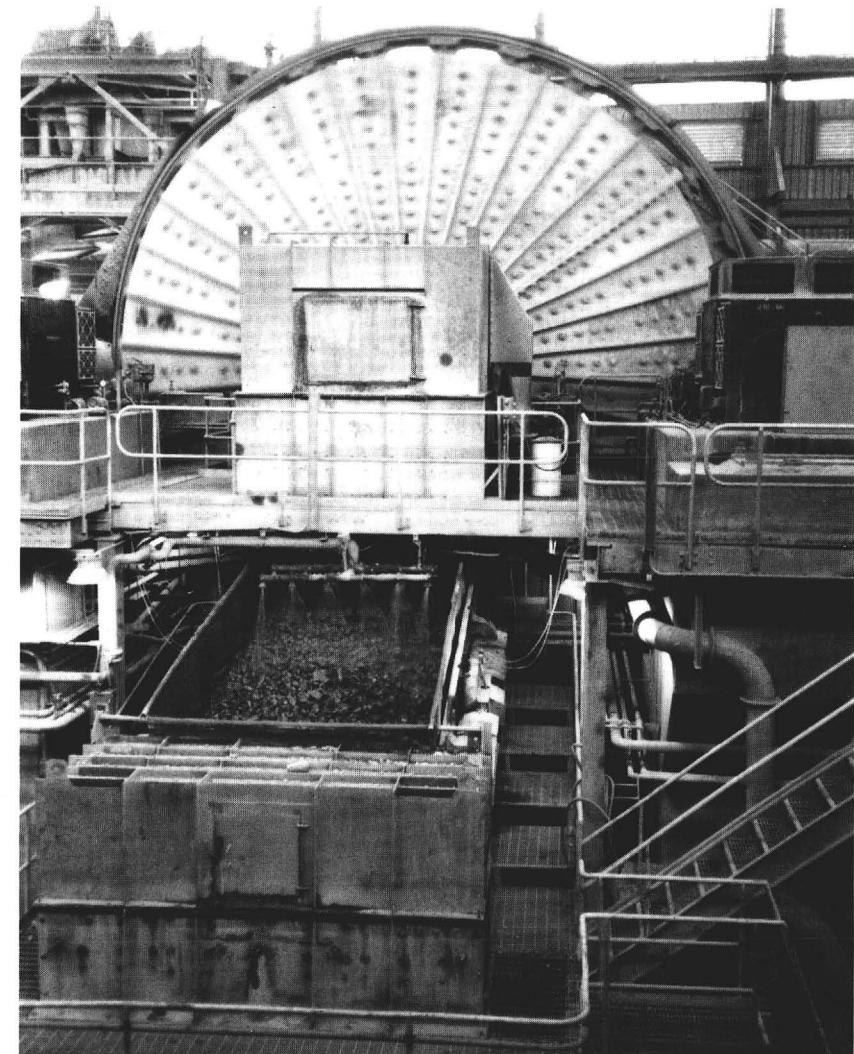


Directory of Active Mines In Arizona 1996



Arizona Department of Mines and
Mineral Resources

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

H. Mason Coggin, Director

1502 West Washington
Phoenix, Arizona 85007
(602) 255-3795
Toll-free in Arizona: 800-446-4259

Board of Governors

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Vice Chairman**

MINE INDEX

MINE NAME (COUNTY)	PAGE	MINE NAME (COUNTY)	PAGE
Ajo Plant & Slag Stockpile (Pima)	A13	Mineral Park Mine (Mohave)	A10
Anasazi Stoneyard (Maricopa)	A6	Mission Mine (Pima)	A7
Andrada Marble Quarry (Pima)	A11	More Sand, Moon Sand (Coconino)	A16
Ashfork Plant & Quarries (Yavapai)	A17	Morenci (Greenlee)	A14
Arizona Picture Rock (Navajo)	A15	Morton Salt Mine (Maricopa)	A13
Aztec Quarry (Yuma)	A17	Nelson Quarries & Plant (Mohave)	A8
Bagdad (Yavapai)	A10	New Cornelia (Pima)	A14
Black Canyon Mill (Maricopa)	A8	New River Slate, Anasazi (Maricopa)	A6
Black Cat Quarries (Coconino)	A6	New River Slate, Building Prd. (Maricopa)	A8
Black Mesa Mine (Navajo)	A13	Oracle Ridge Mine (Pima)	A13
Blaser Stoneyard (Yavapai)	A6	Pantano Clay Pits (Pima)	A9
Blue Bell Schist Quarry (Yavapai)	A6	Phoenix Brick Yard (Maricopa)	A9
Bowie Chabazite (Cochise)	A16	Pinto Valley (Gila)	A12
Brown Quarry (Navajo)	A15	Queen Creek Marble Quarry (Pinal)	A13
Buckskin Quarry (Navajo)	A15	Rainbow Schist Quarry (Yavapai)	A6
Burro Creek Clay (Mohave)	A11	Rattlesnake Quarries (Coconino)	A6
Camp Verde Gypsum (Yavapai)	A16	Ray Mine (Pinal)	A7
Carlota (Gila)	A8	Red Mountain Quarry (Maricopa)	A15
Cheto No. 1 (Apache)	A17	Red Rock Quarry (Coconino)	A6
Cheto No. 2 (Apache)	A10	Rillito Plant & Quarry (Pima)	A7
Clarkdale Quarry & Plant (Yavapai)	A14	Rim Quarry (Navajo)	A8
Copper Hill Mine (Gila)	A11	Rock House Quarry (Coconino)	A10
Copper Queen (Cochise)	A14	Salome Gypsum Mine (La Paz)	A17
Crown Claims (Coconino)	A16	San Manuel (Pinal)	A12
Darling Cinder Pit (Coconino)	A16	San Manuel Smelter (Pinal)	A12
Devils Wash (Pima)	A11	Santa Rita Quarry (Pima)	A15
Dewey Ranch #2 (Yavapai)	A8	Seligman (Yavapai)	A13
Douglas Quarry & Plant (Cochise)	A9	Shipley Pit (Mohave)	A13
Dunbar Stone Plant (Coconino)	A10	Sidewinder Quarries (Coconino)	A6
Emerald Isle (Mohave)	A6	Sierra Quarry, SW Stone (Navajo)	A15
Evening Star (Maricopa)	A11	Sierra Quarry, T&C Ent. (Navajo)	A16
Feldman Quarry (Pinal)	A13	Sierrita Mine (Pima)	A9
Flagstone Quarries (Coconino)	A11	Silver Bell (Pima)	A8
Golden Rule (Cochise)	A9	Sleeping Beauty Mine (Gila)	A17
Gold Hill Mine (Pinal)	A12	Snowflake Gypsum Mine (Mohave)	A17
Gold Prince (Cochise)	A17	Star Valley Granite Quarry (Gila)	A15
Gold Road (Mohave)	A6	Stutenroth Mill (Pinal)	A15
Grace Chabazite Mine (Cochise)	A11	Superior Perlite (Pinal)	A11
Hayden Concentrator and Smelter (Gila)	A7	Swansea Mine (La Paz)	A16
Houck Silica Sand (Apache)	A7	Tohono Mine (Pinal)	A10
Iron Chancellor (Yavapai)	A7	Tolleson Mine (Maricopa)	A9
Johnson Camp Mine (Cochise)	A6	Treasure Chest Granite Quarry (Pinal)	A16
Kayenta Mine (Navajo)	A14	Union Pass Mordenite (Mohave)	A16
Kilauea Quarry (Maricopa)	A11	United Verde Mine (Yavapai)	A14
Little Rock Quarry (Yavapai)	A6	Van Dyke Mine (Gila)	A6
Lizard Canyon Quarry (Yavapai)	A6	Weary Lode Mine (Gila)	A12
Lyles Mine (Yavapai)	A11	White Cliff Diatomite (Pinal)	A6
M C Canyon Quarries (Coconino)	A7	White Cross Mine (Pinal)	A14
M C Canyon Quarries (Coconino)	A16	White Vulcan (Coconino)	A16
M C Quarry (Coconino)	A10	Wildcat Hill Pit, Flag. Cinder Sales (Coconino)	A10
Magma Mine (Pinal)	A12	Wildcat Hill Pit, Coconino Cind. (Coconino)	A9
Mayer Onyx Quarry (Yavapai)	A6	Winkelman Gypsum (Pinal)	A16
Miami Mine, Cyprus (Gila)	A10	Yellow Wasp No. 2 (Coconino)	A6
Miami Mine, Magma (Gila)	A12	Zonia (Yavapai)	A6

Active Mines in Arizona - 1996

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

Department of Mines and Mineral Resources

Directory 44



State of Arizona
Fife Symington, Governor

Phoenix, Arizona
December, 1995

PHOTOGRAPHS

This 1996 edition of the *Directory of Active Mines in Arizona* features the photographs of A. L. Flagg, Arizona pioneer, mining engineer, and photographer. The collection of over 2000 images was cataloged by the Department last year. His photographs remind us that the history of mining in Arizona is a story of families and communities as well as miners and companies.

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 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 publications 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 listing of the Department publications is available upon request.
- Operate the Arizona Mining and Mineral Museum.

COMMODITY INDEX

CEMENT/LIME

Clarkdale Quarry
Douglas Quarry
Nelson Quarry
Rillito Quarry

CINDERS

Darling Cinder Pit
Wildcat Hill

CLAY

Cheto No. 1
Cheto No. 2
Burro Creek Clay Pit
Dewey Ranch Quarry
Lyles Mine
Pantano Clay Pits
Rim Quarry
Tolleson Mine
Weary Lode Mine

COAL

Black Mesa Mine
Kayenta Mine

COPPER

Bagdad Mine
Copper Queen Mine
Emerald Isle
Johnson Camp Mine
Magma Mine
Miami Mine, Cyprus
Miami Mine, Magma
Mineral Park Mine
Mission Mine
Morenci Mine
Oracle Ridge Mine
Pinto Valley Mine
Ray Mine
San Manuel Mine
Sierrita Mine
Silver Bell Mine
Tohono Mine

CUSTOM MILLS

Black Canyon Mill
Stutenroth Mill

DIATOMITE

White Cliff Mine

GEMSTONES

Sleeping Beauty Mine

GOLD and SILVER

Devils Wash Placer
Evening Star
Gold Prince
Gold Road
Golden Rule

Magma Mine*
Mission Mine*
Oracle Ridge Mine*
Pinto Valley Mine*
Ray Mine*
Morenci Mine*
San Manuel Mine*
Sierrita Mine*

GRANITE/DECORATIVE STONE

Aztec Quarry
Kilauea Quarry
Red Mountain Quarry
Star Valley Granite Quarry
Treasure Chest Granite Quarry

GYPSUM

Camp Verde Gypsum Mine
Feldman Quarry
Salome Gypsum Mine
Snowflake Gypsum Mine
White Cross Mine
Winkelman Gypsum

LIMESTONE/MARBLE

Andrada Marble Quarry
Queen Creek Marble Quarry
Santa Rita Quarry
Shipley Pit

MOLYBDENUM

Bagdad Mine*
Morenci Mine*
Pinto Valley Mine*
San Manuel Mine*
Sierrita Mine*

PERLITE

Superior Perlite Mine

PIGMENT

Swansea Mine
Iron Chancellor Mine

PUMICE

Crown Claims
More Sand, Moon Sand
White Vulcan

SALT

Morton Salt Mine

SAND & GRAVEL

See listing of sand and gravel

SAND, INDUSTRIAL

Ajo Plant & Slag Stockpile
Houck Silica Sand

SILICA SMELTER FLUX

Copper Hill
Evening Star

Gold Hill Mine
Gold Prince

SILVER

Bagdad Mine*
Mission Mine*
Morenci*
Pinto Valley Mine*
Ray Mine*

SLATE

New River Slate Quarry

SMELTERS

Hayden
Miami
San Manuel

STONE, DIMENSION

Arizona Picture Rock Quarry
Black Cat Quarry
Blue Bell Schist Quarry
Brown Quarry
Buckskin Quarry
Dunbar Quarries
Flagstone Quarries
Little Rock Quarry
Lizard Canyon Quarry
M C Canyon Quarries
M C Quarry
Mayer Onyx Quarry
New River Slate Quarry
Rainbow Schist Quarry
Rattlesnake Quarry
Red Rock Quarry
Rock House Quarry
Sidewinder Quarry
Sierra Quarry
Western States Stone Quarries
Yellow Wasp Quarry

ZEOLITES

Bowie Chazazite Mine
Grace Chabazite Mine
Union Pass Mordenite

* Produced as a by-product

SUPPLEMENTAL INFORMATION

Arizona State Agencies

- Arizona Geological Survey**
416 West Congress, Tucson, AZ 85701
Phone (520) 770-3500
- Arizona Mines and Mineral Resources**
1502 West Washington, Phoenix, AZ 85007
Phone (602) 255-3791
- Land Department - Minerals Section**
1616 West Adams, Phoenix, AZ 85007
Phone (602) 542-4628
- Mine Inspector**
State Capital, West Wing, Room 403, Phoenix,
AZ 85007 Phone (602) 542-5971
- Federal Agencies**
- Bureau of Land Management**
Arizona State Office, 3707 North 7th St. #300,
Phoenix, AZ 85014 Phone (602) 650-0528
- Bureau of Mines**
The Bureau of Mines was terminated by Congress in October, 1995. Although most functions were eliminated, some were transferred to other federal agencies. Mineral production information will be available through the Geological Survey. Certain safety functions were transferred to Mine Safety and Health Administration and some research projects to the Department of Energy.
- Forest Service**
Arizona Zone Office - Minerals, 2324 East McDowell Rd., Phoenix, AZ 85006
Phone (602) 225-5262
- Mine Safety and Health Administration (MSHA)**
63 East Main #303, Mesa, AZ 85201
Phone (602) 649-5452
- U.S. Geological Survey**
Mineral Information Office, 340 North 6th Avenue, Tucson, AZ 85705
Phone (520) 670-5544

Industry Associations

- Arizona Mining Association**
2702 North 3rd Street, #2015, Phoenix, AZ 85004
Phone (602) 266-4416, FAX (602) 266-4418
Administrative Assistant . . . June Castelhana
Director of Education Larry McBiles
- AMIGOS (Arizona's Mining & Industry Gets Our Support)**
2907 North 2nd Street, Phoenix, AZ 85012,
P.O. Box 25187, Phoenix, AZ 85002
Phone (602) 279-3199, FAX (602) 263-0363
Executive Director Sydney Hoff Hay
- Arizona Rock Products Association**
1825 West Adams, AGS Building, Phoenix, AZ 85007
Phone (602) 271-0346, FAX (602) 255-0363
Executive Vice President . . Ken Quartermain
Deputy Director David Martin
Director of Administration Ricki Salyer
- Society For Mining, Metallurgy, and Exploration, Inc. - National Headquarters**
P. O. Box 625002, Littleton, CO 80162-5002
Phone (303) 973-9550, FAX (303) 973-3845
Executive Director Gary Howell
Director of Publications Joseph Zullo
Assoc. Executive Dir.
for Members Helga Gruenerud
Editor - Mining Engineering . . . Tim O'Neil
Director of Administrative
Services John Orologio

Additional copies of the Directory of Active Mines in Arizona 1996 may be obtained for \$5.00 (\$6.50 by mail). Circulars with complete listings of mining related Federal, Arizona, and County agencies as well as mine permitting information are available. For more information or a publication list contact the Department.

Arizona Department of Mines & Mineral Resources
1502 West Washington, Phoenix, Arizona 85007
(602) 255-3795 Toll-free in-state 1-800-446-4259

Directory of Active Mines in Arizona

1996

Table of Contents

Arizona's Mineral Industry A1

Mineral Production Table A2

Company Listing A6

Sand and Gravel Operations A18

Supplemental Information A23

Commodity Index A24

Mine Index A25

Forward

This directory was compiled in November, 1995 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, commodities, operation description, and key personnel.



Do you need this information in an alternative format? Please call the Department office at 255-3791.

ARIZONA'S MINERAL INDUSTRY

Arizona again ranked first in nonfuel mineral production in the U.S. in 1994. The value of all mineral output was \$3.62 billion, an increase of nearly 20 percent over 1993. Arizona also remains the leader in U.S. copper production, supplying 65% of the U.S. total. Arizona's 1994 copper production was 2.6 billion pounds valued at \$2.82 billion. Arizona also leads or is among the leaders in the production of gemstones, molybdenum, silver, perlite, and sand and gravel. Excluding sand and gravel operations, there are 106 active mines in Arizona producing the above commodities plus additional metals and 18 varieties of industrial minerals. There are 100 sand and gravel operations in the state. More than 17,500 people are directly employed by the mining industry.

COPPER

Copper represents about 85 percent of Arizona's non-fuel mineral value. Rising copper prices, increased sales volume, and slightly lower production costs gave the copper industry record operating earnings in 1994. The trend has continued through 1995. The price for cathode copper, averaging 88 cents in 1993, rose to \$1.07 in 1994, and averaged \$1.39 for the first 9 months of 1995.

Arimetco Incorporated

Arimetco produces cathode copper from the Johnson Camp mine, while development continues at their Van Dyke, Zonia, and Emerald Isle copper properties.

Johnson Camp, located 65 miles east of Tucson, produced 5.6 million pounds of copper in 1994, down from 7.4 million pounds in 1993 due to leach pad construction. Reserves at Johnson Camp's producing Burro Pit are estimated at over 18 million tons, while the undeveloped Copper Chief orebody contains reserves estimated at 9.6 million tons.

The Emerald Isle open pit mine and SX-EW plant located near Kingman has been on care and maintenance, but is scheduled to reopen December, 1995. Ore reserves are estimated at 2.6 million tons of 0.51 percent copper.

Premine drilling was completed at Zonia near Kirkland Junction, identifying reserves totaling 47 million tons. It is expected that all permits will be obtained in 1996 with mine development and SX-EW plant construction to follow.

Future mining plans for the Van Dyke, located underneath the town of Miami, are to inject acid into previously mined underground areas and treat recovered solutions in an SX-EW plant. The ore reserve is an estimated 110 million tons at 0.60 percent copper.

Asarco Incorporated

Asarco's Arizona operations consist of the Hayden copper smelter, two major open-pit mines, Mission and Ray, and a dump leaching/cementation operation at the Silver Bell mine. The mines' production was 508 million pounds of copper in 1994.

Asarco, along with joint venture partner Freeport, continues the in-situ leach research project at the Santa Cruz property in cooperation with the U.S. Bureau of Mines. In 1995 a test project that injects sulfuric acid into the undisturbed copper bearing formation was begun. This technology, if successful, has the potential of extracting copper from deep deposits with very little impact on the environment.

The Hayden Smelter consists of an INCO flash furnace rated at 720,000 tons of charge per year for an estimated production of 175,000 tons of blister copper.

The company's Mission complex, 18 miles south of Tucson, is a consolidation of the Mission, Eisenhower, San Xavier South, and Pima open-pit mines. The smaller but separate San Xavier North pit is also included. Sulfide ore is treated at two mills, Mission and South. They have the capacity to process 63,000 tons of ore daily resulting in an annual capacity of 124,000 tons of copper in concentrates. Mission produced 225 million pounds of copper in 1994.

In 1994 Asarco began developing a 5 million ton underground deposit at Mission. Access to the orebody is through declines driven from the base level of the Mission pit. The underground operation will add about 28 million pounds of copper per year beginning in mid-1996.

The Ray mine consists of an open-pit mine, two mills - a concentrator at Hayden and a recently commissioned 30,000 ton per day concentrator at Ray, dump and heap leach operations, and a 40,000 ton per year SX-EW plant at Ray. A 15-month accelerated development program has been completed and production is at full capacity. The Ray mine is in an elite group of three deposits in the U.S. with reserves in excess of 1 billion tons.

Asarco's Silver Bell mine produces copper by dump leach precipitation. The open-pit mine and mill remain on stand-by status. The company received permits in 1994 for a new SX-EW plant that when completed is expected to produce 18,000 tons of refined cathode copper annually at substantially lower cost. Oxide ore is expected to come from a new area of the property known as Silver Bell North.

36030, Tucson, AZ 85740-6030 - Phone (520) 744-3222, Fax (520) 744-4394 - Employees 150 - Two operations in the Tucson area - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.

President Richard Hrubes
Sales Manager Ron Green
Operations Manager Mike Smith

UNITED METRO MATERIALS, INC.

701 North 44th Street, Phoenix, AZ 85008, P.O. Box 52140, Phoenix, AZ 85072 - Phone (602) 220-5000 - Employees: 825 - Sand, gravel, ready mix concrete, and asphalt material.
President John Fowler
Vice President Sales Bill Heeter
Chief Engineer Bill Peck
Plant Safety Dir./Environmental Coord. Tom Dunwell
Safety Administrator David Chavez

Plant 1 - Central Avenue Plant

2800 S. Central Ave., Phoenix, AZ 85066 - Phone (602) 243-7080 or (602) 220-5000 Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.
Plant Superintendent Randy Patheal

Plant 2 - Mesa Plant

2830 North Beeline, Mesa, AZ 85256 - Phone (602) 990-0844 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.
Plant Superintendent Jim Shields

Plant 6 - El Mirage Plant

8507 N. El Mirage Road, El Mirage, AZ 85335 - Phone (602) 935-2653 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete - On standby.

Plant 11- 19th Avenue Plant

3640 S. 19th Avenue, Phoenix, AZ 85009 - Phone (602) 262-1391 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.
Plant Superintendent Randy Patheal

Plant 12 - Glendale Plant

11920 W. Glendale Road, Glendale, AZ 85307 - Phone (602) 935-3562 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.
Plant Superintendent Norris Fish

Plant 33 - Flagstaff Plant

5200 E. Railroad Avenue, Flagstaff, AZ 86004 - Phone (520) 526-5250 - Plant site - Material shipped in from various company pits, ready mix, asphaltic concrete.
Plant Superintendent Kent Krumm

Plant 36 - McCormick Pit

Highway 89 and Sunset Crater - Sand and gravel pit - Portable crushing and screening plant - Operated on a seasonal basis.

Plant 41 - Maricopa Plant

Maricopa Road and the Gila River, Maricopa - Phone (602) 220-5540 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.
Plant Superintendent David Arbo

Plant 47 - Coolidge Plant

Highway 287 and Attaway Road, Coolidge, AZ - (520) 723-5851 - Sand, gravel, rock products, ready mix concrete, and ABC.

Plant Superintendent Don Wofford
Plant 48 - Sacaton Plant

Highway 93, 1 mile north of Casa Blanca Road, Sacaton, AZ - (602) 262-1453 - Sand, gravel, rock products, ready mix concrete, and ABC.

Plant Superintendent Llyn Fulmer
Plant 49 - Casa Grande Plant

2305 S. Rooftile Rd., Casa Grande, AZ 85222 - Phone (520) 836-8705 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.

Plant Superintendent Will Wodkins

VALLEY CONCRETE & MATERIALS

820 E. Hwy. 89-A, P.O. Box 634, Cottonwood, AZ 86326 - Phone (520) 634-4250 - Employees: 45 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.

Plant Manager David Heath

VALLEY ROCK & SAND CO.

10700 E. Irvington Road, P.O. Box 18469, Tucson, AZ 85731 - Phone (520) 296-1733 - Employees: 4 - Sand, gravel, and rock products.

President Martin McCann

W.A. MORRIS SAND, GRAVEL & CONCRETE INC.
US Highway 191 South, Safford, AZ 85546 - Phone (520) 428-1371 - Employees: 25 - Sand, gravel, rock products, ABC, ready mix concrete, and asphaltic concrete.

Owner Jack Gilbert

WESTERN SAND & ROCK

4175 S. Litchfield Rd., P.O. Box 65, Avondale, AZ 85323
Phone (602) 932-1391 Employees: 3 - Sand, gravel, rock products, and ready mix concrete.

President Mike Quackenbush
Secretary and Operations Jennifer Quackenbush

W.M.K. TRANSIT MIX CO.

1680 Highway 95, P.O. Box 31, Bullhead City, AZ 86430 - Phone (520) 763-3887 - Employees: 37 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.

Manager Bob Swartzman

WICKENBURG CONCRETE & MATERIALS

U.S. Hwy. 60, M.P. 117.5, P.O. Box 1450, Wickenburg, AZ 85358 - Phone (520) 684-3402 - Employees: 17 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.

President Edwin Dillard
Vice President George Dillard

WILLCOX ROCK & SAND

1401 E. Maley, P.O. Box 156, Willcox, AZ 85644 - Phone (520) 384-2181 - Employees: 10 - Sand, gravel, rock products, ABC, and ready mix concrete.

Owners: Keith, Robert, and William Gallagher

YAVAPAI MATERIALS, INC.

5899 Wilkinson Drive, P.O. Box 814, Prescott, AZ 86302 - Phone (520) 445-7305 - Employees: 17 - Sand and gravel.
President/Owner John Pemberton

President Thomas M. Valente
Vice President Timothy Valente
Marketing Director Allan Ladd
Plant Manager Bob Strom
Controller Toby Ballintine

PIONEER SAND COMPANY

745 N. Gilbert #124-360, Gilbert, AZ 85234 - Phone (602) 926-8200 - Employees: 100.

Pioneer Sand #7

5901 W. Broadway Rd., Phoenix, AZ 85043 - Phone (602) 233-2971 - Sand, natural river rock, crushed rock, and ABC.

Florence Pit

19925 East Price Road, Florence, AZ 85232 - Phone (520) 868-4616 - Natural river rock and sand.

Casa Grande Quarry

Grande Rose decorative landscape rock and boulders.

Owner Gary Schnurr
Superintendent Dave Sawyers

REIDHEAD SAND & ROCK, INC.

P.O. Box 7, Paper Mill Rd., Taylor, AZ 85939 - Phone (520) 536-4519 - Employees - 35 - Sand, gravel, and ready mix concrete.

Manager Jack Zellner

RUE HALE PIPELINE SERVICE

611 S. Voight St., P.O. Box 221, Springerville, AZ 85938 - Phone (520) 333-4483 - Employees: 2 - Sand and gravel.

Owner Rue Hale
Sales Manager Lori Hale

SALT RIVER SAND & ROCK

Dobson Road and McKellips Road, P.O. Box 728, Mesa, AZ 85211 - Phone (602) 990-1987 - Employees: 200 - Sand and gravel - Second largest sand and gravel mine in the United States.

Owner Maricopa-Pima Salt River Indian Nations
Manager Wayne Hills
Sales Manager Denny Willcox

SAND SPECIALTIES, INC.

5570 N. Bush Highway, Mesa, AZ 85205 - Phone (602) 832-2120 - Employees: 4 - Aggregate products.

Manager Ernest Perkins

SAN XAVIER ROCK & MATERIALS

3895 N. Business Center Dr., Tucson, AZ 85745, P.O. Box 551, Cortaro, AZ 85652 - Phone (520) 293-6833 - Employees: 180 - Ready mix concrete, sand, and gravel.

Vice President and Division Manager Al Wilcox
Sales Manager Benny Bingham
Nogales Plant

91 Old Ruby Road, Nogales, AZ 85621 - Phone (520) 281-9669 - Sand and gravel products, ABC, and ready mix concrete.

Plant Superintendent Dave Sunderman

Plant Superintendent Bill Wion
Tucson Plants

6200 Cortaro Farms Road, Tucson; 10011 Valencia Road, Tucson; Southwest of Tucson International Airport.
Green Valley Plant

24560 S. Old Nogales Highway, Green Valley.

Pinal County Plant

North of Catalina.

SCARBOROUGH SAND & GRAVEL

920 Stratton Dr., Safford, AZ 85546 - Phone (520) 428-3138 - Employees: 5 - Sand, gravel, and rock products.

Owner/Manager Winfred Scarborough

SMITH AND BELL CONSTRUCTION

1711 N. 8th Avenue, Safford, AZ 85546 - Phone (520) 428-4747 - Employees: 10 - Sand, gravel, ABC, and rock products.

Owner Rick Findley

SUN STATE ROCK & MATERIAL CORP.

P.O. Box 1340, Sun City, AZ 85372 - Phone (602) 566-3000 - Employees: 40 - Sand, gravel, ABC, and rock products.

Owner Dolores Walker

SUNWARD MATERIALS

2625 S. 19th Ave., Phoenix, AZ 85009 - Phone (602) 253-2505 - Employees: 300 - Sand, gravel, rock products, and ready mix concrete.

Vice President Operations Chris Reinesch

SUPERIOR COMPANIES

Hayfield Draw & Cherry Pit, Camp Verde, AZ 86322 - Phone (520) 567-2244 - Employees: 60 - Sand, gravel, and rock.

General Manager Ed Davidson
Maintenance Supervisor Randy Austin
Foreman Bruce McDonald

SUPERSTITION CRUSHING

2323 E. Hale, Mesa, AZ 85213 - Phone (602) 962-5326.

Owner John Weik

Owner Myron Jones

Yuma Pit

Southwest of intersection of Avenue 3E and County 19 east of Yuma, 2755 4th Avenue #938, Yuma, AZ 85364 - Phone (520) 341-9866 - Employees: 25 - Sand, gravel, rock products, and ABC. Aggregate also supplied to company's ready mix concrete and asphaltic concrete plants at another Yuma location.

THE TANNER COMPANIES

2088 E. 20th Street, P.O. Box 1449, Yuma, AZ 85366 - Phone (520) 343-4100 - Employees 200.

President Gerald Janney

Plant 180 - Yuma

13 miles east of Yuma on S.R. 95 @ M.P. 37.5 - Phone (520) 343-4180 - Sand, gravel, and asphaltic concrete.

Plant 182 - Yuma

10th Street, Yuma, AZ - ABC.

Plant 185 - Parker

4.5 miles north of Parker on S.R.95 - Phone (520) 669-9251 - Aggregate, ready mix concrete, and asphaltic concrete.

Plant Foreman Virgil Hollis

TUCSON ROCK AND SAND

6601 N. Casa Grande Hwy., Tucson, AZ 85743, P.O. Box

Cambior U.S.A.

Carlota Copper Company, a subsidiary of Cambior U.S.A., continues environmental permitting for its Carlota project near Globe. It is anticipated the final Environmental Impact Statement from Tonto National Forest will be received by January 1996 and construction started by mid-year. The property consists of four oxide ore bodies, Carlota, Cactus, and North and South Eder. Minal reserves total 96 million tons grading 0.44 percent copper. Production is planned at a rate of 30,000 tons of copper per year for the first ten years via open pit mining, heap leaching and SX-EW.

Cyprus Climax Metals Company

Cyprus is Arizona's second largest producer of copper and the world's largest producer of molybdenum. Copper totals for 1994 were 601 million pounds of copper with an estimate of 675 million pounds for 1995. Cyprus Climax Minerals Company maintains corporate headquarters in Tempe, Arizona and operates five copper producing operations in the State: Bagdad, Tohono, Miami, Mineral Park, and Sierrita.

The Sierrita property consists of three open-pit copper-molybdenum mines, a 110,000 ton per day concentrator, two molybdenum roasting plants, a ferromolybdenum plant, a rhenium plant, a dump leaching operation, and an SX-EW plant. More than three quarters of Cyprus' molybdenum concentrate from Thompson Creek (Idaho), Bagdad, and Sierrita is processed at Sierrita through roasters to produce molybdenum oxide and ferromolybdenum. Sierrita is recognized as one of the most efficient mines in the world as it operates with the lowest copper grade, 0.28 percent, of any milling operation.

The Bagdad operation consists of an open-pit copper-molybdenum mine, a 85,000 ton per day concentrator, a dump leach operation, and a SX-EW plant. In 1994 Bagdad produced 31 million pounds, or 15 percent of its total copper production, as electrowon copper cathode. Bagdad has a billion ton proven and probable ore reserve of 0.38 percent copper and 0.028 percent molybdenum.

Cyprus has entered an agreement with the Tohono O'-Odham Nation to develop a 600 million ton resource at Casa Grande. The Bureau of Land Management has approved the final environmental impact statement for the project. The Tohono operation consists of an open pit, copper heap leach, and SX-EW plant. In 1994 Tohono produced 24 million pounds of copper.

The Miami mine consists of an open pit copper mine, an SX-EW plant, a smelter recently expanded to a capacity of 650,000 tons per year, an acid plant, a new 380 million pound electrolytic refinery, and a 135,000 ton per year rod plant. Miami produced 119 million pounds of copper in 1994 and has increased the capacity of its SX-EW plant to increase production in 1995. The investments in the smelter and refinery at Miami have made Cyprus, not only more

MINERAL PRODUCTION IN ARIZONA - 1994

COMMODITY	QUANTITY	VALUE
Clay (tons)	101,000	\$421,000
Copper (tons)	1,301,000	2,820,000,000
Gemstones		3,780,000
Gold (troy ounces)	80,000	28,900,000
Sand & gravel(tons)	49,600,000	185,000,000
Silver (troy ounces)	5,470,000	23,500,000
Stone-crushed(tons)	7,280,000	38,300,000
Pigments (tons)	75	38,000
Coal (tons)	12,901,000	300,000,000
Other ²		225,000,000

TOTAL	\$3,625,000,000
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1/ Nonfuel figures from U.S. Bureau of Mines.

2/ Cement, clays (bentonite), gypsum, lime, molybdenum, perlite, pumice, salt, sand & gravel (industrial), dimension stone, lead.

efficient, but also self sufficient in domestic copper smelting and refining.

At the Mineral Park open-pit copper-molybdenum mine in Mohave County, Cyprus converted the in-place leach and precipitate operation to an SX-EW operation capable of producing 6 to 8 million pounds of copper per annum. A research project studying the feasibility of in-situ leaching a fracture hosted chalcocite deposit at Mineral Park is underway.

Magma Copper Company

San Manuel, Pinto Valley, and Superior are Magma Copper company's three mining divisions in Arizona. Magma Copper Company's corporate headquarters are located at Tucson. Magma holds additional, undeveloped reserves at the Poston Butte and Copper Creek deposits. Magma acquired the Poston Butte deposit at Florence from Conoco in 1992. It completed a 17-month prefeasibility study to evaluate the deposit as an in-situ leach operation in 1994. Magma has initiated the permitting and feasibility study process.

The underground mine at San Manuel is the largest underground operation in the United States and the largest underground copper mine in the world. San Manuel produced 215 million pounds of copper in 1994. The San Manuel Division consists of a block-caving underground copper mine, a 62,000 ton per day concentrator, heap leach,

in-situ leach, SX-EW plant, a 1,300,000 ton per year smelter with a 3,000 ton per day acid plant and a 345,000 ton per year electrolytic refinery, and a 180,000 ton per year rod plant. Development of the downfaulted Kalamazoo ore body at San Manuel is continuing. Its estimated ore reserves of 2.1 billion pounds contained copper will add twelve years to the San Manuel underground mine. Production is planned to be phased in with the depletion of the San Manuel orebody over the period from 1997 through 1999.

Magma's San Manuel smelter accounts for about 25 percent of U.S. copper smelting capacity. The Outokumpu flash smelting furnace was the largest single furnace smelter in the industry and a 20 percent expansion of its capacity was completed in March, 1994.

The Pinto Valley division includes the Pinto Valley mine and the Miami in-situ and Miami No. 2 tailings leach operations. The Pinto Valley mine consists of an open-pit mine, a 63,000-ton-per-day concentrator, dump leach and 8,000 ton per year SX-EW plant. Miami's leach operations recover copper from in-situ leaching of the old Miami mine block cave area and by hydraulic mining and leaching of the old Miami tailings. The resulting pregnant leach solutions are processed through Miami's 10,000 ton per year SX-EW plant. Pinto Valley produced 199 million pounds of copper in 1994.

The Superior division consists of the company's namesake, the Magma underground mine. This mine overcomes the difficult mining challenges of being hot, wet, and deep. That it remains in production is credited to its high grade ore, averaging 5.53% copper in 1994, ten times the average content of Arizona copper ore. Magma produced 41 million pounds of copper in 1994, but is slated for closure in 1996.

Oracle Ridge Mining Partners

The Oracle Ridge Mining Partnership consists of Santa Catalina Mining Corp., (formerly South Atlantic Ventures Ltd.) who hold a 70% interest and operate the mine, and Continental Materials holding the remaining 30%. The underground Oracle Ridge mine produced concentrates containing 5.2 million pounds of copper in 1993. The company is planning to expand production to 1 million pounds per month.

Phelps Dodge Corporation

Phelps Dodge Corporation, headquartered in Phoenix, is the nation's largest copper producer and the world's largest producer of SX/EW cathode copper. Its mining division, Phelps Dodge Mining Company, produces about one-third of the U.S.'s new copper at its mines in southeastern Arizona and southwestern New Mexico. In Arizona Phelps Dodge holds the Copper Queen Mine in Bisbee and the Morenci in Greenlee County. Morenci is the largest copper producer in North America and the second largest copper mine in the world. In 1994, Morenci

produced a record 407,400 tons of copper! Phelps Dodge owns an 85 percent undivided interest in the Morenci Mine; the remaining 15 percent is owned by Sumitomo Metal Mining Company, Ltd. Morenci employes more than 2,000 people.

The Morenci operation consists of the Morenci, Metcalf, and Northwest Extension open-pit copper mines, the 100,000 ton per day Morenci concentrator with a molybdenum circuit, the 40,000 ton per day Metcalf concentrator, three dump leaches with SX plants and at a capacity of 340 million pounds annually, the worlds largest EW plant. A \$200 million expansion to the SX-EW facility was completed in 1994. The Southside deposit adjacent to the Morenci pit, with reserves estimated at 150 million tons, is scheduled to go into production in late 1995. It will produce an additional 130 million pounds of high-grade copper per year.

The feasibility of adding a fourth open pit, Coronado, to the mining operation is under way. It hosts 480 million tons of sulfide and oxide ore. The near-by Western Copper deposit is estimated to contain 530 million tons of milling material at a grade of 0.55 percent copper, and 500 million tons of leach material at a grade of 0.31 percent copper. In 1994, part of a large resource of leachable material, containing 760 million tons grading 0.28 percent copper, was outlined north of the Morenci mine in an area called Garfield. Drilling to define the rest of this deposit was continued.

The company's Copper Queen mine consists of a dump leaching and precipitation operation at the depleted Lavender pit. No decision has been made as to when to bring the adjacent Cochise deposit to production.

Phelps Dodge has opened an office in Safford where evaluation of the Lone Star, Dos Pobres, and San Juan deposits continues. Recent drilling at these deposits has increased identified resources to nearly 2 billion tons of open pitable material that could be recovered by heap leach SX-EW operations. Work is also underway on a land exchange to facilitate development in the district.

At San Juan 170,000 feet of reverse circulation drilling and core drilling in 152 holes was completed and an option to acquire the property was exercised in September of 1994. In May 1995, negotiations were begun to purchase the Sanchez property near Safford from Azco Mining Company. The acquisition of Sanchez would add 200 million tons of copper reserves and complete Phelps Dodge's land position in the district. A final decision is pending approval by Azco.

The New Cornelia mine at Ajo remains inactive. The ore reserves there are 160 million tons grading 0.56 percent copper.

HAMILTON SAND & GRAVEL

Hamilton Rd., RR 1 Box 1350, Willcox, AZ 85643 - Phone (520) 384-2582 - Sand, gravel, and rock.
Owner David May

HATCH CONSTRUCTION & PAVING

Hwy. 77, Taylor, AZ 85939 - Phone (520) 536-7213 - Employees: 75 - Sand, gravel, road materials, and ready mix concrete.
President Jerrold L. Hatch
Vice President Lynn R. Hatch
Vice President Lenn B. Hatch
Secretary Danny F. Hatch

HUACHUCA CONCRETE, INC.

P. O. Box 2868, Sierra Vista, AZ 85636 - Phone (520) 456-1600 - Employees: 9 - Sand, gravel, aggregate products, ABC, leach rock, and rip rap.
General Manager Mike Berry

J.D.'S SAND & GRAVEL INC.

559 Ruby Rd., P.O. Box 35, Nogales, AZ 85628 - Phone (520) 281- 9449 - Employees: 4 - ABC, fill, and aggregate.
President Michael Williams

JIM BUSH SAND & GRAVEL

1015 N. Cameron, Ajo, AZ 85321 - Phone (520) 387-6250 - Employees: 4 - Sand, gravel, and landscaping material.
President Patti Bush
Vice President David Bush

KINGMAN REDIMIX

9985 Shipping Lane, Kingman, AZ 86401 - Phone (520) 757-7446 - Employees: 10 - Sand, gravel, and ready mix concrete.
President Pete Campbell

KOCJAN ASSOCIATES, INC.

Industrial Park, P.O. Box 3748, Page, AZ 86040 - Phone (520) 645-3602 - Employees: 10 - Sand, gravel, ABC, ready mix concrete, and asphaltic concrete.
President John Kocjan
Vice President Gerald Kocjan
Secretary Ted Kocjan

MADDUX & SONS, INC.

1927 Pan American, P.O. Box 1077, Douglas, AZ 85608 - Phone (520) 364-7564 - Employees: 50 - Sand, gravel, ready mix, and rock products.
President Lenard Maddux
Office Manager Toni Vance
Sales and Orders Roxy Maddux
Sales and Orders Debby Hauley

MCCORMICK CONSTRUCTION

1941 Richardo Ave., P.O. Box 545, Bullhead City, AZ 86430 - Phone (520) 763-2272 - Employees: 19 - Sand, gravel, rock products, and asphaltic concrete.
Vice President Scott Merrill
Office Manager Sharon Hartman

MESA MATERIALS, INC.

3410 N. Higley Road, Mesa 85205, P.O. Box 20040, Mesa, AZ 85277 - Phone (602) 830-1521 - Fax (602) 981-9255
Employees: 50 - Operates multiple quarries - Sand, gravel, and asphaltic concrete.
Owner Edward C. Levy
Vice President Wayne Stamper
Office Manager Bruce Erickson
Accounts Payable Belinda Beck
Operations Manager, East Side Dave Scheffler
Operations Manager, West Side Ron Ernst
Receptionist Tess Sanderlin

MOHAVE CONCRETE & MATERIALS INC.

4502 Hwy. 95 N., Lake Havasu City, AZ 86404 - Phone (520) 764-2226 - Employees: 30 - Sand, gravel, rock products, and ready mix concete.
Owner Qinto Polidori
Treasurer Veronica Polidori
Mohave Concrete S&G No. 1
Superintendent Jay Finnegan
Mohave Concrete S&G No. 2
1781 E. Boundary Cone Road, Mohave Valley, AZ - Phone (520) 330-3750.
Superintendent Willis Hedley
Mohave Concrete S&G No. 3
2699 West Hwy. 66, Kingman, AZ - Phone (520) 753-5554.
Superintendent Richard Hadley

PADILLA SAND & GRAVEL HCR

409 Camino Ramonte, Rio Rico, AZ 85648 - Phone (520) 287-8831 - Employees: 5 - Sand, gravel, and ready mix concrete.
Owner Manuel Padilla

PAULDEN SAND & ROCK REDIMIX

Division of Dunbar Stone Co., Inc.
P.O. Box 403, Paulden, AZ 86334 - Phone (520) 636-2500 - Employees - 11 - Sand, gravel, and ready mix concrete.
Vice President Warren Dunbar
Office Manager/Sales & Orders Barbara McGirr

PAYSON CONCRETE & MATERIALS, INC.

1900 E. Hwy. 260, Payson, AZ 85541 - Phone (520) 474-2231 - Employees: 40 - Aggregate, sand, gravel, rock products, ready mix concrete, and asphaltic concrete.
Plant Manager George Randall
Plant Manager John Chillson
Asphalt Plant Manager Fred Randall
Sale Representative Tim Hughes

PEARCE, JOY T. CONSTRUCTION, INC.

1020 Pearce Road, Show Low, AZ 85901 - Phone (520) 537-7454 - Employees: 28 - Rock, sand, cinders, ready mix concrete, and asphaltic concrete.
Owner/President Mr. Joy T. Pearce
Secretary Beth Pearce

PHOENIX REDIMIX COMPANY

3635 S. 43rd Ave., Phoenix, AZ 85009 - Phone (602) 272-2637 - Employees: 200 - Operates 3 quarries - Sand, gravel, and ready mix concrete.

8855 S. Hughes Access Road, Tucson, AZ 85706 - Phone (520) 574-9002 - Ready mix concrete and asphaltic concrete.

Tangerine Plant
W. Naranja, Tucson, AZ 85704 - (520) 682-2158 - Ready mix concrete and asphaltic concrete.
Rillito Quarry
11351 Casa Grande Hwy., Tucson, AZ 85743 - Phone (520) 884-7768 - Sand, gravel, rock products, and ABC.

CAMPBELL REDI-MIX
1510 Copper Lane, Lake Havasu, AZ 86403 - Phone (520) 855-6535 - Employees: 3 - Sand, gravel, and rock products.
Owner Delbert Campbell

CENTRAL ARIZONA MATERIALS
9699 E. Hwy. 287, Coolidge, AZ 85228 - Phone (602) 649-0244 - Employees: 4 - Landscaping and construction materials.
Manager/Owner Randy Parsons

CHANDLER READY MIX
3250 E. Lehi Road, P.O. Box 928, Mesa, AZ 85211 - Corporate phone (602) 892-0501 - Quarry phone (602) 830-3464 - Employees: 30 - Sand and gravel.
President David Hudder

CHURCHMAN SAND & GRAVEL
P. O. Box 42874, Tucson, AZ 85733 - Phone (520) 325-1611 - Employees: 5 - Sand and gravel.
President Dick Smith
Vice President Doug Smith

CKC MATERIALS DIVISION
1234 E. Airport Road, Safford, AZ 85546 - Phone (520) 428-3423 - Employees: 25 - Aggregate base, mineral base, and ready mix concrete.
President David Cluff
General Manager Carl Bryce

DESERT CONCRETE CO.
5231 E. Buffalo Soldier Road, P.O. Box 430, Sierra Vista, AZ 85636 - Phone (520) 378-2321 - Employees: 5 - Sand and gravel.
Manager Jeannine Austin

DESERT CONSTRUCTION INC.
4490 E. Hwy. 66, Kingman, AZ 86401 - Phone (520) 757-2213 - Employees: 45 - Paving materials, ready mix concrete, and rock products.
President Tom Short
Secretary/Treasurer Jim Short

DOWNEY, L. A. & SONS INC.
11600 E. Poorman Rd., Tucson, AZ 85747 - Phone (520) 886-2315 - Employees: 9 - Sand and gravel.
President Dennis C. Downey
Vice President Darrell Downey
Secretary/Treasurer David Downey

EADS CONSTRUCTION & REDI-MIX INC.
46 Cochise Row, Bisbee, AZ 85603 - Phone (520) 432-4121

- Employees: 7 - Sand and gravel.
President Charles R. Eads
Vice President Sunny Quinn
Secretary/Treasurer Louise Eads

EARTH PRODUCTS
7563 E. Highway 69, Prescott Valley, AZ 86314 - Phone (520) 772-6446 - Employees: 26 - Sand and gravel, rock, leach rock, and decomposed granite.
President William H. Hyslip
Superintendent William G. Hyslip

FT. MCDOWELL SAND & GRAVEL CO.
State Route 87, P.O. Box 17150, Fountain Hills, AZ 85268 - Phone (602) 837-2358 - Employees: 70 - Sand and gravel.
President John Kirk

FRANCIS DAY & SONS
P.O. Box 157, St. Johns, AZ 85936 - Phone (520) 337-2121 - Employees: 7 - Sand, gravel, and ready mix concrete.
Owners Francis and Marlow Day

FRED CLARK TRUCKING CO. INC.
104 Main, Mammoth, P.O. Box 116, AZ 85618 - Phone (520) 487-2232 - Employees: 18 - Sand, gravel, and ready mix concrete.
Owner Charles Clark

G & S SAND & ROCK
P.O. Box 1254, Mayer, AZ 86333 - Phone (520) 632-9359 - Employees: 4 - Aggregate materials.
Owner Susan Bennett

GENERAL ROCK & SAND
Industrial Road, P.O. Box 3049, Page, AZ 86040 - Phone (520) 645-3289 - Employees: 30 - Sand, gravel, and ready mix concrete.
President Merrill Jessop
Superintendent Donovan Stubbs

GLORY ENTERPRISE, LLC
P.O. Box 3627, Flagstaff, AZ 86003 - Phone (520) 526-5571 - Employees: 4 - Volcanic cinders, ABC, and fill dirt.
Owner Bonnie and Jim Crick

GRANITE CONSTRUCTION CO.
4115 E. Illinois, P.O. Box 27557, Tucson, AZ 85726 - Phone (520) 748-8000 - Employees: 298 - Sand, gravel, road materials, soil, ready mix concrete, and asphaltic concrete.
Branch Manager Ted Haworth
Office Manager Maura Noland

GRANITE MOUNTAIN MATERIALS
560 EZ Street, P.O. Box 3520, Prescott, AZ 86302 - Phone (520) 778-5553 - Employees: 6 - Crushed granite.

GUZMAN CONSTRUCTION
P.O. Box 3100, Globe, AZ 85502 - Phone (520) 425-5775 - Employees: 60 - Sand, gravel, rock, and road materials.
President Mike Guzman Jr.
Vice President Wess Bryant
Superintendent Joe Rackley

COAL

Coal is a distant second to copper in economic importance of mineral commodities produced in the State. In 1994 Arizona's coal production was 12,901,000 short tons, having an estimated value of \$300 million. All production is from land leased from the Navajo and Hopi Nations by Peabody Western Coal Company. Royalties from coal production total \$30 million annually. Peabody is the nation's largest coal producer and Kayenta is their largest operation.

High-quality coal is strip mined from the Kayenta and Black Mesa mines in central Navajo County. The coal is subbituminous with an average quality of 11,000 Btu, 0.5 percent sulfur, and 10 percent ash. Both mines are now using 300-ton capacity tractor trailer bottom-dump trucks to transport coal from the mine to the conveyors and pipeline feed plants.

Kayenta Mine's production capacity is 8 million tons annually. The coal from the mine is carried by a conveyor system 17 miles to storage silos. From there it is transported by the electric-powered trains of the Black Mesa & Lake Powell Railroad to the Salt River Project Navajo Generating Plant 78 miles away.

Black Mesa Mine's annual capacity is 4.5 million tons. Here, the coal is powdered and mixed with water prior to transport by the world's longest coal-slurry pipeline. The 273-mile journey to the Mohave Generating Station at Laughlin, Nevada takes about three days.

Peabody's operations at Black Mesa are model reclamation programs. Mining and reclamation proceed at the same

rate of approximately 500 acres annually. 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

In December of 1994 Addwest Minerals Inc. reopened the Gold Road mine in the historic Oatman mining district following construction of a 500 ton per day mill. During 1995 the company announced plans to sell this project and their other gold holdings. Production continues while the property remains on the market.

The Gold Prince mine in the Dos Cabezas Mountains continued to produce gold-bearing silica flux supplying Phelps Dodge's Hidalgo Smelter in Playas, New Mexico. Western States Minerals replaced the mining contractor with its own staff during 1995.

Two new gold operations are added to this years active mines list. Cochise Resources is operating the Golden Rule in Cochise County with a small gravity and flotation mill producing a gold, lead, and silver concentrate. Gold Chord Inc. has nearly finished development at the Evening Star mine located in western Maricopa County. Shipments of gold and copper bearing silica flux should begin in the spring of 1996.

Gold continues to be produced as a by-product of the copper industry in Arizona. Last year the major copper mines produced approximately 60,000 ounces of gold from the following mines: San Manuel, Magma, Morenci, Ray, Mission, Sierrita, Pinto Valley, and Oracle Ridge.

"Gray's children on burro" circa 1906



INDUSTRIAL MINERALS

Although copper accounts for three-fourths 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 construction aggregate, diatomite for metallurgical process insulation, tile and brick clay, salt, cinders, smelter slag, pumice for laundry uses and light-weight aggregate, zeolites for molecular sieves, crushed stone, decomposed granite, perlite for filters, gypsum for wall board and agriculture, silica flux, hematite for pigments, quarried flagstone, and hydrafrac sand.

Construction aggregates in the form of sand and gravel lead this industrial mineral group, both in volume and value of production. For 1994 and the first quarter of 1995 Arizona's sand and gravel production ranked third in the United States. For the same period Arizona's position in total construction aggregate production (sand and gravel combined with crushed stone) was eleventh in the country. In 1994 Salt River Sand & Rock located in Maricopa County operated the second largest sand and gravel plant in the U.S.

Arizona is fortunate to have large quantities of sand and gravel near consuming centers. Slightly over ninety percent of Arizona's construction aggregate is produced from sand and gravel deposits. The remaining ten percent is produced from quarries where it must be drilled, loaded with explosives, blasted, crushed, and screened. The average value of Arizona's sand and gravel is \$4.10 per ton compared to \$5.80 per ton for crushed rock.

The Arizona Department of Mines and Mineral Resources continues to encourage exploration, development, and production of industrial mineral deposits in Arizona to supply southwestern United States and northern Mexico markets.

GEMSTONES

Arizona is a leading state in the value of mined gemstones in the United States. Approximately \$3.7 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, and fire agate making up the remainder.

Turquoise, a hydrous phosphate of aluminum and copper, is the leading gemstone produced in Arizona. Prized for its color, turquoise is the traditional gemstone used in Southwestern Native American 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 Reservation east of Globe. Arizona material is suitable for faceting and is 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. Petrified wood occurs in all Arizona counties, but that occurring in Navajo and Apache counties in the Triassic Chinle Formation supplies nearly all of the gem market. Commercial production comes only from private lands.

Gem material, mineral specimens, and fossils collected by the rockhound hobbyist is not included in the reported gemstone production, but it is likely that rockhound production is higher than the reported mine production. Some portion of rockhound-collected material goes directly into collections, however much of it is processed by lapidaries, and sold privately or at gem shows. The gem show in Quartzsite, for example, is the largest in the world, drawing in excess of 100,000 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.

RECREATIONAL PROSPECTING

An important segment of the Arizona mineral industry is that of recreational mining. This group includes primarily gold-panners and operators of small hobby-type suction dredges. Although some gold is likely recovered by nearly all who participate in this form of recreation, the recreational value nearly always out weighs the value of gold produced. Economic data for recreational mining is difficult to quantify, but the impact on the Arizona tourism industry is significant.

SAND AND GRAVEL OPERATIONS

A & A MATERIALS
10333 E. McDowell Road, Scottsdale, AZ 85257 - Phone (602) 990-0557 - Employees: 25 - Landscape materials, granite, river rock, sand, and gravel.
President/Owner/Manager Arthur H. Adams
Co Vice President Raymond A. Adams
Co Vice President DeWayne Adams

A-ROCK INC.
P.O. Box 781, Flagstaff, 86002 - Phone (520) 527-0031 - Employees: 12 - Sand and gravel.
Manager Don Merrick

ABC SAND & ROCK
5401 N. 119th Avenue, Glendale, AZ 85307 - Phone (602) 935-1677 - Employees: 4 - Natural river rock and sand.
Owner David Waltemath

ACE SAND & GRAVEL
1011 W. Silverlake Rd., Tucson, AZ 85713 - Phone (520) 622-1869 - Employees: 3 - Sand and gravel.
Owner Delia Gastelum

ACME SAND & GRAVEL
7707 E. 22nd Street, Tucson, AZ 85710 - Phone (520) 296-6231 - Employees: 3 - Sand and gravel, fill, and top soil.
Owner Flo Kempton

AJAX SAND & GRAVEL
5026 S. 51st Avenue, Laveen, AZ 85339 - Phone (602) 237-3232 - Employees: 2 - Landscaping rock.

ALLISON ROCK & SAND CONSTRUCTION
(dba L. Sheldon & Co.)
P.O. Box 5065, Huachuca City, AZ 85616 - Phone (520) 456-1521 - Employees: 6 - ABC, sand, leach rock, and topsoil.
President Loren Sheldon

ARIZONA CRUSHING CO.
650 W. McKellips Road, Mesa, AZ 85201 - Phone (602) 835-0207 - Employees: 75 - Blended sand and gravel products.
President Terese Sanders
Vice President Joe Moody

ARIZONA SAND & GRAVEL
1401 Atlantic Ave., Yuma, AZ 85365 - Phone (520) 344-5577 - Employees: 3 - Ready mix concrete and sand and gravel.
President Ernie Kaznak

B & R MATERIALS
4200 S. Harrison Road, P.O. Box 18138, Tucson, AZ 85731 - Phone (520) 298-2371 - Employees: 23 - Sand and gravel.
President Roland C. Brown
Vice President Kim Schroeder

BRIMHALL SAND, ROCK, & BUILDING MATERIAL
P.O. Box 750, Snowflake, AZ 85937 - Phone (520) 536-4226 - Employees: 62 - Sand and gravel products.
President Darrell Brimhall
Vice President Larry Brimhall
General Manager M. Kirk Brimhall

CALMAT COMPANIES
CALMAT COMPANY OF ARIZONA
Corporate Office - 3200 San Fernando Road, Los Angeles, CA 90065 - Phone (213) 258-2777.
Concrete and Aggregate Division, Arizona and New Mexico - 1801 E. University Drive, Phoenix, AZ - Phone (602) 254-8464 - Employees: 325 - Sand, gravel, rock products, ready mix concrete, ABC, and asphaltic concrete.
Vice President/General Manager Charles Wallace
Regional Operations Manager Frank Herrick
Phoenix District Operations Manager Dave Moran
Properties Division - Phone (602) 254-8465
Manager, Planning and Regulatory Affairs Lee Edmonson
Center Street Plant
2405 N. Center Street, Mesa, AZ 85201 - Sand, gravel, rock products, ABC, and ready mix concrete.
Deer Valley Plant
2205 W. Adobe, Phoenix AZ 85027 - Phone (602) 842-4403 - Ready mix concrete.
Litchfield Plant
11923 W. Indian School Road, Litchfield Park, AZ 85340 - Phone (602) 935- 2323 - Sand, gravel, rock products, ABC, and ready mix concrete.
Manager Joe Flores
Mesa Plant
1900 N. Longmore, Scottsdale, AZ 85201 (on the Salt River Pima Maricopa Indian Community Reservation) - Ready mix concrete and asphaltic concrete.
Manager Eddie Center
Phoenix Plant
1801 E. University Drive, Phoenix, AZ 85034 - Sand, gravel, rock products, ABC, ready mix concrete, and asphaltic concrete.
Manager Richard McDonald
Sun City Plant
14521 N. 115th Avenue, El Mirage, AZ 85335 - Sand, gravel, rock products, ABC, ready mix concrete, and asphaltic concrete.
Manager Jack Long
West Phoenix Plant
4830 S. 43rd Avenue, Phoenix, AZ 85041 - Sand, gravel, rock products, and ABC.
Apex Plant and Tucson Administrative Office
11500 N. CalMat Drive, Marana, AZ 85653 - Phone (520) 629-0460 - Sand, gravel, rock products, ABC, and ready mix concrete.
District Manager Bill Mackey
Airport Plant

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: 6 - Located 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) Matthew Rix

WESTERN ARIZONA ROCK PRODUCTS

A Division of Hanson Natural Resources, Inc.

P.O. Box 178, Dateland, AZ 85333 - Phone (520) 454-2253, Fax (520) 454-2290 - Employees: 9.

Plant Manager Larry Lunsford
Assistant Plant Manager Gilbert Rodriguez
Office Manager Patti Wipple
Aztec Quarry T7S R12W Sec. 28

Granite quarry for railroad ballast - Crushing and screening plant - Located between Aztec and Dateland south of I-8 and the Southern Pacific Railroad - Sales outside of railroad system are for landscape uses.

WESTERN GYPSUM INC.

130 E. 200 North, St. George, UT 84770 P.O. Box 850, St. George, UT 84771 Phone (801) 628-3916, Fax (801) 628-4441 - Employees: 21.

President Don Cecala
Mine Superintendent Tracy Cannon
Office Manager Matina Harward
Snowflake Gypsum Mine T41N R13W Sec. 25

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.

WESTERN ORGANICS INC.

420 East Southern, Tempe, AZ 85282, P.O.Box 25406, Tempe, AZ 85285-5406 - Phone (602) 966-4442

Plant located at 27th Avenue and Lower Buckeye Road in Phoenix - Phone (602) 269-5756, Fax (602) 269-7621 - Employees: 100.

President James Porter
Vice President/Operations Manager D. C. Porter
Sales Manager Dennis Reynolds
Office Manager Adrian Cluff
Controller David Hancock

Salome Gypsum Mine T5N R11W Sec. 30

Open-pit gypsum mine operated by contractors - Gypsum for agricultural and horticultural uses, bagged and bulk - Used directly and in blends.

WESTERN STATES MINERALS CORP.

HCR 2, Box 3424, Hurtaldo Ranch Road, Dos Cabezas, AZ 85644 - Phone (520) 384-2564, Fax (520) 384-3766 - Employees: 18.

Project Manager Charlie Bauer
Mine Superintendent Bob Foster
Gold Prince Mine T14S R27E Sec. 22

Underground gold silica flux mine - Located 16 miles east of Willcox - ships directly to copper smelter- Capacity 100 TPD.

WESTERN STATES STONE COMPANY

2830 Grand Ave., Phoenix, AZ 85017 - Phone (602) 253-2018.

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

Quarries

P.O. Box 316 - Ash Fork, AZ 86320 - Phone (520) 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.

Superintendent-Sales Shirley Robertson
Superintendent- Mining Howard Gray

YELLOW HAIR TRADING AND MINING

P.O. Box 111, Globe, AZ 85502 - Phone (520) 425-7625 or 425-0446, Fax (520) 425-0738 - Employees: 45.

President & Co-owner W. H. Preston
Vice President & Co-owner Monty Nichols
Secretary-Treasurer & Co-owner Cheryl Preston
Sales Ed Wheeler
Sleeping Beauty Mine T1N R14E Sec. 12

Produces turquoise under contract with Magma Copper Company - Sorts, grades, and processes turquoise for worldwide distribution.

COMPANY LISTING

The following list is arranged alphabetically by company. To locate a specific mine use the index on page A25.

ADDWEST MINERALS INC.

P.O. Box 869, Oatman, AZ 86433 - Phone (520) 768-1600 - Employees: 120.

Acting General Manager Douglas Christopherson
Mine Superintendent Bill Rawls
Gold Road T19N R20W Sec. 11
Located at Oatman - Underground gold mine - 500 TPD CIP mill.

AMERICAN SANDSTONE

Blaser Corporation

2600 N. Highway 89, P.O. Box 1154, Chino Valley, AZ 86323 - Phone (520) 636-4454, Fax (520) 636-2780 - Employees: 50 - Quarries and processes Arizona flagstone into flagging, dimension stone and tiles.

President Donald Blaser
Vice President W. Larry Blaser
Sec./Treas. & Mgr. Operations - Orders . . . Dayle Blaser
Transportation Coordination Marcia Stewart
Blaser Stoneyard T16N R2W Sec. 22
Black Cat Quarries T22N R1W Sec. 17
Yellow Wasp No. 2 T22N R1W Sec. 9
Little Rock Quarry T22N R2W Sec. 24
Lizard Canyon Quarry T20N R1E Sec. 32
Red Rock Quarry T22N R1W Sec. 20

ANASAZI COMPANY

7486 E. Adobe Drive, Scottsdale, AZ 85255 - Phone (602) 585-9882 - Employees: 25 - Operates flagstone quarries in Coconino County and slate quarry in Maricopa County - Fabrication yard in Scottsdale - Marketed in the United States and Asia.

Co-owner & Fabrication Manager Grady Dawe
Co-owner & Mining Supervisor Neil Cowie
Anasazi Stoneyard T4N R4E Sec. 14
New River Slate Quarry T7N R3E Sec. 5
Rattlesnake Quarries T20N R1E Sec. 19
Sidewinder Quarries T23N R2W Sec. 36

APACHE STONE DIVISION

Halquist Stone Co. Inc.

22040 N. 21st Ave., Phoenix, AZ 85027 - Phone (602) 267-8658, Fax (602) 780-0544 - Employees: 9 (including contractors) - Quarries located near Mayer - Onyx marble quarry - Schist quarries - Landscape boulders, building and dimension stone.

President Perry Halquist
Manager Wayne Evans

Mayer Onyx Quarry T12N R1E Sec. 22

Blue Bell Schist Quarry T11.5N R1E Sec. 24

Rainbow Schist Quarry T12N R1E Sec. 23

ARIMETCO INTERNATIONAL INC.

Arimetco Inc.

335 N. Wilmot Rd., Suite 400, Tucson, AZ 85711 - Phone (520) 748-2600 - Fax (520) 748-2494.

President, Chairman, CEO H. Roy Shipes
Vice President, Chief Financial Officer Harold E. Davis
Senior Vice President & Assistant

Corporate Secretary John McKinney
Secretary Lona McBurney
Controller Martin Martinez
Chief Geologist Harrison Matson
V.P. and General Manager, U.S.

Operations Henry Shipes
Johnson Camp T15S R22E Sec. 26

Johnson Mine Road, Dragoon, AZ 85609 - Phone (520) 586-2241. Employees: 35 - Located north of exit 322 off I-10 - Open pit copper mine - Heap leach - Solvent extraction-electrowinning plant - Capacity 30,000 lb. copper per day.

Mine Manager Dave Jarvis
Emerald Isle T23N R18W Sec. 22

Old Chloride Road, Chloride, AZ 86431 - Phone (520) 565-4554 - Open pit copper mine - Heap leach - Solvent extraction-electrowinning plant - Capacity 10,000 lb. copper per day.

Van Dyke T1N R15E Sec. 30

P.O. Box 747, Miami, AZ 85539 - Phone (520) 473-2421 - In-situ leach - Under care and maintenance.

Zonia T11N R4W Sec. 12

P.O. Box 649, Yarnell, AZ 85362 - Phone (520) 427-3564 - Employees: 4 - Open pit copper mine - Heap leach - Solvent extraction-electrowinning plant- Permitting and engineering stage.

White Cliff Diatomite T9S R17E Sec 24

P.O. Box 1049, San Manuel, AZ 85618 - Phone (520) 385-2515 - Employees: 4 - Open pit diatomaceous earth mine and processing plant.

Mine Manager Nic Arrieta

ARIZONA OXIDES

1741 E. Morten, Phoenix, Arizona 85020 - Phone (602) 944-9494 - Fax (602) 944-8930 - Employees: 13.

President David C. Lincoln
Vice President & General Manager Vincent Scott

Marketing Director John Von Thaden
Plant Manager Steve Licano
Laboratory Manager Barbara Penunuri
Processing Plant
Grinding and sizing plant reduces crude hematite to red iron oxide pigment - Used in paints, plastics, concrete products and as a mold release in castings - Marketed internationally - New plant under construction in El Mirage.
Iron Chancellor Mine T20N R6W Sec. 22
Open pit and underground hematite pigment mine - Mining by contractors.

ARIZONA PORTLAND CEMENT COMPANY
State Sales Office
2400 N. Central, Suite 308, Phoenix, AZ 85004 - Phone (602) 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 (520) 682-2221 - Employees: 144 - Twin Peaks limestone quarry 5 miles west of plant - Cement plant - Capacity 1,100,000 TPY.
Plant Manager Dave Brittel
Quality Control Superintendent Steve Regis
Quality Control Supervisor Bill Phillips
Plant Engineer Russell Hawks
Personnel Manager Fran Young
Quarry Supervisor Chuck Hansen
Purchasing Agent Tom Follett

ARIZONA SILICA SAND COMPANY
P.O. Box 108, Houck, AZ 86506 - Phone (520) 688-2602, FAX (520) 688-2607 - Employees: 18 - Plant south of Houck - Hydrafrac sand for oil well treatment - Abrasives and mold sand - Markets in Arizona, California, and New Mexico - Bagged and bulk products available.
President Robert D. Fisher
General Manager James Burkewitz
Foreman Ralph Nelson
Evening Foreman Michael Murphy
Houck Silica Sand T22N R29E Sec. 29
Open pit hydrafrac sand mine.

ARIZONA STONE PRODUCTS
9643 N. Casa Grande Highway, Tucson, AZ 85743 - Phone (520) 798-3909 - Employees: 7.
Owner/General Manager Roger Hudman
M C Canyon Quarries T19N R1E Sec. 23
Sandstone quarries located 8 miles northeast of Drake - Quarried for flagstone - River run (stream worn) and surface (naturally weathered) sandstone for landscaping.

ASARCO INCORPORATED
Tucson Office
1150 N. 7th Avenue, Tucson, AZ 85705, P.O. Box 5747, Tucson, AZ 85703 - Phone (520) 798-7500 Fax (520) 798-7781.
Asarco Copper Operations
Executive Vice President F. R. McAllister
Assistant to the
Executive Vice President T. E. Scartaccini
Manager Development,
Projects & Services D. C. Dixon, Jr.
Financial Coordinator O. Ho
Environmental Engineering Manager D. M. Yantorno
Director of Materials L. G. Widugiris
Chief Geologist S. A. Anzalone
Santa Cruz and
Special Projects Manager D. F. Skidmore
Site Manager - Santa Cruz Project H. G. Kreis
Acid Sales Department
National Sales Manager G. P. Gillen
Governmental Affairs
Manager, State Legislative Affairs R. E. Quick
Tucson Information Services
Manager T. Fedoruk
Mission Mine T16S R12E Sec. 36
Box 111, Sahuarita, AZ 85629 - West Pima Mine Road - Phone (520) 648-2500 Fax (520) 648-0802 - Employees: 914 - Open pit copper mine - Two concentrators: Mission and South with a total rated capacity of 63,000 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
Financial 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 T3S R13E Sec. 10
Hayden Concentrator & Smelter T5S R15E Sec. 11
Ray Complex, P.O. Box 8, Hayden, AZ 85235 - Phone (520) 356-7811 Fax (520) 356-3802 - Employees: 1,644 - Open pit copper mine - Dump leach - Heap leach - Solvent extraction-electrowinning plant - Two concentrators: Ray rated at 30,000 TPD and Hayden rated at 30,000 TPD - Smelter capacity 720,000 TPY and 1,600 TPD acid plant.
General Manager T. E. Erskine
Manager, Ray Operations B. K. Malone
Manager, Hayden Operations J. Wilhelm

SUPERIOR COMPANIES
100 W. Coolidge, Phoenix, AZ 85013 - Phone (602) 230-9300 - Fax (602) 230-0189 - Employees: 60 - Company operates gypsum, clay, sand and gravel, and limestone mines.
President Archer V. Shelton
Vice President Don Fischer
Camp Verde Gypsum T13N R5E Sec. 11
P.O. Box 786, Camp Verde, AZ 86322 - Phone (520) 567-3854 - Gypsum and clay quarry five miles east of Camp Verde on State Highway 260 - Supplies gypsum to Phoenix Cement Company Plant at Clarkdale - Agricultural and horticultural uses - Clay for pond, ditch, and liner uses.
General Manager Ed Davidson
Maintenance Supervisor Randy Austin
Foreman Bruce McDonald
Winkelman Gypsum T6S R16E Sec. 27
P.O. Box 327, Winkelman, AZ 85292 - Phone (520) 357-7002 - Gypsum quarry - Gypsum for Arizona Portland Cement Plant at Rillito and agricultural uses.
Superintendent John Nevitt

SUPERLITE BLOCK COMPANY
4150 W. Turney, P.O. Box 23163, Phoenix, AZ 85063 - Phone (602) 269-3561.
President Norman Stout
Darling Cinder Pit T21N R9E Sec. 2
P.O. Box 30956, Flagstaff, AZ 86003-0956 - Phone (520) 526-5499 - Employees: 5 - Open pit cinder mine east of Flagstaff - Volcanic cinders used to make building block at the company's Phoenix and Mesa plants.
Mine Superintendent Terry Mitchell

SWANSEA MINERALS INC.
Office: 6360 E. Rose Circle Dr. Scottsdale, AZ 85251 - Phone (602) 994- 9964 - Fax (602) 941-2473 - Plant located at 1210 E. Gilbert Rd., Building H2, Tempe, AZ - Employees: 2 - Beneficiation plant.
President/General Manager John Challinor
Co-owner Peter Challinor
Swansea Mine T10N R15W Sec. 32
Produces hematite, micaceous-iron-oxide variety - Used for pigment and anti-corrosion barriers.

3 WIN QUARRIES
P.O. Box 3794, Riverside, California 92519 - Phone (909) 877-1611 - Employees: 16.
Owner/General Manager Richard Gutierrez
M C Canyon Quarries T19N R1E Sec. 23
Sandstone quarries located 8 miles northeast of Drake - Stone processing plant located at Drake - Sandstone quarried for flagstone.

T & C ENTERPRIZES
Stone Fabrication Plant
State Road 277 West, Snowflake, 85937, P.O. Box 832, Taylor, 85939 - Phone (520) 536-4944 - Employees: 4 - Quarries picture sandstone - Fabricates sandstone art objects and tableware.
President Howard Thomas
Sierra Quarry T12N R20E Sec. 20

TREASURE CHEST MINING
1701 N. Bridal Wreath, Tempe, AZ 85281 - Phone (602) 983-1606 - Employees: 4 - Produces Desert Rose and Spanish Gold screened decomposed granite.
General Manager P.J. Patton
Office Manager Patsy Elmore
Treasure Chest Granite Quarry T1N R8E Sec. 3

TUFFLITE INC.
2432 W. Peoria, Suite 1081, Phoenix, AZ 85029 - Phone (602) 931-3681 - Glendale yard located at 6856 W. Oran-
gewood, Glendale - Employees: 20.
President C. T. Morgan
Vice President/Mine Manager (Flagstaff) . . . Ed Morgan
Secretary/Treasurer Clay Morgan
Orders and Transportation Kelly Burgett
Office Manager Marleen Bustamante
Sales Manager Cord Angier
Crown Claims T23N R7E Sec. several
More Sand, Moon Sand T23N R7E Sec. 24
White Vulcan T23N R8E Sec. 19
Mines located 12 miles north of Flagstaff - Pozzolanic pumice quarries - 6,000 yards/month - Used in making lightweight redimix and block - Large size material used in the preparation of stone washed denim and in horticultural preparations.

UOP
P.O. Box 2790, Grand Junction, CO 81502 - Phone (970) 245-7957.
Senior Mining Engineer Jim Kirchner
Bowie Chabazite T11S R28E & T11S R29E
Open pit zeolite mines operated by contract mining company - Chabazite used for specialty adsorbants - Shipped out of state for further processing.
Union Pass Mordenite T21N R20W Sec. 11
Open pit zeolite mines operated by independent contract mining company - Mordenite used for specialty adsorbants - Shipped out of state for further processing.

"Richard Flagg,
Morgan Mine"
circa 1927



Orders and Transportation Kirke Anderson
Office Manager Patricia Gerkin
White Cross Mine T7S R17E Sec. 31
Quarry four miles north of Mammoth - Used for agricultural gypsum - Company delivers and applies gypsum to crop land and golf courses.

RED MOUNTAIN MINING INC.
4250 North Bush Highway, Mesa, AZ 85215 - Phone (602) 832-3390 - Employees: 28.
Owner D. Lavoy Adams
Red Mountain Quarry T2N R6E Sec. 24
Quarry located 10 miles north east of Mesa - Crushed granite for desert landscaping.

SOUTHWESTERN STONE, INC.
18 S. Main, P.O. Box 454, Taylor, AZ 85939 - Phone (520) 536-4912 - Employees: 9 - Quarries sandstone and fabricates building and patio stone - diamond saws tiles and decorative objects.
Owner/Operator Barbara Chartrand
Co-owner/Plant Operator Lee Chartrand
Foreman Pat Denetso
Sierra Quarry T12N R20E Sec. 20
Arizona Picture Rock Quarry T11N R14E Sec. 3
Brown Quarry T15N R19E Sec. 31
Buckskin Quarry T17N R21E Sec. 30

SPECIALTY MINERALS INC.
P.O. Box 759, Sahuarita, AZ 85629 - Phone (520) 625-6040, Fax (520) 625-0388 - Employees: 12.
Site Manager Carlos Cardadeiro
Market Development Engineer Rick Smith
Office Manager Jackie Young
Maintenance Supervisor Roger Young
Santa Rita Quarry T18S R15E Sec. 15
Located 15 miles southeast of Sahuarita at end of Santa Rita Road - White marble quarry - Raymond roller mills - Sizing and bagging plant - Crushed or ground for landscape, functional filler, and chemical uses - Markets in Arizona and the southwestern United States.

STAR VALLEY GRANITE & MATERIALS
Star Valley, HCR Box 43B, Payson, AZ 85541 - Phone (520) 474-9396 - Employees: 4 - Quarries and processes decomposed granite.
Star Valley Granite Quarry T11N R11E Sec. 31

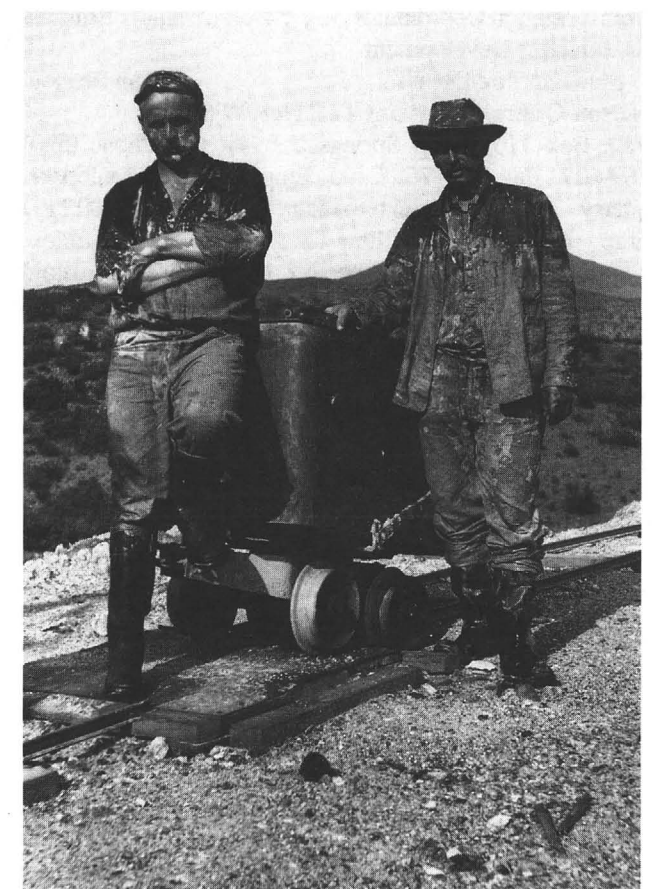
STUTENROTH MILLING & MANUFACTURING
7611 W. Comman Road, Casa Grande, AZ 85222 - Phone (520) 836-5568 - Employees: 2.
Owner-Operator Archie Stutenroth
Stutenroth Mill T7S R7E Sec. 8
Custom grinding mill - 10 TPD capacity - All types of ore - Located eight miles southeast of Casa Grande.

Mine Manager R. E. Thompson
SX-EW Manager L. A. Davis
Technical Services Manager N. A. Gambell
Ray Concentrator Manager S. A. McGhee
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'Neil, Jr.
Human Resources Director W. E. Burrell
Materials Manager K. C. Newnam
Chief Engineer R.S. Rhoades
Safety Director Warren Traweek
Senior Geologist Edward John
Silver Bell T12S R8E Sec. 11
25000 W. Avra Valley Rd., Marana, AZ 85653 - Phone (520) 682-2420 Fax (520) 682-2347 - Employees: 20 - Open-pit copper mine and 11,000 TPD concentrator on standby - Dump leach & precipitation plant operating - Solvent extraction-electrowinning plant and Silver Bell North pit under development.
Mill Manager D. J. Duncan

BLACK CANYON MILLING
Arizona Zinc Plating Inc.
117 W. Forest Grove Ave., Phoenix, AZ 85041 - Phone (602) 276-9045.
Owner/Manager Bill Schleisman
Black Canyon Mill T8N R2E Sec. 15
Mill located one half mile south of Rock Springs, west of Interstate 17 - 3 ton per hour gravity mill consisting of crushing, grinding, magnetic separation, and table and cone concentration.

BUILDING PRODUCTS COMPANY
Phoenix Plant
4850 W. Buckeye Road, Phoenix, AZ 85043 - Phone (602) 272-5576 - Employees: 2 contract - Plant consumes clay to produce extruded sewer pipe and roofing tile.
Plant Manager and Mining Supervisor . . Jon Humphreys
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.

CARLOTA COPPER COMPANY
subsidiary of Cambior USA Inc.
P.O. Box 1009, Miami, AZ, 85539 - Phone (520) 473-3518 - Employees: 8.



"Esmeralda Camp, Cornicopia Shaft, Yavapai County"
circa 1906

Manager Bob Walish
Mine Superintendent Paul Johnson
Human Resource Manager Kevin Webster
Carlota T1N R13E Sec. 36
Located 8 miles east of Miami - Anticipated employment: 300 - Open pit copper mine - Heap leach - Solvent extraction-electrowinning plant - Capacity 50 million lb. cathode copper per year - Permitting and engineering phase - Construction anticipated to begin mid-1996.

CHEMICAL LIME
Scottsdale Office
7272 E. Indian School Road, Suite 350, Scottsdale, AZ 85251 - Phone (602) 941-1291 - Fax (602) 941-2015.
President, Western Division Bob Derks
Vice President, Industrial Sales Bob Plains
Regional Sales Manager David Fleming
Senior Project Manager Rob Kohl
Manager, Technical Services Starr Curtis
Regional Operations Manager Mike S. Eliassen
Distribution Manager John McMullan

Transportation Coordinator Chris Bruskas
Sr. Business Development
Manager Poz-O-Cap John Reaney
Nelson Quarries & Plant T25N R10W Sec. 25
P.O. Box 370, Peach Springs, AZ 86434 - Phone (520)
769-2271 Fax (520) 769-2305 - Employees: 72 - Limestone
quarry - Lime plant with two rotary kilns rated at 1800 TPD
lime - Markets include lime for flue gas desulfurization,
alkalinity control for copper ore beneficiation and gold
leaching, and for soil stabilization. By-product calcium
hydrate used for filler in asphaltic products.
Plant Manager William Schoof
Maintenance Superintendent Mark Phillips
Quarry Superintendent Jim Blackwell
Plant Buyer Danny Roberts
Shipping/Transportation Coordinator Joe Fuentes
Quality Control Technician Gerald Findley
Quality Control Technician Perry Curley
Quality Control Technician Mike Donofrio
Douglas Quarry & Plant T24S R26E Sec. 7
Route 1, Box 110, Douglas, AZ 85607 - Phone (520)
364-2429 - Fax (520) 364-2706 - Employees: 60 - Lime-
stone quarry and plant located at Paul Spur - 3 lime kilns -
Plant capacity rated at 1,000 TPD lime - Markets include
lime for alkalinity control for copper ore beneficiation, lime
for stabilization, and crude crushed limestone for flue gas
desulfurization.
Plant Manager Jerry Young
Maintenance Superintendent Richard Anderson
Quarry Superintendent Don Russell
Production Services Superintendent Don Williams
Process Engineer Pat Morgen
Quality Control Technician Louis Roqueni

CLINTON - CAMPBELL CONTRACTING INC.

Phoenix Brick Yard
1814 S. 7th Ave., Phoenix, AZ 85007 - Phone (602) 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 (2 miles
northwest of the Interstate 10 Pantano Exit) - Clay used in
the manufacture of structural clay products.

COCHISE RESOURCES

196 East 5th Street, Benson, AZ - Phone (520) 826-3886 -
Employees: 5.
Manager John Londry
Golden Rule T16S R23E, Sec. 23

Located 4 miles east of Dragoon - Underground gold, lead,
silver mine - Gravity and flotation mill - Capacity 20 TPD.

COCONINO CINDER AND MATERIALS

7000 E. Highway 66, Flagstaff, AZ 86004 - Phone (520)
526-9509 - Employees: 4.
Owner/General Manager Bob Payne
Wildcat Hill Pit T21N R8E Sec. 9
Located 2 miles east of Flagstaff - Cinder and basalt quarry
- Used for landscaping, aggregate, horticulture, specialty
uses, and construction materials.

CYPRUS CLIMAX METALS COMPANY

subsidiary of Cyprus Amax Minerals Company
1501 W. Fountainhead Parkway, Suite 290, Tempe, AZ
85282 - Phone (602) 929-4400.
President Jeffrey G. Clevenger
Vice President, Molybdenum Operations Bill Doepken
Sr. Vice President/Technical
& Development Jacob Timmers
Sr. Vice President, Sales and Marketing Louis Morse
Vice President, Environmental Affairs Jerry W. Danni
Sr. Vice President,
Copper Operations William H. Champion
General Attorney Sarah Strunk
General Attorney Bruce Kirchhoff
Vice President & Controller Lowell Shonk
Regional Director,
Organizational Services Mitchell Craig Patrick
Cyprus Sierrita Corp.
Sierrita T18S R12E Secs. 7, 8, 9, 10, 16, 17
P.O. Box 527, Green Valley, AZ 85622 - Phone (520)
648-8500 - Employees: 720 - Sierrita, Ocotillo open pit
copper-molybdenum mines - 110,000 TPD concentrator -
17,500 TPD concentrator - Ferromolybdenum plant -
Rhenium plant - Dump leach - Solvent extraction-
electrowinning plant - Located 30 miles south of Tucson.
Vice President & Gen. Manager Andrew Kaczmarek
Manager, Mining Robert Wishart
Manager, Metallurgical Processing Steve Mueller
Manager, Human Resources Steve Rosene
Manager, Accounting/
Materials Manager Rickey Lamb
Mine Operations & Maintenance Michael Feehan
Electrical/Instrumentation
Superintendent Jesus Figueroa
Plant Department Superintendent Steve Koski
SX-EW Superintendent Ramon Hernandez
Superintendent Technical Services William Sweetser
Superintendent of Moly Processing Michael Shinn
Superintendent of Mine Engineering Ed Fidler
Primary Crushing &
Conveying Superintendent William Davis
Cyprus Miami Mining Corp.

Kayenta Mine T36N R18E Sec. 9

P.O. Box 605, Kayenta, AZ 86033 - Phone (520) 677-5008
- Employees: 511 - Surface coal mine - Located 30 miles
southwest of Kayenta.
Mine Superintendent Joe Johnson
Assistant Superintendent, 1st Shift Wayne E. Helgedick
Assistant Superintendent, 2nd Shift Tony G. Bryant
Assistant Superintendent, 3rd Shift Joseph R. Harris
Safety Supervisor Joe Holgate
Safety and Training William K. Bippus
Manager, Training Marvin Yoyokie

PHELPS DODGE CORPORATION

Corporate Headquarters
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
(602) 234-8100.
Chairman, President & CEO D. C. Yearley
Senior Vice President J.S. Whisler
Senior Vice President M.J. Iraola
Senior Vice President T.M. St.Clair
Phelps Dodge Mining Company
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
(602) 234-8100.
President J. S. Whisler
Vice President & General Manager J. L. Madson
Vice President, Exploration A.L. Lawrence
Vice President, Engineering Services R.W. Rice
Vice President, Arizona Operations T.R. Snider
Vice president, New Mexico Operations D.P. Milovich
Controller J.M. McCarty
Director, Employee Relations S. L. Marcus
Director, Materials Management M.F. Upton
General Transportation Manager J.P. Sheridan
Phelps Dodge Exploration Corporation
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
(602) 234-8100.
Vice President A. L. Lawrence
Vice President & Counsel S.D. Colton
U.S. Exploration
Union Plaza, Suite 300, 200 Union Blvd, Lakewood, CO
80228-1831 - Phone (303) 989-8873
Western Exploration
P.O. Box 50427, Tucson, AZ 85703-1427 Phone (520)
792-4981.
Manager, Western Exploration W.H. Wilkinson
Copper Queen T23S R24E Sec. 15
36 W. Highway 92, Bisbee, AZ 85603 - Phone (520) 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 (520)
865-4521 - Employees: 2,064 - Open pit copper mine - Two

concentrators (one with molybdenum circuit), total capacity
125,000 TPD - 500 million lb. per year copper solvent
extraction-electrowinning plant.

President T.R. Snider
General Manager, Operations R.I. Pennington
General Manager, Technical Services D.H. Thornton
Manager, Mining Operations D.J. Quinn
Manager, Concentrator Operations J.G. Davis
Manager, Hydrometallurgical Operations R.H. White
Manager, Engineering Services J.D. Brack
Manager, Geological Services M. S. Enders
Director of Analytical Services
/Raw Materials D.K. Farquhar
Safford District Office
625 Main Street, Safford, AZ 85546 - Phone (520) 428-
0205 - Land exchange underway.
Project Manager A.,J. Broaderick
New Cornelia T12S R6W Secs. 23, 26, 27
P.O. Drawer 9, Ajo, AZ 85321 - Phone (520) 387-7451 -
Employees: 22 - Inactive open pit copper mine.
Plant Superintendent J. Zamar
United Verde Mine T16N R2E Sec. 22
Inactive copper mine - Located at Jerome, AZ - Phone (520)
634-2622.
Agent J.H. Zamar

PHOENIX CEMENT COMPANY

Phoenix Office
2501 W. Behrend Drive, Suite 23, Phoenix, AZ 85027, P.O.
Box 43740, Phoenix, AZ 85080 - Phone (602) 264-0511 -
Employees: 11.
President James E. Carmichael
V.P. Sales & Marketing Pete Kuehner
Bulk Cement Terminal
1941 W. Lower Buckeye Road, Phoenix, AZ 85009 - Phone
(602) 258-7798.
Clarkdale Quarry & Plant T16N R2E Sec. 11
P.O. Box 428, Clarkdale, AZ 86324 - Phone (520) 634-2261
- Employees: 147 - Quarry and plant two miles northwest
of Clarkdale - 630,000 TPY - Cement used for building
industry.
V.P. Operations/Plant Manager John B. Conway
Assistant Plant Manager/Maintenance Joe D'Avignon
Assistant Plant Manager/Engineering Tom Gibbons
Manager of Logistics Cliff Ayres
Controller Micheal La Lond
Purchasing/Stores Bill Ayres
Environmental Engineer Floyd Musselman

PINAL HARVEST

dba PINAL GYPSUM COMPANY
P.O. Box 99, Coolidge, AZ 85228 - Phone (520) 723-3131,
Fax (520) 723-9711 - Employees: 10.
President and General Manager James Bechtel

"Richard Flagg,
Morgan Mine"
circa 1927



Orders and Transportation Kirke Anderson
Office Manager Patricia Gerkin
White Cross Mine T7S R17E Sec. 31
Quarry four miles north of Mammoth - Used for agricultural gypsum - Company delivers and applies gypsum to crop land and golf courses.

RED MOUNTAIN MINING INC.
4250 North Bush Highway, Mesa, AZ 85215 - Phone (602) 832-3390 - Employees: 28.
Owner D. Lavoy Adams
Red Mountain Quarry T2N R6E Sec. 24
Quarry located 10 miles north east of Mesa - Crushed granite for desert landscaping.

SOUTHWESTERN STONE, INC.
18 S. Main, P.O. Box 454, Taylor, AZ 85939 - Phone (520) 536-4912 - Employees: 9 - Quarries sandstone and fabricates building and patio stone - diamond saws tiles and decorative objects.
Owner/Operator Barbara Chartrand
Co-owner/Plant Operator Lee Chartrand
Foreman Pat Denetso
Sierra Quarry T12N R20E Sec. 20
Arizona Picture Rock Quarry T11N R14E Sec. 3
Brown Quarry T15N R19E Sec. 31
Buckskin Quarry T17N R21E Sec. 30

SPECIALTY MINERALS INC.
P.O. Box 759, Sahuarita, AZ 85629 - Phone (520) 625-6040, Fax (520) 625-0388 - Employees: 12.
Site Manager Carlos Cardadeiro
Market Development Engineer Rick Smith
Office Manager Jackie Young
Maintenance Supervisor Roger Young
Santa Rita Quarry T18S R15E Sec. 15
Located 15 miles southeast of Sahuarita at end of Santa Rita Road - White marble quarry - Raymond roller mills - Sizing and bagging plant - Crushed or ground for landscape, functional filler, and chemical uses - Markets in Arizona and the southwestern United States.

STAR VALLEY GRANITE & MATERIALS
Star Valley, HCR Box 43B, Payson, AZ 85541 - Phone (520) 474-9396 - Employees: 4 - Quarries and processes decomposed granite.
Star Valley Granite Quarry T11N R11E Sec. 31

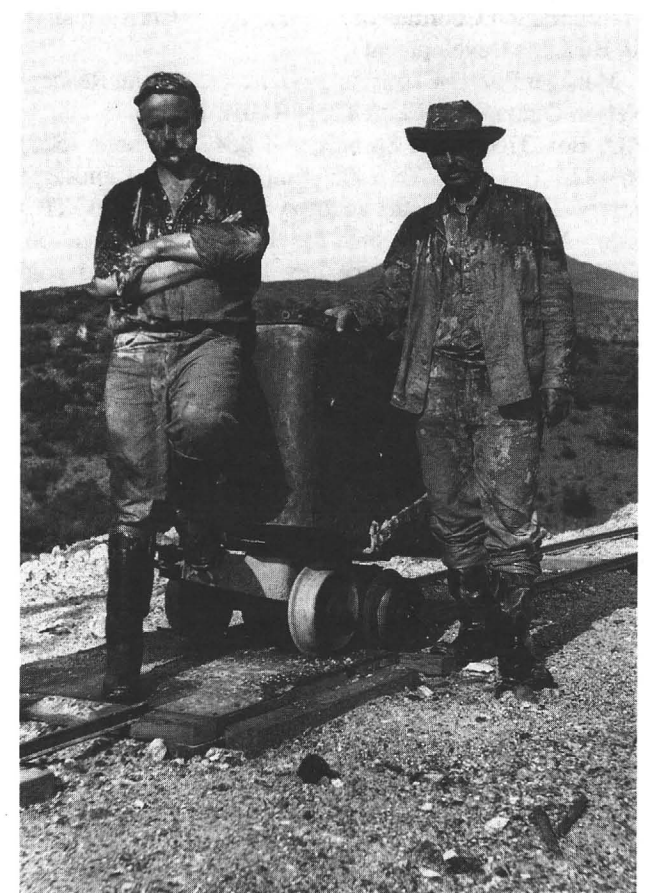
STUTENROTH MILLING & MANUFACTURING
7611 W. Cornman Road, Casa Grande, AZ 85222 - Phone (520) 836-5568 - Employees: 2.
Owner-Operator Archie Stutenroth
Stutenroth Mill T7S R7E Sec. 8
Custom grinding mill - 10 TPD capacity - All types of ore - Located eight miles southeast of Casa Grande.

Mine Manager R. E. Thompson
SX-EW Manager L. A. Davis
Technical Services Manager N. A. Gambell
Ray Concentrator Manager S. A. McGhee
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'Neil, Jr.
Human Resources Director W. E. Burrell
Materials Manager K. C. Newnam
Chief Engineer R.S. Rhoades
Safety Director Warren Traweek
Senior Geologist Edward John
Silver Bell T12S R8E Sec. 11
25000 W. Avra Valley Rd., Marana, AZ 85653 - Phone (520) 682-2420 Fax (520) 682-2347 - Employees: 20 - Open-pit copper mine and 11,000 TPD concentrator on standby - Dump leach & precipitation plant operating - Solvent extraction-electrowinning plant and Silver Bell North pit under development.
Mill Manager D. J. Duncan

BLACK CANYON MILLING
Arizona Zinc Plating Inc.
117 W. Forest Grove Ave., Phoenix, AZ 85041 - Phone (602) 276-9045.
Owner/Manager Bill Schleisman
Black Canyon Mill T8N R2E Sec. 15
Mill located one half mile south of Rock Springs, west of Interstate 17 - 3 ton per hour gravity mill consisting of crushing, grinding, magnetic separation, and table and cone concentration.

BUILDING PRODUCTS COMPANY
Phoenix Plant
4850 W. Buckeye Road, Phoenix, AZ 85043 - Phone (602) 272-5576 - Employees: 2 contract - Plant consumes clay to produce extruded sewer pipe and roofing tile.
Plant Manager and Mining Supervisor . . Jon Humphreys
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.

CARLOTA COPPER COMPANY
subsidiary of Cambior USA Inc.
P.O. Box 1009, Miami, AZ, 85539 - Phone (520) 473-3518 - Employees: 8.



"Esmeralda Camp, Cornicopia Shaft, Yavapai County"
circa 1906

Manager Bob Walish
Mine Superintendent Paul Johnson
Human Resource Manager Kevin Webster
Carlota T1N R13E Sec. 36
Located 8 miles east of Miami - Anticipated employment: 300 - Open pit copper mine - Heap leach - Solvent extraction-electrowinning plant - Capacity 50 million lb. cathode copper per year - Permitting and engineering phase - Construction anticipated to begin mid-1996.

CHEMICAL LIME
Scottsdale Office
7272 E. Indian School Road, Suite 350, Scottsdale, AZ 85251 - Phone (602) 941-1291 - Fax (602) 941-2015.
President, Western Division Bob Derks
Vice President, Industrial Sales Bob Plains
Regional Sales Manager David Fleming
Senior Project Manager Rob Kohl
Manager, Technical Services Starr Curtis
Regional Operations Manager Mike S. Eliassen
Distribution Manager John McMullan

Transportation Coordinator Chris Bruskas
Sr. Business Development
Manager Poz-O-Cap John Reaney
Nelson Quarries & Plant T25N R10W Sec. 25
P.O. Box 370, Peach Springs, AZ 86434 - Phone (520)
769-2271 Fax (520) 769-2305 - Employees: 72 - Limestone
quarry - Lime plant with two rotary kilns rated at 1800 TPD
lime - Markets include lime for flue gas desulfurization,
alkalinity control for copper ore beneficiation and gold
leaching, and for soil stabalization. By-product calcium
hydrate used for filler in asphaltic products.
Plant Manager William Schoof
Maintenance Superintendent Mark Phillips
Quarry Superintendent Jim Blackwell
Plant Buyer Danny Roberts
Shipping/Transportation Coordinator Joe Fuentes
Quality Control Technician Gerald Findley
Quality Control Technician Perry Curley
Quality Control Technician Mike Donofrio
Douglas Quarry & Plant T24S R26E Sec. 7
Route 1, Box 110, Douglas, AZ 85607 - Phone (520)
364-2429 - Fax (520) 364-2706 - Employees: 60 - Lime-
stone quarry and plant located at Paul Spur - 3 lime kilns -
Plant capacity rated at 1,000 TPD lime - Markets include
lime for alkalinity control for copper ore beneficiation, lime
for stabilization, and crude crushed limestone for flue gas
desulfurization.
Plant Manager Jerry Young
Maintenance Superintendent Richard Anderson
Quarry Superintendent Don Russell
Production Services Superintendent Don Williams
Process Engineer Pat Morgen
Quality Control Technician Louis Roqueni

**CLINTON - CAMPBELL
CONTRACTING INC.**

Phoenix Brick Yard
1814 S. 7th Ave., Phoenix, AZ 85007 - Phone (602) 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 (2 miles
northwest of the Interstate 10 Pantano Exit) - Clay used in
the manufacture of structural clay products.

COCHISE RESOURCES

196 East 5th Street, Benson, AZ - Phone (520) 826-3886 -
Employees: 5.
Manager John Londry
Golden Rule T16S R23E, Sec. 23

Located 4 miles east of Dragoon - Underground gold, lead,
silver mine - Gravity and flotation mill - Capacity 20 TPD.

COCONINO CINDER AND MATERIALS

7000 E. Highway 66, Flagstaff, AZ 86004 - Phone (520)
526-9509 - Employees: 4.
Owner/General Manager Bob Payne
Wildcat Hill Pit T21N R8E Sec. 9
Located 2 miles east of Flagstaff - Cinder and basalt quarry
- Used for landscaping, aggregate, horticulture, specialty
uses, and construction materials.

CYPRUS CLIMAX METALS COMPANY

subsidiary of Cyprus Amax Minerals Company
1501 W. Fountainhead Parkway, Suite 290, Tempe, AZ
85282 - Phone (602) 929-4400.
President Jeffrey G. Clevenger
Vice President, Molybdenum Operations . Bill Doepken
Sr. Vice President/Technical
& Development Jacob Timmers
Sr. Vice President, Sales and Marketing . . Louis Morse
Vice President, Environmental Affairs . . Jerry W. Danni
Sr. Vice President,
Copper Operations William H. Champion
General Attorney Sarah Strunk
General Attorney Bruce Kirchhoff
Vice President & Controller Lowell Shonk
Regional Director,
Organizational Services Mitchell Craig Patrick
Cyprus Sierrita Corp.
Sierrita T18S R12E Secs. 7, 8, 9, 10, 16, 17
P.O. Box 527, Green Valley, AZ 85622 - Phone (520)
648-8500 - Employees: 720 - Sierrita, Ocotillo open pit
copper-molybdenum mines - 110,000 TPD concentrator -
17,500 TPD concentrator - Ferromolybdenum plant -
Rhenium plant - Dump leach - Solvent extraction-
electrowinning plant - Located 30 miles south of Tucson.
Vice President & Gen. Manager . . Andrew Kaczmarek
Manager, Mining Robert Wishart
Manager, Metallurgical Processing . . . Steve Mueller
Manager, Human Resources Steve Rosene
Manager, Accounting/
Materials Manager Rickey Lamb
Mine Operations & Maintenance Michael Feehan
Electrical/Instrumentation
Superintendent Jesus Figueroa
Plant Department Superintendent Steve Koski
SX-EW Superintendent Ramon Hernandez
Superintendent Technical Services . William Sweetser
Superintendent of Moly Processing . . . Michael Shinn
Superintendent of Mine Engineering Ed Fidler
Primary Crushing &
Conveying Superintendent William Davis
Cyprus Miami Mining Corp.

Kayenta Mine T36N R18E Sec. 9

P.O. Box 605, Kayenta, AZ 86033 - Phone (520) 677-5008
- Employees: 511 - Surface coal mine - Located 30 miles
southwest of Kayenta.
Mine Superintendent Joe Johnson
Assistant Superintendent, 1st Shift . Wayne E. Helgedick
Assistant Superintendent, 2nd Shift . . . Tony G. Bryant
Assistant Superintendent, 3rd Shift . . . Joseph R. Harris
Safety Supervisor Joe Holgate
Safety and Training William K. Bippus
Manager, Training Marvin Yoyokie

PHELPS DODGE CORPORATION

Corporate Headquarters
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
(602) 234-8100.
Chairman, President & CEO D. C. Yearley
Senior Vice President J.S. Whisler
Senior Vice President M.J. Iraola
Senior Vice President T.M. St.Clair
Phelps Dodge Mining Company
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
(602) 234-8100.
President J. S. Whisler
Vice President & General Manager J. L. Madson
Vice President, Exploration A.L. Lawrence
Vice President, Engineering Services R.W. Rice
Vice President, Arizona Operations T.R. Snider
Vice president, New Mexico Operations . D.P. Milovich
Controller J.M. McCarty
Director, Employee Relations S. L. Marcus
Director, Materials Management M.F. Upton
General Transportation Manager J.P. Sheridan
Phelps Dodge Exploration Corporation
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone
(602) 234-8100.
Vice President A. L. Lawrence
Vice President & Counsel S.D. Colton
U.S. Exploration
Union Plaza, Suite 300, 200 Union Blvd, Lakewood, CO
80228-1831 - Phone (303) 989-8873
Western Exploration
P.O. Box 50427, Tucson, AZ 85703-1427 Phone (520)
792-4981.
Manager, Western Exploration W.H. Wilkinson
Copper Queen T23S R24E Sec. 15
36 W. Highway 92, Bisbee, AZ 85603 - Phone (520) 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 (520)
865-4521 - Employees: 2,064 - Open pit copper mine - Two

concentrators (one with molybdenum circuit), total capacity
125,000 TPD - 500 million lb. per year copper solvent
extraction-electrowinning plant.
President T.R. Snider
General Manager, Operations R.I. Pennington
General Manager, Technical Services . . . D.H. Thornton
Manager, Mining Operations D.J. Quinn
Manager, Concentrator Operations J.G. Davis
Manager, Hydrometallurgical Operations . . R.H. White
Manager, Engineering Services J.D. Brack
Manager, Geological Services M. S. Enders
Director of Analytical Services
/Raw Materials D.K. Farquhar
Safford District Office
625 Main Street, Safford, AZ 85546 - Phone (520) 428-
0205 - Land exchange underway.
Project Manager A.,J. Broaderick
New Cornelia T12S R6W Secs. 23, 26, 27
P.O. Drawer 9, Ajo, AZ 85321 - Phone (520) 387-7451 -
Employees: 22 - Inactive open pit copper mine.
Plant Superintendent J. Zamar
United Verde Mine T16N R2E Sec. 22
Inactive copper mine - Located at Jerome, AZ - Phone (520)
634-2622.
Agent J.H. Zamar

PHOENIX CEMENT COMPANY

Phoenix Office
2501 W. Behrend Drive, Suite 23, Phoenix, AZ 85027, P.O.
Box 43740, Phoenix, AZ 85080 - Phone (602) 264-0511 -
Employees: 11.
President James E. Carmichael
V.P. Sales & Marketing Pete Kuehner
Bulk Cement Terminal
1941 W. Lower Buckeye Road, Phoenix, AZ 85009 - Phone
(602) 258-7798.
Clarkdale Quarry & Plant T16N R2E Sec. 11
P.O. Box 428, Clarkdale, AZ 86324 - Phone (520) 634-2261
- Employees: 147 - Quarry and plant two miles northwest
of Clarkdale - 630,000 TPY - Cement used for building
industry.
V.P. Operations/Plant Manager John B. Conway
Assistant Plant Manager/Maintenance . . Joe D'Avignon
Assistant Plant Manager/Engineering . . . Tom Gibbons
Manager of Logistics Cliff Ayres
Controller Micheal La Lond
Purchasing/Stores Bill Ayres
Environmental Engineer Floyd Musselman

**PINAL HARVEST
dba PINAL GYPSUM COMPANY**

P.O. Box 99, Coolidge, AZ 85228 - Phone (520) 723-3131,
Fax (520) 723-9711 - Employees: 10.
President and General Manager James Bechtel

MINERAL DEVELOPMENT, INC.

Superior Marble Division

21555 East Ocotillo, Queen Creek, AZ 85242 - Phone (602) 987-1916, Fax (602) 987-1917 - Employees: 20 - Plant located at the intersection of Rittenhouse and Ocotillo in Queen Creek - Marble crushing and screening plant - Crushed, sized white marble used for landscape, plaster, feed supplements, and specialty aggregate. Markets in Arizona, adjacent states and Texas.

Owner/General Manager Laurence Turley
Sales Rick Erman
Office Manager Mark Turley
Plant Superintendent J. T. Nelson
Mine Superintendent Miguel Olivares
Queen Creek Marble Quarry T1S R13E Sec. 17
Marble quarry - Primary crushing and screening plant.

MINERALS RESEARCH AND RECOVERY, INC.

Tucson Office and Plant

4620 S. Coach, Tucson, 85714 - Phone (520) 748-9362 - Employees: 54.

President Manjit Chopra
Plant Manager Michael Vick
Plant Superintendent and Sales Chris Wells
Ajo Plant and Slag Stockpile T12S R6W Sec. 23
Highway 85, Ajo, 85321 - Phone (520) 387-7682 - Processes copper smelter slag for roofing granules, abrasives, filtration media, nuclear shielding, and ship ballast.

MORTON SALT DIVISION

Morton International

13000 W. Glendale Ave., Glendale, AZ 85307 - Phone (602) 247-3000 - Employees: 35.

Facilities Manager Geron Turnquest
Morton Salt Mine T2N R1W Sec. 2
Solution mining via wells - Solar evaporation of brines - Produces salt for water softeners, domestic, agricultural, and industrial use - Underground solution cavities are used for propane and butane storage.

NATIONAL GYPSUM COMPANY

Gold Bond Building Products Division

1414 E. Hadley St., Phoenix, AZ 85034 - Phone (602) 258-9321 - Employees: 58 - Wallboard plant - Wallboard joint cement plant.

Plant Manager Dan Garson
Office Manager Wendy Self
Production Manager Wes Gross
Joint Cement Quality Control Nick Tuhus
Feldman Quarry T6S R16E Sec. 27
Star Route, Box 3990, Winkelman, AZ 85292 - Phone (520) 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

ORACLE RIDGE MINING PARTNERS

P.O. Box 70, San Manuel, AZ 85631 - Phone (520) 576-1412, Fax (520) 576-1539 - Employees: 95.

General Manager Rene Tourigny
Superintendent of Technical Services Murray Strachan
Accounting Supervisor Joseph Sawyer
Purchasing/Warehouse Anna Hayden
Mill Superintendent Rick Scoles
Chief Metallurgist Dennis Rice
Oracle Ridge Mine T11S R16E Sec. 16
Underground mine producing copper, gold, and silver - Located 25 miles northeast of Tucson - Column flotation mill - 1020 TPD - Ships concentrates to custom smelter.

OUTLAND RESOURCES INC.

2260 E. Andy Devine, Kingman, 86401 - Phone (520) 753-1444 - Fax (520) 753-1444 (call first) - Employees: 8 (plus contracted services).

President Patti Lewis
Vice President Charlie Starkebaum
Seligman Quarry T23N R6W Sec. 32
Shipley Pit T25N R10W Sec. 28
Produces dolomite, sandstone, and natural colored aggregates for landscape and specialty aggregate.

PEABODY WESTERN COAL COMPANY

Flagstaff Office

1300 S. Yale, Flagstaff, AZ 86001 - Phone (520) 774-5253 - Employees: 66.

President W. Howard Carson
Vice President, Operations Gary L. Melvin
General Superintendent, Mines Dan Cartwright
Director, Human Resources Tony Baca
Director of Engineering Frank Farnsworth
Director Materials Management Merle Hendricks
Controller Charles W. Tilly
Manager, Quality Control Charles J. Stenftenagel
Manager, Reclamation Teddy Begay
Senior Mgr. Environmental Affairs Brian P. Dunfee
Black Mesa Mine T35N R18E Sec. 5
P.O. Box 605, Kayenta, AZ 86033 - Phone (520) 677-5040 - Employees: 331 - Surface coal mine - Located approximately 30 miles southwest of Kayenta.
Mine Superintendent Robert D. Boone
Assistant Superintendent, 1st Shift Randall L. Hendrix
Assistant Superintendent, 2nd Shift Douglas C. Botone
Assistant Superintendent, 3rd Shift Barry L. Grass
Safety Supervisor Keith Grass

Miami T1N R14E Sec. 24, 25, 26, 35

P.O. Box 4444, Claypool, AZ 85532 - Phone (520) 473-7150 - Employees: 873 + 32 temporaries - Open pit oxide copper mine - Dump leach - Solvent extraction-electrowinning plant - 120,000 TPY smelter - Acid plant - Electrolytic refinery - 100,000 TPY continuous cast rod plant - 24,000 TPD concentrator is inactive.

Vice President & General Manager Don Prah
Controller/Materials Management Ron France
Manager, Technical Services James Handley
Manager, Copper Products Ken Watkins
Manager, Copper Production Kent Watson
Manager, Safety Robert Altamirano
Manager, Human Resources Richard Hodges
Supt. Eng./Strategic Planning Cal Iles
Superintendent, Mine Operations Joesph Kridel
Superintendent, Mine Maintenance Russ Sours
Superintendent SX/EW Mike Benjamin
Superintendent, Maintenance Copper

Products Division Richard Riddle
Superintendent, Rod Plant Mark Nowicki
Coordinator Quality Assurance Richard Dana
Manager, Environmental Affairs Robert Ressler
Superintendent, Smelter Howard Hilshorst
Senior Staff Engineer Robert Tunis
Superintendent, Hydrometallurgy Samuel Yang
Cyprus Bagdad Copper Corp.
Bagdad T14N R9W Sec. 4

P.O. Box 245, Bagdad, AZ 86321 - Phone (520) 633-2241 - Employees: 500 - Open pit copper-molybdenum mine - 85,000 TPD concentrator - Dump leach - Solvent extraction-electrowinning plant.

Vice President, General Manager Gene Consalus
Manager, Mine Leon Hardy
Plant Superintendent Bruce Clements
Manager, Human Resource

& Community Services Janette Bush
Supervisor, Safety Joe Mortimer
Controller, Materials Manager Randy Hoffman
Plant Maintenance Superintendent Craig Ammar
Mine Technical Services Superintendent Jim Hesketh
Mill Technical Services Superintendent Tom Bender
Cyprus Tohono Corporation

Tohono T10S R4E Sec. 25

P.O. Box 15009, Casa Grande, AZ 85230-5009 - Phone (520) 623-1539 - Employees: 116 & 37 contract - Open pit heap leach copper mine - Solvent extraction-electrowinning plant.

Vice President & General Manager Al Tittes
Manager, Accounting and Materials W. Fulgham
Plant Manager Kermit Behnke
Mine Manager Mike Schroder
Manager, Human Resources Richard Stilgenbauer
Environmental Engineer Open

Cyprus Mineral Park Corp.

Mineral Park T23N R17W Sec. 19

HC 37 Box 500, Kingman, AZ 86401 - Phone (520) 565-2226 - Employees: 15 - Located 16 miles north of Kingman - Dump and bench leach copper mine - Solvent extraction-electrowinning plant - In situ research project underway.
Superintendent George Burns
Plant Supervisor Joey Matthews

DRAKE STONE PRODUCTS

P.O. Box 11676, Prescott, AZ 86304 - Phone (520) 445-3028, Message/Fax (520) 778-5447 - Stone processing plant at Drake - Quarries and processes Arizona flagstone into flagging, dimension stone and tiles.

Owner/Operator Harley Gray Jr.
Co-owner Deborah Gray
Rock House Quarry T19N R1E Sec. 10
M C Quarry T19N R1E Sec. 35

DUNBAR STONE COMPANY

P.O. Box 246, Ash Fork, AZ 86320 - 901 Lewis - Phone (520) 637- 2591 or (520) 637-2592, Fax (520) 637-2355 - Employees: 85 - Quarries in Coconino, Maricopa, Mohave, and Yavapai Counties - Flagstone, marble, and schist - Stone processing plant in Ashfork - Quarries and processes Arizona flagstone into flagging, dimension stone and tiles.

President Gerry E. Dunbar
Vice President W. B. Dunbar
Maintenance Superintendent Ron Dunbar
Office Manager & Transportation Leslie Tooley
Dunbar Stone Plant T21N R2W Sec. 3
Operates over 60 quarries for the production of dimension stone in northern and western Arizona. Many quarries are operated intermittently on an as needed basis.

ENGELHARD CORPORATION

Chemical Division

Box 155, Sanders, AZ 86512 - Phone (520) 688-2468, Fax (520) 521-3796 - Employees: 6 - Located 6 miles southeast of Sanders.

General Superintendent Perry Skersick
Cheto No. 2 T21N R29E Sec. 23
Surface strip bentonite mine - Primary use is in filters and catalysts, also used in agriculture and desiccants - Shipped to Mississippi for processing.

FLAGSTAFF CINDER SALES INC.

Old Highway 66 East, P.O. Box 2415, Flagstaff, AZ 86003 - Phone (520) 526-0801 - Employees: 7.
President Mary Lou Olivier
General Manager Rob Olivier
Wildcat Hill Pit T21N R8E Sec. 9
Located 1.5 miles east of Flagstaff - Cinder quarry - Used for aggregate, landscaping, and construction materials.

**GEORGIA MARBLE COMPANY
OF ARIZONA**

16101 S. Wentworth Road, Vail, AZ 85641 - Phone (520) 762-9119, 1-800-952-2769, Fax (520) 762-5592 - Employees: 13.
Division Manager Carl Rohde
Office Manager Susan Jansen
Sales Carl Cuthbertson
Andrada Marble Quarry T17S R16E Sec. 21
Open pit marble mine - Crushing and grinding plant - Used for calcium feed additive, decorative stone, plaster and roofing material - Fine ground material used as mineral filler.

GOLD CHORD RESOURCES INC.

6636 East Thunderbird Road, Scottsdale, AZ 85254 - Phone (602) 948-1758 or (602) 967-3363- Employees: 4
Project Manager Richard Heise
Superintendent Doug Heise
Evening Star T4N R9W Sec. 18
Underground gold silica flux mine - Located 23 miles south of Aguila - Will ship directly to copper smelter - Under development - Production anticipated 1st quarter 1996 - Capacity 25 TPD.

**GOLDEN GREEN PLACER MINING
PARTNERSHIP**

HCR Box 840-A, Sells, AZ 85634 - Phone/fax (520) 361-2310 - Employees: 4.
Project Manager Jack Otani
Devils Wash T15S R2E Sec. 2
Located approximately 1.5 miles southwest of Quijotoa - Gold placer operation - Wet gravity concentration - Capacity 750 yards/day.

GSA RESOURCES INC.

7660 N. Business Park Drive, Tucson, AZ 85743 - Phone (520) 744-8845 - Employees: 8 (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 viscosifier and thickener 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, specialty adsorbants, deodorizers, and RAD waste treatment for adsorbing Cs¹³⁷ and Sr⁹⁰
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

P.O. Box 960, Superior, AZ 85273 - Phone (520) 689-5723, FAX (520) 689-5723 - Employees: 12 - Perlite crushing, screening, and drying plant located 2 miles west of Superior - Two open pit perlite mines, located 2 miles southwest of Superior - Used in the manufacture of filter media for filtering pharmaceuticals, chemicals, sugar, and beverages and as an agricultural fertilizer carrier.
Plant Manager Louie Lucero
Assistant Manager Bob Farmer
Secretary - Orders & Transportation . . . Jackie Alvarez
Superior Perlite T2S R12E Sec. 9

HARLEY GRAY STONE COMPANY

P.O. Box 323, Paulden, AZ 86334 - Phone (520) 636-2436 - Employees: 15 - Quarries located 8 miles northeast of Drake - Quarries and processes Arizona flagstone into flagging, dimension stone, and tiles.
Owner Carl Gray
Flagstone Quarries

KESSON AND KESSON

P.O. Box 174, Globe, AZ 85502 - Phone (520) 425-8452 - Employees: 6.
Owner Stewart Kesson
Copper Hill Mine T1N R15E Sec. 15
Silica flux for Cyprus Miami copper smelter - Mine located northwest of Globe.

KILAUEA CRUSHERS INC.

P.O.Box 10606, Glendale, AZ 85318-0606 - Phone (602) 843-1888 - Fax (602) 561-1528 - Employees: 12.
President Bill Nichols
Kilauea Quarry T6N R2W Sec. 5
Quarry located 12 miles east of Morristown - Crushed rhyolite for desert landscaping.

LEVIN STONE COMPANY, INC.

P.O. Box 95, Ashfork, AZ 86320 - Phone (520) 637-2288 - Employees: 35-50 - Processing plant located on Double A Ranch Road 2 miles north of Ashfork - Quarries and processes sandstone from nine deposits - Purchases sandstone from independent quarries - Specializes in hand cut hearths, table tops, and dimensional cuts.
President Phil Levin
Manager Lyle Levin
Transportation & Maintenance Supervisor . . . Van Falls

LITTLE HILL MINES INC.

P.O. Box 332, Oracle, AZ 85623 - Phone (520) 896-2245 - Employees: 9.
President Dave McGee
General Superintendent Robert Poss
Gold Hill Mine T10S R15E Sec. 5
Open pit mine - Located 6 miles southwest of Oracle - Copper bearing silica flux for Asarco's Hayden copper smelter and decorative rock for landscaping.

MAGMA COPPER COMPANY

Corporate Headquarters
7400 N. Oracle Road, Tucson, AZ 85704 - Phone (520) 575-5600 Fax (520) 575-5663.
President and CEO J. Burgess Winter
San Manuel Mine T8S R16E Sec. 34, 35
P.O. Box M, San Manuel, AZ 85631 - Phone (520) 385-3100 - Employees: 1,920 - Underground copper-molybdenum mine - 62,000 TPD concentrator - In-situ leach - Heap Leach - Solvent extraction-electrowinning plant - Capacity 120 million lb. copper per year - Underground Kalamazoo deposit under development.
Vice President & Gen. Manager . . Francisco E. Durazo
Manager Sulfide Mining Hendrick W. Seaney, Jr.
Superintendent Concentrator . . . Gerald R. Brunskill
Superintendent In-situ Chris W. Burt
Superintendent SX-EW Joel Witt
Magma Metals Company
San Manuel Smelter T9S R17E Sec. 32
P.O. Box M, San Manuel, AZ 85631 - Phone (520) 385-3100 - Employees: 1,217 - 1,300,000 TPY flash smelter - 1,150,000 TPY acid plant - 345,000 TPY electrolytic refinery - 180,000 TPY continuous cast rod plant.
President Craig Steinke
Vice President Operations J. D. McCain
Vice President Marketing & Sales . . . Brian Disbury
Vice President Technology Tom Jordan
Pinto Valley Mine T1N R14E Sec. 20
Miami T1N R15E Sec. 19
P.O. Box 100, Miami, AZ 85539 - Phone (520) 473-6200 - Employees: 620 - Open pit copper-molybdenum mine - 63,000 TPD concentrator - Dump leach - Solvent extraction-electrowinning plant - Miami in-situ leach - Miami No. 2 tailings reclaim leach - Miami solvent extraction-electrowinning plant.
Vice President/General Manager . . . Doug McGregor
Manager Mining Operations Dale Pierce
Manager of Miami Unit
Leaching/SX-EW John J. Pio
Manager of Concentrator
Operations Jack D. Conklin
Manager Human Resources David L. Palmer
Magma Mine T1S R12E Sec. 35



"Margaret" 1913

P.O. Box 37, Superior, AZ 85273 - Phone (520) 689-2444 - Employees: 363 - Underground copper mine - 3,300 TPD concentrator.
General Manager Doug McGregor
Mine Superintendent Steve Lautenschlaeger
Mill Superintendent Clifford D. Nelson

McKUSICK MOSAIC

Route 1, Box 35-D, Globe, AZ 85501 - Phone (520) 425-5051 or 425-8428 - Employees: 3.
Co-owner Robert & Charmion McKusick
Co-owner Kathleen Condit
Weary Lode Mine T1S R15E Sec. 22
Surface clay mine located 5 miles south of Globe - Used for tile and wind chimes, cosmetic additives, sealant, and slip glazing material.