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HEAP LEACHING OF PRECIOUS METALS

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May 24, 1977

Heap Leaching Parameters

A. Metal Price; Au= $150, Ag= $5.00

B. Metal Recovery; Au= 60%, Ag= 30%

C. Gross Recovered Value(GRV);

1. Au content/ton= (Au head)($150)(60%)
= (Au head)($90)

2. Ag content/ton= (Ag head)($5)(30%)
= (Ag head)($1.5)

D. Net Operating Profit(NOP);

NOP= (GRV - Total Cost Per Ton)(Ore Tonnage)

E. Total Cost Per Ton-Operational(C_T);

C_T= Unit Operating Cost Per Ton +
Amortization of Capital Investment Per Ton
(All for a Specific Ore Tonnage)

GRAPH A..

Graph A was computed from the simple relationship:

Gross Recovered(Leached) Value Per Ton =

Combined Recovered(Leached) Values of Au & Ag.

Notice that one-cycle semi-log paper was used and that there is no zero Gold(.01). The graph was computed using the following:

$$GRV = Au(\$90) + Ag(\$1.5)$$

or

$$Au = \frac{GRV - Ag(\$1.5)}{\$90}$$

Example

For a given GRV value ($10), compute the gold value that is required when 4 ounces silver are in the ore.

$$Au = \frac{\$10 - 4(\$1.5)}{\$90}$$

$$= \$10 - 4(\$1.5) = \$10-6 = \$4$$

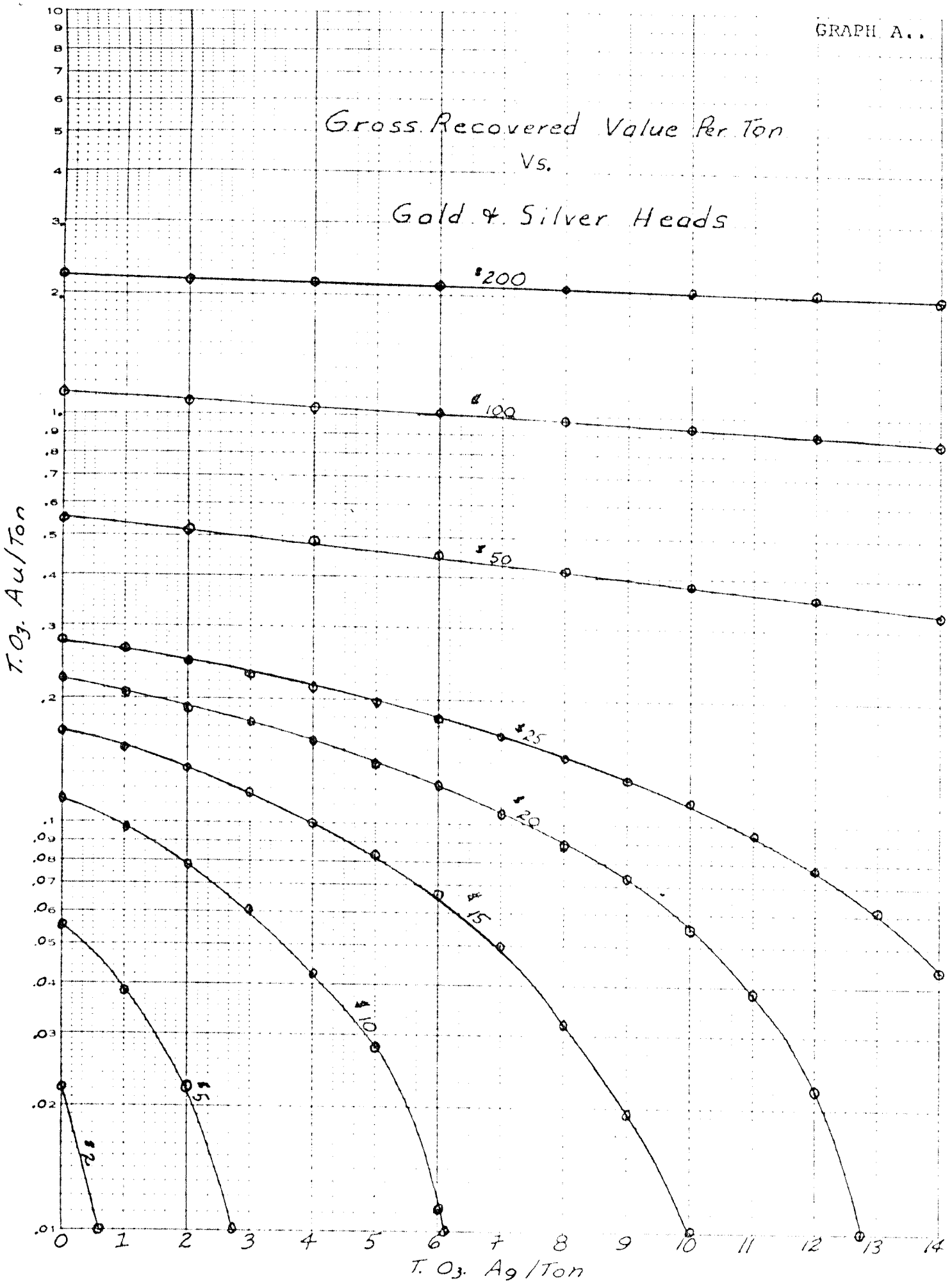
$$= \$4/\$90$$

$$= .0444444$$

Use

Graph A can be used to estimate the gross recovered value (to be used in the next graph) for ore deposits with both gold and silver.

GRAPH A..


Gross Recovered Value Per Ton
Vs.
Gold & Silver Heads
$200
$100
$50
$25
$20
$15
$10
$5
$2
T. Oz. Au/Ton
T. Oz. Ag/Ton
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
10 9 8 7 6 5 4 3 2 1. .9 .8 .7 .6 .5 .4 .3 .2 .1 .09 .08 .07 .06 .05 .04 .03 .02 .01

GRAPH B..

Graph B is to be used to estimate the net operating profit using heap leaching. It is computed from the relationship:

$$\text{Net Operating Profit} = (\text{GRV} - \text{Cost}_T)(\text{Tonnage}_{Ore})$$

where;

$$\text{Cost}_T = (\text{Unit Operating Cost})_T + \text{Amortization of Capital Investment Per Ton})_T$$

and;

T = Specific Ore Tonnage

OPERATING COST ESTIMATE(/Ton)

Item	Deposit Size		
	Small	Medium	Large
1. Administrative	$ .10	$ .12	$ .15
2. Legal	.02	.02	.02
3. Shipping & Ref.	.13	.13	.15
4. State Sales Tax	.20	.20	.20
5. Mining			
A. Drill & Blast	.40	.35	.30
B. Loading	.20	.20	.20
C. Haulage	.35	.35	.30
D. Dumping	.05	.05	.05
6. Plant			
A. Zinc	.02	.03	.03
B. Cyanide	.19	.19	.19
C. Caustic	.08	.08	.08
D. Labor	.07	.06	.05
E. Supervision	.04	.04	.03
7. Contingency	.14	.14	.14
	$1.99	$1.96	$1.89

CAPITAL COST ESTIMATE

Item	Deposit Size			
	Small (200,000 t)	Medium (1½ MM tons)	Med-Large (3 MM tons)	Large (10 MM tons
1. Legal	$ 10,000	$ 10,000	$ 10,000	$ 20,000
2. Engineering	10,000	10,000	10,000	50,000
3. Water Survey	5,000	10,000	15,000	20,000
4. Well	5,000	9,000	13,000	25,000
5. Water Line	10,000	25,000	100,000	130,000
6. Pad	50,000	50,000	50,000	100,000
7. Pond	10,000	10,000	10,000	40,000
8. Fencing	2,000	3,000	5,000	20,000
9. Roads	5,000	10,000	15,000	50,000
10. Housing	5,000	10,000	15,000	50,000
11. Freight	20,000	30,000	50,000	150,000
12. Pre-Production Mining	25,000	50,000	75,000	500,000
13. Generators	30,000	40,000	50,000	150,000
14. Plant	150,000	300,000	450,000	650,000
15. Mgmt. Overhead	15,000	20,000	25,000	100,000
16. Ancillary	-	-	-	2,500,000
17. Contingency	48,000	63,000	107,000	445,000
	$400,000	$650,000	$1,000,000	$5,000,000

For large deposits, additional ancillary facilities are justified, such as maintanence shops, laboratory, offices, etc.. The capital costs are quantified for specific tonnages and amortized on a per ton basis, as follows:

DEPOSIT Tonnage ($X\ 10^6$)	COST PER TON ORE		
	Unit Operating Cost (No Stripping)	Amortization of Capital Investment	C_T
.1	$2.50	$3.50	$6.00
.2	2.30	2.00	4.30
.3	2.15	1.50	3.65
.4	2.05	1.15	3.20
.5	2.00	.93	2.93
.6	1.99	.78	2.77
.7	1.98	.68	2.66
.8	1.97	.60	2.57
.9	1.96	.55	2.51
1.0	1.96	.50	2.46
2	1.96	.35	2.31
3	1.96	.33	2.29
4	1.95	.50	2.45
5	1.94	.50	2.44
6	1.93	.50	2.43
7	1.90	.50	2.40
8	1.89	.50	2.39
9	1.89	.50	2.36
10	1.85	.50	2.35
20	1.84	.40	2.24

Graph B was computed from the following relationship:

$$\text{Net Operating Profit} = (\text{GRV} - C_T)(\text{Ore Tonnage})$$

$$\text{NOP} = \text{GRV}(T) - C_T(T)$$

$$\text{GRV}(T) = \text{NOP} + C_T(T)$$

or;

$$\text{GRV} = \frac{\text{NOP} + C_T(T)}{T}$$

Example

Net Operating Profit envelopes were computed for various ore tonnages from the above equation. Let us compute the GRV for an ore tonnage of 2,000,000 tons with a NOP of $20,000,000.

$$\text{GRV} = \frac{\$20\text{mm} + \$2.31(2\text{mm})}{2\text{mm}}$$

$$= 12.31(\$)$$

Uses

Assume a financial criteron of:

A. Net Op Profit/yr = $2mm
B. Min. Mine Life = 8 years

To define the gold-silver target requirements;

A. Assume the ore target can be mined open-pit with no waste stripping and the "geologic geometry" restricts the ore tonnage to 2mm.
B. Assume- Au deposit; Ag deposit; 50/50 Au-Ag

1. Total NOP = $2mm (8) = $16mm

2. GRV = $1o.31 from graph A

3. This deposit would then have to contain;
   a. Au = .1146 t. oz./ton
   b. Ag = 6.87 t. oz./ton
   c. Au = .057 & Ag = 3.44 t. oz./ton for combination ore.

The additional cost(C_T) for waste stripping must be added to C_T. The largest percentage cost increase due to stripping waste is for the large tonnages - 10mm ton deposits are double the cost increase due to stripping than for 100,000 ton deposits.

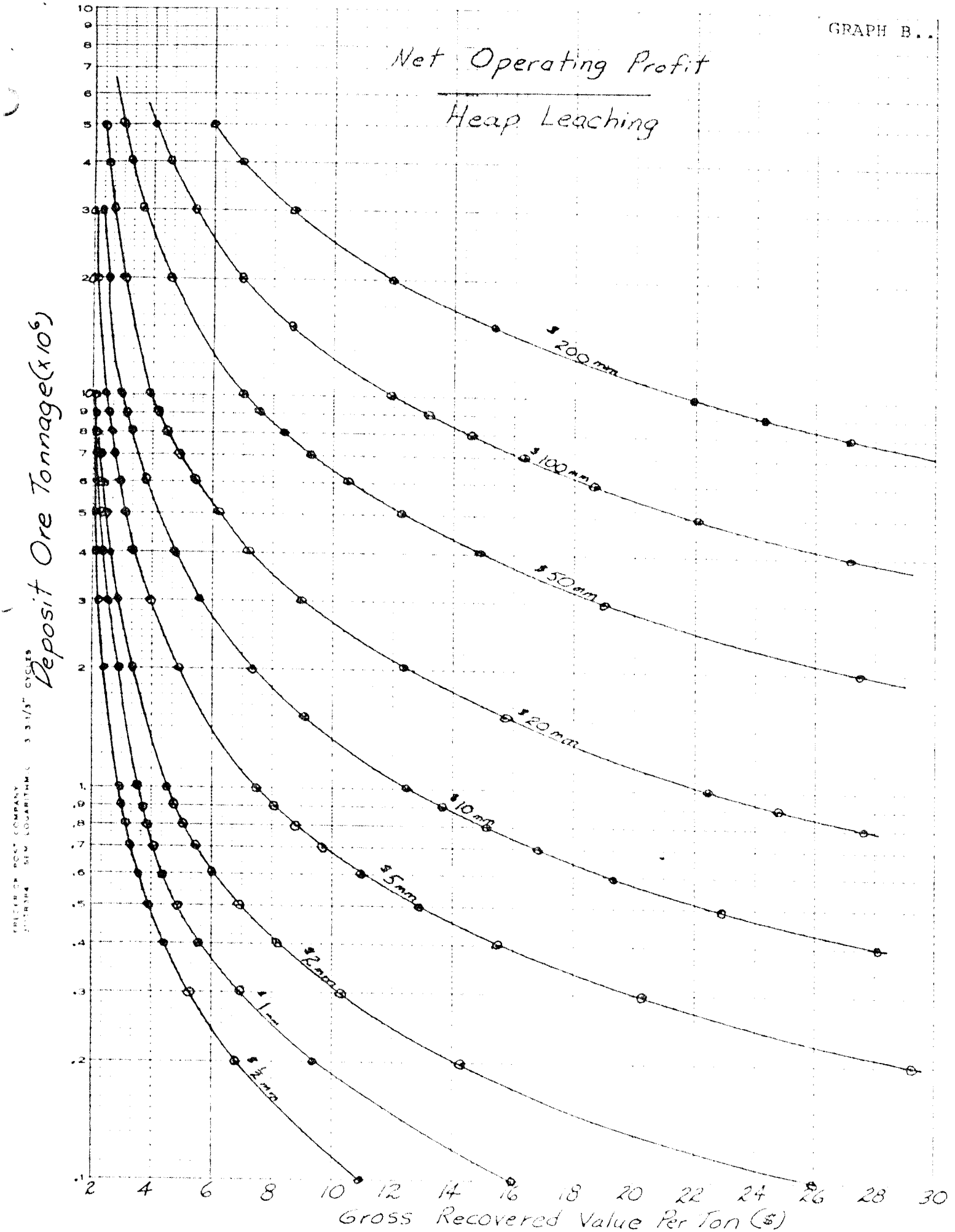
The effect of stripping ratio on Net Operating Profit follows for a case with 2,000,000 tons ore and a NOP for no stripping of $20,000,000. From graph A, the GRV = $12.31..

	o:1	1:1	2:1	3:1	4:1	5:1	6:1	(Stripping Ratio)
C_T	$2.31	2.81	3.31	3.81	4.31	4.81	5.31	
NOP	$20mm	19mm	18mm	17mm	16mm	15mm	14mm	

GRAPH B..

Net Operating Profit

Heap Leaching



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GENERAL
HEAP LEACHING
ACTIVITY ANALYSIS

1. Review of Available Data
2. Bulk Sampling for Preliminary Leaching Tests
3. Legal Agreements
4. Cadastral Survey
   - A. Patented Claims
   - B. Lode Claims
5. Claim Staking
   - A. Lode
   - B. Mill Site
6. Geology
   - A. Mapping; Lithology, Alteration, & Structure
   - B. Ore Occurrence
   - C. Ore Mineralology
7. Drilling
   - A. Core- Logging
   - B. Rotary
   - C. Assaying
   - D. Ore Body Geometry
8. Sampling & Metallurgical Testing
   - A. Head Assays; Recovery- Actual & Per Cent/Solvent
   - B. Effect of Crushing
   - C. Solvent Selection
     1. Toxic
     2. Non-toxic
     3. pH; natural & control
     4. Pre-treatment
        - a. Carbon- kerogen
        - b. Tellurides
   - D. Precious Metal Processing
     1. Zinc Replacement
     2. Carbon Adsorption
   - E. Reagent Consumption
9. Mine Layout & Design
   - A. Dumps
     1. Tonnage for sections of dump
     2. Head & Recoverable Grade for Sections
     3. Production Costs
     4. Economic Dump Ore Reserve
   - B. Open-Pit Ore
     1. Bench Height
     2. Bench Reference Elevation
     3. Production Rate & Costs- Cut-off Grade
     4. Mineable Ore Reserves

10. Environmental Survey
    A. Local-State-Federal Regulations
    B. Obtain Permits
    C. Design Monitor System
11. Water
    A. Location Selection & Drilling
    B. Ownership
    C. Draw-down Tests
    D. Source Decision
    E. Reaming & Casing
    F. Pump Installation & Generator
    G. Pipe Installation
12. Power
    A. Source-Availability Decision
    B. Installation
13. Pad(s)
    A. Site(s)
        1. Layout
        2. Survey
        3. Surface Area & Slope
    B. Construction Materials
        1. Tailings
        2. Clay- Volcanic Tuffs
        3. Desert Soil
        4. Artificial Liners
14. Pond(s)
    A. Site Survey
    B. Design & Layout
    C. Construction
15. Plant
    A. Design
    B. Equipment Selection
    C. Equipment Purchase
    D. Plant Construction
    E. Installation on Site
16. Mining & Haulage
    A. Dump Phase
        1. Truck Sizing & Cycle Times
        2. Production Rate
        3. Loader Selection
        4. Haul Raod Design, Layout, & Survey
    B. Open Pit Phase
        1. Truck Sizing, Number, & Cycle Times
        2. Blast-Hole Drilling Design
        3. Haulage Road Layout
        4. Production Rate
        5. Haulage Road Construction

17. Leaching
    A. Plumbing
        1. Plant/Make-up Solution Tank/Spray Manifold
        2. Ditch Liners/Pond(s)
        3. Pond(s)/Plant
    B. Pad Design & Layout
        1. Slope and Surface Area Per Pad
        2. Site Preparation
        3. Pad Drainage Spacing/Network
        4. Drainage Ditch Layout
    C. "Heap Design"
        1. Optimun Lift Increment
        2. Surface Area Under Leach/Time Period
        3. Quantity of Solution/Unit Area
        4. Spray Spacing & Layout
    D. Spray Cycle
        1. Saturation
        2. Optimum Leach Period
        3. De-water Period
    E. Reagents
        1. Solvent(s) Selection
        2. pH Control
        3. Anti-Scaling Reagents
        4. Oxygen Control
        5. Pre-Treatment
    F. Plant Solvent & Reagent Monitoring
        1. Preg-pond
        2. Test/Monitor Wells
        3. Ground Water
18. Ancillary
    A. Office Buildings
    B. Shops-Maintanence
    C. Fencing
    D. Housing
19. Metal Refining & Sales

Date

Schedule I

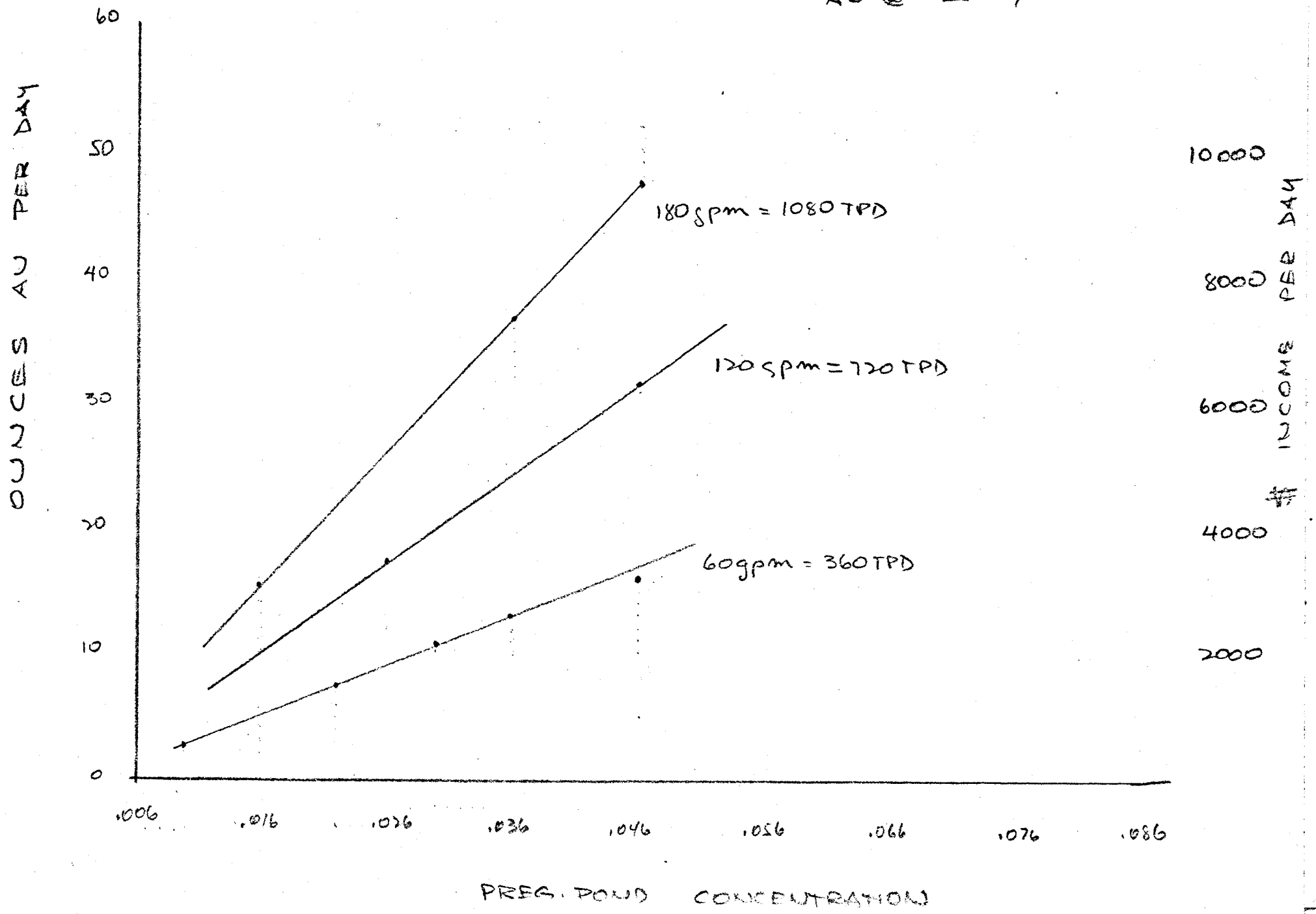
CAPITAL COSTS - $400,000.00

1.	Legal	$ 5,000
2.	Engineering	15,000
3.	Water Survey	5,000
4.	Well	5,000
5.	Water Line	10,000
6.	Pad & Heap	45,000
7.	Ponds	15,000
8.	Fencing	2,000
9.	Roads	5,000
10.	Housing	5,000
11.	Freight	20,000
12.	Pre-Production Mining	25,000
13.	Generators	30,000
14.	Plant	150,000
15.	Management Overhead	25,000
16.	Contingency	38,000
		$400,000

Schedule II

Operating costs per ton based on single shift operation processing 600,000 tons of ore: ± 2000 T/day

Administrative	$0.14
Legal	0.02
Shipping & Refining	0.20
State Proceeds Tax	0.05
	0.41
Mining:	
Drilling & Blasting	0.25
Loading	0.20
Hauling	0.30
Dumping	0.05
Plastic Liners	0.09
	0.89
Waste Removal:	
Stripping ratio(3:1) @$.55/ton	1.65
Plant:	
Carbon	0.03
Cyanide	0.23
Alkalai	0.05
Labor	0.17
Supervision	0.07
Power	0.10
Quality Control-Lab	0.12
Recovery	0.02
	0.79
Depreciation of Equipment	0.35
	4.09
Contingency	0.16
	$4.25


AU @ $200/02.
60
50
40
30
20
10
0
OUNCES AU PER DAY
10000
8000
6000
4000
2000
INCOME PER DAY
$
180 gpm = 1080 TPD
120 gpm = 720 TPD
60 gpm = 360 TPD
.006
.016
.026
.036
.046
.056
.066
.076
.086
PREG. POND CONCENTRATION

125' x 200'

SCHEDULE FOR THE CONSTRUCTION AND LOADING OF THE NORTH SECTION OF KEWANA #2

It is assumed that before this schedule begins, that the main haul road will have been extended, and that the pump will have been lowered into the Jupiter Shaft.

WORKING DAY ONE
Dozer will work 14 hrs. leveling pad area.
One truck will work with dozer compacting dirt.
The blade will assist the dozer in leveling pad area.

WORKING DAY TWO
Dozer will work 14 hrs. leveling pad area.
One truck will work with the dozer compacting dirt.
One truck and the loader will haul clay for pad.
The road blade will work and spread the clay.

WORKING DAY THREE
Dozer will work 14 hrs. leveling pad area.
One truck and the loader will haul clay for pad.
One truck will compact the clay.
The road blade will spread the clay.

WORKING DAY FOUR
Dozer will work 14 hrs. constructing the sand ditch.
One truck and one loader will assist the dozer.
The road blade will spread the clay on the pad.
One truck will compact clay on the pad.

WORKING DAY FIVE
Dozer will work 14 hrs. constructing the sand ditch.
One truck and the loader will assist the Dozer.
The road blade will spread clay on the pad.
One truck will compact the clay on the pad.

WORKING DAY SIX
Dozer will work 14 hrs. constructing the sand ditch.
One truck and the loader will assist the dozer.
The road blade will spread clay on the pad.
One truck will compact the clay on the pad.

WORKING DAY SEVEN
Dozer will work 14 hrs. constructing the sand ditch.
One truck and the loader will assist the dozer.
The road blade will spread clay on the pad.
One truck will compact clay on the pad.

WORKING DAY EIGHT
Dozer will work 14 hrs. digging pond.
Two trucks and the loader will haul 3200 tons ore to pad.

WORKING DAY NINE
Dozer will work 14 hrs. digging pond.
Two trucks and the loader will haul 3200 tons ore to pad.

WORKING DAY TEN
Dozer will work 14 hrs. digging pond.
Two trucks and the loader will haul 3200 tons ore to pad.

WORKING DAY ELEVEN
Dozer will work 14 hrs. digging pond.
Two trucks and the loader will haul 3200 tons ore to pad.

WORKING DAY TWELVE
Dozer will work 14 hrs. digging pond.
The road blade will assist the dozer.
Two trucks and the loader will haul 3200 tons ore to pad.

WORKING DAY THIRTEEN
Dozer and the blade will clay the sand ditch. (dozer 14 hrs.)
Two trucks and the loader will haul clay to sand ditch and pond.
Remaining time for loader and trucks will be used for ore.

WORKING DAY FOURTEEN
Dozer and the blade will clay the pond. (dozer 14 hrs.)
Two trucks and the loader wil haul clay to the pond.
Remaining time for loader and trucks will be used for ore.

WORKING DAY FIFTEEN
Dozer will work 14 hrs. claying the pond.
Two trucks and the loader will haul 3200 tons ore to pad.

WORKING DAY SIXTEEN
Dozer will work normal shift leveling heaps.
Loader will compact pond and sand ditch.
Three-man crew will set up pumps.

WORKING DAY SEVENTEEN
Three-man crew will work on pumps and pipe.
Two trucks and the loader will haul 3200 tons ore to pad.
Electrician will do the wiring on pumps.

WORKING DAY EIGHTEEN
Four man crew runs pipe to plant.
Two trucks and the loader haul 3200 tons ore to the pad.

WORKING DAY NINETEEN
Four-man crew works on pipelines
Two trucks and the loader haul 3200 tons ore to the pad.

WORKING DAY TWENTY
Sprinkler lines set.
Two trucks and the loader haul 3200 tons ore to the pad.

WORKING DAY TWENTY ONE
Sprinkler lines set.
Two trucks and the loader haul 3200 tons ore to the pad.

WORKING DAY TWENTY TWO
Remaining sprinkler line installed on heap.

NOTE: As soon as sprinkler lines are installed on any one heap saturation may begin.

NOTE: Rain on pad delays loading and requires dozer to be shifted over to loading operation.

November 4, 1977

"PROJECT 78"

Month One	February	Weeks 1,2,3,4	1/30/78 - 2/26/78
Month Two	March	Weeks 5,6.7,8,9	2/27/78 - 4/2/78
Month Three	April	Weeks 10,11,12,13	4/3/78 - 4/30/78
Month Four	May	Weeks 14,15,16,17,18	5/1/78 - 6/4/78
Month Five	June	Weeks 19,20,21,22	6/5/78 - 7/2/78
Month Six	July	Weeks 23,24,25,26	7/3/78 - 7/30/78
Month Seven	August	Weeks 27,28,29,30,31	7/31/78 - 9/3/78
Month Eight	September	Weeks 32,33,34,35	9/4/78 - 10/1/78
Month Nine	October	Weeks 36,37,38,39	10/2/78 - 10/29/78
Month Ten	November	Weeks 40,41,42,43,44	10/30/78 - 12/3/78

"PROJECT 78"

25,000 tons of ore of 0.072 ounces per ton = 1,800 ounces.

Leached for 390 days at an average return of 4.4 ounces per day.
30x13=390
390 x 4.4 = 1,716 ounces
1,716 = 95.3% of 1,800 ounces

83 gpm = 502 tons per 24 hours = 119,520 gallons

Pregnant solution value = 0.3 ppm = 0.0088 oz/ton x 502 = 4.4 ounces

2.2 oz/day in 1,100 pounds = 132 ounces in 60 days of loading.

Gold listed as bullion stock is considered sold at $155.00 per ounce.

The activity schedule is based on each carbon absorption being out of service for one week (7 days) when it is being stripped.

"PROJECT 78"

MONTH ONE

Beginning of Month	Gold Stocks			
	Bullion	Carbon	Heap	Total
Troy ounces on hand	-0-	-0-	-0-	-0-

a. Start to mine and stack 25,000 tons of ore (Module 1) plus 75,000 tons of waste.

b. No modules are leaching at this time.

c. The flow rate is expected to be 83 gpm from each module.

d. The rate of gold dissolution is expected to be 4.4 ounces per day per module.

e. Two carbon absorption tanks holding 1,100 pounds of carbon each will be used for each module.

f. Absorption tanks number 1 and number 2 are being installed.

End of Month	Bullion	Carbon	Heap	Total
Troy ounces of hand	-0-	-0-	1,800	1,800

a. Finished mining and stacking 25,000 tons of ore (Module 1).

b. Starting to leach Module 1.

c. No flow rate has started at this time.

d. No gold is being dissolved at this time.

e. Two carbon tanks are ready to receive pregnant solution.

f. Each carbon absorption tank holds 1,100 pounds of carbon.

"PROJECT 78"

MONTH TWO

Beginning of Month	Gold Stocks			
	Bullion	Carbon	Heap	Total
Troy ounces on hand	-0-	-0-	1,800	1,800

a. Start to mine and stack 25,000 tons of ore (Module 2).

b. Module 1 has now started to leach.

c. The flow rate is 83 gpm from Module 1.

d. The rate of gold dissolution is 4.4 ounces per day per module.

e. The rate of carbon loading is 2.2 ounces per day per 1,000 pounds.

f. Absorption tanks number 1 and number 2 are loading at the rate of 2.2 ounces per day per tank.

g. Absorption tanks number 3 and number 4 are being installed.

End of Month	Bullion	Carbon	Heap	Total
Troy ounces of hand	-0-	132	3,468	3,600

a. Finished mining and stacking 25,000 tons of ore (Module 2).

b. Module 1 has been leaching for 30 days.
Module 2 is starting to leach.

c. Module 1 has a flow rate of 83 gpm.
Module 2 has no flow rate at this time.

d. Leaching has dissolved 132 ounces of gold from Module 1.

e. Carbon tanks number 1 and number 2 have each absorbed 66 ounces of gold.

f. Absorption tanks number 3 and number 4 are ready to load.

"PROJECT 78"

MONTH THREE

Beginning of Month	Gold Stocks			
	Bullion	Carbon	Heap	Total
Troy ounces on hand	-0-	132	3,468	3,600

a. Start to mine and stack 25,000 tons of ore (Module 3).

b. Modules 1 and 2 have now started to leach.

c. The flow rate from each module is 83 gpm.

d. The rate of gold dissolution now totals 8.8 ounces per day.

e. Gold is being absorped on each of the four tanks at a rate of 2.2 ounces per tank per day.

f. Absorption tanks number 3 and number 4 are now being loaded.

g. Absorption tanks number 5 and number 6 are being installed.

End of Month	Bullion	Carbon	Heap	Total
Troy ounces on hand	-0-	396	5,004	5,400
(Value at $155)	-0-	($61,380)	($775,680)	($837,000)

a. Finished mining and stacking 25,000 tons of ore (Module 3).

b. Module 1 has been leaching for 60 days.
Module 2 has been leaching for 30 days.
Module 3 is starting to leach.

c. The flow rate is 83 gpm from Module 1 and 83 gpm from Module 2 for a total flow rate of 166 gpm (9,960 gph).
There is no flow rate from Module 3 at this time.

d. Leaching has dissolved 264 ounces of gold from Module 1 and 132 ounces of gold from Module 2.
No leaching is taking place on Module 3 at this time.

e. Gold is being absorbed onto the carbon of each of the four absorption tanks at the rate of 2.2 ounces per tank per day.

f. Absorption tanks number 5 and number 6 are now ready to start loading.

g. Take absorption tank number 1 into plant and desorb 132 ounces of gold for bullion stock. (Value = $20,460.00)

"PROJECT 78"

MONTH FOUR

Beginning of Month	Gold Stocks			
	Bullion	Carbon	Heap	Total
Troy ounces on hand	132	264	5,004	5,400

a. Start to mine and stack 24,000 tons of ore (Module 4).

b. Modules 1, 2 and 3 have now started to leach.

c. The flow rate from each module is 83 gpm for a total of 249 gpm.

d. The rate of gold dissolution is 4.4 ounces per module for a total of 13.2 ounces per day.

e. Gold is being absorbed onto the carbon at the rate of 2.2 ounces per tank per day for a total of 13.2 ounces per day for the 6 tanks.

f. Absorption tank number 1 has been stripped and has been placed back into service.

g. Absorption tanks 2, 3, 4, 5, and 6 are now loading with gold at the rate of 2.2 ounces per day per tank.

End of Month

	Bullion	Carbon	Heap	Total
Troy ounces on hand	132	638	6,430	7,200
				$1,116,000.00

a. Finished mining and stacking 25,000 tons of ore (Module 4).

b. Module 1 has been leaching for 90 days.
Module 2 has been leaching for 60 days.
Module 3 has been leaching for 30 days.
Module 4 is ready to start leaching.

c. Modules 1, 2 and 3 each have flow rates of 83 gpm for a combined flow rate of 249 gpm.
Module 4 has no flow rate at this time.

d. Gold dissolved from Module 1 equals 396 ounces (22%), 264 ounces (15%) from Module 2 and 132 ounces (7%) from Module 3.

e. Gold has been absorbing onto the carbon of the 6 absorption tanks at the rate of 2.2 ounces per tank per day for a total of 13.2 ounces per day. Tank 2 has been loading for 90 days for a loading of 198 ounces. Tanks 3 and 4 have been loading for 60 days for a loading of 132 ounces each. And tanks 5 and 6 have been loading for 30 days for a loading of 66 ounces each. Tank 1 has started a second loading and is up to 20 days for a loading of 44 ounces. The total carbon loading is 638 ounces.

f. Carbon tank 2 is ready to take to the plant for recovery of the 198 ounces of gold and converting it into bullion. (Value = $30,690.00)

"PROJECT 78"

MONTH FIVE (JUNE)

Weeks 19, 20, 21 & 22

Beginning of Month	Gold Stocks			
	Bullion	Carbon	Heap	Total
Troy ounces of gold	132	638	6,430	7,200

a. Start to mine and stack 25,000 tons of ore (Module 5).

b. Modules 1, 2, 3 and 4 have been started and are now leaching.

c. The flow rate from each module is 83 gpm for a total flow of 332 gpm.

d. The rate of gold dissolution is 4.4 ounces per module for a total of 17.6 ounces per day.

e. Gold is being absorbed onto the carbon at the rate of 2.2 ounces per tank per day.

f. Tank 2 is being stripped of 198 ounces of bullion and will be back in service at the start of Week 19.

g. Tank 3 will be stripped of its bullion during Week 19 after loading for 67 days for a loading content of 147 ounces.

h. Tank 4 will be stripped during Week 20 after loading for 74 days to a bullion content of 163 ounces.

i. Tank 5 will be stripped of its 112 ounces of bullion during Week 21 after loading for 51 days.

j. During Week 22 Tank 6 will be stripped of its 128 ounces of bullion after loading for 58 days.

End of Month

	Bullion	Carbon	Heap	Total
Troy ounces of gold	880	440	7,680	9,000

a. Finished mining and stacking 25,000 tons of ore (Module 5).

b. Module 1 has been leaching for 120 days.
Module 2 has been leaching for 90 days.
Module 3 has been leaching for 60 days.
Module 4 has been leaching for 30 days.
Module 5 is ready to start leaching.

c. Modules 1, 2, 3 and 4 have flow rates of 83 gpm each for a combined flow rate of 332 gpm.
Module 5 has no flow rate at this time.

d. Of the 1,800 ounces of gold in each module, 528 ounces (29%) has been dissolved from Module 1, 396 ounces (22%) from Module 2, 264 ounces (15%) from Module 3 and 132 (7%) from Module 4.

e. Gold has been absorbing onto the carbon of the 8 absorption tanks at the rate of 2.2 ounces per day per tank for a total of 17.6 ounces per day being loading onto the carbon.

f. The first loading and stripping of tanks 1, 2, 3, 4, 5 and 6 has been finished and each of these tanks has now started on its second loading cycle. Tanks 7 and 8 have been in the first loading cycle and after 30 days of loading now are loaded to 66 ounces per tank.

g. In the second loading cycle, Tank 1 has 50 days for 110 ounces, Tank 2 has 28 days for 62 ounces, Tank 3 has 21 days for 46.2 ounces, Tank 4 has 14 days for 31 ounces, Tank 5 has 7 days for 15 ounces and Tank 6 has just been put back in service.

h. Carbon absorption tanks 9 and 10 for Module 5 are being put into service at this time.