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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: SUNNYSIDE MINE GROUP

ALTERNATE NAMES:
  FARRELL
  HORSESHOE
  PINA
  SUNNYSIDE COPPER PROPERTY

SANTA CRUZ COUNTY MILS NUMBER: 124

LOCATION: TOWNSHIP 23 S RANGE 16 E SECTION 6 QUARTER NE
LATITUDE: N 31 DEG 27MIN 54SEC  LONGITUDE: W 110 DEG 44MIN 37SEC
TOPO MAP NAME: LOCHIEL - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
  COPPER OXIDE
  SILVER
  LEAD
  ZINC
  GOLD

BIBLIOGRAPHY:
  KEITH, S.B., 1975, INDEX OF MINING PROP. IN SANTA CRUZ CO., AZBM BULL. 191, P. 59
  LENON'S MAP OF SANTA CRUZ CO.
  AZBM CARD FILE SANTA CRUZ CO.
  ADMMR "U" FILE CU 19
  ADMMR CARD, AGS BOOTPRINTS FT 14
  USGS BULL. 582, P. 254, USBM MLA94-22
  ADMMR SUNNYSIDE MINE GROUP FILE
SUNNYSIDE MINE GROUP

MILS Santa Cruz Index #124

AKA: Volcano Mine, Pina, Horseshoe Claim, Farrell Claim

USGS Bull. 582, p. 255-256

ABM Bull. 191, p. 59

USGS PP 658-E, p. 9

Cumero Canyon 7.5 (included in file)
**GENERAL REFERENCES**

REFERENCE 1 Fl < 8BfrMT-I 258M PI

REFERENCE 2 F2 < C.USB M

REFERENCE 3 F3 < SCHRADER, FRANK C. 1915. MINERAL DEPOSITS OF THE SANTA RITA AND PATAGONIA MOUNTAINS, ARIZONA; USGS BULLETIN 583, P. 255-256.


REFERENCE 5 < GEOLOGIC COORDINATES LOCATE VOLCANO SHAFT>

REFERENCE 6 < TUFFACEOUS SANDSTONE OR GIST>

REFERENCE 7 < ALTERED TO QUARTZ, SERICITE, KALUNITE, ALUMITE, PIRITE, AND TOURMALINE>

REFERENCE 8 < ROCK WITH ISOLATED SHOWINGS OF COPPER CARBONATE ORES>

REFERENCE 9 < ADAMS FILE DATA; VOLCANO MINE>

REFERENCE 10 < ADAMS CLIPPING FILE; VOLCANO GROUP OF MINES, SUNNYSIDE GROUP - PATAGONIA>

REFERENCE 11 < SIMONS, FRANKS. 1972. GEOLOGIC MAP AND SECTIONS OF THE MOGULS AND LOCHIEL QUADRANGLES, SANTA CRUZ COUNTY, ARIZONA; USGS MAP I-962 (1:40,000)

REFERENCE 12 < KEITH, STANLEY B. 1972. INDEX OF MINING PROPERTIES IN SANTA CRUZ COUNTY, ARIZONA; ARIZONA BUREAU OF MINES, BULLETIN 141, P. 99>

REFERENCE 13 < ADAMS FILES; STANLEY B. KEITH>

REFERENCE 14 < SIMONS, FRANKS. 1972. MISRO201; STRATIGRAPHY OF THE PATAGONIA MOUNTAINS AND AROUND AREAS, SANTA CRUZ COUNTY, ARIZONA; USGS PROFESSIONAL PAPER 158-E, P. 9>

**U.S. CRIB-SITE FORM**

**RECORD IDENTIFICATION**

**LOCATION**

**UTM**

**CADASTRAL**

**POSITION FROM NEAREST PROMINENT LOCALITY A83 < 2.5 MILES SW OF HARSHAW**

**ESSENTIAL INFORMATION**

**ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED**
COMMODITY INFORMATION

C10 (C1, Ni, Ag, Zn, Pb, Sn, Au, Cu, V, Fe, Pb)

C1 (MALACHITE, CHALCOPRYITE, COPPER, CARBONATE LEAD ORE, GALENA)

MINERAL PRODUCTS

MAJOR (Cu, Ag, Zn, Pb, Sn, Au, Cu, V, Fe, Pb)

MINOR (Ag, Zn, Pb, Sn, Au, Cu, V, Fe, Pb)

POТЕNTIAL (Cu, Ag, Zn, Pb, Sn, Au, Cu, V, Fe, Pb)

SIGNIFICANCE

ORE

"PERT. MINERALS (NOT ORE) K ...

FORMATION NAME N35A

PROCESS OF OONCtENRICH. N80 < 5

SIGNIFICANT LOCAL STRUq,N70 < .:200

YEAR

PRESENT/LAST OPERATOR A13 _____________________________

SIGNIFICANT ALTERATION : N75 < ,Sl}SFCtCCf

Maj.

DISCOVERER L20 < R. FARRELL

YEAR OF DISCOVERY L10 < 1893

NATURE OF DISCOVERY L30 (p) "YEAR OF FIRST PRODUCTION L45 < 1893 " YEAR OF LAST PRODUCTION L45 < 1958

PRESENT/LAST OWNER A12 _____________________________

PRESENT/LAST OPERATOR A13 _____________________________

PROPERTY C0MPONENTS L11<. PROPERTY COMPRlSES 8 UNPATENTED CLAIMS, WORKED IN LATE 1890'S AND SARPADICALLY THROUGH 1953, OWNERS AND OPERATORS INCLUDED L.D. RICKETS (1912), SANTA CRUZ

DESCRIPTION OF DEPOSIT

DEPOT TYPE(S) C40 < SHEAR ZONE VEINLETS

DEPOT FORM/SHAPE M15 < IRREGULAR; FIBROUS ROSETTES

DEPTH TO TOP M20 ( ) UNITS M21 ( ) MAXIMUM LENGTH M40 ( ) UNITS M41 ( )

DEPTH TO BOTTOM M20 ( ) UNITS M21 ( ) MAXIMUM WIDTH M50 ( ) UNITS M51 ( )

PROPORTION M30 ( ) MAXIMUM THICKNESS M60 ( ) UNITS M61 ( )

PRODUCTION M70 ( ) TOP M80 ( ) 90 SW

DESCRIPTION OF WORKINGS

MINERALIZED SHEAR ZONE IS 200 FT WIDE; ASSOCIATED VEINLETS AVERAGE 5-8 FT IN WIDTH

DESCRIPTION OF WORKINGS

MINERALIZED SHEAR ZONE OF DEPTH OF 90 FT BY SEVERAL SHAFTS, INCLUDING 30 FT INCLINED (DIPPING 30 SW) VOLCANIC SHAFT; VARIOUS STOPES AND DRIFTS; SHALLOW OPEN-CUTS; VOLCANIC CLAIM WORKINGS ALSO INCLUDE 50-FT VERTICAL SHAFT, 550 FT LONG, ADIT WITH CROSSCUTS TOTALING

DESCRIPTION OF WORKINGS

GEOLoy

AGE OF HOST ROCK(S) K1 < TIR, TUR .... v

HOST ROCK TYPE(S) K1A < MONZONITE (S) PORPHYRY

AGE OF IGNEOUS ROCK(S) K2 < TIR, TUR .... v

IGNEOUS ROCK TYPE(S) K2A < RHYOLITE AGGLOMERATE; RHYOLITIC TO LATITIC LAVA AND TUFF WITH SOME

AGE OF MINERALIZATION K3 < CRET. ? TERT.

PRACT. MINERALS (NOT ORE) K4 < LIMONITE QUARTZ

SIGNS OR CONTROLLING FACTOR(S) K5 < SHALLOW, NORTHERLY SHEAR ZONE IN GRANITE PORPHYRY

Tectonic Setting

SIGNIFICANT LOCAL STRUCTURAL FEATURES N15 < DISLOCATIONS IN GRANITE PORPHYRY, MOUNT WIGHTON FORMATION AND IS LOCALLY MUSCHLIZED

THUNDER MINE FALL BLOCK

200 FT WIDE MINERALIZED ZONE CONSISTS OF BELTS OF SHEARED AND SILICIFIED COUNTRY.. SURFACE OXIDATION OVER 200 FT IN DEPTH

SIGNIFICANT ALTERATION : N75 < SECONDARY ENRICHMENT ALONG FAULT ZONES

PROCESS OF CONC. ENRICH. N85 <

FORMATION AGE N20 < ...

FORMATION NAME N30A <

SECOND FA AGE N35 < ...

SECOND FA NAME N35A <

IGNEOUS UNIT AGE N50 < TIR, TUR .... v

IGNEOUS UNIT NAME N50A < MOUNT WIGHTON FORMATION

SECOND IS. UNIT AGE N55 <

IGNIS. UNIT NAME N55A <

SIGNS OF MINERALIZATION N85 <

MINERALIZED ZONE TO DEPTH OF 40 FT IS COMPOSED LARGELY OF QUARTZ CARRYING CONSIDERABLE COPPER CARBONATES; SMALL PULPIT OF BLACK ONIZED COPPER ARE ENCOUNTERED.

GENERAL COMMENTS
Trip 14: Patagonia, Red Mountain, Hardshell
October, 1994

Bootprints Along the Cordillera
Porphyry Copper Deposits from Alaska to Chile

PRINTED AT TUCSON BLUEPRINT
The Sunnyside porphyry copper system is defined by an elliptical zone of pyrite mineralization covering 9 square miles. The pyrite zone is centered on a quartz latite porphyry intrusion which was emplaced at the northern end of the Patagonia granodiorite, a large Laramide-age pluton.

The quartz latite porphyry is confined to a diatreme perhaps 5000 feet in diameter at the present surface. The diatreme is filled with a lapilli tuff compositionally and texturally similar to the porphyry. The lapilli tuff is locally well bedded suggesting epiclastic reworking and all beds dip inward toward the center of the diatreme. Several small plugs and the roots of a possible flow dome of porphyry cut the lapilli tuff. Deep drilling indicates these masses coalesce at a depth of 5000 feet to form a single porphyry mass 1 mile in diameter.

At the present surface the porphyry is dominated by lapilli of numerous rock types, ghosts of flattened pumice-like clasts, and sanidine and strongly resorbed and broken quartz phenocrysts in a matrix of altered ash. Textures in the porphyry change systematically to depths of 4000 feet where clasts are absent and unbroken phenocrysts of orthoclase, plagioclase, and rounded quartz occur in a matrix of granophyre. These features suggest the porphyry reached the surface during an explosive event in which a crater was formed then quickly filled with ejecta of porphyry and other rocks.

Pervasive lateral and vertical zoning of hydrothermal alteration and sulfide assemblages is funnel-shaped. At the surface a central zone of advanced argillic alteration (alunite-kaolinite-diaspore-pyrite-enargite) is surrounded by phyllic alteration (quartz-sericite-pyrite). Advanced argillic alteration dies out at depths of 1000 feet where it is underlain successively by an argillic zone (kaolinite-pyrite-montmorillonite?), a phyllic zone, then at depths of greater than 4000 feet a zone of potassic alteration (quartz-kfeldspar-biotite-pyrite-chalcopyrite-magnetite) and complex skarns in adjacent carbonate rocks. All alteration and mineralization is centered on the porphyry which contains a zone of several hundred million tons averaging 0.6% Cu, 0.02% Mo, and 0.15 oz. Ag at a depth of 4000 feet. Adjacent skarns contain zones of 1% Cu, 3% Pb, 10% Zn, and 10 oz.Ag over 50-120 foot lengths of drill core.

The original surface morphology of the Sunnyside system appears to have been a volcanic field with flows and ejecta blankets cut by extrusive felsic domes rather than a single large stratovolcano. This area is a good example of a porphyry copper deposit in which the full vertical extent of the system starting at the Laramide erosion surface has been preserved.
Additions for Arizona Copper Resource database

<table>
<thead>
<tr>
<th>Name, County</th>
<th>Tons (millions)</th>
<th>Grade (% Cu)</th>
<th>Comments/Reference</th>
<th>Owner/Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission UG, Pima Co.</td>
<td>5.1</td>
<td>2.07</td>
<td>Reported in Pay Dirt Nov, 1994. Active, Operated as part of Mission Complex.</td>
<td>Asarco</td>
</tr>
<tr>
<td>Pine Flat, Yavapai Co.</td>
<td>25</td>
<td>0.36</td>
<td>Resource from: Spatz, D., AGS Digest 20.</td>
<td>Numerous owners of patented claims. 110 acres by Woodburn Pine Flat L.C. Des Moines, IA.</td>
</tr>
<tr>
<td>Planet - Mineral Hill</td>
<td>5.76</td>
<td>5.5</td>
<td>Harrer, C.M. 1964 USBM IC 8236, P.</td>
<td>Fred Kallof</td>
</tr>
<tr>
<td>Red Hills, Pinal Co.</td>
<td>500</td>
<td>0.1</td>
<td>Oxide; William S.A. and Forrester, J.D., AGS Digest 20.</td>
<td>Red Hills Mining, Mesa, Az</td>
</tr>
<tr>
<td>Sol</td>
<td></td>
<td></td>
<td>Porphyry Copper system with two untested geochemical targets remain. AMAX/PD drilled 16 holes in 1970's. 150mm tons at 0.1% Cu geological resource reported by ACTLABS in a 1998 enzyme leach test study.</td>
<td>Miller Resources</td>
</tr>
<tr>
<td>Squaw Peak, Yavapai Co.</td>
<td>30</td>
<td>0.35</td>
<td>Also includes 0.03% MoS2.</td>
<td>Desert Pacific, Reno Nevada</td>
</tr>
<tr>
<td>Sunnyside, Santa Cruz Co.</td>
<td>plus 200</td>
<td>0.6</td>
<td>Graybeal, F.T., Sunnyside Por. Cu System, 1994. 4000' deep, contains 0.2% Mo, 0.15 opt Ag, and adjacent Pb-Zn-Ag skarns.</td>
<td>Asarco</td>
</tr>
<tr>
<td>Ventura Porphyry, Santa Cruz Co.</td>
<td>plus 200</td>
<td>0.3</td>
<td>USBM Mineral Land Assessment 22-94.</td>
<td>Noranda ?</td>
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