

Directory of Active Mines In Arizona 1993

Incorporating Sand & Gravel Operations

THE ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

The objective of the Department is to promote the development of Arizona's mineral resources. This is accomplished through technical research, field investigations, compilation of information into a mineral occurrence data base, and disseminating information through publications, personal contacts, and seminars.

The Department's mining engineers and geologists assist mining and exploration companies, prospectors and others interested in Arizona's minerals with mineral processing, mineral land acquisition, exploration, mine development, financing, government regulations, and marketing.

The Department is a service agency and does not regulate, tax, or require any type of registration. The agency provides assistance that is tailored to meet the diverse needs of the public. The following is a partial list of services that the Department offers:

- Maintain a site specific data base of unpublished reports and maps that includes 4,000 mine files and indexes of 10,000 computerized Arizona mineral occurrences.
- Maintain an information bank and library of mineral and mining information including a mine map library (hard copy and microfilm), government publications, periodicals, and unpublished master and doctorate theses.
- Gather and disseminate information on commodities and markets.
- Suggest target areas for exploration activity.
- Suggest properties for acquisition and development.
- Assist individuals and companies in their dealings with State regulatory agencies to facilitate their mining and exploration activity.
- Produce publications in the form of mineral reports, annual directories, technical reports, annual mineral industry surveys and information circulars. These include *Laws and Regulations Governing Mineral Rights in Arizona*, *Directory of Active Mines in Arizona*, *Manual for Determination of Status and Ownership of Arizona Mineral and Water Rights*, and others. A current listing of the Department publications is available upon request.
- Maintain the Arizona Mining and Mineral Museum.



Arizona Department of Mines and
Mineral Resources

**ARIZONA DEPARTMENT OF MINES
AND MINERAL RESOURCES**

Leroy E. Kissinger, Director

1502 West Washington
Phoenix, Arizona 85007
(602) 255-3791
Toll Free in Arizona: 800-446-4259

Board of Governors

Roy Miller - Phoenix
Chairman

Ken C. Bennett, Phoenix
Member

Clifford B. Altfeld - Tucson
Vice Chairman

Edna Vinck - Globe
Member

Doug Lindsay Sr. - Phoenix
Member

2088 E. 20th Street, Yuma, AZ 85365
Phone 343-4100 - Employees: 150 - Construction material supplier.

VALLEY CONCRETE & MATERIALS
820 E. Hwy 89-A, P.O. Box 634, Cottonwood, AZ 86326
Phone 634-4250 - Employees: 35 - Material supplier of sand, gravel and ABC.

Plant Manager.....David Heath

VALLEY ROCK & SAND CO.
P.O. Box 18469, Tucson, AZ 85731
Phone 296-1733 - Employees: 4 - Sand & gravel materials.

President.....Martin McCann

W.A. MORRIS SAND, GRAVEL & CONCRETE INC.
US Highway 191 South, Safford, AZ 85546
Phone 429-1371 - Employees: 15 - Sand, gravel and concrete supplier.

OwnerJack Gilbert

WESTERN SAND & ROCK
P.O. Box 65, 4175 S. Litchfield Rd., Avondale, AZ 85323
Phone 932-1391 - Employees: WND

W.M. K. TRANSIT MIX CO.
P.O. Box 31, Bullhead City, AZ 86430
Phone 763-3887 - Employees: 35-40 - Concrete, ready mix, building materials.

ManagerBob Swartzman

WICKENBURG CONCRETE & MATERIALS
P.O. Box 516, U.S. Hwy. 60, M.P. 115½, Wickenburg, AZ 85358
Phone 684-3402 - Employees: 17 - Supplier of aggregate materials.

President.....Edwin Dillard
Vice President.....George Dillard

WILLCOX ROCK & SAND
770 S. Cochise Ave., P.O. Box 156, Willcox, AZ 85643
Phone 384-2181 - Employees: 10 - Supplier of aggregate and concrete materials.


YAVAPAI MATERIALS, INC.
P.O. Box 814, Near Airport - Hwy. 89, Prescott, AZ 86301
Phone 445-7305 - Employees: 17 - Sand and gravel producer.

Active Mines in Arizona - 1993

by K.A. Phillips, N.J. Niemuth, and D.R. Bain

Department of Mines and Mineral Resources

Directory 40



The Trade Association Which Offers

THE BEST OF BOTH WORLDS

An Influential Voice for Smaller Industrial Business

*we speak out in favor of economic growth
we lobby for better business conditions in Arizona
we speak up for the smaller businessman*

and

Arizona's Mine Suppliers Association

*we support the mining industry with lobbying & promotional activities
we bring miners and suppliers together for networking and mutual benefit
we publish the only Buyers Guide for suppliers and the mines*

AMIGOS Trade Association • Post Office Box 25187 • Phoenix, Arizona 85002 • 602-279-3199



State of Arizona
Fife Symington, Governor

Phoenix, Arizona
December, 1992



SUPPORTING ARIZONA'S CONSTRUCTION AND MINING INDUSTRIES

As a member of
ASSOCIATED EQUIPMENT DISTRIBUTORS OF ARIZONA

* We believe that our integrity and reputation are based on fair dealings with our customers and our manufacturer suppliers.

* We conduct our business in a spirit of fairness to all and devotion to high ideals of honesty and courtesy.

* We seek a normal reward of business: a profit commensurate with the risks involved.

* We comply with those laws and regulations designed to protect the competitive enterprise system.

* We engage in proper and ethical standards of soliciting business and do not approve of false or disparaging statements, either written or oral, or in circulating harmful rumors about a competitor's product, selling prices, business, financial or personal standing.

* We recognize our obligation to honestly represent the products we merchandise, and to back every sale with a concept of service to the customer.

* We do not condone initiating negotiations for the services of any party employed by any other distributor member.

* We conduct our affairs at all times in a manner that is compatible with the public interest and the principles of the A.E.D.A., and will not engage in activities which could bring discredit to A.D.E.A. or the industry it represents.

* We subscribe to the Trade Practice Rules endorsed by A.D.E.A and issued by the Federal Trade Commission for the Construction Equipment Distribution Industry.

* We endeavor to comply in every way with those governmental laws, rules and regulations which have application to the operations of the trade associations serving out chosen industry.

ACM Equipment Rental & Sales Co.
(602) 898-4500

Century Machinery Co., Inc.
(602) 243-7137

Ingersoll-Rand Equipment Sales
(602) 258-6493

Road Machinery Co.
(602) 252-7121

Arizona Industrial Machinery Co.
(602) 269-7111

Clifton, Gunderson & Co (CPA)
(602) 230-0166

Inland Kenworth
(602) 258-7791

SMA Equipment Co. Inc.
(602) 829-0991

Arizona Mite-E-Lift
(602) 437-8373

Conveyor Sales Co.
(602) 273-1455

Lindco Equipment Co.
(602) 254-6494

Southwest Contractor
(602) 258-1641

Arnold Machinery Co.
(602) 237-3755

Crusher Service Co.
(602) 834-3077

Mardian Equipment Co.
(602) 484-7799

Sun Country Equipment
(602) 243-5243

Associated Commercial Corp.
(602) 946-5610

Cummins Southwest, Inc.
(602) 252-8021

North Rentals, Inc.
(602) 943-3274

Sunstate Equipment
(602) 275-0601

Associated Services
(602) 266-7319

Ditch Witch Of Arizona
(602) 437-0351

Orix Credit Alliance, Inc.
(602) 482-0695

Valley Rentals
(602) 834-3355

CIT Group/Equipment, LTD.
(602) 784-2300

Empire Machinery Co.
(602) 898-4400

Rental City
(602) 947-7303

Williams Detroit Diesel Allison
(602) 257-0561

Canyon State Equipment, LTD.
(602) 269-3221

G.E. Capital Corp.
(602) 831-6114

Reuter Equipment, Inc.
(602) 269-1050

PHOENIX REDI-MIX COMPANY

3635 S. 43rd Ave., Phoenix, AZ 85009
Phone 272-2637 - Mining & selling of aggregates, sand and gravel.

President.....Thomas M. Valente
Vice President.....Timothy Valente
Marketing DirectorJoe Nonno
Plant ManagerBob Strom

PIONEER SAND COMPANY

5901 W. Broadway Rd., Phoenix, AZ 85043
Phone 233-2971 Employees: 30.

REIDHEAD SAND & ROCK, INC.

P.O. Box 7, Paper Mill Rd., Taylor, AZ 85939
Phone 436-4519.

RUE HALE PIPELINE SERVICE

611 S. Voight St., P.O. Box 221, Springerville, AZ 85938
Phone 333-4483. - Sand and gravel producer.

SALT RIVER SAND & ROCK

P.O. Box 728, Mesa, AZ 85211
Phone 990-1987 - Employees: 40 - Aggregates, cement/asphalt, sand and gravel.

SAND SPECIALTIES, INC.

5570 N. Bush Highway, Mesa, AZ 85205
Phone 832-2120 - Employees: 4 - Supplier for aggregate products.

ManagerErnest Perkins

SAN XAVIER ROCK & MATERIALS

3895 N. Business Center Dr., Tucson, AZ 85745, P.O. Box 551, Cortaro, AZ 85652
Phone (602) 293-6833 - Employees: 100 - Ready mix, sand and gravel.

Division Manager.....Al Wilcox

SCARBOROUGH SAND & GRAVEL

920 E. Stratton Dr., Safford, AZ 85546
Phone 428-3138 - Employees: 5 - Contractor for sand and gravel, septic tanks, septic systems.

Owner/ManagerWinfred Scarborough

STAR VALLEY GRANITE & MATERIALS

Star Valley, HCR Box 43B, Payson, AZ 85541 - Phone 474-9396 - Employees: 2 - Decomposed granite.

SUN LAND SAND & GRAVEL

6950 W. Southern, Laveen, AZ 85339
Phone 237-3210 - Employees: 4 - Screening of natural river rock mortar sand.

SUN STATE ROCK & MATERIAL

P.O. Box 1340, Sun City, AZ 85372
Phone 566-3000.

SUNWARD MATERIALS

2625 S. 19th Ave., Phoenix, AZ 85009
Phone 253-2505 - Employees: 270 - Ready-mix concrete company.

SUPERIOR COMPANIES

Hayfield Draw, Camp Verde, AZ 85322
Phone 567-2244 - Ready mix/sand and gravel/gypsum.

General Manager.....Ed Davidson

SUPERSTITION CRUSHING

2400 S. Meridian Rd., Queen Creek, AZ 85242 Phone 987-9468.

TREASURE CHEST MINING

1701 N. Bridal Wreath, Tempe, AZ 85281
Phone 983-1606 - Employees: 4 - Sand and gravel producer.

UNION ROCK & MATERIALS CORP.

P.O. Box 8007, 2800 S. Central Ave., Phoenix, AZ 85066
Phone 276-4211.
El Mirage plant - 935-2653
Mesa plant - 935-2653 - Employees: 203 - Sand and gravel quarry and plant - produce ready mix concrete, asphaltic concrete aggregate.

UNITED METRO

A DIVISION OF THE TANNER COMPANIES

P.O. Box 52140, Phoenix, AZ 85072
Phone 220-5000 - Employees: 110 - Sand, gravel, asphalt material supplier.

President.....John Fowler

P.O. Box 36030, Tucson, AZ 85740-6030
Phone (602) 744-3222 - Construction material supplier

Division PresidentRichard Hrubes

Casa Grande Plant
2305 S. Rooftile Rd., Casa Grande, AZ 85222
Phone 836-8705 - Employees: 30 - Material suppliers: sand, gravel, asphalt, ready mix.

Plant ManagerWill Watkins

1785 Kiowa Blvd., Lake Havasu City, AZ 86403 - Employees: 20-25 - Material supplier - sand, gravel, concrete, asphalt.

Plant Manager.....George Davis

Riverside Drive, Parker, AZ 85344 - Employees: 20-25 - Materials supplier sand, gravel, concrete and asphalt.

Plant Manager.....George Davis

91 Old Ruby Road, Nogales, AZ 85621
Phone 281-9669 - Employees: 7 - Ready mix supplier.

Plant ManagerEmie Bracamonte

GUZMAN CONSTRUCTION
P.O. Box 3100, Superior-Globe, Globe, AZ 85501
Phone 425-5775 - Employees: 70.

President.....Mike Guzman Jr.
Vice PresidentWess Bryant
Superintendent.....Joe Rackley

HAMILTON SAND & GRAVEL
Hamilton Rd., RR 1 Box 1350, Willcox, AZ 85643
Phone 384-2582

HATCH CONSTRUCTION & PAVING
Hwy. 77, Taylor, AZ 85939
Phone 536-7213 - Employees: 75.

PresidentJerrold L. Hatch
SecretaryDanny F. Hatch
Vice PresidentLynn R. Hatch
Vice PresidentLenn B. Hatch

J.D.'S SAND & GRAVEL INC.
559 Ruby Rd., P.O. Box 35, Nogales, AZ 85628
Phone 281-9449 - Employees: 4 - AB & fill.

President.....Michael Williams

JIM BUSH SAND & GRAVEL
1015 N. Cameron Ajo, AZ 85321
Phone 387-6250 - Employees: 4 - Sand and Gravel - Excavating contractor.

President.....Patti Bush
Vice President.....David Bush

J & F SAND & GRAVEL
136 50 N. Frntage Rd., Yuma, AZ 85365
Phone 342-3654 - Sand and gravel producer.

KILAUEA CRUSHERS INC.
P.O. Box 5385, Glendale, AZ 85312
Phone 843-1888 - Employees: 4 - Crushed granite.

President.....Bill Nichols

KINGMAN REDI-MIX
Mohave Airport Dr., Kingman, AZ 86401
Phone 757-7446 - Employees: 11.

President.....Pete Campbell

KOCJAN ASSOCIATES, INC.
P.O. Box 3748, Industrial Park, Page, AZ 86040
Phone 645-3602 - Employees: 5.

PresidentJohn Kocjan
Vice PresidentGerald Kocjan

MADDUX & SONS, INC. READY MIX
1927 Pan American, P.O. Box 1077, Douglas, AZ 85608
Phone 364-7564 - Employees: 45.

Owner.....Leonard Maddux
Office ManagerToni Vance

MESA MATERIALS, INC.
3410 N. Higley Rd., Mesa, AZ 85205
Phone 830-1521 - Employees: 45.

OwnerEdward C. Levy Co.
Office ManagerBruce Erickson
Purchasing.....Sheron Crane
Operations Manager.....Dave Schessler

MESA SAND & ROCK INC.
2246 N. Country Club Dr., Mesa, AZ 85201
Phone 964-1773 - Employees: 35 - Ready-mix.

President.....Robert Shill

MOHAVE CONCRETE & MATERIALS INC.
Hwy. 95 N., Lake Havasu City, AZ 86043
Phone 764-2226 - Employees: 28 - Concrete manufacturer, ready mix.

OwnerQinto Polidori
TreasurerVeronica Polidori
SuperintendentPete Tiburzi

OAKCREEK CONTRACTING INC.
S. 4th, Duncan, AZ 85534
Phone 359-2722

PADILLA SAND & GRAVEL
HCR Box 87, Nogales, AZ 85621 - Employees: 5 - Supplier of sand, gravel and concrete.

OwnerManuel Padilla

PAULDEN SAND & ROCK REDI-MIX
Div. Dunbar Stone Co., Inc., P.O. Box 403, Paulden, AZ 86334
Phone 636-2500. - Sand and gravel producer, ready mix.

PAYSON CONCRETE & MATERIALS, INC.
1900 E. Hwy 260, Payson, AZ 85541
Phone 474-2231 - Employees: 40 - Aggregate, concrete, septic tanks and culvert supplier, excavators.

Plant Managers.....George Randall, John Chillson

JOY T. PEARCE CONSTRUCTION, INC.
P.O. Box 2049, Hwy. 260, Show Low, AZ 85901
Phone 537-7454 - Employees: 12 - General engineering contractor, asphalt excavation, roads, parking lots, building pads, rocks, sand, cinders materials.

Owner/President.....Mr. Joy T. Pearce
SecretaryBeth Pearce

Directory of Active Mines in Arizona

1993

Table of Contents

Arizona's Mineral Industry	A1
Mineral Production Table	A2
Company Listing	A9
Sand and Gravel Operations	A21
Mine Index	A23

Forward

This directory was compiled in November, 1992 from field visits and information received by the Department's technical staff. For the purpose of this directory, an active mine is defined as a mine in continuous operation, either in production or under full-time development for production. Custom milling operations that are active or available on a full-time basis are also included in the directory.

It is acknowledged that there are additional mines not listed that are in an exploration, evaluation, or part-time development phase. There are others where production is on an intermittent basis that are not listed. The report is dependent on the cooperation of government agencies, private industry, and individuals who voluntarily provide information on their projects and activities.

The directory is arranged alphabetically by company name. Each listing includes corporate addresses, mine name and location, operation description, and key personnel. The listing for the sand and gravel operations include name, address, and phone number. The area code for all Arizona phone numbers is 602.

ARIZONA'S MINERAL INDUSTRY

Arizona continues to rank as the Nation's leading mineral producer. The value of mineral production in the State last year was in excess of \$3.1 billion (see table, p. A2) . As it has since 1910, Arizona leads the Nation in copper production. A total of 2.233 billion pounds of copper was produced in 1991, 62% of the U.S. total. Arizona also ranks first in the Nation in mined gemstone production and is among the leaders in the production of molybdenum, silver, pyrite, and perlite. There are over 102 mines active, excluding sand and gravel operations, producing the above mentioned metals plus 18 industrial mineral commodities. The mining industry directly employs over 14,000 people. Estimates of development expenditures exceeded \$100 million.

COPPER

The dominant trend in the State's copper industry is the continued modernization of the industry's infrastructure in order to lower production costs and expand production capacity. An important part of this process has been the widespread deployment of solvent extraction electrowinning (SX-EW) technology. This process produces cathode grade copper, which is directly marketable, from low cost leach solutions obtained from oxide ores or mine dumps. Some companies have acquired ore reserves and formulated development plans for leach only deposits.

Copper prices declined 13 cents to \$1.09/lb in 1991, but this price decrease was partially offset by a 4.6 percent increase in production that lessened the drop in value of the year's production.

Arimetco Incorporated

Arimetco owns and/or operates the Emerald Isle, Johnson Camp, Van Dyke, and Zonia copper properties and also has industrial mineral interests in Arizona.

Their Emerald Isle mine, which consists of in-situ leaching and a precipitation plant, was shut down in the first quarter of 1990. Planning and permitting for an 8,000 pounds per day SX-EW facility and associated components began in mid-1991. The plant is expected to be operational in the spring of 1992. The SX-EW plant will be fed by a combination of solutions from a leach pad and an in-situ leach of the pit bottom.

The Johnson Camp mine contributed in excess of 60 percent of the company's production during 1991 and is expected to produce over 9 million pounds of copper during 1992. The addition of a second train in the solvent extraction plant has increased the flexibility and overall operational efficiency of the mine.

Until mid-year, production was entirely dependent on the leaching of copper from existing heaps. Mine planning to produce new ore began early in 1991 and development began in May of 1991. The first fresh ore was placed on the dumps in July. Mining at the rate of 10,000 tons per day is

expected to continue from the Burro Pit and adjacent areas until the end of 1993.

Arimetco reports that good progress has been made during the year in formulating a development plan for its Van Dyke ore body, partially located under the town of Miami. Copper will be produced by injecting acid into mined out areas and treating recovered solutions in an SX-EW plant.

They have examined the possibility of initially using the existing Van Dyke shaft, which accesses the entire ore body and connects with all workings, as an extraction well. The advantage of using the shaft as a collection point for the injected fluids are many. The eventual access to the ore body through the shaft is viewed as a major advantage.

Asarco Inc.

Asarco's Arizona operation consists of a major copper smelter at the Hayden Unit, major open-pit mines at the Mission and Ray Units, and a dump leaching/cementation operation at the Silver Bell Unit. With the increased production at the Mission Complex, Asarco is able to produce 76 percent of the copper concentrate feed to its smelters. Asarco continued its \$375 million program to become self-sufficient in concentrates to feed its smelters.

Asarco, along with joint venture partner Freeport, continued the in-situ leach research at the Santa Cruz property in cooperation with the U.S. Bureau of Mines. Part of the study consists of injection of saline solution to determine the hydrology of the deposit. The results are being evaluated.

Asarco also holds major reserves at the Chilito north of Hayden, at Helvetica east of the Mission Complex, and at Sacaton East.

The Asarco Hayden Unit consists of an INCO flash furnace smelter rated at 720,000 tons of charge per year for an estimated production of 175,000 tons of blister copper. An acid plant rated at 1,600 tons of sulfuric acid per day keeps sulfur dioxide emissions within air quality restraints.

The company's Mission Unit consists of the consolidation of the Mission, Eisenhower, San Xavier, and Pima

CALMAT OF ARIZONA

P.O. Box 418, Rillito, AZ 85654
Phone 629-0460 - Employees: 8 - Ready mix concrete - also sell rock, sand, and gravel.

Operating ManagerDan McQuade
District ManagerTom Newman

CENTRAL ARIZONA MATERIALS

9699 E. Hwy 287, Coolidge, AZ 85228
Phone 649-0244 - Employees: 4 - Supply decorative and construction materials to contractors and suppliers.

Manager/OwnerRandy Parsons

CHANDLER READY MIX

P.O. Box 928, Mesa, AZ 85211
Phone 892-0501 - Employees: 75 - Ready mix manufacturer.

PresidentRonald R. Perkins
Vice President.....Wanda Perkins

CHURCHMAN SAND & GRAVEL

2165 N. Rita Rd., Tucson, AZ 85747
Phone 325-1611 - Employees: 5 - Sand and gravel trucking company.

PresidentDick Smith
Vice PresidentSuzie White

CKC MATERIALS DIVISION

1234 E. Airport Rd., Safford, AZ 85546
Phone 428-3423 - Employees: 20 - Aggregate base, mineral base, concrete.

PresidentDavid Cluff
General ManagerCarl Bryce

DESERT CONCRETE CO.

P.O. Box 430, Haws Substation Rd., Sierra Vista, AZ 85635
Phone 378-2321 - Employees: 3 - Sand and gravel producer.

DESERT CONSTRUCTION INC.

4490 E. Hwy 66, Kingman, AZ 86401
Phone 757-2213 - Employees: 30-50 - Supply paving, redi mix and rock products.

PresidentTom Short
Secretary.....Jim Short

DILLION SAND & GRAVEL

P.O. Box 4208, Tucson, AZ 85738
Phone 825-2099 - Employees: 2 - Custom sand and gravel supplier.

PresidentBill Dillion

DOWNEY, L.A. & SONS INC.

11600 E. Poorman Rd., Tucson, AZ 85747
Phone 886-2315 - Employees: 7- Sand and gravel.

President.....Dennis C. Downey
Vice PresidentDarrell Downey
Secretary/TreasurerDavid Downey

EADS CONSTRUCTION & REDI-MIX INC.

Hwy. 92, Bisbee, AZ 85603
Phone 432-4121 - Employees: 7 - Sand and gravel.

PresidentCharles Eads
Vice PresidentCharles R. Eads
Secretary.....Louise Eads

EARTH PRODUCTS

7001 2nd St., Prescott Valley, AZ 86314
Phone 772-6446 - Employees: 26.

President.....William H. Hyslip
SuperintendentWilliam G. Hyslip

FT. MCDOWELL SAND & GRAVEL CO.

P.O. Box 17150, Fountain Hills, AZ 85268
Phone 837-2358 - Employees: 40 - Producer of Mission Red gravel.

President.....John Kirk

FRANCIS DAY & SONS

P.O. Box 157, St. Johns, AZ 85936
Phone 337-2121 - Employees: 7 - Sand, gravel, concrete producer.

FRED CLARK TRUCKING CO., INC.

P.O. Box 116, 104 Main, Mammoth, AZ 85618
Phone 487-2232 - Employees: 18 - Sand and gravel producer.

GENERAL ROCK & SAND

P.O. Box 237, Industrial Park, Page, AZ 86040
Phone 645-3289 - Employees: 30.

PresidentMeril Jessop
SuperintendentFred Jessop

GRANITE CONSTRUCTION CO.

4115 E. Illinois, P.O. Box 27557, Tucson, AZ 85726
Phone 748-8000 - Employees: 298.

Branch ManagerTed Hanorth
Office Manager.....Bruce Enger

GRATE SAND & GRAVEL CO.

12124 E. County 8, Yuma, AZ 85365
Phone 344-1145 - Employees: 5.

PresidentMr. Robinson
TreasurerMay Robinson

SAND AND GRAVEL OPERATIONS LISTING

A & A MATERIALS
10333 E. McDowell Road, Scottsdale, AZ 85257
Phone 990-0557 - Employees: 25 - Desert landscape materials - granite, river rock, sand, gravel.

President/Owner.....Arthur H. Adams
Co Vice Presidents.....Raymond A. Adams
.....DeWayne Adams
Treasurer.....Vivian Adams

ABC SAND & ROCK
5401 N. 119th Avenue, Glendale, AZ 85307
Phone 935-1677 - Employees: 4 - Mine sand and gravel from Agu Fria river.

OwnerDavid Waltemath

ABES MATERIALS
1421 W. La Quinta, Nogales, AZ 85621
Phone 281-4471 - Employees: 35 - Dirt, rock, gravel, concrete supplier.

OwnerLawrence Harvey

ACE SAND & GRAVEL
1011 W. Silverlake Rd., Tucson, AZ 85713
Phone 622-1869 - Employees: 3 - Supplier of sand and gravel products.

OwnerDelia Gastelum

ACME SAND & GRAVEL
7707 E. 22nd Street, Tucson, AZ 85710
Phone 296-6231 - Employees: 3 - Sand and gravel products, dirt, top soil supplier.

OwnerJoe Kempton

AJAX SAND & GRAVEL
5026 S. 51st Avenue, Laveen, AZ 85339
Phone 237-3232 - Employees: 2 - Landscaping rock.

Owner.....O.A. Gwinn

ALLISON ROCK & SAND CONSTRUCTION
P.O. Box 5065, Huachuca City, AZ 85616
Phone 456-1521 - Employees: 6 - Supply AB, sand, leach rock and topsoil.

President.....Loren Sheldon

ARIZONA CRUSHING CO.
650 W. McKellips Road, Mesa, AZ 85201
Phone 835-0207 - Employees: 50-100 - Supplier for commercial and residential contractors for exterior wall products, sand, rock.

President.....Terese Sanders

Vice President.....Joe Moody

ARIZONA'S QUALITY GRANITE
7401 W. Villa Rita, Glendale, AZ 85308
Phone 869-0635 - Employees: 15 - Granite mine - crush for landscape, ABC for road base boulders and rip rap.

Owner.....Darlene Sanner
Office ManagerLynn Rainey
Sales.....Sam Indelicato

ARIZONA SAND & GRAVEL
1401 Atlantic Ave., Yuma, AZ 85364
Phone 344-5577 - Employees: 3 - Process and supply sand & gravel.

President.....Emie Kaznak

AZTEC MATERIALS
P.O. Box 928, Mesa, AZ 85211
Phone 892-0501 - Employees: 16 - Provide sand, rock, ABC to concrete companies.

PresidentRonald R. Perkins
Vice President.....Wanda Perkins

B AND B MATERIALS
P.O. Box 868, Rimrock, AZ 86335
Phone 457-5702 - Employees: 5 - Gravel pit - supply sand, gravel and rock.

Owner.....Art Bader

B & R MATERIALS
P.O. Box 18138, Tucson, AZ 85731
Phone 298-2371 - Employees: 23 - Sand and gravel manufacturer and supply.

PresidentRoland C. Brown
Vice President.....Kim Brown

BRIMHALL SAND & ROCK BUILDING MATERIAL
P.O. Box 750, Snowflake, AZ 85937
Phone 536-4226 - Employees: 62 - Crush raw products - supply sand and gravel products.

President.....Darrell Brimhall
Vice President.....Larry Brimhall
General ManagerM. Kurt Brimhall

CALMAT COMPANIES
P.O. Box 52012, Phoenix, AZ 85072
Phone 254-8465 - Employees: 325 - Ready mix concrete, sand, gravel, asphalt com.

Vice President /General ManagerBruce Dyer
Sales ManagerBob Maurer

open-pit mines into one large open-pit referred to as the Mission Complex. Also included is the smaller San Xavier North pit. The acquisition of the rest of the Eisenhower in April and of the Mineral Hill deposit adjacent to the Pima section of the pit late in 1987 increased reserves and facilitates further efficiencies in pit design and mine planning.

Mining at Mission is conducted by electric shovels with truck haulage to the primary crusher and waste dumps. Some areas of the pit are back to final limits allowing some waste dumping in the pit. The stripping ratio in 1991 was 3.92:1, waste to ore; a high ratio that reflects removal of large amounts of waste related to expansion.

The expansion of the Mission Mine was completed in the fourth quarter of 1991, more than doubling production capacity from mid-1980's levels, to 124,000 tons of contained copper per year. The addition of the refurbished Pima Mill, now called the South Mill, increased concentrator capacity to a total of 59,000 tons per day.

Their Ray Unit consists of an open-pit mine, dump leach and heap leach operations, and a 40,000 ton per year SX-EW plant at Ray and a 26,000 ton per day concentrator at Hayden.

Mining is conducted by electric shovels supplemented by front-end loaders utilizing truck haulage. The production rate is 100,000 tons per day of which 26,000 tons are sulfide ore sent to the mill, and 10,000 tons are silicate ore that is crushed and sent to the leach heaps. The remainder is low grade sent to leach dumps or waste sent to waste dumps. The stripping ratio in 1991 was 3.18:1, waste to ore, a high ratio that reflects mine development ahead of increased production. The mine plans are predicated on the sulfide operation and therefore silicate ore is stockpiled when in excess and fed from the stockpile to the crushers when short.

Sulfide ore is hauled by truck to the primary crusher at Ray where it is crushed and transferred to trains for the 20 mile haul to the mill.

Silicate ore is hauled to the primary crusher, then further reduced to minus 3/4 inch by secondary and tertiary crushers. It is then transported by conveyor where it is agglomerated with sulfuric acid while in transit to the heap leach area. Final haulage and placement on the heaps is by end-dump trucks.

Low grade muck is hauled to prepared leaching areas and non-mineral muck is hauled to waste dumps by end dump trucks. All leach solution are now fed to the SX-EW plant. Previously stockpiled native copper ore is being reclaimed and fed to the mill in small proportions as is smelter slag.

A \$12 million project was started in 1988 to maintain production capacity as the hardness of the ore increases as the pit deepens. A 60,000 ton per day portable in-pit crusher and conveying system will replace the 30,000 ton per day primary crusher at the pit and a 20,000 ton per day concentrator will be built at the mine site. Concentrates will be hauled by rail to the smelter at Hayden.

MINERAL PRODUCTION IN ARIZONA - 1991 [(np), no production]

COMMODITY	QUANTITY	VALUE
Nonfuel ¹		
Clay (tons)	251,781	\$3,830,000
Copper (tons)	1,128,845	2,468,255,000
Gemstones ²		3,173,000
Gold (troy ounces) ²	181,748	67,247,000
Sand & gravel(tons) ^e	22,500,000	79,400,000
Silver (troy ounces)	4,758,304	19,212,000
Stone-crushed(tons)	7,060,000	32,842,000
Pigments (tons)	20	22,000
Other ³		198,230,000
Fuel		
Coal (tons) ⁴	11,695,00	230,000,000
Uranium (pounds) ⁵	np	np
TOTAL		\$3,102,211,000

1/ Nonfuel figures from U.S. Bureau of Mines.

2/ ADMMR estimate.

3/ Cement, gypsum, lime, molybdenum, perlite, pumice, pyrite, salt, sand & gravel (industrial), dimension & specialty stone.

4/ Source: Coal production - DOE/EIA's "Weekly Coal Production," Value - ADMMR estimate.

5/ Source: Energy Fuels.

e/ U.S. Bureau of Mines estimate.

The difficult permitting process for the Ray Mine expansion was satisfactorily concluded in late 1991. Scheduled start up of the new mill had been delayed until 1992. The Ray Mine output of copper will increase by 58 percent to 182,000 tons per year as a result of this expansion. The project is scheduled for completion in 1992.

Asarco's Silver Bell Unit consists of an open-pit copper mine on stand-by status. Mining was stopped in 1984 because of high operating costs and plans to build a new solvent extraction/electrowinning plant. The new facility when complete in 1994 will produce 18,000 tons of refined cathode copper per year at substantially lower cost. In late 1991, the company began the permitting process for reactivation of the mine and construction of the SX-EW plant. The dump leaching operation and precipitation plant have continued in operation.

Cyprus Minerals Company

Cyprus was Arizona's second largest producer of copper in 1991 and continues to be the largest producer of molybdenum.

Cyprus Copper Company maintains its corporate headquarters in Arizona and operates four copper producing mine complexes in the State: Cyprus Bagdad, Cyprus Casa Grande, Cyprus Miami, and Cyprus Sierrita. Additionally, they operate a dump and in-pit leaching operation and precipitation plant at Mineral Park. The Mineral Park open-pit copper-molybdenum mine and its 15,000 ton per day concentrator are both on stand-by status.

In March, 1988, through a 15-year lease, Cyprus acquired the Twin Buttes property formerly operated by Anamax. In July, 1988 they acquired the entire Inspiration property at Miami, including the mines, concentrator (inactive), SX-EW plant, smelter, acid plant, electrolytic refinery, and rod plant.

In addition to its copper-molybdenum properties, Cyprus operates Arizona's largest gold mine, the Copperstone north of Quartzsite.

Cyprus continues to increase its copper leaching capabilities with the expansion of leaching operations at Bagdad, Mineral Park, and Sierrita. Cyprus had the second copper solvent extraction - electrowinning unit in the world at Bagdad and produced the first cathodes to meet the stringent specifications for trading on the London Metal Exchange and COMEX. The company currently produces 210 million pounds, or approximately 33 percent of normal annual copper production, from leach solvent extraction-electrowinning technology.

Their Cyprus Bagdad operation consists of an open-pit copper-molybdenum mine, a 75,000 ton per day concentrator, a dump leach operation, and an SX-EW plant. Mining is conducted by electric shovels using truck haulage to the primary crusher and dumps. The stripping ratio in 1991 was 0.80: 1, waste to ore.

The sulfide ore is transported from the primary crusher at the mine, a distance of 6,400 feet to the coarse ore stockpile at the concentrator, by conveyor belts. There it is crushed further, ground by autogenous and ball mills, and copper and molybdenum concentrates are produced. Column cells are utilized in the molybdenum flotation circuit.

Dual process ore (sulfide ore with an unusually high oxide content) is placed in heaps and leached for 60 days before being sent to the concentrator.

Pregnant solutions from the leach dumps are collected behind dams and pumped to the SX-EW plant at approximately 1.8 grams of copper per liter. The barren solutions are returned to the dumps after the copper has been extracted.

Their Cyprus Casa Grande operation consist of the refurbished Hecla Lakeshore Roast-Leach-Electrowinning

(RLE) plant that is treating concentrates from other Cyprus properties.

The Casa Grande operation consists of an in-situ leaching operation and an SX-EW plant. The block caved stopes in the oxide ore body are being leached and development of a leaching operation in virgin ground is underway using high pressure pumps to inject sulfuric acid solution into holes drilled from the old underground workings. Pregnant solutions are collected in sumps underground and pumped to the SX-EW plant.

The roasters and acid plant of the RLE plant originally built by Hecla and refurbished by Cyprus are treating approximately 160,000 tons of copper concentrates from other Cyprus operations yearly. The pregnant solutions go to the SX-EW plant and the acid produced from the roaster gases is used for the leaching operations.

The Cyprus Miami properties consist of three open pit copper mines formerly called Inspiration Mines, a 24,000 ton per day concentrator that is currently on standby status, a smelter soon to have an expanded capacity of 650,000 tons per year, an acid plant, SX-EW plant, electrolytic refinery, and a 135,000 ton per year rod plant.

The ore is mined at the rate of 50,000 tons per day with electric shovels and hauled by truck to high grade, low grade, and waste dumps. The stripping ratio in 1991 was 0.57:1, waste to ore. Soon after Cyprus acquired the property the construction of the second, nearly identical, solvent extraction train was completed, increasing the capacity of the plant to 8,000 gallons per minute. The cathodes from both the electrowinning and electrorefining sections are fed to the continuous cast rod plant to produce 5/16 inch copper rod on reels holding three and one-third miles of rod each. In 1991 the Miami rod mill produced 252 million pounds of copper rod, approximately 93 percent of capacity, mostly from Cyprus-produced cathode.

A 3-year pilot project with Arizona Ranch Management has been underway to test and evaluate the use of cattle as a tool to promote vegetative growth, to control dust, and curtail erosion on tailings at the Miami operation. Costs of reclamation were substantially reduced by the use of livestock in a reclamation process. Cattle are used on bare tailing material to prepare a base to stabilize the tailings and to promote plant growth.

A project to make Cyprus independent of outside smelting continued in 1992. An increase in capacity from 450,000 tons to 650,000 tons of concentrate per year was completed in July, 1992 at the Miami Smelter. The \$106-million project increased smelting capacity by about 50 percent. Their new ISASMELT furnace began operation with production planned to gradually increase until full annual capacity of 650,000 tons is reached in 1993.

The Cyprus Sierrita property consists of an open-pit copper-molybdenum mine, a 95,000 ton per day concentrator, a ferromolybdenum plant, a rhenium plant, a dump leaching operation, and an SX-EW plant. Mining is conducted using electric shovels and truck haulage to the

MINE INDEX

MINE NAME (COUNTY)	PAGE	MINE NAME (COUNTY)	PAGE
Ajo Plant & Slag Stockpile (Pima)	A15	Magma Mine (Pinal)	A15
Anasazi Stoneyard (Maricopa)	A9	Mayer Onyx Quarry (Yavapai)	A9
Andrada Marble Quarry (Pima)	A14	McCabe Mine (Yavapai)	A15
Arizona One (Mohave)	A13	McConnico Pit (Mohave)	A16
Armco Custom Mill (Cochise)	A9	Miami Mine (Gila)	A12
Ashfork Plant & Quarries (Yavapai)	A19	Mineral Park Mine (Mohave)	A13
Aztec Quarry (Yuma)	A19	Mission Mine (Pima)	A10
Bagdad (Yavapai)	A12	More Sand, Moon Sand (Coconino)	A18
Black Canyon Mill	A11	Morenci (Greenlee)	A17
Black Cat Quarries (Coconino)	A9	Nelson Quarries & Plant (Mohave)	A11
Black Mesa Mine (Navajo)	A16	New Cornelia (Pima)	A17
Blaser Stoneyard (Yavapai)	A9	New River Slate Quarry (Maricopa)	A17
Blue Bell Schist Quarry (Yavapai)	A9	Oracle Ridge Mine (Pima)	A16
Bowie Chabazite Operations (Cochise)	A18	Pantano Clay Pits (Pima)	A11
Burro Creek Clay (Mohave)	A14	Phoenix Brick Yard	A11
Camp Verde Gypsum (Yavapai)	A18	Pine Nut (Mohave)	A13
Canyon (Coconino)	A13	Pinto Valley (Gila)	A15
Casa Grande Mine (Pinal)	A13	Rainbow Schist Quarry (Yavapai)	A9
Cheto No. 1 (Apache)	A19	Rattlesnake Quarries (Coconino)	A9
Cheto No. 2 (Apache)	A13	Ray Mine and Concentrator (Pinal)	A10
Chicago Pit (Pinal)	A16	Rillito Plant & Quarry (Pima)	A10
Clarkdale Quarry & Plant (Yavapai)	A17	Rim Quarry (Navajo)	A11
Congress Mine (Yavapai)	A18	Rock House Quarry	A13
Copper Hill Mine (Gila)	A14	Salome Gypsum Mine (La Paz)	A19
Copper Queen (Cochise)	A17	San Manuel (Pinal)	A15
Copperstone Mine (La Paz)	A13	San Manuel Smelter (Pinal)	A15
Crown Claims (Coconino)	A18	Santa Rita Quarry (Pima)	A18
Darling Cinder Pit (Coconino)	A18	Shipley Pit (Mohave)	A16
Dead Eye Mines (Coconino)	A15	Sidewinder Quarries (Coconino)	A9
Devils Wash Placer (Pima)	A14	Sierrita Mine (Pima)	A12
Dewey Ranch #2 (Yavapai)	A11	Silver Bell (Pima)	A11
Douglas Quarry & Plant (Cochise)	A11	Sleeping Beauty Mine (Gila)	A19
Dunbar Stone Plant (Coconino)	A13	Snowflake Gypsum Mine (Mohave)	A19
Emerald Isle	A9	Southwest Salt Mine (Maricopa)	A15
Feldman Quarry (Pinal)	A16	St. Johns Limestone (Apache)	A18
Flagstone Quarries (Coconino)	A14	Stutenroth Mill (Pinal)	A18
Gold Hill Mine (Pinal)	A18	Superior Perlite (Pinal)	A14
Government Canyon Quarry (Coconino)	A9	Taylor Pit (Mohave)	A16
Grace Chabazite Mine (Cochise)	A14	Tolleson Mine (Maricopa)	A11
Hackberry Pit (Mohave)	A16	Twin Buttes Mine (Pima)	A12
Hayden Concentrator and Smelter (Gila)	A10	United Verde Mine (Yavapai)	A17
Hermit (Mohave)	A13	UVX (Yavapai)	A9
Houck Silica Sand (Apache)	A10	Van Dyke Mine (Gila)	A9
Johnson Mine (Cochise)	A9	Weary Lode Mine (Gila)	A14
Kanab North (Mohave)	A13	White Cliff Diatomite	A10
Kayenta Mine (Navajo)	A17	White Cross Mine (Pinal)	A17
Little Rock Quarry (Yavapai)	A9	White Rock Mine (Pinal)	A11
Lizard Canyon Quarry	A9	White Vulcan (Coconino)	A18
Lower Cedar Tank Quarry (Coconino)	A9	Wildcat Hill Pit (Coconino)	A14
Lyles Mine (Yavapai)	A14	Winkelman Gypsum (Pinal)	A18
M C Canyon Quarries (Coconino)	A14	Yellow Wasp No. 2 (Coconino)	A9
M C Quarry	A13		
Magma Limestone (Pinal)	A14		

UNITED DESSICANTS **United Catalyst, Inc.**

Corporate Headquarters - P.O. Box 32370, Louisville, KY 40232 - Phone (502) 634-7200 - Processing plant c/o United Dessicants, 101 Christine Drive, Belen, NM 87002 - Phone (505)864-6691.

Cheto No. 1 T21N R29E Sec. 23

Employees: 10 - Located approximately six miles southeast of Sanders in northeastern Arizona - Surface strip bentonite mine - Seasonal operation by mining contractors - Low swelling bentonite is shipped to Belen, New Mexico for the production of desiccants.

Vice President (Louisville) Bill Monin
 General Manager (Belen) George Klett
 Technical Director (Belen) Mathew Rix

WESTERN ARIZONA ROCK PRODUCTS INC.

Aztec Quarry T7S R12W Sec. 28

P.O. Box 27019, Albuquerque, New Mexico 87125 - Phone (505) 880-5314 - local address, P.O. Box 178, Dateland, AZ 85333 - Phone 454- 2253, FAX 454-2290 - Employees: 9 - Granite quarry for railroad ballast - Crushing and screening plant - Located between Aztec and Dateland south of I-8 and the Southern Pacific Railroad - Material used in Arizona and California - Sales outside of railroad system are for landscape uses.

Plant Manager Larry Lunsford
 Office Manager Patti Wipple

WESTERN GYPSUM INC.

Snowflake Gypsum Mine T41N R13W Sec. 25

130 E. 200 North, P.O. Box 850, St. George, UT 84770 Phone (801) 628-3916, FAX (801) 628-4441 - Employees: 10 - Open pit gypsum mines - Primary and secondary crushing, and screening plant - 100 ton per day fine grinding plant and loading terminal at Glendale, Nevada - Producing gypsum for cement industry, agriculture, fertilizer industry, functional fillers, and water treatment - Markets in California, Colorado, and Arizona.

President Don Cecala
 Mine Superintendent Tracy Cannon
 Office Manager Lynette Albertson

WESTERN ORGANICS INC.

Salome Gypsum Mine T5N R11W Sec. 30

P.O.Box 6876, Phoenix, AZ 85005 - Phone 269-5756, FAX 269-7621 - Plant located at 27th Avenue and Lower Buckeye Road in Phoenix - Employees: 100 - Open pit gypsum mine operated by contractors - Gypsum for agricultural and horticultural uses, bagged and bulk - Used directly and in blends - Markets in western United States.

President J. D. Porter

Vice President/Operations Manager D. C. Porter
 Sales Manager Dennis Reynolds
 Office Manager Adrian Cluff

WESTERN STATES STONE COMPANY

2830 Grand Ave., Phoenix, AZ 85017 - Phone 253-2018.

President C. E. Webster
Ashfork Plant T21N R2W Sec. 3

Quarries

P.O. Box 316 - Ash Fork, AZ 86220 - Phone 637-2542 - Employees: 40 - Quarries located in Coconino, La Paz, Maricopa, Mohave, and Yavapai Counties - Stone processing facility in Ashfork - Commercial and decorative building stone marketed locally, out of state, and exported.

Superintendent Ismah Albright

YELLOW HAIR TRADING AND MINING

Sleeping Beauty Mine T1N R14E Sec. 12

P.O. Box 111, Globe, AZ 85502 - Phone 425-7625 or 425-0446 - Employees: 45 - Produces turquoise under contract with Magma Copper Company - Sorts, grades, and processes turquoise for worldwide distribution.

President & Co-owner W. H. Preston
 Vice President & Co-owner Monty Nichols
 Secretary-Treasurer & Co-owner Cheryl Preston
 Sales Ed Wheeler

crushers and dumps. The stripping ratio in 1991 was 0.91:1, waste to ore.

Production was started at the Twin Buttes mine in 1988 providing additional feed to the Sierrita Mill. The stripping ratio in 1991 was reduced significantly to 2.15:1. Sulfide ore is transported to the Sierrita concentrator by a 6.8 mile conveyor. Twin Buttes contributed over 40 percent of the copper produced at the Sierrita concentrator in 1991. The SX-EW plant at Twin Buttes is fed with solutions from leaching tailings.

More than three quarters of Cyprus' molybdenum concentrate from their Thompson Creek (Idaho), Bagdad, and Sierrita operations is processed at Sierrita through on-site roasters to produce molybdenum oxide and ferromolybdenum that are shipped to customers worldwide.

Magma Copper Company

In March, 1987, after nearly 20 years as a wholly owned subsidiary of Newmont Mining Corporation, Magma once again became an independent corporation. As such it has continued implementing an extensive expansion and modernization program to meet environmental constraints and to become competitive in the copper market.

Magma's Arizona operations are divided into the San Manuel Division and the Pinto Valley Division that includes the Pinto Valley Unit and the Miami Units, and the original Magma Mine at Superior.

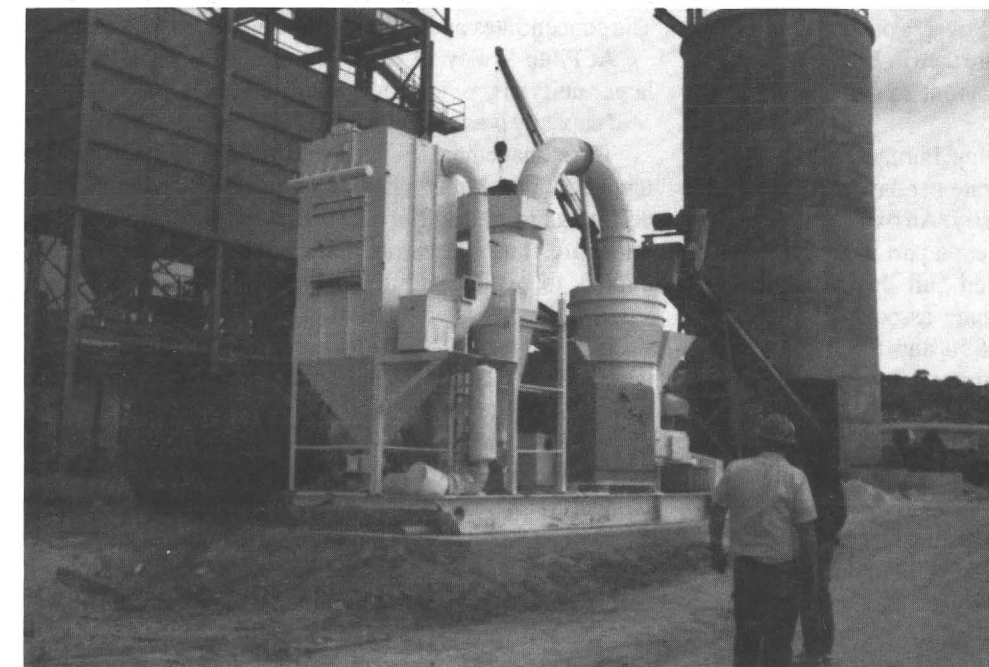
Magma also operates the McCabe gold mine near Mayer and a railroad. The McCabe gold mine started production with concentrates being shipped to the San Manuel Smelter for treatment. The railroad operation consists of a 29-mile railroad from San Manuel and a 28-mile railroad from Superior. Both connect to the Santa Fe Southern Pacific system.

Magma reports that production, cost reduction, and productivity have improved dramatically since Magma became an independent company in 1988. New development projects and purchase of a major high quality ore body have supplemented Magma's reserves to ensure copper production into the next century.

Company highlights for 1991 include the achievement of record operating performance, the signing of a historic fifteen-year labor contract, the implementation of employee gainsharing programs, the refinancing of the company's debt, and the reorganization of its balance sheet.

The expansion and modernization program that began in 1987 included a major expansion of the San Manuel smelter and refinery as well as several different leaching, solvent extraction, and electrowinning projects. These projects suffered a series of technical start-up problems that resulted in initial production and cost disappointments.

An innovative 15-year labor contract was signed in October, 1991. The contract is tailored to the needs of the company, unions, employees, and management, and is



Skid mounted Raymond roller mill, classifier, and dust collector at the Andrada Marble Quarry.

dedicated to employee involvement, high productivity, low production cost, and greater employment security.

The San Manuel Division consists of a block-caving underground copper-molybdenum mine, a 62,000 ton per day concentrator, an open pit oxide copper mine, pad leach, in-situ leach, SX-EW plant, a 1,000,000 ton per year smelter with a 3,000 ton per day acid plant and a 300,000 ton per year electrolytic refinery, and a 180,000 ton per year rod plant.

After development of the grizzly and haulage levels, caving is initiated by undercutting the ore block. The caved ore is drawn through the grizzlies to the haulage level. Haulage to the production shafts is by 23-ton trolley locomotives pulling ten 15-17 ton ASEA cars or fifteen 12-13 ton rotary dump cars. After hoisting to the surface the ore is hauled by rail to the mill in 100 ton cars in groups of 35 to 40 pulled by 125 ton diesel-electric locomotives.

Three years ago Magma was facing the planned closure of the San Manuel underground mine. Currently, a feasibility study is underway to assess the financial viability of mining the nearby Kalamazoo ore body. The study will be completed by the end of 1992. Preliminary results indicate that the development of the ore body could extend the San Manuel underground mine's life by eleven years - from 1997 to 2008.

Utilization of high performance production techniques developed in the Kalamazoo ore body pilot production project have helped increase the San Manuel underground production by 22 percent from 184 million pounds in 1988 to 222 million pounds in 1991, while reducing net cash operation cost by \$ 0.24 per pound from \$1.06 in 1988 to \$0.82 in 1991.

In 1991 the smelter processed over 1 one million tons of new concentrate, 42 percent more than in 1988. Magma's San Manuel smelter accounts for about 25 percent of U.S. copper smelter capacity.

The Outokumpu Flash Smelting Furnace, at a design capacity of 3,000 tons of concentrate per day, is the largest single furnace smelter in the industry. An oxygen plant and modifications to the acid plant were a part of the modernization. The smelter has attained full design capacity production. The technical problems associated with the smelter were resolved by mid-1990 and the facility has operated consistently above design capacity ever since.

In the spring of 1992 Magma announced plans to increase its smelter capacity by up to 20 percent to take advantage of a growing worldwide "smelter bottleneck." Attempts to build new smelters have been thwarted by environmental concerns. Both Mitsubishi Materials and Outokumpu have given up on plans to build new smelters after years of attempting to get approval. As a result, copper smelting charges are skyrocketing. In early 1990, the average smelting and refining charge was 15 cents per pound. By spring of 1992 smelters were charging about 35 cents per pound for custom processing.

To take advantage of this trend, Magma hopes to increase its smelting capacity by 5 percent, or 30 million pounds of copper, in 1992. They are also examining the feasibility of constructing a new acid plant that could increase smelting capacity by another 15 percent. Magma reports that more than one quarter of Magma's copper throughput is derived from custom smelting and refining.

Mining at the open-pit oxide mine is accomplished with front-end loaders with truck haulage at the rate of 28,000 tons of ore and 65,000 tons of waste per day. Ore is placed on the polyethylene-lined leach pads and some of the waste is dumped in the subsidence area. Any sulfide ore encountered is hauled to a railroad siding and added to the feed going to the concentrator. Copper is recovered from the leach solutions at the SX-EW plant that uses the ISA process of plating the copper on stainless steel sheets rather than on copper starter sheets. The solutions from the in-situ leaching are also fed to this plant that was expanded to a capacity of 75,000 tons of copper per year.

Electrowon cathode production has increased considerably since 1988. In 1991, 130 million pounds were produced, 51 percent above the 86 million pounds produced in 1988. This increase is partly attributable to increased production at San Manuel's in-situ leaching operations that employ well-to-well leaching. Cathodes from the electrolytic refinery and the SX-EW plant are melted and cast into continuous rods at the rod plant.

The Pinto Valley Division consists of the Pinto Valley Unit and the Miami Unit. At the Pinto Valley Unit mining is accomplished with electric shovels and truck haulage to the 63,000 ton per day concentrator. A dump leaching and an 8000 tons per year SX-EW plant are also in operation. The concentrates and cathodes are shipped to San Manuel.

At Pinto Valley 14 haulage trucks were replaced with larger units to provide additional feed to the concentrator. Mill capacity was expanded in 1989.

The management team at Pinto Valley has been restructured and a new mine plan has been developed to address declining ore grades. The new plan theoretically reduces the mine life, but is economically more attractive. Opportunities to exploit additional oxide ore zones are being studied to increase production of electrowon copper.

In April of 1988, following favorable metallurgical tests, a feasibility study, and permitting, the company began a project for the reclamation and leaching of mill tailings associated with the old Miami underground mine. The tailings are reclaimed using hydraulic mining methods to produce a slurry of tailings and water. Sulfuric acid is added to slurry to dissolve the contained copper and the resulting pregnant leach solution is processed through the Miami Unit's SX-EW plant. The remaining tailings are transported for disposal through an overland pipe to an abandoned Miami Unit pit. During 1991, approximately 3.9 million tons of tailings were mined, producing nearly 9 million pounds of copper. Production from the project is expected to continue until 1998.

REPUBLIC GOLDFIELDS INC.

Congress Mine T10N R6W Sec. 23
P.O. Box 361, Congress, AZ 85332 - Phone 427-3393 - Employees: 4 - Located 16 miles northwest of Wickenburg - Idle - Underground gold mine - 350 TPD CIP mill held on a care and maintenance basis.
Vice President James Sullivan
Mill Superintendent Colin Kirkpatrick
Chief Assayer Jim Weatherby
Chief Electrician Lowell Hatfield

SILICA MINES INC.

Gold Hill Mine T10S R15E Sec. 5
P.O. Box 332, Oracle, AZ 85623 - Phone 896-2245 - Employees: 8 - Open pit mine - Located 6 miles southwest of Oracle - Copper bearing silica flux for copper smelter at Hayden.
President Dave McGee
General Superintendent Dan Perham

SPECIALTY MINERALS INC.

Santa Rita Quarry T18S R15E Sec. 15
P.O. Box 759, Sahuarita, AZ 85629 - Phone 625-6040 - Employees: 20 - Located 15 miles southeast of Sahuarita at end of Santa Rita Road - White marble quarry - Crushed and/or ground for landscape, functional filler, and chemical uses - Raymond roller mills - Sizing and bagging plant - Markets in Arizona and southwestern United States.
Site Manager Carlos Cardadeiro
Office Manager Pennie Hunnewell

STUTENROTH MILLING & MANUFACTURING

Stutenroth Mill T7S R7E Sec. 8
7611 W. Cornman Road, Casa Grande, AZ 85222 - Phone 836-5568 - Employees: 2 - Custom gravity mill - 50 TPD capacity - All types of ore - Located eight miles southeast of Casa Grande.
Owner-Operator Archie Stutenroth

SUPERIOR COMPANIES

100 W. Coolidge, Phoenix, AZ 85013 - Phone 230-9300 - Employees: 50.
President Archer V. Shelton
Vice President, Administration Mary Kessler
Vice President, Finance Don Fischer
Camp Verde Gypsum T13N R5E Sec. 11
P.O. Box 786, Camp Verde, AZ 86322 - Phone 567-3854 - Gypsum and clay quarry four miles southeast of Camp Verde - Supplies gypsum to Phoenix Cement Company Plant at Clarkdale and for agricultural and horticultural uses. Clay for pond, ditch, and impervious pad sealing uses.

General Manager - Verde Valley
Operations Ed Davidson
Maintenance Supervisor Randy Austin
Foreman Bruce McDonald
St. Johns Limestone T12N R29E Sec. 4
P.O. Box 2777, St. Johns, AZ 85936 - Phone 337-4529 - Limestone quarry 5 miles southeast of St. Johns - Provides limestone for coal plant gas scrubbing, landscape rock and road base.
Superintendent Efram Chavez
Winkelman Gypsum T6S R16E Sec. 27
P.O. Box 327, Winkelman, AZ 85292 - Phone 357-7002 - Gypsum Quarry - Gypsum for Arizona Portland Cement Plant at Rillito and agricultural uses.
Superintendent John Nevitt

SUPERLITE BLOCK COMPANY

P.O. Box 23163, 4150 W. Turney, Phoenix, AZ 85063 - Phone 269-3561.
President Max Graves
Darling Cinder Pit T21N R9E Sec. 2
P.O. Box 30956, Flagstaff, AZ 86003-0956 - Phone 526-5499 - Employees: 5 - Open pit mine east of Flagstaff - Volcanic cinders used to make building block at Phoenix and Mesa plants.
Mine Superintendent Terry Mitchell

TUFFLITE INC.

Crown Claims T23N R7E
More Sand, Moon Sand T23N R7E Sec. 24
White Vulcan T23N R8E Sec. 19
2432 W. Peoria, Suite 1081, Phoenix, AZ 85029 - Phone 931-3681 - Glendale yard located at 6856 W. Orangewood, Glendale - Employees: 20 - Mines located 12 miles north of Flagstaff - Pozzolan pumice quarries - 6000 yards/month - Used in making lightweight redimix and block - Large size material used in the preparation of "stone washed blue jeans" and in horticultural preparations - Marketed in and out of Arizona.
President C. T. Morgan
Vice President/Mine Manager (Flagstaff) . . . Ed Morgan
Secretary/Treasurer Clay Morgan
Orders and Transportation Marleen Bustamante
Sales Manager Linda Whitehead

UOP

115 N. Fifth Street, Suite 401, Grand Junction, CO 81501
Phone (303) 245-7957.
Senior Mining Engineer Jim Kirchner
Bowie Chabazite Operations T11S R28E & T11S R29E
Open pit mines operated by independent contract mining company - Chabazite used for specialty adsorbants - Shipped out of state for further processing.

Safety Supervisor Keith Grass
Human Resources Director Pete Craig
Kayenta Mine T36W R18E Sec. 9
P.O. Box 606, Kayenta, AZ 86033 - Phone 677-5008 -
Employees: 700 - Surface coal mine - Located 30 miles
southwest of Kayenta.
Mine Superintendent Joe Johnson
Assistant Superintendent Robert D. Boone
Safety Supervisor Joe Holgate

PHELPS DODGE CORPORATION

Corporate Headquarters

2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
234-8100.

Chairman of the Board,

President & CEO D. C. Yearley

Senior Vice President - Phelps Dodge Corporation

President - Phelps Dodge

Mining Company J. S. Whisler

Senior Vice President - Phelps Dodge Corporation

Executive Vice President -

Phelps Dodge Mining P. J. Ryan

Phelps Dodge Mining Company

2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
234-8100.

Vice President & General Manager J. L. Madson

Vice President Engineering Services R. W. Rice

Controller R. G. Peru

Director, Employee Relations S. L. Marcus

Manager, Employee Relations D. E. Brooks

Assist. Director, Materials Management . . C. R. Jennings

Traffic Manager J. Sheridan

Exploration and Development Group

2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
234-8100.

Vice President A. L. Lawrence

U.S. Exploration

Union Plaza, Suite 300, 200 Union Blvd, Lakewood, CO

80228-1831 - Phone (303)-989-8873

Manager, U.S. Exploration D.E. Ranta

Western Exploration

P.O. Box 50427, Tucson, AZ 85703-1427 Phone 792-4981.

Manager, Western Exploration W.H. Wilkinson

United Verde Mine T16N R2E Sec. 22

Inactive copper mine - Located at Jerome - Phone 634-2622.

Agent A.D. Peterson

Copper Queen T23S R24E Sec. 15

Highway 92, Bisbee, AZ 85603 - Phone 432-3621 -

Employees: 54 - Mine dump leaching - Copper precipitation
plant.

Area Supervisor J. H. Zamar

Morenci T4S R29E Secs. 3, 4, 5, 8, 9, 10, 15, 16, 17, 21,
22 & 23

4521 State Hwy. 191, Morenci, AZ 85540 - Phone 865-

4521 - Employees: 2064 - Open pit copper mine - Two

concentrators (one with molybdenum circuit) - Total
capacity 100,000 TPD - 650,000 TPY smelter with 2,400
TPD acid plant (inactive) - 340 million pound per year
solvent extraction-electrowinning plant.

Manager T.R. Snider

General Superintendent D.H. Thornton

Mine Superintendent A.R. Edwards

Concentrator Superintendent E. C. Dowling

Hydrometallurgical Superintendent A.J. Broderick, Jr.

Mechanical / Electrical Supt. J. B. McBiles

Chief Engineer S.C. Holmes

Chief Geologist F. J. Menzer

New Cornelia T12S R6W Secs. 23, 26, 27

Ajo, AZ 85321 - Phone 387-7451 - Employees: 22 - Open

pit copper mine - 30,000 TPD concentrator with molyb-

denum circuit - 190,000 TPD smelter with acid plant - All

inactive.

Plant Superintendent J. L. Armstrong

PHOENIX CEMENT COMPANY

Phoenix Office

2501 W. Behrend Drive, Suite 23, Phoenix, AZ 85027, P.O.

Box 43740, Phoenix, AZ 85080 - Phone 264-0511 -

Employees: 11.

President James E. Carmichael

Sales Manager Pete Kuehner

V.P. Manufacturing Pat Neilio

Bulk Cement Terminal

1941 W. Lower Buckeye Road, Phoenix, AZ 85009 - Phone

258-7798.

Clarkdale Quarry & Plant T16N R2E Sec. 11

P.O. Box 428, Clarkdale, AZ 86324 - Phone 634-2261 -

Employees: 130 - Quarry and plant two miles northwest of

Clarkdale - 630,000 TPY - Cement used for building in-

dustry - Marketed in Arizona, New Mexico, Utah, and

Nevada.

V.P. Operations/Plant Manager John B. Conway

Assistant Plant Manager/Maintenance . . Joe D'Avignon

Assistant Plant Manager/Engineering . . Tom Gibbons

Industrial Relations Manager Cliff Ayres

Controller Meg Slanski

Purchasing/Stores Frank Contreras

Environmental Engineer Bernie Ott

PINAL GYPSUM CORP.

White Cross Mine T7S R17E Sec. 31

P.O. Box 99, Coolidge, AZ 85228 - Phone 723-3131, FAX

723-9711 - Employees: 10 - Quarry four miles north of

Mammoth - Used for agricultural gypsum.

President Orin Benton

Vice President (Operations) James Bechtel

The Magma underground mine at Superior was closed
in 1982 due to high operating costs and low productivity.
The company reopened this deep, high-grade mine in 1990
with an expected production rate of 1500 tons of ore per
day. This ore body produced 25 million pounds of copper
in 1991. The work force has operated at productivity levels
higher than before closure. A fire in the fourth quarter of
1991 resulted in lower operating performance than was
expected.

Phelps Dodge Corporation

Phelps Dodge Mining Company was formed in Septem-
ber, 1988 as one of two operating divisions of Phelps Dodge
Corporation. It is the nation's largest copper producer and
accounts for about one-third of the nation's copper produc-
tion at its mines in southeastern Arizona and southwestern
New Mexico. In conjunction with its Arizona operations,
Phelps Dodge operates the Hidalgo Smelter near Playas,
New Mexico, a 420,000 ton per year refinery at El Paso
Texas, and two mines in New Mexico, the Tyrone and the
Chino Mine near Silver City.

In 1991 Phelps Dodge Mining Company's U.S. mines
and related facilities produced 621,800 tons of copper,
518,100 tons for the company and the balance for the
accounts of minority interest owners. This production in-
cluded a record 234,100 tons of copper from SX-EW plants,
approximately 197,800 tons of which were for the
company's account.

Copper produced by SX-EW accounted for 37 percent
of Phelps Dodge Mining Company's total production in
1991, compared with 31 percent in 1990. The company
expects SX-EW eventually to contribute nearly 50 percent,
or about 250,000 tons, of annual production.

Phelps Dodge's Morenci mine is the largest copper
producer in North America and the second largest copper
producer in the world. The operation consists of two open
pits, two concentrators, and an SX-EW plant. The two pits,
Morenci and Metcalf, are located on two sections of the
same deposit. Phelps Dodge owns an 85 percent undivided
interest in the Morenci Mine; the remaining 15 percent is
owned by Sumitomo Metal Mining Company, Ltd. and
Sumitomo Corporation. Morenci employees nearly 2,000
people. During 1991 Morenci produced a record 342,000
tons of copper, accounting for more than half of all copper
produced by Phelps Dodge in the United States.

The operation consists of the combined Morenci-Met-
calf open pit copper mine, the 60,000 ton per day Morenci
concentrator with a molybdenum circuit, the 40,000 ton per
day Metcalf concentrator, and a dump leach - SX-EW
operation. The 650,000 ton per year smelter with a 2,400
ton per day acid plant remain inactive and will require
extensive modifications to meet air quality restraints if ever
reactivated.

Mining is conducted with electric shovels and truck
haulage utilizing a computer controlled Modular Mining

Truck Dispatching System for maximum efficiency.
During 1989 the completion of the in-pit crushing and
conveying (IPCC) system eliminated rail haulage com-
pletely. The trucks dump into the two semi-mobile primary
crushers in the pit and the crushed ore is conveyed to the
coarse ore stockpile by conveyor belt. Each concentrator is
fed by conveyors running under the stockpile. Both con-
centrators are standard flotation mills except that column
flotation cells have been installed in the cleaner circuit of
each.

All mined material other than ore is classified as leach
material and is taken to one of several leach dumps. There
are three widely spaced solvent extraction plants to upgrade
the solutions before they are pumped to the centrally located
tank house for electrowinning.

Construction continued on the \$112 million Northwest
Extension project, which will add 70,000 tons of SX-EW
production per year. Upon completion of this project in
1992, the Morenci SX-EW plant will be the largest in the
world, with an annual production capacity of 170,000 tons
of high cathode copper.

Two other substantial capital programs at Morenci that
continued during 1991 included reentry into the Metcalf pit
and extension of the ore crushing and conveying systems.

The company's Copper Queen facility consists of a
dump leaching and precipitation operation at the mined out
Lavender pit.

Their New Cornelia Branch consists of an open-pit
copper mine, a 30,000 ton per day concentrator with a
molybdenum circuit, and a 190,000 ton per year smelter
with an acid plant. The mine has been inactive since August,
1984 and the smelter was shut down in April, 1985. There
are no immediate plans to reactivate the operation.

The Hidalgo smelter near Playas, New Mexico is an
Outokumpo flash furnace rated at 500,000 tons per year.
During 1986 the oxygen enrichment plant from the Morenci
smelter was installed to increase capacity and efficiency.
The resulting increase in sulfur dioxide concentration of the
gases improved the operation of the acid plant as well.

COAL

Coal ranks second to copper in economic importance in the State. In 1991 Arizona coal production was 11,695,000 short tons with an estimated value of \$230 million. Coal is mined from the Kayenta and Black Mesa mines. Surface mining is done on reservation land leased from the Navajo and Hopi Tribes by Peabody Coal. Peabody is the Nation's largest coal producer and the Kayenta mine in northeastern Arizona is their largest operation.

The coal deposits occur on Black Mesa, a prominent structural basin feature of the Colorado Plateau, in the Cretaceous Wepo Formation. Peabody Coal has 35-year leases on 64,858 acres. Mining and reclamation proceed at the same rate; approximately 500 acres annually.

The Kayenta mine, employing over 700 people, is located in central Navajo County. The coal from the Kayenta mine is carried by conveyer belt 15 miles to storage silos. From there it is transported by automated trains to the Salt River Project's Navajo Generating Plant 80 miles away. The Black Mesa mine produces about 4.5 million tons annually. Here, coal is powdered and mixed with water prior to transport by the world's longest, and the Nation's only, coal slurry pipeline. The 272-mile journey to the power plant at Laughlin, Nevada takes three days.

The Peabody operations at Black Mesa are model reclamation programs. As an area is mined, the topsoil is removed and stored. After mining is completed, the topsoil is returned and the surface is contoured. The resultant

reclaimed land, used for grazing, is more productive than the original land.

GOLD

A six-year low in gold prices has adversely impacted new gold projects.

Republic Goldfields' Congress Mine shut down operation during 1992. The mine and mill are being held on a care-and-maintenance basis by a small staff. Both reopening the mine and/or operating just the mill on a custom basis are being considered under possible new financial arrangements.

The Cyprus Copperstone open pit mine remained Arizona's largest gold producer with production of over 100,000 ounces. Copperstone's reserves are expected to be depleted by early April, 1993 and mill and heap leach production will cease. Some production will occur as the heap leach and tailings are washed and neutralized. The mill and surface plant will be dismantled as part of the surface reclamation.

Magma Copper Company continued operating the underground McCabe Mine. Ore is hoisted to the surface and concentrated by flotation. The resulting sulfide concentrate containing gold and copper is processed at the San Manuel smelter.

Feldman Quarry T6S R16E Sec. 27
Star Route, Box 3990, Winkelman, AZ 85292 - Phone 357-7180 - Employees: 5 - Open pit gypsum mine located 12 miles south of Winkelman - Crude gypsum shipped to Phoenix plant for manufacture of plaster board.
Quarry Superintendent David Klein

NORD PERLITE COMPANY

Chicago Pit (AKA Nord Sil-Flo Pit) T2S R12E Sec. 16
Box 127, Superior, AZ 85273 - Phone 689-5631 - Employees: 10 - Plant at Superior, 45438 North Silver King Road, north of railroad track - Open pit perlite mine located two miles southwest of Superior - Dried, sized perlite shipped out of State for manufacture into filter aid for use in filtering pharmaceuticals, chemicals, sugar, and beverages - Major markets are in Louisiana, Illinois, Wyoming, Pennsylvania, Texas, and Indiana.
President Terence Lang
General Manager Peter Davies
Production Manager Charles Wiseman
Plant Manager Louis R. Lucero

ORACLE RIDGE MINING PARTNERS

Oracle Ridge Mine T11S R16E Sec. 16
P.O. Box 7, San Manuel, AZ 85631 - Phone 576-1412, - Employees: 55 - Underground copper, gold, silver mine - Located 25 miles northeast of Tucson - Column flotation mill - 850 TPD - Ships concentrates to custom smelter.
General Manager Rene Tourigny
Mine Manager Joe Sawyer
Controller Pam Carter
Purchasing Manager Quanah Tierra
Maintenance Foreman Rick Hill
Mill Manager Rick Scoles

OUTLAND RESOURCES INC.

Shipley Pit T25N R10W Sec. 28
Taylor Pit T22N R17W Sec. 26
McConnico Pit T20N R17W Sec. 5
Hackberry Pit T23N R13W Secs. 19 & 20
2260 E. Andy Devine, PO Box 4105, Kingman, 86402 - Phone 753-1444 - FAX 753- 1444 (call first) - Employees 4 (plus contracted services) - Produces dolomite-limestone, quartz, feldspar, onyx, and natural colored aggregates. Used for landscape, gemstones, chemical materials, fillers, and special aggregate. Sold in Arizona, Nevada, and California.
President Patti Lewis
Vice President Charlie Starkebaum

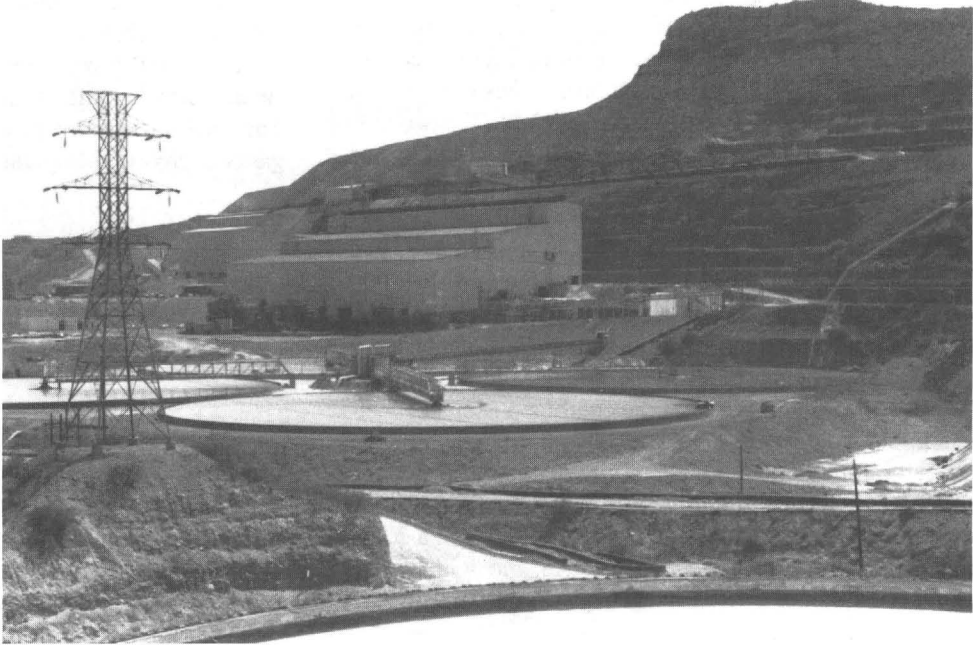


Blast hole drill — Bagdad.

PEABODY COAL COMPANY

Flagstaff Office
1300 S. Yale, Flagstaff, AZ 86001 - Phone 774-5253 - Employees: 80.
President Dennis L. Stevenson
General Supervisor, Operations Sil Perla
Director of Human Resources Tony Baka
Director of Engineering Frank Farnsworth
Division Materials Manager Merle Hendricks
Controller Roger Burch
Manager, Quality Control . . . Charles J. Stenftenagel
Manager, Reclamation Wayne E. Hilgedick
Black Mesa Mine T35N R18E Sec. 5
P.O. Box 605, Kayenta, AZ 86033 - Phone 677-5040 - Employees: 400 - Surface coal mine - Located approximately 30 miles southwest of Kayenta.
Mine Superintendent Lewis Allan Gough
Assistant Superintendent Rick Contratta

Metcalf mill and tailings thickeners.



MAGMA COPPER COMPANY

Corporate Headquarters

7400 N. Oracle Rd, Tucson, AZ 85704 - Phone 575-5600
President and CEO J. Burgess Winter
San Manuel Mine T8S R16E Sec 34, 35
P.O. Box M, San Manuel, AZ 85631 - Phone 385-3100 -
Employees: 2151 - Underground copper-molybdenum
mine - 62,000 TPD concentrator - Open pit oxide mine -
In-situ leaching - Heap Leaching - Solvent extraction-
electrowinning plant.
Vice President & General Manager Francisco E. Durazo
Manager Sulfide Mining . . . Hendrick W. Seamey, Jr.
Manager Oxide Mining, Leaching
& SX-EW Michael A. Eamon
Superintendent Concentrator . . . Gerald R. Brunskill
Magma Metals Company
San Manuel Smelter T9S R17E Sec 32
P.O. Box M, San Manuel, AZ 85631 - Phone 385-3100 -
Employees: 1217 - 1,000,000 TPY flash smelter - 1,000,000
TPY acid plant - 300,000 TPY electrolytic refinery -
180,000 TPY continuous cast rod plant.
President John F. Champagne
Vice President Operations J. D. McCain
Vice President Marketing & Sales . . . Brian Disbury
Vice President Technology Tom Jordan
Pinto Valley Mine T1N R14E Sec. 20
P.O. Box 100, Miami, AZ 85539 - Phone 425-7611 -
Employees: 620 - Open pit copper-molybdenum mine -
63,000 TPD concentrator - Dump leach - Solvent extraction
- electrowinning plant - In-situ leach - Tailings reclaim
leach - Solvent extraction electrowinning plant.
Vice President/General Manager . . . K. Lee Browne
Manager Mining Operations . . . Charles D. O'Coyné
Manager of Miami Unit
Leaching/SX-EW Robert V. Washnock
Manager of Concentrator
Operations Jack D. Conklin
Manager Human Resources David L. Palmer
Magma Mine T1S R12E Sec 35
P.O. Box 37, Superior, AZ 85273 - Phone 689-2444 -
Employees: 356 - Underground copper mine - 3300 TPD
concentrator.
General Manager Doug McGregor
Mine Superintendent Steve Lautenschlaeger
Mill Superintendent Clifford D. Nelson

MAGMA GOLD LTD.

Subsidiary of Magma Copper Company

McCabe Mine T13N R1E Sec 29, 30
P.O. Box 460, Humboldt, AZ 86329 - Phone 632-5165 -
Employees: 108 - Underground mine - 600 TPD flotation
mill (operating 7 days, 7 days off) - Produces sulfide con-
centrate containing copper and precious metals.
General Manager Errol O. Anderson

Mine Manager Richard Pape
Senior Engineer Arnold Buchanan
Staff Metallurgist Steve Recio
Purchasing Agent Larry Waugh
Human Resources & Safety Ronald M. Plantz

MINERALS RESEARCH AND RECOVERY, INC.

Ajo Plant and Slag Stockpile T12S R6W Sec. 23
Tucson Office and Plant, 4565 S. Palo Verde, Suite 203,
Tucson, 85714 - Phone 748-9362 - Ajo Plant and New
Cornelia Copper Smelter Slag Stockpile, Highway 85, Ajo,
85321 - Phone 387-5310 - Employees: 54 - Processes cop-
per smelter slag for roofing granules, abrasives, filtration
media, nuclear shielding, and ship ballast - Markets in
Arizona, the United States, and throughout the world.
President Manjit Chopra
Plant Manager (Ajo) Joe Fanning, Sr.
Plant Manager (Tucson) Michael Vick

MORTON SALT DIVISION

Morton International

Southwest Salt Mine T2N R1W Sec. 2
13000 W. Glendale Ave., Glendale, AZ 85307 - Phone
247-3000 - Employees: 35 - Solution mining via wells -
Solar evaporation of brines - Produces salt for water sof-
teners, domestic, agricultural, and industrial use - Under-
ground solution cavities are used for propane and butane
storage.
Plant Manager Gary McFarlin

MOUNTAIN VIEW MINING, INC.

Chem-Stone, Inc.

2015 W. Mountain View, Phoenix, AZ 85021 - Phone
997-2013 - Employees: 45 - Pumice treatment plant -
Produces specialized ready-to-use pumice for the garment
industry.
President David L. Bellaire
Dead Eye Mines T21N R2E Secs. 4, 16
South Fourth Street, P.O. Box 783, Williams, AZ 86046 -
Phone 997-2013 - Pumice mine - Open pit mining of spe-
cialized pumice - Sizing plant.
Operations Manager Joe Brouder

NATIONAL GYPSUM COMPANY

Gold Bond Building Products Division
P.O. Box 20863, Phoenix, AZ 85036 - Phone 258-9321 -
Employees: 58 - Wallboard plant - Wallboard joint cement
plant.
Plant Manager H. E. Skelley
Office Manager J. C. Cassidy
Joint Cement Plant Manager Bill Brundage
Joint Cement Quality Control Nick Tuhus

URANIUM

Lower uranium prices (NUEXCO spot price \$7.50/lb.as
of 12-92) continue to negatively influence this industry
segment. While waiting for price and demand to improve,
Energy Fuels Nuclear Inc.'s mines are on care-and-main-
tenance basis. Developed deposits include Arizona One,
Hermit, Kanab North, and Pine Nut. Development of the
Canyon Mine awaits regulatory approval.

INDUSTRIAL MINERALS

Although copper accounts for two-thirds of the State's
mineral production by value, mining in Arizona continues
to be a diversified activity. Industrial minerals mined in the
State last year include calcium carbonate as limestone and
marble for mineral filler and as raw material for lime and
cement plants, bentonite for desiccants and for bleaching
and clarifying of edible oils, sand and gravel for construc-
tion aggregate, tile and brick clay, salt, cinders, pumice for
laundry uses and light-weight aggregate, zeolites for
molecular sieves, stone, perlite for filters, gypsum for wall
board and agriculture, silica flux, pyrite and micaceous
hematite for pigment, quarried flagstone, and hydrofrac
sand. Although sand and gravel lead this industrial mineral
group, both in volume and value of production, many
market niches exist for the specialized industrial mineral
producer. The tremendous range in employee and capital
requirements for the industrial minerals commodities vary
widely enough to accommodate a family-run operation as
well as large corporate producers. The increase in the num-
ber of family run decorative and dimension stone producers
is an indication of this condition.

Pfizer Minerals division, which acquired Calcium
Products of Arizona's Santa Rita Quarry and marble filler
mill in late 1991, has gone through a corporate adjustment
and now operate the mine and plant as Specialty Minerals
Incorporated, a subsidiary of Minerals Technologies Incor-
porated.

The Arizona Department of Mines and Mineral
Resources' project to survey and quantify consumption of
industrial minerals in Arizona's market area continues. The
object of this project is to encourage exploration, develop-
ment, and production of industrial mineral deposits in
Arizona that can supply southwestern United States and
northern Mexico markets.

GEMSTONES

Arizona is the leading state in the value of mined
gemstones in the United States. Approximately \$3.2 million
worth of commercial gemstone production is reported for
Arizona annually. Turquoise, peridot, and petrified wood
account for most of the value, with amethyst, chrysocolla,

azurite, malachite, fire agate, and apache tears making up
the remainder.

Turquoise, a hydrous phosphate of aluminum and cop-
per, is the leading gemstone produced in Arizona. Prized
for its color, turquoise is the traditional gemstone used in
Southwestern American Indian jewelry. It is mined as a
by-product at a number of Arizona porphyry copper
deposits. The best quality material is sold by the piece, and
the remainder sold or processed for sale by weight.

Peridot is the gem variety of the mineral olivine. The
translucent green material comes from the Peridot Mesa
area of the San Carlos Apache Indian Reservation east of
Globe. Arizona material is suitable for faceting and is of the
finest quality in the world. Occurring in Quaternary basalt,
the olivine is mined by shallow drilling and blasting of
productive zones followed by hand breaking, screening,
and sorting.

Petrified wood, although occurring in nearly every state,
is best known as an Arizona gem material. Petrified wood
is a fossil in which a mineral material, usually silica, has
replaced the original cellular structure of the wood. Petri-
fied wood occurs in all Arizona counties, but that
occurring in Navajo and Apache counties in the Triassic
Chinle Formation of northeastern Arizona supplies nearly
all of the gem market. Commercial production comes only
from private lands.

RECREATIONAL PROSPECTING

Rockhounding continues to be a popular recreational
activity in the State. The resultant impact on the Arizona
tourism industry is hard to determine, but undoubtedly is
significant. The gem show in Quartzsite, for example, is the
largest in the world, drawing in excess of a hundred
thousand visitors. The prestigious Tucson Gem And
Mineral Show attracts visitors and dealers from around the
world. More than 20 additional gem shows are held in the
State annually and 61 organized earth science clubs are
currently active.

Gem material collected by the rockhound hobbyist is
not included in the official reported gemstone production,
but it is likely that rockhound production is higher than the
reported mine production. A portion of rockhound-col-
lected material goes directly into collections, but much of
it is sold privately or at gem shows.

Gold panning as a recreational activity has seen in-
creased interest in the last few years. Perhaps this can be
linked to interest generated by tourists and the current
popularity of outdoor recreational activities. A Department
publication, *Gold Panning in Arizona*, is available to pro-
vide information to the general public on this subject.

COMPANY LISTING

The following list is arranged alphabetically by company. To locate a specific mine use the index on page A23.

A. F. BUDGE (MINING) LTD.

UVX T16N R2E Sec. 23
P.O. Box 938, Jerome, AZ 86331 - Phone 634-9034 - Employees: 13 - Located at Jerome - Underground mine producing gold and silver bearing flux for copper smelter. General Manager Ronald R. Short Mine Superintendent Pete Flores Mine Geologist John McKenny Foreman Cundo Jauregui

ALANCO ENVIRONMENTAL RESOURCES CORP.
Office
14555 N. Scottsdale Road, Suite 200, Scottsdale, AZ 85260 - Phone 991-8540.
CEO and President Richard Steinke Vice President Larry Kersey
ARMCO Custom Mill T20S R22E Sec. 21
Phone 457-2221 - Located 4 miles east of Tombstone on Charleston Road - Custom milling facility - Gravity, flotation, and CCD circuits.
Assayer Gary Lindroos

AMERICAN SANDSTONE Blaser Corporation

Blaser Stoneyard T16N R2W Sec. 22
Black Cat Quarries T22N R1W Sec. 17
Lower Cedar Tank Quarry T22N R2W Sec. 2
Yellow Wasp No. 2 T22N R1W Sec. 9
Government Canyon Quarry T19N R2E Sec. 34
Little Rock Quarry T22N R2W Sec.24
Lizard Canyon Quarry T20N R1E Sec. 32
North Highway 89, P.O. Box 1154, Chino Valley, AZ 86323 - Phone 636-4454, FAX 636-2780 - Employees: 40 - Quarries, processes, saws, and cuts Arizona flagstone and sandstone as flagging, dimension stone and tiles - Marketed in Arizona, the United States, and throughout the world.
President Donald Blaser
Vice President W. Larry Blaser
Secretary/Treasurer - Mgr. Operations . . . Dayle Blaser
Orders David Tyler
Transportation Coordination Marcia Stewart

ANASAZI COMPANY

Anasazi Stoneyard T4N R4E Sec. 14
Rattlesnake Quarries T20N R1E Sec. 19
Sidewinder Quarries T23N R2W Sec. 36

7486 E. Adobe Drive, Scottsdale, AZ 85255 - Phone 585-9882 - Employees: 20 - Operates flagstone quarries in Coconino County - Fabrication yard in Scottsdale - Marketed in United States and Asia.
Owner Grady Dawe
Mining Supervisor Neil Cowie

APACHE STONE DIVISION Halquist Stone Co. Inc.

Mayer Onyx Quarry T12N R1E Sec. 22
Blue Bell Schist Quarry T11.5N R1E Sec. 24
Rainbow Schist Quarry T12N R1E Sec. 23
22040 N. 21st Ave., Phoenix, AZ 85027 - Phone 267-8658, FAX 780- 0544 - Employees: 9 (including contractors) - quarries located near Mayer - Onyx marble quarry - Schist quarries - Landscape boulders, building and dimension stone - Marketed in Arizona, the United States, and throughout the world.
President Perry Halquist
Manager Wayne Evans

ARIMETCO INTERNATIONAL INC.

6245 E. Broadway, Suite 350, Tucson, AZ 85711, Phone 745-8882.
President H. Roy Shipes
Chief Operating Officer Russell Alley
Sr. Vice President-
Latin American Affairs John Bracale
Vice President-Corporate Affairs . . . John McKinney
Controller Bob Moon
General Manager-
Corporate Development Alan Mathews
Chief Mine Engineer Ken Bradley
Chief Geologist Harrison Matson
Johnson Mine T15S R22E Sec. 26
Phone 586-2241. Employees: 46 - Open pit copper mine - Heap and dump leaching - Solvent extraction electrowinning plant - Capacity 30,000 lb. copper per day.
Mine Manager Ed Smith
Plant Manager Shane Smith
Van Dyke T1N R15E Sec. 5
P.O. Box 747,
Miami, AZ 85539, Phone 473-2421. In-situ leach-solvent extraction electrowinning - Shaft rehabilitation underway.
Mine Manager Richard Gustafson
Emerald Isle Mine T23N R18W Sec. 22

FLAGSTAFF CINDER SALES INC.

Wildcat Hill Pit T21N R8E Sec. 9
Old Highway 66 East, P.O. Box 2415, Flagstaff, AZ 86003 - Phone 526-0801 - Employees: 7 - Located 1.5 miles east of Flagstaff - Cinder quarry - Used for aggregate, landscaping, and construction materials.
President Mary Lou Olivier
General Manager Rob Olivier

GEORGIA MARBLE COMPANY INC.

Andrada Marble Quarry T17S R16E Sec. 21
16101 S. Wentworth Road, Vail, AZ 85641 - Phone 762-9119, 1-800-952-2769, FAX 762-5592 - Employees: 10 - Open pit marble mine - Used for calcium feed additive, plastering material, decorative stone, roofing material, fine ground material used as mineral filler - Crushing and grinding plant.
Division Manager Larry Mattison
Office Manager Ardie Lauxman
Sales Carl Cuthbertson

GOLDEN GREEN PLACER MINING PARTNERSHIP

Devils Wash T15S R2E Sec. 2
HCR Box 840-A, Sells, AZ 85634 - Phone 361-2310- Employees: 4 - Located approximately 1.5 miles southwest of Quijotoa - Gold placer operation - Wet gravity concentration - Capacity 500 yards/week - Expansion underway.
Project Manager Jack Otani

GSA RESOURCES INC.

P.O. Box 509, Cortaro, AZ 85652 - Phone 297-4330, 744-8845 (after Feb. 1, 1992) - Employees: 16 (including contractors).
President Ted H. Eyde
Vice President Daniel T. Eyde
Lyles Mine T13N R6W Secs. 11, 12
Open pit clay mine located west of Kirkland - Hectorite clay -Used as viscosifiers and thickeners in pharmaceuticals and cosmetics.
Grace Chabazite Mine T12S R29E Secs. 1, 2, 12
Open pit mine located 13 miles north of Bowie - Chabazite - Used for cation exchange media and specialty adsorbants and deodorizers - Toll processed in Tucson.
Burro Creek Clay T14N R10W Sec. 7
Open pit clay mine located 8 miles southwest of Bagdad along Burro Creek - Saponite clay - Shipped out of state for manufacture into viscosifiers for detergents and drainage aid for treating pulp for fine white paper made from recycled paper fibers.

HARBORLITE CORPORATION

Superior Perlite T2S R12E Sec. 9
P.O. Box 960, Superior, AZ 85273 - Phone 689-5723 - Employees: 9 - Plant located 2 miles west of Superior on Silver King Mine Road south of railroad track - Open pit perlite - Two mines, located 2 miles southwest of Superior - Markets in Florida, California, Michigan, and Wyoming - Used in filtering for pharmaceuticals, chemicals, sugar, and beverages - Also used as agricultural fertilizer carrier.
Plant Manager Bill Smith
Assistant Manager Bob Farmer

HARLEY GRAY STONE COMPANY

Flagstone Quarries
P.O. Box 323, Paulden, AZ 86334 - Phone 636-2436 - Employees: 10 - Quarries located 8 miles northeast of Drake - Flagstone, cut stone - Marketed locally, throughout the United States, and exported.
Owner Harley Gray
Owner Carl Gray

HUDMAN STONE

M C Canyon Quarries T19N R1E Sec. 23
9640 W. Picture Rocks Road, Tucson, AZ 85743 - Phone 798-3909 - Employees: 10 - Quarries located 8 miles northeast of Drake - Flagstone for decorative use - River run (stream worn), surface (natural weathered), and quarried sandstone for flagstone. Marketed in Arizona, the United States, and throughout the world.
General Manager Roger Hudman

KESSON & KESSON

1201 E. Marshall, Phoenix, AZ 85014 - Phone 277-9883 - Employees: 12.
Owner David Kesson
Copper Hill Mine T1N R15E Sec. 15
Silica flux for Cyprus Miami copper smelter - Northwest of Globe.
Magma Limestone T1S R12E Sec. 35
Limestone flux for Cyprus Miami copper smelter - East of Superior.

McKUSICK MOSAIC

Weary Lode Mine T1S R15E Sec. 22
Route 1, Box 35-D, Globe, AZ 85501 - Phone 425-5051 or 425-8428 - Employees: 3 - Surface clay mine located 5 miles south of Globe - Used for tile and wind chimes, cosmetic additives, sealant, and slip glazing material.
Owners Robert & Charmion McKusick
Co-owner Kathleen Condit

Vice President Pat Fitch
 Manager, Materials R. J. Cunningham
 Manager, Mine Kent Watson
 General Manager G. G. Granger
 Manager, Community Services
 & Manager, Human Resources J. S. Bush
 Supervisor, Safety Joe Mortimer
 Maintenance Manager Gary Hutchison
 Accounting Manager R. Hoffman
 Technical Services Manager Ev Sequeira
Cyprus Casa Grande Corp.
Casa Grande T10S R4E Sec. 25
 P.O. Box 15009, Casa Grande, AZ 85230-5009 - Phone
 623-1539 - Employees: 160 - In-situ leach copper mine -
 Roast Leach - Solvent extraction-electrowinning plant -
 Acid plant - Located 32 miles south of Casa Grande.
 Vice President and General Manager . . Ronald Kellner
 Manager/Accounting & Materials A. L. Villard
 Manager/Metallurgy James Garvey
 Process Manager Samuel Yang
 Mine Development Superintendent . . . Kermit Behnke
 Manager/Human Resources Richard Stilgenbauer
 Environment Engineer John Kline
Cyprus Mineral Park Corp.
Mineral Park T23N R17W Sec. 19
 HC 37 Box 500, Kingman, AZ 86401 - Phone 565-2226 -
 Employees: 15 - Open pit copper-molybdenum mine &
 15,000 TPD concentrator - On standby - Dump leach -
 Precipitation plant operating - Located 16 miles north of
 Kingman.
 Superintendent G. H. Veach
 Plant Supervisor Joey Matthews

CYPRUS GOLD COMPANY
Cyprus Copperstone Gold Corp.

Copperstone T6N R20W Sec. 12
 P.O. Box AI, Parker, AZ 85344 - Phone (619) 665-9261 -
 Employees: 55 - Located 12 miles north of Quartzsite -
 Open pit gold mine - Cyanide agitation leach - Rated mill
 capacity 2,850 TPD - Heap leach - Production closure
 scheduled for April 10, 1992 - Plant disassembly and
 reclamation scheduled through year end.
 Resident Manager George R. Burns
 Plant Superintendent Kurt G. Markola
 Administrative Supervisor Mark A. Browning
 Mine Superintendent Jay L. Cupp
 Senior Mine Geologist Phil Gyger
 Senior Mine Engineer Joe F. Hatrick
 Mill Maintenance Supervisor Emmett P. Sours
 Operation Supervisor Gary R. Eastham
 Human Resource & Safety Supervisor . . Loretta Hanson

DRAKE STONE PRODUCTS
Rock House Quarry T19N R1E Sec. 10
M C Quarry T19N R1E Sec. 35

P.O. Box 11676, Prescott, AZ 86304 - Phone 445-3028,
 Message FAX 778-5447 - Stone processing plant at Drake
 - Flagstone and cut stone - Marketed in Arizona, the United
 States, and throughout the world.
 Owner/Operator Harley Gray Jr.
 Co-owner Deborah Gray

DUNBAR STONE COMPANY

Dunbar Stone Plant T21N R2W Sec. 3
 P.O. Box 246, Ash Fork, AZ 86320 - 901 Lewis - Phone
 637-2591, FAX 637-2355 - Employees: 45 - Quarries in
 Coconino, La Paz, Maricopa, Mohave, and Yavapai Coun-
 ties - Flagstone, marble, quartzite, and schist - Stone
 processing plant in Ashfork - Marketed in Arizona, the
 United States, and throughout the world.
 President G. E. Dunbar
 Vice President W. B. Dunbar
 Maintenance Superintendent Ron Dunbar
 General Manager Witt Randall
 Office Manager & Transportation . . . Darlene Berthold

ENERGY FUELS NUCLEAR INC.

P.O. Box 36, Fredonia, AZ 86022 - Phone 643-7321 -
 Employees: 14.
 Manager Mining Operations Roger Smith
Arizona One T36N R5W Sec. 22
 Located 45 miles southwest of Fredonia -Underground
 uranium mine - Developed - On standby.
Kanab North T38N R3W Sec. 17
 Located 25 miles southwest of Fredonia - Underground
 uranium mine - Developed - On Standby.
Hermit T38N R4W Sec. 17
 Located 30 miles southwest of Fredonia - Underground
 uranium mine - Developed - On standby.
Pine Nut T36N R4W Sec. 21
 Located 45 miles southwest of Fredonia - Underground
 uranium mine - Developed - On standby.
Canyon T29N R3E Sec. 20
 Located 45 miles north of Williams - Underground uranium
 mine - Development awaiting regulatory approval.

ENGELHARD CORPORATION
Chemical Division

Cheto No. 2 T21N R29E Sec. 23
 Box 155, Sanders, AZ 86512 - Phone 688-2468, FAX
 688-2485 (use FAX to leave written messages) -
 Employees: 6 - Located 6 miles southeast of Sanders -
 Surface strip bentonite mine - Primary use is in filters and
 catalysts, also used in agriculture and desiccants - Shipped
 overseas and to Mississippi for processing.
 General Superintendent Gary McDonald

Kingman, AZ - Phone 565-4554 - Employees 18 - Copper
 heap leach - 8,000 pounds per day SX-EW plant.
 Mine Manager Leo Young
White Cliff Diatomite T9S R17E Sec 24
 Mammoth, AZ - Phone 385-2515 - Open-pit diatomaceous
 earth mine and processing plant - Production to begin
 February, 1993.

ARIZONA PORTLAND CEMENT COMPANY

State Sales Office
 2400 N. Central, Suite 308, Phoenix, AZ 85004 - Phone
 271-0069.
 Executive Vice President and
 General Manager Vaughn S. Corley
 Vice President, Sales Craig Starkey
Rillito Plant & Quarry T12S R11E Sec. 26
 P.O. Box 338, Rillito, AZ 85654 - Phone (Tucson) 682-
 2221 - Employees: 144 - Twin Peaks limestone quarry 5
 miles from plant - Cement - Annual capacity 1,100,000 tons
 cement - Longest conveyor transport system in country.
 Plant Manager Tom Brosnan
 Quality Control Superintendent Steve Regis
 Quality Control Supervisor R.G."Smitty" Smith
 Plant Engineer John Frye
 Plant Electrician Russell Hawks
 Personnel Manager Fran Young
 Quarry Supervisor Chuck Hansen
 Purchasing Agent Tom Follett

ARIZONA SILICA SAND COMPANY

Houck Silica Sand T22N R29E Sec. 29
 P.O. Box 108, Houck, AZ 86506 - Phone 688-2602 -
 Employees: 18 - Open pit mine - Plant south of Houck -
 Hydrafrac sand for oil well treatment - Markets include New
 Mexico and California - Abrasives and mold sand - Markets
 in Arizona and New Mexico - Bagged and bulk products
 available.
 President Robert D. Fisher
 General Manager James Burkerwitz
 Foreman Ralph Nelson

ASARCO INCORPORATED

Tucson Office
 1150 N. 7th Avenue, Tucson, AZ 85705, P.O. Box 5747,
 Tucson, AZ 85703 - Phone 792-3010.
 Asarco Copper Operations
 Executive Vice President F. R. McAllister
 Development & Services
 Manager M.G. Lee
Southwestern Mining Department
 General Manager T. E. Scartaccini
 (April 1993 - General Manager, Ray Complex)
 Special Projects Manager D. F. Skidmore

Financial Manager G. H. Myers
 Environmental Engineering Manager . . . P. J. Maley
Mining Department/Corporate Office
 Assistant to Vice President A. D. Coumides
 Chief Geologist S. A. Anzalone
Mineral Beneficiation Department
 Director D. E. Crowell
 Chief Metallurgist T. D. Henderson
Exploration Department
 Manager, Western U.S.A W. L. Kurtz
Acid Sales Department
 National Sales Manager G. P. Gillen
Governmental Affairs
 Manager, State Legislative Affairs R. E. Quick
Safety Department
 Director of Safety - Mining B. G. Brumbaugh
 Director of Safety - Smelting R. Maxwell
Tucson Information Services
 Manager T. Fedoruk
Mission Mine T16S R12E Sec. 36
 Box 111, Sahuarita, AZ 85629 - West Pima Mine Road -
 Phone 648-2500 - Employees: 760 - Open pit copper mine
 - Two concentrators: Mission and South with a total rated
 capacity of 59,000 TPD.
 General Manager John D. Low
 Operations Manager J. B. Lichtenhan
 Mine Manager S. L. Lakosky
 Chief Engineer B. M. Williams
 Senior Geologist R. B. Cummings
 Chief Metallurgist J. P. Reynolds
 Maintenance Manager H. E. Hughes
 Mill Manager, Mission C. A. Carroll
 Mill Manager, South S. D. Lawrence
 Accounting Manager D. J. Hoffman
 Industrial Relations Manager J. F. Coxon
 General Electrical Supervisor J. B. Barton
 Safety Administrator R. E. Jordan
 Environmental Engineer A. T. Cooper
Ray Mine & Concentrator T3S R13E Sec. 10
Hayden Concentrator & Smelter T5S R15E Sec. 11
 Ray Complex, P.O. Box 8, Hayden, AZ 85235 - Phone
 356-7811 - Employees: 1587 - Open pit copper mine -
 Dump leach - Heap leach - Solvent extraction-electrowin-
 ning plant - Two concentrators: Ray rated at 30,000 TPD
 and Hayden rated at 31,000 TPD - Smelter capacity 720,000
 TPD and 1600 TPD acid plant.
 General Manager K.R. Morano
 General Manager T.E. Scartaccini
 (effective 4/30/93)
 Manager, Ray Operation B. K. Malone
 Manager, Hayden Operation D. C. Himmesoete
 Mine Manager R. E. Thompson
 Smelter Manager Joe Wilhelm
 SX-EW Manager L. A. Davis
 Technical Services Manager N. A. Gambell
 Ray Concentrator Manager S. A. McGee

Hayden Concentrator Manager G. L. Lubers
Electrical Manager, Ray J. L. Weller
Electrical Manager, Hayden G. T. Coryell
Maintenance Manager, Ray Bill Pyle
Maintenance Manager, Hayden Hugh Alexander
Support Manager J. W. Murphy
Financial Manager J. T. O'Neal
Human Resources Director W. E. Burrell
Purchasing Agent K. C. Newman
Chief Engineer S. F. Johnson
Safety Director Warren Traweek
Senior Geologist Edward John
Silver Bell T12S R8E Sec.11
Marana, AZ 85653 - Phone 682-2420 - Employees: 20 -
Open-pit copper mine - 11,000 TPD concentrator - On
standby - Dump leach & precipitation plant operating.
Mill Manager D. J. Duncan
Accounting Manager A. J. Robles

BLACK CANYON MILLING
Arizona Zinc Plating Inc.
Black Canyon Mill T8N R2E Sec. 15
Office: 117 W. Forest Grove Ave., Phoenix, AZ 85040 -
Mill located one half mile south of Rock Springs on west
site of Interstate 17 - 3 ton per hour gravity mill consisting
of crushing, grinding, magnetic separation, and table and
cone concentrators.
Owner/Manager Bill Schleisman

BUILDING PRODUCTS COMPANY
Phoenix Plant
4850 W. Buckeye Road, Phoenix, AZ 85043 - Phone 272-
5576 - Clay mining by contractor - Plant consumes clay to
produce extruded sewer pipe and roofing tile.
Plant Manager and Mining Supervisor . . . Vern Hamner
Rim Quarry T11N R19E Sec. 30
Clay mine located 10 miles southwest of Clay Springs.
New River Slate Quarry T7N R3E Sec. 5
Slate quarry located approximately 6 miles northeast of
New River.
Dewey Ranch #2 T14N R1E Sec. 15
Clay mine located approximately 6 miles north of Dewey.

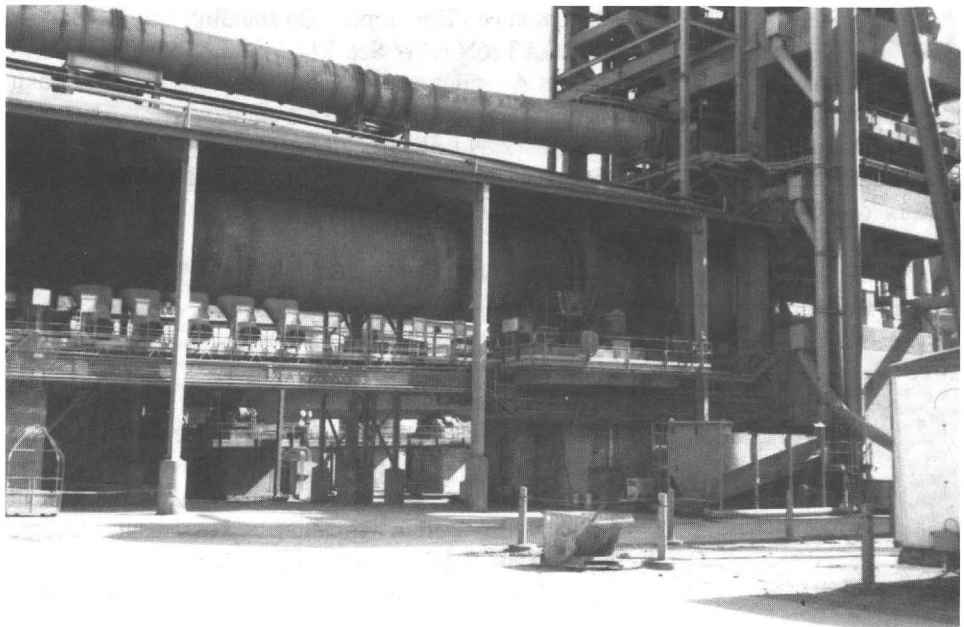
CATALINA MARBLE, INC.
White Rock Mine T10S R13E Secs. 31 & 32
P.O. Box 8643, Catalina AZ 85738 - Phone 797-8858 -
White marble quarried and processed for use as veneer,
decorative stone, plaster sand, and animal feed additive -
also used for subgrade in highway construction.
Operator Darell Goode

CHEMSTAR LIME
2800 N. 44th St., Suite 400, Phoenix, AZ 85008 - Phone
955-5711.
President Dave Reilly
Vice President, Manufacturing
& Engineering Larry Warner
Vice President, Marketing Bob Derks
Vice President, Industrial Sales Bob Plains
District Sales Manager David Fleming
Chief Engineer Bill McCandlish
Manager, Technical Services Starr Curtis
HiCal Operations Manager Ed Barry
Materials Manager Mike Pinnau
Distribution Manager John Mc Mullan
Transportation Manager Chris Brukas
Nelson Quarries & Plant T25N R10W Sec. 25
P.O. Box 370, Peach Springs, AZ 86434 - Phone 769-2271
- Employees: 72 - Limestone quarry - Lime plant with two
rotary kilns rated at 1800 tons of lime per day.
Plant Manager Mike S. Eliason
Production Superintendent Bill Schoof
Maintenance Superintendent Mark Phillips
Quarry Superintendent Jose M. Ontiverous
Plant Buyer Danny Roberts
Shipping/Transportation Coordinator Joe Fuentes
Quality Control Technician Richard Schnider
Douglas Quarry & Plant T24S R26E Sec. 7
Route 1, Box 110, Douglas, AZ 85607 - Phone 364-2429 -
Employees: 60 - Quarry and plant located at Paul Spur - 3
lime kilns - Plant capacity rated at 1000 tons of lime per day.
Plant Manager Jerry Young
Production & Maintenance
Superintendent Richard Anderson
Quarry Superintendent Steve Bell
Production Services Superintendent Don Williams
Quality Control Technician Louis Roqueni

CLINTON - CAMPBELL CONTRACTING INC.
Phoenix Brick Yard
1814 S. 7th Ave., Phoenix, AZ 85007 - Phone 258-7158 -
Employees: 96.
President Frederic Campbell
Plant Superintendent Don Campbell
Tolleson Mine T1N R1E Sec. 3
Clay pit located on 84th Avenue north of Van Buren - Used
in manufacture of structural clay products.
Pantano Clay Pits T16S R17E Secs. 21, 26, 27, 28, 35
Clay pits located 25 miles southeast of Tucson (North of
Interstate 10 - 2 miles northwest of the Pantano Interchange)
- Clay used in the manufacture of structural clay products.

CYPRUS COPPER COMPANY
(A subsidiary of Cyprus Minerals Company)
1501 W. Fountain Head Parkway, Tempe, AZ 85282 -
Phone 929-4400
President F. Steven Mooney
Sr. Vice President Jeffrey G. Clevenger
Vice President/Technical Services Jake Timmers
Cyprus Sierrita Corp.
Sierrita T18S R12E Secs. 7, 8, 9, 10, 16, 17
Twin Buttes T18S R13E Sec. 5
P.O. Box 527, Green Valley, AZ 85622 - Phone 648-8710
- Employees: 1000 plus 50 Triple Nichol Inc. contract
employees - Sierrita, Esperanza and Twin Buttes open pit
copper-molybdenum mines - 95,000 TPD concentrator -
The inactive Esperanza open pit - 17,500 TPD concentrator
- Ferromolybdenum plant - Rhenium plant - Dump leach,
solvent extraction - electrowinning plant - Located 30 miles
south of Tucson.
Vice President & General Manager Gene Consalus
Manager, Mining D. L. Prah
Manager, Metallurgical Processing M. H. Khan
Manager, Human Resources Craig Patrick
Manager, Accounting Rickey Lamb
Manager, Materials Management Darryl Kribbel
Plant Manager Bob Comstock
Mine Operations Leon Hardy
Plant Maintenance Superintendent Jesus Figueroa
Mill Operations Superintendent Tom Comi
Fine Crushing Superintendent William Davis
SX-EW Superintendent Doug Sims
Technical Services Superintendent William Sweetser
Superintendent of Moly Processing Steve Koski
Superintendent of Mine Engineering Tom McNamara

Cyprus Miami Mining Corp.
Miami T1N R14E Sec. 24, 25, 26, 35
P.O. Box 4444, Claypool, AZ 85532 - Phone 473-7150 -
Employees: 1000 - Open pit oxide copper mine - Dump
leach - Solvent extraction - electrowinning plant - 120,000
TPY Smelter - Acid plant - Electrolytic refinery - 100,000
TPY continuous rod plant - 24,000 TPD concentrator is
inactive.
Vice President & General Manager . . . Christopher Janes
Manager, Copper Treatment Division Ken Larson
Manager,
Domestic Copper Production Division . . . John Fenn
Manager, Human Resources Robert Revitte
Technical Service Superintendent . . . William Sweetser
Superintendent/Moly Processing Steve Koski
Superintendent/Leaching Operations . . . Gerald Fountain
Superintendent/Mine Engineers Tom McNamara
Superintendent, Rod Plant Ken Watkins
Superintendent, Metallurgical Control Eric Selley
Superintendent, Environmental Services . . . Bob Ressler
Superintendent, Smelter Operations . . . Luis Contande
Superintendent, Smelter Maintenance . . . Scott Vandela
Superintendent, Smelter Technical
Services Rex Henderson
Superintendent, Smelter Resource
Recycling Larry Le Compte
Materials Management Hugo Schriewer
Cyprus Bagdad Copper Corp.
Bagdad T14N R9W Sec. 4
P.O. Box 245, Bagdad, AZ 86321 - Phone 633-2241 -
Employees: 712 - Open pit copper-molybdenum mine -
71,000 TPD concentrator - Dump leach-solvent extraction-
electrowinning plant.



Arizona Portland Cement
Company's Rillito Mill,
Pima County