

005021

CYPRUS ANVIL MINE  
UPDATE OF AUGUST 1984 STUDY  
AND  
EVALUATION OF ALTERNATIVE  
MINING OPTIONS

Prepared for  
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APPENDIX D - Milling



## 1.0 INTRODUCTION

Following a meeting held in Tucson on February 26, 1985, Mr. E. L. Forgues, Vice President of Dome Petroleum and President of Cyprus Anvil Mining Corporation, (CAMC), a subsidiary of Dome, requested Pincock, Allen & Holt, Inc. (PAH) to undertake a three part study consisting of the following:

- 1) Update the PAH August 1984 Report on the Faro deposit to reflect changes in costs for power, concentrate transport, product prices, treatment charges, labor rates, and consumable items. In addition, revisions to capital requirements would be assessed.
- 2) Apply the modifications in Item 1 above to a revised mine plan, based on a 180 degree reversal of mining direction and a change in cutoff grade from four to six percent. The impact of higher head grades on recoveries would also be assessed.
- 3) Evaluate Item 2 above with respect to anticipated increases in productivity and reductions in labor rates.

As in the initial August 1984 study, Dome made available to PAH current reserve estimates, production schedules, cost records, metallurgical test results, and other information required for the study. PAH also had free access to both Dome and CAMC personnel. In the course of the study, PAH made independent estimates of equipment requirements, manpower, supplies, and costs where necessary.

PAH would like to thank Mr. Forgues and his staff for their cooperation and assistance. In addition, the periodical comments and reviews by Mr. Peter Steen, independent mining consultant, were greatly appreciated.

The monetary unit used throughout this report is the Canadian dollar, unless specifically stated otherwise. The exchange rate used in this report is \$1.00 Canadian = \$0.72 U.S. All revenues and costs in this report are first quarter, 1985 dollars.



## 2.0 SUMMARY

The three scenarios described in Section 1.0 have been evaluated under the parameters summarized in Table 2-1 (Mining), 2-2 (Milling), and 2-3 (Financial). Mine and mill operating costs, based on these parameters, are compared in Table 2-4, along with costs from the august 1984 study. While the four percent cutoff studies (August 1984 Report and August 1984 Update) cannot be directly compared to the six percent cutoff studies (Six Percent Mine Plan and Six Percent Modified Mine Plan) due to the different time frames and partial years of different lengths, the annual cash flows, in thousands of dollars, are summarized as follows:

| <u>Year</u>         | <u>Aug/84<br/>Report</u> | <u>Aug/84<br/>Update</u> | <u>Six Percent<br/>Mine Plan</u> | <u>Six Percent<br/>Modified Mine Plan</u> |
|---------------------|--------------------------|--------------------------|----------------------------------|-------------------------------------------|
| 1984                | -21,067                  | 16,580                   | -                                | -                                         |
| 1985                | 7,177                    | 19,782                   | -28,031                          | -27,012                                   |
| 1986                | 24,749                   | 40,928                   | 39,403                           | 43,015                                    |
| 1987                | 21,106                   | 37,698                   | 64,793                           | 69,371                                    |
| 1988                | 52,467                   | 69,170                   | 58,386                           | 62,045                                    |
| 1989                | 57,950                   | 73,686                   | 74,129                           | 76,866                                    |
| 1990                | 52,512                   | 68,262                   | 69,754                           | 71,341                                    |
| 1991                | 36,259                   | 49,363                   | 27,488                           | 28,896                                    |
| 1992                | -                        | -                        | 19,978                           | 20,802                                    |
| Total               | 231,153                  | 342,310                  | 325,901                          | 345,324                                   |
| Approx<br>NPV @ 15% | 114,000                  | 183,190                  | 194,675                          | 208,267                                   |

The major cost differences that resulted in the significant NPV increase from the August 1984 report were:

TABLE 2-1  
Cyprus Anvil  
Summary Of Study Parameters (Mining)

| Item                                | Aug/84 Report                                               | Aug/84 Update                                                                       | 6% Mine Plan                                                                  | 6% Modified Plan                                             |
|-------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------|
| Minable Reserves                    | Pit @ 4% 26,432 ktonnes<br>Ox Stkpl 1,400<br>27,832 ktonnes | Same as Aug/84 Report                                                               | Pit @ 6% 18,538 ktonnes<br>Ox Stkpl 1,236<br>Lg Stkpl 6,832<br>26,606 ktonnes | Same as 6% Mine Plan                                         |
| Mine Plan                           | From SE to NW                                               | Same as Aug/84 Report                                                               | From NW to SE                                                                 | Same as 6% Mine Plan                                         |
| Mining Starts                       | November, 1984                                              | Same as Aug/84 Report                                                               | June, 1985                                                                    | Same as 6% Mine Plan                                         |
| Mining Ends                         | November, 1991                                              | Same as Aug/84 Report                                                               | August, 1990 (Pit)<br>July, 1992 (Stkpl)                                      | Same as 6% Mine Plan                                         |
| Wage Rates                          | Base Rates From<br>Collective Agreement                     | Base Rates Adjusted For<br>Not Change, Shift Differ-<br>ential & Weekend Premiums   | Same as Aug/84 Update                                                         | 20% Reduction from 6%<br>Mine Plan                           |
| Effective Time/Shift                | 525 Min.                                                    | 525 Min.                                                                            | 525 Min.                                                                      | 584 Min.                                                     |
| Scheduled Hrs/Man/Year              | 2,190 Hours                                                 | 1,884 Hours                                                                         | 1,884 Hours                                                                   | 1,884 Hours                                                  |
| Paid Hrs/Man/Year                   | 2,376 Hours                                                 | 2,042 Hours                                                                         | 2,042 Hours                                                                   | 2,042 Hours                                                  |
| VSA Allowable                       | Covered By Utilitymen                                       | 16% Added To Individual<br>Job Categories; Utility-<br>men Reduced                  | Same As Aug/84 Update                                                         | Same as 6% Mine Plan                                         |
| Equipment Productivities            | Initial Estimate                                            | Same as Aug/84 Report                                                               | Revised on Basis of More<br>Detailed Breakout of<br>Individual Rock Types     | Same as 6% Mine Plan<br>Plus Adjustment for<br>584 Min/Shift |
| Operating Manpower                  | Initial Estimate                                            | Refined by Grouping<br>Similar Equipment                                            | Same as Aug/84 Update                                                         | Revised Due to Improved<br>Equipment Productivities          |
| Maintenance Manpower                | Initial Estimate                                            | Revised Due to Rate and<br>Hrs/Man/Year Adjustments                                 | Same as Aug/84 Update                                                         | Revised Due to Improved<br>Equipment Productivities          |
| Supervisory & Technical<br>Manpower | Initial Estimate                                            | Same as Aug/84 Report                                                               | Same as Aug/84 Update                                                         | Same as 6% Mine Plan                                         |
| Power Cost                          | \$0.07/KWH                                                  | \$0.04/KWH                                                                          | \$0.04/KWH                                                                    | \$0.04/KWH                                                   |
| Diesel Cost                         | \$0.41/Liter                                                | \$0.40/Liter                                                                        | \$0.40/Liter                                                                  | \$0.40/Liter                                                 |
| Tire Costs                          | Initial Estimate                                            | Revised to Current Quotes<br>by CAMC                                                | Same as Aug/84 Update                                                         | Same as 6% Mine Plan                                         |
| Explosives Costs                    | Initial Estimate                                            | Revised to Reflect More<br>Detailed Consumption Esti-<br>mates and New CIL Contract | Same as Aug/84 Update                                                         | Same as 6% Mine Plan                                         |

TABLE 2-2

Cyprus Anvil  
Summary Of Study Parameters (Milling)

| Item                                  | Aug/84 Report    | Aug/84 Update                                                | 6% Mine Plan          |         | 6% Modified Plan     |         |
|---------------------------------------|------------------|--------------------------------------------------------------|-----------------------|---------|----------------------|---------|
| Milling Starts                        | November, 1984   | November, 1984                                               | December, 1985        |         | December, 1985       |         |
| Milling Ends                          | November, 1991   | November, 1991                                               | June, 1992            |         | June, 1992           |         |
| Milling Rate                          | 11,160 MTPD      | 11,160 MTPD                                                  | 11,160 MTPD           |         | 11,160 MTPD          |         |
| Head Grade<br>(Mine Life Avg.)        |                  |                                                              |                       |         |                      |         |
| Zinc %                                | 4.3              | 4.3                                                          | 4.5                   | (4.8)*  | 4.5                  | (4.8)*  |
| Lead %                                | 2.9              | 2.9                                                          | 2.9                   | (3.2)   | 2.9                  | (3.2)   |
| Silver %/t                            | 35.9             | 35.9                                                         | 36.1                  | (38.5)  | 36.1                 | (38.5)  |
| Recovery<br>(Mine Life Avg.)          |                  |                                                              |                       |         |                      |         |
| Zinc %                                | 80.4             | 80.4                                                         | 81.8                  | (83.1)* | 81.8                 | (83.1)* |
| Lead %                                | 79.5             | 79.5                                                         | 80.1                  | (81.9)  | 80.1                 | (81.8)  |
| Concentrate Grade<br>(Mine Life Avg.) |                  |                                                              |                       |         |                      |         |
| Zinc %                                | 50.0             | 50.0                                                         | 50.4                  | (51.0)* | 50.4                 | (51.0)* |
| Lead %                                | 59.8             | 59.8                                                         | 61.1                  | (61.6)  | 61.1                 | (61.1)  |
| Operating Manpower                    | Initial Estimate | Revised                                                      | Revised               |         | Revised              |         |
| Maintenance Manpower                  | Initial Estimate | Revised                                                      | Revised               |         | Revised              |         |
| Power Cost                            | \$0.07/KWH       | \$0.04/KWH                                                   | \$0.04/KWH            |         | \$0.04/KWH           |         |
| Drying/Heating                        | Oil              | Coal                                                         | Coal                  |         | Coal                 |         |
| Operating Supplies                    | Initial Estimate | Lowered to Reflect<br>Reduced Cost or<br>Improved Efficiency | Same as Aug/84 Update |         | Same as 6% Mine Plan |         |

\* Figures in brackets ( ) do not include milling of low grade stockpile at end of pit life.

TABLE 2-3

Cyprus Anvil  
Summary Of Study Parameters (Financial Analysis)

| Item                          | Aug/84 Report     | Aug/84 Update     | 6% Mine Plan      | 6% Modified Plan  |
|-------------------------------|-------------------|-------------------|-------------------|-------------------|
| Land Freight                  | \$52.00/WMT       | \$42.50/WMT       | \$42.50/WMT       | \$42.50/WMT       |
| Terminal Costs                | \$3,120,000/year  | \$3,100,000/year  | \$3,100,000/year  | \$3,100,000/year  |
| Ocean Freight                 | \$24.00/WMT       | \$25.00/WMT       | \$25.00/WMT       | \$25.00/WMT       |
| Product Pricing               |                   |                   |                   |                   |
| Zinc                          | \$0.45 U.S./lb    | \$0.43 U.S./lb    | \$0.43 U.S./lb    | \$0.43 U.S./lb    |
| Lead                          | \$0.22 U.S./lb    | \$0.20 U.S./lb    | \$0.20 U.S./lb    | \$0.20 U.S./lb    |
| Silver                        | \$7.50 U.S./lb    | \$7.00 U.S./lb    | \$7.00 U.S./lb    | \$7.00 U.S./lb    |
| Exchange Rate<br>\$1.00 CDW = | \$0.75 U.S.       | \$0.72 U.S.       | \$0.72 U.S.       | \$0.72 U.S.       |
| Zinc Treatment Charges        | U.S. \$155.00/DMT | U.S. \$154.00/DMT | U.S. \$154.00/DMT | U.S. \$154.00/DMT |
| Lead Treatment Charges        | U.S. \$150.00/DMT | U.S. \$130.00/DMT | U.S. \$130.00/DMT | U.S. \$130.00/DMT |
| Silver Refining Charges       | \$0.33/tr oz      | \$0.35/tr oz      | \$0.35/tr oz      | \$0.35 tr oz      |
| Other Concentrate Costs       | \$2.00/DMT        | \$2.08/DMT        | \$2.08/DMT        | \$2.08/DMT        |
| G & A Costs                   | \$10,331,000/year | \$6,435,000/year  | \$6,435,000/year  | \$6,435,000/year  |
| Calgary, VCVR Overhead        | \$1,800,000       | \$1,800,000       | \$1,800,000       | \$1,800,000       |
| Capital Expenditures*         | \$18,599,000      | \$18,917,000      | \$18,917,000      | \$18,917,000      |
| Working Capital               | \$10,000,000      | \$6,000,000**     | \$6,000,000**     | \$6,000,000**     |

\* Includes replacement capital costs.

\*\* Initial working capital cost was adjusted by \$4,000,000 for credit by Canadian government for stripping cost. Recapture of working capital was \$10,000,000 in last year of production.

TABLE 2-4

## Cyprus Anvil

Operating Unit Cost Summary  
(Canadian Dollars)

|                                                         | <u>Aug/84<br/>Report</u> | <u>Aug/84<br/>Update</u> | <u>6% Mine<br/>Plan</u> | <u>6% Modified<br/>Mine Plan</u> |
|---------------------------------------------------------|--------------------------|--------------------------|-------------------------|----------------------------------|
| <u>Mining Cost</u>                                      |                          |                          |                         |                                  |
| (Costs Per Total Tonne Mined)*                          |                          |                          |                         |                                  |
| Operating Labor                                         | \$0.17                   | \$0.15                   | \$0.17                  | \$0.13                           |
| Maintenance Labor                                       | 0.21                     | 0.17                     | 0.16                    | 0.12                             |
| Parts & Consumables                                     | 0.75                     | 0.73                     | 0.68                    | 0.67                             |
| Mine Overhead                                           | <u>0.20</u>              | <u>0.19</u>              | <u>0.17</u>             | <u>0.15</u>                      |
| Total                                                   | \$1.33                   | \$1.24                   | \$1.18                  | \$1.07                           |
|                                                         | \$1.34                   |                          |                         |                                  |
|                                                         | \$1.34                   |                          |                         |                                  |
| <u>Milling Costs</u>                                    |                          |                          |                         |                                  |
| (Costs Per Tonne Milled -<br>Sulfide Ore @ 11,160 mtpd) |                          |                          |                         |                                  |
| Operating Personnel                                     | \$1.13                   | \$1.03                   | \$1.03                  | \$0.91 .88                       |
| Flotation Supplies                                      | 2.10                     | 2.00                     | 2.02                    | 2.02 1.76                        |
| Steel                                                   | 1.50                     | 1.50                     | 1.50                    | 1.50 1.35                        |
| Crushing/Grinding Supplies                              | 0.17                     | 0.15                     | 0.15                    | 0.15 .14                         |
| Miscellaneous                                           | 0.27                     | 0.27                     | 0.27                    | 0.27 .20                         |
| Maintenance Personnel                                   | 0.76                     | 0.68                     | 0.68                    | 0.56 .56                         |
| Maintenance Supplies                                    | 0.88                     | 0.83                     | 0.85                    | 0.85 .83                         |
| Heating/Drying                                          | 0.47                     | 0.33                     | 0.35                    | 0.35 .33                         |
| Power                                                   | <u>2.90</u>              | <u>1.61</u>              | <u>1.61</u>             | <u>1.61</u> 1.53                 |
| Total                                                   | \$10.18                  | \$8.40                   | \$8.46                  | \$8.22 7.26                      |
|                                                         |                          |                          |                         | 7.57 plus power                  |
|                                                         |                          |                          |                         | 7.57                             |
| <u>Milling Costs</u>                                    |                          |                          |                         |                                  |
| (Cost Per Tonne Milled -<br>Overall Average)**          |                          |                          |                         |                                  |
| Total                                                   | \$10.22                  | \$8.56                   | \$8.47                  | \$8.24                           |

\*Total tonnes include ore, waste, and stockpile rehandle.

\*\*Reflects higher costs for reduced milling rates and oxide ores.

- 1) Reduced labor costs,
- 2) Lower power costs,
- 3) Reduced land concentrate transport charges, and
- 4) Reduced general and administrative expenses

These four items account for more than 90 percent of the difference between the August report and this report. Labor costs, fringe benefit reductions and increased labor productivities will depend on future negotiations with the Union. It should be noted that in the six percent sensitivity case, increased productivities were based upon a profit sharing concept and PAH has not reduced the cash flows to reflect any yet-to-be-negotiated profit sharing agreement.

The lower power costs as provided by CAMC will be dependent on continued negotiations with the power authorities and there appears to be a good chance that these reductions will be obtained.

Lower land concentrate transport charges is based upon the use of the Whitehorse to Skagway highway. This will depend on the outcome of negotiations with both the Yukon and Alaska governments.

General and administrative costs were reduced to reflect the proposed sale or rental of housing to the employees. This change will also be subject to Union review and approval.

It should also be noted that the stated cash flows and net present values are pretax numbers without any deductions for the current debt load, and non-cash costs such as depreciation.

## 2.1 August 1984 Report Update

On a life-of-mine basis, mine operating costs average \$1.24 per tonne of material mined or \$5.05 per tonne of ore mined, which is a reduction of \$0.09 per tonne mined or \$0.31 per tonne of ore, from the costs determined in the August 1984 Report. The primary reasons for this deduction are: (1) a more refined calculation of labor requirements, (2) a reduction in paid hours per man-year, and (3) reduced power and fuel costs.

Mill operating costs at full capacity on sulfide ore were reduced by \$1.74 per tonne milled relative to the August 1984 Report. The major contributor was the reduction in power costs from \$0.07 to \$0.04 per kwh.

Capital costs were changed to reflect the most recent CAMC estimates. These were reviewed in detail and PAH believes the cost estimates are reasonable. Capital costs for the mill modifications were increased for the August 1984 Report by \$1,923,000. The major portion of this increase was a cost of \$1,800,000 to cover the expansion of the water reservoir.

Capital costs per year are summarized below:

| <u>Year</u> | <u>August 1984</u> | <u>August 1984 Update<br/>&amp; Six Percent Plans</u> |
|-------------|--------------------|-------------------------------------------------------|
| 1984*       | \$7,906,000        | \$6,920,000                                           |
| 1985        | 7,393,000          | 8,167,000                                             |
| 1986        | 600,000            | 1,130,000                                             |
| 1987        | 600,000            | 600,000                                               |
| 1988        | 600,000            | 600,000                                               |
| 1989        | 600,000            | 600,000                                               |
| 1990        | 500,000            | 500,000                                               |
| 1991        | 400,000            | 400,000                                               |

\*For the six percent plan, the first year is 1985 and last year 1992.

## 2.2 Six Percent Plan

In raising the cutoff grade from four percent to six percent, the assumption has been made that the resulting low grade material will be stockpiled and remained for mill feed after the pit reserves are exhausted. Mine operating costs over the mine life averaged \$1.18 per tonne of material mined or \$4.82 per tonne of ore mined. Relative to the August 1984 Update, the cost savings is primarily due to the higher daily tonnage movements in the early years that results in cost savings per tonne of material mined.

Increasing the cutoff grade results in only minor changes in mill operating parameters. No modifications were made to the CAMC recovery estimates until the start of the milling of the low grade stockpile. Average recoveries for +6

percent sulfide ore are 83.3 percent for zinc and 81.9 percent for lead. Mill operating costs were increased by \$0.06 per tonne ore over the August 1984 Update to reflect the impact of greater concentrate tonnages.

Capital costs are the same per year as the four percent update, however the costs are delayed one year to reflect the one year shift difference between the 1984 plan and the revised 1985 plan start-up.

### 2.3 Six Percent Modified Mine Plan

Modifications to the initial six percent plan consist of increasing the effective minutes per shift in mine operations from 525 to 584 and reducing labor rates by 20 percent. These modifications are objectives specified by CAMC and may or may not be achievable, depending on the quality of management, the quality of labor, labor turnover, and the outcome of future labor negotiations. The incorporation of these modifications with the six percent mine plan results in a mine operating cost of \$1.07 per tonne of material mined or \$4.38 per tonne of ore mined, which is a reduction of \$0.11 per total tonne from the initial six percent plan.

The only change affecting mill operations is the reduction in hourly wage rates, which reduced the mill operating costs from \$8.46 to \$8.22 per tonne milled.

Capital costs were not changed from the previous six percent cutoff case.



### 3.0 AUGUST 1985 REPORT UPDATE

#### 3.1 Mining

The August 1984 PAH report was based on a mining sequence progressing from southeast to northwest, utilizing a four percent combined lead-zinc cutoff grade. This mining direction represents a 180 degree change from initial pit sequencing and was implemented to minimize advance stripping upon resuming operations.

##### 3.1.1 Mine Plan

In the August 1984 report, minable reserves are shown as follows:

|              |                                                        |
|--------------|--------------------------------------------------------|
| Open Pit Ore |                                                        |
| (4% COG)     | = 26,432 ktonnes @ 4.3% Zn, 2.9% Pb, 36.1 g/t Ag       |
| Oxide Stpls  | = <u>1,400</u> ktonnes @ 4.7% Zn, 2.9% Pb, 36.2 g/t Ag |
| Total        | 27,832 ktonnes @ 4.3% Zn, 2.9% Pb, 36.2 g/t Ag         |

The mine production schedule, in ktonnes, consisted of:

| <u>Year</u>    | <u>Pit<br/>Ore</u> | <u>Stkpl<br/>Ore</u> | <u>Waste</u> | <u>Total</u> |
|----------------|--------------------|----------------------|--------------|--------------|
| 1984 (Nov-Dec) | 0                  | 427                  | 4,355        | 4,782        |
| 1985           | 2,631              | 973                  | 23,442       | 27,046       |
| 1986           | 4,073              | 0                    | 22,398       | 26,471       |
| 1987           | 4,073              | 0                    | 21,466       | 25,339       |
| 1988           | 4,073              | 0                    | 8,233        | 12,306       |
| 1989           | 4,073              | 0                    | 2,642        | 6,715        |
| 1990           | 4,073              | 0                    | 1,151        | 5,224        |
| 1991 (Jan-Nov) | <u>3,436</u>       | <u>0</u>             | <u>963</u>   | <u>4,399</u> |
| Total          | 26,432             | 1,400                | 84,650       | 112,482      |

For this update of the August 1984 report, no revisions to the reserves or the production schedule have been made.

### 3.1.2 Equipment Requirements

No changes have been made to equipment productivities or requirements shown in the August 1984 report. For reference, the following tables are included herein:

|           |                                                           |
|-----------|-----------------------------------------------------------|
| Table 3-1 | Drilling Productivity - Ore                               |
| Table 3-2 | Drilling Productivity - Waste                             |
| Table 3-3 | Drill Requirements                                        |
| Table 3-4 | 15 Yard Shovel Productivity<br>With 120 Ton Truck - Ore   |
| Table 3-5 | 15 Yard Shovel Productivity<br>With 170 Ton Truck - Ore   |
| Table 3-6 | 15 Yard Shovel Productivity<br>With 120 Ton Truck - Waste |

|            |                                                           |
|------------|-----------------------------------------------------------|
| Table 3-7  | 15 Yard Shovel Productivity<br>With 170 Ton Truck - Waste |
| Table 3-8  | 15 Yard Shovel Requirements                               |
| Table 3-9  | 10 Yard Loader Productivity - Ore Stockpile               |
| Table 3-10 | 10 Yard Loader Requirements - Ore Stockpile               |
| Table 3-11 | 120 Ton Truck Requirements                                |
| Table 3-12 | 170 Ton Ton Truck Requirements                            |
| Table 3-13 | Auxiliary Equipment Requirements - FEL                    |
| Table 3-14 | Auxiliary Equipment Requirements - RTD                    |
| Table 3-15 | Auxiliary Equipment Requirements - D9 Dozer               |
| Table 3-16 | Auxiliary Equipment Requirements - D8 Dozer               |
| Table 3-17 | Auxiliary Equipment Requirements - Grader                 |
| Table 3-18 | Auxiliary Equipment Requirements - Water Truck            |
| Table 3-19 | Equipment Shift Requirements                              |

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## DRILLING EQUIPMENT PRODUCTIVITY

DRILLTYPE

9 7/8 inch

MATERIAL TO DRILL

ORE

IN-SITU DENSITY OF MATERIAL

3.80 Tonne/M3

BLASTING

## Basic Equation:

|                         |                |
|-------------------------|----------------|
| Bench Height            | 20.00 ft       |
| Subgrade Drilling       | 4.00 ft        |
| Hole Depth              | 24.00 ft       |
| Hole Diameter           | 9.90 in.       |
| Explosives Sp. Gr.      | 0.88 g/cc      |
| Powder Factor           | 0.16 kg./tonne |
| Powder Rise             | 9.25 ft        |
| Stemming Height         | 14.75 ft       |
| Column Load             | 13.27 kg./ft   |
| Burden                  | 17.29 ft       |
| Spacing                 | 17.29 ft       |
| Tonnes Drilled per Hole | 643 tonnes     |

DRILLING PRODUCTIVITY

|                                       |                  |
|---------------------------------------|------------------|
| Tonnes per Foot Drilled               | 26.90 tonnes/ft. |
| Penetration Rate                      | 74.00 ft/hr.     |
| Down-the-Hole Drilling Time per Shift | 7.00 hrs.        |
| Feet Drilled per Operating Shift      | 518.00 ft        |
| Tonnes Drilled per Operating Shift    | 13934 tonnes     |

TABLE 3-2

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## DRILLING EQUIPMENT PRODUCTIVITY

DRILLTYPE

9 7/8 inch

MATERIAL TO DRILL

WASTE

IN-SITU DENSITY OF MATERIAL

2.75 Tonne/M3

BLASTING

Basic Equation:

|                         |                |
|-------------------------|----------------|
| Bench Height            | 40.00 ft       |
| Subgrade Drilling       | 6.00 ft        |
| Hole Depth              | 46.00 ft       |
| Hole Diameter           | 9.90 in.       |
| Explosives Sp. Gr.      | 0.88 g/cc      |
| Powder Factor           | 0.19 kg./tonne |
| Powder Rise             | 25.60 ft       |
| Stemming Height         | 20.40 ft       |
| Column Load             | 13.27 kg./ft   |
| Burden                  | 23.95 ft       |
| Spacing                 | 23.95 ft       |
| Tonnes Drilled per Hole | 1786 tonnes    |

DRILLING PRODUCTIVITY

|                                       |                  |
|---------------------------------------|------------------|
| Tonnes per Foot Drilled               | 38.91 tonnes/ft. |
| Penetration Rate                      | 42.70 ft/hr.     |
| Down-the-Hole Drilling Time per Shift | 7.00 hrs.        |
| Feet Drilled per Operating Shift      | 980.00 ft        |
| Tonnes Drilled per Operating Shift    | 38131 tonnes     |

TABLE 3-3

3.6

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## DRILLING EQUIPMENT REQUIREMENTS

9 7/8 inch Drill

| <u>Period</u>  | <u>Kt.</u> | <u>T./<br/>Shift</u> | <u>Req.d<br/>Shifts</u> | <u>Avail.<br/>Shifts</u> | <u>Mech.<br/>Avail</u> | <u>Units Required</u> |              |             |
|----------------|------------|----------------------|-------------------------|--------------------------|------------------------|-----------------------|--------------|-------------|
|                |            |                      |                         |                          |                        | <u>Oprrtg.</u>        | <u>Util.</u> | <u>Flee</u> |
| 1984 (NOV-DEC) | 4355       | 38202                | 114                     | 120                      | 80%                    | 0.94                  | 47%          | 2           |
| 1985           | 26073      | 32429                | 804                     | 710                      | 80%                    | 1.13                  | 38%          | 3           |
| 1986           | 26471      | 30081                | 880                     | 710                      | 79%                    | 1.24                  | 41%          | 3           |
| 1987           | 25539      | 29870                | 855                     | 710                      | 78%                    | 1.20                  | 40%          | 3           |
| 1988           | 12306      | 24224                | 508                     | 710                      | 76%                    | 0.72                  | 24%          | 3           |
| 1989           | 6715       | 18550                | 362                     | 355                      | 76%                    | 1.02                  | 34%          | 3           |
| 1990           | 5224       | 16224                | 322                     | 355                      | 75%                    | 0.91                  | 30%          | 3           |
| 1991 (JAN-OCT) | 4399       | 16173                | 272                     | 291                      | 74%                    | 0.93                  | 31%          | 3           |

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## LOADING EQUIPMENT PRODUCTIVITY

Material: ORE

TYPE OF EQUIPMENT:

|        |              |
|--------|--------------|
| Shovel | 11.47 M3     |
| Truck  | 108.94 tonne |

MATERIAL TO LOAD:

|                 |               |
|-----------------|---------------|
| In-Situ Density | 3.80 tonne/M3 |
| Swell Factor    | 1.30          |
| Loose Density   | 2.92 tonne/M3 |
| Bench Height    | 6.10 m.       |

PRODUCTIVITY PER LOAD:

|                              |               |
|------------------------------|---------------|
| Bucket Size                  | 11.47 M3      |
| Bucket Fill Factor           | 90.00 %       |
| Tonnes per Bucket            | 30.14 tonnes  |
| Truck Size                   | 108.94 tonnes |
| Theoretical Buckets per Load | 3.33 buckets  |
| Actual Buckets per Load      | 4 buckets     |
| Swing Cycle Time             | 30.00 sec.    |
| Spot Time between Loads      | 10.00 sec.    |
| Total Time per Load          | 2.17 min/load |

PRODUCTIVITY PER SHIFT:

|                                    |                    |
|------------------------------------|--------------------|
| Effective Minutes per Shift        | 525.00 min./shift  |
| Truck Loads per Shift              | 241.94 loads/shift |
| Truck Load Factor                  | 92.00 %            |
| Average Truck Load                 | 100.22 tonnes      |
| Shovel Production per Oprtg. Shift | 24247 tonnes       |

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## LOADING EQUIPMENT PRODUCTIVITY

Material: ORE

TYPE OF EQUIPMENT:Shovel  
Truck11.47 M3  
154.33 tonneMATERIAL TO LOAD:In-Situ Density  
Swell Factor  
Loose Density  
Bench Height3.80 tonne/M3  
1.30  
2.92 tonne/M3  
6.10 m.PRODUCTIVITY PER LOAD:Bucket Size  
Bucket Fill Factor  
Tonnes per Bucket  
Truck Size  
Theoretical Buckets per Load  
Actual Buckets per Load  
Swing Cycle Time  
Spot Time between Loads  
Total Time per Load11.47 M3  
90.00 %  
30.14 tonnes  
154.33 tonnes  
4.71 buckets  
5 buckets  
30.00 sec.  
10.00 sec.  
2.67 min/loadPRODUCTIVITY PER SHIFT:Effective Minutes per Shift  
Truck Loads per Shift  
Truck Load Factor  
Average Truck Load  
Shovel Production per Oprtg. Shift525.00 min./shift  
196.63 loads/shift  
92.00 %  
141.98 tonnes  
27918 tonnes

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## LOADING EQUIPMENT PRODUCTIVITY

Material: WASTE

TYPE OF EQUIPMENT:

|        |              |
|--------|--------------|
| Shovel | 11.47 M3     |
| Truck  | 108.94 tonne |

MATERIAL TO LOAD:

|                 |               |
|-----------------|---------------|
| In-Situ Density | 2.75 tonne/M3 |
| Swell Factor    | 1.25          |
| Loose Density   | 2.20 tonne/M3 |
| Bench Height    | 12.20 m.      |

PRODUCTIVITY PER LOAD:

|                              |               |
|------------------------------|---------------|
| Bucket Size                  | 11.47 M3      |
| Bucket Fill Factor           | 90.00 %       |
| Tonnes per Bucket            | 22.71 tonnes  |
| Truck Size                   | 108.94 tonnes |
| Theoretical Buckets per Load | 4.41 buckets  |
| Actual Buckets per Load      | 5 buckets     |
| Swing Cycle Time             | 30.00 sec.    |
| Spot Time between Loads      | 10.00 sec.    |
| Total Time per Load          | 2.67 min/load |

PRODUCTIVITY PER SHIFT:

|                                    |                    |
|------------------------------------|--------------------|
| Effective Minutes per Shift        | 525.00 min./shift  |
| Truck Loads per Shift              | 196.63 loads/shift |
| Truck Load Factor                  | 92.00 %            |
| Average Truck Load                 | 100.22 tonnes      |
| Shovel Production per Oprtg. Shift | 19706 tonnes       |

TABLE 3-7

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## LOADING EQUIPMENT PRODUCTIVITY

Material: WASTE

TYPE OF EQUIPMENT:

|        |              |
|--------|--------------|
| Shovel | 11.47 M3     |
| Truck  | 154.33 tonne |

MATERIAL TO LOAD:

|                 |               |
|-----------------|---------------|
| In-Situ Density | 2.75 tonne/M3 |
| Swell Factor    | 1.25          |
| Loose Density   | 2.20 tonne/M3 |
| Bench Height    | 12.20 m.      |

PRODUCTIVITY PER LOAD:

|                              |               |
|------------------------------|---------------|
| Bucket Size                  | 11.47 M3      |
| Bucket Fill Factor           | 90.00 %       |
| Tonnes per Bucket            | 22.71 tonnes  |
| Truck Size                   | 154.33 tonnes |
| Theoretical Buckets per Load | 6.25 buckets  |
| Actual Buckets per Load      | 7 buckets     |
| Swing Cycle Time             | 30.00 sec.    |
| Spot Time between Loads      | 10.00 sec.    |
| Total Time per Load          | 3.67 min/load |

PRODUCTIVITY PER SHIFT:

|                                    |                    |
|------------------------------------|--------------------|
| Effective Minutes per Shift        | 525.00 min./shift  |
| Truck Loads per Shift              | 143.05 loads/shift |
| Truck Load Factor                  | 92.00 %            |
| Average Truck Load                 | 141.98 tonnes      |
| Shovel Production per Oprtg. Shift | 20310 tonnes       |

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## LOADING EQUIPMENT REQUIREMENTS

Shovel 11.5 M3

| <u>Period</u>  | <u>Kt.</u> | <u>T/<br/>Shift</u> | <u>Req.d<br/>Shifts</u> | <u>Avail.<br/>Shifts</u> | <u>Mech.<br/>Avail</u> | <u>Units Required</u> |              |              |
|----------------|------------|---------------------|-------------------------|--------------------------|------------------------|-----------------------|--------------|--------------|
|                |            |                     |                         |                          |                        | <u>Oprtg.</u>         | <u>Util.</u> | <u>Fleet</u> |
| 1984 (NOV-DEC) | 4355       | 20199               | 216                     | 120                      | 81%                    | 1.80                  | 60%          | 3            |
| 1985           | 26073      | 20590               | 1266                    | 710                      | 80%                    | 1.78                  | 59%          | 3            |
| 1986           | 26471      | 20730               | 1277                    | 710                      | 77%                    | 1.80                  | 60%          | 3            |
| 1987           | 25539      | 20812               | 1227                    | 710                      | 75%                    | 1.73                  | 58%          | 3            |
| 1988           | 12306      | 22324               | 551                     | 710                      | 75%                    | 0.78                  | 26%          | 3            |
| 1989           | 6715       | 24220               | 277                     | 355                      | 75%                    | 0.78                  | 26%          | 3            |
| 1990           | 5224       | 25789               | 203                     | 355                      | 75%                    | 0.57                  | 19%          | 3            |
| 1991 (JAN-OCT) | 4399       | 25802               | 170                     | 291                      | 75%                    | 0.58                  | 19%          | 3            |

TABLE 3-9

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## LOADING EQUIPMENT PRODUCTIVITY

Material:ORE STPL

TYPE OF EQUIPMENT:

|        |              |
|--------|--------------|
| Loader | 7.65 M3      |
| Truck  | 108.94 tonne |

MATERIAL TO LOAD:

|                 |               |
|-----------------|---------------|
| In-Situ Density | 3.80 tonne/M3 |
| Swell Factor    | 1.30          |
| Loose Density   | 2.92 tonne/M3 |
| Bench Height    | 0.00 m.       |

PRODUCTIVITY PER LOAD:

|                              |               |
|------------------------------|---------------|
| Bucket Size                  | 7.65 M3       |
| Bucket Fill Factor           | 90.00 %       |
| Tonnes per Bucket            | 20.10 tonnes  |
| Truck Size                   | 108.94 tonnes |
| Theoretical Buckets per Load | 4.99 buckets  |
| Actual Buckets per Load      | 5 buckets     |
| Swing Cycle Time             | 45.00 sec.    |
| Spot Time between Loads      | 10.00 sec.    |
| Total Time per Load          | 3.92 min/load |

PRODUCTIVITY PER SHIFT:

|                                    |                    |
|------------------------------------|--------------------|
| Effective Minutes per Shift        | 525.00 min./shift  |
| Truck Loads per Shift              | 133.93 loads/shift |
| Truck Load Factor                  | 92.00 %            |
| Average Truck Load                 | 100.22 tonnes      |
| Loader Production per Oprtg. Shift | 13422 tonnes       |

TABLE 3-10

3.13

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## LOADING EQUIPMENT REQUIREMENTS

Loader 7.7 M3

| <u>Period</u>  | <u>Kt.</u> | <u>T/<br/>Shift</u> | <u>Req.d<br/>Shifts</u> | <u>Avail.<br/>Shifts</u> | <u>Mech.<br/>Avail</u> | <u>Units Required</u> |              |             |
|----------------|------------|---------------------|-------------------------|--------------------------|------------------------|-----------------------|--------------|-------------|
|                |            |                     |                         |                          |                        | <u>Oprtg.</u>         | <u>Util.</u> | <u>Flee</u> |
| 1984 (NOV-DEC) | 427        | 13422               | 32                      | 120                      | 80%                    | 0.27                  | 27%          | 1           |
| 1985           | 2551       | 13422               | 190                     | 710                      | 80%                    | 0.27                  | 27%          | 1           |
| 1986           | 2444       | 13422               | 182                     | 710                      | 80%                    | 0.26                  | 26%          | 1           |
| 1987           | 2444       | 13422               | 182                     | 710                      | 80%                    | 0.26                  | 26%          | 1           |
| 1988           | 2444       | 13422               | 182                     | 710                      | 80%                    | 0.26                  | 26%          | 1           |
| 1989           | 2444       | 13422               | 182                     | 355                      | 73%                    | 0.51                  | 51%          | 1           |
| 1990           | 2444       | 13422               | 182                     | 355                      | 70%                    | 0.51                  | 51%          | 1           |
| 1991 (JAN-OCT) | 2068       | 13422               | 154                     | 291                      | 67%                    | 0.53                  | 53%          | 1           |

TABLE 3-11

3.14

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## TRUCK REQUIREMENTS

| <u>Period</u>  | <u>Kt.</u> | (120 - ton Trucks)         |                               | <u>Mech.</u><br><u>Avail</u> | <u>Units Required</u>          |                |              |             |
|----------------|------------|----------------------------|-------------------------------|------------------------------|--------------------------------|----------------|--------------|-------------|
|                |            | <u>T./</u><br><u>Shift</u> | <u>Req.d</u><br><u>Shifts</u> |                              | <u>Avail.</u><br><u>Shifts</u> | <u>Oprrtg.</u> | <u>Util.</u> | <u>Flee</u> |
| 1984 (NOV-DEC) | 1202       | 4308                       | 279                           | 121                          | 75%                            | 2.31           | 58%          | 4           |
| 1985           | 7524       | 3597                       | 2092                          | 710                          | 75%                            | 2.95           | 59%          | 5           |
| 1986           | 10615      | 2685                       | 3954                          | 710                          | 75%                            | 5.57           | 70%          | 8           |
| 1987           | 7983       | 2589                       | 3084                          | 710                          | 73%                            | 4.34           | 54%          | 8           |
| 1988           | 2444       | 5431                       | 450                           | 710                          | 71%                            | 0.63           | 8%           | 8           |
| 1989           | 3286       | 4583                       | 717                           | 355                          | 71%                            | 2.02           | 25%          | 8           |
| 1990           | 2444       | 5431                       | 450                           | 355                          | 71%                            | 1.27           | 16%          | 8           |
| 1991 (JAN-OCT) | 2068       | 5428                       | 381                           | 291                          | 71%                            | 1.31           | 16%          | 8           |

TABLE 3-12

3.15

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## TRUCK REQUIREMENTS

| <u>Period</u>  | <u>Kt.</u> | (170 - ton Trucks)         |                               | <u>Mech.</u><br><u>Avail</u> | <u>Units Required</u>          |               |              |             |
|----------------|------------|----------------------------|-------------------------------|------------------------------|--------------------------------|---------------|--------------|-------------|
|                |            | <u>T./</u><br><u>Shift</u> | <u>Req.d</u><br><u>Shifts</u> |                              | <u>Avail.</u><br><u>Shifts</u> | <u>Oprtg.</u> | <u>Util.</u> | <u>Flee</u> |
| 1984 (NOV-DEC) | 3580       | 5319                       | 673                           | 121                          | 75%                            | 5.56          | 70%          | 8           |
| 1985           | 21100      | 5324                       | 3963                          | 710                          | 75%                            | 5.58          | 70%          | 8           |
| 1986           | 18300      | 4614                       | 3966                          | 710                          | 74%                            | 5.59          | 70%          | 8           |
| 1987           | 20000      | 5325                       | 3756                          | 710                          | 71%                            | 5.29          | 66%          | 8           |
| 1988           | 12306      | 4095                       | 3005                          | 710                          | 70%                            | 4.23          | 53%          | 8           |
| 1989           | 5873       | 3136                       | 1873                          | 355                          | 70%                            | 5.28          | 66%          | 8           |
| 1990           | 5224       | 3241                       | 1612                          | 355                          | 70%                            | 4.54          | 57%          | 8           |
| 1991 (JAN-OCT) | 4399       | 3053                       | 1441                          | 291                          | 69%                            | 4.95          | 62%          | 8           |

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## AUXILIARY EQUIPMENT REQUIREMENTS

## F.E.L.

| <u>Period</u>  | <u>Reqd.<br/>shifts</u> | <u>Avail.<br/>shifts</u> | <u>Mech.<br/>avail.</u> | <u>Units required</u> |              |              |
|----------------|-------------------------|--------------------------|-------------------------|-----------------------|--------------|--------------|
|                |                         |                          |                         | <u>Oprg.</u>          | <u>Util.</u> | <u>Fleet</u> |
| 1984 (NOV-DEC) | 34                      | 120                      | 60%                     | 0.28                  | 28%          | 1            |
| 1985           | 260                     | 710                      | 60%                     | 0.37                  | 37%          | 1            |
| 1986           | 210                     | 710                      | 60%                     | 0.30                  | 30%          | 1            |
| 1987           | 210                     | 710                      | 60%                     | 0.30                  | 30%          | 1            |
| 1988           | 110                     | 710                      | 60%                     | 0.15                  | 15%          | 1            |
| 1989           | 100                     | 710                      | 60%                     | 0.14                  | 14%          | 1            |
| 1990           | 100                     | 710                      | 60%                     | 0.14                  | 14%          | 1            |
| 1991 (JAN-OCT) | 60                      | 291                      | 60%                     | 0.21                  | 21%          | 1            |

No units are taken out of the fleet unless scrap age is reached

TABLE 3-14

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## AUXILIARY EQUIPMENT REQUIREMENTS

R.T.D.

| <u>Period</u>  | <u>Reqd.<br/>shifts</u> | <u>Avail.<br/>shifts</u> | <u>Mech.<br/>avail.</u> | <u>Units required</u> |              |              |
|----------------|-------------------------|--------------------------|-------------------------|-----------------------|--------------|--------------|
|                |                         |                          |                         | <u>Oprg.</u>          | <u>Util.</u> | <u>Fleet</u> |
| 1984 (NOV-DEC) | 62                      | 120                      | 65%                     | 0.52                  | 52%          | 1            |
| 1985           | 365                     | 710                      | 65%                     | 0.51                  | 51%          | 1            |
| 1986           | 365                     | 710                      | 63%                     | 0.51                  | 51%          | 1            |
| 1987           | 365                     | 710                      | 63%                     | 0.51                  | 51%          | 1            |
| 1988           | 300                     | 710                      | 62%                     | 0.42                  | 42%          | 1            |
| 1989           | 150                     | 355                      | 62%                     | 0.42                  | 42%          | 1            |
| 1990           | 150                     | 355                      | 60%                     | 0.42                  | 42%          | 1            |
| 1991 (JAN-OCT) | 60                      | 291                      | 60%                     | 0.21                  | 21%          | 1            |

No units are taken out of the fleet unless scrap age is reached

TABLE 3-15

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## AUXILIARY EQUIPMENT REQUIREMENTS

## D9 Dozer

| <u>Period</u>  | <u>Reqd.<br/>shifts</u> | <u>Avail.<br/>shifts</u> | <u>Mech.<br/>avail.</u> | <u>Units required</u> |              |              |
|----------------|-------------------------|--------------------------|-------------------------|-----------------------|--------------|--------------|
|                |                         |                          |                         | <u>Oprg.</u>          | <u>Util.</u> | <u>Fleet</u> |
| 1984 (NOV-DEC) | 144                     | 120                      | 66%                     | 1.20                  | 60%          | 2            |
| 1985           | 850                     | 710                      | 66%                     | 1.20                  | 60%          | 2            |
| 1986           | 850                     | 710                      | 65%                     | 1.20                  | 60%          | 2            |
| 1987           | 850                     | 710                      | 65%                     | 1.20                  | 60%          | 2            |
| 1988           | 425                     | 710                      | 65%                     | 0.60                  | 30%          | 2            |
| 1989           | 100                     | 355                      | 65%                     | 0.28                  | 14%          | 2            |
| 1990           | 100                     | 355                      | 65%                     | 0.28                  | 14%          | 2            |
| 1991 (JAN-OCT) | 50                      | 291                      | 65%                     | 0.17                  | 9%           | 2            |

No units are taken out of the fleet unless scrap age is reached

TABLE 3-16

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## AUXILIARY EQUIPMENT REQUIREMENTS

## D8 Dozer

| <u>Period</u>  | <u>Reqd.<br/>shifts</u> | <u>Avail.<br/>shifts</u> | <u>Mech.<br/>avail.</u> | <u>Units required</u> |              |              |
|----------------|-------------------------|--------------------------|-------------------------|-----------------------|--------------|--------------|
|                |                         |                          |                         | <u>Oprg.</u>          | <u>Util.</u> | <u>Fleet</u> |
| 1984 (NOV-DEC) | 72                      | 120                      | 67%                     | 0.60                  | 60%          | 1            |
| 1985           | 425                     | 710                      | 66%                     | 0.60                  | 60%          | 1            |
| 1986           | 425                     | 710                      | 65%                     | 0.60                  | 60%          | 1            |
| 1987           | 425                     | 710                      | 65%                     | 0.60                  | 60%          | 1            |
| 1988           | 425                     | 710                      | 65%                     | 0.60                  | 60%          | 1            |
| 1989           | 210                     | 355                      | 65%                     | 0.59                  | 59%          | 1            |
| 1990           | 210                     | 355                      | 65%                     | 0.59                  | 59%          | 1            |
| 1991 (JAN-OCT) | 110                     | 291                      | 65%                     | 0.38                  | 38%          | 1            |

No units are taken out of the fleet unless scrap age is reached

TABLE 3-17

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## AUXILIARY EQUIPMENT REQUIREMENTS

## Road Grader

| Period         | Reqd.<br>shifts | Avail.<br>shifts | Mech.<br>avail. | Units required |       |       |
|----------------|-----------------|------------------|-----------------|----------------|-------|-------|
|                |                 |                  |                 | Oprg.          | Util. | Fleet |
| 1984 (NOV-DEC) | 200             | 120              | 61%             | 1.67           | 56%   | 3     |
| 1985           | 1200            | 710              | 61%             | 1.69           | 56%   | 3     |
| 1986           | 1200            | 710              | 61%             | 1.69           | 56%   | 3     |
| 1987           | 1200            | 710              | 61%             | 1.69           | 56%   | 3     |
| 1988           | 600             | 710              | 61%             | 0.85           | 28%   | 3     |
| 1989           | 300             | 355              | 61%             | 0.85           | 28%   | 3     |
| 1990           | 300             | 355              | 60%             | 0.85           | 28%   | 3     |
| 1991 (JAN-OCT) | 150             | 291              | 60%             | 0.52           | 17%   | 3     |

No units are taken out of the fleet unless scrap age is reached

TABLE 3-18

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

## AUXILIARY EQUIPMENT REQUIREMENTS

## Water Truck

| <u>Period</u>  | <u>Reqd.</u><br><u>shifts</u> | <u>Avail.</u><br><u>shifts</u> | <u>Mech.</u><br><u>avail.</u> | <u>Units required</u> |              |              |
|----------------|-------------------------------|--------------------------------|-------------------------------|-----------------------|--------------|--------------|
|                |                               |                                |                               | <u>Oprg.</u>          | <u>Util.</u> | <u>Fleet</u> |
| 1984 (NOV-DEC) | 51                            | 120                            | 74%                           | 0.43                  | 43%          | 1            |
| 1985           | 300                           | 710                            | 74%                           | 0.42                  | 42%          | 1            |
| 1986           | 300                           | 710                            | 72%                           | 0.42                  | 42%          | 1            |
| 1987           | 300                           | 710                            | 72%                           | 0.42                  | 42%          | 1            |
| 1988           | 300                           | 710                            | 71%                           | 0.42                  | 42%          | 1            |
| 1989           | 150                           | 355                            | 71%                           | 0.42                  | 42%          | 1            |
| 1990           | 150                           | 355                            | 70%                           | 0.42                  | 42%          | 1            |
| 1991 (JAN-OCT) | 80                            | 291                            | 70%                           | 0.27                  | 27%          | 1            |

No units are taken out of the fleet unless scrap age is reached

TABLE 3-19

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT.

## EQUIPMENT SHIFT REQUIREMENTS

| PERIOD         | PRIMARY UNITS |        |       |         |         | AUXILIARY UNITS |        |       |       |        |       |
|----------------|---------------|--------|-------|---------|---------|-----------------|--------|-------|-------|--------|-------|
|                | Drill         | Shovel | F.E.L | Truck   | Truck   | F.F.L.          | R.T.D. | Dozer | Dozer | Road   | Water |
|                | 9 7/8         | 15 yd. | Stpl. | 120 ton | 170 ton | 10 yd.          |        | D-9   | D-8   | Grader | Truck |
| 1984 (NOV-DEC) | 114           | 216    | 32    | 279     | 673     | 34              | 62     | 144   | 72    | 200    | 51    |
| 1985           | 804           | 1266   | 190   | 2092    | 3963    | 260             | 365    | 850   | 425   | 1200   | 300   |
| 1986           | 880           | 1277   | 182   | 3954    | 3966    | 210             | 365    | 850   | 425   | 1200   | 300   |
| 1987           | 855           | 1227   | 182   | 3084    | 3756    | 210             | 365    | 850   | 425   | 1200   | 300   |
| 1988           | 508           | 551    | 182   | 450     | 3005    | 110             | 300    | 425   | 425   | 600    | 300   |
| 1989           | 362           | 277    | 182   | 717     | 1873    | 100             | 150    | 100   | 210   | 300    | 150   |
| 1990           | 322           | 203    | 182   | 450     | 1612    | 100             | 150    | 100   | 210   | 300    | 150   |
| 1991 (JAN-OCT) | 272           | 170    | 154   | 381     | 1441    | 60              | 60     | 50    | 110   | 150    | 80    |

### 3.1.3 Manpower Requirements

In the process of determining equipment requirements, the number of equipment operating shifts per year is derived for each type of mining equipment. Dividing these required shifts by the number of available or scheduled shifts per year gives the average number of units operating at any given time. In a simplistic sense, sufficient operators must be scheduled on each crew to cover the average number of units operating. Using 120 ton trucks in 1986 as an example, an average of 5.57 trucks will be operating and a four-crew system is in effect. Therefore, 23 truck drivers ( $5.57 \times 4$ ) will be required. However, this methodology assumes that the average number of trucks operating will not vary significantly. In actual fact, the actual number of units mechanically available from a given fleet size will vary significantly from the mean. Since equipment status is either up or down, and the ratio of up time to total time is defined as the availability, a natural extension of the binomial distribution to equipment operations exists. Using the same example as above and using a 75 percent availability and a fleet of eight trucks, application of the binomial distribution yields a total of 25 operators required to insure that the number of require shifts will be attained during 1986.

To avoid over-staffing, similar equipment fleets have been combined. Operators have been determined for the combined 120 and 170 ton trucks. Auxiliary equipment has also been combined into a single fleet for the calculation of operator requirements.

In the August 1984 report, a pool of utilitymen was retained to cover vacation, sick leave, and absenteeism. This method of VSA coverage did not consider the higher rate paid when a utilityman covered a different job classification. In this study, a VSA allowance in 16 percent has been added to individual job classifications and utilitymen have been reduced to two per crew.

Based on current fleet sizes and annual material movement dictated by the production schedule, a two shift per day - seven days per week (four crew) operation is required through 1988. The decline in total material movement thereafter indicates that a one shift per day - seven days per week (two crew) operation will suffice.

Maintenance manpower requirements are based on providing sufficient maintenance personnel to insure that the required number of equipment operating shifts can be attained. PAH utilizes a system, similar to that used by Caterpillar and other equipment manufacturers, in which factors are employed to

relate the delivered cost of equipment to an hourly maintenance cost per operating shift. This maintenance labor cost per operating shift in conjunction with hourly maintenance labor rates will yield the number of maintenance shifts required per equipment operating shift. These maintenance shifts are subdivided into mechanic, welder, and electrician shifts via an historical distribution for each type of equipment.

Maintenance manpower requirements (mechanics, welders, and electricians) are then calculated using the following algorithm:

$$\text{Men} = (\text{Equip Shifts}) \times \frac{(\text{Maint Shifts})}{(\text{Opertg Shift})} \times \frac{(\text{Shifts/Man})}{\text{Year}} \times (\text{Yrs in Period})$$

In this exercise, shifts/man/year are shifts worked (1984 hrs/12 = 157) and years in period are 1.00 except for partial years.

The resulting maintenance personnel are those required to maintain the equipment at the mid-point of usable life. Since manpower requirements and maintenance costs are lower than the mid-point when equipment is new and higher towards the end of its life, labor requirements are adjusted as a function of age relative to service life. Details of the PAH method for deriving maintenance manpower requirements have been presented in a memo to H. M. Visagie dated March 28, 1985. Maintenance manpower other than mechanics, welders, and electricians is parallel to that developed in the August 1984 report.

Supervisory and technical personnel requirements are based on those developed in the August 1984 report. Manpower requirements are summarized as follows:

| <u>Year</u> | <u>Operators</u> | <u>Maintenance</u> | <u>Supervisory</u> | <u>Total</u> |
|-------------|------------------|--------------------|--------------------|--------------|
| 1984        | 92               | 96                 | 28                 | 216          |
| 1985        | 96               | 96                 | 30                 | 222          |
| 1986        | 111              | 111                | 30                 | 252          |
| 1987        | 101              | 112                | 30                 | 243          |
| 1988        | 59               | 73                 | 19                 | 160          |
| 1989        | 43               | 52                 | 19                 | 114          |
| 1990        | 36               | 48                 | 7                  | 102          |
| 1991        | 35               | 46                 | 7                  | 97           |

Manpower details are summarized in Appendix A.

### 3.1.4 Mine Operating Costs

The mine operating costs developed herein incorporate the following changes from the August 1984 report:

- 1) Hourly rates for mine operations personnel on a "hot change" basis have been increased by \$0.92 over the base rate.
- 2) Hourly rates for mine operations and mine maintenance personnel on a rotating shift basis have been increased by \$1.00 over the base rate to cover weekend and shift premiums.
- 3) The cost per man per year for hourly mine operations and mine maintenance personnel has been based on 2,042 hours.
- 4) Fringe benefits for hourly personnel have been based on 1,884 hours per year (157 shifts).
- 5) Power costs are \$0.04 per kwhr.
- 6) Diesel fuel cost is \$0.40 per liter.
- 7) Tire costs are current quotes obtained by CAMC as follows:

|            |          |
|------------|----------|
| 36 x 51    | \$11,600 |
| 30 x 51    | 9,100    |
| 18 x 33    | 2,300    |
| 37.25 x 35 | 9,000    |
| 29.5 x 35  | 5,000    |

- 8) Explosives costs are based on the new CIL schedule.

Based on the above material costs, an equipment operating cost per shift was developed for each type of mine equipment. These costs are summarized in Tables 3-20 through 3-30.

TABLE 3-20

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

3.28

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

Drill 9 7/8 inch

|                   |           |    |        |
|-------------------|-----------|----|--------|
| LIST PRICE        | Sx1000    | \$ | 1580.0 |
| BIT COST          |           | \$ | 4018   |
| BIT LIFE HRS      |           |    | 137    |
| POWER CONSUMPTION | (kWhr/hr) |    | 125    |

COST BREAKDOWN (\$/hr.)

|            |              |    |      |
|------------|--------------|----|------|
| Power cost | \$0.040/KWhr | \$ | 5.00 |
|------------|--------------|----|------|

|          |  |    |       |
|----------|--|----|-------|
| Bit Cost |  | \$ | 29.33 |
|----------|--|----|-------|

|                         |  |    |      |
|-------------------------|--|----|------|
| Drill Pipe & Stabilizer |  |    |      |
| @ 1/4 Bit Cost          |  | \$ | 7.33 |

|                     |  |    |       |
|---------------------|--|----|-------|
| Repair Parts        |  |    |       |
| (0.0468 x Delivered |  |    |       |
| Cost in Sx1000)     |  | \$ | 73.94 |

|                     |  |    |       |
|---------------------|--|----|-------|
| Maintenance Labor   |  |    |       |
| (0.0200 x Delivered |  |    |       |
| Cost in Sx1000)     |  | \$ | 31.60 |

|                      |  |  |      |
|----------------------|--|--|------|
| OPERATING HRS./SHIFT |  |  | 10.5 |
|----------------------|--|--|------|

|                     |  |  |     |
|---------------------|--|--|-----|
| DRILLING HRS./SHIFT |  |  | 7.0 |
|---------------------|--|--|-----|

COST BREAKDOWN (\$/Shift)

|                           |    |        |
|---------------------------|----|--------|
| Bit Cost @ 7.00hrs./shift | \$ | 205.31 |
|---------------------------|----|--------|

|                         |    |       |
|-------------------------|----|-------|
| Drill Pipe & Stabilizer |    |       |
| @ 7.00hrs./shift        | \$ | 51.33 |

|                             |    |        |
|-----------------------------|----|--------|
| Repair Parts @10.50hrs/shft | \$ | 776.37 |
|-----------------------------|----|--------|

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor |    |        |
| @10.50hrs./shift  | \$ | 331.80 |

|                             |    |       |
|-----------------------------|----|-------|
| Power Cost @10.50 hrs.shift | \$ | 52.50 |
|-----------------------------|----|-------|

Above costs are average costs over the life of the equipment.  
Costs for each year have been adjusted to reflect the age of the equipment.

TABLE 3-21

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

Shovel 15 yd

|                   |           |    |        |
|-------------------|-----------|----|--------|
| LIST PRICE        | \$x1000   | \$ | 3240.0 |
| POWER CONSUMPTION | (kWhr/hr) |    | 550    |

COST BREAKDOWN (\$/hr.)

|            |              |    |       |
|------------|--------------|----|-------|
| Power cost | \$0.040/KWhr | \$ | 22.00 |
|------------|--------------|----|-------|

|                     |    |        |  |
|---------------------|----|--------|--|
| Repair Parts        |    |        |  |
| (0.0480 x Delivered |    |        |  |
| Cost in \$x1000)    | \$ | 155.52 |  |

|                     |    |       |  |
|---------------------|----|-------|--|
| Maintenance Labor   |    |       |  |
| (0.0170 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 55.08 |  |

|                      |  |      |
|----------------------|--|------|
| OPERATING HRS./SHIFT |  | 10.5 |
|----------------------|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 578.34 |
|-------------------|----|--------|

|                     |    |         |
|---------------------|----|---------|
| Parts & Consumables | \$ | 1863.96 |
|                     |    | -----   |

|                            |    |         |
|----------------------------|----|---------|
| TOTAL OPERATING COST/SHIFT | \$ | 2442.30 |
|----------------------------|----|---------|

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

TABLE 3-22

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

F.E.L.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 897.4 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 861.4 |
| FUEL CONSUMPTION LIT./HR   |         |    | 85    |
| COST PER TIRE              |         | \$ | 9000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 5000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 34.00 |
| Tire Cost                                                    | \$ | 7.20  |
| Repair Parts<br>(0.0648 x Delivered<br>Cost in \$x1000)      | \$ | 55.82 |
| Maintenance Labor<br>(0.0270 x Delivered<br>Cost in \$x1000) | \$ | 23.26 |

OPERATING HRS./SHIFT 10.5

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 244.23  |
| Parts & Consumables        | \$ | 1018.71 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1262.94 |

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

TABLE 3-23

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

120 - Ton truck

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 939.1 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 884.5 |
| FUEL CONSUMPTION LIT./HR   |         |    | 60    |
| COST PER TIRE              |         | \$ | 9100  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3500  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 24.00 |
| Tire Cost                                                    | \$ | 15.60 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 38.21 |
| Maintenance Labor<br>(0.0190 x Delivered<br>Cost in \$x1000) | \$ | 16.81 |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 10.5 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 176.50 |
| Parts & Consumables        | \$ | 817.01 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 993.51 |

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

170 - Ton truck

|                            |         |    |        |
|----------------------------|---------|----|--------|
| LIST PRICE                 | \$x1000 | \$ | 1279.6 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 1210.0 |
| FUEL CONSUMPTION LIT./HR   |         |    | 100    |
| COST PER TIRE              |         | \$ | 11600  |
| NUMBER OF TIRES            |         |    | 6      |
| TIRE LIFE HRS              |         |    | 3500   |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 40.00 |
| Tire Cost                                                    | \$ | 19.89 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 52.27 |
| Maintenance Labor<br>(0.0190 x Delivered<br>Cost in \$x1000) | \$ | 22.99 |

OPERATING HRS./SHIFT 10.5

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 241.40  |
| Parts & Consumables        | \$ | 1177.69 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1419.09 |

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

F.E.L.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 897.4 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 861.4 |
| FUEL CONSUMPTION LIT./HR   |         |    | 85    |
| COST PER TIRE              |         | \$ | 9000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 5000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 34.00 |
| Tire Cost                                                    | \$ | 7.20  |
| Repair Parts<br>(0.0648 x Delivered<br>Cost in \$x1000)      | \$ | 55.82 |
| Maintenance Labor<br>(0.0270 x Delivered<br>Cost in \$x1000) | \$ | 23.26 |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 10.5 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 244.23  |
| Parts & Consumables        | \$ | 1018.71 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1262.94 |

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

R.T.D.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 318.6 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 298.6 |
| FUEL CONSUMPTION LIT./HR   |         |    | 25    |
| COST PER TIRE              |         | \$ | 5000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 3000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 10.00 |
| Tire Cost                                                    | \$ | 6.67  |
| Repair Parts<br>(0.0460 x Delivered<br>Cost in \$x1000)      | \$ | 13.74 |
| Maintenance Labor<br>(0.0240 x Delivered<br>Cost in \$x1000) | \$ | 7.17  |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 10.5 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 75.29  |
| Parts & Consumables        | \$ | 319.31 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 394.60 |

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

TABLE 3-27

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

D9 Dozer

|                  |         |    |       |
|------------------|---------|----|-------|
| LIST PRICE       | \$x1000 | \$ | 550.0 |
| FUEL CONSUMPTION | LIT./HR |    | 35    |

COST BREAKDOWN (\$/hr.)

|           |               |    |       |
|-----------|---------------|----|-------|
| Fuel cost | \$0.400/litre | \$ | 14.00 |
|-----------|---------------|----|-------|

|                     |    |       |  |
|---------------------|----|-------|--|
| Repair Parts        |    |       |  |
| (0.0700 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 38.50 |  |

|                     |    |       |  |
|---------------------|----|-------|--|
| Maintenance Labor   |    |       |  |
| (0.0340 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 18.70 |  |

|                      |  |  |      |
|----------------------|--|--|------|
| OPERATING HRS./SHIFT |  |  | 10.5 |
|----------------------|--|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 196.35 |
|-------------------|----|--------|

|                     |    |        |
|---------------------|----|--------|
| Parts & Consumables | \$ | 551.25 |
|                     |    | -----  |

|                            |    |        |
|----------------------------|----|--------|
| TOTAL OPERATING COST/SHIFT | \$ | 747.60 |
|----------------------------|----|--------|

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

## D8 Dozer

|                          |         |    |       |
|--------------------------|---------|----|-------|
| LIST PRICE               | \$x1000 | \$ | 390.0 |
| FUEL CONSUMPTION LIT./HR |         |    | 30    |

COST BREAKDOWN (\$/hr.)

|                         |    |       |
|-------------------------|----|-------|
| Fuel cost \$0.400/litre | \$ | 12.00 |
|-------------------------|----|-------|

|                                                         |    |       |
|---------------------------------------------------------|----|-------|
| Repair Parts<br>(0.0700 x Delivered<br>Cost in \$x1000) | \$ | 27.30 |
|---------------------------------------------------------|----|-------|

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Maintenance Labor<br>(0.0360 x Delivered<br>Cost in \$x1000) | \$ | 14.04 |
|--------------------------------------------------------------|----|-------|

|                      |  |      |
|----------------------|--|------|
| OPERATING HRS./SHIFT |  | 10.5 |
|----------------------|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 147.42 |
|-------------------|----|--------|

|                     |    |        |
|---------------------|----|--------|
| Parts & Consumables | \$ | 412.65 |
|                     |    | -----  |

|                            |    |        |
|----------------------------|----|--------|
| TOTAL OPERATING COST/SHIFT | \$ | 560.07 |
|----------------------------|----|--------|

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

## Road Grader

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 344.9 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 331.1 |
| FUEL CONSUMPTION LIT./HR   |         |    | 25    |
| COST PER TIRE              |         | \$ | 2300  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 10.00 |
| Tire Cost                                                    | \$ | 4.60  |
| Repair Parts<br>(0.0696 x Delivered<br>Cost in \$x1000)      | \$ | 23.04 |
| Maintenance Labor<br>(0.0260 x Delivered<br>Cost in \$x1000) | \$ | 8.61  |

|                      |  |      |
|----------------------|--|------|
| OPERATING HRS./SHIFT |  | 10.5 |
|----------------------|--|------|

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 90.41  |
| Parts & Consumables        | \$ | 395.22 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 485.63 |

Above costs are average costs over the life of the equipment.

Costs for each year have been adjusted to reflect the age of the equipment.

## CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in second quarter, 1984, Can. dollars)

## Water Truck

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 700.5 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 664.5 |
| FUEL CONSUMPTION LIT./HR   |         |    | 60    |
| COST PER TIRE              |         | \$ | 6000  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3500  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 24.00 |
| Tire Cost                                                    | \$ | 10.29 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 28.71 |
| Maintenance Labor<br>(0.0270 x Delivered<br>Cost in \$x1000) | \$ | 17.94 |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 10.5 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 188.37 |
| Parts & Consumables        | \$ | 661.50 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 849.87 |

Above costs are average costs over the life of the equipment.  
Costs for each year have been adjusted to reflect the age of the equipment.

Mine operating and maintenance labor costs have been developed for each year, based on the hourly rates and hours/man/year referred to above. These calculations are contained in Appendix A. Annual operating labor costs have been assimilated by mining function and divided by total tonnage moved to obtain functional unit costs on an annual basis. These calculations are also contained in Appendix A.

Functional unit costs for mine maintenance are based on the equipment operating cost per shift (Tables 3-20 through 3-30) and annual equipment shifts required (Table 3-19). The equipment shift costs shown in Tables 3-20 through 3-30 are average costs over equipment life. These costs have been adjusted for equipment age so that costs in early years (newer equipment) are lower than in later years. Annual maintenance labor unit costs are shown in Appendix A.

Functional unit costs for repair parts and consumables have been similarly developed on a required operating shift and cost per shift basis. Annual explosives consumption and costs are based on revised information provided by CAMC, using the new CIL contract, and are summarized in Table 3-31. In Table 3-32, an allowance of 17 percent of the explosives cost has been added to cover blasting supplies and an additional two percent has been added to cover secondary blasting. Total repair parts and consumables on a functional unit cost basis are summarized in Appendix A.

TABLE 3-31

CYPRUS ANVIL

EXPLOSIVES CONSUMPTION  
(4% MINE PLAN - Aug./84 REPORT UPDATE)

| Year | ktonnes<br>Mined | AN/FD |       |         | ALAN/FD-10 |       |         | ALAN/FD-15 |       |         | SLURRY A |       |         | SLURRY C |       |         | Total \$/tonne |        |
|------|------------------|-------|-------|---------|------------|-------|---------|------------|-------|---------|----------|-------|---------|----------|-------|---------|----------------|--------|
|      |                  | mt    | \$/mt | \$x1000 | mt         | \$/mt | \$x1000 | mt         | \$/mt | \$x1000 | mt       | \$/mt | \$x1000 | mt       | \$/mt | \$x1000 | \$x1000        | Mined  |
| 1984 | 4782             |       |       |         |            |       |         |            |       |         |          |       |         |          |       |         | 616.4          | 0.1289 |
| 1985 | 27046            | 1621  | 517   | 838.1   | 902        | 762   | 687.3   | 717        | 882   | 632.4   | 823      | 738   | 607.4   | 639      | 947   | 605.1   | 3370.3         | 0.1246 |
| 1986 | 26471            | 1531  | 531   | 813.0   | 1192       | 776   | 925.0   | 177        | 895   | 158.4   | 797      | 738   | 588.2   | 531      | 947   | 502.9   | 2987.5         | 0.1129 |
| 1987 | 25539            | 1521  | 531   | 807.7   | 1300       | 776   | 1008.8  | 0          | 0     | 0.      | 797      | 738   | 588.2   | 501      | 947   | 474.4   | 2879.1         | 0.1127 |
| 1988 | 12306            | 573   | 676   | 387.3   | 556        | 921   | 512.1   | 0          | 0     | 0.      | 330      | 1056  | 348.5   | 229      | 1264  | 289.5   | 1537.4         | 0.1249 |
| 1989 | 6715             | 252   | 706   | 177.9   | 303        | 951   | 288.2   | 0          | 0     | 0.      | 171      | 1308  | 223.7   | 136      | 1515  | 206.0   | 895.8          | 0.1334 |
| 1990 | 5224             | 161   | 721   | 116.1   | 231        | 966   | 223.1   | 0          | 0     | 0.      | 126      | 1308  | 164.8   | 109      | 1515  | 165.1   | 669.1          | 0.1281 |
| 1991 | 4399             | 136   | 721   | 98.1    | 196        | 966   | 189.3   | 0          | 0     | 0.      | 106      | 1308  | 138.6   | 93       | 1515  | 140.9   | 566.9          | 0.1289 |

NOTE: Explosives costs for 1984 assumed to be the same as 1991 (based on total tonnes mined).  
Also note that the above costs do not include blasting supplies and secondary blasting.

TABLE 3-32

## CYPRUS ANVIL

ANNUAL COST - BLASTING CONSUMABLES  
(4% MINE PLAN - Aug./84 REPORT UPDATE)

| Unit Cost (\$/total tonne mined) |                  |            |                   |          |                         |        |                      |
|----------------------------------|------------------|------------|-------------------|----------|-------------------------|--------|----------------------|
| Year                             | ktonnes<br>Mined | Explosives | Supplies<br>@ 17% | Subtotal | Secondary<br>@ 2% of ST | Total  | Cost/Year<br>\$x1000 |
| 1984                             | 4782             | 0.1289     | 0.0219            | 0.1508   | 0.0030                  | 0.1538 | 735.5                |
| 1985                             | 27046            | 0.1246     | 0.0212            | 0.1458   | 0.0029                  | 0.1487 | 4021.7               |
| 1986                             | 26471            | 0.1129     | 0.0192            | 0.1321   | 0.0026                  | 0.1347 | 3565.6               |
| 1987                             | 25539            | 0.1127     | 0.0192            | 0.1319   | 0.0026                  | 0.1345 | 3435.0               |
| 1988                             | 12306            | 0.1249     | 0.0212            | 0.1461   | 0.0029                  | 0.1490 | 1833.6               |
| 1989                             | 6715             | 0.1334     | 0.0227            | 0.1561   | 0.0031                  | 0.1592 | 1069.0               |
| 1990                             | 5224             | 0.1281     | 0.0218            | 0.1499   | 0.0030                  | 0.1529 | 798.7                |
| 1991                             | 4399             | 0.1289     | 0.0219            | 0.1508   | 0.0030                  | 0.1538 | 676.6                |

Mine overhead costs consist of salaried labor, salaried fringes, and hourly fringes. In Table 3-33, these costs are accumulated and presented on an annual unit cost basis.

The functional unit costs described in the preceding paragraphs are summarized for each year in terms of operating labor, maintenance labor, parts and consumables, and mine overhead, and these annual summaries are contained in Appendix A. Functional unit costs are also summarized in Table 3-34 for the life of mine operations.

TABLE 3-33

3.43

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

MINE OVERHEAD COST/Tonne

| PERIOD         | SALARIED |         | HOURLY  | TOTAL     | TOTAL  | Cost/  |
|----------------|----------|---------|---------|-----------|--------|--------|
|                | Salary   | Fringes | Fringes | (\$x1000) | Kt.    | Tonne  |
| 1984 (NOV-DEC) | 221.1    | 77.4    | 315.2   | 613.7     | 4782   | 0.1283 |
| 1985           | 1390.6   | 486.7   | 1893.3  | 3770.6    | 27046  | 0.1394 |
| 1986           | 1390.6   | 486.7   | 2196.1  | 4073.4    | 26471  | 0.1539 |
| 1987           | 1390.6   | 486.7   | 2108.6  | 3985.9    | 25539  | 0.1561 |
| 1988           | 1298.2   | 454.4   | 1300.7  | 3053.3    | 12306  | 0.2481 |
| 1989           | 882.4    | 308.8   | 930.1   | 2121.3    | 6715   | 0.3159 |
| 1990           | 836.2    | 292.7   | 824.5   | 1953.4    | 5224   | 0.3739 |
| 1991 (JAN-OCT) | 610.1    | 213.5   | 652.7   | 1476.3    | 4399   | 0.3356 |
| TOTAL          | 8019.8   | 2806.9  | 10221.2 | 21047.9   | 112482 | 0.1871 |

TABLE 3-34

CYPRUS ANVIL. 4 PERCENT CUTOFF, 525 MINUTES/SHIFT

OPERATING COST SUMMARY BY FUNCTION  
Canadian dollars

| PERIOD         | UNIT COST (\$/Total tonne) |            |         |         |        |        |                |               |                 |                |        | TOTAL<br>COST<br>(\$x1000) | COST/<br>TONNE<br>ORE |
|----------------|----------------------------|------------|---------|---------|--------|--------|----------------|---------------|-----------------|----------------|--------|----------------------------|-----------------------|
|                | TOTAL<br>Kt.               | ORE<br>Kt. | Dring.* | Blstg.* | Loadg. | Haulg. | Aux.<br>Equip. | Genl.<br>Mine | Genl.<br>Mntce. | Genl.<br>Admin | Total  |                            |                       |
| 1984 (NOV-DEC) | 4782                       | 427        | 0.0348  | 0.1592  | 0.1070 | 0.2920 | 0.1144         | 0.0409        | 0.0943          | 0.1283         | 0.9709 | 4643                       | 10.87                 |
| 1985           | 27046                      | 3604       | 0.0368  | 0.1543  | 0.1120 | 0.3233 | 0.1225         | 0.0412        | 0.0929          | 0.1394         | 1.0224 | 27652                      | 7.67                  |
| 1986           | 26471                      | 4073       | 0.0491  | 0.1404  | 0.1193 | 0.4209 | 0.1339         | 0.0414        | 0.0951          | 0.1539         | 1.1540 | 30548                      | 7.50                  |
| 1987           | 25539                      | 4073       | 0.0558  | 0.1404  | 0.1254 | 0.4036 | 0.1371         | 0.0418        | 0.0959          | 0.1561         | 1.1561 | 29526                      | 7.25                  |
| 1988           | 12306                      | 4073       | 0.0701  | 0.1590  | 0.1466 | 0.4822 | 0.1801         | 0.0472        | 0.1205          | 0.2481         | 1.4538 | 17890                      | 4.39                  |
| 1989           | 6715                       | 4073       | 0.0977  | 0.1733  | 0.1633 | 0.6348 | 0.1641         | 0.0599        | 0.1583          | 0.3159         | 1.7673 | 11867                      | 2.91                  |
| 1990           | 5224                       | 4073       | 0.1099  | 0.1710  | 0.1794 | 0.6588 | 0.2155         | 0.0559        | 0.1906          | 0.3739         | 1.9550 | 10213                      | 2.51                  |
| 1991 (JAN-OCT) | 4399                       | 3436       | 0.1145  | 0.1715  | 0.1796 | 0.6952 | 0.1396         | 0.0553        | 0.1763          | 0.3356         | 1.8676 | 8216                       | 2.39                  |
| TOTAL          | 112482                     | 27832      | 0.0576  | 0.1512  | 0.1292 | 0.4293 | 0.1419         | 0.0444        | 0.1089          | 0.1871         | 1.2496 | 140555                     | 5.05                  |

## Distribution within Total:

|                     |        |        |        |        |        |        |        |        |        |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Operating Labor     | 0.0106 | 0.0077 | 0.0176 | 0.0685 | 0.0368 | 0.0124 | 0.0000 | 0.0000 | 0.1536 |
| Maintenance Labor   | 0.0107 | 0.0000 | 0.0254 | 0.0627 | 0.0250 | 0.0000 | 0.0509 | 0.0000 | 0.1747 |
| Parts & Consumables | 0.0364 | 0.1435 | 0.0861 | 0.2981 | 0.0801 | 0.0320 | 0.0580 | 0.0000 | 0.7342 |
| Mine Overhead       | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1871 | 0.1871 |

\* No costs for stockpile ore

### 3.2 Milling

#### 3.2.1 Summary

The metallurgical estimates remained unchanged with the average recoveries on sulfide ore being 82 percent for zinc and 81.2 percent for lead. Likewise, the mill capacity remained unchanged at 11,160 mtpd at a grind of 80 percent minus 70 microns.

The operating cost at full capacity on sulfide ore was reduced by \$1.74 per tonne to \$8.40 per tonne. The major source of this reduction was the decrease in power cost from \$0.07 per kilowatt-hour to \$0.04 per kwh. Other savings were in hourly manpower and reagent prices.

The total capital cost for additions/modifications to the mill are \$10,677,000. This value is divided between \$1,800,000 for added fresh water capacity, \$6,845,000 for mill modifications and \$2,032,000 for tailings.

#### 3.2.2 Mill Capacity

The mill capacity at a grind of 80 percent passing 70 microns is 11,500 mtpd. The scheduled milling rate is 11,160 mtpd. If the criteria in Table 3-35 are met, and in particular

TABLE 3-35

## Cyprus Anvil Mine

Grinding Design Criteria

|                                            |        |
|--------------------------------------------|--------|
| Daily Milling Rate (mtpd)                  | 11,500 |
| Operating Availability (%)                 | 92     |
| Rod Mill Feed (80 Percent Passing-Microns) | 15,000 |
| Final Product (80 Percent Passing-Microns) | 70     |
| Bond Work Index (kwh/mt)                   | 13.2   |
| Mill Sizes and Horsepower Draw             |        |
| Three Rod Mills, 9-ft dia by               |        |

if maximum power draft is always maintained, the final product size may approach 65 microns. However, 70 microns should be utilized for all estimates since it is nearly impossible to utilize full power at all times. The capacity of each unit operation remains unchanged from the original August report.

### 3.2.3 Recovery and Concentrate Grade

There has been no change in the projected recoveries and concentrate grades from the original August report.

Table 3-36 summarizes the pertinent metallurgical data by year.

TABLE 3-36

August Update

Summary Of Metallurgical Data

| YEAR           | <u>1984</u> | <u>1985</u> | <u>1986</u> | <u>1987</u> | <u>1988</u> | <u>1989</u> | <u>1990</u> | <u>1991</u> |
|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Ore Milled-DMT | 427,000     | 3,604,000   | 4,073,000   | 4,073,000   | 4,073,000   | 4,073,000   | 4,073,000   | 3,436,000   |
| Ore Assay      |             |             |             |             |             |             |             |             |
| % Zn           | 4.7         | 4.4         | 4.4         | 4.0         | 4.5         | 4.7         | 4.6         | 4.1         |
| % Pb           | 2.9         | 2.7         | 2.8         | 2.8         | 3.4         | 3.2         | 3.0         | 2.4         |
| GM/T Ag        | 37.6        | 36.7        | 33.4        | 35.7        | 45.2        | 40.2        | 35.8        | 26.6        |
| Zinc           |             |             |             |             |             |             |             |             |
| Recovery-%     | 67.9        | 79.4        | 81.8        | 81.3        | 82.9        | 82.0        | 82.7        | 81.5        |
| Conc. Grade-%  | 48.0        | 50.2        | 51.0        | 51.1        | 50.6        | 50.8        | 50.8        | 50.9        |
| Lead           |             |             |             |             |             |             |             |             |
| Recovery-%     | 65.2        | 77.4        | 80.6        | 81.0        | 82.6        | 82.1        | 81.3        | 79.6        |
| Conc. Grade-%  | 58.0        | 60.4        | 61.1        | 61.7        | 60.7        | 61.0        | 60.0        | 59.9        |
| GM/T Ag        | 525.6       | 566.1       | 516.3       | 569.2       | 584.7       | 556.7       | 507.0       | 466.5       |

#### 3.2.4 Operating Costs

For the August Update review, the greatest changes occur in the mill operating cost estimate. The updated costs are summarized in Tables 3-37 and 3-38 and compared to the original costs in Table 3-39.

The basis for the updated cost review is the "Summary of Mill Cost Estimate" by H. M. Visagie which is attached as Appendix D. The higher operating cost in years 1984 and 1985 is due to processing oxidized ore which result in increase reagent costs.

The basis for each cost item in the PAH estimate is as follows:

##### Mill Personnel

The updated CAMC estimate of personnel indicates a total staffing of 137. PAH has added four additional hourly employees to cover vacation, sick leave and absenteeism, to give a total of 141 (Table 3-40). PAH recognizes that this represents a relatively "lean" staff and that the lower staffing is predicated on assumption contained in Table 3-41.

TABLE 3-37

August Update  
Summary Of Mill Costs

|                       | <u>Total Cost (\$/Yrx10<sup>3</sup>)</u> | <u>Unit Cost (\$/T)</u> |
|-----------------------|------------------------------------------|-------------------------|
| <u>Operations</u>     |                                          |                         |
| Personnel             | 4,206,000                                | 1.03                    |
| Flotation (Sulfide)   | 8,146,000                                | 2.00                    |
| Steel                 | 6,110,000                                | 1.50                    |
| Crusher/Grinding      | 594,000                                  | 0.15                    |
| Other                 | 1,100,000                                | 0.27                    |
| <u>Maintenance</u>    |                                          |                         |
| Personnel             | 2,775,000                                | 0.68                    |
| Supplies              | 3,397,000                                | 0.83                    |
| <u>Power</u>          | 6,542,000                                | 1.61                    |
| <u>Heating/Drying</u> | 1,344,000                                | 0.33                    |
|                       | <hr/>                                    | <hr/>                   |
| TOTAL                 | 34,204,000                               | 8.40                    |

Comparison:

|                               |            |
|-------------------------------|------------|
| CAMC Base Case 8/84           | \$10.18/mt |
| CAMC Initial Case (Coal) 3/85 | \$ 8.78/mt |
| CAMC Proposed Case 3/85       | \$ 7.57/mt |

TABLE 3-38

## Cyprus Anvil Mine

August Update  
PAH Estimated Operating Costs  
By Years

---

| <u>Year</u> | <u>Milling<br/>Rate<br/>(MTPD)</u> | <u>Percent Oxide<br/>Ore in<br/>Feed</u> | <u>Mill<br/>Operating<br/>Cost</u> |
|-------------|------------------------------------|------------------------------------------|------------------------------------|
| 1984        | 7,000                              | 100                                      | 12.05                              |
| 1985        | 9,870                              | 23                                       | 9.23                               |
| 1986        | 11,160                             | 0                                        | 8.40                               |
| 1987        | 11,160                             | 0                                        | 8.40                               |
| 1988        | 11,160                             | 0                                        | 8.40                               |
| 1989        | 11,160                             | 0                                        | 8.40                               |
| 1990        | 11,160                             | 0                                        | 8.40                               |
| 1991        | 11,160                             | 0                                        | 8.40                               |

TABLE 3-39

August Update  
Comparison Of Savings  
To Original 8/84 Report

|                     | <u>\$/MT Reduction</u> | <u>% of Savings</u> |
|---------------------|------------------------|---------------------|
| Operating Personnel | 0.10                   | 5.6                 |
| Flotation           | 0.11                   | 6.2                 |
| Steel               | 0                      | 0                   |
| Crusher/Grinding    | 0.02                   | 1.1                 |
| Other               | 0                      | 0                   |
| Repair Personnel    | 0.08                   | 4.5                 |
| Repair Supplies     | 0.05                   | 2.8                 |
| Power               | 1.29                   | 72.0                |
| Heating/Drying      | <u>0.14</u>            | <u>7.8</u>          |
|                     | 1.79                   | 100.0               |

TABLE 3-40  
August Update  
Mill Personnel Costs

| <u>Category</u>    | <u>CAMC</u><br><u>No.</u> | <u>PAH</u><br><u>No.</u> | <u>\$/Yr/Man</u> | <u>\$/Yr</u>  |
|--------------------|---------------------------|--------------------------|------------------|---------------|
| <u>OPERATIONS</u>  |                           |                          |                  |               |
| Staff              | 14                        | 14                       | 60,000           | 840,000       |
| Operators          | 38                        | 42                       | 54,000           | 2,052,000     |
| Utility/Laborers   | 21                        | 21                       | 42,000           | 882,000       |
| Technicians        | 9                         | 9                        | 44,000           | 396,000       |
| Clerical           | 1                         | 1                        | 36,000           | <u>36,000</u> |
|                    |                           |                          |                  | 4,206,000     |
| <u>MAINTENANCE</u> |                           |                          |                  |               |
| Staff              | 6                         | 6                        | 60,000           | 360,000       |
| Millwrights, etc.  | 45                        | 45                       | 51,000           | 2,295,000     |
| Clerical           | 1                         | 1                        | 36,000           | 36,000        |
| Apprentices        | 2                         | 2                        | 42,000           | <u>84,000</u> |
|                    |                           |                          |                  | 2,775,000     |

NOTES:

- 1) Manpower represents lowering of estimate from August report. PAH added four persons for VSA. Hourly operations manpower is very lean.
- 2) Wage rates same as original August report.

TABLE 3-41

## Cyprus Anvil Mine

Underlying Assumptions To  
Mill Manpower Requirements

- 1) A maximum instantaneous mill feed rate of 12,065 mtpd (11,160 mtpd at 92.5 percent availability) was considered.
- 2) All maintenance - mechanical and electrical was assumed to have been completed.
- 3) Projects of significant size would/may require additional people.
- ✓4) Operators and attendants are responsible for clean-up in addition to their other duties.
- 5) A new control room and control system would be required for the crushers so that they can be operated by two men.
- 6) Installation of a rock breaker, a change in conveyors from 30 inch to 42 inch, a redesign of chutes to minimize blockages and wear, and reuse of double-deck screens to increase screening efficiencies would all be required.
- 7) Components of the fine ore feeding system (slot feeders, chutes) must be redesigned, and adequate supply and pressure of water for the grinding mills ensured to reduce spillage at feed and discharge ends.
- 8) A cyclone feed control system including variable speed pumps to minimize pump box spillage and improve cyclone performance is required.
- 9) Flotation changes required to reduce spillage and water consumption include splitter boxes, O.K. cell feed and intermediate boxes, and all concentrate launders (pipes).
- 10) Regrind cyclone clusters have to be changed to handle the larger (actual) feed rate they must handle and the grinding steel addition method must be altered to reduce ball spillage.

TABLE 3-41 (Cont.)

## Cyprus Anvil Mine

Underlying Assumption To  
Mill Manpower Requirements

- 11) A complete revision of the dewatering system is required - including automatic density controls, installation of vertical pumps, automatic filter boot level control, and an improved filtrate/vacuum system.
- 12) No major changes in the loadout to reduce the necessary manpower were assumed.
- 13) A conventional pressure lime unloading system would be required in addition to an improved soda ash loop for better pH control.
- 14) Also required is an augmented - increased volume and pressure - water supply to reduce the spills and blockages caused by an inadequate water supply volume or pressure. Internal recycle must be nil or minimal.

Flotation

The reduced cost of flotation supplies is due to lower reagent purchased costs, but not reduced consumption (Table 3-42).

TABLE 3-42

August Update  
Flotation Materials Basis

| <u>Item</u>    | <u>ZONE 3</u>       |                             |             | <u>Oxide</u> |
|----------------|---------------------|-----------------------------|-------------|--------------|
|                | <u>Cost (\$/Kg)</u> | <u>Sulfide Usage (Kg/T)</u> | <u>\$/T</u> | <u>\$/T</u>  |
| Soda Ash       | 0.274               | 2.00                        | 0.55        | 0            |
| Lime           | 0.157               | 1.50                        | 0.24        | 1.09         |
| Copper Sulfate | 0.840               | 0.50                        | 0.42        | 0.59         |
| Xanthate       | 1.580               | 0.30                        | 0.47        | 0.63         |
| Cyanide        | 1.830               | 0.10                        | 0.18        | 0.16         |
| MIBC           | 1.773               | 0.015                       | 0.03        | 0.03         |
| Dow 1012       | 2.189               | 0.003                       | 0.01        | 0.01         |
| Floc.          | 5.36                | 0.003                       | 0.02        | 0.02         |
| Filter Acid    | 1.890               | 0.04                        | 0.08        | 0.08         |
| Sodium Sulfate | --                  | --                          | <u>0</u>    | <u>0.59</u>  |
|                |                     |                             | 2.00        | 3.20         |

## NOTE:

- 1) Unit prices are new from CAMC
- 2) Consumptions are from original report.

Grinding Steel

The cost of grinding media was set at \$1.50 per tonne as developed by CAMC.

Crusher Supplies

The CAMC range of estimates is \$280,000 to \$316,000 per year or \$0.07 to \$0.08 per ton. Given the added capital that will be spent in this area in the early years, the lower figure appears reasonable.

Grinding Liners

CAMC has proposed a 32 percent reduction in liner costs on an annual basis. There appears to be little available historical data. For comparison purposes the various estimates have been:

|           |           |
|-----------|-----------|
| CAMC 8/84 | \$398,000 |
| CAMC 3/85 | 270,000   |
| Kilborn   | 415,000   |

A reasonable consumption rate for the three stage circuit would appear to be 0.1 lb/ton. At a cost of \$1,400/st for liners, this equates to \$0.077 per metric ton or \$313,600

per year. PAH has utilized this latter value, but recognizes that additional work is needed in this area to better define costs.

#### Other Supplies

CAMC has proposed a 25 percent reduction in the cost for the following supplies:

- Flotation Miscellaneous
- Thickeners/Filters (bags, miscellaneous)
- Pump House
- Loadout (antifreeze, miscellaneous)
- Tailings Disposal
- Heating/Drying
- Metallurgy Lab
- Training/Travel
- Miscellaneous

Without better documentation it is difficult to evaluate these savings. The reduction in plant testing of \$180,000 per year seems reasonable, but this can be offset by increases in other areas in the reduced cost estimate. Given that the initial estimates were based on historical data, it appears prudent to use the original \$1,100,000 per year.

### Repair Supplies

The five percent reduction in repair materials proposed by CAMC still places the cost within historical range of repair costs (\$0.62 to \$0.85 per tonne). It is doubtful if the accuracy of any of the estimates could detect changes in costs of ± five percent. PAH utilized the lower figure of \$3,397,000 per year for repair supplies.

### Power

When the plant operated at milling rates as proposed, the total energy consumption was near the budgeted value of 41.4 kwh/T. There is no justification for the eight percent drop in power proposed by CAMC and, therefore, PAH utilized 41.4 kwh/T at \$0.04/kwh for the total power cost. For the mill operating cost, 1.25 kwh per tonne was allowed for the mine, thus leaving 40.15 kwh per tonne for the mill.

### Coal Cost

The cost of \$91.00 per tonne for delivered coal was utilized together with the annual consumption of 12,318 tonnes. The 35 percent energy efficiency used in the CAMC estimate should be evaluated on startup and an energy audit performed on the drying circuit to minimize energy losses.

Adjustments

In addition, the increase in operating cost due to the oxide ore, there is an increase in operating cost due to lower milling rates. These increases are associated with the fixed cost of labor and a fixed portion of the power demand. The added costs for the lower milling rates are:

|                              | <u>1984</u> | <u>1985</u> |
|------------------------------|-------------|-------------|
| Milling Rate (mtpd)          | 7,000       | 9,870       |
| Increased Power Cost (\$/mt) | 0.42        | 0.09        |
| Increased Labor Cost (\$/mt) | 1.01        | 0.23        |

3.2.5 Capital Expenditures

The CAMC proposed mill capital expenditures are summarized in Table 3-43. The total value is estimated by CAMC to be \$10,677,000. This capital amount is to be expensed in the following schedule:

| <u>Year</u> | <u>Mill</u> | <u>Area</u><br><u>Water System</u> | <u>Tailings</u> | <u>Total</u>   |
|-------------|-------------|------------------------------------|-----------------|----------------|
| 1984        | 4,285,000   | ---                                | 45,000          | 4,330,000      |
| 1985        | 2,030,000   | 1,800,000                          | 1,987,000       | 5,817,000      |
| 1986        | 530,000     | ---                                | ---             | <u>530,000</u> |
|             |             |                                    |                 | 10,677,000     |

TABLE 3-43

## Cyprus Anvil Mine

Summary  
Mill Project Scheduling/Costing

| Project Area | Must Before Milling Starts                | Cost        | Within 4 to 6 Months            | Cost        | Within 6 Mo. to 2 Yrs.         | Cost        | Other/Comments                      |
|--------------|-------------------------------------------|-------------|---------------------------------|-------------|--------------------------------|-------------|-------------------------------------|
| Contractor   | (All Areas) Material and Labor            | \$1,565,000 | Fresh Water Dam (all inclusive) | \$1,800,000 |                                |             |                                     |
|              | Housing & Busing (based on 600 man weeks) | \$ 250,000  |                                 |             |                                |             |                                     |
|              | Engineering and Supervision               | \$ 250,000  |                                 |             |                                |             |                                     |
|              | SUB TOTALS                                | \$2,065,000 |                                 | \$1,800,000 |                                |             |                                     |
| Mill Work    | (all areas) Material and Labor            | \$1,720,000 | (all areas) Material and Labor  | \$ 780,000  | (all areas) Material and Labor | \$1,330,000 |                                     |
|              | Engineering and Supervision               | \$ 200,000  |                                 | \$ 100,000  |                                | \$ 150,000  |                                     |
|              | SUB TOTALS                                | \$1,920,000 |                                 | \$ 880,000  |                                | \$ 148,000  |                                     |
|              | GRAND TOTALS                              | \$3,985,000 |                                 | \$2,680,000 |                                | \$1,480,000 | Grand Total All Columns \$8,145,000 |
|              | *Contingencies                            | 300,000     |                                 | 150,000     |                                | 50,000      | Conting. \$ 500,000                 |
|              | TOTAL INCLUDING                           | \$4,285,000 |                                 | \$2,830,000 |                                | \$1,530,000 | \$8,645,000                         |

TABLE 3-43 (Continued)

## Cyprus Anvil Mine

Summary  
Mill Project Scheduling/Costing

| <u>Project Area</u> | <u>Must Before Milling Starts</u> | <u>Cost</u> | <u>Within 4 to 6 Months</u> | <u>Cost</u> | <u>Within 6 Mo. to 2 Yrs.</u> | <u>Cost</u> | <u>Other/Comments</u> |
|---------------------|-----------------------------------|-------------|-----------------------------|-------------|-------------------------------|-------------|-----------------------|
| Crushing            | Pedistal for Rockbreaker          | \$ 25,000   |                             |             |                               |             |                       |
|                     | Extend Apron Feeder               | 50,000      |                             |             |                               |             |                       |
|                     | Replace Conveyors 14-17           | 400,000     |                             |             |                               |             |                       |
|                     | Conveyor Maintenance              | 200,000     |                             |             |                               |             |                       |
|                     | No. 8 Conv.-Tail End              | 50,000      |                             |             |                               |             |                       |
|                     | No. 11 Conv.-Tail End             | 25,000      |                             |             |                               |             |                       |
|                     | Coarse Ore-Carman Feeders         | 25,000      |                             |             |                               |             |                       |
|                     | Install New Control Room          | 50,000      |                             |             |                               |             |                       |
|                     | Electrical Maintenance            | 50,000      |                             |             |                               |             |                       |
|                     | Floor Alterations-Const.          | 100,000     |                             |             |                               |             |                       |
|                     |                                   | \$ 975,000  |                             |             |                               |             |                       |
| Grinding            | Grinding Mill Alignments          | \$ 75,000   |                             |             |                               |             |                       |
|                     | Fine Ore Bin Slot Feeders         | 75,000      |                             |             |                               |             |                       |
|                     | Electrical Maintenance            | 50,000      |                             |             |                               |             |                       |
|                     | Conveyor Belt Maintenance         | 50,000      |                             |             |                               |             |                       |
|                     |                                   | \$ 250,000  |                             |             |                               |             |                       |
| Flotation           | Overhaul Denver Cells             | \$ 100,000  |                             |             |                               |             |                       |
| Dewatering          | Vacuum System Pipe & Filters      | \$ 125,000  |                             |             |                               |             |                       |
|                     | Overhaul Thickener Drives         | 40,000      |                             |             |                               |             |                       |
|                     | Conveyor Belt Maintenance         | 75,000      |                             |             |                               |             |                       |
|                     |                                   | \$ 240,000  |                             |             |                               |             |                       |
| Other               |                                   |             | Fresh Water* Storage Dam    | \$1,800,000 |                               |             |                       |
| TOTAL               |                                   | \$1,565,000 |                             | \$1,800,000 |                               |             |                       |

\*This work may be done partial by CAMC's mine group

TABLE 3-43 (Continued)

## Cyprus Anvil Mine

Summary  
Mill Project Scheduling/Costing

| Project Area | Must Before Milling Starts            | Cost              | Within 4 to 6 Months     | Cost              | Within 6 Mo. to 2 Yrs.                                         | Cost              | Other/Comments |
|--------------|---------------------------------------|-------------------|--------------------------|-------------------|----------------------------------------------------------------|-------------------|----------------|
| Crushing     | General Maintenance                   | \$ 200,000        | Install Rockbreaker      | \$ 200,000        | Modifications section screens (if necessary)                   | \$ 40,000         |                |
|              | Double-deck pri Screens               | 40,000            | Various Other-Chutes     | 75,000            | Various Other Chutes                                           | 75,000            |                |
|              | Chute Conveyors 200586                | 20,000            | Dust Collection          | 25,000            | Instrumentation                                                | 300,000           |                |
|              | Chute Conveyors                       | 10,000            |                          |                   |                                                                |                   |                |
|              |                                       | <u>\$ 270,000</u> |                          | <u>\$ 300,000</u> |                                                                | <u>\$ 415,000</u> |                |
| Grinding     | Install Hydraulic Drives              | \$ 5,000          | Chute Modifications      | \$ 50,000         | Chute Modifications                                            | \$ 50,000         |                |
|              | Chute Modifications                   | 50,000            | Bypass Piping            | 25,000            | Mod. Cyclones A Circuit                                        | 5,000             |                |
|              | Instrumentation Piping                | 50,000            | Dust Collection          | 25,000            | Instrumentation Variable Speed Pump Drives (tertiary cyclones) | 75,000            |                |
|              |                                       | 25,000            |                          |                   |                                                                | 200,000           |                |
|              | General Maintenance                   | <u>\$ 100,000</u> |                          | <u>\$ 100,000</u> |                                                                | <u>\$ 340,000</u> |                |
| Flotation    | OK Cell Maintenance                   | \$ 50,000         | Cleaner Flow Splitter    | \$ 50,000         | Regrind Cyclone Alt.                                           | \$ 150,000        |                |
|              | General Maintenance                   | 100,000           | Zinc Conditioning        | 250,000           | Instrumentation                                                | 100,000           |                |
|              | OSA & Sampling                        | 50,000            |                          |                   |                                                                |                   |                |
|              | Instrumentation                       | 50,000            |                          |                   |                                                                |                   |                |
|              |                                       | <u>\$ 250,000</u> |                          | <u>\$ 300,000</u> |                                                                | <u>\$ 250,000</u> |                |
| Dewatering   | Thickener Froth Rings & Feed Wells    | \$ 40,000         | 2 Slurry Pumps Installed | \$ 30,000         | Instrumentation and Controls                                   | \$ 200,000        |                |
|              | 2 Slurry Pumps (Inst.)                | 30,000            | Dryer Maintenance        | 25,000            |                                                                |                   |                |
|              | Overhaul Coal & Ash System            | 300,000           | Loadout Mod.             | 25,000            |                                                                |                   |                |
|              | Piping, Splitting & Other Slurry Mod. | 50,000            |                          |                   |                                                                |                   |                |
|              | Dryer Maintenance                     | 75,000            |                          |                   |                                                                |                   |                |
|              | Loadout Mod.                          | 25,000            |                          |                   |                                                                |                   |                |
|              | Miscellaneous                         | 125,000           |                          |                   |                                                                |                   |                |
|              |                                       | <u>\$ 645,000</u> |                          | <u>\$ 80,000</u>  |                                                                | <u>\$ 200,000</u> |                |

TABLE 3-43 (Continued)

Cyprus Anvil Mine

Summary

Mill Project Scheduling/Costing

| <u>Project Area</u> | <u>Must Before Milling Starts</u> | <u>Cost</u>        | <u>Within 4 to 6 Months</u> | <u>Cost</u>       | <u>Within 6 Mo. to 2 Yrs.</u>        | <u>Cost</u>        | <u>Other/Comments</u> |
|---------------------|-----------------------------------|--------------------|-----------------------------|-------------------|--------------------------------------|--------------------|-----------------------|
| Water               | Water Pumping                     | \$ 50,000          |                             |                   | Other Piping & Pumping Modifications | \$ 75,000          |                       |
|                     | Piping                            | 50,000             |                             |                   |                                      |                    |                       |
|                     | General Maintenance               | 25,000             |                             |                   |                                      |                    |                       |
|                     |                                   | <u>\$ 125,000</u>  |                             |                   |                                      |                    |                       |
| Reagent Systems     | Lime System                       | \$ 100,000         |                             |                   | Further Reagent System Improvements  | 50,000             |                       |
|                     | Soda Ash & Other Reagents         | 75,000             |                             |                   |                                      |                    |                       |
|                     | General Maintenance               | 25,000             |                             |                   |                                      |                    |                       |
|                     |                                   | <u>\$ 200,000</u>  |                             |                   |                                      |                    |                       |
| TOTAL               |                                   | <u>\$1,720,000</u> |                             | <u>\$ 780,000</u> |                                      | <u>\$1,330,000</u> |                       |

The 1985 mill expenditure may be reduced, with the difference added to the 1986 amount, if insufficient maintenance manpower exists to accomplish the outlined modification.

PAH is in agreement with the proposed budget with the following provisions:

- PAH has not reviewed a detailed schedule of the plant modifications. Such a schedule must be produced prior to commencing the modifications and should include capital costs for each item, job sequencing, manpower requirements, and a cost rationale for each proposed modification.
- If only the Faro ore is to be milled, thus shortening the life of the project, each item in the modification list should be reviewed for elimination. The economics of making major capital modifications may be altered if the plant is to operate only seven to eight years. Among the items that the shortened mill life may influence are the installation of new conveyors (rather than speeding up the old) and the amount of new instrumentation.

### 3.3 Concentrate Marketing

#### 3.3.1 Marketability

We have reviewed detailed concentrate analyses for the selective lead concentrates and selective zinc concentrates produced by CAMC in the past. This review included correspondence in CAMC's files with potential customers for the concentrates and with consultants commenting on concentrate markets. Based on discussions with merchants and custom smelters and review of PAH's files, it is PAH's opinion that the concentrates are marketable to East Asian and western European smelting companies, but the marketing effort must be very carefully planned and executed.

The tonnages of concentrates that would be produced are very large. The annual tonnage of zinc concentrates is in the 250,000 to 310,000 DMT range, and the annual tonnage of lead concentrates is in the 125,000 to 190,000 DMT range. Such large tonnages coming on the market, if not handled carefully, could result in less favorable terms (treatment charges) than might otherwise be obtained.

The CAMC zinc concentrate is not a high quality concentrate because of its relatively low zinc content, roughly 50 percent to 51 percent zinc, and its high mercury content, over 300 ppm. Certain treatment plants can handle large quantities of high mercury material because they have installed circuits in their plants to get rid of it. Other plants must blend this material with low mercury concentrates to achieve an acceptable mercury content. Some penalty for mercury can be expected. The amount of the penalty could depend to some extent on the buying smelters' perception of the difficulty CAMC will have in selling very large tonnages of concentrates.

Some smelters charge a penalty of US\$1.50 or \$2.00 per metric ton of zinc concentrate smelted for iron content exceeding 10 percent, and in some cases, 8 percent. One plant is allowing 10 percent iron plus manganese free, and charging \$5.00 per unit (1 percent) over 10 percent.

The CAMC lead concentrate is a relatively clean concentrate and should pose no marketing problem from the point of view of its composition. The mercury content is a little on the high side at 45 ppm. The low bismuth content (about 0.007 percent) is favorable.

It is our recommendation that if Dome decides to start up the mine, negotiations for smelting contracts should begin at once. It is not too early to start negotiations for future tonnages. Substantive and continual contacts with the market will be required. We recommend that CAMC engage a consultant who has recent hands-on experience with marketing lead and zinc concentrates to assist with the marketing effort.

We have not considered marketing of the concentrates in the United States since costs of doing so would probably be very high compared to Asian and European costs. For one thing, shipping costs would be higher since the Jones Act would apply on ocean shipping from one U.S. port (Skagway or Haines) to another. In addition, treatment charges in the United States would be higher. Terms at one major U.S. zinc plant might be as follows:

- 1) Pay for 85 percent of the zinc, with a minimum deduction of 8 units, at the High Grade zinc price less US\$0.02 per pound of payable metal.
- 2) Treatment charge US\$160-\$165/DST (\$176.37 - \$181.88/DMT) based on a U.S. settlement price of \$0.51. Upscale \$3.50/\$0.01 price increase. Downscale \$2.50/\$0.01 price decrease.

### 3.3.2 Treatment Contract Terms

#### Zinc Concentrates

##### Payable Metal

Standard terms in zinc smelting contracts call for payment for 85 percent of the contained zinc, with a minimum deduction of eight units (8 percent) from the zinc assay. The smelter pays for 100 percent of the metal remaining after the deduction. PAH has used these standard metal deduction terms in our cash flow projections. The zinc concentrates do not contain payable metals other than zinc.

##### Treatment Charges

The range of treatment charges is in the range of US\$150 to \$160/DMT cif Japanese or western European ports. Most contracts call for an increase or decrease of US\$3.50 or \$3.00 per DMT in the treatment charge for each US\$0.01 increase or decrease in the European Producer Price. There will be a floor treatment charge on the downside.

As noted above, it is most likely that some penalty will be charged for mercury. The amount of the charge, like the rest of the terms, will be subject to negotiation. We have

used a treatment charge of U.S. \$149.00/DMT cif Japanese or western Europe ports plus a U.S. \$5.00/DMT charge for mercury penalty.

No iron penalty will be incurred if the iron content is below 8 percent. If it exceeds 10 percent a penalty of US\$1.50 or \$2.00 per unit in excess of 10 percent could be incurred.

#### Lead Concentrates

##### Payable Metal

We have used standard terms of payment for 95 percent of the contained lead, with a minimum deduction of three units (3 percent) from the lead assay. The smelter pays for 100 percent of the lead remaining after the deduction.

The lead concentrates contain payable silver. We have used a deduction of one troy ounce per DMT of concentrate, with payment for 100 percent of the remaining silver. The silver deduction varies considerably. Examples are:

- deduct 30 grams, pay for 100 percent of the balance,
- deduct 50 grams, pay for 100 percent of the balance,
- pay for 95 percent, or
- deduct 1 troy ounce, pay for 95 percent of the balance.

### Treatment Charges

We have used a treatment charge of US\$130/DMT cif Japanese or western European ports in our cash flow projections. There will typically be a clause calling for an increase of US\$2.50 or \$3.00/DMT for US\$0.01 increase in the lead price above a base LME price stated in the contract. The clause will also call for a decrease of US\$2.00 or \$2.50/DMT for each US\$0.01 decrease in the lead price below the base price.

The experience of CAMC has been that certain smelters levied an explicit silver refining charge, while others did not. We have used a silver refining charge of US\$0.25 per payable troy ounce of silver, but have only charged it against one-half of the payable silver content in the lead concentrates for our cash flow projections.

### 3.3.3 Other Marketing Costs

Certain other costs will be incurred for such items as draft surveying of vessels, representation of destination ports, umpire sampling and assaying, etc. We have used a cost of US\$1.50/DMT for this cost, based on CAMC's past experience.

#### 3.3.4 Losses In Transport

We have assumed that 0.50 percent of the concentrates produced will be lost in transportation and handling. This is based on past experience of CAMC.

#### 3.3.5 Moisture Content

We have assume moisture contents of 6.5 percent for the zinc concentrate and 6.0 percent of the lead concentrate based on CAMC's past experience.

### 3.4 Concentrate Transportation

#### 3.4.1 Overland Transportation

PAH has reviewed three alternative methods of transporting concentrates to ports for loading on ships for transport to Europe and Asia. These are:

- 1) Truck haulage from Faro to Skagway, Alaska;
- 2) Truck haulage from Faro to Haines, Alaska;
- 3) Truck haulage from Faro to Whitehorse, Yukon, and rail haulage from Whitehorse to Skagway.

Method 1 is the transportation alternative which CAMC and PAH have assumed for this analysis. CAMC is currently seeking permission from the Canadian Transport Commission and the Alaskan state government to truck over the Faro-to-Skagway (South Klondike) road.

As part of our 1984 evaluation of the Anvil mine, PAH engaged Mr. Robert H. Hurst, a trucking consultant familiar with the roads in question, to drive the roads and prepare a brief report on the feasibility of using them. His findings are that it is technically feasible to use either road. If CAMC has a choice, he recommends the Skagway route because of the shorter distance (288 miles shorter), better road conditions, fewer road closures during winter months, and less tourist traffic.

The concentrate transportation costs for each alternative are estimated to be as shown here:

|                              |               |
|------------------------------|---------------|
| Trucking Faro to Skagway     | CS\$42.50/WMT |
| Trucking Faro to Haines      | 52.00/WMT     |
| Trucking and Rail to Skagway | 58.00/WMT     |

The cost of trucking to Skagway was provided by CAMC based on bids and CAMC estimates. The cost of trucking to Haines is based on a bid received by CAMC, and amounts to about \$0.11

metric ton-mile for a distance of 470 miles. The cost of combined truck and rail haulage is based on a recent tentative estimate by the White Pass and Yukon Railway for the first quarter of 1985.

As discussed below, port facilities would have to be constructed at Haines, while storage and shiploading facilities already exist at Skagway.

#### 3.4.2 Port Facilities

In the past CAMC's concentrates were stored and loaded onto ships at the White Pass and Yukon terminal at Skagway. Based on actual costs, CAMC has estimated that the annual cost of using the terminal at Skagway would be \$3,100,000. In 1982 CAMC concentrates were arriving at the terminal in rail cars. If trucking is permitted, minor modifications to the terminal would be required for receipt of concentrates by truck. CAMC has assumed that no front-end capital charge would be made by White Pass and Yukon for these modifications.

In the case of trucking to Haines, port facilities would have to be constructed at Haines. No detailed estimate has been made of the cost of constructing the terminal, but CAMC and PAH concur that a figure of \$5 million is reasonable. CAMC has assumed that a contract would be made with an outside party

to construct and operate the terminal, and that such party would recover their investment in the terminal through charges to CAMC over some amortization period. There is no operating cost estimate for the Haines port facility.

### 3.4.3 Ocean Freight

We have used an average ocean freight cost of US\$18.00/WMT (C\$25.00) of concentrate for ocean freight. The actual cost should be somewhat less for shipment to East Asian ports and somewhat higher for shipment to western European ports.

## 3.5 Financial Evaluation

### 3.5.1 Ore Reserve And Production Schedule

The ore reserves at the 4.0 percent cutoff for this evaluation are:

|            |                  |            | <u>Zn</u>   | <u>Pb</u>   | <u>Ag</u>       |
|------------|------------------|------------|-------------|-------------|-----------------|
| Pit Ore    | 26,432,000       | DMT        | 4.3%        | 2.9%        | 36.1 g/t        |
| Stockpiles | <u>1,400,000</u> | <u>DMT</u> | <u>4.7%</u> | <u>2.9%</u> | <u>37.6 g/t</u> |
| Total      | 27,832,000       | DMT        | 4.3%        | 2.9%        | 36.2 g/t        |

Table 3-44 shows the production schedule for the 4.0 percent cutoff evaluation.

TABLE 3-44

PRO FORMA PRODUCTION STATEMENT  
CYPRUS ANVIL MINE

| PRODUCTION YEAR                            | 1984      | 1985       | 1986       | 1987       | 1988       | 1989       | 1990       | 1991       |
|--------------------------------------------|-----------|------------|------------|------------|------------|------------|------------|------------|
| ORE MILLED, DMT                            | 427000    | 3604000    | 4073000    | 4073000    | 4073000    | 4073000    | 4073000    | 3436000    |
| WASTE MINED, DMT                           | 4355000   | 23442000   | 22398000   | 21466000   | 8233000    | 2642000    | 1151000    | 963000     |
| STRIP RATIO                                | 10.20     | 6.50       | 5.50       | 5.27       | 2.02       | 0.65       | 0.28       | 0.28       |
| ZN ASSAY OF ORE MILLED, %                  | 4.7       | 4.4        | 4.4        | 4.0        | 4.5        | 4.7        | 4.6        | 4.1        |
| MILL RECOVERY OF ZN, %                     | 67.90     | 79.40      | 81.80      | 81.30      | 82.90      | 82.00      | 82.70      | 81.50      |
| ZINC CONCENTRATE, WMT                      | 30235.    | 267118.    | 306125.    | 276054.    | 319801.    | 329087.    | 324835.    | 240230.    |
| ZINC CONCENTRATE, DMT                      | 28390.    | 250815.    | 287441.    | 259205.    | 300283.    | 309002.    | 305010.    | 225568.    |
| ZN ASSAY OF ZN CONC, %                     | 40.0      | 50.2       | 51.0       | 51.1       | 50.6       | 50.8       | 50.8       | 50.9       |
| TRANSPORT & HANDLING LOSS<br>FOR ZINC, %   | 0.50      | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       |
| SMELTER PAY FOR ZN, %                      | 83.3      | 84.1       | 84.3       | 84.3       | 84.2       | 84.3       | 84.3       | 84.3       |
| COMPOSITE RECOVERY FOR ZN, %               | 56.30     | 66.41      | 68.62      | 68.23      | 69.44      | 68.74      | 69.33      | 68.35      |
| ZN PAID FOR/TON ORE MILLED, LBS            | 58.34     | 64.42      | 66.57      | 60.17      | 68.89      | 71.23      | 70.31      | 61.78      |
| PAYABLE ZINC, LBS                          | 24909895. | 232176571. | 271125472. | 245061074. | 280603228. | 290106794. | 286358782. | 212269326. |
| PB ASSAY OF ORE MILLED                     | 2.9       | 2.7        | 2.8        | 2.8        | 3.4        | 3.2        | 3.0        | 2.4        |
| MILL RECOVERY OF PB, %                     | 65.20     | 77.40      | 80.60      | 81.00      | 82.60      | 82.10      | 81.30      | 79.60      |
| LEAD CONCENTRATE, WMT                      | 14756.    | 132177.    | 159467.    | 158701.    | 199751.    | 185945.    | 175501.    | 116159.    |
| LEAD CONCENTRATE, DMT                      | 13921.    | 124695.    | 150440.    | 149718.    | 188445.    | 175420.    | 165567.    | 109584.    |
| PB ASSAY OF PB CONC, %                     | 58.0      | 60.4       | 61.1       | 61.7       | 60.7       | 61.0       | 60.0       | 59.9       |
| TRANSPORT & HANDLING LOSS<br>FOR LEAD, %   | 0.50      | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       |
| SMELTER PAY FOR PB, %                      | 94.8      | 95.0       | 95.0       | 95.0       | 95.0       | 95.0       | 95.0       | 95.0       |
| COMPOSITE RECOVERY FOR PB, %               | 61.52     | 73.16      | 76.19      | 76.57      | 78.08      | 77.61      | 76.85      | 75.24      |
| PB PAID FOR/TON ORE MILLED, LBS            | 39.33     | 43.55      | 47.03      | 47.26      | 58.52      | 54.75      | 50.83      | 39.81      |
| PAYABLE LEAD, LBS                          | 16794858. | 156950873. | 191549834. | 192502176. | 238368774. | 222989605. | 207014442. | 136777139. |
| AG ASSAY OF PB CONCENTRATE,<br>TR OZ/DMT   | 16.9      | 18.2       | 16.6       | 18.3       | 18.8       | 17.9       | 16.3       | 15.0       |
| PAYABLE AG, TR OZ/DMT CONC,<br>TROY OUNCES | 15.9      | 17.2       | 15.6       | 17.3       | 17.8       | 16.9       | 15.3       | 14.0       |
| PAYABLE SILVER, TR OZ                      | 220232.   | 2134036.   | 2335134.   | 2577171.   | 3337546.   | 2949769.   | 2520504.   | 1526509.   |
| TR OZ AG PAID FOR/LB PAYABLE PB            | 0.01      | 0.01       | 0.01       | 0.01       | 0.01       | 0.01       | 0.01       | 0.01       |
| LBS ZN & PB/TON ORE MILLED                 | 97.7      | 108.0      | 113.6      | 107.4      | 127.4      | 126.0      | 121.1      | 101.6      |
| TOTAL PAYABLE LBS OF<br>LEAD AND ZINC      | 41704752. | 389127444. | 462675306. | 437563249. | 518972002. | 513096399. | 493373224. | 349046466. |

At the time of the August 1984 Report, there was no comprehensive current reserve estimate for the Faro deposit, nor was there a detailed life-of-mine mining plan. PAH has based its evaluation on the best reserve information available. We believe that the above reserve figures are reasonable for this evaluation.

There were minor discrepancies between the ore production schedule developed by CAMC's mining staff and the ore milling schedule used by the CAMC metallurgical staff. These were primarily in 1985 and 1991. In order to make the numbers match, PAH has made some necessary adjustments to these numbers, none of which in themselves have a significant impact on the project economics. For example, in 1985 we have assumed milling of 3,604,000 DMT of ore. This figure is taken directly from a CAMC milling schedule. It was about 94,000 DMT more than the mining schedule showed. The ore tonnage mined in 1985 was adjusted upward to reflect the milling tonnage requirement. Naturally there is some uncertainty associated with the waste tonnage that will be mined in the last year or two. We believe, however, that the figures used in this evaluation are reasonable in light of everything known about the ore body at this time.

The production schedule is based on the mining schedule discussed in Section 3.1, mill recoveries discussed in Section 3.2, smelter payable metals, and other factors discussed in Sections 3.3 and 3.4, and summarized again briefly in this Section 3.5.

### 3.5.2 Metal Prices

PAH has projected cash flows from operations using the following zinc, lead, and silver prices:

|                      | <u>US\$</u> | <u>Cdn\$</u> |
|----------------------|-------------|--------------|
| Zinc/lb., EPP        | 0.43        | 0.60         |
| Lead/lb., LME        | 0.20        | 0.28         |
| Silver/troy oz., LME | 7.00        | 9.72         |

### 3.5.3 Sales Of Concentrator Products

All metals are assumed to be paid in the year in which they are produced. In fact, there would be a time lag between production of concentrates and partial and final payments by the smelter. We have allowed for C\$10 million working capital at the outset of milling to reflect the time lag between concentrate production and payment. However, this figure has been adjusted to C\$6 million with the credit of C\$4 million from the Canadian government for stripping costs.

#### 3.5.4 Treatment And Freight Costs

##### Smelter Deductions

##### Zinc Concentrates

The only payable metal in the zinc concentrates is zinc. We have used standard terms of a deduction of eight units from the zinc assay, or 15 percent of the zinc content, whichever is greater.

##### Lead Concentrates

In addition to the lead, the lead concentrates contain payable silver. We have used standard terms of payment for 95 percent of the lead, with a minimum deduction of three units. We have used a deduction of one troy ounce of silver per DMT of concentrate to estimate payable silver.

##### Treatment Costs

##### Zinc Concentrates

We have used a base treatment charge of US\$149/DMT of concentrate cif Japanese or western European ports. A mercury penalty of US\$5.00/DMT has been used. No other penalties, e.g., iron, have been taken into account.

Lead Concentrates

We have used a treatment charge of US\$130/DMT of concentrate cif Japanese or western European ports. For the silver in the concentrate we have used a refining charge of US\$0.25 per payable ounce for one-half of the payable silver. This reflects an assumption that half of the lead concentrates would go to smelters who levy a refining charge for the silver, and half would go to smelters which do not.

Land Freight

We have assumed trucking all the way from the concentrator to the port at Skagway, Alaska. We have used a cost of CS42.50/WMT of zinc or lead concentrate. This is based on a bid received by CAMC. We have assumed a moisture content of 6.5 percent for the zinc concentrate and 6.0 percent for the lead concentrate.

Port Charge

CAMC has estimated that the annual cost of using the existing terminal at Skagway would be \$3,100,000. This is based on actual costs prior to shutdown of the Anvil mill in 1982.

### Ocean Freight

We have used US\$18.00/WMT of zinc or lead concentrate for ocean freight. The actual cost should be somewhat less for shipment to Japan and somewhat higher for shipment to Europe.

### Other Costs

A cost of US\$1.50/DMT of concentrate smelted has been used to cover representation at destination ports, draft surveying, umpire sampling and assaying, etc.

### 3.5.5      Cash Production Cost               Of Concentrate Production

Cash production costs of concentrate production include costs of mining, milling, general and administrative costs, townsite expenses, and Vancouver and Calgary overhead. Mining and milling cost estimates are discussed in more detail in Sections 3.1 and 3.2 of this report.

### Mining Cost

The mine operating costs are shown in Table 3-45. These costs assume an electric power cost of \$0.04/kwhr.

TABLE 3-45  
Mining Costs  
Cyprus Anvil Mine\*

| <u>Year</u>    | <u>Cost Per DMT**<br/>Of Rock Mined</u> | <u>Total Metric Tons<br/>Mined<br/>(Millions)</u> | <u>Annual<br/>Cost<br/>(Millions)</u> |
|----------------|-----------------------------------------|---------------------------------------------------|---------------------------------------|
| 1984 (Nov-Dec) | \$ 0.98                                 | 4.8                                               | \$ 4.7                                |
| 1985           | 1.04                                    | 27.0                                              | 28.0                                  |
| 1986           | 1.20                                    | 26.5                                              | 31.7                                  |
| 1987           | 1.20                                    | 25.6                                              | 30.7                                  |
| 1988           | 1.54                                    | 12.3                                              | 19.0                                  |
| 1989           | 1.86                                    | 6.7                                               | 12.5                                  |
| 1990           | 2.06                                    | 5.2                                               | 10.8                                  |
| 1991 (Jan-Oct) | 1.92                                    | 4.4                                               | 8.4                                   |
|                | Avg. \$ 1.30                            | Total 112.5                                       | Total \$145.8                         |

\*Includes rehandling of stockpiled ore.

\*\*Rounded from mining cost table in Section 3.1.

### Milling Cost

The mill operating costs are shown in Table 3-46. The costs in 1984 and 1985 reflect the lower milling rate and the milling of oxide ores.

### General And Administrative And Townsite Expense

We have used for this evaluation an estimated annual amount of \$6,435,000 as shown in Table 3-47. The estimate on which this is based was provided by CAMC. This estimate is based on CAMC's assumptions that significant cost savings will result from the successful of a new union contract, including payment by employees of a higher share of housing and utility costs, townsite expense could be reduced. PAH has used a full year's cost for 1991 although the mill is only projected to run a little over ten months of that year.

### Vancouver And Calgary Overhead

CAMC has budgeted an amount of \$1,800,000 per year for this cost. PAH has used this figure.

TABLE 3-46Milling Cost Per Metric Tons Of Ore Milled  
Cyprus Anvil Mine

| <u>Year(s)</u> | <u>CS/DMT</u> |
|----------------|---------------|
| 1984           | \$12.07       |
| 1985           | 9.23          |
| 1986-91        | 8.40          |

TABLE 3-47

General And Administrative And Townsite Cost  
Cyprus Anvil Mine

| <u>Personnel</u>          | <u>Number Of Personnel</u> | <u>Cost</u>                |
|---------------------------|----------------------------|----------------------------|
| Administration            | 2                          | \$ 144,000                 |
| Engineering               | 12                         | 618,000                    |
| Safety And Security       | 8                          | 348,000                    |
| Environment               | 2                          | 96,000                     |
| Personnel                 | 5                          | 300,000                    |
| Townsite                  | 5                          | 204,000                    |
| Accounting                | 12                         | 516,000                    |
| Purchasing                | 13                         | 568,000                    |
| Subtotal                  | 59                         | \$ 2,794,000               |
| <u>Supplies And Other</u> |                            |                            |
| Administration            |                            | \$ 1,143,000               |
| Engineering               |                            | 152,000                    |
| Safety And Security       |                            | 182,000                    |
| Environmental             |                            | 89,000                     |
| Personnel                 |                            | 563,000                    |
| Townsite                  |                            | 1,261,000                  |
| Accounting                |                            | 181,000                    |
| Purchasing                |                            | 18,000                     |
| Subtotal                  |                            | \$ 3,641,000               |
| TOTAL                     |                            | <u><u>\$ 6,435,000</u></u> |

### 3.5.6 Capital Expenditures

CAMC has budgeted capital expenditures for 1984 and 1985 for the Anvil mine, mill and townsite as shown in Table 348. PAH has reviewed these estimates and has used them in the cash flow projection.

PAH also briefly reviewed the replacement capital expenditure which had been budgeted by CAMC for 1986-1991. After review with CAMC, replacement capital expenditures are assumed to be shown here for years after 1985 and are also shown in Table 3-48.

The above figures do not include any amounts for replacement capital for the mill since it is not possible at this time to assign benefits to such capital expenditures. No major tailings project is needed unless the Vangorda Plateau deposits are developed. There should be no need to purchase major mining equipment with the exception of the one blasthole drill and R.T. dozer shown in Table 3-48 unless the Vangorda Plateau deposits are developed.

TABLE 3-48

Anvil Mine Capital Expenditures  
Cyprus Anvil Mine

| <u>Mine</u>                                                                | <u>1984</u> | <u>1985</u> | <u>1986</u> | <u>1987-1989</u> | <u>1990</u> | <u>1991</u> |
|----------------------------------------------------------------------------|-------------|-------------|-------------|------------------|-------------|-------------|
| Drill and R.T. Dozer                                                       |             | \$2,150,000 |             |                  |             |             |
| Pit Dewatering                                                             |             | 100,000     |             |                  |             |             |
| Remove unstable material threatening<br>east wall of pit, ±1,000,000 yards | \$1,500,000 |             |             |                  |             |             |
| Light Vehicle Fleet                                                        | 100,000     | 100,000     |             |                  |             |             |
| Computer System                                                            | 40,000      |             |             |                  |             |             |
| Subtotal                                                                   | \$1,640,000 | \$2,350,000 |             |                  |             |             |
| <u>Mill</u>                                                                |             |             |             |                  |             |             |
| Expansion/Modifications                                                    | \$4,330,000 | \$5,817,000 | 530,000     |                  |             |             |
| <u>Townsite</u>                                                            |             |             |             |                  |             |             |
| Demothball Houses                                                          | 200,000     |             |             |                  |             |             |
| <u>Recruiting</u>                                                          | 750,000     |             |             |                  |             |             |
| <u>Equipment Replacement</u>                                               |             |             | 600,000     | 600,000          | 500,000     | 400,000     |
| TOTAL                                                                      | \$6,920,000 | \$8,167,000 | \$1,130,000 | \$ 600,000       | \$ 500,000  | \$ 400,000  |

### 3.5.7 Cash Flow From Operations

Table 3-49 shows the cash flow from operations. It will be noted that the table begins with 1984. Only the last two months of 1984 are included. The reason for beginning the schedule at November 1, 1984 is that all mining schedules, milling schedules, etc., prepared by CAMC have been built around that date. For the purpose of this evaluation it is not necessary to develop and entirely new schedule. It would have been far too time-consuming. The impact of a later start-up is primarily to incur additional holding costs and to slip cash flows back in time. For example, if a start-up were scheduled for the second quarter of 1985, there would not be a great deal of difference in the time pattern of capital expenditure outlays. The working capital would shift into 1985. Cash receipts would be set back several months as would cash operating costs.

The costs in the table do not include depreciation of fixed asset balances presently on CAMC's books, depreciation of pre-start-up capital outlays, interest on present or future debt, Yukon royalty, or federal income taxes.

TABLE 3-49

PRO FORMA CASH FLOW STATEMENTS  
CYPRUS ANVIL MINE

AUGUST 1984 UPDATE

ZINC PRICE = \$ 0.60/POUND

LEAD PRICE = \$ 0.28/POUND

SILVER PRICE = \$ 9.72/TR OZ

ALL DOLLAR AMOUNTS ARE SHOWN IN CANADIAN DOLLARS

| CASH FLOW YEAR               | 1984       | 1985       | 1986       | 1987       | 1988       | 1989       | 1990       | 1991       |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| SALES OF ZINC                | 14945937.  | 139305942. | 162675283. | 147036644. | 168361937. | 174064076. | 171815269. | 127361596. |
| SALES OF LEAD                | 4702560.   | 43946244.  | 53633954.  | 53900609.  | 66743257.  | 62437090.  | 57964044.  | 38297599.  |
| SALES OF SILVER              | 2140658.   | 20742834.  | 22697500.  | 25050098.  | 32440948.  | 28671760.  | 24499300.  | 14837671.  |
| TOTAL SALES                  | 21789155.  | 203995021. | 239006737. | 225987352. | 267546141. | 265172925. | 254278614. | 180496866. |
| -ZINC SMELTING               | 6041887.   | 53378531.  | 61173389.  | 55164253.  | 63906310.  | 65761969.  | 64912362.  | 48005459.  |
| -LEAD SMELTING               | 2500952.   | 22402420.  | 27027676.  | 26897915.  | 33855467.  | 31515407.  | 29745244.  | 19687610.  |
| -SILVER REFINING             | 38541.     | 373456.    | 408648.    | 451005.    | 584071.    | 516210.    | 441088.    | 267139.    |
| -CONCENTRATE FREIGHT, OCEAN  | 1124771.   | 9982370.   | 11639788.  | 10868873.  | 12988812.  | 12875799.  | 12508404.  | 8909726.   |
| -CONCENTRATE FREIGHT, LAND   | 1912111.   | 16970028.  | 19787640.  | 18477083.  | 22080980.  | 21888858.  | 21264286.  | 15146535.  |
| -PORT CHARGES                | 520000.    | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.   |
| -OTHER CONCENTRATE COSTS     | 87565.     | 777156.    | 906239.    | 846308.    | 1011470.   | 1002559.   | 973905.    | 693631.    |
| -MINING COSTS                | 4642844.   | 27651830.  | 30547534.  | 29525638.  | 17890463.  | 11867420.  | 10212920.  | 8215572.   |
| -MILLING COSTS               | 5153890.   | 33264920.  | 34213200.  | 34213200.  | 34213200.  | 34213200.  | 34213200.  | 28862400.  |
| -GENERAL AND ADMINISTRATIVE  | 3127000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   |
| -CALGARY, VANCOUVER OVERHEAD | 300000.    | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1500000.   |
| -CAPITAL EXPENDITURES        | 6920000.   | 8167000.   | 1130000.   | 600000.    | 600000.    | 600000.    | 500000.    | 400000.    |
| (-/+ )WORKING CAPITAL*       | -6000000.  | 0.         | 0.         | 0.         | 0.         | 0.         | 0.         | 10000000.  |
| OPERATING CASH FLOW**        | -16580405. | 19782310.  | 40927621.  | 37698077.  | 69170368.  | 73686504.  | 68262204.  | 49363794.  |

\*INCLUDES \$4,000,000 CREDIT IN 1984 FROM THE CANADIAN GOVERNMENT FOR STRIPPING COSTS

\*\*NOTE: COLUMNS MAY NOT ADD IN LAST DIGIT DUE TO COMPUTER ROUNDING

While the table is largely self-explanatory, a few comments are in order. First we have estimated working capital requirements at between C\$9 and C\$10 million. Based on our discussions with CAMC staff, CAMC estimates \$10 million would be required. We have shown C\$10 million as working capital required in 1984 with a C\$4 million credit from the Canadian government for stripping costs, and recovered in 1991.

The cost of stripping 4,355,000 DMT of waste in November and December 1984 is included as a mining cost in 1984.

#### 3.5.8 Cash Costs Per Pound Of Payable Metal

Table 3-50 shows the cash cost per pound of payable zinc and lead for each year. The method of coproduct cost accounting we have used is to sum the yearly cash costs incurred up to the point at which the two concentrates, zinc and lead, are produced. These costs include mining, milling, general and administrative, townsite, and corporate overhead costs. That sum is then divided by the total pounds of payable zinc and lead produced in that year, to arrive at the cost per pound of zinc or lead. Silver is a byproduct of the lead concentrate and the silver credit is applied against the cost of lead.

TABLE 3-50

CASH COST PER POUND OF PAYABLE METAL\*  
 . AUGUST 1984 UPDATE  
 CYPRUS ANVIL MINE

|                                   | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991  |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|
| ZINC                              |       |       |       |       |       |       |       |
| MINING, MILLING, G&A,<br>TOWNSITE | 0.177 | 0.158 | 0.164 | 0.116 | 0.106 | 0.107 | 0.129 |
| LAND TRANSPORT                    | 0.049 | 0.048 | 0.048 | 0.048 | 0.048 | 0.048 | 0.048 |
| OCEAN TRANSPORT                   | 0.038 | 0.036 | 0.036 | 0.035 | 0.035 | 0.035 | 0.038 |
| SMELTING                          | 0.232 | 0.228 | 0.227 | 0.230 | 0.229 | 0.229 | 0.228 |
|                                   | 0.496 | 0.469 | 0.476 | 0.430 | 0.418 | 0.419 | 0.443 |
| CAPITAL                           | 0.021 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| TOTAL (CANADIAN \$)               | 0.517 | 0.472 | 0.477 | 0.431 | 0.419 | 0.420 | 0.444 |
| TOTAL (U.S. \$)                   | 0.372 | 0.340 | 0.343 | 0.310 | 0.302 | 0.302 | 0.320 |
| LEAD                              |       |       |       |       |       |       |       |
| MINING, MILLING, G&A,<br>TOWNSITE | 0.177 | 0.158 | 0.164 | 0.116 | 0.106 | 0.107 | 0.129 |
| LAND TRANSPORT                    | 0.036 | 0.035 | 0.035 | 0.036 | 0.035 | 0.036 | 0.036 |
| OCEAN TRANSPORT                   | 0.028 | 0.026 | 0.026 | 0.026 | 0.026 | 0.026 | 0.029 |
| SMELTING                          | 0.144 | 0.143 | 0.141 | 0.144 | 0.143 | 0.145 | 0.146 |
|                                   | 0.385 | 0.362 | 0.367 | 0.321 | 0.310 | 0.314 | 0.339 |
| SILVER CREDIT                     | 0.130 | 0.116 | 0.128 | 0.134 | 0.126 | 0.116 | 0.107 |
|                                   | 0.255 | 0.246 | 0.239 | 0.188 | 0.184 | 0.198 | 0.232 |
| CAPITAL                           | 0.021 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| TOTAL (CANADIAN \$)               | 0.276 | 0.248 | 0.241 | 0.189 | 0.185 | 0.199 | 0.234 |
| TOTAL (U.S. \$)                   | 0.199 | 0.179 | 0.173 | 0.136 | 0.133 | 0.143 | 0.168 |

\* C\$1.00 = U.S.\$0.72

### 3.5.9 Discussion Of Results

As can be seen from inspection of Table 3-49 at the selected zinc, lead, and silver prices, and assuming that the power cost of \$0.04/kwhr is achieved, and truck haulage of concentrates from Faro to Skagway is allowed with truck backhaul of operating supplies, the project could begin generating cash in 1985. Recovery of the incremental investment, including working capital, in the project could take place in the first year of full production. In 1988-91, as a result of a large drop in the stripping ratio and a significant increase in the zinc and lead grades of ore milled, the project has the potential to generate significant cash flows.

The discounted cash flow return on investment (ROI) represented by the pre-tax cash flows in Table 3-49 is 137.9 percent. The cumulative net cash flow is C\$342 million. The net present value at a 15 percent discount rate is C\$183 million. These are pre-tax numbers. In view of the tax position of CAMC, it is unlikely that any taxes would be payable for some years, according to Dome management. That being the case, the after-tax ROI would also be very high.

4.0 6% MINE PLAN

#### 4.0 SIX PERCENT CUTOFF GRADE

##### 4.1 Mining

The six percent COG (cutoff grade) mine plan represents a return to the original northwest-to-southeast mining sequence, as opposed to the southeast-to-northwest sequence reviewed in the August 1984 PAH report. Basic information made available to PAH for this review included:

- 1) Phase designs at 1" = 100'.
- 2) Ultimate pit and dump designs @ 1" = 200'.
- 3) Mine production schedule in bar chart form (February 15, 1985).
- 4) Summary of phased reserves in bcy (February 27, 1985).
- 5) Summary of phased reserves in tonnes (March 11, 1985).
- 6) Summary of annual mill feed (February 20, 1985).
- 7) Waste rock breakdown for use in drill and blast forecasting (March 4, 1985).

##### 4.1.1 Mine Plan

In order to develop a production schedule for costing purposes, it was necessary to determine annual ore, waste, and stockpile rehandle quantities. To expedite this exercise, the 20-foot benches listed in the phased reserves were combined

into 40-foot benches. Since the phased reserves in tonnes did not distinguish between waste rock types, the March 4 D&B memo was utilized to pro-rate total waste tonnes to individual rock types. This effort was necessary as equipment productivities (particularly drilling) vary significantly with rock type. These phased reserves (Phases A, JB, B, C, and D) yield the total minable reserves shown in Table 4-1. The remaining ore tonnage as of June 1, 1985 (+4%) of 26,606 ktonnes (including oxide stockpiles) is 1,226 ktonnes less than the 27,832 ktonnes documented in the August 1984 report. The difference is explained by design revisions made to relocate the final pit haul road.

Since the bar chart production schedule gave the timing of benches to be mined from each phase, but did not show the quantities of material involved, the phased reserves were utilized to develop a production schedule for costing purposes. Using the bar chart as a base and the February 20 summary table for annual mill feed, annual quantities of ore and waste (by rock type) were derived. Oxide stockpile inventory as of June 1, 1985 has been assumed to be 1,236 ktonnes, as stated in a footnote in the March 11 memo. Quantities and timing of material into and out of stockpiles has been based on the bar chart. In this mine plan, low grade material (+4%-6%) will be stockpiled for use as mill feed at the end of pit life. Total low grade material (6,831 ktonnes) was derived from the March

TABLE 4-1

## CYPRUS ANVIL

TOTAL MINABLE RESERVES  
(Sum of Phases @ 6% COG)  
Effective June 1, 1985

| Bench | Ore<br>ktonnes | Low Grd.<br>ktonnes | Waste (ktonnes) |       |      |       | W:O<br>Ratio<br>mt/mt | Total<br>Material<br>ktonnes |
|-------|----------------|---------------------|-----------------|-------|------|-------|-----------------------|------------------------------|
|       |                |                     | 1D              | 3D    | 3Dbx | Total |                       |                              |
| 4030  | 0              | 0                   | 0               | 0     | 0    | 0     |                       | 0                            |
| 3990  | 0              | 0                   | 0               | 305   | 0    | 305   |                       | 305                          |
| 3950  | 0              | 0                   | 0               | 694   | 0    | 694   |                       | 694                          |
| 3910  | 0              | 0                   | 369             | 1614  | 213  | 2196  |                       | 2196                         |
| 3870  | 287            | 24                  | 2086            | 2073  | 1821 | 6004  | 20.92                 | 6291                         |
| 3830  | 130            | 207                 | 6198            | 2588  | 2240 | 11233 | 86.41                 | 11363                        |
| 3790  | 261            | 125                 | 7407            | 1699  | 1372 | 10603 | 40.62                 | 10864                        |
| 3750  | 337            | 186                 | 8238            | 816   | 841  | 10081 | 29.91                 | 10418                        |
| 3710  | 492            | 382                 | 8218            | 242   | 636  | 9478  | 19.26                 | 9970                         |
| 3670  | 321            | 443                 | 8345            | 85    | 180  | 9053  | 28.20                 | 9374                         |
| 3630  | 452            | 600                 | 7915            | 0     | 8    | 8523  | 18.86                 | 8975                         |
| 3590  | 1475           | 451                 | 6594            | 0     | 0    | 7045  | 4.78                  | 8520                         |
| 3550  | 1973           | 720                 | 5523            | 0     | 0    | 6243  | 3.16                  | 8216                         |
| 3510  | 3596           | 951                 | 2902            | 0     | 0    | 3853  | 1.07                  | 7449                         |
| 3470  | 4033           | 1003                | 1285            | 0     | 0    | 2288  | 0.57                  | 6321                         |
| 3430  | 3247           | 893                 | 834             | 0     | 0    | 1727  | 0.53                  | 4974                         |
| 3390  | 1354           | 588                 | 660             | 0     | 0    | 1248  | 0.92                  | 2602                         |
| 3350  | 524            | 169                 | 342             | 0     | 0    | 511   | 0.98                  | 1035                         |
| 3310  | 56             | 90                  | 114             | 0     | 0    | 209   | 3.73                  | 255                          |
| Total | 18538          | 6832                | 67035           | 10116 | 7311 | 91294 | 4.92                  | 104832                       |

## AVAILABLE MILL FEED SUMMARY:

|                |                                                  |
|----------------|--------------------------------------------------|
| Ore (+6%)      | = 18,538 ktonnes @ 3.5% Pb, 5.1% Zn, 41.9 g/t Ag |
| LG (+4%-6%)    | = 6,832 ktonnes @ 2.1% Pb, 3.3% Zn, 29.0 g/t Ag  |
| From Pit (+4%) | = 25,370 ktonnes @ 3.1% Pb, 4.6% Zn, 38.4 g/t Ag |
| Oxide Stkpl.   | = 1,236 ktonnes                                  |
| Total Feed     | = 26,606 ktonnes                                 |

11 summary of reserves in tonnes. Grade of this material is based on a weighted average (6%-4%) from the February 27 memo: 2.1% Pb, 3.3% Zn, 20.0 gm/mt Ag. To expedite the scheduling process, the low grade material has been considered as waste when mined and has not been quantified on an annual basis. The production schedule, summarizing pit operations from 1985 through 1990 and low grade material from stockpiles from 1990 through 1992, is shown in Table 4-2. Details for individual years are contained in Appendix B.

Total mill feed over mine life is summarized as follows:

|                                     |                       |
|-------------------------------------|-----------------------|
| Oxide from stockpile                | 1,236 ktonnes         |
| +6% DMF (direct mill feed)          | 14,764 ktonnes        |
| +6% from stockpile (double handled) | 3,775 ktonnes         |
| Lg DMF                              | 602 ktonnes (in 1990) |
| Lg from stockpile (double handled)  | <u>6,229 ktonnes</u>  |
|                                     | 26,606 ktonnes        |

Total material double handled over mine life is 10,004 ktonnes, not including the oxide stockpiles.

Based on the production schedule and the individual phase designs, pit composites were developed to show operating geometry at the end of each calendar year. These composites serve a dual purpose: 1) operating geometry is reviewed and 2) the composites form a basis for measurement of annual haul profiles.

TABLE 4-2

## CYPRUS ANVIL

## PRODUCTION SCHEDULE - 6% MINE PLAN

## SUMMARY

| Mine Production (ktonnes) |       |       |       |      |       |               |             |               |       |       |                         |                        |
|---------------------------|-------|-------|-------|------|-------|---------------|-------------|---------------|-------|-------|-------------------------|------------------------|
| Year                      | Ore   | Waste |       |      |       | Mtl.<br>Total | Mill Feed   |               |       |       | Ore<br>Stkpl<br>Invntry | LG<br>Stkpl<br>Invntry |
|                           |       | 1D    | 3D    | 3Dbx | Total |               | To<br>Stkpl | From<br>Stkpl | DMF   | Total |                         |                        |
|                           |       |       |       |      |       |               |             |               |       |       |                         |                        |
| 1985                      | 417   | 9043  | 620   | 1411 | 11074 | 11491         | 417         | 173           | 0     | 173   | 1480                    | N/A                    |
| 1986                      | 2523  | 20428 | 2654  | 1900 | 24982 | 27505         | 761         | 2241          | 1762  | 4003  | 0                       | N/A                    |
| 1987                      | 4078  | 16887 | 6513  | 2963 | 26363 | 30441         | 17          | 0             | 4061  | 4061  | 17                      | N/A                    |
| 1988                      | 4790  | 19128 | 329   | 784  | 20051 | 24841         | 842         | 124           | 3948  | 4072  | 735                     | N/A                    |
| 1989                      | 4189  | 6711  | 0     | 253  | 6964  | 11153         | 1013        | 885           | 3176  | 4061  | 863                     | N/A                    |
| 1990                      | 2541  | 1860  | 0     | 0    | 1860  | 4401          | 724         | 1642          | 2419  | 4061  | 0                       | 6175                   |
| 1991                      | 0     | 0     | 0     | 0    | 0     | 0             | 0           | 4061          | 0     | 4061  | 0                       | 2114                   |
| 1992                      | 0     | 0     | 0     | 0    | 0     | 0             | 0           | 2114          | 0     | 2114  | 0                       | 0                      |
| Tot.                      | 18538 | 74057 | 10116 | 7311 | 91294 | 109832        | 3774        | 11240         | 15366 | 26606 | 0                       | 0                      |

Figures 4.1 through 4.7 are pit composites as follows:

Figure 4-1 May 31, 1985

Figure 4-2 End of 1985

Figure 4-3 End of 1986

Figure 4-4 End of 1987

Figure 4-5 End of 1988

Figure 4-6 End of 1989

Figure 4-7 1990-Final Pit

All composites are single-line drawings representing bench toes and year-end bench positions are estimates (rough percent of total bench mined). In reviewing the operating geometry, PAH has found the phase designs to be well thought out and no operating problems were noted.

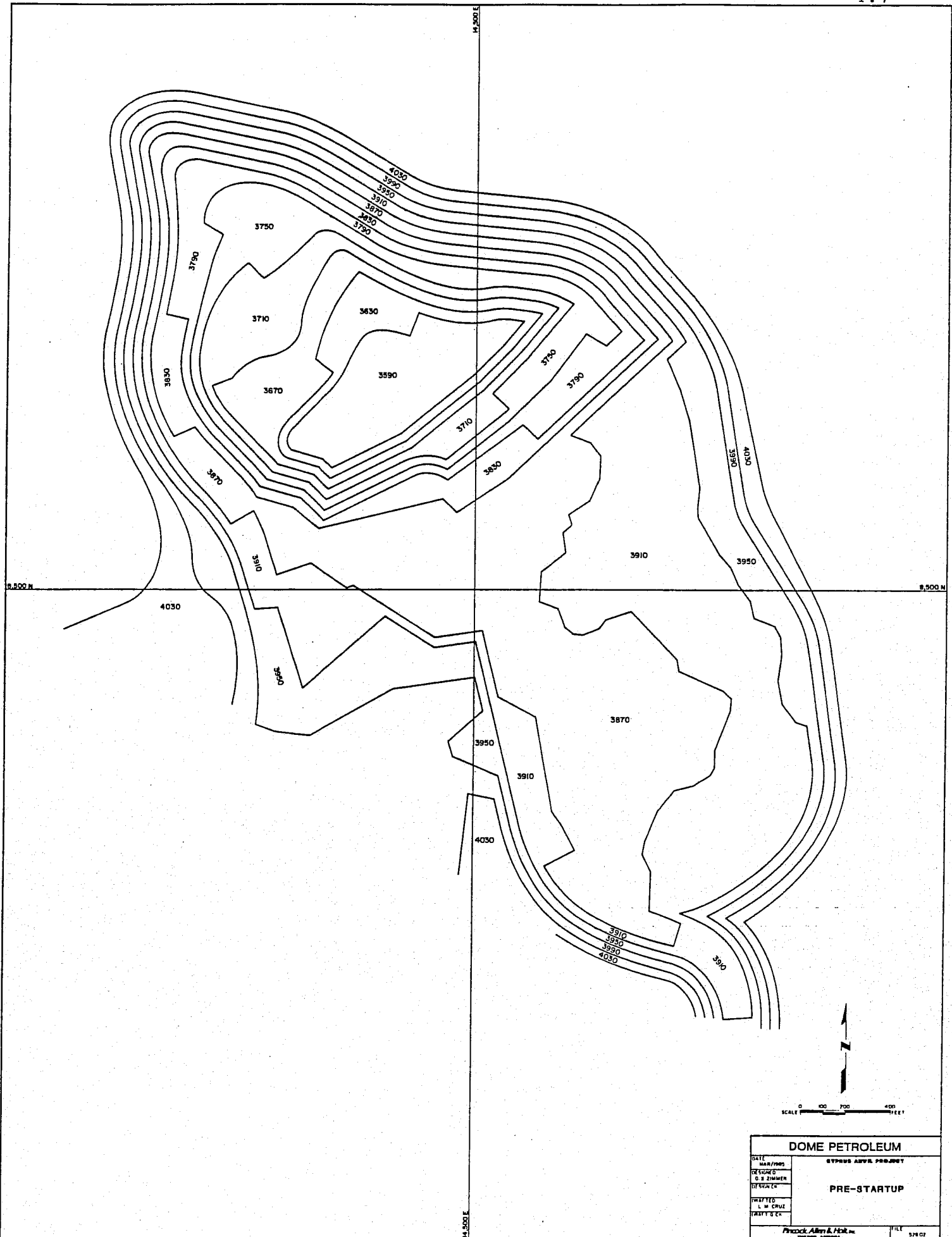
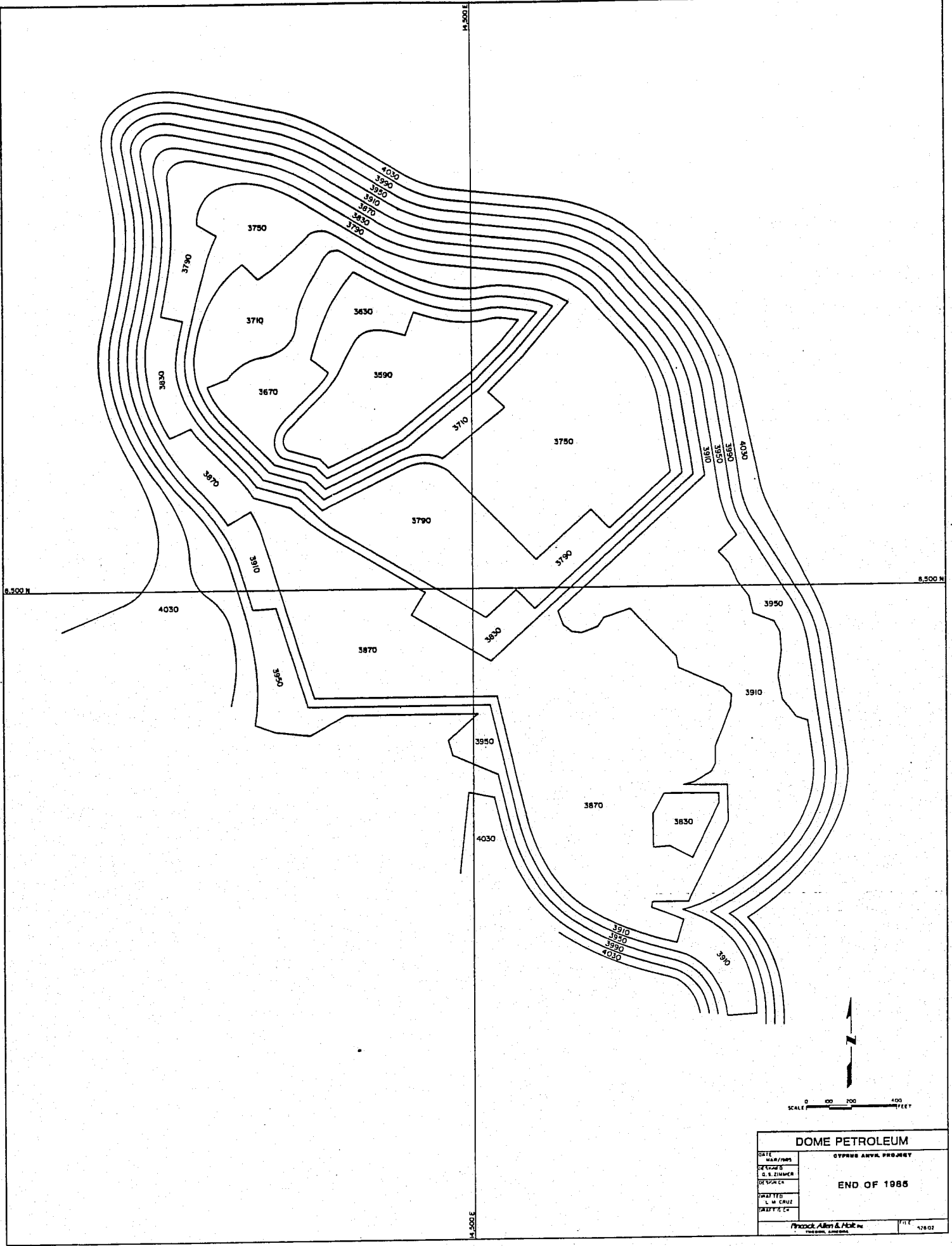


FIGURE 4.1



| DOME PETROLEUM              |              |
|-----------------------------|--------------|
| DATE                        | 01/28/85     |
| MAP/NO.                     | 1            |
| BY                          | L. S. SUMNER |
| CHECKED BY                  | L. M. CRUZ   |
| DATE                        | 01/28/85     |
| END OF 1985                 |              |
| PROJECT: ALBERT & HOLT INC. |              |
| TULSA, OKLAHOMA             |              |
| FILE                        |              |
| 42802                       |              |

FIGURE 4.2

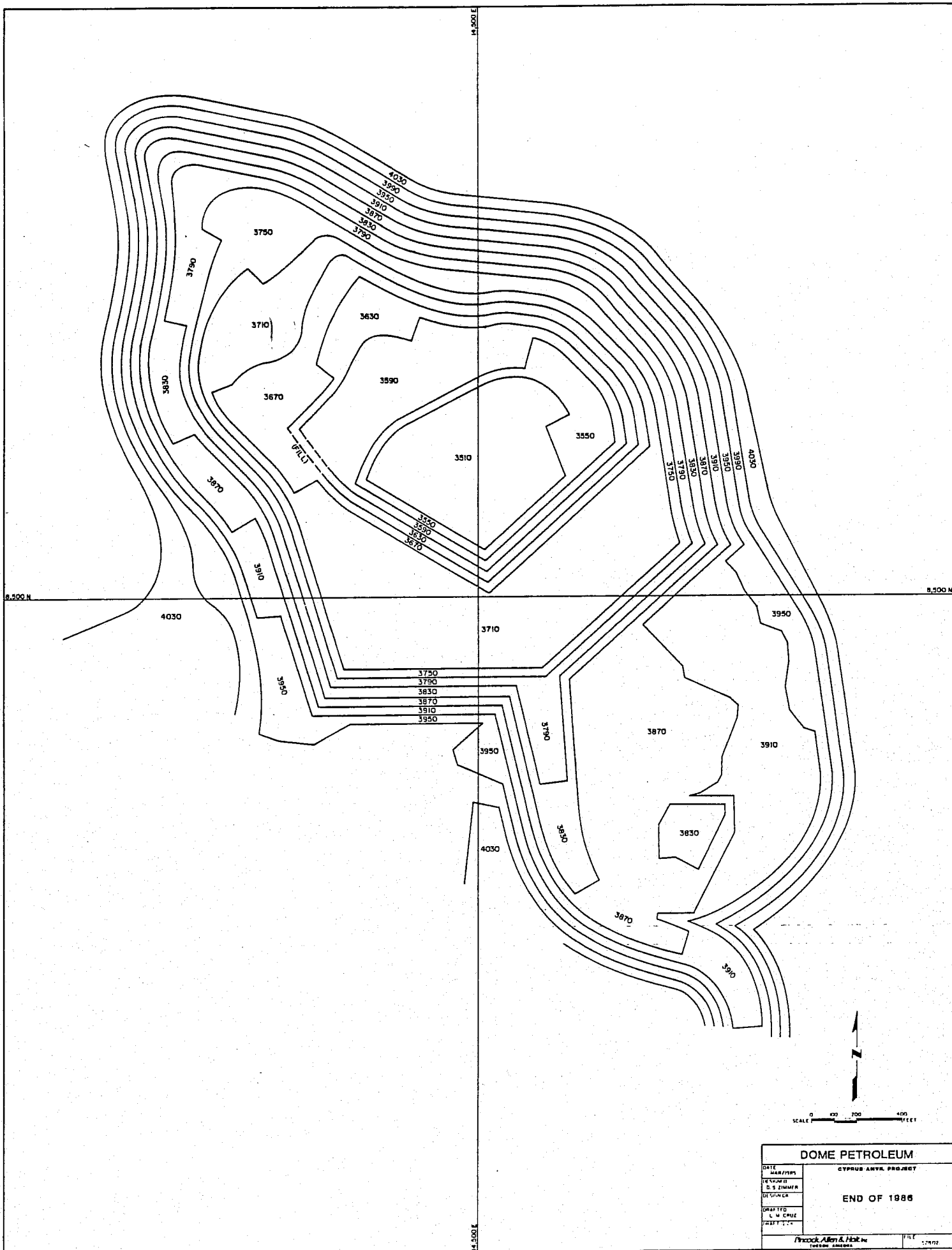
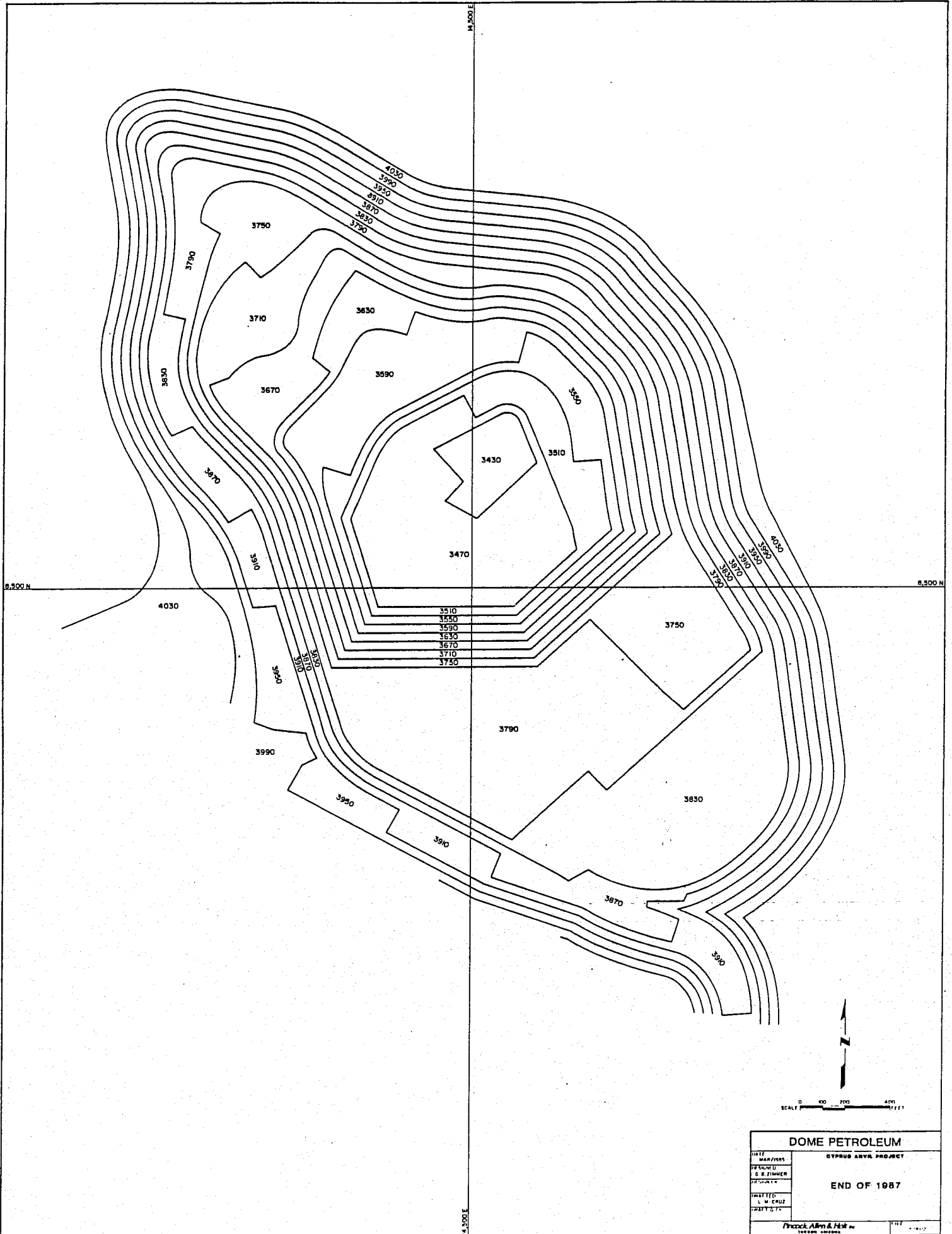


FIGURE 4.3



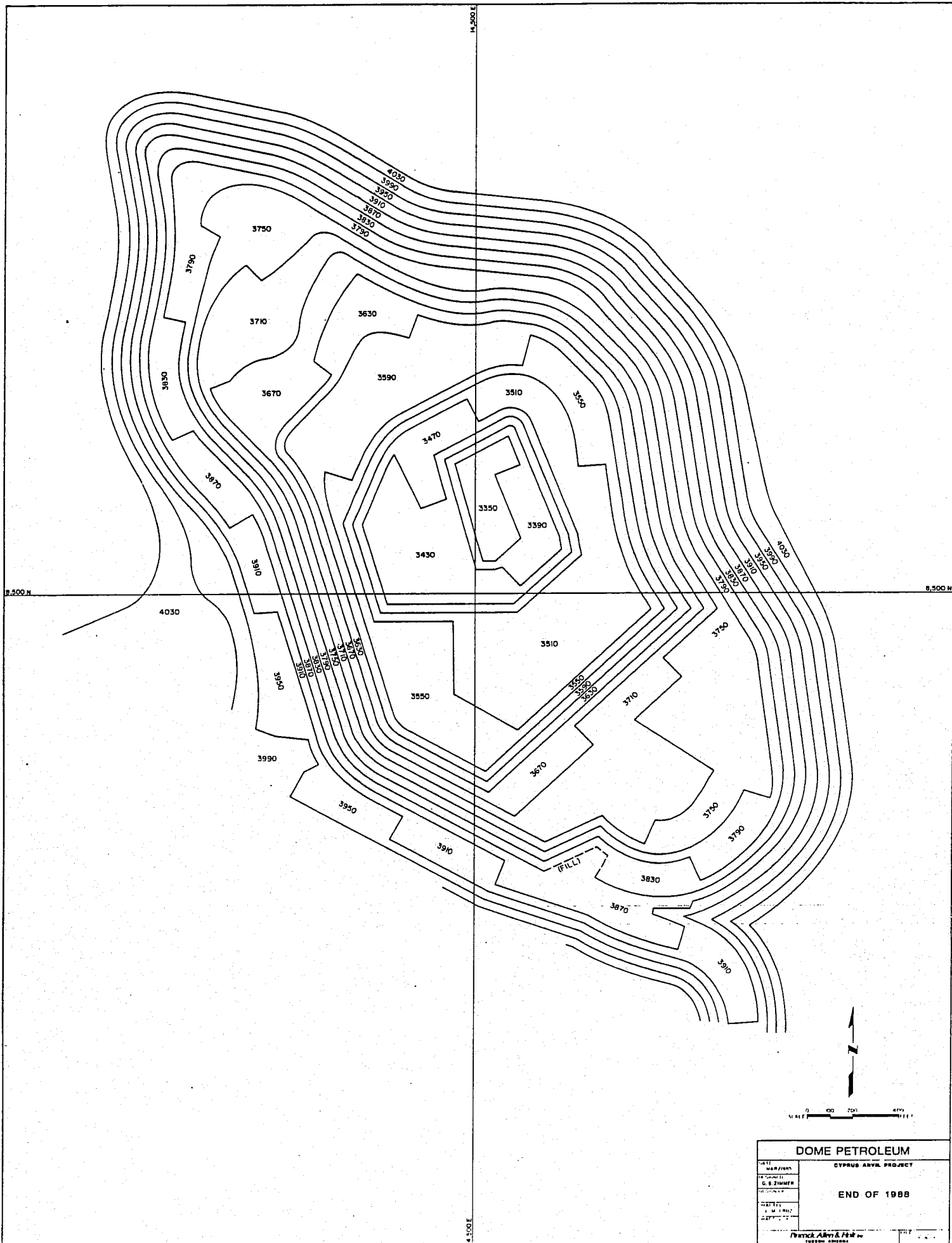
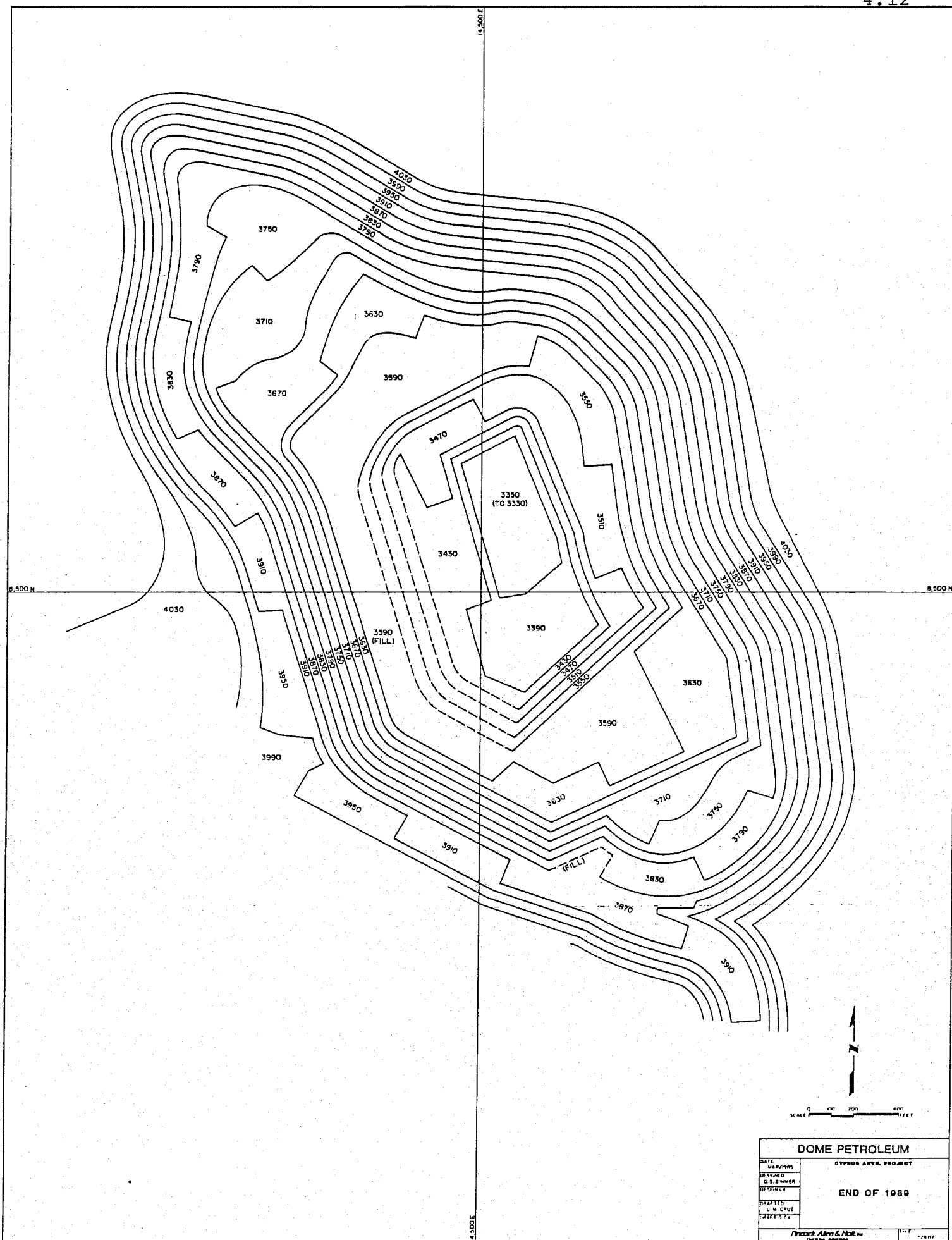


FIGURE 4.5



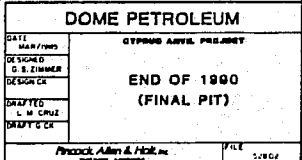


FIGURE 4.7

#### 4.1.2 Equipment Requirements

Equipment productivities in this exercise are based on 525 effective minutes per 12-hour shift, which is derived as follows:

|                                      |                  |
|--------------------------------------|------------------|
| Total time per shift (12 x 60)       | 720 min.         |
| Contractual non-effective time       |                  |
| Lunch - 2 @ 30 min.                  | -60 min.         |
| Work breaks - 2 @ 10 min.            | -20 min.         |
| Work Related: walk around inspection | <u>-10</u> min.  |
| Time remaining (10.5 hours)          | 630 min.         |
| Normal operating delays:             |                  |
| 10 min. per hour remaining           | <u>-105</u> min. |
| Effective minutes/shift              | 525 min.         |

Historical and projected blast hole drilling data was made available to PAH. This information consisted of penetration rates, down-the-hole drilling times, pattern sizes, and powder factors for each rock type. PAH has reviewed this data and concludes that the bottom line, tonnes per operating shift, is within acceptable limits. In some instances, the patterns are slightly larger than PAH would roughly estimate, but efficient cost-effective mining dictates using the largest pattern possible. Using the CAMC parameters, drill productivities and explosives consumptions for each rock type are

summarized in Table 4-3. Using these productivities, Annual drill requirements are derived and summarized in Table 4-4. Note that the mechanical availabilities used are PAH estimates based on current age and declining with future use.

As shown in Table 4-5, 15 yard shovel productivities are a function of material type and truck size. These productivities are utilized in Table 4-6 to determine shovel requirements. In developing Table 4-6, the following assumptions were made:

- 1) The 170 ton trucks will be utilized to fleet capacity on waste in order to take advantage of scale economy.
- 2) The 120 ton trucks would haul ore in the early years plus the incremental waste over the capacity of the 170 ton fleet.
- 3) At the end of pit life, the shovels would load the LG stockpile material, utilizing 120 ton trucks.
- 4) Deep ore toward the end of pit life (1989 and 1990) would be loaded into 170 ton trucks.

As indicated, determination of shovel requirements required interaction with truck requirement calculations, to be described later in this section.

TABLE 4-3

## CYPRUS ANVIL

DRILLING PRODUCTIVITY AND EXPLOSIVES CONSUMPTION  
 9-7/8 inch DRILL  
 (6% NINE PLAN - 525 min/shift)

| Rock Type                 | Ore (dry)    | Ore (wet)  | 1D (dry)     | 1D (wet)   | 3D (dry)     | 3D (wet)   | 3Dbx (dry)   | 3Dbx (wet) |
|---------------------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|
| Rock Density (g/cc)       | 3.93         | 3.93       | 2.60         | 2.60       | 2.75         | 2.75       | 2.71         | 2.71       |
| <b>BLASTING</b>           |              |            |              |            |              |            |              |            |
| Bench Height (meters)     | 6.10         | 6.10       | 12.19        | 12.19      | 12.19        | 12.19      | 12.19        | 12.19      |
| Subgrade (meters)         | 1.22         | 1.22       | 1.52         | 1.52       | 1.52         | 1.52       | 1.52         | 1.52       |
| Hole Depth (meters)       | 7.32         | 7.32       | 13.71        | 13.71      | 13.71        | 13.71      | 13.71        | 13.71      |
| Hole Diameter (mm)        | 250.83       | 250.83     | 250.83       | 250.83     | 250.83       | 250.83     | 250.83       | 280.53     |
| Burden (meters)           | 7.32         | 7.32       | 8.23         | 8.23       | 7.62         | 7.62       | 7.01         | 7.01       |
| Spacing (meters)          | 7.32         | 7.32       | 8.23         | 8.23       | 7.62         | 7.62       | 7.01         | 7.01       |
| Tonnes per Hole           | 1282.85      | 1282.85    | 2146.73      | 2146.73    | 1946.46      | 1946.46    | 1263.34      | 1623.34    |
| Explosives                |              |            |              |            |              |            |              |            |
| Column Load               | AN/FO        | POWERGEL A | AN/FO        | POWERGEL A | AN/FO        | POWERGEL A | AN/FO        | POWERGEL A |
| Density (g/cc)            | 0.84         | 1.25       | 0.84         | 1.25       | 0.84         | 1.25       | 0.84         | 1.25       |
| Quantity (kg)             | 36.74        | 87.54      | 204.12       | 274.42     | 176.90       | 249.48     | 170.10       | 204.12     |
| Powder Factor (g/tonne)   | 28.64        | 68.24      | 95.08        | 127.83     | 90.88        | 128.17     | 104.78       | 125.74     |
| Toe Load                  | 10% AL/AN/FO | POWERGEL C | 10% AL/AN/FO | POWERGEL C | 10% AL/AN/FO | POWERGEL C | 15% AL/AN/FO | POWERGEL C |
| Density (g/cc)            | 0.87         | 1.25       | 0.87         | 1.25       | 0.87         | 1.25       | 0.87         | 1.25       |
| Quantity (kg)             | 72.57        | 86.18      | 136.08       | 136.08     | 170.10       | 158.76     | 183.70       | 199.58     |
| Powder Factor (g/tonne)   | 56.57        | 67.18      | 63.39        | 63.39      | 87.39        | 81.56      | 113.16       | 122.94     |
| Total Load                |              |            |              |            |              |            |              |            |
| Density (g/cc)            | 0.86         | 1.25       | 0.85         | 1.25       | 0.85         | 1.25       | 0.86         | 1.25       |
| Quantity (kg)             | 109.31       | 173.72     | 340.20       | 410.50     | 347.00       | 408.24     | 353.80       | 403.70     |
| Powder Factor (g/tonne)   | 85.21        | 135.42     | 158.47       | 191.22     | 178.27       | 209.73     | 217.95       | 248.68     |
| Powder Rise (meters)      | 2.56         | 2.83       | 8.08         | 6.64       | 8.23         | 6.61       | 8.35         | 6.52       |
| Stemming Height (meters)  | 4.76         | 4.49       | 5.63         | 7.07       | 5.48         | 7.10       | 5.36         | 7.19       |
| <b>DRILL PRODUCTIVITY</b> |              |            |              |            |              |            |              |            |
| Penetration Rate (m/hour) | 21.95        | 21.95      | 45.72        | 45.72      | 29.26        | 29.26      | 10.97        | 10.97      |
| D-T-H Time/Shift (hours)  | 5.76         | 5.76       | 5.63         | 5.63       | 6.11         | 6.11       | 7.20         | 7.20       |
| Meters Drilled per Shift  | 126.43       | 126.43     | 257.40       | 257.40     | 178.78       | 178.78     | 78.98        | 78.98      |
| Tonnes per Meter Drilled  | 175.25       | 175.25     | 156.58       | 156.58     | 141.97       | 141.97     | 118.41       | 118.41     |
| Tonnes per Drill Shift    | 22157.21     | 22157.21   | 40304.26     | 40304.26   | 25381.20     | 25831.20   | 9352.50      | 9352.50    |
| SAY                       | 22200.00     | 22200.00   | 40300.00     | 40300.00   | 25400.00     | 25400.00   | 9400.00      | 9400.00    |

TABLE 4-4

## CYPRUS ANVIL

9-7/8 inch DRILL REQUIREMENTS  
(6% MINE PLAN - 525 min/shift)

|                   | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991 | 1992 |
|-------------------|-------|-------|-------|-------|-------|-------|------|------|
| ORE               |       |       |       |       |       |       |      |      |
| ktonnes           | 417   | 2523  | 4078  | 4790  | 4189  | 2541  | 0    | 0    |
| tonnes/shift      | 22200 | 22200 | 22200 | 22200 | 22200 | 22200 | 0    | 0    |
| Reqd. shifts      | 19    | 114   | 184   | 216   | 189   | 115   | 0    | 0    |
| ROCK TYPE 10      |       |       |       |       |       |       |      |      |
| ktonnes           | 9043  | 20428 | 16887 | 19128 | 6711  | 1860  | 0    | 0    |
| tonnes/shift      | 40300 | 40300 | 40300 | 40300 | 40300 | 40300 | 0    | 0    |
| Reqd. shifts      | 225   | 507   | 419   | 475   | 166   | 46    | 0    | 0    |
| ROCK TYPE 30      |       |       |       |       |       |       |      |      |
| ktonnes           | 620   | 2654  | 6513  | 329   | 0     | 0     | 0    | 0    |
| tonnes/shift      | 25400 | 25400 | 25400 | 25400 | 0     | 0     | 0    | 0    |
| Reqd. shifts      | 24    | 104   | 256   | 13    | 0     | 0     | 0    | 0    |
| ROCK TYPE 30bx    |       |       |       |       |       |       |      |      |
| ktonnes           | 1411  | 1900  | 2963  | 784   | 253   | 0     | 0    | 0    |
| tonnes/shift      | 9400  | 9400  | 9400  | 9400  | 9400  | 0     | 0    | 0    |
| Reqd. shifts      | 150   | 202   | 315   | 83    | 27    | 0     | 0    | 0    |
| DRILLS REQUIRED   |       |       |       |       |       |       |      |      |
| Total shifts      | 418   | 927   | 1174  | 787   | 382   | 161   | 0    | 0    |
| Available shifts  | 411   | 710   | 710   | 710   | 355   | 222   | 0    | 0    |
| Avg. units oprtg. | 1.02  | 1.31  | 1.65  | 1.11  | 1.08  | 0.73  | 0    | 0    |
| % mech. avail.    | 80    | 79    | 78    | 76    | 75    | 75    | 0    | 0    |
| Fleet             | 2     | 3     | 3     | 3     | 3     | 3     | 0    | 0    |
| % utilization     | 51    | 44    | 55    | 37    | 36    | 24    | 0    | 0    |

TABLE 4-5

## CYPRUS ANVIL

LOADING EQUIPMENT PRODUCTIVITY  
(6% MINE PLAN - 525 min/shift)

## 15 yard SHOVEL

|                                | ORE    | STKPL  | 1D     | 3D     | 3Dbx   |
|--------------------------------|--------|--------|--------|--------|--------|
| Rock Type                      |        |        |        |        |        |
| In-situ density (g/cc)         | 3.93   | 3.93   | 2.60   | 2.75   | 2.71   |
| Swell factor                   | 1.30   | 1.30   | 1.30   | 1.30   | 1.30   |
| Loose density (g/cc)           | 3.02   | 3.02   | 2.00   | 2.12   | 2.08   |
| Productivity per Load          |        |        |        |        |        |
| Bucket size (cu.m.)            | 11.47  | 11.47  | 11.47  | 11.47  | 11.47  |
| Bucket fill factor (%)         | 90     | 90     | 90     | 90     | 90     |
| Tonnes per bucket              | 31.18  | 31.18  | 20.65  | 21.88  | 21.47  |
| Truck size (tonnes) (120)      | 108.94 | 108.94 | 108.94 | 108.94 | 108.94 |
| (tonnes) (170)                 | 154.33 | 154.33 | 154.33 | 154.33 | 154.33 |
| Truck load factor (%)          | 92     | 92     | 92     | 92     | 92     |
| Avg. truck load (tonnes) (120) | 100.22 | 100.22 | 100.22 | 100.22 | 100.22 |
| (tonnes) (170)                 | 141.98 | 141.98 | 141.98 | 141.98 | 141.98 |
| Theoretical buckets (120)      | 3.21   | 3.21   | 4.85   | 4.58   | 4.67   |
| (170)                          | 4.55   | 4.55   | 6.88   | 6.49   | 6.61   |
| Actual buckets (120)           | 4      | 4      | 5      | 5      | 5      |
| (170)                          | 5      | 5      | 7      | 7      | 7      |
| Swing time (sec.)              | 30     | 30     | 30     | 30     | 30     |
| Spot time (sec.)               | 10     | 10     | 10     | 10     | 10     |
| Total time (min.) (120)        | 2.17   | 2.17   | 2.67   | 2.67   | 2.67   |
| (170)                          | 2.67   | 2.67   | 3.67   | 3.67   | 3.67   |
| Productivity per Shift         |        |        |        |        |        |
| Effective minutes per shift    | 525    | 525    | 525    | 525    | 525    |
| Loads per shift (120)          | 241.94 | 241.94 | 196.63 | 196.63 | 196.63 |
| (170)                          | 196.63 | 196.63 | 143.05 | 143.05 | 143.05 |
| Tonnes per load (120)          | 100.22 | 100.22 | 100.22 | 100.22 | 100.22 |
| (170)                          | 141.98 | 141.98 | 141.98 | 141.98 | 141.98 |
| Tonnes per shift (120)         | 24247  | 24247  | 19706  | 19706  | 19706  |
| (170)                          | 27918  | 27918  | 20310  | 20310  | 30310  |

TABLE 4-6

## CYPRUS ANVIL

15 yard SHOVEL REQUIREMENTS  
(6% MINE PLAN - 525 min/shift)

|                           | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991  | 1992  |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>ORE</b>                |       |       |       |       |       |       |       |       |
| 120 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 417   | 2523  | 4078  | 4790  | 0     | 0     | 0     | 0     |
| tonnes/shift              | 24247 | 24247 | 24247 | 24247 | 0     | 0     | 0     | 0     |
| Reqd. shifts              | 17    | 104   | 168   | 198   | 0     | 0     | 0     | 0     |
| 170 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 0     | 0     | 0     | 0     | 4189  | 2541  | 0     | 0     |
| tonnes/shift              | 0     | 0     | 0     | 0     | 27918 | 27918 | 0     | 0     |
| Reqd. shifts              | 0     | 0     | 0     | 0     | 150   | 92    | 0     | 0     |
| <b>STOCKPILE REHANDLE</b> |       |       |       |       |       |       |       |       |
| 120 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 0     | 0     | 0     | 0     | 0     | 918   | 4061  | 2114  |
| tonnes/shift              | 0     | 0     | 0     | 0     | 0     | 24247 | 24247 | 24247 |
| Reqd. shifts              | 0     | 0     | 0     | 0     | 0     | 39    | 167   | 87    |
| <b>WASTE</b>              |       |       |       |       |       |       |       |       |
| 120 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 0     | 9979  | 11468 | 4415  | 4679  | 927   | 0     | 0     |
| tonnes/shift              | 0     | 19706 | 19706 | 19706 | 19706 | 19706 | 0     | 0     |
| Reqd. shifts              | 0     | 506   | 582   | 224   | 237   | 48    | 0     | 0     |
| 170 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 11074 | 15003 | 14895 | 15826 | 2285  | 933   | 0     | 0     |
| tonnes/shift              | 20310 | 20310 | 20310 | 20310 | 20310 | 20310 | 0     | 0     |
| Reqd. shifts              | 544   | 739   | 733   | 779   | 113   | 47    | 0     | 0     |
| <b>SHOVELS REQUIRED</b>   |       |       |       |       |       |       |       |       |
| Total reqd. shifts        | 561   | 1349  | 1483  | 1202  | 500   | 226   | 167   | 87    |
| Available shifts          | 411   | 710   | 710   | 710   | 355   | 355   | 355   | 223   |
| Avg. units oprtg.         | 1.36  | 1.90  | 2.09  | 1.69  | 1.41  | 0.64  | 0.47  | 0.39  |
| % mech. avail.            | 80    | 80    | 78    | 76    | 75    | 75    | 75    | 75    |
| Fleet                     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     |
| % utilization             | 45    | 63    | 70    | 56    | 47    | 21    | 16    | 13    |

One of the two ten yard loaders will be used to rehandle stockpile material in conjunction with 120 ton trucks. Loader productivity per operating shift is estimated in Table 4-7 and loader requirements are summarized in Table 4-8. As previously noted, the shovels will replace the loaders on the LG stockpile material at the end of pit life.

Determination of annual truck requirements necessitated the derivation of average haul profiles on an annual basis. Using the mine composite drawings, annual haul distances were measured from the centroid of each bench mined to the respective pit exit point. Measurements for each 40 foot bench consisted of total distance, vertical lift, and vertical fall. For each year, incremental distances to the crusher, stockpile area, and waste dump were added to the in-pit distances. Total distances for each bench were weighted by respective bench tonnes to obtain average annual distances. These measurements and calculations are summarized in Appendix B. To convert the measured annual haul distances to haul profiles, it was assumed that all ramps are at eight percent. To obtain ramp distances, vertical lift and fall were divided by eight percent. To allow for acceleration and deceleration (A/D), 100 feet at each end of the cycle have been isolated. The flat haulage distance has been calculated by difference (total dist. - ramp up - ramp down - 200 feet). The same average truck speeds have been assumed for both 120 and 170 units:

TABLE 4-7

## CYPRUS ANVIL

LOADING EQUIPMENT PRODUCTIVITY  
(6% MINE PLAN - 525 min/shift)

## 10 yard RUBBER TIRED LOADER (FEL)

|                                | ORE  | STKPL  | 1D   | 3D   | 3Dbx |
|--------------------------------|------|--------|------|------|------|
| Rock Type                      |      |        |      |      |      |
| In-situ density (g/cc)         | 3.93 | 3.93   | 2.60 | 2.75 | 2.71 |
| Swell factor                   | 1.30 | 1.30   | 1.30 | 1.30 | 1.30 |
| Loose density (g/cc)           | 3.02 | 3.02   | 2.00 | 2.12 | 2.08 |
| Productivity per Load          |      |        |      |      |      |
| Bucket size (cu.m.)            |      | 7.65   |      |      |      |
| Bucket fill factor (%)         |      | 90     |      |      |      |
| Tonnes per bucket              |      | 20.79  |      |      |      |
| Truck size (tonnes) (120)      |      | 108.94 |      |      |      |
| Truck load factor (%)          |      | 92     |      |      |      |
| Avg. truck load (tonnes) (120) |      | 100.22 |      |      |      |
| Theoretical buckets (120)      |      | 4.82   |      |      |      |
| Actual buckets (120)           |      | 5      |      |      |      |
| Swing time (sec.)              |      | 45     |      |      |      |
| Spot time (sec.)               |      | 10     |      |      |      |
| Total time (min.) (120)        |      | 3.92   |      |      |      |
| Productivity per Shift         |      |        |      |      |      |
| Effective minutes per shift    |      | 525    |      |      |      |
| Loads per shift (120)          |      | 133.93 |      |      |      |
| Tonnes per load (120)          |      | 100.22 |      |      |      |
| Tonnes per shift (120)         |      | 13422  |      |      |      |

TABLE 4-8

## CYPRUS ANVIL

10 yard RUBBER-TIRED LOADER (FEL) REQUIREMENTS  
(6% MINE PLAN - 525 min/shift)

|                           | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991 | 1992 |
|---------------------------|-------|-------|-------|-------|-------|-------|------|------|
| <b>ORE</b>                |       |       |       |       |       |       |      |      |
| 120 ton trucks            |       |       |       |       |       |       |      |      |
| ktonnes                   | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| tonnes/shift              | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Reqd. shifts              | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| <b>STOCKPILE REHANDLE</b> |       |       |       |       |       |       |      |      |
| 120 ton trucks            |       |       |       |       |       |       |      |      |
| ktonnes                   | 190   | 2641  | 406   | 531   | 1291  | 1130  | 0    | 0    |
| tonnes/shift              | 13422 | 13422 | 13422 | 13422 | 13422 | 13422 | 0    | 0    |
| Reqd. shifts              | 14    | 197   | 30    | 40    | 96    | 84    | 0    | 0    |
| <b>WASTE</b>              |       |       |       |       |       |       |      |      |
| 120 ton trucks            |       |       |       |       |       |       |      |      |
| ktonnes                   | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| tonnes/shift              | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Reqd. shifts              | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| <b>LOADERS REQUIRED</b>   |       |       |       |       |       |       |      |      |
| Total reqd. shifts        | 14    | 197   | 30    | 40    | 96    | 84    | 0    | 0    |
| Available shifts          | 411   | 710   | 710   | 710   | 355   | 355   | 0    | 0    |
| Avg. units oprtg.         | 0.03  | 0.28  | 0.04  | 0.06  | 0.27  | 0.24  | 0    | 0    |
| % mech. avail.            | 80    | 80    | 80    | 80    | 80    | 80    | 0    | 0    |
| Fleet                     | 1     | 1     | 1     | 1     | 1     | 1     | 0    | 0    |
| % utilization             | 3     | 29    | 4     | 6     | 27    | 24    | 0    | 0    |

NOTE: Stockpile rehandle tonnages shown above include the stockpile tonnages indicated in the Production Schedule plus an allowance, consisting of 10% of the annual mill feed, for short-term stockpiling adjacent to the crusher to facilitate batch-feeding of ore types.

| <u>Profile Segment</u> | <u>Loaded</u> | <u>Empty</u> |
|------------------------|---------------|--------------|
| Flat                   | 20 mph        | 20 mph       |
| Up @ 8%                | 9 mph         | 15 mph       |
| Down @ 8%              | 15 mph        | 15 mph       |
| A/D                    | 9 mph         | 9 mph        |

For truck scheduling purposes, it was assumed that the eight 170 ton units would be used to capacity to take advantage of economy of scale. As described under 'Shovels' above, 120 ton units were utilized to cover material in excess of the 170 ton fleet capacity. Truck requirements are summarized in Table 4-9 (120 ton) and 4-10 (170 ton).

Auxiliary equipment requirements are summarized in Table 4-11, and are based on operating shift levels parallel to those determined in the August 1984 PAH report. A summary of required equipment operating shifts for all mine equipment is shown in Table 4-12.

#### 4.1.3 Mine Manpower Requirements

Mine operations and maintenance labor requirements were derived in the manner described in Section 3.1.3. Based on fleet sizes and annual material movement dictated by the production schedule, a four-crew operation is required through 1988, followed by a two-crew operation for the balance of mine life. Supervisory and technical personnel requirements are parallel to those developed in the August 1984 report.

TABLE 4-9

## CYPRUS ANVIL

120 ton TRUCK REQUIREMENTS  
(6% MINE PLAN - 525 min/shift)

|                           | 1985  | 1986  | 1987  | 1988  | 1989  | 1990   | 1991   | 1992   |
|---------------------------|-------|-------|-------|-------|-------|--------|--------|--------|
| <b>ORE</b>                |       |       |       |       |       |        |        |        |
| ktonnes                   | 417   | 2523  | 4078  | 4790  | 0     | 0      | 0      | 0      |
| Profile (ft.) flat        | 6019  | 3701  | 4481  | 4001  | 0     | 0      | 0      | 0      |
| up                        | 1775  | 5613  | 6463  | 6263  | 0     | 0      | 0      | 0      |
| down                      | 0     | 1250  | 1250  | 1313  | 0     | 0      | 0      | 0      |
| A/D                       | 200   | 200   | 200   | 200   | 0     | 0      | 0      | 0      |
| Haul time (min.)          | 10.93 | 17.95 | 20.57 | 19.68 | 0     | 0      | 0      | 0      |
| Fixed time (min.)         | 2.17  | 2.17  | 2.17  | 2.17  | 0     | 0      | 0      | 0      |
| Cycle time (min.)         | 13.10 | 20.12 | 22.74 | 21.85 | 0     | 0      | 0      | 0      |
| Loads/525 min. shift      | 40.08 | 26.09 | 23.09 | 24.03 | 0     | 0      | 0      | 0      |
| Tonnes/truck shift        | 4016  | 2615  | 2314  | 2408  | 0     | 0      | 0      | 0      |
| Required shifts           | 104   | 965   | 1762  | 1989  | 0     | 0      | 0      | 0      |
| <b>STACKPILE REHANDLE</b> |       |       |       |       |       |        |        |        |
| ktonnes                   | 173   | 2241  | 0     | 124   | 885   | 1642   | 4061   | 2114   |
| Profile (ft.) flat        | 1400  | 1400  | 0     | 1400  | 1400  | 1400   | 1400   | 1400   |
| up                        | 0     | 0     | 0     | 0     | 0     | 0      | 0      | 0      |
| down                      | 0     | 0     | 0     | 0     | 0     | 0      | 0      | 0      |
| A/D                       | 200   | 200   | 0     | 200   | 200   | 200    | 200    | 200    |
| Haul time (min.)          | 2.10  | 2.10  | 0     | 2.10  | 2.10  | 2.10   | 2.10   | 2.10   |
| Fixed time (min.)         | 3.92  | 3.92  | 0     | 3.92  | 3.92  | 2.17   | 2.17   | 2.17   |
| Cycle time (min.)         | 6.02  | 6.02  | 0     | 6.02  | 6.02  | 4.27   | 4.27   | 4.27   |
| Loads/525 min. shift      | 87.21 | 87.21 | 0     | 87.21 | 87.21 | 122.95 | 122.95 | 122.95 |
| Tonnes/truck shift        | 8740  | 8740  | 0     | 8740  | 8740  | 12322  | 12322  | 12322  |
| Required shifts           | 20    | 256   | 0     | 14    | 101   | 133    | 330    | 172    |
| <b>WASTE</b>              |       |       |       |       |       |        |        |        |
| ktonnes                   | 0     | 9979  | 11468 | 4415  | 4679  | 927    | 0      | 0      |
| Profile (ft.) flat        | 0     | 4187  | 3296  | 3700  | 3381  | 3831   | 0      | 0      |
| up                        | 0     | 5350  | 5525  | 6113  | 5325  | 9350   | 0      | 0      |
| down                      | 0     | 50    | 50    | 38    | 0     | 413    | 0      | 0      |
| A/D                       | 0     | 200   | 200   | 200   | 200   | 200    | 0      | 0      |
| Haul time (min.)          | 0     | 16.16 | 15.50 | 17.12 | 14.99 | 24.38  | 0      | 0      |
| Fixed time (min.)         | 0     | 2.67  | 2.67  | 2.67  | 2.67  | 2.67   | 0      | 0      |
| Cycle time (min.)         | 0     | 18.83 | 27.88 | 19.79 | 17.66 | 27.05  | 0      | 0      |
| Loads/525 min. shift      | 0     | 27.88 | 18.83 | 26.53 | 29.73 | 19.41  | 0      | 0      |
| Tonnes/truck shift        | 0     | 2794  | 1887  | 2659  | 2979  | 1945   | 0      | 0      |
| Required shifts           | 0     | 3572  | 6077  | 1660  | 1571  | 477    | 0      | 0      |
| <b>TRUCKS REQUIRED</b>    |       |       |       |       |       |        |        |        |
| Total reqd. shifts        | 124   | 4793  | 7839  | 3663  | 1672  | 610    | 330    | 172    |
| Available shifts          | 412   | 710   | 710   | 710   | 355   | 355    | 355    | 224    |
| Avg. units oprtg.         | .30   | 6.75  | 11.04 | 5.16  | 4.71  | 1.72   | 0.93   | 0.77   |
| % mech. avail.            | 75    | 75    | 75    | 74    | 73    | 71     | 71     | 71     |
| Fleet                     | 1     | 10    | 16    | 8     | 7     | 3      | 2      | 2      |
| % utilization             | 30    | 38    | 69    | 65    | 67    | 57     | 47     | 47     |

NOTE: For manpower calculation purposes after 1987, it has been assumed that a fleet of 16 out of 22 trucks will be maintained.

TABLE 4-10

## CYPRUS ANVIL

170 ton TRUCK REQUIREMENTS  
(6% MINE PLAN - 525 min/shift)

|                           | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991 | 1992 |
|---------------------------|-------|-------|-------|-------|-------|-------|------|------|
| <b>ORE</b>                |       |       |       |       |       |       |      |      |
| ktonnes                   | 0     | 0     | 0     | 0     | 4189  | 2541  | 0    | 0    |
| Profile (ft.) flat        | 0     | 0     | 0     | 0     | 4382  | 4724  | 0    | 0    |
| up                        | 0     | 0     | 0     | 0     | 6538  | 6400  | 0    | 0    |
| down                      | 0     | 0     | 0     | 0     | 1363  | 1577  | 0    | 0    |
| A/D                       | 0     | 0     | 0     | 0     | 200   | 200   | 0    | 0    |
| Haul time (min.)          | 0     | 0     | 0     | 0     | 20.76 | 21.18 | 0    | 0    |
| Fixed time (min.)         | 0     | 0     | 0     | 0     | 2.67  | 2.67  | 0    | 0    |
| Cycle time (min.)         | 0     | 0     | 0     | 0     | 23.43 | 23.85 | 0    | 0    |
| Loads/525 min. shift      | 0     | 0     | 0     | 0     | 22.41 | 22.01 | 0    | 0    |
| Tonnes/truck shift        | 0     | 0     | 0     | 0     | 3181  | 3125  | 0    | 0    |
| Required shifts           | 0     | 0     | 0     | 0     | 1317  | 813   | 0    | 0    |
| <b>STOCKPILE REHANDLE</b> |       |       |       |       |       |       |      |      |
| ktonnes                   | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Profile (ft.) flat        | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| up                        | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| down                      | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| A/D                       | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Haul time (min.)          | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Fixed time (min.)         | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Cycle time (min.)         | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Loads/525 min. shift      | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Tonnes/truck shift        | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Required shifts           | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| <b>WASTE</b>              |       |       |       |       |       |       |      |      |
| ktonnes                   | 11074 | 15003 | 14895 | 15826 | 2285  | 933   | 0    | 0    |
| Profile (ft.) flat        | 4249  | 4187  | 3296  | 3700  | 3381  | 3831  | 0    | 0    |
| up                        | 3488  | 5350  | 5525  | 6113  | 5325  | 9350  | 0    | 0    |
| down                      | 0     | 50    | 50    | 38    | 0     | 413   | 0    | 0    |
| A/D                       | 200   | 200   | 200   | 200   | 200   | 200   | 0    | 0    |
| Haul time (min.)          | 12.37 | 16.16 | 15.50 | 17.12 | 14.99 | 24.33 | 0    | 0    |
| Fixed time (min.)         | 3.67  | 3.67  | 3.67  | 3.67  | 3.67  | 3.67  | 0    | 0    |
| Cycle time (min.)         | 16.04 | 19.83 | 19.17 | 17.79 | 18.66 | 28.05 | 0    | 0    |
| Loads/525 min. shift      | 32.73 | 26.48 | 27.39 | 29.51 | 28.14 | 18.72 | 0    | 0    |
| Tonnes/truck shift        | 4647  | 3759  | 3888  | 4190  | 3995  | 2657  | 0    | 0    |
| Required shifts           | 2383  | 3991  | 3831  | 3777  | 572   | 351   | 0    | 0    |
| <b>TRUCKS REQUIRED</b>    |       |       |       |       |       |       |      |      |
| Total reqd. shifts        | 2383  | 3991  | 3831  | 3777  | 1889  | 1164  | 0    | 0    |
| Available shifts          | 412   | 710   | 710   | 710   | 355   | 222   | 0    | 0    |
| Avg. units oprtg.         | 5.78  | 5.62  | 5.40  | 5.32  | 5.32  | 5.24  | 0    | 0    |
| % mech. avail.            | 76    | 75    | 73    | 70    | 70    | 70    | 0    | 0    |
| Fleet                     | 8     | 8     | 8     | 8     | 8     | 8     | 0    | 0    |
| % utilization             | 72    | 70    | 68    | 67    | 67    | 66    | 0    | 0    |

NOTE: Available fleet of 8 trucks operated at capacity for duration of pit life.

TABLE 4-11

## CYPRUS ANVIL

AUXILIARY EQUIPMENT REQUIREMENTS  
(6% MINE PLAN - 525 min/shift & 584 min/shift)

|                              | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|------------------------------|------|------|------|------|------|------|------|------|
| <b>FEL'S REQUIRED</b>        |      |      |      |      |      |      |      |      |
| Total shifts                 | 150  | 260  | 210  | 210  | 100  | 100  | 100  | 60   |
| Available shifts             | 412  | 710  | 710  | 710  | 355  | 355  | 355  | 206  |
| Avg. units oprtg.            | 0.36 | 0.37 | 0.30 | 0.30 | 0.28 | 0.28 | 0.28 | 0.29 |
| % mech. avail.               | 60   | 60   | 60   | 60   | 60   | 60   | 60   | 60   |
| Fleet                        | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    |
| % utilization                | 36   | 30   | 30   | 30   | 28   | 28   | 28   | 29   |
| <b>RTD'S REQUIRED</b>        |      |      |      |      |      |      |      |      |
| Total shifts                 | 210  | 365  | 365  | 365  | 150  | 150  | 150  | 95   |
| Available shifts             | 412  | 710  | 710  | 710  | 355  | 355  | 355  | 206  |
| Avg. units oprtg.            | 0.51 | 0.51 | 0.51 | 0.51 | 0.42 | 0.42 | 0.42 | 0.46 |
| % mech. avail.               | 65   | 64   | 63   | 63   | 80   | 80   | 80   | 80   |
| Fleet                        | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    |
| % utilization                | 51   | 51   | 51   | 51   | 42   | 42   | 42   | 46   |
| <b>D-9 DOZERS REQUIRED</b>   |      |      |      |      |      |      |      |      |
| Total shifts                 | 490  | 850  | 850  | 850  | 100  | 100  | 100  | 60   |
| Available shifts             | 412  | 710  | 710  | 710  | 355  | 355  | 355  | 206  |
| Avg. units oprtg.            | 1.19 | 1.20 | 1.20 | 1.20 | 0.28 | 0.28 | 0.28 | 0.29 |
| % mech. avail.               | 66   | 65   | 65   | 65   | 75   | 75   | 75   | 75   |
| Fleet                        | 2    | 2    | 2    | 2    | 1    | 1    | 1    | 1    |
| % utilization                | 59   | 60   | 60   | 60   | 28   | 28   | 28   | 29   |
| <b>D-8 DOZERS REQUIRED</b>   |      |      |      |      |      |      |      |      |
| Total shifts                 | 245  | 425  | 425  | 425  | 210  | 210  | 210  | 130  |
| Available shifts             | 412  | 710  | 710  | 710  | 355  | 355  | 355  | 206  |
| Avg. units oprtg.            | 0.59 | 0.60 | 0.60 | 0.60 | 0.59 | 0.59 | 0.59 | 0.63 |
| % mech. avail.               | 67   | 66   | 65   | 65   | 75   | 75   | 75   | 72   |
| Fleet                        | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    |
| % utilization                | 59   | 60   | 60   | 60   | 59   | 59   | 59   | 63   |
| <b>GRADERS REQUIRED</b>      |      |      |      |      |      |      |      |      |
| Total shifts                 | 700  | 1200 | 1200 | 1200 | 300  | 300  | 300  | 190  |
| Available shifts             | 412  | 710  | 710  | 710  | 355  | 355  | 355  | 206  |
| Avg. units oprtg.            | 1.70 | 1.69 | 1.69 | 1.69 | 0.85 | 0.85 | 0.85 | 0.92 |
| % mech. avail.               | 57   | 56   | 56   | 56   | 42   | 42   | 42   | 46   |
| Fleet                        | 3    | 3    | 3    | 3    | 2    | 2    | 2    | 2    |
| % utilization                | 57   | 56   | 56   | 56   | 42   | 42   | 42   | 46   |
| <b>WATER TRUCKS REQUIRED</b> |      |      |      |      |      |      |      |      |
| Total shifts                 | 175  | 300  | 300  | 300  | 150  | 150  | 150  | 95   |
| Available shifts             | 412  | 710  | 710  | 710  | 355  | 355  | 355  | 206  |
| Avg. units oprtg.            | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.46 |
| % mech. avail.               | 74   | 73   | 72   | 72   | 71   | 70   | 70   | 70   |
| Fleet                        | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    |
| % utilization                | 42   | 42   | 42   | 42   | 42   | 42   | 42   | 46   |

## REPLACEMENTS REQUIRED:

|             |                               |
|-------------|-------------------------------|
| R.T.D.      | buy 1 in 1988 for use in 1989 |
| D-9 Dozer   | buy 1 in 1988 for use in 1989 |
| D-8 Dozer   | buy 1 in 1988 for use in 1989 |
| Grader(16G) | buy 1 in 1988 for use in 1989 |

TABLE 4-12

CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT SHIFT REQUIREMENTS

| PERIOD          | PRIMARY UNITS |        |        |         |         | AUXILIARY UNITS |        |       |       |        |       |
|-----------------|---------------|--------|--------|---------|---------|-----------------|--------|-------|-------|--------|-------|
|                 | Drill         | Shovel | F.E.L. | Truck   | Truck   | F.E.L.          | R.T.D. | Dozer | Dozer | Road   | Water |
|                 | 9 7/8         | 15 yd. | Stpl.  | 120 ton | 170 ton | 10 yd.          |        | D-9   | D-8   | Grader | Truck |
| 1985 (JUNE-DEC) | 418           | 561    | 14     | 124     | 2383    | 150             | 210    | 490   | 245   | 700    | 175   |
| 1986            | 927           | 1349   | 197    | 4793    | 3991    | 260             | 365    | 850   | 425   | 1200   | 300   |
| 1987            | 1174          | 1483   | 30     | 7839    | 3831    | 210             | 365    | 850   | 425   | 1200   | 300   |
| 1988            | 787           | 1202   | 40     | 3663    | 3777    | 210             | 365    | 850   | 425   | 1200   | 300   |
| 1989            | 382           | 500    | 96     | 1672    | 1889    | 100             | 150    | 100   | 210   | 300    | 150   |
| 1990            | 161           | 226    | 84     | 610     | 1164    | 100             | 150    | 100   | 210   | 300    | 150   |
| 1991            | 0             | 167    | 0      | 330     | 0       | 100             | 150    | 100   | 210   | 300    | 150   |
| 1992 (JAN-AUG)  | 0             | 87     | 0      | 172     | 0       | 60              | 95     | 60    | 130   | 190    | 95    |

Manpower requirements are detailed in Appendix B and are summarized as follows:

| <u>Year</u> | <u>Operators</u> | <u>Maintenance</u> | <u>Supervisory</u> | <u>Total</u> |
|-------------|------------------|--------------------|--------------------|--------------|
| 1985        | 80               | 82                 | 28                 | 190          |
| 1986        | 117              | 111                | 30                 | 258          |
| 1987        | 138              | 129                | 30                 | 297          |
| 1988        | 102              | 112                | 30                 | 244          |
| 1989        | 85               | 57                 | 19                 | 161          |
| 1990        | 53               | 39                 | 19                 | 111          |
| 1991        | 26               | 24                 | 7                  | 57           |
| 1992        | 26               | 21                 | 7                  | 54           |

#### 4.1.4 Mine Operating Costs

The mine operating costs developed herein incorporate the following changes from the August 1984 report:

- 1) Hourly rates for mine operations personnel on a "hot change" basis have been increased by \$0.92 over the base rate.
- 2) Hourly rates for mine operations and mine maintenance personnel on a rotating shift basis have been increased by \$1.00 over the base rate to cover weekend and shift premiums.
- 3) The cost per man per year for hourly mine operations and mine maintenance personnel has been based on 2,042 hours.
- 4) Fringe benefits for hourly personnel have been based on 1,884 hours per year (157 shifts).
- 5) Power costs are \$0.04 per kwh.
- 6) Diesel fuel cost is \$0.40 per liter.

- 7) Tire costs are current quotes obtained by CAMC as follows:

|            |          |
|------------|----------|
| 36 x 51    | \$11,600 |
| 30 x 51    | 9,100    |
| 18 x 33    | 2,300    |
| 37.25 x 35 | 9,000    |
| 29.5 x 35  | 5,000    |

- 8) Explosives costs are based on the new CIL schedule.

Based on the above material costs, an equipment operating cost per shift was developed for each type of mine equipment. These costs are summarized in Tables 4-13 through 4-23.

Mine operating and maintenance labor costs have been developed for each year, based on the hourly rates and hours/man/year referred to above. These calculations are contained in Appendix B. Annual operating labor costs have been assimilated by mining function and divided by total tonnage moved to obtain functional unit costs on an annual basis. These calculations are also contained in Appendix B.

Functional unit costs for mine maintenance are based on the equipment operating cost per shift (Tables 4-13 through 4-23) and annual equipment shifts required (Table 4-12). The equipment shift costs shown in Tables 4-13 through 4-23 are

CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

Drill 9 7/8 inch

|                   |           |    |        |
|-------------------|-----------|----|--------|
| LIST PRICE        | \$x1000   | \$ | 1580.0 |
| BIT COST          |           | \$ | 4018   |
| BIT LIFE HRS      |           |    | 137    |
| POWER CONSUMPTION | (kWhr/hr) |    | 125    |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Power cost \$0.040/KWhr                                      | \$ | 5.00  |
| Bit Cost                                                     | \$ | 29.33 |
| Drill Pipe & Stabilizer<br>@ 1/4 Bit Cost                    | \$ | 7.33  |
| Repair Parts<br>(0.0372 x Delivered<br>Cost in \$x1000)      | \$ | 58.78 |
| Maintenance Labor<br>(0.0200 x Delivered<br>Cost in \$x1000) | \$ | 31.60 |
| OPERATING HRS./SHIFT                                         |    | 10.5  |
| DRILLING HRS./SHIFT                                          |    | 6.0   |

COST BREAKDOWN (\$/Shift)

|                                            |    |        |
|--------------------------------------------|----|--------|
| Bit Cost @6.00hrs./shift                   | \$ | 175.98 |
| Drill Pipe & Stabilizer<br>@6.00hrs./shift | \$ | 44.00  |
| Repair Parts @10.50hrs/shft                | \$ | 617.19 |
| Maintenance Labor<br>@10.50hrs./shift      | \$ | 331.80 |
| Power Cost @10.50 hrs.shift                | \$ | 52.50  |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

Shovel 15 yd

|                   |           |    |        |
|-------------------|-----------|----|--------|
| LIST PRICE        | \$x1000   | \$ | 3240.0 |
| POWER CONSUMPTION | (kWhr/hr) |    | 550    |

COST BREAKDOWN (\$/hr.)

|            |              |    |       |
|------------|--------------|----|-------|
| Power cost | \$0.040/KWhr | \$ | 22.00 |
|------------|--------------|----|-------|

|                     |    |        |  |
|---------------------|----|--------|--|
| Repair Parts        |    |        |  |
| (0.0480 x Delivered |    |        |  |
| Cost in \$x1000)    | \$ | 155.52 |  |

|                     |    |       |  |
|---------------------|----|-------|--|
| Maintenance Labor   |    |       |  |
| (0.0170 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 55.08 |  |

|                      |  |  |      |
|----------------------|--|--|------|
| OPERATING HRS./SHIFT |  |  | 10.5 |
|----------------------|--|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 578.34 |
|-------------------|----|--------|

|                     |    |         |
|---------------------|----|---------|
| Parts & Consumables | \$ | 1863.96 |
|                     |    | -----   |

|                            |    |         |
|----------------------------|----|---------|
| TOTAL OPERATING COST/SHIFT | \$ | 2442.30 |
|----------------------------|----|---------|

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

F.E.L.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 897.4 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 861.4 |
| FUEL CONSUMPTION LIT./HR   |         |    | 85    |
| COST PER TIRE              |         | \$ | 9000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 5000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 34.00 |
| Tire Cost                                                    | \$ | 7.20  |
| Repair Parts<br>(0.0648 x Delivered<br>Cost in \$x1000)      | \$ | 55.82 |
| Maintenance Labor<br>(0.0270 x Delivered<br>Cost in \$x1000) | \$ | 23.26 |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 10.5 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 244.23  |
| Parts & Consumables        | \$ | 1018.71 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1262.94 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

120 - Ton truck

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 939.1 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 884.5 |
| FUEL CONSUMPTION LIT./HR   |         |    | 60    |
| COST PER TIRE              |         | \$ | 9100  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3500  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 24.00 |
| Tire Cost                                                    | \$ | 15.60 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 38.21 |
| Maintenance Labor<br>(0.0190 x Delivered<br>Cost in \$x1000) | \$ | 16.81 |

OPERATING HRS./SHIFT 10.5

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 176.50 |
| Parts & Consumables        | \$ | 817.01 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 993.51 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

170 - Ton truck

|                            |         |    |        |
|----------------------------|---------|----|--------|
| LIST PRICE                 | \$x1000 | \$ | 1279.6 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 1210.0 |
| FUEL CONSUMPTION LIT./HR   |         |    | 100    |
| COST PER TIRE              |         | \$ | 11600  |
| NUMBER OF TIRES            |         |    | 6      |
| TIRE LIFE HRS              |         |    | 3500   |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 40.00 |
| Tire Cost                                                    | \$ | 19.89 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 52.27 |
| Maintenance Labor<br>(0.0190 x Delivered<br>Cost in \$x1000) | \$ | 22.99 |

OPERATING HRS./SHIFT 10.5

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 241.40  |
| Parts & Consumables        | \$ | 1177.69 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1419.09 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

F.E.L.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 897.4 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 861.4 |
| FUEL CONSUMPTION LIT./HR   |         |    | 85    |
| COST PER TIRE              |         | \$ | 9000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 5000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 34.00 |
| Tire Cost                                                    | \$ | 7.20  |
| Repair Parts<br>(0.0648 x Delivered<br>Cost in \$x1000)      | \$ | 55.82 |
| Maintenance Labor<br>(0.0270 x Delivered<br>Cost in \$x1000) | \$ | 23.26 |

OPERATING HRS./SHIFT 10.5

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 244.23  |
| Parts & Consumables        | \$ | 1018.71 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1262.94 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

R.T.D.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 318.6 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 298.6 |
| FUEL CONSUMPTION LIT./HR   |         |    | 25    |
| COST PER TIRE              |         | \$ | 5000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 3000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 10.00 |
| Tire Cost                                                    | \$ | 6.67  |
| Repair Parts<br>(0.0460 x Delivered<br>Cost in \$x1000)      | \$ | 13.74 |
| Maintenance Labor<br>(0.0240 x Delivered<br>Cost in \$x1000) | \$ | 7.17  |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 10.5 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 75.29  |
| Parts & Consumables        | \$ | 319.31 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 394.60 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

## D9 Dozer

|                  |         |    |       |
|------------------|---------|----|-------|
| LIST PRICE       | \$x1000 | \$ | 550.0 |
| FUEL CONSUMPTION | LIT./HR |    | 35    |

COST BREAKDOWN (\$/hr.)

|           |               |    |       |
|-----------|---------------|----|-------|
| Fuel cost | \$0.400/litre | \$ | 14.00 |
|-----------|---------------|----|-------|

|                     |    |       |  |
|---------------------|----|-------|--|
| Repair Parts        |    |       |  |
| (0.0700 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 38.50 |  |

|                     |    |       |  |
|---------------------|----|-------|--|
| Maintenance Labor   |    |       |  |
| (0.0340 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 18.70 |  |

|                      |  |  |      |
|----------------------|--|--|------|
| OPERATING HRS./SHIFT |  |  | 10.5 |
|----------------------|--|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 196.35 |
|-------------------|----|--------|

|                     |    |        |
|---------------------|----|--------|
| Parts & Consumables | \$ | 551.25 |
|---------------------|----|--------|

|                            |    |        |
|----------------------------|----|--------|
| TOTAL OPERATING COST/SHIFT | \$ | 747.60 |
|----------------------------|----|--------|

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

## D8 Dozer

|                  |         |    |       |
|------------------|---------|----|-------|
| LIST PRICE       | \$x1000 | \$ | 390.0 |
| FUEL CONSUMPTION | LIT./HR |    | 30    |

COST BREAKDOWN (\$/hr.)

|           |               |    |       |
|-----------|---------------|----|-------|
| Fuel cost | \$0.400/litre | \$ | 12.00 |
|-----------|---------------|----|-------|

|                     |    |       |  |
|---------------------|----|-------|--|
| Repair Parts        |    |       |  |
| (0.0700 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 27.30 |  |

|                     |    |       |  |
|---------------------|----|-------|--|
| Maintenance Labor   |    |       |  |
| (0.0360 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 14.04 |  |

|                      |  |  |      |
|----------------------|--|--|------|
| OPERATING HRS./SHIFT |  |  | 10.5 |
|----------------------|--|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 147.42 |
|-------------------|----|--------|

|                     |    |        |
|---------------------|----|--------|
| Parts & Consumables | \$ | 412.65 |
|---------------------|----|--------|

|                            |    |        |
|----------------------------|----|--------|
| TOTAL OPERATING COST/SHIFT | \$ | 560.07 |
|----------------------------|----|--------|

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

## Road Grader

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 344.9 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 331.1 |
| FUEL CONSUMPTION LIT./HR   |         |    | 25    |
| COST PER TIRE              |         | \$ | 2300  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 10.00 |
| Tire Cost                                                    | \$ | 4.60  |
| Repair Parts<br>(0.0696 x Delivered<br>Cost in \$x1000)      | \$ | 23.04 |
| Maintenance Labor<br>(0.0260 x Delivered<br>Cost in \$x1000) | \$ | 8.61  |
| OPERATING HRS./SHIFT                                         |    | 10.5  |

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 90.41  |
| Parts & Consumables        | \$ | 395.22 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 485.63 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

## Water Truck

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 700.5 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 664.5 |
| FUEL CONSUMPTION LIT./HR   |         |    | 60    |
| COST PER TIRE              |         | \$ | 6000  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3500  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 24.00 |
| Tire Cost                                                    | \$ | 10.29 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 28.71 |
| Maintenance Labor<br>(0.0270 x Delivered<br>Cost in \$x1000) | \$ | 17.94 |
| OPERATING HRS./SHIFT                                         |    | 10.5  |

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 188.37 |
| Parts & Consumables        | \$ | 661.50 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 849.87 |

average costs over equipment life. These costs have been adjusted for equipment age so that costs in early years (newer equipment) are lower than in later years. Annual maintenance labor unit costs are shown in Appendix B.

Functional unit costs for repair parts and consumables have been similarly developed on a required operating shift and cost per shift basis. Costs for blasting consumables are based on the powder factors shown in Table 4-3 and the annual tonnes by rock type dictated by the production schedule. As in the August, 1984 Report Update, each year is assumed to have 27 percent wet holes and 73 percent dry holes. Annual explosives consumption is summarized in Table 4-24. The new CIL contract prices for explosives are based on yearly consumption levels. Since mining in this study is scheduled to commence on June 1, 1985, the mining years and explosive consumption years will be out of phase by seven months. In order to determine explosives costs for calendar (mining) years, a 7/12 and 5/12 ratio was utilized. Table 4-25 summarizes annual explosives costs, based on the CIL contract rates adjusted to match calendar years. In Table 4-26, explosives costs have been increased to include blasting supplies (+17%) and secondary blasting (2%), which are accumulated as total blasting consumables. Total repair parts and consumables on a functional unit cost basis are summarized in Appendix B.

Mine overhead costs consist of salaried labor, salaried fringes, and hourly fringes. In Table 4-27, these costs are accumulated and presented on an annual unit cost basis.

The functional unit costs described in the preceeding paragraphs are summarized for each year in terms of operating labor, mainteance labor, parts and consumables, and mine overhead, and annual summaries are contained in Appendix B. Functional unit costs are also summarized in Table 4-28 for the life of the mine operations.

## 4.2 Milling

### 4.2.1 Summary

The increase in the cutoff grade results in only minor changes in the mill operating parameters. The reviewed CAMC start-up projection provides for the gradual improvement in the mill performance with regard to grind recoveries and concentrate grades. No modification to the CAMC estimate were made until the milling of low grade stockpile ore occurs. The average recoveries for the high grade sulfide ore are 83.3 percent for zinc and 81.9 percent for lead. Mill capacity remains unchanged at 11,160 metric tons per day.

TABLE 4-24

CYPRUS ANVIL  
EXPLOSIVES CONSUMPTION  
(6% Mine Plan)

|                            | 1985 | 1986  | 1987  | 1988  | 1989 | 1990 |
|----------------------------|------|-------|-------|-------|------|------|
| <b>ORE</b>                 |      |       |       |       |      |      |
| Total ktonnes              | 417  | 2523  | 4078  | 4790  | 4189 | 2541 |
| Dry ktonnes                | 305  | 1847  | 2986  | 3507  | 3067 | 1860 |
| AN/FO @ 28.64 gpt          | 9    | 53    | 86    | 100   | 88   | 53   |
| 10% AL/AN/FO @ 56.57 gpt   | 17   | 104   | 169   | 198   | 174  | 105  |
| Wet ktonnes                | 112  | 676   | 1092  | 1283  | 1122 | 681  |
| POWERGEL A @ 68.24 gpt     | 8    | 46    | 75    | 88    | 77   | 46   |
| POWERGEL C @ 67.18 gpt     | 8    | 45    | 73    | 86    | 75   | 46   |
| <b>ROCK TYPE 1D</b>        |      |       |       |       |      |      |
| Total ktonnes              | 9043 | 20428 | 16887 | 19128 | 6711 | 1860 |
| Dry ktonnes                | 6621 | 14957 | 12364 | 14005 | 4914 | 1362 |
| AN/FO @ 95.08 gpt          | 630  | 1422  | 1176  | 1332  | 467  | 129  |
| 10% AL/AN/FO @ 63.39 gpt   | 420  | 948   | 784   | 888   | 311  | 86   |
| Wet ktonnes                | 2422 | 5471  | 4523  | 5123  | 1797 | 498  |
| POWERGEL A @ 127.83 gpt    | 310  | 699   | 578   | 655   | 230  | 64   |
| POWERGEL C @ 63.39 gpt     | 154  | 347   | 287   | 325   | 114  | 32   |
| <b>ROCK TYPE 3D</b>        |      |       |       |       |      |      |
| Total ktonnes              | 620  | 2654  | 6513  | 329   | 0    | 0    |
| Dry ktonnes                | 454  | 1943  | 4769  | 241   | 0    | 0    |
| AN/FO @ 90.88 gpt          | 41   | 177   | 433   | 22    | 0    | 0    |
| 10% AL/AN/FO @ 87.39 gpt   | 40   | 170   | 417   | 21    | 0    | 0    |
| Wet ktonnes                | 166  | 711   | 1744  | 88    | 0    | 0    |
| POWERGEL A @ 128.17 gpt    | 21   | 91    | 224   | 11    | 0    | 0    |
| POWERGEL C @ 81.56 gpt     | 14   | 58    | 142   | 7     | 0    | 0    |
| <b>ROCK TYPE 3Dbx</b>      |      |       |       |       |      |      |
| Total ktonnes              | 1411 | 1900  | 2963  | 784   | 253  | 0    |
| Dry ktonnes                | 1033 | 1391  | 2169  | 574   | 185  | 0    |
| AN/FO @ 104.78 gpt         | 108  | 146   | 227   | 60    | 19   | 0    |
| 15% AL/AN/FO @ 113.16 gpt  | 117  | 157   | 245   | 65    | 21   | 0    |
| Wet ktonnes                | 378  | 509   | 794   | 210   | 68   | 0    |
| POWERGEL A @ 125.74 gpt    | 48   | 64    | 100   | 26    | 9    | 0    |
| POWERGEL C @ 122.94 gpt    | 46   | 63    | 98    | 26    | 8    | 0    |
| <b>SUMMARY</b>             |      |       |       |       |      |      |
| AN/FO Base                 |      |       |       |       |      |      |
| AN/FO (tonnes)             | 788  | 1798  | 1922  | 1514  | 574  | 182  |
| 10% AL/AN/FO (tonnes)      | 477  | 1222  | 1370  | 1107  | 485  | 191  |
| 15% AL/AN/FO (tonnes)      | 117  | 157   | 245   | 65    | 21   | 0    |
| Total AN/FO Base (tonnes)  | 1382 | 3177  | 3537  | 2686  | 1080 | 373  |
| Slurry Base                |      |       |       |       |      |      |
| POWERGEL A (tonnes)        | 387  | 900   | 977   | 780   | 316  | 110  |
| POWERGEL C (tonnes)        | 222  | 513   | 600   | 444   | 197  | 78   |
| Total Slurry Base (tonnes) | 609  | 1413  | 1577  | 1224  | 513  | 188  |

TABLE 4-25

CYPRUS ANVIL  
ANNUAL EXPLOSIVES CONSUMPTION AND COST  
(6% Mine Plan)

| Year | Mined | AN/FO |       |         | 10% AL/AN/FO |       |         | 15% AL/AN/FO |       |         | POWERGEL A |       |         | POWERGEL C |       |         | Total<br>\$x1000 | \$ /tonne<br>Mined |
|------|-------|-------|-------|---------|--------------|-------|---------|--------------|-------|---------|------------|-------|---------|------------|-------|---------|------------------|--------------------|
|      |       | mt    | \$/mt | \$x1000 | mt           | \$/mt | \$x1000 | mt           | \$/mt | \$x1000 | mt         | \$/mt | \$x1000 | mt         | \$/mt | \$x1000 |                  |                    |
| 1985 | 11664 | 788   | 549   | 433     | 477          | 794   | 379     | 117          | 913   | 107     | 387        | 880   | 341     | 222        | 1088  | 242     | 1502             | 0.1290             |
| 1986 | 29746 | 1798  | 528   | 949     | 1222         | 773   | 945     | 157          | 892   | 140     | 900        | 797   | 717     | 513        | 1006  | 516     | 3267             | 0.1100             |
| 1987 | 30441 | 1922  | 515   | 990     | 1370         | 760   | 1041    | 245          | 880   | 216     | 977        | 738   | 721     | 600        | 947   | 568     | 3536             | 0.1160             |
| 1988 | 25155 | 1514  | 540   | 818     | 1107         | 785   | 869     | 65           | 904   | 59      | 780        | 821   | 640     | 444        | 1029  | 457     | 2843             | 0.1130             |
| 1989 | 12038 | 574   | 626   | 359     | 485          | 871   | 422     | 21           | 990   | 21      | 316        | 1130  | 357     | 197        | 1337  | 263     | 1422             | 0.1180             |
| 1990 | 6043  | 182   | 691   | 126     | 191          | 936   | 179     | 0            |       | 0       | 110        | 1308  | 144     | 78         | 1515  | 118     | 567              | 0.0940             |
| 1991 | 4061  | 0     |       | 0       | 0            |       | 0       | 0            |       | 0       | 0          |       | 0       | 0          |       | 0       | 0                | 0.0000             |
| 1992 | 2114  | 0     |       | 0       | 0            |       | 0       | 0            |       | 0       | 0          |       | 0       | 0          |       | 0       | 0                | 0.0000             |

TABLE 4-26

## CYPRUS ANVIL

ANNUAL COST - BLASTING CONSUMABLES  
(6% Mine Plan)

| Unit Cost (\$/total tonne mined) |                  |            |                   |          |                         |        |                        |
|----------------------------------|------------------|------------|-------------------|----------|-------------------------|--------|------------------------|
| Year                             | ktonnes<br>Mined | Explosives | Supplies<br>@ 17% | Subtotal | Secondary<br>@ 2% of ST | Total  | Cost/Year<br>(\$x1000) |
| 1985                             | 11664            | 0.1290     | 0.0219            | 0.1509   | 0.0030                  | 0.1539 | 1795                   |
| 1986                             | 29746            | 0.1100     | 0.0187            | 0.1287   | 0.0026                  | 0.1313 | 3906                   |
| 1987                             | 30441            | 0.1160     | 0.0197            | 0.1357   | 0.0027                  | 0.1384 | 4213                   |
| 1988                             | 25155            | 0.1130     | 0.0192            | 0.1322   | 0.0026                  | 0.1348 | 3391                   |
| 1989                             | 12038            | 0.1180     | 0.0201            | 0.1381   | 0.0028                  | 0.1409 | 1696                   |
| 1990                             | 6043             | 0.0940     | 0.0160            | 0.1100   | 0.0022                  | 0.1122 | 678                    |
| 1991                             | 4061             | 0.0000     | 0.0000            | 0.0000   | 0.0000                  | 0.0000 | 0                      |
| 1992                             | 2114             | 0.0000     | 0.0000            | 0.0000   | 0.0000                  | 0.0000 | 0                      |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

## MINE OVERHEAD COST/Tonne

| PERIOD          | SALARIED |         | HOURLY  | TOTAL     | TOTAL  | Cost/  |
|-----------------|----------|---------|---------|-----------|--------|--------|
|                 | Salary   | Fringes | Fringes | (\$x1000) | Kt.    | Tonne  |
| 1985 (JUNE-DEC) | 753.0    | 263.6   | 922.7   | 1939.3    | 11664  | 0.1663 |
| 1986            | 1390.6   | 486.7   | 2256.3  | 4133.6    | 29746  | 0.1390 |
| 1987            | 1390.6   | 486.7   | 2649.5  | 4526.8    | 30441  | 0.1487 |
| 1988            | 1390.6   | 486.7   | 2119.4  | 3996.7    | 25155  | 0.1589 |
| 1989            | 882.4    | 308.8   | 1391.8  | 2583.0    | 12038  | 0.2146 |
| 1990            | 882.4    | 308.8   | 894.9   | 2086.1    | 6043   | 0.3452 |
| 1991            | 328.0    | 114.8   | 482.9   | 925.7     | 4061   | 0.2279 |
| 1992 (JAN-AUG)  | 206.6    | 72.3    | 286.3   | 565.2     | 2114   | 0.2674 |
| TOTAL           | 7224.2   | 2528.4  | 11003.8 | 20756.4   | 121262 | 0.1712 |

TABLE 4-28

CYPRUS ANVIL. 6 PERCENT CUTOFF, 525 MINUTES/SHIFT

## OPERATING COST SUMMARY BY FUNCTION

| PERIOD          | UNIT COST (\$/Total tonne) |            |        |        |        |        |                |               |                 |                |        | TOTAL<br>COST<br>(\$xMill.) | COST/<br>TONNE<br>ORE |
|-----------------|----------------------------|------------|--------|--------|--------|--------|----------------|---------------|-----------------|----------------|--------|-----------------------------|-----------------------|
|                 | TOTAL<br>Kt.               | ORE<br>Kt. | Dring. | Blstg. | Loadg. | Haulg. | Aux.<br>Equip. | Genl.<br>Mine | Genl.<br>Mntce. | Genl.<br>Admin | Total  |                             |                       |
| 1985 (JUNE-DEC) | 11664                      | 590        | 0.0407 | 0.1614 | 0.1072 | 0.3362 | 0.1601         | 0.0444        | 0.1023          | 0.1663         | 1,1186 | 13.0                        | 22.11                 |
| 1986            | 29746                      | 4764       | 0.0403 | 0.1364 | 0.1077 | 0.4027 | 0.1135         | 0.0404        | 0.0899          | 0.1390         | 1,0699 | 31.8                        | 6.68                  |
| 1987            | 30441                      | 4078       | 0.0478 | 0.1434 | 0.1145 | 0.5149 | 0.1138         | 0.0402        | 0.0875          | 0.1487         | 1,2108 | 36.9                        | 9.04                  |
| 1988            | 25155                      | 4914       | 0.0421 | 0.1408 | 0.1289 | 0.4423 | 0.1362         | 0.0419        | 0.0928          | 0.1589         | 1,1839 | 29.8                        | 6.06                  |
| 1989            | 12038                      | 5074       | 0.0564 | 0.1460 | 0.1356 | 0.5234 | 0.0843         | 0.0476        | 0.1138          | 0.2146         | 1,3217 | 15.9                        | 3.14                  |
| 1990            | 6043                       | 4183       | 0.0501 | 0.1224 | 0.1330 | 0.5470 | 0.1638         | 0.0630        | 0.1621          | 0.3452         | 1,5866 | 9.6                         | 2.29                  |
| 1991            | 4061                       | 4061       | 0.0000 | 0.0000 | 0.1287 | 0.1363 | 0.2438         | 0.0628        | 0.1958          | 0.2279         | 0,9953 | 4.0                         | 1.00                  |
| 1992 (JAN-AUG)  | 2114                       | 2114       | 0.0000 | 0.0000 | 0.1346 | 0.1471 | 0.2984         | 0.0693        | 0.2010          | 0.2674         | 1,1178 | 2.4                         | 1.12                  |
| TOTAL           | 121262                     | 29778      | 0.0426 | 0.1348 | 0.1190 | 0.4385 | 0.1300         | 0.0441        | 0.1025          | 0.1712         | 1,1827 | 143.4                       | 4.82                  |

## Distribution within Total:

|                     |        |        |        |        |        |        |        |        |        |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Operating Labor     | 0.0107 | 0.0055 | 0.0180 | 0.0848 | 0.0388 | 0.0121 | 0.0000 | 0.0000 | 0.1699 |
| Maintenance Labor   | 0.0081 | 0.0000 | 0.0233 | 0.0610 | 0.0209 | 0.0000 | 0.0445 | 0.0000 | 0.1578 |
| Parts & Consumables | 0.0238 | 0.1293 | 0.0777 | 0.2927 | 0.0702 | 0.0320 | 0.0580 | 0.0000 | 0.6837 |
| Mine Overhead       | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1712 | 0.1712 |

The operating cost was increased by \$0.06 per tonne over the August Update rates to reflect the impact of larger concentrate tonnages. The total operating cost is \$8.46 per tonne when operating at full capacity on sulfide ore.

The required mill capital is unchanged at \$10,677,000.

#### 4.2.2 Mill Capacity

For the six percent cutoff case, the mill capacity is maintained at 11,160 mtpd at a grind of 80 percent passing 70 microns. In the first 25 months of CAMC start-up, the performance of the mill is penalized to allow for the gradual optimization of the circuits and training of the personnel. This penalty is taken primarily as a coarser grind. PAH considers the start-up plan to be well thought out and has made no modifications. The need to handle additional concentrate tonnages will be within the ability of the mill given that capital expenditures are scheduled in the areas of filtering, drying, and loadout.

#### 4.2.3 Recovery And Concentrate Grade

The use of a six percent cutoff has raised mill feed grades considerably over the August Update Case. The CAMC estimated head grades and recoveries are presented in Table 4-29. The CAMC estimated recoveries and concentrate grades are slowly raised from December, 1985 thru August, 1986. Optimum grade and recovery conditions commence in the first quarter of 1988. The CAMC updated start-up schedule appears excellent and should more than adequate to cover potential difficulties in the early months.

An examination of the PAH recoveries (Table 4-30) shows no deviation from the CAMC estimates until 1990. Commencing in the fourth quarter of 1990, low grade stockpile material will begin to be milled. A total of 6,831,000 tonnes of ore containing 2.1 percent lead, 3.3 percent zinc and 29 grams per ton silver will be processed. Several characteristics of this stockpile will result in lower recoveries. The stockpile ore will have undergone some oxidation. The amount of oxidation cannot be quantified, but the storage of the ore for several years will result in some deterioration in metallurgical performance. Additionally, the different ore types will now be milled as a mixture, rather than milled separately as were the earlier, high grade ores. The milling of the high grade ores

TABLE 4-29  
PAH Summary  
Six Percent Cutoff

| Time Period      | Grind<br>P80u | Mill Feed         |       |      |         |           | Lead Concentrate |         |            |      |           | Zinc Concentrate |      |          |
|------------------|---------------|-------------------|-------|------|---------|-----------|------------------|---------|------------|------|-----------|------------------|------|----------|
|                  |               | Tonnage<br>(mtpd) | Grade |      |         | DMT Conc. | Grades           |         | Recoveries |      | DMT Conc. | Grade            |      | Recovery |
|                  |               |                   | % Pb  | % Zn | GM/T Ag |           | % Pb             | GM/T Ag | % Pb       | Ag % |           | % Zn             | % Zn |          |
| December 1985    | 91            | 5,583             | 2.90  | 4.70 | 33.0    | 5,460.4   | 58.0             | 457.1   | 63.1       | 43.7 | 11,853.6  | 47.2             | 65.3 |          |
| 1985 Total       | 91            | 5,583             | 2.90  | 4.70 | 33.0    | 5,460.4   | 58.0             | 457.1   | 63.1       | 43.7 | 11,853.6  | 47.2             | 65.3 |          |
| January 1986     | 91            | 9,272             | 2.90  | 4.70 | 33.0    | 9,068.1   | 58.0             | 457.1   | 63.1       | 43.7 | 18,688.9  | 47.2             | 65.3 |          |
| February 1986    | 86            | 11,126            | 2.90  | 4.70 | 33.0    | 10,099.8  | 58.5             | 467.2   | 65.4       | 45.9 | 20,098.1  | 47.5             | 67.8 |          |
| March 1986       | 86            | 11,126            | 2.90  | 4.70 | 33.0    | 11,181.9  | 58.5             | 467.2   | 65.4       | 45.9 | 23,138.3  | 47.5             | 67.8 |          |
| April 1986       | 82            | 11,126            | 4.04  | 4.76 | 60.7    | 15,810.0  | 59.2             | 629.9   | 69.3       | 49.1 | 23,718.8  | 48.2             | 72.0 |          |
| May 1986         | 82            | 11,126            | 3.30  | 4.80 | 46.1    | 15,051.0  | 61.0             | 601.5   | 80.6       | 56.9 | 26,593.8  | 50.8             | 81.6 |          |
| June 1986        | 78            | 11,126            | 3.40  | 4.90 | 42.2    | 15,124.8  | 61.4             | 534.6   | 81.8       | 57.4 | 26,546.7  | 50.9             | 82.6 |          |
| 3rd Quarter 1986 | 78            | 11,126            | 3.00  | 5.10 | 31.8    | 40,983.2  | 61.7             | 465.7   | 82.4       | 58.6 | 85,158.2  | 51.1             | 83.4 |          |
| 4th Quarter 1986 | 78            | 11,126            | 3.60  | 5.10 | 42.1    | 48,668.7  | 62.3             | 517.3   | 82.2       | 58.4 | 84,208.6  | 51.5             | 83.0 |          |
| 1986 TOTAL       | 81            | 11,126            | 3.28  | 4.95 | 39.2    | 165,987.3 | 60.9             | 514.8   | 77.1       | 54.4 | 308,952.4 | 50.2             | 78.5 |          |
| 1st Quarter 1987 | 78            | 11,126            | 3.80  | 5.10 | 49.3    | 50,558.6  | 61.9             | 571.1   | 82.3       | 58.5 | 82,858.0  | 51.3             | 83.2 |          |
| 2nd Quarter 1987 | 75            | 11,126            | 3.70  | 4.90 | 44.9    | 50,014.5  | 61.7             | 528.7   | 82.3       | 58.2 | 80,796.2  | 51.1             | 83.2 |          |
| 3rd Quarter 1987 | 75            | 11,126            | 3.70  | 4.90 | 53.2    | 51,066.4  | 61.3             | 625.8   | 82.6       | 58.7 | 82,637.1  | 50.8             | 83.8 |          |
| 4th Quarter 1987 | 75            | 11,126            | 3.60  | 5.20 | 46.7    | 49,494.4  | 61.7             | 574.0   | 82.9       | 59.4 | 87,561.4  | 51.2             | 84.2 |          |
| 1987 TOTAL       | 76            | 11,126            | 3.70  | 5.02 | 48.5    | 201,113.9 | 61.7             | 575.1   | 82.5       | 58.7 | 333,858.7 | 51.1             | 83.6 |          |
| 1st Quarter 1988 | 70            | 11,126            | 3.60  | 5.00 | 43.0    | 48,998.7  | 62.0             | 535.5   | 83.4       | 60.3 | 83,644.0  | 51.4             | 84.9 |          |
| 2nd Quarter 1988 | 70            | 11,126            | 3.00  | 4.60 | 31.6    | 40,394.5  | 62.7             | 478.2   | 83.4       | 60.4 | 76,127.3  | 51.8             | 83.4 |          |
| 3rd Quarter 1988 | 70            | 11,126            | 2.80  | 4.50 | 29.6    | 38,659.5  | 61.8             | 470.6   | 83.3       | 60.1 | 76,321.3  | 51.2             | 84.8 |          |
| 4th Quarter 1988 | 70            | 11,126            | 3.60  | 4.50 | 49.9    | 49,842.3  | 61.1             | 599.1   | 82.6       | 58.5 | 76,163.2  | 50.7             | 83.9 |          |
| 1988 TOTAL       | 70            | 11,126            | 3.25  | 4.65 | 38.5    | 177,895.0 | 61.9             | 526.2   | 83.2       | 59.7 | 312,255.9 | 51.3             | 84.6 |          |
| 1st Quarter 1989 | 70            | 11,126            | 3.40  | 4.60 | 45.8    | 45,588.7  | 62.3             | 605.8   | 83.4       | 60.2 | 75,786.4  | 51.5             | 84.7 |          |
| 2nd Quarter 1989 | 70            | 11,126            | 3.20  | 4.70 | 39.1    | 43,725.0  | 61.8             | 546.2   | 83.4       | 60.3 | 78,956.3  | 51.2             | 85.0 |          |
| 3rd Quarter 1989 | 70            | 11,126            | 3.10  | 4.90 | 31.9    | 92,931.8  | 61.7             | 458.7   | 83.4       | 60.3 | 83,434.1  | 51.1             | 85.0 |          |
| 4th Quarter 1989 | 70            | 11,126            | 3.00  | 4.90 | 37.5    | 41,963.6  | 61.1             | 551.3   | 83.5       | 60.3 | 84,287.5  | 50.7             | 85.2 |          |
| 1989 TOTAL       | 70            | 11,126            | 3.17  | 4.78 | 38.5    | 174,209.1 | 61.7             | 541.5   | 83.4       | 60.3 | 322,464.4 | 51.1             | 85.0 |          |
| 1st Quarter 1990 | 70            | 11,126            | 2.90  | 4.70 | 35.0    | 39,292.7  | 61.6             | 534.9   | 83.3       | 60.0 | 78,213.7  | 51.0             | 84.8 |          |
| 2nd Quarter 1990 | 70            | 11,126            | 2.90  | 4.60 | 36.2    | 39,540.4  | 61.9             | 557.3   | 83.3       | 60.1 | 77,057.4  | 51.3             | 84.8 |          |
| 3rd Quarter 1990 | 70            | 11,126            | 3.00  | 5.10 | 29.5    | 40,984.3  | 62.5             | 444.8   | 83.4       | 60.4 | 85,640.4  | 51.7             | 84.8 |          |
| 4th Quarter 1990 | 70            | 11,126            | 2.52  | 4.36 | 30.7    | 33,293.4  | 60.4             | 476.5   | 78.6       | 50.9 | 72,579.9  | 49.7             | 81.0 |          |
| 1990 TOTAL       | 70            | 11,126            | 2.83  | 4.69 | 32.9    | 153,116.8 | 61.6             | 503.4   | 82.2       | 57.9 | 313,491.4 | 50.9             | 83.8 |          |
| 1991 TOTAL       | 70            | 11,126            | 2.10  | 3.30 | 29.0    | 107,316.4 | 59.6             | 482.9   | 75.0       | 44.0 | 216,418.0 | 48.3             | 78.0 |          |
| 1992 TOTAL       | 70            | 11,126            | 2.10  | 3.30 | 29.0    | 57,580.9  | 59.6             | 482.9   | 75.0       | 44.0 | 114,929.8 | 48.3             | 78.0 |          |

4.50

TABLE 4-30  
CAMC Summary  
Six Percent Cutoff

| Time Period      | Grind<br>P80u | Mill Feed         |       |      |         | Lead Concentrate |        |         |            |      | Zinc Concentrate |               |                  |
|------------------|---------------|-------------------|-------|------|---------|------------------|--------|---------|------------|------|------------------|---------------|------------------|
|                  |               | Tonnage<br>(mtpd) | Grade |      |         | DMT Conc.        | Grades |         | Recoveries |      | DMT Conc.        | Grade<br>% Zn | Recovery<br>% Zn |
|                  |               |                   | % Pb  | % Zn | GM/T Ag |                  | % Pb   | GM/T Ag | % Pb       | Ag % |                  |               |                  |
| December 1985    | 91            | 5,583             | 2.90  | 4.70 | 33.0    | 5,460.4          | 58.0   | 457.1   | 63.1       | 43.7 | 11,853.6         | 47.2          | 65.3             |
| 1985 Total       | 91            | 5,583             | 2.90  | 4.70 | 33.0    | 5,460.4          | 58.0   | 457.1   | 63.1       | 43.7 | 11,853.6         | 47.2          | 65.3             |
| January 1986     | 91            | 9,272             | 2.90  | 4.70 | 33.0    | 9,068.1          | 58.0   | 457.1   | 63.1       | 43.7 | 18,688.9         | 47.2          | 65.3             |
| February 1986    | 86            | 11,126            | 2.90  | 4.70 | 33.0    | 10,099.8         | 58.5   | 467.2   | 65.4       | 45.9 | 20,098.1         | 47.5          | 67.8             |
| March 1986       | 86            | 11,126            | 2.90  | 4.70 | 33.0    | 11,181.9         | 58.5   | 467.2   | 65.4       | 45.9 | 23,138.3         | 47.5          | 67.8             |
| April 1986       | 82            | 11,126            | 4.04  | 4.76 | 60.7    | 15,810.0         | 59.2   | 629.9   | 69.3       | 49.1 | 23,718.8         | 48.2          | 72.0             |
| May 1986         | 82            | 11,126            | 3.30  | 4.80 | 46.1    | 15,051.0         | 61.0   | 601.5   | 80.6       | 56.9 | 26,593.8         | 50.8          | 81.6             |
| June 1986        | 78            | 11,126            | 3.40  | 4.90 | 42.2    | 15,124.8         | 61.4   | 534.6   | 81.8       | 57.4 | 26,546.7         | 50.9          | 82.6             |
| 3rd Quarter 1986 | 78            | 11,126            | 3.00  | 5.10 | 31.8    | 40,983.2         | 61.7   | 465.7   | 82.4       | 58.6 | 85,158.2         | 51.1          | 83.4             |
| 4th Quarter 1986 | 78            | 11,126            | 3.60  | 5.10 | 42.1    | 48,668.7         | 62.3   | 517.3   | 82.2       | 58.4 | 84,208.6         | 51.5          | 83.0             |
| 1986 TOTAL       | 81            | 11,126            | 3.28  | 4.95 | 39.2    | 165,987.3        | 60.9   | 514.8   | 77.1       | 54.4 | 308,952.4        | 50.2          | 78.5             |
| 1st Quarter 1987 | 78            | 11,126            | 3.80  | 5.10 | 49.3    | 50,558.6         | 61.9   | 571.1   | 82.3       | 58.5 | 82,858.0         | 51.3          | 83.2             |
| 2nd Quarter 1987 | 75            | 11,126            | 3.70  | 4.90 | 44.9    | 50,014.5         | 61.7   | 528.7   | 82.3       | 58.2 | 80,796.2         | 51.1          | 83.2             |
| 3rd Quarter 1987 | 75            | 11,126            | 3.70  | 4.90 | 53.2    | 51,066.4         | 61.3   | 625.8   | 82.6       | 58.7 | 82,637.1         | 50.8          | 83.8             |
| 4th Quarter 1987 | 75            | 11,126            | 3.60  | 5.20 | 46.7    | 49,494.4         | 61.7   | 574.0   | 82.9       | 59.4 | 87,561.4         | 51.2          | 84.2             |
| 1987 TOTAL       | 76            | 11,126            | 3.70  | 5.02 | 48.5    | 201,113.9        | 61.7   | 575.1   | 82.5       | 58.7 | 333,858.7        | 51.1          | 83.6             |
| 1st Quarter 1988 | 70            | 11,126            | 3.60  | 5.00 | 43.0    | 48,998.7         | 62.0   | 535.5   | 83.4       | 60.3 | 83,644.0         | 51.4          | 84.9             |
| 2nd Quarter 1988 | 70            | 11,126            | 3.00  | 4.60 | 31.6    | 40,394.5         | 62.7   | 478.2   | 83.4       | 60.4 | 76,127.3         | 51.8          | 83.4             |
| 3rd Quarter 1988 | 70            | 11,126            | 2.80  | 4.50 | 29.6    | 38,659.5         | 61.8   | 470.6   | 83.3       | 60.1 | 76,321.3         | 51.2          | 84.8             |
| 4th Quarter 1988 | 70            | 11,126            | 3.60  | 4.50 | 49.9    | 49,842.3         | 61.1   | 599.1   | 82.6       | 58.5 | 76,163.2         | 50.7          | 83.9             |
| 1988 TOTAL       | 70            | 11,126            | 3.25  | 4.65 | 38.5    | 177,895.0        | 61.9   | 526.2   | 83.2       | 59.7 | 312,255.9        | 51.3          | 84.6             |
| 1st Quarter 1989 | 70            | 11,126            | 3.40  | 4.60 | 45.8    | 45,588.7         | 62.3   | 605.8   | 83.4       | 60.2 | 75,786.4         | 51.5          | 84.7             |
| 2nd Quarter 1989 | 70            | 11,126            | 3.20  | 4.70 | 39.1    | 43,725.0         | 61.8   | 546.2   | 83.4       | 60.3 | 78,956.3         | 51.2          | 85.0             |
| 3rd Quarter 1989 | 70            | 11,126            | 3.10  | 4.90 | 31.9    | 92,931.8         | 61.7   | 458.7   | 83.4       | 60.3 | 83,434.1         | 51.1          | 85.0             |
| 4th Quarter 1989 | 70            | 11,126            | 3.00  | 4.90 | 37.5    | 41,963.6         | 61.1   | 551.3   | 83.5       | 60.3 | 84,287.5         | 50.7          | 85.2             |
| 1989 TOTAL       | 70            | 11,126            | 3.17  | 4.78 | 38.5    | 174,209.1        | 61.7   | 541.5   | 83.4       | 60.3 | 322,464.4        | 51.1          | 85.0             |
| 1st Quarter 1990 | 70            | 11,126            | 2.90  | 4.70 | 35.0    | 39,292.7         | 61.6   | 534.9   | 83.3       | 60.0 | 78,213.7         | 51.0          | 84.8             |
| 2nd Quarter 1990 | 70            | 11,126            | 2.90  | 4.60 | 36.2    | 39,540.4         | 61.9   | 557.3   | 83.3       | 60.1 | 77,057.4         | 51.3          | 84.8             |
| 3rd Quarter 1990 | 70            | 11,126            | 3.00  | 5.10 | 29.5    | 40,984.3         | 62.5   | 444.8   | 83.4       | 60.4 | 85,640.4         | 51.7          | 84.8             |
| 4th Quarter 1990 | 70            | 11,126            | 3.10  | 5.80 | 29.5    | 18,186.4         | 61.5   | 423.1   | 83.5       | 60.3 | 41,837.3         | 51.0          | 85.1             |
| 1990 TOTAL       | 70            | 11,126            | 2.95  | 4.93 | 33.0    | 138,003.7        | 61.9   | 499.8   | 83.4       | 60.2 | 282,748.9        | 51.3          | 84.8             |

separately has been implemented in order to increase recoveries, therefore it appears logical to lower the recoveries for the mixed low grade ores. Lastly, the low grade stockpiled ore will be significantly lower in metal content than the previously milled high grade ore. PAH deems it prudent to allow for lower recoveries for ores that contain only 60 percent of the previous levels of metals.

While all the above will result in lower recoveries, the exact amount that the recoveries will drop cannot be calculated in a definitive manner. In 1982, stockpile ore was milled and resulted in recoveries of 70 and 73 percent for lead and zinc, respectively. The 1982 stockpile ore was undoubtedly more oxidized than the current low grade ore and therefore the 1982 recoveries cannot be applied to 1991 and 1992 ores. Additionally, the modifications to the mill will provide for increased recoveries over those obtained in 1982. If the theory of a constant tailing were utilized for estimating recoveries, the low grade recoveries would be approximately 72 percent for lead and the zinc recovery would hold at 75 percent. PAH considers that the constant tail would also be too conservative an approach. The recoveries utilized in this report for the low grade stockpile are:

|        |    |
|--------|----|
| Lead   | 75 |
| Zinc   | 78 |
| Silver | 44 |

The ability to estimate the quality of the concentrates produced from the low grade stockpile is also a subjective. While intense attention is being paid to maximize recovery from the low grade ore, it will be difficult to produce high quality concentrates. For this study, PAH has reduced the grade of lead concentrate from 61.6 percent to 59.6 percent, while dropping zinc concentrate grades from approximately 51.5 percent to 48.8 percent. The lower concentrate grades are similar to values produced in 1982 from stockpiled ore.

#### 4.2.4 Operating Cost

There are only minor changes in the mill operating cost increases associated with the higher cutoff grade. These added costs are associated with the approximate 10 percent added concentrate produced. The August report is based on producing 0.11 tonnes of concentrate per ton of ore. For the higher cutoff grade, this rate increases to 0.12 tonnes of concentrate per ton of ore.

The increase in concentrate drying costs will amount to \$0.02 per tonne of ore. Due to the larger quantities of concentrate, the repair costs in the regrinding, thickening, filtering, drying and loadout areas will increase. The added repair costs is estimated to be \$0.02 per tonne of ore. The

added costs for reagents is too complex to adequately calculate. The costs for flocculent and filter aid will go up 10 percent or \$0.01 per tonne. There will also be added costs for reagents in the cleaning circuits, but this is a difficult number to quantify due to the influence of circulating loads and reagents from thickener overflows. A value of \$0.01 would seem reasonable.

Given the above changes, the higher grade cutoff operating costs would increase the August costs by \$0.06 to 8.46 per tonne of ore.

For treating the low grade stockpile ore which will contain some oxidized ore, the operating costs are kept the same as the high grade ore. While the previous oxidized ore required an additional \$0.69 per tonne of ore for reagents, the current low grade stockpile will contain less oxidized material. The \$0.06 added to the August cost as an adjustment for higher feed grades will be maintained for the low grade ore to offset potentially higher costs for treating stockpiled ore.

In the first two months there is also an increase in operating cost per tonne due to the lower milling rate. For December, 1985, the reduced milling rate raises the operating cost by \$2.33 per tonne. The effect of the reduced tonnage of January on the annual milling cost is negligible.

#### 4.2.5 Capital Expenditures

The same mill capital expenditures will be utilized for the six percent cutoff case, except that the years in which the funds are spent are changed as follows:

| <u>Year</u> | <u>Area</u> |                     |                 | <u>Total</u>      |
|-------------|-------------|---------------------|-----------------|-------------------|
|             | <u>Mill</u> | <u>Water System</u> | <u>Tailings</u> |                   |
| 1985        | 4,285,000   | ---                 | 45,000          | 4,330,000         |
| 1986        | 2,030,000   | 1,800,000           | 1,987,000       | 5,817,000         |
| 1987        | 530,000     | ---                 | ---             | 530,000           |
|             |             |                     |                 | <u>10,677,000</u> |

The six percent cutoff shortens the mine life (assuming only Grum ore) from the August case. The shorter project duration may influence whether all the capital should be spent. As noted earlier, a review of each item should be made in light of the shorter mine life.

#### 4.3 Concentrate Marketing

##### 4.3.1 Marketability

There are no changes in this section from the August 1984 update as presented in Section 3.3.1.

#### 4.3.2 Treatment Contract Terms

There are no changes in this section from the August 1984 update as presented in Section 3.3.2.

#### 4.3.3 Other Marketing Costs

There are no changes in this section from the August 1984 update as presented in Section 3.3.3.

#### 4.3.4 Losses In Transport

There are no changes in this section from the August 1984 update as presented in Section 3.3.4.

#### 4.3.5 Moisture Content

There are no changes in this section from the August 1984 update as presented in Section 3.3.5.

#### 4.4 Concentrate Transportation

##### 4.4.1 Overland Transportation

There are no changes in this section from the August 1984 update as presented in Section 3.4.1.

#### 4.4.2 Port Facilities

There are no changes in this section from the August 1984 update as presented in Section 3.4.2.

#### 4.4.3 Ocean Freight

There are no changes in this section from the August 1984 update as presented in Section 3.4.3.

### 4.5 Financial Evaluation

#### 4.5.1 Ore Reserve And Production Schedule

The ore reserves at the 6.0 percent cutoff grade are as follows:

|                     |                  |            | <u>Zn</u>   | <u>Pb</u>   | <u>Ag</u>       |
|---------------------|------------------|------------|-------------|-------------|-----------------|
| Pit Ore             | 18,538,000       | DMT        | 5.1%        | 3.5%        | 41.9 g/t        |
| Low-Grade Stockpile | 6,832,000        | DMT        | 3.3%        | 2.1%        | 29.0 g/t        |
| Oxide Stockpile     | <u>1,236,000</u> | <u>DMT</u> | <u>4.7%</u> | <u>2.9%</u> | <u>37.6 g/t</u> |
| Total               | 26,606,000       | DMT        | 4.6%        | 3.1%        | 38.5 g/t        |

Table 4-31 shows the production schedule for the 6.0 percent cutoff grade.

TABLE 4-31

| PRO FORMA PRODUCTION STATEMENT<br>CYPRUS ANVIL MINE<br>6% MINE PLAN |           |            |            |            |            |            |            |            |
|---------------------------------------------------------------------|-----------|------------|------------|------------|------------|------------|------------|------------|
| PRODUCTION YEAR                                                     | 1985      | 1986       | 1987       | 1988       | 1989       | 1990       | 1991       | 1992       |
| ORE MILLED, DMT                                                     | 173070    | 4003470    | 4060954    | 4072080    | 4060954    | 4060990    | 4061000    | 2178933    |
| WASTE MINED, DMT                                                    | 11074000  | 24982000   | 26363000   | 20241000   | 6964000    | 1860000    | .0         | 0          |
| STRIP RATIO                                                         | 63.99     | 6.24       | 6.49       | 4.97       | 1.71       | 0.46       | 0.00       | 0.00       |
| PR ASSAY OF ORE MILLED                                              | 2.90      | 3.28       | 3.70       | 3.25       | 3.17       | 2.83       | 2.10       | 2.10       |
| MILL RECOVERY OF PR, %                                              | 63.10     | 77.10      | 82.50      | 83.20      | 83.40      | 82.20      | 75.00      | 75.00      |
| LEAD CONCENTRATE, WMT                                               | 5788.     | 176219.    | 212964.    | 188555.    | 184449.    | 162560.    | 113756.    | 61035.     |
| LEAD CONCENTRATE, DMT                                               | 5460.     | 166245.    | 200909.    | 177882.    | 174008.    | 153359.    | 107317.    | 57581.     |
| PR ASSAY OF PR CONC, %                                              | 58.0      | 60.9       | 61.7       | 61.9       | 61.7       | 61.6       | 59.6       | 59.6       |
| TRANSPORT & HANDLING LOSS<br>FOR LEAD, %                            | 0.50      | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       |
| SMELTER PAY FOR PR, %                                               | 94.8      | 95.0       | 95.0       | 95.0       | 95.0       | 95.0       | 95.0       | 95.0       |
| COMPOSITE RECOVERY FOR PR, %                                        | 59.54     | 72.88      | 77.98      | 78.64      | 78.83      | 77.70      | 70.87      | 70.87      |
| PR PAID FOR/TON ORE MILLED, LBS                                     | 38.06     | 52.70      | 63.61      | 56.35      | 55.09      | 48.48      | 32.81      | 32.81      |
| PAYABLE LEAD, LBS                                                   | 6587728.  | 210980100. | 258322099. | 229455941. | 223733557. | 196863774. | 133241128. | 71489955.  |
| ZN ASSAY OF ORE MILLED, %                                           | 4.70      | 4.93       | 5.02       | 4.65       | 4.78       | 4.69       | 3.30       | 3.30       |
| MILL RECOVERY OF ZN, %                                              | 65.30     | 78.50      | 83.60      | 84.60      | 85.00      | 83.80      | 78.00      | 78.00      |
| ZINC CONCENTRATE, WMT                                               | 11986.    | 328699.    | 355195.    | 332562.    | 343878.    | 333950.    | 230485.    | 122401.    |
| ZINC CONCENTRATE, DMT                                               | 11254.    | 308637.    | 333517.    | 312265.    | 322890.    | 313568.    | 216418.    | 114930.    |
| ZN ASSAY OF ZN CONC, %                                              | 47.2      | 50.2       | 51.1       | 51.3       | 51.1       | 50.9       | 48.3       | 48.8       |
| TRANSPORT & HANDLING LOSS<br>FOR ZINC, %                            | 0.50      | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       | 0.50       |
| SMELTER PAY FOR ZN, %                                               | 83.1      | 84.1       | 84.3       | 84.4       | 84.3       | 84.3       | 83.4       | 83.6       |
| COMPOSITE RECOVERY FOR ZN, %                                        | 53.96     | 65.66      | 70.16      | 71.05      | 71.33      | 70.28      | 64.76      | 64.89      |
| ZN PAID FOR/TON ORE MILLED, LBS                                     | 55.92     | 71.36      | 77.65      | 72.84      | 75.17      | 72.66      | 47.11      | 47.21      |
| PAYABLE ZINC, LBS                                                   | 9677318.  | 285702445. | 315317194. | 296595282. | 305270826. | 295081245. | 191316202. | 102860278. |
| AG ASSAY OF PR CONCENTRATE,<br>TR OZ/DMT                            | 14.7      | 16.6       | 18.5       | 16.9       | 17.4       | 16.2       | 15.5       | 15.5       |
| PAYABLE AG, TR OZ/DMT CONC,<br>TROY OUNCES                          | 13.7      | 15.6       | 17.5       | 15.9       | 16.4       | 15.2       | 14.5       | 14.5       |
| PAYABLE SILVER, TR OZ                                               | 74433.    | 2580450.   | 3498332.   | 2814183.   | 2839464.   | 2319398.   | 1548318.   | 830743.    |
| TR OZ AG PAID FOR/LR PAYABLE PR                                     | 0.01      | 0.01       | 0.01       | 0.01       | 0.01       | 0.01       | 0.01       | 0.01       |
| LBS ZN & PR/TON ORE MILLED                                          | 94.0      | 124.1      | 141.3      | 129.2      | 130.3      | 121.1      | 79.9       | 80.0       |
| TOTAL PAYABLE LBS OF<br>LEAD AND ZINC                               | 16265046. | 496682546. | 573639293. | 526051224. | 529004383. | 491945019. | 324557329. | 174350233. |

The production schedule is based on the mining schedule discussed in Section 4.1, mill recoveries discussed in Section 4.2, smelter payable metals, and other factors discussed in Sections 4.3 and 4.4, and summarized again briefly in this Section 4.5.

#### 4.5.2 Metal Prices

There are no changes in this section from the August 1984 update as presented in Section 3.5.2.

#### 4.5.3 Sales Of Concentrator Products

There are no changes in this section as from the August 1984 update as presented in Section 3.5.3.

#### 4.5.4 Treatment And Freight Costs

There are no changes in this section from the August 1984 updated as presented in Section 3.5.4.

#### 4.5.5 Cash Production Costs Of Concentrate Production

Cash production costs of concentrate production include costs of mining, milling, general and administrative costs, townsite expenses, and Vancouver and Calgary overhead. Mining and milling cost estimates are discussed in more detail in Sections 4.1 and 4.2 of this report.

##### Mining Cost

The mine operating costs are shown in Table 4-32. These costs assume an electric power cost of \$0.04/kwhr.

##### Milling Cost

The mill operating costs are shown in Table 4-33.

##### General And Administrative And Townsite Expense, Vancouver-Calgary Overhead

There are no changes in the General and Administrative, Townsite Expenses, or Vancouver-Calgary overhead as presented in the August 1984 update in Section 3.5.5.

TABLE 4-32

Cyprus Anvil Mine  
Mining Costs At 6 Percent Cutoff (525 Minutes/Shift)

| <u>Year</u>     | <u>Cost Per DMT<br/>Of Rock Mined</u> | <u>Total Metric Tons<br/>Mined<br/>(Millions)</u> | <u>Annual<br/>Cost<br/>(Millions)</u> |
|-----------------|---------------------------------------|---------------------------------------------------|---------------------------------------|
| 1985 (June-Dec) | \$ 1.12                               | 11.7                                              | \$ 13.0                               |
| 1986            | 1.07                                  | 29.7                                              | 31.8                                  |
| 1987            | 1.21                                  | 30.4                                              | 36.9                                  |
| 1988            | 1.18                                  | 25.2                                              | 29.8                                  |
| 1989            | 1.32                                  | 12.0                                              | 15.9                                  |
| 1990            | 1.59                                  | 6.0                                               | 9.6                                   |
| 1991            | 1.00                                  | 4.1                                               | 4.0                                   |
| 1992 (Jan-Aug)  | 1.12                                  | 2.1                                               | 2.4                                   |
|                 | Avg. \$ 1.18                          | Total 121.3                                       | Total \$143.4                         |

TABLE 4-33Milling Cost Per Metric Tons Of Ore Milled  
Cyprus Anvil Mine

| <u>Year(s)</u> | <u>CS/DMT</u> |
|----------------|---------------|
| 1985           | \$10.79       |
| 1986-1992      | 8.46          |

#### 4.5.6 Capital Expenditures

Table 4-34 shows the projected capital expenditures for the 6.0 percent cutoff. These are the same capital expenditures as for the August 1984 update except that the expenditures begin in 1985 instead of 1984.

#### 4.5.7 Cash Flow From Operations

Table 4-35 shows the pro forma cash flow from operations for June 1985 through 1992 based on the 6.0 percent cutoff grade.

#### 4.5.8 Cash Costs Per Pound Of Payable Metal

Table 4-36 shows the cash cost per pound of payable zinc and lead for each year. The method of coproduct cost accounting we have used is to sum the yearly cash costs incurred up to the point at which the two concentrates, zinc and lead, are produced. These costs include mining, milling, general and administrative, townsite, and corporate overhead costs. That sum is then divided by the total pounds of payable zinc and lead produced in that year, to arrive at the cost per pound of zinc or lead. Silver is a byproduct of the lead concentrate and the silver credit is applied against the cost of lead.

TABLE 4-34

Anvil Mine Capital Expenditures  
Cyprus Anvil Mine

| <u>Mine</u>                                                                | <u>1985</u> | <u>1986</u> | <u>1987</u> | <u>1988-1990</u> | <u>1991</u> | <u>1992</u> |
|----------------------------------------------------------------------------|-------------|-------------|-------------|------------------|-------------|-------------|
| Drill and R.T. Dozer                                                       |             | \$2,150,000 |             |                  |             |             |
| Pit Dewatering                                                             |             | 100,000     |             |                  |             |             |
| Remove unstable material threatening<br>east wall of pit, ±1,000,000 yards | \$1,500,000 |             |             |                  |             |             |
| Light Vehicle Fleet                                                        | 100,000     | 100,000     |             |                  |             |             |
| Computer System                                                            | 40,000      |             |             |                  |             |             |
| Subtotal                                                                   | \$1,640,000 | \$2,350,000 |             |                  |             |             |
| <u>Mill</u>                                                                |             |             |             |                  |             |             |
| Expansion/Modifications                                                    | \$4,330,000 | \$5,817,000 | 530,000     |                  |             |             |
| <u>Townsite</u>                                                            |             |             |             |                  |             |             |
| Demothhall Houses                                                          | 200,000     |             |             |                  |             |             |
| <u>Recruiting</u>                                                          | 750,000     |             |             |                  |             |             |
| <u>Equipment Replacement</u>                                               |             |             | 600,000     | 600,000          | 500,000     | 400,000     |
| TOTAL                                                                      | \$6,920,000 | \$8,167,000 | \$1,130,000 | \$ 600,000       | \$ 500,000  | \$ 400,000  |

TABLE 4-35

PRO FORMA CASH FLOW STATEMENTS  
 CYPRUS ANVIL MINE  
 6\* MINE PLAN (525 MINUTES/SHIFT)  
 ZINC PRICE = \$ 0.60/POUND  
 LEAD PRICE = \$ 0.28/POUND  
 SILVER PRICE = \$ 9.72/TR OZ  
 ALL DOLLAR AMOUNTS ARE SHOWN IN CANADIAN DOLLARS

| CASH FLOW YEAR               | 1985       | 1986       | 1987       | 1988       | 1989       | 1990       | 1991       | 1992      |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| SALES OF LEAD                | 1844564.   | 59074428.  | 72330188.  | 64247664.  | 62645396.  | 55121857.  | 37307516.  | 20017187. |
| SALES OF ZINC                | 5806391.   | 171421467. | 189190316. | 177957169. | 183162496. | 177048747. | 114789721. | 61716167. |
| SALES OF SILVER              | 723486.    | 25081971.  | 34003788.  | 27353861.  | 27599592.  | 22544548.  | 15049648.  | 8074824.  |
| TOTAL SALES                  | 8374440.   | 255577866. | 295524292. | 269558694. | 273407484. | 254715152. | 167146884. | 89808178. |
| -ZINC SMELTING               | 2395133.   | 65684392.  | 70979193.  | 66456432.  | 68717715.  | 66733667.  | 46058244.  | 24459536. |
| -LEAD SMELTING               | 980990.    | 29867051.  | 36094791.  | 31957794.  | 31261809.  | 27552007.  | 19280292.  | 10344758. |
| -SILVER REFINING             | 13026.     | 451579.    | 612208.    | 492482.    | 496906.    | 405895.    | 270956.    | 145380.   |
| -CONCENTRATE FREIGHT, OCEAN  | 444343.    | 12622956.  | 14203975.  | 13027933.  | 13208172.  | 12412749.  | 8606039.   | 4585904.  |
| -CONCENTRATE FREIGHT, LAND   | 755383.    | 21459025.  | 24146758.  | 22147487.  | 22453892.  | 21101674.  | 14630266.  | 7796037.  |
| -PORT CHARGES                | 520000.    | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.  |
| -OTHER CONCENTRATE COSTS     | 34592.     | 982816.    | 1106048.   | 1014409.   | 1028381.   | 966351.    | 670003.    | 357028.   |
| -MINING COSTS                | 13047351.  | 31825246.  | 36857964.  | 29781004.  | 15910624.  | 9587823.   | 4041913.   | 2363029.  |
| -MILLING COSTS               | 1867425.   | 33869356.  | 34355671.  | 34449797.  | 34355671.  | 31355975.  | 34356060.  | 18433773. |
| -GENERAL AND ADMINISTRATIVE  | 3127000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.  |
| -CALGARY, VANCOUVER OVERHEAD | 300000.    | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1500000.  |
| -CAPITAL EXPENDITURES        | 6920000.   | 8167000.   | 1130000.   | 600000.    | 600000.    | 600000.    | 500000.    | 400000.   |
| (-/+ )WORKING CAPITAL*       | -6000000.  | 0.         | 0.         | 0.         | 0.         | 0.         | 0.         | 10000000. |
| OPERATING CASH FLOW**        | -28030804. | 39403446.  | 64792684.  | 58386357.  | 74129314.  | 69754011.  | 27488112.  | 19977732. |

\*INCLUDES \$4,000,000 CREDIT IN 1985 FROM THE CANADIAN GOVERNMENT FOR STRIPPING COSTS

\*\*NOTE: COLUMNS MAY NOT ADD IN LAST DIGIT DUE TO COMPUTER ROUNDING

TABLE 4-36

| CASH COST PER POUND OF PAYABLE METAL* |       |       |       |       |       |       |       |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| CYPRUS ANVIL MINE                     |       |       |       |       |       |       |       |
| 6% MINE PLAN (525 MINUTES/SHIFT)      |       |       |       |       |       |       |       |
|                                       | 1986  | 1987  | 1988  | 1989  | 1990  | 1991  | 1992  |
| ZINC                                  |       |       |       |       |       |       |       |
| MINING, MILLING, G&A,<br>TOWNSITE     | 0.149 | 0.138 | 0.138 | 0.110 | 0.106 | 0.143 | 0.164 |
| LAND TRANSPORT                        | 0.049 | 0.048 | 0.048 | 0.048 | 0.048 | 0.051 | 0.051 |
| OCEAN TRANSPORT                       | 0.036 | 0.034 | 0.035 | 0.035 | 0.035 | 0.041 | 0.050 |
| SMEETING                              | 0.232 | 0.227 | 0.226 | 0.227 | 0.228 | 0.243 | 0.240 |
|                                       | 0.466 | 0.448 | 0.446 | 0.420 | 0.418 | 0.479 | 0.505 |
| CAPITAL                               | 0.016 | 0.002 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 |
| TOTAL (CANADIAN \$)                   | 0.482 | 0.450 | 0.447 | 0.421 | 0.419 | 0.480 | 0.507 |
| TOTAL (U.S. \$)                       | 0.347 | 0.324 | 0.322 | 0.303 | 0.302 | 0.346 | 0.365 |
| LEAD                                  |       |       |       |       |       |       |       |
| MINING, MILLING, G&A,<br>TOWNSITE     | 0.149 | 0.138 | 0.138 | 0.110 | 0.106 | 0.143 | 0.164 |
| LAND TRANSPORT                        | 0.035 | 0.035 | 0.035 | 0.035 | 0.035 | 0.036 | 0.036 |
| OCEAN TRANSPORT                       | 0.026 | 0.025 | 0.025 | 0.025 | 0.026 | 0.029 | 0.036 |
| SMEETING                              | 0.143 | 0.141 | 0.141 | 0.141 | 0.142 | 0.146 | 0.146 |
|                                       | 0.353 | 0.340 | 0.339 | 0.312 | 0.308 | 0.355 | 0.383 |
| SILVER CREDIT                         | 0.117 | 0.129 | 0.117 | 0.121 | 0.112 | 0.111 | 0.111 |
|                                       | 0.237 | 0.211 | 0.222 | 0.191 | 0.196 | 0.244 | 0.272 |
| CAPITAL                               | 0.016 | 0.002 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 |
| TOTAL (CANADIAN \$)                   | 0.253 | 0.213 | 0.223 | 0.192 | 0.197 | 0.246 | 0.274 |
| TOTAL (U.S. \$)                       | 0.182 | 0.153 | 0.160 | 0.138 | 0.142 | 0.177 | 0.197 |

\* C\$1.00 = U.S.\$0.72

\*\* NOTE: COLUMNS MAY NOT ADD IN LAST DIGIT DUE TO COMPUTER ROUNDING.

#### 4.5.9 Discussion Of Results

The project could begin generating a positive cash flow in the first full year of production, 1986, for the 6.0 percent cutoff grade based on the aforementioned assumptions for metal prices, capital and operating costs (See Table 4-35). The discounted cash flow return on investment (ROI) represented by the pre-tax cash flows in Table 4-35 is 143.1 percent. The cumulative net cash flow is CS326 million. The net present value at a 15 percent discount rate is CS195 million. These are pre-tax numbers. In view of the tax position of CAMC, it is unlikely that any taxes would be payable for some years, according to Dome management. That being the case, the after-tax ROI would also be very high.

5.0 6% MODIFIED  
MINE PLAN

## 5.0 SIX PERCENT MODIFIED MINE PLAN

### 5.1 Mining

This exercise evaluates the mine plan described in Section 4.1.1 in terms of higher equipment productivities and lower labor rates, both specified by CAMC. Consequently, the minable reserves and the production schedule remain unchanged.

#### 5.1.1 Mine Plan

See Section 4.1.1

#### 5.1.2 Equipment Requirements

Equipment productivities for this option are based on 584 effective minutes per 12-hour shift as specified by CAMC. This revision is approximated as follows:

|                                      |      |          |              |
|--------------------------------------|------|----------|--------------|
| Total time per shift (12 x 60)       |      | 720 min. | 720          |
| Contractual non-effective time       |      |          |              |
| Lunch - 1 @ 30 min.                  |      | -30 min. | -60          |
| Work related: Walk around inspection |      | -10 min. | -10          |
| Time remaining (11.3 hours)          |      | 680 min. | 650          |
| Normal operating delays              |      |          |              |
| 8.5 min. per hour remaining          | 85.8 | 90       | -96 min. -65 |
| Effective Minutes/Shift              |      | 584 min. | 585          |

Must increase shift efficiency to 90%

The down-the-hole drilling time per shift shown in Table 4-3 for each rock type has been increased by a factor of 584/525, rather than by 59 minutes (584-525), as some of the additional time will be used in drill moves. The revised down-the-hole times are used in Table 5-1 to develop revised drill productivities by rock type. Revised drill shifts and drill requirements are shown in Table 5-2.

Revised productivities for the 15 yard shovels are summarized in Table 5-3 and annual shovel shifts/requirements are derived in Table 5-4. As in the initial six percent plan, it was assumed that the 170 ton truck fleet would be used to capacity and that the 120 ton trucks would haul the balance of scheduled material.

Revised loader productivity on stockpiled ore is defined in Table 5-5 and loader shifts/requirements are calculated on annual basis in Table 5-6. Upon completion of pit mining, the 15 year shovels will be transferred to the low grade stockpiles, as in the preceding study.

In determining truck requirements, the same haul profiles and truck speeds as in the initial six percent study were used. Due to the increase in productivity, a reallocation of annual tonnages between the 120 ton 170 ton fleets was necessary. Annual shifts and fleet requirements for 120 ton and 170 ton units are summarized in Tables 5-7 and 5-8.

TABLE 5-1

## CYPRUS ANVIL

DRILLING PRODUCTIVITY AND EXPLOSIVES CONSUMPTION  
 9-7/8 inch DRILL  
 (6% MINE PLAN - 584 min/shift)

| Rock Type                 | Ore (dry)    | Ore (wet)  | 10 (dry)     | 10 (wet)   | 30 (dry)     | 30 (wet)   | 30bx (dry)   | 30bx (wet) |
|---------------------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|
| Rock Density (g/cc)       | 3.93         | 3.93       | 2.60         | 2.60       | 2.75         | 2.75       | 2.71         | 2.71       |
| <b>BLASTING</b>           |              |            |              |            |              |            |              |            |
| Bench Height (meters)     | 6.10         | 6.10       | 12.19        | 12.19      | 12.19        | 12.19      | 12.19        | 12.19      |
| Subgrade (meters)         | 1.22         | 1.22       | 1.52         | 1.52       | 1.52         | 1.52       | 1.52         | 1.52       |
| Hole Depth (meters)       | 7.32         | 7.32       | 13.71        | 13.71      | 13.71        | 13.71      | 13.71        | 13.71      |
| Hole Diameter (mm)        | 250.83       | 250.83     | 250.83       | 250.83     | 250.83       | 250.83     | 250.83       | 250.83     |
| Burden (meters)           | 7.32         | 7.32       | 8.23         | 8.23       | 7.62         | 7.62       | 7.01         | 280.53     |
| Spacing (meters)          | 7.32         | 7.32       | 8.23         | 8.23       | 7.62         | 7.62       | 7.01         | 7.01       |
| Tonnes per Hole           | 1282.85      | 1282.85    | 2146.73      | 2146.73    | 1946.46      | 1946.46    | 1263.34      | 7.01       |
| Explosives                |              |            |              |            |              |            |              | 1623.34    |
| Column Load               | AN/FO        | POWERGEL A | AN/FO        | POWERGEL A | AN/FO        | POWERGEL A | AN/FO        | POWERGEL A |
| Density (g/cc)            | 0.84         | 1.25       | 0.84         | 1.25       | 0.84         | 1.25       | 0.84         | 1.25       |
| Quantity (kg)             | 36.74        | 87.54      | 204.12       | 274.42     | 176.90       | 243.48     | 170.10       | 204.12     |
| Powder Factor (g/tonne)   | 28.64        | 68.24      | 35.08        | 127.83     | 90.88        | 128.17     | 104.78       | 125.74     |
| Toe Load                  | 10% AL/AN/FO | POWERGEL C | 10% AL/AN/FO | POWERGEL C | 10% AL/AN/FO | POWERGEL C | 15% AL/AN/FO | POWERGEL C |
| Density (g/cc)            | 0.87         | 1.25       | 0.87         | 1.25       | 0.87         | 1.25       | 0.87         | 1.25       |
| Quantity (kg)             | 72.57        | 86.18      | 136.08       | 136.08     | 170.10       | 158.76     | 183.70       | 199.58     |
| Powder Factor (g/tonne)   | 56.57        | 67.18      | 63.39        | 63.39      | 87.39        | 81.56      | 113.16       | 122.94     |
| Total Load                |              |            |              |            |              |            |              |            |
| Density (g/cc)            | 0.86         | 1.25       | 0.85         | 1.25       | 0.85         | 1.25       | 0.86         | 1.25       |
| Quantity (kg)             | 109.31       | 173.72     | 340.20       | 410.50     | 347.00       | 408.24     | 353.80       | 403.70     |
| Powder Factor (g/tonne)   | 85.21        | 135.42     | 158.47       | 191.22     | 178.27       | 209.73     | 217.95       | 248.68     |
| Powder Rise (meters)      | 2.56         | 2.83       | 8.08         | 6.64       | 8.23         | 6.61       | 8.35         | 6.52       |
| Stemming Height (meters)  | 4.76         | 4.49       | 5.63         | 7.07       | 5.48         | 7.10       | 5.36         | 7.19       |
| <b>DRILL PRODUCTIVITY</b> |              |            |              |            |              |            |              |            |
| Penetration Rate (m/hour) | 21.95        | 21.95      | 45.72        | 45.72      | 29.26        | 29.26      | 10.97        | 10.97      |
| O-T-H Time/Shift (hours)  | 6.41         | 6.41       | 6.26         | 6.26       | 6.80         | 6.80       | 8.01         | 8.01       |
| Meters Drilled per Shift  | 140.70       | 140.70     | 286.21       | 286.21     | 198.97       | 198.97     | 87.87        | 87.87      |
| Tonnes per Meter Drilled  | 175.25       | 175.25     | 156.58       | 156.58     | 141.97       | 141.97     | 118.41       | 118.41     |
| Tonnes per Drill Shift    | 24657.68     | 24657.68   | 44814.76     | 44814.76   | 28247.77     | 28247.77   | 10404.69     | 10404.69   |
| SAY                       | 24700.00     | 24700.00   | 44800.00     | 44800.00   | 28200.00     | 28200.00   | 10400.00     | 10400.00   |

TABLE 5-2

## CYPRUS ANVIL

9-7/8 inch DRILL REQUIREMENTS  
(6% MINE PLAN - 584 min/shift)

|                   | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991 | 1992 |
|-------------------|-------|-------|-------|-------|-------|-------|------|------|
| ORE               |       |       |       |       |       |       |      |      |
| ktonnes           | 417   | 2523  | 4078  | 4790  | 4189  | 2541  | 0    | 0    |
| tonnes/shift      | 24700 | 24700 | 24700 | 24700 | 24700 | 24700 | 0    | 0    |
| Reqd. shifts      | 17    | 102   | 165   | 194   | 170   | 103   | 0    | 0    |
| ROCK TYPE 10      |       |       |       |       |       |       |      |      |
| ktonnes           | 9043  | 20428 | 16887 | 19128 | 6711  | 1860  | 0    | 0    |
| tonnes/shift      | 44800 | 44800 | 44800 | 44800 | 44800 | 44800 | 0    | 0    |
| Reqd. shifts      | 202   | 456   | 377   | 427   | 150   | 42    | 0    | 0    |
| ROCK TYPE 30      |       |       |       |       |       |       |      |      |
| ktonnes           | 620   | 2654  | 6513  | 329   | 0     | 0     | 0    | 0    |
| tonnes/shift      | 28200 | 28200 | 28200 | 28200 | 0     | 0     | 0    | 0    |
| Reqd. shifts      | 22    | 94    | 231   | 12    | 0     | 0     | 0    | 0    |
| ROCK TYPE 30bx    |       |       |       |       |       |       |      |      |
| ktonnes           | 1411  | 1900  | 2963  | 784   | 253   | 0     | 0    | 0    |
| tonnes/shift      | 10400 | 10400 | 10400 | 10400 | 10400 | 0     | 0    | 0    |
| Reqd. shifts      | 136   | 183   | 285   | 75    | 24    | 0     | 0    | 0    |
| DRILLS REQUIRED   |       |       |       |       |       |       |      |      |
| Total shifts      | 377   | 835   | 1058  | 708   | 344   | 145   | 0    | 0    |
| Available shifts  | 414   | 710   | 710   | 710   | 355   | 222   | 0    | 0    |
| Avg. units oprtg. | 0.91  | 1.18  | 1.49  | 1.00  | 0.97  | 0.65  | 0    | 0    |
| % mech. avail.    | 80    | 79    | 78    | 76    | 75    | 74    | 0    | 0    |
| Fleet             | 2     | 3     | 3     | 3     | 3     | 3     | 0    | 0    |
| % utilization     | 46    | 39    | 50    | 33    | 32    | 22    | 0    | 0    |

## CYPRUS ANVIL

LOADING EQUIPMENT PRODUCTIVITY  
(6% MINE PLAN - 584 min/shift)

## 15 yard SHOVEL

|                                | ORE    | STKPL  | 1D     | 3D     | 3Dbx   |
|--------------------------------|--------|--------|--------|--------|--------|
| Rock Type                      |        |        |        |        |        |
| In-situ density (g/cc)         | 3.93   | 3.93   | 2.60   | 2.75   | 2.71   |
| Swell factor                   | 1.30   | 1.30   | 1.30   | 1.30   | 1.30   |
| Loose density (g/cc)           | 3.02   | 3.02   | 2.00   | 2.12   | 2.08   |
| Productivity per Load          |        |        |        |        |        |
| Bucket size (cu.m.)            | 11.47  | 11.47  | 11.47  | 11.47  | 11.47  |
| Bucket fill factor (%)         | 90     | 90     | 90     | 90     | 90     |
| Tonnes per bucket              | 31.18  | 31.18  | 20.65  | 21.88  | 21.47  |
| Truck size (tonnes) (120)      | 108.94 | 108.94 | 108.94 | 108.94 | 108.94 |
| (tonnes) (170)                 | 154.33 | 154.33 | 154.33 | 154.33 | 154.33 |
| Truck load factor (%)          | 92     | 92     | 92     | 92     | 92     |
| Avg. truck load (tonnes) (120) | 100.22 | 100.22 | 100.22 | 100.22 | 100.22 |
| (tonnes) (170)                 | 141.98 | 141.98 | 141.98 | 141.98 | 141.98 |
| Theoretical buckets (120)      | 3.21   | 3.21   | 4.85   | 4.58   | 4.67   |
| (170)                          | 4.55   | 4.55   | 6.88   | 6.49   | 6.61   |
| Actual buckets (120)           | 4      | 4      | 5      | 5      | 5      |
| (170)                          | 5      | 5      | 7      | 7      | 7      |
| Swing time (sec.)              | 30     | 30     | 30     | 30     | 30     |
| Spot time (sec.)               | 10     | 10     | 10     | 10     | 10     |
| Total time (min.) (120)        | 2.17   | 2.17   | 2.67   | 2.67   | 2.67   |
| (170)                          | 2.67   | 2.67   | 3.67   | 3.67   | 3.67   |
| Productivity per Shift         |        |        |        |        |        |
| Effective minutes per shift    | 584    | 584    | 584    | 584    | 584    |
| Loads per shift (120)          | 269.12 | 269.12 | 218.73 | 218.73 | 218.73 |
| (170)                          | 218.73 | 218.73 | 159.13 | 159.13 | 159.13 |
| Tonnes per load (120)          | 100.22 | 100.22 | 100.22 | 100.22 | 100.22 |
| (170)                          | 141.98 | 141.98 | 141.98 | 141.98 | 141.98 |
| Tonnes per shift (120)         | 26971  | 26971  | 21921  | 21921  | 21921  |
| (170)                          | 31055  | 31055  | 22593  | 22593  | 22593  |

TABLE 5-4

## CYPRUS ANVIL

15 yard SHOVEL REQUIREMENTS  
(6% MINE PLAN - 584 min/shift)

|                           | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991  | 1992  |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>ORE</b>                |       |       |       |       |       |       |       |       |
| 120 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 417   | 2523  | 4078  | 4790  | 0     | 0     | 0     | 0     |
| tonnes/shift              | 26971 | 26971 | 26971 | 26971 | 0     | 0     | 0     | 0     |
| Reqd. shifts              | 15    | 94    | 151   | 178   | 0     | 0     | 0     | 0     |
| 170 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 0     | 0     | 0     | 0     | 4189  | 2541  | 0     | 0     |
| tonnes/shift              | 0     | 0     | 0     | 0     | 31055 | 31055 | 0     | 0     |
| Reqd. shifts              | 0     | 0     | 0     | 0     | 135   | 82    | 0     | 0     |
| <b>STOCKPILE REHANDLE</b> |       |       |       |       |       |       |       |       |
| 120 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 0     | 0     | 0     | 0     | 0     | 918   | 4061  | 2114  |
| tonnes/shift              | 0     | 0     | 0     | 0     | 0     | 26971 | 26971 | 26971 |
| Reqd. shifts              | 0     | 0     | 0     | 0     | 0     | 34    | 151   | 78    |
| <b>WASTE</b>              |       |       |       |       |       |       |       |       |
| 120 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 0     | 8288  | 9781  | 2637  | 3827  | 639   | 0     | 0     |
| tonnes/shift              | 0     | 21921 | 21921 | 21921 | 21921 | 21921 | 0     | 0     |
| Reqd. shifts              | 0     | 378   | 446   | 120   | 175   | 29    | 0     | 0     |
| 170 ton trucks            |       |       |       |       |       |       |       |       |
| ktonnes                   | 11074 | 16694 | 16582 | 17604 | 3137  | 1221  | 0     | 0     |
| tonnes/shift              | 22593 | 22593 | 22593 | 22593 | 22593 | 22593 | 0     | 0     |
| Reqd. shifts              | 490   | 739   | 734   | 779   | 139   | 54    | 0     | 0     |
| <b>SHOVELS REQUIRED</b>   |       |       |       |       |       |       |       |       |
| Total reqd. shifts        | 505   | 1211  | 1331  | 1077  | 449   | 199   | 151   | 78    |
| Available shifts          | 414   | 710   | 710   | 710   | 355   | 355   | 355   | 185   |
| Avg. units oprtg.         | 1.22  | 1.71  | 1.87  | 1.52  | 1.26  | 0.56  | 0.43  | 0.42  |
| % mech. avail.            | 80    | 77    | 75    | 75    | 75    | 75    | 75    | 75    |
| Fleet                     | 3     | 3     | 3     | 3     | 3     | 3     | 3     | 3     |
| % utilization             | 41    | 57    | 62    | 51    | 42    | 19    | 14    | 14    |

## CYPRUS ANVIL

LOADING EQUIPMENT PRODUCTIVITY  
(6% MINE PLAN - 584 min/shift)

## 10 yard RUBBER TIRED LOADER (FEL)

|                                | ORE  | STKPL  | 1D   | 3D   | 3Dbx |
|--------------------------------|------|--------|------|------|------|
| Rock Type                      |      |        |      |      |      |
| In-situ density (g/cc)         | 3.93 | 3.93   | 2.60 | 2.75 | 2.71 |
| Swell factor                   | 1.30 | 1.30   | 1.30 | 1.30 | 1.30 |
| Loose density (g/cc)           | 3.02 | 3.02   | 2.00 | 2.12 | 2.08 |
| Productivity per Load          |      |        |      |      |      |
| Bucket size (cu.m.)            |      | 7.65   |      |      |      |
| Bucket fill factor (%)         |      | 90     |      |      |      |
| Tonnes per bucket              |      | 20.79  |      |      |      |
| Truck size (tonnes) (120)      |      | 108.94 |      |      |      |
| Truck load factor (%)          |      | 92     |      |      |      |
| Avg. truck load (tonnes) (120) |      | 100.22 |      |      |      |
| Theoretical buckets (120)      |      | 4.82   |      |      |      |
| Actual buckets (120)           |      | 5      |      |      |      |
| Swing time (sec.)              |      | 45     |      |      |      |
| Spot time (sec.)               |      | 10     |      |      |      |
| Total time (min.) (120)        |      | 3.92   |      |      |      |
| Productivity per Shift         |      |        |      |      |      |
| Effective minutes per shift    |      | 584    |      |      |      |
| Loads per shift (120)          |      | 148.98 |      |      |      |
| Tonnes per load (120)          |      | 100.22 |      |      |      |
| Tonnes per shift (120)         |      | 14931  |      |      |      |

TABLE 5-6

CYPRUS ANVIL

10 yard RUBBER TIRED LOADER (FEL) REQUIREMENTS  
(6% MINE PLAN - 584 min/shift)

|                    | 1985  | 1986  | 1987 | 1988  | 1989  | 1990  | 1991 | 1992 |
|--------------------|-------|-------|------|-------|-------|-------|------|------|
| ORE                |       |       |      |       |       |       |      |      |
| 120 ton trucks     |       |       |      |       |       |       |      |      |
| ktonnes            | 0     | 0     | 0    | 0     | 0     | 0     | 0    | 0    |
| tonnes/shift       | 0     | 0     | 0    | 0     | 0     | 0     | 0    | 0    |
| Reqd. shifts       | 0     | 0     | 0    | 0     | 0     | 0     | 0    | 0    |
| STOCKPILE REHANDLE |       |       |      |       |       |       |      |      |
| 120 ton trucks     |       |       |      |       |       |       |      |      |
| ktonnes            | 173   | 2241  | 0    | 124   | 885   | 724   | 0    | 0    |
| tonnes/shift       | 14931 | 14931 | 0    | 14931 | 14931 | 14931 | 0    | 0    |
| Reqd. shifts       | 12    | 150   | 0    | 8     | 59    | 48    | 0    | 0    |
| WASTE              |       |       |      |       |       |       |      |      |
| 120 ton trucks     |       |       |      |       |       |       |      |      |
| ktonnes            | 0     | 0     | 0    | 0     | 0     | 0     | 0    | 0    |
| tonnes/shift       | 0     | 0     | 0    | 0     | 0     | 0     | 0    | 0    |
| Reqd. shifts       | 0     | 0     | 0    | 0     | 0     | 0     | 0    | 0    |
| LOADERS REQUIRED   |       |       |      |       |       |       |      |      |
| Total reqd. shifts | 12    | 150   | 0    | 8     | 59    | 48    | 0    | 0    |
| Available shifts   | 417   | 710   | 0    | 710   | 355   | 222   | 0    | 0    |
| Avg. units oprtg.  | 0.03  | 0.21  | 0    | 0.01  | 0.17  | 0.22  | 0    | 0    |
| % mech. avail.     | 80    | 80    | 0    | 73    | 70    | 67    | 0    | 0    |
| Fleet              | 1     | 1     | 0    | 1     | 1     | 1     | 0    | 0    |
| % utilization      | 3     | 21    | 0    | 1     | 17    | 22    | 0    | 0    |

NOTE: Stockpile rehandle tonnages shown above include the stockpile tonnages indicated in the Production Schedule plus an allowance, consisting of 10% of the annual mill feed, for short-term stockpiling adjacent to the crushed to facilitate batch-feeding of ore types.

TABLE 5-7

CYPRUS ANVIL  
120 ton TRUCK REQUIREMENTS  
(6% MINE PLAN - 584 min/shift)

|                           | 1985  | 1986  | 1987  | 1988  | 1989  | 1990   | 1991   | 1992   |
|---------------------------|-------|-------|-------|-------|-------|--------|--------|--------|
| <b>ORE</b>                |       |       |       |       |       |        |        |        |
| ktonnes                   | 417   | 2523  | 4078  | 4790  | 0     | 0      | 0      | 0      |
| Profile (ft.) flat        | 6019  | 3701  | 4481  | 4001  | 0     | 0      | 0      | 0      |
| up                        | 1775  | 5613  | 6463  | 6263  | 0     | 0      | 0      | 0      |
| down                      | 0     | 1250  | 1250  | 1313  | 0     | 0      | 0      | 0      |
| A/D                       | 200   | 200   | 200   | 200   | 0     | 0      | 0      | 0      |
| Haul time (min.)          | 10.93 | 17.95 | 20.57 | 19.68 | 0     | 0      | 0      | 0      |
| Fixed time (min.)         | 2.17  | 2.17  | 2.17  | 2.17  | 0     | 0      | 0      | 0      |
| Cycle time (min.)         | 13.10 | 20.12 | 22.74 | 21.85 | 0     | 0      | 0      | 0      |
| Loads/584 min. shift      | 44.58 | 29.03 | 25.68 | 26.73 | 0     | 0      | 0      | 0      |
| Tonnes/truck shift        | 4468  | 2909  | 2574  | 2679  | 0     | 0      | 0      | 0      |
| Required shifts           | 93    | 867   | 1584  | 1788  | 0     | 0      | 0      | 0      |
| <b>STOCKPILE REHANDLE</b> |       |       |       |       |       |        |        |        |
| ktonnes                   | 173   | 2241  | 0     | 124   | 885   | 1642   | 4061   | 2114   |
| Profile (ft.) flat        | 1400  | 1400  | 0     | 1400  | 1400  | 1400   | 1400   | 1400   |
| up                        | 0     | 0     | 0     | 0     | 0     | 0      | 0      | 0      |
| down                      | 0     | 0     | 0     | 0     | 0     | 0      | 0      | 0      |
| A/D                       | 200   | 200   | 0     | 200   | 200   | 200    | 200    | 200    |
| Haul time (min.)          | 2.10  | 2.10  | 0     | 2.10  | 2.10  | 2.10   | 2.10   | 2.10   |
| Fixed time (min.)         | 3.92  | 3.92  | 0     | 3.92  | 3.92  | 2.17   | 2.17   | 2.17   |
| Cycle time (min.)         | 6.02  | 6.02  | 0     | 6.02  | 6.02  | 4.27   | 4.27   | 4.27   |
| Loads/584 min. shift      | 97.01 | 97.01 | 0     | 97.01 | 97.01 | 136.77 | 136.77 | 136.77 |
| Tonnes/truck shift        | 9722  | 9722  | 0     | 9722  | 9722  | 13707  | 13707  | 13707  |
| Required shifts           | 18    | 231   | 0     | 13    | 91    | 120    | 296    | 154    |
| <b>WASTE</b>              |       |       |       |       |       |        |        |        |
| ktonnes                   | 0     | 8288  | 9781  | 2637  | 3827  | 639    | 0      | 0      |
| Profile (ft.) flat        | 0     | 4187  | 3296  | 3700  | 3381  | 3831   | 0      | 0      |
| up                        | 0     | 5350  | 5525  | 6113  | 5325  | 9350   | 0      | 0      |
| down                      | 0     | 50    | 50    | 38    | 0     | 413    | 0      | 0      |
| A/D                       | 0     | 200   | 200   | 200   | 200   | 200    | 0      | 0      |
| Haul time (min.)          | 0     | 16.16 | 15.50 | 17.12 | 14.99 | 24.38  | 0      | 0      |
| Fixed time (min.)         | 0     | 2.67  | 2.67  | 2.67  | 2.67  | 2.67   | 0      | 0      |
| Cycle time (min.)         | 0     | 18.83 | 27.88 | 19.79 | 17.66 | 27.05  | 0      | 0      |
| Loads/584 min. shift      | 0     | 31.01 | 20.95 | 29.51 | 33.07 | 21.59  | 0      | 0      |
| Tonnes/truck shift        | 0     | 3108  | 2100  | 2957  | 3314  | 2164   | 0      | 0      |
| Required shifts           | 0     | 2667  | 4658  | 892   | 1155  | 295    | 0      | 0      |
| <b>TRUCKS REQUIRED</b>    |       |       |       |       |       |        |        |        |
| Total reqd. shifts        | 111   | 3765  | 6242  | 2693  | 1246  | 415    | 296    | 154    |
| Available shifts          | 414   | 710   | 710   | 710   | 355   | 355    | 355    | 185    |
| Avg. units oprtg.         | 0.27  | 5.30  | 8.79  | 3.79  | 3.51  | 1.17   | 0.83   | 0.83   |
| % mech. avail.            | 75    | 75    | 75    | 73    | 71    | 71     | 71     | 71     |
| Fleet                     | 1     | 8     | 13    | 6     | 6     | 2      | 2      | 2      |
| % utilization             | 27    | 66    | 68    | 63    | 59    | 59     | 42     | 42     |

NOTE: For manpower calculation purposes after 1987, it has been assumed that a fleet of 13 out of 22 trucks will be maintained.

TABLE 5-8

## CYPRUS ANVIL

170 ton TRUCK REQUIREMENTS  
(6% MINE PLAN - 584 min/shift)

|                            | 1985  | 1986  | 1987  | 1988  | 1989  | 1990  | 1991 | 1992 |
|----------------------------|-------|-------|-------|-------|-------|-------|------|------|
| <b>ORE</b>                 |       |       |       |       |       |       |      |      |
| ktonnes                    | 0     | 0     | 0     | 0     | 4189  | 2541  | 0    | 0    |
| Profile (ft.) flat         | 0     | 0     | 0     | 0     | 4382  | 4724  | 0    | 0    |
| up                         | 0     | 0     | 0     | 0     | 6538  | 6400  | 0    | 0    |
| down                       | 0     | 0     | 0     | 0     | 1363  | 1577  | 0    | 0    |
| A/D                        | 0     | 0     | 0     | 0     | 200   | 200   | 0    | 0    |
| Haul time (min.)           | 0     | 0     | 0     | 0     | 20.76 | 21.18 | 0    | 0    |
| Fixed time (min.)          | 0     | 0     | 0     | 0     | 2.67  | 2.67  | 0    | 0    |
| Cycle time (min.)          | 0     | 0     | 0     | 0     | 23.43 | 23.85 | 0    | 0    |
| Loads/584 min. shift       | 0     | 0     | 0     | 0     | 24.93 | 24.49 | 0    | 0    |
| Tonnes/truck shift         | 0     | 0     | 0     | 0     | 3540  | 3386  | 0    | 0    |
| Required shifts            | 0     | 0     | 0     | 0     | 1183  | 750   | 0    | 0    |
| <b>STOCKPILE REMHANDLE</b> |       |       |       |       |       |       |      |      |
| ktonnes                    | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Profile (ft.) flat         | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| up                         | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| down                       | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| A/D                        | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Haul time (min.)           | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Fixed time (min.)          | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Cycle time (min.)          | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Loads/584 min. shift       | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Tonnes/truck shift         | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| Required shifts            | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0    |
| <b>WASTE</b>               |       |       |       |       |       |       |      |      |
| ktonnes                    | 11074 | 16694 | 16582 | 17614 | 3137  | 1221  | 0    | 0    |
| Profile (ft.) flat         | 4249  | 4187  | 3296  | 3700  | 3381  | 3831  | 0    | 0    |
| up                         | 3488  | 5350  | 5525  | 6113  | 5325  | 9350  | 0    | 0    |
| down                       | 0     | 50    | 50    | 38    | 0     | 413   | 0    | 0    |
| A/D                        | 200   | 200   | 200   | 200   | 200   | 200   | 0    | 0    |
| Haul time (min.)           | 12.37 | 16.16 | 15.50 | 17.12 | 14.99 | 24.38 | 0    | 0    |
| Fixed time (min.)          | 3.67  | 3.67  | 3.67  | 3.67  | 3.67  | 3.67  | 0    | 0    |
| Cycle time (min.)          | 16.04 | 19.83 | 19.17 | 17.79 | 18.66 | 28.05 | 0    | 0    |
| Loads/584 min. shift       | 36.41 | 29.45 | 30.46 | 32.83 | 31.30 | 20.82 | 0    | 0    |
| Tonnes/truck shift         | 5169  | 4181  | 4325  | 4661  | 4444  | 2956  | 0    | 0    |
| Required shifts            | 2142  | 3993  | 3834  | 3777  | 706   | 413   | 0    | 0    |
| <b>TRUCKS REQUIRED</b>     |       |       |       |       |       |       |      |      |
| Total reqd. shifts         | 2142  | 3993  | 3834  | 3777  | 1889  | 1163  | 0    | 0    |
| Available shifts           | 414   | 710   | 710   | 710   | 355   | 222   | 0    | 0    |
| Avg. units oprtg.          | 5.17  | 5.62  | 5.40  | 5.32  | 5.32  | 5.24  | 0    | 0    |
| % mech. avail.             | 75    | 74    | 71    | 70    | 70    | 69    | 0    | 0    |
| Fleet                      | 8     | 8     | 8     | 8     | 8     | 8     | 0    | 0    |
| % utilization              | 65    | 70    | 68    | 67    | 67    | 66    | 0    | 0    |

NOTE: Available fleet of 8 trucks operated at capacity for duration of pit life.

TABLE 5-9

CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

## EQUIPMENT SHIFT REQUIREMENTS

| PERIOD          | PRIMARY UNITS |        |        |         |         | AUXILIARY UNITS |        |       |       |        |       |
|-----------------|---------------|--------|--------|---------|---------|-----------------|--------|-------|-------|--------|-------|
|                 | Drill         | Shovel | F.E.L. | Truck   | Truck   | F.E.L.          | R.T.D. | Dozer | Dozer | Road   | Water |
|                 | 9 7/8         | 15 yd. | Stpl.  | 120 ton | 170 ton | 10 yd.          |        | D-9   | D-8   | Grader | Truck |
| 1985 (JUNE-DEC) | 376           | 504    | 13     | 111     | 2142    | 150             | 210    | 490   | 245   | 700    | 175   |
| 1986            | 835           | 1211   | 177    | 3765    | 3993    | 260             | 365    | 850   | 425   | 1200   | 300   |
| 1987            | 1058          | 1331   | 27     | 6242    | 3834    | 210             | 365    | 850   | 425   | 1200   | 300   |
| 1988            | 708           | 1077   | 36     | 2693    | 3771    | 210             | 365    | 850   | 425   | 1200   | 300   |
| 1989            | 344           | 449    | 86     | 1246    | 1889    | 100             | 150    | 100   | 210   | 300    | 150   |
| 1990            | 144           | 199    | 76     | 415     | 1163    | 100             | 150    | 100   | 210   | 300    | 150   |
| 1991            | 0             | 151    | 0      | 296     | 0       | 100             | 150    | 100   | 210   | 300    | 150   |
| 1992 (JAN-AUG)  | 0             | 78     | 0      | 154     | 0       | 60              | 95     | 60    | 130   | 190    | 95    |

#### 5.1.4 Mine Operating Costs

As described in Sections 3.1.4 and 4.1.4, mine operating costs incorporate the following changes from the August 1984 Report:

- 1) Hourly rates for mine operations personnel on a "hot change" basis have been increased by \$0.92 over the base rate.
- 2) Hourly rates for mine operations and mine maintenance personnel on a rotating shift basis have been increased by \$1.00 over the base rate to cover weekend and shift premiums.
- 3) The cost per man per year for hourly mine operations and mine maintenance personnel has been based on 2,042 hours.
- 4) Fringe benefits for hourly personnel have been based on 1,884 hours per year (157 shifts).
- 5) Power costs are \$0.04 per kwh.
- 6) Diesel fuel cost is \$0.40 per liter.
- 7) Tire costs are current quotes obtained by CAMC as follows:

|            |          |
|------------|----------|
| 36 x 51    | \$11,600 |
| 30 x 51    | 9,100    |
| 18 x 33    | 2,300    |
| 37.25 x 35 | 9,000    |
| 29.5 x 35  | 5,000    |

- 8) Explosives costs are based on the new CIL schedule.

In addition to the above, this option increases the equipment operating time per shift from 10.5 to 11.3 hours and reduces hourly wage rates by 20 percent.

Using the above, the operating cost per shift for each type of mine equipment has been recalculated and these are summarized in Tables 5-10 through 5-20. Again, it should be noted that these are estimates of average costs and they will vary with equipment age.

Mine operating and maintenance labor costs have been developed for each year, based on the hourly rates and hours/man/year referred to above. These calculations are contained in Appendix C. Annual operating labor costs have been assimilated by mining function and divided by total tonnage moved to obtain functional unit costs on an annual basis. These calculations are also contained in Appendix C.

Functional unit costs for mine maintenance are based on the equipment operating costs per shift (Tables 5-10 through 5-20) and annual equipment shifts required (Table 5-9). The equipment shift costs shown in Tables 5-10 through 5-20 are average costs over equipment life. These costs have been adjusted for equipment age so that costs in early years (newer equipment) are lower than in later years. Annual maintenance labor unit costs are shown in Appendix C.

CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

Drill 9 7/8 inch

|                   |           |    |        |
|-------------------|-----------|----|--------|
| LIST PRICE        | \$x1000   | \$ | 1580.0 |
| BIT COST          |           | \$ | 4018   |
| BIT LIFE HRS      |           |    | 137    |
| POWER CONSUMPTION | (kWhr/hr) |    | 125    |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Power cost \$0.040/KWhr                                      | \$ | 5.00  |
| Bit Cost                                                     | \$ | 29.33 |
| Drill Pipe & Stabilizer<br>@ 1/4 Bit Cost                    | \$ | 7.33  |
| Repair Parts<br>(0.0372 x Delivered<br>Cost in \$x1000)      | \$ | 58.78 |
| Maintenance Labor<br>(0.0160 x Delivered<br>Cost in \$x1000) | \$ | 25.28 |
| OPERATING HRS./SHIFT                                         |    | 11.3  |
| DRILLING HRS./SHIFT                                          |    | 6.7   |

COST BREAKDOWN (\$/Shift)

|                                            |    |        |
|--------------------------------------------|----|--------|
| Bit Cost @6.70hrs./shift                   | \$ | 196.51 |
| Drill Pipe & Stabilizer<br>@6.70hrs./shift | \$ | 49.13  |
| Repair Parts @11.30hrs/shft                | \$ | 664.21 |
| Maintenance Labor<br>@11.30hrs./shift      | \$ | 285.66 |
| Power Cost @11.30 hrs.shift                | \$ | 56.50  |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

F.E.L.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 897.4 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 861.4 |
| FUEL CONSUMPTION LIT./HR   |         |    | 85    |
| COST PER TIRE              |         | \$ | 9000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 5000  |

COST BREAKDOWN (\$/hr.)

|                      |                     |    |       |
|----------------------|---------------------|----|-------|
| Fuel cost            | \$0.400/litre       | \$ | 34.00 |
| Tire Cost            |                     | \$ | 7.20  |
| Repair Parts         |                     |    |       |
|                      | (0.0648 x Delivered |    |       |
|                      | Cost in \$x1000)    | \$ | 55.82 |
| Maintenance Labor    |                     |    |       |
|                      | (0.0216 x Delivered |    |       |
|                      | Cost in \$x1000)    | \$ | 18.61 |
| OPERATING HRS./SHIFT |                     |    | 11.3  |

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 210.29  |
| Parts & Consumables        | \$ | 1096.33 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1306.62 |

CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

Shovel 15 yd

|                   |           |    |        |
|-------------------|-----------|----|--------|
| LIST PRICE        | \$x1000   | \$ | 3240.0 |
| POWER CONSUMPTION | (kWhr/hr) |    | 550    |

COST BREAKDOWN |(\$/hr.)

|            |              |    |       |
|------------|--------------|----|-------|
| Power cost | \$0.040/KWhr | \$ | 22.00 |
|------------|--------------|----|-------|

|                     |    |        |  |
|---------------------|----|--------|--|
| Repair Parts        |    |        |  |
| (0.0480 x Delivered |    |        |  |
| Cost in \$x1000)    | \$ | 155.52 |  |

|                     |    |       |  |
|---------------------|----|-------|--|
| Maintenance Labor   |    |       |  |
| (0.0136 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 44.06 |  |

|                      |  |  |      |
|----------------------|--|--|------|
| OPERATING HRS./SHIFT |  |  | 11.3 |
|----------------------|--|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 497.88 |
|-------------------|----|--------|

|                     |    |         |
|---------------------|----|---------|
| Parts & Consumables | \$ | 2005.98 |
|                     |    | -----   |

|                            |    |         |
|----------------------------|----|---------|
| TOTAL OPERATING COST/SHIFT | \$ | 2503.86 |
|----------------------------|----|---------|

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

120 - Ton truck

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 939.1 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 884.5 |
| FUEL CONSUMPTION LIT./HR   |         |    | 60    |
| COST PER TIRE              |         | \$ | 9100  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3500  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 24.00 |
| Tire Cost                                                    | \$ | 15.60 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 38.21 |
| Maintenance Labor<br>(0.0152 x Delivered<br>Cost in \$x1000) | \$ | 13.44 |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 11.3 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 151.87  |
| Parts & Consumables        | \$ | 879.25  |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1031.12 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

170 - Ton truck

|                            |         |    |        |
|----------------------------|---------|----|--------|
| LIST PRICE                 | \$x1000 | \$ | 1279.6 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 1210.0 |
| FUEL CONSUMPTION LIT./HR   |         |    | 100    |
| COST PER TIRE              |         | \$ | 11600  |
| NUMBER OF TIRES            |         |    | 6      |
| TIRE LIFE HRS              |         |    | 3500   |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 40.00 |
| Tire Cost                                                    | \$ | 19.89 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 52.27 |
| Maintenance Labor<br>(0.0152 x Delivered<br>Cost in \$x1000) | \$ | 18.39 |

|                      |      |
|----------------------|------|
| OPERATING HRS./SHIFT | 11.3 |
|----------------------|------|

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 207.81  |
| Parts & Consumables        | \$ | 1267.41 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1475.22 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

F.E.L.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 897.4 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 861.4 |
| FUEL CONSUMPTION LIT./HR   |         |    | 85    |
| COST PER TIRE              |         | \$ | 9000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 5000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 34.00 |
| Tire Cost                                                    | \$ | 7.20  |
| Repair Parts<br>(0.0648 x Delivered<br>Cost in \$x1000)      | \$ | 55.82 |
| Maintenance Labor<br>(0.0216 x Delivered<br>Cost in \$x1000) | \$ | 18.61 |

OPERATING HRS./SHIFT 11.3

COST BREAKDOWN (\$/Shift)

|                            |    |         |
|----------------------------|----|---------|
| Maintenance Labor          | \$ | 210.29  |
| Parts & Consumables        | \$ | 1096.33 |
|                            |    | -----   |
| TOTAL OPERATING COST/SHIFT | \$ | 1306.62 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

R.T.D.

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 318.6 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 298.6 |
| FUEL CONSUMPTION LIT./HR   |         |    | 25    |
| COST PER TIRE              |         | \$ | 5000  |
| NUMBER OF TIRES            |         |    | 4     |
| TIRE LIFE HRS              |         |    | 3000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 10.00 |
| Tire Cost                                                    | \$ | 6.67  |
| Repair Parts<br>(0.0460 x Delivered<br>Cost in \$x1000)      | \$ | 13.74 |
| Maintenance Labor<br>(0.0192 x Delivered<br>Cost in \$x1000) | \$ | 5.73  |

|                      |  |      |
|----------------------|--|------|
| OPERATING HRS./SHIFT |  | 11.3 |
|----------------------|--|------|

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 64.75  |
| Parts & Consumables        | \$ | 343.63 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 408.38 |

TABLE 5-17

5.22

CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

D9 Dozer

|                          |         |    |       |
|--------------------------|---------|----|-------|
| LIST PRICE               | \$x1000 | \$ | 550.0 |
| FUEL CONSUMPTION LIT./HR |         |    | 35    |

COST BREAKDOWN (\$/hr.)

|                         |    |       |
|-------------------------|----|-------|
| Fuel cost \$0.400/litre | \$ | 14.00 |
|-------------------------|----|-------|

|                                                         |    |       |
|---------------------------------------------------------|----|-------|
| Repair Parts<br>(0.0700 x Delivered<br>Cost in \$x1000) | \$ | 38.50 |
|---------------------------------------------------------|----|-------|

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Maintenance Labor<br>(0.0272 x Delivered<br>Cost in \$x1000) | \$ | 14.96 |
|--------------------------------------------------------------|----|-------|

|                      |  |      |
|----------------------|--|------|
| OPERATING HRS./SHIFT |  | 11.3 |
|----------------------|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 169.05 |
|-------------------|----|--------|

|                     |    |        |
|---------------------|----|--------|
| Parts & Consumables | \$ | 593.25 |
|---------------------|----|--------|

|                            |    |        |
|----------------------------|----|--------|
| TOTAL OPERATING COST/SHIFT | \$ | 762.30 |
|----------------------------|----|--------|

CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

D8 Dozer

|                  |         |    |       |
|------------------|---------|----|-------|
| LIST PRICE       | \$x1000 | \$ | 390.0 |
| FUEL CONSUMPTION | LIT./HR |    | 30    |

COST BREAKDOWN (\$/hr.)

|           |               |    |       |
|-----------|---------------|----|-------|
| Fuel cost | \$0.400/litre | \$ | 12.00 |
|-----------|---------------|----|-------|

|                     |    |       |  |
|---------------------|----|-------|--|
| Repair Parts        |    |       |  |
| (0.0700 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 27.30 |  |

|                     |    |       |  |
|---------------------|----|-------|--|
| Maintenance Labor   |    |       |  |
| (0.0288 x Delivered |    |       |  |
| Cost in \$x1000)    | \$ | 11.23 |  |

|                      |  |  |      |
|----------------------|--|--|------|
| OPERATING HRS./SHIFT |  |  | 11.3 |
|----------------------|--|--|------|

COST BREAKDOWN (\$/Shift)

|                   |    |        |
|-------------------|----|--------|
| Maintenance Labor | \$ | 126.90 |
|-------------------|----|--------|

|                     |    |        |
|---------------------|----|--------|
| Parts & Consumables | \$ | 444.09 |
|                     |    | -----  |

|                            |    |        |
|----------------------------|----|--------|
| TOTAL OPERATING COST/SHIFT | \$ | 570.99 |
|----------------------------|----|--------|

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

## Road Grader

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 344.9 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 331.1 |
| FUEL CONSUMPTION LIT./HR   |         |    | 25    |
| COST PER TIRE              |         | \$ | 2300  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3000  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 10.00 |
| Tire Cost                                                    | \$ | 4.60  |
| Repair Parts<br>(0.0696 x Delivered<br>Cost in \$x1000)      | \$ | 23.04 |
| Maintenance Labor<br>(0.0208 x Delivered<br>Cost in \$x1000) | \$ | 6.89  |
| OPERATING HRS./SHIFT                                         |    | 11.3  |

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 77.86  |
| Parts & Consumables        | \$ | 425.33 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 503.19 |

## CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

EQUIPMENT OPERATING COST/SHIFT  
(in first quarter, 1985, Can. dollars)

## Water Truck

|                            |         |    |       |
|----------------------------|---------|----|-------|
| LIST PRICE                 | \$x1000 | \$ | 700.5 |
| LIST PRICE EXCLUDING TIRES |         | \$ | 664.5 |
| FUEL CONSUMPTION LIT./HR   |         |    | 60    |
| COST PER TIRE              |         | \$ | 6000  |
| NUMBER OF TIRES            |         |    | 6     |
| TIRE LIFE HRS              |         |    | 3500  |

COST BREAKDOWN (\$/hr.)

|                                                              |    |       |
|--------------------------------------------------------------|----|-------|
| Fuel cost \$0.400/litre                                      | \$ | 24.00 |
| Tire Cost                                                    | \$ | 10.29 |
| Repair Parts<br>(0.0432 x Delivered<br>Cost in \$x1000)      | \$ | 28.71 |
| Maintenance Labor<br>(0.0216 x Delivered<br>Cost in \$x1000) | \$ | 14.35 |
| OPERATING HRS./SHIFT                                         |    | 11.3  |

COST BREAKDOWN (\$/Shift)

|                            |    |        |
|----------------------------|----|--------|
| Maintenance Labor          | \$ | 162.16 |
| Parts & Consumables        | \$ | 711.90 |
|                            |    | -----  |
| TOTAL OPERATING COST/SHIFT | \$ | 874.06 |

Functional unit costs for repair parts and consumables have been similarly developed on a required operating shift and cost per shift basis. Costs for blasting consumables are identical to those calculated in the preceding option (See Table 4-26). Total repair parts and consumables on a functional unit cost basis are summarized in Appendix C.

Mine overhead costs consist of salaried labor, salaried fringes, and hourly fringes. In Table 5-21 these costs are accumulated and presented on an annual unit cost basis.

The functional unit costs described in the preceding paragraphs are summarized for each year in terms of operating labor, maintenance labor, parts and consumables, and mine overhead and these annual summaries are contained in Appendix C. Function unit costs are also summarized in Table 5-22 for the life of the mine operations.

## 5.2 Milling

For the six percent cutoff sensitivity case, the only mill factors that changes are the hourly wage rates. The hourly wage rates are reduced by 20 percent to reflect the projected CAMC labor contract. This reduction will decrease operating costs by \$983,400 per year as shown in Table 5-23. The new mill operating cost is therefore \$8.22 per tonne at full capacity when milling sulfide ore.

TABLE 5-21

CYPRUS ANVIL. 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

5.27

## MINE OVERHEAD COST/Tonne

| PERIOD          | SALARIED |         | HOURLY  | TOTAL     | TOTAL  | Cost/  |
|-----------------|----------|---------|---------|-----------|--------|--------|
|                 | Salary   | Fringes | Fringes | (\$x1000) | Kt.    | Tonne  |
| 1985 (JUNE-DEC) | 753.0    | 263.6   | 719.6   | 1736.2    | 11664  | 0.1489 |
| 1986            | 1390.6   | 486.7   | 1717.8  | 3595.1    | 29746  | 0.1209 |
| 1987            | 1390.6   | 486.7   | 1984.7  | 3862.0    | 30441  | 0.1269 |
| 1988            | 1390.6   | 486.7   | 1615.6  | 3492.9    | 25155  | 0.1389 |
| 1989            | 882.4    | 308.8   | 1042.9  | 2234.1    | 12038  | 0.1856 |
| 1990            | 882.4    | 308.8   | 771.1   | 1962.3    | 6043   | 0.3247 |
| 1991            | 328.0    | 114.8   | 386.2   | 829.0     | 4061   | 0.2041 |
| 1992 (JAN-AUG)  | 206.6    | 72.3    | 218.9   | 497.8     | 2114   | 0.2355 |
| TOTAL           | 7224.2   | 2528.4  | 8456.8  | 18209.4   | 121262 | 0.1502 |

TABLE 5-22

CYPRUS ANVIL, 6 PERCENT CUTOFF, 584 MINUTES/SHIFT

## OPERATING COST SUMMARY BY FUNCTION

| PERIOD          | TOTAL<br>Kt. | ORE<br>Kt. | UNIT COST (\$/Total tonne) |        |        |        |                |               |                 |                |        | TOTAL<br>COST<br>(\$xMill.) | COST/<br>TONNE<br>ORE |
|-----------------|--------------|------------|----------------------------|--------|--------|--------|----------------|---------------|-----------------|----------------|--------|-----------------------------|-----------------------|
|                 |              |            | Dring.                     | Blstg. | Loadg. | Haulg. | Aux.<br>Equip. | Genl.<br>Mine | Genl.<br>Mntce. | Genl.<br>Admin | Total  |                             |                       |
| 1985 (JUNE-DEC) | 11664        | 590        | 0.0352                     | 0.1599 | 0.0971 | 0.3047 | 0.1549         | 0.0419        | 0.0922          | 0.1489         | 1.0348 | 12.1                        | 20.46                 |
| 1986            | 29746        | 4764       | 0.0336                     | 0.1354 | 0.0966 | 0.3615 | 0.1115         | 0.0387        | 0.0826          | 0.1209         | 0.9808 | 29.2                        | 6.12                  |
| 1987            | 30441        | 4078       | 0.0422                     | 0.1424 | 0.1016 | 0.4486 | 0.1103         | 0.0386        | 0.0818          | 0.1269         | 1.0924 | 33.3                        | 8.15                  |
| 1988            | 25155        | 4914       | 0.0363                     | 0.1396 | 0.1084 | 0.3950 | 0.1337         | 0.0400        | 0.0854          | 0.1389         | 1.0773 | 27.1                        | 5.51                  |
| 1989            | 12038        | 5074       | 0.0442                     | 0.1450 | 0.1216 | 0.4510 | 0.0798         | 0.0445        | 0.1036          | 0.1856         | 1.1753 | 14.1                        | 2.79                  |
| 1990            | 6043         | 4183       | 0.0485                     | 0.1204 | 0.1222 | 0.5186 | 0.1509         | 0.0568        | 0.1432          | 0.3247         | 1.4853 | 9.0                         | 2.15                  |
| 1991            | 4061         | 4061       | 0.0000                     | 0.0000 | 0.1156 | 0.1200 | 0.2247         | 0.0566        | 0.1677          | 0.2041         | 0.8887 | 3.6                         | 0.89                  |
| 1992 (JAN-AUG)  | 2114         | 2114       | 0.0000                     | 0.0000 | 0.1196 | 0.1202 | 0.2667         | 0.0618        | 0.1717          | 0.2355         | 0.9755 | 2.1                         | 0.98                  |
| TOTAL           | 121262       | 29778      | 0.0366                     | 0.1337 | 0.1051 | 0.3893 | 0.1253         | 0.0417        | 0.0934          | 0.1502         | 1.0753 | 130.5                       | 4.38                  |

## Distribution within Total:

|                     |        |        |        |        |        |        |        |        |        |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Operating Labor     | 0.0077 | 0.0044 | 0.0139 | 0.0607 | 0.0317 | 0.0097 | 0.0000 | 0.0000 | 0.1281 |
| Maintenance Labor   | 0.0061 | 0.0000 | 0.0176 | 0.0468 | 0.0180 | 0.0000 | 0.0354 | 0.0000 | 0.1239 |
| Parts & Consumables | 0.0228 | 0.1293 | 0.0736 | 0.2818 | 0.0756 | 0.0320 | 0.0580 | 0.0000 | 0.6731 |
| Mine Overhead       | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.1502 | 0.1502 |

TABLE 5-23

## Six Percent Cutoff Sensitivity

Mill Personnel CostsOperations

| <u>Category</u>  | <u>CAMC<br/>No.</u> | <u>August Rate<br/>\$/Yr/Man</u> | <u>New Rate<br/>\$/Yr/Man</u> | <u>Savings<br/>\$/Yr</u> |
|------------------|---------------------|----------------------------------|-------------------------------|--------------------------|
| <u>Operation</u> |                     |                                  |                               |                          |
| Staff            | 14                  | 60,000                           | 60,000                        | 0                        |
| Operators        | 38                  | 54,000                           | 43,200                        | 237,600                  |
| Utility/Labors   | 21                  | 42,000                           | 33,600                        | 176,400                  |
| Technicians      | 9                   | 44,000                           | 35,200                        | 79,200                   |
| Clerical         | 1                   | 36,000                           | 28,800                        | 7,200                    |

Maintenance

|                   |    |        |        |               |
|-------------------|----|--------|--------|---------------|
| Staff             | 6  | 60,000 | 60,000 | 0             |
| Millwrights, etc. | 45 | 51,000 | 40,800 | 459,000       |
| Clerical          | 1  | 36,000 | 28,800 | 7,200         |
| Apprentices       | 2  | 42,000 | 33,600 | <u>16,800</u> |

TOTAL SAVINGS. . . . . 983,400

### Capital Expenditures

The mill capital expenditures are as follows:

| <u>Year</u> | <u>Area</u> |                     |                 | <u>Total</u>      |
|-------------|-------------|---------------------|-----------------|-------------------|
|             | <u>Mill</u> | <u>Water System</u> | <u>Tailings</u> |                   |
| 1985        | 4,285,000   | ---                 | 45,000          | 4,330,000         |
| 1986        | 2,030,000   | 1,800,000           | 1,987,000       | 5,817,000         |
| 1987        | 530,000     | ---                 | ---             | 530,000           |
|             |             |                     |                 | <u>10,677,000</u> |

### 5.3 Concentrate Marketing

#### 5.3.1 Marketability

There are no changes in this section from the August 1984 update as presented in Section 3.3.1.

#### 5.3.2 Treatment Contract Terms

There are no changes in this section from the August 1984 update as presented in Section 3.3.2.

#### 5.3.3 Other Marketing Costs

There are no changes in this section from the August 1984 update as presented in Section 3.3.3.

#### 5.3.4 Losses In Transport

There are no changes in this section from the August 1984 update as presented in Section 3.3.4.

#### 5.3.5 Moisture Content

There are no changes in this section from the August 1984 update as presented in Section 3.3.5.

### 5.4 Concentrate Transportation

#### 5.4.1 Overland Transportation

There are no changes in this section from the August 1984 update as presented in Section 3.4.1.

#### 5.4.2 Port Facilities

There are no changes in this section from the August 1984 update as presented in Section 3.4.2.

#### 5.4.3 Ocean Freight

There are no changes in this section from the August 1984 update as presented in Section 3.4.3.

## 5.5 Financial Evaluation

### 5.5.1 Ore Reserve And Production Schedule

There are no changes in this section for the 6.0 percent cutoff grade as presented in 4.5.1.

The production schedule is based on the mining schedule discussed in Section 5.1, mill recoveries discussed in Section 5.2, smelter payable metals, and other factors discussed in Sections 5.3 and 5.4, and summarized again briefly in this Section 5.5.

### 5.5.2 Metal Prices

There are no changes in this section from the August 1984 update as presented in Section 3.5.2.

### 5.5.3 Sales Of Concentrator Products

There are no changes in this section from the August 1984 update as presented in Section 3.5.3.

### 5.5.4 Treatment And Freight Costs

There are no changes in this section from the August 1984 update as presented in Section 3.5.4.

#### 5.5.5      Cash Production Costs               Of Concentrate Production

Cash production costs of concentrate production include costs of mining, milling, general and administrative costs, townsite expenses, and Vancouver and Calgary overhead. Mining and milling cost estimates are discussed in more detail in Sections 5.1 and 5.2 of this report.

##### Mining Cost

The mine operating costs are shown in Table 5-24. These costs assume an electric power cost of \$0.04/kwhr.

##### Milling Cost

The mill operating costs are shown in Table 5-25.

##### General And Administrative And Townsite Expense, Vancouver-Calgary Overhead

There are no changes in this section from the August 1984 update as presented in Section 3.5.5.

TABLE 5-24

Cyprus Anvil Mine  
Mining Costs At 6 Percent Cutoff (584 Minutes/Shift)

| <u>Year</u>     | <u>Cost Per DMT<br/>Of Rock Mined</u> | <u>Total Metric Tons<br/>Mined<br/>(Millions)</u> | <u>Annual<br/>Cost<br/>(Millions)</u> |
|-----------------|---------------------------------------|---------------------------------------------------|---------------------------------------|
| 1985 (June-Dec) | \$ 1.03                               | 11.7                                              | \$ 12.1                               |
| 1986            | 0.98                                  | 29.7                                              | 29.2                                  |
| 1987            | 1.09                                  | 30.4                                              | 33.3                                  |
| 1988            | 1.08                                  | 25.2                                              | 27.1                                  |
| 1989            | 1.18                                  | 12.0                                              | 14.1                                  |
| 1990            | 1.49                                  | 6.0                                               | 9.0                                   |
| 1991            | 0.89                                  | 4.1                                               | 3.6                                   |
| 1992 (Jan-Aug)  | 0.98                                  | 2.1                                               | 2.1                                   |
|                 | Avg. \$ 1.08                          | Total 121.2                                       | Total \$130.5                         |

TABLE 5-25Milling Cost Per Metric Tons Of Ore Milled  
Cyprus Anvil Mine

| <u>Year(s)</u> | <u>C\$/DMT</u> |
|----------------|----------------|
| 1985           | \$10.55        |
| 1986-1992      | 8.22           |

#### 5.5.6 Capital Expenditures

There are no changes in this section from the Capital Expenditures for the 6.0 percent cutoff grade as presented in Section 4.5.6.

#### 5.5.7 Cash Flow From Operations

Table 5-26 shows the pro forma cash flows for the 6.0 percent cutoff grade at the 584 minutes per shift.

#### 5.5.8 Cash Costs Per Pound Of Payable Metal

Table 5-27 shows the cash cost per pound of payable zinc and lead for each year. The method of coproduct cost accounting we have used is to sum the yearly cash costs incurred up to the point at which the two concentrates, zinc and lead, are produced. These costs include mining, milling, general and administrative, townsite, and corporate overhead costs. That sum is then divided by the total pounds of payable zinc and lead produced in that year, to arrive at the cost per pound of zinc or lead. Silver is a byproduct of the lead concentrate and the silver credit is applied against the cost of lead.

TABLE 5-26

PRO FORMA CASH FLOW STATEMENTS  
 CYPRUS ANVIL MINE  
 6 $\frac{1}{2}$  MINE PLAN (584 MINUTES/SHIFT)  
 ZINC PRICE = \$ 0.60/POUND  
 LEAD PRICE = \$ 0.28/POUND  
 SILVER PRICE = \$ 9.72/TR OZ  
 ALL DOLLAR AMOUNTS ARE SHOWN IN CANADIAN DOLLARS

| CASH FLOW YEAR               | 1985       | 1986       | 1987       | 1988       | 1989       | 1990       | 1991       | 1992      |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| SALES OF LEAD                | 1844564.   | 59074428.  | 72330188.  | 64247664.  | 62645396.  | 55121857.  | 37307516.  | 20017187. |
| SALES OF ZINC                | 5806391.   | 171421467. | 189190316. | 177957169. | 183162496. | 177048747. | 114789721. | 61716167. |
| SALES OF SILVER              | 723486.    | 25081971.  | 34003788.  | 27353861.  | 27599592.  | 22544548.  | 15049648.  | 8074824.  |
| TOTAL SALES                  | 8374440.   | 255577866. | 295524292. | 269558694. | 273407484. | 254715152. | 167146884. | 89808178. |
| -ZINC SMELTING               | 2395133.   | 65684392.  | 70979193.  | 66456432.  | 68717715.  | 66733667.  | 46058244.  | 24459536. |
| -LEAD SMELTING               | 980990.    | 29867051.  | 36094791.  | 31957794.  | 31261809.  | 27552007.  | 19280292.  | 10344758. |
| -SILVER REFINING             | 13026.     | 451579.    | 612208.    | 492482.    | 496906.    | 405895.    | 270956.    | 145380.   |
| -CONCENTRATE FREIGHT, OCEAN  | 444343.    | 12622956.  | 14203975.  | 13027933.  | 13208172.  | 12412749.  | 8606039.   | 4585904.  |
| -CONCENTRATE FREIGHT, LAND   | 755383.    | 21459025.  | 24146758.  | 22147487.  | 22453892.  | 21101674.  | 14630266.  | 7796037.  |
| -PORT CHARGES                | 520000.    | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.   | 3100000.  |
| -OTHER CONCENTRATE COSTS     | 34592.     | 982816.    | 1106048.   | 1014409.   | 1028381.   | 966351.    | 670003.    | 357028.   |
| -MINING COSTS                | 12069908.  | 29174876.  | 33253748.  | 27099480.  | 14148261.  | 8975668.   | 3609011.   | 2062207.  |
| -MILLING COSTS               | 1825889.   | 32908523.  | 33381042.  | 33472498.  | 33381042.  | 33381338.  | 33381420.  | 17910829. |
| -GENERAL AND ADMINISTRATIVE  | 3127000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.   | 6345000.  |
| -CALGARY, VANCOUVER OVERHEAD | 300000.    | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1800000.   | 1500000.  |
| -CAPITAL EXPENDITURES        | 6920000.   | 8167000.   | 1130000.   | 600000.    | 600000.    | 600000.    | 500000.    | 400000.   |
| (-/+ )WORKING CAPITAL*       | -6000000.  | 0.         | 0.         | 0.         | 0.         | 0.         | 0.         | 10000000. |
| OPERATING CASH FLOW**        | -27011824. | 43014649.  | 69371529.  | 62045180.  | 76866306.  | 71340803.  | 28895654.  | 20801498. |

\*INCLUDES \$4,000,000 CREDIT IN 1985 FROM THE CANADIAN GOVERNMENT FOR STRIPPING COSTS

\*\*NOTE: COLUMNS MAY NOT ADD IN LAST DIGIT DUE TO COMPUTER ROUNDING

TABLE 5-27

| CASH COST PER POUND OF PAYABLE METAL* |       |       |       |       |       |       |       |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| CYPRUS ANVIL MINE                     |       |       |       |       |       |       |       |
| 6% MINE PLAN (584 MINUTES/SHIFT)      |       |       |       |       |       |       |       |
|                                       | 1986  | 1987  | 1988  | 1989  | 1990  | 1991  | 1992  |
| ZINC                                  |       |       |       |       |       |       |       |
| MINING, MILLING, G&A,<br>TOWNSITE     | 0.141 | 0.130 | 0.131 | 0.105 | 0.103 | 0.139 | 0.160 |
| LAND TRANSPORT                        | 0.049 | 0.048 | 0.048 | 0.048 | 0.048 | 0.051 | 0.051 |
| OCEAN TRANSPORT                       | 0.036 | 0.034 | 0.035 | 0.035 | 0.035 | 0.041 | 0.050 |
| SMELTING                              | 0.232 | 0.227 | 0.226 | 0.227 | 0.228 | 0.243 | 0.240 |
|                                       | 0.458 | 0.440 | 0.439 | 0.415 | 0.414 | 0.474 | 0.500 |
| CAPITAL                               | 0.016 | 0.002 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 |
| TOTAL (CANADIAN \$)                   | 0.475 | 0.442 | 0.440 | 0.416 | 0.416 | 0.476 | 0.502 |
| TOTAL (U.S. \$)                       | 0.342 | 0.318 | 0.317 | 0.300 | 0.299 | 0.343 | 0.362 |
| LEAD                                  |       |       |       |       |       |       |       |
| MINING, MILLING, G&A,<br>TOWNSITE     | 0.141 | 0.130 | 0.131 | 0.105 | 0.103 | 0.139 | 0.160 |
| LAND TRANSPORT                        | 0.035 | 0.035 | 0.035 | 0.035 | 0.035 | 0.036 | 0.036 |
| OCEAN TRANSPORT                       | 0.026 | 0.025 | 0.025 | 0.025 | 0.026 | 0.029 | 0.036 |
| SMELTING                              | 0.143 | 0.141 | 0.141 | 0.141 | 0.142 | 0.146 | 0.146 |
|                                       | 0.346 | 0.332 | 0.332 | 0.307 | 0.305 | 0.351 | 0.378 |
| SILVER CREDIT                         | 0.117 | 0.129 | 0.117 | 0.121 | 0.112 | 0.111 | 0.111 |
|                                       | 0.229 | 0.203 | 0.215 | 0.186 | 0.193 | 0.240 | 0.267 |
| CAPITAL                               | 0.016 | 0.002 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 |
| TOTAL (CANADIAN \$)                   | 0.246 | 0.205 | 0.216 | 0.187 | 0.194 | 0.241 | 0.269 |
| TOTAL (U.S. \$)                       | 0.177 | 0.147 | 0.155 | 0.135 | 0.140 | 0.174 | 0.194 |

\* CS1.00 = U.S.\$0.72

\*\* NOTE: COLUMNS MAY NOT ADD IN LAST DIGIT DUE TO COMPUTER ROUNDING.

#### 5.5.9 Discussion Of Results

The project could begin generating a positive cash flow in 1986, the first full year of production, based on the assumptions for the aforementioned operating parameters and costs in Sections 5.1 and 5.2. Recovery of the incremental capital costs could also occur in 1986 (See Table 5-26). The discounted cash flow return on investment (ROI) represented by the pre-tax cash flows in Table 5-26 is 155.8 percent. The cumulative net cash flow is C\$345 million. The net present value at a 15 percent discount rate is C\$208 million. These are pre-tax numbers. In view of the tax position of CAMC, it is unlikely that any taxes would be payable for some years, according to Dome management. That being the case, the after-tax ROI would also be very high.