

# Directory of Active Mines In Arizona 1994

Incorporating Sand & Gravel Operations



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 ) 255-3791  
Toll Free in Arizona: 800-446-4259

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# Active Mines in Arizona = 1994

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

## THE ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

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

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

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

- Maintain a site specific data base of unpublished reports and maps that includes 4,000 mine files and indexes of 10,000 computerized Arizona mineral occurrences.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mining information including a mine map library (hard copy and microfilm), government publications, periodicals, and unpublished master and doctorate theses.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

## Department of Mines and Mineral Resources

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Fife Symington, Governor

Phoenix, Arizona  
December, 1993

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Commodity Index

CEMENT/LIME

Camp Verde Gypsum Mine  
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  
Casa Grande Mine  
Copper Queen Mine  
Johnson 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  
Twin Buttes  
Van Dyke Mine

DIATOMITE

White Cliff Mine

GEMSTONES

Sleeping Beauty Mine

GRANITE

Aztec Quarry

Kilauea Quarry  
Red Mountain Quarry

GOLD and SILVER

Devils Wash Placer  
Gold Prince  
Magma Mine\*  
Mission Mine\*  
Oracle Ridge Mine\*  
Pinto Valley Mine\*  
Ray Mine\*  
Morenci Mine\*  
San Manuel Mine\*  
Sierrita Mine\*

GYPSUM

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

LIMESTONE/MARBLE

Andrada Marble Quarry  
Cyprus Lime Quarry  
Santa Rita Quarry  
St. Johns Limestone Quarry  
Shipley Pit  
White Rock Quarry

MOLYBDENUM

Bagdad Mine\*  
Morenci Mine\*  
Pinto Valley Mine\*  
San Manuel Mine\*  
Sierrita Mine\*  
Twin Buttes\*

PERLITE

Superior Perlite Mine

PIGMENT

Swansea Mine  
Iron Chancellor Mine

PUMICE

Crown Claims  
Dead Eye Mine  
More Sand, Moon Sand  
White Vulcan

SALT

Southwest Salt Mine

SAND & GRAVEL

See Listing of Sand and Gravel  
Operations

SAND, INDUSTRIAL

Ajo Plant & Slag Stockpile  
Houck Silica Sand

SILICA SMELTER FLUX

Copper Hill  
Gold Hill Mine  
Gold Prince

SILVER

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

SLATE

New River Slate Quarry

STONE, DIMENSION

Black Cat Quarry  
Blue Bell Schist Quarry  
Dunbar Quarries  
Government Canyon Quarry  
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  
Rock House Quarry  
Sidewinder Quarry  
Western States Stone Quarries  
Yellow Wasp Quarry

ZEOLITES

Bowie Chazazite Mine  
Grace Chabazite Mine  
Union Pass Mordenite

\* Produced as a by-product

Directory of Active Mines in Arizona

1994

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Forward

This directory was compiled in November, 1993 from field visits and information received by the Department's technical staff. For the purpose of this directory, an active mine is defined as a mine in continuous operation, either in production or under full-time development for production. Custom milling operations that are active or available on a full-time basis are also included in the directory.

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

The directory is arranged alphabetically by company name. Each listing includes corporate addresses, mine name and location, operation description, and key personnel when provided. The area code for all Arizona phone numbers is 602.

## ARIZONA'S MINERAL INDUSTRY

Arizona continues to rank as the nation's leading mineral producer. The value of mineral production in the state last year was in excess of \$3.44 billion (see table, p. A2). As it has since 1910, Arizona leads the nation in copper production. A total of 2.542 billion pounds of copper was produced in 1992, 65% of the U.S. total. Arizona also ranks first in the nation in mined gemstone production and is among the leaders in the production of molybdenum, silver, pyrite, and perlite. There are over 104 mines active, excluding sand and gravel operations, producing the above mentioned metals plus 18 industrial mineral commodities. The mining industry directly employs more than 16,000 people.

### COPPER

The copper mines produced a record amount of copper in 1992! This was the third year of record production. Completion of expansion projects along with good market prices and operating conditions contributed to higher levels of production. Leach solvent extraction electrowinning (SX-EW) production reached 30% of total production, an all time high, despite flotation concentrate production being up 10.5%, reaching 1.767 billion pounds. Record rainfall during December, 1992 through February, 1993 hampered operations with flooding occurring in open pits and lowering copper concentrations in leach solutions.

Copper value reached \$2.731 billion as copper prices were nearly unchanged in 1992 down only \$0.02 averaging \$1.07/pound. The slow world economy and growing copper inventories in commodity warehouses have resulted in prices dropping to \$0.74 in December 1993. Producers have been cutting costs and attempting to preserve corporate earnings by hedging and forward selling portions of their 1993 production. The outlook looks grim for 1994 unless demand increases significantly.

Byproduct production and value from copper mining for 1992 was as follows: molybdenum - 30.8 million pounds, \$61 million; silver - 5,015,702 ounces, \$19.8 million and gold - 60,089 ounces, \$20.6 million.

### Arimetco Incorporated

Arimetco produced copper from the Emerald Isle and Johnson Camp mines, while development continued at the Van Dyke and Zonia copper properties. The two properties combined to produce 8.7 million pounds in 1992. The company also operates the Yerrington copper mine in Nevada.

Johnson Camp's 8.2 million pounds of copper accounted for over 45% of the company's production in 1992. This was the first full year of mining at the property by Arimetco. Additional reserves of 4 million tons were identified by drilling in the producing Burro pit. These extend its life further and will allow postponement of development of the Copper Chief ore body.

The Emerald Isle open pit mine produced in 1992 from heap leach pads and an 8,000 pounds per day SX-EW facility. Heavy 92-93 winter rains flooding the pit have forced this operation to assume a care and maintenance status.

Arimetco reports that good progress was made during 1992 in rehabilitating the Van Dyke shaft. Plans are to inject acid into previously mined underground areas and treat recovered solutions in an SX-EW plant. Use of the shaft is planned to access workings and serve as a collection point for injected leach solutions. Unfortunately, flooding caused by winter rains in Magma's adjacent Miami mine has caused operations to be suspended. The two mines are connected by a bulkhead and high water levels in the Miami mine pose a safety hazard to underground miners at Van Dyke.

Premine-planning drilling was completed at Zonia in 1993. Reserves totaling 30 million tons have been identified with additional tonnage possible. Engineering, permitting and planning efforts are under way for an open pit mine and construction of an SX-EW plant.

### Asarco Inc.

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 544 million pounds of copper in 1992. Asarco, along with joint venture partner Freeport, continue the in-situ leach research at the Santa Cruz property in cooperation with the U.S. Bureau of Mines. Asarco also holds major reserves at the Chilito north of Hayden, at Helvetia, east of the Mission Complex, and at Sacaton East.

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. An acid plant rated at 1,600 tons of sulfuric acid per day controls sulfur dioxide emissions.

The company's Mission Complex 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,

## Supplemental Information

### Arizona State Agencies

#### Arizona Geological Survey

845 North Park Avenue, Tucson, AZ 85719  
Phone 882-4795

#### Arizona Mines and Mineral Resources

1502 West Washington, Phoenix, AZ 85007  
Phone: 255-3791

#### Land Department - Minerals Section

1616 West Adams, Phoenix, AZ 85007 Phone:  
542-4628

#### Mine Inspector

State Capital, West Wing, Room 403, Phoenix,  
AZ 85007 Phone: 542-5971

### Federal Agencies

#### Bureau of Land Management

Arizona State Office, 3707 North 7th St. #300,  
Phoenix, AZ 85014 Phone: 650-0200

#### Bureau of Mines

Arizona State Activity Officer, P.O. Box  
25086, Building 20, Denver Federal Center,  
Denver CO 80225-0086 Phone: 303-236-0451

#### Forest Service

Arizona Zone Office - Minerals, 2324 East McDowell Rd., Phoenix, AZ 85006, Phone: 225-5262

#### Mine Safety and Health Administration

305 East Main, Mesa, AZ 85201 Phone: 379-4658

#### U.S. Geological Survey

Mineral Information Office, 340 North 6th  
Avenue, Tucson, AZ 85705 Phone: 670-5544

### Industry Associations

#### Arizona Mining Association

2702 North 3rd Avenue, #2015, Phoenix, AZ  
85004 Phone: 266-4416

#### AMIGOS

500 East Thomas, P.O. Box 25187, Phoenix,  
AZ 85002 Phone: 279-3199

#### Arizona Rock Products Association

1825 West Adams, AGS Building, Phoenix,  
AZ 85007 Phone: 271-0346

#### Society For Mining, Metallurgy, and Exploration, Inc. - National Headquarters

P. O. Box 625002, Littleton, CO 80162-5002  
Phone: 303-973-9550

#### Society For Mining, Metallurgy, and Exploration, Inc. - Arizona Conference

2700 East Executive Dr., Tucson, AZ 85714  
Phone: 294-9862

Additional copies of *Directory of Active Mines in Arizona 1994* may be obtained for \$4.00 (\$5.50 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 Arizona Mines and Mineral Resources.



**SUN STATE ROCK & MATERIAL CORP.**  
P.O. Box 1340, Sun City, AZ 85372 - Phone 566-3000 -  
Employees: 40 - Sand, gravel, ABC, rock products.  
Owner . . . . . Dolores Walker

**SUNWARD MATERIALS**  
2625 S. 19th Ave., Phoenix, AZ 85009 - Phone 253-2505 -  
Employees: 270 - Sand, gravel, rock products, redimix.  
Vice President Operations . . . . . Chris Reinesch

**SUPERIOR COMPANIES**  
Hayfield Draw, Camp Verde, AZ 85322 - Phone 567-2244  
- Employees: 50 - Produces sand, gravel, rock products,  
gypsum and clay.  
General Manager . . . . . Ed Davidson

**SUPERSTITION CRUSHING**  
2323 E. Hale, Mesa, AZ 85213 - Phone 962-5326 -  
Employees: 25 - Custom crushing, sand and gravel - Pit in  
Yuma.  
Owner . . . . . John Weik,  
Owner . . . . . Myron Jones

**TREASURE CHEST MINING**  
1701 N. Bridal Wreath, Tempe, AZ 85281 - Phone 983-  
1606 - Employees: 4 - Sand, gravel producer.

**UNION ROCK & MATERIALS CORP.**  
P.O. Box 8007, 2800 S. Central Ave., Phoenix, AZ 85066  
- Phone 276-4211. Employees: 250 - Produces sand, gravel,  
rock products, ready mix, ABC and asphaltic concrete  
aggregate.  
President . . . . . Chris Murphy  
V. President . . . . . Al Wilcox

**El Mirage Plant - 935-2653**  
Yard Superintendent . . . . . Jim Shields

**Mesa Plant - 990-0844**  
Yard Superintendent . . . . . Marshal Jurn

**UNITED METRO**  
**A DIVISION OF THE TANNER COMPANIES**  
P.O. Box 52140, Phoenix, AZ 85072 - Phone 220-5000 -  
Employees: 600 - Sand, gravel, asphalt material supplier.  
President . . . . . John Fowler

**Tucson Rock and Sand**  
P.O. Box 36030, Tucson, AZ 85740-6030 - Phone (602)  
7443222 - Construction material supplier  
Division President . . . . . Richard Hrubec

**Casa Grande Plant** 2305 S. Roofite Rd., Casa Grande, AZ  
85222 - Phone 836-8705 Material suppliers: sand, gravel  
asphalt, ready mix.  
Plant Manager . . . . . Will Watkins

**Havasu Contracting and Materials Division**  
1785 Kiowa Blvd., Lake Havasu City, AZ 86403 - Phone  
(602) 855-7210 - Material supplier, sand, gravel, concrete,  
asphalt.  
Plant Manager . . . . . George Davis

**Parker Contracting and Materials Division**  
Riverside Drive, Parker, AZ 85344 - Phone (602) 669-9252  
- Materials supplier, sand, gravel, concrete and asphalt -  
Plant Manager Virgil Hollis

**Nogales Plant**  
91 Old Ruby Road, Nogales, AZ 85621 - Phone 281-9669  
- Ready mix supplier.  
Plant Manager . . . . . Ernie Bracamonte

**Yuma Construction Division**  
2088 E. 20th Street, Yuma, AZ 85365 - Phone 343-4100 -  
Construction material supplier.  
Division President . . . . . Jerry Janney

**VALLEY CONCRETE & MATERIALS**  
820 E. Hwy. 89-A, P.O. Box 634, Cottonwood, AZ 86326  
- Phone 634-4250 - Employees: 35 - Sand, gravel and ABC.  
Plant Manager . . . . . David Heath

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

**W.A. MORRIS SAND, GRAVEL & CONCRETE INC.**  
US Highway 191 South, Safford, AZ 85546 - Phone 428-  
1371 - Employees: 15 - Sand, gravel and concrete supplier.  
Owner . . . . . Jack Gilbert

**WESTERN SAND & ROCK**  
P.O. Box 65, 4175 S. Litchfield Rd., Avondale, AZ 85323  
Phone 932-1391 Employees: 10 - Produces sand, gravel  
and rock products.  
Owner . . . . . Mike Quackenbush

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

**WICKENBURG CONCRETE & MATERIALS**  
P.O. Box 516, U.S. Hwy. 60, M.P. 115.5, Wickenburg,  
AZ 85358 - Phone 684-3402 - Employees: 17 - Supplier  
of aggregate materials.  
President . . . . . Edwin Dillard  
Vice President . . . . . George Dillard

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

**YAVAPAI MATERIALS, INC.**  
P.O. Box 814, 5899 Wilkinson, Prescott, AZ 86301 - Phone  
445-7305 - Employees: 17 - Sand and gravel producer.  
President/Owner . . . . . John Pemberton

Mission and South. They have the capacity to process  
59,000 tons of ore daily resulting in an annual capacity of  
124,000 tons of copper in concentrates.

The Ray Mine consists of an open-pit mine, two mills,  
a 26,000 ton per day concentrator at Hayden and a newly  
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. Output from the new mill made Ray  
the second largest producer in the state in 1992. The new  
mill allowed lowering of the cut-off grade to 0.3% that  
resulted in nearly a doubling of the reserves to 1.1 billion  
tons. This puts the Ray mine in an elite group of three  
deposits in the U.S. with reserves in excess of 1 billion tons.  
Rainfall totaling 22 inches in December 1992 and January  
1993 (average annual rainfall is 17.5 inches) hurt 4th and  
1st quarter production.

Asarco's Silver Bell mine produces copper by dump  
leach precipitation. The open-pit mine and mill remained  
on stand-by status. Permitting for a new SX-EW plant  
continues. The new facility 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.

## Cyprus Climax Metals Company

Late in 1993 Cyprus Minerals Company and AMAX  
Inc. merged to create Cyprus Amax Minerals Inc. and  
formed a new subsidiary known as Cyprus Climax Minerals  
Company.

Cyprus was Arizona's second largest producer of cop-  
per in 1992 and continues to be the largest producer of  
molybdenum. Totals for the year were 647 million pounds  
of copper and 25 million pounds of molybdenum. Cyprus  
Climax Minerals Company maintains corporate head-  
quarters in Tempe, Arizona and operates five copper  
producing operations in the State: Bagdad, Casa Grande,  
Miami, Mineral Park, and Sierrita.

The Bagdad operation consists of an open-pit copper-  
molybdenum mine, a 75,000 ton per day concentrator, a  
dump leach operation, and an SX-EW plant. The mill was  
being expanded to increase capacity by 10% in 1993.

The Casa Grande operation consists of an in-situ leach-  
ing operation, an SX-EW plant, and a roast-leach-  
electrowinning (RLE) plant that is treating approximately  
160,000 tons of copper concentrates from other Cyprus  
properties. Acid produced from the RLE gases is used for  
the leaching operations. The block caved stopes in the oxide  
ore body are being leached and development of a leaching  
operation in virgin ground is under way using high pressure  
pumps to inject sulfuric acid solution into holes drilled from  
the old underground workings. Evaluation of open pit min-  
ing and heap leaching a portion of the oxide ore body was  
underway during 1993.

The Miami property consists of three open pit copper  
mines formerly known as Inspiration, Bluebird, and Ox

## MINERAL PRODUCTION IN ARIZONA - 1992

COMMODITY	QUANTITY	VALUE
Clay (tons)	112,808	\$463,000
Copper (tons)	1,271,220	2,731,152,000
Gemstones		5,416,000
Gold (troy ounces)	213,995	73,818,000
Sand & gravel(tons)	33,842,000	123,517,000
Silver (troy ounces)	5,304,865	20,873,000
Stone-crushed(tons)	5,500,000	26,300,000
Pigments (tons)	85	62,000
Coal (tons)	12,500,000	275,000,000
Other <sup>2</sup>		184,337,000
<b>TOTAL</b>		<b>\$3,440,938,000</b>

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

2/ Cement, clays (bentonite), gypsum, lime, molyb-  
denum, perlite, pumice, pyrites, salt, sand & gravel (in-  
dustrial), dimension stone, lead, tin.

Hide, an SX-EW plant, a smelter recently expanded to a  
capacity of 650,000 tons per year, an acid plant, SX- EW  
plant, electrolytic refinery, a 135,000 ton per year rod plant,  
and a 24,000 ton per day concentrator that is currently on  
standby status.

Cyprus operates a dump and in-pit leaching operation  
and precipitation plant at Mineral Park. The Mineral Park  
open-pit copper-molybdenum mine and its 15,000 ton per  
day concentrator are on stand-by status.

The Cyprus Sierrita property consists of an open-pit  
copper-molybdenum mine, a 95,000-ton-per-day con-  
centrator, two molybdenum roasting plants, a ferromolyb-  
denum plant, a rhenium plant, a dump leaching operation,  
and an SX- EW plant. An expansion of mill capacity by  
10% was being undertaken in 1993. More than three  
quarters of Cyprus' molybdenum concentrate from their  
Thompson Creek (Idaho), Bagdad, and Sierrita operations  
is processed at Sierrita through on-site roasters to produce  
molybdenum oxide and ferromolybdenum.

Twin Buttes contributed over 40% of the copper  
produced at the Sierrita concentrator in 1992. Sulfide ore is  
transported to the Sierrita concentrator by a 6.8 mile con-  
veyor. The agitation leach/SX-EW plant at Twin Buttes was  
closed in December of 1992 when oxide ore was depleted.

# Magma Copper Company

Magma Copper Company's corporate headquarters are located in Tucson and the company operates three mining divisions in Arizona — San Manuel, Pinto Valley, and Superior. In 1992 they produced 554 million pounds of copper, making the company the third largest producer in the state. Magma also holds significant undeveloped reserves in the Florence and Copper Creek deposits. In addition to the divisions, the company operates a 29-mile railroad from San Manuel and a 28-mile railroad from Superior, both connecting to the Santa Fe Southern Pacific's railways.

The San Manuel Division consists of a block-caving underground copper mine, a 62,000 ton per day concentrator, an open pit oxide copper mine and heap leach, in-situ leach, SX-EW plant, a 1,000,000 ton per year smelter with a 3,000 ton per day acid plant and a 310,000 ton per year electrolytic refinery, and a 180,000 ton per year rod plant. The underground mine is the largest underground operation in the United States and the largest underground copper mine in the world. During 1993 Magma Copper decided to proceed with a \$135 million development of the downfaulted Kalamazoo ore body that will add twelve years to the San Manuel underground mine. Magma's San Manuel smelter accounts for about 25 percent of U.S. copper smelting capacity. Even though the Outokumpu flash smelting furnace, at a design capacity of 3,000 tons of concentrate per day, is the largest single furnace smelter in

the industry, an expansion of its capacity by 20% was announced in 1993.

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 8000 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.

The Superior division consists of the company's namesake, 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 5.56% copper in 1992, ten times the average content of Arizona copper ore.

## Oracle Ridge Mining Partners

The Oracle Ridge Mining Partnership consists of South Atlantic Ventures Ltd., who hold a 70% interest and operate the mine and Continental Materials with the remaining 30%. The underground Oracle Ridge mine produced concentrates containing 6.9 million pounds of copper in 1992.

## Mine rank in 1992, by copper production

Mine/Company	Production (pounds)	% of total
1 Morenci/Phelps Dodge Corp.	778,600,000	30.6
2 Ray/Asarco Inc.	331,108,985	13.0
3 San Manuel/Magma Copper Co.	330,141,371	13.0
4 Bagdad/Cyprus Copper Co.	229,302,000	9.0
5 Mission/Asarco Inc.	206,321,800	8.1
6 Pinto Valley/Magma Copper Co.	180,331,000	7.1
7 Sierrita/Cyprus Copper Co.	147,840,000	5.8
8 Twin Buttes/Cyprus Copper Co.	140,144,000	5.5
9 Miami/Cyprus Copper Co.	124,575,000	4.9
10 Superior/Magma Copper Co.	24,401,786	1.0
11 Miami/Magma Copper Co.	19,504,000	0.8
12 Silver Bell/Asarco Inc.	6,650,000	0.3
13 Johnson/Arimetco International Inc.	8,156,435	0.3
14 Oracle Ridge/Oracle Ridge Mining	6,858,000	0.3
15 Mineral Park/Cyprus Copper Co.	4,000,000	0.2
16 Copper Queen/Phelps Dodge Corp.	2,422,000	0.1
17 Casa Grande/Cyprus Copper Co.	2,000,000	0.1
18 Emerald Isle/Arimetco Interntl. Inc.	576,459	0.0
Total	2,542,932,836	100.0

## LITTLE B MINING

P.O. Box 99, Flagstaff, AZ 86002 - Phone 526-5571 - Employees: 8 - Red volcanic cinders, ABC, special products.  
Owner . . . . . Bonnie Crick

## MADDUX & SONS, INC.

1927 Pan American, P.O. Box 1077, Douglas, AZ 85608 - Phone 364-7564 - Employees: 45 - Sand, gravel and rock products.  
Owners . . . . . Hazel & Bryce Maddux  
President . . . . . Leonard Maddux  
Office Manager . . . . . Toni Vance

## MCCORMICK CONSTRUCTION

Bullhead City, AZ - Phone 763-2272 - Employees: 11 - Sand, gravel, rock products.

## MESA MATERIALS, INC.

P.O. Box 20040 Mesa, AZ 85277 - Phone 830-1521 - Employees: 45 - Produces gravel, rock products and asphalt.  
Owner . . . . . Edward C. Levy Co.  
Office Manager . . . . . Bruce Erickson  
Purchasing . . . . . Sharon Crane  
Operations Manager . . . . . Dave Schessler

## MESA SAND & ROCK INC.

2246 N. Country Club Dr., Mesa, AZ 85201 - Phone 964-1773 - Employees: 35 - Produces sand, gravel, rock products and ready-mix.  
President . . . . . Robert Shill  
Owners . . . . . Robert, Richard and David Shill, Louise Branch and Susan Matheson.

## MOHAVE CONCRETE & MATERIALS INC.

Hwy. 95 N., Lake Havasu City, AZ 86043 - Phone 764-2226 - Employees: 28 - Produces sand gravel, rock products and ready mix.  
Owner . . . . . Qinto Polidori  
Treasurer . . . . . Veronica Polidori  
Superintendent . . . . . Pete Tiburzi

## OAKCREEK CONTRACTING INC.

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

## PADILLA SAND & GRAVEL HCR

Box 87, Nogales, AZ 85621 - Phone 287-8831 - Employees: 5 - Supplier of sand, gravel and concrete.  
Owner . . . . . Manuel Padilla

## PAULDEN SAND & ROCK REDIMIX

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

## PAYSON CONCRETE & MATERIALS, INC.

1900 E. Hwy 260, Payson, AZ 85541 - Phone 474-2231 - Employees: 40 - Aggregate, sand, gravel and rock products.  
Plant Managers . . . . . George Randall, John Chillson

## PEARCE, JOY T. CONSTRUCTION, INC.

P.O. Box 2049, Hwy. 260, Show Low, AZ 85901 - Phone 537-7454 - Employees: 12 - General engineering contractor, asphalt excavation, roads, parking lots, building pads, rocks, sand, cinders materials.  
Owner/President . . . . . Mr. Joy T. Pearce  
Secretary . . . . . Beth Pearce

## PANTANO SAND & GRAVEL

10851 E. Nebraska Road, Tucson, AZ - Phone 886-1511 - Employees: 10 - Aggregate plant.

## PHOENIX REDIMIX COMPANY

3635 S. 43rd Ave., Phoenix, AZ 85009 - Phone 272-2637 - Produces sand, gravel, aggregates, and rock products.  
President . . . . . Thomas M. Valente  
Vice President . . . . . Timothy Valente  
Marketing Director . . . . . Allan Ladd  
Plant Manager . . . . . Bob Strom

## PIONEER SAND COMPANY

5901 W. Broadway Rd., Phoenix, AZ 85043 - Phone 233-2971 Employees: 30 - Produces sand, gravel and rock products.  
Owner . . . . . Gary Schurn  
Superintendent . . . . . Dave Sawyers

## REIDHEAD SAND & ROCK, INC.

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

## RUE HALE PIPELINE SERVICE

611 S. Voight St., P.O. Box 221, Springerville, AZ 85938 - Phone 333-4483 - Employees: 2 - Produces sand and gravel.  
Owner . . . . . Rue Hale  
Sales Manager . . . . . Lorie Hale

## SALT RIVER SAND & ROCK

P.O. Box 728, Mesa, AZ 85211 - Phone 990-1987 - Employees: 40 - Aggregates, cement/asphalt, sand and gravel.  
Owner . . . . . Maricopa-Pima Salt River Indian Tribes  
Manager . . . . . Wayne Hills  
Sales Manager . . . . . Benny Willcox

## SAND SPECIALTIES, INC.

5570 N. Bush Highway, Mesa, AZ 85205 - Phone 832-2120 - Employees: 4 - Supplier for 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 293-6833 - Employees: 100 - Ready mix, sand and gravel.  
Division Manager . . . . . Al Wilcox

## SCARBOROUGH SAND & GRAVEL

920 E. Stratton Dr., Safford, AZ 85546 - Phone 428-3138 - Employees: 5 - Sand, gravel, rock products.  
Owner/Manager . . . . . Winfred Scarborough

## SMITH AND BELL CONSTRUCTION

1711 N. 8th Avenue, Safford, AZ 85546 - Phone 428-4747 - Employees: 10 - Sand and gravel, ABC, rock products.  
Owner . . . . . Rick Findley

## STAR VALLEY GRANITE & MATERIALS

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



#### DESERT CONSTRUCTION INC.

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

#### DILLION AND SON SAND & GRAVEL

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

#### DON WATSON EXCAVATION

21846 N. 22nd Street, Phoenix, AZ - Phone 582-2270 - Employees: 8 - Sand, gravel, rock products.  
Owner ..... Don Watson

#### DOWNEY, L. A. & SONS INC.

11600 E. Poorman Rd., Tucson, AZ 85747 - Phone 886-2315 - Employees: 7 - Sand and gravel.  
President ..... Dennis C. Downey  
Vice President ..... Darrell Downey  
Secretary/Treasurer ..... David Downey

#### EADS CONSTRUCTION & REDIMIX INC.

Hwy. 92, Bisbee, AZ 85603 - Phone 432-4121 - Employees: 7 - Sand and gravel.  
President ..... Charles Eads  
Vice President ..... Charles R. Eads  
Secretary ..... Louise Eads

#### EARTH PRODUCTS

7001 2nd St., Prescott Valley, AZ 86314 - Phone 772-6446 - Employees: 26 - Sand and gravel, rock products, leach rock and decomposed granite.  
President ..... William H. Hyslip  
Superintendent ..... William G. Hyslip

#### FT. MCDOWELL SAND & GRAVEL CO.

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

#### FRANCIS DAY & SONS

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

#### FRED CLARK TRUCKING CO., INC.

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

#### GENERAL ROCK & SAND

P.O. Box 3049, Industrial Road, Page, AZ 86040 - Phone 645-3289 - Employees: 30 - Sand, gravel, concrete.  
President ..... Meril Jessop  
Superintendent ..... J. Barlow

#### GRANITE CONSTRUCTION CO.

4115 E. Illinois, P.O. Box 27557, Tucson, AZ 85726 - Phone 748-8000 - Employees: 298. Sand, gravel, road materials, soil cement and asphalt.  
Branch Manager ..... Ted Hanorth  
Office Manager ..... Bruce Enger

#### GRATE SAND & GRAVEL CO.

12124 E. County 8, Yuma, AZ 85365 - Phone 344-1145 - Employees: 5.  
President ..... Mr. Robinson  
Treasurer ..... May Robinson

#### GUZMAN CONSTRUCTION

P.O. Box 3100, Globe, AZ 85502 - Phone 425-5775 - Employees: 70 - Sand and gravel, rock products and road materials.  
President ..... Mike Guzman Jr.  
Vice President ..... Wess Bryant  
Superintendent ..... Joe Rackley

#### HAMILTON SAND & GRAVEL

Hamilton Rd., RR 1 Box 1350, Willcox, AZ 85643 - Phone 384-2582 - Produces sand, gravel, rock products.  
Owner ..... David May

#### HATCH CONSTRUCTION & PAVING

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

#### HI-GRADE MATERIALS CO.

2900 Pass Canyon Road, Bullhead City, AZ - Phone 754-5400 - Employees: 12 - Sand, gravel, rock products.

#### HUACHUCA CONCRETE, INC.

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

#### J&F SAND AND GRAVEL

Avenue 24E Country 9th Street, Yuma, AZ 85367 - Phone 342-3654 - Employees: 2 - Sand and gravel.  
Owner ..... Jesse Gomez

#### J.D.'S SAND & GRAVEL INC.

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

#### JIM BUSH SAND & GRAVEL

1015 N. Cameron Ajo, AZ 85321 - Phone 387-6250 - Employees: 4 - Sand and Gravel - Excavating contractor.  
President ..... Patti Bush  
Vice President ..... David Bush

#### KINGMAN REDIMIX

Mohave Airport Dr., Kingman, AZ 86401 - Phone 757-7446 - Employees: 11 - Sand, gravel and redimix.  
President ..... Pete Campbell

#### KOCJAN ASSOCIATES, INC.

P.O. Box 3748, Industrial Park, Page, AZ 86040 - Phone 645-3602 - Employees: 5.  
President ..... John Kocjan  
Vice President ..... Gerald Kocjan

## Phelps Dodge Corporation

Phelps Dodge Corporation, headquartered in Phoenix, is the nation's largest copper producer. 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 conjunction with its Arizona operations, Morenci and Copper Queen, Phelps Dodge operates the Hidalgo and Chino smelters and the Tyrone and Chico mines in New Mexico, and a 420,000 ton per year refinery at El Paso Texas.

Phelps Dodge's Morenci mine is the largest copper producer in North America and the second largest copper mine in the world. In 1992, Morenci produced a record 778.6 million pounds 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 employees more than 2,000 people.

The Morenci operation consists of the Morenci, Metcalf, and Northwest Extension open pit copper mines, the 60,000 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 170,000 tons annually, the worlds largest EW plant. The 650,000 ton per year smelter with a 2,400-ton-per-day acid plant remains inactive. 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 company's Copper Queen mine consists of a dump leaching and precipitation operation at the depleted Lavender pit. The New Cornelia mine consists of an open-

pit copper mine, a 30,000-ton-per-day concentrator with a molybdenum circuit, and a 190,000-ton-per-year smelter with an acid plant. The mine has been inactive since August, 1984 and the smelter was shut down in April, 1985.

Evaluation of the Lone Star and Dos Pobres deposits near Safford continues. These deposits, estimated to contain nearly 2 billion tons of open pitable material are being evaluated as heap leach SX-EW operations. Phelps Dodge has been rehabilitating underground workings at the United Verde mine at Jerome to sample and evaluate a high grade zinc resource.

## COAL

Low sulfur coal ranks second to copper in economic importance in the State. In 1992 Arizona coal production was 12,513,000 short tons with an estimated value of \$275 million. Coal is mined from the Kayenta and Black Mesa mines in central Navajo County. Surface mining is done on reservation land leased from the Navajo and Hopi Tribes in the 1960's by Peabody Coal Company. Peabody is the Nation's largest coal producer and the Kayenta mine in northeastern Arizona is their largest operation.

The coal from the Black Mesa and Kayenta Mines is subbituminous with an average quality of 11,000 Btu, 0.5% sulfur, and 10% ash. The coal complies with the Clean Air Act Amendments of 1990 emission standard of 1.2 pounds of sulfur dioxide per one million Btu. Kayenta coal, which is burned in Arizona, is blended with other coals at the power plant to meet the more stringent Arizona emissions limit of 1.0 pounds of sulfur dioxide per one million Btu.



*In-pit crusher and ore conveyor - Bagdad.*

The leases from the Navajo's and the Hopi's were renegotiated in 1987. In addition to the 400 million tons of coal covered by the original leases, an additional 270 million tons was acquired in the renegotiated leases. The 670 million tons of coal lie beneath 17,000 acres of the 64,858 acre lease.

The Kayenta mine employs more than 500 people and produces about 8 million tons annually. The coal from the Kayenta mine is carried by a conveyor system 17 miles to storage silos. From there it is transported by automated trains to the Salt River Project's Navajo Generating Plant 78 miles away. The Black Mesa mine produces about 4.5 million tons annually. Here, the coal is powdered and mixed with water prior to transport by the world's longest, and the Nation's only, coal-slurry pipeline. The 273-mile journey to the Mohave Generating Station at Laughlin, Nevada takes, three days.

The Peabody 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

Lower gold prices in 1993 had a negative effect on Arizona's gold producers.

The Cyprus Copperstone open pit, for many years the state's largest producer, exhausted its reserves but continued to mill stockpiled ore through April. Verdestone Gold shipped about 25,000 tons of ore from the Oakland mine in northern Yuma county for processing at Copperstone's mill under a toll agreement before it shut down. The mill and other surface facilities are now being dismantled as part of the mine's reclamation.

Magma Copper Company depleted reserves at the McCabe underground mine in March and closed the operation. Workings have been capped and the flotation mill dismantled. During its year and a half of operation the McCabe mine produced 28,405 ounces of gold, 113,116 ounces of silver and 473,946 pounds of copper.

The Mystic Mine, north of Phoenix, operated for part of 1993 by Mystic Mining LLC, Inc. Ore was trucked to a gravity mill located near Wickenburg for processing. The company reported recovering \$1 million of gold (2,750 ounces) before mining was suspended due to depletion of reserves.

On a positive, note Western States Minerals Corp. returned the Gold Prince, located near Willcox, to production shipping, gold-bearing silica flux to Phelps Dodge's Hidalgo smelter in Playas, New Mexico. During 1994, a drilling program to confirm reserves, followed by development of the lower mine levels is planned.

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. Listed in order of production, San Manuel, Magma, Morenci, Ray, Mission, Sierrita, Pinto Valley, and Oracle Ridge all produced significant quantities of gold.

## URANIUM

Low uranium prices (NUEXCO spot price \$6.90/lb. as of 12-92) continue to negatively influence this industry segment. While waiting for price and demand to improve, Energy Fuels Nuclear Inc.'s mines are on care-and-maintenance basis. Developed deposits include Arizona One, Hermit, Kanab North, and Pine Nut. Development of the Canyon Mine awaits regulatory approval.

## INDUSTRIAL MINERALS

Although copper accounts for two-thirds of the State's mineral production by value, mining in Arizona continues to be a diversified activity. Industrial minerals mined in the state last year include calcium carbonate as limestone and marble for mineral filler and as raw material for lime and cement plants, bentonite for desiccants and for bleaching and clarifying of edible oils, sand and gravel for construction aggregate, diatomite, tile and brick clay, salt, cinders, pumice for laundry uses and light-weight aggregate, zeolites for molecular sieves, stone, perlite for filters, gypsum for wall board and agriculture, silica flux, pyrite and micaceous hematite for pigment, quarried flagstone, and hydrafrac sand. Construction aggregates in the form of sand and gravel lead this industrial mineral group, both in volume and value of production. Salt River Sand & Rock operated the fourth largest sand and gravel plant in the nation in 1992.

Many market niches exist for the specialized industrial mineral producer. The tremendous range in employee and capital requirements for the industrial minerals commodities vary widely enough to accommodate a family-run operation as well as large corporate producers. The increase in the number of family run decorative and dimension stone producers is an indication of this condition.

Arizona Portland Cement's cement plant at Rillito has completed a \$14,000,000 cement kiln efficiency improvement project. The project included a number of modifications to the large kiln that was installed in the 1970's. The improvements made a slight throughput increase and a major improvement in energy efficiency.

Arizona's two new mineral pigment mining and processing operations have been added to the directory. Arizona Oxides mines a natural red iron oxide pigment from their Iron Chancellor Mine and Swansea Minerals produces a micaceous hematite pigment for anticorrosive paints.

The Arizona Department of Mines and Mineral Resources' project to survey and quantify consumption of

# SAND AND GRAVEL OPERATIONS LISTING

## A & A MATERIALS

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

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

## ABC SAND & ROCK

5401 N. 119th Avenue, Glendale, AZ 85307 - Phone 935-1677 - Employees: 4 - Mine sand and gravel from Agua Fria River.

Owner . . . . . David Waltemath

## ACE SAND & GRAVEL

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

Owner . . . . . Delia Gastelum

## ACME SAND & GRAVEL

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

Owner . . . . . Joe Kempton

## AJAX SAND & GRAVEL

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

## ALLISON ROCK & SAND CONSTRUCTION (dba L. Sheldon & Co.)

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

President . . . . . Loren Sheldon

## ARIZONA CRUSHING CO.

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

President . . . . . Terese Sanders  
Vice President . . . . . Joe Moody

## ARIZONA SAND & GRAVEL

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

President . . . . . Ernie Kaznak

## ASHTON COMPANY, INC.

2727 S. Country Club Road, Tucson, AZ - Phone 624-5500 - Sand, gravel, rock products.

Owner/President . . . . . Harold Ashton  
Vice President . . . . . Lawrence Ashton

## AZTEC MATERIALS

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

President . . . . . Ronald R. Perkins  
Vice President . . . . . Wanda Perkins

## B & R MATERIALS

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

President . . . . . Roland C. Brown

Vice President . . . . . Kim Brown

## BRIMHALL SAND & ROCK BUILDING MATERIAL

P.O. Box 750, Snowflake, AZ 85937 - Phone 536-4226 - Employees: 62 - Crush raw products - supply sand and gravel products.

President . . . . . Darrell Brimhall  
Vice President . . . . . Larry Brimhall  
General Manager . . . . . M. Kurt Brimhall

## CALMAT COMPANIES

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

Vice President/General Manager . . . . . Bruce Dyer

Sales Manager . . . . . Bob Maurer

## CALMAT OF ARIZONA

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

Operating Manager . . . . . Dan McQuade  
District Manager . . . . . Tom Newman

## CAMPBELL REDI-MIX

1510 Copper Lane, Lake Havasu, AZ 86403 - Phone 855-6535 - Employees: 3 - Sand, gravel, rock products.

Owner . . . . . Delbert Campbell

## CENTRAL ARIZONA MATERIALS

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

Manager/Owner . . . . . Randy Parsons

## CHANDLER READY MIX

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

President . . . . . Ronald R. Perkins  
Vice President . . . . . Wanda Perkins

## CHURCHMAN SAND & GRAVEL

P. O. Box 42874 Tucson, AZ 85737 - Phone 325-1611 - Employees: 5 - Sand and gravel trucking company.

President . . . . . Dick Smith  
Vice President . . . . . Suzie White

## CKC MATERIALS DIVISION

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

President . . . . . David Cluff  
General Manager . . . . . Carl Bryce

## DESERT CONCRETE CO.

P.O. Box 430, East Garden Ave., Sierra Vista, AZ 85636 - Phone 378-2321 - Employees: 2 - Sand and gravel wholesale.



### WESTERN GYPSUM INC.

130 E. 200 North, P.O. Box 850, St. George, UT 84770  
Phone (801) 628-3916, Fax (801) 628-4441 - Employees:  
10.

President . . . . . Don Cecala  
Mine Superintendent . . . . . Tracy Cannon  
Office Manager . . . . . Lynette Albertson  
**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 gyp-  
sum for cement industry, agriculture, fertilizer industry,  
functional fillers, and water treatment - Markets in Califor-  
nia, Colorado, and Arizona.

### WESTERN ORGANICS INC.

P.O.Box 6876, Phoenix, AZ 85005 - Phone 269-5756, Fax  
269-7621 - Plant located at 27th Avenue and Lower Buck-  
eye Road in Phoenix - Employees: 100 .

President . . . . . James Porter  
Vice President/Operations Manager . . . . . D. C. Porter  
Sales Manager . . . . . Dennis Reynolds  
Office Manager . . . . . Adrian Cluff  
**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 - Markets in western United  
States.

### WESTERN STATES MINERALS CORP.

HCR 2, Box 8011, Willcox, AZ 85643 - Phone 826-3016  
- Employees: 25.

Project Manager . . . . . Mel Swanson  
**Gold Prince Mine T14S R27E Sec. 22**  
Underground gold silica flux mine - ships directly to cop-  
per smelter.

### WESTERN STATES STONE COMPANY

2830 Grand Ave., Phoenix, AZ 85017 - Phone 253-2018.  
President . . . . . C. E. Webster  
**Ashfork Plant T21N R2W Sec. 3**

**Quarries**  
P.O. Box 316 - Ash Fork, AZ 86220 - Phone 637-2542 -  
Employees: 40 - Quarries located in Coconino, La Paz,  
Maricopa, Mohave, and Yavapai counties - Stone process-  
ing facility in Ashfork - Commercial and decorative build-  
ing stone marketed locally, out of state, and exported.  
Superintendent . . . . . Shirley Robertson

### YELLOW HAIR TRADING AND MINING

P.O. Box 111, Globe, AZ 85502 - Phone 425-7625 or  
425-0446 - 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.

industrial minerals in Arizona's market area continues.  
The object of this project is to encourage exploration,  
development, and production of industrial mineral deposits  
in Arizona that can supply southwestern United States and  
northern Mexico markets.

### GEMSTONES

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

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

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

Petrified wood, although occurring in nearly every state,  
is best known as an Arizona gem material. Petrified wood

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

### RECREATIONAL PROSPECTING

Rockhounding continues to be a popular recreational  
activity in the state. The resultant impact on the Arizona  
tourism industry is hard to determine, but undoubtedly is  
significant. The gem show in Quartzsite, for example, is the  
largest in the world, drawing in excess of 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.

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

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

### 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 bas, 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 and 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 bas of unpublished reports and maps that includes 4,000 mine files and indexes of 10,000 computerized Arizona mineral occurrences,
- Maintain an information bank and library of mineral and mining information including a mine map library (hard copy and microfilm), government publications, periodicals, and unpublished master and doctorate theses.
- Gather and disseminate information on commodities and markets.
- Suggest target areas for exploration activity.
- Suggest properties for acquisition and development.
- Assist individuals and companies in their dealings with State regulatory agencies to facilitate their mining and exploration activity.
- Produce publications in the form of mineral reports, annual directories, technical reports, annual mineral industry surveys and information circulars. The 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 current listing of the department publications is available upon request.
- Maintain the Arizona Mining and Mineral Museum.

*Underground ore truck.*



# COMPANY LISTING

The following list is arranged alphabetically by company. To locate a specific mine use the index on page A24.

## AMERICAN SANDSTONE

### Blaser Corporation

North Highway 89, P.O. Box 1154, Chino Valley, AZ 86323 - Phone 636-4454, Fax 636-2780 - Employees: 40 - Quarries, processes, saws, and cuts Arizona flagstone and sandstone as flagging, dimension stone and tiles - Marketed in Arizona, the United States, and throughout the world.  
President . . . . . Donald Blaser  
Vice President . . . . . W. Larry Blaser  
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  
**Government Canyon Quarry** T19N R2E Sec. 34  
**Little Rock Quarry** T22N R2W Sec.24  
**Lizard Canyon Quarry** T20N R1E Sec. 32

## ANASAZI COMPANY

7486 E. Adobe Drive, Scottsdale, AZ 85255 - Phone 585-9882 - Employees: 20 - Operates flagstone quarries in Coconino County and slate quarry in Maricopa County. Fabrication yard in Scottsdale - Marketed in the United States and Asia.  
Owner . . . . . Grady Dawe  
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 267-8658, Fax 780- 0544 - Employees: 9 (including contractors) - quarries located near Mayer - Onyx marble quarry - Schist quarries - Landscape boulders, building and dimension stone - Marketed in Arizona, the United States, and throughout the world.  
President . . . . . Perry Halquist  
Manager . . . . . Wayne Evans  
**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.

335 N. Wilmot Rd., Suite 410, Tucson, AZ 85712 - Phone 795-5725.  
**Arimetco Inc.**  
5099 E. Grant Road, Ste. 120, Tucson, AZ 85712 - Phone 795-5725.  
Chairman, CEO . . . . . H. Roy Shipes  
President, Chief Operating Officer . . Desmond P. Kearns  
Vice President-Corporate Affairs  
Corporate Secretary . . . . . John McKinney  
Controller . . . . . Martin Martinez  
Chief Geologist . . . . . Harrison Matson  
**Johnson Camp Mine** T15S R22E Sec. 26  
Exit 322 off I-10, Johnson Mine Road, Dragoon, AZ 85609-Phone 586-2241. Employees: 27 - Open pit copper mine - Heap leaching - Solvent extraction electrowinning plant - Capacity 30,000 lb. copper per day.  
Mine Superintendent . . . . . Eddie Smith  
Plant Superintendent . . . . . Shane Smith  
**Van Dyke** T1N R15E Sec. 5  
P.O. Box 747, Miami, AZ 85539 - Phone 473-2421. In-situ leach-solvent extraction electrowinning - under development.  
**Zonia Mine**  
P.O. Box 649, Yarnell, AZ 85362 - Phone 427-3564 - Employees: 4 - Permitting and engineering design.  
Mine Superintendent . . . . . A. Joe Smith  
**Emerald Isle Mine** T23N R18W Sec. 22  
Old Chloride Road, Chloride, AZ 86431 - Phone 565-4554 - Copper heap leach - 8,000 pounds per day SX-EW plant - currently on care and maintenance.  
**White Cliff Diatomite** T9S R17E Sec 24  
P.O. Box 1049, San Manuel, AZ 85618 - Phone 385-2515 - Open-pit diatomaceous earth mine and processing plant.  
Mine Manager . . . . . Nic Arrieta

## ARIZONA OXIDES, INC.

3443 N. Central Avenue, Suite 801, Phoenix, AZ 85012 - Phone 265- 5981 - Fax 234-3985 - Employees 13.  
President . . . . . David C. Lincoln  
Vice President & General Manager . . . Vincent Scott  
Marketing Director . . . . . Paul Pomp  
**Processing Plant**  
2221 W. Melinda Lane, Phoenix, AZ 85227 - Phone 581-5144 - Grinding and sizing plant for reducing crude hematite to natural red iron oxide pigment - Marketed internationally - used for pigments in paints, plastics, concrete products and as a mold release in castings.

Vice President . . . . . Don Fischer  
**Camp Verde Gypsum** T13N R5E Sec. 11  
P.O. Box 786, Camp Verde, AZ 86322 - Phone 567-3854 - Gypsum and clay quarry five and one half miles east of Camp Verde on State Highway 260 - Supplies gypsum to Phoenix Cement Company Plant at Clarkdale and for agricultural and horticultural uses. Clay for pond, ditch, and impervious pad sealing uses.  
General Manager . . . . . Ed Davidson  
Maintenance Supervisor . . . . . Randy Austin  
Foreman . . . . . Bruce McDonald  
**St. Johns Limestone** T12N R29E Sec. 4  
P.O. Box 2777, St. Johns, AZ 85936 - Phone 337-4529 - Limestone quarry five and one half miles east of St. Johns on County Road 40 at mile marker 316 - Provides limestone for coal fired power plant flue gas desulfurization (scrubbing) at Salt River Project's Coronado Generating Station and Arizona Public Service's Cholla Power Plant, landscape rock and road base.  
Superintendent . . . . . Efram Chavez  
**Winkelman Gypsum** T6S R16E Sec. 27  
P.O. Box 327, Winkelman, AZ 85292 - Phone 357-7002 - Gypsum Quarry - Gypsum for Arizona Portland Cement Plant at Rillito and agricultural uses.  
Superintendent . . . . . John Nevitt

## SUPERLITE BLOCK COMPANY

P.O. Box 23163, 4150 W. Turney, Phoenix, AZ 85063 - Phone 269-3561.  
President . . . . . Norman Stout  
**Darling Cinder Pit** T21N R9E Sec. 2  
P.O. Box 30956, Flagstaff, AZ 86003-0956 - Phone 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 994- 9964 - Fax 941-2473 - Plant located at 1210 E. Gilbert Rd., Building H2, Tempe, AZ - Employees 4 - Beneficiation plant.  
President/General Manager . . . . . John Challinor  
Co-owner . . . . . Pete Challinor  
**Swansea Mine** T10N R15W Sec. 32  
Produces micaceous-iron-oxide, anti-corrosive barrier pigments.

## TUFFLITE INC.

2432 W. Peoria, Suite 1081, Phoenix, AZ 85029 - Phone 931-3681 - Glendale yard located at 6856 W. Orangewood, Glendale - Employees: 20.  
President . . . . . C. T. Morgan  
Vice President/Mine Manager (Flagstaff) . . Ed Morgan  
Secretary/Treasurer . . . . . Clay Morgan

Orders and Transportation . . . . . Marleen Bustamante  
Sales Manager . . . . . Joe Monno  
**Crown Claims** T23N R7E  
**More Sand, Moon Sand** T23N R7E Sec. 24  
**White Vulcan** T23N R8E Sec. 19  
Mines located 12 miles north of Flagstaff - Pozzolanitic pumice quarries - 6,000 yards/month - Used in making lightweight redimix and block - Large size material used in the preparation of "stone washed blue jeans" and in horticultural preparations - Marketed in and out of Arizona.

## UOP

115 N. Fifth Street, Suite 401, Grand Junction, CO 81501 Phone (303) 245-7957.  
Senior Mining Engineer . . . . . Jim Kirchner  
**Bowie Chabazite** T11S R28E & T11S R29E  
Open pit zeolite mines operated by independent 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.

## UNITED DESSICANTS

### United Catalyst, Inc.

Corporate Headquarters - P.O. Box 32370, Louisville, KY 40232 - Phone (502) 634-7200 - Processing plant c/o United Dessicants, 101 Christine Drive, Belen, NM 87002 - Phone (505)864-6691.  
**Cheto No. 1** T21N R29E Sec. 23  
Employees: 10 - Located approximately six miles southeast of Sanders in northeastern Arizona - Surface strip bentonite mine - Seasonal operation by mining contractors - Low swelling bentonite is shipped to Belen, New Mexico for the production of desiccants.  
Vice President (Louisville) . . . . . Bill Monin  
General Manager (Belen) . . . . . George Klett  
Technical Director (Belen) . . . . . Mathew Rix

## WESTERN ARIZONA ROCK PRODUCTS

### A Division of Hanson Natural Resources, Inc.

P.O. Box 178, Dateland, AZ 85333 - Phone 454- 2253, Fax 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 - Material used in Arizona and California - Sales outside of railroad system are for landscape uses.



**Copper Queen T23S R24E Sec. 15**  
 Highway 92, Bisbee, AZ 85603 - Phone 432-3621 - Employees: 54 - Mine dump leaching - Copper precipitation plant.  
 Area Supervisor . . . . . J. H. Zamar  
**Morenci T4S R29E Secs. 3, 4, 5, 8, 9, 10, 15, 16, 17, 21, 22 & 23**  
 4521 State Hwy. 191, Morenci, AZ 85540 - Phone 865-4521 - Employees: 2064 - Open pit copper mine - Two concentrators (one with molybdenum circuit) - Total capacity 650,000 TPD smelter with 2,400 TPD acid plant (inactive) - 340 million pound per year solvent extraction-electrowinning plant.  
 Manager . . . . . T.R. Snider  
 General Superintendent . . . . . D.H. Thornton  
 Mine Superintendent . . . . . A.R. Edwards  
 Concentrator Superintendent . . . . . J.G. Davis  
 Hydrometallurgical Superintendent . . . . . A.J. Broderick, Jr.  
 Mechanical / Electrical Supt. . . . . J. B. McBiles  
 Chief Engineer . . . . . S.C. Holmes  
 Chief Geologist . . . . . M. S. Enders  
 Raw Materials Director . . . . . D.K. Farquhar  
**New Cornelia T12S R6W Secs. 23, 26, 27**  
 Ajo, AZ 85321 - Phone 387-7451 - Employees: 22 - Open pit copper mine - 30,000 TPD concentrator with molybdenum circuit - 190,000 TPD smelter with acid plant - All inactive.  
 Plant Superintendent . . . . . J. L. Armstrong

**PHOENIX CEMENT COMPANY**  
**Phoenix Office**  
 2501 W. Behrend Drive, Suite 23, Phoenix, AZ 85027, P.O. Box 43740, Phoenix, AZ 85080 - Phone 264-0511 - Employees: 11.  
 President . . . . . James E. Carmichael  
 V.P. Sales & Marketing . . . . . Pete Kuehner  
 V.P. Manufacturing . . . . . Pat Neilio  
**Bulk Cement Terminal**  
 1941 W. Lower Buckeye Road, Phoenix, AZ 85009 - Phone 258-7798.  
**Clarkdale Quarry & Plant T16N R2E Sec. 11**  
 P.O. Box 428, Clarkdale, AZ 86324 - Phone 634-2261 - Employees: 130 - Quarry and plant two miles northwest of Clarkdale - 630,000 TPD - Cement used for building industry - Marketed in Arizona, New Mexico, Utah, and Nevada.  
 V.P. Operations/Plant Manager . . . . John B. Conway  
 Assistant Plant Manager/Maintenance . . . Joe D'Avignon  
 Assistant Plant Manager/Engineering . . . Tom Gibbons  
 Industrial Relations Manager . . . . . Cliff Ayres  
 Controller . . . . . Micheal La Lond  
 Purchasing/Stores . . . . . Frank Contreras  
 Environmental Engineer . . . . . Bernie Ott

**PINAL GYPSUM CORP.**  
 P.O. Box 99, Coolidge, AZ 85228 - Phone 723-3131, Fax 723-9711 - Employees: 10.  
 President . . . . . Orin Benton  
 Vice President (Operations) . . . . . James Bechtel  
**White Cross Mine T7S R17E Sec. 3i**  
 Quarry four miles north of Mammoth - Used for agricultural gypsum.

**RED MOUNTAIN MINING INC.**  
 4250 North Bush Highway, Mesa, AZ 85215 - Phone 832-3390 - Employees: 28.  
 Owner . . . . . D. Lavoy Adams  
**Red Mountain Quarry T2N R7E Sec. 18**  
 Quarry located 10 miles north east of Mesa. Crushed granite for desert landscaping.

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

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

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

**SUPERIOR COMPANIES**  
 100 W. Coolidge, Phoenix, AZ 85013 - Phone 230-9300 - Fax 230-0189 - Employees: 50.  
 President . . . . . Archer V. Shelton  
 Vice President . . . . . Mary Kessler

**Iron Chancellor Mine T20N R6W Sec. 22**  
 Open pit and underground mine producing hematite for production of natural red iron oxide pigments - mining by contractors.

**ARIZONA PORTLAND CEMENT COMPANY**  
**State Sales Office**  
 2400 N. Central, Suite 308, Phoenix, AZ 85004 - Phone 271-0069.  
 Executive Vice President and  
 General Manager . . . . . Vaughn S. Corley  
 Vice President, Sales . . . . . Craig Starkey  
**Rillito Plant & Quarry T12S R11E Sec. 26**  
 P.O. Box 338, Rillito, AZ 85654 - Phone (Tucson) 682-2221 - Employees: 144 - Twin Peaks limestone quarry 5 miles from plant - cement - annual capacity 1,100,000 tons cement.  
 Plant Manager . . . . . Tom Brosnan  
 Quality Control Superintendent . . . . . Steve Regis  
 Quality Control Supervisor . . . . . Bill Phillips  
 Plant Engineer . . . . . John Frye  
 Plant Electrician . . . . . 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 688-2602 - Employees: 18 - Plant south of Houck - Hydrafrac sand for oilwell treatment - Markets include New Mexico and California - Abrasives and mold sand - Markets in Arizona and New Mexico - Bagged and bulk products available.  
 President . . . . . Robert D. Fisher  
 General Manager . . . . . James Burkewitz  
 Foreman . . . . . Ralph Nelson  
 Evening Foreman . . . . . Dave Harris  
**Houck Silica Sand T22N R29E Sec. 29**  
 Open pit hydrafrac sand mine.

**ASARCO INCORPORATED**  
**Tucson Office**  
 1150 N. 7th Avenue, Tucson, AZ 85705, P.O. Box 5747, Tucson, AZ 85703 - Phone 798-7500 Fax 798-7781.  
**Asarco Copper Operations**  
 Executive Vice President . . . . . F. R. McAllister  
 Manager Development & Services . . . . . M.G. Lee  
 Financial Manager . . . . . O. Ho  
 Special Projects Manager . . . . . D. F. Skidmore  
 Environmental Engineering Manager . . . . P. J. Maley  
 Chief Geologist . . . . . S. A. Anzalone  
 Chief Metallurgist . . . . . T. D. Henderson  
**Santa Cruz In-Situ Leach Research Project**  
 Project Manager . . . . . A.R. Raihl  
 Project Geologist . . . . . H.G. Kreis  
**Acid Sales Department**

**National Sales Manager . . . . . G. P. Gillen**  
**Governmental Affairs**  
 Manager, State Legislative Affairs . . . . . R. E. Quick  
**Safety Department**  
 Director of Safety - Mining . . . . . B. G. Brumbaugh  
 Director of Safety - Smelting . . . . . R. Maxwell  
**Tucson Information Services**  
 Manager . . . . . T. Fedoruk  
**Mission Mine T16S R12E Sec. 36**  
 Box 111, Sahuarita, AZ 85629 - West Pima Mine Road - Phone 648-2500 Fax 648-0802 - Employees: 790 - Open pit copper mine - Two concentrators: Mission and South with a total rated capacity of 60,000 TPD.  
 General Manager . . . . . John D. Low  
 Operations Manager . . . . . J. B. Lichtenhan  
 Mine Manager . . . . . S. L. Lakosky  
 Chief Engineer . . . . . B. M. Williams  
 Senior Geologist . . . . . R. B. Cummings  
 Chief Metallurgist . . . . . J. P. Reynolds  
 Maintenance Manager . . . . . H. E. Hughes  
 Mill Manager, Mission . . . . . C. A. Carroll  
 Mill Manager, South . . . . . S. D. Lawrence  
 Accounting Manager . . . . . D. J. Hoffman  
 Industrial Relations Manager . . . . . J. F. Coxon  
 General Electrical Supervisor . . . . . J. B. Barton  
 Safety Administrator . . . . . R. E. Jordan  
 Environmental Engineer . . . . . A. T. Cooper  
**Ray Mine T3S R13E Sec. 10**  
**Hayden Concentrator & Smelter T5S R15E Sec. 11**  
 Ray Complex, P.O. Box 8, Hayden, AZ 85235 - Phone 356-7811 Fax 356-3802 - Employees: 1598 - Open pit copper mine - Dump leach - Heap leach - Solvent extraction-electrowinning plant - Two concentrators: Ray rated at 30,000 TPD and Hayden rated at 31,000 TPD - Smelter capacity 720,000 TPD and 1,600 TPD acid plant.  
 General Manager . . . . . T.E. Scartaccini  
 Manager, Ray Operations . . . . . B. K. Malone  
 Manager, Hayden Operations . . . . . D. C. Himmeseote  
 Mine Manager . . . . . R. E. Thompson  
 Smelter Manager . . . . . Joe Wilhelm  
 SX-EW Manager . . . . . L. A. Davis  
 Technical Services Manager . . . . . N. A. Gambell  
 Ray Concentrator Manager . . . . . S. A. 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. Newnan  
 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 682-2420 Fax 682-2347- Employees: 20 - Open-pit copper mine - 11,000 TPD concentrator - On standby - Dump leach & precipitation plant operating.  
Mill Manager . . . . . D. J. Duncan  
Accounting Manager . . . . . A. J. Robles

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

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

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

**CHEMSTAR LIME**  
**Scottsdale Office**  
7272 E. Indian School Road, Suite 350, Scottsdale, AZ 85251 - Phone 941-1291 - Fax 941-2015.  
President . . . . . Dave Reilly  
Vice President, Manufacturing & Engineering . . . . . Larry Warner  
Vice President, Marketing . . . . . Bob Derks  
Vice President, Industrial Sales . . . . . Bob Plains  
District Sales Manager . . . . . David Fleming  
Senior Project Manager . . . . . Rob Kohl  
Manager, Technical Services . . . . . Starr Curtis  
HiCal Operations Manager . . . . . Mike S. Eliassen  
Materials Manager . . . . . Mike Pinnau

Distribution Manager . . . . . John Mc Mullan  
Transportation Manager . . . . . Chris Bruskas  
POZ-O-CAP Product Manager . . . . . John Reaney  
Leach-It Technical Services Engineer . . . Brian Young  
**Nelson Quarries & Plant T25N R10W Sec. 25**  
P.O. Box 370, Peach Springs, AZ 86434 - Phone 769-2271  
- Employees: 72 - Limestone quarry - Lime plant with two rotary kilns rated at 1800 tons of lime per day. Markets include lime for flue gas desulfurization and alkalinity control for copper ore beneficiation and gold leaching.  
Plant Manager . . . . . William Schoof  
Maintenance Superintendent . . . . . Mark Phillips  
Quarry Superintendent . . . . . Jose M. Ontiveros  
Plant Buyer . . . . . Danny Roberts  
Shipping/Transportation Coordinator . . . Joe Fuentes  
Quality Control Technician . . . . . Richard Schnider  
Quality Control Technician . . . . . Perry Curley  
**Douglas Quarry & Plant T24S R26E Sec. 7**  
Route 1, Box 110, Douglas, AZ 85607 - Phone 364-2429 - Employees: 60 - Quarry and plant located at Paul Spur - 3 lime kilns - Plant capacity rated at 1000 tons of lime per day. 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  
Production & Maintenance Superintendent . . . . . Richard Anderson  
Quarry Superintendent . . . . . Steve Bell  
Production Services Superintendent . . . Don Williams  
Quality Control Technician . . . . . Louis Roqueni

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

**CYPRUS CLIMAX METALS COMPANY**  
**(A subsidiary of Cyprus Amax Minerals Company)**  
1501 W. Fountainhead Parkway, Tempe, AZ 85285 - Phone 929-4400.  
President . . . . . Jeffrey G. Clevenger  
Sr. Vice President . . . . . Robin Hickson  
Sr. Vice President/Technical & Development . . . . . Jake Timmers

**Hackberry Pit T23N R13W Secs. 19 & 20**  
Produces dolomite-limestone, quartz, feldspar, onyx, and natural colored aggregates. Used for landscape, gemstones, chemical materials, fillers, and special aggregate. Sold in Arizona, Nevada, and California.

**PEABODY COAL COMPANY**  
**Flagstaff Office**  
1300 S. Yale, Flagstaff, AZ 86001 - Phone 774-5253 - Employees: 66.  
President . . . . . W. Howard Carson  
Vice President, Operations . . . . . Gary L. Melvin  
General Superintendent, Mines . . . . . Sil Perla  
Senior Manager Labor and Employee Relations . . . . . Tony Baka  
Director of Engineering . . . . . Frank Farnsworth  
Director Materials Management . . . Merle Hendricks  
Controller . . . . . Charles W. Tilly  
Manager, Quality Control . . . . Charles J. Stenftenagel  
Manager, Reclamation . . . . . Wayne E. Hilgedick  
Senior Manager Environmental Affairs Brian P. Dunfee  
**Black Mesa Mine T35N R18E Sec. 5**  
P.O. Box 605, Kayenta, AZ 86033 - Phone 677-5040 - Employees: 331 - Surface coal mine - Located approximately 30 miles southwest of Kayenta.  
Mine Superintendent . . . . . Lewis Allan Gough  
Assistant Superintendent, 1st Shift . . . . . vacant  
Assistant Superintendent, 2nd Shift . . . . Teddy Begay  
Assistant Superintendent, 3rd Shift . Randall L. Hendrix  
Safety Supervisor . . . . . Keith Grass  
Manager Training . . . . . Pete Craig  
**Kayenta Mine T36W R18E Sec. 9**  
P.O. Box 606, Kayenta, AZ 86033 - Phone 677-5008 - Employees: 511 - Surface coal mine - Located 30 miles southwest of Kayenta.  
Mine Superintendent . . . . . Joe Johnson  
Assistant Superintendent 1st Shift . . . Robert D. Boone  
Assistant Superintendent, 2nd Shift . . . Tony G. Bryant  
Assistant Superintendent, 3rd Shift . . Joseph R. Harris  
Safety Supervisor . . . . . Joe Holgate  
Manager Training . . . . . Pete Craig

**PHELPS DODGE CORPORATION**  
**Corporate Headquarters**  
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone 234-8100.  
Chairman of the Board, President & CEO . D. C. Yearley  
Senior Vice President . . . . . J.S. Whisler  
Senior Vice President . . . . . P.J. Ryan  
**Phelps Dodge Mining Company**  
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone 234-8100.  
President . . . . . J. S. Whisler  
Executive Vice President . . . . . P. J. Ryan  
Vice President & General Manager . . . . J. L. Madson



Cathod copper - Bagdad.

Vice President Engineering Services . . . . R. W. Rice  
Controller . . . . . J.M. McCarty  
Director, Employee Relations . . . . . S. L. Marcus  
Director, Materials Management . . . . . M.F. Upton  
Traffic Manager . . . . . J.P. Sheridan  
**Exploration and Development Group**  
2600 N. Central Ave., Phoenix, AZ 85004-3014 - Phone 234-8100.  
Vice President . . . . . A. L. Lawrence  
**U.S. Exploration**  
Union Plaza, Suite 300, 200 Union Blvd, Lakewood, CO 80228-1831 - Phone (303)-989-8873  
**Western Exploration**  
P.O. Box 50427, Tucson, AZ 85703-1427 Phone 792-4981.  
Manager, Western Exploration . . . . W.H. Wilkinson  
**United Verde Mine T16N R2E Sec. 22**  
Inactive copper mine - Located at Jerome - Phone 634-2622.  
Agent . . . . . A.D. Peterson



**Pinto Valley Mine T1N R14E Sec. 20**  
**Miami T1N R15E Sec 19**  
P.O. Box 100, Miami, AZ 85539 - Phone 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 . . . . K. Lee Browne  
Manager Mining Operations . . . . Charles D. O'Coyn  
Manager of Miami Unit  
Leaching/SX-EW . . . . Robert V. Washnock  
Manager of Concentrator  
Operations . . . . Jack D. Conklin  
Manager Human Resources . . . . David L. Palmer  
**Magma Mine T1S R12E Sec 35**  
P.O. Box 37, Superior, AZ 85273 - Phone 689-2444 - Employees: 356 - Underground copper mine - 3300 TPD concentrator.  
General Manager . . . . Doug McGregor  
Mine Superintendent . . . . Steve Lautenschlaeger  
Mill Superintendent . . . . Clifford D. Nelson

#### McKUSICK MOSAIC

Route 1, Box 35-D, Globe, AZ 85501 - Phone 425-5051 or 425-8428 - Employees: 3.  
Owners . . . . 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.

#### MINERALS RESEARCH AND RECOVERY, INC.

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

#### MORTON SALT DIVISION

**Morton International**  
13000 W. Glendale Ave., Glendale, AZ 85307 - Phone 247-3000 - Employees: 35.  
Plant Manager . . . . Gary McFarlin  
**Southwest 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.

#### MOUNTAIN VIEW MINING, INC.

##### Chem-Stone, Inc.

2015 W. Mountain View, Phoenix, AZ 85021 - Phone 997-2013 - Employees: 45 - Pumice treatment plant - Produces specialized ready-to-use pumice for the garment industry.  
President . . . . David L. Bellaire  
**Dead Eye Mines T21N R2E Secs. 4, 16**  
Located on South Fourth Street in Williams - Pumice mine - Open pit mining of specialized pumice - Sizing plant.

#### NATIONAL GYPSUM COMPANY

**Gold Bond Building Products Division**  
P.O. Box 20863, Phoenix, AZ 85036 - Phone 258-9321 - Employees: 58 - Wallboard plant - Wallboard joint cement plant.  
Plant Manager . . . . H. E. Skelley  
Office Manager . . . . J. C. Cassidy  
Joint Cement Plant Manager . . . . Bill Brundage  
Joint Cement Quality Control . . . . Nick Tuhus  
**Feldman Quarry T6S R16E Sec. 27**  
Star Route, Box 3990, Winkelman, AZ 85292 - Phone 357-7180 - Employees: 5 - Open pit gypsum mine located 12 miles south of Winkelman - Crude gypsum shipped to Phoenix plant for manufacture of plaster board.  
Quarry Superintendent . . . . David Klein

#### ORACLE RIDGE MINING PARTNERS

P.O. Box 7, San Manuel, AZ 85631 - Phone 576-1412, Fax 576-1539 - Employees: 68.  
General Manager . . . . Rene Tourigny  
Superintendent of Technical Services . Murray Strachan  
Accounting Supervisor . . . . Joseph Sawyer  
Purchasing/Warehouse . . Anna Hayden/Quanah Guerra  
Master Mechanic . . . . Heinze Woelki  
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, PO Box 4105, Kingman, 86402 - Phone 753-1444 - Fax 753-1444 (call first) - Employees 4 (plus contracted services).  
President . . . . Patti Lewis  
Vice President . . . . Charlie Starkebaum  
**Shipley Pit T25N R10W Sec. 28**

#### Cyprus Sierrita Corp.

**Sierrita T18S R12E Secs. 7, 8, 9, 10, 16, 17**  
**Twin Buttes T18S R13E Sec. 5**  
P.O. Box 527, Green Valley, AZ 85622 - Phone 648-8500 - Employees: 720 - Sierrita, Esperanza and Twin Buttes open pit copper-molybdenum mines - 95,000 TPD concentrator - The inactive Esperanza open pit - 17,500 TPD concentrator - Ferromolybdenum plant - Rhenium plant - Dump leach, solvent extraction - electrowinning plant - Located 30 miles south of Tucson.  
Vice President & General Manager . . . . Randy Scott  
Manager, Mining . . . . Donald Prah  
Manager, Metallurgical Processing . . . . M. H. Khan  
Manager, Human Resources . . . . Craig Patrick  
Manager, Accounting . . . . Rickey Lamb  
Manager, Materials Management . . . . Darryl Kriebel  
Plant Manager . . . . Loyal Johnson  
Mine Operations & Maintenance . . . . Leon Hardy  
Plant Maintenance Superintendent . . . . Jesus Figueroa  
Mill Operations Superintendent . . . . Tom Comi  
Fine Crushing Superintendent . . . . William Davis  
SX-EW Superintendent . . . . Doug Sims  
Superintendent Technical Services . William Sweetser  
Superintendent of Moly Processing . . . . Steve Koski  
Superintendent of Mine Engineering . Tom McNamara  
**Cyprus Miami Mining Corp.**  
**Miami T1N R14E Sec. 24, 25, 26, 35**  
P.O. Box 4444, Claypool, AZ 85532 - Phone 473-7150 - Employees: 1000 - Open pit oxide copper mine - Dump leach - Solvent extraction - electrowinning plant - 120,000 TPY Smelter - Acid plant - Electrolytic refinery - 100,000 TPY continuous rod plant - 24,000 TPD concentrator is inactive.

Vice President & General Manager . Christopher Janes  
Controller . . . . Denise Danner  
Manager, Copper Treatment Division . James Handley  
Manager, Copper Products . . . . Ken Watkins  
Manager, Domestic Copper Production Division . John Fenn  
Manager, Safety . . . . Robert Altamirano  
Manager, Human Resources . . . . Robert Revitte  
Chief Engineer . . . . Cal Iles  
Superintendent, Mine Maintenance . . . Joesph Kridel  
Superintendent SX/Leaching Operations Gerald Fountain  
Superintendent, Maintenance Copper  
Products Division . . . . Richard Riddle  
Superintendent, Rod Plant . . . . Mark Nowich  
Superintendent, Metallurgical Control . Richard Dana  
Manager, Environmental Affairs . . . . Robert Ressler  
Superintendent, Smelter Operations . Howard Hilshorst  
Superintendent, Smelter Maintenance . Craig Ammar  
Superintendent, Technical  
Services . . . . Myron Henderson  
Superintendent, Smelter Electrical  
Systems . . . . Robert Tunis  
Superintendent, Refinery . . . . Samuel Yang  
Manager, Materials Management . . . Hugo Schriewer  
**Cyprus Bagdad Copper Corp.**  
**Bagdad T14N R9W Sec. 4**  
P.O. Box 245, Bagdad, AZ 86321 - Phone 633-2241 - Employees: 575 - Open pit copper-molybdenum mine - 85,000 TPD concentrator - Dump leach-solvent extraction-electrowinning plant.  
Vice President . . . . Pat Fitch  
Manager, Mine . . . . Kent Watson  
General Manager . . . . Guy Granger



*Tanner Companies' sand and gravel screening and washing plant.*

Manager, Human Resource  
& Community Services . . . . . Janette Bush  
Supervisor, Safety . . . . . Joe Mortimer  
Maintenance Manager . . . . . Gary Hutchison  
Accounting Manager . . . . . Randy Hoffman  
Technical Services Manager . . . . . Ev. Sequira  
**Cyprus Casa Grande Corp.**  
**Casa Grande T10S R4E Sec. 25**  
P.O. Box 15009, Casa Grande, AZ 85230-5009 - Phone  
623-1539 - Employees: 111 - In- situ leach copper mine -  
Roast Leach - Solvent extraction-electrowinning plant -  
Acid plant - Located 32 miles south of Casa Grande.  
Vice President and General Manager . . Ronald Kellner  
Manager/Accounting & Materials . . . . A. L. Villard  
Plant Manager . . . . . Kermit Behnke  
Mine Manager . . . . . Bill Krats  
Manager/Human Resources . . . . Richard Stilgenbauer  
Environment Engineer . . . . . John Kline  
**Cyprus Mineral Park Corp.**  
**Mineral Park T23N R17W Sec. 19**  
HC 37 Box 500, Kingman, AZ 86401 - Phone 565-2226 -  
Employees: 15 - Open pit - Dump leach copper mine -  
Precipitation plant operating - Located 16 miles north of  
Kingman.  
Superintendent . . . . . George Veach  
Plant Supervisor . . . . . Joey Matthews

**DCRS (US) Inc.**  
P.O. Box 20818, Wickenburg, AZ 85358 - Phone: 684-  
3032, Phone/Fax 684-3074 - Employees: 16.  
Vice President . . . . . Bob Barefoot  
Mill Superintendent . . . . . Larry Burnhardt  
Operations Manager . . . . . Bruce Downey  
**Redtail Mill T 9N R 5 W Sec. 30**  
Custom gravity mill - capacity 100 TPD.

**DRAKE STONE PRODUCTS**  
P.O. Box 11676, Prescott, AZ 86304 - Phone 445-3028,  
Message Fax 778-5447 - Stone processing plant at Drake -  
Flagstone and cut stone - Marketed in Arizona, the United  
States, and throughout the world.  
Owner/Operator . . . . . Harley Gray Jr.  
Co-owner . . . . . Deborah Gray  
**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  
637-2591, Fax 637-2355 - Employees: 45 - Quarries in  
Coconino, La Paz, Maricopa, Mohave, and Yavapai Coun-  
ties - Flagstone, marble, and schist - Stone processing plant  
in Ashfork - Marketed in Arizona, the United States, and  
throughout the world.  
President . . . . . G. E. Dunbar  
Vice President . . . . . W. B. Dunbar

Maintenance Superintendent . . . . . Ron Dunbar  
Office Manager & Transportation . . . . Leslie Tooley  
**Dunbar Stone Plant T21N R2W Sec. 3**  
**Quarries**

**ENERGY FUELS NUCLEAR INC.**  
HC 64, Box 152 2555 North Hwy 89A, Fredonia, AZ 86022  
Phone 643-7321 - Employees: 9.  
Manager Mining Operations . . . . . Roger Smith  
**Arizona One T36N R5W Sec. 22**  
Located 45 miles southwest of Fredonia - Underground  
uranium mine - Developed - On standby.  
**Kanab North T38N R3W Sec. 17**  
Located 25 miles southwest of Fredonia - Underground  
uranium mine - Developed - On Standby.  
**Hermit T38N R4W Sec. 17**  
Located 30 miles southwest of Fredonia - Underground  
uranium mine - Developed - On standby.  
**Pine Nut T36N R4W Sec. 21**  
Located 45 miles southwest of Fredonia - Underground  
uranium mine - Developed - On standby.  
**Canyon T29N R3E Sec. 20**  
Located 45 miles north of Williams - Underground uranium  
mine - Development awaiting regulatory approval.

**ENGELHARD CORPORATION**  
**Chemical Division**  
Box 155, Sanders, AZ 86512 - Phone 688-2468, Fax 688-  
2485 - 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 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 762-  
9119, 1-800-952-2769, Fax 762-5592 - Employees: 10.  
Division Manager . . . . . Larry Mattison  
Office Manager . . . . . Elaine Wickam  
Sales . . . . . Carl Cuthbertson  
**Andrada Marble Quarry T17S R16E Sec. 21**  
Open pit marble mine - Used for calcium feed additive,  
plastering material, decorative stone, roofing material, fine

ground material used as mineral filler - Crushing and grind-  
ing plant.

**GOLDEN GREEN PLACER MINING**  
**PARTNERSHIP**  
HCR Box 840-A, Sells, AZ 85634 - Phone 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 500 yards/week - Expansion underway.

**GSA RESOURCES INC.**  
P.O. Box 509, Cortaro, AZ 85652 - Phone 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 viscosifiers and thickeners in pharmaceuticals and  
cosmetics.  
**Grace Chabazite Mine T12S R29E Secs. 1, 2, 12**  
Open pit mine located 13 miles north of Bowie - Chabazite  
- Used for cation exchange media and specialty adsorbants  
and deodorizers - Toll processed in Tucson.  
**Burro Creek Clay T14N R10W Sec. 7**  
Open pit clay mine located 8 miles southwest of Bagdad  
along Burro Creek - Saponite clay - Shipped out of state for  
manufacture into viscosifiers for detergents and drainage  
aid for treating pulp for fine white paper made from recycled  
paper fibers.

**HARBORLITE CORPORATION**  
P.O. Box 960, Superior, AZ 85273 - Phone 689-5723 -  
Employees: 11 - Two separate plants located 2 miles west  
of Superior on Silver King Mine Road on each side of  
railroad track; north plant (formerly Nord Sil-Flo) is cur-  
rently idle - Two open pit perlite mines, located 2 miles  
southwest of Superior - Markets in Florida, California,  
Michigan, and Wyoming - Used in filtering for phar-  
maceuticals, chemicals, sugar, and beverages - Also used as  
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**  
**Flagstone Quarries**  
P.O. Box 323, Paulden, AZ 86334 - Phone 636-2436 -  
Employees: 15 - Quarries located 8 miles northeast of Drake  
- Flagstone, cut stone - Marketed locally, throughout the  
United States, and exported.  
Owner . . . . . Carl Gray

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

**KESSON & KESSON**  
1201 E. Marshall, Phoenix, AZ 85014 - Phone 277-9883,  
425-4175 - Employees: 12.  
Owner . . . . . David Kesson  
**Copper Hill Mine T1N R15E Sec. 15**  
Silica flux for Cyprus Miami copper smelter - Northwest  
of Globe.  
**Cyprus Lime Quarry T1N R15E Sec. 7**  
Limestone flux for Cyprus Miami copper smelter - North-  
east of Miami.

**KILAUEA CRUSHERS INC.**  
P.O.Box 5358, Glendale, AZ 85312 - Phone 843-1888  
Employees 12.  
President . . . . . Bill Nichols  
**Kilauea Quarry T6N R2W Sec. 5**  
Quarry located 12 miles east of Morristown. Crushed  
rhyolite for desert landscaping.

**MAGMA COPPER COMPANY**  
**Corporate Headquarters**  
7400 N. Oracle Rd, Tucson, AZ 85704 - Phone 575-5600  
Fax 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 385-3100 -  
Employees: 2151 - Underground copper-molybdenum  
mine - 62,000 TPD concentrator - Open pit oxide mine -  
In-situ leach - Heap Leach - Solvent extraction-electrowin-  
ning plant.  
Vice President & General Manager Francisco E. Durazo  
Manager Sulfide Mining . . . Hendrick W. Seamey, Jr.  
Manager Oxide Mining, Leaching  
& SX-EW . . . . . Michael A. Eamon  
Superintendent Concentrator . . . Gerald R. Brunskill  
**Magma Metals Company**  
**San Manuel Smelter T9S R17E Sec 32**  
P.O. Box M, San Manuel, AZ 85631 - Phone 385-3100 -  
Employees: 1217 - 1,000,000 TPY flash smelter - 1,000,000  
TPY acid plant - 300,000 TPY electrolytic refinery -  
180,000 TPY continuous cast rod plant.  
President . . . . . John F. Champagne  
Vice President Operations . . . . . J. D. McCain  
Vice President Marketing & Sales . . . . Brian Disbury  
Vice President Technology . . . . . Tom Jordan