CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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PARK CORPORATION
Mine Equipment Division
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LIQUIDATION

LATE MODEL MINE MACHINERY & EQUIPMENT including COMPLETE PLANTS

COMPLETE MODERN PLANTS

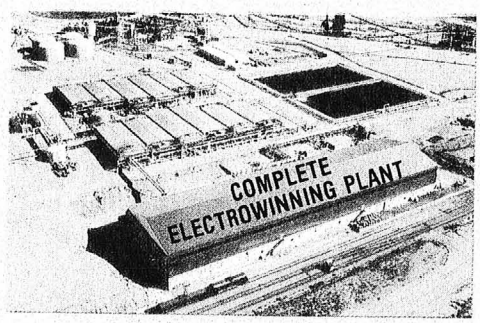
~~OXIDE PLANT~~ • SULPHIDE CONCENTRATE PLANT
MOLY PLANT • PELLETIZING PLANT

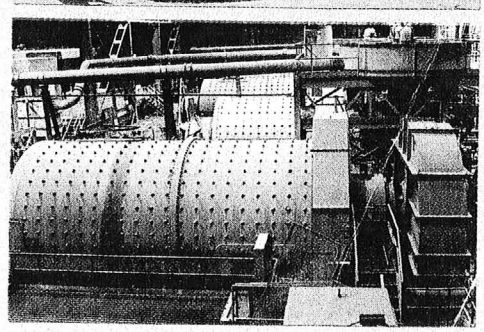
LATE MODEL EQUIPMENT AND MACHINES

CRUSHERS • GRINDING MILLS • CONVEYORS
ELECTRIC SHOVELS • HAULAGE TRUCKS and LOADERS • ELECTRIC and DIESEL/ELECTRIC DRILLS
STACKERS • RECLAIMERS

SUPPORT EQUIPMENT

SCREENS • ~~ROTARY KILN~~ • BELTING • MOTORS • GEARBOXES • TRANSFORMERS • DOZERS • CRANES
ELECTRICAL EQUIPMENT and A HUGE INVENTORY OF NEW SPARE AND REPLACEMENT PARTS

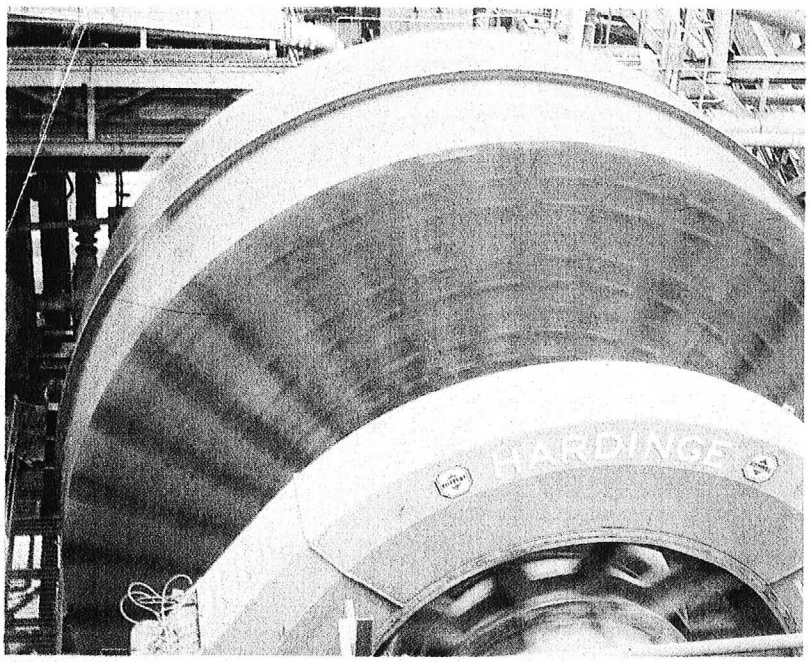




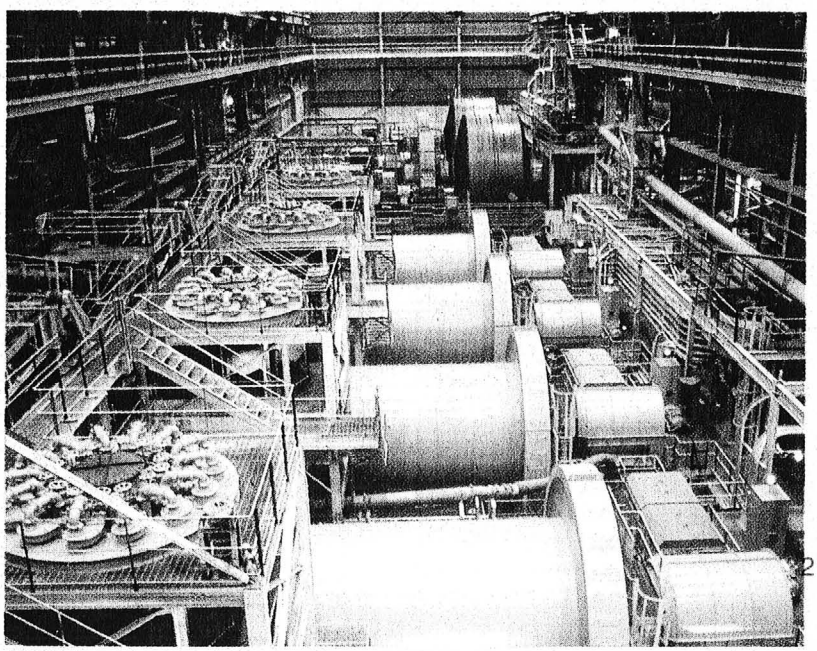
For complete information and specifications,
Call: (602) 648-1630

MINE EQUIPMENT DIVISION
PARK CORPORATION
P.O. BOX 1488
GREEN VALLEY, ARIZONA 85622

Grinding Mills



(2) Hardinge 32' x 12' Autogenous Mills, Twin 3400 H.P. Motor, 4160 volt



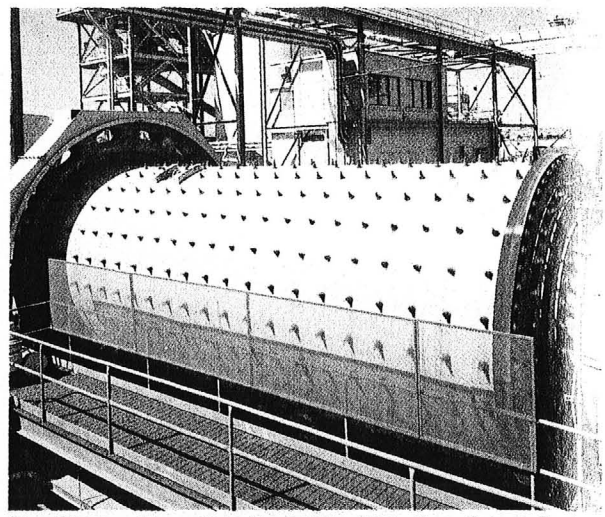
(4) Dominion 14' x 28' Pebble Mills, 2000 H.P.

Rod Mills

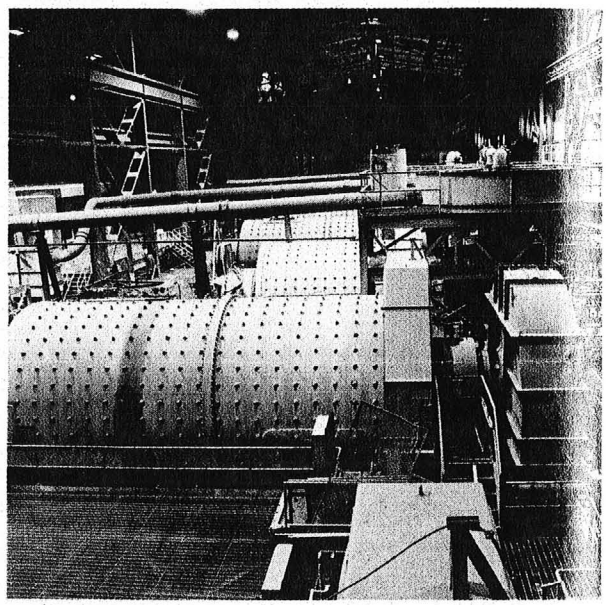
1—Nordberg 14 x 21'2" Rod Mill, 2000 hp, 180 rpm, 4160 volt motor
1—Allis Chalmers 14' x 20' Rod Mill, 2000 hp, 180 rpm, 4000 volt motor
3—Allis Chalmer 14' by 18'6" Rod Mills, 1-2000 hp, 720 rpm, 4000 volt motor
1—Marcy 14' by 18'6" Rod Mill, 2000 hp, 720 rpm, 4000 volt motor
1—Allis Chalmers 6, by 9' Regrind Rod Mill, 1-125 hp, 1200 rpm, 550 volt motor

Pebble Mills

4—Dominion 14, x 28' Pebble Mills, 2000 hp, 200 rpm, 4160 volt motor



One Of The Many Grinding Mills With New Spare Parts



1 of 16 Ball Mills

Autogenous

2—Hardinge 32' by 12' Autogenous Mills each has twin 3400 hp Drive, 720 rpm, 4000 volt motors

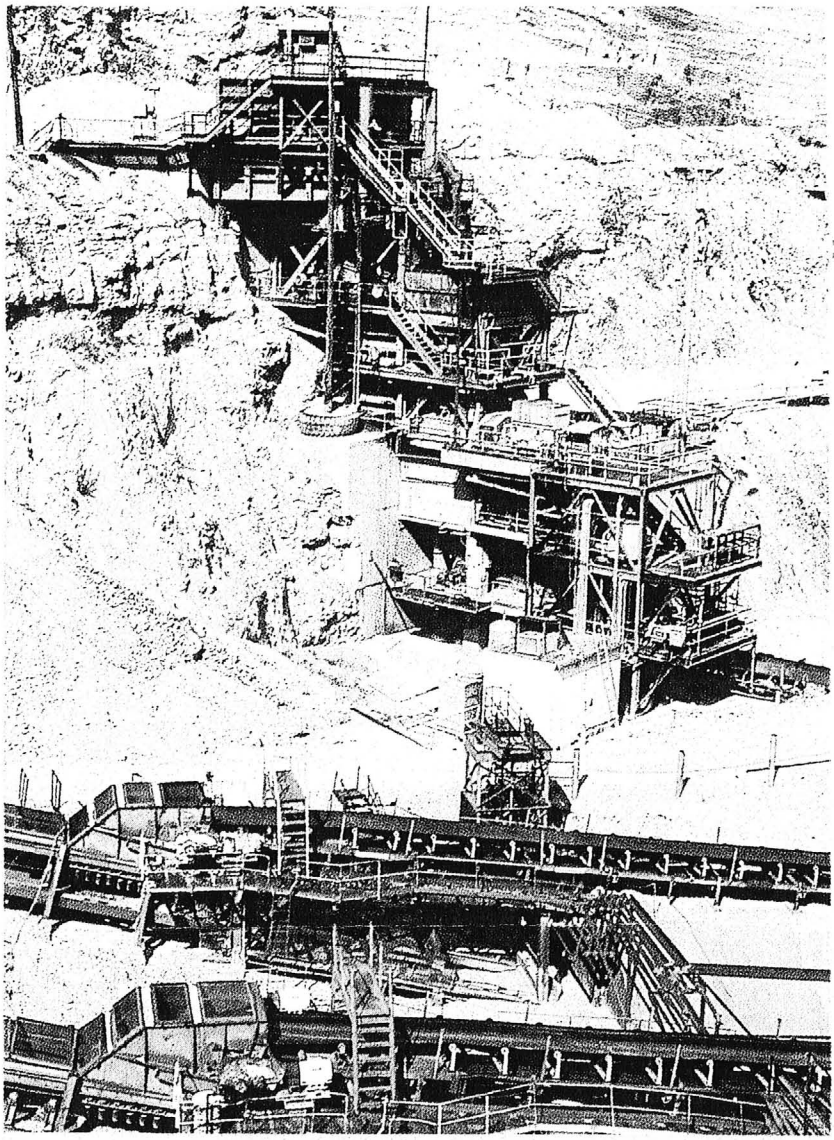
Ball Mills

2—Allis Chalmers 14'6" x 28' Ball Mills, 3000 hp, 720 rpm, 4000 volt motor
2—Marcy 14'6" x 23'6" Ball Mills, 3000 hp, 720 rpm, 4000 volt motor
3—Nordberg 14' x 38'7" Ball Mills, 4400 hp, 4160 volt motor, 514 rpm
2—Allis Chalmers 14' x 27' Ball Mills, 3000 hp, 180 rpm, 4000 volt motor
2—Marcy 7'6" x 23' Regrind Ball Mills, 500 hp, 720 rpm, 4000 volt motor

To Be Sold As A Unit

1 Grinding Mill Package Consisting of

2—Marcy 12'6" x 30' Ball Mills, 3000 hp, 720 rpm, 4000 volt motors
2—Marcy 11'6" x 18' Rod Mills, 1250 hp, 720 rpm, 4000 volt motors



1 of 3 Nordberg 54'' x 80'' Gyratory Crushers, 500 H.P.

Crushers

Gyratory

1—Nordberg 60" x 102" Primary Gyratory Driven by 1-500 hp, 700 rpm, 4160 volt motor

~~3~~—Nordberg 54" x 80" Heavy Duty Gyratory each 2 crusher driven by 1-500 hp, 700 rpm, 4160 volt motor

1—Allis Chalmers 54" x 74" Gyratory driven by 1-500 hp, 514 rpm, 4160 volt motor

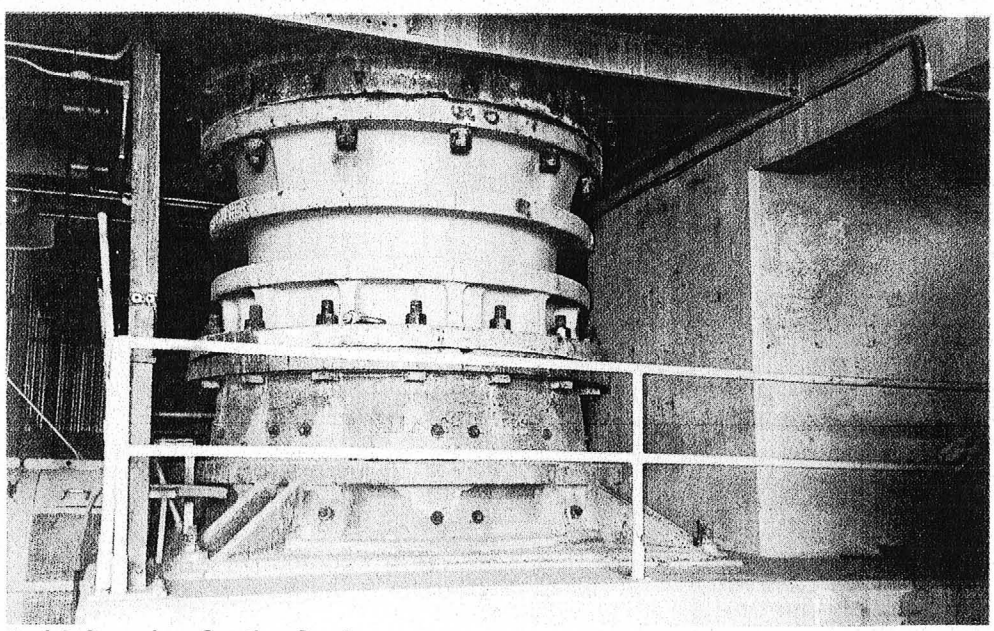
2—Allis Chalmers 30" x 70" Gyratory each crusher driven by 400 hp, 500 rpm, 4160 volt motor

Cone Crushers

2—Nordberg 7' Extra Heavy Duty Shorthead each crusher driven by 1-350 hp, 700 rpm, 4160 volt

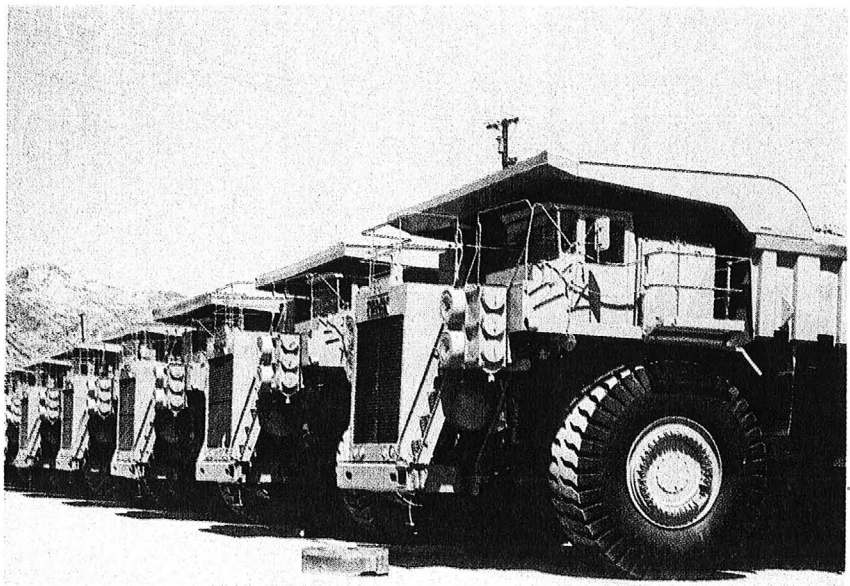
1—Nordberg 7' Extra Heavy Duty Shorthead driven by 1-350 hp, 700 rpm, 4160 volt

1—Nordberg 7' Heavy Duty Shorthead each crusher driven by 1-300 hp, 700 rpm, 4160 volt



1 of 2 Secondary Gyrating Crushers

Haulage Trucks



(6) Terex 33-15 170 Ton Trucks - 75% Good Rubber

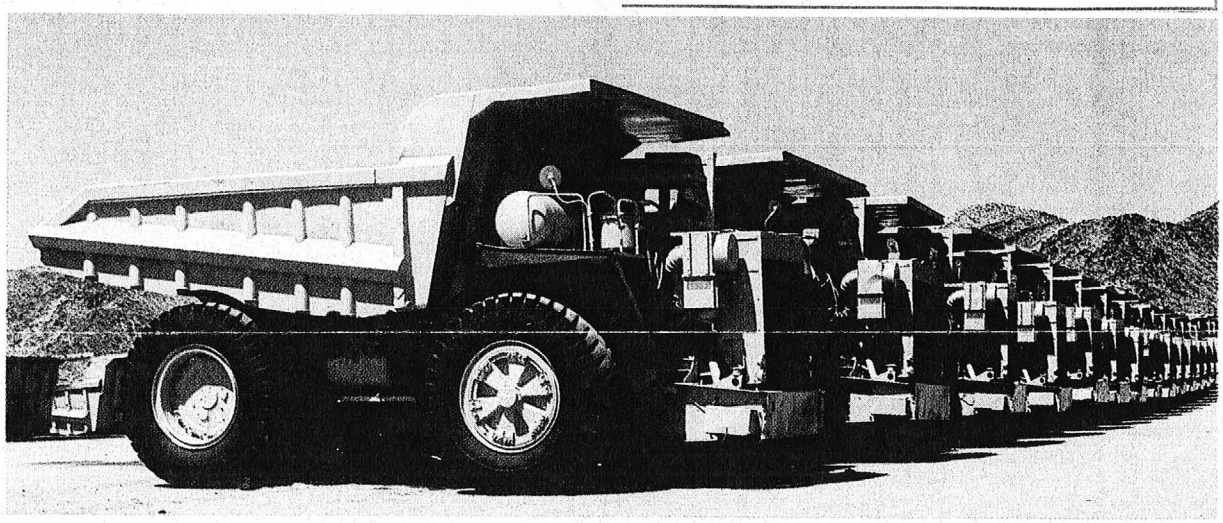
6—Terex 33-15 170 Ton Trucks
Engine: Detroit Diesel 16V149TI
Generator: G.M.
Traction Motors: 2 ea G.M.
Tire Size: 36.00 x 51 58PR 75% Good Rubber

7—WABCO 120B 120 Ton Trucks
Engine: Detroit Diesel 12V149TI
Generator: G.E. GTA-603
Motorized Wheel: GE772
Tire Size: 27.00 x 49 42PR 75% Good Rubber

~~18~~16—KW Dart Model D2771, D2772 110 Ton Trucks
Engine: Detriot Diesel 12V149TI
Transmission: Allison DP8960 or DP8961 6 speed w/electric shift
Tire Size: 27.00 x 49 42PR (Good Rubber)

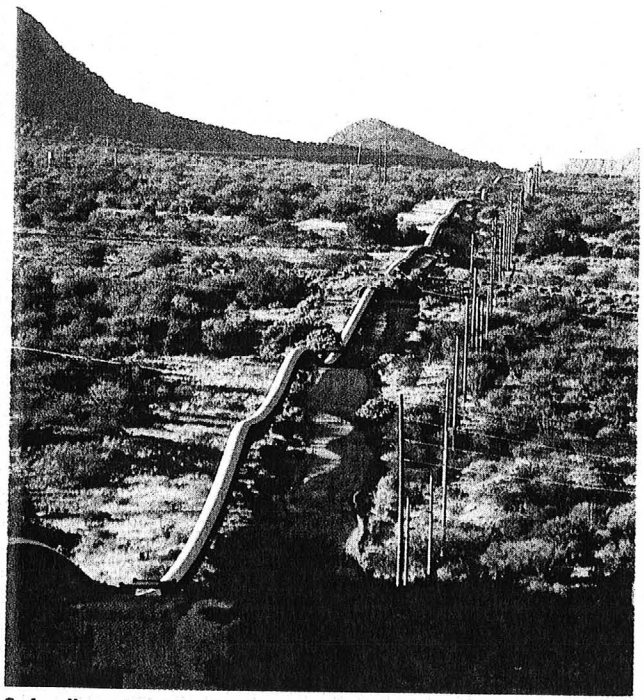
Late Arrivals

1— CATERPILLAR D-8L
2—FIAT ALLIS FD-30
2—EUCLID R-100 100 Ton Trucks
3—WABCO 120C 120 Ton Trucks
7—EUCLID R-100
4—WABCO 85C
3—WABCO 85D



~~(18)~~ (16) KW Dart Model D2771, D2772 110 Ton Trucks—Good Rubber

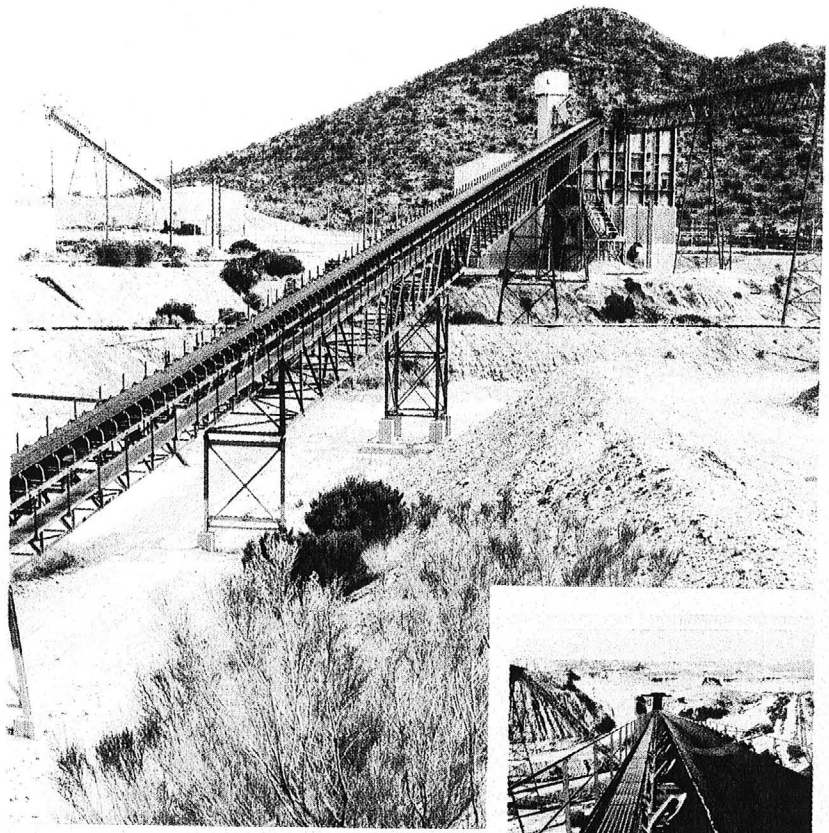
(7) WABCO 120-Ton, 120B Rear Dump Trucks - 75% Good Rubber



6.4 mile cable belt, 42'' excellent condition

Cable Belt

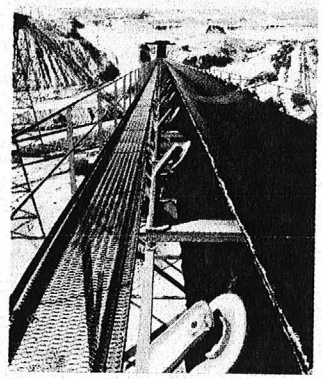
A 42-in. x 6.4-mile Cable Belt Ltd. conveyor system that separates driving (tension) and material carrying functions, enabling use of a single drive station and lower power consumption. Twin 1500 hp drive, 4160 volt.



Miles of Conveyors

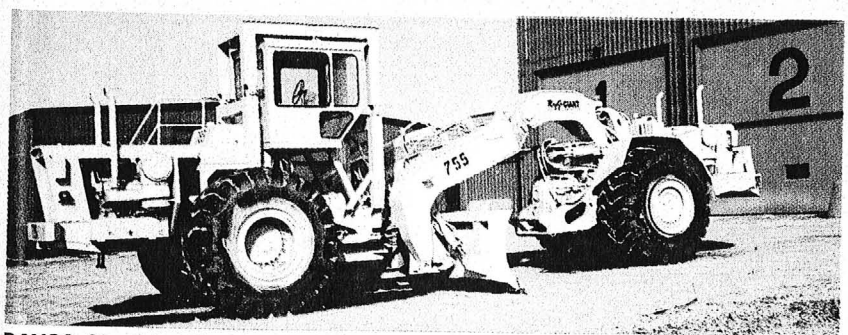
Conveyors

Over 20,000 ft of 18, 24, 30, 34, 36, 42, 48, 52, 60, 72 and 84 inch conveyor

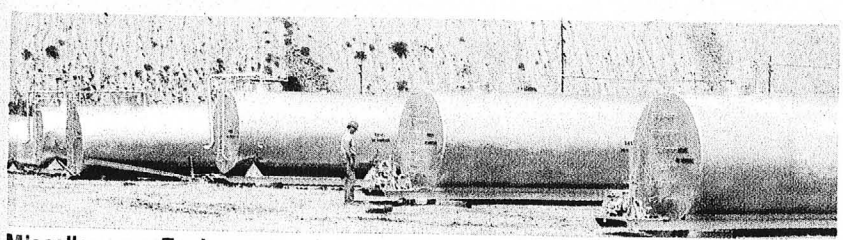


Miles of Conveyors

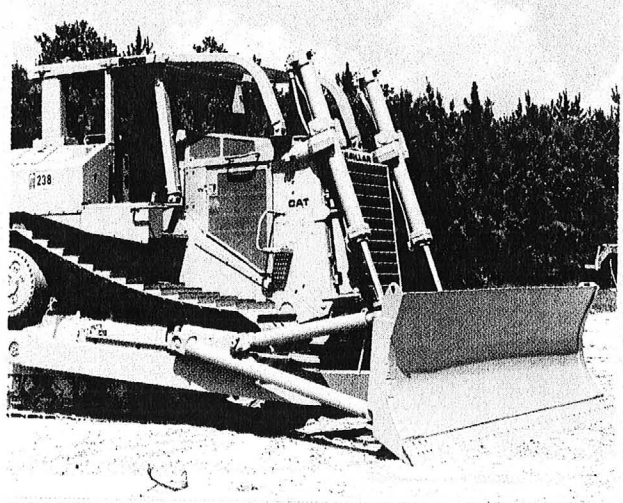
Support Equipment For Sale



RAYGO Giant Grader, 1978



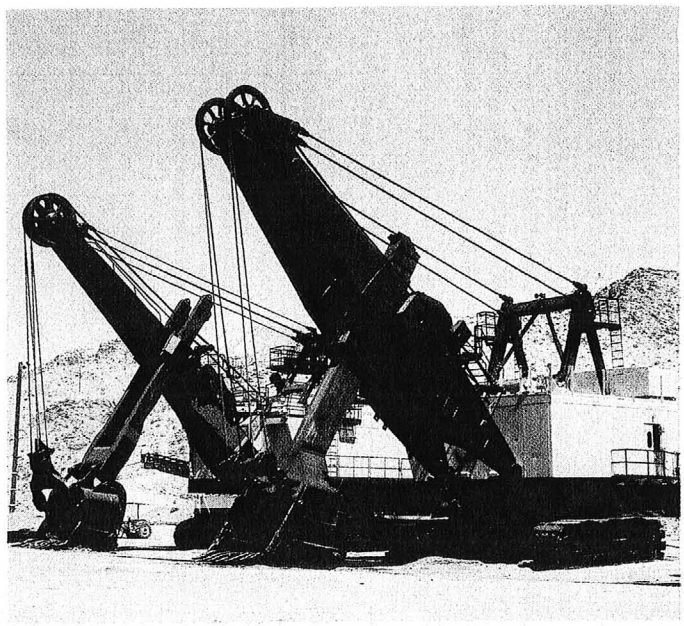
Miscellaneous Tanks



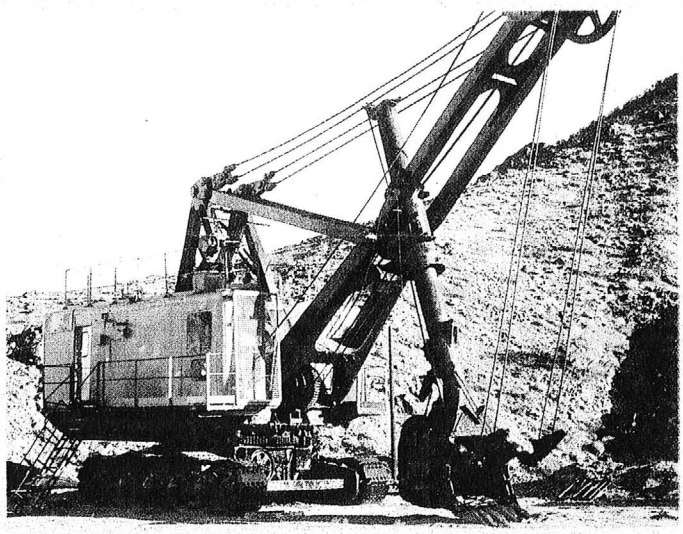
CAT D8L, 1984

Shovels Electric and Diesel

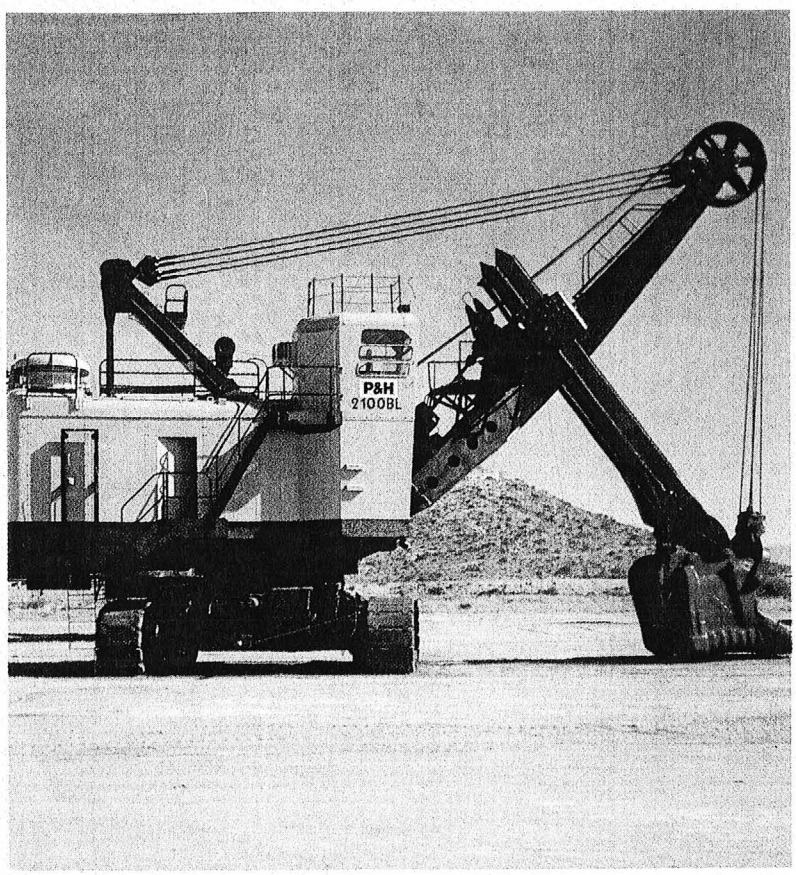
Make	S/N	Year	Type	Bucket Size	Powered
Marion	23008	1973	192M	17yd	electric
P&H	35550	1973	2100BL	15yd	electric
~~P&H~~ SOLD	~~34720~~	~~1972~~	~~2100BL~~	~~15yd~~	~~electric~~
P&H	30880	1969	2100B	15yd	electric
P&H	30870	1969	2100B	15yd	electric
Marion	22841	1968	191M	15yd	electric
Marion	22825	1967	191M	15yd	electric
Marion	22824	1967	191M	15yd	electric
Bucyrus Erie	129537	1965	280B	12yd	electric
Bucyrus Erie	125749	1965	280B	12yd	electric
Bucyrus Erie	125748	1965	280B	12yd	electric
Bucyrus Erie	124487	1965	280B	12yd	electric
P&H	30040	1968	1900B	10yd	electric
Bucyrus Erie	118583	1957	190B	8yd	electric
Bucyrus Erie	117901	1957	190B	8yd	electric
Bucyrus Erie	133914	1973	150B	6½yd	electric
Bucyrus Erie	136005	1975	150B	6½yd	electric
Bucyrus Erie	127904	1966	150B	6½yd	electric
Bucyrus Erie	127905	1966	150B	6½yd	electric
Bucyrus Erie	127932	1966	150B	6½yd	electric
Bucyrus Erie	110873	1954	150B	6yd	electric
Bucyrus Erie	100504	1958	150B	6½yd	electric
Bucyrus Erie	93115		150B	6½yd	electric
Bucyrus Erie	93117		150B	6½yd	electric
Bucyrus Erie	89334	1954	150B	6yd	electric
Bucyrus Erie	89331	1952	150B	6½yd	electric
Northwest	26706-46509B	1975	180D	5yd	diesel



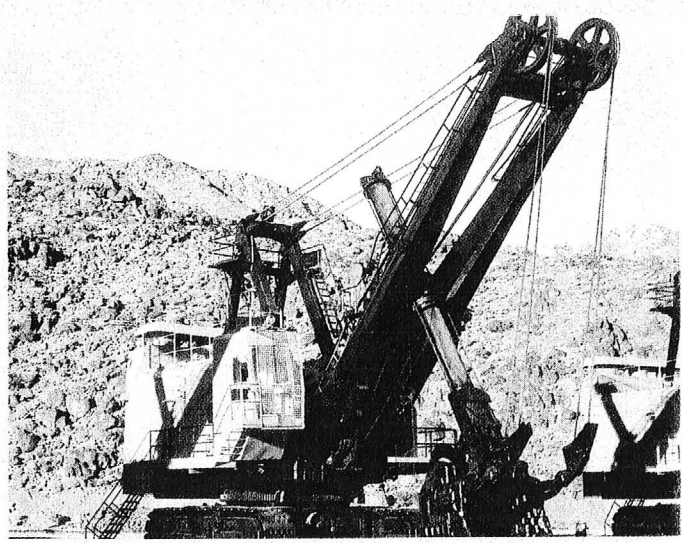
Marion 192M Electric Shovel, 1973 - 17 Yard



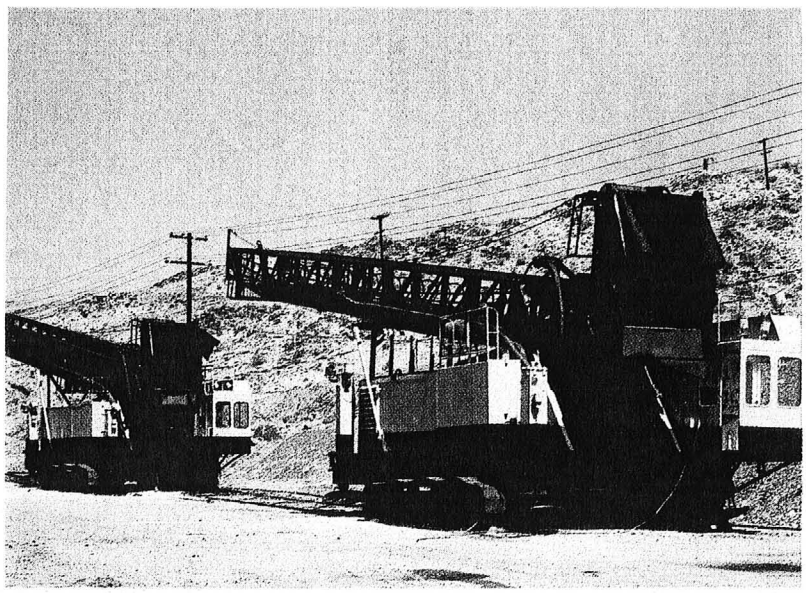
(11) BUCYRUS-ERIE 150B Electric Shovels - 6½ Yard



(2) P&H 2100BL Electric Shovels, 1972 & 1973 - 15 Yard



(2) BUCYRUS-ERIE 190B Electric Shovels, 8 Yard



(7) BUCYRUS-ERIE 60R Electric and Diesel Drills

Rotary Drills

(Electric and Diesel)

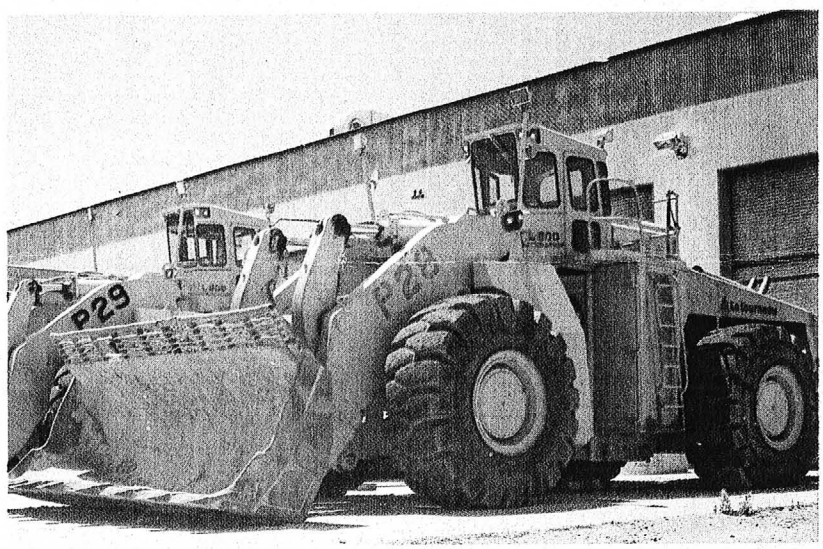
MAKE	YEAR	S/N	TYPE	POWERED
Bucyrus Erie	1973	133772	60R	electric
Bucyrus Erie	1973	134519	60R	diesel/electric
Bucyrus Erie	1972	133295	60R	diesel/electric
Bucyrus Erie	1972	133107	60R	electric
Bucyrus Erie	1972	133103	60R	electric
Bucyrus Erie	1967	129269	60R	diesel/electric
Bucyrus Erie	1967	128751	60R	diesel/electric
Gardner-Denver	1975	1027	GD-120	diesel/electric
Gardner-Denver	1975	1026	GD-120	diesel/electric
Gardner-Denver	1972	1003	GD-120	electric
Bucyrus Erie	1966	128689	45R	electric
Bucyrus Erie	1965	127928	40R	electric
Atlas Copco	1981	BRE-1072A	ROC-810H	diesel
Ingersol Rand	1975	IC-19751	PT85	diesel

Loaders

4—Marathon LeTourneau L800, 13 Yard Loaders
Engine: 1 with Cummings KT2300
3 with Detroit Diesel 16V92T
Tire Size: 37.5 x 39 (Good Rubber)

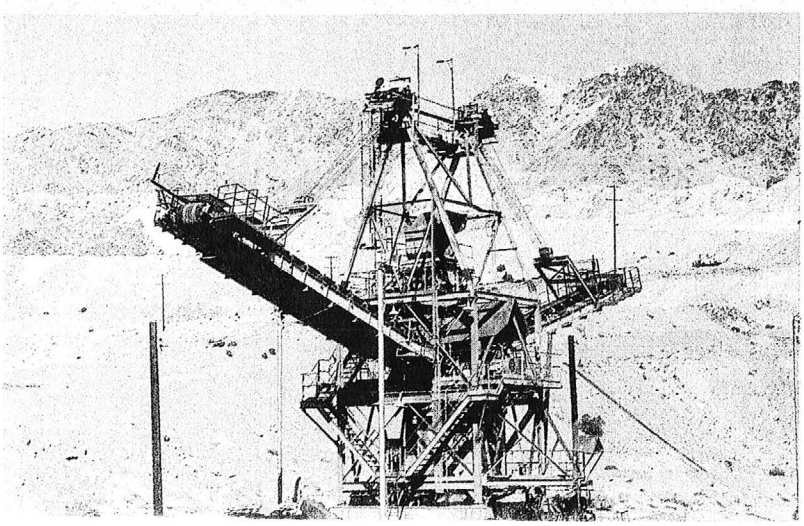
For Additional Information Call

(602) 648-1630



Marathon Le Tourneau L800, 13 yard loaders

Stackers and Reclaimers



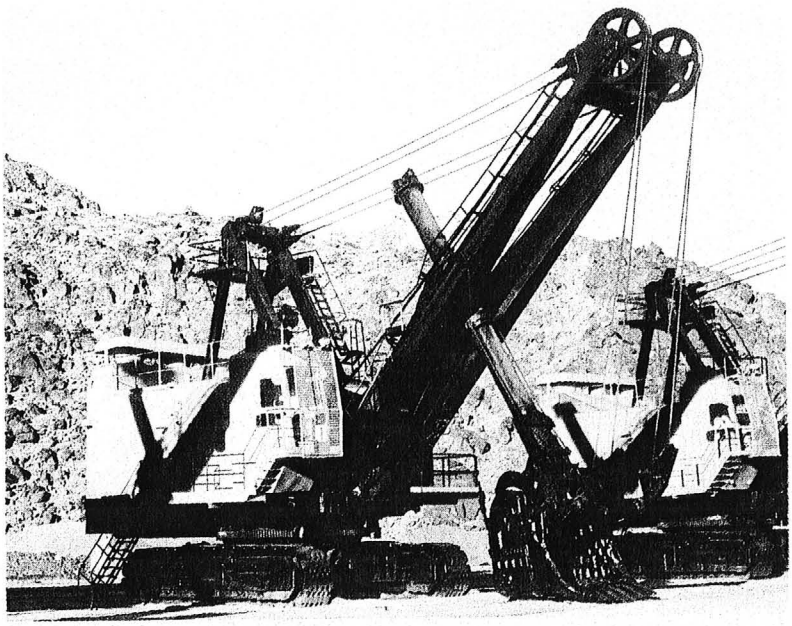
Stackers

1—Hewitt-Robbins 2 42", 2280 TPH Cap.
1—Link Belt, Double Boom, 2000 STPH Cap.

Reclaimers

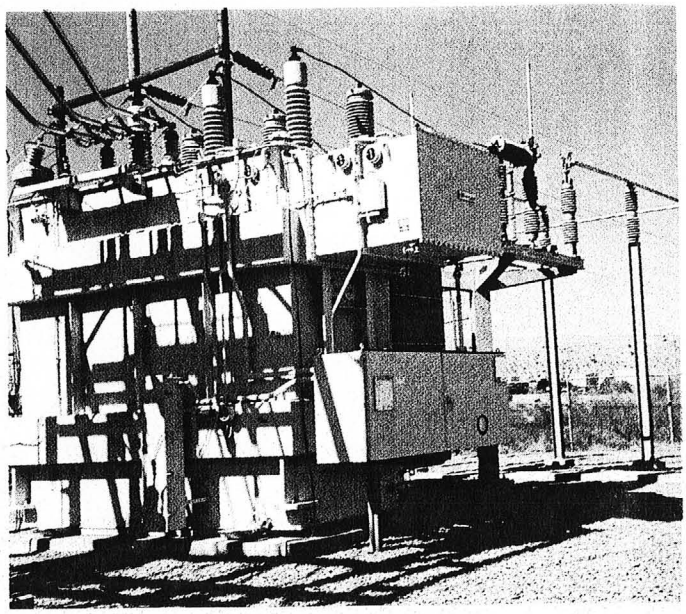
1—Hewitt-Robbins, 1950 TPH Cap.
1—Link Belt 10 ton Bucket, 1400 TPH Cap.

All Equipment is Available For Immediate Sale at Liquidation Prices



(4) BUCYRUS-ERIE 280B Electric Shovels, 1965 - 12 Yard

Electrical Equipment



In addition to equipment and machines listed or pictured, the MINE EQUIPMENT DIVISION INVENTORY INCLUDES Screens, Rotary Kiln, Electric Motors, Transformers, Gear Boxes, Overhead Cranes, Dozers, Electrical Equipment, Support Vehicles and a complete array of NEW and SPARE REPLACEMENT PARTS.

All Equipment is Available Immediately at Liquidation Prices

For complete information, specification and individual brochures, call:

(602) 648-1630

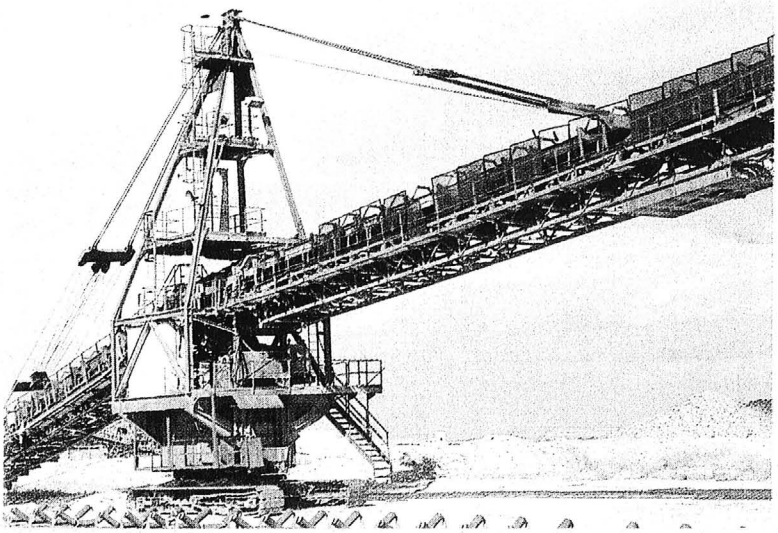
Telex: 823037
TeleFax: (602) 648-0832

MINE EQUIPMENT DIVISION
PARK CORPORATION
P.O. BOX 1488
GREEN VALLEY, ARIZONA 85622

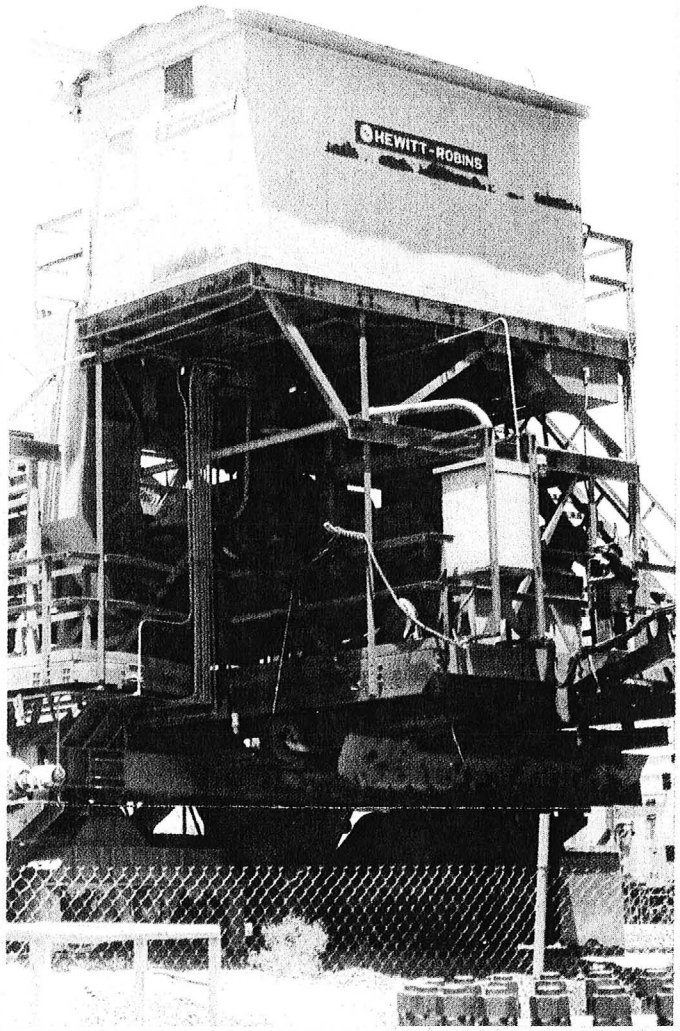
(602) 648-1630

at Liquidation Prices

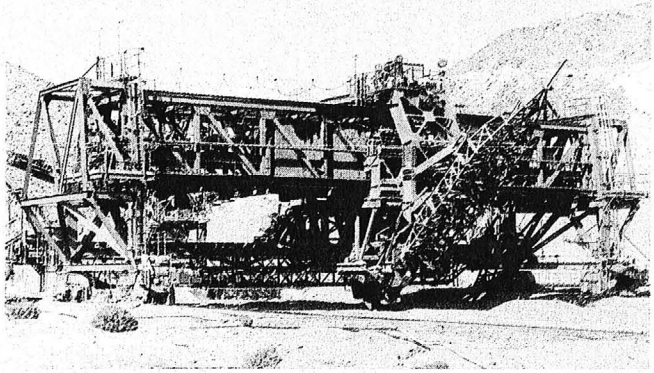
Link Belt Stackers



One of Many Stackers



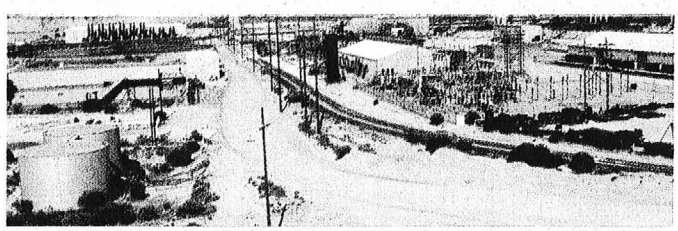
Hewitt-Robbins Reclaimer, 1950 TPH cap



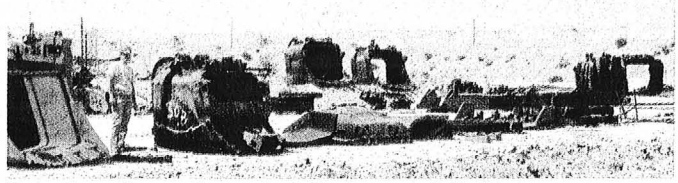
Link Belt Reclaimers, 10 Ton Bucket, 1400 TPH cap

New Spare and Replacement Parts

Million Dollar Inventory of New Spare and Replacement Parts

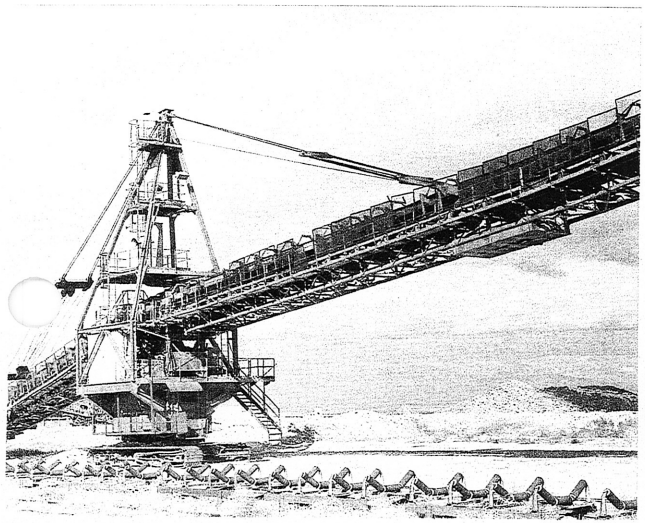


Miscellaneous Mine Equipment

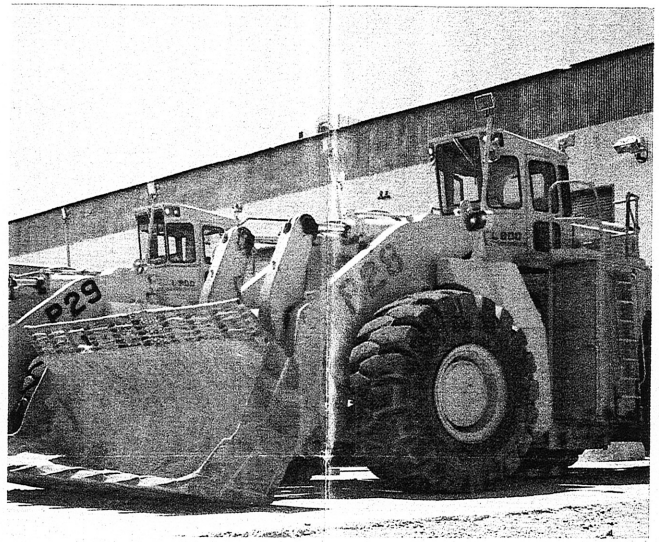


Huge Inventory - Spare and Replacement Parts

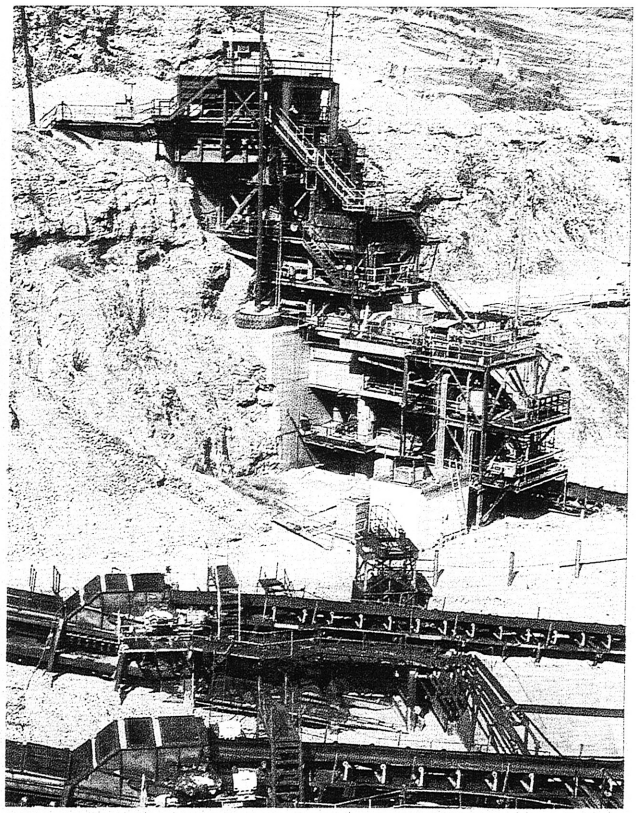
COMPLETE MODERN PLANTS & LATE MODEL MACHINES & EQUIPMENT



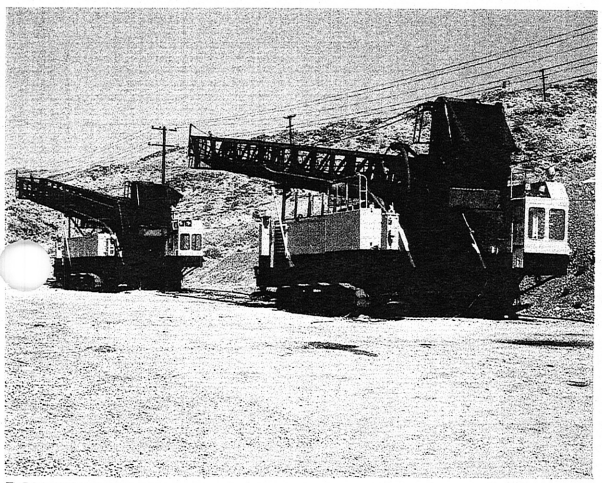
RECLAIMERS and STACKERS



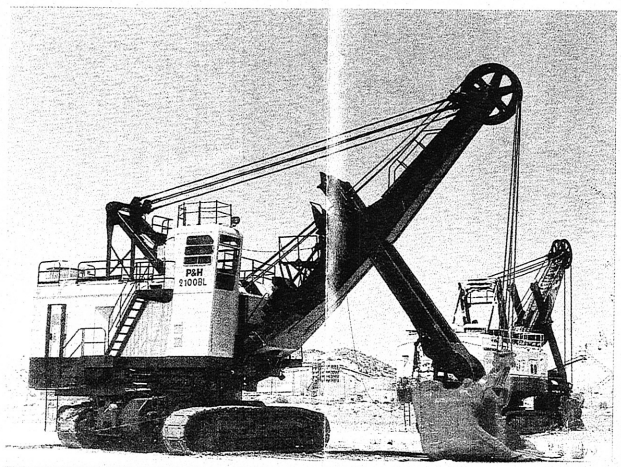
LOADERS — 13 Yard Capacity



CRUSHERS



ROTARY DRILLS

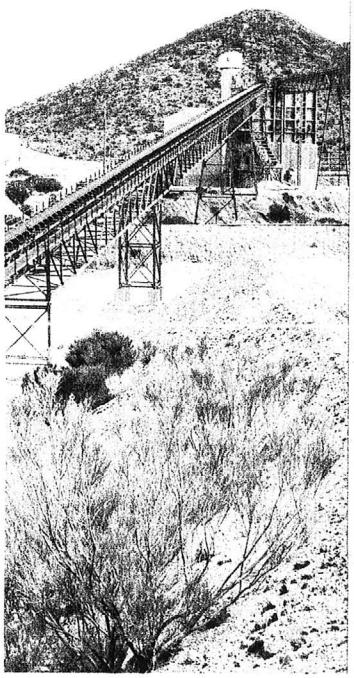


ELECTRIC SHOVELS — 5 Yard to 17 Yard Capacity

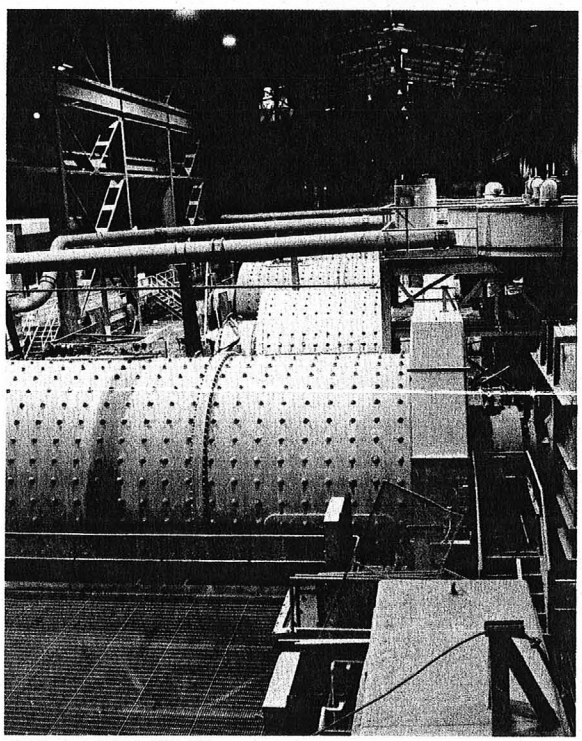
All Equipment Is Immediately Available

For Information Call (602) 648-1630

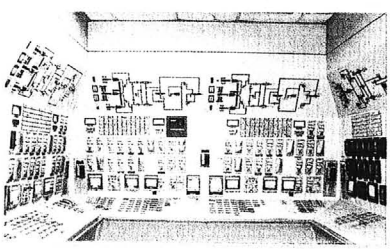
TRUCKS 110, 120, & 170 Ton — Excellent Condition — Excellent Rubber

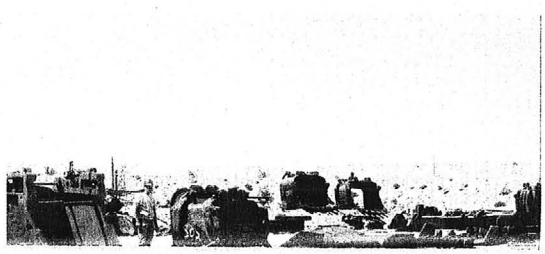


MILES OF CONVEYORS

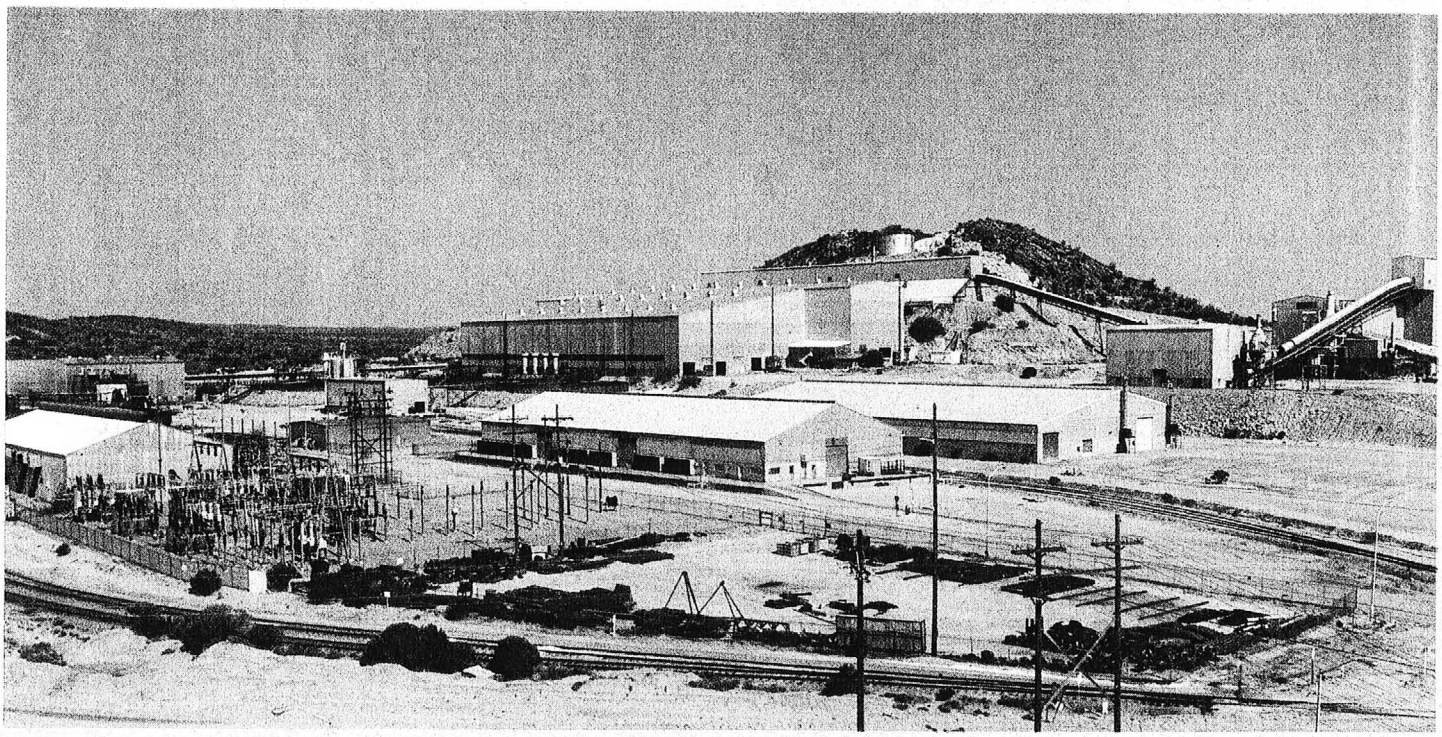


ROD and BALL MILLS





SULPHIDE CONCENTRATOR PLANT



44,000 ton per day plant—opened in 1970 and operated until recently.
Three major elements: CONCENTRATOR (Mills, Flotation, Thickeners)—MOLYBDENUM PLANT—FILTRATION.

CONCENTRATOR

44,000 ton per day concentrator consists of four milling divisions, each of which draw their rod mill feed from beneath the fine ore storage bin.
Each division consists of a rod mill and two ball mills, two cyclone feed pumps and four Krebs D-26 cyclones.
Flotation consists of 14 rows of rougher cells, three regrind mills, three sets of nine Krebs D15B cyclones and six rows of cleaner and scavenger cells. There are three 120' rougher concentrate thickeners.
The Concentrator sends its tails to two 400' thickeners which each have eight D26B cyclones. The concentrate is fed to the molybdenum plant to remove moly and then goes to the filter plant.

MOLYBDENUM PLANT

The Molybdenum Plant was designed to process 1200 tons per day of CuMo concentrate and produce up to 20 tons per day of MoS_2. The circuit consists of two parallel trains of conditioning, rougher flotation and up to seven cleaner cells. Additionally, there is an insoluble flotation circuit, two thickeners, two spray dryers and a dry handling and packaging system.

FILTRATION

The sulfide concentrate is stored and thickened in two 100' thickeners, than fed into three drum filters. These are installed outdoors and designed to operate 24 hours per day on an 85% availability. Maximum output was designed at 50 tons per hour with the feed slurry at 58% solids, 120°F temperature, 1.85 SG. The screen size is 325 mesh. Ph to be 7 plus.
The filter cake is 10% moisture by weight by the use of 80 PSI steam.
The plant includes concentrate handling and rail car loading systems put into operation in 1976.

For complete information and specifications,
Call: (602) 648-1630

PARK
P.O. BOX 1488

MINE EQUIPMENT DIVISION
CORPORATION
GREEN VALLEY, ARIZONA 85622

(602) 648-1630
Telex: 823037
TeleFax: (602) 648-0832

OXIDE PLANT

OXIDE PLANT

GRINDING, LEACHING & THICKENING

Oxide ore is reclaimed by belt feeders from fine ore storage and milled in two parallel trains consisting of an 11.5' x 18' rod mill feeding a 12.5' x 30' ball mill in an open circuit wet grinding. The ball mill discharge is pumped to an overflow leach tank circuit using concentrated H_2SO_4 acid. The slurry is then pumped to a train of four thickener countercurrent decantation for liquid solid separation. The pregnant solution is sent through two clarifiers and to the SX plant and the thickened solids are pumped to tails. The plant is designed to mill 10,000 ton per day.

COPPER SOLVENT EXTRACTION

The copper bearing solution is split into two streams of 3000 to 3300 gpm each for counter current copper extraction in two parallel trains of mixer settlers. Each train has four extraction and two stripping stages. Mixer settlers are a standard Davey Powergas gravity design. A square mixing box 15' x 15' contains a draft tube through which the phases are introduced into the eye of the turbine.
All wetted parts of the mixer settlers are 316 stainless steel construction.

ELECTROWINNING

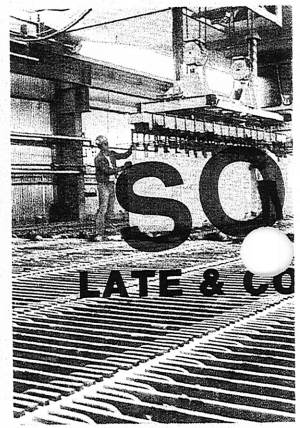
The tank house has 216 concrete cells lined with PVC paraliner. Each cell contains 51 3' x 4' cathodes and 52 cast lead calcium alloy anodes on 4'' centers. Starter sheets are prepared on titanium blanks. There are three recirculation systems in the tank house all fed from the common reservoir. Each recirculation system has eight sections of nine cells each, and each has a transformer/rectifier for a nominal capacity of 120 tons per day.
The tank house is 100 ft. wide by 400 ft. long. Steel construction with 316SS corrugated sheeting on walls and roof. Both cranes are on the same rails and cover the entire tank house cells and sheet preparation area. All piping is either PVC lined mild steel, 316 stainless steel, or polythene.

GRINDING, LEACHING & THICKENING

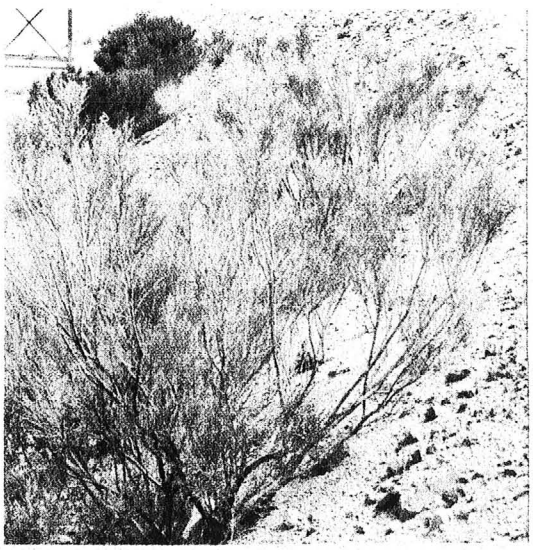
COPPER SOLVENT EXTRACTION

10,000 ton per day plant—
opened in 1975 and operated
until recently.

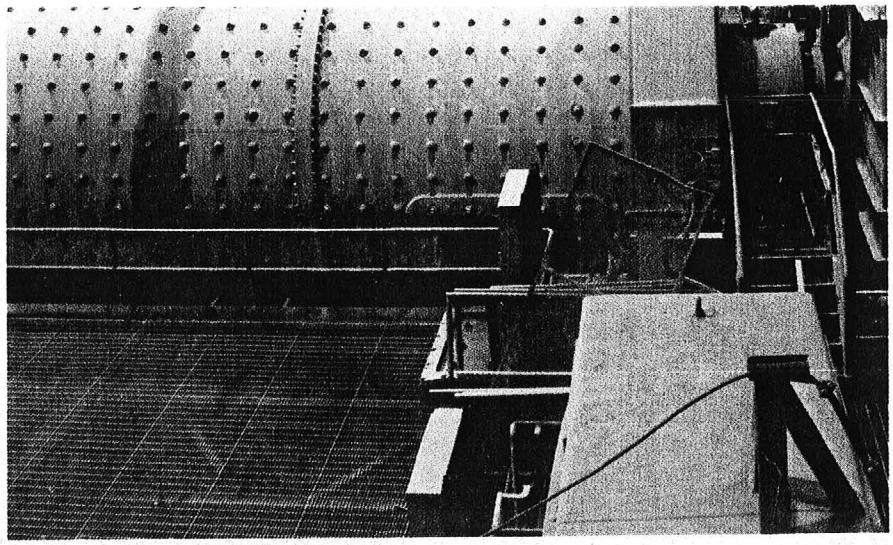
Three major elements:
GRINDING, LEACHING and THICKENING — COPPER SOLVENT EXTRACTION — ELECTROWINNING.



ELECTROWINNING



MILES OF CONVEYORS



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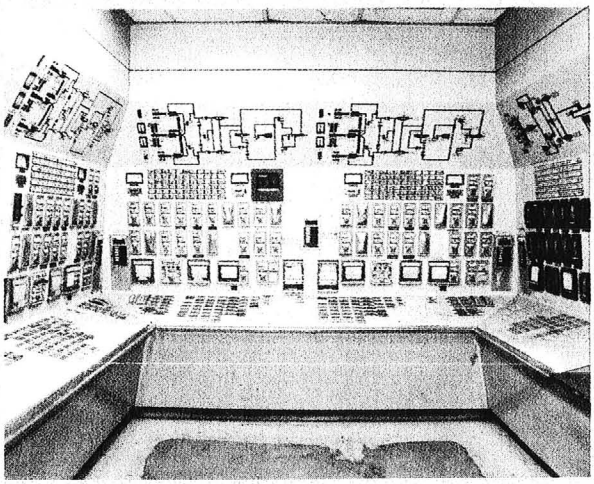
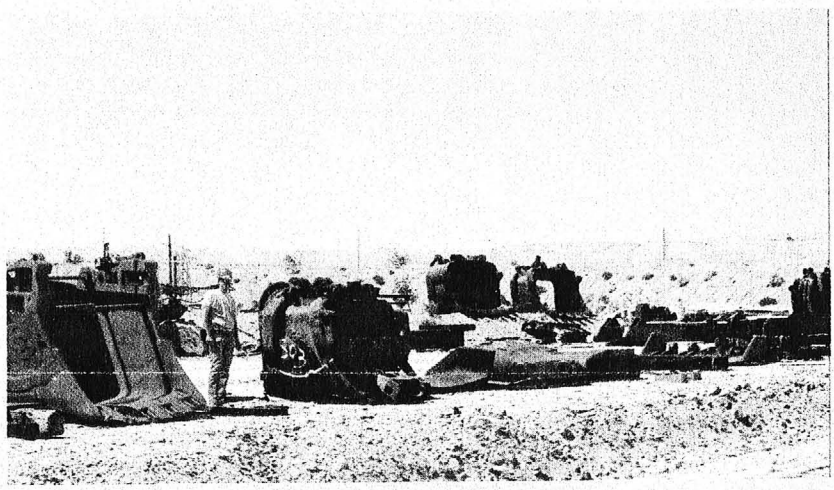
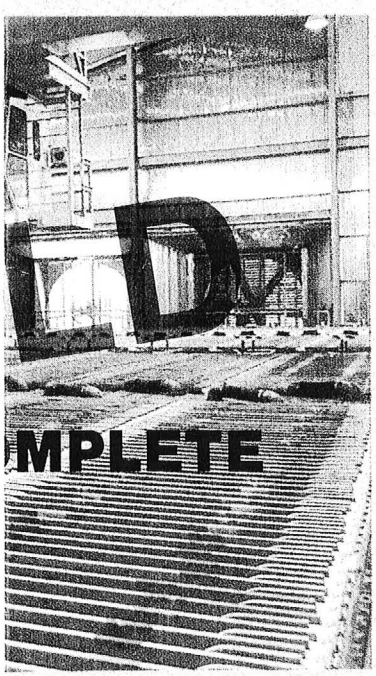


ELECTRICAL EQUIPMENT



NEW SPARE and REPLACEMENT PARTS



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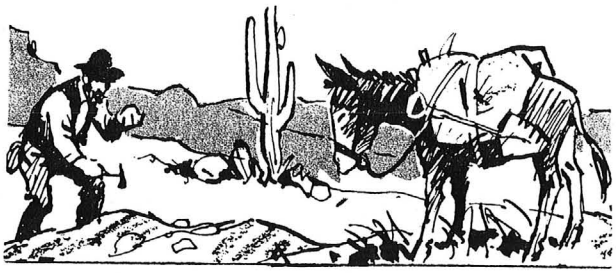
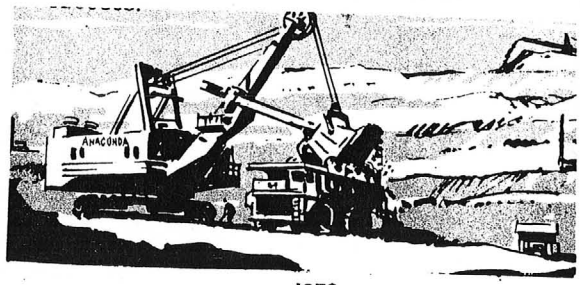


1870

THE TWIN BUTTES STORY



1970

Copper mining in this area had its beginnings in the 1870's when prospectors found rich outcrops of copper ore. It wasn't long until these rich, easy to mine pockets of ore were mined out.

In the early 1900's the copper mines near Twin Buttes enjoyed a brief return to productivity. Copper prices were good, optimism was high to the degree that a railroad line was built from Tucson to service this area. This rebirth of mining activity was short lived, however, and it wasn't until the 1950's that new interest was shown in this mining district. Modern day prospectors, geologists and engineers armed with the most up-to-date tools for divining the secrets of the earth began an intensive exploration of the district, hoping to find areas of mineralization suitable for mining.

In 1963 The Anaconda Company and the Banner Mining Company entered a long-term lease agreement for the exploration and development of Banner properties.

Shortly thereafter, an extensive program of diamond drilling was undertaken to develop the limits of what was possibly a large, low-grade ore body and to provide information as to the expected grade of the mineralization.

Engineers undertook the task of designing the mine and conducted economic studies to determine the best mining method...a task of unbelievable complexity!

Following this, an underground shaft was sunk for the purpose of acquiring additional geologic data. This also provided large, bulk samples of mineralized material for processing through a pilot plant to determine the most efficient method of removing the metal from the rock.

In making the decision to mine the ore by open pit methods, many factors had to be considered. One of the most significant was the fact that the ore body is overlain by 460 feet of sand and gravel. Anaconda was faced with the biggest pre-production stripping job in copper mining history anywhere in the world--a job that involved the removal of more than 200,000,000 tons of material before getting into the ore body in the underlying hard rock. It was decided to strip this over-burden by means of scrapers, belt conveyors and bottom dump trucks.

Ore and rock are mined by 15 cubic yard electric shovels, loaded into 100-ton capacity end dump trucks and hauled to the primary crushers deep in the pit.

Belts carry ore to the surface for treatment in a multimillion dollar concentrator. Other belts convey waste rock to disposal areas.

All of this complex operation is designed to mine ore that averages less than six tenths of 1% copper, or less than 12 pounds of copper per ton. In the development and mining of this ore body the lowest possible costs must be achieved for a successful operation. A tremendous expenditure of money was made before a single pound of copper concentrate was produced, and it will take many years to recover this investment.

The application of the most advanced technology plus the interest, enthusiasm and cooperation of the men and women working for Anaconda are our best guarantees for success.

A TOUR OF ANACONDA TWIN BUTTES MINE

1. THE MINE ENTRANCE affords an excellent frontal view of the Alluvium (sand and gravel) dikes, terraced and planted with shrubs and grasses.

2. INSIDE THE MINE PROPERTY the dikes are 200 feet high and the steep slope makes them susceptible to erosion. The dikes here are not terraced.

3. THE MINE SHOP AREA is the nerve center of the entire Twin Buttes operation and its 1000 employees. The offices are located here along with the maintenance area for all the major equipment.

4. DIKES constructed with the Alluvium overburden removed from the pit area form tailing ponds where mill waste is impounded and from which water is recovered for re-use.

5. LANDSCAPING together with irrigation and fertilizing is required to transform the dikes from mountains of barren waste to verdant hillsides, blending into the natural desert beauty of the surrounding Santa Cruz Valley.

6. OBSERVATION AREA provides a breathtaking view of the pit area, 4000 feet from left to right and 6000 feet long. The 100 ton bottom dump trucks appear as toys from this vantage point.

7. THE ALLUVIUM CONVEYOR is located on the east wall. As the pit is expanded the conveyor removes the overburden at the rate of 8000 tons per hour. This expansion will continue for the life of the mine, which is estimated to extend possibly into the next century.

8. PIT FLOOR is currently at a depth of 750 feet. Ultimate depth is 1800 feet! Down here the trucks no longer appear as toys.

9. ORE and ROCK CONVEYOR runs up the west wall at a speed of 950 feet per minute. Primary ore crusher is located near the bottom of this conveyor system and grinds the ore to medium size.

10. WASTE ROCK DISPOSAL AREA is fed by one branch of the conveyor system. After every blast in the pit, the Ore Control Engineer analyzes samples and determines whether the rocks will go to the waste area or the concentrator.

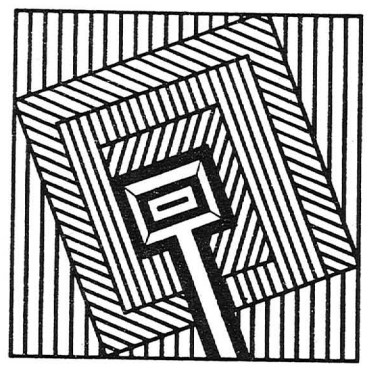
11. THE ORIGINAL TWIN BUTTES VILLAGE came into being 100 years ago when prospectors found rich outcrops of copper ore in the area. It wasn't long until these rich, easy-to-mine pockets of ore were mined out and the village was abandoned.

12. THE FINE ORE CRUSHER is located next to the concentrator and grinds the ore into a heavy gravel suitable for introduction into the concentrator.

13. IN THE CONCENTRATOR the grinding section reduces the rocks to a very small size. The brassy colored copper minerals are then separated from the waste in flotation cells.

14. THICKENERS, circular in shape, receive the brassy-yellow colored mixture and remove the excess water. The concentrate is then dried and is ready for shipment to a smelter. 100 pounds of ore produces about 2 pounds of concentrate and this in turn will produce a little over one-half pound of copper.

15. TWIN BUTTES, from which the original village and the current mine draw their names, stand watch over the entire area.



ANACONDA®

TWIN BUTTES, ARIZONA

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ANAMAX
MINING COMPANY

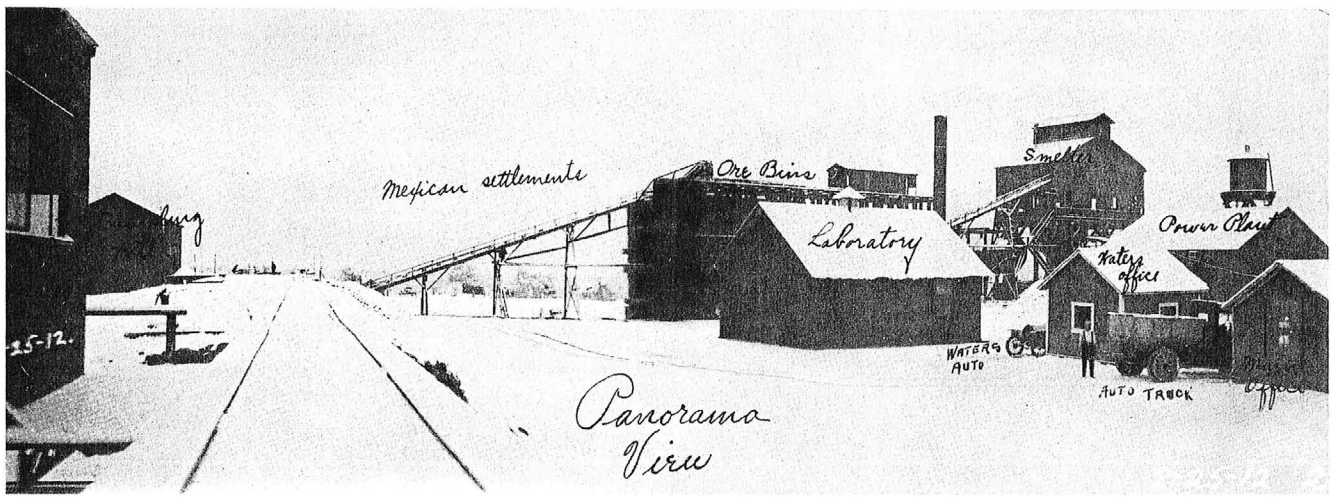
TWIN BUTTES OPERATION
ARIZONA

BEGINNINGS

The copper-rich Pima Mining District of southern Arizona is dotted with evidence of early mining activity —the remains of old workings, discarded equipment, exploratory shafts—some dating back to the 1870's. In the area known as Twin Buttes many small mining operations flourished and failed.

Over the years the Banner Mining Company gained extensive mineral holdings in the Twin Buttes area. In 1965, The Anaconda Company, under agreement with Banner, began an exploration and mining project far beyond the scope of those early day mines.

After four years of development, Anaconda produced the first copper concentrate from the Twin Buttes mine in 1969. In a later expansion, Anaconda entered into a partnership with AMAX Inc., forming the Anamax Mining Company, in 1973.



In 1912, the year Arizona became America's 48th state, the Twin Buttes Mining and Smelting Company operated Pioneer Smelting at a site called Camp Corwin, near today's Twin Buttes operation. This picture was made just after the Washington's Birthday snow.

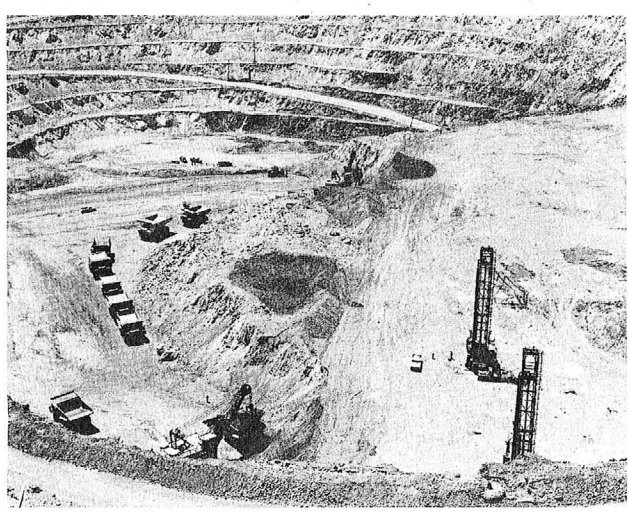
HARD ROCK MINING

Anamax's Twin Buttes operation is an open pit copper mine. To reach the relatively low grade copper ore lying deep below the surface, 500-800 feet of waste material had to be removed. Since the project began in 1965, more than a billion tons of material have been moved here.

True to modern mining methods, Anamax's engineers make use of computers to assist them in pit design. Core samples from various holes are assayed, the results computerized, and from this data the engineers determine the configuration of the pit. Current design calls for the pit to be 1¾ miles long, 1¼ miles wide and 1700 feet deep, with the sides sloping downward in a series of 40 to 50 foot benches.

Daily blasting is the first of many steps in mining copper. For each blast a series of 80-100 holes, 47 feet deep, twelve and one-half inches in diameter, are drilled at 30 foot intervals and loaded with explosives.

Once the ore and rock have been loosened and fractured by blasting, electric power shovels move in to load it onto 100 ton end-dump trucks (below left). These trucks carry the ore and rock to one of three crushers in the pit which reduce it to a size that can be carried on five foot wide conveyor belts, up and out of the pit to the various processing points on the property.



Many operations underway simultaneously in the pit. At right, a survey crew is dwarfed by two rigs drilling blast holes. In the background, left of center, another crew loads explosives and in the foreground, an electric shovel takes three or four bites to load a 100-ton dump truck with ore.

COPPER RECOVERY

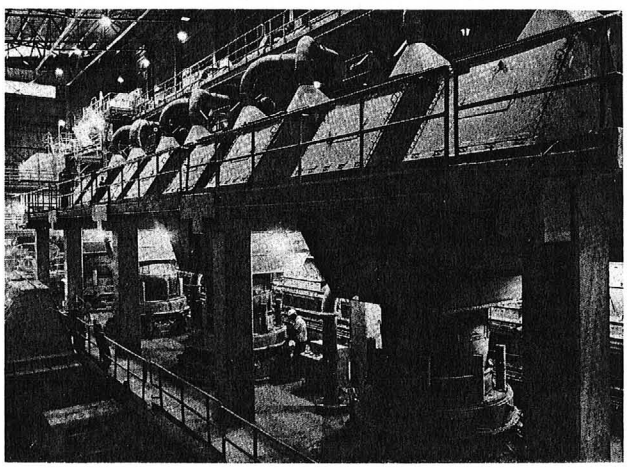
There are two distinct types of copper ore mined at Twin Buttes—oxide ore which is principally chrysocolla, and sulfide ore which is principally chalcopyrite.

The Sulfide Mill

The Sulfide Mill at Twin Buttes has the capacity to process 40,000 tons of ore per day, yielding 1,200 tons of copper concentrate.

Sulfide ore, traveling up from the pit by conveyor is sent through a secondary crushing stage. Upon reaching the Fine Ore Crusher, the ore is circulated through a series of giant cone crushers (shown below) which eventually reduce it to a pebble size. The fine ore is then moved by conveyor to the Sulfide Concentrator where it is fed into the series of rod and ball grinding mills.

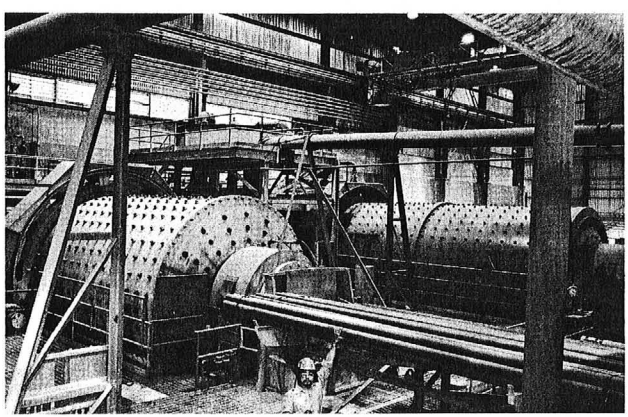
A rod mill is a large steel drum 18½ feet long and 14 feet in diameter which rotates at a speed of 15 RPM. The

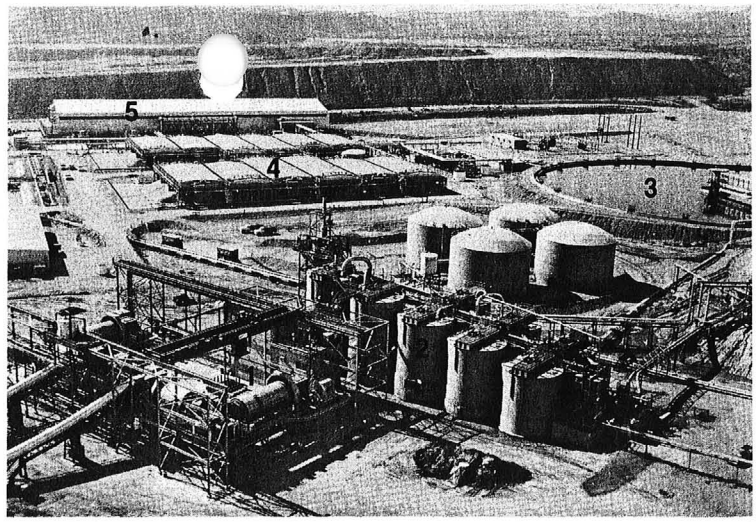


inside of the mill is partially loaded with 4 inch diameter by 17 foot long steel rods. The ball mills are slightly larger and are filled with 2 inch diameter steel balls. (In the picture below, the mill worker stands in front of a rod and a ball mill, holding a steel ball and pointing to the rods.) Fine ore, fed into these mills, is mixed with water and ground into a mud-like substance called slurry.

The slurry is mixed with chemical reagents and pumped into large flotation tanks. Here the mixture is agitated with air and whipped into a froth. The reagents cause the copper to float to the top of the tanks, coating the large bubbles which are formed. The froth holding the copper concentrate is then floated off while the waste, called tailings, drops to the bottom and is pumped out.

The concentrate goes through one final milling step, again using the flotation method, which separates out the molybdenum, an important by-product metal. Dried to a black powder, the concentrate is shipped to copper smelters around the U.S. for further refining.





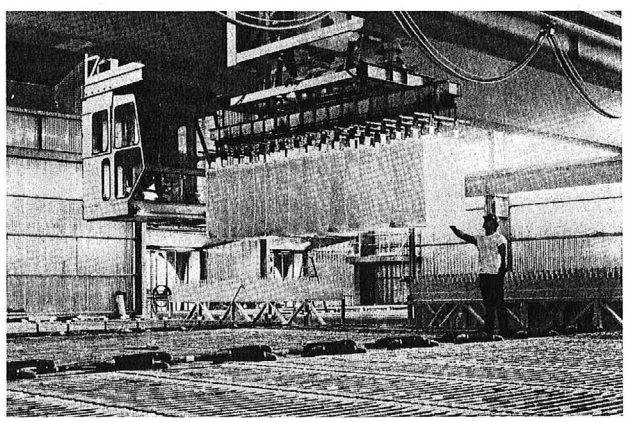
The Oxide Plant

Anamax's Oxide Leaching and Electrowinning plant is one of the first and largest of such facilities in the country incorporating a liquid ion exchange (solvent extraction) process. One hundred tons of pure copper can be produced here each day.

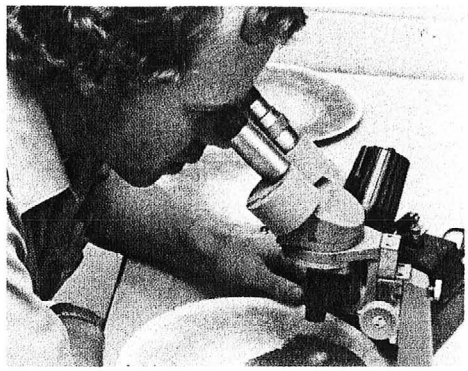
After crushing, oxide ore is fed into rod and ball mills[1] and reduced to a slurry which is then pumped through a series of eight leaching tanks[2]. Sulfuric acid in the tanks leaches the copper minerals from the ore. After eight hours, virtually all the copper oxide has been removed from the ore and is in solution with the acid. It is then fed through a series of four thickener tanks[3], 400 feet in diameter, where the waste or tailing is separated from the acid leach solution.

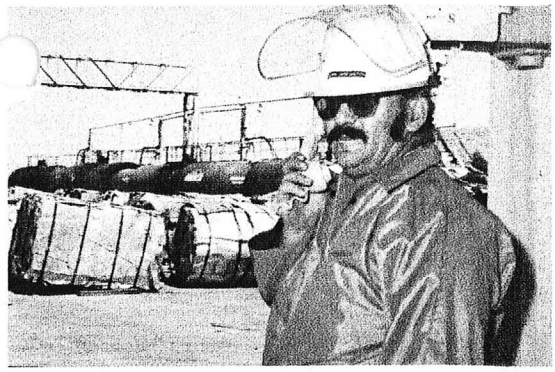
Solvent extraction and electrowinning are the two final steps in producing pure copper from oxide ore. In solvent extraction[4] a chemical reagent called an organic extractant is mixed with kerosene and is used to transfer the copper out of the acid solution leaving other impurities behind. More acid is then added to separate the copper from the organic solution and prepare it for electrowinning.

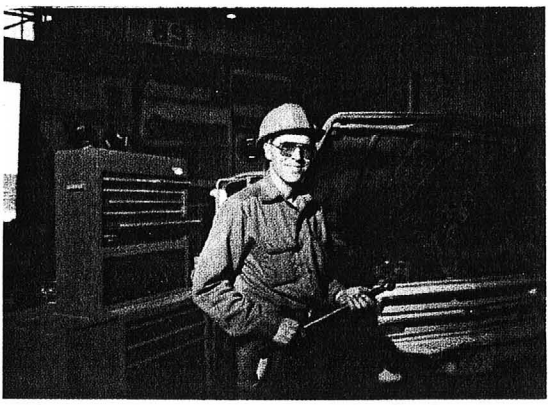
In the tankhouse[5], where electrowinning takes place, the acid/copper solution, called electrolyte, is pumped into



plastic lined concrete tanks. Each tank is filled with copper starting sheets. Each starting sheet is placed between two anodes. An electric current is passed through the tanks causing copper in the solution to be deposited on the starting sheets. After seven days in the tanks the finished sheets of copper, now called cathodes, are removed (above), washed, and loaded into railroad cars for shipping. The finished cathodes, each 36 inches by 44 inches and weighing about 140 pounds, are 99.9% pure copper—a finished product ready for fabrication.





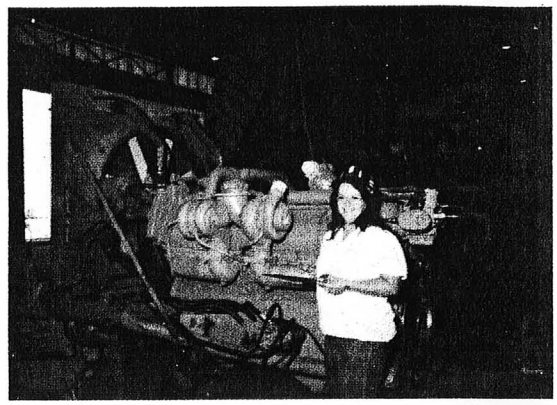


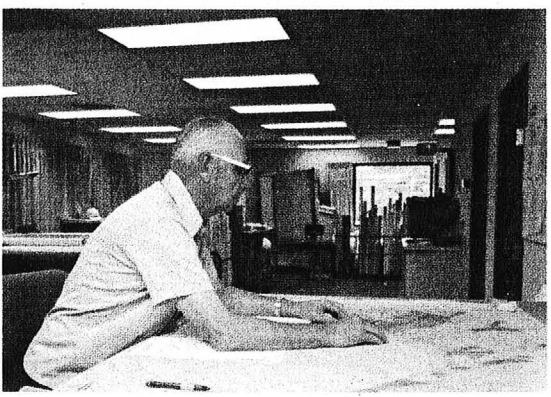
Anamax People

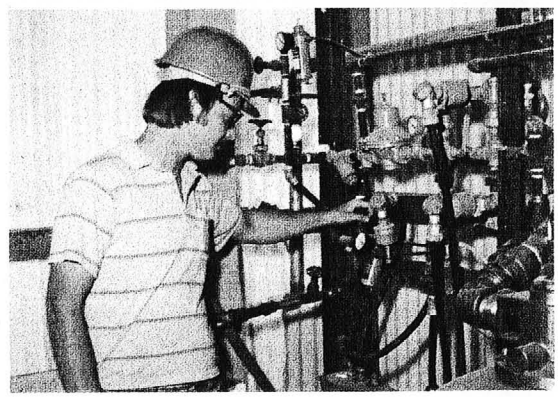
The effective operation of a modern copper mine such as Twin Buttes demands a wide variety of skills on the part of its employees. In addition to the mining engineers, metallurgical engineers, and equipment operators, there are carpenters, accountants, pipefitters, mechanics, buyers, computer programmers, safety experts, schedulers —even landscapers who restore a foliage covering to the moved earth.

In its traditionally masculine industry, Anamax was one of the first in the area to open fully equal job opportunities to women.

The Anamax economic impact extends to neighboring communities where a host of support facilities do an important part of their business with the mine.







The Future

Anamax Twin Buttes continues to grow. A new partnership has been formed with American Smelting and Refining Company to bring ore 6½ miles overland on a new "cable belt" conveyor for processing through the Sulfide Mill.

New methods for recovering other metals as by-products of copper production are being tried at Anamax. A uranium extraction plant will recover this important by-product metal.

Innovative from its beginnings, Anamax will continue to be an important contributor to a nation in need of its products.