
ARIZONA COPPER RESERVES

OPEN-FILE REPORT 92-11

July, 1992

by Nyal J. Niemuth

**ARIZONA DEPARTMENT OF MINES
& MINERAL RESOURCES**

1502 West Washington
Phoenix, Arizona 85007

This is a preliminary report,
subject to technical and
editorial revision.

Arizona Department of Mines and Mineral Resources Arizona Copper Reserve Base as of 2-1994.

Reserve base is that part of an identified resource that meets specified minimum physical and chemical criteria related to current mining and production practices, including those for grade, quality, thickness, and depth. The reserve base is the in-place demonstrated (measured plus indicated) resource from which reserves are estimated. It may encompass those parts of the resources that have a reasonable potential for becoming economically available within planning horizons beyond those that assume proven technology and current economics. The reserve base includes those resources that are currently economic (reserves), marginally economic (marginal reserves), and some of those that are currently sub economic (sub economic resources).

From "Mineral Facts and Problems" 1985 edition, U.S. Bureau of Mines, Bulletin 675, page 3.

PROPERTY LISTING

ANTLERStandard Metals Corp.
ATLASAsarco Inc.
BAGDADCyprus Minerals Co.
BUCKEYE EASTAsarco Inc.
CARLOTACambior
CASA GRANDE Asarco-Freeport McMoran JV
CHILITOAsarco Inc.
CHRISTMASCyprus Minerals Co.
COCHISEPhelps Dodge
COPPER BASINPhelps Dodge
COPPER BUTTEAsarco Inc.
COPPER CREEKMagma Copper Company
COPPER QUEENPhelps Dodge
DOS POBRESPhelps Dodge
DRAGOONSullivan, James
DYNAMITEAddison Smith
EMERALD ISLEArimetco International
ESPERANZACyprus Minerals Co.
FOUR METALS Herb Duerr & John Prochnav
GIBSONLodestar Minerals Inc.
HELVETIAAsarco Inc.
I-10James Sullivan
INSPIRATION AREA MINES .Cyprus Minerals Co.
IRON DOORUnknown
JOHNSONArimetco International
KALAMAZOOMagma Copper Company
KAY COPPER MINERayrock Mines Inc.
KORN KOBKeystone Minerals, Inc.
LAKESHORECyprus Minerals Co.
LONE STARPhelps Dodge
LONESOME PINECorn, Russ
MAGMA MINEMagma Copper Company
MAMEHope Mining & Milling Co.
MIAMI EASTMagma Copper Company

MIAMI TAILINGSMagma Copper Company
MINERAL BUTTEUS Government
MINERAL PARKCyprus Minerals Co.
MISSION COMPLEXAsarco Inc.
MORENCIPhelps Dodge & Sumitomo
NEW CORNELIAPhelps Dodge
ORACLE RIDGESouthern Copper Corp.
PEACH ELGINAsarco Inc.
PINTO VALLEYMagma Copper Company
POSTON BUTTEMagma Copper Company
RAYAsarco Inc.
RED MOUNTAINKerr-McGee Corp.
SACATON EASTAsarco Inc.
SAN JUANClaridge, Alf, et al
SAN MANUEL PITMagma Copper Company
SAN MANUEL UGMagma Copper Company
SANCHEZAZCO - Arizona Copper Co.
SANTA CRUZ Asarco-Freeport McMoran JV
SHEEP MOUNTAINOrcana Resources
SIERRITACyprus Minerals Co.
SILVER BELLAsarco Inc.
SQUAW PEAKSquaw Peak Copper Mining Co.
STRAY ELEPHANTHeinrichs GEO Expl. Co.
STRONG & HARRISDurham, Robert
SWANSEAChallinor, John
TURQUOISESanta Fe Pacific Mining
TWIN BUTTESCyprus Minerals Co.
TWO PEAKSDugan Production
UNITED VERDEPhelps Dodge Corp.
VAN DYKEArimetco International
VEKOL HILLSTohono O'odham Nation
VENTURACyprus Minerals Co.
WHITE MESAMesa Mining
ZONIAArimetco International

COMPANY INDEX

COMPANY COPPER PROPERTY

AZCO - Arizona Copper Co. SANCHEZ
 Addison Smith DYNAMITE
 Arimetco SOL
 Arimetco International EMERALD ISLE
 Arimetco International JOHNSON
 Arimetco International VAN DYKE
 Asarco Inc. ATLAS
 Asarco Inc. BUCKEYE EAST
 Asarco Inc. CHILITO
 Asarco Inc. COPPER BUTTE
 Asarco Inc. HELVETIA
 Asarco Inc. MISSION COMPLEX
 Asarco Inc. PEACH ELGIN
 Asarco Inc. RAY
 Asarco Inc. SACATON EAST
 Asarco Inc. SILVER BELL
 Asarco-Freeport McMoran JV CASA GRANDE
 Asarco-Freeport McMoran JV SANTA CRUZ
 Berry, Julian MINERAL BUTTE
 Cambior CARLOTA
 Cambior, Inc. CACTUS
 Claridge, Alf SAN JUAN
 Conoco Inc. POSTON BUTTE
 Cyprus Minerals Co. BAGDAD
 Cyprus Minerals Co. CHRISTMAS
 Cyprus Minerals Co. ESPERANZA
 Cyprus Minerals Co. INSPIRATION AREA MINES
 Cyprus Minerals Co. LAKESHORE
 Cyprus Minerals Co. MINERAL PARK
 Cyprus Minerals Co. SIERRITA
 Cyprus Minerals Co. TWIN BUTTES
 Cyprus Minerals Co. VENTURA
 Dore Mining & Milling FOUR METALS
 Durham, Robert STRONG & HARRIS

COMPANY COPPER PROPERTY

Heinrichs GEO Exploration Co. STRAY ELEPHANT
 Hope Mining & Milling Co. MAME
 Jacobs, Aurther ? SAGINAW HILL
 James Sullivan I-10
 Kerr-McGee Corp. RED MOUNTAIN
 Keystone Minerals, Inc. KORN KOB
 Lodestar Minerals Inc. GIBSON
 Magma Copper Company COPPER CREEK
 Magma Copper Company KALAMAZOO
 Magma Copper Company MAGMA MINE
 Magma Copper Company MIAMI EAST
 Magma Copper Company MIAMI TAILINGS
 Magma Copper Company PINTO VALLEY
 Magma Copper Company SAN MANUEL OPEN PIT
 Magma Copper Company SAN MANUEL UG
 Navajo Nation WHITE MESA
 Phelps Dodge COCHISE
 Phelps Dodge COPPER BASIN
 Phelps Dodge COPPER QUEEN
 Phelps Dodge DOS POBRES
 Phelps Dodge LONE STAR
 Phelps Dodge NEW CORNELIA
 Phelps Dodge & Sumitomo MORENCI
 Phelps Dodge Corp. UNITED VERDE
 Ungava Iron Ores Ltd. SHEEP MOUNTAIN
 Rayrock Mines Inc. KAY COPPER MINE
 Santa Fe Pacific Mining TURQUOISE
 South Atlantic Venture Ltd. ORACLE RIDGE
 Squaw Peak Copper Mining Co. SQUAW PEAK
 Standard Metals Corp. ANTLER
 Sullivan, James DRAGOON
 Tohono O'odham Nation VEKOL HILLS
 Unknown IRON DOOR
 Zonia Co. ZONIA

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

ANTLER

ALSO KNOWN AS - Spuyten Duyvil

OPERATOR\OWNER:

Standard Metals Corp.
666, 45 Rockefeller Plaza
New York, NY 10020
212-956-5450

LOCATION INFORMATION:

TOWNSHIP 17 N RANGE 16 W SECTION 4
COUNTY - Mohave AZMILS - 500A
DESCRIPTION - 30 miles south of Kingman - 10 miles east of Yucca

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 5 MILLION TONS AT 1.95% Cu

RESERVE INFO - Sulfide - with 4.13% Zn, 0.94% Pb and 1.05 oz/ton Ag

SOURCES:

Standard Metals Annual Report 1978 pg 3

COMMENTS:

An additional 2.5 million tons reported in 1979 Annual Report. Property now adjacent to Wabayuma Peak Wilderness.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

ATLAS

ALSO KNOWN AS - BS&K Project

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 11 S RANGE 8 E SECTION 32
COUNTY - Pima AZMILS - 267
DESCRIPTION - 45 miles NW of Tucson - Pima Co.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 5.38 MILLION TONS AT 0.64% Cu (a)
Sulfide - 18.93 MILLION TONS AT 0.66% Cu (b)
Acid Soluble - 4.87 MILLION TONS AT 0.37% Cu (a)
Acid Soluble - 12.06 MILLION TONS AT 0.38% Cu (b)

SOURCES:

"Report on the BS&K Project, Pima Co., AZ" by Frank H. Buchella,
Jr. PE, June 1983 (in ADMMR Atlas file)

COMMENTS:

Purchased by American Pacific in 1988 for \$2.8 million -- Reserve
s based on 0.40% Cu cutoff on sulfide and 0.20% Cu cutoff on acid solubl
e. (a) Atlas Property (b) Asarco property adjacent to Atlas

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

BAGDAD

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 14 N RANGE 9 W SECTION 4
COUNTY - Yavapai AZMILS - 119B
DESCRIPTION - Bagdad, AZ - Yavapai Co.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 774.1 MILLION TONS AT 0.41% Cu

RESERVE INFO - Sulfide - (includes acid soluble) and 0.022% Mo

SOURCES:

Cyprus Minerals Co. Form 10K 1990 pg 2.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

BUCKEYE EAST

ALSO KNOWN AS - Kennecott Copper Claims 26-27

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 3 S RANGE 12 E SECTION 26
COUNTY - Pinal AZMILS - 177A&B
DESCRIPTION - 20 miles NE of Florence

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 20 MILLION TONS AT 0.65% Cu

RESERVE INFO - 40 million tons potential

SOURCES:

AMA - "AZ Wilderness 1988" Report A-23 to Congress "Proposed Phoenix RMP and Final EIS" BLM Letter # 30 Administrator, Ray Unit Asarco

COMMENTS:

Reserves are Buckeye East -- Buckeye West being assessed

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

CACTUS

OPERATOR\OWNER:

Cambior, Inc.
4949 South Syracuse #4200
Denver, Co 80237
303-694-4936

LOCATION INFORMATION:

TOWNSHIP 1 N RANGE 13 E SECTION 36
COUNTY - Gila AZMILS - 126B
DESCRIPTION - 7 miles west of Miami (Next to Pinto Valley)

ORE TYPE AND RESERVE INFORMATION:

Mixed - 10 MILLION TONS AT 0.70% TCu

RESERVE INFO - Mixed - (Cutoff at 0.2%)

SOURCES:

Cactus Prospect Report - ADMMR Cactus file

COMMENTS:

Drilling during 1989-90 identified 50 MT resource at .5% TCu combined with Carlotta - Gary Parkinson of Westmont at 91 AIME Meeting

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

CARLOTA

OPERATOR\OWNER:

Cambior
4949 South Syracuse #4200
Denver, CO 80237
303-694-4936

LOCATION INFORMATION:

TOWNSHIP 1 N RANGE 13 E SECTION 36
COUNTY - Gila AZMILS - 126A
DESCRIPTION - 7 miles west of Miami (Next to Pinto Valley)

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 4 MILLION TONS AT 0.85% Cu

SOURCES:

Sherwood B. Owens Sept. 7, 1979 MG WR 9/7/79 ADMMR Carlotta file

COMMENTS:

Drilling during 1988-90 identified 50 MT resource at .5% TCu combined with Cactus - Gary Parkinson of Westmont at 91 AIME Meeting

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

CASA GRANDE

ALSO KNOWN AS - Fannie Grande, Francisco Grande

OPERATOR\OWNER:

Asarco-Freeport McMoran Joint Venture
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 6 S RANGE 5 E SECTION 18
COUNTY - Pinal AZMILS - 445
DESCRIPTION - 6 miles west of Casa Grande

ORE TYPE AND RESERVE INFORMATION:

Mixed - 352 MILLION TONS AT 1.00% TCu

RESERVE INFO - Mixed - (0.5% Cu cutoff) .01% Mo

SOURCES:

Getty Oil Co. Annual Report 1980 - Lowell, J.D. "The Casa Grande
West Orebody" AZ State AIME 12/6/82 ADMMR Fannie Grande file

COMMENTS:

Adjacent to Santa Cruz in-situ leach research project and has same potential.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

CHILITO

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 4 S RANGE 15 E SECTION 22
COUNTY - Gila AZMILS - 11A&B
DESCRIPTION - 5 miles north of Hayden

ORE TYPE AND RESERVE INFORMATION:

Mixed - 74.7 MILLION TONS AT 0.51% TCu

RESERVE INFO - Mixed - 0.01% Mo, 0.04 oz Ag

SOURCES:

Chilito Mines Report ADMMR files

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

CHRISTMAS

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 4 S RANGE 16 E SECTION 30
COUNTY - Gila AZMILS - 20B
DESCRIPTION - 30 miles south of Globe

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 7 MILLION TONS AT 0.63% Cu
Sulfide - 20 MILLION TONS AT 1.82% Cu

RESERVE INFO - Sulfide - First Open Pit -- Second Underground

SOURCES:

Inspiration Resources Form 10K 1983 pg 8

COMMENTS:

Cyprus acquired property July 1, 1988 from Inspiration

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

COCHISE

ALSO KNOWN AS - Bisbee North, Dubacher Canyon

OPERATOR\OWNER:

Phelps Dodge
2600 N. Central Avenue
Phoenix, AZ 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 23 S RANGE 24 E SECTION 9&10
COUNTY - Cochise AZMILS - 619
DESCRIPTION - East edge of Bisbee, Cochise Co.

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 210 MILLION TONS AT 0.40% Cu

SOURCES:

"Metals Week" Oct. 12, 1987; "Bisbee Gazette" Oct. 14, 1987; "Pay dirt" Nov. 1987 pg 3A; Phelps Dodge Form 10K, 1990, page 10.

COMMENTS:

Mostly chalcocite, ADMMR Cochise file. Leaching studies completed by Phelps Dodge.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

COPPER BASIN

OPERATOR\OWNER:

Phelps Dodge
2600 N. Central Avenue
Phoenix, AZ 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 13 N RANGE 3 W SECTION 20
COUNTY - Yavapai AZMILS - 1334
DESCRIPTION - 8 miles SW of Prescott

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 70 MILLION TONS AT 0.53% Cu

RESERVE INFO - Sulfide - 0.021% Mo

SOURCES:

Phelps Dodge Form 10K 1990 - Pg. 10

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

COPPER BUTTE

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 3 S RANGE 13 E SECTION 30
COUNTY - Pinal AZMILS - 172
DESCRIPTION - 20 miles NE of Florence

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 22 MILLION TONS AT 1.09% Cu

SOURCES:

AMA - "AZ Wilderness 1988" Report A-23 to Congress. "Proposed Phoenix RMP and Final EIS" BLM Letter # 30 From Administrator, Ray Unit, Asarco 4/27/88

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

COPPER CREEK

OPERATOR\OWNER:

Magma Copper Company
7400 N. Oracle Road
Tucson, AZ 85704
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 8 S RANGE 18 E SECTION 11
COUNTY - Pinal AZMILS - 548E
DESCRIPTION - 10 miles east of Mammoth

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 80 MILLION TONS AT 0.55% TCu

SOURCES:

Old Cu Reserves Data

COMMENTS:

Includes Childs Aldwinkel, Copper Prince, and Old Reliable

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

COPPER QUEEN

OPERATOR\OWNER:

Phelps Dodge
2600 N. Central Avenue
Phoenix, AZ 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 23 S RANGE 24 E SECTION 9
COUNTY - Cochise AZMILS - 262
DESCRIPTION - Bisbee, AZ - Cochise Co.

ORE TYPE AND RESERVE INFORMATION:

Mixed - 1 MILLION TONS AT 5.5% Cu (a)

RESERVE INFO - Mixed - Underground

RESERVE INFO - Acid Soluble - Undetermined amount and grade of dumps being leached

SOURCES:

(a) PD Prospectus dated May 8, 1975 pg 12

COMMENTS:

Dump leaching MILS Cochise 559, T23S R24E Sec. 15 Significant go
ld resource also.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

DOS POBRES

ALSO KNOWN AS - Safford Project

OPERATOR\OWNER:

Phelps Dodge
2600 N. Central Avenue
Phoenix, AZ 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 5 S RANGE 26 E SECTION 27
COUNTY - Graham AZMILS - 98
DESCRIPTION - 10 miles north of Safford

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 232 MILLION TONS AT 0.89% Cu

SOURCES:

Phelps Dodge Form 10K 19897 pg 7

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

DRAGOON

OPERATOR\OWNER:

Sullivan, James
P. O. Box 3030 - 7459 E. Alameria Rd.
Scottsdale, AZ 85257
602-945-4800

LOCATION INFORMATION:

TOWNSHIP 16 S RANGE 22 E SECTION 25
COUNTY - Cochise AZMILS - 806
DESCRIPTION - 20 miles NE of Benson, Cochise Co.

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 25 MILLION TONS AT 0.5% ASCu

RESERVE INFO - Acid Soluble - 0.5 to 0.6 ASCu (acid soluble copper)

SOURCES:

Previous Copper Reports

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

DYNAMITE

ALSO KNOWN AS - Copper Prince (MILS 578?)

OPERATOR\OWNER:

Addison Smith
9025 E. Calle Bolivar
Tucson, AZ 85715
602-296-7891

LOCATION INFORMATION:

TOWNSHIP 17 S RANGE 13 E SECTION 30
COUNTY - Pima AZMILS - 1134
DESCRIPTION - 20 miles south of Tucson (north of Twin Buttes)

ORE TYPE AND RESERVE INFORMATION:

Mixed - 100 MILLION TONS AT 0.53% TCu

RESERVE INFO - Mixed - TCu

SOURCES:

Mr. Addison Smith MG WR 10/11/85 ADMMR Dynamite file

03/06/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

EMERALD ISLE

OPERATOR\OWNER:

Holcorp Mines Ltd.
P. O. Box 52
Toronto, ON, Canada M5K 1E7
416-863-5680

LOCATION INFORMATION:

TOWNSHIP 23 N RANGE 18 W SECTION 22
COUNTY - Mohave AZMILS - 127A
DESCRIPTION - 15 miles north of Kingman (just west of Mineral Park)

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 1.8 MILLION TONS AT 0.72% Cu

RESERVE INFO - 6.4 Mt at .42% Cu includes probable resources

SOURCES:

Arimetco Int. and American Mines Handbook 1991-1992.

COMMENTS:

Arimetco built and operated a 8,000 lb/day SX-EW plant as part of the sale agreement. Title to transfer March 1992.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

ESPERANZA

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 18 S RANGE 12 E SECTION 16
COUNTY - Pima AZMILS - 864
DESCRIPTION - 25 miles south of Tucson

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 48 MILLION TONS AT 0.27% Cu

RESERVE INFO - Sulfide - 0.034% Mo

SOURCES:

Pennzoil Form 10K, 1981

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

FOUR METALS

OPERATOR\OWNER:

Dore Mining & Milling
West 601 Ave. #507
Spokane, WA 99204

LOCATION INFORMATION:

TOWNSHIP 23 S RANGE 16 E SECTION 20
COUNTY - Santa Cruz AZMILS - 119
DESCRIPTION - 15 miles NE of Nogales

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 3 MILLION TONS AT 0.82% Cu

SOURCES:

Iso Mines Ltd. Annual Report 1965 (subsidiary of Noranda) ADMMR F
our Metals file

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

GIBSON

OPERATOR\OWNER:

Lodestar Minerals Inc.
P. O. Box 971
Miami, AZ 85539
602-830-8001

LOCATION INFORMATION:

TOWNSHIP 1 S RANGE 14 E SECTION 21
COUNTY - Gila AZMILS - 87B
DESCRIPTION - 7 miles SW of Miami

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 10.8 MILLION TONS AT 0.70% TCu
Acid Soluble - 43.2 MILLION TONS AT 0.40% TCu

SOURCES:

Fletcher, J.B. et al - "Gibson Mine Project Scope and Preliminary
Property Evaluation Report" pg viii - 4 & 5, Aug. 1984

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

HELVETIA

ALSO KNOWN AS - Helvetia East

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 18 S RANGE 15 E SECTION 36
COUNTY - Pima AZMILS - 866
DESCRIPTION - Twenty miles SE of Tucson in Santa Rita Mtns.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 337 MILLION TONS AT 0.54% Cu
Acid Soluble - 22 MILLION TONS AT 0.55% Cu

RESERVE INFO - Sulfide - 0.088 oz/ton Ag, 0.0005 oz/ton Au

SOURCES:

Drescher, T.A. "Deposit Summary Report Helvetia East Deposit" April 1979 pg 11 ADMMR Helvetia file

COMMENTS:

Purchased by Asarco in 1988 for \$1 million cash and 1200 acres of Non-mineral land. (Peach Elgin included) "Metals Week", Aug 29, 1988 pg 1 gave sulfide - 280 million tons at 0.62% Cu; 0.016% Mo, Acid Soluble - 23 million tons at 0.78% Cu

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

I-10

OPERATOR\OWNER:

James Sullivan
P. O. Box 3030
Scottsdale, AZ 85257
303-945-4800

LOCATION INFORMATION:

TOWNSHIP 15 S RANGE 23 E SECTION 31
COUNTY - Cochise AZMILS - 784
DESCRIPTION - 15 miles SW of Willcox

ORE TYPE AND RESERVE INFORMATION:

Mixed - 100 MILLION TONS AT 0.52% TCu

RESERVE INFO - Mixed - 0.02% Mo

SOURCES:

Unpublished estimate from previous Cu reports

COMMENTS:

Mixed claims and private land controlled by Sullivan.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

INSPIRATION AREA MINES

ALSO KNOWN AS - Cyprus Miami

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 1 N RANGE 14 E SECTION 25
COUNTY - Gila AZMILS - 136F
DESCRIPTION - Miami, AZ - Gila Co.

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 226.1 MILLION TONS AT 0.43% TCu

SOURCES:

Cyprus Minerals Co. Form 10-K 1990, page 2.

COMMENTS:

Acquired by Cyprus from Inspiration July 1, 1988

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

IRON DOOR

OPERATOR\OWNER:

Unknown

LOCATION INFORMATION:

TOWNSHIP 13 S RANGE 25 E SECTION 17
COUNTY - Cochise AZMILS - 612
DESCRIPTION - 5 miles NE of Willcox

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 63 MILLION TONS AT 0.38% TCu

RESERVE INFO - Sulfide - 0.20% Cu cutoff grade

SOURCES:

Spike-E Hills Report, ADMMR Iron Door file

COMMENTS:

Possibly returned to surface owner

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

JOHNSON

OPERATOR\OWNER:

Arimetco International
6245 E. Broadway, Suite 350
Tucson, AZ 85711
602-745-8882

LOCATION INFORMATION:

TOWNSHIP 15 S RANGE 22 E SECTION 26
COUNTY - Cochise AZMILS - 567
DESCRIPTION - 18 miles east of Benson, NW of I-10 and The Thing

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 26.5 MILLION TONS AT 0.29% Cu
Sulfide - 9 MILLION TONS AT 0.6% TCu

SOURCES:

Arimetco International Inc. Prospectus May 16, 1990

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

KALAMAZOO

OPERATOR\OWNER:

Magma Copper Company
7400 North Oracle Road
Tucson, AZ 85704
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 9 S RANGE 16 E SECTION 9
COUNTY - Pinal AZMILS - 578B
DESCRIPTION - 7 miles NW of San Manuel, 45 miles NE of Tucson

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 11 MILLION TONS AT 0.77% Cu (a)
Sulfide - 310 MILLION TONS AT 0.73% Cu (b)

RESERVE INFO - (a) Tonnage reported is in current mine plan.
RESERVE INFO - (b) Tonnage reported is additional mineralized material.

SOURCES:

Magma Form 10K 1990, page 19.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

KAY COPPER MINE

OPERATOR\OWNER:

Rayrock Mines Inc. (Rayrock Yellowknife)
65 Granby St.
Toronto, Ontario M5B 1H8
416-489-0022

LOCATION INFORMATION:

TOWNSHIP 8 N RANGE 2 E SECTION 4
COUNTY - Yavapai AZMILS - 866B
DESCRIPTION - 45 miles north of Phoenix

ORE TYPE AND RESERVE INFORMATION:

- MILLION TONS AT %

RESERVE INFO - EST 6 Mt sulfide at 2.2% Cu, 3% Zn, 1.6 opt Ag .08 opt Au

SOURCES:

Northern Mines Handbook 1990-91

COMMENTS:

Deposit is Precambrian massive sulfide underground reserve.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

KORN KOB

OPERATOR\OWNER:

Keystone Minerals, Inc.
6318 E. Haynes St.
Tucson, AZ 85710
602-747-9551

LOCATION INFORMATION:

TOWNSHIP 11 S RANGE 17 E SECTION 14
COUNTY - Pima AZMILS - 263
DESCRIPTION - 35 miles NE of Tucson

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 2.4 MILLION TONS AT 0.537%
Acid Soluble - 8.0 MILLION TONS AT 0.443%

RESERVE INFO - Acid Soluble - Type1 North Ore Body -- Type2 South Ore Body
RESERVE INFO - Total - 10.4 million tons at 0.464%

SOURCES:

Holmes & Narrou report on Korn Kob, March 1974 section 5 - ADMMR
Korn Kob file

COMMENTS:

A. F. Budge Mining drilled deposit 1990. 12 million tons oxide ore at 0.48% Cu - 1:1 stripping ratio from advertisement in "The Mining Journal" Jan. 11, 1989 pg. 5

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

LAKESHORE

ALSO KNOWN AS - Cyprus Casa Grande

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 10 S RANGE 4 E SECTION 25
COUNTY - Pinal AZMILS - 680E
DESCRIPTION - 32 miles SW of Casa Grande

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 41 MILLION TONS AT 0.71% Cu (a)
Sulfide - 9 MILLION TONS AT 1.35% Cu (a)
Acid Soluble - 15.5 MILLION TONS AT 0.77% Cu (b)

RESERVE INFO - Sulfide - Porphyry -- Tactite

SOURCES:

(a) Noranda Annual Report 1980 (b) Cyprus Minerals Form 10K 1989
p. 2

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

LONE STAR

ALSO KNOWN AS - Safford Project

OPERATOR\OWNER:

Phelps Dodge
2600 N. Central Avenue
Phoenix, AZ 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 6 S RANGE 27 E SECTION 5
COUNTY - Graham AZMILS - 99
DESCRIPTION - 10 miles NE of Safford

ORE TYPE AND RESERVE INFORMATION:

Mixed - 1065 MILLION TONS AT 0.58% TCu (a)
Mixed - 1000+ MILLION TONS AT 0.41% Cu (b)

SOURCES:

(a) "World Mining" May 1981 (b) Phelps Dodge Form 10K 1989 pg 7

COMMENTS:

Acquired by Phelps Dodge from Kennecott - ADMMR Lone Star Group file

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MAGMA MINE

ALSO KNOWN AS - Superior

OPERATOR\OWNER:

Magma Copper Company
7400 North Oracle Road
Tucson, AZ 85704
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 1 S RANGE 12 E SECTION 35
COUNTY - Pinal AZMILS - 98A
DESCRIPTION - Superior, 40 miles east of Mesa

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 5.0 MILLION TONS AT 5.52% Cu

RESERVE INFO - Current reserve of 1.7 million tons at 6.9% Cu (5% cutoff)
RESERVE INFO - is economic at \$.70/lb.

SOURCES:

"Pay Dirt" Southwestern edition, March 1990 p. 4a-6a. Magma Form
10K, 1990 page 18.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MAME

OPERATOR\OWNER:

Hope Mining & Milling Co.
3653 N. 6th Avenue C-22
Phoenix, AZ 85013

LOCATION INFORMATION:

TOWNSHIP 19 S RANGE 25 E SECTION 20
COUNTY - Cochise AZMILS - 240
DESCRIPTION - Courtland. 50 miles south of Wilcox, Ccochise Co.

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 1.4 MILLION TONS AT 1.1% Cu

SOURCES:

Mr. Irwin Icove quoted by Frank Knight in memo to files 5/14/59 i
n Mame file

COMMENTS:

Contact at Hope Mining & Milling Co. is Mrs. Margaret Fournier

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MIAMI EAST

OPERATOR\OWNER:

Magma Copper Company
7400 North Oracle Road
Tucson, AZ 85704
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 1 N RANGE 15 E SECTION 19
COUNTY - Gila AZMILS - 161C
DESCRIPTION - Miami, AZ - Gila Co.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 6 MILLION TONS AT 3.14% Cu (a)
Sulfide - 50 MILLION TONS AT 1.95% Cu (b)

SOURCES:

(a) Newmont Mining Annual Report 1985 (b) "Minerals Yearbook" 19
73 VII Area Reports USBM

COMMENTS:

Underground reserves

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MIAMI TAILINGS

OPERATOR\OWNER:

Magma Copper Company
7400 North Oracle Road
Tucson, AZ 85704
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 1 N RANGE 15 E SECTION 30
COUNTY - Gila AZMILS - 577
DESCRIPTION - Miami. AZ - Gila Co.

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 30 MILLION TONS AT 0.34% Cu

SOURCES:

Magma Form 10K 1990, page 18.

COMMENTS:

54% recovery expected.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MINERAL BUTTE

ALSO KNOWN AS - Mineral Butte & Gold Mine Mtn Area

OPERATOR\OWNER:

Berry, Julian
2850 W. Camelback #112
Phoenix, AZ 85017

LOCATION INFORMATION:

TOWNSHIP 4 S RANGE 7 E SECTION 1
COUNTY - Pinal AZMILS - 291
DESCRIPTION - 20 miles SE of Chandler

ORE TYPE AND RESERVE INFORMATION:

Mixed - 14.6 MILLION TONS AT 0.42% TCu

RESERVE INFO - Mixed - Cutoff grade 0.32%

SOURCES:

ADMMR files - Bear Creek Report

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MINERAL PARK

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 23 N RANGE 17 W SECTION 19
COUNTY - Mohave AZMILS - 106A
DESCRIPTION - 15 miles north of Kingman

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 35 MILLION TONS AT 0.17% Cu

RESERVE INFO - Sulfide - 0.054% Mo

SOURCES:

Pennzoil Form 10K, 1981

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MISSION COMPLEX

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 16 S RANGE 12 E SECTION 31
COUNTY - Pima AZMILS - 230
DESCRIPTION - 15 miles south of Tucson

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 600 MILLION TONS AT 0.68% Cu

RESERVE INFO - Sulfide - 0.13 oz/ton Ag

SOURCES:

Asarco Annual Report 1990, page 34.

COMMENTS:

Reserves include Mission, Eisenhower, Pima and San Xavier (including San Xavier North), Anamax's Eisenhower reserves acquired in April 1987 and the Mineral Hill Deposit adjacent to the Pima Mine acquired in late 1987.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

MORENCI

OPERATOR\OWNER:

Phelps Dodge 85% Sumitomo 15%
2600 N. Central Avenue
Phoenix, AZ 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 4 S RANGE 29 E SECTION 16
COUNTY - Greenlee AZMILS - 47
DESCRIPTION - Morenci, AZ - Greenlee Co.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 665 MILLION TONS AT 0.79% Cu (a)
Acid Soluble - 960 MILLION TONS AT 0.35% Cu (b)
Sulfide - 150 MILLION TONS AT 0.72% Cu (c)
Mixed - 150 MILLION TONS AT .70% Cu (d)

RESERVE INFO - (a) - Milling Reserves (b) - Leaching reserves
RESERVE INFO - (c) - Western Copper Deposit (d) - Coronado deposit

SOURCES:

Phelps Dodge Form 10K 1990, pages 9-10.

COMMENTS:

Includes Metcalf - MILS 135

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

NEW CORNELIA

ALSO KNOWN AS - Ajo

OPERATOR\OWNER:

Phelps Dodge
2600 N. Central Avenue
Phoenix, AZ 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 12 S RANGE 6 W SECTION 27
COUNTY - Pima AZMILS - 3
DESCRIPTION - Ajo, AZ - Pima Co.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 160 MILLION TONS AT 0.56% Cu

SOURCES:

Phelps Dodge Form 10K 1990, page 10.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

ORACLE RIDGE

OPERATOR\OWNER:

South Atlantic Venture Ltd.
405-750 W. Pender St.
Vancouver, BC V6C-2T7
604-689-7842

LOCATION INFORMATION:

TOWNSHIP 11 S RANGE 16 E SECTION 16
COUNTY - Pima AZMILS - 881
DESCRIPTION - 10 miles south of Oracle

ORE TYPE AND RESERVE INFORMATION:

Mixed - 4 MILLION TONS AT 2.33% TCu

RESERVE INFO - Additional reserves of 4.4 million tons at 2%-2.5% possible.
RESERVE INFO - Reserve contains .6 oz/ton Ag.

SOURCES:

E&MJ June 1989 p. 89

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

PEACH ELGIN

ALSO KNOWN AS - Helvetia West

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 18 S RANGE 15 E SECTION 15
COUNTY - Pima AZMILS - 450
DESCRIPTION - Twenty miles SE of Tucson in Santa Rita Mtns.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 13.5 MILLION TONS AT 0.78% Cu
Acid Soluble - 10 MILLION TONS AT 0.75% Cu

SOURCES:

West, Barbara J. "Deposit Summary Report Helvetia West", Jan. 198
0 pg 4, ADMMR Helvetia file

COMMENTS:

Included in sale to Asarco of Helvetia in 1988

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

PINTO VALLEY

OPERATOR\OWNER:

Magma Copper Company
7400 North Road
Tucson, AZ 85704 San Manuel, AZ 85631
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 1 N RANGE 14 E SECTION 2
COUNTY - Gila AZMILS - 140C
DESCRIPTION - 6 miles west of Miami

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 355 MILLION TONS AT 0.39% Cu

RESERVE INFO - Leach Dumps - 413 million tons at 0.12% Cu

RESERVE INFO - Sulfide peripheral - currently uneconomic 317 million tons at 0.394%

SOURCES:

Magma Form 10K 1990, pages 18-19.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

POSTON BUTTE

OPERATOR\OWNER:

Conoco Inc.
High Park Ridge
Stanford, CT 06904
203-329-2300

LOCATION INFORMATION:

TOWNSHIP 4 S RANGE 9 E SECTION 33
COUNTY - Pinal AZMILS - 296
DESCRIPTION - 4 miles NW of Florence, Pinal Co.

ORE TYPE AND RESERVE INFORMATION:

Mixed - 800 MILLION TONS AT 0.4% TCu

SOURCES:

Copper Studies Inc., NYC, March 30, 1979 in ADMMR Poston Butte Project file

COMMENTS:

500 million tons at 0.5% TCu from Conoco Annual Report 1972

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

RAY

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 3 S RANGE 13 E SECTION 10
COUNTY - Pinal AZMILS - 142A
DESCRIPTION - 26 miles north of Hayden

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 626 MILLION TONS AT 0.69% Cu

SOURCES:

Asarco Annual Report 1990, page 34.

COMMENTS:

Includes native copper and silicate

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

RED MOUNTAIN

OPERATOR\OWNER:

Kerr-McGee Corp.
P. O. Box 25861
Oklahoma City, OK 73125
405-270-1313

LOCATION INFORMATION:

TOWNSHIP 22 S RANGE 16 E SECTION 20
COUNTY - Santa Cruz AZMILS - 98
DESCRIPTION - 3 miles south of Patagonia

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 100 MILLION TONS AT 0.71% Cu

RESERVE INFO - Sulfide - possible

SOURCES:

"Tucson Daily Citizen" Sept. 23, 1970 pg 8, Economic Geology Vol.
70 No. 8 pg 1437-47

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SACATON EAST

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 5 S RANGE 5 E SECTION 26
COUNTY - Pinal AZMILS - 441A
DESCRIPTION - 5 miles NW of Casa Grande, Pinal Co.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 15 MILLION TONS AT 1.25% Cu

SOURCES:

Asarco Inc. 10K 1979

COMMENTS:

Underground reserves - allowed to flood

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SAGINAW HILL

OPERATOR\OWNER:

Jacobs, Aurther ?

LOCATION INFORMATION:

TOWNSHIP 15 S RANGE 12 E SECTION 12
COUNTY - Pima AZMILS - 23
DESCRIPTION - 10 miles southwest of Tucson

ORE TYPE AND RESERVE INFORMATION:

- MILLION TONS AT %

RESERVE INFO - Acid Soluble - unknown amount and grade

SOURCES:

ADMMR file

COMMENTS:

Urban development encroaches on deposit.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SAN JUAN

ALSO KNOWN AS - Peacock

OPERATOR\OWNER:

Claridge, Alf
E. Highway 90
Safford, AZ 85546
602-428-1789

LOCATION INFORMATION:

TOWNSHIP 5 S RANGE 26 E SECTION 35
COUNTY - Graham AZMILS - 94A
DESCRIPTION - 7 miles north of Safford

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 15.5 MILLION TONS AT 0.52% TCu

RESERVE INFO - Acid Soluble - 0.35% TCu cutoff

RESERVE INFO - Acid Soluble - or 20 million tons at lower grade with lower cutoff

SOURCES:

Safford Copper Project - Producers Minerals Corporation Report June 1975 pg 2, ADMMR San Juan file

COMMENTS:

Cochise Mining Corp. AKA Producers Minerals

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SAN MANUEL OPEN PIT

OPERATOR\OWNER:

Magma Copper Company
7400 North Oracle Road
Tucson, AZ 85704
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 8 S RANGE 16 E SECTION 35
COUNTY - Pinal AZMILS - 744
DESCRIPTION - 7 miles NW of San Manuel, 45 miles NE of Tucson

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 38 MILLION TONS AT 0.42% Cu
Acid Soluble - 9 MILLION TONS AT 0.14% Cu (a)
Sulfide - 1 MILLION TONS AT 0.95% Cu

RESERVE INFO - (a) Open pit marginal - assays greater than either 0.13%
RESERVE INFO - acid soluble or 0.26% total copper.

SOURCES:

Magma copper Company Form 10K 1990, pages 18-19.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SAN MANUEL UNDERGROUND

OPERATOR\OWNER:

Magma Copper Company
7400 North Oracle Road
Tucson, AZ 85707
602-575-5600

LOCATION INFORMATION:

TOWNSHIP 8 S RANGE 16 E SECTION 34
COUNTY - Pinal AZMILS - 577A
DESCRIPTION - 7 miles NW of San Manuel, 45 miles NE of Tucson

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 87 MILLION TONS AT 0.72% Cu (a)
Sulfide - 142 MILLION TONS AT 0.64% Cu (b)
Acid Soluble - 248 MILLION TONS AT 0.355% Cu (c)

RESERVE INFO - (a) Tonnage in current mining plan. (b) Additional mineralization
RESERVE INFO - in shaft pillar (c) In-situ

SOURCES:

Magma Form 10K 1990, pages 18-19.

COMMENTS:

Cut off grades for underground is 0.5% and in-situ 0.15%. Mining
of shaft pillar reserves will require a new production shaft.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SANCHEZ

OPERATOR\OWNER:

AZCO - Arizona Copper Co.
165 S. Union Blvd. #350
Lakewood CO 80228
303-969-0591

LOCATION INFORMATION:

TOWNSHIP 6 S RANGE 27 E SECTION 25
COUNTY - Graham AZMILS - 108
DESCRIPTION - 10 miles NE of Safford

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 168 MILLION TONS AT 0.34% Cu (a)
Sulfide - 120 MILLION TONS AT 0.4% Cu (b)
Acid Soluble - 80 MILLION TONS AT 0.3% Cu (b)

RESERVE INFO - (b) Sulfide contains 0.008 oz/ton Au, 0.1 oz/ton Ag

SOURCES:

(a) Northern Miner, 12/23/91 p. 17 (b) Report from William Sorsen
to Ken Phillips, August 1988, ADMMR Sanchez file

COMMENTS:

Optioned by AZCO January 1989. Permitting and financing underway
1991.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SANTA CRUZ

OPERATOR\OWNER:

Asarco-Freeport McMoran Joint Venture
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 6 S RANGE 4 E SECTION 13
COUNTY - Pinal AZMILS - 736
DESCRIPTION - 7 miles west of Casa Grande

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 800 MILLION TONS AT 0.43% TCu

SOURCES:

USBM Data - 1985 - ADMMR Santa Cruz file

COMMENTS:

Joint venture partners are involved with in situ leaching research project with USBM.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SHEEP MOUNTAIN PROPERTY

OPERATOR\OWNER:

Ungava Iron Ores Ltd.
121 Richmond St West Suite 405
Toronto, Ontario Canada M5H 2K1
416-364-2015

LOCATION INFORMATION:

TOWNSHIP 8 N RANGE 2 W SECTION 13
COUNTY - Yavapai AZMILS - 947
DESCRIPTION - 50 miles NW of Phoenix

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 350 MILLION TONS AT 1.0% Cu (a)

SOURCES:

Smith, Ken P., former owner, based on drilling done by Utah International and Phelps Dodge, ADMMR Sheep Mountain Property file.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SIERRITA

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 18 S RANGE 12 E SECTION 7
COUNTY - Pima AZMILS - 243
DESCRIPTION - 25 miles south of Tucson

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 464 MILLION TONS AT 0.34% Cu

RESERVE INFO - Sulfide includes 0.037% Mo
RESERVE INFO - Reserves include Twin Buttes mine.

SOURCES:

Cyprus Minerals Co. Form 10K 1990, page 2.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SILVER BELL

OPERATOR\OWNER:

Asarco Inc.
180 Maiden Lane
New York, NY 10038
212-510-1810

LOCATION INFORMATION:

TOWNSHIP 12 S RANGE 8 E SECTION 11
COUNTY - Pima AZMILS - 272
DESCRIPTION - 40 miles NW of Tucson, Pima Co.

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 101 MILLION TONS AT 0.47% Cu

RESERVE INFO - Sulfide - 0.01 oz/ton Ag

SOURCES:

Asarco Annual Report 1989 p. 17

COMMENTS:

No mining at this time but leaching of dumps continues 8/90.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SOL

OPERATOR\OWNER:

Arimetco
6245 E. Broadway, Suite 350
Tucson, Az 85711
602-745-8882

LOCATION INFORMATION:

TOWNSHIP 7 S RANGE 27 E SECTION 24
COUNTY - Graham AZMILS - 308
DESCRIPTION - 10 miles east of Safford

ORE TYPE AND RESERVE INFORMATION:

- MILLION TONS AT %

RESERVE INFO - No known economic reserves.

SOURCES:

USGS I 1617 - Geologic Map of Safford Quad. by Houser et al (1985
) Arimetco International, Inc. Prospectus May 16, 1990

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

SQUAW PEAK

OPERATOR\OWNER:

Squaw Peak Copper Mining Co.
P. O. Box 69
Camp Verde, AZ 86322

LOCATION INFORMATION:

TOWNSHIP 13 N RANGE 5 E SECTION 29&30
COUNTY - Yavapai AZMILS - 979
DESCRIPTION - 8 miles south of Camp Verde

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 20 MILLION TONS AT 0.36% TCu

SOURCES:

Roe, Robert R. "Geology of the Squaw Peak Porphyry Copper - Molybdenum Deposit, Yavapai County, Arizona" 1976 pg ix, ADMMR Geology files

COMMENTS:

With substantial molybdenum

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

STRAY ELEPHANT

ALSO KNOWN AS - S E Claims, Gonzales Wash

OPERATOR\OWNER:

Heinrichs GEO Exploration Co.
P. O. Box 5964
Tucson, AZ 85703-0964
602-623-0578

LOCATION INFORMATION:

TOWNSHIP 4 N RANGE 20 W SECTION 31,32
COUNTY - LA PAZ AZMILS - 819
DESCRIPTION - 8 miles west of Quartzite

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 3.7 MILLION TONS AT 0.36% ASCu

RESERVE INFO - TCu grade is .60%

SOURCES:

1989 report by James Loughry in ADMMR Stray Elephant file

COMMENTS:

Potential of 11 to 13 million tons of plus .50% ASCu.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

STRONG & HARRIS

ALSO KNOWN AS - Surprise & Norte Claims

OPERATOR\OWNER:

Durham, Robert
840 S. Santa Rita
Tucson, AZ 85719
602-293-8864

LOCATION INFORMATION:

TOWNSHIP 15 S RANGE 22 E SECTION 13
COUNTY - Cochise AZMILS - 803
DESCRIPTION - 18 miles SW of Willcox, 18 miles NE of Benson

ORE TYPE AND RESERVE INFORMATION:

Mixed - 60 MILLION TONS AT 0.60% TCu

RESERVE INFO - Mixed - 0.70% Zn

SOURCES:

Unpublished estimate by Strong & Harris

COMMENTS:

Optioned by AZCO January 1989

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

TURQUOISE

OPERATOR\OWNER:

Santa Fe Pacific Mining
P. O. Box 27019
Albuquerque, NM 87125
505-881-3050

LOCATION INFORMATION:

TOWNSHIP 19 S RANGE 25 E SECTION 17
COUNTY - Cochise AZMILS - 220
DESCRIPTION - Courtland, 35 miles NW of Douglas

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 15 MILLION TONS AT 1.50% Cu

RESERVE INFO - Contains .05 oz/ton Au plus silver mineralization.

SOURCES:

Northern Miner June 4, 1990

COMMENTS:

Santa Fe is seeking a joint venture partner to continue exploration and begin development.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

TWIN BUTTES

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood Co 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 18 S RANGE 13 E SECTION 5
COUNTY - Pima AZMILS - 246
DESCRIPTION - 20 miles south of Tucson

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 37 MILLION TONS AT 0.92% Cu
Acid Soluble - 10.6 MILLION TONS AT 0.73% Cu

SOURCES:

Cyprus Minerals Co. Form 10K 1987 p. 4

COMMENTS:

Cyprus has 15 year lease from Park Corporation, 1988. Reserves being depleted in conjunction with the Sierrita and remaining reserves are included with Sierrita's per Cyprus Minerals Co. form 10k, 1989.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

UNITED VERDE

OPERATOR\OWNER:

Phelps Dodge Corp.
2600 N. Central Ave.
Phoenix, Az 85004-3015
602-234-8100

LOCATION INFORMATION:

TOWNSHIP 16 N RANGE 2 E SECTION 22
COUNTY - Yavapai AZMILS - 551B
DESCRIPTION - Jerome, 30 miles northeast of Prescott

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 21 MILLION TONS AT 0.52% Cu

RESERVE INFO - Reserve also contains 6.6% Zn, .61 oz/ton Ag and .02 oz/ton Au.

SOURCES:

USGS Bulletin 1857-D.

COMMENTS:

Precambrian massive sulfide deposit.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

VAN DYKE

OPERATOR\OWNER:

Arimetco International
6245 E. Broadway Suite 350
Tucson, Az 85711
602-745-8882

LOCATION INFORMATION:

TOWNSHIP 1 N RANGE 15 E SECTION 30
COUNTY - Gila AZMILS - 165
DESCRIPTION - Miami, AZ - Gila Co.

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 100 MILLION TONS AT 0.50% TCu

SOURCES:

"Mining Engineering" Dec. 1977

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

VEKOL HILLS

OPERATOR\OWNER:

Tohono O'odham Nation
201 N. Stone Ave
Tucson, AZ 85701
602-623-1312

LOCATION INFORMATION:

TOWNSHIP 10 S RANGE 3 E SECTION 4
COUNTY - Pinal AZMILS - 732
DESCRIPTION - 35 miles south of Casa Grande

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 105 MILLION TONS AT 0.56% Cu

RESERVE INFO - Sulfide - 0.014 Mo

RESERVE INFO - Acid Soluble - 16 million tons at ? open pit

SOURCES:

Final Environmental Impact Statement, Vekol Hills Project, US Dep
t. of Interior, Bureau of Indian Affairs, May 1988

COMMENTS:

104 million at 0.54% TCu & 0.014 Mo, E&MJ Int Dir of Mining 1980

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

VENTURA

OPERATOR\OWNER:

Cyprus Minerals Co.
9100 E. Mineral Circle
Englewood CO 80155
303-740-5000

LOCATION INFORMATION:

TOWNSHIP 23 S RANGE 15 E SECTION 1
COUNTY - Santa Cruz AZMILS - 1C
DESCRIPTION - 20 miles NE of Nogales

ORE TYPE AND RESERVE INFORMATION:

Sulfide - 6.3 MILLION TONS AT 0.26% TCu

RESERVE INFO - Sulfide - 0.28% MoS₂ (6 million additional tons possible)

SOURCES:

Iso Mines Ltd. Annual Report 1965 (subsidiary of Noranda)

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

WHITE MESA

ALSO KNOWN AS - Mardun Copper

OPERATOR\OWNER:

Navajo Nation (1)

Window Rock, AZ 86515

LOCATION INFORMATION:

TOWNSHIP 38 N RANGE 9 E SECTION 29
COUNTY - Coconino AZMILS - 8
DESCRIPTION - 100 miles north of Flagstaff

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 2 MILLION TONS AT 0.75% Cu

SOURCES:

Mayo, E.B., 1955, Metalliferous Minerals and Mineral Fuels, V. 1
Mineral Resources, Navajo-Hopi Indian Reservations, AZ - UT; UofAZ pg 19
-32. USGS Bull. 540, p. 159-163

COMMENTS:

(1) Part of the deposit lies on patented land. Contact: Shattuck,
Laird, and Sutter, P. O. Box 42081, Tucson, AZ 85733.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

ZONIA

OPERATOR\OWNER:

Zonia Co.
212 S. Marina St.
Prescott, AZ 86303
602-778-2101

LOCATION INFORMATION:

TOWNSHIP 11 N RANGE 4 W SECTION 12
COUNTY - Yavapai AZMILS - 407
DESCRIPTION - 30 miles north of Wickenburg

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 35 MILLION TONS AT 0.31% Cu

RESERVE INFO - Acid Soluble - (includes minable and in situ)

SOURCES:

George Phelps - NJN WR 3/1/85, Lundin, Richard J. et al "Porphyry
Copper Mineralization Assoc. with the Central Arizona Greenstone Belt."
Feb 1985 pg 4 (ADMMR Zonia file)

COMMENTS:

In 1990 being proposed as a private land fill site by owners.

02/05/92

ARIZONA COPPER RESERVES

COMPILED BY

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

PROPERTY:

WHITE MESA

ALSO KNOWN AS - Mardun Copper

OPERATOR\OWNER:

Navajo Nation (1)

Window Rock, AZ 86515

LOCATION INFORMATION:

TOWNSHIP 38 N RANGE 9 E SECTION 29

COUNTY - Coconino AZMILS - 8

DESCRIPTION - 100 miles north of Flagstaff

ORE TYPE AND RESERVE INFORMATION:

Acid Soluble - 2 MILLION TONS AT 0.75% Cu

SOURCES:

Mayo, E.B., 1955, Metalliferous Minerals and Mineral Fuels, V. 1
Mineral Resources, Navajo-Hopi Indian Reservations, AZ - UT; UofAZ pg 19
-32. USGS Bull. 540, p. 159-163

COMMENTS:

(1) Part of the deposit lies on patented land. Contact: Shattuck,
Laird, and Sutter, P. O. Box 42081, Tucson, AZ 85733.