation. The tests performed by The Booth Company achieved recoveries of approximately 95% for gold and 60% for silver. TABLE 3.3 summarizes the results of The Booth Company results.

TABLE 3.3
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

THE BOOTH COMPANY FLOTATION AND CYANIDATION TESTS ON GOLD ROAD ORE

Authorized by Sharon Steel-1981

BOOTH LOT #	DESCRIPTION	HEAD ASSAY OZ/Ton		FLOTATION RECOVERIES		CYANIDE EXTRACTION % TOTAL Au & Ag	
		Au	Ag	%Au	%Ag	%Au	%Ag
1897	LINE ROAD ADIT GRAB SAMPLE, BIN	0.24	0.31	88.1%	52.7%	83.5%	48.3%
1896	NO. 1 SHAFT CRUSHED ORE SPILL	0.28	0.32	88.0%	44.5%	95.1%	60.2%
1895	CRUSHED ORE SAMPLE SPLITTER HOPPER	0.18	0.42	88.7%	35.5%	95.5%	62.1%
1894	UPPER TAILINGS	0.08	0.32	57.2%	16.1%	72.1%	14.3%

NOTE: Lot #1894 is anomolously low in cyanide extraction for samples taken from the mine. This sample contained woody material and other contaminants which would absorb gold. The lower cyanide extraction percentages of Lot # 1894 is not surprising because it is a sample of tailings from past cyanide processing and it is very low grade.

Results of The Booth Company's tests demonstrate that the Gold Road ore needs to be ground to minus 200 mesh but that its cleanness gives the ore excellent settling and filtering qualities that are beneficial to cyanidation. The lack of impurities should also mean minimal consumption of reagents.

The complete Booth Company study along with detailed reports of the historical milling operations of the Gold Road Mine are available in APPENDIX C, HISTORICAL METALLURGICAL DATA, for examination and further study.

3.4 TEST WORK BY ADDWEST MINERALS

The historical mill records and the test work conducted by The Booth Company all indicated that:

(i) The Gold Road ore responds well to cyanidation;

(ii) High extraction (95%) can be achieved at grinding to 80% -325 mesh; and

(iii) Cyanide consumption should be low.

Addwest had Barringer Laboratories perform cyanide shakes and bottle roll tests on samples of the Gold Road ore taken from the 100 level of the mine from ore blocks 1 and 2 as designated in the resource evaluation.

Ten ore samples ranging in grade from 0.14 to 1.295 ounces per ton of gold, as determined by fire assay, were analyzed by three different cyanide shake tests: (1) ground to -200 mesh and leached for one hour; (2) ground to -200 mesh and leached for 2 hours; and (3) ground to -325 mesh and leached for 2 hours. Four of these same samples ranging in grade from 0.249 to 1.295 ounces per ton of gold were also submitted for bottle roll tests. The results for these tests are summarized in TABLE 3.4.

TABLE 3.4
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

GOLD ROAD MINE CYANIDE RECOVERIES AND EXTRACTIONS
FROM CYANIDE SHAKES AND BOTTLE ROLLS-SAMPLES FROM THE 100 LEVEL

CYANIDE SHAKE TESTS								BOTTLE ROLLS (-200 MESH)			
SAMPLE NUMBER	FIRE ASSAY	-200 MESH 1 HOUR CN LEACH	-200 MESH 2 HOUR CN LEACH	-325 MESH 2 HOUR CN LEACH	-200 MESH 1 HOUR RECOVERY%	-200 MESH 2 HOUR RECOVERY%	-325 MESH 2 HOUR RECOVERY%	RECOVERY (OPT)	EXTRACT. PERCENT	TAILS (OPT)	RECOV.+ TAILS (OPT)
4990H	0.140	0.102	0.096	0.110	72.86%	68.57%	78.57%				
4980V	0.198	0.156	0.176	0.164	78.79%	88.89%	82.83%				
3995V	0.249	0.195	0.190	0.216	78.31%	76.31%	86.75%	0.195	92.40%	0.016	0.211
5020V	0.259	0.213	0.212	0.230	82.24%	81.85%	88.80%	0.234	95.10%	0.012	0.246
3900V	0.280	0.228	0.240	0.266	81.43%	85.71%	95.00%				
4020	0.316	0.264	0.286	0.300	83.54%	90.51%	94.94%				
5300V	0.335	0.231	0.244	0.290	68.96%	72.84%	86.57%				
5190FV	0.443	0.408	0.420	0.426	92.10%	94.81%	96.16%				
5320V	0.657	0.456	0.490	0.624	69.41%	74.58%	94.98%				
5220V	0.674	0.567	0.570	0.648	84.12%	84.57%	96.14%	0.612	96.50%	0.022	0.634
5210V	1.214	1.11	1.120	1.188	91.43%	92.26%	97.86%				
5200FV	1.295	1.151	1.260	1.272	88.88%	97.30%	98.22%	1.135	92.20%	0.096	1.231
AVERAGES:	0.505	0.423	0.442	0.478	81.01%	84.02%	91.40%	0.544	94.05%	0.0365	0.581
AV.> 0.20 OPT	0.572	0.482	0.503	0.546	82.04%	85.07%	93.54%				
AV.> 0.50 OPT	0.960	0.821	0.860	0.933	83.46%	87.18%	96.80%				

The cyanide shake tests indicate that the finer the grind and the longer the leach time the better the recoveries. Excellent recoveries, averaging 84% and 91.4% respectively, were obtained from the 2 hour test of the -200 and -325 material. The cyanide shake tests also show that the higher

the grade of ore the better the recovery. The lowest grade sample (#4990H at 0.14 OPT Au) achieved the lowest recovery in all the shake tests; 68.6% and 78.6% respectively, on the 2 hour -200 and -325 mesh. The samples which assayed above 0.20 ounces per ton gold averaged 85.1% and 93.5% respectively, from the 2 hour -200 and -325 mesh tests, while those four samples which assayed above 0.50 ounces per ton of gold averaged 87.2% and 96.8% recoveries from those same tests.

The bottle roll tests on four of the ore samples also achieved excellent results averaging 95% extraction. The highest grade sample, 5200FV at 1.295 ounces per ton of gold, achieved the lowest extraction percentage 92.2% and the highest tails, 0.096 ounces per ton of gold. This is probably the result of a coarse nugget effect. The extraction verses time curve for this sample is still increasing after fifty hours, the end of the test. Better extractions could probably be achieved by adding more cyanide, increasing the retention time, or using a finer grind or a combination of these three parameters.

3.5 CYANIDATION AND GRIND STUDIES [ICT FOR ADDWEST MINERALS

In 1993 Addwest contracted I C Technologies, Inc. [ICT] to perform cyanidation and grind tests and some engineering studies on the Gold Road ore to facilitate in the design of the production plant at the Gold Road Mine. These tests and studies were designed to determine optimum grind size, leach time,pulp density, cyanide concentration, work indices, and power requirements. The ICT report titled Metallurgical and Engineering Evaluation of Samples From the Gold Road Mine is attached as APPENDIX D. Details and specifics of ICT's evaluation of the Gold Road ore can be examined in that report.

In summary, it appears that the Gold Road ore can be optimally processed by grinding until 80% of the material is between -270 and -400 [-325] mesh. With a leach time of 24 hours, recoveries in the cyanidation tests averaged approximately 95% for gold and just over 50% for silver. The cyanide consumption averaged 1 pound per ton of ore and lime use averaged approximately 2 pounds per ton. Pulp density should be maintained at 40-50% solids. Aerating the pulped ore reduces the cyanide consumption considerably.

Work indices performed on two composite samples of relatively hard ore for the mine were 21.8 and 25.5. Power requirements of 900 horsepower versus 400 horsepower in the old USSRM mill indicate that the samples used for this study were considerably harder than the typical ore historically milled at the Gold Road Mine.

Three samples, referred to as composite #1, composite #2 and a high grade sample, were used to perform these tests. The samples were composed of vein material collected during check sampling program conducted by Addwest in designated ore blocks 1 and 2 located between the 4900 and 5300 east coordinates of the mine. Samples composite #1 and composite #2 consist of an aggregate of several samples composited to represent "run of mine" ore grade and composition from this section of the mine. The high grade sample was a composite of several samples from the same area of the mine that averaged over 1.0 ounce of gold per ton. These

samples were collected from an area of the mine refereed by the historical miners as containing the hardest rock ever encountered in the mine. The work indexes from these samples can be considered as maximums.

The Cyclic cyanidation tests performed by ICT indicate that approximately 95% of the gold and 50% of the silver can be extracted from the ore in 24 hours by grinding to 80% -325 mesh and consuming one pound or less sodium cyanide solution. TABLE 3.5 summarizes the results of the cyclic cyanidation tests performed on Gold Road ore samples composite #1 and #2.

TABLE 3.5
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

SUMMARY OF CYCLIC CYANIDATION TESTS

Test No.	SODIUM CYANIDE Added lb/st	Consumed lb./st			Final g/L	Residue 0z/st		Extraction %	
		Grind	Leach	Total		Au	Ag	Au	A
COMPOSITE #1									
1	2.60		1.30	1.30	0.63	0.013	0.14	96.1	60
2	2.60	0.18	1.10	1.28	0.88	0.016	0.12	95.2	64
3	1.92	0.27	0.87	1.13	0.74	0.014	0.09	95.8	70
4	2.00	0.24	0.93	1.17	0.77	0.013	0.06	96.1	78
5	1.40	0.34	0.84	1.17	0.52	0.014	0.12	95.8	64
6	1.00	0.17	0.64	0.81	0.36	0.022	0.16	93.5	57
7	1.00	0.42	0.50	0.92	0.41	0.043	0.15	88.0	58
8	0.60	0.26	0.45	0.70	0.20	0.054	0.13	85.4	62
COMPOSITE #2									
1	2.60		1.10	1.10	0.73	0.016	0.32	95.4	45
2	2.60	0.16	0.67	0.83	1.13	0.018	0.29	94.9	47
3	2.00	0.17	0.77	0.93	0.94	0.016	0.26	95.4	50
4	2.00	0.46	0.94	1.41	0.83	0.018	0.24	94.9	52
5	1.40	0.19	0.70	0.89	0.69	0.009	0.29	97.4	47
6	1.00	0.31	0.56	0.87	0.44	0.024	0.25	93.3	51
7	1.00	0.53	0.51	1.03	0.44	0.034	0.27	90.8	49
8	0.60	0.03	0.57	0.60	0.24	0.054	0.29	86.1	47

3.6 METALLURGICAL ASSUMPTIONS FOR THE PROPOSED MILL

The various mineralogic and metallurgic tests performed on the Gold Road ore have produced the data necessary to design an optimal mill facility for the project. These metallurgical parameters, along with expected ore grade, are summarized in TABLE 3.6.

TABLE 3.6
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

PROCESSING CRITERIA - GOLD ROAD MILL

PROCESS CRITERIA	ASSUMPTION
ORE GRADE	0.20 to 1.0 0z./Ton
FEED	
Rate	500stpd
Size	Run of Mine
CRUSHING	
Stages	2
Product	≈1/2-inch
GRINDING	
Type	Ball Mill
Product	80% Passing 325-Mesh
Ore Hardness	Up to Bond Index of 25 kwh/st
Mill Power	1000 HP
Mill Density	≈67% Solids
Lime Addition	1.5 - 2.0 lb. CaO/st
Mill Solution	C-I-P Tails Decant
CYANIDATION	
Retention	24 Hours
Pulp Density	50% Solids
Alkalinity	10.5 Ph
Total Lime Addition	2.0 lb./st CaO
Cyanide Control	0.6 g/L Free NaCN
Cyanide Addition	1.4 lb. NaCN/st
Cyanide Consumption	1.0 lb. NaCN/st
Cyanide Residual	0.4 lb. NaCN/st
Carbon Content in C-I-P	20 g/L
Carbon Loading	120-150 oz. Au/st
Gold Extraction	94-96%
TAILINGS THICKENING	
Flocculent Addition	0.024 lb./st, very high Molecular Weight non-ionic polyacrylamide
Terminal Density	63-64% Solids
Unit Area	1.2 ft^2/stpd
CYANIDE DESTRUCTION	
Slurry Total CN	<500 mg/L
Slurry WAD CN	<300 mg/L
Chlorine Addition	≈1.9 g Cl2/g CN
Lime Addition	≈2 g CaO/g CN
Residual Total CN	80 mg/L
Residual WAD CN	1.6 mg/L
Residual Copper	<5 mg/L

The mill will be designed to efficiently process ore that consists of grades within the 0.20 to 1.0 ounce of gold per ton range. The cut-off grade and range of grades used to calculate the reserves of the Gold Road mine will easily allow for maintenance of the optimal grade range as indicated in TABLE 3.6, particularly if blending is utilized. The next section of this report, Section 4, explains how the tonnages and grades of the Gold Road reserves were determined. Details of the tailing facility and requirements are described in Section 5, Process Description, of this report.

Section 4

RESOURCES AND RESERVES

4.1 INTRODUCTION

In October of 1992, Addwest commissioned Western Services Engineering, Inc. (WSE) to complete an ore reserve evaluation of the Gold Road Project. WSE's report was completed in January of 1993. The report includes an audit of the project database, an in situ geological resource estimate, and an in situ minable ore reserve suitable for detailed mine planning.

The WSE report, titled The Gold Road Project Minable Reserve Evaluation, Mohave County, Arizona, is available as a separate document for reference as to the details of ore reserve compilation.

4.2 DATABASE DESCRIPTION

Extensive historical production, sampling and map file databases were utilized in the assessment of the Gold Road Project. Assays have been collected from both mined and unmined areas. Great quantities of assay and geological data have been incorporated into computer data bases at considerable expenditures of both time and money. This data-set was used by WSE to estimate resources into undeveloped areas as well as provide estimates within mined areas for use in reconciliation and subsequent verification of the selected resource estimation algorithm.

Addwest conducted a confirmation channel sampling program within selected, accessible areas of the mine. This included the area east of the 4975 raise on the 100 level (samples were collected on ten foot intervals) and on 50 to 100 foot intervals throughout the remaining accessible development drifts on the 100 and Line Road levels. Addwest's samples were fire-assayed by Barringer Laboratories in Reno, Nevada.

4.3 STATISTICAL ANALYSIS OF THE DATABASE

WSE conducted a series of classical statistical analyses to determine the character of the gold populations with regard to distribution on both a statistical and spatial basis. The gold grade distribution, based on all historical sample data in both the vertical and horizontal directions, indicated a lack of grade zoning in the Gold Road Mine.

A classical statistical analysis of the raw data set defined the character and variability of the mineralized width of the Gold Road deposit. The results indicated that the mineralized raw assay data intercepts (0.10 OPT cut-off grade) range in thickness from 1.0 to 17.0 feet and have an

average grade on the order of 0.459 OPT Au.

Addwest determined that minable widths of 5.0 feet and a 0.150 OPT grade were appropriate for minable blocks. Using these criteria, WSE composited the data to construct the in situ geological and minable reserve models. It was established that a total of 2,388 composited data-set intervals (out of a total of 7000 new data-sets) were within mineralized areas (potential stopes). The combined total of all of these intervals had an average gold grade of 0.332 OPT with an average thickness indicated to be 5.54 feet.

A log-probability plot of the composite data set indicated the grade cutting should be implemented for all values greater than 5.0 OPT. Further evaluation of the information indicated that these high grade samples were located in two distinct pods indicating reasonable continuity. WSE determined that the composite grades would be utilized during the estimation process with subsequent reduction of all plus 5.0 OPT model grades being cut to 5.0 OPT.

Variograms of the composited data set were compiled to determine the lateral continuity of the gold mineralization and its related thickness. Continuity of the gold grade and vein thickness of the mineralization is defined to be on the order of approximately 100 feet in the horizontal direction. Continuity in the vertical direction could not be reasonably established as the data was spatially and numerically limited (i.e. most data was from assays along drifts and a few raises).

Addwest collected channel samples from the 100 and Line Road (200) levels. A comparison of the assay results of these new samples with assays done by USSRM in the past indicates the average grade of the corresponding historical data was 0.279 OPT while the recently collected Addwest data set was 0.2986 OPT, a difference of 5.9%.

4.4 RESERVES OF THE GOLD ROAD MINE

Since the closure of the mine in 1942, several predecessor companies compiled resource estimates using the mine data-set within the area of historical mine development. WSE independently compiled an estimate to verify the previous efforts which included:

[a] Definition of a computerized three-dimensional sectional model that included the zones of potentially economic mineralization;

[b] Estimation of gold grades and thicknesses using the inverse-distance [IDS] method; and

[c] Summarization and reporting of both the in situ geological and in situ minable reserve.

TABLE 4.1 presents a summary of the historical and current resource estimates within the historically mined area of the Gold Road Mine.

TABLE 4.1
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

GOLD ROAD MINE IN SITU GEOLOGICAL RESOURCE ESTIMATES

Company	Year	Type of Estimation	Tonnage	Grade [OPT Au]	Ounces [Au]
USSRM	1942	Manual [0.17 OPT]	456,138	0.325	148,245
ARAVA	1989	Manual [0.17 OPT]	456,000	0.325	148,200
ADDWEST	1992	Manual [0.15 OPT]	540,728	0.320	171,345
ADDWEST	1993	Manual [0.10 OPT]	611,984	0.324	198,250
WSE	1993	IDS Computer [0.01 OPT]	519,600	0.341	177,200

Comparison of the varying estimates indicates that the contained ounces range from approximately 150,000 to 200,000 ounces of gold. The 1993 Addwest and WSE estimates are the higher of those reported, but are based on a different stope design than that used by the earlier estimates. These later Addwest and WSE stopes were delineated by manually interpreting the assay and geological data of the mine drifts using a 0.10 OPT Au assay cut-off. Areas along drifts with a reasonable length of greater than 0.10 OPT were combined with similar areas on drifts above and/or below to outline possible minable stopes. Examination of the data indicates that the USSRM, Arava and early Addwest (1992) estimates may have been conservative in the projection of the ore boundaries for stope outline definition.

Plate 2 of this report (Longitudinal Mine Section) is a computer generated longitudinal section delineating the workings, proposed stopes and potential resource areas of the Gold Road Mine. TABLE 4.5 (WSE Summary of Stope Grades and Thicknesses) at the end of this section of this report, summarizes the individual stope grades, thicknesses, tonnages and contained ounces of gold as determined by WSE. TABLE 4.6 presents the same data as TABLE 4.5, but sorts the stopes by grade. TABLE 4.7, also at the end of this section, summarizes the same stope by stope details as determined by Addwest manually in 1993.

TABLE 4.2 presents the in situ minable reserve statement as determined by WSE using a series of incremental cut-off grades which enables a more direct comparison with the results of TABLE 4.1. A total of 177,200 ounces of gold, defined as proven and probable, have been defined within the WSE estimate of in situ minable reserves.

TABLE 4.2
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

WSE IN SITU MINABLE ORE RESERVE ESTIMATE

Cut-off Grade [OPT Au]	Tonnage	Grade [OPT Au]	Ounces
0.000	579,470	0.318	184,100
0.100	562,940	0.325	182,700
0.150	486,190	0.355	172,600
0.170	462,550	0.365	168,800
0.200	349,390	0.424	148,100
0.250	264,050	0.488	128,900
0.300	171,780	0.606	104,100
0.350	142,920	0.662	94,613

4.5 INFERRED RESOURCES

WSE and Addwest developed an estimate of additional resource potential to aid in the definition of future exploration requirements of the Gold Road Mine Project. This resource estimate consists of the determination of tonnages and grades for those previously undefined potential stope areas for which data was too limited, as well as for those areas downdip and along strike, particularly to the southeast, where there is a good possibility that additional ore will be discovered in the future. These estimates are considered to be inferred and require confirmation.

There is considered to be good potential to the southeast because of the two drill holes drilled by UV Industries 500 and 1000 feet beyond the existing mine workings. Both of these holes encountered over four feet of ore-grade vein at a level approximately equal to the 500 level of the mine. The deep ore is considered to have potential because there is no statistical lessening of ore or grade with depth in the known workings and because of a reference to the Gold Road structure being encountered in the old 1450 winze.

Estimation of the tonnage, grade and contained ounces within inferred stopes within the developed portions of the Gold Road Mine was attained by utilizing the results generated during the estimation process of the proven and probable stopes presented in the "In Situ Minable Reserve Estimate." WSE simply summed the longitudinal section areas of the individual inferred stopes, as interpreted by Addwest, (432,025 ft^2) and multiplied that total by the average thickness of the minable vein (5.68 ft) to determine the potential total volume of those inferred stopes. Using 13 cubic feet per ton (the historical tonnage factor) and an average grade of 0.355 OPT Au (from the WSE reserve estimate), WSE determined that the potential for another 188,762 tons containing 67,010 ounces of gold exists within the developed area of the Gold Road Mine. These areas can be tested with limited work because they are located within the proximity of existing mine workings.

The last inferred area for estimation consists of areas downdip and along strike from the existing mine workings. This estimate of inferred resource was derived by using the proven and probable average stope grade and thickness. The total area of the downdip and along strike potential was determined by Addwest using the Line Road drift extension, two core holes drilled by Amwest southeast of the mine workings, and some exploration raises and winzes. It was established that approximately 60% of the developed area of the Gold Road Mine was mineralized. Using the 60% mineralization factor and the average grade and thickness from the proven and probable stopes, it can be determined that the potential for an additional 1.97 million tons of ore exists that could contain approximately 700,000 ounces of gold. Significant exploration is required to determine the true potential of the project.

TABLE 4.3 presents a summary of the WSE reserves and inferred resources of the Gold Road Mine Project generated during this evaluation.

TABLE 4.3
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

IN SITU POTENTIAL MINABLE RESOURCE - CUT-OFF GRADE=0.150 OPT Au

Classification Reserve\Resource	Tonnage	Grade [OPT Au]	Ounces
Proven\Probable	486,190	0.355	172,600
Possible [Inferred Stopes]	188,762	0.355	67,010
Inferred	1,970,000	0.355	700,000
TOTAL	**2,644,952**	**0.355**	**939,610**

Inferred classed resources are based on a factored approach. Significant exploration is required to develop this portion of the estimate.

4.6 EXPLORATION POTENTIAL

Besides the areas downdip and along strike to the southeast of the developed portions, there is considerable additional exploration potential at the Gold Road Mine. This potential includes parallel ore-shoots within developed portions of the mine as well as potential parallel structures along strike and downdip of the projected inferred resources outlined above. There is also an unknown potential in the presumably faulted off western extension of the Gold Road vein. A successful program to explore this parallel and western potential could add an additional 400,000 ounces, or more, to the Gold Road resource base.

Mining and drifting in the past in the Gold Road Mine was generally conducted on the most accessible portions of the vein and very little underground exploration drilling was done. For example, when a particular ore-shoot ran out or was faulted off, a side drift or drifts were excavated until vein material was again encountered. Then, drifting and development continued along this portion of the vein until it ran out, and so on. Parallel strands of the vein were seldom evaluated, particularly if the strand being developed was high grade. This means that large portions of the mine have large lengths of unexplored potential in parallel strands and structures.

This parallel strand potential was recognized by the engineers and mine managers when the mine was being re-evaluated for reopening in the 1940's. They also understood that some undeveloped portions of the mine contained considerable potential that was never truly evaluated because their effort was expended in exploiting the high grade known ore blocks further along strike. The USSRM miners and engineers believed that anywhere there was quartz in the mine had potential for minable ore and should eventually be examined ("..our experience in the last few years has shown that barren zones in quartz are not large.." W.F. Elgin-Mine Manager-1942 in evaluation report 9/44).

In 1942, USSRM personnel identified several areas of the mine with potential in zones parallel to the mined ore shoots that warranted further examination. These areas were outlined by Mr. T. P. Billings in his reopening evaluation report of September of 1945. Using Addwest's average vein parameters (i.e. 5.6 feet wide, 0.355 OPT Au, etc.), these zones could hold an additional 407,500 tons containing 144,700 ounces of gold in addition to the resources as outlined above by WSE (TABLE 4.3). The following list summarizes the parallel targets recognized by USSRM:

a] 100 level, between 1340E and 2550E, "...there is approximately 1000 feet that is unexplored...". Potential Resource = 103,000 tons.

b] 800 and 900 level west, "...it seems that the two veins are separated in the west end of the 800 level, for there are crosscuts to the hanging and foot walls." Potential Resource = 69,000 tons.

c] 350 level, near 3590 raise, "... vein has apparently split into three strands...center is already mined...we have exposed the hanging wall strand with the 3590 crosscut...the 3420 stope will mine the footwall..." 3400E to 3860E. Potential = 39,600 tons.

d] 100 level between 3800E and 4200E, "...high grade ore was found 9 to 12 feet in the footwall...ore undoubtedly makes in the footwall...". Potential Resource = 17,000 tons.

e] 350 level foot and hanging wall drifts above Sharp stope between No.2 and No.3 shafts, "... Sharp stope was cut by a fault at about 50 feet above the 300 level...crosscut to the hanging wall and look for the continuation of the Sharp orebody...ore down the No. 2 shaft 80 feet below the 100 level..." Potential Resource = 50,000 tons or more.

f] 350 and 500 level east drift, 5100E to 5545E, "...ore split a few feet from the face..."(500 level), "...crosscuts to both walls...show 18.5 feet of stranded ore...". Potential Resource = 51,700 tons.

g] 500 level, footwall at No.3 shaft, "Diamond drill hole No. 5-A cut 9 feet of vein that assayed 0.175 oz. gold. The hole cut the vein 35 to 40 feet ahead of the face."..... "The vein will probably split and the footwall strand may lead to the excellent ore that is 100 feet in the footwall of the Sharp stope on and just below the 300 level at 1100 to 1200 east. A serious effort should be made to get under that ore as it is about 5 feet wide and assays 1.00 oz. gold."..... "The old operations mined the Sharp orebody and when they pulled the stope on the 700 level they noticed some of this footwall ore coming out the chutes."..... "When we re-opened the 700 level we pulled several thousand tons and recovered some of this footwall ore. Even with the enormous amount of waste that we had to handle, this paid, and the only reason that we quit was because we were afraid that we would cave the ore above the 300 level and that cave might extend to the surface." Potential Resources (91100E to 2000E) = 77,500 tons or more.

These targets, as described by USSRM, represent evaluation of the parallel potential of the Gold Road Mine covering 30% to 40% of the previously developed workings. Similar parallel ore shoots probably will be discovered adjacent to the remainder of the mine. This could add an additional potential of 400,000 tons (assuming one can approximately double the potential delineated by USSRM) for a total potential of 807,500 tons, or 286,700 ounces of gold.

As has been stated above, it appears that the west end of the Gold Road orebody has been terminated by faulting. If the continuation of the vein can be discovered to the west and an ore zone similar in size (approx. 1200 by 800 feet) to the ore shoot around the No.1 shaft can be delineated, then an additional potential of 413,000 tons containing 147,000 ounces could be added to the potential resource base of the property.

The parallel and western extensions could add an additional 1,221,000 tons or approximately 433,700 ounces of gold to the possible resource inventory of the Gold Road Project. TABLE 4.4 summarizes the total potential of the property as delineated to date.

TABLE 4.4
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

TOTAL POTENTIAL GOLD RESOURCES - GOLD ROAD MINE PROJECT

Classification Reserve\Resource	Tonnage	Grade [OPT Au]	Ounces
Proven\Probable (0.15 Cutoff)	**486,190**	**0.355**	**172,600**
(0.10 Cutoff)	(579,470)	(0.318)	(184,138)
Possible [Inferred Stopes]	**188,762**	**0.355**	**67,010**
Inferred	**1,970,000**	**0.355**	**700,000**
SUBTOTAL	**2,644,952**	**0.355**	**939,610**
Parallel Veins [Possible Inferred]	807,500	0.355	286,700
West Extension [Possible Inferred]	413,500	0.355	147,000
TOTAL	**3,870,952**	**0.355**	**1,373,272**

4.7 EXPLORATION

The above outlined exploration targets, including all of the inferred and possible resources, will be evaluated during develpment and production of the mine. Operating costs have been allocated for underground exploration drilling to explore parallel, deep and strike extension targets. As the development decline(s) progress, drill stations will be excavated at periodic intervals to evaluate the various targets.

TABLE 4.5
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

W S E

STOPE GRADE TONNAGE SUMMARY - NO CUT-OFF GRADE

STOPE ID	TONS	GRADE	OUNCES	THICKNESS
1001	30,480	0.339	10,333	5.36
1002	19,430	0.430	8,355	5.64
1003	21,690	0.473	10,259	5.66
1004	16,390	1.204	19,734	5.69
1005	10,520	0.442	4,650	7.13
1006	6,960	0.354	2,464	5.23
1007	16,730	0.390	6,525	7.94
1008	9,940	0.322	3,201	5.36
1009	4,340	0.177	768	5.06
1010	4,500	0.154	693	5.25
1011	3,820	0.306	1,169	5.00
1012	2,150	0.203	436	5.00
1013	3,340	0.224	748	5.00
1014	17,220	0.292	5,028	5.16
1015	4,730	0.302	1,428	5.23
1016	6,230	0.287	1,788	5.23
1017	3,910	0.294	1,150	5.51
1018	2,410	0.262	631	5.05
1019	8,350	0.233	1,946	5.00
1020	2,410	0.825	1,988	5.05
1021	17,650	0.210	3,707	5.07
1022	24,440	0.219	5,352	5.30
1023	11,090	0.163	1,808	5.59
1024	11,200	0.157	1,758	5.23
1025	28,470	0.196	5,580	5.10
1026	10,980	0.158	1,735	5.12
1027	7,630	0.193	1,473	6.12
1028	2,390	0.180	430	5.00
1029	5,290	0.196	1,037	5.05
1030	3,900	0.192	749	5.49
1031	5,340	0.239	1,276	5.35
1032	2,900	0.206	597	5.58
1033	5,480	0.272	1,491	6.84
1034	24,500	0.214	5,243	5.37
1035	7,340	0.370	2,716	5.32
1036	2,390	0.115	275	5.00
1037	12,320	0.169	2,082	5.29
1038	6,640	0.223	1,481	5.16
1039	2,860	0.278	795	5.00
1040	2,270	0.112	254	5.30
1041	1,490	0.220	328	5.20
1042	4,300	0.193	830	5.29
1043	5,230	0.274	1,433	5.22
1044	1,430	0.390	558	5.00
1045	3,590	0.345	1,239	6.66
1046	2,860	0.183	523	5.00
1047	14,740	0.431	6,353	6.81
1048	6,870	0.259	1,779	6.01
1049	8,400	0.155	1,302	6.01
1050	7,900	0.246	1,943	9.04
1051	6,440	0.251	1,616	5.00
1052	4,330	0.512	2,217	5.05
1053	4,810	0.121	582	5.69
1054	15,210	0.773	11,757	6.02
1055	2,930	0.261	765	5.12
1056	1,510	0.474	716	5.27
1057	500	0.350	175	5.20
1058	1,850	0.828	1,532	5.56
1059	2,970	0.602	1,788	5.19
1060	2,050	0.221	453	5.40
1061	950	0.228	217	5.00
1062	7,850	0.280	2,198	5.76
1063	11,460	0.284	3,255	5.12
1064	4,960	0.281	1,394	5.21
1065	2,660	0.250	665	5.07
1066	22,480	0.198	4,451	5.57
1067	3,580	0.119	426	5.39
1068	3,340	0.180	601	5.00
1069	2,220	0.587	1,303	8.20
1070	1,360	0.180	245	5.70
1071	1,800	0.267	481	5.40
1072	3,740	0.343	1,283	5.60
1073	15,860	0.334	5,297	6.05
1074	1,620	0.237	384	5.66
1075	2,920	0.180	526	5.10
1100	2,630	0.145	381	5.00
TOTAL	579,470	0.318	184,127	5.58

TABLE 4.6
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

SORTED STOPES BY GRADE - NO CUT-OFF GRADE

WSE

STOPE	TONS	GRADE	OUNCES	CUM OZ	CUM TONS	CUM
1004	16,390	1.204	19,743	19,743	16,390	1.205
1058	1,350	0.828	1,532	21,275	18,240	1.166
1020	2,410	0.825	1,988	23,263	20,650	1.127
1054	15,210	0.773	11,757	35,020	35,860	0.977
1059	2,970	0.602	1,788	36,808	38,830	0.948
1069	2,220	0.587	1,303	38,111	41,050	0.928
1052	4,330	0.512	2,217	40,328	45,380	0.889
1056	1,510	0.474	716	41,044	46,890	0.875
1003	21,690	0.473	10,259	51,303	68,580	0.748
1005	10,520	0.442	4,650	55,953	79,100	0.707
1047	14,740	0.431	6,353	62,306	93,840	0.664
1002	19,430	0.430	8,355	70,661	113,270	0.624
1007	16,730	0.390	6,525	77,186	130,000	0.594
1044	1,430	0.390	558	77,744	131,430	0.592
1035	7,340	0.370	2,716	80,460	138,770	0.580
1006	6,960	0.354	2,464	82,924	145,730	0.569
1057	500	0.350	175	83,099	146,230	0.568
1045	3,590	0.345	1,239	84,338	149,820	0.563
1072	3,740	0.343	1,283	85,621	153,560	0.558
1001	30,480	0.339	10,333	95,954	184,040	0.521
1073	15,860	0.334	5,297	101,251	199,900	0.507
1008	9,940	0.322	3,201	104,452	209,840	0.498
1011	3,820	0.306	1,169	105,621	213,660	0.494
1015	4,730	0.302	1,428	107,049	218,390	0.490
1017	3,910	0.294	1,150	108,199	222,300	0.487
1014	17,220	0.292	5,028	113,227	239,520	0.473
1016	6,230	0.287	1,788	115,015	245,750	0.468
1063	11,460	0.284	3,255	118,270	257,210	0.460
1064	4,960	0.281	1,394	119,664	262,170	0.456
1062	7,850	0.280	2,198	121,862	270,020	0.451
1039	2,860	0.278	795	122,657	272,880	0.449
1043	5,230	0.274	1,433	124,090	278,110	0.446
1033	5,480	0.272	1,491	125,581	283,590	0.443
1071	1,800	0.267	481	126,062	285,390	0.442
1018	2,410	0.262	631	126,693	287,800	0.440
1055	2,930	0.261	765	127,458	290,730	0.438
1048	6,870	0.259	1,779	129,237	297,600	0.434
1051	6,440	0.251	1,616	130,853	304,040	0.430
1065	2,660	0.250	665	131,518	306,700	0.429
1050	7,900	0.246	1,943	133,461	314,600	0.424
1031	5,340	0.239	1,276	134,737	319,940	0.421
1074	1,620	0.237	384	135,121	321,560	0.420
1019	8,350	0.233	1,946	137,067	329,910	0.415
1061	950	0.228	217	137,284	330,860	0.415
1013	3,340	0.224	748	138,032	334,200	0.413
1038	6,640	0.223	1,481	139,513	340,840	0.409
1060	2,050	0.221	453	139,966	342,890	0.408
1041	1,490	0.220	328	140,294	344,380	0.407
1022	24,440	0.219	5,352	145,646	368,820	0.395
1034	24,500	0.214	5,243	150,889	393,320	0.384
1021	17,650	0.210	3,707	154,596	410,970	0.376
1032	2,900	0.206	597	155,193	413,870	0.375
1012	2,150	0.203	436	155,629	416,020	0.374
1066	22,480	0.198	4,451	160,080	438,500	0.365
1025	28,470	0.196	5,580	165,660	466,970	0.355
1029	5,290	0.196	1,037	166,697	472,260	0.353
1027	7,630	0.193	1,473	168,170	479,890	0.350
1042	4,300	0.193	830	169,000	484,190	0.349
1030	3,900	0.192	749	169,749	488,090	0.348
1046	2,860	0.183	523	170,272	490,950	0.347
1070	1,360	0.180	245	170,517	492,310	0.346
1068	3,340	0.180	601	171,118	495,650	0.345
1075	2,920	0.180	526	171,644	498,570	0.344
1028	2,390	0.180	430	172,074	500,960	0.343
1009	4,340	0.177	768	172,842	505,300	0.342
1037	12,320	0.169	2,082	174,924	517,620	0.338
1023	11,090	0.163	1,808	176,732	528,710	0.334
1026	10,980	0.158	1,735	178,467	539,690	0.331
1024	11,200	0.157	1,758	180,225	550,890	0.327
1049	8,400	0.155	1,302	181,527	559,290	0.325
1010	4,500	0.154	693	182,220	563,790	0.323
1100	2,630	0.145	381	182,601	566,420	0.322
1053	4,810	0.121	582	183,183	571,230	0.321
1067	3,580	0.119	426	183,609	574,810	0.319
1036	2,390	0.115	275	183,884	577,200	0.319
1040	2,270	0.112	254	184,138	579,470	0.318

TABLE 4.7
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

AMI, 1993 Manual In Situ Mineable Reserve by Stope
Cut-off Grade = 0.010 OPT
[Continued]

Block	Grade [OPT]	Thickness [Ft]	Tons	Ounces
43	0.320	5.44	5,300	1,696
44	0.241	5.00	1,862	449
45	0.449	6.32	2,860	1,284
46	0.210	5.00	2,375	499
47	0.474	6.38	14,063	6,666
48	0.270	5.98	7,069	1,909
49	0.147	5.66	7,904	1,162
50	0.263	8.87	7,065	1,858
51	0.268	5.01	5,833	1,563
52	0.351	5.01	4,662	1,636
53	0.133	5.58	4,677	622
54	0.958	5.92	16,017	15,522
55	0.240	5.12	3,151	756
56	0.679	5.36	1,562	1,061
57	0.189	5.17	521	98
58	0.672	5.35	2,221	1,493
59	0.801	5.20	2,950	2,363
60	0.235	5.40	1,947	458
61	0.240	5.00	774	186
62	0.342	5.67	7,313	2,501
63	0.234	5.02	10,691	2,502
64	0.236	5.18	4,876	1,151
65	0.243	5.09	2,397	582
66	0.260	5.87	27,853	7,242
67	0.175	5.28	4,036	706
68	0.181	5.00	2,067	374
69	0.659	6.72	1,477	973
70	0.182	5.78	960	175
71	0.230	5.28	1,020	235
72	0.268	5.45	3,598	964
73	0.323	6.54	14,000	4,522
74	0.225	5.71	1,262	284
75	0.190	5.14	3,492	663
RED TOP	0.149	5.06	9,984	1,813
TOTALS	0.324	5.65	611,984	198,248

TABLE 4.7
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

AMI, 1993 Manual In Situ Mineable Reserve By Stope
Cut-off Grade = 0.010 OPT

Block	Grade [OPT]	Thickness [Ft]	Tons	Ounces
1	0.322	5.41	30,410	9,792
2	0.680	5.44	18,706	12,720
3	0.388	6.00	24,666	9,570
4	0.982	5.57	17,612	17,298
5	0.390	7.44	13,205	5,150
6	0.303	5.63	12,009	3,639
7	0.362	6.72	15,608	5,650
8	0.298	5.62	14,478	4,314
9	0.134	5.02	4,716	632
10	0.145	5.60	5,760	835
11	0.267	5.00	3,564	952
12	0.181	5.00	1,587	287
13	0.219	5.00	3,057	669
14	0.315	5.32	19,616	6,179
15	0.302	5.33	5,820	1,758
16	0.314	5.45	6,469	2,031
17	0.250	5.43	3,251	813
18	0.263	5.05	2,726	717
19	0.307	5.00	10,125	3,108
20	0.592	5.21	2,987	1,768
21	0.196	5.30	17,612	3,452
22	0.214	5.66	24,879	5,324
23	0.174	6.70	12,869	2,239
24	0.205	5.43	11,229	2,302
25	0.203	5.41	28,874	5,861
26	0.123	5.06	11,126	1,368
27	0.220	6.16	8,089	1,780
28	0.259	5.00	2,366	613
29	0.213	5.02	6,142	1,308
30	0.221	5.46	3,819	844
31	0.243	5.24	4,228	1,027
32	0.217	5.40	3,135	680
33	0.311	6.14	5,389	1,676
34	0.223	5.46	25,957	5,788
35	0.355	5.54	8,353	2,965
36	0.116	5.00	2,094	243
37	0.189	5.27	12,749	2,410
38	0.252	5.35	7,275	1,833
39	0.212	5.06	3,130	664
40	0.149	5.27	2,257	336
41	0.222	5.35	1,766	392
42	0.291	5.50	4,435	1,291

Section 5
MINING PLAN

5.1 UNDERGROUND MINING OPERATION SUMMARY

The mining operation at the Gold Road Mine will involve two principle activities; mine development and stoping. Mine development will consist of primary mine access and drifting along the footwall of the ore structure to extend existing levels into previously undeveloped areas. Rehabilitation of existing workings within the mine may be done where such work would result in overall cost savings over new openings.

The Gold Road Deposit consists of very steeply-dipping quartz and calcite ore within competent andesite wallrock. These parameters make it a good candidate for sublevel longhole shrinkage, which offers some of the advantages of bulk mining methods. A comparison of conventional shrinkage, Alimak shrinkage and sublevel longhole shrinkage methods indicates that sublevel longhole shrinkage will be the most economic and efficient way to exploit the Gold Road Deposit. This method offers flexibility in mining individual ore shoots by varying the extent of stope preparation and equipment utilization.

Conventional shrink stoping was the mining method used for most of the historical production at the Gold Road Mine. In the last few years of operation, production averaged a little over 500 tons per day utilizing a total workforce averaging 200 personnel, of which 150 worked underground.

In Addwest's proposed operation, a mine workforce totaling 75 personnel, including above ground mine maintenance staff, will be required to operate the mine at up to 700 tons per day production 24 hours per day, five days per week. This will achieve production levels allowing 500 tons per day mill production seven days per week. The average total operating cost of the mining should be $33.51 per standard ton, exclusive of development costs.

Mine production will be done through a decline with a portal at the millsite. The old #3 shaft will be rehabilitated so as to initially give secondary access. Pre-production construction and development, above and below ground, will take approximately 8 months. The pre-production development underground will consist of decline and drift construction to access the delineated ore blocks. Limited production can begin as soon as ore blocks are accessed by the decline and sublevels are in place. Once the decline reaches the 350 level, an incline will be installed to access the high grade ore blocks at the east end of the 100 level and above.

Pre-production capital costs for mine development are estimated to be $3,333,295.00. Total Capital costs for mine equipment and mine development should total $5,348,795.00 over the life of the mine, based on the current reserve inventory.

5.2 CAPITAL BUDGET-MINING OPERATION

5.2.1 Summary

The following mine capital cost budget, as outlined in TABLE 5.1, at the end of this section (5), of this report, presents the anticipated expenditures required to achieve continuing production of ore from the Gold Road Mine. The total itemized capital costs presented in TABLE 5.1 were derived from per unit figures. The detailed per unit capital costs from decline construction, stope and raise excavation, and administration are presented in APPENDIX E, also at the end of this section. The budget, as prepared, presents a development program which relies on the construction of a decline, portaled in proximity to the proposed mill, to serve as the primary mine access. The decline will allow Addwest the opportunity to achieve its desired production goals with a seven month period following commencement. The scope of work has been formulated to achieve the following objectives:

1. To establish viable production capabilities of 3,500 tons per five day week from the Mine.

2. To maximize the initial grade of ore produced from the Mine.

3. To achieve an inventory of developed ore blocks which will allow a degree of flexibility to changing market conditions, while maximizing the exploitation of the Mine's resource base.

4. To allow greater exploration of under-explored areas within the Mine without significant additional cost.

Requirements of the underground workings are based on assumptions of conditions existing within the Mine which will allow the budgeted rates of advance.

Personnel staffing is based on Addwest's hiring of employees possessing required job skills. It was assumed that engineering and administrative functions would be performed by Addwest employees working at the Mine's location. Labor rates are based on regional standards. Equipment is assumed to be available for use or purchase from rental yards and dealers with costs of rent and/or purchase included in this budget. Equipment scheduled for purchase is assumed to be available at the stated rebuilt/reconditioned prices. The construction costs of mine infrastructure items including an ongoing maintenance program is budgeted.

Alternative concepts of entry and development were studied, including the rehabilitation of the Gold Road Number Three Shaft for production hoisting and mine access to its current depth. This alternative included the rehabilitation of the Line Road Adit Level to the 4975 Raise location, as well as the rehabilitation of the 100, and 350 levels east of the Number Three Shaft. This alternative was estimated to cost $1 million more than the proposed method. A second analysis which replaced the rehabilitation of the Line Road Adit with the construction of a decline portaled near the Line Road portal servicing the 100 and 350 levels was also reviewed. This option did not result in significant cost savings over the other shaft option. Both alternative

concepts resulted in significant portions of Ore Reserve Blocks 54, 52 and 51 being reclassified as semi-permanent pillars due to their proximity to the Number Three Shaft.

The total capital pre-production budget requirement for the Gold Road Mine is $3,333,295.00, inclusive of initial in mine broken ore inventory of approximately 7,000 tons.

The mine capital construction will begin with surface installations and continue with the decline construction once the infrastructure is in place. Stope and raise development will begin and proceed as minable ore blocks are encountered as the decline progresses. CHART 5.1, at the end of this section, presents the anticipated timing of the budgeted capital construction for the first phase of the the mines operation.

A conceptual post-production capital budget is presented for information purposes at the bottom of the first page of TABLE 5.1. The post-production budget carries a lower confidence level due to the unknown conditions of the lower levels of the mine, which are flooded.

5.2.2 Pre-Production Mine Construction

Surface construction budgeted for this project is minimized by the integration of surface infrastructure items with the proposed mill. Included in the integration of facilities are warehousing, change houses, administration offices, utility structures and other common support structures. Construction timing is minimal under this concept.

Concurrent with the completion of permitting and construction of the Mill will be the driving of a decline, portaled at an estimated elevation of 3,000 feet above sea level at an outcrop near the proposed Mill water storage tank (location shown on FIGURE 6.1). This decline will be driven at a negative twelve (12%) percent grade and have a cross section of ten by twelve (10'X12') feet and will parallel the dip-strike of the Gold Road vein and historical workings at a distance of approximately fifty feet. The decline will be excavated by conventional tunneling techniques utilizing rubber-tired mobile equipment. Remuck bays will be placed on a maximum of 300 foot spacings, as required. These bays will serve as drill bays following their useful life as remucks. The large cross section of the decline will allow twenty-five ton class haul trucks passage. Mine electrical, water and air services are budgeted for installation along this decline. A portal meeting statutory and operational requirements will be installed as part of this work.

Sixteen hundred feet (Station 16+00) from the portal a connection with the existing Number Three Shaft will be achieved by driving a fifty foot crosscut. This connection will meet ventilation requirements for the next section of the decline to be driven without a corresponding increase in ventilation equipment, as well as a second means of egress from the mine.

The second section of the decline will have the same physical characteristics of the first section and will be extended 1,200 feet to station 28+00. Station 28+00 will be equal in elevation with the existing 350 level of the mine. A fifty foot cross cut is budgeted to achieve connection with this level.

At station 28+00 work will be suspended on the decline until after production requirements are met.

The budgeted cost for this pre-production surface and underground construction is $765,000.00 over a twenty-two week period, exclusive of site engineering and administration.

5.2.3 Post-Production Mine Construction

It is anticipated that the Decline will be extended to the elevations of the 500 and 700 levels of the Mine during what is designated as Phase 2 of the operation. The length of this drive will total 1,800 feet and include two cross cuts, each fifty feet long, to achieve contact with the two respective levels. Capital costs for this second phase, including the additional equipment needed for the post-production development, is expected to be $1,659,250 (TABLE 5.1).

The third phase of production, Phase 3, includes driving a decline from the 700 level to the proposed 900 level of the mine. This ramp will be driven a 11% grade and will begin at approximately the intersection of the Mill Decline with the 700 level underhaulage. The estimated length of this ramp is 1,860 feet. Unit costs of $191.36 per foot of decline has been used to determine a capital cost of $356,250 for Phase 3 development (TABLE 5.1).

5.2.4 Level Development and Rehabilitation

At Decline station 28+00, a ramp (incline) will be driven at an inclination of fifteen (15%) percent. This ramp will strike easterly, parallel to the vein, and will be driven to an elevation equal to the current 100 level. A fifty foot crosscut will achieve the physical connection with the 100 level. The design of this ramp calls for it to have a cross section of one hundred (100 ft^2 or 10'X10') square feet. The 100 level ramp will be 1,600 feet long.

Concurrent with the driving of the 100 level access ramp will be the rehabilitation of the 350 level. Because of uncertainty regarding the actual conditions of this currently flooded level, the cost of driving a new parallel drift is budgeted. This opening will be driven at a slight positive inclination (0.5%) and have a cross section similar to the 100 level ramp.

Required mine services to meet electrical, water, compressed air and ventilation requirements will be carried in these openings. Alternative egress routes will be available with the connection of the levels through the existing 350 level-100 level connection at the 4575 raise and No. Three Shaft manway.

Budgeted cost of the level development and rehabilitation is $710,000.00 over a fourteen week period, exclusive of site engineering and administration costs. Information presented in APPENDIX E was used to develop the budget for this work.

5.2.5 Post-Production Level Development and Rehabilitation

The anticipated post-production work in this section is the continuation of the 100 level ramp to the elevation of the Line Road Adit workings and the rehabilitation of one thousand feet of this level to aid in the exploration to the Red Top Sill ore zone.

5.2.6 Stope Development

Concurrent with the level development and rehabilitation in the eastern section of the Mine, stope development of the ore reserve occurring in blocks 54, 52 and 51 will occur. This development will commence from the Decline - Number Three Shaft crosscut at decline station 16+00. Consisting of a ramp driven at a negative twenty [20%] percent and have an orientation layout as a tight spiral, this ramp will be driven to an elevation equal to approximately 25 feet from the bottom of the projected reserve block 54 and 25. The bottom twenty-five feet of the reserve block will be left as pillar to prevent breakthrough into the "Sharp Stope" void. Upon gaining access to the ore reserve, the first sublevel undercut raises will be started. The importance of these reserve blocks is represented in the area's reported grade of 0.60 ounce per ton gold over a tonnage of 25,900 tons, less pillar requirements. At least 7,000 tons of this material will be mined prior to the start of mill operations.

At the completion of the driving of the 100 Ramp ore reserve blocks 30, 31, portions of blocks 26 and 25 as well as blocks 19 and 24 will be available for extraction via short (under 50 foot) crosscuts and or raises from this ramp. An estimated 79,000 tons of ore will have been undercut and ready for mining at this time.

The rehabilitation of the 350 level will provide underhaulage access to ore reserve blocks 03, 04, 14 and 21. These four blocks will add 72,400 tons of ore with a reported 38,650 ounces of gold to the developed classification.

The budgeted cost for this section of stope development is $211,900.00, exclusive of site engineering and administration costs. The cost ($231,500.00) of mining an in-mine broken ore inventory of 7,000 tons is also budgeted here.

5.2.7 Shops and Other Underground Chambers

Thirty-six thousand two hundred dollars have been budgeted for the construction of 60,375 cubic feet of underground chambers, which will be used as shops, for storage of materials and as explosive magazines. These chambers will be constructed over the entire period of pre-production construction. Costing of these chambers was generated from the per foot costs as developed in APPENDIX E.

5.2.8 Site Engineering and Construction Administration

This budget has been developed based on the assumption that Addwest would develop the required operating staff to operate the mine once production capabilities were achieved. One technique which has been used successfully by other operations has been to use the construction period as a training and orientation period for the professional and administration staff. The management philosophy behind such a system is that the construction period allows the staff to incorporate its ideas and concepts into the final design, to become familiar with local conditions, and to develop into an operating team, rather than have a contractor build the facility and then assemble and train a staff.

This budget has adopted this philosophy. The budgeted cost for site engineering and administration during mine construction and initial production is $257,100.00. This amount represents eleven and one half (11.5%) percent of the budgeted pre-production capital costs for this program.

5.2.9 Mine Equipment Purchases

The anticipated cost of purchasing used, reconditioned equipment has been included in this budget. Currently scheduled equipment is available at the budgeted prices. CHART 5.2, at the end of this section, presents the timing for purchase of equipment for the initial phase of the mine's operation, Phase 1. A total of $1,021,000.00 is budgeted for equipment purchases.

5.2.10 Mine Inventory

An initial capital expendature of $100,000.00 has been allocated for spare parts and supplies inventory for the mine.

5.3 UNDERGROUND MINING OPERATION SUMMARY

5.3.1 Introduction

The Gold Road Mine was in production, under various owners, since 1902 and finally ceased operations in 1942. Conventional shrinkage stoping has been the predominant mining method throughout the mine's life. A sublevel longhole method is now being proposed which should improve on the previous productivities and relative operating costs.

The intention of Addwest is to construct a production decline and rehabilitate some of the existing workings to bring the mine into production at 500 to 700 tons per day. The mine should be able to begin limited production 3 months after the decline and rehabilitation is initiated. Full production should be on stream in 9 months from start-up.

The Gold Road Deposit consists of very steeply-dipping quartz and calcite ore within competent wallrock. These parameters are conducive to a traditional shrinkage method of stoping, relying on gravity flow of the broken material and, in fact, this was the historical method used at the Gold Road Mine. Often this method is used when the wall rock is somewhat incompetent and the stopes are supported by broken muck. In conventional shrinkage mining, the muck acts as a platform for the miners to stand on while taking the next "lift". In deposits with incompetent wallrock conditions, the broken muck will not restrain compression of the wallrock which could cut off the stopes; so, rock pillars, timber stulls, or rock bolts are needed to contain sloughing. Wallrock incompetency is not anticipated to be a major problem at the Gold Road Mine and containment should only be necessary locally. With traditional shrinkage mining, wallrock dilution should be estimated and considered in economic evaluations and, if unacceptable, other mining methods must be considered.

The characteristics of the Gold Road vein make it a good candidate for longhole vein mining. Longhole vein mining methods are relatively new and have been utilized at a number of underground operations in the past 20 years. Where the wallrock is competent and where the muck is not needed as a platform, all the blasted material can be pulled without leaving any pillars, provided the stope does not cave or that the even draw-down is not compromised. Thus, relative to conventional shrinkage or some other underground methods, longhole vein mining offers some of the advantages of bulk mining. However, the stope criteria for longhole vein mining methods are specific and they do not lend themselves to a wide range of stope geometries.

The essential criteria for longhole vein mining are:

* The vein dip must be greater than 50 degrees.

* A fairly competent hanging wall and footwall is required.

* The orebody should be consistent in section and fairly regular in plan. A detailed ore definition is required for drill pattern design.

* A minimum vein width of 3 feet.

* The muck must be free-running and contain minimum quantities of altered material that could interfere with the stope.

The Gold Road vein satisfies all of these criteria. The vein dips from 70 to 90 degrees; the wall rock on both the hanging wall and footwall is hard, mostly unaltered andesite; the ore is consistent and regular over hundreds of feet vertically and horizontally; the minimum width of blocked out ore is over 3 feet thick; and the ore and muck are hard, brittle, and should be free running. Thus, sublevel longhole stoping should be a practical method of production at the Gold Road Mine.

5.3.2 Mine Development

Mine development activities will be required in order to gain access to both previously and newly developed reserves. For previously developed areas, mainly to the west of the 4975 E coordinate, new access or rehabilitation of existing levels will be required. The thrust of this work will be to gain access to nearby higher-grade blocks at minimal cost. A major effort towards redevelopment of the entire mine is not foreseen due to the limited quantity of higher-grade reserves in the more westerly portions of the mine.

A new decline adit (mill decline), portaled near Coordinate 500N; 500E is recommended for principal mine access and production. The decline will parallel the dip strike of the ore zone and be driven along the corresponding southeasterly strike of the ore zone. The second mine access will be provided via the existing No. 3 Shaft.

It was decided to construct a new decline as the main access to the mine after careful deliberation of several alternatives, including a new shaft and rehabilitation of existing shafts and drifts. The new decline alternative will provide for the most economic, efficient and rapid development of the ore. APPENDIX F, ENTRY OPTIONS, summaries the cost and performance comparisons of the new decline, with a shaft or decline located to the southeast accessing the vein under the Red Top Claim.

Compared to a new production shaft located to the southeast of existing workings, the new decline will allow for much more rapid ore production (within three to four months of braking ground) at a much lower pre-production capital cost. Also, ore blocks not economically accessible from a new shaft far to the east could be exploited through the decline.

Using the decline option instead of rehabilitating old shafts and drifts also saves pre-production expenditures and time plus has the added benefit of not having to dewater the mine prior to production. This is important because the mine contains an estimated 85,000,000 gallons of water that can be of great use in the first years at the mill facility. Permits to dewater will also not be required if the water is used in the mill.

Crosscuts to the ore zone will be driven on elevations equal to the connecting point with the No. 3 Shaft and 350 level of the present mine. An inclined ramp will be driven to connect the 100 level with the 350 level. Drifting to connect with some ore blocks on the 100 and 350 levels of the old mine will be done from the Mill Decline main stem.

Post-production continuation of the Mill Decline to the 500 and 700 levels is planned. Extending the 100 level ramp to intersect the present Line Road Adit level will allow access to the Red Top Sill Resource Area.

Post-production level drifting from the decline to the east will allow the development of large inferred blocks of ore east of the present mine workings.

A new, 900 level is proposed to develop reserves 200 feet below the existing 700 level. Should resources be identified to the west of the Gold Road Number 1 shaft, this new level would

service this resource area at a depth of approximately 700 feet below the surface. Initially this level would be reached by a ramp from the Mill Decline, however a Raised Bored Shaft is recommended once the 900 level is in proximity to the Mill location. This shaft would simplify haulage from this deep level of the Mine.

5.3.3 Level Rehabilitation

Access to the reserve blocks located west of the 4975 coordinate will require rehabilitation of existing levels or the driving of new drifts. Because only limited data is available on the size and condition of these levels, the actual cost of rehabilitation may vary widely from any estimated cost. This potential variance injects a significant element of risk in assessing the profitability of reserve blocks which are located more than a few thousand feet from the 4975 coordinate.

It appears that the haulage drifts were driven in the vein with stoping occurring directly over and under the drifts, utilizing timber sets to create and support the drift opening. Pillars may not exist along stoped areas of the haulage drifts. Physical inspection of the open portions of the mine has shown the drifts to have a nominal size of five (5) by seven (7) feet and reflect the sinuosity of the vein.

Based on current observations and the unknown nature of the present conditions within the greater portion of the old mine, it is recommend that new drifting be done in the footwall country rock at approximately 25 to 50 feet from the ore zone. New drifts will provide a benchmark for ore block development costs. In the event slashing or rehabilitation of existing drifts provide economies then the cost savings would be taken with gain to the overall project.

Longhole drilling is budgeted to be done from the footwall haulage to define individual ore blocks within the zone. The drilling would be done from cutouts located on fifty foot intervals along the haulage drift. Holes would be collared in fans to provide overlapping coverage within the ore zone.

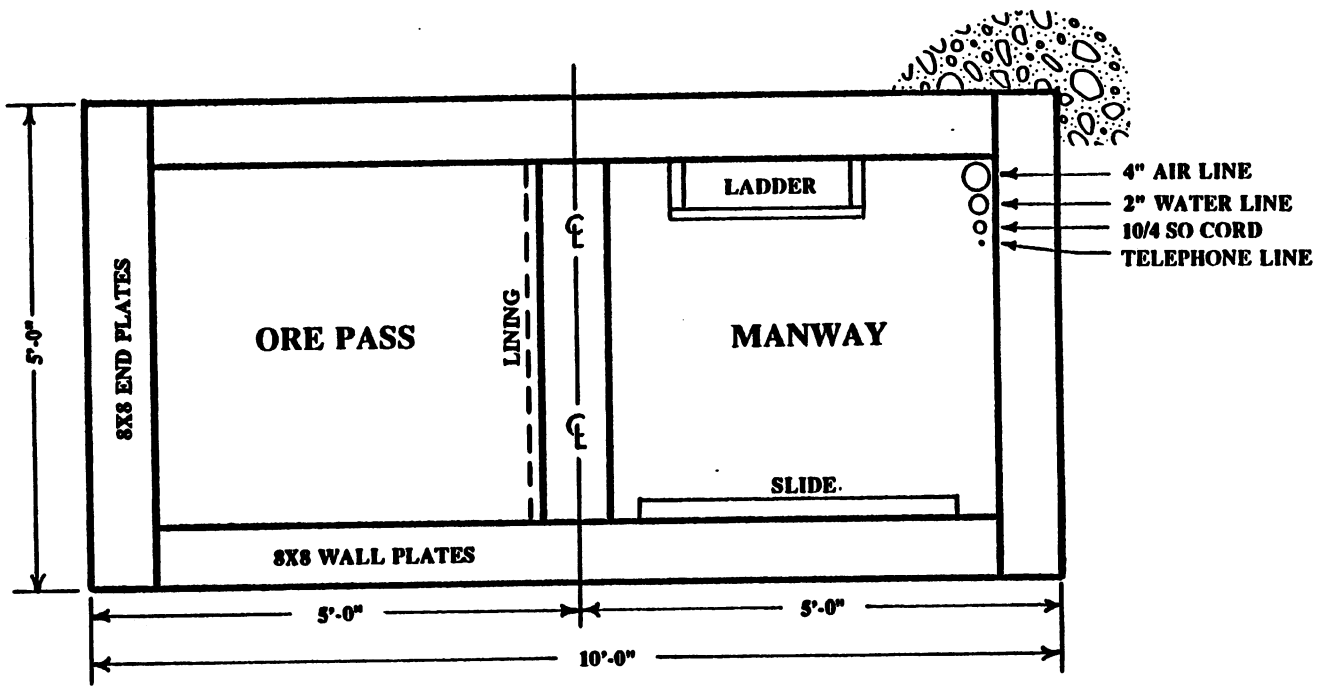
5.3.4 Stoping

Access to an ore block will be gained by extending the drill cutout(s) to form a crosscut to the ore block. Upon intersecting the ore block an undercut will be driven along the ore, intersecting additional drill - crosscut openings on 50 foot intervals along the strike of the ore block. The undercut will be seven to eight feet high with the width determined by the ore block or a minimum of five (5) feet. The purpose in extending the drill - crosscut openings will be to provide mucking access to the broken ore upon mining of the stope.

5.3.5 Two Compartment Stope Service

The stope service raise will be a 4 x 8 foot, two compartment timbered raise, providing access

ADDWEST MINERALS, INC.
Gold Road Project - Mohave Co., Arizona



STOPE ACCESS RAISE

SCALE: 1/2" = 1'-0"

Figure 5.1

and services to the stope while serving as an ore pass for ore excavated during sublevel drifting. The service raise(s) will be driven to connect with the next haulage level above. The service raise(s) will be located a maximum of two hundred feet apart along the strike of an ore block. These raise(s) would be driven in sequence with one another and would also provide limited ore production during excavation. Proposed raise configuration is shown on FIGURE 5.1. A mechanical raise climber could be utilized in this function in lieu of the timbered raise.

5.3.6 Stope Sublevels

When the service raise system is completed, sublevel development will begin. The sublevels will be driven from the service raise(s) along the strike of the vein a distance of two hundred feet in each direction linking the service raises. Jacklegs and anfo will be used for drilling and blasting. An electric slusher ranging in size from 25 H.P to 40 H.P. with a 4 to 6 foot bucket will be utilized for mucking the broken ore to the raise ore pass. The size of the slusher will be determined by the width of the ore shoot. In extremely wide stopes a triple drum slusher or electric L.H.D could be utilized with similar operating results. The sublevels will be eight feet high by the width of the ore bearing zone or at a minimum width of five feet. Ground control will be provided by rock bolting as required.

The slusher will be hoisted up the manway with the help of a tugger on an upper level when each sublevel is completed. At completion of the sublevel, a wagon drill will be placed on the sublevel to drill a slot raise and the level pillar.

The slot raises will be located midway between the service raises or a maximum of two hundred feet from the service raise. The slot raise will have dimensions of four feet along strike and as wide as the vein and will connect from each sublevel to a lower one. The slot raise will be blasted in lifts from the bottom up, the lifts determined by ground conditions. A free face is created for longhole blasting when the slot raise is completed.

Sublevels will be excavated on 50 foot centers up the service raise. At eight feet high, that would leave a 42 foot pillar between each sublevel. These pillars will to be drilled and blasted using the wagon drill. These pillars will be drilled as wide as the ore bearing zone and the full depth of the pillar. The second and third floor pillar will be top loaded with Anfo and blasted on retreat from the slot raise to the service raise(s). The fourth or first floor will be bottom loaded from the third sublevel and shot in sequence with the third floor pillar. The ore will fall to the haulage level undercut below.

Each sublevel pillar will be retreated from the slot raise to the service raise. As each sublevel pillar is mined, that section of the service raise would be abandoned with stope access being provided from the haulage level above. On the third sublevel the overhead pillar would also be drilled with the wagon drill.

During the drilling of the stope pillars, time has been budgeted to longhole drill lateral exploration holes from the sublevels to the hanging wall of the ore zone. This drilling will aid in the identification of hidden ore shoots which may exist within the ore zone.

As the pillars are shot, the broken ore will be mucked from the loading crosscuts which were driven from the haulage level with one to three yard L.H.D.'s and loaded into 13 to 15 ton trucks for transport to level orepasses or the Mill Decline. If ground conditions require, the L.H.D.'s would be equipped with remote controls without adverse operational effects. Mill Decline haulage will be via 25 ton underground haul trucks.

FIGURE 5.2 illustrates the stoping process planned for use in the Gold Road Mine.

By the time the last sublevel pillar in a particular stope block is broken, the next stope block will be ready for production. The proposed method will result in almost complete extraction of the ore shoots, while minimizing risks associated with pillar robbing.

5.4 FORECASTED MINE OPERATING EXPENSES

Total estimated operating expenses of the Gold Road Mine are expected to be $33.51 per ton of ore produced. TABLE 5.2, at the end of this section, is a detailed summary of these operating costs and their derivation.

These costs were derived from a proposed operation employing 75 mining personnel, both above and below ground, that can produce up to 700 tons per day. Production will be from several stopes simultaneously and the main haulage will be by 25-ton rubber-tired vehicles.

5.5 PROPOSED STOPE DEVELOPMENT AND PRODUCTION FOR SMALL ORE SHOOTS

Within the Gold Road ore reserve are blocks which may not have dimensions appropriate for the recommended stoping method, or new ore reserve blocks may be identified during the course of mining whose full dimensions are unavailable. For reserves which fall into this category, an alternate stoping plan has been developed.

Presented and described below, are the steps involved in developing a typical stope having ill defined dimensions or smaller reserves than normal.

Drifting Under Stope Area

Accessed from the longhole cutouts, this item serves as the undercut to the ore block. The size will be similar to the preferred method undercut.

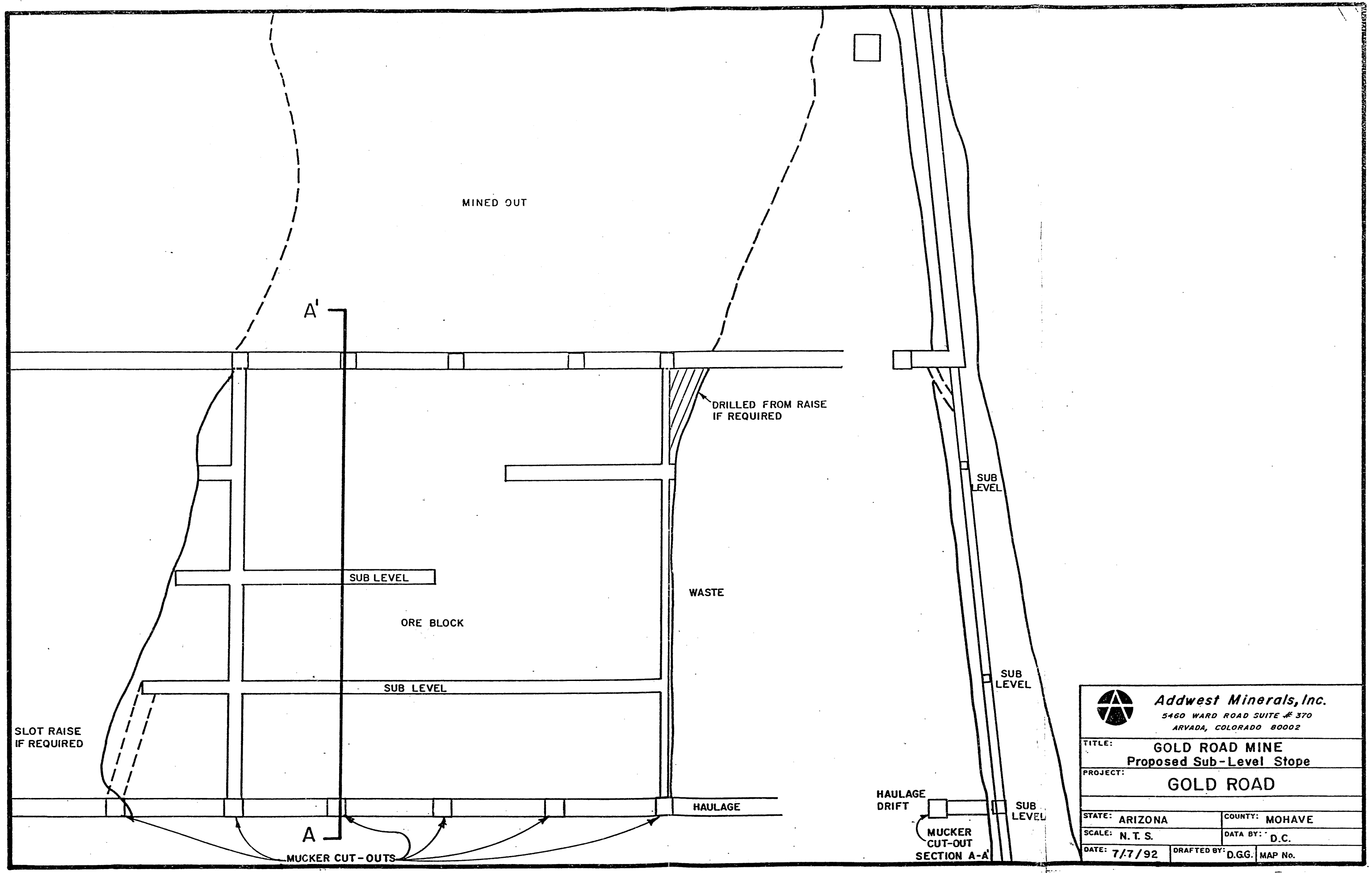

MINED OUT
A'
DRILLED FROM RAISE IF REQUIRED
SUB LEVEL
WASTE
ORE BLOCK
SUB LEVEL
SLOT RAISE IF REQUIRED
HAULAGE
A
MUCKER CUT-OUTS
SUB LEVEL
SUB LEVEL
HAULAGE DRIFT
SUB LEVEL
MUCKER CUT-OUT
SECTION A-A'
Addwest Minerals, Inc.
5460 WARD ROAD SUITE # 370
ARVADA, COLORADO 80002
TITLE: GOLD ROAD MINE
Proposed Sub-Level Stope
PROJECT: GOLD ROAD
STATE: ARIZONA
COUNTY: MOHAVE
SCALE: N. T. S.
DATA BY: D.C.
DATE: 7/7/92
DRAFTED BY: D.G.G.
MAP No.

FIGURE 5.2

Stope Raise

This raise would be a 4 x 8 foot two compartment timbered facility, providing access and services to the stope. In addition, the raise would provide additional data on the vertical axis of the ore shoot. Thus, the service raise would stop at the vertical limit of minable ore. Service raises will be located a maximum of two hundred feet apart along an ore shoot. This spacing will allow the ore shoot to be exploited by the preferred stoping method, should information be gained during the development of the ore shoot. In addition, the raise will also provide limited ore production during excavation. The proposed raise configuration is the same as the preferred service raise.

Stope Sublevels

The purpose of these sublevels is to provide information on the extent of ore horizontally above the haulage level. Thus, should irregularities exist in the ore body, ore raises or mucker cutouts can be omitted or added as conditions warrant. These sublevels would be excavated on 30 foot intervals vertically and extend along strike until ore values terminate. The excavation of these sublevels also allow for the extraction of minable ore via the stope raise which may occur above waste areas over the haulage level.

Ore Raise, Chute and Bell

Installed as required by the extent of the ore body, these items allow for the removal of ore from the stope. It is important to note that unlike a conventional shrinkage stope method, these ore raises are installed only after it is assured that required tonnage is available to justify the cost of installation. Thus, should the available tonnage be less than anticipated, the installation of these chutes are minimized or omitted and available economic tonnage extracted via the stope raise. Additionally, the steps outlined above (Stope Raise and Sublevels) are done in ore and all work ideally results in ore production.

Shrink and Draw Stope

Following the stope preparation described above, the ore body is mined via shrinkage methods with approximately 30% of each cut being removed during mining and the balance upon completion of stoping.

TABLE 5.1
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

GOLD ROAD - MINE CAPITAL BUDGET ESTIMATE

PRE-PRODUCTION CAPITAL BUDGET		
1.0	Mill Decline and Cross-Cuts	$764,970
2.0	Level Development	$710,000
3.0	Stope Development Broken Ore in Mine	$211,900 $231,500 $443,400
4.0	Shop & Other Underground Chambers	$36,225
5.0	Site Engineering and Construction Admin.	$257,100
6.0	Mine Equipment	$1,021,600
7.0	Mine Inventory	$100,000
	Total Phase 1	**$3,333,295**
POST-PRODUCTION CAPITAL BUDGET		
	Phase 2	
1.1	Mill Decline and Cross-Cuts	$574,750
2.1	Level Development and Rehabilitation	$450,000
6.1	Mine Equipment	$634,550
	Total Phase 2	**$1,659,250**
	Phase 3	
1.2.1	Decline 700 to 900 Level (1860 Feet @ $191.36/Ft)	**$356,250**
	Total Post-Production Capital	$2,015,500
	TOTAL MINE CAPITAL COST	**$5,348,795**

GOLD ROAD - MINE CAPITAL BUDGET ESTIMATE

1.0 Mill Decline

1.0.1	Mob	$10,000
1.0.2	Site preparation	7,480
1.0.3	Excavate foundations	4,600
1.0.4	Pour foundations	11,340
1.0.5	Excavate portal(s)	8,550
1.0.6	Erect surface plant	114,000
1.0.7	Drive 0+00 - 16+00	320,000
1.0.8	Drive 16+00 XCut	10,000
1.0.9	Drive 16+00 - 28+00	240,000
1.0.10	Drive 28+00 XCut	10,000
1.0.11	Primary mine power system	29,000
		$764,970

1.1 Mill Decline, Post-Production

1.1.1	Dewater below 350 level	$50,000
1.1.2	Drive 28+00 - 38+00	200,000
1.1.3	Drive 38+00 XCut	10,000
1.1.4	Drive 38+00 - 46+00	240,000
1.1.5	Drive 46+00 XCut	10,000
1.1.6	Rehab 4975 Rse	64,750
		$574,750

1.2 Phase 3 Development

1.2.1	Decline-700 Level to 900 Level (1,860 Feet @ $191.36/Ft)	$356,250

GOLD ROAD - MINE CAPITAL BUDGET ESTIMATE

1.0 Mill Decline Surface Construction Detail

1.0.1	Mobilization	$10,000
1.0.2	Site Preparation:	
	20 hours D-9 @ $150/hr	3,000
	20 hours FEL @ $100/hr.	2,000
	20 hours Drill @ $75/hr.	1,500
	Miscellaneous 15%	975
		7,475
1.0.3	Excavate Foundations	
	20 hours 235 Ex @ $125/hr.	2,500
	20 hours 416 B.H. @ $75/hr.	1,500
	Miscellaneous 15%	600
		4,600
1.0.4	Pour Foundations	
	Forming 30 hours @ (6@15)	270
	Rebar placement 35 hours @ (8@15)	4,200
	Materials	
	- steel 6,600 @ $.20	1,320
	- cement 50 yards @ $.75	3,750
	Miscellaneous @ 15%	1,800
		11,340
1.0.5	Excavate Portal(s)	
	Face up	1,000
	Support	7,500
		8,500
1.0.6	Erect Surface Plant*	
	Cost of structures	50,000
	Cost of erection	10,000
	HVAC	25,000
	Plumbing	10,000
	Other Mechanical/Electrical - 20%	19,000
		114,000

*Include erection of compressors, subs, etc.

GOLD ROAD - MINE CAPITAL BUDGET ESTIMATE

2.0 Level Development

2.0.1	100 level ramp	$320,000
2.0.2	Rehab 350 level	390,000
		$710,000

2.1 Level Development, Post-Production

2.1.1	100 level ramp to Line Road Elevation	$240,000
2.1.2	Line Road XCut	10,000
2.1.3	Line Level Rehab	200,000
		$450,000

TABLE 5.1 (Cont'd)

GOLD ROAD - MINE CAPITAL BUDGET ESTIMATE

3.0 Stope Development

3.0.1	Block 54, 52, 51 - 600 ft. ramp @ $191	$114,600
3.0.2	RSE to 30 - 31 - 150 ft. ramp @ $188	28,200
3.0.3	Xcut to 26 - 50 ft. ramp @ $191	9,550
3.0.4	Xcut to 25 - 50 ft. ramp @ $191	9,550
3.0.5	Miscellaneous chambers/underground excavations	50,000
		$211,900

GOLD ROAD - MINE CAPITAL BUDGET ESTIMATE

4.0 Shops and Other Underground Chambers

4.0.1	Underground Shops -	
	4.4.1 15 x 15 x 50 - 3 each	33,750 ft^3
	4.1.2 15 x 15 x 65 - 1 each	14,625 ft^3
4.0.2	Underground Storage/Magazine(s)	
	4.2.1 10 x 20 x 30 - 1 each	6,000 ft^3
	4.2.2 10 x 10 x 30 - 2 each	6,000 ft^3
		60,375 ft^3

Drifting = $200/ft w/services @ 10 x 12 or

200/120 ft.3 or 0.60/ft^3 therefore:

60,375ft^3 x $00.60 = $36,225

5.0 Site Engineering and Construction Administration

38 weeks @ ($1,353.16/day x 5 day/week) $ 257,100

TABLE 5.1(Cont'd)

GOLD ROAD - MINE CAPITAL BUDGET ESTIMATE

6.0 Mine Equipment

1	350 h.p. Compressor 2 @ $50,000	$100,000
2	Fans	20,000
3	Power Centers (Underground subs) 3 @ $12,000	36,000
4	L.H.D. 3 1/2 yard 2 @ $75,000	150,000
5	L.H.D. 1 yard 3 @ $33,000	99,000
6	Trucks 415 class 2 @ $35,000	70,000
7	Trucks 425 class 2 @ $45,000	90,000
8	Pickup 3 @ $12,000	36,000
9	Utility vehicle (underground) 2 @ $15,000	30,000
10	2 Ton Flatbed 1/2 @ $17,500	8,750
11	FEL 966 class 1/2 @ $70,500	35,250
12	Jumbo - 2 boom hydro	100,000
13	Jacklegs 15 @ $1,250	18,750
14	Stopers 15 @ $1,000	15,000
15	Slushers 5 @ $5,000	25,000
16	Wagon drills 5 @ $15,000	75,000
17	Tuggers 5 @ $4,000	20,000
18	Miscellaneous @ 10%	92,875
		$1,021,625

6.1 Post-Production Equipment Requirements

1	Jacklegs 10 @ $1,250	12,500
2	Stopers 10 @ $1,000	10,000
3	Slushers 4 @ $5,000	20,000
4	Wagon drills 4 @ $15,000	60,000
5	Tuggers 4 @ $4,000	16,000
6	Jumbo (1 boom hydro)	65,000
7	Raise Climber System (750 feet capability)	350,000
8	Power centers 2 @ $12,000	24,000
9	Dewatering pumps 2 @ $10,000	20,000
10	Fans	20,000
11	Miscellaneous @ 5%	37,000
		$634,500

TABLE 5.2

FORECASTED MINE OPERATING EXPENSE

CLIENT : ADDWEST PROJECT : Gold Road
SHEET : DATE : April 17, 1993

ITEM : Mine and Mill Operations
ITEM DESC : Mine Cost Estimate

Hr /Shift :	8	Item Quantity	ounce	Date of Last Change :	06/19/93
Sh	3	Item Performance	174	Time of Last Change :	10:30
Days/Wk :	6	Item Time	DAY		
Days/Mo :	21.60	Tons Per Day	580		

1. LABOR	$/Hr	Base/day	O.T./ Bonus	Burden	Cost /M. Day	Roster	% Alloc.	Cost /Item	Cost/ Item unit	Cost/ Ton
Mine Manager	30.00	240.00	0.00	88.80	328.80	1.00	0.00	0.00	0.00	0.00
Mill Supt	27.50	220.00	0.00	81.40	301.40	0.00	0.00	0.00	0.00	0.00
Mine Supt.	27.50	220.00	0.00	81.40	301.40	1.00	1.00	301.40	1.73	0.52
Shift Boss 1	22.50	180.00	0.00	66.60	246.60	3.00	1.00	739.80	4.25	1.28
Shift Boss 2	20.50	165.00	0.00	61.05	226.05	0.00	0.00	0.00	0.00	0.00
Assay/Refiner	17.50	140.00	0.00	51.80	191.80	1.00	0.00	0.00	0.00	0.00
Geo	17.50	140.00	0.00	51.80	191.80	1.00	1.00	191.80	1.10	0.33
Eng	17.50	140.00	0.00	51.80	191.80	1.00	1.00	191.80	1.10	0.33
Tech/Drafting	10.00	80.00	4.00	31.08	115.08	1.00	1.00	115.08	0.66	0.20
Mechanic Super.	25.50	204.00	0.00	75.48	279.48	1.00	0.50	139.74	0.80	0.24
Office Manager	10.00	80.00	0.00	29.60	109.60	1.00	0.00	0.00	0.00	0.00
Clerk	7.50	60.00	0.00	22.20	82.20	1.00	0.00	0.00	0.00	0.00
Miner	11.00	88.00	4.00	34.04	126.04	26.00	1.00	3,277.04	18.83	5.65
Utility	9.00	72.00	4.00	28.12	104.12	26.00	1.00	2,707.12	15.56	4.67
U/G Truck driver	9.00	72.00	4.00	28.12	104.12	11.00	1.00	1,145.32	6.58	1.97
Toplander	8.50	68.00	4.00	26.64	98.64	2.00	1.00	197.28	1.13	0.34
Mechanic	11.50	92.00	4.00	35.52	131.52	4.00	1.00	526.08	3.02	0.91
Oiler	9.50	76.00	4.00	29.60	109.60	3.00	1.00	328.80	1.89	0.57
Electrician	11.50	92.00	4.00	35.52	131.52	2.00	1.00	263.04	1.51	0.45
Driller	10.00	80.00	4.00	31.08	115.08	3.00	1.00	345.24	1.98	0.60
Totals						89.00		10,469.54	60.17	18.05

CLIENT : ADDWEST PROJECT : Gold Road
SHEET : DATE : April 17, 1993

ITEM : Mine and Mill Operations
ITEM DESC : Mine Cost Estimate

Hr /Shift :	8	Item Quantity	ounce	Date of Last Change :	06/19/93
Sh	3	Item Performance	174	Time of Last Change :	10:30
Days/Wk :	6	Item Time	DAY		
Days/Mo :	21.60	Tons Per Day	580		

2 EQUIPMENT	No Units	Rent /Month Ea	Rent /Day Ea	Repair Parts/day Ea	Cost/ Day	% Alloc. /Item	Equipment Cost/Item	Equipment Cost/Ton
MINE PLANT:								
Compressor (350 hp)	2		0.00	35.00	70.00	1.00	0.40	0.12
F.E.L.	1		0.00	25.00	25.00	1.00	0.14	0.04
Truck	2		0.00	10.00	20.00	1.00	0.11	0.03
Misc.	1		0.00	10.00	10.00	1.00	0.06	0.02
Elect Motors	1200		0.00	0.01	12.00	1.00	0.07	0.02
Hoist(100)	1		0.00	10.00	10.00	1.00	0.06	0.02
Fans/Surface	4		0.00	1.50	6.00	1.00	0.03	0.01
LHD	4		0.00	25.00	100.00	1.00	0.57	0.17
Truck	5		0.00	30.00	150.00	1.00	0.86	0.26
Jack Leg	12		0.00	5.00	60.00	1.00	0.34	0.10
U.V.	1		0.00	15.00	15.00	1.00	0.09	0.03
Stoper	25		0.00	5.00	125.00	1.00	0.72	0.22
Sinker	5		0.00	5.00	25.00	1.00	0.14	0.04
Tugger	5		0.00	2.50	12.50	1.00	0.07	0.02
Long Hole	2		0.00	10.00	20.00	1.00	0.11	0.03
Slusher	15		0.00	10.00	150.00	1.00	0.86	0.26
Fan U/G	6		0.00	1.00	6.00	1.00	0.03	0.01
Chain Saw	3		0.00	1.00	3.00	1.00	0.02	0.01
Pump	3		0.00	15.00	45.00	1.00	0.26	0.08
Misc.	1		0.00	10.00	10.00	1.00	0.06	0.02
Jumbo	1		0.00	35.00	35.00	1.00	0.20	0.06
Sub Total Mine		0.00	0.00		909.50		5.23	1.57
Assay	1		0.00	10.00	10.00	0.00	0.00	0.00
Office	1		0.00	10.00	10.00	0.00	0.00	0.00
Whse	1		0.00	10.00	10.00	0.00	0.00	0.00
Sub Total Mine Admin		0.00	0.00		30.00		0.00	0.00
TOTAL EQUIPMENT		0.00	0.00		939.50		5.23	1.57

CLIENT : ADDWEST PROJECT : Gold Road
SHEET : DATE : April 17, 1993

ITEM : Mine and Mill Operations
ITEM DESC : Mine Cost Estimate

Hr /Shift :	8	Item Quantity	ounce		Date of Last Change :	06/19/93
Sh	3	Item Performance		174	Time of Last Change :	10:30
Days/Wk :	6	Item Time	DAY			
Days/Mo :	21.60	Tons Per Day		580		

3. MATERIALS	Quan	Unit	Price/ Unit	% used /Item	Cost/day	Cost/ Item	Cost/ Ton
MINE							
Ventilation	50	lf	4.18	1.00	209.00	1.20	0.36
Cement	0.5	bag	2.50	1.00	1.25	0.01	0.00
Concrete	1	cu/yd	40.00	0.00	0.00	0.00	0.00
Steel	150	lb	0.22	0.00	0.00	0.00	0.00
Timber/lumber	1000	Bf	0.37	1.00	370.00	2.13	0.64
2" Pipe	100	lf	2.50	1.00	250.00	1.44	0.43
4" Pipe	50	lf	6.00	1.00	300.00	1.72	0.52
6" Pipe	50	lf	10.00	1.00	500.00	2.87	0.86
Valves/fittings	12	Ea	15.00	1.00	180.00	1.03	0.31
Split set Bolts	100	Ea	7.50	1.00	750.00	4.31	1.29
Rock Bolts, other	5	Ea	5.00	1.00	25.00	0.14	0.04
Wire Fabric	500	sf	0.39	1.00	195.00	1.12	0.34
Other	1		200.00	0.00	0.00	0.00	0.00
Total Mine:					2,780.25	15.98	4.79
Assay	1		75.00	0.00	0.00	0.00	0.00
Office	1		25.00	0.00	0.00	0.00	0.00
Whse			25.00	0.00	0.00	0.00	0.00
					0.00	0.00	0.00
TOTAL MATERIALS				10.00	2,780.25	15.98	4.79

CLIENT :	ADDWEST	PROJECT :	Gold Road	ITEM :	Mine and Mill Operations
SHEET :		DATE :	April 17, 1993	ITEM DESC :	Mine Cost Estimate

Hr /Shift :	8	Item Quantity	ounce	Date of Last Change :	06/19/93
Sh	3	Item Performance	174	Time of Last Change :	10:30
Days/Wk :	6	Item Time	DAY		
Days/Mo :	21.60	Tons Per Day	580		

4. SUPPLIES	Quan	Unit	Price/ Unit	% used /Item	Cost/day	Cost/ Item	Cost/ Ton
MINE							
Fuel & Lube	300	Gal	1.10	1.00	330.00	1.90	0.57
Small Tools	2	Ea	25.00	1.00	50.00	0.29	0.09
Steel Products	10	lb	1.00	1.00	10.00	0.06	0.02
Tires	0.35	Ea	650.00	1.00	227.50	1.31	0.39
Elect Power	950	Kw/hr	0.05	1.00	47.50	0.27	0.08
Elect Supplies	1	Ea	100.00	1.00	100.00	0.57	0.17
Repair Parts	1	Ea	100.00	1.00	100.00	0.57	0.17
Office, Dry & Shop	1	Ea	20.00	1.00	20.00	0.11	0.03
Safety & Clothing	1	Ea	35.00	1.00	35.00	0.20	0.06
Explosives and Caps	500	lb	1.00	1.00	500.00	2.87	0.86
Drill Steel & Bits	10	Ea	25.00	1.00	250.00	1.44	0.43
Hose & Fittings	25	lf	2.00	1.00	50.00	0.29	0.09
Tools & Welding	1	Ea	15.00	1.00	15.00	0.09	0.03
Misc Items	1	Ea	25.00	1.00	25.00	0.14	0.04
				1.00	0.00	0.00	0.00
Total Mine					1760	10.11	3.03
Assay	1	Ea	75	0.50	37.50	0.22	0.06
Office	1	Ea	25	0.30	7.50	0.04	0.01
Whse	1	Ea	25	0.40	10.00	0.06	0.02
Total Mine Admin					55	0.32	0.09
TOTAL SUPPLIES					1,815.00	10.43	3.13

CLIENT :	ADDWEST	PROJECT :	Gold Road	ITEM :	Mine and Mill Operations
SHEET :		DATE :	April 17, 1993	ITEM DESC :	Mine Cost Estimate

Hr /Shift :	8	Item Quantity	ounce	Date of Last Change :	06/19/93
Sh	3	Item Performance	174	Time of Last Change :	10:30
Days/Wk :	6	Item Time	DAY		
Days/Mo :	21.60	Tons Per Day	580		

5. SERVICES	Cost/month	Cost/day	% Alloc	Cost/Item	Cost/Ton
Septic Pumping	200.00	9.26	0.50	0.03	0.01
Communications	750.00	34.72	0.33	0.07	0.02
Assay	1,000.00	46.30	0.50	0.13	0.04
Consulting	1,000.00	46.30	0.00	0.00	0.00
Travel	750.00	34.72	0.33	0.07	0.02
Hazardous Waste Disposal	1,500.00	69.44	0.50	0.20	0.06
Accounting/payroll	1,500.00	69.44	0.50	0.20	0.06
TOTAL SERVICES	6,700.00	310.19		0.69	0.21

6. INDIRECTS	Cost/month	Cost/day	% Alloc	Cost/Item	Cost/Ton
Equipment Insurance	0.00	0.00	0	0.00	0.00
Equipment Damage	0.00	0.00	0	0.00	0.00
Comp Gen Liab Ins	0.00	0.00	0	0.00	0.00
Royalty	0.00	0.00	0	0.00	0.00
Casualty Insurance	0.00	0.00	0	0.00	0.00
TOTAL INDIRECTS	0.00	0.00		0.00	0.00

7. SUB-CONTRACTS	Cost/month	Cost/day	% Alloc	Cost/Item	Cost/Ton
	0.00	0.00	1	0.00	0.00
	0.00	0.00	1	0.00	0.00
	0.00	0.00	1	0.00	0.00
	0.00	0.00	1	0.00	0.00
TOTAL SUB-CONTRACTS		0.00		0.00	0.00

CLIENT :	ADDWEST	PROJECT :	Gold Road	ITEM :	Mine and Mill Operations
SHEET :		DATE :	April 17, 1993	ITEM DESC :	Mine Cost Estimate

Hr /Shift :	8	Item Quantity	ounce	Date of Last Change :	06/19/93
Sh	3	Item Performance	174	Time of Last Change :	10:30
Days/Wk :	6	Item Time	DAY		
Days/Mo :	21.60	Tons Per Day	580		

SUMMARY		AMOUNT/ITEM TOTAL	AMOUNT/TON TOTAL
1. LABOR		60.17	18.05
2. EQUIPMENT		5.23	5.23
3. MATERIALS		15.98	4.79
4. SUPPLIES		10.43	3.13
5. SERVICES		0.69	0.21
6. INDIRECTS		0.00	0.00
7. CONTRACT		0.00	0.00
TOTAL COST		92.50	31.41
CONTINGINCY @	0.067	6.20	2.10
TOTAL		98.69	33.51

Section 6

PROCESS DESCRIPTION

6.1 PROJECT DESCRIPTION SUMMARY

The Gold Road Project consists of an underground mine, various production declines, associated ventilation and access shafts, and a crushing plant, mill, and tailings management system. The site has ready access to power, water, and natural gas. The mill and tailing disposal facility will be located in an area previously disturbed by historical workings, between the old mill site and the No. 3 shaft (Plate 1). FIGURE 5.1 illustrates the general layout of the mine, mill and tailings facilities proposed for the Gold Road Project.

The operations have been planned and will be operated in a manner that is fully consistent with safety and environmental requirements and good engineering practices. Tailings will be treated to remove cyanide and heavy metals and will be placed in a synthetically lined, engineered impoundment structure. The operation will be fenced and secured from public access.

Mine production operations are based upon extracting and hoisting a nominal 3500 tons per week on a five day, three shift operation. The milling operation will employ 19 personnel and will operate continuously, treating approximately 500 tons per day of gold-bearing quartz ore. TABLE 6.1 outlines the general production parameters that are expected from the Gold Road Project.

TABLE 6.1
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

KEY PRODUCTION PARAMETERS - GOLD ROAD MILL

Ore to Treatment	150,000 tons per year
Average Gold Grade in Mill Feed	0.355 ounces per ton
Average Silver Grade in Mill Feed	0.355 ounces per ton
Average Gold Recovery	95%
Average Silver Recovery	50%
Annual Gold Production	50,588 ounces
Annual Silver Production	26,625 ounces

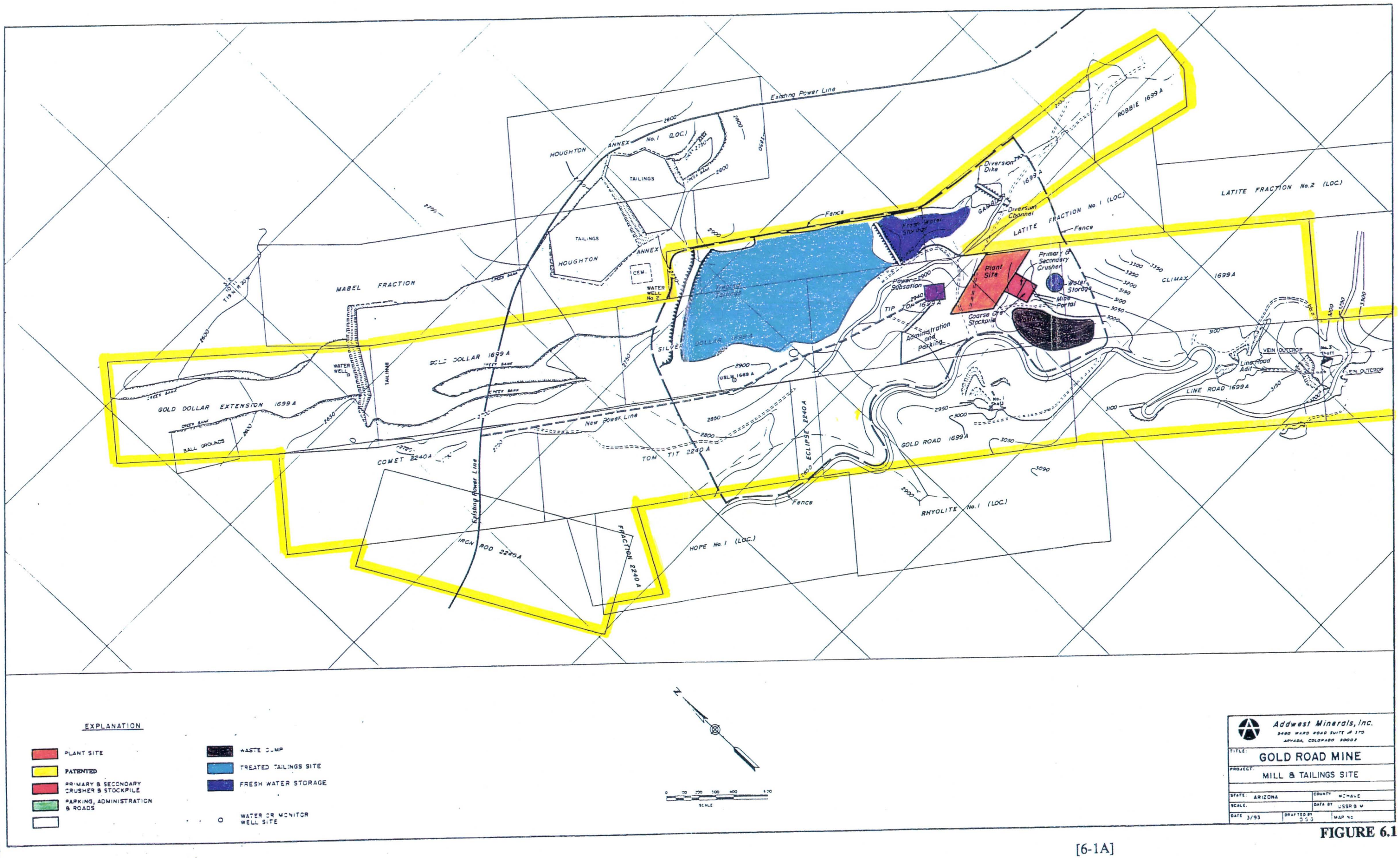

Existing Power Line
HOUGHTON ANNEX No. 1 (LOC.)
TAILINGS
HOUGHTON ANNEX
CEM.
WATER WELL No. 2
MABEL FRACTION
GOLD DOLLAR 1699 A
GOLD DOLLAR EXTENSION 1699 A
WATER WELL
TAIL RACE
CREEK BANK
BALL GROUNDS
New Power Line
COMET 2240 A
IRON ROD 2240 A
FRACTION 2240 A
Existing Power Line
TOM TIT 2240 A
ECLIPSE 2240 A
USLM 1668 A
Fresh Water Storage
Tailings Pond
Diversion Dike
Diversion Channel
GAMBLE
ROBBIE 1699 A
LATITE FRACTION No. 1 (LOC.)
LATITE FRACTION No. 2 (LOC.)
Fence
Plant Site
Primary & Secondary Crushers
Water Storage
Mine Portal
Power Substation
TIP TOP 1699 A
Coarse Ore Stockpile
Administration and Parking
CLIMAX 1699 A
VEIN OUTCROP
Limerock Adit
LINE ROAD 1699 A
GOLD ROAD 1699 A
RHYOLITE No. 1 (LOC.)
HOPE No. 1 (LOC.)
EXPLANATION
PLANT SITE
PATENTED
PRIMARY & SECONDARY CRUSHER & STOCKPILE
PARKING, ADMINISTRATION & ROADS
WASTE DUMP
TREATED TAILINGS SITE
FRESH WATER STORAGE
WATER OR MONITOR WELL SITE
N
SCALE
Addwest Minerals, Inc.
3480 WARD ROAD SUITE # 370
ARVADA, COLORADO 80002
TITLE: GOLD ROAD MINE
PROJECT: MILL & TAILINGS SITE
STATE: ARIZONA
COUNTY: MOHAVE
SCALE:
DATA BY: USSR & M
DATE: 3/93
DRAFTED BY: DGS
MAP NO.

FIGURE 6.1

The mine was operated on at least two prior occasions, most recently in 1937 to 1942; after which it was closed under the War Powers Act. There are excellent descriptions available from mine records of the performance of the operation, including a thorough set of process baseline data in the Mineral Processing Handbook published by Taggart in 1939. Much of this data forms the basis for the preliminary metallurgical strategy, flowsheet, equipment sizing, and cost estimates developed for this report.

A full set of metallurgical tests was performed by Industrial Compliance Technologies (ICT) to verify the assumptions, metallurgical responses, and power requirements necessary to provide a complete basis for developing a full conceptual design of the milling facilities. The mass balance calculations which are outlined in TABLE 6.9 are based on this test work. TABLE 6.2 presents the design criteria established for the mill (also see APPENDIX D and TABLE 3.6). The mill process flow sheet is shown on Plate 3.

TABLE 6.2
Addwest Minerals, Inc
Gold Road Project - Mohave County, Arizona

PROCESS DESIGN CRITERIA - GOLD ROAD MILL

PROCESS PARAMETER	DESIGN BASIS
Ore Grade	0.2 - 1.0 oz. Au/st
Hardness	Up To 25 Work Index
Cyanide Consumption	1 lb./st Feed
Lime Consumption	4 lb./st Feed
Leach Time	24 Hours
Carbon Loading	150 oz.Au/st
Pulp Density	
Mill	67% Solids
Leach Tanks	50% Solids
Thickener Area	1.2 ft^2
Density of Tailings	65% Solids
Chlorine Addition	2 lb./st Feed
Ball Consumption	4 lb./st Feed
Tailing Pond Capacity	
Phase 1	300,000 tons
Phase 2	1 million tons

The metallurgical process technology to be implemented for the project consists of a modern cyanide leaching and activated carbon adsorption process. The process was developed in the early 1970's by the Bureau of Mines and is widely used today throughout the gold industry.

6.2 GEOLOGY, MINERALOGY, AND WASTE MATERIAL CHARACTERISTICS

6.2.1 Geology and Mineralogy

The Gold Road ore is mainly a quartz-calcite rock containing very fine grained gold-silver alloy at a ratio of approximately one to one. The higher grade ore zones contain little, if any, calcite and may have up to five stages of quartz. Sulfides and other metals are rare in the ore. Mercury is present but rare, though concentrations as high as 34 ppm occur locally in the ore. Fluorine, averaging 300 to 500 ppm, is present locally, particularly where calcite is present. High grade ore frequently contains very fine-grained, visible free gold in thin quartz bands. Coarse gold has been rarely observed in the mine. APPENDIX D includes geochemical analysis of some ore and tailings material.

Waste rock is typically slightly altered to fresh andesite or latite. Only rarely will there be any significant clay.

6.2.2 Ore and Waste Characterization

Samples representing ore, waste and historical tailings were collected by Addwest and evaluated by geochemical testing. The historical waste samples were considered to be a good representation of the average material that will be processed through the mill and so several samples were collected and analyzed from throughout the tailings deposits. The samples were tested for their leachability and acid generating and neutralizing potential, as well as other characteristics.

Some of the historic tailings were also tested under the Meteoric Water Mobility Procedure (MWMP), as recommended by the Arizona Department of Environmental Quality, which simulates actual environmental conditions to which the waste will be exposed. More detailed descriptions of these tests and other environmental criteria can be examined in the Aquifer Protection Permit Application for the Gold Road Project, which has been submitted to the Arizona Department of Environmental Quality. Results of these tests are summarized in TABLES 6.3, 6.4 and 6.5. Other geochemical analyses of ore, rock, tailings and water pertinent to the Gold Road Project are available in the Aquifer Protection Permit Application and in Addwest's files.

The tests on the historic tailings indicate they have a significant net neutralizing potential (TABLE 6.3). The 14 samples had less than 0.1% total sulfur content each. The average ANP/AGP ratio for the tailings was 202 with the lowest being greater than 95, indicating the historic tailings can be considered a non-generator of acid. The MWMP (TABLE 6.5) tests of

TABLE 6.3
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

HISTORIC TAILING ACID/BASE CHARACTERIZATION
Summarized from Core Laboratories, Analytical Report, March 17, 1993

Historic Tailing	Percent Sulfur	AGP Total Sulfur	ANP	NAGP	ANP/AGP
Lab ID 930321-0001	0.01	0.3	28.6	-28.3	>95
Lab ID 930321-0002	<0.01	<0.3	34.2	-33.9	>114
Lab ID 930321-0003	<0.01	<0.3	53.2	-52.9	>177
Lab ID 930321-0004	<0.01	<0.3	58.7	-58.4	>195
Lab ID 930321-0005	<0.01	<0.3	73.8	-73.5	>246
Lab ID 930321-0006	<0.01	<0.3	113.0	-112.7	>377
Lab ID 930321-0007	<0.01	<0.3	58.0	-57.7	>192
Lab ID 930321-0008	<0.01	<0.3	56.6	-56.3	>188
Lab ID 930321-0009	<0.01	<0.3	43.7	-43.4	>146
Lab ID 930321-0010	<0.01	<0.3	41.0	-40.7	>137
Lab ID 930321-0011	<0.01	<0.3	54.6	-54.3	>182
Lab ID 930321-0012	<0.01	<0.3	62.8	-62.5	>209
Lab ID 930321-0013	<0.01	<0.3	82.0	-81.7	>273
Lab ID 930321-0014	<0.01	<0.3	87.4	-87.1	>291

EPA recommends 100 times the Drinking Water Maximum Contaiminant Limit (MCL) as leachability limit.
AGP, ANP, and NAGP values are in Tons CaCO3/Kt.

ORE AND WASTE ROCK CHARACTERIZATION
Summarized from Core Laboratories, Laboratory Test Results, November 17, 1992

Type	Percent Sulfur	AGP Total Sulfur	ANP	NAGP	ANP/AGP
Ore	<0.01	<0.3	21.1	-20.8	>69
Waste Rock	<0.01	<0.3	259.0	-258.7	>863

AGP: Acid Generation Potential
ANP: Acid Neutralization Potential
NAGP: Net Acid Generation Potential (NAGP=AGP-ANP)

TABLE 6.4
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

USEPA METHOD 1312 LEACHABILITY TEST RESULTS – WASTE ROCK AND ORE
Summarized from Core Laboratories, Laboratory Test Results, November 17, 1992

Parameter (Dissolved)	Ore	Waste Rock	100X Drinking MCL's (1)
Bicarbonate (mg/L)	51.0	16.0	
Carbonate (mg/L)	<1.0	8.0	
Chloride (mg/L)	0.7	1.0	
Conductivity (umhos/cm)	53	55	
Hydroxide (mg/L)	<1.0	<1.0	
Sulfate (mg/L)	<10	<10	
pH	8.64	8.9	
Total Dissolved Solids (mg/L)	45.0	33.0	50,000
Aluminum (mg/L)	0.3	0.18	
Antimony (mg/L)	<0.1	<0.1	
Arsenic (mg/L)	<0.05	<0.05	5
Barium (mg/L)	<0.01	<0.01	100
Beryllium (mg/L)	<0.005	<0.005	
Boron (mg/L)	<0.05	<0.05	
Cadmium (mg/L)	<0.005	<0.005	1
Calcium (mg/L)	5.0	5.5	
Chromium (mg/L)	<0.01	<0.01	5
Cobalt (mg/L)	<0.03	<0.03	
Copper (mg/L)	<0.01	<0.01	100
Iron (mg/L)	0.04	<0.03	30
Lead (mg/L)	<0.05	<0.05	5
Magnesium (mg/L)	0.40	0.40	
Manganese (mg/L)	0.01	<0.01	5
Molybdenum (mg/L)	<0.05	<0.05	
Nickel (mg/L)	<0.04	<0.04	
Potassium (mg/L)	<5.0	<5.0	
Selenium (mg/L)	<0.1	<0.1	1
Silver (mg/L)	<0.01	<0.01	5
Sodium (mg/L)	1.0	1.0	
Strontium (mg/L)	0.04	0.03	
Titanium (mg/L)	<0.05	<0.05	
Vanadium (mg/L)	<0.05	<0.05	
Zinc (mg/L)	0.01	0.01	500

Note: (1) EPA recommends 100 times the Drinking Water Maximum Contaiminant Limit (MCL) as a leachability limit for Method 1312.

TABLE 6.5
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

METEORIC WATER MOBILITY TEST – HISTORIC TAILINGS
Summarized from Core Laboratories, Analytical Report, March 17, 1993

Parameter Dissolved	Sample GR 1B	Sample GR 2	Sample GR 4	Sample GR 9	10X Drinking MCL's (1)
Bicarbonate (mg/L)	59.09	72.73	<7.14	<7.35	
Carbonate (mg/L)	15.15	6.06	28.6	29.41	
Chloride (mg/L)	37.9	30.3	45.7	70.59	
Conductivity (umhos/cm)	270	310	538	634	
Flouride (mg/L)	.45	0.61	1.3	1.18	
Total Hardness (mg/L)	21.2	60.61	224.3	323.5	
Hydroxide (mg/L)	<1.52	<1.52	25.7	23.53	
Nitrogen, Total (mg/L)	1.52	1.52	4.3	2.94	
Nitrate+Nitrite (as N) (mg/L)	4.12	5.27	4.4	9.62	
pH	9.07	8.7	9.81	9.86	
Total Dissolved Solids (mg/L)	383	173	630	556	5,000
Sulfate (mg/L)	48.5	109.1	171.0	260.3	
Aluminum (mg/L)	<0.08	0.21	0.07	0.07	
Antimony (mg/L)	<0.15	<0.15	<0.14	<0.15	
Arsenic (mg/L)	<0.08	<0.08	<0.07	<0.07	0.5
Barium (mg/L)	<0.015	0.015	<0.014	<0.015	10
Beryllium (mg/L)	<0.008	<0.008	<0.007	<0.007	
Boron (mg/L)	0.94	0.12	0.19	0.21	
Cadmium (mg/L)	<0.008	<0.008	<0.007	<0.007	0.1
Calcium (mg/L)	7.58	21.21	89.14	129.26	
Chromium (mg/L)	<0.015	<0.015	<0.014	<0.015	0.5
Cobalt (mg/L)	0.06	0.06	<0.1	0.15	
Copper (mg/L)	<0.015	<0.015	<0.014	<0.015	10
Gross Alpha (pCi/L)	1.5	0.2	2.3	2.4	
Iron (mg/L)	0.08	0.58	2.03	0.38	3
Lead (mg/L)	<0.08	<0.08	<0.07	<0.07	0.5
Mercury (mg/L)	<0.0005	<0.0005	<0.007	0.0004	
Magnesium (mg/L)	0.45	1.82	0.29	0.29	
Manganese (mg/L)	<0.015	<0.015	<0.014	<0.015	0.5
Molybdenum (mg/L)	<0.08	<0.08	<0.07	<0.07	
Nickel (mg/L)	<0.06	<0.06	<0.06	<0.06	
Potassium (mg/L)	10.6	12.1	10	11.8	
Radium 226 (pCi/L)	0.4	0.3	0.1	ND	
Radium 228 (pCi/L)	3.8	17.7	5.2	5.1	
Selenium (mg/L)	<0.008	<0.008	0.008	0.009	0.1
Silver (mg/L)	<0.015	<0.015	<0.014	<0.015	0.5
Sodium (mg/L)	72.7	66.7	70	61.8	
Strontium (mg/L)	0.12	0.19	0.61	0.96	
Titanium (mg/L)	<0.08	<0.08	<0.07	<0.07	
Vanadium (mg/L)	<0.08	<0.08	0.07	<0.07	
Zinc (mg/L)	<0.015	<0.015	<0.014	<0.015	50

10X Drinking Water Maximum Contaminant Limit (MCL) as the leachability limit.

TABLE 6.5 (Cont.)

METEORIC WATER MOBILITY TEST – HISTORIC TAILINGS
Summarized from Core Laboratories, Analytical Report, March 17, 1993

	Sample			
	GR 1B	GR 2	GR 4	GR 9
Total Cyanide (mg/kg)	2.3	7.4	7.1	2.3
W.A.D. Cyanide (mg/kg)	NA	0.5	1.7	0.8

metal leachability indicate that the historic tailings produce leachate that is at or near drinking water standards and well within the recommended 10 times the Federal Primary Drinking Water (MCL)s.

Acid generation tests on a composite of ore material resulted in total sulfur of less than 0.1% and an ANP/AGP ratio of greater than 69 (TABLE 6.30). These results indicate that the ore has significant neutralizing potential and should not adversely affect the environment if stored in stockpiles for a short time. Leachability tests using U.S. EPA Method 1312 (TABLE 6.4) indicate that the ore produces leachate that is below drinking water standards and well below the EPA recommended 100 times the Drinking Water (MCL).

Two composite samples of waste (wall rocks from the mine) was also tested using the same procedures (TABLES 6.3 and 6.4). The waste rock has total sulfur of less than 0.1% and an ANP/AGP ratio of greater than 863, indicating significant net neutralizing abilities and there should be no problem with a waste disposal area for the up to 100,000 tons of waste that may be generated. Leachability tests (TABLE 6.4) indicate the waste rock samples are well within the limits recommended by the EPA. The metals in the waste rock are not likely to be mobile.

6.2.3 Emissions Inventory

The emissions into the atmosphere from the Gold Road facility are expected to be small amounts of particulates from the crushing, grinding, transport and storage equipment in addition to a small amount of gaseous emissions from the various kilns and heaters. TABLE 6.6 summarizes the expected emission points and their yearly emissions as indicated on the Permit Application to the Arizona Department of Environmental Quality.

TABLE 6.6
Addwest Minerals, Inc
Gold Road Project - Mohave County, Arizona

SUMMARY OF EMISSIONS FROM THE GOLD ROAD PROJECT FACILITIES

EMISSION POINT	COMPONENT OF EMISSION [*]	MAXIMUM EMISSION TONS/YEAR
Primary Crusher [Water Sprays]	TSP PM-10	0.26 0.12
Secondary Crusher [Wi]	TSP PM-10	0.039 0.016
Screen [2ndry Crshr] [Wi]	TSP PM-10	0.10 0.079
Stacker[Crs. Ore] Water Sprays	TSP PM-10	1.70 0.79
Reclaim Feeder Belt	TSP PM-10	0.045 0.02
Two Transfer Belts	TSP PM-10	0.28 0.14
Grinding Mill Feed Belt	TSP PM-10	0.04 0.02
ROM	TSP PM-10	1.0 0.4
Coarse Ore Pile	TSP PM-10	1.6 0.6
Waste Rock Pile	TSP PM-10	10.9 3.9
Lime Silo [Wi]	TSP PM-10	0.0005 0.0005
Lime Silo-Discharge	TSP PM-10	0.007 0.007
Heat Exchanger/Blr [Fueled by Natural Gas or Propane] [Emissions from Worst Fuel Shown]	TSP PM-10 SO2 NOx CO VOC	0.022 0.022 0.001 0.257 0.039 0.011
Carbon Regen. Kiln [Natural Gas or Propane] [Emissions from Worst Fuel Shown]	TSP PM-10 SO2 NOx CO VOC	0.008 0.008 0.0004 0.086 0.013 0.004
Drying Furnace [Natural Gas or Propane] [Emissions from Worst Fuel Shown]	TSP PM-10 SO2 NOx CO VOC	0.002 0.002 0.00008 0.017 0.003 0.0007
Dore' Furnace [Natural Gas or Propane] [Emissions from Worst Fuel Shown]	TSP PM-10 SO2 NOx CO VOC	0.006 0.006 0. 0003 0.068 0.011 0.003

[*] Abbreviations for components are from Arizona DEQ-see Permit Application

6.3 GENERAL PROCESS DESCRIPTION

Run-of-mine ore is to be delivered from the underground mine operation in rubber-tired LHD trucks and discharged into a dump pocket located above the primary crusher. The crushing system reduces run-of-mine ore to a size which is suitable as feed to the primary grinding mill. The material is crushed in two stages and conveyed to fine ore bins for storage, reclaim and delivery to the grinding system.

Crushed ore is withdrawn from the fine ore bins and conveyed to the grinding circuit. The ore is ground extremely fine, screened to remove wood chips, metal fragments and other debris, and is sparged with air to oxidize cyanide-consuming materials. The oxidized slurry is then thickened and pumped to the cyanide leaching operations.

Cyanide operations consist of three leach tanks and six carbon-in-pulp (CIP) tanks. Thickener underflow is mixed with cyanide-bearing process solution and a make-up solution of sodium cyanide. Compressed air is introduced into the leaching tanks to assure that there is sufficient oxygen reagent to dissolve gold and silver according to Elsner's equation:

Eq 1) $$4Au + 8NaCN + O_2 = 4NaAu(CN)_2 + 2NaOH$$

Dissolved gold and silver is then recovered from the leaching solutions by adsorption onto activated carbon. Barren activated carbon is introduced into the circuit in the last CIP tank. The carbon is generally advanced daily, countercurrent to the ore slurry flow. The carbon collects gold and silver as it is advanced and, when loaded to design capacity, it is withdrawn from the first CIP tank and delivered to the desorption and electrowinning process operations.

Barren slurry exits the CIP system and flows to a high rate thickener for density adjustment. The final tailings slurry is then treated to reduce its cyanide concentration and is pumped to the tailings impoundment where it will present only a minimal risk to the surrounding environment.

In the desorption operation, the loaded carbon is washed with nitric acid solution and rinsed with water. Then, the gold and silver is resolubilized with hot, highly alkaline cyanide solution and is eluted (washed) from the column. The eluted gold solution is circulated through electrowinning (gold recovery) cells where the gold deposits on stainless steel cathodes as a fine, dark precipitate that can be easily washed from the cathode surfaces. After washing, the gold precipitate is filtered, dried, mixed with flux, and smelted. Upon cooling, the molds (referred to as ingots or as Dore' bullion) are secured and sent to a refinery for final purification of gold and by-product silver.

6.4 DETAILED PROCESS DESCRIPTIONS

6.4.1 Ore receiving, Crushing, Screening & Fine Ore Storage

The crushing system is designed to reduce the size of run-of-mine ore to a nominal minus ½

inch, which is suitable as feed to the primary grinding mill. The material is crushed in two stages, and delivered to cylindrical fine ore bins for storage, reclaim, and delivery to the grinding system.

Run-of-mine ore is delivered to the crushing plant from the underground mine operation in rubber-tired LHD trucks on a three-shift, five-day basis. The ore is discharged into a 150 cubic yard dump pocket which is located above the primary crusher. The dump pocket is covered by an 18" by 12" metal grid to prevent oversize rocks from entering the crushing system. When the crushing plant is not in operation the ore will be stockpiled adjacent to the crushing plant and then returned to the crusher dump pocket by front end loader as required to maintain daily production.

The crushing plant will operate day shift only, five days per week. The crushing plant is designed to process up to 110 tons per hour. Ore is withdrawn from the dump pocket by a vibrating feeder and delivered to a 20" by 36" primary jaw crusher. The crushed product (minus three to four inches in size) falls onto the primary conveyor, is transferred to the return conveyer, and is then delivered to a vibrating screen.

The screen is 5 foot wide by 16 feet long and is equipped with two screening decks. The screen receives the partially crushed ore and removes a plus ½ inch material that is returned to the crushing operation. Screen oversize is further reduced to about -¾ inch by a 4-¼ foot cone crusher. Secondary crusher product falls to the primary belt and joins the primary crusher product for delivery to the return conveyor and the vibrating screen.

A crushed ore product (nominally minus ½ inch in size) is transported by conveyor belt to one of two 625-ton fine ore bins. The bins provide approximately 2-½ days of "live" storage capacity and function as a buffer between the crushing plant, which is operated one shift per day, and the mill which operates continuously.

Dust emissions are carefully controlled at the crushing plant, transfer points, and the ore bins. An atomized water spray dust suppression system is installed at the primary crusher. The vibrating screen, conveyor transfer points, and the fine ore bins are covered and ventilated to a fabric dust collector. Collected dusts are returned to the operations at various convenient points in the crushing process.

Jib hoists are located adjacent to the crushers and screen for easy replacement of drives and wear materials. A wheel mounted hoist will be available for major repairs or heavy lifting.

6.4.2 Grinding, Classifying, Pre-leaching, & Thickening

The gold and silver in the Gold Road orebody is generally present as discrete "free" particles that will dissolve as soon as sufficient surface area is exposed. The grinding circuit will prepare the ore for leaching by releasing the fine gold and silver particles from the quartz host rock, or by adequately exposing the particle surfaces to access by the leaching solutions.

belt for delivery to the grinding circuit. The feeders are 18" wide by 6' long. The feeders are adjustable and the mill feed rate can be maintained by one feeder operating at full rate, or by several feeders operating together, but at a reduced delivery rate. Pebble lime is added to the grinding mill feed conveyor from a silo located adjacent to the ball mill feed conveyor.

The ore is automatically weighed and sampled prior to discharging into the grinding mill feed chute. Cyclone underflow slurry, recirculating dilution water, and make-up water also are directed into the grinding mill feed chute.

Test results indicate that the Gold Road ore is extremely hard. Grinding performance has been projected based upon an average work index of 20. The grinding mill has been sized to grind up to 25 tons per hour of new feed to produce a product that is 80% passing 325 mesh.

The ball mill is a nominal 12 foot diameter by 16 foot long rotating cylinder and will be driven by a 1000 hp motor. The mill is lined with alloy metal wear plates and will contain grinding balls up to 3 inches in diameter.

Ground ore flows through the mill and over a short discharge trommel, where large ball chips and trash is removed. Trommel undersize material then flows into a sump, where process water is added and the diluted slurry is delivered by a 6x5 metal lined centrifugal pump to a cluster of four, ten-inch diameter hydrocyclones. Normally, three cyclones will be in operation; the other is ready as a standby or is removed for repairs. The cyclones remove insufficiently ground material for return to the grinding mill.

Cyclone overflow (at minus 325 mesh and 25% solids) is directed to a small vibrating screen and, subsequently, to pre-leaching and thickening. The vibrating screen removes small rock, wood, and ball chips and other debris that could interfere with downstream operations. The screen surface is sprayed with process water to remove any fine materials that may cling to the debris. Screen oversize (trash) is generally delivered to the tailings sump for pumping to the tailings impoundment.

Test results indicate that a significant level of cyanide consuming material is present in the ore. A pre-oxidation leach is designed to oxidize this material in order to prevent undesireable side reactions with cyanide in subsequent operations.

Screened cyclone overflow is directed to the first of two air-sparged and agitated pre-oxidation tanks that are sized to contact the ground ore with air for up to two hours. Each tank is 15 feet in diameter by 18 feet high and is stirred by a 48" mixer. All tank levels are controlled by an air-operated dart valve in the discharge well that regulates the flow of slurry from the tank.

Preoxidized slurry then flows to the feed box of a 32 foot diameter high rate thickener. The thickener is designed to increase the solids content of the underflow to 65% solids. A flocculent is continuously added to the thickener feedwell. Flocculent enhances the solid-liquid separation in the thickener by causing fine particles to agglomerate and form larger flocs, which settle rapidly. Extra dilution water can be directed to the feedwell to improve settling performance. Thickener overflow proceeds to the mill water tank for return to the grinding circuit.

Thickener overflow proceeds to the mill water tank for return to the grinding circuit.

Thickener underflow is then pumped to the first leach tank. A by-pass allows delivery to the second tank when the first tank is out of service.

Jib hoists are located adjacent to the grinding mill for handling liners. A wheel mounted hoist will be available when major repairs or lifts are necessary.

6.4.3 Leaching and Carbon-in-Pulp Adsorption

Leaching exposes the gold in the finely ground ore slurry to contact with the cyanide solution which dissolves the gold for subsequent adsorption in the carbon-in-pulp (CIP) circuit. The CIP adsorption operation provides prolonged contact between the gold-bearing solution and the activated carbon, which is suspended in each of the tanks. The dissolved gold is adsorbed onto the carbon so that the slurry leaving the last tank is barren and can be released to the tailings impoundment.

Three leaching tanks are sized to accommodate a 50% by weight slurry for up to six hours each. Each tank is 20 feet in diameter and 22 feet deep. The tanks are stirred by 72 inch diameter, 7.5 hp mixers. Each tank is sparged with approximately 75 to 100 acfm of air. The mixer maintains the slurry in suspension, ensures thorough mixing of the cyanide solution, and disperses the air throughout the tank.

Slurry exits each leach tank through a wire mesh screen into a discharge well, and then continues through large diameter pipes to the next tank in the process sequence. Tank levels (and flow rates) are controlled by air-operated dart valves.

The pH in the leaching tanks will be maintained at 10.5 to 11.0 by sensing the alkalinity of the cyclone overflow slurry as it enters the thickener feedwell and adjusting the amount of lime added to the ball mill feed conveyor. The cyanide concentration is measured in the clear, recycled overflow from the tailings thickener. Makeup cyanide solution is added to the first leach tank as required to maintain a pre-set concentration of free cyanide in the tank.

The slurry flows continuously through the CIP train. Fresh (reactivated) carbon is added in batches to the last tank and is periodically transferred from one tank to the next, advancing upstream or countercurrent to the slurry flow. This allows contact of the freshest carbon with the lowest grade solution, maximizing adsorption of the gold.

There are six (6) CIP tanks, each 12 feet in diameter and 16 feet high. The retention time in each tank will be approximately 70 minutes for a total of eight hours. The tanks are mechanically stirred by 48" diameter mixers, each requiring 2.5 hp. The mixers maintain the solids in suspension and ensure contact of the carbon granules with the slurry.

Each CIP tank outlet is fitted with a carbon retention screen. The screen openings allow the slurry to flow down the adsorption train but retain the larger granules of carbon in the tank. The

screens are cylindrical with 18 mesh woven wire apertures. Motor driven wiper blades sweep the surface of the screen to prevent build-up of carbon and blinding of the screen cloth. The tank levels are controlled by air-operated dart valves.

The carbon advance sequence operates automatically under the control of a PLC system. Recessed impeller pumps transfer the carbon and slurry through clear plastic pipe from one tank to another. The pumps advance the carbon content of one tank at a time, in sequence. Each tank transfer requires three hours, for a total operating time of 18 hours per day.

Carbon content in each CIP tank is designed to be 20 grams/liter and carbon will be loaded to 150 ounces of gold per short ton (opt) of carbon (TABLE 6.2).

6.4.4 Tailings Treatment

Tailings treatment consists of a dewatering process to recover cyanide process solution for reuse, followed by an alkaline chlorination oxidation process in which free and weak acid dissociable (WAD) cyanide compounds are converted to less toxic compounds.

CIP tailings flow by gravity to a 32 foot diameter high rate thickener, where the barren slurry is thickened to approximately 65% solids by weight. Flocculent is continuously injected into the tailings thickener feedwell and dilution water may be recirculated through the feedwell to improve settling performance. Thickener underflow is pumped to the alkaline chlorination tanks. Clear, barren cyanide solution overflows the thickener and is pumped to the mill water tank for reuse in leaching.

The addition of a milk of lime slurry is required to maintain the strongly alkaline conditions required for the oxidation reactions and to precipitate any heavy metals that may have been dissolved during the leaching operations. The tailings can then be sparged with chlorine and air to oxidize free cyanide and to alter certain metal-cyanide complexes to cyanate compounds, and ultimately, to ammonium carbonate and calcium carbonate.

Chlorine dissolves in water and alkaline solutions to form hypochlorite, a strong oxidant. The hypochlorite then oxidizes free cyanides and WAD cyanides to cyanates, which then hydrolyze. The oxidation reaction is rapid and is shown by test work to consistently produce free and WAD cyanide levels of below 30 mg/l in the final tailing solution.

The overall chemical reactions are shown below.

Eq 2) $Cl_2 + Ca(OH)_2 + 1/2O_2 = Ca(OCl)_2 + H_2O$

Eq 3) $2NaCN + Ca(OCl)_2 = Ca(CNO)_2 + 2NaCl$

Eq 4) $Ca(CNO)_2 + 4H_2O = (NH_4)_2CO_3 + CaCO_3$

The alkaline chlorination operations are conducted in two, 6 foot diameter by 12 foot deep tanks.

Each tank is stirred by a 24" diameter mechanical mixer. The tank level and slurry flow rate is regulated by a dart valve in each tank discharge well. The tanks are covered and ventilated for safety. The process is also monitored and controlled by a PLC system complete with alarms and fail-safe interlocks.

The treated tailings slurry is pumped at 65% solids to the tailings impoundment. Additional water will be recovered from the impounded tailing slurry as the materials consolidate. Approximately half of the water released to the impoundment will be lost to evaporation, especially in the summer months. The water that is recovered is pumped to the non-cyanide process water tank for reuse.

6.4.5 Process Water Procurement

Up to 72,000 gallons of water per day (60 gpm) will be needed at the Gold Road facility for processing ore and other necessities. Addwest plans to obtain most of the required water by drilling one or more water wells as close as possible to the mill.

In addition, the mine is currently filled to approximately the 320 level with water. This calculates to approximately 85,000,000 gallons of water stored in the old workings. This water could supply the mill facility for up to three years of operation. Since the mining operation will not extend to the 350 level for at least 1.5 years, the mine water can be pumped to the milling facility as required. Dewatering of the old workings should be nearly completed when access to the lower ore zones is required.

Also, any water that accumulates in the fresh water storage pond, upstream of tailing disposal area, can be used as needed, at the milling facility.

6.4.6 Tailing Impoundment Facility

The tailing impoundment facility of the Gold Road Project consists of a synthetically lined pond located with the area of historical tailings (Figure 5.1). The initial impoundment is designed to hold approximately 300,000 tons of processed material with expansion capacity to 1,000,000 tons. The consulting engineering firm of Knight Piesold and Co. (Knight Piesold) has designed the tailing impoundment facility. A copy of their report titled Tailing Facility Design Report is available in Section C of the Aquifer Protection Permit Application, or is available separately from Addwest. The document contains details of the tailing facility and its design criteria, as well as the site, hydrologic, and material studies completed and used as a basis for the tailing facility design.

The design of the new tailing facility confines it to the site of the historic tailing area to minimize the environmental impact of the disturbance. The historic tailing deposit will also provide an excellent base for the synthetic liner to be installed. The existing tailing deposit will be stripped of surface vegetation and then reshaped to provide a contoured basin suitable for the 30-mil PVC geomembrane liner. A geonet/geotextile composite will be positioned on the liner

The tailing impound embankment will be constructed in phases. A starter embankment will be initially constructed at the lower end of the tailing basin area. This starter will hold four to six months deposition. When the tailing deposit reaches the limits of the starter embankment, further embankment construction will be accomplished by excavating and pushing the contemporary tailing onto the embankment crest until sufficient height is reached for additional slurry deposition. The embankment will be continuously raised by grading the material to form a stable downstream slope.

In addition to the tailing impoundment facility, a Process Water Reclaim Pond (PWRP) and a fresh water storage pond have been included in the design. The PWRP will be located at the low end of the tailing storage area which will allow for gravity flow of the solution. The site and details of the PWRP are shown on Knight Piesold drawings 1245A-101 and 1245A-102 in Section C of the Aquifer Protection Permit Application. The PWRP will be double lined and incorporate an LCRS (leachate collection and recovery system).

The PWRP has been designed to maintain an operational fluid level as well as to handle the runoff from a 100 year storm event. The PWRP is not subject to the jurisdiction of the State of Arizona Department of Water Resources because the storage capacity is less than 15 acre feet.

The fresh water storage pond has been designed to store make up water for the milling process. The source of the water will most likely be from production wells, underground workings, and runoff from Silver Creek. The pond will be unlined and, other than removing vegetation, the basin area will be left in its natural state. The containment embankment will be constructed as a zoned structure with a 12 foot thick sloping low permeability seal zone to minimize seepage flow through the embankment.

Runoff from areas upgradient of the tailing storage area will be diverted around the facility in a diversion channel for off site discharge. The diversion channel will be sited along the southern perimeter of the tailing facility and fresh water storage ponds and is designed to pass the runoff from the 100 year/24 hour event. A preliminary layout and details of the proposed channel can be referenced on Knight Piesold drawings 1245A-101 and 1245A-103 Section C of the Aquifer Protection Permit Application.

The initial cost for the proposed tailing facility, including the starter embankments, the water storage ponds, and the diversion channel will total approximately $800,000. A breakdown of these costs is outlined in the Aquifer Protection Permit Application.

6.4.7 Desorption, Electrowinning & Dore' Production

The plant will be equipped with a two ton per day (2 tpd) Anglo American Research Laboratories (AARL) carbon desorption system. The loaded carbon is charged into a vertical, cylindrical, insulated pressure vessel and subjected to a series of treatment solutions that desorbs the gold and silver. The desorbed precious metals are then collected in an alkaline electrolyte for subsequent recovery by electrowinning.

recovery by electrowinning.

The desorption process removes gold and silver from the loaded carbon by contact with a hot, concentrated caustic and cyanide solution, followed by rinsing with hot water. The operating sequences are controlled automatically with alarms and interlocks to protect equipment and personnel.

Reagents are delivered to the desorption column by metering pumps drawing from the nitric acid, sodium hydroxide, and sodium cyanide storage tanks. The column operates at a temperature of 248°F (120°C). Strip solution is partially preheated in a heat exchanger by the hot soaking solution leaving the column. Final heating is achieved by a natural gas or propane-fired boiler.

After loading into the column, the carbon is then treated with a 3% solution of nitric acid to remove carbonates and other deposits which may inhibit gold adsorption when the carbon is returned to the CIP process circuit. After a soaking period, the acid is discharged and the carbon is washed with water to remove all traces of the acid. The carbon is then washed a second time with hot water to bring the temperature of the column and the contents to the specified (120 °C) operating temperature.

After heating, the secondary wash solution is discharged and a hot solution of sodium hydroxide and sodium cyanide is then introduced into the column. After soaking to solubilize the gold, the solution is displaced from the column with hot water and flows to the eluate tank. Sufficient hot water is used to thoroughly rinse the solubilized gold from the column and into the eluate tank.

The stripped carbon is then cooled by pumping fresh water through the column. When cooled, the carbon is transferred to the feed hopper of an indirect-fired rotary kiln where it is thermally regenerated. Hot, reactivated carbon is then discharged from the kiln, quenched, and stored for return to the CIP circuit.

Gold-bearing electrolyte is pumped from the insulated eluate storage tank to two electrowinning cells which are arranged in parallel. Each cell has 9 stainless steel wire cathodes enclosed by stainless steel frames and screen cloth. Electrowinning current is supplied by two 800 amp, 15 volt, DC rectifiers.

After approximately 18 hours, gold deposition on the cathodes will be complete. The loaded cathodes are then removed from the cells and the gold sponge is rinsed from the cathodes with a water jet. Finally, the sponge is rinsed, filtered, dried, mixed with flux, and smelted in an electric induction furnace. The product is cast into molds as ingots as a gold-silver alloy, referred to as Dore' bullion.

6.4.8 Reagent Storage & Preparation

Lime

Lime is required in the process for alkalinity (pH) control; first, for maintaining cyanide in

solution for leaching of gold and silver and second, for maintaining the alkalinity required to oxidize residual free and WAD cyanide and to precipitate any heavy metals that might be dissolved during the leaching operations. Lime is added to control the pH of the slurry leaving the grinding circuit and the slurry entering the alkaline chlorination process to 11.0.

Pebble quicklime is delivered to the site in bulk tankers and pneumatically conveyed into a twenty ton silo adjacent to the ball mill feed conveyor, and to a second storage silo adjacent to the alkaline chlorination operations. Lime is withdrawn from the bins by a live bottom activator and variable speed screw feeder.

Pebble lime is added onto the feed belt to the grinding mill circuit. The amount added is controlled by adjusting the speed of the feeder in response to the signal from pH probes located in the thickener overflow well.

A milk of lime slurry is prepared for the chlorination operations. Pebble lime is delivered to an intensely agitated, water filled tank. The mixing tank is sized to prepare and contain up to 1500 gallons of 10% $Ca(OH)_2$ solution. The tank is equipped with a mechanical mixer to suspend and dissolve the quicklime. The mixer operates continuously. Considerable heat is generated as the lime hydrates. The tank is covered and vented for safety. Milk of lime is withdrawn by a slurry pump and metered to the chlorination tanks as required to maintain a strongly alkaline pH in the process.

Sodium Cyanide

Sodium cyanide is used in the leaching circuit to dissolve gold and silver for subsequent recovery by adsorption on activated carbon in the CIP circuit and the carbon columns. Cyanide is also used in the desorption process where the gold and silver is removed from the loaded carbon prior to recovery by electrowinning.

Sodium cyanide is delivered to the site in bulk containers which are stored on a concrete pad within a fenced and secured enclosure adjacent to the mill building. When required, a container is moved by a forklift and placed into position above the cyanide mixing and storage tank.

The mixing tank is sized to prepare and contain up to 500 gallons of 20% NaCN solution. The tank is equipped with a mechanical mixer to suspend and dissolve the cyanide briquettes. Caustic solution is withdrawn by a metering pump connected to an outlet pipe near the bottom of the tank. The pump suction is protected from blockage or damage by debris or undissolved briquettes with an in-line screen strainer. The tank is covered and vented by an in-line ventilation fan.

A batch of cyanide solution is prepared by adding a metered amount of fresh water to the tank. Sodium hydroxide is then added to the water to ensure that the solution pH is above 12.0. With the mixer and ventilation fan running, the bin outlet slide is opened to discharge the cyanide briquettes into the tank. Once the cyanide has dissolved, the mixer can be turned off. For safety, the ventilation fan continues to run at all times.

The cyanide mixing and storage tank is equipped with three variable-speed metering pumps. Two of the pumps (one on-line, one stand-by) deliver cyanide solution to one or more points for addition to the extraction process. The primary addition point will be at the feedwell to the first leaching tank where the solution will be used as make-up to adjust the cyanide concentration as measured in the tailings thickener overflow. The third pump meters cyanide solution into a manifold at the bottom of the elution column, when required, during the desorption sequence. In the event that all delivery valves are closed or if the lines are blocked, each pump is protected with by-pass lines that return to the tank through pressure control valves.

Activated Carbon

Activated carbon for most gold operations is typically prepared from charred coconut shell. The carbon granules are carefully sized to a very narrow range between 6 to 16 mesh. The carbon is added to the slurry in the CIP tanks to adsorb the gold that is dissolved by the leaching process solution. Fresh carbon is added to the circuit, as required, to make up the small losses that occur as carbon particles are abraded.

Carbon is delivered to the site in bulk bags. The bags are emptied, as required, into a holding tank equipped with a recessed impeller pump, where the carbon is recirculated for sufficient time to remove readily abraded materials. "Aged" carbon can then be transferred to the carbon reactivation furnace quench hopper for introduction into the process.

Sodium Hydroxide

Sodium hydroxide (NaOH) is required for alkalinity control in preparing the make-up cyanide solution and as a component of the solutions used to desorb gold and silver from loaded carbon. NaOH is generally received in drums as caustic soda flakes. Solutions of 50% NaOH are also available.

A batch of caustic solution is prepared by adding a metered amount of fresh water to the tank. Sodium hydroxide, as flake or solution, is added to the water to a concentration of 20%. The tank is then be stirred, covered, and ventilated. Substantial heat of dissolution is evolved, so the solids addition must be carefully monitored. With the mixer and ventilation fan running, the bin outlet slide is opened and the solids fall onto a small vibrating feeder that slowly adds the flakes to the solution. Once the caustic is dissolved and the solution cools to ambient temperature, the mixer and the fan can be turned off.

Sodium hydroxide is delivered to the elution circuit by a metering pump that is controlled by the PLC system for the overall desorption operations. The solution is withdrawn through an outlet pipe near the bottom of the tank. The pump suction is protected from blockage or damage by debris or undissolved briquettes with an in-line strainer. The tank is covered and vented through an in-line ventilation fan.

Nitric Acid

Nitric acid removes carbonates and other acid soluble deposits from the loaded carbon before

A dilute (3%) nitric acid solution is prepared by adding a metered amount of fresh water to the solution storage tank. Concentrated acid is then metered into the solution storage tank. The solution is then delivered to the elution column through a metering pump as required by the PLC system. The delivery line is equipped with a return line through a pressure control valve. A pump is located in a sump within the curbed area surrounding the acid tank. Any spillage is pumped to the pre-oxidation tanks for neutralization.

Flocculent

Flocculent is used to enhance the settling rate and solids density which is achieved in the thickeners by causing agglomeration of fine particles as flocs which settle rapidly. Flocculent solution will be delivered into a process water line upstream of a static mixer. The diluted solution will be added to each thickener feedwell.

Flocculent can be delivered to the site either as a dry solid in bulk, in flo-bins, or in 50 pound bags. Alternatively, flocculent may be received as a solution or emulsion in 55 gallon drums. A solution is prepared by dissolving or dispersing the dry or concentrated flocculent in water. A final solution of approximately 0.5% strength is transferred to a storage tank.

Anti-scalant

All unit operations in the Gold Road mill are conducted under highly alkaline conditions, that are maintained by adding lime and caustic to various process operations. Under these conditions, calcium, iron and aluminum salts tend to precipitate from solution, contributing to scaling and fouling of pipes, valves and tanks. Also, as make-up water is added to the process, precipitation and scaling is likely. Anti-scalants, generally a combination of of polyphoshates and sodium silicates, are often necessary to manage scaling and fouling tendencies.

The chemicals are generally received in bags or bulk containers and the solutions are prepared in a manner similar to procedures for preparing caustic and sodium cyanide solutions. The mixing tank is sized to prepare and contain up to 500 gallons of approximately 20% solution. The tank is equipped with a mechanical mixer to disperse and dissolve the sodium silicate/polyphosphate mixture. The solution is withdrawn by a metering pump for delivery to the process. An in-line strainer protects the pump suction from blockage or damage from debris.

Chlorine

Chlorine, milk of lime, and air is reacted with the tailings slurry to convert free and WAD cyanide to less toxic (and less volatile) cyanate compounds. Liquid chlorine is delivered to the site in one or two-ton canisters.

Liquid chlorine is metered to a vaporizer and then delivered into the bottom of the chlorination process tanks where the chlorine is almost instantly converted to hypochlorite.. The rate of chlorine addition is controlled by measuring the oxidation-reduction potential in the inlet to the second chlorination tank. A pH indicating controller is also located in the line to control the

addition of milk of lime. The tanks are also air sparged to provide sufficient oxygen to form the hypochlorites. The chlorine delivery lines are protected with a by-pass to return chlorine gas to an empty canister in the event that all delivery lines are closed. Fail-safe interlocks are connected to level alarms in the tanks, to flowmeters in the incoming feed line, and to a low pressure alarm.

Grinding Media

Balls for the grinding mill are delivered in bulk and dumped into a storage bunker adjacent to the grinding mill. Balls are then transferred by magnet and jib crane to a ball hopper, which will be located above the mill feed chute. Make-up balls, approximately 2½ and 3 inches in diameter are delivered to the feed chute as required to maintain a pre-set power level for grinding.

6.5 MILL CAPITAL AND OPERATING COST SUMMARIES

Capital costs for the plant, as described, have been developed by using estimating factors and applying these factors to a comprehensive list of process equipment. An estimate of all process tanks has also been developed, and the cost of these tanks has been estimated on a per pound, erected basis. Total capital costs for the milling facility are summarized in TABLE 6.6. A more detailed outline of the capital costs of the Gold Road Mill is given in TABLE 6.12 at the back of this section of the report.

TABLE 6.7
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

CAPITAL COST ESTIMATE-MILL

Total Process Equipment	$1,860,000
Factored Constructed Costs	$1,270,000
Tanks, Erected	$299,000
Equipment Subcontracts, Installed	$630,000
Building, Erected	$221,000
Start-up Operating Supplies and Spares	$150,000
Engineering and Construction Management	$500,000
"Used Equipment Savings"	($650,000)
Total Capital Cost Estimate	$4,280,000

Sourcing the major portions of the process equipment, tankage, and ancillary equipment in the used equipment markets may dramatically reduce the overall capital required for the project. As stated above, in the section covering the tailings impoundment facility, the capital cost to

construct the initial tailing impoundment and water ponds will be approximately $800,000.

Operating costs have been developed based upon estimates of manpower requirements and local labor rates. The operating cost estimate presumes an automated process plant so that operating labor is minimized. Chemical and electrical power consumption figures are based upon consumptions in similar operations, from the ICT test results, and according to information previously available from prior operations. TABLE 6.7 below, summarizes the total estimated annual operating costs of the mill and the per ton milling cost. A more detailed outline of the operating costs of the proposed Gold Road milling facility is given in TABLE 6.14 at the end of this section of this report. Supporting data, useful for comparison with the current cost estimates, is included in the historical operating summary in APPENDIX C.

TABLE 6.8
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

ANNUAL CASH OPERATING COST ESTIMATE-MILL

Operating and Maintenance Labor	$607,748
Maintenance Labor	$181,662
Plant Supplies and Consumables	$968,600
Annual Cash Operating Cost	$1,817,560
Cost Per Operating Day	$6,643.35
Operating Cost Per Ton	**$12.11**

TABLE 6.9
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

MASS BALANCE & FLOW CALCULATIONS

		Crushed Ore	Cyclone U.flow	Mill Trim H_2O	Mill Pulp	Cyclone Dilution H_2O
		1	2	3	4	5
Tph Solids	T	24.51	61.27		85.78	
Weight Solids, %	Cw	96.00	65.00		67.00	
Volume Solids, %	Cv	90.07	41.12		43.38	
Pulp Density	Sm	2.49	1.68		1.72	
Liquid Flow, gpm	Ql	4.08	131.97	32.98	169.03	257.11
Solids Flow, gpm	Qs	37.00	92.48		129.48	
Slurry Flow, gpm	Qm	41.08	224.45	32.98	298.51	257.11

		Cyclone Feed Pump	Cyclone O'flow	Screen O'size	Screen Wash H_2O	Pre-leach Feed
		6	7	8	9	10
Tph Solids		85.78	24.51	0.1		24.41
Weight Solids, %	Cw	44.74	25.00	80.00		23.26
Volume Solids, %	Cv	23.30	11.17	60.00		10.21
Pulp Density	Sm	1.38	1.30	1.99		1.17
Liquid Flow, gpm	Ql	426.14	294.17	0.10	30.00	324.07
Solids Flow, gpm	Qs	129.48	37.00	0.15		36.85
Slurry Flow, gpm	Qm	555.62	331.17	0.25	30.00	360.92

Table 6.9 (Continued)
Addwest Minerals, Inc.

MASS BALANCE & FLOW CALCULATIONS

		Thick O'flow	Thick U'flow	Leach Dil H_2O	Leach-CIP	
		11	12	13	14	
Tph Solids	T		24.41		24.41	
Weight Solids, %	Cw		65.00		50.00	
Volume Solids, %	Cv		41.21		27.40	
Pulp Density	Sm		1.68		1.45	
Liquid Flow, gpm	Ql	271.50	52.57	45.06	97.63	
Solids Flow, gpm	Qs		36.85		36.85	
Slurry Flow, gpm	Qm	271.50	89.42	45.06	134.48	

		Tail Thk O'flow	Tail Thk U'flow	Process Tailing	Reclaim H_2O	Final Tailing
		15	16	17	18	19
Tph Solids	T		24.41	24.41		24.41
Weight Solids, %	Cw		65.00	65.00		75.00
Volume Solids, %	Cv		41.21	41.21		53.11
Pulp Density	Sm		1.68	1.68		1.88
Liquid Flow, gpm	Ql	45.06	52.57	52.57	20.03	32.54
Solids Flow, gpm	Qs		36.85	36.85		36.8
Slurry Flow, gpm	Qm	45.06	89.42	89.42	20.03	69.39

TABLE 6.10
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

EQUIPMENT LIST and ESTIMATED EQUIPMENT COSTS

Item #	Description	Installed hp	Cost x $1000
	Crushing Plant & Fine Ore Storage		
1.	Vibrating Feeder, 36" x 12'	15	15
2.	Jaw Crusher, 20 x 36	75	95
3.	Conveyor 01, 24" x 90'	15	27
4.	Conveyor 02, 24" x 95'	15	28
5.	Vibrating Screen, 5 x 16 DD	15	33
6.	Cone Crusher, 4-1/4	150	170
7.	Conveyor 03, 24" x 150'	30	45
8.	Shuttle Conveyor 04	5	15
9.	Fine Ore Bins (2)		
	Ancillary Crushing Plant Equipment	10	35
	Summary	330	463
	Grinding, Pre-leaching & Thickening		
10.	Vibrating Feeders (4), 18" x 6'	4	8
11.	Ball Mill Feed Conveyor, 24" x 90'	5	30
12.	Ball Mill (1), 12' x 16' with Motor, Reducer, Feed Spout, & Trommel	1000	900
13.	Cyclone Feed Pump, 6x5 metal lined	20	15
14.	Cyclone Classifiers (4), 10"		12
15.	Overflow Trash Screen, 2 x 4	1	4
16.	Pre-leach Tank Mixers (2) 48", 2.5 hp	5	10
17.	High Rate Thickener, 32' diam	3	20

Table 6.10 (Continued)
Addwest Minerals, Inc.

Item #	Description	Installed hp	Cost x $1000
18.	Blower, 300 acfm	5	8
19.	Thickener U'flow Pump, 4x3, RL	5	5
20.	Mill Water Tank, 3000 gal		
21.	Mill Water Pump, 3x2 metal	5	4
	Ancillaries	10	40
	Summary	1063	1056
	Leaching, Carbon-in-Pulp		
22.	Leaching Tank Mixers (3), 72" , 5.0 hp	15	18
23.	Blower, 300 acfm	5	8
24.	Carbon-in-Pulp Tanks, 12' diam x 16', 48" Mixer, 2 hp	12	24
25.	Carbon Transfer Pumps (6), 70 gpm	10	15
	Ancillaries	25	30
	Summary	67	95
	Tails Thickener & Alkaline Chlorination		
26.	High Rate Thickener, 32'	3	20
27.	Thickener U'flow Pump, 3x2 RL	2	5
28.	Alk Chlor Mixers (2), 36", 1.5 hp	3	8
29.	Blower, 300 acfm	5	8
30.	Tailings, 4x3 rubber lined	15	15
31.	Tailings Reclaim Water Pumps (2)	30	15
	Ancillaries	5	25
	Summary	63	96

Table 6.10 (Continued)
Addwest Minerals, Inc.

Item #	Description	Installed hp	Cost x $1000
	Carbon Desorption & Regeneration		
32.	Loaded Carbon Screen, 2x4	1	4
33.	Loaded Carbon Storage Bin		
34.	Desorption Pressure Vessel, 3.5'x 25		
35.	Desorption Wash Pump, 2x1.5	3	5
36.	Wash Solution Tank, 4000 gal		
37.	Wash/Elution Heat Exchanger		4
38.	Wash/Elution Heater		15
39.	Eluate Pump, 15 gpm	2	5
40.	Eluate Tank, 8000 gal		
41.	Barren Carbon Dewatering Screen, 2x4	1	4
42.	Barren Carbon Dewatering Tank		
43.	Reactivation Kiln Feeder	1	3
44.	Reactivation Kiln, 5' diam x 20'	2	100
45.	Carbon Quench Tank		
46.	Carbon Transfer Eductor		1
47.	Barren Carbon Screen, 2x4	1	4
	Ancillaries	5	30
	Summary	16	175

Table 6.10 (Continued)
Addwest Minerals, Inc.

Item #	Description	Installed hp	Cost x $1000
	Electrowinning and Smelting		
48.	Electrowinning Cells (2) 9 cathodes ea		36
49.	Cathode Washdown Tank		
50.	Cathode Sponge Filter		2
51.	Cathode Sponge Tray Dryer		5
52.	Induction Smelting Furnace		50
53.	Gold Room Security System		50
54.	Safe		15
	Ancillaries	5	35
	Summary	5	193
	Reagent Storage, Preparation & Delivery		
55.	Lime Silo & Feeder (2)	1	20
56.	Sodium Cyanide Mixer, Metering Pumps (3) & Ventilation Fan	3	10
57.	Caustic Soda Mixer, Metering Pumps (2) & Vent Fan	3	10
58.	Nitric Acid Storage, Metering Pump	1	10
59.	Flocculent Mixer & Metering Pumps (2)	1	5
60.	Anti-scalant Mixer & Metering Pump	1	5
61.	Mill Water Storage, Water Pumps (2) & Gasoline Powered Fire Water Pump	10	25
62.	Potable Water System & Pumps (2)		15
63.	Lime Slurry Mixer & Slurry Pump	1	5
64.	Chlorine Metering Pump & Vaporizer	1	5
	Ancillaries	7	40
	Summary	29	155

TABLE 6.11
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

TANK LIST and ESTIMATED ERECTED COSTS

Item #	Description	Cost x $1000
9.	Fine Ore Bins (2), 20' diam x 35'	80
13.	Cyclone Feed Pump Sump	2
16.	Pre-leaching Tanks (2), 15' diam x 18'	18
17.	High Rate Thickener, 32' diam x 15'	30
20.	Mill Water Tank, 3000 gal	3
22.	Leaching Tanks (3), 20'diam x 22'	60
24.	Carbon-in-Pulp Tanks, (6) 12' diam x 16'	40
26.	High Rate Thickener, 32' diam x 15'	30
28.	Alkaline Chlorination Tanks (2), 12' diam x 16'	15
33.	Loaded Carbon Storage Bin	1
34.	Desorption Column, 3.5'x 25' Pressure Vessel	12
36.	Wash Solution Tank, 4000 gal	2
40.	Eluate Tank, 8000 gal	6
42.	Barren Carbon Dewatering Tank	1
45.	Carbon Quench Tank	1
49.	Cathode Washdown Tank	1
56.	Sodium Cyanide Mixing Tank, 500 gal	1
57.	Caustic Soda Mixing Tank, 500 gal	1
58.	Nitric Acid Storage, 500 gal	2
59.	Flocculent Mixing Tank, 500 gal	1
60.	Anti-scalant Mixing Tank, 500 gal	1
61.	Raw Water Storage Tank, 10,000 gal	8
62.	Potable Water Storage Tank, 2000 gal	3
63.	Milk of Lime Storage Tank, 2000 gal	3

TABLE 6.11
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

TANK LIST and ESTIMATED ERECTED COSTS

Item #	Description	Cost x $1000
9.	Fine Ore Bins (2), 20' diam x 35'	80
13.	Cyclone Feed Pump Sump	2
16.	Pre-leaching Tanks (2), 15' diam x 18'	18
17.	High Rate Thickener, 32' diam x 15'	30
20.	Mill Water Tank, 3000 gal	3
22.	Leaching Tanks (3), 20'diam x 22'	60
24.	Carbon-in-Pulp Tanks, (6) 12' diam x 16'	40
26.	High Rate Thickener, 32' diam x 15'	30
28.	Alkaline Chlorination Tanks (2), 12' diam x 16'	15
33.	Loaded Carbon Storage Bin	1
34.	Desorption Column, 3.5'x 25' Pressure Vessel	12
36.	Wash Solution Tank, 4000 gal	2
40.	Eluate Tank, 8000 gal	6
42.	Barren Carbon Dewatering Tank	1
45.	Carbon Quench Tank	1
49.	Cathode Washdown Tank	1
56.	Sodium Cyanide Mixing Tank, 500 gal	1
57.	Caustic Soda Mixing Tank, 500 gal	1
58.	Nitric Acid Storage, 500 gal	2
59.	Flocculent Mixing Tank, 500 gal	1
60.	Anti-scalant Mixing Tank, 500 gal	1
61.	Raw Water Storage Tank, 10,000 gal	8
62.	Potable Water Storage Tank, 2000 gal	3
63.	Milk of Lime Storage Tank, 2000 gal	3

TABLE 6.12
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

PUMP LIST

Item #	Description	Installed hp
13.	Cyclone Feed Pump, 6x5 metal lined	20
19.	Thickener U'flow Pump, 4x3 RL	5
21.	Mill Water Pumps (2), 3x2 metal	10
25.	Carbon Transfer Pumps (6), 70 gpm	10
27.	Tailing Thickener U'flow Pump, 3x2 RL	2
30.	Tailings Pump, 4x3 RL	15
31.	Tailings Reclaim Water Pumps (2)	30
35.	Desorption Wash Pump, 2x1.5	3
39.	Eluate Pump, 15 gpm	2
	Eductor Pump	2
56.	Sodium Cyanide Metering Pumps (3)	3
57.	Caustic Soda Metering Pumps (2)	2
58.	Nitric Acid Metering Pump	1
59.	Flocculent Metering Pumps (2)	1
60.	Anti-scalant Metering Pump	1
61.	Raw Water Pumps (2)	10
	Gasoline-powered Fire Water Pump	
62.	Potable Water System Pumps	3
63.	Milk of Lime Slurry Delivery Pump	2
64.	Chlorine Metering Pump	1
	Summary	123

Ancillary Pumps Not Specifically Identified:
Crushing Plant Dust Suppression Spray Pump
Grinding Floor Sump Pump
Process Tank Floor Sump Pump (2)
Reagent Storage Basin Sump Pumps (4)

TABLE 6.13
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

CAPITAL COST SUMMARY

	Capital Cost
Process Equipment	
Crushing and Ore Storage	$463,000
Grinding, Pre-leach, Thickening	1,056,000
Leaching, CIP	95,000
Tailings, Alkaline Chlorination	96,000
Reagent Preparation & Delivery	150,000
Process Equipment Cost	**$1,860,000**
Equipment Installation & Erection Cost	**$1,270,000**
Other Equipment & Systems	
Tanks, Erected	299,000
Carbon Elution & Electrowinning, Turnkey	260,000
Regeneration Kiln	100,000
Gold Room and Security	270,000
Building, Lab & Offices	221,000
Other Equipment & System Costs	**$1,150,000**
Engineering & Construction Management	**$500,000**
Total Equipment & Construction Costs (Excluding Contingency)	**$4,780,000**
Less Savings for Major Used Equipment	**($650,000)**
Estimated Constructed Cost	**$4,130,000**

TABLE 6.14
Addwest Minerals, Inc.
Gold Road Project-Mohave County, Arizona

ANNUAL CASH OPERATING COST ESTIMATE

Operating Labor	Cost/shift	$Annual
Mill Superintendent (1)	$301.40	$78,364
Mill General Foreman (1)	266.05	69,173
Mill Shift Foremen (4)	126.04	131,082
Mill Operators (4)	87.68	91,187
Crusher Operators (2)	98.64	51,293
Mill Laborers (4)	87.68	91,187
Assayer (1)	191.80	49,868
Laborers (2)	87.68	45,594
Annual Operating Labor (Per Operating Day)		**$607,748.00 ($2,337.49)**

Operating Supplies	#/ton	Tons/yr	$/ton	$Annual
Lime	4	300	65	$19,500
Sodium Cyanide	1	75	1360	102,000
Sodium Hydroxide	0.5	38	300	11,400
Nitric Acid		23	150	3,450
Chlorine	2	150	300	45,000
Anti-scalants	0.1	8	1600	12,800
Activated Carbon		5	1500	7,500
Grinding Balls	4	300	500	150,000
Crusher/Mill Liners	0.6	45	1600	72,000
Flocculent	.05	4	3000	12,000
Misc. Consumables				7,500
Operating Supplies (Per Operating Day)				**$443,150.00** ($1.477.16)

Maintenance Supplies (10% of Installed Equipment) (Per Operating Day)	**$186,000** ($620.00)
Maintenance Labor (Per Operating Day)	**$181,662** ($698.70)
Power (900 kwhr avg @ 5 cents per kwhr) (Per Operating Day)	**$324,000** ($1,080.00)
Fuel (Per Operating Day)	**$75,000** ($250.00)
Total Annual Cash Operating Cost	**$1,817,560**
Per Operating Day	**$6463.35**
Operating Cost Per Ton	**$12.11**

TABLE 6.14 (CONT'D)

Maintenance Supplies (10% of Installed Equipment) (Per Operating Day)	**$186,000** ($620.00)
Maintenance Labor (Per Operating Day)	**$181,662** ($698.70)
Power (900 kwhr avg @ 5 cents per kwhr) (Per Operating Day)	**$324,000** ($1,080.00)
Fuel (Per Operating Day)	**$75,000** ($250.00)
Total Annual Cash Operating Cost	**$1,817,560**
Per Operating Day	**$6463.35**
Operating Cost Per Ton	**$12.11**

PRODUCTION SUMMARY (MINE OUT PLAN)

7.1 INTRODUCTION

Developing a total operating cost, combining the expenses of the mine, mill, and administration, and combining these expenses with the total capital costs, allows for the establishment of total cost of production numbers for the project. These costs can be used with a production development and production schedule of the delineated proven/probable reserves, plus 99,720 tons of inferred ore adjacent to some of the ore blocks on the lowermost level of the mine, to generate an economic evaluation of the project.

7.2 FORECASTED MINE AND MILL OPERATING EXPENSES

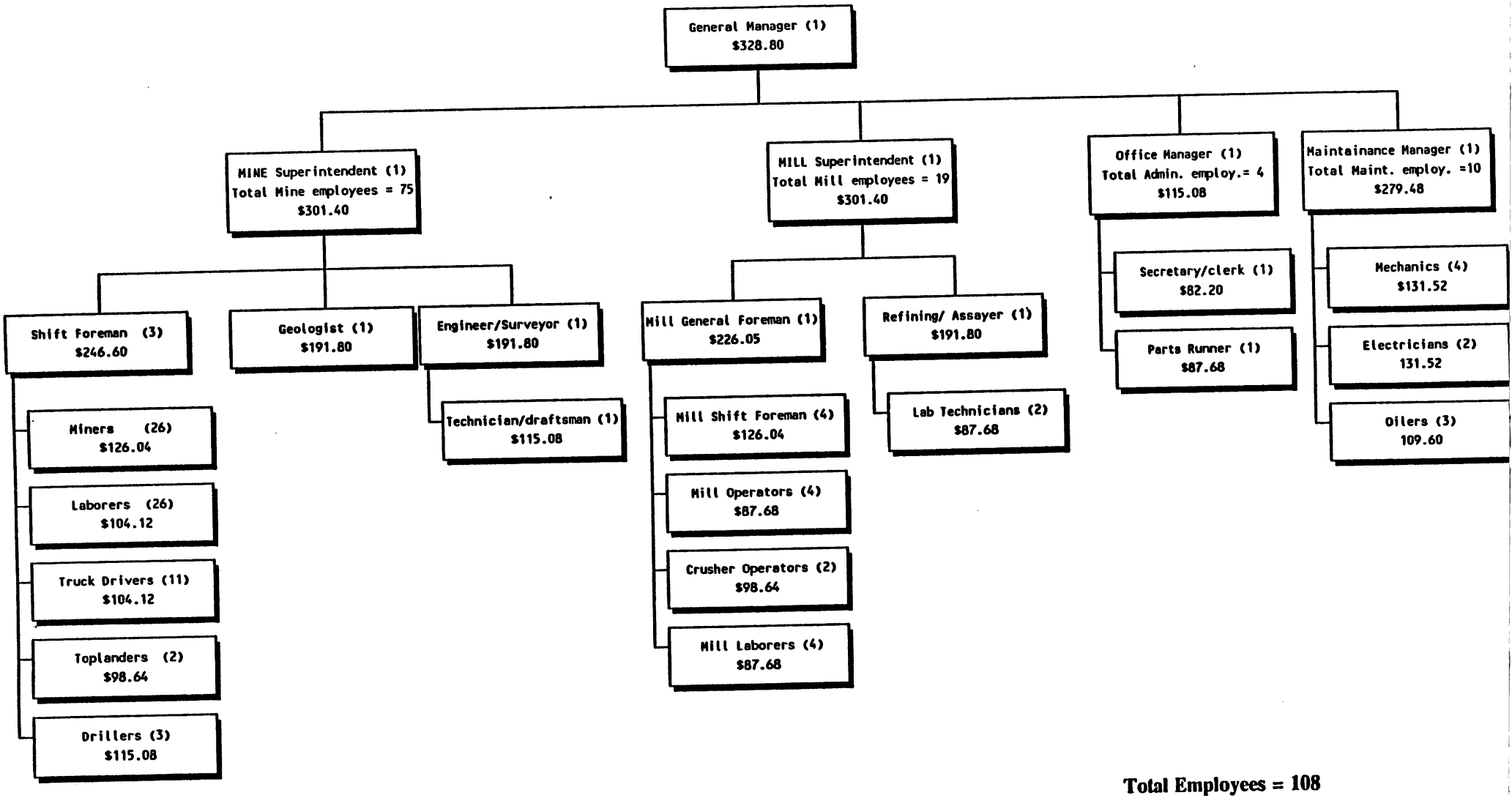
Combining the milling and mining costs of the proposed Gold Road Mine, as described in the above sections of this report, along with the administrative costs, results in a total estimated operating cost of $57.34 per ton of ore produced, including royalties and property and severance taxes but excluding capital costs. TABLE 7.1 summarizes the combined operating and capital costs, per ton, before royalties and taxes, as used to determine the block by block (stope by stope) economics as outlined in APPENDIX G. Details of the combined mine and mill operating costs are outlined in APPENDIX H.

TABLE 7.1
Addwest Minerals, Inc,
Gold Road Project - Mohave County, Arizona

FORECASTED MINE AND MILL OPERATING EXPENSE (cost per ton)

	MINE	MILL	ADMIN.	TOTAL
1. LABOR	$18.05	$4.60	$1.04	$23.69
2. EQUIPMENT	$5.23	$0.31	$0.10	$5.64
3. MATERIALS	$4.79	$1.06	$0.50	$6.35
4. SUPPLIES	$3.13	$4.95	$0.40	$8.48
5. SERVICES	$0.21	$0.07	$0.23	$0.51
6. INDIRECTS	0.00	0.00	$0.67	$0.67
7. CONTRACT	0.00	0.00	0.00	0.00
TOTAL COST	$31.41	$10.98	$2.94	$45.33
CONTINGENCY	$2.10	$1.10	$0.18	$3.36
TOTAL	**$33.51**	**$12.09**	**$3.10**	**$48.69**

Gold Road Manning Chart



Total Employees = 108

Wages shown include benefits and overtime.

Addwest Minerals, Inc.

[7-2]

FIGUP

Total manpower requirements (mine, mill, maintenance and administration) for the Gold Road Mine are expected to be 108 personnel. FIGURE 7.1 provides a manning chart for the entire project including the daily per man cost.

7.3 PRODUCTION SCHEDULE

Pre-production development in the mine will establish access to old 100 and 350 levels of the mine. Ore blocks will be exploited as they are made accessible by the production decline, drifts and sublevels. Initially, all of the ore delineated on the 100 and 350 levels of the mine will be extracted during the first phase of the operation. After that, development and mining will continue into lower levels of the mine until all the delineated ore has been extracted. CHART 7.1 depicts the first phase of the mine out schedule as proposed for the project using the currently blocked out ore. If additional ore is encountered during the initial phase of mining, particularly to the southeast where the existing drifts end in ore grade material, the scheduling of the later phases of the operation will be adjusted.

7.4 PRODUCTION SUMMARY (MINE OUT PLAN)

7.4.1 General

APPENDIX G, Stope Production Summary (Mine Out Plan), outlines the stope by stope production and individual stope economics of the current proven/probable ore reserve of the Gold Road Mine. APPENDIX G is broken down into three phases and is based on the time and mining level exploited, and on the results in the mining of the ore reserve in approximately 47 months. TABLE 7.4 at the end of this section, summarizes the stope by stope economics as developed in APPENDIX G. This estimate does not include mining any of the possible ore, to the east of the current headings, that can be expected to be proven up during the first phase of production. This mining plan will be modified if that ore is developed, as is anticipated.

Phase 1 will include the first 17.2 months of the operation and will exploit all of the currently minable ore delineated above the 350 level of the mine (see plate 2). Phase 2 takes the mine through the 500 and 700 levels and requires 10.6 months. Phase 3 exploits portions of the designated 900 level of the mine and will require an additional 18.9 months to complete.

The project will require expenditures of $5,348,795 for underground capital costs and $5,275,302 mill and surface facilities. Total direct operating costs for mining the delineated reserves total $28,505,585. With a $375 /ounce price of gold and mining 583,662 tons of ore, the project should generate a pre-royalty and tax net margin of $39,510,415 or $217.84 per ounce of gold produced. (The Mine Out Plan calculates the total ore mined to be 583,662 tons. This is slightly more than the 579,470 tons delineated in the WSE reserve audit of Section 4 because the mine out plan extended some of the lower ore blocks to the 900 level and included this small additional tonnage.

TABLE 7.2 summarizes the phased operations planned for the Gold Road Project as outlined in APPENDIX F. The detailed operating and capital costs used for the compilation of APPENDIX F and TABLE 7.2 are derived from Sections 5 and 6 of this report. Average total net production costs for the project, excluding capital costs, calculate to $57.47, including royalties and property taxes. This compares quite favorably to the $57.34 as estimated from mine forecasting. The slight difference is due to the individual ore blocks each requiring specific incremental development and unit costs.

TABLE 7.2 also shows how the economics of the project are effected by plus or minus 25% fluctuations in the predicted operating costs, and plus or minus 15% fluctuations in the price of gold. Even if the operating costs are a full 25% higher, the total net margin is still over $37 million. Likewise, a drop in gold price of 15% only reduces the net margin to $33,764,183.

TABLE 7.2
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

OPERATING SUMMARY (BASE CASE)

Gold Price: $375	Phase 1 +350 Level	Phase 2 +700 Level	Phase 3 +900 Level	**TOTAL**
Mine Capital Cost	$3,333,295	$1,659,250	$356,250	$5,348,795
Mill Capital Cost	$5,130,300	$332,000		$5,462,300
Operating Cost	$10,666,541	$7,151,993	$10,687,051	$28,505,585
Tons Mined	215,244	132,790	235,628	583,662
Ounces Mined	83,810	37,277	60,289	181,376
Production Term [Months]	17.22	10.62	18.85	46.69
Net Margin	$20,762,209	$6,826,882	$11,921,324	$39,510,415
Net Margin/Ounce	$247.73	$183.14	$197.74	$217.84

DIRECT OPERATING COST/TON $48.69
FORECASTED OPERATING COST/TON $60.78
(Includes Royalty, Taxes, and Post-production Development Costs)

+25% Operating Cost (Net Margin)	$18,095,574	$5,038,884	$9,249,561	$32,384,019
-25% Operating Cost (Net Margin)	$23,428,844	$8,614,880	$14,593,087	$46,636,811
+15% Gold Price $431.25	$25,476,522	$8,923,713	$15,312,580	$49,712,815
-15% Gold Price $318.75	$16,047,897	$5,079,523	$8,530,068	$29,657,487

7.4.2 Reserve Block Analysis

In order to calculate the expected operating results as outlined in APPENDIX F for each ore block, a cost per shift of $2,205.00 (which reflected anticipated operating costs) was developed. This cost per shift incorporated the total operating costs, including mine, mill and administration, as presented earlier in this report, exclusive of taxes and royalties.

The cost per shift of $2,205.00 is based on :

Estimated Cost Per Ton Mine/Mill:	$57.34
Tons Per Day, Milled:	500
Stope (Reserve Block) Crew Size:	3
Production Crew Size:	39

This converts to the formula:

($57.34 * 500 tpd) / 39 employees * 3 employees/stope = $2,205.00
the total per shift cost.

This calculated amount per shift was then used to determine the cost to perform the tasks associated with mining a particular ore block. This was accomplished by determining the number of shifts required to perform the correct number of tasks and advance the particular amount of feet for each ore block, and multiplying that number of shifts times the cost of each shift ($1,838). For example, Block 54 requires 2 pillar cuts, 600 feet of drift access and 130 feet of mucker cutouts, for a total of 263 shifts to mine the block plus 91 shifts to provide access. Thus, 263 plus 91, times $2,205.00 gives $781,366 cost to mine the ore block.

The following production assumptions were used to determine the tasks and number of shifts required per ore block:

	Feet/Shift Required
Access Drift:	8
Undercuts:	8
Raises:	8
Pillars:	5
Pillar Height:	40 Feet
Drift Height:	8 Feet
Shifts/Day:	3
Cubic Feet/ Ton:	13
Mill Recovery:	95%
Cost Per Shift:	$2,205

These production assumptions are reported on each reserve block analysis sheet of APPENDIX F.

Each block has been analyzed according to the block's relative position to the point of access for the local primary under-haulage for each group of blocks and to the relationship of the block being analyzed to it's adjoining blocks, and it's individual characteristics, such as dimensions, available tonnage, and recoverable ounces of gold.

Gold recovery (95%) is based on current metallurgical work as summarized in Section 3 of this report. Values for recovered silver were not incorporated into this analysis.

7.4.3 Incremental Development

The Mine Out Plan is dependent on the ongoing development of the mine throughout the production period. This development was grouped so as to identify ore reserve blocks which can be readily accessed by the development phases. Each succeeding increment of production is dependent on the preceding development being operational throughout the total production life. Phases 1 and 2 of the development schedule include only proven and probable ore. Phase 3 of this base case schedule also includes approximately 99,720 tons of possible ore which were added to the lowermost ore blocks to facilitate mining to the proposed 900 level of the mine.

7.4.4 Phase 1

The first phase includes all of the pre-production development of the mine. This includes the basic equipment of the mine, driving a decline adit to access ore blocks above the 350 level, excavating internal accesses for the individual ore blocks, and installing mine services. Mill construction costs have been included as a separate capital item.

Approximately 215,244 tons containing 83,810 ounces of gold is scheduled to be developed and produced during Phase 1 requiring 17.2 months from the commencement of production.

7.4.5 Phase 2

The second phase includes continuing to drive the production decline to provide access to the ore blocks delineated between the 350 and 700 levels. Additional mine equipment is scheduled for this period of operation, reflecting the increase in haulage distances and a maturing of mine services.

Phase 2 should produce 132,790 tons of ore containing 37,277 ounces of gold over a 10.6 month period.

7.4.6 Phase 3

The third phase of mine development and production will exploit the ore reserve occurring above the 900 datum level of the mine. This portion of the reserve is planned to be developed via a

ramp originating from the production decline near the 700 datum level.

Phase 3 will produce an additional 60,289 ounces of gold in 18.93 months. Approximately 99,720 tons of inferred resources are included in Phase 3.

7.5 SENSITIVITY TO HIGH GRADE RESERVE BLOCKS

Five reserve blocks carry a grade of gold greater than 0.55 ounces per ton. To determine the Mine Out Plan's sensitivity to the possibility of these blocks not maintaining their high grade, an analysis was done cutting the grades of these five blocks to a maximum of 0.55 ounces per ton. TABLE 7.3 presents the net margin, the ounces mined, and net margin per ounce for the project if the high grade reserve blocks are cut back, and compares these figures to the originally calculated numbers; all other parameters remaining constant.

TABLE 7.3
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

MINE OUT PLAN SENSITIVITY TO HIGH GRADE STOPES

Price of Gold: $375	Phase 1 +350 Level	Phase 2 +700 Level	Phase 3 +900 Level	Total
As Originally Calculated				
Ounces Mined	83,810	37,277	60,287	181,374
Net Margin	$20,763,053	$8,018,122	$11,920,904	$40,702,079
Net Margin/Oz.	$247.74	$215.10	$197.74	$224.41
Calculated With Grade Cut To 0.55 OPT				
Ounces Mined	66,486	37,277	58,940	162,703
Net Margin	$14,266,428	$8,018,122	$11,415,174	$33,699,724
Net Margin/Oz.	$214.58	$215.10	$193.67	$207.12

TABLE 7.4

SUMMARY OF STOPE BY STOPE ECONOMICS
(MINE OUT PLAN)

Client:	Addwest Minerals	Project: Date:	Gold Road 04/30/93	Date of last change: Time of last change:	06/19/93 11.00		New		

STOPE PRODUCTION SUMMARY

PRICE AU: $375.00

FIRST PHASE

BLOCK I.D.:	AVAILABLE TONS:	AVAILABLE OUNCES:	COST PER TON:	COST PER OUNCE:	BLOCK P/L		$ MARGIN / OUNCE	AVERAGE TPD:	COST OF PRODUCTION
MD/54	15,210	11,169	51.37	69.96	3,407,183	3,407,009	305.04	151.89	781,366
MD/52	4,330	2,106	65.93	135.55	504,306	504,264	239.45	134.02	285,486
MD/51	6,440	1,536	59.02	247.52	195,760	195,903	127.48	144.00	380,097
MD/38	6,640	1,406	53.71	253.64	170,623	170,640	121.36	137.00	356,610
350/31	5,340	1,212	46.71	205.72	205,239	205,072	169.28	153.00	249,428
350/30	3,900	711	71.77	393.50	(13,158)	(13,293)	-18.5	139.00	279,918
350/26	10,980	1,648	43.36	288.87	141,950	141,914	86.13	149.00	476,086
350/25	28,470	5,301	41.38	222.21	809,969	809,926	152.79	148.00	1,177,949
350/21	7,254	1,447	59.65	298.99	109,994	109,929	76.01	135.00	432,696
350/14	17,230	4,780	41.57	149.84	1,076,154	1,076,303	225.16	150.00	716,197
350/04	16,390	18,747	42.57	37.22	6,332,354	6,332,398	337.78	165.00	697,727
350/03	21,690	9,746	42.39	94.33	2,735,533	2,735,382	280.67	164.00	919,368
100/01A	15,240	4,908	51.82	160.91	1,050,769	1,050,753	214.09	146.00	789,747
100/01B	15,240	4,908	51.82	160.91	1,050,769	1,050,753	214.09	146.00	789,747
100/02	19,430	7,937	42.66	104.44	2,147,486	2,147,428	270.56	164.00	828,947
100/11	3,820	1,110	70.55	242.69	146,930	146,753	132.31	133.00	269,497
100/12&13	5,490	1,125	60.96	297.38	87,351	87,209	77.62	145.00	334,666
100/20	2,410	1,889	146.21	186.55	355,949	356,010	188.45	114.00	352,365
100/19	8,350	1,848	56.69	256.09	219,773	219,670	118.91	145.00	473,330
100/24	11,200	1,670	57.99	388.80	(23,054)	(23,234)	-13.8	152.00	649,484
100/28	2,390	429	89.21	496.59	(52,202)	(52,330)	-121.59	119.00	213,205
100/29	5,290	987	57.15	359.84	14,961	14,893	15.16	127.00	355,232
100/36	2,390	310	78.39	605.22	(71,264)	(71,097)	-230.22	126.00	187,347
100/37	12,320	1,500	54.43	447.09	(108,132)	(108,101)	-72.09	133.00	670,601
TOTALS/AVG	215,244	83,810	49.56	127.27	20,763,053	20,762,209		145	10,666,541
W/(BLOCKS)	225,054	85,204	49.95	131.93	20,711,880	20,710,789			11,240,711

Client:	Addwest Minerals	Project: Date:	Gold Road 04/30/93	Date of last change: Time of last change:	06/19/93 19.1		New		

STOPE PRODUCTION SUMMARY
SECOND PHASE

PRICE AU: $375.00

BLOCK I.D.:	AVAILABLE TONS:	AVAILABLE OUNCES:	COST PER TON:	COST PER OUNCE:	BLOCK P/L		$ MARGIN / OUNCE	AVERAGE TPD:	COST OF PRODUCTION
500/32	2,900	568	154.68	658.73	(161,025)	(235,574)	-283.73	117.44	448,574
500/21	17,650	3,521	47.93	223.00	615,384	474,391	152	134.55	845,984
500/16	6,230	1,699	62.15	189.98	314,272	249,915	185.02	139.00	387,210
500/15	4,730	1,357	57.85	168.05	280,839	235,242	206.95	139.00	273,633
500/06	6,960	2,341	74.20	183.89	447,329	361,430	191.11	132.00	516,445
500/05	10,520	4,417	44.74	88.80	1,264,230	1,185,692	286.2	180.00	470,683
600/27	7,630	1,409	57.53	259.68	162,443	89,449	115.32	129.00	438,926
700/33	5,480	1,416	61.99	199.92	247,914	191,316	175.08	199.00	339,684
700/22	24,440	5,116	49.50	197.08	910,310	708,629	177.92	145.00	1,209,871
700/18	2,410	600	78.74	263.67	66,783	35,227	111.33	147.00	189,773
700/17	3,910	1,092	81.59	243.45	143,657	90,492	131.55	125.00	319,008
700/08	9,940	3,041	48.48	132.08	738,639	658,499	242.92	156.00	481,876
700/07	16,730	6,198	34.37	77.32	1,845,166	1,749,197	297.68	231.00	575,053
700/35	7,340	2,532	58.82	142.12	589,586	517,797	232.88	154.00	431,703
700/43	5,230	1,361	62.19	199.11	239,454	185,137	175.89	143.00	325,238
700/45	3,590	1,177	96.63	245.76	152,116	94,469	129.24	177.00	346,906
TOTALS/AVG	132,790	37,277	53.86	191.86	8,018,122	6,826,882		155	7,151,993
W/(BLOCKS)	135,690	37,845	56.01	200.83	7,857,097	6,591,308		153	7,600,567

Client:	Addwest Minerals	Project:	Gold Road	Date of last change:	06/19/93		New		
		Date:	04/30/93	Time of last change:	19.00				

STOPE PRODUCTION SUMMARY

PRICE AU: $375.00 Third Phase

BLOCK I.D.:	AVAILABLE TONS:	AVAILABLE OUNCES:	COST PER TON:	COST PER OUNCE:	BLOCK P/L		$ MARGIN / OUNCE	AVERAGE TPD:	COST OF PRODUCTION
900/44	2,860	1,060	63.21	170.61	216,575	216,714	204.39	143.59	180,786
900/34	49,000	9,962	42.67	209.90	1,644,717	1,644,829	165.1	154.22	2,090,921
900/23	11,090	1,717	56.60	365.49	16,331	16,224	9.51	161.00	627,651
900/10	9,000	1,317	63.12	431.46	(74,343)	(74,231)	-56.46	151.00	568,106
900/09	8,680	1,460	55.32	328.98	67,162	67,334	46.02	145.00	480,166
900/46	5,720	994	53.87	309.88	64,762	64,603	65.12	144.00	308,147
900/47	29,480	12,071	34.82	85.05	3,499,920	3,500,076	289.95	196.00	1,026,549
900/48	13,740	3,381	41.69	169.43	694,980	695,083	205.57	173.00	572,792
900/49	16,800	2,474	42.40	287.93	215,392	215,467	87.07	173.00	712,283
900/53	9,620	1,106	44.30	385.36	(11,452)	(11,385)	-10.36	163.00	426,135
900/55	5,860	1,453	58.14	234.47	204,194	204,199	140.53	147.00	340,676
900/56/57	4,020	1,692	59.17	140.54	396,802	396,650	234.46	149.00	237,850
900/58/59	9,640	6,308	57.27	87.53	1,813,198	1,813,383	287.47	152.00	552,117
900/60/61	6,000	1,272	51.36	242.19	168,979	168,853	132.81	149.00	308,147
900/62/63	16,414	4,403	46.52	173.42	887,570	887,567	201.58	158.00	763,558
900/64/65	9,144	2,347	49.44	192.61	428,072	428,077	182.39	148.00	452,048
900/66	44,960	8,457	40.86	217.22	1,334,340	1,334,349	157.78	160.00	1,837,026
900/68	6,680	1,142	85.98	502.80	(145,981)	(146,086)	-127.8	126.00	574,336
900/69	2,220	1,238	88.44	158.59	267,910	267,916	216.41	185.00	196,334
TOTALS/AVG	235,628	60,289	45.36	177.26	11,920,904	11,921,324		159	10,687,051
W/(BLOCKS)	260,928	63,854	46.97	191.93	11,689,128	11,689,622		157	12,255,628

Section 8

ECONOMIC ANALYSIS

8.1 GENERAL

The economic evaluation of the Gold Road Project was derived from the proven and probable reserve base of 579,470 tons (no cutoff grade) plus some additional inferred resources added to the mine plan in the lowermost level of the mine. This gives an initial mine life of 3.75 years. The evaluation was done on a pre-income tax basis. Sensitivity analyses were run to evaluate the project's downside risk, as well as upside potential, due to fluctuations in operating costs, the price of gold and the ultimate reserves.

8.2 PRO FORMA CASH FLOW

A pro forma cash flow economic model (TABLE 8.1) was developed to calculate and forecast the pre-income tax net cash flow for each quarter of the Gold Road Project using the information, operational parameters, capital cost estimates and projected operational costs defined within previous sections of this report. The pro forma is organized into five sections as follows:

a] Operating Parameters;

b] Income

c] Expenses

d] Capital Investment

e] Financial Summary

The Expenses portion of the pro forma is broken down into Administrative Cost, Mine Cost, Mill Cost, and Royalties and Taxes sections. TABLE 8.2 summarizes the operating expenses calculated for the Gold Road Project. Projected operating costs are based on actual labor, consumable, indirect, and service costs based on the mining schedule developed in Section 7 of this report.

Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona
GOLD ROAD PROJECT - PRO FORMA

ADDWEST MINERALS
GOLD ROAD PROJECT – MOHAVE COUNTY, ARIZONA

	UNITS	BASE PRODUCTION MONTH	PREPRODUCTION MONTH 1	MONTH 2	MONTH 3	MONTH 4	MONTH 5	MONTH 6	PRODUCTION MONTH 1	MONTH 2	MONTH 3	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 5	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9	QUARTER 10	QUARTER 11	QUARTER 12	QUARTER 13	QUARTER 14	QUARTER 15	QUARTER 16	TOTAL
OPERATING DAYS/MONTH MINE			22	0	0	0	0	0	0	22	22	22	65	65	65	65	65	65	65	65	65	65	65	65	65	65	37	
OPERATING DAYS/MONTH MILL			25	0	0	0	0	0	0	25	25	25	75	75	75	75	75	75	75	75	75	75	75	75	75	75	42	
OPERATING PARAMETERS																											
TONS ORE MINED/ DAY	5791/d	12,500	0	0	0	0	0	0	12,500	12,500	12,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	21,412	583,908
TONS MILLED/DAY	500 t/d	12,500	0	0	0	0	0	0	12,500	12,500	12,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	21,000	583,500
MINING RECOVERY	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%	
GOLD MILLING RECOVERY	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	
SILVER MILLING RECOVERY	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	50.00%	
ELECTRICITY PRICE/KWH	$0.049 /kwh	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	$0.049	0.340
GRADE GOLD MINED	OZ./TON	0.355	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.380	0.293	0.293	0.300	0.277	0.277	0.277	0.277	0.277	0.277	
GRADE SILVER MINED	OZ./TON	0.355	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.410	0.380	0.293	0.293	0.300	0.277	0.277	0.277	0.277	0.277	0.277	
REVENUE																											
GOLD PRODUCED/ MONTH			4,349	0	0	0	0	0	0	5,023	5,023	5,023	15,068	15,068	15,068	15,068	13,965	10,768	10,768	11,025	10,180	10,180	10,180	10,180	10,180	5,701	188,642
SILVER PRODUCED/ MONTH			2,219	0	0	0	0	0	0	2,563	2,563	2,563	7,688	7,688	7,688	7,688	7,125	5,494	5,494	5,625	5,194	5,194	5,194	5,194	5,194	2,909	96,245
GOLD PRICE	$375/OUNCE	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	$375	
SILVER PRICE	$4.50/OUNCE	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	$4.50	
GOLD INCOME / MONTH			1,630,781	0	0	0	0	0	0	1,883,438	1,883,438	1,883,438	5,650,313	5,650,313	5,650,313	5,650,313	5,236,875	4,037,906	4,037,906	4,134,375	3,817,406	3,817,406	3,817,406	3,817,406	3,817,406	2,137,748	70,740,810
SILVER INCOME / MONTH			9,984	0	0	0	0	0	0	11,531	11,531	11,531	34,594	34,594	34,594	34,594	32,063	24,722	24,722	25,313	23,372	23,372	23,372	23,372	23,372	13,068	433,107
TOTAL INCOME			1,640,766	0	0	0	0	0	0	1,894,969	1,894,969	1,894,969	5,684,906	5,684,906	5,684,906	5,684,906	5,268,938	4,062,628	4,062,628	4,159,688	3,840,778	3,840,778	3,840,778	3,840,778	3,840,778	2,150,836	71,173,917
EXPENSES																											
ADMINISTRATIVE COST																											
LABOR TOTAL	$608.28 /DAY	13,139	0	0	0	0	0	0	13,139	13,139	13,139	39,417	39,417	39,417	39,417	39,417	39,417	39,417	39,417	39,417	39,417	39,417	39,417	39,417	39,417	22,505	
EQUIPMENT MAINTENANCE	$50.00 /DAY	1,080	0	0	0	0	0	0	1,080	1,080	1,080	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	3,240	1,850	
SUPPLIES	$200.00 /DAY	4,320	0	0	0	0	0	0	4,320	4,320	4,320	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	12,960	7,400	
RECLAMATION	$0.50/TON	6,250	0	0	0	0	0	0	6,250	6,250	6,250	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	10,705	
SERVICES	$310.19 /DAY	6,700	0	0	0	0	0	0	6,700	6,700	6,700	20,100	20,100	20,100	20,100	20,100	20,100	20,100	20,100	20,100	20,100	20,100	20,100	20,100	20,100	11,477	
INDIRECTS	$334.07 /DAY	7,216	0	0	0	0	0	0	7,216	7,216	7,216	21,648	21,648	21,648	21,648	21,648	21,648	21,648	21,648	21,648	21,648	21,648	21,648	21,648	21,648	12,361	
TOTAL ADMINISTRATIVE COST		$38,705	$0	$0	$0	$0	$0	$0	$38,705	$38,705	$38,705	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$116,114	$66,300	
COST /OUNCE GOLD PRODUCED		$8.90							$7.71	$7.71	$7.71	$7.71	$7.71	$7.71	$7.71	$8.31	$10.78	$10.78	$10.53	$11.41	$11.41	$11.41	$11.41	$11.41	$11.41	$11.63	
COST /TON MILLED		$3.10							$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.10	$3.16	
MINE COST																											
MINE LABOR	$12,188.89 /DAY	263,280	0	0	0	0	0	0	263,280	263,280	263,280	789,840	789,840	789,840	789,840	789,840	789,840	789,840	789,840	789,840	789,840	789,840	789,840	789,840	789,840	450,969	
MAINTENANCE LABOR	$698.70 /DAY	15,092	0	0	0	0	0	0	15,092	15,092	15,092	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	25,852	
EQUIPMENT MAINTAINANCE	$939.50 /DAY	20,293	0	0	0	0	0	0	20,293	20,293	20,293	60,880	60,880	60,880	60,880	60,880	60,880	60,880	60,880	60,880	60,880	60,880	60,880	60,880	60,880	34,762	
MATERIALS	$4,300.25 /DAY	92,885	0	0	0	0	0	0	92,885	92,885	92,885	278,656	278,656	278,656	278,656	278,656	278,656	278,656	278,656	278,656	278,656	278,656	278,656	278,656	278,656	159,109	
SUPPLIES	$1,267.00 /DAY	27,367	0	0	0	0	0	0	27,367	27,367	27,367	82,102	82,102	82,102	82,102	82,102	82,102	82,102	82,102	82,102	82,102	82,102	82,102	82,102	82,102	46,879	
MINED EVELOPMENT			0	0	0	0	0	0	0	0	0	0	201,550	201,550	201,550	201,550	201,550	201,550	201,550	201,550	201,550	0	0	0	0	0	
TOTAL MINE COST		418,918	0	0	0	0	0	0	418,918	418,918	418,918	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,458,303	1,256,753	717,591
COST /OUNCE GOLD PRODUCED		$96.33							$83.41	$83.41	$83.41	$96.78	$96.78	$96.78	$96.78	$104.43	$135.43	$135.43	$132.27	$143.26	$123.46	$123.46	$123.46	$123.46	$123.46	$125.88	
COST /TON MINED		$33.51							$33.51	$33.51	$33.51	$38.89	$38.89	$38.89	$38.89	$38.89	$38.89	$38.89	$38.89	$38.89	$33.51	$33.51	$33.51	$33.51	$33.51	$34.17	
MILL COST																											
LABOR	$2,337.48 /DAY	50,490	0	0	0	0	0	0	50,490	50,490	50,490	151,469	151,469	151,469	151,469	151,469	151,469	151,469	151,469	151,469	151,469	151,469	151,469	151,469	151,469	86,467	
MAINTENANCE LABOR	$698.70 /DAY	15,092	0	0	0	0	0	0	15,092	15,092	15,092	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	45,276	25,852	
EQUIPMENT MAINTAINANCE	$939.50 /DAY	15,500	0	0	0	0	0	0	15,500	15,500	15,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	46,500	26,040	
SUPPLIES	$1,477.16 /DAY	36,929	0	0	0	0	0	0	36,929	36,929	36,929	110,787	110,787	110,787	110,787	110,787	110,787	110,787	110,787	110,787	110,787	110,787	110,787	110,787	110,787	62,041	
UTILITIES	$1,080.00 /DAY	27,000	0	0	0	0	0	0	27,000	27,000	27,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	81,000	45,360	
FUEL	$250.00 /DAY	6,250	0	0	0	0	0	0	6,250	6,250	6,250	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	18,750	10,500	
TOTAL MILL COST		151,260	0	0	0	0	0	0	151,260	151,260	151,260	453,781	453,781	453,781	453,781	453,781	453,781	453,781	453,781	453,781	453,781	453,781	453,781	453,781	453,781	256,279	
COST /OUNCE GOLD PRODUCED		$34.78							$30.12	$30.12	$30.12	$30.12	$30.12	$30.12	$30.12	$32.49	$42.14	$42.14	$41.16	$44.58	$44.58	$44.58	$44.58	$44.58	$44.58	$44.96	
COST /TON MILLED		$12.10							$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.10	$12.20	
ROYALTIES AND TAXES																											
PROPERTY TAX	$10,000,000 NPV	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	75,279	
ROYALTY	3.50%	57,427	0	0	0	0	0	0	66,324	66,324	66,324	198,972	198,972	198,972	198,972	184,413	142,192	142,192	145,589	134,427	134,427	134,427	134,427	134,427	134,427	26,885	
SEVERANCE TAX	2.50%	20,510	0	0	0	0	0	0	23,687	23,687	23,687	71,061	71,061	71,061	71,061	65,862	50,783	50,783	51,996	48,010	48,010	48,010	48,010	48,010	48,010		
TOTAL TAXES		$107,936	$30,000	$30,000	$30,000	$30,000	$30,000	$30,000	$120,011	$120,011	$120,011	$360,033	$360,033	$360,033	$360,033	$340,275	$282,975	$282,975	$287,585	$272,437	$272,437	$272,437	$272,437	$272,437	$272,437	$192,165	
COST /OUNCE GOLD PRODUCED		$24.62							$23.69	$23.69	$23.69	$23.69	$23.69	$23.69	$23.69	$24.37	$27.07	$27.55	$26.28	$26.76	$26.76	$26.76	$26.76	$26.76	$26.76	$33.71	
COST /TON MILLED		$8.63							$9.60	$9.60	$9.60	$9.60	$9.60	$9.60	$9.60	$9.60	$7.55	$7.55	$7.67	$7.26	$7.26	$7.26	$7.26	$7.26	$7.26	$9.15	
CAPITAL INVESTMENT		TOTAL																									
1.0 PROPERTY PAYMENTS		1,187,500	0	0	0	0	90,000	0	0	0	0	200,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	290,000	
2.0 MINE PREPRODUCTION COST		3,333,295	538,881	538,883	538,883	538,883	538,883	538,883	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,333,296
3.0 MILL PREPRODUCTION COST		4,280,000	0	0	1,032,500	1,032,500	1,032,500	1,182,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(500,000)	3,780,000
4.0 TAILINGS PREPRODUCTION COST		785,302	0	0	0	0	0	785,302	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,117,302	
5.0 POWERLINE AND SUBSTATION		35,000	35,000	0	0	0	0	0	0	0	0	0	0	0	0	332,000	0	0	0	0	0	0	0	0	0	0	35,000
6.0 PERMITTING		30,000	5,000	5,000	5,000	5,000	5,000	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30,000
7.0 WORKING CAPITAL		1,000,000	0	0	0	0	0	1,000,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(1,000,000)	0
********TOTAL INSTALLATION COST		10,651,097	578,881	543,883	1,576,383	1,576,383	1,666,383	3,611,685	0	0	0	200,000	0	0	0	332,000	0	0	0	0	0	0	0	0	0	(1,500,000)	8,585,598
CASH FLOW																											
INCOME		1,640,766	0	0	0	0	0	0	1,894,969	1,894,969	1,894,969	5,684,906	5,684,906	5,684,906	5,684,906	5,268,938	4,062,628	4,062,628	4,159,688	3,840,778	3,840,778	3,840,778	3,840,778	3,840,778	3,840,778	2,150,836	71,173,917
EXPENSES		(716,811)	(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(728,894)	(728,894)	(728,894)	(2,388,232)	(2,388,232)	(2,388,232)	(2,388,232)	(2,368,474)	(2,311,174)	(2,311,174)	(2,315,784)	(2,300,636)	(2,300,636)	(2,099,086)	(2,099,086)	(2,099,086)	(2,099,086)	(1,232,335)	(35,456,168)
CAPITAL EXPENDITURE		0	(578,881)	(543,883)	(1,576,383)	(1,576,383)	(1,666,383)	(3,611,685)	0	0	0	0	0	0	0	(332,000)	0	0	0	0	0	0	0	0	0	1,500,000	(10,085,598)
CASH FLOW		923,946	(608,881)	(573,883)	(1,606,383)	(1,606,383)	(1,696,383)	(3,641,685)	1,166,075	1,166,075	1,166,075	3,296,674	3,296,674	3,296,674	3,296,674	2,568,464	1,751,454	1,751,454	1,843,903	1,540,142	1,540,142	1,741,692	1,741,692	1,741,692	1,741,692	2,418,501	27,132,151
CUM. CASH FLOW			(608,881)	(1,182,764)	(2,789,147)	(4,395,530)	(6,091,913)	(9,733,598)	(8,567,523)	(7,401,449)	(6,235,374)	(3,138,700)	157,974	3,454,648	6,751,322	9,319,786	11,071,240	12,822,694	14,666,597	16,206,739	17,746,881	19,488,573	21,230,265	22,971,957	24,713,649	27,132,151	
OPERATING COST / OUNCE									($145.13)	($145.13)	($145.13)	($158.50)	($158.50)	($158.50)	($158.50)	($169.60)	($214.64)	($214.64)	($210.05)	($226.00)	($226.00)	($206.20)	($206.20)	($206.20)	($206.20)	($216.17)	($187.95)	
CAPITAL COST/ OUNCE									($51.66)	($51.66)	($51.66)	($64.87)	($51.66)	($51.66)	($51.66)	($75.37)	($51.66)	($51.66)	($51.66)	($51.66)	($51.66)	($51.66)	($51.66)	($51.66)	($51.66)	$211.53	($53.46)
TOTAL COST/ OUNCE									($196.72)	($196.72)	($196.72)	($223.37)	($210.16)	($210.16)	($210.16)	($244.97)	($266.24)	($266.24)	($261.65)	($277.60)	($277.60)	($257.80)	($257.80)	($257.80)	($257.80)	($4.64)	($241.42)
OPERATING COST / TON									($58.31)	($58.31)	($63.66)	($63.66)	($63.66)	($63.66)	($63.66)	($63.16)	($61.63)	($61.63)	($61.75)	($61.35)	($61.35)	($55.98)	($55.98)	($55.98)	($55.98)	($58.68)	($60.76)	
CAPITAL COST/ TON									($16.68)	($16.68)	($22.01)	($16.68)	($16.68)	($16.68)	($16.68)	($25.53)	($16.68)	($16.68)	($16.68)	($16.68)	($16.68)	($16.68)	($16.68)	($16.68)	($16.68)	$54.75	($17.28)
TOTAL COST/ TON									($74.99)	($74.99)	($85.70)	($80.37)	($80.37)	($80.37)	($80.37)	($88.69)	($78.31)	($78.31)	($78.44)	($78.03)	($78.03)	($72.66)	($72.66)	($72.66)	($72.66)	($3.94)	($78.05)

	PREPRODUCTION QUARTER 1	PREPRODUCTION QUARTER 2	PRODUCTION QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 5	QUARTER 6	QUARTER 7	QUARTER 8	QUARTER 9	QUARTER 10	QUARTER 11	QUARTER 12	QUARTER 13	QUARTER 14	QUARTER 15	QUARTER 16
QUARTERLY CASH FLOW	(2,789,147)	(6,944,451)	3,498,224	3,096,674	3,296,674	3,296,674	3,296,674	2,568,464	1,751,454	1,751,454	1,843,903	1,540,142	1,540,142	1,741,692	1,741,692	1,741,692	1,741,692	2,418,501
QUARTERLY CASH FLOW	(2,789,147)	(9,733,598)	(6,235,374)	(3,138,700)	157,974	3,454,648	6,751,322	9,319,786	11,071,240	12,822,694	14,666,597	16,206,739	17,746,881	19,488,573	21,230,265	22,971,957	24,713,649	27,132,151
CUMULATIVE CASH FLOW																		
NET PRESENT VALUE @10%	20,605,623																	
IRR	108.82%																	

TABLE 8.2
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

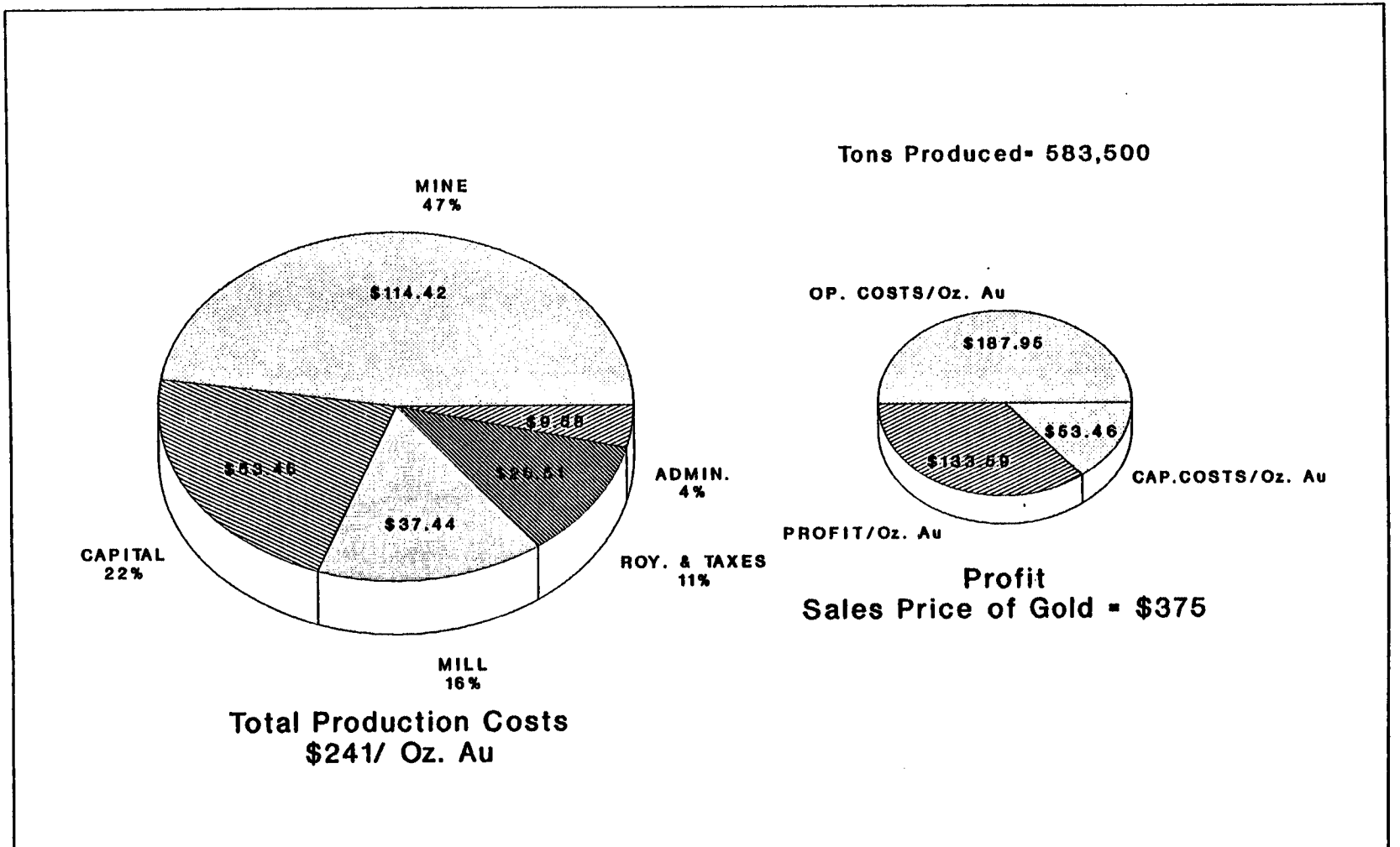
TOTAL OPERATING EXPENSES ESTIMATE-BASE PRODUCTION MONTH

EXPENSE	COST/OUNCE GOLD PRODUCED	COST/TON	TOTAL MONTHLY COST
Administrative Cost	$8.90	$3.10	$38,705
Mine Cost	$96.33	$33.51	$418,918
Mill Cost	$34.78	$12.10	$151,260
Royalties and Taxes	$24.82	$8.63	$107,936
TOTAL	$164.83	$57.34	$716,819

The total cost per ounce of gold produced at the Gold Road Project, including all capital costs, is expected to $241.42. FIGURE 8.1 illustrates how the expenses relate to each other and shows the profit per ounce of gold produced.

Pre-production capital expenditures were made over the first six months (two quarters) of operations and includes pre-production mine development, property payments, and permitting costs. The remaining, or "Deferred Capital", is expended as needed for underground and tailings facilities after production begins, and is paid for out of cash flow. TABLE 8.3 presents a summary of the capital costs required for the Gold Road Project to produce the initial ore reserve of the project. During the pre-production period, $8,553,597 will be spent for mine development, plant construction, start-up costs and property payments. An additional $1,000,000 has been budgeted for operating capital for a total of $9,553,597 needed to get the property into production.

GOLD ROAD PROJECT
PRODUCTION COSTS AND PROFIT



ADDWEST MINERALS INC.

FIGURE 8.1

TABLE 8.3
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

ESTIMATED TOTAL CAPITAL INVESTMENT

CAPITAL INVESTMENT	PRE-PRODUCTION	DEFERRED	TOTAL
Property Payments	$90,000(A.R.) ($107,500 paid) $100,000	$200,000	$1,187,500 ($887,500 Adv. Roy.)
Mine Development	$3,333,295	$2,015,500	$5,348,795
Mill	$4,280,000		$4,280,000
Tailings Facility	$785,302	$332,000	$1,117,302
Powerline & Substation	$35,000		$35,000
Permitting	$30,000		$30,000
Working Capital	$1,000,000		
TOTALS	$8,553,597	$2,547,500	$11,111,097

8.3 PRE INCOME-TAX ECONOMIC MODEL AND CRITERIA

The net quarterly cash flow was used to calculate measures of profitability, including payback period and internal rate of return (IRR). The net present value (NPV) was also calculated using a discount rate of 10%.

The payback period, expressed in quarters, is the amount of time that is required to pay back the initial capital investment. The IRR, expressed in percent, is that rate which causes the net present value of a project to equal zero. The higher the IRR, the more profitable the project.

Income is based on the sales of gold and silver. Prices of $375/ ounce of gold and $4.50/ounce of silver were used. Although gold is the only metal for which reserves have been estimated, credit has been given for silver using the historical gold:silver ratio of 1:1 and 50% recovery of silver.

Cash Flow equals revenue less Operating Expenses, Capital Expenditures, and Royalties and Taxes (taxes here are property and severance taxes).

8.4 BASE CASE ECONOMIC ANALYSIS

Based on the initial and deferred capital expenditures and the actual site operating costs, the

results of the pre-income-tax base case economic analysis is outlined in TABLE 8.4.

TABLE 8.4
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

BASE CASE ECONOMIC ANALYSIS

Payback	4 Quarters (12 Months)
Cumulative Cash Flow	$27,132,151
IRR	108.82%
Net Present Value @10%	$20,605,623
Cost Per Ounce	$241 (Including Capital)

Payback is expected in less than one year after production begins, and the total cumulative cash flow for the proven/probable reserve should be $27,7132,151. FIGURE 8.2 illustrates the project's cumulative cash flow by quarters.

8.5 SENSITIVITY ANALYSES

Given the current operating parameters, sensitivity analyses were conducted to determine the effects of increases in the reserves and changes in the price of gold and operating costs on the economics of the Gold Road Project.

FIGURE 8.3 illustrates the change in the net present value (NPV) of the Gold Road Project at various reserve tonnages and at different gold prices. A total inferred resource of 2.6 million tons was determined by WSE to exist on the property (see Section 4 of this report).

FIGURE 8.4 shows how the NPV of the Gold Road Project is effected by changes of plus or minus $25 in the price of gold and in the operating costs. TABLE 8.5 summarizes the effects of these possible changes on the gold price and operating costs on the payback, cumulative cash flow and IRR of the project.

GOLD ROAD PROJECT
Cumulative Cash Flow

ADDWEST MINERALS INC.

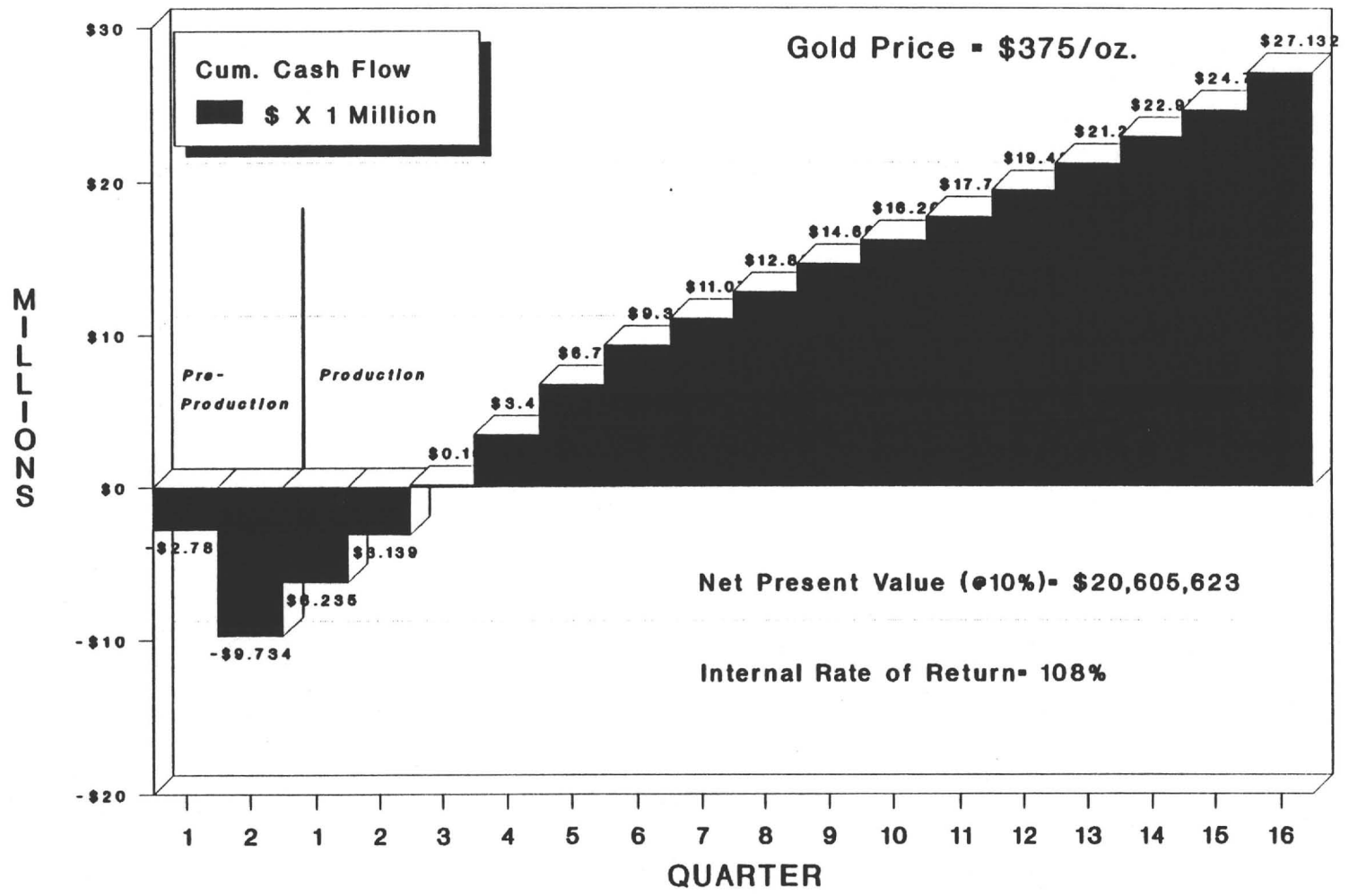
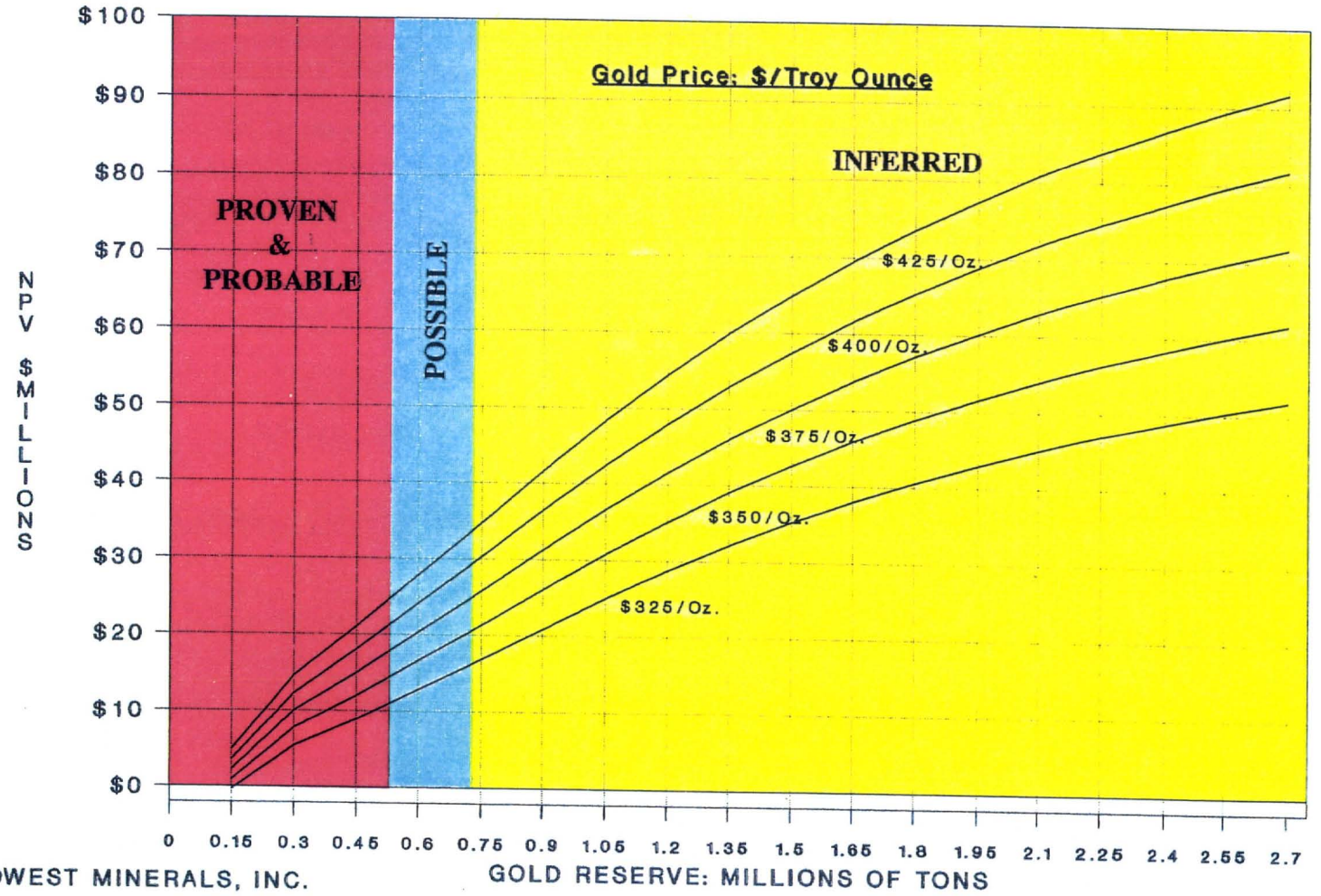


FIGURE 8.2

SENSITIVITY OF NET PRESENT VALUE TO THE PRICE OF GOLD AND TONS OF RESERVES

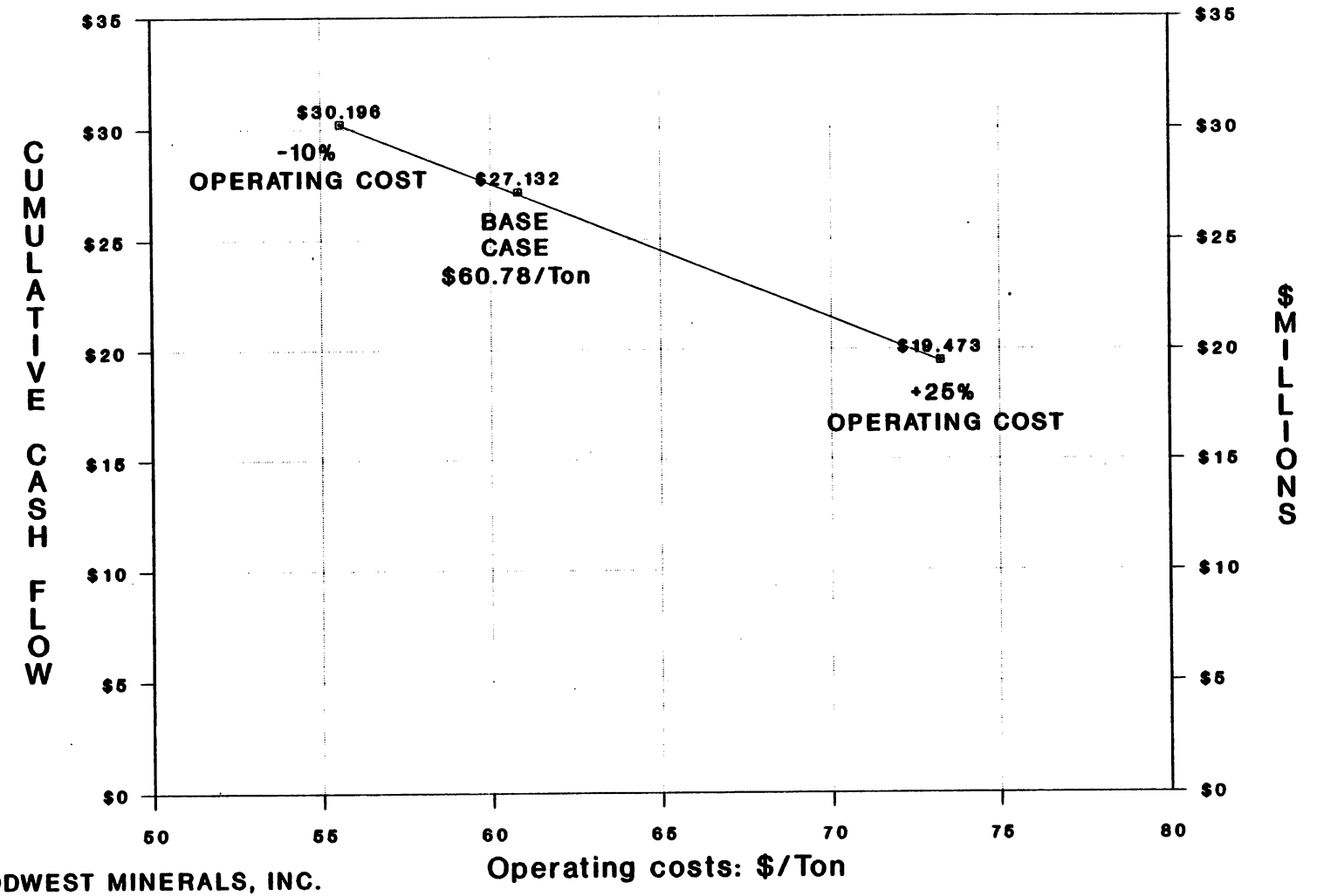


ADDWEST MINERALS, INC.

Gold Road Mine Project

FIGURE 8.3

SENSITIVITY OF CUMULATIVE CASH FLOW TO CHANGES IN THE OPERATING COSTS



ADDWEST MINERALS, INC.

GOLD ROAD MINE PROJECT

FIGURE 8.4

TABLE 8.5
Addwest Minerals, Inc.
Gold Road Project - Mohave County, Arizona

SUMMARY OF ECONOMIC ANALYSES

SENSITIVITY ANALYSIS	PAYBACK (MONTHS)	CUMULATIVE CASH FLOW	NPV	IRR [%]
Base Case	10	$27,132,151	$20,605,623	108%
+15% Gold Price ($431)	8	$34,909,000	$28,802,309	140%
-15% Gold Price ($319)	12	$15,871,274	$11,352,654	73%
+25% Operating Cost	12	$19,473,299	$14,454,325	85%
-10% Operating Cost	9	$30,195,691	$23,066,142	117%

8.6 DISCUSSION OF RESULTS OF ANALYSES

FIGURES 8.1 through 8.4 and TABLES 8.1 through 8.5 indicate that the Gold Road Project is economically viable with an estimated cumulative cash flow of $27,132,151 through the exploitation of approximately 583,500 tons of reserves.

8.7 EXTENDED ECONOMIC ANALYSIS

Since there is excellent potential that additional reserves will be delineated from the one to two million tons of inferred and possible resources, it was deemed appropriate to conduct an economic analysis of the property using an ultimate mined out total of 1,500,000 tons. This adds just under 1,000,000 tons (approximately 1/2 of the inferred resources) of 0.355 OPT/Au material from the inferred category as outlined in Section 4.

Ultimate production of 1,500,000 tons, at the planned production rates, results in a total mine life of 10 years with a cumulative cash flow of +$88,168,119. At a 10% discount rate, the Net Present Value of mining 1,500,000 tons at Gold Road would be $50,070,649.

TABLE 8.6 outlines the economic analysis of the Gold Road Project if 1,500,000 tons is ultimately produced. FIGURE 8.5 illustrates how the cash flow could accumulate for the project once the reserve base is expanded.

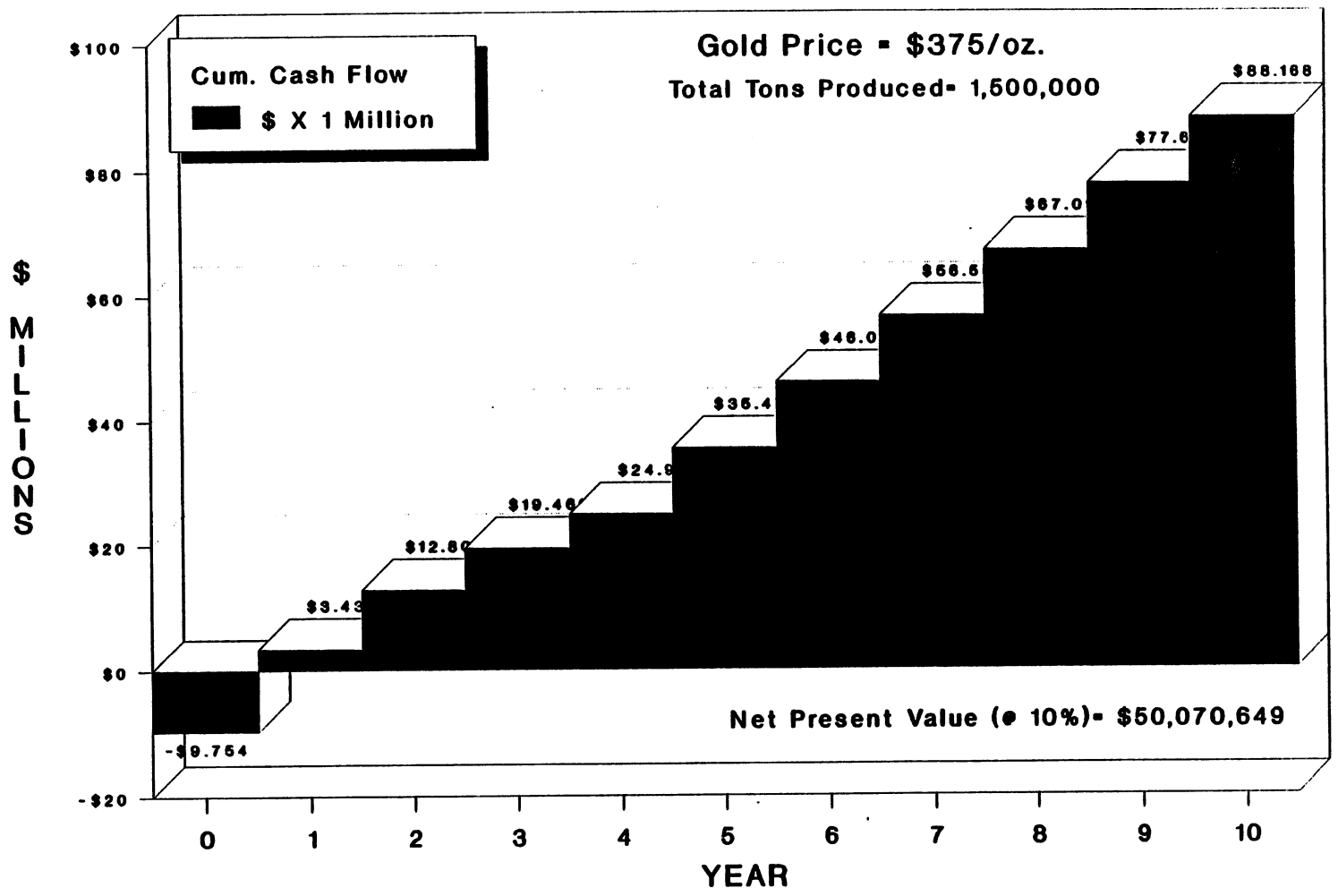
TABLE 8.6
Addwest minerals, Inc.
Gold Road Project - Mohave County, Arizona

EXTENDED ECONOMIC ANALYSIS

CASH FLOW BY YEAR

GOLD PRICE	$375 PRE PRODUCTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	TOTAL
ANNUAL CASH FLOW	(9,753,597)	13,188,246	9,368,046	6,685,879	5,471,686	10,537,976	10,537,976	10,537,976	10,537,976	10,537,976	10,537,976	88,168,119
CUM. CASH FLOW	(9,753,597)	3,434,649	12,802,695	19,488,574	24,940,260	35,478,237	46,016,213	56,554,189	67,092,166	77,630,142	88,168,119	
RESERVE MINED	0	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000
CUM. RESERVE MINED		150,000	300,000	450,000	600,000	750,000	900,000	1,050,000	1,200,000	1,350,000	1,500,000	
NPV @ 10%		2,235,718	6,977,905	14,986,078	18,723,313	25,266,567	31,214,980	36,622,629	41,539,672	46,007,803	50,070,649	

GOLD ROAD PROJECT
Cumulative Cash Flow-Extended Basis



ADDWEST MINERALS INC.

FIGURE 8.5

Watts, Griffis and McOuat

Consulting Geologists

October 31, 1995

M. Elzear Belzile
c/o M. Jean Depatie
Cambior Exploration
800 Rene Levesque Ouest, Suite 850
Montreal, Quebec, Canada
H3B 1X9

Dear Elzear:

It was my great pleasure to meet and travel with you on the inspection trip to the Gold Road mine last week. For your use, I enclose copies of the following:

- A print out of the spreadsheet constructed from the monthly stope record book. I recorded the "adjusted" extraction from each stope, the tons represented by assays of the mine cars, the assays and sampled widths from the stopes and the number of channels assayed. From that I calculated the ounces of gold expected from the extracted tons using the car sample assays and the stope sample assays and the percentage variation from the ounces expected by using the stope sample assays. The net difference was -12.6% although the individual stopes varied from -55% to +75%.

- A plot of the assays at five foot interval along the westernmost end of the 800 level.

- A plot of the assays at five foot intervals along the westernmost end of the 700 level.

As we agreed, the property has exploration potential. Reserves remaining above the 350 level are in the range of 45,000 to 55,000 ounces of gold. Another 20,000 to 25,000 may be projected from the old workings below the 350 level and some may be possible below the 700 level. I estimated that drilling along sections to test from 100 feet above the 100 level to the 700 level by intersecting the structure two times between the 700 and 500 levels, the 500 and 350 levels, the 350 and 100 levels with two intersections above the 100 level and one at the 700 level would amount to about 2400 feet of drilling. Of this, 1225 would be above the 350 level and 1175 feet below the 350 level. At $40 per foot, this represents $96,000. To test the structure 100 feet east or west of the section without moving the drill would require another 2650 feet each way. The total to test from the 350 level to 100 feet above the 100 level for 200 feet of strike would be 3895 feet which, at $40 per foot would be $155,800. Estimating that 50% to 60% of the structure would average 7 feet thickness of 0.20 oz. Au/t, the tested block would contain 4300 to 5200 ounces of gold at an exploration cost of $30 to $36 per ounce. Development costs would be minimal. Exploration costs below the 350 level would be slightly lower but to those costs would have to be added the cost of dewatering and vertical development. Clearly, the area of

WATTS, GRIFFIS AND MCOUAT LIMITED

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immediate testing first above the 350 level on section then below the 350 level on section, then 100 feet to the east, 100 feet to the west and then below the 350 level to the east and west.

With underground discovery costs expected to be in the $30 to $40 range, little premium, if any, may be given to the 45,000 to 55,000 ounces available to the existing development. If the existing reserves can continue to be produced at the $56/t cost reported for September by Doug Christopherson, the reserves have only a simplistic $20 per ounce value which is $900,000 to $1,100,000. There is some additional value to the mine and mill equipment but this value is not determined at this time. Certainly it will be considerably less than the book asset value provided to you. If the mining and administrative costs could be reduced, the existing reserves could have greater values. As an example, the August administrative and milling costs could be reduced by 20% by increasing the average mill throughput from 400 tpd to 500 tpd.

Sound management can produce profits at Gold Road. Determining the value for a cash buyout will require Cambior's careful projection of operating and exploration costs.

I appreciated your experienced observations and remain at your service.

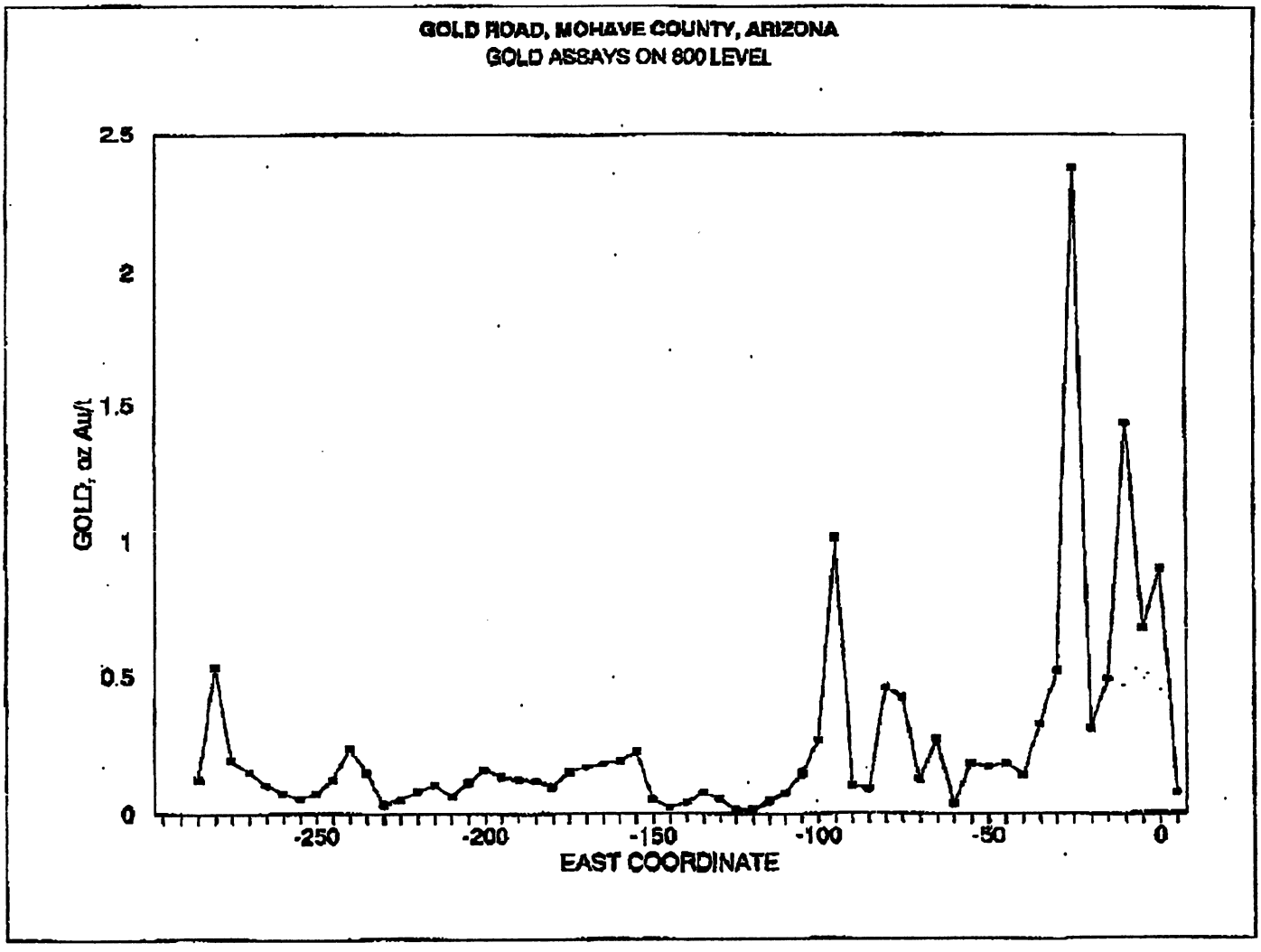
Very truly yours,

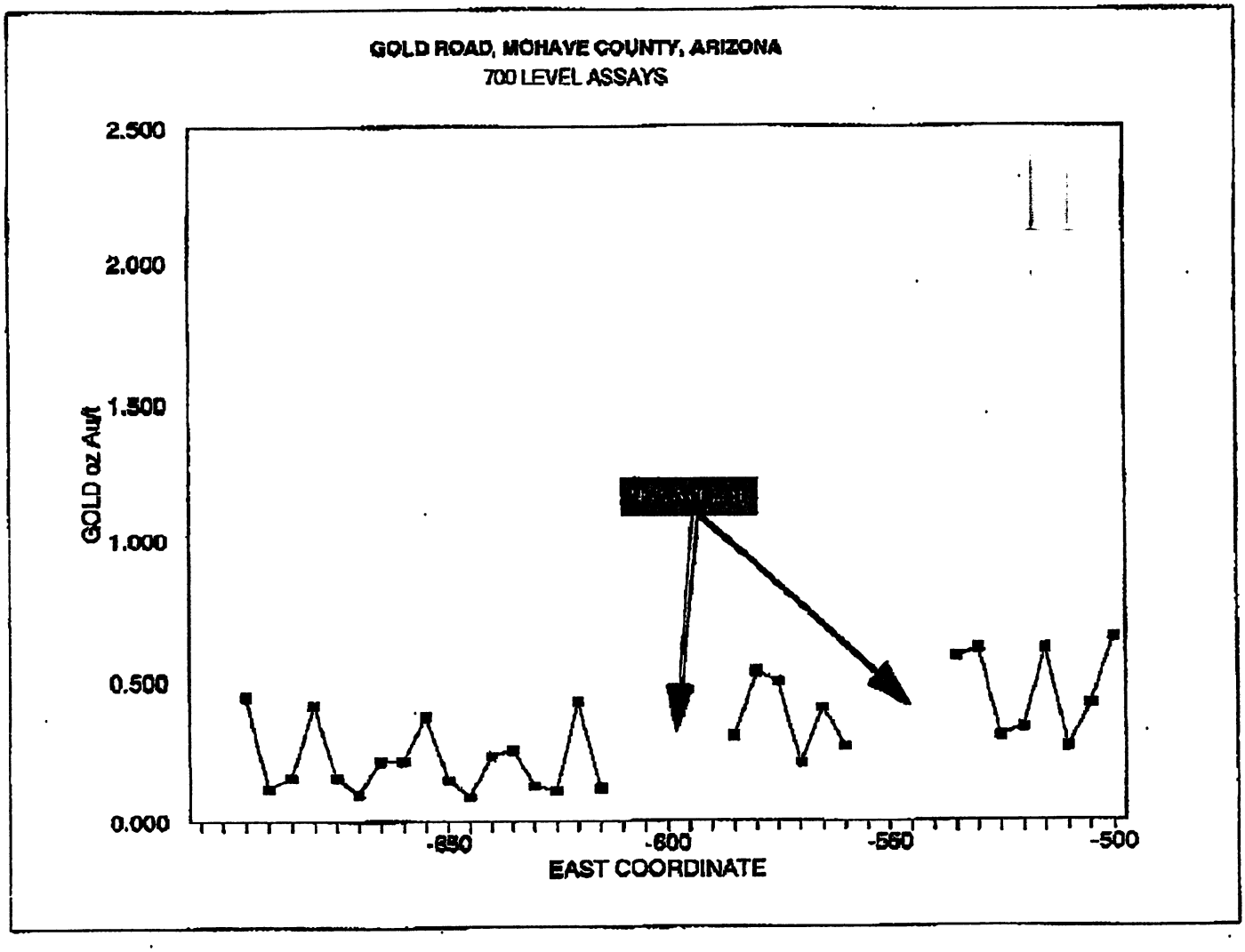
J. R. Wojcik
Manager

JRW/vs
encl.

GOLD ROAD RECONCILIATION FROM MONTHLY STOPE LOG BOOK TOTALS
EXTYRACTED OCTOBER 28, 1995

STOPE	EXTRACTED	ASSAYED	GRADE ASSAYED	GRADE SAMPLED	WIDTH STOPED	WIDTH SAMPLED	SAMPLES	OUNCES FROM EXTRACTE TIMES CAR ASSAYS	OUNCES TIMES EXTRACTE TIMES CUT ASSAYS	PERCENT DIFFERENCE FROM CUT CALCULATE ASSAYS
460A 3400	896	896	0.31	0.268	4.62	4.56	16	277.76	240.128	15.67
460 3900	13587	16671	0.264	0.299	5.3	4.32	279	3585.968	4062.513	-11.71
460A 3900	1815	1066	0.287	0.582	3.8	2.67	37	539.055	947.43	-43.10
460A 4160	9209	9930	0.275	0.17	4.73	3.94	150	2532.475	2466.43	1.85
460A 4160	18184	18024	0.225	0.19	5.48	3.77	333	4091.4	3454.96	16.42
460A E DRIFT								0	0	ERR
UNDER 4150	1019	980	0.276	0.285	5.62	2.48	68	281.244	290.415	-3.16
300A 3885	16812		0.297	0.321	6.52	4.77	246	5587.164	6038.652	-7.48
300A 4340	5833	3071	0.26	0.267		4.61	85	1516.58	1557.411	-2.62
LR 1800	4233	4214	0.256	0.228		4.72	88	1083.648	1007.464	7.56
LR 2000	2685	2705	0.198	0.236	18			531.53	639.03	-16.81
LR 2200	6515	6695	0.18	0.228		4.37	61	1172.7	1485.42	-21.05
LR 2330	4876	5114	0.201	0.166	6	3.43	93	1060.718	779.216	75.30
LR 2600	6810	6053	0.165	0.136		5.81	40	1123.65	926.16	21.32
LR 2800	4110							0	0	ERR
LR 3600	5198	4487	0.187	0.2		5.3	125	972.026	1039.8	-6.50
LR 4900	13294	13626	0.159	0.171		4.54	215	2104.206	2263.014	-7.02
LR 4885	1748	1900	0.22	0.378		3.04	121	384.12	659.965	-41.80
LR 5200	13219	16416	0.218	0.249		4.32	118	2881.742	3291.831	-12.45
100 #3SHAFT	8718	8140	0.512	0.479		3.36	140	4463.616	4175.922	6.89
100 1550	2624	2708	0.284	0.307		3.6	117	744.216	805.566	-7.49
100 EAST	973	1058	0.605	1.325		3.98	79	588.665	1289.225	-54.34
100 4620	7458	8075	0.577	0.985		4.19	127	4303.266	7345.13	-41.42
100 #2SHAFT	9358	10353	0.232					2180.936	0	ERR
100 1340	11743	11499	0.172	0.202		9.29	219	2019.796	3428.958	-41.10
107A 1920	2056	1639	0.193	0.158		4.49	48	396.508	324.848	22.15
300 110FW	4642	4479	0.286	0.406		3.61	266	1327.612	1892.936	-29.90
300 1115HW	1600	840	0.177					265.6	0	ERR
300 1100	674	568	0.328					184.825	0	ERR
350 2010	4278	3567	0.186	0.224	5.46	3.56	164	795.708	958.272	-16.96
350 2595	10311	12779	0.21	0.251		9.2	193	2270.31	2713.561	-16.33
350 2890	7197	6205	0.178	0.232		5.39	111	1281.666	1669.704	-23.26
350 3320	2672	1711	0.443	0.293		8.1	36	1183.696	782.896	51.19
350 3420	961	737	0.271	0.292		4.87	35	260.551	276.642	-5.80
350E DRIFT	2438	1739	0.199	0.453		4.99	73	482.724	1177.594	-59.01
500 E DRIFT	5568	3861	0.344	0.363		5.38	108	1234.272	1302.444	-5.23
500 3810	30619	17715	0.185	0.203		9.1	569	6684.515	6215.657	-8.87
500 3795	12121	4249	0.214	0.284		4.76	12	2593.694	9442.364	-24.65
ALL 3550	25094	22060	0.232	0.177		4.5	84	6030.608	4600.938	31.07
500 2510	12494	9843	0.174	0.22		8.27	216	2173.956	2748.68	-20.91
700 4100	842	842	0.137	0.138		4.45	53	115.354	116.196	-0.72
700 3595	4279	4130	0.128	0.116		8.02	123	539.154	496.364	8.62
700 4000	4464	4287	0.15	0.251		5.1	137	669.6	1120.464	-40.24
700 3280	2931	2922	0.125	0.27		4.82	15	366.306	791.37	-53.73
700 4075	3065	3160	0.228	0.338		4.77	154	699.69	1025.97	-33.14
LR 3110	10589	13014	0.349	0.519		2.92	169	3698.561	5485.311	-32.76
LR 1850	817	828	0.143	0.263		5.01	25	116.931	214.871	-45.63
LR 2750	992	1060	0.122	0.194		3.14	29	119.804	190.808	-37.11
300A 3880	9220	9040	0.333	0.371		3.82	144	3070.26	3420.62	-10.24
300A 3850	5435	5264	0.177	0.409		3.8	90	961.995	2233.918	-56.72
700 1850	19804	21575	0.165	0.255		6.12	40	3264.16	5075.62	-35.69
700 2450	6380	6750	0.261	0.329		7.37	112	1665.18	2099.02	-20.67
350 1975	458	356	0.085	0.127		6.43	15	38.93	58.166	-33.07
600 4725	3575	2235	0.339	0.3		6.25	126	1211.925	1078.5	13.00
500 4600	453	191	0.236	0.376		4.58	10	106.908	170.328	-37.23
600 220	3012	2299	0.176	0.244		3.28	35	530.112	734.936	-27.87
10E WZ	2533	2892	0.222	0.131		5.11	117	562.326	331.823	69.47
100 1700	7105	6061	0.232	0.291		4.06	168	1648.36	2067.555	-20.27
100 3900	6285	6760	0.321	0.398		4.05	138	2011.065	2480.94	-18.96
100 2835	564	506	0.085	0.076		3.89	32	47.94	42.484	11.84
100 1300	468	951	0.23					114.54	0	ERR
100 3580	1029	940	0.204	0.347		2.95	61	209.916	357.063	-41.21
500 4975	549	185	0.362	0.343		7.72	4	208.718	188.507	11.37
	389589		0.257357725026171	0.272320980587758				92483.982	106093.252	-12.85


GOLD ROAD, MOHAVE COUNTY, ARIZONA
GOLD ASSAYS ON 800 LEVEL
GOLD, oz Au/t
2.5
2
1.5
1
0.5
0
-250
-200
-150
-100
-50
0
EAST COORDINATE


GOLD ROAD, MOHAVE COUNTY, ARIZONA
700 LEVEL ASSAYS
2.500
2.000
1.500
1.000
0.500
0.000
GOLD oz Au/t
-650
-600
-550
-500
EAST COORDINATE

Watts, Griffis and McOuat Limited Consulting Geologists

Telecopier: (303) 986-2903
Type: HP Fax 950 Unattended

TO: J. Depatie PROJECT:

FAX NO.: 514-878-0635

FROM: J. R. Wojcik ——— Joe

SUBJECT: Flight arrangements

DATE: October 19, 1995

NO. PAGES: 1
Operator: vs

*IF ANY QUESTIONS OR PROBLEMS, PLEASE CALL 303-986-2420

Dear Jean:

My flight to Las Vegas arrives at 15:00. I will meet your flight at the gate. I have made reservations for Depatie, Belzile, Wojcik and Moore at Harrah's in Laughlin for October 26 through 28. My departure from Las Vegas is scheduled at 9:40 on the 29th. Addwest is prepared for us on Friday and Saturday, if necessary.

Best regards,

JRWojcik

Watts Griffis and McOuat Limited
Suite 210, 165 S. Union Boulevard, Lakewood, Colorado 80228 (303) 986-2420

To: Jean Depatie
From: Randy Moore
Date: November 1, 1995
Subject: Gold Road Mine, Mohave County, Arizona

A property visit and data review for the Gold Road Mine were conducted on October 27-28 with Elzear Belziel and Joe Wojeik. The mine is currently producing approximately 1,000 to 1,200 ounces a month at an operating cost of roughly $600/oz of Au. The 500 ton/day mill has yet to reach capacity and gold grades are half that of the reserve numbers. The feasibility report states proven and probable reserves of 486,000 tons @ 0.355 oz/t Au for a total of 172,600 ounces. Based on the mine performance to date, there may be 50,000 ounces which could be placed in a minable category at a grade of 0.2 to 0.25 oz/t Au.

The operation was poorly conceived from the start and the property should be considered only as an exploration target, not as an operating mine. The operators, Addwest Minerals, placed the property into production using only historic underground sample data from the 1930's and early 1940's. This sampling came from the 100, 350, 500 and 700 foot levels with no drilling data. If ore grades were found on two consecutive levels, all the material between was considered to be proven and probable, thus making projections of 200 to 250 feet between sample points. Addwest is now discovering that the grades, as well as thicknesses, are highly variable (as would be expected in an epithermal vein system) and that the production grades are much lower than the book values.

The mining is being done on minimum 7-foot widths with the average vein width being 5 feet. This gives a dilution factor of roughly 40%. Within the stopes currently being mined, the actual dilution appears to be as great as 100% in some cases. Viewing the historic records, the stope widths were between 4 to 5 feet with grades ranging from 0.25 to 0.4 oz/t Au. Production drift sampling by Addwest is returning values of 0.1 to 0.15 oz/t Au over 7 to 10 foot widths. These values correspond well to the production grades and to the historic grades if they are diluted over these widths.

The exploration potential of the Gold Road vein system is considered good to excellent. It is important to note however, that the potential is for similar type material to that which is currently being mined, or grades of 0.2 to 0.25 oz/t Au over narrow mine widths. These grades do not appear to be an attractive target for a Cambiex venture. If the decision is made to become involved in the property, it is recommended that all mining activities stop upon acquisition and that an extensive exploration program be initiated to develop proven reserves. This would require approximately 12 months to complete at a cost of roughly $2,000,000. Once this work is completed a new feasibility study would be necessary to determine the profitability of any potential operation. Should the feasibility study be positive an additional 6 to 12 months and several million dollars would be required for development work.

The Gold Road property holds no potential as a source of cash flow for Cambiex in the short term. It is an exploration property that is roughly 2 years and over $4,000,000 away from being a profitable operation. While there is additional exploration potential, the expectations are for an 0.2 to 0.25 oz/t, undiluted, underground gold grade over mining widths of 4 to 5 feet.

Randy Moore
Senior Geologist

CAMBIOR MEMORANDUM

Date: October 23, 1995

To: Elzéar Belzile - *Cambior, Val d'Or*
Randy Moore - *Cambior, Reno*
Joe Wojcik - *W.G.M., Denver*

From: Jean Depatie

Re: **Gold Road Mine, Mohave County, Arizona**
Property Visit - October 27 - 28, 1995

Since you have all been made aware that I will not be able to be with you for the property visit scheduled for October 27 - 28, I am appointing Elzear Belzile as the project leader and I think that you will probably be able to do a better job than if I was there.

Mr. Belzile will therefore coordinate everything with you so that we find out exactly what's wrong with the mining operations at Gold Road and if we can do any better. More important to me is to estimate how long it will take (and at what cost) to have a profitable venture.

Good luck to you all!

Jean Depatie
President - Cambiex

P.S.:
- Elzear Belzile is to leave Val d'Or at 09:55 and arrive in Las Vegas at 18:03 on October 26 via American Airlines, flight #561. Return scheduled in the morning of October 29.
- Joe Wojcik will arrive in Las Vegas at 15:00 on the same day and will meet Elzear Belzile at the gate.
- We have made a reservation at Budget, Las Vegas airport, for an intermediate car.
- Randy Moore's definite schedule is not available yet. To coordinate with Elzear Belzile and Joe Wojcik. He is to fly back to Reno on October 28.
- Joe Wojcik to communicate to Elzear Belzile and Randy Moore the list of the principals at the mine site.
- Your client is Cambiex Exploration Inc., Montreal office.

CAMBIOR

FORMULE DE TRANSMISSION PAR TÉLÉCOPIEUR
(Telecopier covering sheet)

Date: 23/10 **# de télécopieur:**

Destinataire: (Addressee)
Nom (name): Elzéar Belzile & Randy Moore
Compagnie (company): Cambior Val d'Or & Reno
C.C.:

Expéditeur: (Sender)
Nom (name): Jean Depatie

Nombre de pages (incluant celle-ci): 3
(Number of pages (including this one))

MESSAGE

CAMBIOR INC.
800 René-Lévesque Ouest, suite 850, Montréal (Québec) Canada. H3B 1X9
Tel.: (514) 878-3166 Fax: (514) 878-0635 Telex: 055-60930

CAMBIOR

To: Jean Depatie
From: Randy Moore
Date: November 1, 1995
Subject: Gold Road Mine, Mohave County, Arizona

A property visit and data review for the Gold Road Mine were conducted on October 27-28 with Elzear Belziel and Joe Wojeik. The mine is currently producing approximately 1,000 to 1,200 ounces a month at an operating cost of roughly $600/oz of Au. The 500 ton/day mill has yet to reach capacity and gold grades are half that of the reserve numbers. The feasibility report states proven and probable reserves of 486,000 tons @ 0.355 oz/t Au for a total of 172,600 ounces. Based on the mine performance to date, there may be 50,000 ounces which could be placed in a minable category at a grade of 0.2 to 0.25 oz/t Au.

The operation was poorly conceived from the start and should be considered only as an exploration target, not as an operating mine. The operators, Addwest Minerals, placed the property into production using only historic underground sample data from the 1930's and early 1940's. This sampling came from the 100, 350, 500 and 700 foot levels with no drilling data. If ore grades were found on two consecutive levels, all the material between was considered to be proven and probable, thus making projections of 200 to 250 feet between sample points. Addwest is now discovering that the grades, as well as thicknesses, are highly variable (as would be expected in an epithermal vein system) and that the production grades are much lower than the book values.

The mining is being done on minimum 7-foot widths with the average vein width being 5 feet. This gives a minimum of 40% dilution. Within the stopes currently being mined, the actual dilution appears to be as great as 100% in some cases. Viewing the historic records, the stope widths were between 4 to 5 feet with grades ranging from 0.25 to 0.4 oz/t Au. Production drift sampling by Addwest is returning values of 0.1 to 0.15 oz/t Au over 7 to 10 foot widths. These values correspond well to the production grades and to the historic grades if they are diluted over these widths.

The exploration potential of the Gold Road vein system is considered good to excellent. It is important to note however, that the potential is for similar type material to that which is currently being mined, or grades of 0.2 to 0.25 oz/t Au over narrow mine widths. These grades do not appear to be an attractive target for a Cambiex venture. If the decision is made to become involved in the property, it is recommended that all mining activities stop upon acquisition and that an extensive exploration program be initiated to develop proven reserves. This would require approximately 12 months to complete at a cost of roughly $2,000,000. Once this work is completed a new feasibility study would be necessary to determine the profitability of any potential operation. Should the feasibility study be positive an additional 6 to 12 months and several million dollars would be required for development work.

Cambior Exploration USA, Inc.

230 South Rock Blvd., Suite #23, Reno, Nevada 89502-2345, USA, Telephone 702-856-5189, Fax 702-856-4549

The Gold Road property holds no potential as a source of cash flow for Cambiex in the short term. It is an exploration property that is roughly 2 years and over $4,000,000 away from being a profitable operation. While there is additional exploration potential, the expectations are for an 0.2 to 0.25 oz/t, undiluted, underground gold grade over mining widths of 4 to 5 feet.

Randy Moore
Senior Geologist

Gold Road Reserves

Cut off @ .17 oz/t

	Tons		
497 & Raise	178,991	.408	73,028 oz
Below 700	24,824	.297	25,193 oz ?
			98,221 oz
East to DDH-1	330,000	.321	105,930 oz

Wilderness ?

Please File

Gold Roads
Mohave Co., Az.

Thanks
Tony

AMWEST EXPLORATION COMPANY

303 Fierro Road P. O. Box 406
Hanover, New Mexico 88041

Phone: (505) 537-3884 Fax: (505) 537-3144

January 13, 1992

Mr. Randy Moore
Cambior USA, Inc.
Suite 23, 230 South Rock Blvd.
Reno, Nevada 89502-2345

Dear Randy:

Enclosed herewith are copies of the following items related to the Gold Road property, Mohave County, Arizona which will help in your evaluation:

1. Engineering and cost study of Gold Road Mine by American Mine Services, 1987
2. Booth Company report, 1981
3. Property Map
4. Plan and section of mine workings 1" = 200'
5. Reserve map of S.E. end of mine, 1" = 50'
6. Reports by J. Schulz, 1972 and 1973

Much of the exploration potential of the Gold Road Mine is located beneath the four claims owned by Gold Road Red Top Mining Company that are held by lease. The terms of this lease are not favorable but we are in the process of negotiating new terms and believe that this problem can be resolved to the mutual benefit of all concerned.

Should you have any questions or need additional information, please feel free to contact me.

Sincerely,

Wm. T. Worthington

William T. Worthingotn
Manager of Exploration

REC - CAMBIOR USA

JAN 16 1992

WTW:avf

Enc.

THE BOOTH COMPANY
A Division of MCRC

Engineering Division:
333 WEST 1410 SOUTH STREET
SALT LAKE CITY, UTAH 84115 • U.S.A.
PHONE 801 487-7845

August 28, 1981

Gaylon Hansen
Sharon Steel Corporation
Mining Division
University Club Bldg.

Dear Gaylon:

This is a brief report of two tests carried out on your Gold Road ore. Two samples were received August 17, 1981 labeled thus -

1. Gold Road specimens from Line Road Adit.
2. Gold Road specimens from shaft No. 3 and 800 feet to the south along open stopes above Line Road.

The samples were combined as received for laboratory use.

The primary purpose of this preliminary work was to study the degree of liberation and a secondary purpose was to observe whatever might be useful by way of process development.

In test no. 1 the material was ball milled in stages to all minus 100 mesh then treated by flotation with no cleaning steps. The flotation tail was then screened at 200 and 325 mesh and the resulting fractions assayed. Data are as follows:

	PRODUCT	ASSAYS OZ/TON Au	Ag	% DISTRIBUTION Au	Ag
2	Rougher conc't	40.68	18.91	77.02	44.89
3	Flot. Tail	0.23	0.44	22.98	55.11
1	Calculated head	0.98	0.78	100.00	100.00
1	Head Assay	1.03	0.82		
4	100 x 200	0.33	0.50	7.79	14.39
5	200 x 325	0.28	0.52	6.19	14.00
6	Minus 325	0.16	0.39	9.00	26.72
3	Flot. Tail	0.23	0.44	22.98	55.11
3	Flot. Tail Assay	0.185	0.47		

In test no. 2 the material was ball milled exactly as in test no. 1

and then screened at 200 and 325 mesh. Each fraction was then cyanided for 24 hours at 50 % solids at pH 11.0 to 11.8 and adding 5.0 lbs NaCN per ton of solution. Pregnant solutions and washed residues were assayed. The calculated screen analysis is as follows:

PRODUCT	%WT.	ASSAYS OZ/TON Au	ASSAYS OZ/TON Ag	% DISTRIBUTION Au	% DISTRIBUTION Ag
100 x 200	27.31	0.76	0.88	24.83	26.15
200 x 325	21.98	0.76	0.78	19.97	18.65
Minus 325	50.71	0.91	1.00	55.20	55.20
Calc. Head	100.00	0.84	0.92	100.00	100.00
Head Assay		1.03	0.82		

Extractions on the fractions were as follows:

FRACTION	% Au EXTRACTION	% Ag EXTRACTION
100 x 200	79.39	41.83
200 x 325	88.14	41.30
Minus 325	94.59	55.00

COMMENT AND OBSERVATIONS

The head shown here is far higher in gold than your stated mine run. You apparently expected this. Nevertheless, both tests prove that acceptable liberation would require a grind finer than minus 100 mesh. Note the descending Au content (locked Au) with respect to particle size in the flotation tail fractions (test 1). Note the ascending distribution of Au toward the fine end in the screen analysis test 2 (free plus locked Au). Note the ascending cyanide extraction toward the fine end test 2.

Flotation was fast and positive. The ore is very clean as noted by the high rougher concentrate grade. The ground material settles and filters fast. Hardness is above average and will require correspondingly more energy for a fine grind.

Silver does not closely follow the gold suggesting that some of the silver might be cerargyrite silver. The low silver cyanide extractions test 2 are not surprising since silver typically requires considerably more retention time than gold. If a finer grind would liberate gold well enough to allow a flotation recovery approaching within about 5 percent of cyanide extraction, we believe flotation could be economically more viable than cyaniding.

BOOTH COMPANY

We recommend that a similar kind of study be made on a more representative sample ground to all minus 200 mesh.

Respectfully submitted,

THE BOOTH COMPANY

Jay B. Clitheroe

JBC/pj

SHARON STEEL CORPORATION

LABORATORY INVESTIGATION

GOLD ROAD MINE

Prepared by The Booth Company, SLC, Utah

October 27, 1981

THE BOOTH COMPANY

THE BOOTH COMPANY
A Division of MCRC

Engineering Division:
333 WEST 1410 SOUTH STREET
SALT LAKE CITY, UTAH 84115 · U.S.A.
PHONE 801 487-7845

October 26, 1981

Gaylon Hansen
Sharon Steel Corporation
Mining Division
University Club Bldg.
Salt Lake City, Utah 84111

Dear Gaylon:

This report describes laboratory work carried out on the below listed Gold Road Mine ore samples.

BOOTH LOT NO.	YOUR DESCRIPTION	HEAD ASSAY Oz/T Au	Oz/T Ag
1897	Grab sample out of bin from Line Road Adit	0.24	0.31
1896	Grab sample of no. 1 shaft crushed spill ore	0.28	0.32
1895	Grab sample of crushed ore from sample splitter hopper	0.18	0.42
1894	Upper tailings	0.08	0.32

TESTING AND RESULTS

This work was a continuation of preliminary studies made on Lot 1892, a composite of two specimen samples, reported to you in our letter of August 28, 1981. That work proved that a grind to all minus 100 mesh did not sufficiently liberate the gold to allow satisfactory recoveries by flotation or cyaniding. This work was therefore all carried out on material stage ground to all minus 200 mesh.

Each equal weight test sample of the mine samples, lots 1897, 1896, & 1895, were stage ground in exactly the same manner. The resulting grinds were in good agreement, averaging 19 % plus 325 mesh with a variance of about 2 %. Lot 1894 (tailings) samples were stage ground with a lower ball mill retention than the others but with the same sample weight and mill feed size yielded a plus 325 mesh weight fraction of 16.5 %.

Each of the three mine samples were treated by flotation and by cyaniding. A screen analysis was made on the flotation tailings. The cyaniding was carried out separately on plus and minus 325 mesh fractions. For lots 1896 and 1895 flotation was repeated with flotation

tails being tabled to simulate a gold trap that would inevitably be part of a flotation mill flowsheet on free gold. The latter was done after observing that the larger pieces of gold were peened during grinding into thin plates that are more difficult to float. This would not likely happen in closed circuit grinding but if so a gold trap such as a jig on the ball mill discharge would entrap the peened gold particles.

Detailed data sheets are appended for the 11 tests that were run. Following is a tabulation of recoveries and extractions:

FLOTATION RECOVERIES, % OF TOTAL Au & Ag

Lot no.	Test no.	Product	Au	Ag
1897	1	Flot. conc't	88.1	52.7
1896	3	Flot. conc't	86.8	43.4
		Table conc't	1.2	1.1
		Total	88.0	44.5
1895	3	Flot. conc't	87.6	33.5
		Table conc't	1.1	2.0
		Total	88.7	35.5
1894	2	Flot. conc't	57.2	16.1

CYANIDE EXTRACTION, % OF TOTAL Au & Ag

Lot no.	Test no.	Au	Ag
1897	2	83.5	48.3
1896	2	95.1	60.2
1895	2	95.5	62.1
1894	3	72.1	14.3

From the above we conclude that gold flotation recovery on mine ore cannot be expected to exceed 88 % on a minus 200 mesh grind. The low flotation recovery on the tailing sample, lot 1894, is not surprising in view of the low head. The low silver flotation recoveries shown indicate, as we previously suggested, that some of the silver might be cerargyrite.

From the above we also conclude that you could expect 95 % cyanide extraction of gold at a minus 200 mesh grind, and a 60 % extraction of the silver.

Note that the cyanide extraction shown for lot 1897 is anomalously low for the mine samples. This sample contained woody material and other

organic contamination which would adsorb soluble gold. Assays were repeated on that test without change. It would not have been worthwhile to repeat the cyanide test.

The lower cyanide extraction on lot 1894 is not surprising in view of the fact that this is a cyanide tailing and that it is low grade.

The lower cyanide silver extractions is another indication of cerargyrite silver or perhaps some argentojarosite. Cerargyrite cyanides much more slowly than gold and argentojarosite will not cyanide.

All flotation concentrates were rougher concentrates only because there was not enough material to go to cleaner flotation. The rougher concentrate grades for the mine samples ranged from 1.75 to 7.3 oz Au/T. We believe they would clean up to 20 oz/ton or better.

Test 1 lot 1894 was a screen analysis showing that this tailing sample was surprisingly coarse, 37.5% plus 100 mesh. The plus 100 mesh contained 56 % of the gold which is a good indication, as we reported previously, of the degree to which the gold is locked in this ore.

Gold assaying was good, particularly in view of the probability of error in sampling materials containing free gold. Gold head assays and calculated heads checked well generally. Silver head assays and calculated heads were not very good and we cannot explain this.

CONCLUSIONS AND RECOMMENDATIONS

Although this ore is a hard ore requiring fine grinding it is a beautiful milling ore in terms of its cleanliness. The absence of argyllaceous or earthy slime producing minerals means excellent settling and filtering qualities that are beneficial to either flotation or cyaniding. This and the lack of impurities means minimal consumption of reagents in flotation or cyaniding.

We hoped that flotation recovery would more nearly approach cyanide extraction. We believe that flotation would represent lower capital cost, lower operating cost, and most certainly less struggle with environmentalists. However, at $400.00 per oz. gold the 7 % difference in recovery on a 0.2 oz/ton feed would be $5.60 per ton and look worse at a price above $400.00 per oz.

Should you desire further work on this ore we recommend that a cyanide extraction-time curve be established. All cyanide work to date was at an arbitrarily chosen 24 hours. This time might be reduced 50 % with the same extraction which means reduced cost of agitation leach tankage and power comsumption. We also recommend that settling tests should be run to get a handle on the size of a CCD thickening system for solution recovery.

BOOTH COMPANY

We have appreciated being called upon to do this work for you.

Respectfully submitted,

THE BOOTH COMPANY

Jay B Clitheroe

Jay B. Clitheroe

JBC/pj

ASSAYER Sharon Steel PROJECT GOLD ROAD MINE DATA SHEET Booth Job No. 121 E235

Flotation test and screen analysis of flotation tail. 1000 grams, 10 mesh, Stage grind to 200 mesh.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH	AC-350	Dow-250							
Grind	25-15-15	65										
Conditioner	3	30	8.3	0.10								
Rougher Float	7-8		8.3	0.10 *	0.05							

*Added after 7 min.

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Rougher Concentrate	5.77	4.364	2.06					88.13	52.69				
Rougher Tail	94.23	0.036	0.143					11.87	47.31				
Calculated Head	100.00	0.286	0.28					100.00	100.00				
Head Assay		0.24	0.31										

ENGINEERING DIVISION
RESEARCH DEPARTMENT

THE BOOTH COMPANY
335 WEST 1410 SOUTH ST. · SALT LAKE CITY, UTAH 84115 · U.S.A.

OUR LOT NO. 1897 TEST NO. 1

DATE 8/31/81 BY SM

ASSAYER Sharon Steel PROJECT GOLD ROAD MINE DATA SHEET Booth Job No. 121 E235

Screen Analysis of flotation rougher tail, test no. 1

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH									

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Plus 325 Mesh	18.57	0.06	0.023					31.32	2.99				
Minus 325 Mesh	81.43	0.03	0.17					68.68	97.01				
Rougher Tail	100.00	0.036	0.143					100.00	100.00				
Rougher Tail Assay		0.025	0.17										

ENGINEERING DIVISION
RESEARCH DEPARTMENT

THE BOOTH COMPANY
333 WEST 1310 SOUTH ST. • SALT LAKE CITY, UTAH 84115 • U.S.A.

OUR LOT NO. 1897 TEST NO. 1

DATE 8/31/81

ASSAYER Sharon Steel PROJECT GOLD ROAD MINE DATA SHEET Booth Job No. 121 E235

Cyanide Test - Stage gind to 200 mesh, Screen on 325 mesh, cyanide fractions separately.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME XXX	% SOLIDS	PH	Lime	NaCN							
Plus 325 mesh fraction												
Bottle	24 hrs.	38.7	11.2	10.0	5.0 lb per ton soln. NaCN consumed = 0.57 lb per ton ore.							
Minus 325 mesh fraction												
Bottle	24 hrs.	29.3	10.5	20.0	5.1 lb per ton soln. NaCN consumed = 1.26 lb per ton ore.							

METALLURGICAL RESULTS

PRODUCT	% Wt.	Assays		% Distribution	
		Oz/T Au	Oz/T Ag	Au	Ag
Plus 325 mesh					
Preg. Liquor	61.28	0.084	0.04	73.47	29.68
Residue	38.72	0.048	0.15	26.53	70.32
Pulp	100.00	0.070	0.083	100.00	100.00
Calc. plus 325		0.18	0.22		
Minus 325 Mesh					
Preg liquor	70.74	0.063	0.037	85.90	54.39
Residue	29.26	0.025	0.075	14.10	45.61
Pulp	100.00	0.052	0.048	100.00	100.00
Calc. minus 325		0.18	0.164		
Plus 325	19.12	0.18	0.22	19.09	24.53
Minus 325	80.88	0.18	0.16	80.91	75.47
Calc. Head	100.00	0.18	0.17	100.00	100.00
Head Assay		0.24	0.31		

Overall Extraction (-325) + (+325)

	Au	Ag
Preg. liquor	83.53	48.33
Residue	16.47	51.67
Head	100.00	100.00

OUR LOT NO. 1995 TEST NO. 2

ENGINEERING DIVISION THE BOOTH COMPANY

DATA SHEET Booth Job No. 121 E235

Screen analysis of flotation rougher tail, test no. 1

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH									

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Plus 325 mesh	19.54	0.04	0.24					8.85	17.23				
Minus 325 mesh	80.46	0.10	0.28					91.15	82.77				
Rougher Tail, Calc.	100.00	0.088	0.272					100.00	100.00				
Rougher tail assay		Not assayed											

ENGINEERING DIVISION
RESEARCH DEPARTMENT

THE BOOTH COMPANY
333 WEST 1340 SOUTH ST. • SALT LAKE CITY, UTAH 84115 • U.S.A.

OUR LOT NO. 1896 TEST NO. 1

DATE 9/11/81 BY CW

Sharon Steel PROJECT GOLD ROAD MINE DATA SHEET Booth job no. 121 E235

Flotation test and screen analysis of flotation tail. 100 grams, 10 mesh, stage grind to 200 mesh.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH	AC-350	Dow-250							
Grind	25-15-15											
Conditioner	3	30	8.3	0.1								
Rougher Float	7 - 8	30	8.3	0.1 *	0.06							

* Added after 7 min.

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Rougher Concentrate	3.77	7.29	3.33					76.45	32.42				
Rougher Tail	96.23	0.088	0.272					23.55	67.58				
Calculated Head	100.00	0.36	0.39					100.00	100.00				
Head Assay		0.28	0.32										

OUR LOT NO. 1896 TEST NO. 1

ENGINEERING DIVISION
RESEARCH DEPARTMENT
THE BOOTH COMPANY
333 WEST 1410 SOUTH ST. · SALT LAKE CITY UTAH 84115 · U.S.A.

DATE 9/11/81 CW

ASSAYER Sharon Steel PROJECT Grab sample of no. 1 shaft crushed spill ore GOLD ROAD MINE DATA SHEET No. 6 Booth job no. 121 E235

Cyanide Test - Stage grind to 200 mesh, screen on 325 mesh, cyanide fractions separately.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME ~~XXX~~	% SOLIDS	PH	Lime	NaCN							
Plus 325 mesh fraction												
Bottle	24 hrs.	37.5	11.3	10.0	5.0 lb per ton soln. NaCN consumed = 0.32 lb per ton ore.							
Minus 325 mesh fraction												
Bottle	24 hrs.	30.0	10.7	19.5	5.2 lb per ton soln. NaCN consumed = 2.36 lb per ton ore.							

METALLURGICAL RESULTS

PRODUCT	% Wt.	Assays		% Distribution	
		Oz/T Au	Oz/T Ag	Au	Ag
Plus 325 mesh					
Preg. liquor	62.55	0.155	0.095	89.62	43.04
Residue	37.45	0.03	0.21	10.38	56.96
Pulp	100.00	0.11	0.14	100.00	100.00
Calc. plus 325		0.294	0.374		
Minus 325 mesh					
Preg. liquor	70.00	0.115	0.091	96.41	64.87
Residue	30.00	0.01	0.115	3.59	35.13
Pulp	100.00	0.083	0.098	100.00	100.00
Calc. minus 325		0.278	0.31		
Plus 325	18.26	0.294	0.374	19.09	21.21
Minus 325	81.84	0.278	0.31	80.91	78.79
Calc. Head	100.00	0.28	0.32	100.00	100.00
Head Assay	"	0.28	0.32		

Overall Extraction (-325) + (+325)

	Au	Ag
Preg. liquor	95.12	60.24
Residue	4.88	39.76
Head	100.00	100.00

ASSAYER Sharon Steel PROJECT GOLD ROAD MINE DATA SHEET No. 7 Booth job no. 121 E235

Two 1000 gram batches for flotation, combined flotation tails for table test. Batches stage ground to 200 mesh.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH	AC-350	Dow-250							
Grind	25-15-15											
Conditioner	3	30	8.3	0.10								
Rougher Float	7-8	30	8.3	0.10 *	0.05							

* Added after 7 min.

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS			PERCENT DISTRIBUTION			
		Oz/T Au	Oz/T Ag		Au	Ag		
2 Rougher conc't	5.06	5.37	2.31		86.83	43.36		
3 Rougher tail	94.94	0.04	0.16		13.17	56.64		
~~1 Calc. Head~~	~~100.00~~	~~0.31~~	~~0.27~~		~~100.00~~	~~100.00~~		
Head Assay		0.28	0.32					
4 Table conc't	1.37	0.277	0.22		1.22	1.11		
~~5 Table tail~~	~~93.57~~	~~0.04~~	~~0.16~~		~~11.95~~	~~55.53~~		
~~3 Rougher tail~~	~~94.94~~	~~0.04~~	~~0.16~~		~~13.17~~	~~56.64~~		
2 + 4	6.43	4.28	1.86		88.05	44.47		

ENGINEERING DIVISION
RESEARCH DEPARTMENT
THE BOOTH COMPANY
333 WEST 1410 SOUTH ST. · SALT LAKE CITY, UTAH 84115 · U.S.A.

OUR LOT NO. 1896 TEST NO. 3

DATE 9/28/83 BY SM

ASSAYER Sharon Steel PROJECT splitter hopper, shaft no. 1 GOLD ROAD MINE DATA SHEET No. 8 Booth job no. 121 E235.

Flotation test and screen analysis of flotation tail. 100 grams, 10 mesh, stage grind to 200 mesh.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH	AC-350	Dow-250							
Grind	25-15-15	65										
Conditioner	3	30	8.1	0.10								
Rougher Float	7-8	30	8.1	0.10 *	0.06							

* Added after 7 min.

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Rougher Concentrate	4.65	3.33	1.61					68.41	37.65				
Rougher Tail	95.35	0.075	0.13					31.59	62.35				
Calculated Head	100.00	0.226	0.199					100.00	100.00				
Head Assay		0.18	0.42										

ENGINEERING DIVISION
RESEARCH DEPARTMENT

THE BOOTH COMPANY
333 WEST 1410 SOUTH ST. • SALT LAKE CITY, UTAH 84115 • U.S.A.

OUR LOT NO. 1895 TEST NO. 1

DATE 9/16/81 BY CW

ASSAYER Sharon Steel PROJECT GOLD ROAD MINE DATA SHEET Booth job No. 121 E235

Screen analysis of flotation rougher tail, test no. 1

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH									

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Plus 325 mesh	19.85	0.068	0.132					19.39	20.09				
Minus 325 mesh	80.15	0.07	0.13					80.61	79.91				
Rougher Tail Calc.	100.00	0.075	0.13					100.00	100.00				
Rougher tail assay		Not assayed											

OUR LOT NO. 1895 TEST NO. 1

THE BOOTH COMPANY

ENGINEERING DIVISION

RESEARCH DEPARTMENT

DATE 9/16/81

CW

[illegible] PROJECT GOLD ROAD MINE No. 10

DATA SHEET Booth job no. 121 E235

Cyanide test - Stage grind to 200 mesh, screen on 325 mesh, cyanide fractions separately.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME XXX	% SOLIDS	PH	Lime	NaCN							
Plus 325 mesh fraction												
Bottle	24 hrs.	33.4	11.3	11.8	4.6 lb per ton solution. NaCN consumed = 0.29 lb per ton ore.							
Minus 325 mesh fraction												
Bottle	24 hrs.	30.74	10.9	21.0	5.2 lb. per ton solution. NaCN Consumed = 5.2 lb per ton ore.							

METALLURGICAL RESULTS

PRODUCT	% Wt.	Assays		% Distribution	
		Oz/T Au	Oz/T Ag	Au	Ag
Plus 325 mesh					
Preg. Liquor	66.65	0.096	0.044	90.52	63.70
Residue	33.35	0.02	0.05	9.48	36.30
Pulp	100.00	0.07	0.046	100.00	100.00
Calc. plus 325		0.21	0.14		
Minus 325 mesh					
Preg. Liquor	69.26	0.064	0.036	96.72	61.79
Residue	30.74	0.005	0.05	3.28	38.21
Pulp	100.00	0.05	0.04	100.00	100.00
Calc. minus 325		0.16	0.13		
Plus 325	15.85	0.21	0.14	19.83	16.87
Minus 325	84.15	0.16	0.13	80.17	83.13
Calc. Head		0.17	0.13		
Head Assay	"	0.18	0.13	"	"

Overall Extraction (-325) + (+325)

	Au	Ag
Preg. Liquor	95.49	62.11
Residue	4.51	37.89
Head	100.00	100.00

ENGINEERING DIVISION
RESEARCH DEPARTMENT

THE BOOTH COMPANY
[illegible] WEST 1410 SOUTH ST. • SALT LAKE CITY, UTAH 84115 • U.S.A.

OUR LOT NO. 1895 TEST NO. 2

DATE 9/18/81 CW

splitter hopper, shaft no. 1

ASSAYER Sharon Steel PROJECT GOLD ROAD MINE DATA SHEET No. 11 Booth job no. 121 E235

Two 1000 gram batches for flotation, combined flotation tails for table test. Batches stage ground to 200 mesh.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH	AC-350	Dow-250							
Grind	25-15-15	65										
Conditioner	3	30		0.10								
Rougher float	7-8	30		0.10 *	0.06							

* Added after 7 min.

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
2 Rougher conc't	9.82	1.75	0.89					87.57	33.47				
3 Rougher tail	90.18	0.027	0.193					12.43	66.53				
~~1 Calc. Head~~	~~100.00~~	~~0.196~~	~~0.26~~					~~100.00~~	~~100.00~~				
Head Assay		0.18	0.42										
4 Table conc't	1.52	0.145	0.34					1.12	1.99				
~~5 Table tail~~	~~88.66~~	~~0.025~~	~~0.19~~					~~11.31~~	~~64.54~~				
3 Rougher tail	90.18	0.027	0.193					12.43	66.53				
2 + 4	11.34	1.54	0.82					88.69	35.46				

ASSAYER Sharon Steel PROJECT Upper Tailings GOLD ROAD MINE

No.12
DATA SHEET Booth job no. 121 E235

Screen analysis with assays. 1000 grams as received, agitate at 30 % solids to break up lumps then screen.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH									

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Plus 100 mesh	37.44	0.12	0.48					56.34	49.13				
100 x 200 mesh	15.28	0.05	0.37					9.54	15.45				
200 x 325 mesh	10.03	0.03	0.40					3.76	10.97				
Minus 325	37.25	0.065	0.24					30.36	24.45				
Calc. Head	100.00	0.08	0.37					100.00	100.00				
Head Assay		0.08	0.32										

ASSAYER Sharon PROJECT Upper Tailings GOLD ROAD MINE DATA SHEET No. 13 Booth job no. 121 E235

Flotation test. 1000 grams as received, stage grind to 200 mesh.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME MIN.	% SOLIDS	PH	AC-350	Dow-250							
Grind	15-12-6	65										
Conditioner	3	30	8.3	0.10								
Rougher float	7-8	30	8.3	0.10*	0.05							

* Added after 7 min.

METALLURGICAL RESULTS

PRODUCT	% WEIGHT	ASSAYS						PERCENT DISTRIBUTION					
		Oz/T Au	Oz/T Ag					Au	Ag				
Rougher conc't	3.93	0.98	0.89					57.21	16.09				
Rougher tail	96.07	0.03	0.19					42.79	83.91				
Calc. Head	100.00	0.07	0.22					100.00	100.00				
Head Assay		0.08	0.32										

ENGINEERING DIVISION
RESEARCH DEPARTMENT

THE BOOTH COMPANY
333 WEST 1410 SOUTH ST. · SALT LAKE CITY UTAH 84115 · U.S.A.

OUR LOT NO. 1894 TEST NO. 2

DATE 9/25/81

...GOLD ROAD MINE

DATA SHEET Booth job no. 121 E235

Cyanide Test - Stage grind to 200 mesh, Screen on 325 mesh, cyanide fractions separately.

POINT OF ADDITION	CONDITIONS			REAGENTS POUNDS PER TON								
	TIME XXX	% SOLIDS	PH	Lime	NaCN							
Plus 325 mesh fraction												
Bottle	24 hrs.	35.3	11.6	11.5	5.0 lb	per ton solution.	NaCN Consumed = 0.3 lb per ton ore.					
Minus 325 mesh fraction												
Bottle	24 hrs.	37.8	10.7	22.5	5.0 lb	per ton solution.	NaCN Consumed = 1.6 lb per ton ore.					

METALLURGICAL RESULTS

PRODUCT	% Wt.	Assays		% Distribution	
		Oz/T Au	Oz/T Ag	Au	Ag
Plus 325 mesh					
Preg. Liquor	64.74	0.064	0.106	85.46	31.67
Residue	35.26	0.02	0.42	14.54	68.33
Pulp	100.00	0.05	0.22	100.00	100.00
Calc. plus 325		0.14	0.62		
Minus 325 mesh					
Preg Liquor	62.23	0.007	0.008	53.56	5.42
Residue	37.77	0.01	0.23	46.44	94.58
Pulp	100.00	0.02	0.092	100.00	100.00
Calc. minus 325		0.02	0.24		
Plus 325	16.49	0.14	0.62	58.04	33.77
Minus 325	83.51	0.02	0.24	41.96	66.23
Calc. Head	100.00	0.04	0.30	100.00	100.00
Head Assay	"	"	0.08	0.32	

Overall Extraction (-325) + (+325)

	Au	Ag
Preg. Liquor	72.07	14.28
Residue	27.93	85.72
Head	100.00	100.00

...GINEERING DIVISION
...SEARCH DEPARTMENT

THE BOOTH COMPANY
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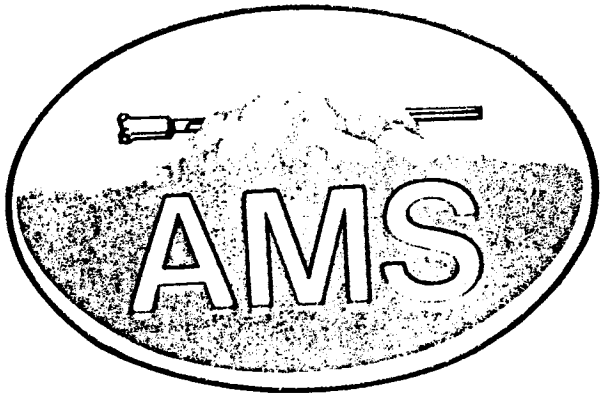
OUR LOT NO. 1894 TEST NO. 3

DATE 9/30/81 SM



TO

SHARON STEEL

FOR

ENGINEERING & COST STUDY

OF

THE GOLD ROAD MINE
MOHAVE COUNTY, ARIZONA

JANUARY 1987

AMERICAN MINE SERVICES, INC.

ENGINEERS
CONTRACTORS
DRILLERS
SERVING THE MINING INDUSTRY.

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1.0 EXECUTIVE SUMMARY

AMS has prepared an engineering and cost study for Sharon Steel of resuming gold mining operations at the Gold Road Mine. The principle elements of this study include: resources and reserves, mine development, mine operations, milling and economic analysis. The conclusions reached for each of those elements are as follows.

1.1 Resources and Reserves

AMS has accepted a series of calculations, completed in 1942, which show that some 456,000 tons of mineralized material at an average in-place grade of 0.325 oz Au per ton exist as "reserve blocks" within the mine workings. AMS calculates that an additional 330,000 tons of mineralized material, at a similar in-place grade, are located along strike as an eastern extension of the vein.

From these quantities, AMS has made a series of calculations and judgements resulting in the following conclusions:

1. 193,000 tons at a diluted grade of 0.31 oz Au per ton are believed to be recoverable from the 4975 raise area. This material is classified as an indicated reserve.
2. 360,000 tons at a diluted grade of 0.25 oz Au per ton are believed to be recoverable from the eastern extension of the vein. This material is classified as an inferred reserve.
3. The remaining material which might be recoverable from within the mine workings, approximately 275,000 tons at an average diluted grade of 0.21 oz Au per ton, is classified as an indicated resource because of constraints on access and economics.

The potential for discovery of additional resources in horizontal or vertical extensions of the vein is rated as good.

1.2 Mine Development

A three-phased program of mine development is proposed: I - Surface Drilling Program to explore possible horizontal extensions of the vein and to increase the level of confidence in the inferred reserve; II - 100 Level Exploration Program to bring such newly defined reserves of the upper levels into the indicated category; and III - Contract Development of a production shaft to the 700 level. The total cost of the program is estimated to be $4,618,000.00. Time requirements will be 19 months as shown in Figure 1.1.

The surface drilling program is estimated to require 6,000 to 14,000 feet of core drilling and to cost from $157,000.00 to $300,000.00 depending upon consistancy of results and degree of acceptable risk in committing to an underground program. The time requirement for Phase I is estimated to be three months.

The 100 level exploration program is designed to test the vein for continuity, to upgrade drilling resources to indicated reserves and to develop those reserves. Access to this 100 level development would be by means of a trackless decline. Alternative means of access such as rehabilitation of the Line Road Tunnel are judged to carry much greater risk in both schedule and cost. The total estimated cost of the 100 level exploration program is $1,830,000.00 and the time requirement is nine months.

The Phase III Contract Development Program is estimated to cost $2,630,000.00 and to require nine months to complete. This program includes a raise bored eight-foot production shaft from surface to 700 level and raise bored 6-foot orepass between the 100 and 700 levels. These elements would follow rehabilitation of the 4975 raise and dewatering of the mine.

1.3 Mining

A narrow-vein sublevel stoping system is proposed for mine operations. Initial activities would be concentrated in the area of the 4975 raise with ongoing development to the east. Mine capital costs are estimated to be $1,969,000.00 while operating costs are expected to be $32.44/ton. Mine production is planned at a rate of 350 tons of ore per day.

1.4 Milling

A 300 ton per day CCD cyanide mill is proposed, probably situated on the old mill site. A 95% recovery would be expected. Capital costs are estimated to be $2,415,000.00 and operating costs are estimated at $14.11/ton. No particular problems in permitting or operations are expected.

1.5 General

General and administrative capital is forecast to be $77,000.00. G&A operating cost is estimated at $10.89/ton.

1.6 Economic Analysis

Table 1.1 summarizes the estimated costs for the proposed operation and Table 1.2 sets forth a projected cash flow (Base Case).

This cash flow projects the following:

a.	Total Tons Mined	553,500	T
b.	Total oz. gold produced	167,463	oz.
c.	Project Operating Life	6.54	Years
d.	Break Even Point	1.82	Years
e.	Break Even Tonnage	140,700	T @ 0.335 oz/T
f.	Total Revenue	$ 66,985,300	
g.	Total Preproduction Capital	$ 9,078,600	
h.	Total Direct Expense	$ 31,393,800	
i.	Gross Profit	$ 26,512,900	
j.	Total Cost per Ounce Au	$ 241.68	
k.	Gross Profit per Ounce Au	$ 158.32	
l.	Before Tax DCFIRR	43.96	%

The cash flow analysis includes net present value calculations for convenient comparison.

To evaluate the project's economic sensitivity to possible changes in basic premises used by AMS, the Base Case Cash Flow has been varied in 10% increments from -20% to +20% for the following parameters.

1. Sale Price of Gold
2. Ore Grade Mined
3. Annual Production Rate
4. Total Available Reserves
5. Direct Operating Cost
6. Preproduction and Capital Costs

A summary of these evaluations are given in Table 1.3 and the resulting DCFIRR values for each of the six parameters are plotted in Figure 1.2.

The project is, as would be expected, most sensitive to either price changes in gold or ore grade mined. However, the project DCFIRR becomes zero (0) at a gold price of $242.00/oz or at an average ore grade of 0.192 oz/ton. Of the 3,100 haulage level samples west of the 4975 raise that were analyzed statistically, 84% of the samples had a grade in excess of 0.200 oz/ton. 84% of the exposed vein would then have an average mineable grade of 0.188 oz/ton (see Table 1.4).

The sensitivity of annual production variations closely parallels that of price and grade for the ranges used in the evaluation. Increases above those shown would require corresponding increases in capital. Up to +20% increase in annual production will not require significant capital cost increases.

The project is only marginally sensitive to capital and operating costs and is even less sensitive to changes in total available reserves.

1.7 Project Risks

The major economic risk at this time is the positive identification of sufficient ore and ore grade material to meet economic objectives. Economic break-even will occur at 150,000 to 180,000 tons of a grade of 0.32 oz/ton. There are 190,000 tons at 0.32 oz/ton of indicated (probable) ore reserves in the vicinity of the 4975 raise. Exploration core holes DDH1 and DDH2 intersected mineralized vein 500 and 1,200 feet east of these reserves. To reduce the overall risk, AMS has recommended a minimum of six additional surface drill holes in this reserve block. If these holes approach, within reasonable limits, the statistical averages of historic sampling, reopening and additional confirmation exploration expenses are warranted. Other ore sources may be available within the existing mine property that due to location or access problems have been excluded. If the property is brought into production, part of these sources may prove to be economic.

The property has an extensive history that is well documented. Mining conditions, ore dilution, ore continuity, etc., can be projected with a reasonable degree of accuracy. The same conclusion can be reached for ore treatment and gold recovery.

Mine operating costs are dependent upon reaching productivity levels as forecasted. The sublevel mining method used in this evaluation, although in use elsewhere, has not been used at the Gold Road property. However, the shrink stoping methods used at Gold Road would have direct operating costs very near the cost used in this evaluation.

Mill operating costs are based upon historic data upgraded to more modern practices and equipment and serious changes in operating costs or recovery has a relatively low probability.

TABLE 1.1

COST SUMMARY

Preproduction Expense		
Phase I - Surface Drilling		$ 157,369.00
Phase II - 100 Level Exploration		$ 1,641,605.00
Preproduction Studies		$ 189,000.00
Phase III - Contract Development		$ 2,557,967.00
Mill Site Costs		$ 72,000.00
TOTAL		**$ 4,617,941.00**
Capital Expenses		
General and Administration		$ 77,000.00
Mine		$ 1,968,860.00
Mill		$ 2,414,800.00
TOTAL		**$ 4,460,660.00**

Operating Cost	$/Ton	$/Oz
General and Administration	$ 10.89	$ 35.82
Mining	$ 32.44	$ 106.71
Milling	$ 14.11	$ 46.41
TOTAL	**$ 57.44**	**$ 188.94**

GOLD ROAD MINE - CASHFLOW SUMMARY - BASE CASE

ITEM			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	GRAND TOTAL
ORE PRODUCTION			10,936	16,406	19,688	21,875	68,906	87,500	87,500	87,500	87,500	87,500	47,094		553,500
GRADE ORE MINED			0.34	0.34	0.34	0.34	0.34	0.33	0.32	0.31	0.31	0.31	0.31		0.318
OUNCES GOLD MINED			3,719	5,578	6,694	7,438	23,428	28,875	28,000	27,125	27,125	27,125	14,599		176,277
OUNCES GOLD PRODUCED	@ % RECOVERY	95.00%	3,533	5,299	6,359	7,066	22,257	27,431	26,600	25,769	25,769	25,769	13,869		167,463
GROSS REVENUE	@ $/OZ	$400.00	$1,413,125	$2,119,688	$2,543,625	$2,826,250	$8,902,688	$10,972,500	$10,640,000	$10,307,500	$10,307,500	$10,307,500	$5,547,644		$66,985,331
DIRECT OPERATING EXPENSE															
GENERAL AND ADMINISTRATIVE															
SALARIES			$67,884	$67,884	$67,884	$67,884	$271,538	$271,538	$271,538	$271,538	$271,538	$271,538	$78,654		$1,707,885
EQUIPMENT AND MATERIALS			$26,097	$32,418	$37,757	$42,719	$138,991	$170,931	$161,255	$166,889	$160,097	$159,305	$98,966		$1,050,436
POWER			$78,006	$104,007	$130,009	$130,009	$442,032	$520,037	$520,037	$520,037	$520,037	$520,037	$279,892		$3,322,111
SUBTOTAL			$171,987	$204,310	$235,651	$240,613	$852,561	$962,507	$952,830	$952,465	$951,673	$950,881	$457,516		$6,080,432
MINE OPERATIONS															
SALARIES			$122,577	$122,577	$122,577	$122,577	$490,308	$490,308	$490,308	$490,308	$490,308	$490,308	$142,030		$3,043,876
INDIRECT LABOR			$150,555	$157,515	$164,475	$164,475	$637,020	$457,900	$457,900	$457,900	$457,900	$457,900	$190,577		$4,117,097
DIRECT LABOR			$127,100	$164,299	$199,567	$233,312	$724,277	$934,922	$862,189	$862,189	$855,733	$849,277	$188,699		$5,277,286
GEN AND ADMIN MATERIALS			$4,950	$4,950	$4,950	$4,950	$19,800	$19,800	$19,800	$19,800	$19,800	$19,800	$10,657		$129,457
INDIRECT EQUIP AND MATERIALS			$21,780	$23,820	$25,860	$27,900	$99,360	$111,600	$111,600	$111,600	$111,600	$111,600	$60,045		$717,425
DIRECT EQUIPMENT AND MATERIALS			$102,029	$131,506	$162,126	$194,345	$590,006	$781,208	$696,545	$696,545	$689,367	$682,188	$487,382		$4,623,267
SUBTOTAL			$528,991	$604,667	$679,555	$747,559	$2,560,772	$2,995,737	$2,838,342	$2,838,342	$2,824,707	$2,811,053	$1,079,415		$17,948,407
MILL OPERATIONS															
SALARIES			$42,856	$42,856	$42,856	$42,856	$251,424	$251,424	$251,424	$251,424	$251,424	$251,424	$72,831		$1,581,375
LABOR			$140,754	$140,754	$140,754	$140,754	$543,018	$563,018	$563,018	$563,018	$563,018	$563,018	$163,092		$3,541,198
GEN AND ADMIN EQUIP AND MATERIALS			$18,885	$27,278	$32,625	$36,450	$115,238	$142,475	$139,150	$135,825	$135,825	$135,825	$73,103		$877,440
DIRECT EQUIPMENT AND MATERIALS			$35,109	$52,644	$63,197	$70,219	$221,189	$280,675	$280,675	$280,675	$280,675	$280,675	$151,171		$1,776,735
SUBTOTAL			$257,605	$283,532	$299,432	$310,279	$1,150,868	$1,237,792	$1,234,467	$1,231,142	$1,231,142	$1,231,142	$460,197		$7,776,749
TOTAL DIRECT EXPENSE			$958,583	$1,092,529	$1,214,639	$1,298,450	$4,564,201	$5,196,036	$5,025,659	$5,021,968	$5,007,522	$4,993,075	$1,997,128		$31,805,588
PREPRODUCTION EXPENSES				PREPRODUCTION	YEAR 1	YEAR 2									
PHASE I					$157,369										$157,369
PHASE II					$1,641,605										$1,641,605
PREPRODUCTION CONSULTING					$189,000										$189,000
PHASE III						$2,557,967									$2,557,967
MILL SITE PREPARATION						$72,000									$72,000
SUBTOTAL					$1,987,974	$2,629,967									$4,617,941
CAPITAL EXPENSES															
GENERAL AND ADMINISTRATIVE						$77,000									$77,000
MINE						$1,968,860									$1,968,860
MILL						$2,357,400									$2,357,400
TAILINGS						$57,400									$57,400
SUBTOTAL						$4,460,660									$4,460,660
GROSS PROFIT							$4,338,487	$5,776,464	$5,614,341	$5,285,532	$5,299,978	$5,314,425	$3,550,516		$35,179,743
WORKING CAPITAL							($1,175,282)						$1,141,050		($34,232)
SALVAGE VALUE													$446,066		$446,066
TOTAL CASH FLOW					($1,987,974)	($7,090,627)	$3,163,205	$5,776,464	$5,614,341	$5,285,532	$5,299,978	$5,314,425	$5,137,632		$26,512,977
COST PER TON ORE							$66.24	$59.38	$57.44	$57.39	$57.23	$57.06	$42.41		$73.12
MARGIN PER TON ORE							$45.91	$66.02	$64.16	$60.41	$60.57	$60.74	$109.09		$47.90
COST PER OUNCE							$205.07	$189.42	$188.93	$194.89	$194.33	$193.76	$144.00		$241.68
MARGIN PER OUNCE							$142.12	$210.58	$211.07	$205.11	$205.67	$206.24	$370.44		$158.32

PROJECT DCFIRR		43.958%	
NET PRESENT VALUE	@	15.00%	$8,558,955
NET PRESENT VALUE	@	20.00%	$5,772,776
NET PRESENT VALUE	@	25.00%	$3,775,158
NET PRESENT VALUE	@	30.00%	$2,325,185
NET PRESENT VALUE	@	43.96%	$0.00

TABLE 1.3

SHARON STEEL - GOLD ROAD MINE

ECONOMIC ANALYSIS SUMMARY

RISK NUMBER	RISK TITLE	PRICE OF GOLD	GOLD GRADE	TONS OF ORE	OPERATING COST (1)	TOTAL CAPITAL (2)	GROSS REVENUE	GROSS PROFIT (3)	COST/ TON (4)	MARGIN/ TON	COST/OZ GOLD (4)	MARGIN/OZ GOLD (3)	DCFIRR (5)
1	BASE CASE	$400.00	0.318	553,500	$31,805,588	$9,078,601	$46,985,331	$26,512,977	$73.12	$47.90	$241.68	$158.32	43.958%
	PRICE FLUCTUATION												
2	80 % GOLD PRICE	$320.00	0.318	553,500	$31,805,588	$9,078,601	$53,588,265	$13,115,911	$73.12	$23.70	$241.68	$78.32	23.912%
3	90 % GOLD PRICE	$360.00	0.318	553,500	$31,805,588	$9,078,601	$60,286,798	$19,814,444	$73.12	$35.80	$241.68	$118.32	34.306%
4	110 % GOLD PRICE	$440.00	0.318	553,500	$31,805,588	$9,078,601	$73,683,864	$33,211,510	$73.12	$60.00	$241.68	$198.32	53.053%
5	120 % GOLD PRICE	$480.00	0.318	553,500	$31,805,588	$9,078,601	$80,382,398	$39,910,043	$73.12	$72.10	$241.68	$238.32	61.707%
	GRADE FLUCTUATION												
6	80 % ORE GRADE	$400.00	0.255	553,500	$31,805,588	$9,078,601	$53,588,265	$13,115,911	$73.12	$23.70	$302.10	$97.90	23.912%
7	90 % ORE GRADE	$400.00	0.287	553,500	$31,805,588	$9,078,601	$60,286,798	$19,814,444	$73.12	$35.80	$260.53	$131.47	34.306%
8	110 % ORE GRADE	$400.00	0.350	553,500	$31,805,588	$9,078,601	$73,683,864	$33,211,510	$73.12	$60.00	$219.71	$180.29	53.053%
9	120 % ORE GRADE	$400.00	0.382	553,500	$31,805,588	$9,078,601	$80,382,398	$39,910,043	$73.12	$72.10	$201.40	$198.60	61.707%
	PRODUCTION FLUCTUATION												
10	80 % ANNUAL TONNAGE	$400.00	0.318	553,500	$36,876,364	$9,078,601	$46,985,359	$21,540,267	$82.10	$38.92	$271.37	$128.63	31.014%
11	90 % ANNUAL TONNAGE	$400.00	0.318	553,500	$34,455,625	$9,078,601	$46,985,099	$23,911,727	$77.82	$43.20	$257.21	$142.79	37.442%
12	110 % ANNUAL TONNAGE	$400.00	0.318	553,500	$30,961,331	$9,078,601	$46,985,278	$27,308,161	$71.68	$49.34	$236.93	$163.07	49.512%
13	120 % ANNUAL TONNAGE	$400.00	0.318	553,501	$29,654,440	$9,078,601	$46,985,290	$28,566,025	$69.41	$51.61	$229.42	$170.58	55.337%
	TONNAGE FLUCTUATION												
14	80 % TOTAL TONNAGE	$400.00	0.321	442,800	$26,182,810	$9,078,601	$53,944,901	$19,095,324	$78.70	$43.12	$258.41	$141.59	40.676%
15	90 % TOTAL TONNAGE	$400.00	0.319	498,150	$29,350,426	$9,078,601	$50,445,131	$22,447,939	$76.32	$45.06	$251.50	$148.50	42.629%
16	110 % TOTAL TONNAGE	$400.00	0.318	608,850	$35,683,937	$9,078,601	$73,505,591	$29,154,887	$72.84	$47.89	$241.35	$158.65	44.602%
17	120 % TOTAL TONNAGE	$400.00	0.317	664,200	$38,851,051	$9,078,601	$80,025,821	$32,508,003	$71.54	$48.94	$237.51	$162.49	45.359%
	COST FLUCTUATION												
18	80 % DIRECT COST	$400.00	0.318	553,500	$28,322,724	$9,078,601	$46,985,331	$29,999,827	$66.82	$54.20	$220.86	$179.14	49.148%
19	90 % DIRECT COST	$400.00	0.318	553,500	$30,063,922	$9,078,601	$46,985,331	$28,256,402	$69.97	$51.05	$231.27	$168.73	46.566%
20	110 % DIRECT COST	$400.00	0.318	553,500	$33,547,224	$9,078,601	$46,985,331	$24,769,552	$76.27	$44.75	$252.09	$147.91	41.322%
21	120 % DIRECT COST	$400.00	0.318	553,500	$35,288,920	$9,078,601	$46,985,331	$23,026,126	$79.42	$41.60	$262.50	$137.50	38.658%
	CAPITAL FLUCTUATION												
22	80 % CAPITAL COST	$400.00	0.318	553,500	$31,805,588	$7,262,881	$46,985,331	$28,239,484	$70.00	$51.02	$231.37	$168.63	54.630%
23	90 % CAPITAL COST	$400.00	0.318	553,500	$31,805,588	$8,170,741	$46,985,331	$27,376,230	$71.56	$49.46	$236.52	$163.48	48.824%
24	110 % CAPITAL COST	$400.00	0.318	553,500	$31,805,588	$9,986,461	$46,985,331	$25,649,723	$74.68	$46.34	$246.83	$153.17	39.804%
25	120 % CAPITAL COST	$400.00	0.318	553,500	$31,805,588	$10,894,321	$46,985,331	$24,786,470	$76.24	$44.78	$251.99	$148.01	36.204%

(1) TOTAL DIRECT SITE COST
(2) INCLUDES ALL PHASES OF EXPLORATION AND PREPRODUCTION EXPENSES AND TOTAL CAPITAL COST
(3) AFTER CAPITAL IS RECAPTURED
(4) INCLUDES CAPITAL & DIRECT OPERATING COSTS
(5) BEFORE TAXES

TARGET RESERVE ESTIMATION

TABLE 1.4

GRADE RANGE	ACTUAL PERCENT	PERCENT X GRADE	ACCUM GRD X %	ACCUM GRADE	ACCUM %	INPLACE AVER GRADE	DILUTED GRADE TO MILL 0.70	TARGET TONS 623,769.60	PROBABLE PLUS TARGET 206,000.00	AVER MINED GRADE 0.32
1.00	0.458	0.458	0.458	1.00	0.4583	1.000	0.700	2,859	208,859	0.325
0.95	0.542	0.515	0.973	1.95	1.0000	0.973	0.681	6,238	212,238	0.321
0.90	0.583	0.525	1.498	2.85	1.5833	0.946	0.662	9,876	215,876	0.336
0.85	0.583	0.496	1.994	3.70	2.1667	0.920	0.644	13,515	219,515	0.340
0.80	0.417	0.333	2.327	4.50	2.5833	0.901	0.631	16,114	222,114	0.343
0.75	0.458	0.344	2.671	5.25	3.0417	0.878	0.615	18,973	224,973	0.345
0.70	0.958	0.671	3.342	5.95	4.0000	0.835	0.585	24,951	230,951	0.349
0.65	1.958	1.273	4.615	6.60	5.9583	0.774	0.542	37,166	243,166	0.354
0.60	1.833	1.100	5.715	7.20	7.7917	0.733	0.513	48,602	254,602	0.357
0.55	2.542	1.398	7.112	7.75	10.3333	0.688	0.482	64,456	270,456	0.359
0.50	1.750	0.875	7.987	8.25	12.0833	0.661	0.463	75,372	281,372	0.358
0.45	4.458	2.006	9.994	8.70	16.5417	0.604	0.423	103,182	309,182	0.354
0.40	2.833	1.133	11.127	9.10	19.3750	0.574	0.402	120,855	326,855	0.350
0.35	6.250	2.187	13.315	9.45	25.6250	0.520	0.364	159,841	365,841	0.339
0.30	6.917	2.075	15.390	9.75	32.5417	0.473	0.331	202,985	408,985	0.325
0.25	10.542	2.635	18.025	10.00	43.0833	0.418	0.293	268,741	474,741	0.305
0.20	12.625	2.525	20.550	10.20	55.7083	0.369	0.258	347,492	553,492	0.281
0.15	13.417	2.012	22.562	10.35	69.1250	0.326	0.228	431,181	637,181	0.258
0.10	15.250	1.525	24.087	10.45	84.3750	0.285	0.200	526,306	732,306	0.234
0.05	14.167	0.708	24.796	10.50	98.5417	0.252	0.176	614,673	820,673	0.212

AMERICAN MINE SERVICES, INC.

SHARON STEEL - GOLD ROAD MINE

PREPRODUCTION SCHEDULE

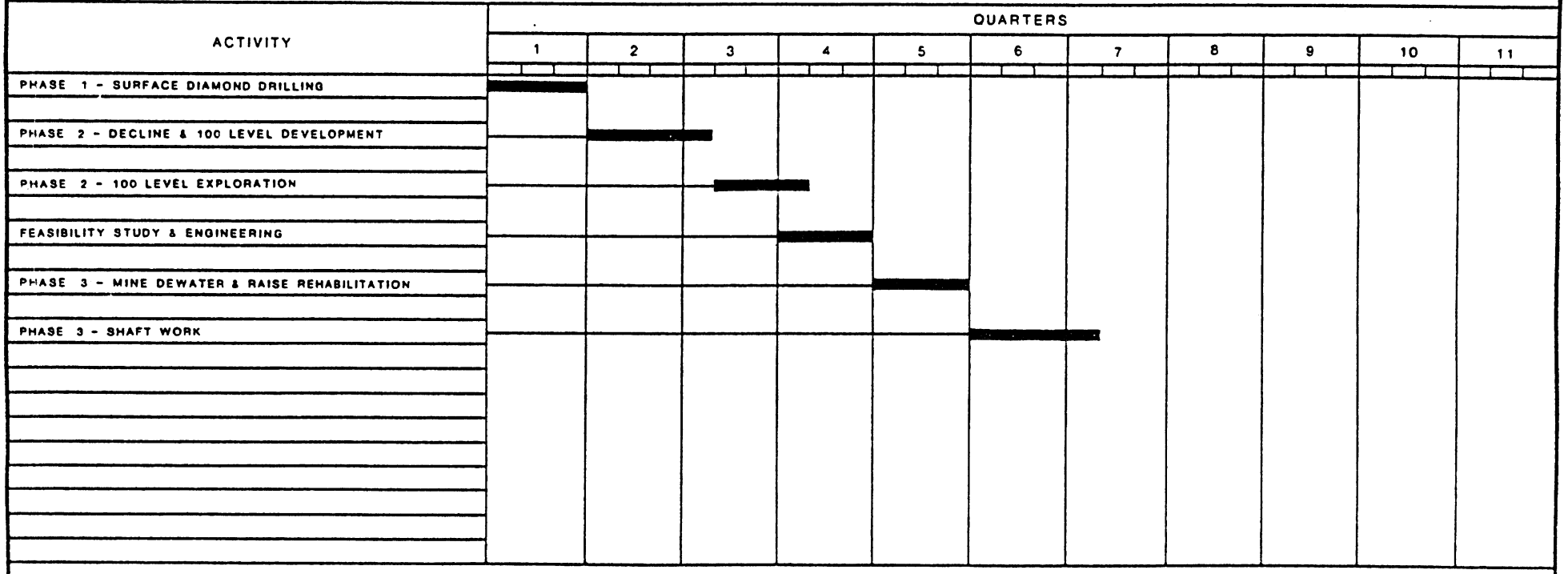
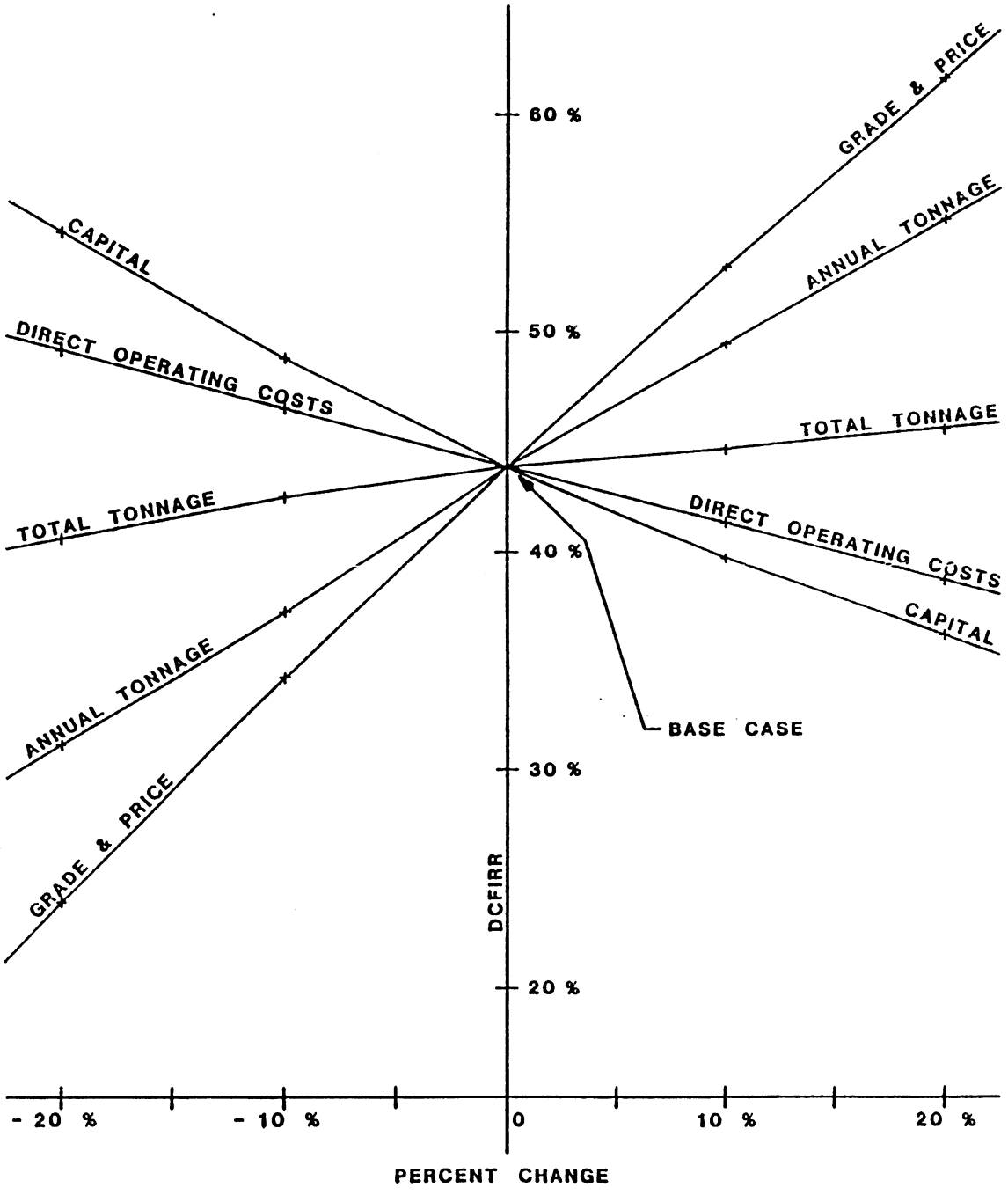


FIGURE 1.1

SENSITIVITY ANALYSIS

DCFIRR VS % CHANGE



* DCFIRR = DISCOUNTED CASH FLOW INTERNAL RATE OF RETURN

FIGURE 1.2

2.0 INTRODUCTION

In accordance with a proposal dated October 1, 1986, American Mine Services has prepared an engineering and cost study of proposed operations at the Gold Road Mine. This mine operated during several periods in the past, most recently in 1942, and achieved a total production of approximately 600,000 ounces of gold. Production was primarily from underground on a steeply-dipping vein extending some 7,000 feet in length and at depths up to 1,200 feet. The mine workings are currently inaccessable.

2.1 Location and Access

The Gold Road Mine is located in Mohave County, Arizona, approximately twenty-five miles west of Kingman, Arizona, at an elevation of 3,000 feet. The mine area is characterized by barren, rugged topography and straddles a narrow paved road between Kingman and Oatman (see Figure 2.1).

2.2 Terms of Reference

This engineering and cost study is based upon the following parameters.

1. Sharon Steel provided AMS with a variety of information, reports, drawings, etc., largely historical, as listed in Appendix B - Bibliography. All of this material is currently on file in the Sharon Steel office in Denver, Colorado.

2. Sharon Steel personnel contributed most of the report sections on history, geology and land status as well as portions of other sections dealing with the proposed drilling program and environmental considerations. Their assistance in compiling this information is gratefully acknowledged.

3. AMS personnel have visited and examined the mine site, mill site and surrounding area.

4. The performances of men and equipment upon which much of the costing is based are in conformance with the experience of AMS in similar situations. All costs are in 1986 dollars.

5. As the mine workings are not currently accessable, check sampling of the old workings was not possible.

6. The economic evaluations prepared by AMS do not include consideration of off-site costs such as royalty, home office overhead or refining. Some of these costs may be offset to some degree by silver credits which were also not included.

LOCATION MAP

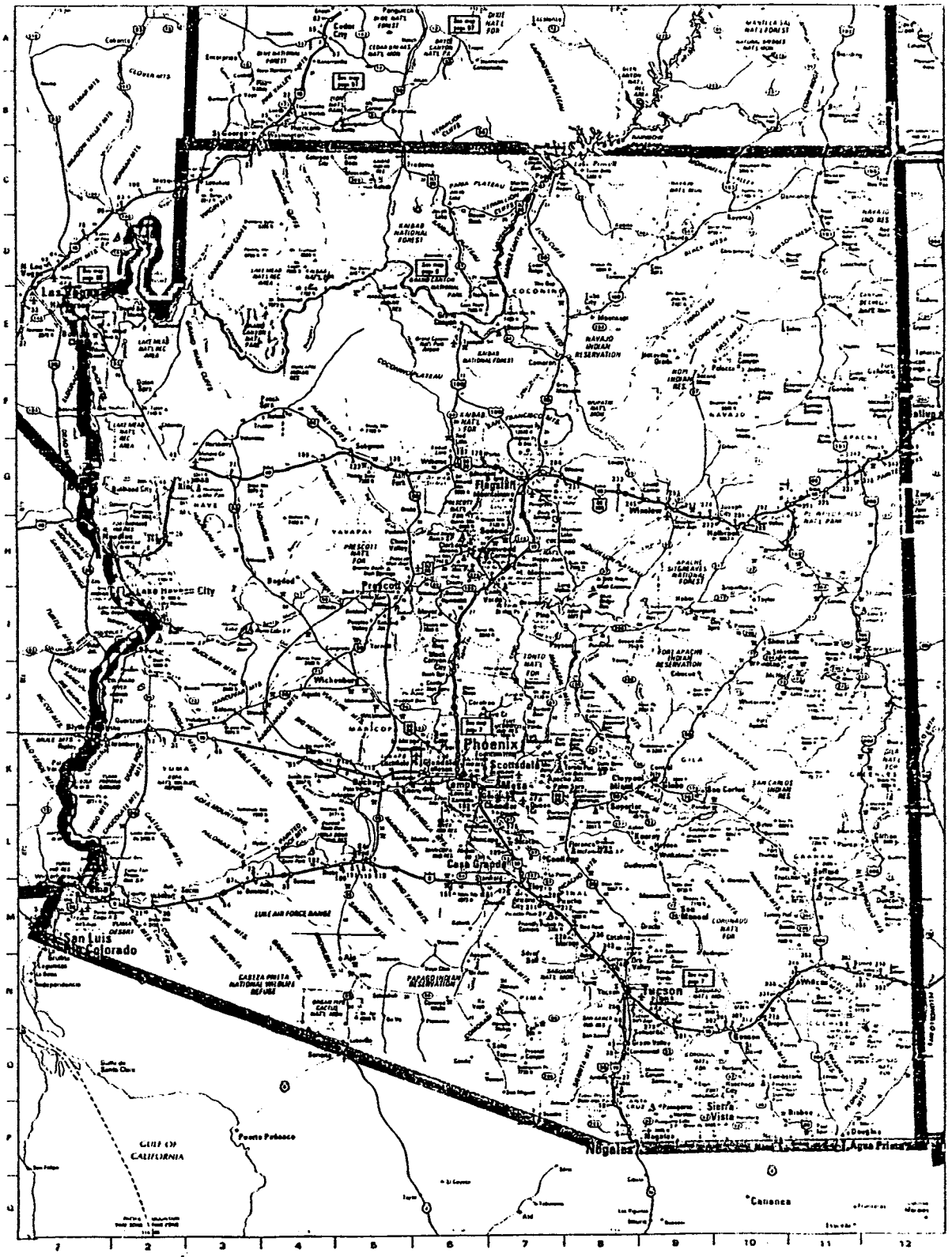


FIGURE 2.1 A

LOCATION MAP

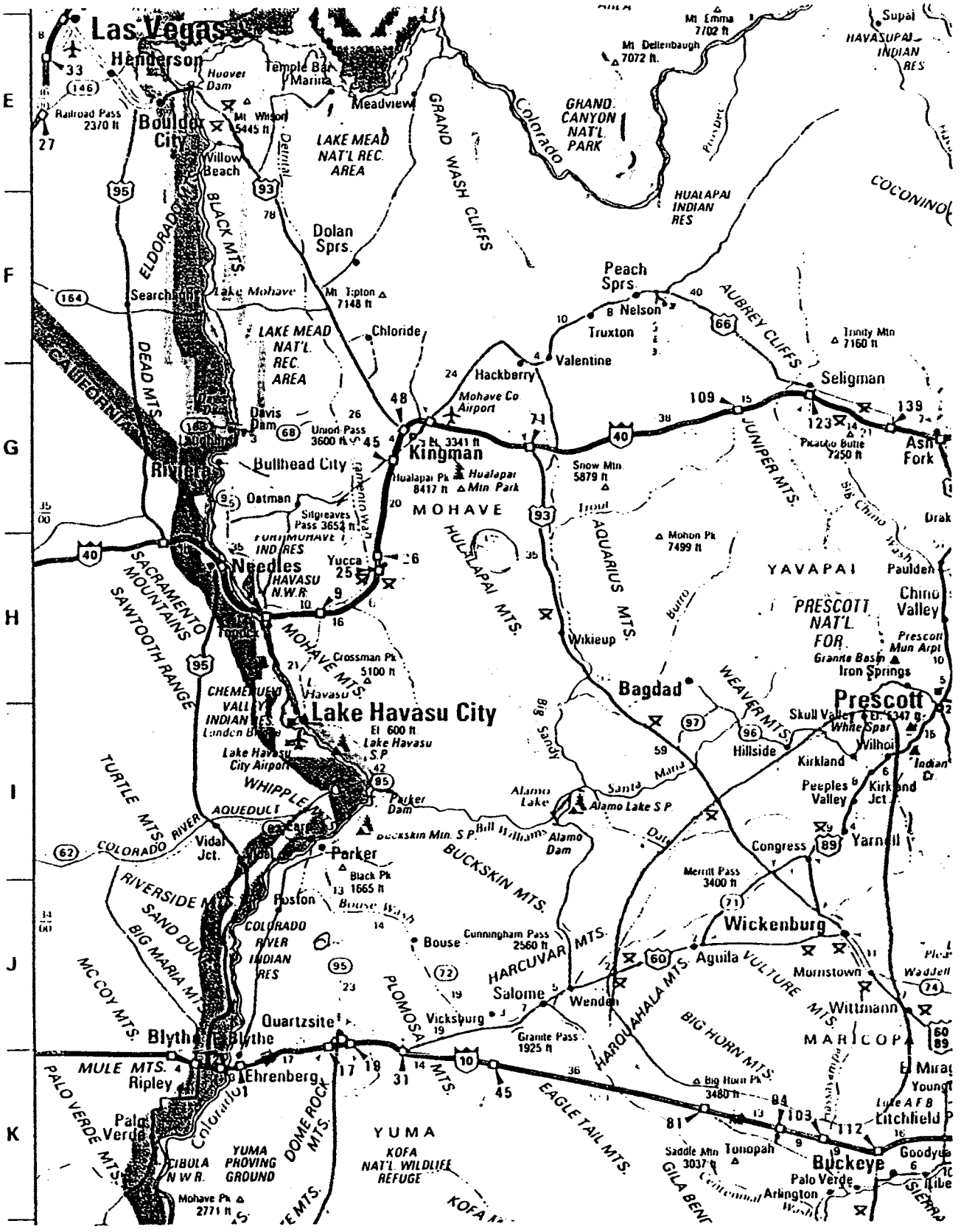


FIGURE 2.1 B

3.0 HISTORY

Prospecting activity in the San Francisco Mining District, also known as the Oatman Mining District, Mohave County, Arizona, began in the early 1860's by soldiers from Camp Mohave situated on the Colorado River. In 1863 or 1864, John Moss was reported to have taken $240,000 worth of gold from a pocket on the Moss Vein. The Hardy, Leland and Gold Dust veins were located soon afterward, but the bold outcrops of the Tom Reed and Gold Road veins remained untested for many years. The 1866 outbreak of the Hualpai Indians resulted in abandonment of the district for several years.

The initial location on the Gold Road vein was made in 1902 by Joe Jeneres, a Mexican prospector, who had been grubstaked by Henry Lovin of Kingman. Lovin and Jeneres sold the property to Joseph Burkhardt for $50,000, who, after a short period of operation, sold the mine to Posey, Bayly and McCormick for $275,000. Shortly thereafter Posey formed the Gold Road Mining and Exploration Company, the stock of which was controlled by an American-French syndicate with offices in Los Angeles, California and Paris, France.

The mining method employed by this company and all subsequent operators was shrinkage stoping. In later years a dilution of 25% was shown to be normal, with an average 4.7 feet vein width and an average 6.3 feet mining width.

Initially, a dry crushing mill operated by gasoline engines was built, but proved to be unsatisfactory; subsequently, (prior to February 1911) a sliming plant was installed. Here, the initial crushing was done by eight batteries of five stamps each, the ore being stamped in a cyanide solution. Ensuing processing involved two classifiers, tube mills, three Pachuca tanks, Butters filter, precipitation tanks and a pressure filter. This was a straight cyanide process; no attempt was made to recover values by amalgamation.

The property was taken over by USSR&M Co. in July 1911 and operated into 1916. At the time of take over, the mine had been developed by five shafts, with eight levels established off of No. 1 Incline, the main working shaft. Work during the 1911-1916 period included establishing the 900 level.

Lessees operated the property during 1917-1922.

During the 1923-1924 period, the mining done by USSR&M Co. was limited to mining ore that was above the water level which was a little below the 300 level. This ore, from the southeastern part of the mine was removed through the Line Road Tunnel. During the 1925-1928 period, production was again by lessees.

R.T. Walker, Chief Geologist for USSR&M Co., examined the Gold Road Mine and submitted a report dated June 30, 1932. Due to the subsequent increase in the price of gold from $20.67 per ounce to $35.00 per ounce, Walker, in a March 30, 1935 report, recommended rehabilitating the mine and conducting an exploration program. Within six months ore was being shipped to Oatman, the old French Company processing plant having been removed. By 1937 a mill was erected on the property and was operational. During 1941, the last full year of operation, there was an average of 423 tons milled daily.

After closure in August 1942, by Government Order L-208, the mining and milling installations were removed, a good portion being transported to the Company's Bayard Department, New Mexico, where the mill was installed and modified to mill zinc ore. Other portions were sold, with all material removed by the end of 1954, leaving only foundations and a few crumbling rock walls. Activity since has consisted only of performing assessment work by road and drill site building and a limited amount of surface diamond drilling. Three claims, not contiguous to the remaining claims, have necessitated trench excavations for assessment work. Periodic reviews of the feasibility of reopening the property have been conducted in view of the marked increase in the price of gold.

The following table summarizes Historical production at the Gold Road Mine.

Historical Production, Gold Road Mine

Operator	Period	Tonnage	Au Oz's/Ton	Ag Oz's/Ton
Gold Road Mining & Exploration Co. (American & French)	1903-1911	327,165	0.60	N/A
USSR&M Co.	1911-1916	500,104	0.37	0.35
Lessees	1917-1922	352	0.44	N/A
USSR&M Co.	1923-1924	60,965	0.60	N/A
Lessees	1925-1928	2,847	0.63	N/A
USSR&M Co.	1935-1942	800,000	0.24	0.19
TOTAL		1,691,433	0.36	

4.0 GEOLOGY OF THE OATMAN DISTRICT

The Oatman District lies on the western flank of the Black Mountains, a fault-bounded Tertiary volcanic sequence composed of trachyte, andesite, latite, rhyolite and basalt situated at the southern end of the Basin and Range province. The Black Mountains show little erosion on the eastern flank, but are deeply eroded on the western flank where exposures of Precambrian basement rock are found in the western margin and north end of the district. Evidence strongly suggests the volcanic center is in the Oatman area. From this position the lava flows, tuffs and agglomerates accumulated to a thickness of 4,000 to 5,000 feet.

R.T. Walker, past Chief Geologist of USSR&M Co., divided the earliest emissions into three parts. The lowest, the "Alcyone trachyte," rests on the Precambrian basement and is overlain by the "Oatman andesite." It in turn is overlain by the "Gold Road latite." He contends that "these extrusives are probably differentiates of the same underlying magma, as both chemically and mineralogically the differences between them are not large -- the separation having been made primarily to facilitate geological mapping, rather than as indicating any strongly marked stratigraphic breaks."

Later, extrusive activity produced rhyolitic and latitic lavas and tuffs, and at this time the Sitgreaves tuff which overlies the Gold Road latite was formed. Walker contends that auriferous mineralization occurred following these eruptions, which was in turn followed by an eruptive capping of "basalt which probably originated from a group of craters some miles to the east of Oatman."

North-south faulting after the cessation of volcanic activities, is believed to have elevated the area, creating the Black Range fault block with its gentle easterly dip. The general strike of all major faults in the district is northwesterly-southeasterly and it is in these that the productive veins have formed (see Plate 1: Geology of the Oatman District). These faults show normal offsets, the Gold Road and Tom Reed having 300 to 500 feet of vertical displacement. The dip direction varies, with the Tom Reed structure and those east of it dipping easterly, while in the western and southern part of the district, a southwesterly dip is more predominant.

There are twenty-three identified vein systems in the seven mile north-south extent of the Oatman District. Of these, the Gold Road Vein, the Tom Reed Vein and the United Eastern Vein, a split of the latter, have been the major producers.

The veins can, at times, be simple structures consisting of quartz and calcite with well-defined walls. Most of the ore deposits, however, are lodes which consist of a large number of variable width stringers separated from each other by barren rock, which when traversed by a sufficient number of mineralized veinlets may constitute ore. In addition to quartz and calcite, the vein gangue may include lesser amounts of adularia and fluorite.

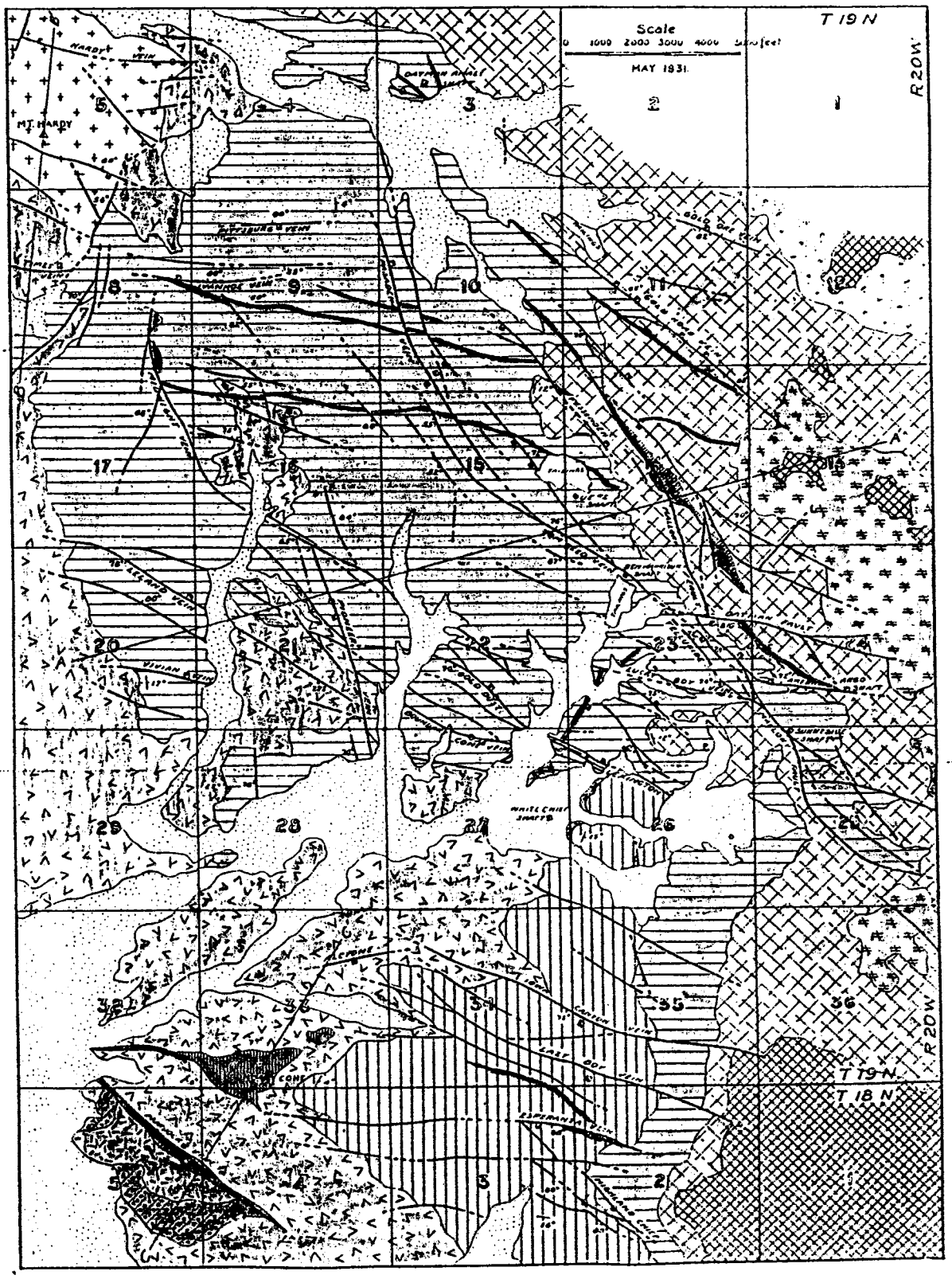
GEOLOGIC MAP OF THE
OATMAN DISTRICT
MOHAVE COUNTY, ARIZONA.

LEGEND

Pre-Cambrian | Tertiary | Quaternary

Extrusive | Intrusive

Granite—Gneiss, etc. | Murdock Breccia | Alcyone Trachyte | Esperanza Trachyte | Oatman Andesite | Gold Road Latite | Antelope Rhyolite | Silgreaves Tuff | Olivine Basalt | Times Porphyry | Rhyolite Porphyry | Gravel & Sand



5.0 GEOLOGY OF THE GOLD ROAD MINE

The Gold Road Vein occupies a strong, compound normal fault fissure, typical of the district. This structure was formed by several separate movements, before, during and after auriferous mineralization. Walker contends that the original break was somewhat sinuous with the strike varying from about N50°W to N60°W, dipping 65° to 85° to the northeast, with a horizontal component of motion southeasterly on the hanging wall side. Succeeding movements tended to coincide with the original break and thus form a simple fissure where the strike was about N60°W, and to depart from it and form a multiple fissure zone where the strike was nearer N50°W. This resulted in wide zones of quartz and calcite lenses alternating with sections of narrow veins. The commercial ore was limited to the lenses, but the distribution of the gold within the lenses themselves was shown to be very erratic.

The Gold Road vein traverses three formations, the Oatman andesite being the lowest, the Gold Road latite overlying it and the Sitgreaves tuff at the top. There is no abrupt change in the vein size at the different contacts, but the vein gradually narrows as it extends upward from a maximum width of 30 feet in the Oatman andesite to only a few inches in the Sitgreave tuff. Ore has been found where the host rock is both the Oatman andesite and the Gold Road latite. A 200 foot or so layer in the Gold Road latite, known as the "Red Sill," has established an upper limit to the ore. and rakes 25° or so to the southeast. The 150 to 200 feet of Gold Road latite overlying it has been but sparsely prospected and may have some ore potential.

Despite the varying vein widths, a realistic average mining width of 6.3 feet, (vein width of 4.7 feet plus 1.6 feet of dilution), was shown in later years.

A crossfault offsets the Gold Road Vein in the northwest part of the mine; at time of closure, the offset portion had not been located.

The mineralogy of the Gold Road Vein is typical of the district. As stated by Walker, gold in adularia is rather uncommon, yet a thin section of some rich ore from the Gold Road Mine showed a parallel intergrowth of quartz grains and plates of adularia. Free gold as thin wires in this specimen traversed both minerals. Much of the vein quartz in the mine is of third stage deposition as described in University of Arizona Bulletin 131.

Gold is the most valuable constituent of the ore, and is always alloyed with silver. High grade ore frequently showed free gold in quartz layers less than one-tenth of an inch in thickness. Coarse gold is rarely found. Gold considered to be primary in origin is of a pale, brassy color, and contains approximately 20 percent silver by weight. Gold believed to be secondary is of a deep brassy yellow color and occurs as loose flakes and wires in vugs with the oxides of iron and manganese. This secondary gold is almost always in larger particles than the primary. A large amount of the gold was found associated with silver in electrum.

Both the Gold Road latite and the Oatman andesite hosted orebodies, with the latter showing most of the ore in the district. The individual orebodies have been large, from 50,000 to over 500,000 tons in size, from 3 to 45 feet in width, from 100 to over 1,600 feet along strike and from 200 to over 1,000 in depth. Along the Tom Reed and Gold Road veins the ore shoots occur at periodic intervals.

Lausen and others recognized the epithermal mode of deposition. Fischer-Watt geologists conducted fluid inclusion studies which substantiate the boiling zone premise. Considering the fact that in this district only two of the orebodies, the Ben Harrison and the Gold Road, cropout, it follows that a thorough understanding of and application of such techniques will improve the odds of finding ore. The process of vein contouring, to disclose the deviation of a vein from a perfect plane was applied by the Fischer-Watt staff. This permitted them to identify periodicity, rake, width and depth control on various structures.

6.0 LAND STATUS

The Gold Road property consists of eighteen patented, contiguous lode claims totalling 271.89 acres, four separate patented millsites totalling 18.71 acres, seven separate unpatented millsites, twenty-eight unpatented lode claims, four leased unpatented lode claims, and water rights associated with certain millsite claims and a spring. The lode claims are located along the trend of the Gold Road Vein and cover a block of ground approximately 18,000 feet long and averaging around 2,000 feet wide. Various unpatented and patented millsite claims are located at distances of up to one mile in a northerly and easterly direction from the claim block. Three unpatented claims are located along the trend of the vein approximately one half mile southeast of the main block and are separated from it by a tract of private land (see Figure 6.1).

A complete list of all of the claims located at Gold Road and controlled or owned by Sharon Steel is given in the Table 6.1.

TABLE 6.1

Patented (18) Lode	Mineral Survey No.
Gold Dollar Ext.	1699A
Gold Dollar	1699A
Silver Dollar	1699A
Tip Top	1699A
Houghton	1699A
Gambler	1699A
Robbie	1699A
Climax	1699A
Comet	2240A
Iron Rod	2240A
Tom Tit	2240A
Fraction	2240A
Eclipse	2240A
Gold Road	1699A
Line Road	1699A
Billy Bryan	1699A
Railroad	2440
Last Chance	2440

Patented (4) Millsites	Mineral Survey No.
Gold Road	1699B
Line Road	1699B
Billy Bryan	1699B
Tom Tit	2240B

Unpatented (7) Millsites	BLM Serial Number
Bull Run	A-MC 35909
Climax	A-MC 35910
Gold Brook	A-MC 36911
Railroad	A-MC 35912
Surprise	A-MC 35913
Tip Top	A-MC 35914
Infallible	A-MC 35915

TABLE 6.1
(CONTINUED)

Unpatented - Leased (4)	BLM Serial Number
Red Top	A-MC 35951
Red Top Extension	A-MC 35952
Red Top Extension No. 1	A-MC 35953
Red Top Extension No. 2	A-MC 35954
Unpatented (28)	
Houghton Annex	A-MC 35929
Houghton Annex No. 1	A-MC 35930
Marble Fraction	A-MC 35936
Latite Fraction No. 1	A-MC 35934
Latite Fraction No. 2	A-MC 35935
Latite No. 4	A-MC 35931
Latite No. 5	A-MC 35932
Latite No. 6	A-MC 35933
G.R.1	A-MC 35916
G.R.2	A-MC 35917
G.R.3	A-MC 35918
G.R.4	A-MC 35919
G.R.5	A-MC 35920
G.R.6	A-MC 35921
G.R.7	A-MC 35922
G.R.8	A-MC 35923
G.R.9	A-MC 35924
G.R.10	A-MC 35925
G.R.11	A-MC 35926
G.R.12	A-MC 35927
G.R.13	A-MC 35928

TABLE 6.1
(CONTINUED)

Unpatented (28) (Continued)	BLM Serial Number
G.R.16	A-MC 12799
G.R.17	A-MC 12800
G.R.18	A-MC 12801
G.R.19	A-MC 12802
G.R.15	A-MC 12798
G.R.20	A-MC 13713
G.R.21	A-MC 13714

Water Rights

Bull Run Millsite
Climax Millsite
Surprise Millsite
Antelope Spring

The twenty-eight owned unpatented claims and four leased unpatented claims are held by right of location. A minimum expenditure of one hundred dollars in improvements is required on each claim each year in order to continue to hold the claims. Failure to comply with required expenditures and recordation requirements would result in loss of the property.

6.1 Leased Property

Four unpatented claims known as the Red Top group are held by lease from Gold Road Red Top Mining Company, an Arizona corporation. The lease was signed October 1, 1972, for an initial term of 15 years and may be extended for an additional term of 15 years beginning October 1, 1987, and ending October 1, 2002. There is no provision for any additional extension.

The Lease calls for a minimum work commitment of fifty man-shifts of work or equivalent expenditures during each six month period in which the lease is in force. The work shifts are cumulative and excessive shifts or shift equivalents may be carried forward and used to fulfill requirements during succeeding terms.

The Lease calls for monthly royalty payments based upon the average of the gross value per dry ton of gold and silver contained in such ores. The royalty begins at a minimum of $0.25 per dry ton on ores valued at below $15.00 per ton and increases in equal increments of 1% royalty for each $5.00 increase in value from 3% royalty on ores with a gross value of $15.01 to $20.00 per dry ton to 20% on all ores with a gross value over $100.00 per ton. The lease did not contain a provision for adjustment due to inflation and, thus, what was a moderately reasonable rate in 1972, is now highly unfavorable.

6.2 Water Rights

Many of the patented and unpatented millsite claims listed in Table 6.1, at Gold Road are located over natural springs. During past operations, water was collected from these various springs and piped to the Gold Road Mill for use. Water from Indian Springs on the Billy Bryan Millsite and from the "Little Meadows Well" on the Gold Road Millsite has been maintained in beneficial use by agreements with nearby residents. The status of water rights on various other millsites is not known.

The company owned water rights without a corresponding millsite claim on Antelope Spring. Whether this right is still valid is not known.

7.0 RESERVES AND RESOURCES

A variety of sampling and reserve calculation data exists for the Gold Road Mine. A complete set of consistent data is not available, however, and the mixture of techniques and methodologies does not provide absolute confidence in the accuracy of the existing data. Detailed sampling data, for example, on the most recently developed area of the mine was reported to have been lost during a move of corporate headquarters. Nevertheless, AMS believes that the available data provides a reasonable base from which certain general, overall conclusions may be drawn.

In discussing the tenor and quantity of mineralized material identified and designated by the data base to occur within the Gold Road Mine, AMS prefers to refer to this material in accordance with the definitions set forth by the U.S. Bureau of Mines and the U.S. Geological Survey in Geological Survey Circular 831 (see Appendix A). In a very general way, these definitions reflect decreasing degrees of geologic certainty with the terms measured, indicated and inferred, and decreasing degrees of economic certainty with the terms reserve and resource. For purposes of clarity, AMS has sometimes added certain modifiers to those terms. These modifiers include such words as in-place and mine recoverable.

Detailed calculations of the quantity and grade of mineralized material occuring within the mine were prepared after closure of the mine in 1942. These calculations set forth a total of "sight ore" of 456,138 tons at an average grade of 0.325 oz Au per ton. AMS has accepted this total quantity as an in-place resource and has subdivided that total into several categories as shown in Table 7.1.

The derivation of these quantities as well as the potential for increasing them and their confidence level is discussed in the following paragraphs.

7.1 In-Place Resources

In-place resources are deemed to be those fully or partially developed blocks of "ore" occurring within the existing workings of the Gold Road Mine. In general, these blocks are defined reasonably well on at least one side. Figure 7.1 illustrates the location of these blocks. Table 7.2 summarizes their grade and tonnage. Figure 7.2 presents an assessment of the quantity and grade of those blocks above a given minimum block grade.

To use Figure 7.2, select a minimum block grade; pass horizontally to left hand scale for total tonnage of all blocks which exceed that grade; pass horizontally to curve and down to lower scale for average grade of all blocks which exceed the given minimum block grade.

Thus, in the example shown, at a minimum block grade of 0.30 oz/ton, the blocks exceeding that grade total 225,000 tons and have an average grade of 0.42 oz/ton.

Grade and tonnage determinations for the indicated resource blocks are based, largely, on a reserve summary dated 01/01/42. This summary appears to have been prepared from a combination of a 1936 estimate adjusted for a tonnage factor changed from 12 to 13 cubic feet per ton for stopes not worked during the 1936-1942 period and from then-current data for worked stopes. Additional data is available from an undated stope map which provides the only information on the most easterly portion of the mine. It is not known if this map reflects the resource situation at the time of the mine closure or at some point prior to closure. A letter signed by C.B.E. Douglas and dated September 13, 1945, sets the then-present "ore reserves" to be 456,138 tons at a grade of 0.325 ounces Au per ton. These "reserves" were based upon a cutoff grade of 0.17 oz Au per ton. The principal portion of the data base in use during the 1936-1942 period was obtained from earlier work by a D.R. Muir and consisted of channel samples of the vein taken at 5.0-foot intervals. The mine superintendent during the 1936-1942 period, Mr. L.H. Duriez attempted to confirm that earlier work by taking a number of his own samples and comparing them with the earlier samples. That comparison is shown in Table 7.3. Since the Duriez samples were taken at intervals much greater than 5.0 feet, a certain amount of variation is to be expected in individual comparisons.

The primary difference in the two sets of samples is in vein width with the Duriez samples averaging 4.3 feet and the earlier samples averaging 5.5 feet. Overall, the Duriez samples indicate about 18 percent less mineral than the earlier samples.

Because the mine workings are not currently accessable, AMS has not been able to independently confirm, by sampling, the data provided. AMS has, however, compiled several statistical analyses of the channel sample data as a means of checking for anomalies which might invalidate the data. Typically, trace metal deposits, such as Gold Road, exhibit a characteristic log normal distribution of grades. AMS has prepared several sample distribution graphs which plot grade vs. frequency. These graphs (Figures 7.3 through 7.6) indicate that the grade of the Gold Road channel samples have the log normal frequency distribution expected. This indication is based on the bell shaped curve distribution shown in Figure 7.5 and the straight line (for all but very high grade material) shown in Figure 7.6.

AMS has also compiled a preliminary continuity analysis in the form of a variogram (Figure 7.7). In essence, the variogram is a plot of sample variation vs. distance. The results for Gold Road indicate sample variation increasing up to a distance of about 60 feet and then leveling off. This indicates continuity of mineralization over a distance of 60 feet (along strike); a reasonable distance for this type of deposit.

AMS has also contoured all the channel sample data; again, in an attempt to validate the sample data. Notably, most higher grade zones coincided exactly with stoped areas.

Through these various validation processes, AMS has come to have a high degree of confidence in the data provided.

7.1.1 Accessability/Economic Classification

The in-place resources of the Gold Road Mine occur in three groups: a cluster of partially-developed/exploited reserve blocks in the area of the 4975 raise; a long string of small undeveloped reserve blocks below the 700 level; and scattered remnents of reserve blocks above the 700 level.

IN-PLACE RESOURCE SUMMARY

Area	In-Place Tons	In-Place Grade (Oz/Ton)
4975 Raise	178,991	0.408
Below 700 Level	84,824	0.297
Above 700 Level	174,327	0.245

As set forth in Section 8.0 of this report, AMS has proposed a mine development sequence which concentrates most of the future operation of the mine in the area of the 4975 raise. Thus, resources in that area will be more easily accessable than those occuring in other areas of the mine. Given the relatively high (0.408 oz/ton) grade of these resources and the mining and milling costs developed in Sections 9.0 and 10.0, AMS believes that the mine recoverable portion of the reserve blocks of the 4975 raise area are appropriately classified as an indicated reserve.

The reserve blocks located below the 700 level will require extensive rehabilitation efforts for access as well as substantial below level development for exploitation. These costs along with a moderate grade render these quantities less likely to be exploited than those of the 4975 raise area. Reserve blocks above the 700 level and outside of the 4975 raise area are generally remnents of previously mined blocks and may present particular difficulties in access and exploitation; their grade is generally low. AMS believes that questions of access and cost place reserve blocks outside of the 4975 raise area into an indicated resource category.

Details of each resource group are shown in Tables 7.4, 7.5 and 7.6, and Figures 7.8, 7.9 and 7.10.

7.2 Inferred Reserves

The inferred reserves assigned to the Gold Road Mine are predicated, primarily, upon two diamond drill holes, collared on surface,which intersect the easterly portion of the vein at an elevation of approximately 2,700 feet.

DDH2 cut 4.8 feet of 0.28 Au at a point 555 feet ahead of and 50 feet above the 500 level southeast heading which was stopped in ore. DDH1 cut 4.0 feet of 0.125 Au at a distance of 1,200 feet ahead of the same drift face at the same elevation as the showing in DDH2. These intercepts are on the ground leased from the Gold Road Red Top Mining Company (see Figure 7.11).

The western portion of this area of inferred reserves is defined by the limit of level development off of the 4975E raise. Only composite data is available in this area; individual sample data being reported as lost during a move of corporate headquarters. This composite data is summarized in the following table.

This composite data when combined with the two drillhole intersections results in an average vein width of 4.85 feet and an average grade of 0.321 ounces Au per ton. These results are remarkably close to the in-place resource average figures of 4.6 feet and 0.32 ounces Au per ton.

Considering an area between the Line Road and 700 levels from about 5300E to about 6600E as shown in Figure 7.11, an inferred reserve of some 330,000 tons may be calculated. This calculation is based on the following parameters: area: 886,250 square feet; vein width: 4.85 feet; and tonnage factor: 13 cubic feet per ton.

7.3 Previous Reserve Calculations

The following is a summary of the techniques and methods of calculation of ore reserves at the Gold Road Mine as was devised and used during the various periods of operations. These techniques, together with various experience factors that were applied to make adjustments, proved to be a relatively accurate method of forecasting both tons and grade.

7.3.1 Sampling

Channel samples were cut at right angles across the full width of the vein at close spaced, regular intervals. Sampling was conducted along the vein on all levels, in raises, and on sublevels in areas where the observed vein appeared to contain possible values. Sections of the vein which were thought to be barren were checked by samples taken at wider intervals to make sure this was indeed the case. The samples were pulvarized, split and assayed for gold using fire assay techniques. The silver content of the ore was low and usually predictable from the gold assays so only spot check determinations were made.

7.3.2 Block Calculation Methods

Samples along the vein were grouped into ore and waste areas according to the cut-off grade which had been established by the break even cost in mining and milling operations. No blocks with an average grade below 0.17 ounces of gold per ton were included in the reserve. Isolated waste samples in an ore section were included

with the ore if the samples did not dilute the ore below cutoff grade and if it was necessary to remove such material in order to facilitate mining.

The average grade of a block was calculated by multiplying the width (vein width) of a sample by the length (the sum of half the distance from a sample to the next sample on either side) and then multiplying this number by the gold content. The numbers thus derived for each sample were added together and the sum was divided by the sum of all of the length times width numbers. The result was a weighted average of gold content for all samples within the block and was used as the average block grade.

Ore reserve blocks were plotted on vein longitudinal sections and volumes were calculated by multiplying average vein width by total length of and height the block. This would give cubic feet of ore within the block which could then be converted to tons by dividing by 13 (the number of cubic feet of typical Gold Road ore that is equivalent to one ton). Measurements of block width and length were derived from actual measurement along the mine entry. The height of the block was usually projected to be 50 feet unless additional information indicated that a shorter or longer projection was justified.

The average grade of all blocks was calculated by multiplying the tons in each block by the grade and then dividing the sum by the total tons.

7.3.3 Reserve Categories

Reserves were divided into two main categories designed to reflect the certainty with which the blocks should be viewed. Sight ore consisted of all ore blocks exposed, sampled, and open for examination on at least one side in the mine workings. Possible ore consisted of ore projected in blocks beyond the end of sight blocks into areas where reserves might be reasonably expected to continue but which had not yet been explored.

Sight ore reserves were futher subdivided into three categories: blocks exposed on one side, blocks exposed on two sides, blocks on three or more sides. The accuracy with which each block can be calculated is, of course, increased as it is exposed on additional sides.

7.3.4 Adjustment Factors

The above described methods were used to estimate the total undiluted ore reserves at Gold Road. In the process of mining a reserve such as this, the actual production grade was usually lower than reserve grade and tonnage was usually higher. This is due to dilution.

It was found in detailed studies conducted by Mr. Elgin at Gold Road in 1940 and 1941 that cut samples of stope ore averaged 88.52% of the grade of "vein-in-place" channel samples used to estimate the ore blocks. Overbreak (dilution) for the two year period averaged 1.27 feet (21.9%) for an average 7.06 foot stope width on veins with an average 5.79 foot width. Adjusted grade (using the 88.52% factor) for overbreak material was found to average 0.027 ounces per ton in gold. The average grade of silver in the reserves was calculated by using the ratio of silver to gold (1.181 to 1) for the five year period of 1937 through 1941.

7.3.5 Reported Reserves

Undiluted ore reserves as reported at the closure of the mine in 1942 are listed below.

	Grade Tons	Oz. Per Ton
Sight Ore	456,138	0.325
Possible Ore	413,061	0.325
TOTAL	869,199	0.325

When the above described adjustment and correction factors are applied to the closure estimate, the reserve would appear as follows as calculated by Mr. J.B. Knaebel.

	Tons	Sampled Grade Ounces	Channel Sample Correction Factor	Corrected Grade Ounces
Sight Ore				
Estimated	456,138	0.325	88.52%	0.288
Overbreak @ 21.93%	100,031	0.031	88.52%	0.027
Total Diluted	556,169			0.241
Possible Ore				
Estimated	413,061	0.325	88.52%	0.288
Overbreak @ 21.93%	90,584	0.031	88.52%	0.027
Total Diluted	503,645			0.241
Grand Total	**1,059,814**			**0.241**

Average Silver at 1.181 to 1 = 0.284 ounces

It should be remembered that the above numbers represent reserves at mine closure. Some of the areas in which these reserves are located have now been caved and inaccessible for many years. Other portions of the reserve may be too narrow or too low grade to consider for mining when using modern techniques. While AMS accepts the "sight ore" calculations as a reasonable expectation of potential resources, sufficient data is not available on the calculation of "possible ore" for us to accept the reported figure.

7.6 Potential Expansion of Reserve

The ore reserve estimates mentioned throughout this report should not be viewed as final figures but only as estimated based upon the then prevailing or now available data.

The Gold Road Vein has possible unexplored extensions in both the northwesterly and southeasterly directions. To the northwest, the vein is concealed beneath the surface gravels of a broad gulch. This area was not acquired until 1945 and, although it covers approximately 3,000 feet of potentially favorable ground, it has not yet been prospected by drilling.

To the southeast, large bodies of ore have been found at depth below surface outcrops that give little or no indication of the magnitude of ores that might be expected. Drilling and underground exploration has not yet determined the extent to which these ores may continue to the southeast and it is, therefore, possible that large new bodies of ore might be found in this direction.

It is considered that exploratory drilling in both of these directions would have a reasonable probability of success.

7.7 Target Reserve Discussion

When the mine was operating, the vein system was systematically sampled on ± five foot centers along haulage levels. Grade histograms of this information were developed (see Figure 7.3). If the structure and mineralization continue without significant change, the histogram can be used as a forecasting tool. Table 7.8 develops the historic ore grade above a series of cutoff points, the accumulative percentage of samples above each cutoff and the diluted grade expected as mill feed. Assuming a reserve target zone to the east of the existing workings with dimensions of 640 feet vertical (below the 100 level) and 2,000 feet horizontal, the potential target tonnage is calculated. Target plus the existing probable reserve tonnage and grade are given for each cutoff grade.

In order to assess the possibilities of continuity to the east, AMS prepared a trend analysis of the available channel samples as shown in Figure 7.12. For the area studied (-1,000 E to 4,600 E), the grade appears to increase and the thickness appears to decrease; both in an easterly direction. AMS has also included in this study, but under seperate cover, contour maps of this channel sample data.

Sufficient data is not available for AMS to develop a target reserve projection to the west of the existing mine workings. The "Target Reserve" projection to the east is, of course, an alternative outlook to the inferred resources previously calculated, and is not additive to those resources.

The "Probable" tonnage used as the base to develop the "Target Reserve" was compiled from the resources in the vicinity of the 4975 raise (see Table 7.4).

TABLE 7.1

RESERVE/RESOURCE SUMMARY

Area	Tons	In-Place Grade (Oz/Ton)	Diluted Tons	Diluted Grade (Oz/Ton)	Mine * Recoverable Tons	Reserve/ Resource Category
4975 Raise	178,991	0.408	241,159	0.31	193,000	Indicated Reserve
Below 700 Level	84,824	0.297	109,587	0.24	88,000	Indicated Resource
Above 700 Level	174,327	0.245	234,031	0.19	187,000	Indicated Resource
Unknown	17,996	0.406	XX	XX	XX	---
TOTAL	**456,138**	**0.325**	**584,777**	**0.25**	**468,000**	
Eastern Extension	330,000	0.32	440,000	0.25	360,000	Inferred Reserve

* At 80 Percent Recovery

TABLE 7.2

IN-PLACE RESOURCES

BLOCK	TONS	ASSAY
10	1748	0.210
11	1084	0.173
14	471	0.700
18	3618	0.297
26	4038	0.256
27	1574	0.261
29	13331	0.239
30	1253	0.413
32	2615	0.425
33	7682	0.353
34	2108	0.422
41	5038	0.224
42	3521	0.186
43	2775	0.233
44	3935	0.304
45	3920	0.239
46	12156	0.242
47	5612	0.248
48	2430	0.371
50	1938	0.260
51	1483	0.345
56	2572	0.162
57	6179	0.258
58	4188	0.233
61	9608	0.230
63	246	0.203
64	4861	0.240
65	2215	0.378
66	3890	0.340
67	4410	0.242
68	8237	0.304
69	2734	0.202
70	1353	0.226
71	1560	0.304
73	2217	0.309
76	950	0.315
77	2343	0.526
79	2328	0.224
81	1934	0.181
82	2324	0.382
84	1155	0.283
85	493	0.234
86	916	0.234
87	1439	0.459
88	1360	0.308
90	4803	0.235
92	3836	0.221
93	7978	0.281
94	3468	0.162
95	1549	0.362
96	4418	0.188
97	1786	0.237
104	3337	0.346
105	1800	0.241
106	5925	0.309
111	1954	0.264
112	4203	0.263
113	755	0.301
114	2721	0.943
115	555	0.187
117	3989	0.308
118	2729	0.204
126	1388	0.150
130	24306	0.220
131	3510	0.191
132	4850	0.194
134	1511	0.305
135	1632	0.305
141	2071	0.262
143	6493	0.314
144	5463	0.180
147	557	0.360
150	11235	0.329
151	1352	0.332
152	1343	0.322
153	3445	0.193
155	2278	0.250
157	8951	0.351
160	3088	0.707
161	574	0.215
163	6586	0.271
164	2716	0.384
165	1245	0.290
166	1568	0.289
170	1939	0.195
171	7002	0.273
172	39242	0.571
173	12096	0.469
174	1372	0.203
175	4361	0.232
176	5319	0.316
178	17450	0.356
179	1943	0.345
181	27610	0.352
186	21784	0.404
TOTAL	443016	0.324

TABLE 7.3

	DURIEZ SAMPLES			EARLY SAMPLES					
NUMBER CUTS	AVE. WIDTH	AVE. GRADE	NUMBER CUTS	AVE. WIDTH	AVE. GRADE	DURIEZ G x T	EARLY G x T	RATIO D/E
5	1.96	0.281	16	2.45	0.282	0.55	0.69	0.80
10	2.30	0.492	14	2.40	0.315	1.13	0.76	1.50
3	3.51	0.237	23	5.26	0.128	0.83	0.67	1.24
6	3.85	0.239	35	5.62	0.147	0.92	0.83	1.11
2	2.23	0.265	8	4.80	0.085	0.59	0.41	1.45
8	6.45	0.360	36	5.20	0.280	2.32	1.46	1.59
7	2.53	0.544	24	3.42	0.277	1.38	0.95	1.45
6	4.09	0.378	27	5.89	0.167	1.55	0.98	1.57
5	7.47	0.340	24	6.83	0.347	2.54	2.37	1.07
3	4.67	0.225	18	5.44	0.213	1.05	1.16	0.91
6	7.56	0.328	42	7.47	0.438	2.48	3.27	0.76
3	8.45	0.159	14	5.67	0.205	1.34	1.16	1.16
5	2.87	0.226	21	5.85	0.300	0.65	1.76	0.37
3	3.00	0.397	13	5.50	1.142	1.19	6.28	0.19
8	3.80	0.309	27	5.37	0.176	1.17	0.95	1.24
14	4.15	0.112	45	5.82	0.109	0.46	0.63	0.73
3	3.26	0.315	14	6.64	0.156	1.03	1.04	0.99
2	7.50	0.526	15	5.96	0.315	3.95	1.88	2.10
6	5.70	0.224	14	6.03	0.182	1.28	1.10	1.16
7	4.42	0.181	21	5.66	0.115	0.80	0.65	1.23
8	7.15	0.382	17	6.94	0.448	2.73	3.11	0.88
2	3.15	0.283	19	6.65	0.658	0.89	4.38	0.20
3	1.93	0.234	12	5.45	0.164	0.45	0.89	0.51
6	3.35	0.081	24	4.43	0.121	0.27	0.54	0.51
2	1.82	0.091	7	2.71	0.426	0.17	1.15	0.14
6	2.68	0.120	25	4.02	0.101	0.32	0.41	0.79
4	4.35	0.308	14	6.60	0.218	1.34	1.44	0.93
AVERAGE	4.30	0.287		5.50	0.270	1.24	1.51	0.82

TABLE 7.4

4975 RAISE AREA RESERVE BLOCK ANALYSIS

BLOCK NO.	ACCESSABILITY CODE	BLOCK TONS	BLOCK GRADE	VEIN THKNESS	DILUTED THKNESS	DILUTED TONS	DILUTED GRADE
32	B	2615	0.425	1.92	4.00	5,448	0.218
33	B	7682	0.353	2.72	4.22	11,918	0.237
34	A	2,108	0.422	2.42	4.00	3,484	0.266
48	C	2430	0.371	3.43	4.93	3,493	0.266
150	B	11,235	0.329	4.48	5.98	14,997	0.253
151	A	1,352	0.332	4.00	5.50	1,859	0.249
157	A	8,951	0.351	3.36	4.86	12,947	0.251
163	A	6,586	0.271	4.15	5.65	8,966	0.206
164	A	2,716	0.384	5.37	6.87	3,475	0.306
165	C	1245	0.290	4.15	5.65	1,695	0.220
166	C	1568	0.289	5.37	6.87	2,006	0.232
171	B	7,002	0.273	5.53	7.03	8,901	0.221
172	A	39,242	0.571	3.78	5.28	54,814	0.416
173	A	12,096	0.469	4.34	5.84	16,277	0.355
176	A	5,319	0.316	5.33	6.83	6,816	0.253
178	A	17,450	0.356	8.74	10.24	20,445	0.308
181	A	27,610	0.352	6.39	7.89	34,091	0.290
186	A	21,784	0.404	4.22	5.72	29,527	0.305
IN-PLACE TONS		178991					
AVERAGE GRADE IN-PLACE			0.408				
AVERAGE THICKNESS				4.86			
AVERAGE DILUTED THICKNESS					6.37		
DILUTED TONS						241159	
DILUTED GRADE							0.309

ACCESSABILITY CODES

A	GOOD
B	POSSIBLE
C	DOUBTFUL

TABLE 7.5

ABOVE 700 LEVEL RESERVE BLOCK ANALYSIS

BLOCK NO.	ACCESSABILITY CODE	BLOCK TONS	BLOCK GRADE	VEIN THICKNESS	DILUTED THICKNESS	DILUTED TONS	DILUTED GRADE
10	C	1748	0.210	1.92	4.00	3,642	0.115
11	C	1084	0.173	3.00	4.50	1,626	0.124
14	C	471	0.700	2.51	4.01	752	0.448
18	C	3618	0.297	3.01	4.51	5,421	0.207
26	A	4,038	0.256	3.44	4.94	5,799	0.186
27	C	1574	0.261	3.41	4.91	2,266	0.190
29	A	13,331	0.239	4.00	5.50	18,330	0.181
30	C	1253	0.413	3.48	4.98	1,793	0.297
41	C	5038	0.224	4.65	6.15	6,683	0.176
42	C	3521	0.186	6.09	7.59	4,388	0.155
43	A	2,775	0.233	3.29	4.79	4,040	0.168
44	C	3935	0.304	10.10	11.60	4,519	0.268
45	C	2920	0.239	3.85	5.35	4,058	0.180
46	A	12,156	0.242	4.48	5.98	16,226	0.188
47	A	5,612	0.248	4.55	6.05	7,462	0.193
50	C	1938	0.260	3.72	5.22	2,719	0.193
51	C	1483	0.345	2.74	4.24	2,295	0.232
56	A	2,572	0.162	5.58	7.08	3,263	0.133
57	A	6,179	0.258	4.18	5.68	8,376	0.197
58	C	4188	0.233	6.34	7.84	5,179	0.194
61	A	9,608	0.230	5.30	6.80	12,327	0.185
86	A	918	0.234	1.93	4.00	1,898	0.127
87	C	1439	0.459	4.76	6.26	1,892	0.355
93	C	7978	0.281	4.00	5.50	10,970	0.212
94	A	3,468	0.162	5.55	7.05	4,405	0.133
95	A	1,549	0.362	6.20	7.70	1,924	0.297
96	A	4,418	0.188	6.06	7.56	5,512	0.156
117	C	3989	0.308	5.91	7.41	5,001	0.251
118	C	2729	0.204	4.03	5.53	3,745	0.156
126	C	1388	0.150	5.55	7.05	1,763	0.124
130	A	24,306	0.220	5.35	6.85	31,121	0.178
132	C	4850	0.194	5.82	7.32	6,100	0.160
134	A	1,511	0.305	3.56	5.06	2,148	0.223
135	C	1632	0.305	3.56	5.06	2,320	0.223
141	C	2071	0.262	4.52	6.02	2,758	0.203
143	C	6493	0.314	5.93	7.43	8,135	0.256
144	C	5463	0.180	3.00	4.50	8,195	0.129
147	A	557	0.360	5.57	7.07	707	0.289
155	C	2278	0.250	5.36	6.86	2,916	0.201
161	C	574	0.215	3.20	4.70	843	0.155
174	A	1,372	0.203	6.24	7.74	1,702	0.169
175	A	4,361	0.232	4.01	5.51	5,992	0.176
179	C	1943	0.345	3.33	4.83	2,818	0.246
IN-PLACE TONS		174,327					
AVERAGE GRADE IN-PLACE			0.245				
AVERAGE THICKNESS				4.77			
AVERAGE DILUTED THICKNESS					6.19		
TOTAL TONS						234,031	
DILUTED GRADE							0.189

ACCESSABILITY CODES

A	GOOD
B	POSSIBLE
C	DOUBTFUL

TABLE 7.6

BELOW 700 LEVEL RESERVE BLOCK ANALYSIS

BLOCK NO.	ACCESSABILITY CODE	BLOCK TONS	BLOCK GRADE	VEIN THKNESS	DILUTED THKNESS	DILUTED TONS	DILUTED GRADE
63	B	246	0.203	2.95	4.45	371	0.144
64	B	4861	0.240	6.14	7.64	6,049	0.198
65	B	2215	0.378	4.09	5.59	3,027	0.284
66	B	3890	0.340	7.47	8.97	4,671	0.288
67	A	4,418	0.242	4.29	5.79	5,963	0.185
68	A	8,237	0.304	6.03	7.53	10,286	0.249
69	A	2,734	0.202	6.07	7.57	3,410	0.167
70	B	1353	0.226	2.87	4.37	2,060	0.158
71	A	1,560	0.304	3.68	5.18	2,196	0.224
73	B	2217	0.309	3.80	5.30	3,092	0.229
76	B	950	0.315	3.26	4.76	1,387	0.224
77	B	2343	0.526	7.50	9.00	2,812	0.443
79	B	2328	0.224	5.70	7.20	2,941	0.183
81	B	1934	0.181	4.42	5.92	2,590	0.142
82	B	2324	0.382	7.15	8.65	2,812	0.320
84	B	1155	0.283	3.15	4.65	1,705	0.200
85	B	493	0.234	1.93	4.00	1,022	0.127
88	B	1360	0.308	4.35	5.85	1,829	0.236
90	B	4883	0.235	11.72	13.22	5,508	0.211
92	B	3836	0.221	5.94	7.44	4,805	0.182
104	B	3337	0.346	11.20	12.70	3,784	0.308
105	B	1800	0.241	5.40	6.90	2,300	0.194
106	B	5925	0.309	5.55	7.05	7,526	0.249
111	B	1954	0.264	3.91	5.41	2,704	0.198
112	B	4203	0.263	4.51	6.01	5,601	0.204
113	B	755	0.301	3.70	5.20	1,081	0.222
114	B	2721	0.943	4.22	5.72	3,688	0.703
115	B	555	0.187	5.16	6.66	716	0.151
131	B	3510	0.191	4.50	6.00	4,680	0.150
152	B	1343	0.322	4.80	6.30	1,783	0.252
153	B	3445	0.193	4.23	5.73	4,667	0.150
170	B	1939	0.195	4.66	6.16	2,583	0.154
IN-PLACE TONS		84824					
AVERAGE GRADE IN-PLACE			0.297				
AVERAGE THICKNESS				5.79			
AVERAGE DILUTED THICKNESS					7.29		
DILUTED TONS						109587	
DILUTED GRADE							0.236

ACCESSABILITY CODES

A	GOOD
B	POSSIBLE
C	DOUBTFUL

TABLE 7.7

COMPOSITE SAMPLE DATA

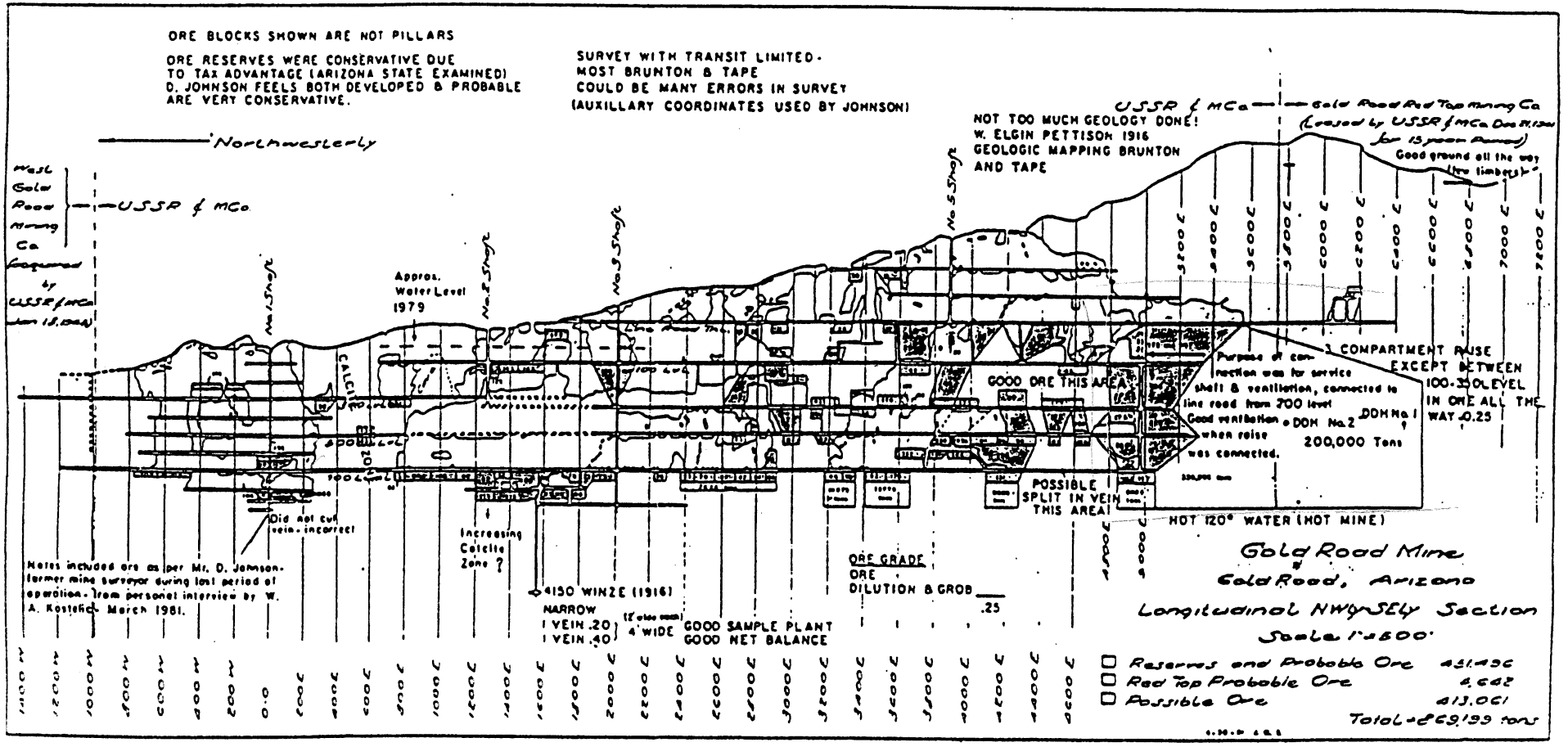
DEVELOPMENT LEVELS EAST OF 4975 RAISE

Level	Average Vein Width (Feet)	Average Vein Grade (oz. AU/Ton)
Line Road	3.38	0.341
100	4.90	0.515
350	3.81	0.364
500	8.79	0.360
700	4.25	0.193

TARGET RESERVE ESTIMATION

TABLE 7.8

GRADE RANGE	ACTUAL PERCENT	PERCENT X GRADE	ACCUM GRD X %	ACCUM GRADE	ACCUM %	INPLACE AVER GRADE	DILUTED GRADE TO MILL 0.70	TARGET TONS 623,769.60	PROBABLE PLUS TARGET 206,000.00	AVER MINED GRADE 0.32
1.00	0.458	0.458	0.458	1.00	0.4583	1.000	0.700	2,859	208,859	0.325
0.95	0.542	0.515	0.973	1.95	1.0000	0.973	0.681	6,238	212,238	0.331
0.90	0.583	0.525	1.498	2.85	1.5833	0.946	0.662	9,876	215,876	0.336
0.85	0.583	0.496	1.994	3.70	2.1667	0.920	0.644	13,515	219,515	0.340
0.80	0.417	0.333	2.327	4.50	2.5833	0.901	0.631	16,114	222,114	0.343
0.75	0.458	0.344	2.671	5.25	3.0417	0.878	0.615	18,973	224,973	0.345
0.70	0.958	0.671	3.342	5.95	4.0000	0.835	0.585	24,951	230,951	0.349
0.65	1.958	1.273	4.615	6.60	5.9583	0.774	0.542	37,166	243,166	0.354
0.60	1.833	1.100	5.715	7.20	7.7917	0.733	0.513	48,602	254,602	0.357
0.55	2.542	1.398	7.112	7.75	10.3333	0.688	0.482	64,456	270,456	0.359
0.50	1.750	0.875	7.987	8.25	12.0833	0.661	0.463	75,372	281,372	0.358
0.45	4.458	2.006	9.994	8.70	16.5417	0.604	0.423	103,182	309,182	0.354
0.40	2.833	1.133	11.127	9.10	19.3750	0.574	0.402	120,855	326,855	0.350
0.35	6.250	2.187	13.315	9.45	25.6250	0.520	0.364	159,841	365,841	0.339
0.30	6.917	2.075	15.390	9.75	32.5417	0.473	0.331	202,985	408,985	0.325
0.25	10.542	2.635	18.025	10.00	43.0833	0.418	0.293	268,741	474,741	0.305
0.20	12.625	2.525	20.550	10.20	55.7083	0.369	0.258	347,492	553,492	0.281
0.15	13.417	2.012	22.562	10.35	69.1250	0.326	0.228	431,181	637,181	0.258
0.10	15.250	1.525	24.087	10.45	84.3750	0.285	0.200	526,306	732,306	0.234
0.05	14.167	0.708	24.796	10.50	98.5417	0.252	0.176	614,673	820,673	0.213



IN-PLACE RESOURCES

FIGURE 7.1

GOLD ROAD MINE

SUMMARY OF 1942 RESERVE BLOCKS

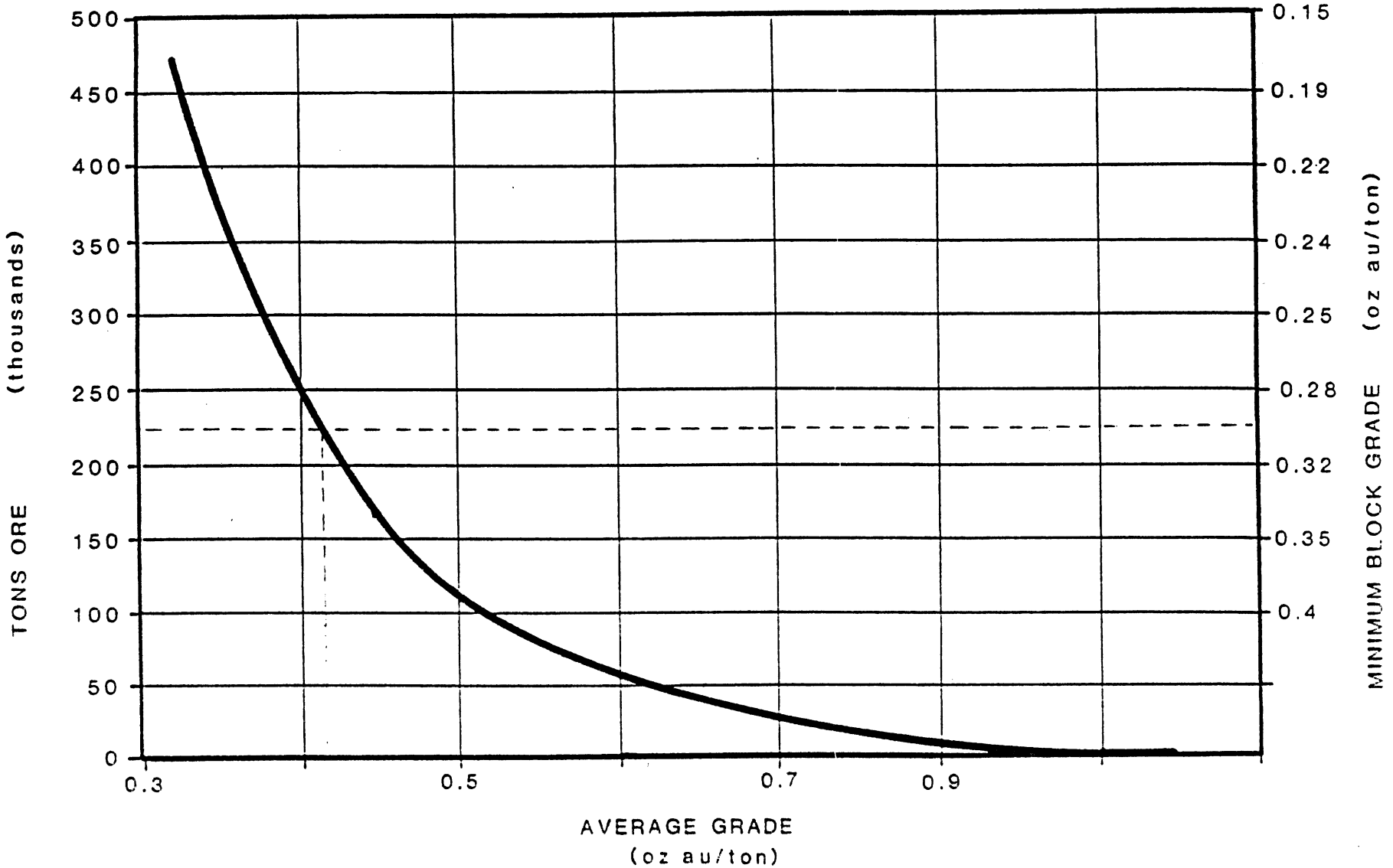


FIGURE 7.2

AMERICAN MINE SERVICES, INC.

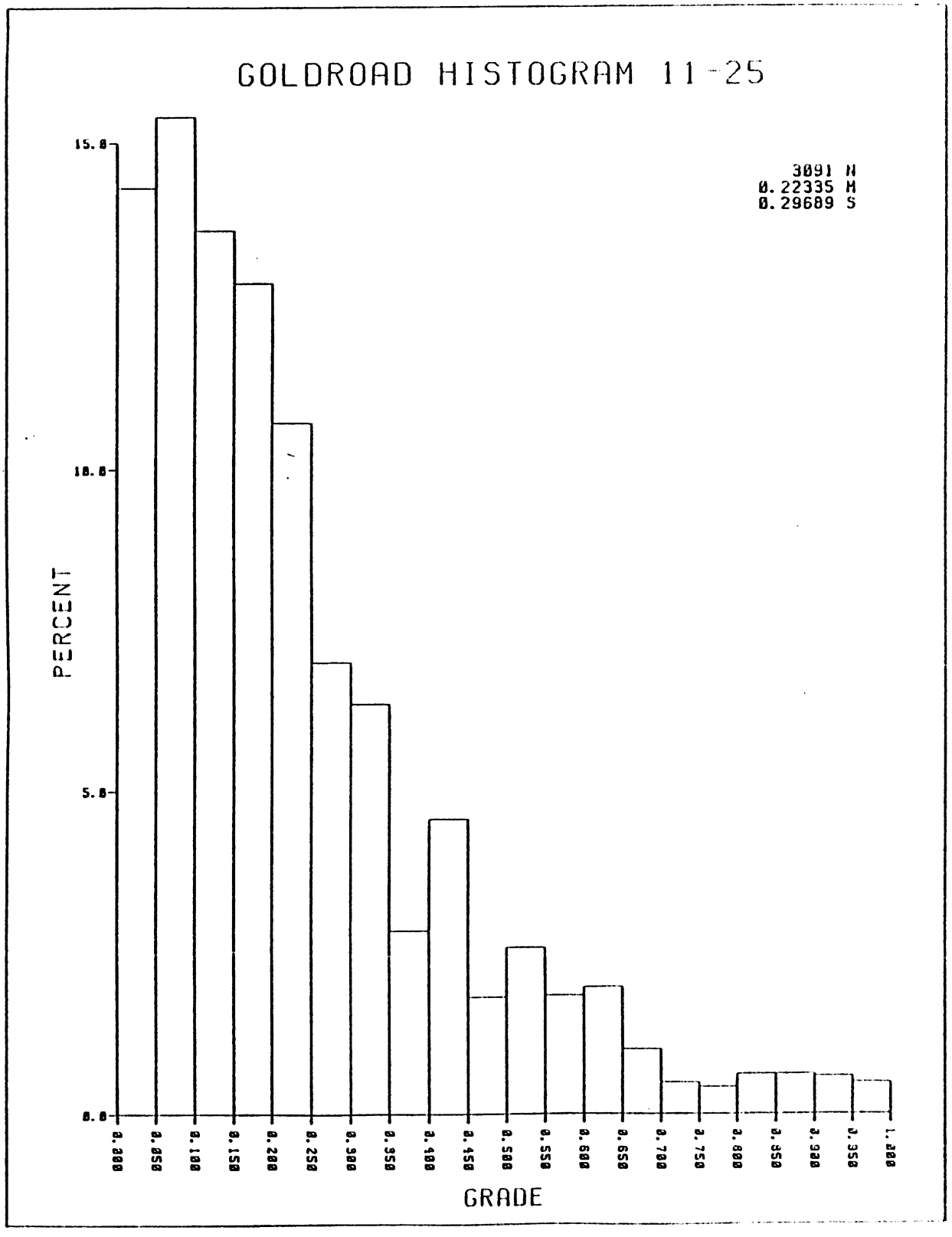

GOLDROAD HISTOGRAM 11-25
3091 N
0.22335 M
0.29689 S
15.0
10.0
5.0
0.0
PERCENT
0.000
0.050
0.100
0.150
0.200
0.250
0.300
0.350
0.400
0.450
0.500
0.550
0.600
0.650
0.700
0.750
0.800
0.850
0.900
0.950
1.000
GRADE

FIGURE 7.3

CUMULATIVE FREQUENCY PLOT

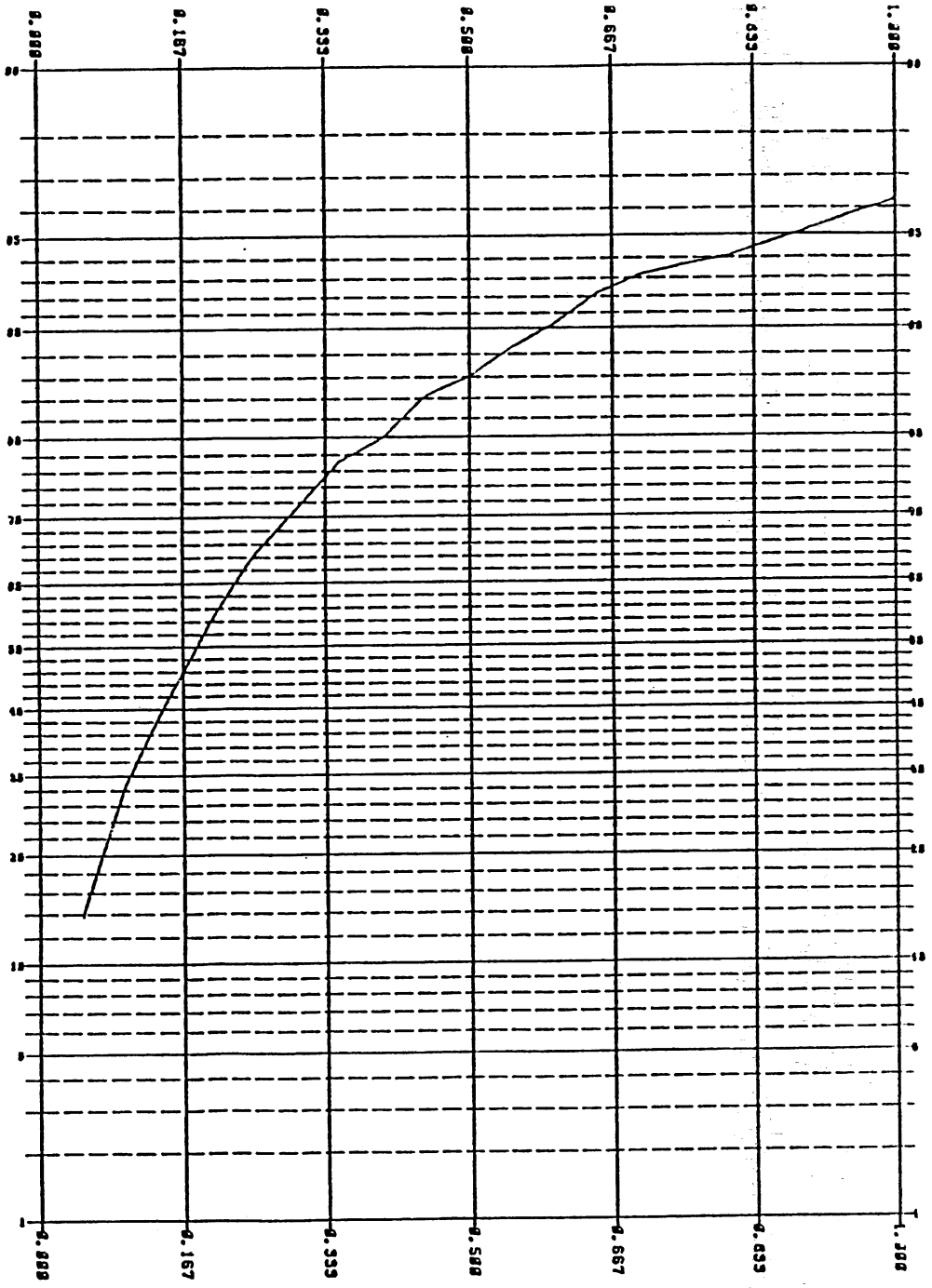


FIGURE 7.4

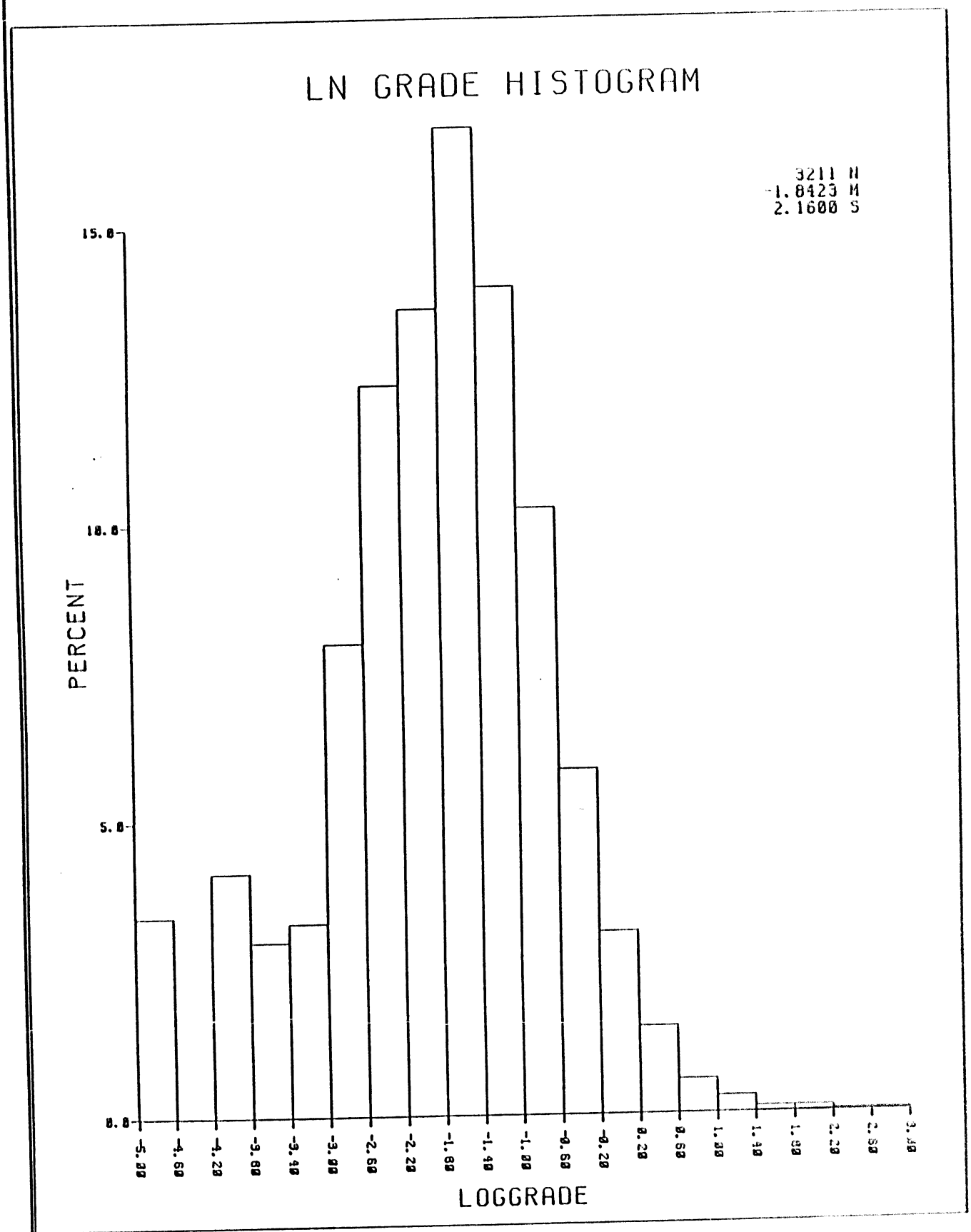

LN GRADE HISTOGRAM
3211 N
-1.8423 M
2.1600 S
15.0
10.0
5.0
0.0
PERCENT
-5.00
-4.60
-4.20
-3.80
-3.40
-3.00
-2.60
-2.20
-1.80
-1.40
-1.00
-0.60
-0.20
0.20
0.60
1.00
1.40
1.80
2.20
2.60
3.00
LOGGRADE

FIGURE 7.5

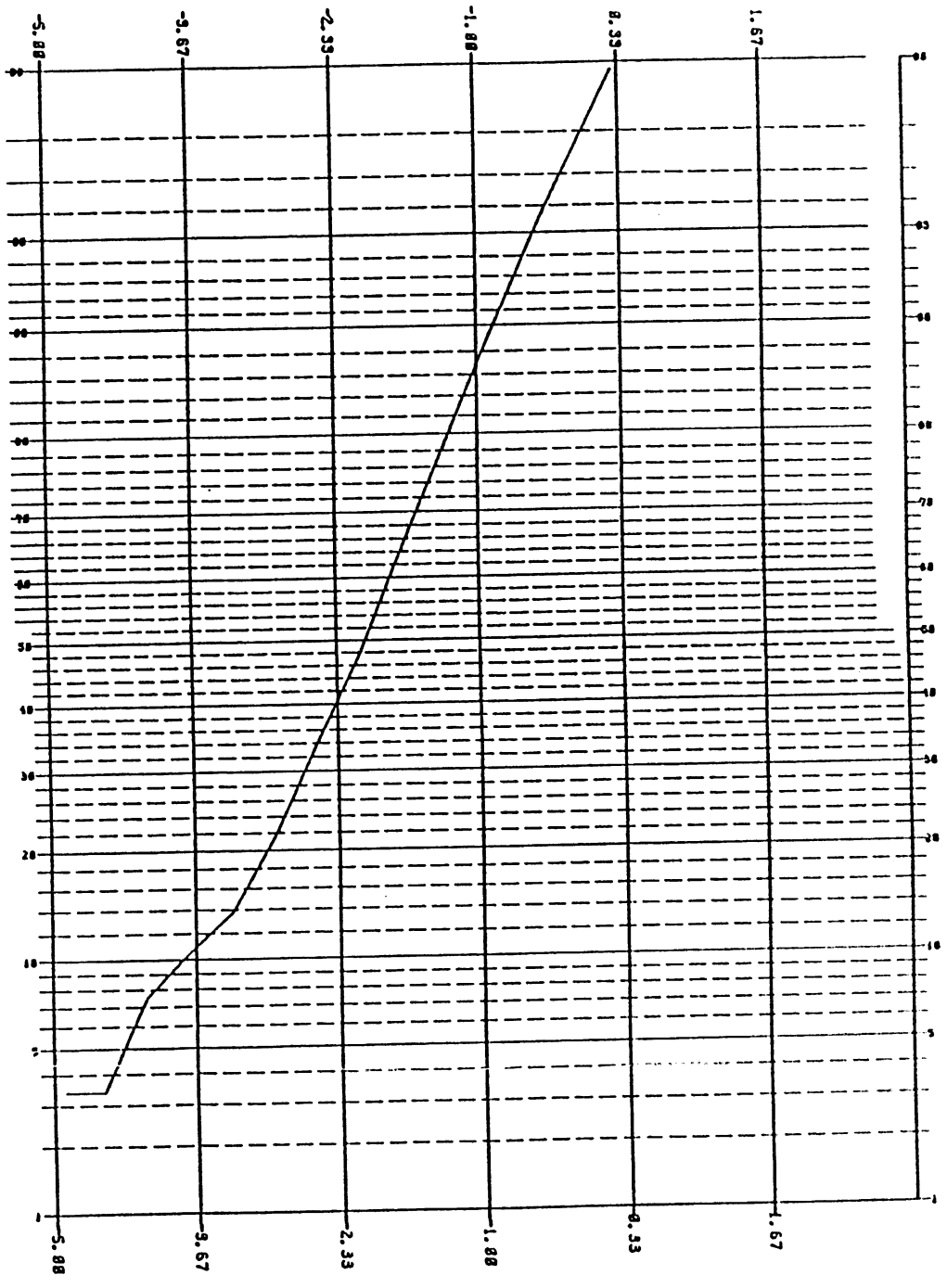

GOLD ROAD LN GRADE CUM. FREQ. 12-2
-5.00
-3.67
-2.33
-1.00
0.33
1.67
LOGGRADE

FIGURE 7.6

AMERICAN MINE SERVICES, INC.

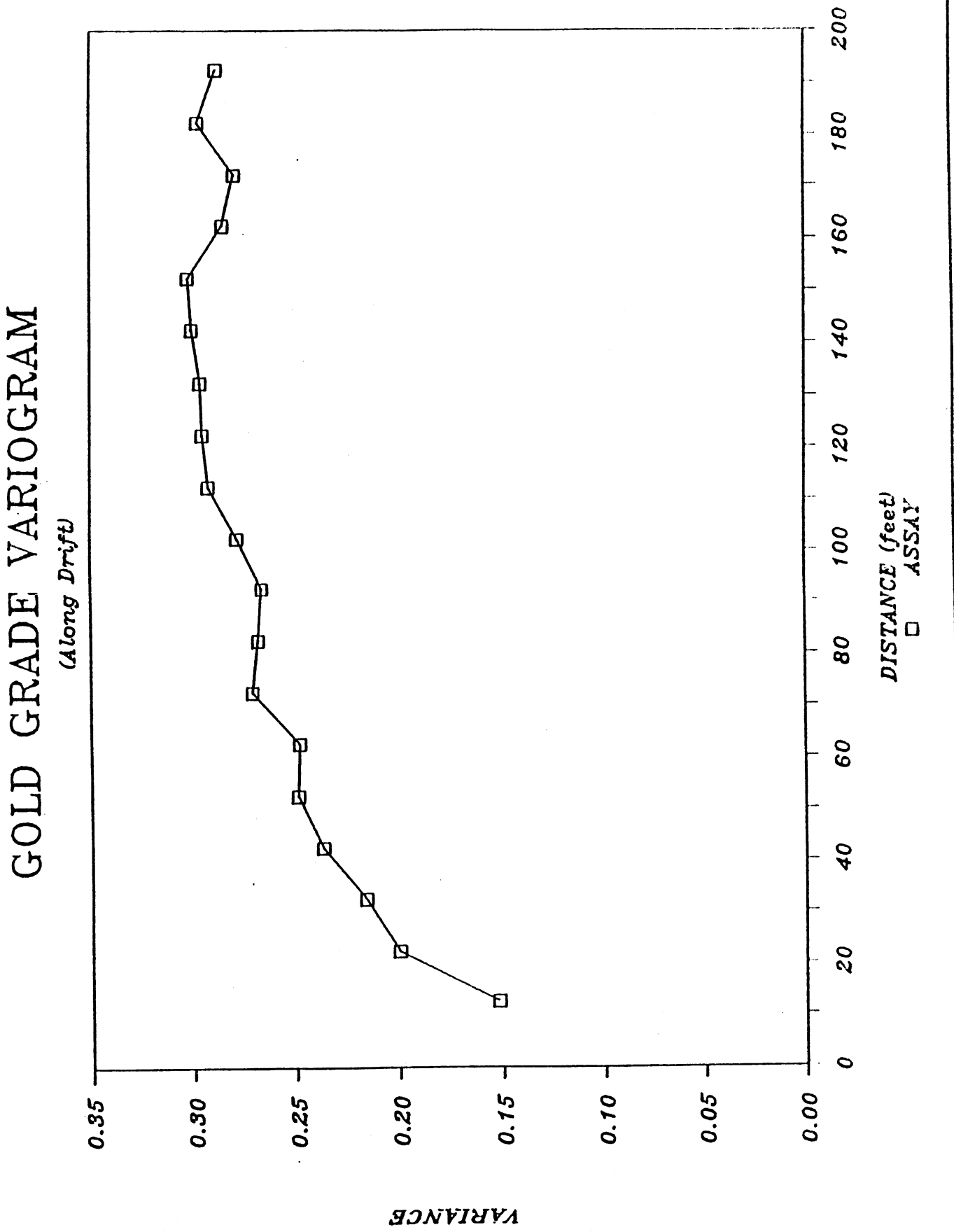
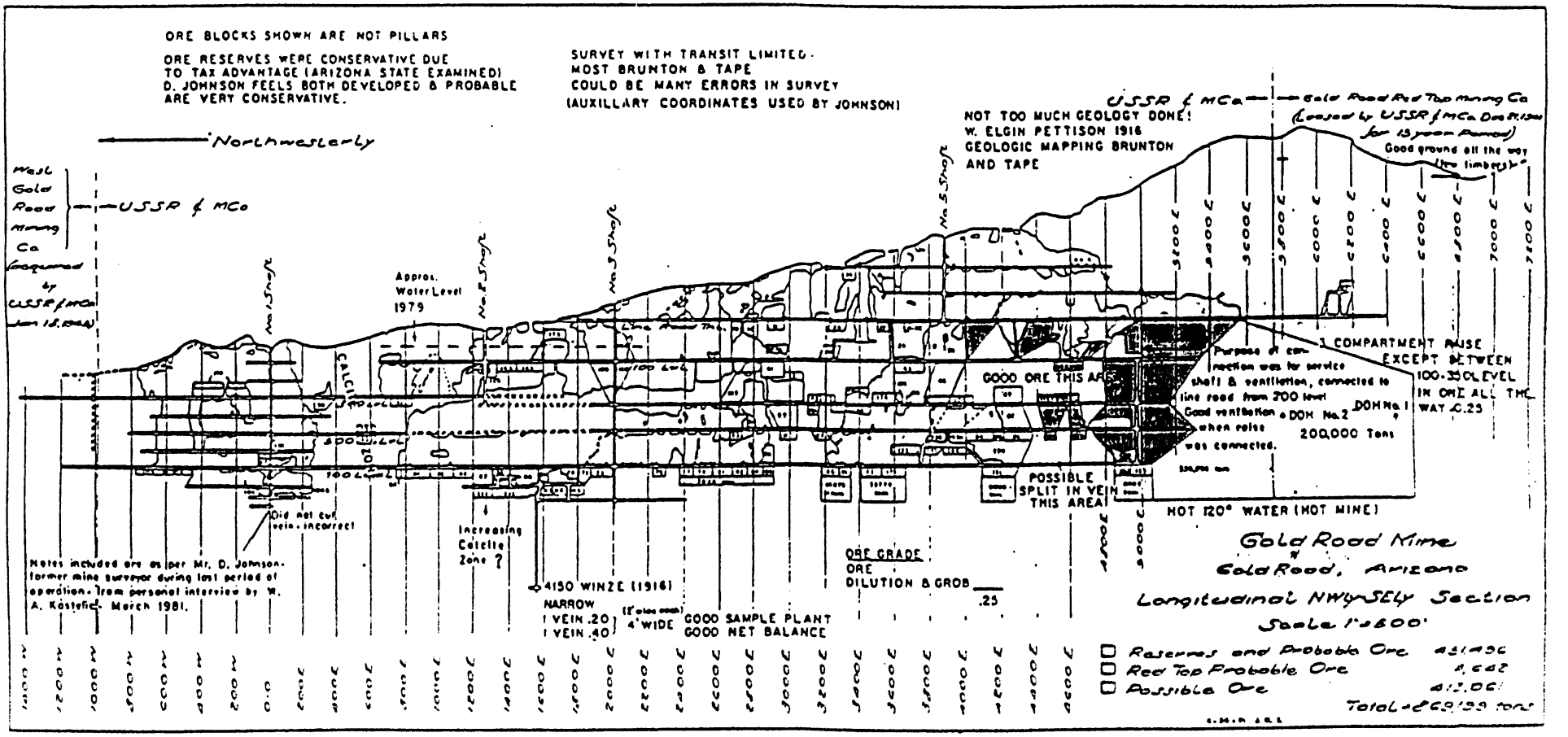
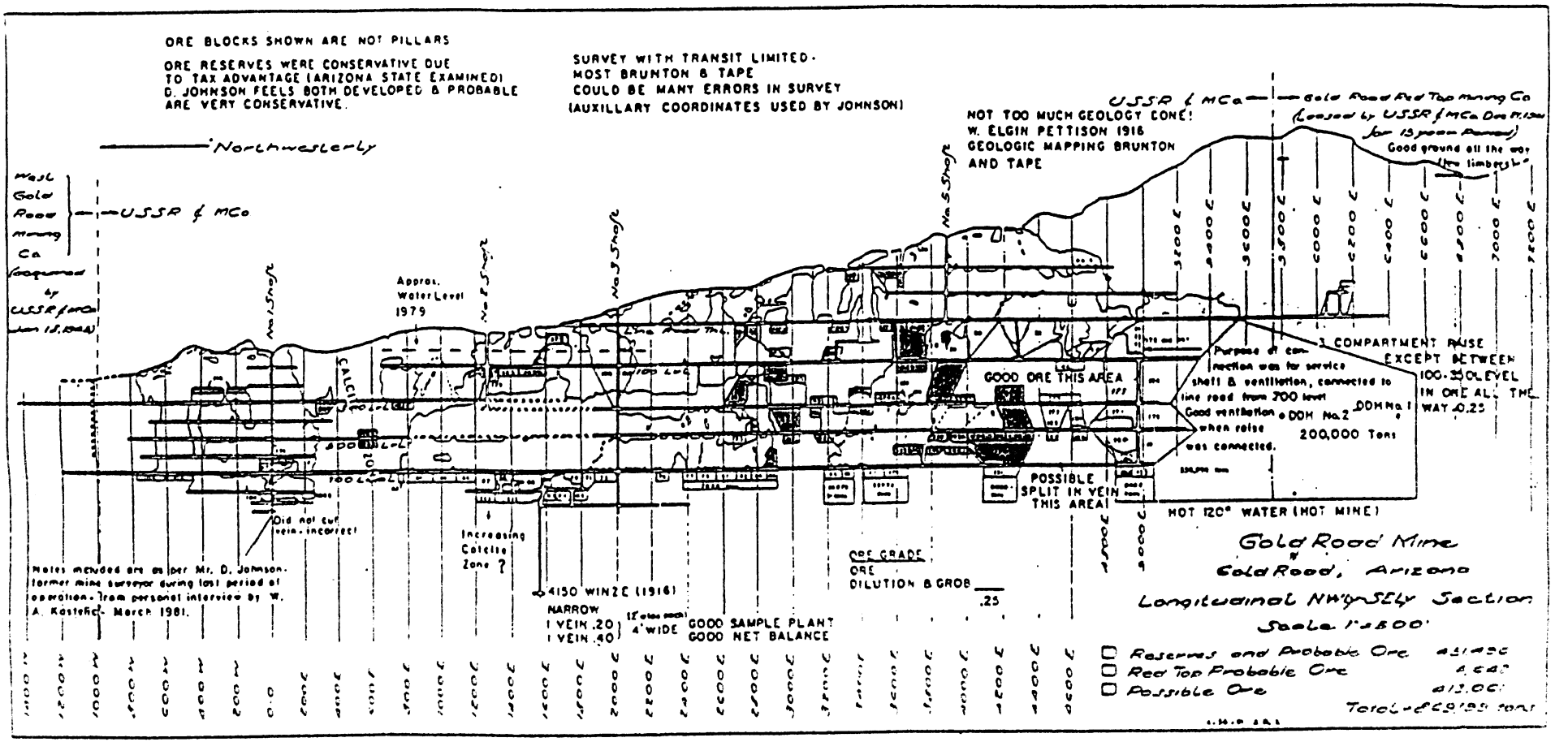


FIGURE 7.7



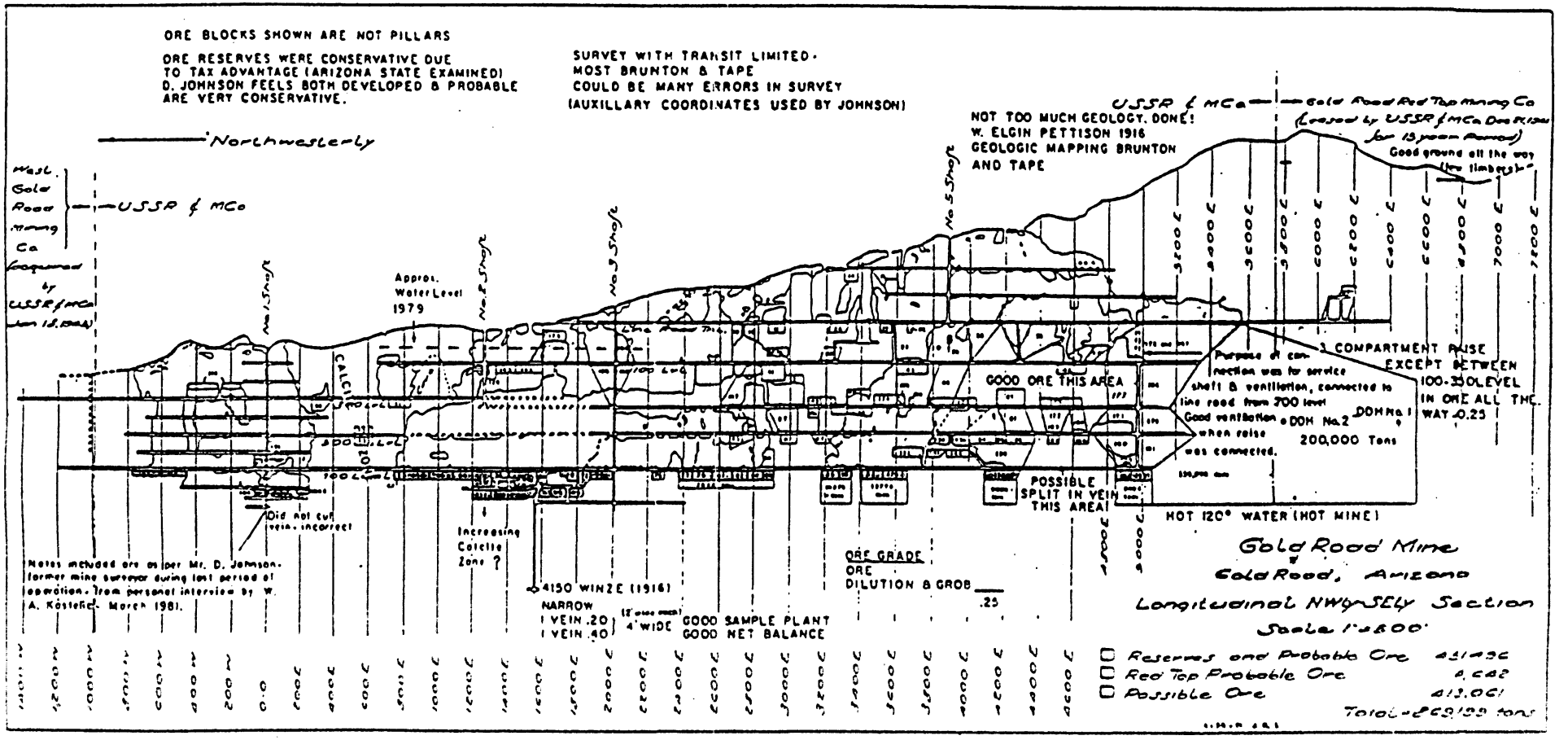
4975 RAISE AREA
INDICATED RESERVES

FIGURE 7.8



ABOVE 700 LEVEL
INDICATED RESOURCES

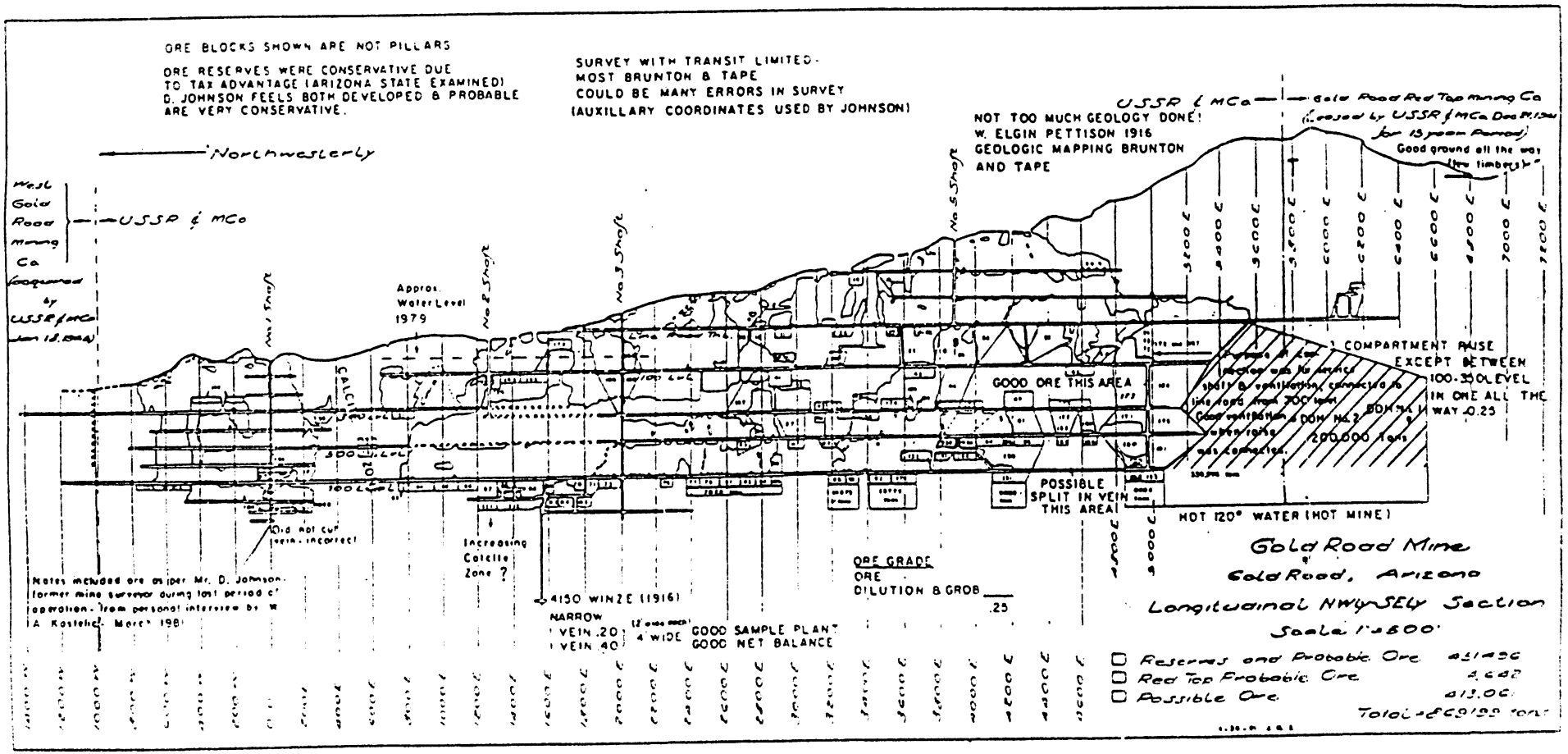
FIGURE 7.9



BELOW 700 LEVEL

INDICATED RESOURCES

FIGURE 7.10



EASTERN EXTENSION

INFERRED RESOURCES AREA

FIGURE 7.11

SHARON STEEL GOLD ROAD .2 CUTOFF

TRENDS (THICKNESS, GRADE AND GRADE THICKNESS)

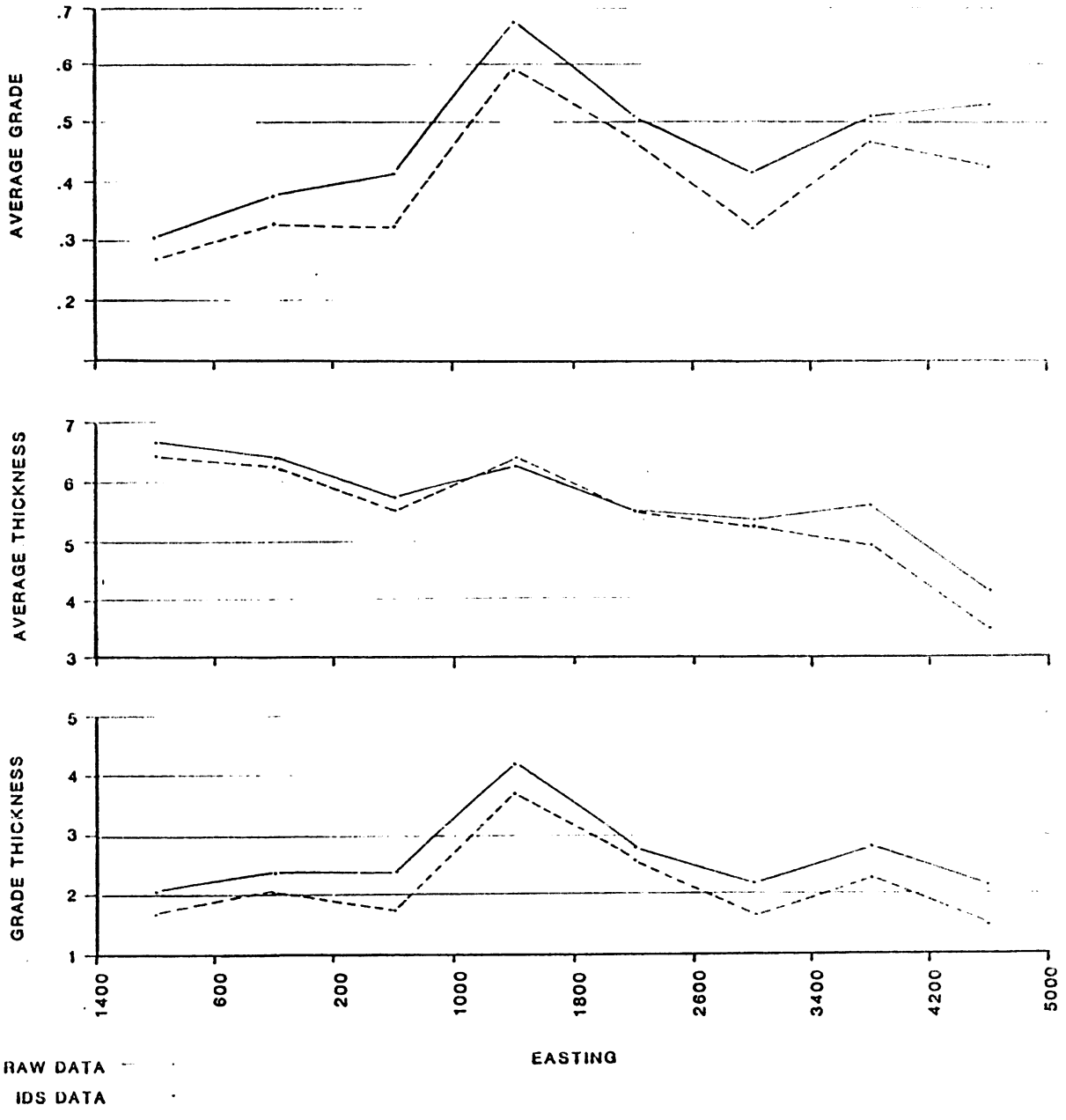


FIGURE 7.12

8.0 MINE DEVELOPMENT

AMS has reviewed several mine development sequences which might fulfill the dual purposes of: a) blocking out sufficient ore to justify project development; and b) exploiting that ore at the lowest possible cost. Most of the sequences which might be utilized involve substantial efforts in rehabilitating existing mine workings (see Tables 8.1 and 8.2, Mine Development Alternatives "A" and "B"). Because the existing mine workings are narrow and sinuous, it is unlikely that their rehabilitation would contribute to a highly-efficient, low-cost mining operation. A further consideration in designing the development sequence is access to the identified resources of ore within the current workings. As shown in Table 8.3, for example, some 179,000 tons of relatively high-grade ore (0.408/ton) have been blocked out in the vicinity of the 4975E raise. These higher-grade resources are fundamental to the viability of the property and represent the "cream" of the indicated resources of the Gold Road Mine.

Given these considerations, AMS has compiled a mine development sequence which concentrates all activities in the eastern portions of the mine where: a) the highest quality resources have been identified; and b) the greatest potential for additional resources is believed to exist. This development sequence does not in any way negate the eventual recovery of all resources, it merely focuses near-term efforts on that area which is critical to the ultimate development of the project. This development would also result in the construction of a modern, efficient mine which would minimize operating costs.

Overall project development is scheduled to proceed in three phases as shown in Table 8.4. Initiation of Phase II is dependent upon positive results from Phase I. Phase III is predicated upon successful completion of Phase II.

The cost of completing all three phases is estimated to be $4,419,837.00. Completion would require approximately 21 months.

8.1 Phase I - Surface Drilling

In the opinion of AMS, the key element in redeveloping the Gold Road Mine is the ore reserve which might occur as an easterly extension of the vein upon which the present mine workings are situated. The most efficient means of identifying this reserve will be a drilling program conducted from surface.

The extent and cost of such a program will be dependent upon both drilling results and corporate philosophy. A minimum program would likely consist of a total of 6,000 feet of drilling completed from three stations along the vein. Consistent, thick high grade intersections would probably tend to encourage an early start to underground development. Erratic, thin or lower grade intersections would likely require additional drilling; perhaps up to another 8,000 feet before sufficient confidence could be gained to proceed with underground development.

An initial 6,000-foot program is estimated to cost $140,000.00 or about $23.00 per foot of NQ core. Some economics might be achieved in drilling additional footage, such that a budgetary figure of $20.00 per foot could be used for drilling in excess of the initial program. Thus, a maximum program of 14,000 feet might be conducted for $300,000.00. Additional costs will be incurred for assaying, plotting and evaluation.

The proposed drilling program is illustrated in Figure 8.1 and 8.2.

This proposed program would be a prelude to the development phase. It would provide additional information on the mineral potential of the vein and on vein and fault locations so as to better direct later underground development. It would provide new information on wall rock conditions and ground stability in new areas that would be developed. Samples from any ore intersections that are cut would provide additional assay information on vein widths and grades and aid in formulating a more accurate ore reserve estimate. Vein material would also provide samples which would allow for further mill testing of the ore from areas not reached by underground exploration.

If possible, two of the proposed drill holes could be drilled to a depth of approximately 400 feet located on the northwestern portion of the property in the area of the old West Gold Road Mining Company claims. These claims were acquired in 1945 and they cover approximately 3,000 feet of the strike of the vein structure in the northwesterly direction that has not been explored. The vein in this area is not well exposed and is generally concealed beneath the gravels of Silver Creek Wash. The drill holes could be designed to cross the vein structure at relatively shallow depths beneath the creek gravels in search of near surface ore that might be thus concealed.

Drilling on the southeasterly end of the vein structure is expected to total approximately 5,200 feet in drill holes that would vary from between 800 to 1,500 feet in depth. These drill holes would test the vein beneath the leased Gold Road Red Top Mining Company claims. These claims cover the area generally believed to hold the greatest potential for the discovery of new reserves. Diamond drill hole DDH1 drilled in 1973 in this area intersected 4.02 feet of vein that assayed 0.128 ounces of gold per ton. Diamond drill hole DDH2 was drilled on the Red Top claims in 1974 and intersected 4.78 feet of vein that returned 0.279 ounces of gold per ton. Drilling on diamond drill hole GR-3 was started in 1984. The hole was taken to a depth of 469 feet before operations were suspended with the completion of required assessment expenditures. It is planned that one of five drill holes proposed for this area would be the completion of drill hole DDH3 provided it has not previously been completed in conducting annual assessment work.

The remaining holes would be placed at widely spaced intervals across the favorable area in order to gather as much general information on the continuation of the vein and its economic potential as possible.

The initial drilling project that is here proposed for the Gold Road Project is a minimal program designed to test the geologic model for the ore deposit as it is now perceived. It is typical of such minimal projects that the results will lean toward being inconclusive or that the data generated will alter the geologic model and suggest new exploration targets. In view of this, there is a strong probability that additional expenditures for diamond drilling may be required prior to a final decision upon the reopening of the mine.

8.2 Phase II - 100 Level Exploration

Should the Phase I Surface Drilling Program provide sufficient encouragement as to the continuity and grade of mineralization, it will then be necessary to "prove up" a certain minimum ore reserve prior to major commitments for mine and mill development. AMS expects that certain economics can be achieved if various elements of the "proving up" process can eventually be used during mine development and production.

The proposed program includes two major elements: 1) a decline from surface east of Sitgreaves Pass to the most easterly point of the 100 level at approximately 5200E; and 2) drifting in an easterly direction along the vein at the 100 level for about 2,000 feet, establishing drill stations on crosscuts and diamond drilling (BQ core) to intersect the vein between the Line Road and 350 levels.

Details of the Phase II program follow.

8.3 PHASE III - Contract Development

Upon the successful completion and evaluation of the 100 level exploration program, contract development activities can be initiated. These activities will be directed toward the establishment of an efficient mining system down to the 700 level. The principle element of this system will be an eight-foot diameter raise bored shaft from surface to the 700 level. Other auxiliary elements include rehabilitation of 4975 raise for a second escapeway and raise boring a six-foot diameter orepass between the 100 and 700 levels. It is anticipated that the eight-foot diameter shaft would be located just east of the 4975 raise so as to service both the newly delineated reserves of Phases I and II, as well as the existing reserves in the old workings.

Details of this Phase III program follow.

TABLE 8.1

ALTERNATIVE "A"
MINE DEVELOPMENT SEQUENCE

ITEM

1. Conduct surface drilling program in area of 5200E to 7000E, down to 700 level.
2a. Reopen and rehabilitate Line Road tunnel from 1700E to 6400E.
2b. Dewater and rehabilitate No. 1 shaft to 700 level.
3a. Rehabilitate 700 level from 0-0 to 5000E.
3b. Reestablish raise connection at 5000E between Line Road Tunnel and 700 level.
4a. Extend Line Road Tunnel to 7000E, establish drill stations and block out ore.
4b. Extend 700 level to 7000E, establish drill stations and block out ore.

TABLE 8.2

ALTERNATIVE "B"
MINE DEVELOPMENT SEQUENCE

ITEM

1. Conduct surface drilling program in area of 5500E to 7000E, 450A level to 700 level.
2. Reopen and rehabilitate Line Road Tunnel from 1700E to 6400E.
3a. Extend Line Road Tunnel to 7000E, establish drill stations and block out ore.
3b. Reestablish raise connection at 5000E between Line Road Tunnel and 700 level.
4. Extend 700 level to 7000E, establish drill stations and block out ore.
5. Raise bore from 700 level to surface at 7000E.

TABLE 8.3

4975 RAISE AREA RESERVE BLOCK ANALYSIS

BLOCK NO.	ACCESSABILITY CODE	BLOCK TONS	BLOCK GRADE	VEIN THKNESS	DILUTED THKNESS	DILUTED TONS	DILUTED GRADE
32	B	2615	0.425	1.92	4.00	5,448	0.218
33	B	7682	0.353	2.72	4.22	11,918	0.237
34	A	2,108	0.422	2.42	4.00	3,484	0.266
48	C	2430	0.371	3.43	4.93	3,493	0.268
150	B	11,235	0.329	4.48	5.98	14,997	0.253
151	A	1,352	0.332	4.00	5.50	1,859	0.249
157	A	8,951	0.351	3.36	4.86	12,947	0.251
163	A	6,586	0.271	4.15	5.65	8,966	0.206
164	A	2,716	0.384	5.37	6.87	3,475	0.306
165	C	1245	0.290	4.15	5.65	1,695	0.220
166	C	1568	0.289	5.37	6.87	2,006	0.232
171	B	7,002	0.273	5.53	7.03	8,901	0.221
172	A	39,242	0.571	3.78	5.28	54,814	0.416
173	A	12,096	0.469	4.34	5.84	16,277	0.355
176	A	5,319	0.316	5.33	6.83	6,816	0.253
178	A	17,450	0.356	8.74	10.24	20,445	0.308
181	A	27,610	0.352	6.39	7.89	34,091	0.290
186	A	21,784	0.404	4.22	5.72	29,527	0.305
IN-PLACE TONS		178991					
AVERAGE GRADE IN-PLACE			0.408				
AVERAGE THICKNESS				4.86			
AVERAGE DILUTED THICKNESS					6.37		
DILUTED TONS						241159	
DILUTED GRADE							0.309

ACCESSABILITY CODES

A	GOOD
B	POSSIBLE
C	DOUBTFUL

TABLE 8.4

PROJECT DEVELOPMENT SEQUENCE

PHASE I — **Surface Drilling Exploration**

Conduct surface drilling program to explore vein from 5200 E to 7300 E and down to 700 level.

PHASE II — **100 Level Exploration**

Drive decline 2200 feet from surface to link up with 100 level at 5300 E. Extend 100 level to 7300 E, establish drill stations, and explore vein between Line Road Tunnel and 350 level.

PHASE III — **Mine Development**

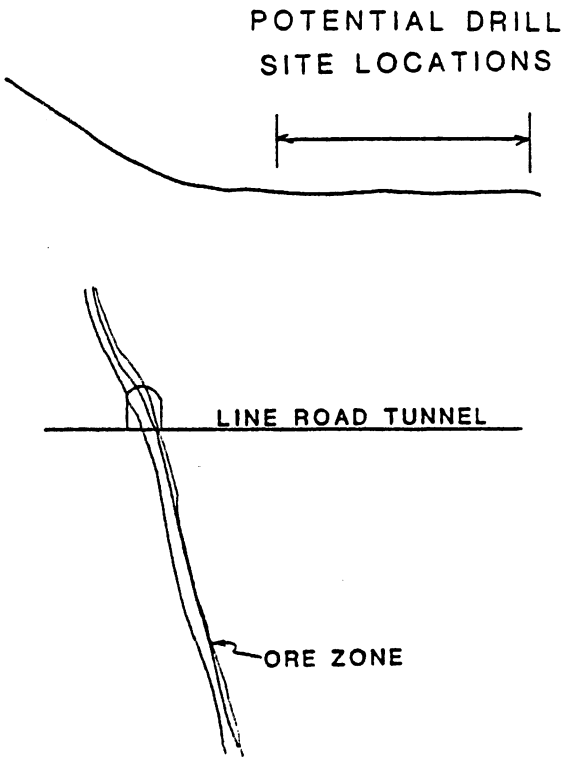
Rehabilitate 4975 raise and dewater mine. Raise bore and equip an eight foot diameter production shaft between surface and 700 level at 5200 E. Raise bore a six foot diameter orepass between the 100 and 700 levels.

In parallel with these mine development activities, a 300-ton per day mill would be constructed either at the previous mill site or at some other site closer to the eastern portions of the mine.

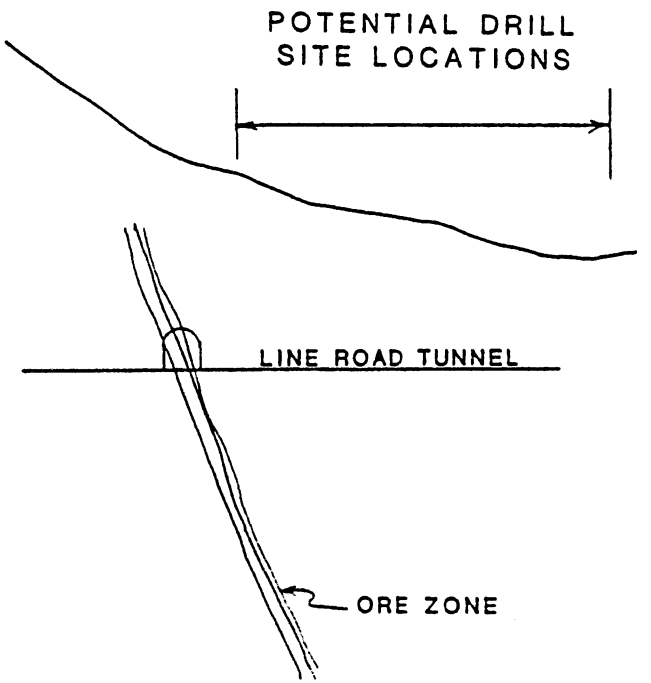
GOLD ROAD MINE

SURFACE DRILLING PROGRAM ILLUSTRATION

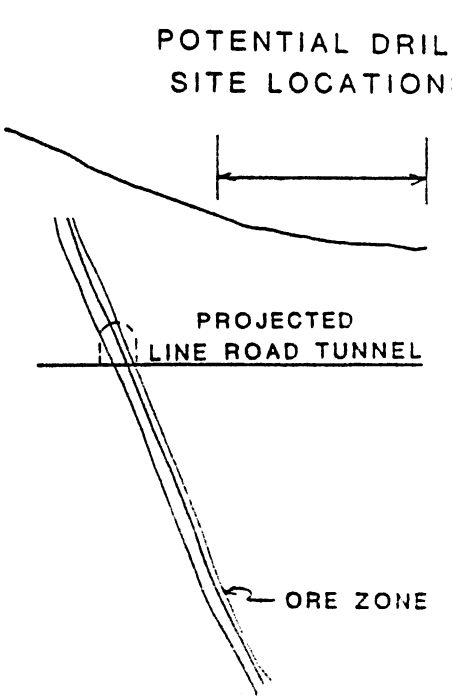
TYPICAL SECTIONS



SECTION N1 5800E



SECTION N2 6400E



SECTION N3 7600E

PHASE I

TOTAL FOOTAGE

6050 ft In 8 HOLES

MIN 400 ft MAX 1100 ft

PHASE II ESTIMATE

SECTION 5500E - 2500ft
SECTION 6100E - 2200 ft
SECTION 6700E - 3050 ft

7750 ft

FIGURE 8.1

GOLD ROAD MINE

SURFACE DRILLING PROGRAM ILLUSTRATION

TARGET AREA INTERSECTIONS

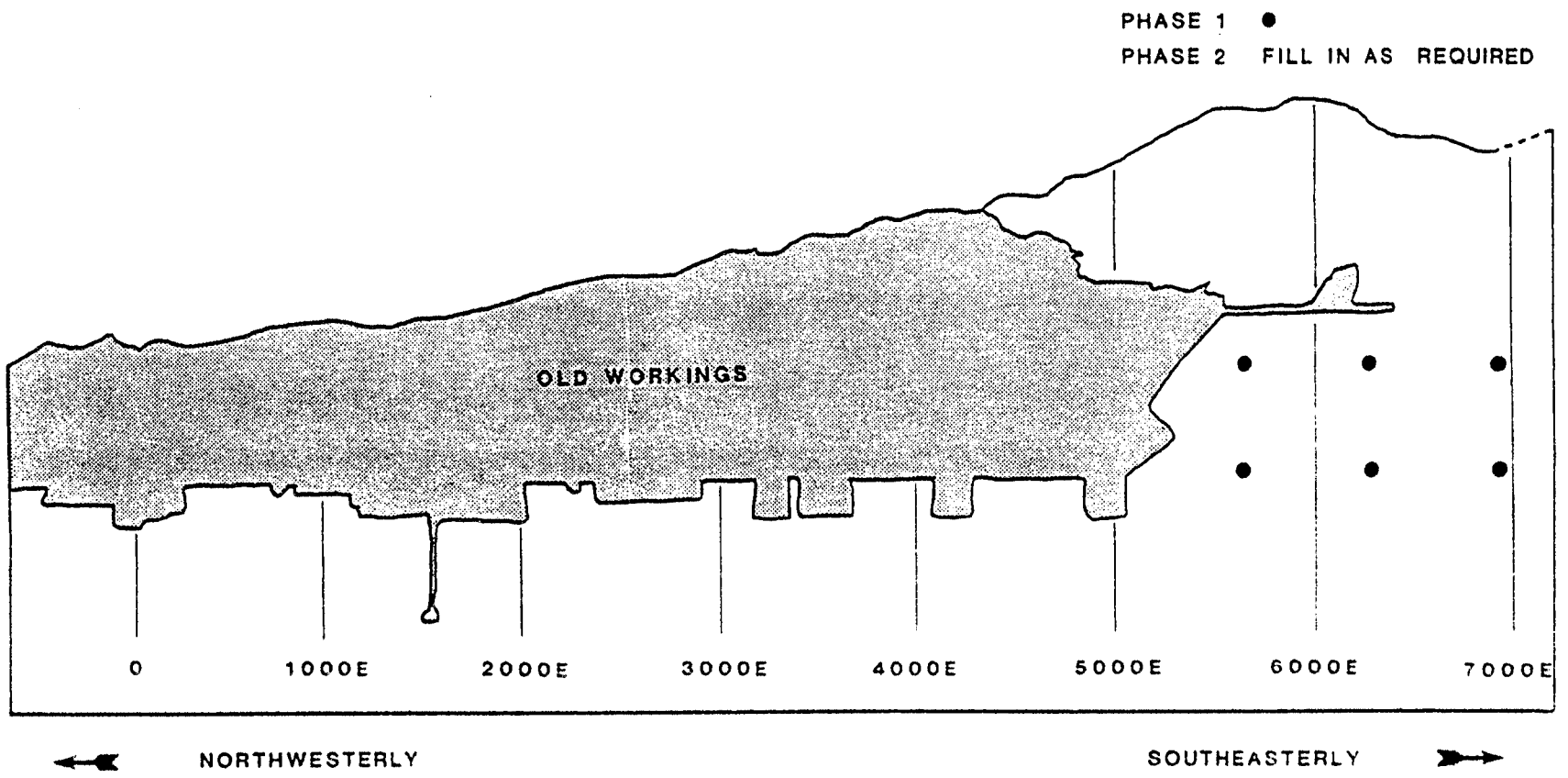


FIGURE 8.2

GOLDROAD MINE

PROPOSED 4975 E. RAISE PUMPING SYSTEM

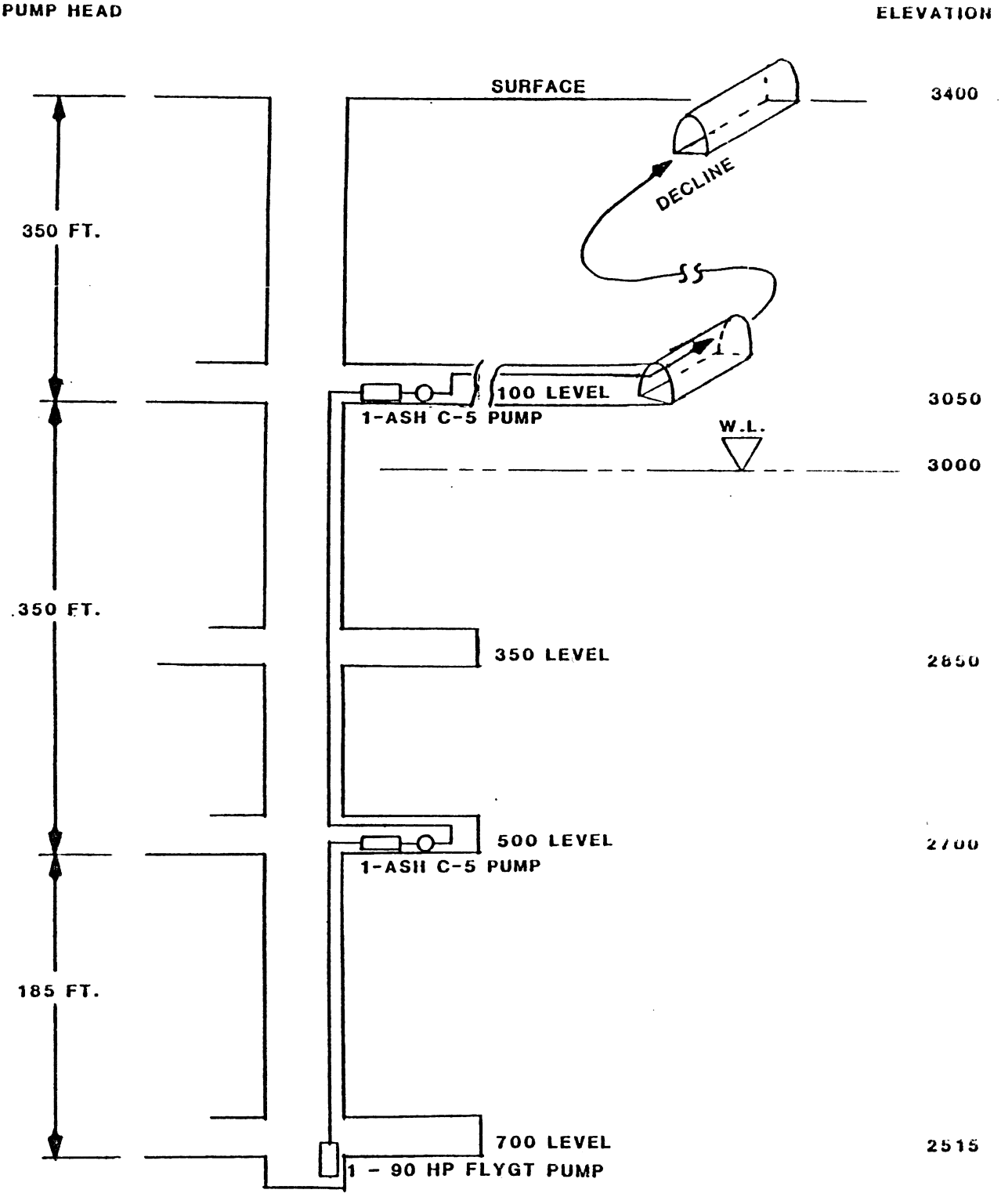
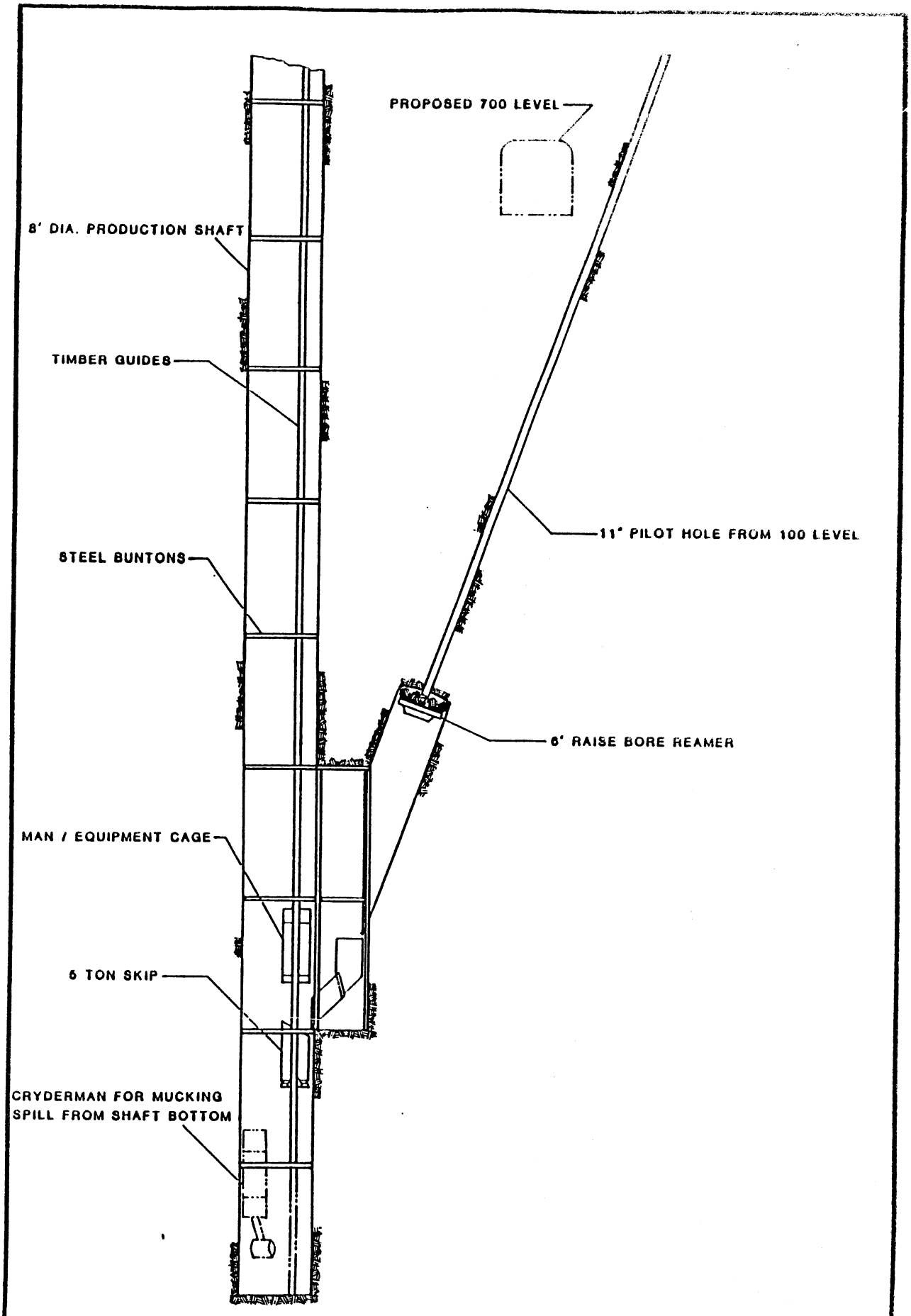


FIGURE 8.3



5 4 3 2 1 0 5 10

SCALE:	DATE
DESIGNED	
DRAWN: G.A.F.	
CHECKED:	
APPROVED:	
APPROVED:	

AMS

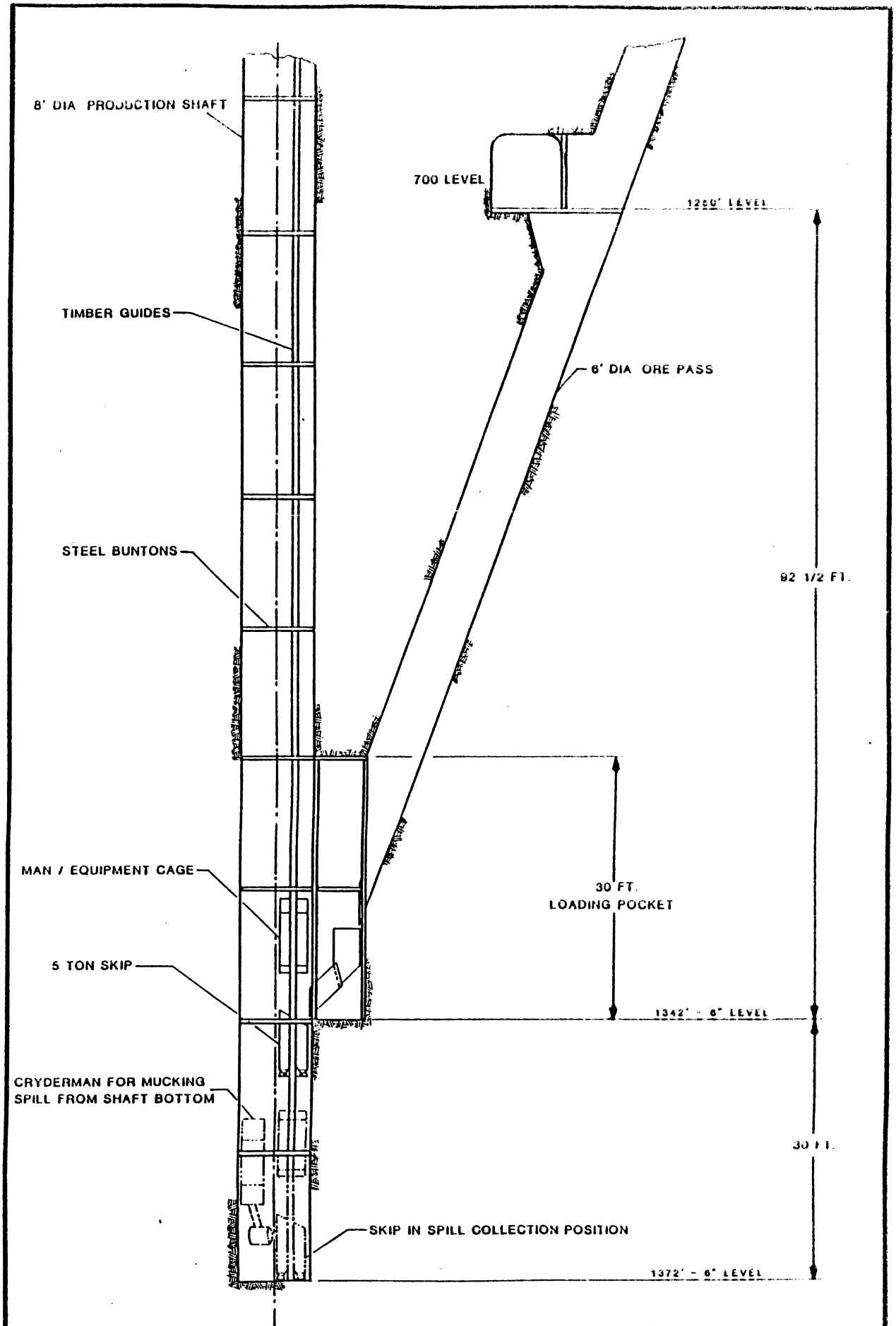
SHARON STEEL

ORE PASS
RAISE BORING SCHEMATIC

AMERICAN MINE SERVICES, INC.

JOB NO.

FIGURE 8.4


8' DIA PRODUCTION SHAFT
700 LEVEL
1260' LEVEL
TIMBER GUIDES
6' DIA ORE PASS
STEEL BUNTONS
92 1/2 FT.
MAN / EQUIPMENT CAGE
30 FT.
LOADING POCKET
5 TON SKIP
1342' - 6" LEVEL
CRYDERMAN FOR MUCKING
SPILL FROM SHAFT BOTTOM
30 FT.
SKIP IN SPILL COLLECTION POSITION
1372' - 6" LEVEL
5 4 3 2 1 0 5 10
SCALE:
DESIGNED:
DRAWN: G.A.F.
CHECKED:
APPROVED:
APPROVED:
DATE
AMS
SHARON STEEL
SHAFT BOTTOM
ARRANGEMENT
AMERICAN MINE SERVICES INC.
FIGURE 8.5

SECTION 8.0 - COMPUTER SHEETS

(SEE APPENDIX C)

Cycle Sheets - Group No. 1

Contract Development - Decline, 30 Feet to 500 Feet
Contract Development - Decline, 500 Feet to 2,200 Feet
Contract Development - Slashing 100 Level - Trackless
Contract Development - Trackless Heading (100 Level)
Contract Development - Station Excavation
Contract Development - Station Slabbing
Contract Development - Shaft Bottom Sinking

Activity Sheets - Group No. 1

Contract Development - Indirect Cost
Contract Development - Mobilization, Demobilization - Cost
Contract Development - Decline, Portal Excavation - Cost
Contract Development - Decline, 30 Feet to 500 Feet - Cost
Contract Development - Decline, 500 Feet to 2,200 Feet - Cost
Contract Development - Slashing 100 Level - Cost
Contract Development - Trackless Headings, 100 Level - Cost
Contract Development - Dewater and Rehabilitate 4975 Raise - Cost
Contract Development - Install Raise Hoist - Cost
Contract Development - Slashing Existing Levels - Rail - Cost
Contract Development - Rail Headings - Cost
Raise Boring - Mobilization/Demobilization Cost
Raise Boring - Site Preparation - Cost
Raise Boring - Machine Set-Up - Cost
Raise Boring - Pilot Hole - Cost
Raise Boring - Ream 8 Foot Diameter Shaft - Cost
Raise Boring - Ream 6 Foot Diameter Ore Pass - Cost
Contract Development - Hoisting and Hauling - Cost
Contract Development - Shaft Hardware Installation - Cost
Contract Development - Station Slabbing - Cost
Contract Development - Station Excavation - Cost
Contract Development - Sinking Shaft Bottom - Cost
Contract Development - Rail Installation 100 Level - Cost

Activity Sheets - Group No. 1 (Continued)

Line Road Tunnel Portal Reconstruction

Line Road Tunnel Rehabilitation With Cave

Line Road Tunnel Rehabilitation Without Cave

Line Road Tunnel With Slabbing

Summary Sheets

Sharon Steel - Gold Road Mine - Preproduction Expense

Activities Scheduled By Days - Phase II

Calculation Sheet Summary - Phase II

Cashflow By Activity - Phase II

Cashflow By Expense Item - Phase II

Activities Scheduled By Days - Phase III

Calculation Sheet Summary - Phase III

Cashflow By Activity - Phase III

Cashflow By Expense Item - Phase III

9.0 MINING

The mining process will consist of two principle activities: stoping and ongoing development. Ongoing development may take the form of slashing existing levels to the east of the 4975 raise, rehabilitating existing levels to the west of the 4975 raise, or drifting in ore to extend existing levels into previously undeveloped areas. Stoping will be by means of a narrow-vein, sublevel method. Alternate systems could likely be applied at similar costs.

9.1 Ongoing Mine Development

Ongoing mine development activities will be required in order to gain access to both previously- and newly-developed reserves. For previously-developed areas, mainly to the west of the 4975 raise, rehabilitation of existing levels will be required. The thrust of this rehabilitation will be to gain access to nearby higher-grade blocks at minimal cost. A major rehabilitation effort towards redevelopment of the entire mine is not forseen due to the limited quantity of higher-grade reserves in the more westerly portions of the mine.

Some slashing on the eastern portions of 350 and 500 levels will be required in order to provide for more-efficient operations in newly-developed areas. Should the reserve situation provide sufficient justification, the 350 and 500 levels will be extended to the east. The 700 level will be extended some 2,000 feet to the east by drifting in the vein and crosscuts will be driven for diamond drilling exploration both above and below the 700 level.

Cycles and costs for these activities follow.

9.1.1 Level Rehabilitation

Access to the reserve blocks located west of the 4975 raise will require rehabilitation of existing levels. Because only limited data is available on the size and condition of these levels, the actual cost of rehabilitation may vary widely from the estimated cost. This potential variance injects a significant element of risk in

assessing the availability of reserve blocks which are located more than a few hundred feet from the 4975 raise. It is known only that the Line Road and 700 level were used for main haulage with 24 inch gauge track and that the intermediate (100, 350, and 500) levels were equipped with 18 inch gauge track. AMS expects that rehabilitation efforts may be somewhat more costly on these narrower levels.

The Line Road and 700 levels are estimated to require standard rehabilitation for 70% of their length, caved ground rehabilitation for 20% and slabbing for 10%. Intermediate levels are estimated to require 50% standard rehabilitation, 20% caved ground rehabilitation and 30% slabbing.

The estimated equipment and material cost for rehabilitation of the various levels by the ongoing mine development crew is summarized in Table 9.1.

TABLE 9.1
LEVEL REHABILITATION COST
(Equipment and Material Only)

	$/Ft.	Main Haulage (%)	Main Haulage ($/Ft.)	Inter. Levels (%)	Inter. Levels ($/Ft.)
Rehabilitation With Cave	80.95	20	16.19	20	16.19
Rehabilitation Standard	29.55	70	20.69	50	14.78
Rehabilitation With Slabbing	34.82	10	3.48	30	10.45
TOTAL			40.36		41.42

Direct man power requirements are estimated to be 2.18 man-hours per foot for the main haulage and 2.07 man-hours per foot the intermediate levels. On this basis, complete rehabilitation of the 700 level (6,200 feet) would be 13,500 man-hours and $250,000.00 for equipment and material.

Some 2,300 feet of level rehabilitation would be required to gain access to the indicated reserves of the 4975 raise area as detailed in Table 9.2.

TABLE 9.2
LEVEL REHABILITATION REQUIREMENTS
4975 RAISE AREA

Level	Length to Rehabilitate
100	1,000 Feet
350	600 Feet
500	500 Feet
700	200 Feet
	2,300 Feet

9.2 Stoping

At the point in time when enough ore is exposed along the haulage level to begin a stope, the development crew will commence undercutting the outlined area. The undercut will be seven to eight feet high and the width will be determined by the vein structure. Upon completion of undercutting, the timber crew will begin standing drift sets at 5 foot centers and installing chutes every 20 feet.

During this time, a manway crosscut will be cut in the middle of the stope block perpendicular to the haulage level on the footwall side. The crosscut will be approximately eight feet wide by eight feet high, and 25-feet long. At the end of the crosscut, an alimak chamber will be cut for storage of the Alimak raise climber during blasting. The alimak raise will start at the crosscut and end at the upper level (approximately 200 feet). The raise will parallel the vein structure at an angle of 65° to 70° from horizontal.

When the manway is complete, it will be timbered one section at a time. The raise will be timbered to the first sublevel to allow for drilling the first sublevel crosscut. The crosscut will be eight feet high by eight feet wide and 25 feet long. The last round will be in ore at the intersection of the vein. Mucking in the crosscut will be done with a small slusher and a minimum of hand mucking. After the last round is cleaned out, a wagon drill will be set up at the vein and crosscut intersection. This wagon drill will drill out a four foot by five foot round down to the under cut level (approximately eight to fifteen feet). The orepass will be blasted from the bottom up, in two to three lifts. During this time, the manway will be timbered up to the next level and then another crosscut, and another orepass. This sequence will continue until the entire manway is timbered and the orepass reaches from the haulage level to the upper most sublevel.

When the orepass, crosscut, manway system is completed, sublevel development will begin. The sublevels will be driven from the orepass out along the vein a distance of 225 feet in each direction. Jacklegs and Anfo will be used for drilling and blasting. A newly designed ½-cubic-yard loader will be utilized for mucking and hauling the broken ore to the orepass.

The sublevels will be eight feet high by a minimum of five feet wide. A five foot wide sublevel will be large enough for operation of this 34-inch wide loader. Having double headings off of the orepass will allow drilling at one face while mucking at the other. The

loader will go to the face, fill the bucket and tram back toward the orepass. Once at the orepass, the loader will back into the crosscut and dump directly into the orepass.

Using a rubber-tired piece of equipment will speed up the mucking cycle for sublevel development, while increasing the length of the sublevel. This mucker will be hoisted up the manway with the help of a tugger on an upper level when each sublevel is completed. At the end of the sublevel (approximately 225 feet from the orepass) the wagon drill will be set up to drill a slot raise.

The slot raises will be four feet along strike and as wide as the vein. The slot raise will connect from each sublevel to a lower one. The slot raise will be blasted in lifts in the same manner as the orepasses. A free face is created for longhole blasting when the slot raise is completed.

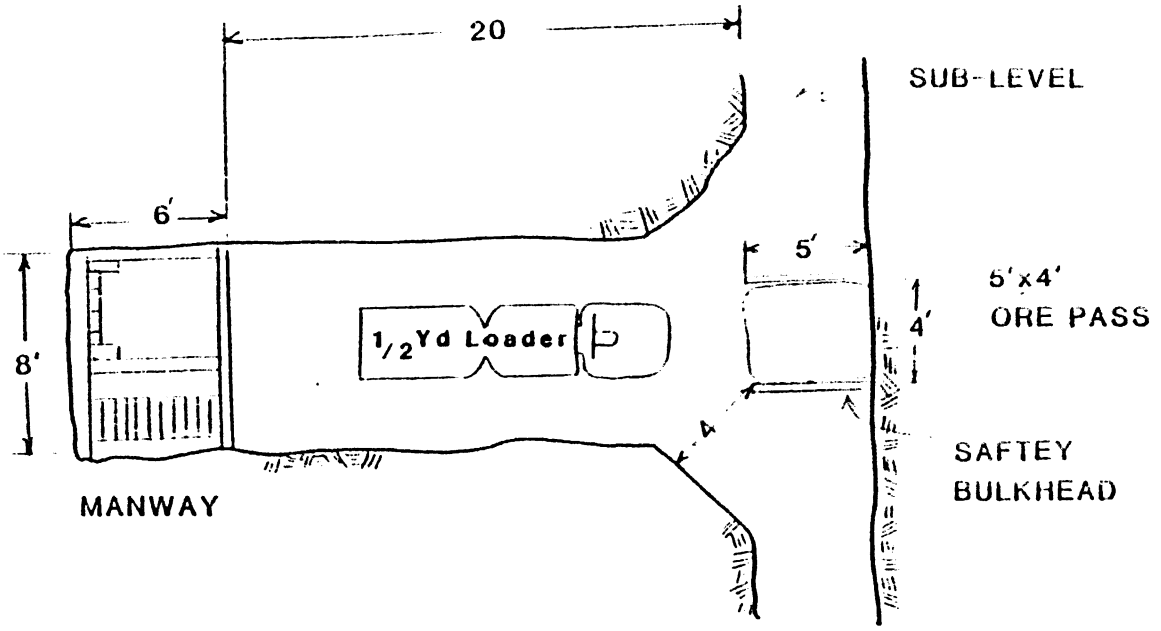
During the time that the slot raises are going in, a safety bulkhead will be constructed at the orepass/sublevel intersection. This bulkhead will seal off the orepass allowing ore to be dumped from the sublevel above without jeopardizing the safety of the miners below.

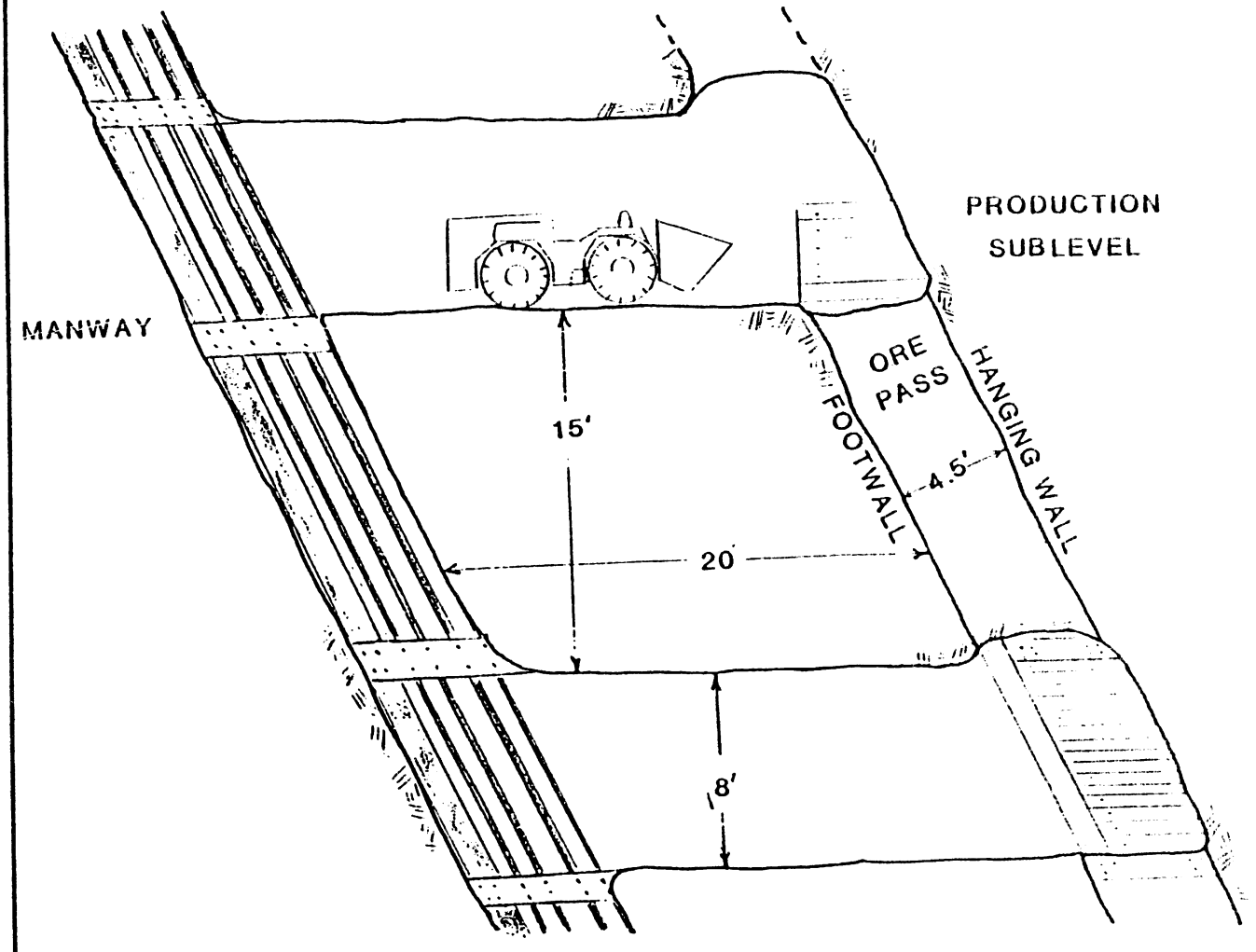
Sublevels will be excavated on 23-foot centers up the manway. At eight feet high, that would leave a fifteen-foot pillar between each sublevel. This pillar is to be drilled and blasted using the wagon drill. The pillar will be drilled five-feet wide an $13\frac{1}{2}$ feet long and the full depth of the pillar. The pillar will be top loaded with Anfo and blasted, yielding 78 tons of ore per blast. The ore will fall to the timbered undercut below.

Each sublevel pillar will be retreated from the slot raise to the orepass pillar which is 25-feet either side of the orepass. The pillar will be left intact until the entire stope is depleted. The ore will not be drawn out of the chutes as soon as it is broken. A predetermined volume of broken ore will be left in the stope to cushion the undercut timber. When the stope is complete, the ore will be drawn and the orepass pillar will be drilled and blasted.

By the time the last sublevel pillar is broken, the next stope block will be ready for production. This cycle continues from the ore blocks on the 100 level down one level at a time, until all the ore is extracted. The cycles and costs for these activities follow.

This stoping process is illustrated in Figures 9.2.1 through 9.2.7.

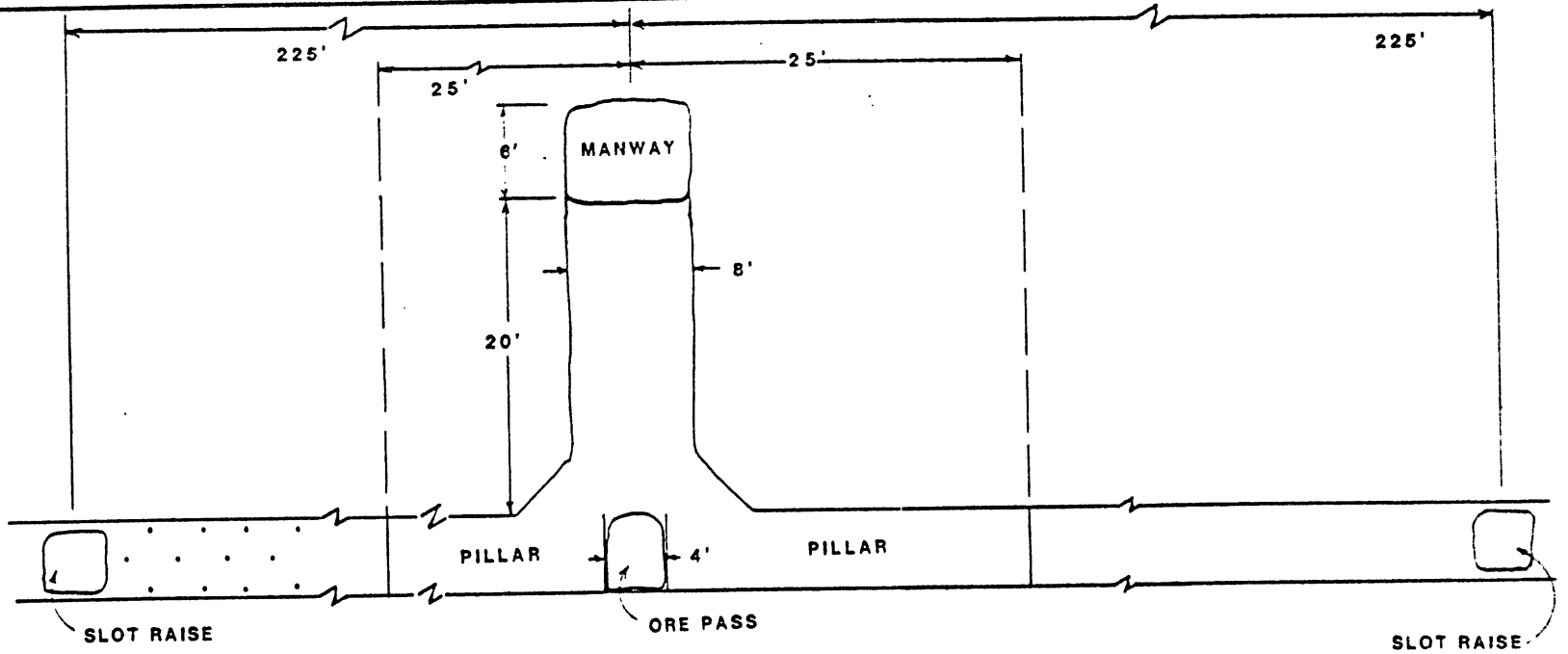




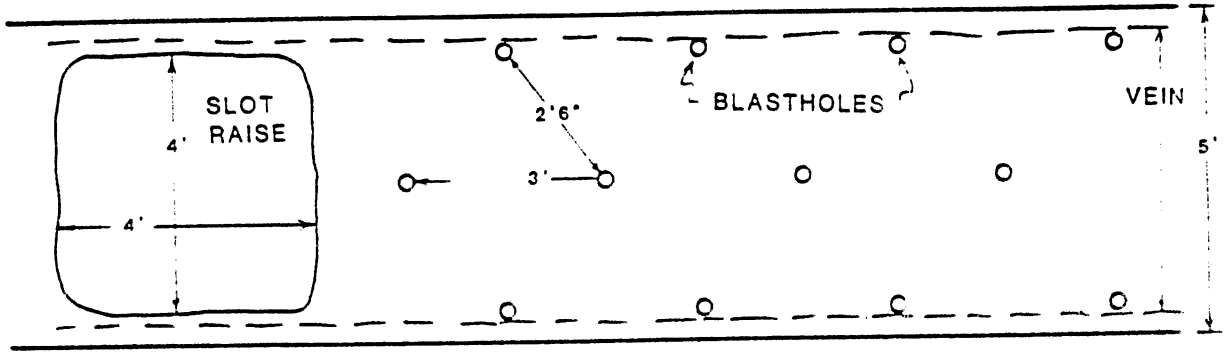
GOLD ROAD MINE

TYPICAL SUB-LEVEL ARRANGEMENT

FIGURE 9.2.1



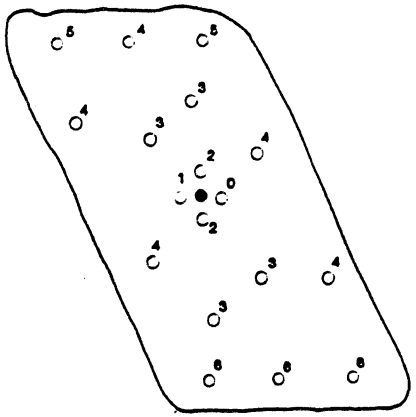
PLAN VIEW OF TYPICAL SUBLEVEL



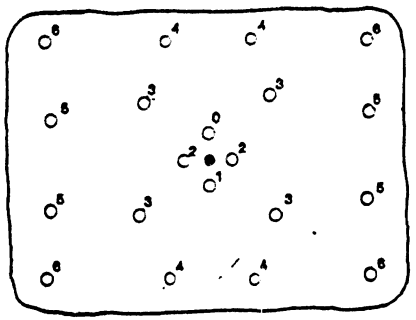
TYPICAL LONGHOLE DRILLING PATTERN

GOLD ROAD MINE
SUBLEVEL DEVELOPMENT

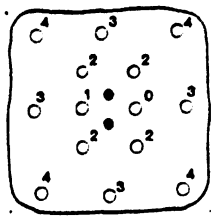
FIGURE 9.2.2



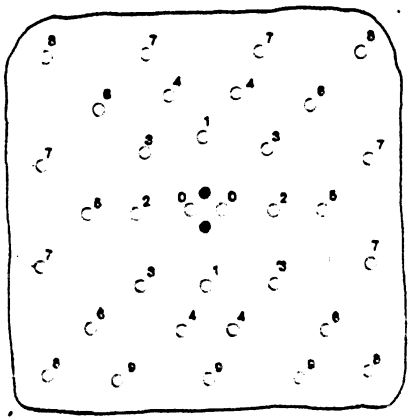
19 - 1 5/8" x 6' HOLES
5'x8' SUBLEVEL DRIFT



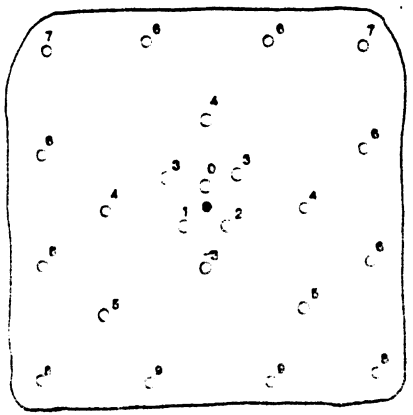
21 - 1 5/8" x 6' HOLES
6'x8' MANWAY



16 - 1 5/8" x 6' HOLES
4'x4' SLOT RAISE



35 - 1 5/8" x 8' HOLES
8'x8' TRACK DRIFT



24 - 1 5/8" x 8' HOLES
8'x8' CROSS CUT

GOLD ROAD MINE
DEVELOPMENT DRILL PATTERN

FIGURE 9.2.3

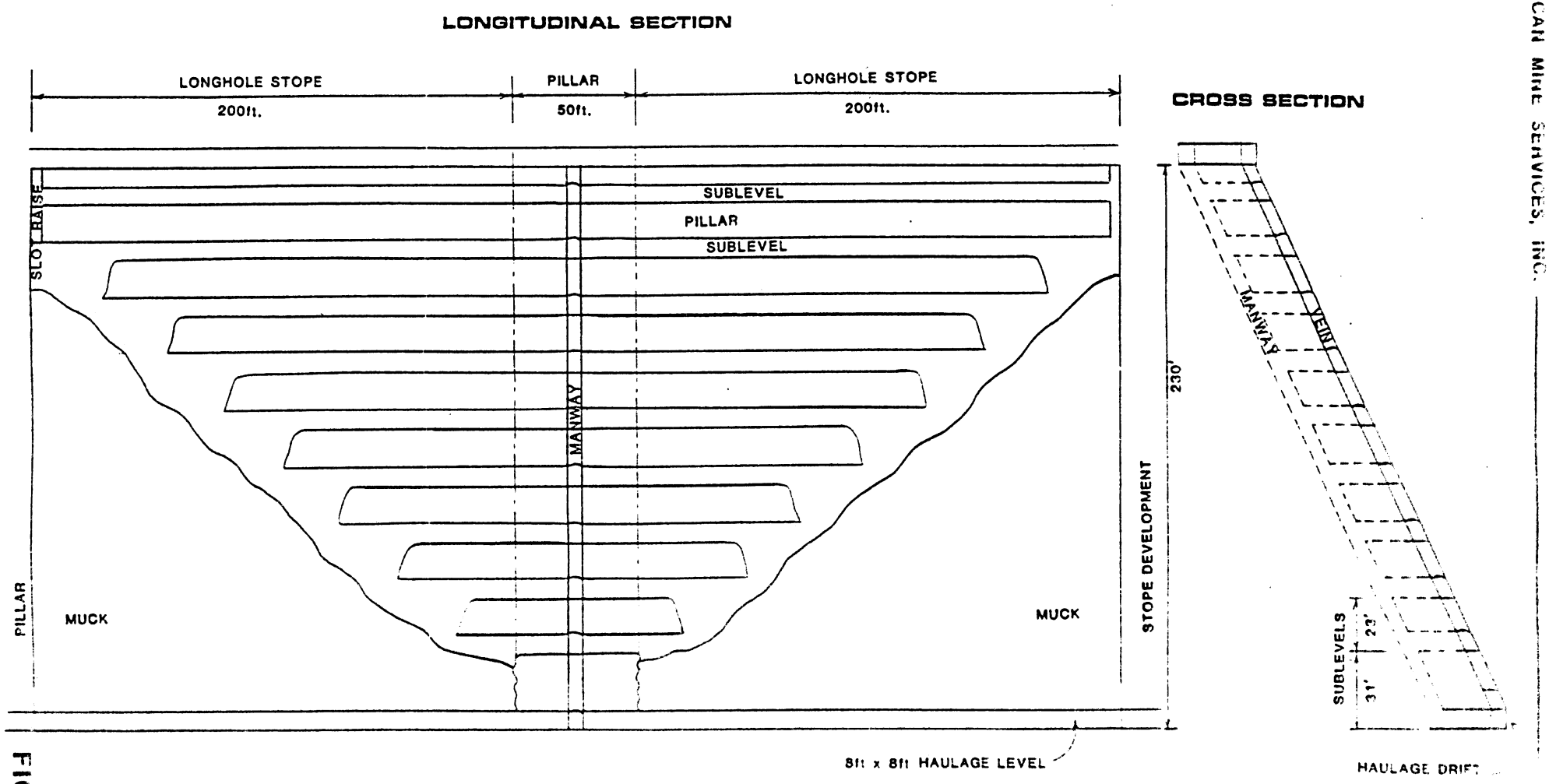


FIGURE 9.2.4

GOLD ROAD MINE

100 LEVEL-SUBLEVEL LONGHOLE STOPING

AMERICAN MINE SERVICES, INC.

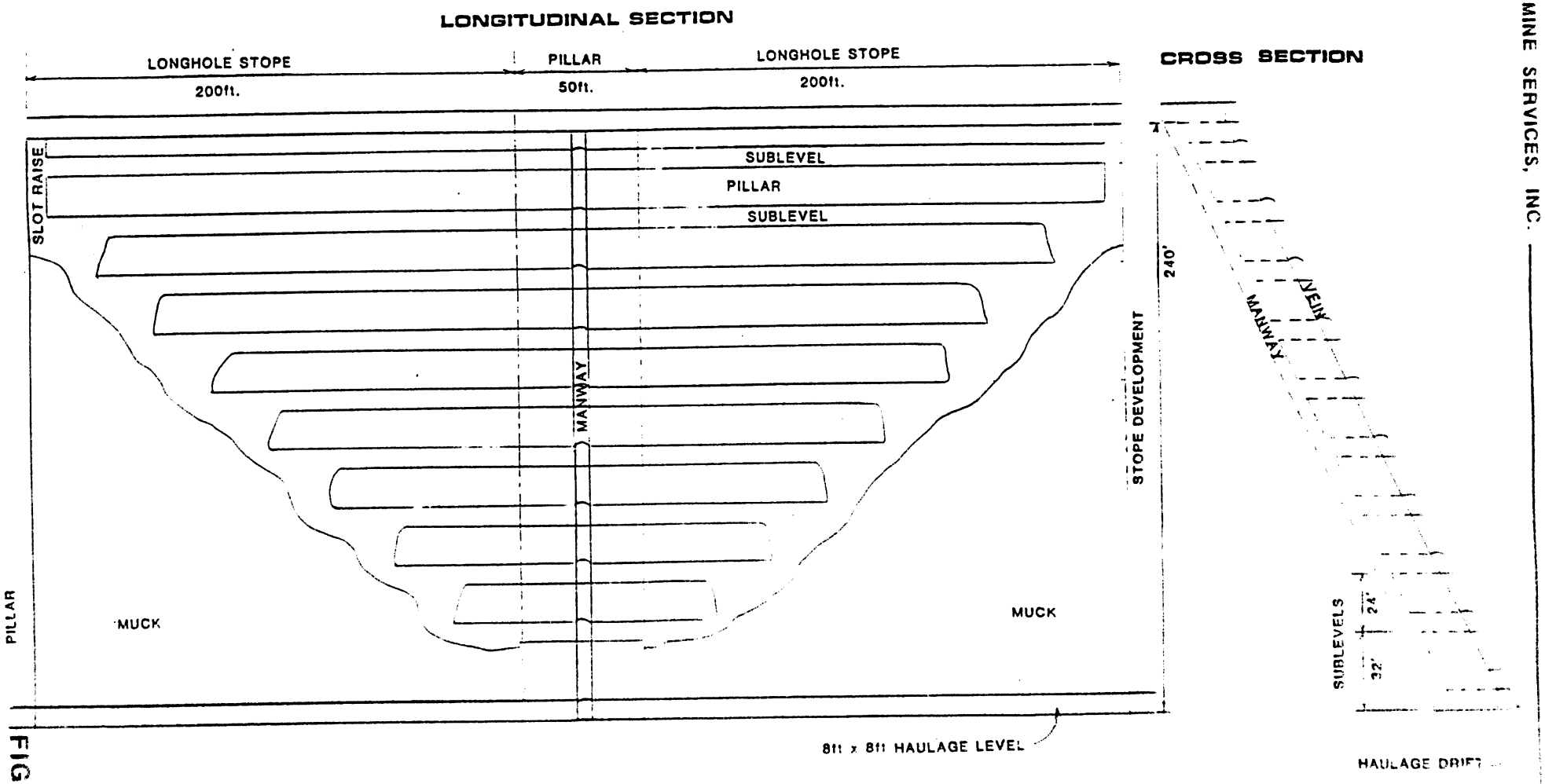
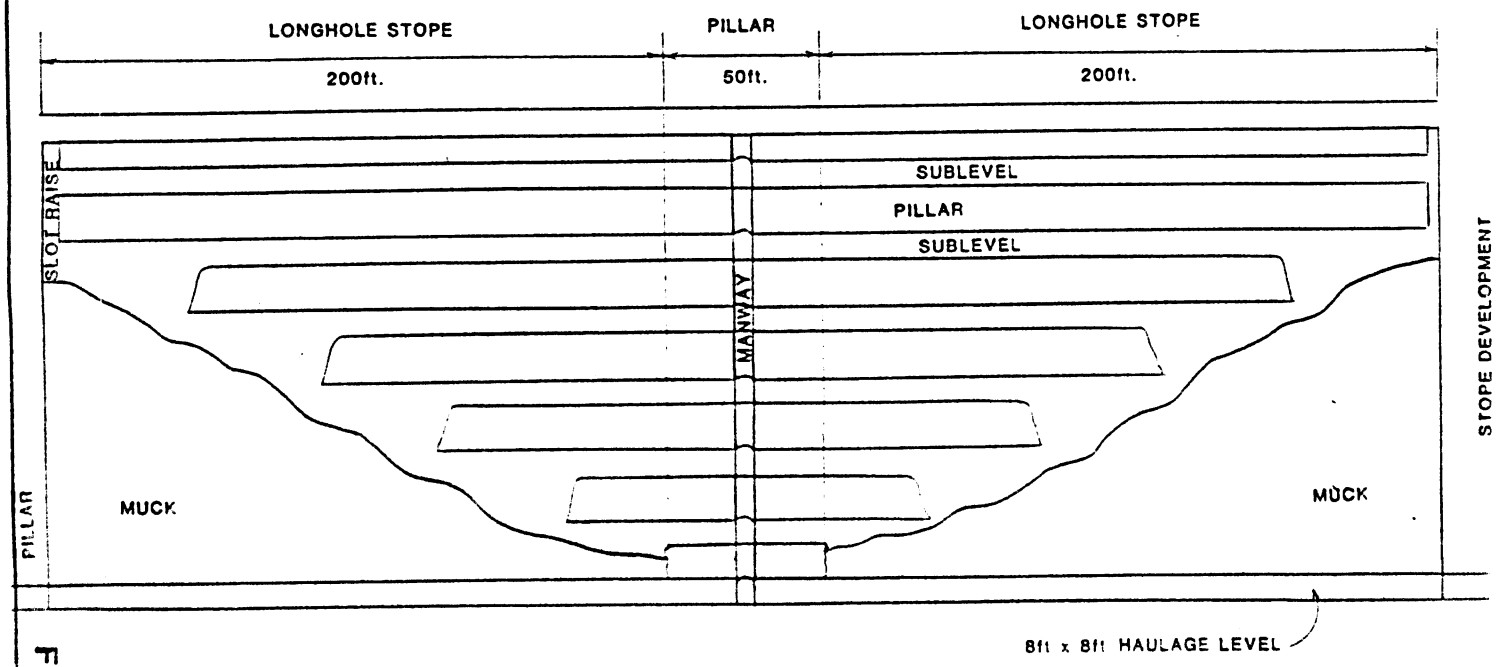


FIGURE 9.2.5

GOLD ROAD MINE

350 LEVEL-SUBLEVEL LONGHOLE STOPING

LONGITUDINAL SECTION



CROSS SECTION

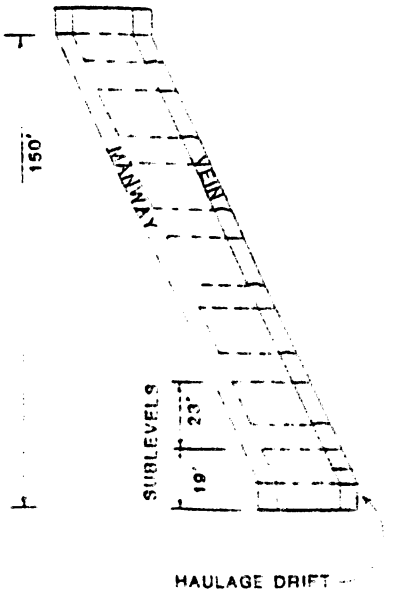


FIGURE 9.2.6

GOLD ROAD MINE

500 LEVEL-SUBLEVEL LONGHOLE STOPING

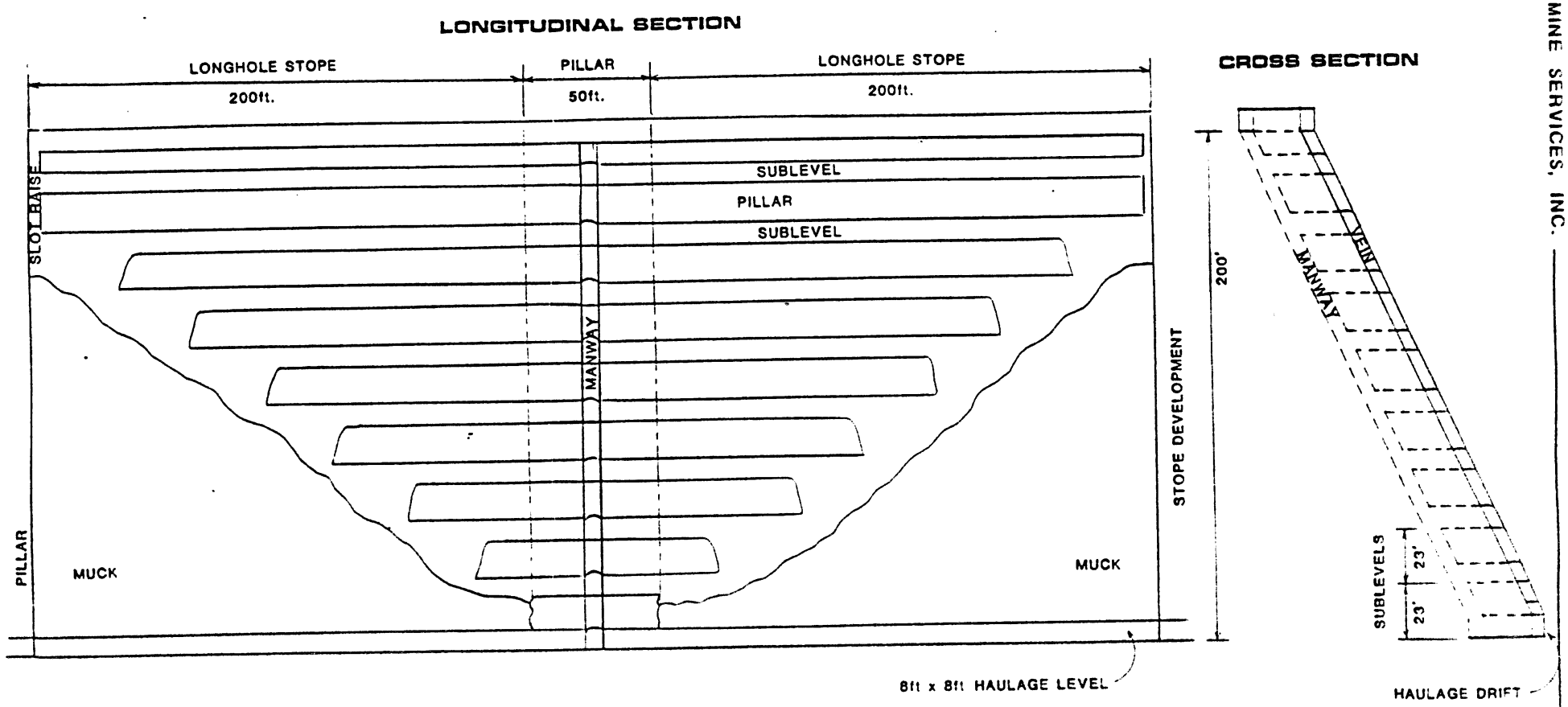


FIGURE 9.2.7

GOLD ROAD MINE

700 LEVEL-SUBLEVEL LONGHOLE STOPING

SECTION 9.0 - COMPUTER SHEETS

(SEE APPENDIX D)

Cycle Sheets - Group No. 2

Stoping - Under Cutting and Timbering
Stoping - Manway Crosscuts
Stoping - Manway (6 x 8) Alimak
Stoping - Orepass (4 x 5)
Stoping - Sublevel Development
Stoping - Slot Raises (4 x 4)
Stoping - Longhole Drilling and Blasting
Mine Development - Rail Headings - Lower Levels
Mine Development - Slashing Lower Levels - Rail

Activity Sheets - Group No. 2

Stoping - Under Cutting and Timbering - Cost (Equipment and Materials)
Stoping - Manway Crosscuts - Cost (Equipment and Materials)
Stoping - Manway (6 x 8) Alimak - Cost (Equipment and Materials)
Stoping - Orepass Raise (4 x 5) - Cost (Equipment and Materials)
Stoping - Sublevel Development - Cost (Equipment and Materials)
Stoping - Slot Raises (4 x 4) - Cost (Equipment and Materials)
Stoping - Longhole Drilling and Blasting - Cost (Equipment and Materials)
Stoping - Track Haulage - Cost (Equipment and Materials)
Stoping - Hoisting - Cost (Equipment and Materials)
Mine Development - Rail Headings, Lower Levels - Cost (Equipment and Materials)
Mine Development - Slashing Existing Levels - Cost (Equipment and Materials)
Mine Development - Level Rehabilitation Without Cave - Cost
Mine Development - Level Rehabilitation With Slabbing - Cost
Mine Development - Level Rehabilitation With Cave - Cost

Summary Sheets

Sharon Steel - Gold Road Mine - Manning Schedule

Sharon Steel - Gold Road Mine - Manning Cost Schedule

Sharon Steel - Gold Road Mine - Equipment and Material Cost

Gold Road Mine - Capital Expenses

SHARON STEEL - GOLD ROAD MINE - MANNING SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
GENERAL AND ADMINISTRATIVE														
PROJECT MANAGER	$4,200	0.3968	$5,867	1	1	1	1	1	1	1	1	1	1	0.54
SAFETY ENGINEER/PERSONNEL	$2,600	0.3968	$3,632	1	1	1	1	1	1	1	1	1	1	0.54
PURCHASING/ACCOUNTING	$1,800	0.3968	$2,514	1	1	1	1	1	1	1	1	1	1	0.54
CLERK	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	0.54
SECRETARY	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	2.15
SECURITY	$1,200	0.3968	$1,676	4	4	4	4	4	4	4	4	4	4	4.84
SUBTOTAL				9	9	9	9	9	9	9	9	9	9	
MINE MANNING														
GENERAL AND ADMINISTRATIVE														
SUPERINTENDANT	$3,800	0.4489	$5,506	1	1	1	1	1	1	1	1	1	1	0.54
SHIFT SUPERVISORS	$3,400	0.4489	$4,926	3	3	3	3	3	3	3	3	3	3	1.61
MASTER MECHANIC	$3,400	0.4489	$4,926	1	1	1	1	1	1	1	1	1	1	0.54
ENGINEER	$2,800	0.4489	$4,057	1	1	1	1	1	1	1	1	1	1	0.54
GEOLOGIST	$2,800	0.4489	$4,057	1	1	1	1	1	1	1	1	1	1	1.08
SURVEYOR/SAMPLER/DRAFTSMAN	$1,800	0.4489	$2,608	2	2	2	2	2	2	2	2	2	2	1.08
CLERK	$1,600	0.4489	$2,318	1	1	1	1	1	1	1	1	1	1	0.54
SUBTOTAL				10	10	10	10	10	10	10	10	10	10	5.38214285
INDIRECT	RATE PER HOUR	FRINGE RATE	MONTHLY COST											
HOISTMAN	$10.50	0.4089	$2,564	4	4	4	4	4	4	4	4	4	4	2.15
TOPLANDER	$9.00	0.4089	$2,198	2	2	2	2	2	2	2	2	2	2	1.08
SKIPTENDER	$10.00	0.4089	$2,442	2	2	2	2	2	2	2	2	2	2	1.08
DRY MAN	$9.00	0.4089	$2,198	1	1	1	1	1	1	1	1	1	1	0.54
MECHANIC	$11.50	0.4089	$2,808	3	3	3	3	3	3	3	3	3	3	1.61
ELECTRICIAN	$11.50	0.4089	$2,808	1	1	1	1	1	1	1	1	1	1	0.54
UTILITYMAN	$10.50	0.4089	$2,564	2	2	2	2	2	2	2	2	2	2	1.08
TIMBERMAN	$10.50	0.4089	$2,564	2	2	2	2	2	2	2	2	2	2	1.08
LABORER	$9.50	0.4089	$2,320	3	4	5	5	5	5	5	5	5	5	2.69
SUBTOTAL				20	21	22	23	23	23	23	23	23	23	12
MINE OPERATION														
LEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	0.00	1.72	2.59	3.45	1.94	2.15	2.15	2.15	1.94	1.72	0.65
CROSS CUT MINER	$11.00	0.4089	$2,686	1.19	0.56	0.71	0.79	0.82	0.79	0.79	0.79	0.79	0.79	0.22
MANWAY RAISE MINER	$11.00	0.4089	$2,686	1.45	0.73	0.87	0.97	1.00	0.97	0.97	0.97	0.97	0.97	0.26
ORE PASS MINER	$11.00	0.4089	$2,686	0.63	0.31	0.38	0.42	0.43	0.42	0.42	0.42	0.42	0.42	0.11
UNDERCUT DEVELOPMENT MINER	$11.00	0.4089	$2,686	2.88	1.44	1.73	1.92	1.99	1.92	1.92	1.92	1.92	1.92	0.52
SUBLEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	6.00	9.00	10.79	11.99	9.45	11.99	11.99	11.99	11.99	11.99	3.23
SLOT RAISE MINER	$11.00	0.4089	$2,686	0.44	0.22	0.38	0.43	0.44	0.43	0.43	0.43	0.43	0.43	0.12
STOPE PRODUCTION DRILLER/BLASTER	$10.75	0.4089	$2,625	1.88	3.75	3.93	4.28	3.75	4.44	4.44	4.44	4.44	4.56	3.56
UNDERGROUND HAULING MOTORMAN	$10.50	0.4089	$2,564	2.17	3.18	3.85	4.20	3.38	4.23	4.23	4.23	4.22	4.21	2.25
SURFACE TRUCK OPERATOR	$10.00	0.4089	$2,442	1	1	1	1	1	1	1	1	1	1	0.54
REHABILITATION MINER	$11.00	0.4089	$2,686	0.00	0.00	0.00	1.00	0.25	2.26	0.00	0.00	0.00		
SUBTOTAL				18	22	26	31	24	31	28	28	28	28	20
TOTAL MINE HOURLY MANNING				38	43	48	53	46	53	50	50	50	50	31
TOTAL MINE MANNING				48	53	58	63	56	63	60	60	60	60	41
TONS PER MAN SHIFT				5.66	4.99	5.41	5.60	4.99	5.59	5.80	5.80	5.80	5.84	5.13

2-Jan-87

FILENAME : MANNING

DISC NUMBER : 1504

AMERICAN MINE SERVICES, INC.

SHASTA STEEL - COLD ROAD MINE - MANNING SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
MILL MANNING														
GENERAL AND ADMINISTRATIVE														
MILL SUPERINTENDANT	$3,800	0.3968	$5,308	1	1	1	1	1	1	1	1	1	1	0.54
METALLURGIST	$3,200	0.3968	$4,470	1	1	1	1	1	1	1	1	1	1	0.54
SUPERVISOR	$3,200	0.3968	$4,470	1	1	1	1	1	1	1	1	1	1	0.54
ASSAYER	$2,000	0.3968	$2,794	1	1	1	1	1	1	1	1	1	1	0.54
SAMPLER/SAMPLE PREP	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	0.54
CLERK	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	0.54
SUBTOTAL				6	6	6	6	6	6	6	6	6	6	3.23
MILL OPERATIONS														
MILL OPERATOR	$10.50	0.3568	$2,469	4	4	4	4	4	4	4	4	4	4	2.15
MILL OPER ASSISTANT	$10.00	0.3568	$2,352	4	4	4	4	4	4	4	4	4	4	2.15
CRUSHER OPERATOR	$10.00	0.3568	$2,352	1	1	1	1	1	1	1	1	1	1	0.54
CRUSHER HELPER	$9.50	0.3568	$2,234	2	2	2	2	2	2	2	2	2	2	1.08
REFINERY OPERATOR	$10.50	0.3568	$2,469	2	2	2	2	2	2	2	2	2	2	1.08
MECHANIC	$10.50	0.3568	$2,469	2	2	2	2	2	2	2	2	2	2	1.08
ELECTRICIAN	$10.50	0.3568	$2,469	2	2	2	2	2	2	2	2	2	2	1.08
LABORER	$9.00	0.3568	$2,117	1	1	1	1	1	1	1	1	1	1	0.54
SUBTOTAL				4	4	4	4	4	4	4	4	4	4	2.15
TOTAL MILL MANNING				20	20	20	20	20	20	20	20	20	20	10.76
TOTAL PROJECT MANNING				26	26	26	26	26	26	26	26	26	26	14
				89	88	92	98	91	98	95	95	95	95	56

FILENAME : MANNING

DISK NUMBER : 150

AMERICAN MINE SERVICES, INC.

SHARON STEEL - GULD ROAD MINE - MANNING COST SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	GRAND TOTAL
GENERAL AND ADMINISTRATIVE															
PROJECT MANAGER	$4,200	0.3968	$5,867	$17,600	$17,600	$17,600	$17,600	$70,399	$70,399	$70,399	$70,399	$70,399	$70,399	$20,393	$442,785
SAFETY ENGINEER/PERSONNEL	$2,600	0.3968	$3,632	$10,895	$10,895	$10,895	$10,895	$43,580	$43,580	$43,580	$43,580	$43,580	$43,580	$12,624	$274,109
PURCHASING/ACCOUNTING	$1,800	0.3968	$2,514	$7,543	$7,543	$7,543	$7,543	$30,171	$30,171	$30,171	$30,171	$30,171	$30,171	$8,740	$189,765
CLERK	$1,400	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
SECRETARY	$1,400	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
SECURITY	$1,200	0.3968	$1,676	$20,114	$20,114	$20,114	$20,114	$80,456	$80,456	$80,456	$80,456	$80,456	$80,456	$23,306	$506,040
SUBTOTAL				$67,884	$67,884	$67,884	$67,884	$271,538	$271,538	$271,538	$271,538	$271,538	$271,538	$78,658	$1,707,882
MINE MANNING															
GENERAL AND ADMINISTRATIVE															
SUPERINTENDENT	$3,800	0.4489	$5,506	$16,517	$16,517	$16,517	$16,517	$66,070	$66,070	$66,070	$66,070	$66,070	$66,070	$19,139	$415,556
SHIFT SUPERVISORS	$3,400	0.4489	$4,926	$44,336	$44,336	$44,336	$44,336	$177,345	$177,345	$177,345	$177,345	$177,345	$177,345	$51,372	$1,115,445
MASTER MECHANIC	$3,400	0.4489	$4,926	$14,779	$14,779	$14,779	$14,779	$59,115	$59,115	$59,115	$59,115	$59,115	$59,115	$17,124	$371,815
ENGINEER	$2,800	0.4489	$4,057	$12,171	$12,171	$12,171	$12,171	$48,683	$48,683	$48,683	$48,683	$48,683	$48,683	$14,102	$306,200
GEOLOGIST	$2,800	0.4489	$4,057	$12,171	$12,171	$12,171	$12,171	$48,683	$48,683	$48,683	$48,683	$48,683	$48,683	$14,102	$306,200
SURVEYOR/SAMPLER/DRAFTSMAN	$1,800	0.4489	$2,608	$15,648	$15,648	$15,648	$15,648	$62,592	$62,592	$62,592	$62,592	$62,592	$62,592	$18,131	$393,684
CLERK	$1,600	0.4489	$2,318	$6,955	$6,955	$6,955	$6,955	$27,819	$27,819	$27,819	$27,819	$27,819	$27,819	$8,058	$174,972
SUBTOTAL				$122,577	$122,577	$122,577	$122,577	$490,308	$490,308	$490,308	$490,308	$490,308	$490,308	$142,030	$3,083,876
INDIRECT	RATE PER HOUR	FRINGE RATE	MONTHLY COST												
HOISTMAN	$10.50	0.4089	$2,564	$30,770	$30,770	$30,770	$30,770	$123,082	$123,082	$123,082	$123,082	$123,082	$123,082	$35,654	$774,143
TOPLANDER	$9.00	0.4089	$2,198	$13,187	$13,187	$13,187	$13,187	$52,749	$52,749	$52,749	$52,749	$52,749	$52,749	$15,280	$331,775
SKIPTENDER	$10.00	0.4089	$2,442	$14,653	$14,653	$14,653	$14,653	$58,610	$58,610	$58,610	$58,610	$58,610	$58,610	$16,978	$368,639
DRY MAN	$9.00	0.4089	$2,198	$6,594	$6,594	$6,594	$6,594	$26,375	$26,375	$26,375	$26,375	$26,375	$26,375	$7,640	$165,888
MECHANIC	$11.50	0.4089	$2,808	$25,276	$25,276	$25,276	$25,276	$101,103	$101,103	$101,103	$101,103	$101,103	$101,103	$29,297	$636,903
ELECTRICIAN	$11.50	0.4089	$2,808	$8,425	$8,425	$8,425	$8,425	$33,701	$33,701	$33,701	$33,701	$33,701	$33,701	$9,762	$211,968
UTILITYMAN	$10.50	0.4089	$2,564	$15,385	$15,385	$15,385	$15,385	$61,541	$61,541	$61,541	$61,541	$61,541	$61,541	$17,827	$387,071
TIMBERMAN	$10.50	0.4089	$2,564	$15,385	$15,385	$15,385	$15,385	$61,541	$61,541	$61,541	$61,541	$61,541	$61,541	$17,827	$387,071
LABORER	$9.50	0.4089	$2,320	$20,880	$27,840	$34,800	$34,800	$118,319	$139,199	$139,199	$139,199	$139,199	$139,199	$40,323	$854,639
SUBTOTAL				$150,555	$157,515	$164,475	$164,475	$637,029	$657,900	$657,900	$657,900	$657,900	$657,900	$190,577	$4,117,097
MINE OPERATION															
LEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	$0	$13,893	$20,835	$27,779	$62,504	$69,448	$69,448	$69,448	$62,504	$55,559	$11,213	$400,124
MANWAY RAISE MINER	$11.00	0.4089	$2,686	$11,695	$5,848	$7,017	$7,797	$32,357	$31,187	$31,187	$31,187	$31,187	$31,187	$4,517	$192,611
ORE PASS MINER	$11.00	0.4089	$2,686	$5,057	$2,529	$3,034	$3,372	$13,992	$13,486	$13,486	$13,486	$13,486	$13,486	$1,953	$83,377
UNDERCUT DEVELOPMENT MINER	$11.00	0.4089	$2,686	$23,185	$11,593	$13,911	$15,457	$64,146	$61,828	$61,828	$61,828	$61,828	$61,828	$8,955	$382,241
SUBLEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	$48,331	$72,497	$86,996	$96,662	$304,485	$386,648	$386,648	$386,648	$386,648	$386,648	$56,001	$2,393,729
STOPE PRODUCTION DRILLER/BLASTER	$10.75	0.4089	$2,625	$14,842	$26,138	$30,842	$33,685	$105,511	$139,981	$139,981	$139,981	$140,851	$141,722	$60,907	$868,833
UNDERGROUND HAULING MOTORMAN	$10.50	0.4089	$2,564	$16,663	$24,480	$29,605	$32,149	$103,896	$130,305	$130,305	$130,305	$129,923	$129,541	$36,763	$791,003
SURFACE TRUCK DR	$10.00	0.4089	$2,442	$7,326	$7,326	$7,326	$7,326	$29,305	$29,305	$29,305	$29,305	$29,305	$29,305	$8,449	$184,329
REHABILITATION MINER	$11.00	0.4089	$2,686	$0	$0	$0	$8,081	$8,081	$72,730	$0	$0	$0	$0	$0	$80,811
SUBTOTAL				$127,100	$164,299	$199,567	$233,312	$724,277	$934,922	$862,189	$862,189	$855,733	$849,277	$188,699	$5,277,256
TOTAL MINE HOURLY MANNING				$277,655	$321,814	$364,042	$397,787	$1,361,298	$1,592,822	$1,520,089	$1,520,089	$1,513,633	$1,507,177	$329,276	$9,394,283
TOTAL MINE MANNING				$400,232	$444,391	$486,619	$520,364	$1,851,605	$2,083,130	$2,010,396	$2,010,396	$2,003,941	$1,997,485	$521,305	$12,478,159
TONS PER MAN SHIFT				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

AMERICAN MINE SERVICES, INC.

SHAROH STEEL - COLD ROAD MINE - MANNING COST SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	GRAND TOTAL
MILL MANNING															
GENERAL AND ADMINISTRATIVE															
MILL SUPERINTENDENT	$3,800	0.3968	$5,308	$15,924	$15,924	$15,924	$15,924	$63,694	$63,694	$63,694	$63,694	$63,694	$63,694	$18,451	$400,615
METALLURGIST	$3,200	0.3968	$4,470	$13,409	$13,409	$13,409	$13,409	$53,637	$53,637	$53,637	$53,637	$53,637	$53,637	$15,537	$337,360
SUPERVISOR	$3,200	0.3968	$4,470	$13,409	$13,409	$13,409	$13,409	$53,637	$53,637	$53,637	$53,637	$53,637	$53,637	$15,537	$337,360
ASSAYER	$2,000	0.3968	$2,794	$8,381	$8,381	$8,381	$8,381	$33,523	$33,523	$33,523	$33,523	$33,523	$33,523	$9,711	$210,850
SAMPLER/SAMPLE PREP	$1,400	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
CLERK	$1,400	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
SUBTOTAL				$62,856	$62,856	$62,856	$62,856	$251,424	$251,424	$251,424	$251,424	$251,424	$251,424	$72,831	$1,581,375
MILL OPERATIONS															
MILL OPERATOR	$10.50	0.3568	$2,469	$29,633	$29,633	$29,633	$29,633	$118,530	$118,530	$118,530	$118,530	$118,530	$118,530	$34,335	$745,515
MILL OPER ASSISTANT	$10.00	0.3568	$2,352	$28,221	$28,221	$28,221	$28,221	$112,886	$112,886	$112,886	$112,886	$112,886	$112,886	$32,700	$710,015
CRUSHER OPERATOR	$10.00	0.3568	$2,352	$7,055	$7,055	$7,055	$7,055	$28,221	$28,221	$28,221	$28,221	$28,221	$28,221	$8,175	$177,504
CRUSHER HELPER	$9.50	0.3568	$2,234	$13,405	$13,405	$13,405	$13,405	$53,621	$53,621	$53,621	$53,621	$53,621	$53,621	$15,535	$337,257
REFINERY OPERATOR	$10.50	0.3568	$2,469	$14,816	$14,816	$14,816	$14,816	$59,265	$59,265	$59,265	$59,265	$59,265	$59,265	$17,168	$372,758
MECHANIC	$10.50	0.3568	$2,469	$14,816	$14,816	$14,816	$14,816	$59,265	$59,265	$59,265	$59,265	$59,265	$59,265	$17,168	$372,758
ELECTRICIAN	$10.50	0.3568	$2,469	$7,408	$7,408	$7,408	$7,408	$29,633	$29,633	$29,633	$29,633	$29,633	$29,633	$8,584	$186,379
LABORER	$9.00	0.3568	$2,117	$25,399	$25,399	$25,399	$25,399	$101,597	$101,597	$101,597	$101,597	$101,597	$101,597	$29,430	$639,013
SUBTOTAL				$140,754	$140,754	$140,754	$140,754	$563,018	$563,018	$563,018	$563,018	$563,018	$563,018	$163,092	$3,541,198
TOTAL MILL MANNING				$203,610	$203,610	$203,610	$203,610	$814,442	$814,442	$814,442	$814,442	$814,442	$814,442	$235,923	$5,122,573
TOTAL PROJECT MANNING				$671,727	$715,886	$758,114	$791,859	$2,937,585	$3,169,109	$3,096,376	$3,096,376	$3,089,920	$3,083,465	$835,886	$19,308,717

AMERICAN MINE SERVICES, INC.

SHARON STEEL - GOLD ROAD MINE - EQUIPMENT & MATERIAL COST

ITEM	UNIT	EQUIPMENT COST PER UNIT	MATERIAL COST PER UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	TOTAL YEAR 1	TOTAL YEAR 2	TOTAL YEAR 3	TOTAL YEAR 4	TOTAL YEAR 5	TOTAL YEAR 6	TOTAL YEAR 7	GRAND TOTAL
GENERAL & ADMINISTRATIVE - MISCELLANEOUS															
OFFICE MATERIALS	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
SAFETY SUPPLIES	$/MONTH		$300	$900	$900	$900	$900	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,538
TRAVEL EXPENSES	$/MONTH		$300	$900	$900	$900	$900	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,538
TECH AND LEGAL CONSULTING EXPENSE	$/MONTH		$400	$1,200	$1,200	$1,200	$1,200	$4,800	$4,800	$4,800	$4,800	$4,800	$4,800	$2,584	$31,384
MISCELLANEOUS	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
AUTO EXPENSE	$/MONTH	$400		$1,200	$1,200	$1,200	$1,200	$4,800	$4,800	$4,800	$4,800	$4,800	$4,800	$2,584	$31,384
SALES TAX	% MATER $		5.00%	$9,408	$12,281	$14,706	$16,963	$53,360	$67,878	$63,480	$63,313	$62,953	$62,593	$35,710	$413,277
PROPERTY & LIABILITY INSURANCE	% LABOR &		4.00%	$11,289	$14,737	$17,650	$20,356	$64,032	$81,453	$76,175	$75,976	$75,544	$75,112	$42,441	$495,932
SUBTOTAL				$26,097	$32,418	$37,757	$42,719	$138,991	$170,931	$161,255	$160,889	$160,097	$159,305	$90,961	$1,050,434
ELECTRIC POWER	$/MONTH	$43,336		$78,006	$104,007	$130,009	$130,009	$442,032	$520,037	$520,037	$520,037	$520,037	$520,037	$279,892	$3,322,111
MINE GENERAL AND ADMIN															
OFFICE SUPPLIES	$/MONTH		$100	$300	$300	$300	$300	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$646	$7,846
ENGINEERING SUPPLIES	$/MONTH		$150	$450	$450	$450	$450	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$969	$11,769
GEOLOGY SUPPLIES	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
TRAVEL EXPENSES	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
AUTO/TRUCK EXPENSE	$/MONTH	$800		$2,400	$2,400	$2,400	$2,400	$9,600	$9,600	$9,600	$9,600	$9,600	$9,600	$5,167	$62,767
HEAT	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
SUBTOTAL				$4,950	$4,950	$4,950	$4,950	$19,800	$19,800	$19,800	$19,800	$19,800	$19,800	$10,657	$129,457
MINE INDIRECT															
VENTILATION	$/MONTH	$600	$600	$2,520	$2,880	$3,240	$3,600	$12,240	$14,400	$14,400	$14,400	$14,400	$14,400	$7,750	$91,990
PUMPING	$/MONTH	$300	$500	$1,860	$2,040	$2,220	$2,400	$8,520	$9,600	$9,600	$9,600	$9,600	$9,600	$5,167	$61,687
COMPRESSED AIR	$/MONTH	$800	$300	$1,860	$2,340	$2,820	$3,300	$10,320	$13,200	$13,200	$13,200	$13,200	$13,200	$7,104	$83,424
HAULAGE LEVEL MAINTENANCE	$/MONTH	$300	$1,200	$3,960	$4,140	$4,320	$4,500	$16,920	$18,000	$18,000	$18,000	$18,000	$18,000	$9,688	$116,608
TIMBER/CHUTE REPAIR	$/MONTH	$400	$800	$2,880	$3,120	$3,360	$3,600	$12,960	$14,400	$14,400	$14,400	$14,400	$14,400	$7,750	$92,710
SERVICE HOIST/RAISE REPAIR	$/MONTH	$200	$500	$1,740	$1,860	$1,980	$2,100	$7,680	$8,400	$8,400	$8,400	$8,400	$8,400	$4,522	$54,202
MAINTENANCE TOOLS AND SUPPLIES	$/MONTH	200	800	$2,640	$2,760	$2,880	$3,000	$11,280	$12,000	$12,000	$12,000	$12,000	$12,000	$6,458	$77,738
MISCELLANEOUS	$/MONTH	$600	$1,200	$4,320	$4,680	$5,040	$5,400	$19,440	$21,600	$21,600	$21,600	$21,600	$21,600	$11,625	$139,065
SUBTOTAL				$21,780	$23,820	$25,860	$27,900	$99,360	$111,600	$111,600	$111,600	$111,600	$111,600	$60,065	$717,425
MINE DIRECT OPERATING															
LEVEL DEVELOPMENT	$/FOOT	$8.80	$42.12	$0	$14,184	$21,276	$28,368	$63,828	$70,920	$70,920	$70,920	$63,828	$56,736	$21,276	$418,428
MAINWAY CROSSCUT	$/FOOT	$2.04	$29.49	$6,606	$3,203	$3,844	$4,271	$17,724	$17,083	$17,083	$17,083	$17,083	$17,083	$4,597	$107,738
MAINWAY RAISE	$/FOOT	$19.66	$43.77	$14,153	$7,076	$8,492	$9,435	$39,156	$37,741	$37,741	$37,741	$37,741	$37,741	$10,156	$233,017
ORE PASS	$/FOOT	$0.41	$43.53	$5,911	$2,956	$3,547	$3,941	$16,355	$15,763	$15,763	$15,763	$15,763	$15,763	$4,240	$99,414
UNDERCUT DEVELOPMENT	$/FOOT	$5.03	$4.81	$6,222	$3,111	$3,733	$4,148	$17,213	$16,591	$16,591	$16,591	$16,591	$16,591	$4,465	$104,431
SUBLEVEL DEVELOPMENT	$/FOOT	$8.12	$17.43	$34,429	$51,643	$61,972	$68,857	$216,900	$275,429	$275,429	$275,429	$275,429	$275,429	$74,120	$1,668,185
SLUT RAISE	$/FOOT	$3.75	$11.92	$4,216	$2,108	$2,529	$2,811	$11,665	$11,243	$11,243	$11,243	$11,243	$11,243	$217,047	$284,928
STOPE PRODUCTION	$/TON	$0.48	$1.16	$7,304	$12,844	$15,183	$16,584	$51,939	$68,907	$68,907	$68,907	$49,336	$49,744	$53,415	$452,375
UNDERGROUND HAULAGE	$/TON	$0.26	$0.25	$4,041	$8,876	$10,734	$12,019	$35,669	$47,244	$47,244	$47,244	$47,105	$46,967	$24,765	$298,238
HOISTING	$/TON	$0.25	$0.10	$4,144	$6,091	$7,366	$8,248	$25,851	$32,422	$32,422	$32,422	$32,277	$32,132	$16,996	$204,673
TRUCKING TO MILL	$/TON	$1.11	$0.00	$13,194	$19,392	$23,452	$26,259	$82,302	$103,222	$103,222	$103,222	$102,919	$102,617	$54,109	$651,013
LEVEL RAHABILITATION	$/FOOT	$24.53	$16.36	$0	$0	$0	$9,405	$9,405	$84,642	$0	$0	$0	$0	$0	$94,047
SUBTOTAL				$102,029	$131,508	$162,126	$194,345	$590,006	$781,206	$696,565	$696,565	$669,347	$682,168	$487,366	$4,623,262
TOTAL MINE OPERATING				$128,759	$160,276	$192,936	$227,195	$709,164	$912,608	$827,965	$827,965	$820,767	$813,568	$558,110	$5,470,149

AMERICAN MINE SERVICES, INC.

SHARON STEEL - COLD ROAD MINE - EQUIPMENT & MATERIAL COST

ITEM	UNIT	EQUIPMENT COST PER UNIT	MATERIAL COST PER UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	TOTAL YEAR 1	TOTAL YEAR 2	TOTAL YEAR 3	TOTAL YEAR 4	TOTAL YEAR 5	TOTAL YEAR 6	TOTAL YEAR 7	GRAND TOTAL
MILL GENERAL AND ADMINISTRATIVE															
OFFICE SUPPLIES	$/MONTH	$100	$200	$720	$780	$840	$900	$3,240	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,178
LABRATORY EXPENSE	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
AUTO/TRUCK	$/MONTH	$1,200		$1,440	$2,160	$2,880	$3,600	$10,080	$14,400	$14,400	$14,400	$14,400	$14,400	$7,750	$89,830
TRAVEL EXPENSE	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
MILLION INSUR, FRT & REFINING	$/OUNCE		$4	$14,131	$21,197	$25,436	$28,263	$89,027	$109,725	$106,400	$103,075	$103,075	$103,075	$55,476	$669,853
HEAT	$/MONTH		$300	$900	$900	$900	$900	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,538
SUBTOTAL				$18,885	$27,278	$32,625	$36,450	$115,238	$142,475	$139,150	$135,825	$135,825	$135,825	$73,100	$877,440
MILL OPERATIONS															
PRIMARY JAW CRUSHER	$/TON		$0.03	$328	$492	$591	$656	$2,067	$2,625	$2,625	$2,625	$2,625	$2,625	$1,413	$16,605
CONE CRUSHER	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
BARMAC CRUSHER	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
SCREENS AND FEEDERS	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
CONVEYORS AND CHUTES	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
PUMP & TANKS	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
UTILITIES	$/TON		$0.02	$219	$328	$394	$438	$1,378	$1,750	$1,750	$1,750	$1,750	$1,750	$942	$11,070
MACH	$/TON		$1.40	$15,312	$22,969	$27,563	$30,625	$96,469	$122,500	$122,500	$122,500	$122,500	$122,500	$65,931	$774,900
LIME	$/TON		$0.16	$1,750	$2,625	$3,150	$3,500	$11,025	$14,000	$14,000	$14,000	$14,000	$14,000	$7,535	$88,560
FLOCCULANTS	$/TON		$0.03	$328	$492	$591	$656	$2,067	$2,625	$2,625	$2,625	$2,625	$2,625	$1,413	$16,605
MISCELLANEOUS REAGENTS	$/TON		$0.03	$328	$492	$591	$656	$2,067	$2,625	$2,625	$2,625	$2,625	$2,625	$1,413	$16,605
ZINC	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
FLUXES	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
GRINDING METAL	$/TON		$0.99	$9,844	$14,766	$17,719	$19,688	$62,016	$78,750	$78,750	$78,750	$78,750	$78,750	$42,384	$498,150
TAILINGS MAINTENANCE	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
SUB TOTAL				$35,109	$52,664	$63,197	$70,219	$221,189	$280,875	$280,875	$280,875	$280,875	$280,875	$151,171	$1,776,735
TOTAL MILL OPERATIONS				$53,994	$79,942	$95,822	$106,669	$336,427	$423,350	$420,025	$416,700	$416,700	$416,700	$224,274	$2,654,175
TOTAL PROJECT EQUIPMENT AND MATERIALS				$286,856	$376,643	$456,525	$506,592	$1,626,614	$2,026,927	$1,979,283	$1,925,592	$1,917,601	$1,909,610	$1,161,241	$12,496,871

GOLD ROAD MINE - CAPITAL EXPENSES

CAPITAL REQUIREMENTS	NUMBER REQUIRED	UNIT COST	TOTAL COST
GENERAL AND ADMINISTRATIVE			
OFFICE BUILDING	1	$35,000	$35,000
OFFICE EQUIP & FURNISHINGS	1	$10,000	$10,000
AUTO - PICKUPS	1	$14,000	$14,000
SANITARY FACILITIES	1	$18,000	$18,000
SUBTOTAL			$77,000
MINE CAPITAL			
MINE SURFACE			
OFFICE/ DRY	1	$60,000	$60,000
WAREHOUSE / SHOP	1	$30,000	$30,000
COMPRESSOR 1200CFM	3	$30,000	$90,000
SUBSTATION	1	$65,000	$65,000
ENGINEERING EQUIPMENT	1	$12,000	$12,000
PICKUP	2	$14,000	$28,000
SURFACE LOADER 680	1	$85,000	$85,000
TRUCK 22T SURFACE	2	$85,000	$170,000
SANITARY FACILITIES	1	$12,500	$12,500
WATER SUPPLY	800	$30	$24,000
LAMPS/SELF RESCUE	50	$220	$11,000
EXPLOSIVE STORAGE	1	$12,000	$12,000
SUBTOTAL			$597,500
MINE HOIST AND SHAFT FACILITIES			
HOIST 500 HP	1	$200,000	$200,000
HEADFRAME 100 FT	1	$100,000	$100,000
LOADING POCKET EQUIPMENT	1	$14,000	$14,000
HOIST BUILDING	1	$30,000	$30,000
SHAFT FURNISHINGS	1480	$57	$84,360
SKIP/CAGE	1	$24,000	$24,000
SUBTOTAL			$452,360
MINE EQUIPMENT			
PRODUCTION LOCOMOTIVE 4 TON	3	$25,000	$75,000
ORE CARS 5 TON	30	$4,500	$135,000
JACKLEG DRILLS	24	$2,500	$60,000
LONGHOLE/BLAST HOLE DRILLS	3	$15,000	$45,000
SERVICE LOCOMOTIVE	4	$16,500	$66,000
LHD 2 CY	2	$66,500	$133,000
LHD 0.5 CY	3	$42,500	$127,500
TRUCK 5 TON UNDERGROUND	2	$45,500	$91,000
SUPPLY CARS	15	$1,500	$22,500
SECONDARY VENT FANS 30HP	5	$3,500	$17,500
DIAMOND DRILL	1	$20,000	$20,000
PRIMARY VENTILATION FAN 150 HP	1	$8,500	$8,500
PRIMARY DEWATERING PUMPS 100 HP	2	$12,500	$25,000
ALIMAK RAISE CLIMBER	1	$75,000	$75,000
MISCELLANEOUS MINE TOOLS	1	$16,000	$16,000
SUBTOTAL			$917,000
MINE TOTAL			$2,045,860

10.0 MILLING

The 1937 Gold Road Mill was a well engineered plant and embodied the latest technology of the times. While the basic metallurgy has not changed in fifty years, the equipment and reagents have improved dramatically. On the other hand, labor and power costs and some reagent costs are much higher even when related to gold prices.

Among the improvements in equipment and reagents since 1937:

Crushing	More Efficient Screens
	Automatic Adjusting Crushers
	Impact Crushers at Fine Sizes
	Alloy Crusher Liners
Grinding	Automatic Density Controls
	Alloy Mill Liners
	Alloy Grinding Balls
Sizing	Hydrocyclones
Solids/Liquids Separation	Flocculants That Work
	Hi-rate Thickeners
	Horizontal Belt Filters
	Pressure Leaf Clarifiers
	Filter Aids

Two circuits have been reviewed for this study, a CCD and a belt filter circuit, both with Merrill-Crowe gold recovery. Given the fast settling and filtration rates, a CIP or CIL circuit presents no economic or metallurgical attraction. The CCD circuit is used as the basis for cost estimates.

The operating parameters for the mill were extrapolated from the data from the previous operations and the Booth test data. The parameters are:

Grind Work Index	18.0 KWH/Ton	
Grind		90% - 200 Mesh
Cyanide Use	2.0#/Ton	
Lime Use	4.0#/Ton	
Settling Rate	5.25 Ft. 2/T	Original
		3.56 Ft. 2/TAt End
		4.0 Ft. 2/TDesign
		12 HoursAreation
		24 HoursDissolution

10.1 Cost Estimate Assumptions

Mill capacity is 300 tons per day.

A high voltage power line crosses the lower end of the property. It is assumed that power is available.

A natural gas pipeline crosses the property. It is assumed natural gas is available.

Two water pipelines cross the property. It is assumed water is available.

The mill site is reasonably level and bedrock is close for mill foundations. The 300 ton bin at #1 shaft is used, all other foundations are new.

The order of magnitude of the cost estimate is ±25%. Equipment cost is used, based on prices obtained within the last six months. New equipment costs are prices obtained on similar equipment in the last six months. Numerous small items, i.e. reagent pumps, feeders and water pumps are new costed. In general, any piece of equipment costing less than $2,000.00 is new.

An assay laboratory capable of running 40 fire assays and 120 A.A. assays per day is included in the costs.

10.2 Grinding

A power requirement of 18.0 KWH per ton was extrapolated from the old mill write up. Grinding would be done in a single eight foot x eight foot ball mill at 350 HP. If the finer Barmac crusher is not selected and the crush is 3/8 inch, a larger mill will be required. The grinding circuit will be closed by hydrocyclone.

10.3 Primary Thickener

An oversize 40 foot primary thickener was selected. The oversize thickener allows for regulation of feed to dissolution and separation circuits.

10.4 Dissolution

Agitated steel tanks are sized for twelve hours areation and 24 hour dissolution.

10.5 CCD

A 5 stage CCD circuit with a fourteen foot diameter high rate thickeners was selected.

10.6 Belt filter

A 12 meter 2 belt filter, with 3 washes would be appropriate.

10.7 Mill Housing

All large tanks would be outside. Crushing and grinding would be housed. A belt filter would require housing.

10.8 Crushing Circuit

The existing 300 ton cement silo would be used. The ore would be fed to a 10 inch x 24 inch jaw crusher set at four inches. The jaw crusher is sized for underground ore. If larger surface ore were to be processed, a larger opening crusher would be required. The jaw crusher discharge is fed directly to a three foot STD Symons Cone set at 1/2 inch. The cone discharge is fed to a four foot x ten foot DD screen with a bottom deck at 1/4 inch. Screen oversize is fed to a Barmac crusher; the Barmac discharge is in closed circuit with the screen. The screen undersize (-1/4 inch) is conveyed to the mill storage bin.

The ore is highly siliceous and an engineered dust suppression system is mandatory. A few water sprays here and there will not do the job. A water spray system with a surface active chemical addition is costed. The system is controlled by power draft. Hoods will be required over the screen, the cone and the Barmac.

The Barmac Rotopactor is a new development in crushing. It is a new type crusher utilizing rock on rock impact to keep wear to a minimum. Its attraction is the ability to fine crush. The fine crush enables a down sizing of the ball mill.

10.9 Tailings

The existing tailings were disposed in the manner of the times. A tails plume is evident for several hundred yards down the gulley. Modern times demand a more efficient tailing disposal system.

With the mining history of the area, however, a fully lined tailings area might not be required.

The CCD circuit is costed for a tails dam starter with subsequent building up by hydrocyclone. The pond is unlined. A return water system is included.

The belt filter tails could be conveyed to an unlined disposal area. A catcher dike is required at the foot of the disposal area. Return water would not be available.

There is good space available within the claim area for tailings disposal.

10.10 Water Requirements

A 300 TPD balanced circuit in a CCD configuration loses 75 gpm to tailings. Approximately 30 gpm is not recoverable and another 10 gpm would be lost to evaporation. The net requirement could be as low as 40 gpm with an efficient water recovery system.

This is a steady state number, instantaneous uses are 200 gpm.

A 300 TPD balanced belt filter circuit would required a steady 30 gpm make up water. The instantaneous uses are 200 gpm.

A safe requirement for a CCD system would be a continuous 75 gpm. A safe requirement for a belt filter system would be a continuous 50 gpm.

Both configurations require substantial tankage in the mill for surges, start ups and spills.

10.11 Power Requirements

CCD

Crushing and Conveying	350
Grinding and Sizing	450
Dissolution and Primary Thickener	100
CCD and Repulp	100
Merrill Crowe and Melt	75
	1075 HP
Misc. Pumps, Water, Lights	50 HP
	1125 HP

Belt Filter

Crushing and Conveying	350
Grinding and Sizing	450
Dissolution and Primary Thick	100
Belt Filter - Vacuum	150
Merrill Crowe and Melt	60
Miscellaneous	50
	1160 HP

These are extremely high requirements. However, the bulk of the power is in crushing and grinding the hard ore.

10.12 Metallurgy

Data from the Booth Tests indicate that 95% gold and a 60% silver recovery could be projected. The last milling operation achieved a 90% gold recovery.

With the advanced technology and a finer grind, a new mill should achieve the Booth recoveries of 95% gold and 60% silver.

There is some indication in the records of 100,000 tons of 0.08 "French" tailing remain on the property, that could be releached at at 75% recovery. This tonnage has not been taken into account as other records indicate it may have been all remilled before shutdown in 1941.

The previous milling operation produced a zinc precipitate which was shipped for refining. The new mill would produce a doré bullion for shipment to a refiner.

Both a CCD and a belt filter circuit have been reviewed. The CCD offers the advantage of overall lower operating costs. The belt filter recovers more solubilized gold in a more concentrated solution. The final selection should be made after thorough testing. There have been some notorious failures of belt filter systems due to inadequate testing.

This study is based on utilization of the old mill site.

If for mining reasons a location on the east side of the ridge were to be favorable, the new costs would not be significantly different.

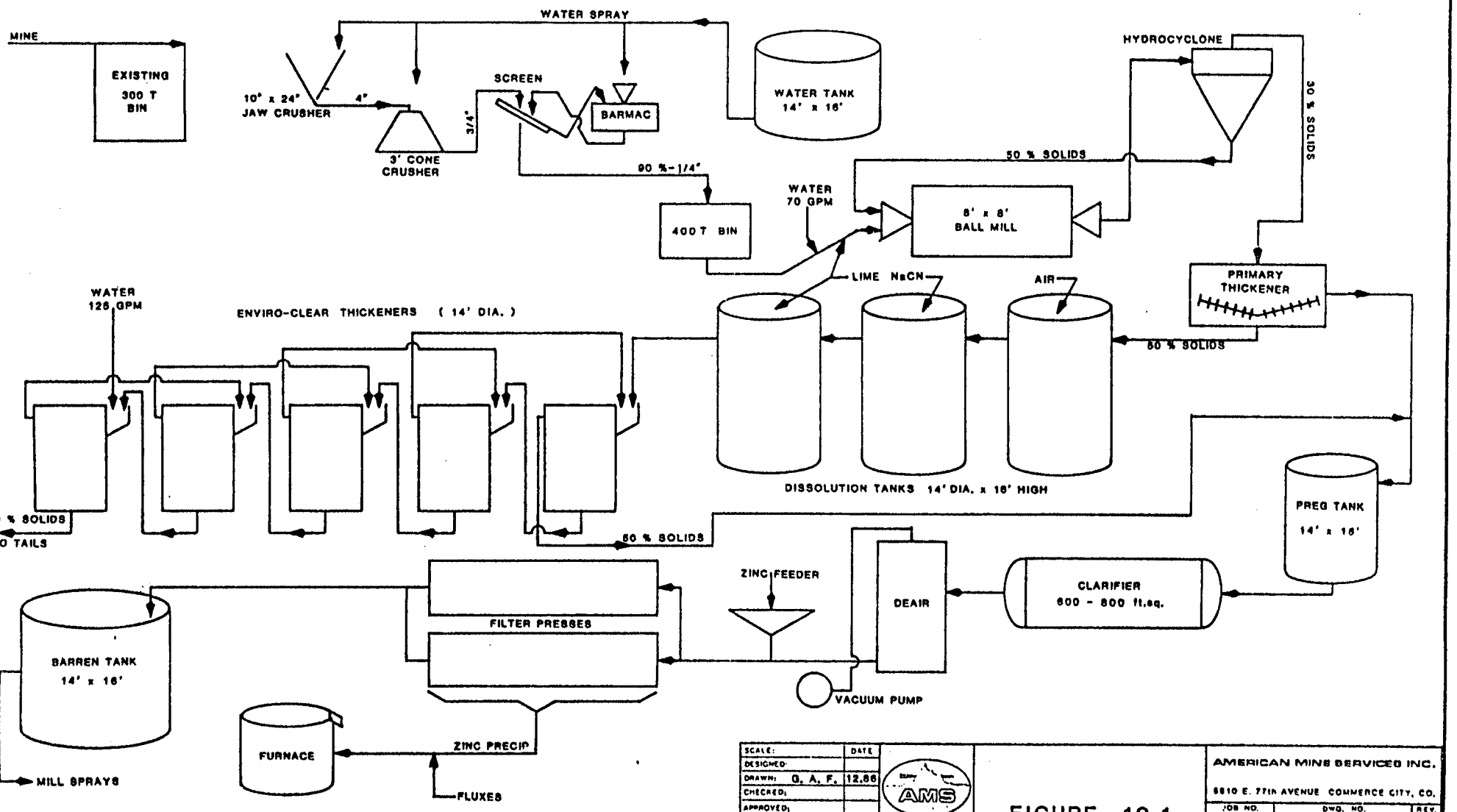
A reasonably flat area exists on and north of claim G.R.4. This site would be ample for a mill and all services including a shaft. If a belt filtration process were selected, up to 2,000,000 tons of filtered tails could be safely stacked at this site.

The area is too steep, with a grade of 4.5%, accommodate a tailings pond at a reasonable cost. However, northeast of the area is a suitable spot for tailings disposal.

The major power line runs within a mile of the site. Two water supply lines run within a mile of the site. An access road of approximately one mile would be required..

In total it appears that another site would result in $150,000 additional cost, exclusive of land or permitting costs.

GOLD ROAD - 300 TPD CCD CIRCUIT



SCALE:	DATE
DESIGNED:	
DRAWN: G. A. F.	12.86
CHECKED:	
APPROVED:	
APPROVED:	

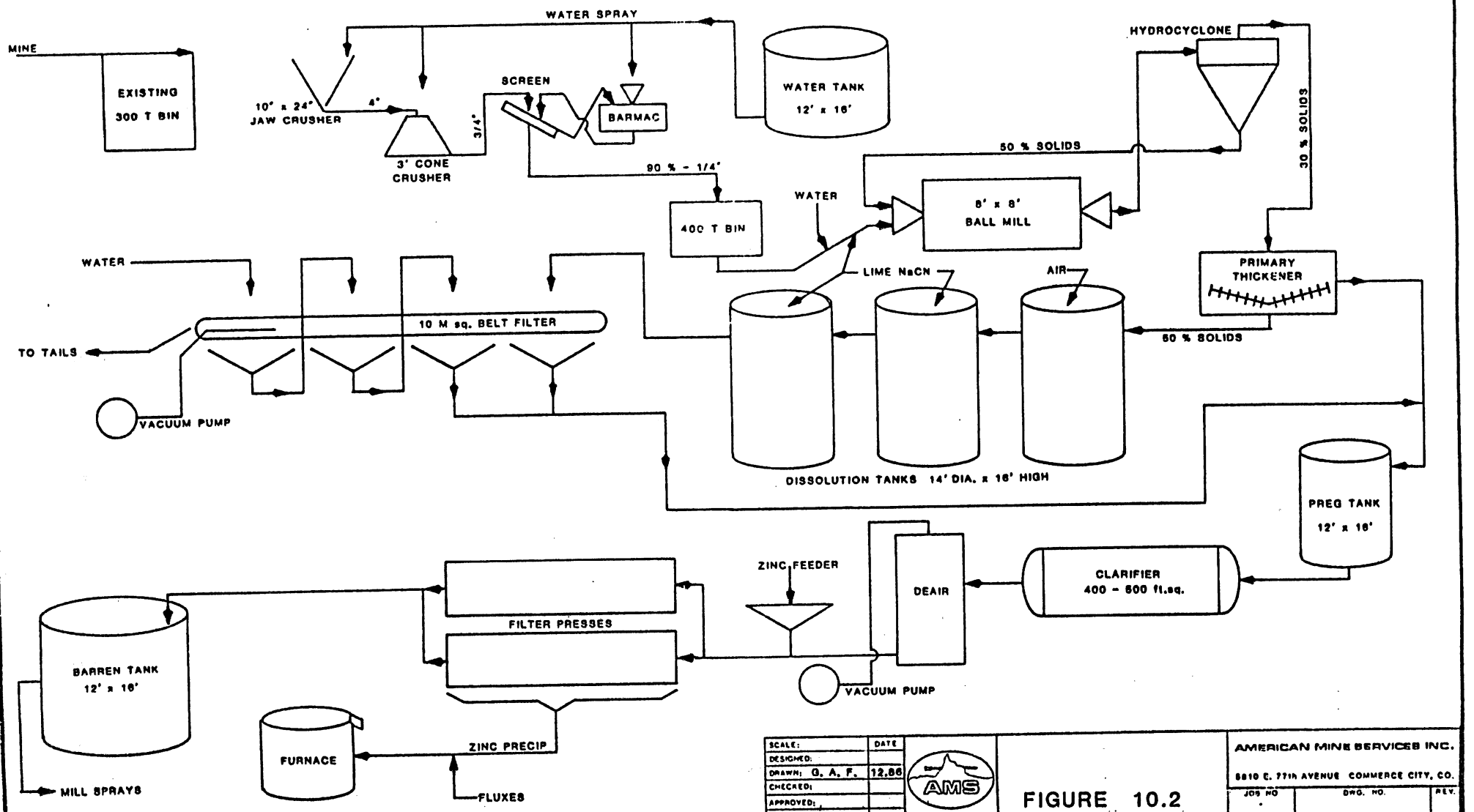
AMS

FIGURE 10.1

AMERICAN MINS SERVICES INC.
6810 E. 77th AVENUE COMMERCE CITY, CO.

JOB NO.	DWG. NO.	REV.

GOLD ROAD - 300 TPD BELT FILTER CIRCUIT



SCALE:	DATE
DESIGNED:	
DRAWN: G. A. F.	12.86
CHECKED:	
APPROVED:	
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AMS

FIGURE 10.2

AMERICAN MINE SERVICES INC.
5810 E. 77th AVENUE COMMERCE CITY, CO.

JOB NO	DWG. NO.	REV.

SECTION 10.0 - MILL COMPUTER SHEETS

Summary Sheets

Sharon Steel - Gold Road Mine - Manning Schedule

Sharon Steel - Gold Road Mine - Manning Cost Schedule

Sharon Steel - Gold Road Mine - Equipment and Material Cost

Gold Road Mine - Capital Expenses

SHARON STEEL - GOLD ROAD MINE - MANNING SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
GENERAL AND ADMINISTRATIVE														
PROJECT MANAGER	$4,200	0.3968	$5,867	1	1	1	1	1	1	1	1	1	1	0.54
SAFETY ENGINEER/PERSONNEL	$2,600	0.3968	$3,632	1	1	1	1	1	1	1	1	1	1	0.54
PURCHASING/ACCOUNTING	$1,800	0.3968	$2,514	1	1	1	1	1	1	1	1	1	1	0.54
CLERK	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	0.54
SECRETARY	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	0.54
SECURITY	$1,200	0.3968	$1,676	4	4	4	4	4	4	4	4	4	4	2.15
SUBTOTAL				9	9	9	9	9	9	9	9	9	9	4.84
MINE MANNING														
GENERAL AND ADMINISTRATIVE														
SUPERINTENDANT	$3,800	0.4489	$5,506	1	1	1	1	1	1	1	1	1	1	0.54
SHIFT SUPERVISORS	$3,400	0.4489	$4,926	3	3	3	3	3	3	3	3	3	3	1.61
MASTER MECHANIC	$3,400	0.4489	$4,926	1	1	1	1	1	1	1	1	1	1	0.54
ENGINEER	$2,800	0.4489	$4,057	1	1	1	1	1	1	1	1	1	1	0.54
GEOLOGIST	$2,800	0.4489	$4,057	1	1	1	1	1	1	1	1	1	1	0.54
SURVEYOR/SAMPLER/DRAFTSMAN	$1,800	0.4489	$2,608	2	2	2	2	2	2	2	2	2	2	1.08
CLERK	$1,600	0.4489	$2,318	1	1	1	1	1	1	1	1	1	1	0.54
SUBTOTAL				10	10	10	10	10	10	10	10	10	10	5.38214285
INDIRECT	RATE PER HOUR	FRINGE RATE	MONTHLY COST											
HOISTMAN	$10.50	0.4089	$2,564	4	4	4	4	4	4	4	4	4	4	2.15
TOPLANDER	$9.00	0.4089	$2,198	2	2	2	2	2	2	2	2	2	2	1.08
SKIPTENDER	$10.00	0.4089	$2,442	2	2	2	2	2	2	2	2	2	2	1.08
DRY MAN	$9.00	0.4089	$2,198	1	1	1	1	1	1	1	1	1	1	0.54
MECHANIC	$11.50	0.4089	$2,808	3	3	3	3	3	3	3	3	3	3	1.61
ELECTRICIAN	$11.50	0.4089	$2,808	1	1	1	1	1	1	1	1	1	1	0.54
UTILITYMAN	$10.50	0.4089	$2,564	2	2	2	2	2	2	2	2	2	2	1.08
TIMBERMAN	$10.50	0.4089	$2,564	2	2	2	2	2	2	2	2	2	2	1.08
LABORER	$9.50	0.4089	$2,320	3	4	5	5	5	5	5	5	5	5	2.69
SUBTOTAL				20	21	22	22	22	22	22	22	22	22	12
MINE OPERATION														
LEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	0.00	1.72	2.59	3.45	1.94	2.15	2.15	2.15	1.94	1.72	0.65
CROSS CUT MINER	$11.00	0.4089	$2,686	1.19	0.59	0.71	0.79	0.82	0.79	0.79	0.79	0.79	0.79	0.21
MANWAY RAISE MINER	$11.00	0.4089	$2,686	1.45	0.73	0.87	0.97	1.00	0.97	0.97	0.97	0.97	0.97	0.26
ORE PASS MINER	$11.00	0.4089	$2,686	0.63	0.31	0.38	0.42	0.43	0.42	0.42	0.42	0.42	0.42	0.11
UNDERCUT DEVELOPMENT MINER	$11.00	0.4089	$2,686	2.88	1.44	1.73	1.92	1.99	1.92	1.92	1.92	1.92	1.92	0.52
SUBLEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	6.00	9.00	10.79	11.99	9.45	11.99	11.99	11.99	11.99	11.99	3.23
SLOT RAISE MINER	$11.00	0.4089	$2,686	0.64	0.32	0.38	0.43	0.44	0.43	0.43	0.43	0.43	0.43	0.23
STOPE PRODUCTION DRILLER/BLASTER	$10.75	0.4089	$2,625	1.88	3.32	3.92	4.28	3.35	4.44	4.44	4.44	4.47	4.50	3.59
UNDERGROUND HAULING MOTORMAN	$10.50	0.4089	$2,564	2.17	3.18	3.85	4.31	3.38	4.23	4.23	4.23	4.22	4.21	2.22
SURFACE TRUCK OPERATOR	$10.00	0.4089	$2,442	1	1	1	1	1	1	1	1	1	1	0.54
REHABILITATION MINER	$11.00	0.4089	$2,686	0.00	0.00	0.00	1.00	0.25	2.26	0.00	0.00	0.00		
SUBTOTAL				18	22	26	31	24	31	28	28	28	28	20
TOTAL MINE HOURLY MANNING				38	43	48	53	46	53	50	50	50	50	31
TOTAL MINE MANNING				48	53	58	63	56	63	60	60	60	60	37
TONS PER MAN SHIFT				3.66	4.99	5.41	5.60	4.92	5.59	5.80	5.80	5.82	5.84	5.12

20-Jan-87 FILENAME : MANNING DISK NUMBER : 1506

AMERICAN MINE SERVICES, INC.

SHARON STEEL - COLD ROAD MINE - MANNING SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7
MILL MANNING														
GENERAL AND ADMINISTRATIVE														
MILL SUPERINTENDANT	$3,800	0.3968	$5,308	1	1	1	1	1	1	1	1	1	1	0.54
METALLURGIST	$3,200	0.3968	$4,470	1	1	1	1	1	1	1	1	1	1	0.54
SUPERVISOR	$3,200	0.3968	$4,470	1	1	1	1	1	1	1	1	1	1	0.54
ASSAYER	$2,000	0.3968	$2,794	1	1	1	1	1	1	1	1	1	1	0.54
SAMPLER/SAMPLE PREP	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	0.54
CLERK	$1,400	0.3968	$1,956	1	1	1	1	1	1	1	1	1	1	0.54
SUBTOTAL				6	6	6	6	6	6	6	6	6	6	3.23
MILL OPERATIONS														
MILL OPERATOR	$10.50	0.3568	$2,469	4	4	4	4	4	4	4	4	4	4	2.15
MILL OPER ASSISTANT	$10.00	0.3568	$2,352	4	4	4	4	4	4	4	4	4	4	2.15
CRUSHER OPERATOR	$10.00	0.3568	$2,352	1	1	1	1	1	1	1	1	1	1	0.54
CRUSHER HELPER	$9.50	0.3568	$2,234	2	2	2	2	2	2	2	2	2	2	1.08
REFINERY OPERATOR	$10.50	0.3568	$2,469	2	2	2	2	2	2	2	2	2	2	1.08
MECHANIC	$10.50	0.3568	$2,469	2	2	2	2	2	2	2	2	2	2	1.08
ELECTRICIAN	$10.50	0.3568	$2,469	2	2	2	2	2	2	2	2	2	2	1.08
LABORER	$9.00	0.3568	$2,117	1	1	1	1	1	1	1	1	1	1	0.54
SUBTOTAL				4	4	4	4	4	4	4	4	4	4	2.15
TOTAL MILL MANNING				20	20	20	20	20	20	20	20	20	20	10.76
TOTAL PROJECT MANNING				26	26	26	26	26	26	26	26	26	26	14
				83	88	93	98	91	98	95	95	95	95	56

20-Jan-87

FILENAME : MANNING

DISK NUMBER : 1506

AMERICAN MINE SERVICES, INC.

SHAROM STEEL - COLD ROAD MINE - MANNING COST SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	GRAND TOTAL
MILL MANNING															
GENERAL AND ADMINISTRATIVE															
MILL SUPERINTENDENT	$3,800	0.3968	$5,308	$15,924	$15,924	$15,924	$15,924	$63,694	$63,694	$63,694	$63,694	$63,694	$63,694	$18,451	$400,615
METALLURGIST	$3,200	0.3968	$4,470	$13,409	$13,409	$13,409	$13,409	$53,637	$53,637	$53,637	$53,637	$53,637	$53,637	$15,537	$337,340
SUPERVISOR	$3,200	0.3968	$4,470	$13,409	$13,409	$13,409	$13,409	$53,637	$53,637	$53,637	$53,637	$53,637	$53,637	$15,537	$337,340
ASSAYER	$2,000	0.3968	$2,794	$8,381	$8,381	$8,381	$8,381	$33,523	$33,523	$33,523	$33,523	$33,523	$33,523	$9,711	$210,850
SAMPLER/SAMPLE PREP	$1,900	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
CLERK	$1,400	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
SUBTOTAL				$62,856	$62,856	$62,856	$62,856	$251,424	$251,424	$251,424	$251,424	$251,424	$251,424	$72,831	$1,581,375
MILL OPERATIONS															
MILL OPERATOR	$10.50	0.3548	$2,469	$29,633	$29,633	$29,633	$29,633	$118,530	$118,530	$118,530	$118,530	$118,530	$118,530	$34,335	$745,515
MILL OPER ASSISTANT	$10.00	0.3548	$2,352	$28,221	$28,221	$28,221	$28,221	$112,886	$112,886	$112,886	$112,886	$112,886	$112,886	$32,700	$710,015
CRUSHER OPERATOR	$10.00	0.3548	$2,352	$7,055	$7,055	$7,055	$7,055	$28,221	$28,221	$28,221	$28,221	$28,221	$28,221	$8,175	$177,504
CRUSHER HELPER	$9.50	0.3548	$2,234	$13,405	$13,405	$13,405	$13,405	$53,621	$53,621	$53,621	$53,621	$53,621	$53,621	$15,538	$337,257
REFINERY OPERATOR	$10.50	0.3548	$2,469	$14,816	$14,816	$14,816	$14,816	$59,265	$59,265	$59,265	$59,265	$59,265	$59,265	$17,168	$372,758
MECHANIC	$10.50	0.3548	$2,469	$14,816	$14,816	$14,816	$14,816	$59,265	$59,265	$59,265	$59,265	$59,265	$59,265	$17,168	$372,758
ELECTRICIAN	$10.50	0.3548	$2,469	$7,408	$7,408	$7,408	$7,408	$29,633	$29,633	$29,633	$29,633	$29,633	$29,633	$8,584	$186,379
LABORER	$9.00	0.3548	$2,117	$25,399	$25,399	$25,399	$25,399	$101,597	$101,597	$101,597	$101,597	$101,597	$101,597	$29,430	$639,013
SUBTOTAL				$140,754	$140,754	$140,754	$140,754	$563,018	$563,018	$563,018	$563,018	$563,018	$563,018	$163,092	$3,541,198
TOTAL MILL MANNING				$203,610	$203,610	$203,610	$203,610	$814,442	$814,442	$814,442	$814,442	$814,442	$814,442	$235,923	$5,122,573
TOTAL PROJECT MANNING				$471,727	$715,686	$758,114	$791,859	$2,937,585	$3,169,109	$3,096,376	$3,096,376	$3,089,920	$3,063,445	$835,886	$19,308,717

AMERICAN MINE SERVICES, INC.

SHARON STEEL - COLD ROAD MINE - MANNING COST SCHEDULE

DESCRIPTION	MONTHLY SALARY	FRINGE RATE	MONTHLY COST	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	GRAND TOTAL
GENERAL AND ADMINISTRATIVE															
PROJECT MANAGER	$4,200	0.3968	$5,867	$17,600	$17,600	$17,600	$17,600	$70,399	$70,399	$70,399	$70,399	$70,399	$70,399	$20,392	$442,785
SAFETY ENGINEER/PERSONNEL	$2,600	0.3968	$3,632	$10,895	$10,895	$10,895	$10,895	$43,580	$43,580	$43,580	$43,580	$43,580	$43,580	$12,624	$274,105
PURCHASING/ACCOUNTING	$1,800	0.3968	$2,514	$7,543	$7,543	$7,543	$7,543	$30,171	$30,171	$30,171	$30,171	$30,171	$30,171	$8,740	$189,765
CLERK	$1,400	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
SECRETARY	$1,400	0.3968	$1,956	$5,867	$5,867	$5,867	$5,867	$23,466	$23,466	$23,466	$23,466	$23,466	$23,466	$6,798	$147,595
SECURITY	$1,200	0.3968	$1,676	$20,114	$20,114	$20,114	$20,114	$80,456	$80,456	$80,456	$80,456	$80,456	$80,456	$23,306	$506,040
SUBTOTAL				$67,884	$67,884	$67,884	$67,884	$271,538	$271,538	$271,538	$271,538	$271,538	$271,538	$78,658	$1,707,885
MINE MANNING															
GENERAL AND ADMINISTRATIVE															
SUPERINTENDENT	$3,800	0.4489	$5,506	$16,517	$16,517	$16,517	$16,517	$66,070	$66,070	$66,070	$66,070	$66,070	$66,070	$19,139	$415,558
SHIFT SUPERVISORS	$3,400	0.4489	$4,926	$44,336	$44,336	$44,336	$44,336	$177,345	$177,345	$177,345	$177,345	$177,345	$177,345	$51,372	$1,115,445
MASTER MECHANIC	$3,400	0.4489	$4,926	$14,779	$14,779	$14,779	$14,779	$59,115	$59,115	$59,115	$59,115	$59,115	$59,115	$17,124	$371,815
ENGINEER	$2,800	0.4489	$4,057	$12,171	$12,171	$12,171	$12,171	$48,683	$48,683	$48,683	$48,683	$48,683	$48,683	$14,102	$306,200
GEOLOGIST	$2,800	0.4489	$4,057	$12,171	$12,171	$12,171	$12,171	$48,683	$48,683	$48,683	$48,683	$48,683	$48,683	$14,102	$306,200
SURVEYOR/SAMPLER/DRAFTSMAN	$1,800	0.4489	$2,608	$15,648	$15,648	$15,648	$15,648	$62,592	$62,592	$62,592	$62,592	$62,592	$62,592	$18,131	$393,686
CLERK	$1,600	0.4489	$2,318	$6,955	$6,955	$6,955	$6,955	$27,819	$27,819	$27,819	$27,819	$27,819	$27,819	$8,058	$174,972
SUBTOTAL				$122,577	$122,577	$122,577	$122,577	$490,308	$490,308	$490,308	$490,308	$490,308	$490,308	$142,030	$3,083,876
INDIRECT	RATE PER HOUR	FRINGE RATE	MONTHLY COST												
HOISTMAN	$10.50	0.4089	$2,564	$30,770	$30,770	$30,770	$30,770	$123,082	$123,082	$123,082	$123,082	$123,082	$123,082	$35,654	$774,143
TUPLAMDER	$9.00	0.4089	$2,198	$13,187	$13,187	$13,187	$13,187	$52,749	$52,749	$52,749	$52,749	$52,749	$52,749	$15,280	$331,775
SKIPTENDER	$10.00	0.4089	$2,442	$14,653	$14,653	$14,653	$14,653	$58,610	$58,610	$58,610	$58,610	$58,610	$58,610	$16,978	$368,639
DRY MAN	$9.00	0.4089	$2,198	$6,594	$6,594	$6,594	$6,594	$26,375	$26,375	$26,375	$26,375	$26,375	$26,375	$7,640	$165,886
MECHANIC	$11.50	0.4089	$2,808	$25,276	$25,276	$25,276	$25,276	$101,103	$101,103	$101,103	$101,103	$101,103	$101,103	$29,297	$636,903
ELECTRICIAN	$11.50	0.4089	$2,808	$8,425	$8,425	$8,425	$8,425	$33,701	$33,701	$33,701	$33,701	$33,701	$33,701	$9,765	$211,968
UTILITYMAN	$10.50	0.4089	$2,564	$15,385	$15,385	$15,385	$15,385	$61,541	$61,541	$61,541	$61,541	$61,541	$61,541	$17,827	$387,071
TIMBERMAN	$10.50	0.4089	$2,564	$15,385	$15,385	$15,385	$15,385	$61,541	$61,541	$61,541	$61,541	$61,541	$61,541	$17,827	$387,071
LABORER	$9.50	0.4089	$2,320	$20,680	$27,840	$34,800	$34,800	$118,319	$139,199	$139,199	$139,199	$139,199	$139,199	$40,323	$854,639
SUBTOTAL				$150,555	$157,515	$164,475	$164,475	$637,020	$657,900	$657,900	$657,900	$657,900	$657,900	$190,577	$4,117,097
MINE OPERATION															
LEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	$0	$13,890	$20,835	$27,779	$62,504	$69,448	$69,448	$69,448	$62,504	$55,559	$11,213	$400,124
MANWAY RAISE MINER	$11.00	0.4089	$2,686	$11,695	$5,848	$7,017	$7,797	$32,357	$31,187	$31,187	$31,187	$31,187	$31,187	$4,517	$192,811
ORE PASS MINER	$11.00	0.4089	$2,686	$5,057	$2,529	$3,034	$3,372	$13,992	$13,486	$13,486	$13,486	$13,486	$13,486	$1,953	$83,377
UNDERCUT DEVELOPMENT MINER	$11.00	0.4089	$2,686	$23,185	$11,593	$13,911	$15,457	$64,146	$61,828	$61,828	$61,828	$61,828	$61,828	$8,955	$382,241
SUBLEVEL DEVELOPMENT MINER	$11.00	0.4089	$2,686	$48,331	$72,497	$86,996	$96,662	$304,485	$386,648	$386,648	$386,648	$386,648	$386,648	$56,001	$2,293,728
STOPE PRODUCTION DRILLER/BLASTER	$10.75	0.4089	$2,625	$14,842	$26,138	$30,842	$33,689	$105,511	$139,981	$139,981	$139,981	$140,851	$141,722	$60,807	$668,833
UNDERGROUND HAULING MOTORMAN	$10.50	0.4089	$2,564	$16,663	$24,480	$29,605	$33,149	$103,896	$130,305	$130,305	$129,923	$129,541	$129,541	$36,763	$791,037
SURFACE TRUCK OP	$10.00	0.4089	$2,442	$7,326	$7,326	$7,326	$7,326	$29,305	$29,305	$29,305	$29,305	$29,305	$29,305	$8,449	$184,320
REHABILITATION MINER	$11.00	0.4089	$2,686	$0	$0	$0	$8,081	$8,081	$72,733	$0	$0	$0	$0	$0	$80,815
SUBTOTAL				$127,100	$164,299	$199,567	$233,312	$724,277	$934,922	$862,189	$853,733	$849,277	$188,699	$5,277,286	
TOTAL MINE HOURLY MANNING				$277,655	$321,814	$364,042	$397,787	$1,361,298	$1,592,822	$1,520,089	$1,513,633	$1,507,177	$379,276	$9,394,382	
TOTAL MINE MANNING				$400,232	$444,391	$486,619	$520,364	$1,851,605	$2,083,130	$2,010,396	$2,003,941	$1,997,485	$521,305	$12,478,259	
TONS PER MAN SHIFT				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

AMERICAN MINE SERVICES, INC.

SHARON STEEL - GOLD ROAD MINE - EQUIPMENT & MATERIAL COST

ITEM	UNIT	EQUIPMENT COST PER UNIT	MATERIAL COST PER UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	TOTAL YEAR 1	TOTAL YEAR 2	TOTAL YEAR 3	TOTAL YEAR 4	TOTAL YEAR 5	TOTAL YEAR 6	TOTAL YEAR 7	GRAND TOTAL
GENERAL & ADMINISTRATIVE - MISCELLANEOUS															
OFFICE MATERIALS	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
SAFETY SUPPLIES	$/MONTH		$300	$900	$900	$900	$900	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,538
TRAVEL EXPENSES	$/MONTH		$300	$900	$900	$900	$900	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,538
TECH AND LEGAL CONSULTING EXPENSE	$/MONTH		$400	$1,200	$1,200	$1,200	$1,200	$4,800	$4,800	$4,800	$4,800	$4,800	$4,800	$2,583	$31,383
MISCELLANEOUS	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
AUTO EXPENSE	$/MONTH	$400		$1,200	$1,200	$1,200	$1,200	$4,800	$4,800	$4,800	$4,800	$4,800	$4,800	$2,583	$31,383
SALES TAX	% MATER $		5.00%	$9,408	$12,281	$14,708	$16,963	$53,360	$67,878	$63,480	$63,313	$62,953	$62,593	$39,700	$413,277
PROPERTY & LIABILITY INSURANCE	% LABOR $		4.00%	$11,289	$14,737	$17,650	$20,356	$64,032	$81,453	$76,175	$75,976	$75,544	$75,112	$47,641	$495,933
SUBTOTAL				$26,097	$32,418	$37,757	$42,719	$138,791	$170,931	$161,255	$160,889	$160,097	$159,305	$98,966	$1,050,434
ELECTRIC POWER	$/MONTH	$43,336		$78,006	$104,007	$130,009	$130,009	$442,032	$520,037	$520,037	$520,037	$520,037	$520,037	$279,892	$3,322,111
MINE GENERAL AND ADMIN															
OFFICE SUPPLIES	$/MONTH		$100	$300	$300	$300	$300	$1,200	$1,200	$1,200	$1,200	$1,200	$1,200	$646	$7,846
ENGINEERING SUPPLIES	$/MONTH		$150	$450	$450	$450	$450	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$969	$11,769
GEOLOGY SUPPLIES	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
TRAVEL EXPENSES	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
AUTO/TRUCK EXPENSE	$/MONTH	$800		$2,400	$2,400	$2,400	$2,400	$9,600	$9,600	$9,600	$9,600	$9,600	$9,600	$5,167	$62,767
HEAT	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,692
SUBTOTAL				$4,950	$4,950	$4,950	$4,950	$19,800	$19,800	$19,800	$19,800	$19,800	$19,800	$10,657	$129,457
MINE INDIRECT															
VENTILATION	$/MONTH	$600	$600	$2,520	$2,880	$3,240	$3,600	$12,240	$14,400	$14,400	$14,400	$14,400	$14,400	$7,750	$91,990
PUMPING	$/MONTH	$300	$500	$1,860	$2,040	$2,220	$2,400	$8,520	$9,600	$9,600	$9,600	$9,600	$9,600	$5,167	$61,687
COMPRESSED AIR	$/MONTH	$800	$300	$1,860	$2,340	$2,820	$3,300	$10,320	$13,200	$13,200	$13,200	$13,200	$13,200	$7,104	$83,424
HAULAGE LEVEL MAINTENANCE	$/MONTH	$300	$1,200	$3,960	$4,140	$4,320	$4,500	$16,920	$18,000	$18,000	$18,000	$18,000	$18,000	$9,688	$114,608
TIMBER/CHUTE REPAIR	$/MONTH	$400	$800	$2,880	$3,120	$3,360	$3,600	$12,960	$14,400	$14,400	$14,400	$14,400	$14,400	$7,750	$92,710
SERVICE HOIST/RAISE REPAIR	$/MONTH	$200	$500	$1,740	$1,860	$1,980	$2,100	$7,680	$8,400	$8,400	$8,400	$8,400	$8,400	$4,521	$54,201
MAINTENANCE TOOLS AND SUPPLIES	$/MONTH	200	800	$2,640	$2,760	$2,880	$3,000	$11,280	$12,000	$12,000	$12,000	$12,000	$12,000	$6,459	$77,739
MISCELLANEOUS	$/MONTH	$600	$1,200	$4,320	$4,680	$5,040	$5,400	$19,440	$21,600	$21,600	$21,600	$21,600	$21,600	$11,625	$139,065
SUBTOTAL				$21,780	$23,820	$25,860	$27,900	$99,360	$111,600	$111,600	$111,600	$111,600	$111,600	$60,065	$717,425
MINE DIRECT OPERATING															
LEVEL DEVELOPMENT	$/FOOT	$8.80	$42.12	$0	$14,184	$21,276	$28,368	$63,828	$70,920	$70,920	$70,920	$63,828	$56,736	$21,276	$418,428
MANWAY CROSSCUT	$/FOOT	$2.04	$29.43	$6,404	$9,203	$12,841	$16,271	$44,719	$51,724	$51,083	$51,083	$51,083	$51,083	$14,597	$315,369
MANWAY RAISE	$/FOOT	$19.66	$43.77	$14,153	$17,076	$18,492	$19,435	$69,156	$37,741	$37,741	$37,741	$37,741	$37,741	$10,154	$238,017
ORE PASS	$/FOOT	$9.41	$43.33	$5,911	$8,956	$12,547	$16,355	$43,769	$115,743	$115,743	$115,743	$115,743	$115,743	$31,142	$729,414
UNDERCUT DEVELOPMENT	$/FOOT	$5.03	$4.81	$6,222	$3,111	$3,731	$4,146	$17,213	$16,591	$16,591	$16,591	$16,591	$16,591	$4,465	$104,631
SUBLEVEL DEVELOPMENT	$/FOOT	$8.12	$17.43	$34,429	$51,643	$61,972	$68,857	$216,900	$275,429	$275,429	$275,429	$275,429	$275,429	$74,120	$1,668,165
SLOT RAISE	$/FOOT	$3.75	$11.92	$4,216	$2,108	$2,530	$2,811	$11,665	$11,243	$11,243	$11,243	$11,243	$11,243	$2,217,047	$284,928
STOPE PRODUCTION	$/TON	$0.48	$1.10	$7,306	$12,866	$15,183	$16,584	$51,939	$68,707	$68,707	$68,707	$69,338	$69,764	$23,613	$453,375
UNDERGROUND HAULAGE	$/TON	$0.26	$0.25	$6,041	$8,876	$10,734	$12,019	$37,669	$47,244	$47,244	$47,244	$47,105	$46,967	$24,765	$298,238
HOISTING	$/TON	$0.25	$0.10	$4,146	$4,991	$7,364	$8,248	$25,851	$32,422	$32,422	$32,422	$32,327	$32,232	$16,976	$204,473
TRUCKING TO MILL	$/TON	$1.11	$0.00	$13,199	$17,592	$23,452	$26,259	$82,302	$103,222	$103,222	$103,222	$102,919	$102,617	$54,107	$651,613
LEVEL RAHABILITATION	$/FOOT	$24.53	$16.36	$0	$0	$0	$9,405	$9,405	$84,642	$0	$0	$0	$0	$0	$94,047
SUBTOTAL				$102,029	$131,506	$162,126	$194,345	$590,006	$781,208	$696,565	$696,563	$689,347	$682,168	$487,388	$4,623,247
TOTAL MINE OPERATIONS				$128,759	$160,276	$192,936	$227,195	$709,166	$912,608	$827,965	$827,965	$820,767	$813,568	$558,110	$5,470,149

AMERICAN MINE SERVICES, INC.

SHARON STEEL - COLD ROAD MINE - EQUIPMENT & MATERIAL COST

ITEM	UNIT	EQUIPMENT COST PER UNIT	MATERIAL COST PER UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	TOTAL YEAR 1	TOTAL YEAR 2	TOTAL YEAR 3	TOTAL YEAR 4	TOTAL YEAR 5	TOTAL YEAR 6	TOTAL YEAR 7	GRAND TOTAL
MILL GENERAL AND ADMINISTRATIVE															
OFFICE SUPPLIES	$/MONTH	$100	$200	$720	$780	$840	$900	$3,240	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,178
LABORATORY EXPENSE	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
AUTO/TRUCK	$/MONTH	$1,200		$1,440	$2,160	$2,880	$3,600	$10,080	$14,400	$14,400	$14,400	$14,400	$14,400	$7,750	$89,830
TRAVEL EXPENSE	$/MONTH		$200	$600	$600	$600	$600	$2,400	$2,400	$2,400	$2,400	$2,400	$2,400	$1,292	$15,492
MILLION INSUR, FRT & REFINING	$/OUNCE		$4	$14,131	$21,197	$25,436	$28,263	$89,027	$109,725	$106,400	$103,075	$103,075	$103,075	$55,476	$448,853
HEAT	$/MONTH		$300	$900	$900	$900	$900	$3,600	$3,600	$3,600	$3,600	$3,600	$3,600	$1,938	$23,538
SUBTOTAL				$18,885	$27,278	$32,625	$36,450	$115,238	$142,475	$139,150	$135,825	$135,825	$135,825	$73,103	$877,440
MILL OPERATIONS															
PRIMARY JAW CRUSHER	$/TON		$0.03	$328	$492	$591	$656	$2,067	$2,625	$2,625	$2,625	$2,625	$2,625	$1,413	$16,605
CONE CRUSHER	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
RAYMAL CRUSHER	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
SCREENS AND FEEDERS	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
CONVEYORS AND CHUTES	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
PUMP & TANKS	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
UTILITIES	$/TON		$0.02	$219	$328	$394	$438	$1,378	$1,750	$1,750	$1,750	$1,750	$1,750	$942	$11,070
MACH	$/TON		$1.40	$15,312	$22,969	$27,563	$30,625	$96,469	$122,500	$122,500	$122,500	$122,500	$122,500	$65,931	$774,900
LIME	$/TON		$0.16	$1,750	$2,625	$3,150	$3,500	$11,025	$14,000	$14,000	$14,000	$14,000	$14,000	$7,535	$88,560
FLOCCULANTS	$/TON		$0.03	$328	$492	$591	$656	$2,067	$2,625	$2,625	$2,625	$2,625	$2,625	$1,413	$16,605
MISCELLANEOUS REAGENTS	$/TON		$0.03	$328	$492	$591	$656	$2,067	$2,625	$2,625	$2,625	$2,625	$2,625	$1,413	$16,605
ZINC	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
FLUXES	$/TON		$0.10	$1,094	$1,641	$1,969	$2,188	$6,891	$8,750	$8,750	$8,750	$8,750	$8,750	$4,709	$55,350
GRINDING METAL	$/TON		$0.90	$9,844	$14,766	$17,719	$19,688	$62,016	$78,750	$78,750	$78,750	$78,750	$78,750	$42,384	$498,150
TAILINGS MAINTENANCE	$/TON		$0.06	$656	$984	$1,181	$1,313	$4,134	$5,250	$5,250	$5,250	$5,250	$5,250	$2,826	$33,210
SUB TOTAL				$35,109	$52,664	$63,197	$70,219	$221,189	$280,875	$280,875	$280,875	$280,875	$280,875	$151,171	$1,776,735
TOTAL MILL OPERATIONS				$53,994	$79,942	$95,822	$106,669	$336,427	$423,350	$420,025	$416,700	$416,700	$416,700	$224,274	$2,654,175
TOTAL PROJECT EQUIPMENT AND MATERIALS				$286,856	$376,643	$456,525	$506,592	$1,626,616	$2,026,927	$1,929,283	$1,925,592	$1,917,601	$1,909,610	$1,161,241	$12,496,871

AMERICAN MINE SERVICES, INC.

GOLD ROAD MINE - CAPITAL EXPENSES

CAPITAL REQUIREMENTS	NUMBER REQUIRED	UNIT COST	TOTAL COST
MILL CAPITAL			
MILL GENERAL			
LABORATORY/WAREHOUSE BLDG	1	$85,000	$85,000
PRIMARY SUBSTATION	1	$65,000	$65,000
WATER STORAGE	1	$36,000	$36,000
REAGENT STORAGE & DISTRIBUTION	1	$34,000	$34,000
MILL INVENTORY	1	$80,000	$80,000
SUBTOTAL			$300,000
PRIMARY AND SECONDARY CRUSHING			
CRUSHER BUILDING/FOUNDATIONS	1	$90,000	$90,000
FEEDER	1	$3,000	$3,000
PRIMARY JAW CRUSHER 10"X24"	1	$15,000	$15,000
3 FT STANDARD CONE	1	$40,000	$40,000
BARMAC IMPACT CRUSHER	1	$80,000	$80,000
CONVEYORS	1200	$100	$120,000
4 FT X 10 FT DD SCREEN	1	$10,000	$10,000
MAGNET	1	$9,000	$9,000
DUST SUPRESSION SYSTEM	1	$30,000	$30,000
MISCELLANEOUS CHUTES	1	$20,000	$20,000
SUBTOTAL			$417,000
MILL			
MILL BUILDING	1	$109,000	$109,000
MILL PIPE INSTALLATION	1	$90,000	$90,000
MECHANICAL INSTALLATIOPN	1	$200,000	$200,000
MILL ELECTRIC DISTRIBUTION	1	$350,000	$350,000
CONCRETE	1	$70,000	$70,000
STORAGE BIN	1	$20,000	$20,000
FEEDER	1	$3,000	$3,000
BELT SCALE	1	$6,000	$6,000
BALL MILL 8X8 350 HP	2	$110,000	$220,000
10 IN CYCLONES	2	$3,000	$6,000
SLURRY PUMPS 4X4	2	$3,000	$6,000
MISCELLANEOUS PUMPS	10	$2,500	$25,000
PRIMARY THICKENER 40 FT	1	$35,000	$35,000
DISSOLUTION & AERATION TANKS 14X16	3	$10,000	$30,000
AGITATORS	3	$8,000	$24,000
COMPRESSOR 400 CFM	1	$15,000	$15,000
CCD TANKS 14FT W/RAKES	5	$30,000	$150,000
REPULP TANKS	4	$3,000	$12,000
BELT FILTER	1	$90,000	$90,000
MISCELLANEOUS TANKS	3	$10,000	$30,000
REAGENT SYSTEM	1	$25,000	$25,000
FLOCCULANT SYSTEM	1	$15,000	$15,000
SUBTOTAL			$1,531,000
RECOVERY SYSTEM			
CLARIFIER	1	$16,000	$16,000
DE-AERATION TOWER 6X14	1	$20,000	$20,000
ZINC CONE AND FEEDER	1	$3,000	$3,000
VACUUM PUMP	1	$8,000	$8,000
INSTRUMENTATION	1	$6,000	$6,000
PUMPS	2	$3,200	$6,400
FILTER PRESS	1	$30,000	$30,000
BULLION FURNACE COMPLETE	1	$20,000	$20,000
SUBTOTAL			$109,400

CAPITAL REQUIREMENTS	NUMBER REQUIRED	UNIT COST	TOTAL COST
TAILINGS DISPOSAL (WET)			
INITIAL DAM	1	$42,000	$42,000
RETURN WATER LINE	600	$5	$3,000
TAILINGS LINE	300	$8	$2,400
PUMP RETURN WATER WITH ELECTRICS	1	$4,000	$4,000
PORTABLE HYDROCYCLONE	1	$6,000	$6,000
SUBTOTAL			$57,400
MILL TOTAL			$2,414,800

11.0 ENVIRONMENTAL REQUIREMENTS

Environmental considerations during the early development and exploration stage on the Gold Road Project are not expected to present any significant problems. Permits would be required from the Arizona Department of Water Resources for the drilling of exploratory holes and an operating plan would be required by the Bureau of Land Management for the construction of drill sites and roads. Completion of this work will precipitate various site reclamation requirements.

The permitting work would accelerate once the decision is made to undertake underground development and exploration. At this point, a Plan of Operations would have to be cleared with the Bureau of Land Management for any areas that would require surface disturbance on BLM land. This permitting process could include studies of the possible impact of mining operations on the Warm Springs Wilderness Study Area located just to the southeast of the project. Permits for Air Quality control would have to be obtained from the appropriate state and federal agencies.

At the point where it was decided to start dewatering the mine, it would become necessary to obtain the appropriate water discharge permits from the Arizona Department of Water Resources. Efforts and expenditures to control the discharged water would help save discharged water for future mill use and might serve as the beginning of a tailings pond disposal dam.

Regulation and permitting for a milling operation at Gold Road would be principally directed toward the control of possible air and water contamination by the sodium cyanide used in mill operations.

The most logical site for a new mill at Gold Road is at the old mill location. This would probably require the least amount of permitting, would be closest to the mine, and most of the installation would be located on company owned land.

Upon completion of operations, the company would be required to remove all equipment and facilities from BLM land and to reclaim and restore such land to a natural state.

The government of the State of Arizona and Mohave County have generally had a favorable attitude toward the mining industry and mineral development.

12.0 ECONOMIC ANALYSIS

Table 12.1 summarizes the estimated costs for the proposed operation and Table 12.2 sets forth a projected cash flow (Base Case).

This cash flow projects the following:

a.	Total Tons Mined	553,500 T
b.	Total Oz. Gold Produced	167,463 oz.
c.	Project Operating Life	6.54 Years
d.	Break Even Point	1.82 Years
e.	Break Even Tonnage	140,700 T @ 0.335 oz/T
f.	Total Revenue	$ 66,985,300
g.	Total Preproduction Capital	$ 9,078,600
h.	Total Direct Expense	$ 31,393,800
i.	Gross Profit	$ 26,512,900
j.	Total Cost per Ounce Au	$ 241.68
k.	Gross Profit per Ounce Au	$ 158.32
l.	Before Tax DCFIRR	43.96 %

The cash flow analysis includes net present value calculations for convenient comparison.

To evaluate the project's economic sensitivity to possible changes in basic premises used by AMS, the Base Case Cash Flow has been varied in 10% increments from -20% to +20% for the following parameters.

1. Sales Price of Gold
2. Ore Grade Mined
3. Annual Production Rate
4. Total Available Reserves
5. Direct Operating Cost
6. Preproduction and Capital Costs

A summary of these evaluations are given in Table 12.3 and the resulting DCFIRR values for each of the six parameters are plotted in Figure 12.1.

The project is, as would be expected, most sensitive to either price changes in gold or at ore average grade mined. However, the project DCFIRR becomes zero (0) at a gold price of $242.00/oz or an ore grade of 0.192 oz/ton. Of the 3,100 haulage level samples west of the 4975 raise that were analyzed statistically, 84% of the samples had a grade in excess of 0.200 oz/ton; 84% of the exposed vein would then nave an average mineable grade of .0188 oz/ton (see Table 12.4).

The sensitivity of annual production variations closely parallels that of price and grade for the ranges used in the evaluation. Increases above those shown would require corresponding increases in capital. Up to +20% increase in annual production will not require significant capital cost increases.

The project is only marginally sensitive to capital and operating costs and is even less sensitive to changes in total available reserves.

12.1 Project Risks

The major economic risk at this time is the positive identification of sufficient ore and ore grade material to meet economic objectives. Economic break-even will occur at 150,000 to 180,000 tons of a grade of 0.32 oz/ton. There are 190,000 tons at 0.32 oz/ton of indicated (probable) ore reserves in the vicinity of the 4975 raise. Exploration core holes DDH1 and DDH2 both intersected mineralized vein east of these reserves with DDH1 extending to known mineralization 1,500 feet further east. To reduce the overall risk, AMS has recommended a minimum of six additional surface drill holes in this reserve block. If these holes approach, within reasonable limits, the statistical averages of historic sampling, reopening and additional confirmation exploration expenses are warranted. Other ore sources may be available within the existing mine proper that due to location or access problems or questions, have been excluded. If the property is brought into production, part of these sources may prove to be economic.

The property has an extensive history that is well documented. Mining conditions, ore dilution, ore continuity, etc., can be projected with a reasonable degree of accuracy. The same conclusion can be reached for ore treatment and gold recovery.

Mine operating costs are dependent upon reaching productivity levels as forecasted. The sublevel mining method used in this evaluation, although in use elsewhere, has not been used at the Gold Road property. However, the shrink stoping methods used at Gold Road would have direct operating costs very near the cost used in this evaluation.

Mill operating costs are based upon historic data upgraded to more modern practices and equipment and serious changes in operating costs or recovery has a relatively low probability.

TABLE 12.1

COST SUMMARY

Preproduction Expense	
Phase I - Surface Drilling	$ 157,369.00
Phase II - 100 Level Exploration	$ 1,641,605.00
Preproduction Studies	$ 189,000.00
Phase III - Contract Development	$ 2,557,967.00
Mill Site Costs	$ 72,000.00
TOTAL	**$ 4,617,941.00**
Capital Expenses	
General and Administration	$ 77,000.00
Mine	$ 1,968,860.00
Mill	$ 2,414,800.00
TOTAL	**$ 4,460,660.00**

Operating Cost	$/Ton	$/Oz
General and Administration	$ 10.89	$ 35.82
Mining	$ 32.44	$ 106.71
Milling	$ 14.11	$ 46.41
TOTAL	**$ 57.44**	**$ 188.94**

GOLD ROAD MINE - CASHFLOW SUMMARY - BASE CASE

ITEM			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	GRAND TOTAL
ORE PRODUCTION															
GRADE ORE MINED			10,938	16,406	19,688	21,875	68,906	87,500	87,500	87,500	87,500	87,500	47,094		553,500
OUNCES GOLD MINED			0.34	0.34	0.34	0.34	0.34	0.33	0.32	0.31	0.31	0.31	0.31		0.318
OUNCES GOLD PRODUCED	@ X RECOVERY	95.00%	3,719	5,578	6,694	7,438	23,428	28,875	28,000	27,125	27,125	27,125	14,599		176,277
			3,533	5,299	6,359	7,066	22,257	27,431	26,600	25,769	25,769	25,769	13,869		167,463
GROSS REVENUE	@ $/OZ	$400.00	$1,413,125	$2,119,688	$2,543,625	$2,826,250	$8,902,688	$10,972,500	$10,640,000	$10,307,500	$10,307,500	$10,307,500	$5,547,644		$66,985,331
DIRECT OPERATING EXPENSE															
GENERAL AND ADMINISTRATIVE															
SALARIES			$67,884	$67,884	$67,884	$67,884	$271,538	$271,538	$271,538	$271,538	$271,538	$271,538	$70,658		$1,707,885
EQUIPMENT AND MATERIALS			$26,097	$32,418	$37,737	$42,719	$138,991	$170,931	$161,255	$166,889	$166,097	$159,305	$98,908		$1,050,434
POWER			$78,006	$104,007	$130,009	$130,009	$442,032	$520,037	$520,037	$520,037	$520,037	$520,037	$279,892		$3,322,111
SUBTOTAL			$171,987	$204,310	$235,651	$240,613	$852,561	$962,507	$952,830	$958,463	$957,672	$950,881	$457,516		$6,080,432
MINE OPERATIONS															
SALARIES			$122,577	$122,577	$122,577	$122,577	$490,308	$490,308	$490,308	$490,308	$490,308	$490,308	$142,030		$3,083,876
INDIRECT LABOR			$150,553	$157,515	$164,475	$164,475	$637,020	$657,900	$657,900	$657,900	$657,900	$657,900	$190,577		$4,117,097
DIRECT LABOR			$127,109	$164,297	$199,367	$233,312	$724,277	$934,922	$862,189	$862,189	$855,733	$849,277	$188,499		$5,277,286
OEM AND ADMIN MATERIALS			$4,950	$4,950	$4,950	$4,950	$19,800	$19,800	$19,800	$19,800	$19,800	$19,800	$10,457		$129,457
INDIRECT EQUIP AND MATERIALS			$21,780	$23,820	$25,860	$27,900	$99,360	$111,600	$111,600	$111,600	$111,600	$111,600	$60,065		$712,425
DIRECT EQUIPMENT AND MATERIALS			$102,029	$131,506	$162,126	$174,345	$570,006	$761,208	$696,545	$696,545	$689,347	$682,148	$467,388		$4,623,267
SUBTOTAL			$528,991	$604,667	$679,553	$747,539	$2,560,772	$2,975,737	$2,838,342	$2,838,342	$2,824,707	$2,811,053	$1,079,413		$17,948,407
MILL OPERATIONS															
SALARIES			$62,856	$62,856	$62,856	$62,856	$251,424	$251,424	$251,424	$251,424	$251,424	$251,424	$72,831		$1,581,373
LABOR			$140,754	$140,754	$140,754	$140,754	$563,018	$563,018	$563,018	$563,018	$563,018	$563,018	$163,092		$3,541,198
OEM AND ADMIN EQUIP AND MATERIALS			$18,885	$27,278	$32,662	$36,450	$115,238	$142,475	$139,150	$135,825	$135,825	$135,825	$73,103		$877,440
DIRECT EQUIPMENT AND MATERIALS			$35,109	$52,644	$63,197	$70,219	$221,189	$260,875	$280,875	$280,875	$280,875	$280,875	$151,171		$1,776,735
SUBTOTAL			$257,603	$283,532	$299,432	$310,279	$1,150,868	$1,237,792	$1,234,467	$1,231,142	$1,231,142	$1,231,142	$460,197		$7,776,749
TOTAL DIRECT EXPENSE			$958,583	$1,092,529	$1,214,639	$1,298,450	$4,564,201	$5,196,036	$5,025,639	$5,021,968	$5,007,522	$4,993,075	$1,997,128		$31,805,588
PREPRODUCTION EXPENSES				PREPRODUCTION	YEAR 1	YEAR 2									
PHASE I					$157,369										$157,369
PHASE II					$1,641,605										$1,641,605
PREPRODUCTION CONSULTING					$189,000										$189,000
PHASE III						$2,557,967									$2,557,967
MILL SITE PREPARATION						$72,000									$72,000
SUBTOTAL					$1,987,974	$2,629,967									$4,617,941
CAPITAL EXPENSES															
GENERAL AND ADMINISTRATIVE						$77,000									$77,000
MINE						$1,968,660									$1,968,660
MILL						$2,357,400									$2,357,400
TAILINGS						$57,400									$57,400
SUBTOTAL						$4,460,660									$4,460,660
GROSS PROFIT							$4,338,487	$5,776,464	$5,614,341	$5,285,532	$5,299,978	$5,314,425	$3,550,516		$35,179,743
WORKING CAPITAL							($1,175,282)						$1,111,050		($334,232)
SALVAGE VALUE													$448,006		$448,006
TOTAL CASH FLOW					($1,987,974)	($7,090,627)	$3,163,205	$5,776,464	$5,614,341	$5,285,532	$5,299,978	$5,314,425	$5,137,632		$26,512,977
COST PER TON ORE							$66.24	$59.38	$57.44	$57.39	$57.23	$57.06	$42.41		$73.12
MARGIN PER TON ORE							$45.91	$66.02	$64.16	$60.41	$60.57	$60.74	$109.09		$47.90
COST PER OUNCE							$205.07	$189.42	$188.93	$194.89	$194.33	$193.76	$144.00		$211.68
MARGIN PER OUNCE							$142.12	$210.58	$211.07	$205.11	$205.67	$206.24	$370.44		$158.32

PROJECT DCFIRR		43.958%
NET PRESENT VALUE	@ 15.00%	$8,558,935
NET PRESENT VALUE	@ 20.00%	$5,772,776
NET PRESENT VALUE	@ 25.00%	$3,775,158
NET PRESENT VALUE	@ 30.00%	$2,325,185
NET PRESENT VALUE	@ 43.96%	$0.00

23-Jan-87

FILENAME : RISK1

DISK NUMBER : 1665

AMERICAN MINE SERVICES, INC.

TABLE 12.2

TABLE 12.3

SHARON STEEL - GOLD ROAD MINE

ECONOMIC ANALYSIS SUMMARY

RISK NUMBER	RISK TITLE	PRICE OF GOLD	GOLD GRADE	TONS OF ORE	OPERATING COST (1)	TOTAL CAPITAL (2)	GROSS REVENUE	GROSS PROFIT (3)	COST/ TON (4)	MARGIN/ TON	COST/OZ GOLD (4)	MARGIN/OZ GOLD (3)	DCFIRR (5)
1	BASE CASE	$400.00	0.318	553,500	$31,805,588	$9,078,601	$46,985,331	$26,512,977	$73.12	$47.90	$241.68	$158.32	43.958%
	PRICE FLUCTUATION												
2	80 % GOLD PRICE	$320.00	0.318	553,500	$31,805,588	$9,078,601	$53,588,265	$13,115,911	$73.12	$23.70	$241.68	$78.32	23.912%
3	90 % GOLD PRICE	$360.00	0.318	553,500	$31,805,588	$9,078,601	$60,286,798	$19,814,444	$73.12	$35.80	$241.68	$118.32	34.306%
4	110 % GOLD PRICE	$440.00	0.318	553,500	$31,805,588	$9,078,601	$73,683,864	$33,211,510	$73.12	$60.00	$241.68	$198.32	53.053%
5	120 % GOLD PRICE	$480.00	0.318	553,500	$31,805,588	$9,078,601	$80,382,398	$39,910,043	$73.12	$72.10	$241.68	$238.32	61.707%
	GRADE FLUCTUATION												
6	80 % ORE GRADE	$400.00	0.255	553,500	$31,805,588	$9,078,601	$53,588,265	$13,115,911	$73.12	$23.70	$302.10	$97.90	23.912%
7	90 % ORE GRADE	$400.00	0.287	553,500	$31,805,588	$9,078,601	$60,286,798	$19,814,444	$73.12	$35.80	$260.53	$131.47	34.306%
8	110 % ORE GRADE	$400.00	0.350	553,500	$31,805,588	$9,078,601	$73,683,864	$33,211,510	$73.12	$60.00	$219.71	$180.29	53.053%
9	120 % ORE GRADE	$400.00	0.382	553,500	$31,805,588	$9,078,601	$80,382,398	$39,910,043	$73.12	$72.10	$201.40	$198.60	61.707%
	PRODUCTION FLUCTUATION												
10	80 % ANNUAL TONNAGE	$400.00	0.318	553,500	$36,676,364	$9,078,601	$46,985,359	$21,540,267	$82.10	$38.92	$271.37	$128.63	31.014%
11	90 % ANNUAL TONNAGE	$400.00	0.318	553,500	$34,455,625	$9,078,601	$46,985,099	$23,911,727	$77.82	$43.20	$257.21	$142.79	37.442%
12	110 % ANNUAL TONNAGE	$400.00	0.318	553,500	$30,961,331	$9,078,601	$46,985,278	$27,308,161	$71.68	$49.34	$236.93	$163.07	49.512%
13	120 % ANNUAL TONNAGE	$400.00	0.318	553,501	$29,654,440	$9,078,601	$46,985,290	$28,566,025	$69.41	$51.61	$229.42	$170.58	55.337%
	TONNAGE FLUCTUATION												
14	80 % TOTAL TONNAGE	$400.00	0.321	442,800	$26,182,810	$9,078,601	$53,944,901	$19,095,324	$78.70	$43.12	$258.41	$141.59	40.676%
15	90 % TOTAL TONNAGE	$400.00	0.319	498,150	$29,350,426	$9,078,601	$50,465,131	$22,447,939	$76.32	$45.06	$251.50	$148.50	42.429%
16	110 % TOTAL TONNAGE	$400.00	0.318	608,850	$35,683,937	$9,078,601	$73,505,591	$29,154,887	$72.84	$47.89	$241.35	$158.65	44.602%
17	120 % TOTAL TONNAGE	$400.00	0.317	664,200	$38,851,051	$9,078,601	$80,025,821	$32,508,003	$71.54	$48.94	$237.51	$162.49	45.359%
	COST FLUCTUATION												
18	80 % DIRECT COST	$400.00	0.318	553,500	$28,322,256	$9,078,601	$46,985,331	$29,999,827	$46.02	$54.20	$220.86	$179.14	47.148%
19	90 % DIRECT COST	$400.00	0.318	553,500	$30,063,922	$9,078,601	$46,985,331	$28,256,402	$49.97	$51.05	$231.27	$168.73	46.566%
20	110 % DIRECT COST	$400.00	0.318	553,500	$33,547,254	$9,078,601	$46,985,331	$24,769,552	$76.27	$44.75	$252.09	$147.91	41.322%
21	120 % DIRECT COST	$400.00	0.318	553,500	$35,288,920	$9,078,601	$46,985,331	$23,026,126	$79.42	$41.60	$262.50	$137.50	38.658%
	CAPITAL FLUCTUATION												
22	80 % CAPITAL COST	$400.00	0.318	553,500	$31,805,588	$7,262,881	$46,985,331	$28,239,484	$70.00	$51.02	$231.37	$168.63	54.630%
23	90 % CAPITAL COST	$400.00	0.318	553,500	$31,805,588	$8,170,741	$46,985,331	$27,376,230	$71.56	$49.46	$236.52	$163.48	48.824%
24	110 % CAPITAL COST	$400.00	0.318	553,500	$31,805,588	$9,986,461	$46,985,331	$25,649,723	$74.68	$46.34	$246.83	$153.17	39.804%
25	120 % CAPITAL COST	$400.00	0.318	553,500	$31,005,588	$10,894,321	$46,985,331	$24,786,470	$76.24	$44.78	$251.99	$148.01	36.204%

(1) TOTAL DIRECT SITE COST
(2) INCLUDES ALL PHASES OF EXPLORATION AND PREPRODUCTION EXPENSES AND TOTAL CAPITAL COST
(3) AFTER CAPITAL IS RECAPTURED
(4) INCLUDES CAPITAL & DIRECT OPERATING COSTS
(5) BEFORE TAXES

TARGET RESERVE ESTIMATION

TABLE 12.4

GRADE RANGE	ACTUAL PERCENT	PERCENT X GRADE	ACCUM GRD X %	ACCUM GRADE	ACCUM %	INPLACE AVER GRADE	DILUTED GRADE TO MILL 0.70	TARGET TONS 623,769.60	PROBABLE PLUS TARGET 208,000.00	AVER MINED GRADE 0.32
1.00	0.458	0.458	0.458	1.00	0.4583	1.000	0.700	2,859	208,959	0.325
0.95	0.542	0.515	0.973	1.95	1.0000	0.973	0.681	6,238	212,238	0.331
0.90	0.583	0.525	1.498	2.85	1.5833	0.946	0.662	9,876	215,876	0.336
0.85	0.583	0.496	1.994	3.70	2.1667	0.920	0.644	13,515	219,515	0.340
0.80	0.417	0.333	2.327	4.50	2.5833	0.901	0.631	16,114	222,114	0.343
0.75	0.458	0.344	2.671	5.25	3.0417	0.878	0.615	18,973	224,973	0.345
0.70	0.958	0.671	3.342	5.95	4.0000	0.835	0.585	24,951	230,951	0.349
0.65	1.958	1.273	4.615	6.60	5.9583	0.774	0.542	37,166	243,166	0.354
0.60	1.833	1.100	5.715	7.20	7.7917	0.733	0.513	48,602	254,602	0.357
0.55	2.542	1.398	7.112	7.75	10.3333	0.688	0.482	64,456	270,456	0.359
0.50	1.750	0.875	7.987	8.25	12.0833	0.661	0.463	75,372	281,372	0.358
0.45	4.458	2.006	9.994	8.70	16.5417	0.604	0.423	103,182	309,182	0.354
0.40	2.833	1.133	11.127	9.10	19.3750	0.574	0.402	120,855	326,855	0.350
0.35	6.250	2.187	13.315	9.45	25.6250	0.520	0.364	159,841	365,841	0.339
0.30	6.917	2.075	15.390	9.75	32.5417	0.473	0.331	202,985	408,985	0.325
0.25	10.542	2.635	18.025	10.00	43.0833	0.418	0.293	268,741	474,741	0.305
0.20	12.625	2.525	20.550	10.20	55.7083	0.369	0.258	347,492	553,492	0.281
0.15	13.417	2.012	22.562	10.35	69.1250	0.326	0.228	431,181	637,181	0.258
0.10	15.250	1.525	24.087	10.45	84.3750	0.285	0.200	526,306	732,306	0.234
0.05	14.167	0.708	24.796	10.50	98.5417	0.252	0.176	614,673	820,673	0.212

GOLD ROAD MINE - CAPITAL EXPENSES & DEPRECIATION SCHEDULE

DESCRIPTION	NUMBER REQUIRED	UNIT COST	TOTAL COST	YEARS DEPREC	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	TOTAL COST
PREPRODUCTION EXPENSE														
PHASE III	1	$2,557,967	$2,557,967	7.00	$365,424	$365,424	$365,424	$365,424	$365,424	$365,424	$365,424	$0	$0	$2,557,967
CAPITAL REQUIREMENTS														
GENERAL AND ADMINISTRATIVE														
OFFICE BUILDING	1	$35,000	$35,000	7.00	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$0	$0	$35,000
OFFICE EQUIP & FURNISHINGS	1	$10,000	$10,000	7.00	$1,429	$1,429	$1,429	$1,429	$1,429	$1,429	$1,429	$0	$0	$10,000
AUTO - PICKUPS	1	$14,000	$14,000	5.00	$2,800	$2,800	$2,800	$2,800	$2,800	$0	$0	$0	$0	$14,000
SANITARY FACILITIES	1	$18,000	$18,000	7.00	$2,571	$2,571	$2,571	$2,571	$2,571	$2,571	$2,571	$0	$0	$18,000
SUBTOTAL			$77,000		$11,800	$11,800	$11,800	$11,800	$11,800	$9,000	$9,000	$0	$0	$77,000
MINE SURFACE														
OFFICE/ DRY	1	$60,000	$60,000	7.00	$8,571	$8,571	$8,571	$8,571	$8,571	$8,571	$8,571	$0	$0	$60,000
WAREHOUSE / SHOP	1	$30,000	$30,000	7.00	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$0	$0	$30,000
COMPRESSOR 1200CFM	3	$30,000	$90,000	7.00	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$0	$0	$90,000
SUBSTATION	1	$65,000	$65,000	7.00	$9,286	$9,286	$9,286	$9,286	$9,286	$9,286	$9,286	$0	$0	$65,000
ENGINEERING EQUIPMENT	1	$12,000	$12,000	5.00	$2,400	$2,400	$2,400	$2,400	$2,400	$0	$0	$0	$0	$12,000
PICKUP	2	$14,000	$28,000	5.00	$5,600	$5,600	$5,600	$5,600	$5,600	$0	$0	$0	$0	$28,000
SURFACE LOADER 680	1	$85,000	$85,000	5.00	$17,000	$17,000	$17,000	$17,000	$17,000	$0	$0	$0	$0	$85,000
TRUCK 22T SURFACE	2	$85,000	$170,000	5.00	$34,000	$34,000	$34,000	$34,000	$34,000	$0	$0	$0	$0	$170,000
SANITARY FACILITIES	1	$12,500	$12,500	7.00	$1,786	$1,786	$1,786	$1,786	$1,786	$1,786	$1,786	$0	$0	$12,500
WATER SUPPLY	800	$30	$24,000	7.00	$3,429	$3,429	$3,429	$3,429	$3,429	$3,429	$3,429	$0	$0	$24,000
LAMPS/SELF RESCUE	50	$220	$11,000	5.00	$2,200	$2,200	$2,200	$2,200	$2,200	$0	$0	$0	$0	$11,000
EXPLOSIVE STORAGE	1	$12,000	$12,000	7.00	$1,714	$1,714	$1,714	$1,714	$1,714	$1,714	$1,714	$0	$0	$12,000
SUBTOTAL			$599,500		$103,129	$103,129	$103,129	$103,129	$103,129	$41,929	$41,929	$0	$0	$599,500
MINE HOIST AND SHAFT FACILITIES														
HOIST 500 HP	1	$200,000	$200,000	7.00	$28,571	$28,571	$28,571	$28,571	$28,571	$28,571	$28,571	$0	$0	$200,000
HEADFRAME 100 FT	1	$100,000	$100,000	7.00	$14,286	$14,286	$14,286	$14,286	$14,286	$14,286	$14,286	$0	$0	$100,000
LOADING POCKET EQUIPMENT	1	$14,000	$14,000	7.00	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$0	$0	$14,000
HOIST BUILDING	1	$30,000	$30,000	7.00	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$0	$0	$30,000
SHAFT FURNISHINGS	1480	$57	$84,360	7.00	$12,051	$12,051	$12,051	$12,051	$12,051	$12,051	$12,051	$0	$0	$84,360
SKIP/CAGE	1	$24,000	$24,000	5.00	$4,800	$4,800	$4,800	$4,800	$4,800	$0	$0	$0	$0	$24,000
SUBTOTAL			$452,360		$65,994	$65,994	$65,994	$65,994	$65,994	$61,194	$61,194	$0	$0	$452,360
MINE EQUIPMENT														
PRODUCTION LOCOMOTIVE 4 TON	3	$25,000	$75,000	5.00	$15,000	$15,000	$15,000	$15,000	$15,000	$0	$0	$0	$0	$75,000
ORE CARS 5 TON	30	$4,500	$135,000	5.00	$27,000	$27,000	$27,000	$27,000	$27,000	$0	$0	$0	$0	$135,000
JACKLEG DRILLS	24	$2,500	$60,000	5.00	$12,000	$12,000	$12,000	$12,000	$12,000	$0	$0	$0	$0	$60,000
LONGHOLE/BLAST HOLE DRILLS	3	$15,000	$45,000	5.00	$9,000	$9,000	$9,000	$9,000	$9,000	$0	$0	$0	$0	$45,000
SERVICE LOCOMOTIVE	4	$16,500	$66,000	5.00	$13,200	$13,200	$13,200	$13,200	$13,200	$0	$0	$0	$0	$66,000
LHD 2 CY	2	$66,500	$133,000	5.00	$26,600	$26,600	$26,600	$26,600	$26,600	$0	$0	$0	$0	$133,000
LHD 0.5 CY	3	$42,500	$127,500	5.00	$25,500	$25,500	$25,500	$25,500	$25,500	$0	$0	$0	$0	$127,500
TRUCK 5 TON UNDERGROUND	2	$45,500	$91,000	5.00	$18,200	$18,200	$18,200	$18,200	$18,200	$0	$0	$0	$0	$91,000
SUPPLY CARS	15	$1,500	$22,500	5.00	$4,500	$4,500	$4,500	$4,500	$4,500	$0	$0	$0	$0	$22,500
SECONDARY VENT FANS 30HP	5	$3,500	$17,500	5.00	$3,500	$3,500	$3,500	$3,500	$3,500	$0	$0	$0	$0	$17,500
DIAMOND DRILL	1	$20,000	$20,000	5.00	$4,000	$4,000	$4,000	$4,000	$4,000	$0	$0	$0	$0	$20,000
PRIMARY VENTILATION FAN 150 HP	1	$8,500	$8,500	5.00	$1,700	$1,700	$1,700	$1,700	$1,700	$0	$0	$0	$0	$8,500
PRIMARY DEWATERING PUMPS 100 HP	2	$12,500	$25,000	5.00	$5,000	$5,000	$5,000	$5,000	$5,000	$0	$0	$0	$0	$25,000
ALIMAK RAISE CLIMBER	1	$75,000	$75,000	5.00	$15,000	$15,000	$15,000	$15,000	$15,000	$0	$0	$0	$0	$75,000
MISCELLANEOUS MINE TOOLS	1	$16,000	$16,000	5.00	$3,200	$3,200	$3,200	$3,200	$3,200	$0	$0	$0	$0	$16,000
SUBTOTAL			$917,000		$183,400	$183,400	$183,400	$183,400	$183,400	$0	$0	$0	$0	$917,000
MILL GENERAL														
LABORATORY/WAREHOUSE BLDG	1	$85,000	$85,000	7.00	$12,143	$12,143	$12,143	$12,143	$12,143	$12,143	$12,143	$0	$0	$85,000
PRIMARY SUBSTATION	1	$65,000	$65,000	7.00	$9,286	$9,286	$9,286	$9,286	$9,286	$9,286	$9,286	$0	$0	$65,000
WATER STORAGE	1	$36,000	$36,000	7.00	$5,143	$5,143	$5,143	$5,143	$5,143	$5,143	$5,143	$0	$0	$36,000
REAGENT STORAGE & DISTRIBUTION	1	$34,000	$34,000	7.00	$4,857	$4,857	$4,857	$4,857	$4,857	$4,857	$4,857	$0	$0	$34,000
MILL INVENTORY	1	$80,000	$80,000	5.00	$16,000	$16,000	$16,000	$16,000	$16,000	$0	$0	$0	$0	$80,000
SUBTOTAL			$300,000		$47,429	$47,429	$47,429	$47,429	$47,429	$31,429	$31,429	$0	$0	$300,000

22-Jan-87

FILENAME : GOLDCAPT

DISK NUMBER : 1606

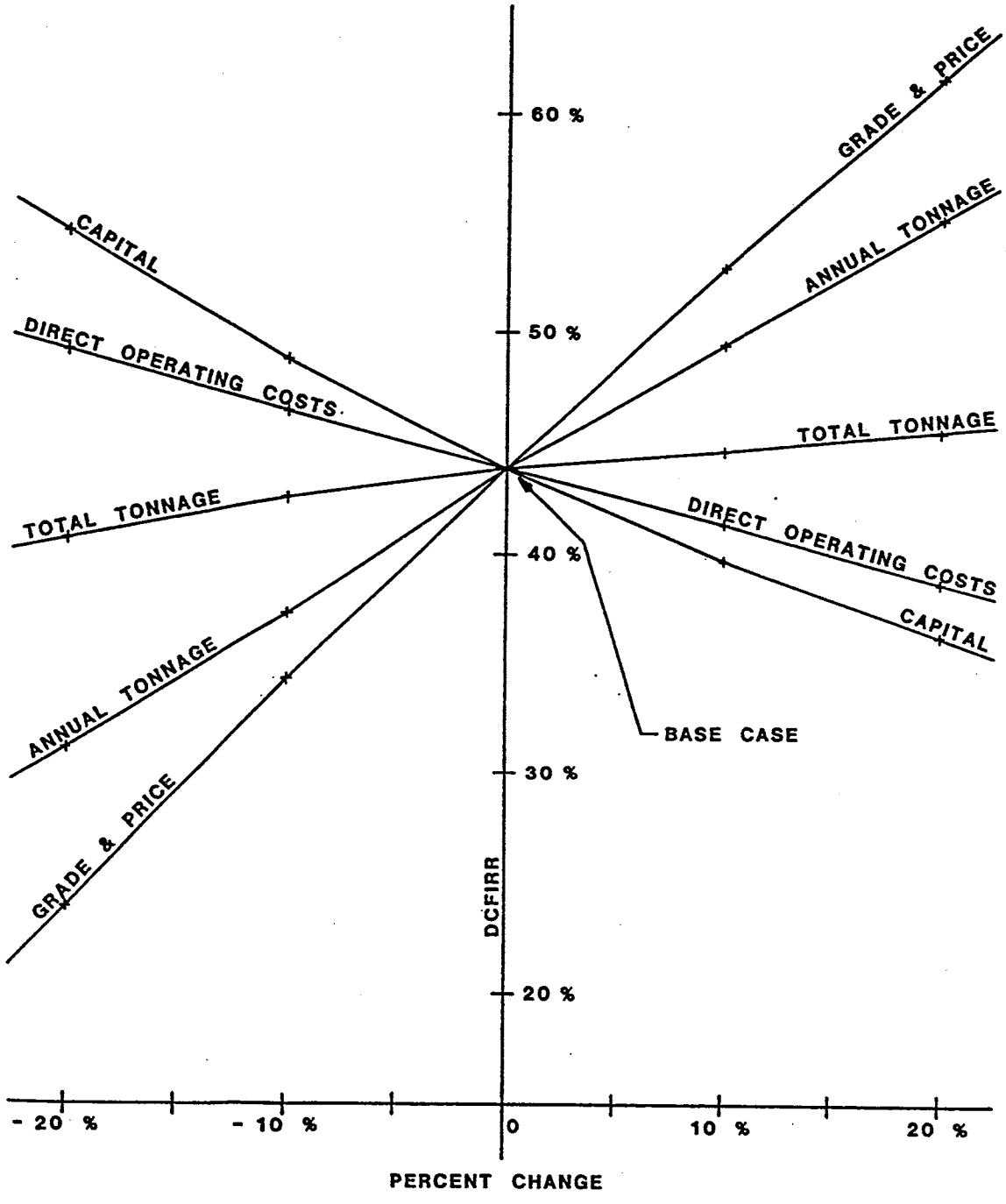
AMERICAN MINE SERVICES, INC.

GOLD ROAD MINE - CAPITAL EXPENSES & DEPRECIATION SCHEDULE

DESCRIPTION	NUMBER REQUIRED	UNIT COST	TOTAL COST	YEARS BEFORE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	TOTAL COST
PRIMARY AND SECONDARY CRUSHING														
CRUSHER BUILDING/FOUNDATIONS	1	$90,000	$90,000	7.00	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$0	$0	$90,000
FEEDER	1	$3,000	$3,000	7.00	$429	$429	$429	$429	$429	$429	$429	$0	$0	$3,000
PRIMARY JAW CRUSHER 10"X24"	1	$15,000	$15,000	7.00	$2,143	$2,143	$2,143	$2,143	$2,143	$2,143	$2,143	$0	$0	$15,000
2 FT STANDARD CONE	1	$40,000	$40,000	7.00	$5,714	$5,714	$5,714	$5,714	$5,714	$5,714	$5,714	$0	$0	$40,000
HAMMC IMPACT CRUSHER	1	$80,000	$80,000	7.00	$11,429	$11,429	$11,429	$11,429	$11,429	$11,429	$11,429	$0	$0	$80,000
CONVEYORS	1200	$100	$120,000	7.00	$17,143	$17,143	$17,143	$17,143	$17,143	$17,143	$17,143	$0	$0	$120,000
4 FT X 10 FT DD SCREEN	1	$10,000	$10,000	7.00	$1,429	$1,429	$1,429	$1,429	$1,429	$1,429	$1,429	$0	$0	$10,000
MAGNET	1	$9,000	$9,000	7.00	$1,286	$1,286	$1,286	$1,286	$1,286	$1,286	$1,286	$0	$0	$9,000
DUST SUPRESSION SYSTEM	1	$30,000	$30,000	7.00	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$0	$0	$30,000
MISCELLANEOUS CHUTES	1	$20,000	$20,000	7.00	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$0	$0	$20,000
SUBTOTAL			$417,000		$59,571	$59,571	$59,571	$59,571	$59,571	$59,571	$59,571	$0	$0	$417,000
MILL														
MILL BUILDING	1	$109,000	$109,000	7.00	$15,571	$15,571	$15,571	$15,571	$15,571	$15,571	$15,571	$0	$0	$109,000
MILL PIPE INSTALLATION	1	$90,000	$90,000	7.00	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$0	$0	$90,000
MECHANICAL INSTALLATION	1	$200,000	$200,000	7.00	$28,571	$28,571	$28,571	$28,571	$28,571	$28,571	$28,571	$0	$0	$200,000
MILL ELECTRIC DISTRIBUTION	1	$350,000	$350,000	7.00	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$0	$0	$350,000
CONCRETE	1	$70,000	$70,000	7.00	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$0	$0	$70,000
STORAGE BIN	1	$20,000	$20,000	7.00	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$0	$0	$20,000
FEEDER	1	$3,000	$3,000	7.00	$429	$429	$429	$429	$429	$429	$429	$0	$0	$3,000
BELT SCALE	1	$6,000	$6,000	7.00	$857	$857	$857	$857	$857	$857	$857	$0	$0	$6,000
BALL MILL 8X8 350 HP	2	$110,000	$220,000	7.00	$31,429	$31,429	$31,429	$31,429	$31,429	$31,429	$31,429	$0	$0	$220,000
10 IN CYCLONES	2	$3,000	$6,000	7.00	$857	$857	$857	$857	$857	$857	$857	$0	$0	$6,000
SLURRY PUMPS 4X4	2	$3,000	$6,000	7.00	$857	$857	$857	$857	$857	$857	$857	$0	$0	$6,000
MISCELLANEOUS PUMPS	10	$2,500	$25,000	7.00	$3,571	$3,571	$3,571	$3,571	$3,571	$3,571	$3,571	$0	$0	$25,000
PRIMARY THICKENER 40 FT	1	$35,000	$35,000	7.00	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$0	$0	$35,000
DISSOLUTION & AERATION TANKS 14X16	3	$10,000	$30,000	7.00	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$0	$0	$30,000
AGITATORS	3	$8,000	$24,000	7.00	$3,429	$3,429	$3,429	$3,429	$3,429	$3,429	$3,429	$0	$0	$24,000
COMPRESSOR 400 CFM	1	$15,000	$15,000	7.00	$2,143	$2,143	$2,143	$2,143	$2,143	$2,143	$2,143	$0	$0	$15,000
CCD TANKS 14FT W/RAKES	5	$30,000	$150,000	7.00	$21,429	$21,429	$21,429	$21,429	$21,429	$21,429	$21,429	$0	$0	$150,000
REPULP TANKS	4	$3,000	$12,000	7.00	$1,714	$1,714	$1,714	$1,714	$1,714	$1,714	$1,714	$0	$0	$12,000
BELT FILTER	1	$90,000	$90,000	7.00	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$12,857	$0	$0	$90,000
MISCELLANEOUS TANKS	3	$10,000	$30,000	7.00	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$0	$0	$30,000
REAGENT SYSTEM	1	$25,000	$25,000	7.00	$3,571	$3,571	$3,571	$3,571	$3,571	$3,571	$3,571	$0	$0	$25,000
FLOCCULANT SYSTEM	1	$15,000	$15,000	7.00	$2,143	$2,143	$2,143	$2,143	$2,143	$2,143	$2,143	$0	$0	$15,000
SUBTOTAL			$1,531,000		$218,714	$218,714	$218,714	$218,714	$218,714	$218,714	$218,714	$0	$0	$1,531,000
RECOVERY SYSTEM														
CLARIFIER	1	$16,000	$16,000	7.00	$2,286	$2,286	$2,286	$2,286	$2,286	$2,286	$2,286	$0	$0	$16,000
DE-AERATION TOWER 6X14	1	$20,000	$20,000	7.00	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$0	$0	$20,000
ZINC CONE AND FEEDER	1	$3,000	$3,000	7.00	$429	$429	$429	$429	$429	$429	$429	$0	$0	$3,000
VACUUM PUMP	1	$8,000	$8,000	7.00	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$1,143	$0	$0	$8,000
INSTRUMENTATION	1	$6,000	$6,000	7.00	$857	$857	$857	$857	$857	$857	$857	$0	$0	$6,000
PUMPS	2	$3,200	$6,400	7.00	$914	$914	$914	$914	$914	$914	$914	$0	$0	$6,400
FILTER PRESS	1	$30,000	$30,000	7.00	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$4,286	$0	$0	$30,000
BULLION FURNACE COMPLETE	1	$20,000	$20,000	7.00	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$2,857	$0	$0	$20,000
					$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL			$109,400		$15,629	$15,629	$15,629	$15,629	$15,629	$15,629	$15,629	$0	$0	$109,400
TAILINGS DISPOSAL (WET)														
INITIAL DAM	1	$42,000	$42,000	7.00	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$6,000	$0	$0	$42,000
RETURN WATER LINE	600	$5	$3,000	7.00	$429	$429	$429	$429	$429	$429	$429	$0	$0	$3,000
TAILINGS LINE	300	$8	$2,400	5.00	$480	$480	$480	$480	$480	$0	$0	$0	$0	$2,400
PUMP RETURN WATER WITH ELECTRICS	1	$4,000	$4,000	5.00	$800	$800	$800	$800	$800	$0	$0	$0	$0	$4,000
PORTABLE HYDROCYCLONE	1	$6,000	$6,000	5.00	$1,200	$1,200	$1,200	$1,200	$1,200	$0	$0	$0	$0	$6,000
SUBTOTAL			$57,400		$8,909	$8,909	$8,909	$8,909	$8,909	$6,429	$6,429	$0	$0	$57,400
GRAND TOTAL			$7,018,627		$1,079,998	$1,079,998	$1,079,998	$1,079,998	$1,079,998	$809,318	$809,318	$0	$0	$7,018,627

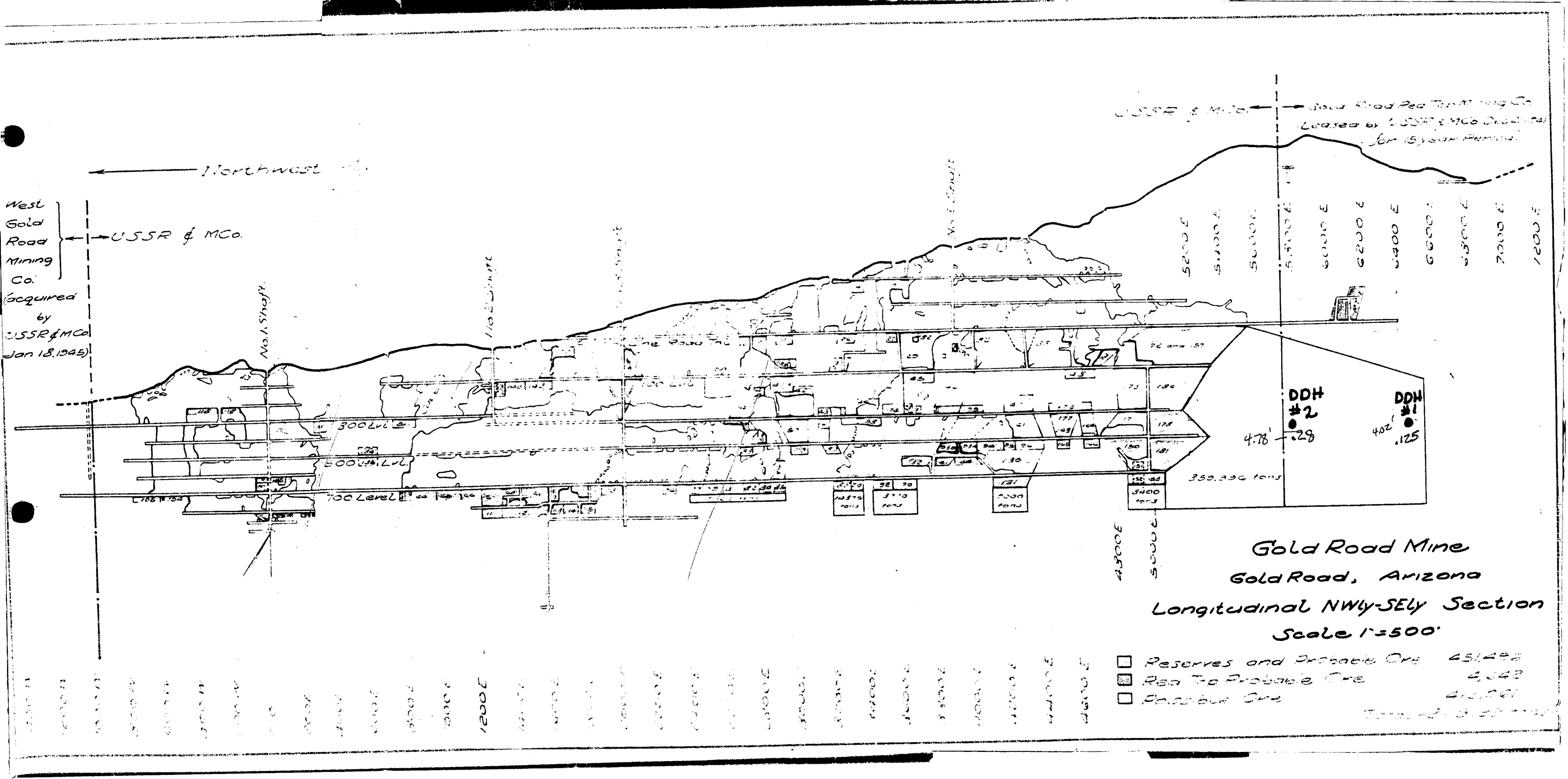
SENSITIVITY ANALYSIS

DCFIRR VS % CHANGE



* DCFIRR = DISCOUNTED CASH FLOW INTERNAL RATE OF RETURN

FIGURE 12.1



Northwest
West Gold Road Mining Co. (acquired by USSR & MCo Jan 18, 1945)
USSR & MCo.
No. 1 Shaft
No. 2 Shaft
No. 3 Shaft
No. 4 Shaft
300 Lvl
500 Lvl
700 Level
DDH #2
DDH #1
4.78'
.28
4.02'
.125
359,396 tons
4300 E
5000 E
5200 E
5400 E
5600 E
5800 E
6000 E
6200 E
6400 E
6600 E
6800 E
7000 E
7200 E
1200 E
Gold Road Mine
Gold Road, Arizona
Longitudinal NWly-SEly Section
Scale 1"=500'
Reserves and Probable Ore
Red Top Probable Ore
Possible Ore

M E M O R A N D U M

TO: J. M. Elias DATED: July 1, 1973

FROM: J. O. Schulz

RE: Summary of Goldroad Exploration
Ending May 26, 1973
Recommendations for Future Work

A steady but occassionally speculative continued rise in the gold price since April, 1972, has warranted renewed interest in the Company's Goldroad mine to the extent that grounds previously controlled have been reacquired and an exploration effort generated. The current gross metal value of assured reserves within the mine amounts to $14,824,485 (at $100 per ounce gold); any additional indication of vein extensions, lateral or vertical, merely enhances the value of the mine as a possible economic venture.

Claims Located, Leases Acquired

In June, 1972, seven claims were located to cover possible easterly extensions of the Goldroad vein. The Gold Road Red Top Mining Company entered into a lease agreement with UV in October, 1972, providing UV the opportunity to explore and possibly mine known extensions of the vein immediately east of Company owned patented claims. Ten additional claims were located in February and April, 1973, to provide protection north and south of the vein outcrops while exploration activites were conducted.

A summary of properties now controlled by UV, the necessary annual expenditures and obligations required to retain the properties is listed below.

Company Owned Patented Land	1972 Property Taxes	Total
18 lode claims	$55.80	$56
4 mill sites		
Company Owned Unpatented Land	**Required Assessment**	
21 lode claims	$2300	$2300
6 mill sites		

(Location work for G.R. 14 - G.R. 17 has not been done at this date; necessity of perfecting these claims is questionable. UV may own more or less than six mill sites.)

Leases Held by Company		
4 unpatented claims	$ 400	*400

*100 manshifts of labor to be performed annually on or for the benefit of the claims leased.

Total . .$2756

As the work commitment on the Gold Road Red Top Mining Company ground is accumulative, costs incurred between April, and May 26, 1973, of $21,750, the equivalent to 870 manshifts, plus 51 manshifts for personnel on the job site, equals a fulfilled work obligation for nine years; annual assessment work, however, remains as an obligation.

Exploration Activities

For the purpose of examining the easterly extension of the Goldroad vein, a diamond drill hole was drilled to intersect the projection of the vein at the 500 Level elevation approximately 1100 feet east of the 500 Level face. Drill hole GR-1 was collared at coordinates 1330 N 6410 E on a bearing of S 40°W and dip of -65°.

At 1013.75 feet the vein was encountered, dipping at a particularly shallow angle of 63°, and 4.02 feet true width examined. The hole was continued to a depth of 1675 feet; no parallel veins, either footwall or strands were encountered. An assay of the entire vein was made on an initial split, a second assay was made on particular intervals and an average of the two applied to the probable value of the vein at the point of intersection.

Split	Interval	Drilled Width	True Width	Oz/Ton Au	Oz/Ton Ag
I	1013.75-1019	5.25	4.02	0.128	0.108
II	1013.75-1014.2	0.45	0.35	0.07	0.08
	1014.2-1016.25	2.05	1.60	0.07	Tr.
	1016.25-1017.5	1.25	0.93	0.05	Tr.
	1017.8 -1019	1.50	1.14	0.18	Tr.
I			4.02	0.128	
II	Weighted Average		4.02	0.097	
	Vein Assay (Average)		4.02	0.1125	

Both walls of the vein were frozen to the country rock, the hanging wall being more poorly defined than the footwall. Mineralogically, the hanging wall 2.5 feet consisted of crystalline blades and rhombohedrons of white to clear calcite; the remaining 2.75 feet, the footwall, was predominately buff and green banded chalcedony and sugary crystalline quartz with minor amounts of calcite. The assay of split II collaborated generalized mineralogic character of the veins in the Oatman District in that gold values were related to the banded chalcedony-quartz-calcite fissuring.

Geology of Goldroad

The country rock in the vicinity of Goldroad consists of Tertiary flows having latite to andesite composition, andesite and rhyolite volcaniclastic tuffs, latite, andesite and rhyolite vents and dikes and Recent (?) basalt flows. Two periods of erosion and at least three periods of structural deformation are represented.

Rock Types, Events - Chronologically	Description and Remarks
Oatman Andesite	Silicified andesite, equigranular and porphyritic; lower most wall rock of Goldroad vein, hardness probably confined vein to only the most prepared ground.

Rock Types, Events (Cont'd)	Description and Remarks (Cont'd)
Gold Road Latite:	Complex series of latite and andesite flows, porphyritic or equigranular, separated by volcaniclastic sequence, generally soft; Goldroad vein persists throughout, achieving its greatest width and depth.
Faulting:	Initial Goldroad fault structure during regional deformation.
Erosional surface, southeasterly tilting Sitgreaves Tuff, fissuring and mineralization:	Volcaniclastic andesitic and rhyolitic tuffs locally containing abundant agate, lower-most units contemporaneous with last stages of fissure mineralization (see Chart)
Sharp fault North-south faults, southeasterly tilting, calcite fissuring:	numerous high angle normal faults dipping west, having small offsets, post-ore but generally healed with calcite.
Erosional surface:	5 to 50 feet of soil and unconsolidated gravels of post-ore age.
Recent (?) basalt:	Massive, flat lying capping flows of post-ore age.

The Goldroad vein is a complex fissure filled, westerly trending, northerly dipping normal fault; the result of dip slip and right lateral strike slip movement has prepared lenticular zones of voids and breccia for multiple stage, epithermal fissuring. Although speculative, it is reasonable to assume the silicified Oatman Andesite required the most intensive breakage, and thus the abrupt boundaries of the ore; the Sitgreaves Tuff, being poorly consolidated, porous and vesicular, needed the least in the way of preparation and thus the vein occurs with the minimum aid of a pre-existing structure. Complexity originates thru the development of hanging and footwall veins, simultaneously or individually, and strands, the resulting width varying from 10 to 80 feet although only 2 to 15 feet would contain the mineralization.

Because of the southeasterly dip of the volcanic rocks, the Goldroad vein probably takes on other properties beyond the physical appearances already described. First, the Gold Road Latite has been mineralized and developed more continuously than other rock types, this coupled with a void of mineralization dipping 25° southeast at the "Red Sill" probably signifies that deeper ore can be expected at greater depths in the eastern portion of the mine. Second, the strike slip-dip slip movement has probably created a more condusive zone for potential mineralization raking southeast, conforming to the dip of enclosing strata. Third, a gradual but recognizable

flattening of dip from west to east may signify important changes in grade and or tonnage potential.

Economic Possibilities

At the time of closure, Goldroad mine reserves were estimated to be 456,138 tons of 0.325 ounces of gold per ton. Because of the intersection of the vein in DDH GR-1, a conservative estimate of 206,872 tons of 0.353 oz/ton (the average grade of 1,647,169 tons mined during all previous operations) should be added to the above reserve figure. Thus:

	Tons	Grade
Proven in the Mine	456,138	0.325
Indicated by DDH GR1	206,872	0.353
Total	663,010	0.334

221,500 oz Au

A dilution factor of 25 percent in the tenor from vein assays to mill heads results in 885,803 tons of 0.250 ounces per ton (assuming the dilution material to be barren).

Economic feasibility as outlined below is particularly favorable, but excludes the development of additional ores and any difficulties encountered in the mining operation.

Capital Expenditures	Amount	Totals
Mill (750 TPD @ $3000/ton)	2,250,000	
Power (Davis Dam-Goldroad)	150,000	
Water (3 wells @ $25,000/well)	75,000	
Mine Surface		
No. 3 Shaft - hoist, compressors	400,000	
No. 1 Shaft-hoist, compressors	125,000	
Mine Underground		
No. 3 Shaft retimber	95,000	
No. 1 Shaft retimber	50,000	
700 Level haulage	300,000	
Misc. Rehabilitation	150,000	
Development (Drill hole ore)		
Drifting @ $75/ft.	386,250	
Raising @ $50/ft.	87,500	
Total		$4,068,750

Operating Cost Per Ton		
Milling	2.50	
Mining	15.520	
		18.020

Reserves, Value Based on July 2, 1973 Price of $122.90/oz

Indicated Tonnage	Diluted Grade	Recovered Grade	Value/Ton
885,808	0.250	0.225	27.653

Operating Time

Mine life at 750 TPD, 350 days per year, 3.375 years

Operating Margin, Steady Gold Price, 6.5% annual inflation

Operating Year		Value/Ton	Cost/Ton	Operating Margin/Ton
1	262,500	27.653	18.020	9.633
2	262,500	27.653	19.191	8.462
3	262,500	27.653	20.438	7.215
3.375	98,308	27.653	20.920	6.733

Annual Profit

Year	1	$2,528,662.50
	2	2,221,750.00
	3	1,893,375.00
	3.375	661,907.76
Gross Profit from Operations		7,305,695.26
Capital Investment		4,086,750.00
Net Profit		3,218,945.26

The above net profit equals an annual rate of return of 19 percent on the initial investment.

For the purpose of establishing a cash flow while development elsewhere in the mine is progressing, six ore blocks on the 100 and 350 Levels (Block A-F) would be mined upon completion of the mill. 112,569 tons of 0.44 oz/ton diluted grade material is here available without seriously affecting the subsequent operation of the mine.

Future Work Proposal

Of course, no mining venture is undertaken without a continued development and exploration program. First, the drilling of DDH GR-1 although seemingly discouraging because of the limited width and meager grade of the vein encountered, is actually an optimistic view of greater lateral and vertical potential of the Goldroad vein than previously developed. Second, potentially important strands and walls adjacent to large ore bodies mined during previous operations may provide significant tonnage of equivalent or higher than average grade material at minimal cost. Third, deeper ore than that already developed undoubtedly exists owing to particularly favorable structures and rock types; therein may exist the greatest potential for understanding and exploiting the maximum of indicated mineralization.

Alternative Operating Capacity at Goldroad

Because of the narrow width of the Goldroad vein, difficulties in achieving a production capacity of 750 tons per day may be realized. Therefore, a reduction in operating size is herein considered and evaluated.

Capital Expenditures

Mill (500 TPD @ $3250/ton)	$1,625,000
Power (Davis Dam - Goldroad)	150,000
Water (3 wells @ $20,000/well)	60,000
Mine Surface and Underground	1,120,000
Development (Drill hole ore)	473,750
Total	$3,428,750

Operating Cost Per Ton

Milling	$ 2.50
Mining	17.50
Total	$20.00

Reserves and metal value as for 750 ton per day operation.

Operating Life

500 TPD x 350 DPY = 175,000 TPY
885,808 T ÷ 175,000 TPY = 5.06 years

Operating Margin (Same conditions as 750 TPD)

Operating Year	Ton	Value/Ton	Cost/Ton	Operating Margin/Ton
1	175,000	27.653	20.000	7.653
2	175,000	27.653	21.300	6.353
3	175,000	27.653	22.685	4.968
4	175,000	27.653	24.160	3.493
5	175,000	27.653	25.730	1.923
5.06	10,808	27.653	25.890	1.763

Annual Gross Profit

Year	1	$1,339,275
	2	1,111,775
	3	869,400
	4	611,275
	5	336,525
	5.06	19,055
Total Gross Profit from Operations		$4,287,305
Capital Expenditures		3,428,750
Net Profit		858,555

Approximate return on investment - 4 Percent

At this time two surface holes are recommended to be drilled at Goldroad for the purpose of delineating the eastern and western extent of the vein. A 1500 foot hole collared at 800N 2600W on a bearing of S 40°W at -45° will examine a probable fault offset continuation of the vein; at 1300N 7350E a S 40°W drill hole at -60° will examine the possible eastward continuation of the vein and determine possible alternatives of future development at Goldroad. Approximately 500,000 tons of potential ore grade material may be realized from this additional work.

Costs, based on the recently completed GR-1 drill hole, are estimated to be $13.50 per foot or $40,500. Because of the already fulfilled assessment obligations, work should not be commenced prior to September 1, 1973.

John Schulz

GOLDROAD : INDICATED RESERVES FROM DDH GR-1

TF = 13

BLK	COORDINATES	LEVEL	WIDTH	LGT	HGT	CU. FT.	TONS
1	5750 - 6410 E	100	2.1	660	220	152,460	11,728
2	5560 - 5750 E	100	2.1	190	220	87,780	6752
3	5320 - 5560 E	100	2.7	240	220	71,280	5483
4	5160 - 5310 E	350	3	150	250	56,250	4,327
5	5160 - 5310 E	500	7	150	150	78,750	6058
6	5040 - 5310 E	700	7	150	200	105,000	8077
7	5310 - 6410 E	700	3.24	1,100	600	2137,811	164447
	TOTAL		3.37				206,872

G7206 GREEN 7206 BUFF MADE IN U.S.A.

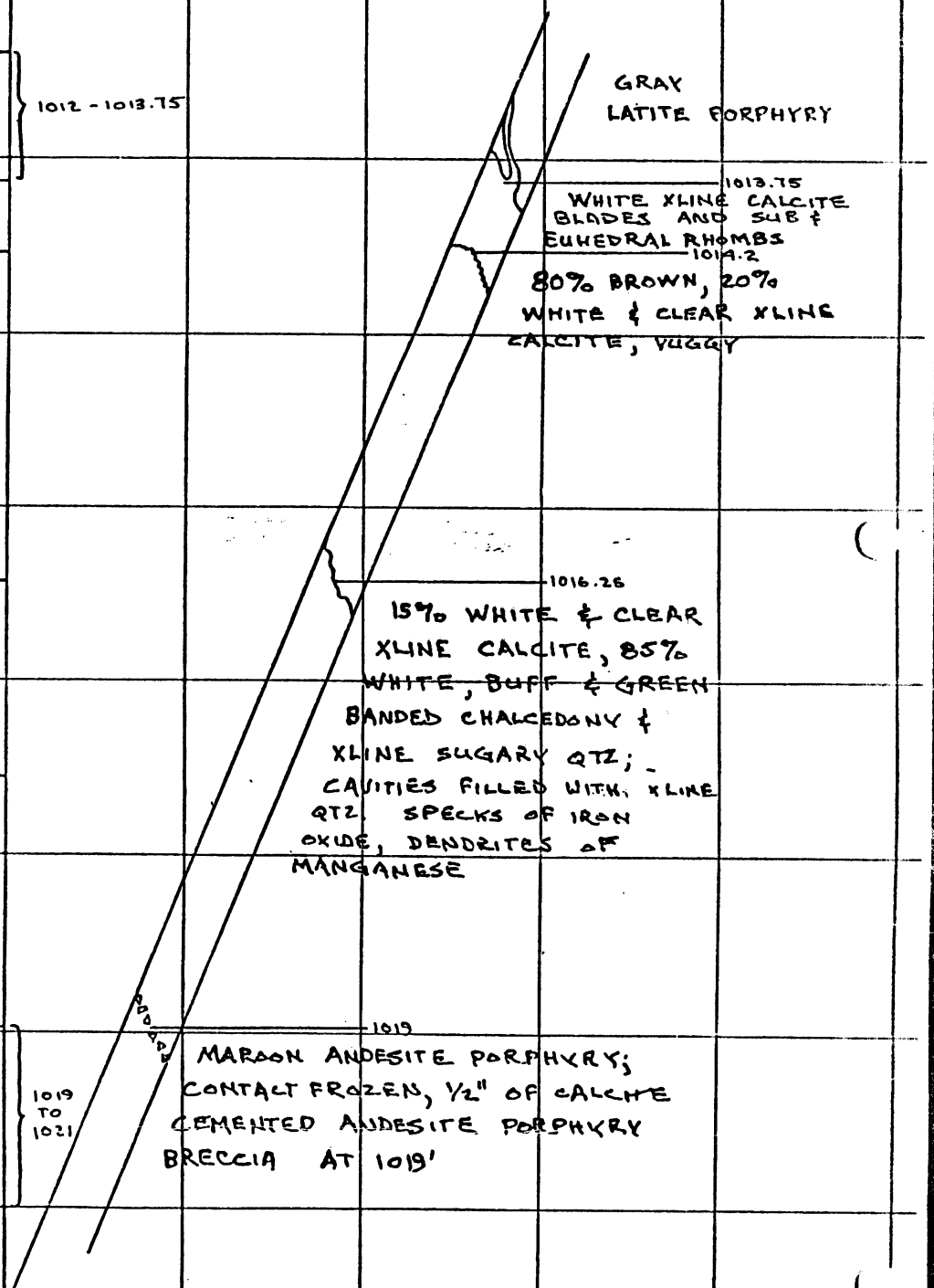
GOLDROAD : RESERVES FOR DEVELOPMENT
BLOCKS A THRU F

LV	BK	COORDINATES	HGT	LGT	WDTH	CU FT	TF = 13 TONS	GRADE
100	A	4505 - 4675E	210	170	3.4	121380	9336	0.37
				RESERVES	REMAINING		7002	
100	B	4800 - 5010E	210	45	3.35	31658	2435	0.93
			210	80	4.3	72240	5556	1.39
			210	110	3.4	78540	6041	0.34
100	C	5010 - 5325E	210	80	4.15	69720	5363	0.44
			210	110	4.9	113190	8707	0.51
			210	115	3.4	82110	6316	0.34
350	D	4410 - 4650E	230	45	5.3	54855	4219	0.26
			230	150	4.5	155250	11924	0.36
			230	10	3.4	7820	601	0.37
350	E	4815 - 4965E	230	150	3.55	122475	9421	0.96
			230	10	4.3	9890	761	1.39
350	F	4975 - 5100E	230	125	3.8	10925	840	0.36
			230	100	4.35	100050	7696	0.44
			230	110	4.9	123970	9536	0.51
	A						7002	0.36
	B						12041	1.16
	C						20386	0.44
	D						16744	0.34
	E						10182	0.99
	F						18072	0.47
		TOTAL					84427	0.59
			DILUTION FACTOR : 25%				112569	0.44

WILSON JONES COMPANY G7206 GREEN 7206 BUFF MADE IN U.S.A.

DDH GR-1

TOTAL INTERVAL oz/ton Au	TOTAL INTERVAL oz/ton Ag	PARTIAL INTERVAL oz/ton Au	PARTIAL INTERVAL oz/ton Ag	
		0.02	0.08	1012 - 1013.75
		0.07	0.08	
		0.07	Tr	
0.128	0.108			
		0.05	Tr	
		0.18	Tr	
		0.01	0.08	1019 TO 1021

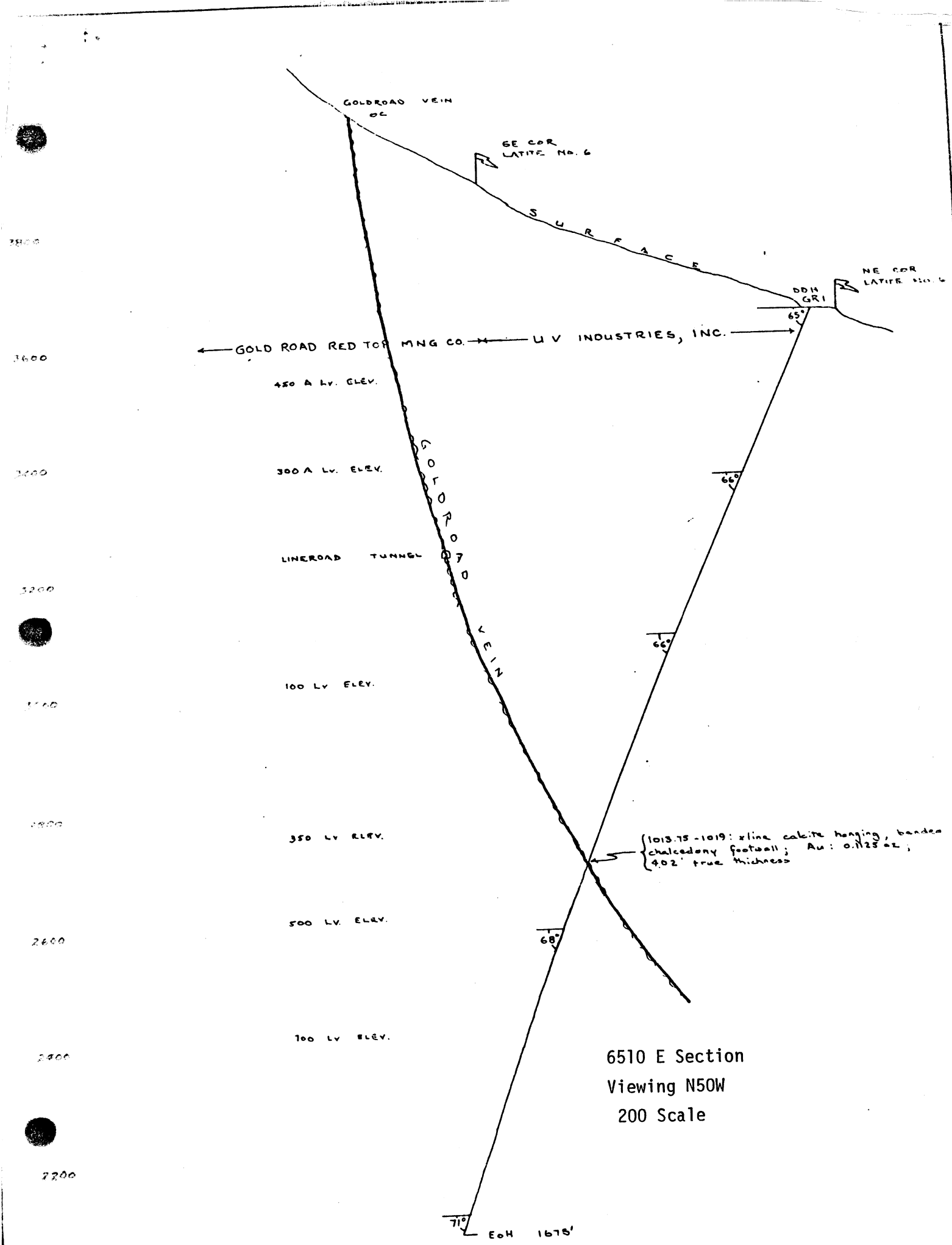


SCALE: 1" = 10'

Characteristic Features of the Five Stages of Quartz Deposition

Stage	Texture	Color	Range of Values Per Ton	Ratio of gold to silver	Relative disb'n in the veins
1st	Coarse to fine grained.	Colorless; white; amethystine.	Up to $1.20	1 to 6	Abundant
2nd	Fine-grained; often shows casts of calcite.	White; rarely yellow	Up to $1.70	1 to 6	Abundant
3rd	Fine-grained. Banded.	Various Colors.	$1.20 to $8.00	2 to 3	Relatively scarce
4th	Fine-grained; often shows casts of platy calcite.	Pale green to yellow.	$4.00 to $20.00	1 to 2	Abundant only in ore shoots
5th	Fine to medium grained; usually banded.	Pale to deep honey-yellow.	$20.00 up.	4 to 1	Abundant only in ore shoots

* Arizona Bureau of Mines, "Geology and Ore Deposits of the Oatman and Katherine Districts, Arizona," by Carl Lausen. P. 72.


GOLDROAD VEIN
OC
SE COR
LATIFE No. 6
SURFACE
NE COR
LATIFE No. 6
DDH
GR1
65°
GOLD ROAD RED TOP MNG CO.
U V INDUSTRIES, INC.
450 A LV. ELEV.
300 A LV. ELEV.
GOLDROAD VEIN
66°
LINEROAD TUNNEL
66°
100 LV ELEV.
(1013.75 - 1019: xline calcite hanging; banded chalcedony footwall; Au: 0.1125 oz; 4.02' true thickness
350 LV ELEV.
500 LV. ELEV.
68°
700 LV ELEV.
71°
EoH 1678'
6510 E Section
Viewing N50W
200 Scale

M E M O R A N D U M

TO: J. M. Elias

DATED: March 20, 1972

FROM: J. O. Schulz

RE: Gold Road Mine
Mohave County, Arizona

HISTORICALLY

U.S. Smelting purchased the Gold Road Mine in 1911 for a reported $1.5 million (Muir, 1931) and operated the same during three periods: 1911-1916; 1923-1924; 1935-1942. The mine was twice closed by what was considered exhaustion of ore. However, R. T. Walker (then Chief Geologist for U.S. Company) began promoting the property in 1932 on the premise of undiscovered fault offsets and the undeveloped northwest and southeast extension of the vein. Walker's enthusiasm for reopening the mine eventually convinced management to commit U.S. to a one year rehabilitation, development and exploration of vein extensions in 1935; within six months ore was being shipped to Oatman and by 1937, a mill had been erected on the property and production maximized. Government Order L-208 closed the mine in August, 1942. Although maintained for the duration of World War II, the mine was not reopened and the following transpired: 1) The equipment which had not been already transferred to Bayard was sold and/or shipped to other properties operated by U.S. 2) The Red Top lease was allowed to expire in 1949. 3) Unpatented claims, except for the Latite's No. 4, 5 and 6 were dropped in 1960. 4) A totally unorganized pursuit towards exploration through assessment work requirements persisted from 1950 to 1970.

PRESENTLY

As the price of gold increased from $20 to $35 per ounce in the 1930's and the economics of operating the Gold Road mine became more attractive, consideration must again be given now in light of $48 gold.

A) Ore Reserves and Economic Evaluation

At the time of closure in 1942 ore reserves were estimated to be 556,169 tons proven and 503,571 tons of probable 0.241 oz. gold and 0.238 oz. silver. The ore blocks were scattered over the entire length of the developed vein and located between the 900 level and the surface. Development work ceased on all levels being driven southeast toward and into the Red Top property with ore at the faces of the 700, 500, 350 and 100 levels and two 165 foot raises into ore on the Line Road tunnel within Red Top ground. Thus, the southeastern extent of the Gold Road vein remained undeveloped and the site of probable reserves in addition to the above stated.

The following figures were derived from a) 1941 costs and returns during the last full year of operation, b) a report by T. P. Billings, 1945, on the economics of operating the mine following the war and c) an estimate of today's costs and economic worth.