CONTACT INFORMATION
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Arizona Geological Survey
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Phoenix, AZ 85007
602-771-1601
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Arizona Department of Mines and Mineral Resources Mining Collection

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10/10/97

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: EXPOSED REEF AND BLUE EAGLE

ALTERNATE NAMES:

SANTA CRUZ COUNTY MILS NUMBER: 89C

LOCATION: TOWNSHIP 22 S RANGE 16 E SECTION 30 QUARTER NE
LATITUDE: N 31DEG 29MIN 40SEC LONGITUDE: W 110DEG 44MIN 53SEC
TOPO MAP NAME: LOCHIEL - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

COPPER SULFIDE
SILVER
GOLD

BIBLIOGRAPHY:

USGS LOCHIEL QUAD
AZBM CLIPPING FILE, M.J. ELSING REPORT 1921
AZBM CARD FILE SANTA CRUZ CO.
ADMMR EXPOSED REEF AND BLUE EAGLE MINE FILE

EFERENCES:

EE: USBM RI 5650 1960 pp-41 (LUCKY DAY CLAIMS)

Santa Cruz County
Harshaw District
T22S R16E Sec. 30

Arizona Mining Journal Issue Feb. 1920 p. 44, 6/1918, p. 43

ee: ABM Bull. 191, pg. 57, (Blue Eagle) T22S, R16E, W Cen. 30

11-1915

Exposed Reef Mine

This property near Patagonia and comprising four claims has been leased to Dowd and Shannon, for a period of two years. The mine is owned by Albert Des Saulles and J. B. Shannon of Bisbee. The property has a tunnel 750 feet in length which cuts a six foot ledge of seven per cent copper ore and is stated to also carry high values in gold and silver.

The property is situated two miles southeast of Patagonia in Alum Gulch, at the south end of Red Mountain, between the old Flux mine and the well known World's Fair, silver mine.

USGS PP 658-E

USGS BULL 582, p. 257-258

Harshaw, AZ 7.5 (included in file)

CANYON QUADRANGLE
NA-SANTA CRUZ CO
E SERIES (TOPOGRAPHIC)
NOGALES 15' QUADRANGLE

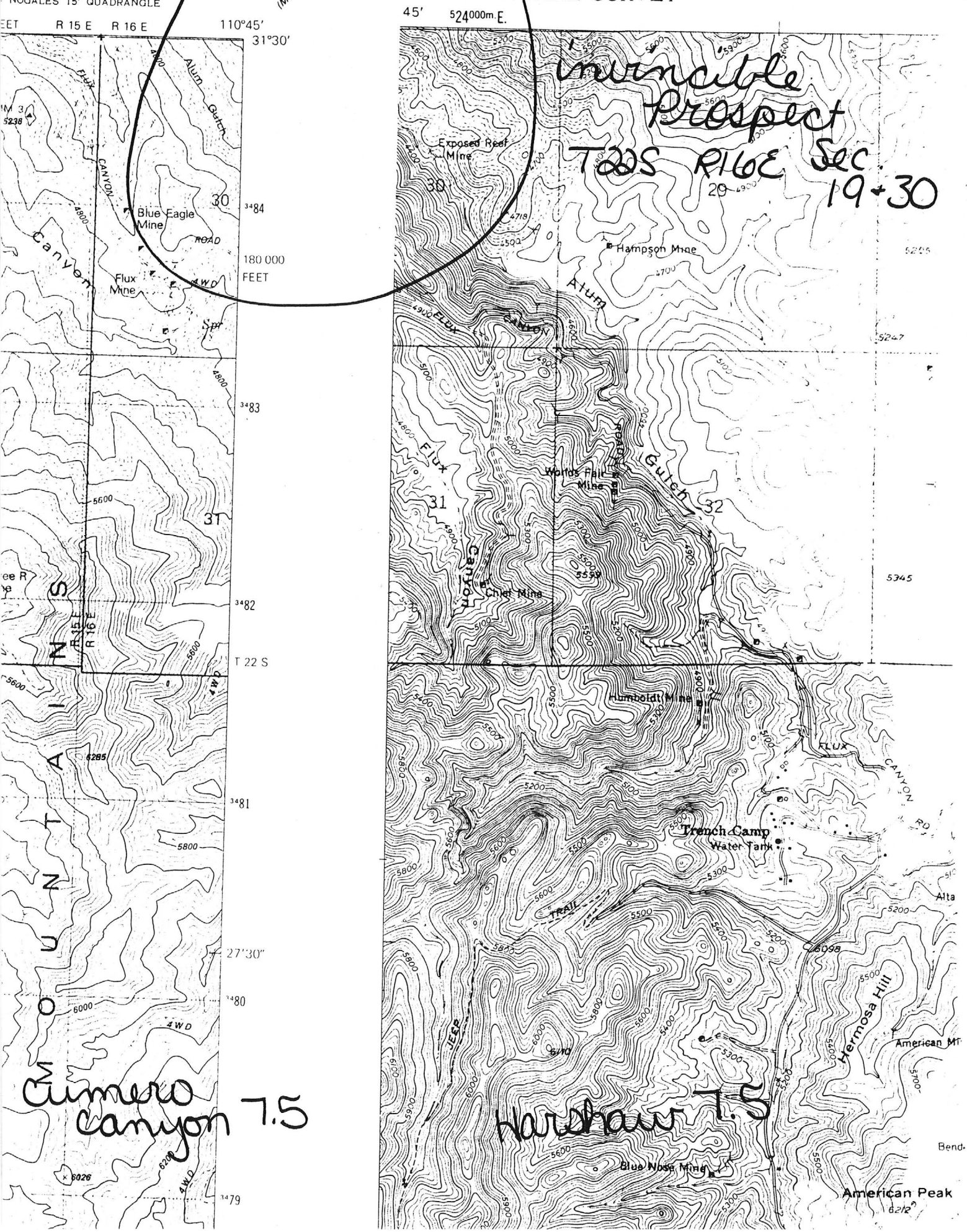
3847 II SW
(MT. HUGHES)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Invincible Prospect
T22S R16E Sec 19+30

Cimero Canyon 7.5

Harshaw 7.5



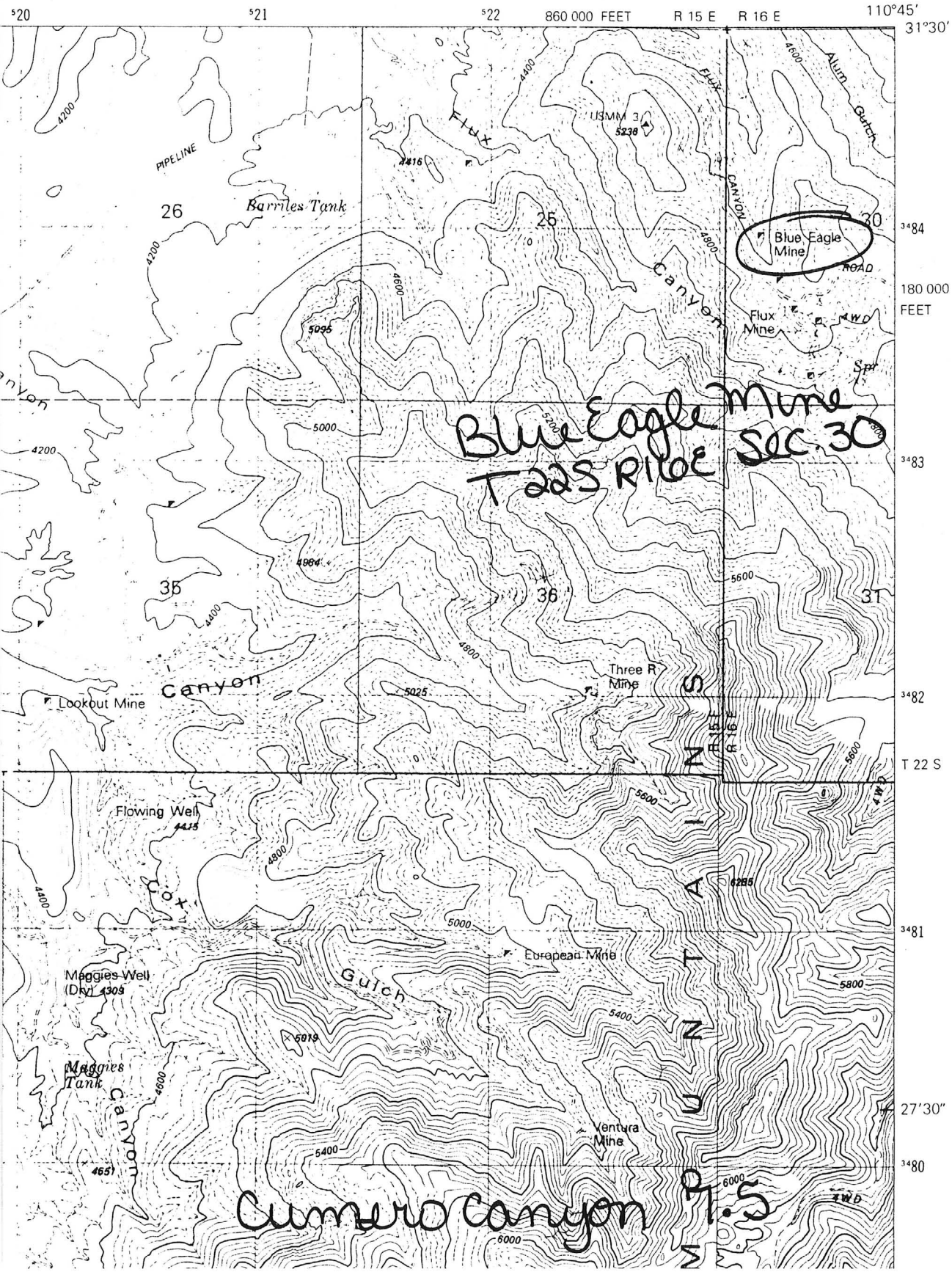
CUMERO CANYON QUADRANGLE

ARIZONA–SANTA CRUZ CO.

7.5 MINUTE SERIES (TOPOGRAPHIC)

NE/4 NOGALES 15' QUADRANGLE

3847 II SW (MT. HUGHES)



* GENERAL REFERENCES

REFERENCE 1 F1 < USBM FILES, EX[illegible] REEF MINES

REFERENCE 2 F2 < ADMR FILE DATA, EXPOSED REEF AND BLUE EAGLE GROUPS

REFERENCE 3 F3 < ABGMT FILES, STANTON B. KEITH

REFERENCE 4 F4 < SCHRADER, FRANK C., 1915, MINERAL DEPOSITS OF THE SANTA RITA AND PATAGONIA MOUNTAINS, ARIZONA; USGS BULLETIN 582, p. 257-258.

C30 < SPHALERITE >
C50 < SOME GOLD AND STRONG IRON CONTENT >
L110 < REED TUNNEL, IRON BANK, BLUE EAGLE NO. 1-2, ST. LOUIS, NORTH STAR, LOG CABIN, COW BOY, POWDER HOUSE, EXPOSED REEF, SILVER TUNNEL, LUCKY DAY, SILVER STAR, INVINCIBLE, ST. PATRICKS, OLD BOY ROGERS, RED FOX NO. 1-4; OWNERS INCLUDED JOHN FARLEY, D. DOWD, J.B. SHANNON >
M110 < BODIES THAT INCREASE BOTH IN SIZE AND VALUES WITH DEPTH; VEINS VARY IN WIDTH FROM 1-30 FT >
M220 < CLAIM: TOTAL OF 11 TUNNELS, FROM 10-500 FT LONG, ON PROPERTY; 600 FT OF DRIFTS AND CROSSCUTS >

K5 < WITH GRANO-PORPHYRY AND QUARTZ DIORITE >

N70 < STAIN, AND BY SEVERAL SMALLER PARALLEL QUARTZ VEINS; 5 PRINCIPAL VEINS ON PROPERTY >

N80 < GRADE ORES TEND TO CONCENTRATE WITH BANDS OF QUARTZ IN FISSURE VEINS >
N85 < CHALCOPYRITE AND CHALCOCITE >
D10 < NO RECORDS OF PRODUCTION >

F5 < SIMONS, FRANK S. 1974 GEOLOGIC MAP AND SECTIONS OF THE NOGALES AND LOCHIEL QUADRANGLES, SANTA CRUZ COUNTY, ARIZONA; USGS MAP I-762 (1:48000) >
F6 < SIMONS, FRANK S. 1972, MESOZOIC STRATIGRAPHY OF THE PATAGONIA MOUNTAINS AND ADJOINING AREAS, SANTA CRUZ COUNTY, ARIZONA; USGS PROFESSIONAL PAPER 658-E >
F7 < ABGMT CLIPPINGS FILE, EXPOSED REEF MINE >
F8 < MOORES, RICHARD C., 1972, THE GEOLOGY AND ORE DEPOSITS OF A PORTION OF THE HARSHAW DISTRICT, SANTA CRUZ COUNTY, ARIZONA; M.S. THESIS, UNIVERSITY OF ARIZONA >

Mib#89C

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

RECORD NUMBER B10 < >
*RECORD TYPE B20 < X, 1, M >
DEPOSIT NUMBER B40 < >
REPORT DATE G1 < 8, 2 ✗, 0, 3 > (YR. MO.)
*INFORMATION SOURCE B30 < 1, 2 >
*FILE LINK IDENT. B50 < USBM-004023 0187 >

REPORTER (SUPERVISOR) G2 < CALDER SUSAN R. > (last, first, middle initial) ( ) (last, first, middle initial)
REPORTER AFFILIATION G5 < ABGMT >
*SITE NAME A10 < EXPOSED REEF MINES >
SYNONYMS A11 < BLUE EAGLE AND EXPOSED REEF GROUP; SAINT LOUIS MINE >

LOCATION

*MINING DISTRICT/AREA A30 < HARSHAW DISTRICT >
*COUNTY A60 < SANTA CRUZ >
*STATE A50 < A, Z >
*COUNTRY A40 < U, S >
*PHYSIOGRAPHIC PROV A63 < 1, 2 ✗ >
*DRAINAGE AREA A62 < 1, 5, 0, 5, 0, 3, 0, 1 ✗, LOWER COLORADO >
*LAND STATUS A64 < 4, 1, ✗, ✗, (1, 9, 7, 9) >
*QUADRANGLE NAME A90 < LOCHIEL (1, 9, 5, 8) >
*QUADRANGLE SCALE A100 < 6, 2, 5, 0, 0 >
SECOND QUAD NAME A92 < HARSHAW (1, 9, 4, 8) >
SECOND QUAD SCALE A91 < 2, 4, 0, 0, 0 >
*ELEVATION A107 < 4, 3, 5, 0 ✗, F, T >

UTM
*NORTHING A120 < 3, 4, 8, 4, 2, 5, 5 >
*EASTING A130 < 5, 2, 3, 9, 4, 0 >
*ZONE NUMBER A110 < +, 1, 2 >

*ACCURACY
ACCURATE ACC (circle)
ESTIMATED EST < >

GEODETIC
*LATITUDE A70 < 3, 1, -, 2, 9, -, 4, 0, N >
*LONGITUDE A80 < 1, 1, 0, -, 4, 4, -, 5, 3, W >

CADASTRAL
*TOWNSHIP(S) A77 < 0, 2, 2, S ✗ >
*RANGE(S) A78 < 0, 1, 6, E ✗ >
*SECTION(S) A79 < 30 ✗ >
*SECTION FRACTION(S) A76 < SW OF NE >
*MERIDIAN(S) A81 < GILA AND SALT RIVER >

*POSITION FROM NEAREST PROMINENT LOCALITY A82 < 4 MILES SOUTH OF PATAGONIA, BETWEEN FLUX AND ANDES MINE GROUPS >
*LOCATION COMMENTS A83 < LOCATED ON NE SIDE OF ALUM GULCH; BLUE EAGLE GROUP LOCATED 1/2 MILE TO SW, ON SOUTH SIDE OF ALUM GULCH >

* ESSENTIAL INFORMATION
+ ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

*COMMODITIES PRESENT C10 <Cu, Ag, Pb, Zn, Fe, Au>
*ORE MINERALS C30 < PYRITE; CHALCOPYRITE; BORNITE; CHALCOCITE; TETRAHEDRITE; CUPRITE; GALENA;
COMMODITY SUBTYPES C41 <
*GEN. ANALYTICAL DATA C43 < ASSAY VALUES AVERAGED 15% Cu, 15 OZ./TON Ag, $2.00/TON Au
COM. INFO. COMMENTS C50 < ORES OF EXPOSED REEF AND BLUE EAGLE GROUPS ARE PRIMARILY ARGENTIFEROUS COPPERS WITH

SIGNIFICANCE

PRODUCER		NON-PRODUCER	
MAJOR PRODUCTS	MAJOR <Cu, Ag>	MAIN COMMODITIES PRESENT	C11 <
MINOR PRODUCTS	MINOR <Pb, Zn, Au>	MINOR COMMODITIES PRESENT	C12 <
POTENTIAL PRODUCTS	POTEN <		
OCCURRENCES	OCCUR <Fe>	OCCURRENCES	OCCUR <

*PRODUCTION

PRODUCER	NON-PRODUCER
PRODUCTION (YES) (circle) PRODUCTION SIZE (SML) MED LGE (circle one)	PRODUCTION UND NO (circle one)

EXPLORATION OR DEVELOPMENT

*STATUS

PRODUCER	NON-PRODUCER
STATUS AND ACTIVITY A20 <H>	STATUS AND ACTIVITY A20 < >

*DISCOVERER L20 <
*YEAR OF DISCOVERY L10 < LATE 1800'S> *NATURE OF DISCOVERY L30 < > *YEAR OF FIRST PRODUCTION L40 < > *YEAR OF LAST PRODUCTION L45 <
*PRESENT/LAST OWNER A12 < ALBERT DE SAULLES, HELEN AND DORIS SIBOLD (1953-?)
*PRESENT/LAST OPERATOR A13 <
EXPL./DEV.COMMENTS L110 < EXPOSED REEF AND BLUE EAGLE PROPERTIES COMPRISE 22 LODE CLAIMS TOTALLING 440 ACRES AND INCLUDING CLAIMS OF BORDER PATROL, LIME BANK NO.1-5, MONNA MARIA, MILL SITE,

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40 < DISSEMINATIONS; VEINS/SHEAR ZONE; CONTACT METASOMATIC
DEPOSIT FORM/SHAPE M10 < IRREGULAR; TABULAR
*DEPTH TO TOP M20 < > *UNITS M21 < > *MAXIMUM LENGTH M40 < 3000 > *UNITS M41 < FT
*DEPTH TO BOTTOM M30 < > *UNITS M31 < > *MAXIMUM WIDTH M50 < 30 > *UNITS M51 < FT
*DEPOSIT SIZE M15 <(SMALL)> M15 <MEDIUM> M15 <LARGE> (circle one) *MAXIMUM THICKNESS M60 < > *UNITS M61 <
*STRIKE M70 < W AND NW > *DIP M80 < NEARLY VERTICAL >
*DIRECTION OF PLUNGE M100 < > *PLUNGE M90 < >
*DEP. DESC. COMMENTS M110 < NUMEROUS VEINS ON PROPERTY CONTAINING LOW-GRADE SULFIDE ORES; MAIN VEIN TRENDS NNW-SE ACROSS SEVERAL CLAIMS; VEINS GENERALLY HAVE VERY WIDE MINERALIZED OUTCROP COPPER ORE

DESCRIPTION OF WORKINGS

Workings are: SURFACE M120 UNDERGROUND (M130) BOTH M140 (circle one) *OVERALL LENGTH M190 < > *UNITS M191 <
*DEPTH BELOW SURFACE M160 < 312 > *UNITS M161 < FT > *OVERALL WIDTH M200 < > *UNITS M201 <
*LENGTH OF WORKINGS M170 < > *UNITS M171 < > *OVERALL AREA M210 < > *UNITS M211 <
DESC. OF WORK. COM. M220 < DEVELOPMENTS INCLUDED 312-FT DEEP EXPOSED REEF SHAFT; 36-FT LONG TUNNEL AND OPEN-CUT ON SAINT LOUIS CLAIM; 500 FT EXPOSED REEF TUNNEL THAT CUTS 3 VEINS; NUMEROUS WINZES AND RAISES EXTENDING FROM SHAFTS AND TUNNELS; 300-FT TUNNEL AND 112-FT SHAFT ON RED FOX NO.1

GEOLOGY

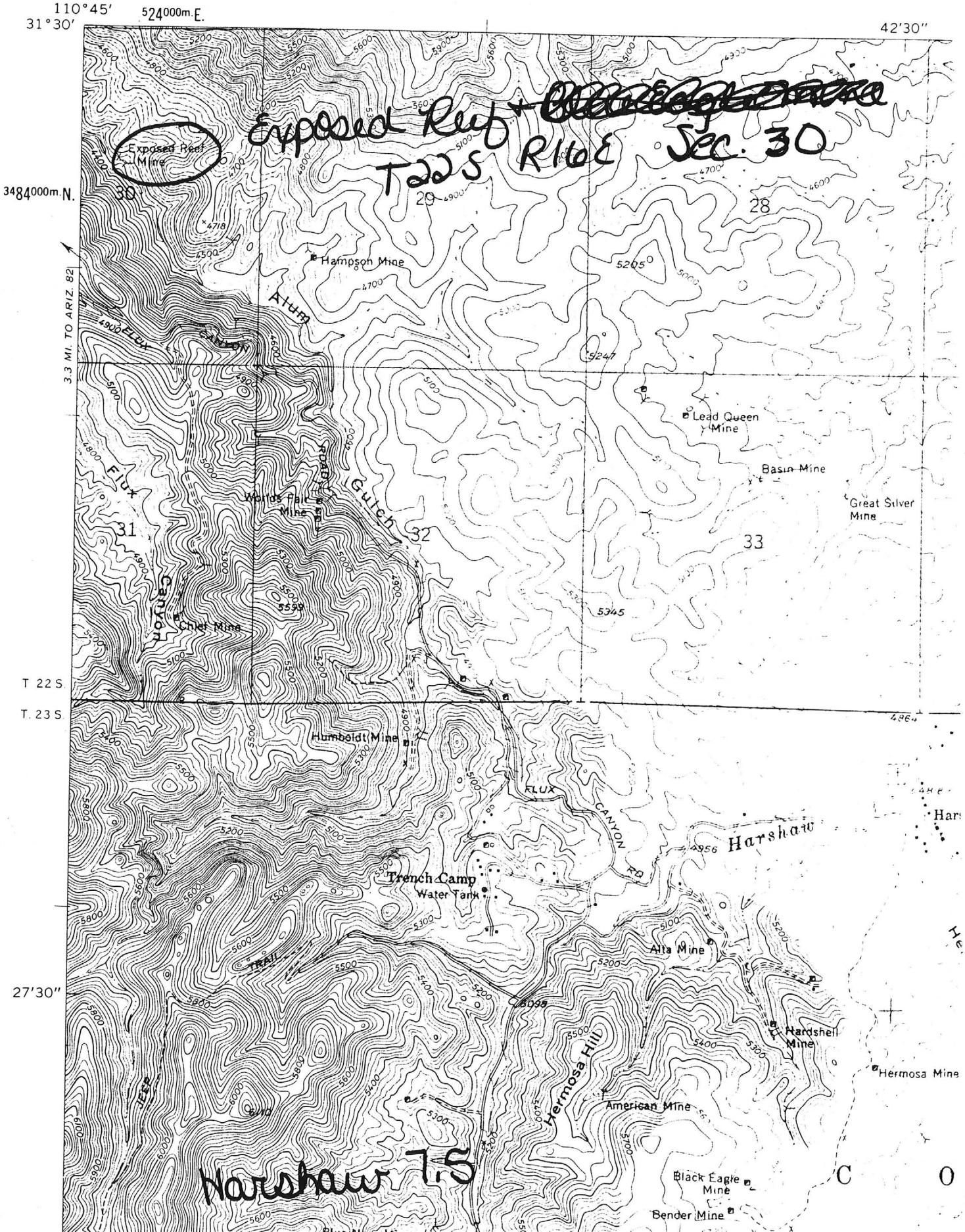
*AGE OF HOST ROCK(S) K1 < L.C.R.E.T.
*HOST ROCK TYPE(S) K1A < COARSE RHYOLITE PORPHYRY, INTRUSIVE DIKES, AND OVERFLOWS
*AGE OF IGNEOUS ROCK(S) K2 < L.C.R.E.T.
*IGNEOUS ROCK TYPE(S) K2A < GRANO-PORPHYRY AND QUARTZ DIORITE; PORPHYRITIC TRACHYANDESITE
*AGE OF MINERALIZATION K3 < L.C.R.E.T.-T.E.R.T.
*PERT. MINERALS (NOT ORE) K4 < HEMATITE; BANDED IRON FORMATION DIKES
*ORE CONTROL/LOCUS K5 < ORES OCCUR PRINCIPALLY IN VEINS, FISSURES, AND CONTACTS IN RHYOLITE AND CONTACTS
*MAJ. REG. TRENDS/STRUCT. N5 < GENERAL STRUCTURE COMMON TO REGIONAL FORMATIONS IS A SHEETING WHICH DIPS 40 NNW
*TECTONIC SETTING N15 < ALUM GULCH FAULT BLOCK
*SIGNIFICANT LOCAL STRUCT. N70 < MAIN VEIN PARALLELED BY BANDED IRON FORMATION-HEMATITE DIKE SHOWING SOME COPPER
*SIGNIFICANT ALTERATION N75 < EXTENSIVE SURFACE OXIDATION
*PROCESS OF CONC./ENRICH. N80 < SECONDARY ENRICHMENT ALONG FAULT FISSURES AND REPLACEMENT OF WALL ROCK; HIGH-
*FORMATION AGE N30 <
*FORMATION NAME N30A <
SECOND FM AGE N35 <
SECOND FM NAME N35A <
*IGNEOUS UNIT AGE N50 < T.R.I.
*IGNEOUS UNIT NAME N50A < MT WRIGHTSON FORMATION
SECOND IG. UNIT AGE N55 < L.C.R.E.T.
COND IG. UNIT NAME N55A < JOSEPHINE CANYON DIORITE
GEOLOGY COMMENTS N85 < CLAIMS LOCATED ON LARGE BELT OF COARSE RHYOLITE PORPHYRY THAT INCLUDES NEARLY ALL OF RED MOUNTAIN; PORPHYRY BELT IS PROFUSELY IMPREGNATED WITH CRYSTALS AND GRAINS OF PYRITE,

GENERAL COMMENTS

GENERAL COMMENTS GEN < SEE ALSO: BLUE EAGLE MINE, INVINCIBLE PROSPECT

WRIGHTSON)
1:62 500

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



ME-16

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
MINE OWNER'S REPORT

Date March 28, 1941

Mine Exposed Reef & Blue Eagle

Location - 5 miles southeast of Patagonia, Arizona.

Mining District & County - Harshaw District
Santa Cruz Co.

Former Name

Owner - Albert Des Saulles

Address - Box 175
Anthony, New Mexico

Operator - none

Address

President, Owning Co.

President, Operating Co.

Gen. Mgr.

Principal Minerals - Copper, Silver, Gold

Mine Supt.

Production Rate

Mill Supt.

Mill: Type & Cap.

Men Employed

Power: Amt. & Type

Operations: Present - None

EXPOSED REEF & BLUE EAGLE

Cu, Ag, Au

Operations: Planned

Santa Cruz 12 - 1 T 22 S, R 16 E

Albert Des Saulles, Box 175, Anthony, N. Mex. '41

Number Claims, Title, etc. - 14 claims forming a compact body or paralleogram. Red Fox 1, 2, 3, 4; Steam Shovel, Cowboy, St. Patrick, Log Cabin, North Star, Old Boy Rogers, Exposed Reef, Blue Eagle 1, 2. There are no disputes as to titles and the assessment work has been done and recorded.

Description: Topography & Geography

Mine Workings: Amt. & Condition - 500 ft. tunnel and 312 ft. shaft. The tunnel cuts three veins, lower, middle, and upper vein. Low-grade sulphides that average 1½ % copper and 4 oz. silver. Higher grade ore in the 40 ft. winze 8% copper, 27 oz. silver. $2 gold per ton. The last work done 3½ ft. ore of argentiferous copper was encountered 15% copper, 15 oz. silver and $2 gold. The shaft is now filled with water. The Blue Eagle shipped 5 carloads averaging 10% copper, 12 oz. silver and $2 gold per ton. Ore could be shipped again at very nominal cost.

Geology & Mineralization - The rhyolites, granite porphyrys and the quartz diorites are the most important rock factors in connection or formation of ore bodies of commercial value.
Rhyolite is the most extensive formation. It occurs in the north and south body some two miles wide and extending across the north central part of the district and includes nearly all of Red Mountain. Hereabouts is a large belt of coarse porphyry profusely crystals and grains over which a number of small prospects are located.

Ore: Positive & Probable, Ore Dumps, Tailings

Dimensions and Value of Ore body

Mine, Mill Equipment & Flow-Sheet

Road Conditions, Route

Water Supply

Brief History

Special Problems, Reports Filed - Report attached, March 29, 1941.

Remarks

If property for sale: Price, terms and address to negotiate

SIGNED - _____

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
MINE OWNER'S REPORT

APR 2 1941
PRESCOTT, ARIZONA

Date March 28,1941

1. Mine Exposed Reef & Blue Eagle
2. Location Five miles southeast of Patagonia, Arizona.
3. Mining District & County Harshaw Mining District
4. Former name
5. Owner Albert Des Saulles
6. Address (Owner) Box 175 Anthony,New mex.
7. Operator none
8. Address (Operator) none
9. President, Owning Co. none
9A. President, Operating Co. none
10. Gen. Mgr. none
14. Principal Minerals ~~Gold~~ Copper Silver
11. Mine Supt. none
15. Production Rate none
12. Mill Supt. none
16. Mill: Type & Cap. none
13. Men Employed none
17. Power: Amt. & Type none
18. Operations: Present none
19. Operations: Planned

20. Number Claims, Title, etc.
Fourteen Claims forming a compact body or paralleogram.
ed Fox 1,2,3,4, Steam Shovel, Cow Boy, St Patrick, Log Cabin, North Star,
ld Boy Rogers, Exposed Reef, Blue Eagle 1,2.
There are no disputes as to titles and the assessment work has been done
nd recorded.

21. Description: Topography & Geography The rhyolites, granite porphrus and the
uartz diorites are the most important rock factors in connection or formation
f ore bodies of commercial value.
Rhyolite is the most extensive formation. It occurs in the north and
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2.000 gold per ton. The last work done 3-1/2ft. ore of argentiferous copper
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(over)

2.00 dollar
2.00 gold per ton. Ore could be

. Geology & Mineralization

. Ore: Positive & Probable, Ore Dumps, Tailings

A. Dimensions and Value of Ore body

. Mine, Mill Equipment & Flow-Sheet

). Road Conditions, Route

'. Water Supply

3. Brief History

). Special Problems, Reports Filed

). Remarks

1. If property for sale: Price, terms and address to negotiate.

32. Signature.....

3. Use additional sheets if necessary.

COPY

PRELIMINARY EXAMINATION
EXPOSED REEF PROPERTY, SANTA CRUZ COUNTY, ARIZONA

LOCATION - This property consists of 14 unpatented mining claims. Title is possessory. There are no disputes as to titles and the assessment work has been properly done and recorded.

The property is located on either side of Alumn Gulch and is 3 miles from Patagonia, Arizona the nearest railroad and supply point. There has been a road direct to the property,but last summers rains washed out a part of this.

HISTORY - The property is owned by Albert Des Saulles.
Some ore has been shipped from this property but the exact tonnage is not known to the writer, This ore was a copper-silver ore with some lead, all as sulphides.

The property has been bonded several times to parties who have done considerable development work. However, none of this work has been conclusive. Encountering some water and financial troubles were the cause of shut-downs.

The adjoining properties are:

The Andes; the Blue Eagle; The Flux Mine; The World Fair, all of which have bee producers, and two of which have shipped more than one million dollars worth of high grade ore. The Henry Ford, California and Jefferson Properties lie closely contiguous and have shipped small tonnages.

DEVELOPMENT - There is a 312 ft. vertical, one and one-half, compartment shaft with a level at the 300 ft. elevation from which about 600 ft. of drifts and crosscuts were driven. The vein was of the fault-fissure type in rhyolite porphyry and parallels a large diorite intrusion. Considerable brecciation and fault gouge was encountered with the workings. Narrow bands of quartz contained considerable mineralization; occasional specimens of very high grade copper ores with argentite are encountered. The vein ranges in width from three to 27 ft. No systematic sampling has ever been done. Some exposures will assay less than 1% copper and 2 oz. silver while other exposures will assay from 3 to 10 per cent in copper. No exposures of commercial ores are exposed or blocked out in this working.

There is also a tunnel driven into Red Mountain for 190 ft. which is said to have encounter a very good showing. The writer has never seen this work but the surface indications are good for additional work on this tunnel. It is now partly caved and no inspection of same can be made.

GEOLOGY - The geology of this area has been preliminarily edited by F. C. Schrader in U. S. G. Bulletin No. 582. No geological examination of this property has been made. It can be said tha the mineralization is largely confined to a wide fault-fissure vein attended by considerable brecciation and mineralization is largely pyrite with some copper minerals showing. Mineralization apparently attended the diorite intrusion. Ores are primary.

CONCLUSIONS - This property can be classified as a well situated property. It is an attractive prospect. The development of this property is entirely speculative but should ore bodies be found they should beof considerable tonnage.

Respectfully submitted,

(Signed) C. A. Pierce
Mining Engineer
Certificate 182.

C O P Y

C O P Y

PRELIMINARY EXAMINATION

EXPOSED REEF PROPERTY, SANTA CRUZ COUNTY, ARIZONA

LOCATION.

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Exposed Reef No. 2.

No exposures of commercial ores are exposed or blocked out in this working.

There is also a tunner driven into Red Mountain for 190 feet which is said to have encountered a very good showing. The writer has never seen this work but the surface indications are good for additional work on this tunnel. It is now partly caved and no inspection of same can be made.

GEOLOGY.

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Ores are primary.

CONCLUSIONS.

This property can be classified as a well situated property. It is an attractive prospect. The development of this property is entirely speculative but should ore bodies be found they should be of considerable tonnage.

Respectfully submitted,

C. A. PIERCE (signed)

Mining Engineer.
Certificate 182

P. O. Box 175
Anthony, New Mexico
August 23, 1940

Mr. J. S. Coupal, Director
Department of Mineral Resources
Capitol Building
Phoenix, Arizona

Dear Mr. Coupal:

In reply to your letter of August 16, I am enclosing your report together with an Engineer's report on the Exposed Reef Mine, located near Patagonia, Arizona.

Very sincerely yours,

Albert Des Saulles

Albert Des Saulles

3 September 1940

Mr. Albert Des Saulles,
P. O. Box 175,
Anthony, New Mexico.

My dear Mr. Des Saulles:

In the absence of Mr. J. S.Coupal, I am taking the liberty of acknowledging receipt of your letter of August 23, in which you enclosed description of the EXPOSED REEF MINE, located near Patagonia.

Within a short time this information will be copied into a mine owners report, and a copy of this report forwarded to you for your files.

Yours very truly,

Jess R. Fickas
Secretary to Mr. Coupal

jrf

DEPT. MINERAL RESOURCES
RECEIVED
APR 2 1941
PHOENIX, ARIZONA

March 29, 1941

Mr. J. S. Coupal, Director
Department of Mineral Resources
Capitol Building
Phoenix, Arizona

Re: Mining Property Located Near Patagonia, Ariz., Submitted for "Class C" Loan.

Dear Mr. Coupal:

Attached herewith is a mining report on the mining claims which I own near Patagonia, Arizona, and which I would appreciate you having listed and submitted to persons requesting mining property.

Although I have previously sent you two other engineer's reports on this same property, I have not as yet received your acknowledgment of receipt of them.

Will you kindly list this property as potential property for qualifying for "Class C" Loans in regard to the article appearing in Pay Dirt of March 24, 1941.

Thanking you for your attention to this matter, I am,

Very sincerely yours,

Albert Des Saulles
Box 175
Anthony, New Mexico

Albert Des Saulles

7 April 1941

Mr. Albert Des Saulles,
Box 175,
Anthony, New Mexico.

My dear Mr. Des Saulles:

I thank you for your letter of March 29 enclosing Mine Owners Report on the EXPOSED REEF & BLUE EAGLE MINE in the Harshaw Mining District, together with a copy of a report on these claims.

I note that you give the principal minerals as GOLD, COPPER, SILVER - which would place the main metal as GOLD.

In a former report which you sent to this office, and which was listed in our last LIST OF MINES, the principal minerals were shown as COPPER, SILVER with some lead - and this would place the property as a COPPER mine, and it is so listed under COPPER MINES.

Will you please advise me what the principal mineral is so that I make correct our records accordingly.

Within a short time a copy of this last report will be mailed to you.

Assuring you of my desire to be helpful, and with best wishes, I am

Yours very truly,

J. S. Coupal
Director

JSC-jrf

P.S. The first report showed the name of the mine as EXPOSED REEF MINE and the new report shows it as EXPOSED REEF & BLUE EAGLE. Please advise me how you wish it listed.

J.S.C.

Report on Exposed Reef and
Blue Eagle Group of Claims

PROPERTY

This property consists of Fourteen unpatented mining claims. Title is possessory. There are no disputes as to titles and assessment work has been properly done and recorded.

The Exposed Reef Group join one another, forming a compact body or parallelogram. They are named as follows: Red Fox 1, 2, 3, 4, Cowboy, St. Patricks, Log Cabin, North Star, Old Boy Rogers Exposed Reef, and Blue Eagle 1, and 2.

None of these are patented, but the titles are clear and good for the reason the location work has been performed on each one of them and the annual assessment complied with up to date.

LOCATION

These mines are all situated in the Harshaw District, Santa Cruz County, Arizona, and five miles southeast from the town of Patagonia, which is located on the railroad from Nogales to Benson and is 22 miles northeast of the town of Nogales, Ariz. A loading station, or platform, however, three miles distant from the Exposed Reef Shaft, down Alum and Flux Gulch as by wagon road. The main group lies between the famous Flux Mines on the southwest and the big Andes Group on the northeast, while the rich and celebrated World's Fair Mine is nar the southeast corner of the Red Fox Group.

GEOLOGY AND MINERALOGY

The principal rock of the district is paleozoic limestones, quartz diorite, granit porphry, phyolite and andeste, although some places syenite sandstone, quartzite, schist and shales are encountered. The rhyolite, granite porphus and the quartz diorites however, seem to be the most important rock factors in connection with the deposition or formation of ore bodies of commercial value.

Rhyolite is the most extnesive formation. It occurs in a north and south body some two miles wide and extending across the north central part of the district and includes nearly all of Red Mountain, which lies to the northeast of and close to the Exposed Reef and Andes Mine Group. Hearabouts is a large belt of coarse porphry profusely impregnated with pyrite, chalcopyrite and chalcocite diseminated in crystals and grains over which a number of promising prospects are located but with small development as yet. Oxidization color themontain red, hence itsname. The rhyolite, apparently of tertiary age, occurs in intrusive dikes and overflows.

The quartz diorite belongs with the group of mesozoic intrusive rocks and is shown in a belt three quarters of a mile wide by three miles long from a point one mile southeast of Harshaw over into Alum Gulch and the World's Fair Mine, and shown in several places highly mineralized outcrops of copper ores on a contact rhyclite.

Granite porphry occurs about one half mile wide along the western border of the district. It is also of Mesozoic time andseems here to underlie the rhyolite. In the western part it is of much larger acre, and in the Palmetto District on the west, is more abundant. Also, on contacts with rhyolite shows mineralized outcrops.

Andesite is the nxt most abundant rock to rhyolite and occurs in flows and tuffs overlying the rhyolite and other older rocks.

The commercial minerals of the district are principally comprised in argentiferous copper andlead ores, most of them carrying gold values generally associated with considerable iron and sometimes with a little zinc. The ores of Exposed Reef, Red Fox and Blue Eagle Groups, for instance, are predominantly argentiferous coppers with some gold and a strong iron content, mostly sulphides, though a little lead is sometimes encountered. Some other mines in the neighborhood have been large producers of both lead and copper ores, with high silver values and sometimes quite rich in gold. The Flux, Hardshell, Old Trench and Mowry are among the principal lead-silver mines of the district, and they also are amont those yielding copper. The Worlds Fair produces both high grade argentiferous lead and copper ores, often quite rich in gold. Several others among the forty or more mines and prospects of the district produce both lead and copper, but taken altogether, copper-silver is the predominating commercial mineral. In some of these mines, which have been developed to from 300 to 500 feet deep and are still in ore, silver is the principal metal of value, ocurring most frequently as argentite, but sometimes as antimonial silver, chlorides, native and associated with copper ores, bornite, chalcopyrite, tetrahedrite and chalcocite. But to repeat, the argentiferous ores are the most abundant and important in the district, and though the very large bodyes therefore are, while commercial, commonly considered low grade. Other quite sizeable are bodies are encountered of high grade value at considerable depths, as, the large body of ore foundin the Worlds Fair Mine below the water level that ran 20% copper 500 ounces silver and $15.00 gold, to the ton. Also in the Exposed Reef Mine shaft, ore not that rich, but still of good pay value, running 15% copper 15 ounces silver and $2.00 gold per ton was encountered, with a minimum of 3-½' in a ledge 30 ft. wide containing milling several feet wide at the shaft bottom 312 feet deep and under water. The copper showed as chalcopyrite, bornite and chalcocite, the silver and gold occurring in combination with the copper.

The aforementioned ores occur principally in veins, fissures and contacts in the rhyolite and contacts with grano-porphry andquartz diorite. Through erosion, the mineralized outcrops have been exposed on the sides of the canyons, and lower hills and deep drainage ways, and although the veins generally show increased width with depth, andin many cases, are only a few feet wide on the surface, some of them, like these in the Exposed Reef and Red Fox Groups have a very wide mineralized outceop copper ore bodies that increased in both size and value as their development workings attained greater depth.

DEVELOPMENT

The principal mine workings on the Exposed Reef Group have been done on the Saint Louis and Exposed Reef lode claims. An open-cut and tunnel have been driven 36 feet long on a 4½ to 30 ft. wide on surfact quartz vein

that occurs with several smaller parallel quartz veins in a big rhyolite dike, on the Saint Louis Mine, near the east bank of Alum Gulch and the northwest end of the Exposed Reef Group (see map). Here nice looking copper ore was encountered, sulphides and carbonates all along the vein to the face of the tunnel, that assayed from 2% to 5% copper, 6 ozs. silver and $1.00 in gold. The larger vein outcrops at intervals for over 3000 ft. lengthwise, through the Saint Louis and diagonally across United Verde Nos. 2, 4, and3, with a tunnel back several hunred feet high. The smaller parellel quartz veins also show mineral outcrops.

The main workings on the Exposed Reef lode mine claims are a 500 foot tunnel and a 312 foot shaft. The tunnel cuts three veins, each known as the lower, middle and upper vein. The lower vein was encountered a short distance in from the mouth of the tunnel andshows thirty foot wide of low grade copper sulphides that averages about 1½% copper and 4 ozs. silver. Higher grade ore was encountered in the 40 feet winze that was sunk from the bottom of the drift on the vein from the main tunnel to the southeast that assayed 8% copper, 27ozs. silver and $2.00 gold per ton. The middle vein was cut 250 feet in and drifted on until connected with the shaft on same, 112 feet deep from the surface. This shaft was continued on down 200 feet more below the tunnel level, thus developing thevein in ore to a depth of 312 feet. When the last work was done, a min. of 3½ ft. ore of argentiferous copper ore per ton. Work was then suspended there perforce, as the last round of shots encountered a rush of water that drove the miners out and was too much to be handled by the limited pumping and bailing capacity of the sinking pump and small hoist on the shaft. However, the shaft showed fairly good ore all the way down and as already stated, commercial shipping ore in the bottom. A cross-cut on the middle vein 12 feet long, made at a point in the drift thereon, thirty feet to the east and a little northwest of the shaft exposed 12 feet of ore that assayed 3% copper and 7 ozs. silver. The upper vein was cut 5 ft. wide and 500 feet in from the tunnel mouth, showing at that point strong iron action, but very little copper. However, this vein shows better mineral values at other pointson the property where it has been partially developed. Its outcrop can be traced from the northwest corner of the Saint Louis Mine onto snd across the Old Roger Boy, Exposed Reef and Log Cabin Claim Mine into the Esther claim, where it makes a junction with the middle vein forming thence whatis called the main vein, that trends on to the southeast through the Cow Boy, Red Fox Nos. 1 & 6. The middle vein also conjuncts withthe lower vein, near the northwest end of Old Roger Boy Mine. The lower vein runs throughout both the Exposed Reef and Red Fox Groups. Commencing at the northwest end of Old Roger Boy claim and extending thence on through into and across the Exposed Reef, Log Cabin, Steam Shovel, and Red Fox Nos. 1, 5, and 7. All three of these veins are described can be readily traced through from one end of the two groups to the other, and more particularly in the territory lying between them, the geological conditions are very favorable for encountering in depth an immense body of disseminated copper ores, aside from those contained in the vein proper. The big hematite dike, showing some copper stain, that ceops out boldly higher up the mountain across its face and almost parallel in course with the trend of the vein, is also a most favorable factor to be considered in this relation. (see map).

The 300 foot tunnel and 112 foot shaft on the Red Fox No. 1, constitute the main development work on the Red Fox Group. A tunnel is driven on the middle or main vein of the Exposed Reef group and shows ore constantly from near the tunnel mouth to the face. The shaft cuts the vein in the tunnel sixty-six feet from the mouth, 60 feet deep and shows all in ore down to the bottom. Some cuprite andnative copper occur in the shaft along with copper sulphides, which contains generally here 3% copper, 5 ozs. silver and one oz. gold per ton. A cross-cut was made on the vein 40 feet long, 27 feet further in or 93 feet from the tunnel face, the ore from which gave an average of 2% copper, 5 ozs. silver and $1.00 gold. The same class of ore continues on in to the tunnel face. Numerous shallow shafts, open-cuts and small winzes have been sunk and worked on the different claims, demonstrating the diversified mineralization of the properties.

Old Blue Eagle Group, that lies just across the Alum Gulch from the Old Boy Roger Mine to the west, has its principal development workings on the Hillside Copper Mine, near the gulch. These comprise a 240 foot tunnel on the main vein and a 20 foot cross-cut to a smaller vein, 20 feet to a raise and 50 foot winze on the main vein.

The main vein shows 2-½ feet wide in the tunnel and winze. Five cars of ore have been shipped from the mine, averaging 10% copper, 12 ozs. silver and $2.00 gold per ton. As the dump lies on the edge of Alum Gulch, most of the milling grade of ore has been washed down the arroyo by the annual freshets, flowing down the canyon each rainy season. However, the vein runs on westardly through the two adjoining claims of the Creston and Kataga where large iron outcrops and the junction with smaller veins should tend to considerably increase the size of the ore bodies, when these sections of the properties become developed. Some black oxide of copper is also found in the tunnel and winze which assay 20% or more.

IMPROVEMENTS

The Exposed Reef Shaft is timbered and equipped with a good gallow frame, a six HP Fairbanks-Morse gasoline engine, one 20HP Hot Head engine to drive the compressor, one two drill air compressor, one No. 5 Cameron sinking pump, with air andwater pipe lines, one air receiver, one swedging tool, one drill press, one blacksmith tool sharpening outfit, one 80 lb. anvil, three buckets and cable for hoist, etc. The tunnel and dump have 600 feet of rail track and two cars, one cook house and several bunk houses are tributary to the shaft. (during the past few several years much of this equipment has been stolen off the property as a watchman was not maintained during the depression.)

HISTORY

These mines have been owned for years by practical, experienced intelligent, hard-working miners, who had only their labor and mining ability for working capital, which explains why more work has not been done on them, and the fine ore showings in the several different places already described, more rapidly developed. For instance, when the water drove them out of the Exposed Reef Shaft, where they had encountered a paying body of good grade shipping ore, they did not have the necessary funds to purchase andinstal a pumping plant to handle the water properly. In other places, where large tonnages of good millingore have been demonstrated, they are likewise without the capital to put in and operate a con-

centrating and leaching plant. Realizing the value of their property, they manage by concentrating their labor for annual assessment work, in the most favorable places, to develop more ore year by year, at the same time maintaining a legal title to the properties until they may be enabled through mutual work and savings to accumulate sufficient capital to operate more successfully on a commercial or paying basis.

Copy of Report .F. Johnston

Report on the Exposed Reef and the Old Blue Eagle Group of Claims

PROPERTY.

There are twenty-two practically full-sized lode mine claims comprised in the group, containing a total of 440 acres. The Exposed Reef Group is the largest.

The twenty-two mining claims of the Exposed Reef and the Blue Eagle Group all join one another, forming a compact body or parallelogram. They are named as follows: Border Patrol, Lime Bank No. 5, Lime Bank No. 4, Lime Bank No. 3, Lime Bank No. 2, Lime Bank, Donna Maria, Mill Site, Reed Tunnel, Iron Bank, Blue Eagle, St. Louis, Blue Eagle No. 1, North Star, Log Cabin, Cow Boy, Powder House, Exposed Reef, Silver Tunnel, Lucky Day, Silver Star, and Invinsible.

None of the claims are patented, but the titles are clear and good for the reason that the location work has been performed on each one of them and the annual assessment work done every year since their location, with every legal requirement complied with up to date.

LOCATION.

These mines are all situated in the Harshaw Mining District, Santa Cruz County, Arizona, and five miles southeast from the town of Patagonia, which is located on the railroad from Nogales to Benson and twenty-two (22) miles northeast of the town of Nogales. A loading station, or platform, however, three miles distant from the Exposed Reef Shaft, down Alum and Flux Gulches, by wagon road, is operative. The main group lies between the famous Flux mines on the southwest and the big Andes Group on the northeast, while the rich and celebrated Worlds Fair Mine is near the southeast.

GEOLOGY AND MINERALOGY.

The principal rock of the district is paleozoic limestone, quartz diorite, granite porphry, rhyolite and andesite, although syenite sandstone, quartzite, schist and shales are encountered in some places. The rhyolites, granite porphrus and the quartz diorites, however, seem to be the most important rock factors in connection with the deposition or formation of ore bodies of commercial value.

Rhyolite is the most extensive formation. It occurs in a

north and south body some two miles wide and extending across the north central part of the district and includes nearly all of Red Mountain, which lies to the northeast of and close to the Exposed Reef and Andes Mine Groups. Hereabouts, is a large belt of coarse porphry profusely impregnanted with pyrite, chalcopyrite disseminated in chrystals and grains over which a number of promising prospects are located. Oxidizations color the mountain red, hence its name. The rhyolite, apparently of tertiary age, occurs both in intrusive dikes and overflows.

The quartz diorite belong with group of mesozoic intrusive rocks and is shown in a belt three quarters of a mile wide by three miles long from a point one mile sougheast of Harshaw over into Alum Canyon and the Worlds Fair Mine, and shows in several places highly mineralized outcrops of copper ores on a contact with rhyolite.

Granite porphry occurs about one half mile wide along the western border of the district. It is also of Mesozoic time and seems here to underlite the rhyolite. In the eastern part it is of much larger acre, and in the Palmetto District on the west, is more abundant. Also on contacts with rhyolite shows mineralized outcrops.

Andesite is the next most abundant rock to rhyolite and occurs in flows and tuffs overlying the rhyolite and other older rocks.

The commercial minerals of the district are principally comprised in argentiferous copper and lead ores, most of them carrying gold values generally associated with considerable iron and sometimes with a little zinc. The ores of Exposed Reef and Blue Eagle Groups, are predominantly argentiferous coppers with some gold and strong iron content, mostly sulphides, though a little lead is sometimes encountered. The argentiferous ores are the most abundant and important in the district, and though the very large bodies therefore are, while commercial, commonly considered low grade. Other quite sizeable ore bodies are encountered of high grade value at considerable depths as that in the Exposed Reef shaft running 15% copper and 15 ounces silver and $2.00 gold per ton encountered with a minimum of 3-1/2' in a ledge 30 ft. wide containing milling ore several feet wide at the shaft bottom 312 feet deep. The copper showed as chalcopyrite, bornite and chalcocite, the silver and gold occurring in combination with the copper.

DEVELOPMENT.

The principal mine workings on the Exposed Reef Group have been done on the Saint Louis and Exposed Reef claims. An open-cut and tunnel have been driven 36 feet long on 4½ to 30 ft. wide on surface quartz vein that occurs with several smaller parallel quartz veins in a big rhyolite dike, on the Saint Louis near the east bank of Alum Gulch and the northwest end of the Exposed Reef Group (see map). Here nice looking copper ore was encountered, sulphides and carbonates all along the vein to the face of the tunnel, that assayed from 2% to 5% copper, 6 ozs. sil-

ver and $1.00 in gold. The larger vein outcrops at intervals for over 3000 feet lengthwise, through the Saint Louis and diagonally acrpss United Verde Nos. 2, 4, and 3, with a tunnel back several hundred feet high. The smaller parallel quartz veins also show mineral outcrops.

The main workings on the Exposed Reef claims are a 500 foot tunnel and a 312 foot shaft. The tunnel cuts three veins, each known as the lower, middle and upper vein. The lower vein was encountered a short distance in from the mouth of the tunnel and shows thirty foot wide of low grade copper sulphides that average about 1-½% copper and 4 ozs. silver. Higher grade ore was encountered in the 40 feet winze that was sunk from the bottom of the drift on the vein from the main tunnel to the south-east that assayed 8% copper, 27 ozs. silver and $2.00 gold per ton. The middle vein was cut 250 feet in and drifted on until connected with the shaft on same, 112 feet deep from the surface. This shaft was continued on down 200 feet more below the tunnel level, thus developing the vein in ore to a depth of 312 feet. When the last work was done, a min. of 3-½ ft. ore of argentiferous copper ore was encountered that assayed 15% copper, 15 ozs. silver and $3.00 gold per ton. They showed fairly good ore all the way down and as already stated, commercial shipping ore in the bottom. A cross-cut on the middle vein 12 feet that assayed 3% copper and 7 ozs. silver. The upper vein was cut 5 ft. wide and 500 feet in from the tunnel mouth, showing at that point strong iron action, but very little copper, this vein shows better mineral value at other points on the property where it has been partially devel ped. Its outcrop can be traced from the northwest corner of the Saint Louis claim onto and across the Old Roger Boy. Exposed Reef and Log Cabin Claim into the Esther claim, where it makes a junction with the middle vein forming thence what is called the main vein, that trends on to the southeast through the Cow Boy. The middle vein also conjuncts with the lower vein, near the northwest end of Old Rodger Boy claim. The lower vein runs throughout both the Exposed Reef groups, commencing at the northwest end of Old Rodger Boy claim and extending thence on through into and across the Exposed Reef, and Log Cabin. All three of these veins described can be readily traced through from one end of the two groups to the other, and mor particularly in the territory lying between them, the geological conditions are very favorable for encountering in depth an immense body of disseminated copper ores, aside from those contained in the vein proper. The bif hematite dike, showing some copper stain, that crops out boldly higher up the mountain across its face and almost parallel in course with the trend of the vein, is also most favorable factor to be considered in this relation.

The Blue Eagle Group, that lies just across the Alum Gulch, from the Old Roy Roger to the west, has its principal development on The Blue Eagle, near the gulch. These comprise a 240 foot tunnel on the main vein and a 20 foot cross-cut to a smaller vein, 20 feet to a raise and 50 foot winze on the main vein.

The main vein shows 2-½ feet wide in the tunnel and winze. Five cars of ore have been shipped from the claim, averaging 10% copper, 12 ozs. silver and $2.00 gold per ton. The vein runs on westardly through the two adjoining claims, where a large iron outcrops and the junction with smaller veins should tend to considerably increase the size of the ore bodies, when these sections of the properties become developed. Some black oxide of copper is also found in the tunnel and winze which assay 20% or more.

* GENERAL REFERENCES

REFERENCE 1 F1 < ABGMT-USBM FILE DATA

REFERENCE 2 F2 < USBM FILES, BLUE EAGLE GROUP

REFERENCE 3 F3 < ABGMT FILES, STANTON B. KEITH

REFERENCE 4 F4 < KEITH, STANTON B, 1975, INDEX OF MINING PROPERTIES IN SANTA CRUZ COUNTY, ARIZONA; ARIZONA BUREAU OF MINES BULLETIN 191, p. 57

K5 < ALONG VEIN >

N5 < TO REGIONAL FORMATIONS IS A SHEETING WHICH DIPS 40NNW >

N70 < GRANITIC APLITE >

N75 < ALTERED TO EPIDOTE TOURMALINE, QUARTZ, SERICITE, KAOLINITE, ALUNITE, AND PYROPHYLLITE; PROPYLITIC ALTERATION >

F5 < MOORES, RICHARD C., 1972 THE GEOLOGY AND ORE DEPOSITS OF A PORTION OF THE HARSHAW DISTRICT, SANTA CRUZ COUNTY, ARIZONA; M.S. THESIS, UNIVERSITY OF ARIZONA >

F6 < SIMONS, FRANK S. 1972 MESOZOIC STRATIGRAPHY OF THE PATAGONIA MOUNTAINS AND ADJOINING AREAS, SANTA CRUZ COUNTY, ARIZONA. USGS PROFESSIONAL PAPER 658-E >

F7 < SIMONS, FRANK S., 1974 GEOLOGIC MAP AND SECTIONS OF THE NOGALES AND LOCHIEL QUADRANGLES, SANTA CRUZ COUNTY, ARIZONA; USGS MAP I-762 (1:48000) >

F8 < SCHRADER, FRANK C., 1915 MINERAL DEPOSITS OF THE SANTA RITA AND PATAGONIA MOUNTAINS, ARIZONA; USGS BULLETIN 582, p. 257-258 >

F9 < ADMR FILE DATA, EXPOSED REEF AND BLUE EAGLE GROUPS >

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

RECORD NUMBER B10 <>

*RECORD TYPE B20 <X, 1, M>

DEPOSIT NUMBER B40 <>

REPORT DATE G1 <8 2 ✗ 0 3> (YR. MO.)

*INFORMATION SOURCE B30 <1 2>

*FILE LINK IDENT. B50 < USBM-004019 0038

*REPORTER(SUPERVISOR) G2 < CALDER, SUSAN R. ( ) > (last, first, middle initial) (last, first, middle initial)

REPORTER AFFILIATION G5 < ABGMT >

*SITE NAME A10 < BLUE EAGLE MINE >

SYNONYMS A11 < BLUE EAGLE AND EXPOSED REEF GROUP; BLUE EAGLE 1 AND 2 CLAIMS; HILLSIDE COPPER MINE >

LOCATION

*MINING DISTRICT/AREA A30 < HARSHAW DISTRICT >

*COUNTY A60 < SANTA CRUZ >

*STATE A50 < A Z >

*COUNTRY A40 < U S >

*PHYSIOGRAPHIC PROV A63 < 1 2 ✗ >

*DRAINAGE AREA A62 < 1 5 0 5 0 3 0 1 ✗ LOWER COLORADO >

*LAND STATUS A64 < 4 1 ✗ ✗ ✗ (1 9 7 9) >

*QUADRANGLE NAME A90 < NOGALES (1 9 5 8) >

*QUADRANGLE SCALE A100 < 6 2 5 0 0 >

SECOND QUAD NAME A92 < LOCHIEL (1 9 5 8) >

SECOND QUAD SCALE A91 < 6 2 5 0 0 >

*ELEVATION A107 < 4 3 7 5 ✗ F T >

UTM

*NORTHING A120 < 3 4 8 4 0 0 0 >

*EASTING A130 < 5 2 3 1 5 0 >

*ZONE NUMBER A110 < + 1 2 >

*ACCURACY

ACCURATE (ACC) (circle)

ESTIMATED EST <>

GEODETIC

*LATITUDE A70 < 3 1 - 2 9 - 3 2 N >

*LONGITUDE A80 < 1 1 0 - 4 5 - 2 2 W >

CADASTRAL

*TOWNSHIP(S) A77 < 0 2 2 5 : ✗ : ✗ : ✗ >

*RANGE(S) A78 < 0 1 6 E : ✗ : ✗ : ✗ >

*SECTION(S) A79 < 30 : ✗ : ✗ : ✗ >

*SECTION FRACTION(S) A76 < SW OF SW OF NW >

*MERIDIAN(S) A81 < GILA AND SALT RIVER >

*POSITION FROM NEAREST PROMINENT LOCALITY A82 < 4 MILES SOUTH OF PATAGONIA; 1/2 MILE NE OF FLUX MINE >

*LOCATION COMMENTS A83 < LOCATED ON SW SIDE OF ALUM GULCH; EXPOSED REEF MINE LOCATED 1/2 MILE TO NE, ON NORTH SIDE OF ALUM GULCH >

* ESSENTIAL INFORMATION

+ ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

COMMODITIES PRESENT C10 <Cu, Au, Zn, Ag, Pb>
ORE MINERALS C30 < BORNITE, PYRITE, CHALCOPYRITE, ARGENTITE, GALENA, SPHALERITE
COMMODITY SUBTYPES C41 <
GEN. ANALYTICAL DATA C43 < EARLY 1900'S ASSAY VALUES AVERAGED 18.5% Cu, 17 OZ/TON AG, $1.50/TON AU
COM. INFO. COMMENTS C50 < SOME OXIDIZED ORES ASSOCIATED WITH SULFIDES AT SURFACE

* SIGNIFICANCE

	PRODUCER	NON-PRODUCER
MAJOR PRODUCTS	MAJOR <Cu>	MAIN COMMODITIES PRESENT C11 <
MINOR PRODUCTS	MINOR <Ag, Pb, Zn, Au>	MINOR COMMODITIES PRESENT C12 <
POTENTIAL PRODUCTS	POTEN <	
OCCURRENCES	OCCUR <	OCCURRENCES OCCUR <

*PRODUCTION

PRODUCER	NON-PRODUCER
PRODUCTION (YES) (circle) PRODUCTION SIZE (SML) MED LGE (circle one)	PRODUCTION UND NO (circle one)

*STATUS

EXPLORATION OR DEVELOPMENT

PRODUCER	NON-PRODUCER
STATUS AND ACTIVITY A20 <H>	STATUS AND ACTIVITY A20 < >

*DISCOVERER L20 < JAMES HALE
*YEAR OF DISCOVERY L10 < 1897 > *NATURE OF DISCOVERY L30 <B> *YEAR OF FIRST PRODUCTION L40 < 1903 > *YEAR OF LAST PRODUCTION L45 < 1956
*PRESENT/LAST OWNER A12 <
*PRESENT/LAST OPERATOR A13 <
EXPL./DEV.COMMENTS L110 < OWNERS AND OPERATORS INCLUDED JAMES HALE (1901-1915?), A.M. EWING, SOTO; PRODUCED SPORADICALLY IN THE EARLY 1900'S AND IN 1956 LOU STEVENS, MARSHALL McDONNELL, E.A. SHAW,

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40 < VEIN / SHEAR ZONE
DEPOSIT FORM/SHAPE M10 < TABULAR; IRREGULAR
*DEPTH TO TOP M20 < > *UNITS M21 < > *MAXIMUM LENGTH M40 < > *UNITS M41 <
DEPTH TO BOTTOM M30 < > *UNITS M31 < > *MAXIMUM WIDTH M50 < 2.5 > *UNITS M51 < FT
*DEPOSIT SIZE M15 (SMALL) M15 <MEDIUM> M15 <LARGE> (circle one) *MAXIMUM THICKNESS M60 < > *UNITS M61 <
*STRIKE M70 < E-W > *DIP M80 < 90 >
*DIRECTION OF PLUNGE M100 < > *PLUNGE M90 <
P. DESC. COMMENTS M110 < MAIN VEIN AVERAGES 2.5 FT IN WIDTH; ASSOCIATED 8-FT WIDE VEIN CARRIES RICH BLACK COPPER ORE

DESCRIPTION OF WORKINGS

Workings are: SURFACE M120 UNDERGROUND (M130) BOTH M140 (circle one) *OVERALL LENGTH M190 < > *UNITS M191 <
*DEPTH BELOW SURFACE M160 < 240 > *UNITS M161 < FT > *OVERALL WIDTH M200 < > *UNITS M201 <
*LENGTH OF WORKINGS M170 < > *UNITS M171 < > *OVERALL AREA M210 < > *UNITS M211 <
DESC. OF WORK.*COM. M220 < DEVELOPMENTS INCLUDED 240-FT TUNNEL ON VEIN, 50-FT WINZE, 40 FT OF RAISES AND CROSSCUTS; MAIN WORKINGS IN THE HILLSIDE COPPER MINE AND BLUE EAGLE NO. 2 CLAIM

GEOLOGY

*AGE OF HOST ROCK(S) K1 < J.R.I.-J.U.R.
*HOST ROCK TYPE(S) K1A < RHYOLITE PORPHYRY AND RELATED VOLCANIC SEDIMENTARY DEPOSITS
*AGE OF IGNEOUS ROCK(S) K2 < J.R.I.
*IGNEOUS ROCK TYPE(S) K2A < RHYOLITIC TO LATITIC LAVA AND TUFF WITH SOME TUFFACEOUS SANDSTONE OR GRIT
*AGE OF MINERALIZATION K3 < L.CR.E.T.-T.E.R.T.
*PERT. MINERALS (NOT ORE) K4 < QUARTZ GANGUE. VEIN CROPPINGS ARE COATED WITH ALUM AND SULPHUR
*ORE CONTROL/LOCUS K5 < E-TRENDING, VERTICAL, WELL-BANDED QUARTZ VEIN; ORE FORMS FEATHERY BRANCHES
*MAJ. REG. TRENDS/STRUCT. N5 < NW-TRENDING HARSH'AW CREEK FAULT (N30W); GENERAL STRUCTURE COMMONLY
*TECTONIC SETTING N15 < ALUM GULCH FAULT BLOCK
*SIGNIFICANT LOCAL STRUCT. N70 < SEDIMENTARY ROCKS ARE LOCALLY INTRUDED BY QUARTZ MONZONITE (?) AND
*SIGNIFICANT ALTERATION N75 < PYRITIC GOSSAN CAPPING DEPOSIT; VOLCANIC SEDIMENTARY ROCKS COMMONLY
*PROCESS OF CONC./ENRICH. N80 < SECONDARY ENRICHMENT ALONG FAULT ZONE
*FORMATION AGE N30 <
*FORMATION NAME N30A <
SECOND FM AGE N35 <
SECOND FM NAME N35A <
*IGNEOUS UNIT AGE N50 < J.R.I.
*IGNEOUS UNIT NAME N50A < MT. WRIGHTSON FORMATION
SECOND IG. UNIT AGE N55 <
COND IG. UNIT NAME N55A <
GEOLOGY COMMENTS N85 < VOLCANIC SEDIMENTARY ROCKS CONSIST OF GREENISH-BROWN TUFFACEOUS SILTSTONE AND SHALE; SANDSTONES IN REGION ARE LOCALLY METAMORPHOSED TO HORNFELS

GENERAL COMMENTS

GENERAL COMMENTS GEN < SEE ALSO = FLUX MINE, EXPOSED REEF GROUP FOR GEOLOGIC INFORMATION

* GENERAL REFERENCES

REFERENCE 1 F1 < USBM FILES, INVINC[illegible] = PROSPECT

REFERENCE 2 F2 < ABGMT FILES, STANTON B. KEITH

REFERENCE 3 F3 < SCHRADER, FRANK C., 1915, MINERAL DEPOSITS OF THE SANTA RITA AND PATAGONIA MOUNTAINS, ARIZONA; USGS BULLETIN 582, p. 257

REFERENCE 4 F4 < ADMR FILE DATA, EXPOSED REEF AND BLUE EAGLE GROUPS

K5 < PORPHYRITIC RHYOLITE COUNTRY ROCK >

N70 < CONCENTRATION OF ALMOST PURE IRON SULFIDES IN VEINLETS OR BANDS (MAXIMUM WIDTH 1.5 IN.) >

F5 < SIMONS, FRANK S. 1974, GEOLOGIC MAP AND SECTIONS OF THE NOGALES AND LOCHIEL QUADRANGLES, SANTA CRUZ COUNTY, ARIZONA; USGS MAP I-762 (1:48000) >

mills # 89D

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

RECORD NUMBER B10 <>

*RECORD TYPE B20 <X,1,M>

DEPOSIT NUMBER B40 <>

REPORT DATE G1 <8,2,0,3> (YR. MO.)

*INFORMATION SOURCE B30 <1,2>

*FILE LINK IDENT. B50 < USBM-004023 0232 >

REPORTER(SUPERVISOR) G2 < CALDER SUSAN R. ( ) > (last, first, middle initial)

REPORTER AFFILIATION G5 < ABGMT >

*SITE NAME A10 < INVINCIBLE PROSPECT >

SYNONYMS A11 < BLUE EAGLE AND EXPOSED REEF GROUP >

LOCATION

MINING DISTRICT/AREA A30 < HARSHAW DISTRICT >

*STATE A50 <A,Z>

*COUNTRY A40 <U,S>

*COUNTY A60 < SANTA CRUZ >

*PHYSIOGRAPHIC PROV A63 <1,2>

*DRAINAGE AREA A62 <1,5,0,5,0,3,0,1 LOWER COLORADO>

*LAND STATUS A64 <4,1,1,9,7,9,1>

*QUADRANGLE NAME A90 < PATAGONIA ,1,9,8,1,1>

*QUADRANGLE SCALE A100 <24,000>

SECOND QUAD NAME A92 < MOUNT WRIGHTSON ,1,9,5,8,1>

SECOND QUAD SCALE A91 <62,500>

*ELEVATION A107 <4,200 FT>

UTM

*NORTHING A120 <3,4,8,5,4,5,0>

*EASTING A130 <5,2,3,1,5,0>

*ZONE NUMBER A110 <+,1,2>

*ACCURACY

ACCURATE ACC (circle)

ESTIMATED (EST) < USED ABGMT FILES, STANTON B. KEITH; SCHRADER (1915) >

GEODETIC

*LATITUDE A70 <3,1,-3,0,-1,4,N>

*LONGITUDE A80 <1,1,0,-4,5,-2,2,W>

CADASTRAL

*TOWNSHIP(S) A77 <0,2,2,S>

*RANGE(S) A78 <0,1,6,E>

*SECTION(S) A79 < 19 (30)

*SECTION FRACTION(S) A76 < NW OF SW >

*MERIDIAN(S) A81 < GILA AND SALT RIVER >

*POSITION FROM NEAREST PROMINENT LOCALITY A82 < 2.5 MILES SOUTH OF PATAGONIA, BETWEEN FLUX AND ANDES MINE GROUPS >

*LOCATION COMMENTS A83 < LOCATED ON NORTH SIDE OF ALUM GULCH; BLUE EAGLE GROUP LOCATED TO SW AND EXPOSED REEF MINE LOCATED ABOUT 1.0 MILE TO SOUTH >

* ESSENTIAL INFORMATION

+ ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

*COMMODITIES PRESENT C10 < CU. AU. >
*ORE MINERALS C30 < CUPRIFEROUS PYRITE ; SOME CHALCOPYRITE
COMMODITY SUBTYPES C41 <
*GEN. ANALYTICAL DATA C43 < EARLY 1900'S ASSAY VALUES AVERAGED 1-3% CU AND ABOUT $1/TON AU
COM. INFO. COMMENTS C50 <

* SIGNIFICANCE

PRODUCER		NON-PRODUCER	
MAJOR PRODUCTS	MAJOR < >	MAIN COMMODITIES PRESENT	C11 < CU. >
MINOR PRODUCTS	MINOR < >	MINOR COMMODITIES PRESENT	C12 < AU. >
POTENTIAL PRODUCTS	POTEN < >		
OCCURRENCES	OCCUR < >	OCCURRENCES	OCCUR < >

*PRODUCTION

PRODUCER	NON-PRODUCER
PRODUCTION YES (circle) PRODUCTION SIZE SML MED LGE (circle one)	PRODUCTION (UND) NO (circle one)

EXPLORATION OR DEVELOPMENT

*STATUS

PRODUCER	NON-PRODUCER
STATUS AND ACTIVITY A20 < >	STATUS AND ACTIVITY A20 < 2 >

*DISCOVERER L20 <
*YEAR OF DISCOVERY L10 < LATE 1800'S > *NATURE OF DISCOVERY L30 < > *YEAR OF FIRST PRODUCTION L40 < > *YEAR OF LAST PRODUCTION L45 <
*PRESENT/LAST OWNER A12 <
*PRESENT/LAST OPERATOR A13 <
EXPL./DEV.COMMENTS L110 < OWNERS AND OPERATORS INCLUDED THE IVANHOE MINING CO.; INVINCIBLE CLAIM IS ONE OF 22 UNPATENTED LODE CLAIMS COMPRISING THE BLUE EAGLE AND EXPOSED REEF GROUP

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40 < DISSEMINATIONS ; VEINLETS
DEPOSIT FORM/SHAPE M10 < IRREGULAR ; BANDED DEPOSITS IN VEINS
*DEPTH TO TOP M20 < > *UNITS M21 < > *MAXIMUM LENGTH M40 < > *UNITS M41 <
*DEPTH TO BOTTOM M30 < > *UNITS M31 < > *MAXIMUM WIDTH M50 < 20 > *UNITS M51 < FT
DEPOSIT SIZE M15 (SMALL) M15 < MEDIUM > M15 < LARGE > (circle one) *MAXIMUM THICKNESS M60 < > *UNITS M61 <
STRIKE M70 < > *DIP M80 <
DIRECTION OF PLUNGE M100 < > *PLUNGE M90 <
DEP. DESC. COMMENTS M110 <

DESCRIPTION OF WORKINGS

Workings are: SURFACE M120 UNDERGROUND M130 (BOTH) M140 (circle one) *OVERALL LENGTH M190 < > *UNITS M191 <
*DEPTH BELOW SURFACE M160 < > *UNITS M161 < > *OVERALL WIDTH M200 < > *UNITS M201 <
*LENGTH OF WORKINGS M170 < > *UNITS M171 < > *OVERALL AREA M210 < > *UNITS M211 <
DESC. OF WORK. COM. M220 < DEVELOPMENTS INCLUDED 60-FT LONG TUNNEL RUNNING N25 E INTO BASE OF RED MOUNTAIN

GEOLOGY

*AGE OF HOST ROCK(S) K1 < L.C.R.E.T. >
*HOST ROCK TYPE(S) K1A < COARSE RHYOLITE PORPHYRY, INTRUSIVE DIKES, AND OVERFLOWS
*AGE OF IGNEOUS ROCK(S) K2 < L.C.R.E.T. >
*IGNEOUS ROCK TYPE(S) K2A < GRANO-PORPHYRY AND QUARTZ DIORITE; PORPHYRITIC TRACHYANDESITE
*AGE OF MINERALIZATION K3 < L.C.R.E.T.-T.E.R.T. >
*PERT. MINERALS (NOT ORE) K4 < VEIN CROPPINGS ARE COATED WITH ALUM AND SULFUR ; PURE IRON SULFIDES; QUARTZ GANGUE
*ORE CONTROL/LOCUS K5 < DISSEMINATED CUPRIFEROUS PYRITE AND MINOR AMOUNTS OF CHALCOPYRITE IN MASSIVE
*MAJ. REG. TRENDS/STRUCT. N5 < GENERAL STRUCTURE COMMON TO REGIONAL FORMATIONS IS A SHEETING WHICH DIPS 40 NW
*TECTONIC SETTING N15 < ALUM GULCH AND RED MOUNTAIN FAULT BLOCK
*SIGNIFICANT LOCAL STRUCT. N70 < RHYOLITE CUT BY SERIES OF JOINTS DIPPING 25-30 NNW, IN WHICH THERE IS A
*SIGNIFICANT ALTERATION N75 < SURFACE OXIDATION TO UNKNOWN DEPTHS
*PROCESS OF CONC./ENRICH. N80 < SECONDARY ENRICHMENT
*FORMATION AGE N30 <
*FORMATION NAME N30A <
SECOND FM AGE N35 <
SECOND FM NAME N35A <
*IGNEOUS UNIT AGE N50 < T.R. >
*IGNEOUS UNIT NAME N50A < MOUNT WRIGHTSON FORMATION
SECOND IG. UNIT AGE N55 < L.C.R.E.T. >
SECOND IG. UNIT NAME N55A < JOSEPHINE CANYON DIORITE
EOLOGY COMMENTS N85 < WALL ROCK TESTED FOR MANUFACTURE OF SULFURIC ACID; CONCENTRATIONS AVERAGING 33% Fe AND 35-36% S.

GENERAL COMMENTS

GENERAL COMMENTS GEN < SEE ALSO : BLUE EAGLE MINE, EXPOSED REEF MINES

E-16

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
MINE OWNER'S REPORT

Date August 23, 1940

1. Mine Exposed Reef Mine

2. Location 3 miles southeast of Patagonia, Arizona.

3. Mining District & County Harshaw Mining District, Santa Cruz Co.

4. Former name

5. Owner : Albert Des Saulles

6. Address (Owner) P.O.Box 175 Anthony, New Mexico

7. Operator

8. Address (Operator)

9. President, Owning Co.

9A. President, Operating Co.

10. Gen. Mgr.

11. Mine Supt.

12. Mill Supt.

13. Men Employed None

14. Principal Minerals Copper-silver with some lead

15. Production Rate Not in production

16. Mill: Type & Cap. None

17. Power: Amt. & Type None

18. Operations: Present None

19. Operations: Planned Not stated

20. Number Claims, Title, etc.

Fourteen Claims (Exposed Reef Mine)

21. Description: Topography & Geography Fairly rugged hills, Elevation approximately 4000 feet above sea level. Vegetation consists largely of scrub oak, mesquite, etc. Property located along both sides of Alumn Gulch, approximately 3 miles southeast of the town of Patagonia.

22. Mine Workings: Amt. & Condition 1 Vertical shaft (1½ compartment) depth 312 feet. Condition unknown. Approximately 500 feet of drifts and crosscuts on the 300 foot level of above shaft. Condition of workings not stated. 1 Tunnel driven to a depth of 190 feet. Partially caved and inacessible. Other workings not described.

(over)

23. Geology & Mineralization

Mineral ation largely confined to a wid fault fissure vein attended by considerable brecciaton. Mineralization is largely pyrite, with some copper minerals showing. Mineralization apparently accompanied the diorite intrusion. Ores are primary. Predominant country rock is rhyolite porphyry, with large intrusion of diorite parallel to fault fissure.

24. Ore: Positive & Probable, Ore Dumps, Tailings

No blocked out tonnage of ore.

24A. Dimensions and Value of Ore body

Vein ranges in width from three to twenty-seven feet. No systematic sampling has ever been d ne on the property. Some exposures will assay less than one per cent copper and two ounces silver, while others will run from three to ten per cant copper.

25. Mine, Mill Equipment & Flow-Sheet

None

26. Road Conditions, Route

Road from Patagonia to property is partly washed out by recent rains.

27. Water Supply

No developed supply, but water is reported to have been encountered in some of the workings.

28. Brief History

Copper-silver sulphide ore has been shipped from the property but there are no records available as to tonnage or grade. Considerable development work done was not of a nature to prove value of property.

29. Special Problems, Reports Filed

None

This area is described in U. S. G. S. Bulletin No. 582 by F. C. Schrader.

30. Remarks

31. If property for sale: Price, terms and address to negotiate.

No statement

32. Signature.....

33. Use additional sheets if necessary.

ME-16

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA

OWNERS MINE REPORT

Date August 23, 1940

1. Mine Exposed Reef Mine

2. Mining District & County Harshaw Mining Distt. Santa Cruz County

3. Former name

4. Location 3 miles southeast of Patagonia, Arizona

5. Owner Albert Des Saulles

6. Address (Owner) P.O. Box 175 Anthony, New Mexico

7. Operator

8. Address (Operator)

9. President

10. Gen. Mgr.

11. Mine Supt.

12. Mill Supt.

13. Principal Metals copper-silver with some lead

14. Men Employed None

15. Production Rate Not in production

16. Mill: Type & Cap. None

17. Power: Amt. & Type None

18. Operations: Present

None

19. Operations Planned

Not stated

20. Number Claims, Title, etc. Fourteen claims (Exposed Reef Mine)

21. Description: Topography & Geography

Fairly rugged hills. Elevation approximately 4000 feet above sea level. Vegetation consists largely of scrub oak, mesquite, etc. Property located along both sides of Alumn Gulch, approximately 3 miles southeast of the town of Patagonia.

22. Mine Workings: Amt. & Condition

1 Vertical shaft ($1\frac{1}{2}$ compartment) depth 312 feet. Condition unknown. Approximately 600 feet of drifts and cross-cuts on the 300 foot level of above shaft. Condition of workings not stated.
1 Tunnel driven to a depth of 190 feet. Partially caved and inaccessible. Other workings not described.

(over)

23. Geology & Mineralization

Mineralization largely confine o a wide fault fissure vein attended by considerable brecci on. Mineralization is largely pyrite, with some copper minerals showing. Mineralization apparently accompanied the diorite intrusion. Ores are primary. Predominant country rock is rhyolite porphyry, with large intrusion of diorite parallel to fault fissure.

24. Ore: Positive & Probable, Ore Dumps, Tailings

No blocked out tonnage of ore.

24-A Vein Width, Length, Value, etc.

Vein ranges in width from three to twenty-seven feet. No systematic sampling has ever been done on the property. Some exposures will assay less than one percent copper and two ounces silver, while others will run from three to ten percent copper.

25. Mine, Mill Equipment & Flow Sheet

None

26. Road Conditions, Route

Road from Patagonia to property is partly washed out by recent rains.

27. Water Supply

No developed supply, but water is reported to have been encountered in some of the workings.

28. Brief History

Copper-silver sulphide ore has been shipped from the property, but there are no records available as to tonnage or grade. Considerable development work done was not of a nature to prove value of property.

29. Special Problems, Reports Filed

None
This area is described in U.S.G.S. Bulletin No. 582 by F. C. Schrader.

30. Remarks

31. If property for sale: Price, terms and address to negotiate.

No statement.

32. Signed.....

33. Use additional sheets if necessary.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA

OWNERS MINE REPORT

Date August 23, 1940

1. Mine Exposed Reef Mine

2. Mining District & County Harshaw Mining Dist. Santa Cruz County

3. Former name

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6. Address (Owner) P.O. Box 175 Anthony, New Mexico

7. Operator

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9. President

10. Gen. Mgr.

11. Mine Supt.

12. Mill Supt.

13. Principal Metals Copper-silver with some lead

14. Men Employed

15. Production Rate Not in production

16. Mill: Type & Cap.

17. Power: Amt. & Type None

18. Operations: Present None

19. Operations Planned Not Stated

20. Number Claims, Title, etc. Fourteen claims (Exposed Reef Mine)

21. Description: Topography & Geography Fairly rugged hills. Elevation approximately 4000 feet above sea level. Vegetation consists largely of scrub oak, mesquite, etc. Property located along both sides of Alumn Gulch, approximately 3 miles southeast of the town of Patagonia.

22. Mine Workings: Amt. & Condition 1 vertical shaft ($1\frac{1}{2}$ compartment) depth 312 feet. Condition unknown. Approximately 600 feet of drifts and crosscuts on the 300 foot level of above shaft. Condition of workings not stated.
1 tunnel driven to a depth of 190 feet. Partially caved and inaccessible. Other workings not described.

(over)

23. Geology & Mineralization Mineralization largely confined to a wide fault fissure vein attended by considerable brecciation. Mineralization is largely pyrite, with some copper minerals showing. Mineralization apparently accompanied the diorite intrusion. Ores are primary. Predominant country rock is rhyolite porphyry, with large intrusion of diorite parallel to fault fissure.

24. Ore: Positive & Probable, Ore Dumps, Tailings No blocked out tonnage of ore.

24-A Vein Width, Length, Value, etc. Vein ranges in width from three to twenty-seven feet. No systematic sampling has ever been done on the property. Some exposures will assay less than one per cent copper and two ounces silver, while others will run from three to ten per cent copper.

25. Mine, Mill Equipment & Flow Sheet None

26. Road Conditions, Route Road from Patagonia to property is partly washed out by recent rains.

27. Water Supply No developed supply, but water is reported to have been encountered in some of the workings.

28. Brief History Copper-silver sulphide ore has been shipped from the property, but there are no records available as to tonnage or grade. Considerable development work done was not of a nature to prove values of property

29. Special Problems, Reports Filed None.
This area is described in U.S.G.S. Bulletin No. 582 by F. C. Schrader.

30. Remarks

31. If property for sale: Price, terms and address to negotiate.
No statement.

32. Signed.....

33. Use additional sheets if necessary.

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
MINE OWNER'S REPORT

Date April 9, 1953

1. Mine: Exposed Reef and Blue Eagle

2. Location: Sec. 30 Twp. 22 S Range 16 E Nearest Town Patagonia

Distance 5 1/2 mi. Direction South Road Condition 5 mi. good---1/2 mi. rough 3/4 mi. no road

3. Mining District & County: Harshaw Dist., Santa Cruz Co.

4. Former Name of Mine: None

5. Owner: Albert Des Saulles, Helen Sibold, and Doris Sibold

Address: Albert Des Saulles, 14868 San Fernando Road, San Fernando, Calif.

6. Operator: Not in Operation

Address:

7. Principal Minerals: Copper, Silver, Lead, and Zinc.

8. Number of Claims: 22 Lode yes Placer

Patented Unpatented yes

9. Type of Surrounding Terrain: Country is quite rough and rugged. The property is situated on both sides of Alum Gulch in the Patagonia Mountains at an altitude of approximately 4400 ft. Vegetation principally scrub oak and mesquite.

10. Geology & Mineralization: The prevailing rocks in the area are rhyolite, rhyolite porphyry, granite porphyry, and quartz diorite, the rhyolite and rhyolite porphyry seems to be the most extensive. There are 5 principal veins on the property, most of them traceable throughout the length of the claims. In addition, there are a number of smaller veins, parallel to the main veins. Veins are of the fissure and fault fissure type, and vary in width from 1 ft. to 30 ft. Veins vary considerable in dip and strike. Prevailing dip is nearly vertical, and strike W and NW. Veins show considerable brecciation and mineralization, containing a large amount of iron pyrites, with chalcopyrite, galena and sphalerite. These minerals are

11. ~~Discussion of Value of Ore Body~~ said to contain a considerable amount of silver, with some gold. Best values seem to be found in the bands of quartz, which are found in nearly all the veins. Some of the veins will probably assay about 1 % copper with a small amount of silver, probably about 2 Oz. Other veins will have areas of better mineralization that may assay from 2 to 8 % of copper, and also have a considerable amount of lead and zinc occurring as galena and sphalerite. I did not find any exposures which showed any shipping grade ore. However, most of the old mine workings are now inaccessible. Apparently, a considerable quantity of milling grade ore could be developed with systematic exploration and development.

12. Ore "Blocked Out" or "In Sigh. None

Ore Probable: A fairly large tonnage of milling grade copper ore could, no doubt, be developed by systematic exploration and development, and opening up the old shafts and tunnels, which are now caved and filled with water. This exploration should include a number of diamond drill holes, located so as to intersect the most prominent ore veins at various depths and locations.

13. Mine Workings—Amount and Condition:

	No.	Feet	Condition
Shafts	3	312-85-50	312' shaft ~~xxxxxxxx~~ in poor ~~shaft~~ shape and needs retimbering. Water within 50 ft. of collar. 85 ' shaft caved in. 50' shaft full of water to the top.
Raises			
Tunnels	11	10 to 500 ft.	Longer tunnels are now caved in and are inaccessible. (1--500 ft. tunnel --1--240 ft. tunnel--~~x~~ 1--300' tunnel.
~~xxxxxxxx~~ Open cuts		20	Most of them small shallow cuts of 5 to 10 ft. on side of canyon into small ore fissures,
Stopes			

In addition, there is said to be about 600 ft. of drifts and cross cuts on the 300 ' level from the 312 ft. shaft.

14. Water Supply: Should be fairly easy to develop a water supply for milling operations.

Old shafts are almost full of water, and quite a stream of water is running down Alum Gulch.

15. Brief History: Old history of the property can not be ascertained by the writer with any degree of accuracy. Miss Sibold, part owner, who showed me the property, was not acquainted with same. Mine apparently has not been operated since 1922. Present owners of the property claim to have kept up the assessment work, and met all legal requirements since that time.

The 312 ft. shaft was sunk by a Mr. Martin, who operated the property, and is said to have also driven the 500 ft. tunnel and the 600 ft. of drifts and cross cuts on the 300 ft. level. According to one report, some commercial shipping ore was found, but the operators were forced to suspend operations on account of encountering more water than they could handle with their limited pumping capacity. Mr. Martin later died, and the property was then acquired by the present owners. Some shipments are said to have been made from this shaft by Mr. Martin, but no records of tonnage or grade is available. Dump shows a large amount of iron pyrites, with some ore indications. (This shaft is called the Exposed Reef shaft).

~~x~~ 5 cars of ore is also reported shipped by another operator from the 240 ft. tunnel on the Blue Eagle Group. This ore was reported to have run 10 % in copper with 12 oz. of Silver and $2.00 per ton gold values.

According to reports, the property has been leased several times (prior ~~xxxxxxxxxx~~ to 1922) to various operators, who did not have capital required to install and operate concentrating plants or leaching plants to treat the lower grade ores on the property, or to conduct extensive exploration and development work.

16. ~~Signature~~

17. If Property for Sale, List Approximate Price and Terms: Lease or sale---$50,000 terms Royalty 10 %.

Axel L Johnson

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
MINE OWNER'S REPORT

Date March 18,1953

1. Mine: Exposed Reef and Old Blue Eagle Group of Claims
2. Location: Sec. ..... Twp. ..... Range ..... Nearest Town Patagonia
   Distance 5 miles Direction Southeast Road Condition Good
3. Mining District & County: Harshaw Mining District, Santa Cruz County
4. Former Name of Mine: Same
5. Owner: Albert Des Saulles Hellen Sibold and Doris Sibold
   Address: 14868 San Fernando Road, San Fernando, California
6. Operator: None
   Address: .....
7. Principal Minerals: Copper, silver, lead and zinc
8. Number of Claims: 22 Lode X Placer .....
   Patented ..... Unpatented X
9. Type of Surrounding Terrain: Rhyolites, granite porphrus and Quartz diorites are the most important rock factors in connection with deposition of ore bodies of commercial value. Rhyolite is the most extensive.
10. Geology & Mineralization: The ores of the above property are argentiferous copper and lead associated with iorn and zinc
11. Dimension & Value of Ore Body: Exposed Reef Shaft ledge 30ft. 3½ft wide 15% copper and 15 oz. Silver.

    Blue Eagle shipped 5 cars. Vein 2½ ft wide 10% Copper, 12 ozs. silver and $2.00 gold. vein runs on westardly through adjoining claims, where a large iron outcrops and junction with smaller veins should increase the size of the ore bodies. Black oxide of copper is also found in the tunnel and winze which assay 20% or more

12. Ore "Blocked Out" or "In Sigh.

No

Ore Probable: Ore can be taken out as soon as Blue Eagle shafe is cleaned out

13. Mine Workings—Amount and Condition:

No.	Feet	Condition
Shafts	312,35,50	in water almost to top
Raises		
Tunnels 10	10 to 200	good
Crosscuts		
Stopes		

14. Water Supply: Plenty for working purposes

15. Brief History: The property has not been worked since 1932. Mr Martin bought the property sunk 312 foot shaft,500tunnel then became ill and died. The heirs let the property revert back to me.

I have been doing the assessment work each year trying to develope the mine

All development work indicates a large ore body at a considerable dept.

16. Signature: Albert Lee Sandlers

17. If Property for Sale, List Approximate Price and Terms: Lease or sale $50,000.00 terms 10% Royaly

DEPARTMENT OF MINERAL RESOURCES
State of Arizona
MINE OWNER'S REPORT

Date March 18,1953

1. Mine: Exposed Reef and Old Blue Eagle Group of Claims
2. Location: Sec. ..... Twp. ..... Range ..... Nearest Town Patagonia
   Distance 5 miles Direction Southeast Road Condition Good
3. Mining District & County: Harshaw Mining District, Santa Cruz County
4. Former Name of Mine: Same
5. Owner: Albert Des Saulles Hellen Sibold and Doris Sibold
   Address: 14868 San Fernando Road, San Fernando, California
6. Operator: None
   Address: .....
7. Principal Minerals: Copper, silver, lead and zinc
8. Number of Claims: 22 Lode X Placer .....
   Patented ..... Unpatented X
9. Type of Surrounding Terrain: Rhyolites, granite porphrus and quartz diorites are the most important rock factors in connection with deposition of ore bodies of commercial value. Rhyolite is the most extensive.

10. Geology & Mineralization: The ores ofthe above property are argentiferous copper and lead associated with iorn and zinc

11. Dimension & Value of Ore Body: Exposed Reef shaft ledge 30ft. 3½ft wide 15% copper and 15 oz. silver.

Blue Eagle shipped 5 cars . Vein 2½ ft wide 10% Copper, 12 ozs. silver and $2.00 gold . vein runs on westardly through adjoining claims, where a large iron outcrops and junction with smaller veins should increase the size of the ore bodies. Black oxide of copper is also found in the tunnel and winze which assay 20% or more

12. Ore "Blocked Out" or "In Sig... No

Ore Probable: Ore can be taken out as soon as Blue Eagle shafe is cleaned out

13. Mine Workings—Amount and Condition:

	No.	Feet	Condition
Shafts	3	312,85,50	in water almost to top
Raises			
Tunnels	10	10 to 200	good
Crosscuts			
Stopes			

14. Water Supply: plenty for working purposes

15. Brief History: The property has not been worked sinde 1922.by Mr Martin bought the property sunk 312 foot shaft,500tunnel then became ill and died. The heirs let the property revert back to me.

I have been doing the assessment work each year trying to develope the mine

All deveopment work indicates a large ore body at a considerable dept.

16. Signature: [illegible]

17. If Property for Sale, List Approximate Price and Terms: Lease or sale $50,000.00 terms 10% Royaly

COPY

REPORT ON EXPOSED REEF AND BLUE EAGLE GROUP OF CLAIMS

PROPERTY. This property consists of 14 unpatented mining claims. Title is possessory. There are no disputes as to titles and assessment work has been properly recorded.

The Exposed Reef Group join one another, forming a compact body or parallelogram. They are named as follows: Red Fox 1, 2, 3, 4, Cowboy, St. Patricks, Log Cabin, North Star, Old Boy Rogers, Exposed Reef, and Blue Eagle 1, and 2.

None of these are patented, but the titles are clear and good for the reason the location work has been performed on each one of them and the annual assessment complied with up to date.

LOCATION. These mines are all situated in the Harshaw District, Santa Cruz County, Arizona, and five miles southeast from the town of Patagonia, which is located on the railroad from Nogales to Benson and is 22 miles northeast of the town of Nogales, Arizona. A loading station, or platform, however, three miles distance from the Exposed Reef Shaft, down Alum and Flux Gulch as by wagon road, The main group lies between the famous Flux Mines on the southwest and the big Andes Group on the northeast, while the rich and celebrated World's Fair Mine is near the southeast corner of the Red Fox Group.

GEOLOGY AND MINERALOGY. The principal rock of the district is paleozoic limestone, quartz, granite porphyry, phyolite and andesite, although some places syenite, sandstone, quartzite, schist and shales are encountered. The rhyolite, granite porphyry and the quartz diorites however, seem to be the most important rock factors in connection with the deposition or formation of ore bodies of commercial value.

Rhyolite is the most extensive formation. It occurs in a north and south body some two miles wide and extending across the north central part of the district and includes nearly all of Red Mountain, which lies to the northeast of and close to the Exposed Reef and Andes Mine Group. Hereabouts is a large belt of coarse prophyry profusely impregnated with pyrite, chalcopyrite and chalcocite disseminated in crystals and grains over which a number of promising prospects are located but with small development as yet. Oxidization color the mountain red, hence its name. The rhyolite, apparently of tertiary age, occurs in intrusive dikes and overflows.

The Quartz diorite belongs with the group of mesozoic intrusive rocks and is shown in a belt three quarters of a mile wide by three miles long from a point one mile southeast of Harshaw over into Alum Gulch and the World's Fair Mine, and shown in several places highly mineralized outcrops of copper ores on a contact rhyolite.

Granite prophyry occurs about 1/2 mile wide along the western border of the district. It is also of Mesozoic time and seems to underlie the rhyolite. In the western part it is of much larger acre, and in the Palmetto district on the west, is more abundant. Also, on contacts with rhyolite shows mineralized outcrops.

Andesite is the next most abundant rock to rhyolite and occurs in flows and tuffs overlying the rhyolite and other older rocks.

The commercial minerals of the district are principally comprised in argentiferous copper and lead ores, most of them carrying gold values generally associated with considerable iron and sometimes with a little zinc. The ores of Exposed Reef, Red Fox

and Blue Eagle Groups, for instance, are predominantly argentiferous coppers with some gold and a strong iron content, mostly sulphides, though a little lead is sometimes encountered. Some other mines in the neighborhood have been large producers of both lead and copper ores, with high silver values and sometimes quite rich in gold. The Flux, Hardshell, Old Trench and Mowry are among the principal lead-silver mines of the district, and they also are among those yielding copper. The World's Fair produces both high grade argentiferous lead and copper ores, often quite rich in gold. Several others among the 40 or more mines and prospects of the district produce both lead and copper, but taken altogether, copper-silver is the predominating commercial mineral. In some of these mines, which have been developed to form 300 to 500 feet deep and are still in ore, silver is the principal metal of value, occurring most frequently as argentite, but sometimes as antimonial silver, chlorides, native and associated with copper ores, bornite, chalcopyrite, tetrahedrite amd chalcocite. But to repeat, the argentiferous ores are the most abundant and important in the district, and though the very large bodies therefore are, while commercial, commonly considered low grade. Other quite sizeable ore bodies are encountered of high grade value at considerable depths, as, the large body of ore found in Worlds Fair mine below the water level that ran 20% copper, 500 ounces silver and $15 gold, to the ton. Also the Exposed Reef mine shaft, ore not that rich, but still of good pay value running 15% copper, 15 ounces silver and $2 gold per ton was encountered, with a minimum of 3½ ft. in a ledge 30 ft. wide containing milling several feet wide at the shaft bottom 312 feet deep and under water. The copper showed as chalcopyrite, bornite and chalcocite, the silver and gold occurring in combination with the copper.

The aforementioned ores occur principally in veins, fissures and contacts in the rhyolite and contacts with grano-porphyry and quartz diorite. Through erosion, the mineralized outcrops have been exposed on the sides of the canyons, and lower hills and deep draingage ways, and although the veins generally show increased width with depth, and in many cases, are only a few feet wide on the surface, some of them, like these in the Exposed Reef and Red Fox Groups have very wide mineralized outcrop copper ore bodies that increased in both size and values as their development workings attained greater depth.

DEVELOPMENT. The principal mine workings on the Exposed Reef Group have been done on the Saint Louis and Exposed Reef lode claims. An opencut and tunnel have been driven 36 feet long on a 4½ to 30 ft. wide on surface quartz vein that occurs with several smaller parallel quartz veins in a big rhyolite dike, on the Saint Louis Mine, near the east bank of Alum Gulch and the northwest end of the Exposed Reef Group (see map). Here nice looking copper ore was encountered, sulphides and carbonates all along the vein to the face of the tunnel, that assayed from 2% to 5% copper, 6 oz. silver and $1 in gold. The larger vein outcrops at intervals for over 3000 ft. lengthwise, through the Saint Louis and diagonally across United Verde Nos. 2, 4, and 3, with a tunnel back several hundred feet high. The smaller parallel quartz veins also show mineral outcrops.

The main workings on the Exposed Reef lode claims are a 500 ft. tunnel and a 312 ft. shaft. The tunnel cuts three veins, each known as the lower, middle and upper vein. The lower vein was encountered a short distance in from the mouth of the tunnel and shows 30 ft. wide of low grade copper sulphides that averages about 1½% copper and 4 oz. silver. Higher grade ore was encountered in the 40 ft. winze that was sunk from the bottom of the drift on the vein from the main tunnel to the south-east that assayed 8% copper, 27 oz. silver and $2 gold per ton. The middle vein was cut 250 ft. in and drifted on until connected with the shaft on same, 112 ft. deep from the surface. This shaft was continued on down 200 ft. more below the tunnel level, thus developing the vein in ore to a depth of 312 ft. When the last work was done, a min. of 3½ ft. ore of argentiferous copper ore per ton. Work was then suspended there perforce, as the last round of shots encountered a rush of water that

drove the miners out and [illegible] too much to be handled by the limited pumping and bailing capacity of the sinking pump and small hoist on the shaft. However, the shaft showed fairly good ore all the way down and as already stated, commercial shipping ore in the bottom. A crosscut on the middle vein 12 ft. long, made at a point in the drift thereon, 30 ft. to the east and a little northwest of the shaft exposed 12 ft. of ore that assayed 3% copper and 7 oz. silver. The upper vein was cut 5 ft. wide and 500 ft. in from the tunnel mouth, showing at that point strong iron action, but very little copper. However, this vein shows better mineral values at other points on the property where it has been partially developed. Its outcrop can be traced from the northwest corner of the Saint Louis mine onto and across the Old Roger Boy, Exposed Reef and Log Cabin Claim Mine into the Esther claim, where it makes a junction with the middle vein forming thence what is called the mainvein, that trends on to the southeast through the Cowboy, Red Fox Nos. 1 and 6. The middle vein also conjuncts with the lower vein, near the northwest end of Old Roger Boy Mine. The lower vein runs throughout both the Exposed Reef and Red Fox Groups. Commencing at the northwest end of Old Roger Boy claim and extending thence on through into and across the Exposed Reef, Log Cabin, Steam Shovel, and Red Fox Nos. 1, 5, and 7. All three of these veins are described can be readily traced through from one end of the two groups to the other, and more particularly, in the territory lying between them, the geological conditions are very favorable for encountering in depth an immense body of disseminated copper ores, aside from those contained in the vein proper. The big hematite dike, showing some copper stain, that crops out boldly higher up the mountain across its face and almost parallel in course with the trend of the vein, is also a most favorable factor to be considered in this relation. (see map).

The 300 ft. tunnel and 112 ft. shaft on the Red Fox No. 1, constitute the main development work on the Red Fox group. A tunnel is driven on the middle or main vein of the Exposed Reef group and shows ore constantly from near the tunnel mouth to the face. The shaft cuts the vein in the tunnel 66 feet from the mouth, 60 ft. deep and shows all in ore down to the bottom. Some cuprite and native copper occur in the shaft along with copper sulphides, which contains generally here 3% copper, 5 oz. silver and 1 oz. gold per ton. A crosscut was made on the vein 40 ft. long, 27 ft. further in or 93 ft. from the tunnel face, the ore from which gave an average of 2% copper, 5 oz. silver and $1 gold. The same class of ore continues on in to the tunnel face. Numerous shallow shafts, opencuts and small winzes have been sunk and worked on the sufferent claims, demonstrating the diversified mineralization of the properties.

The Old Blue Eagle Group, that lies just across the Alum Gulch from the Old Boy Roger Mine to the west, has its principal development workings on the Hillside Copper Mine, near the gulch. These comprise a 240 ft. tunnel on the main vein and a 20 ft. crosscut to a smaller vein, 20 ft. to a raise and 50 ft. winze on the main vein.

The main vein shows 2½ ft. wide in the tunnel and winze. Five cars of ore have been shipped from the mine, averaging 10% copper, 12 ozs. silver and $2 gold per ton. As the dump lies on the edge of Alum Gulch, most of the milling grade of ore has been washed down the arroyo by the annual freshets, flowing down the canyon each rainy season. However, the vein runs on westardly through the two adjoining claims of the Creston and Katago where large iron outcrops and the junction with smaller veins should tend to considerably increase the size of the ore bodies, when these sections of the properties become developed. Some black oxide of copper is also found in the tunnel and winze which assay 20% or more.

IMPROVEMENTS. The Exposed Reef shaft is timbered and equipped with a good gallow frame, a six HP Fairbanks-Morse gaoline engine, one 20 HP Hot Head engine to drive the compressor, one 2 drill air compressor, one No. 5 Cameron sinking

pump, with air and water pipe lines, one air receiver, one swedging tool, one drill press, one blacksmith tool sharpening outfit, one 80 lb. anvil, three buckets and cable for hoist, etc. The tunnel and dump have 600 ft. of rail track and two cars, one cook house and several bunk houses are tributary to the shaft. (during the past few several years much of this equipment has been stolen off the property as a watchman was not maintained during the depression).

HISTORY. These mines have been owned for years by practical, experienced, intelligent, hard-working miners, who had only their labor and mining ability for working capital, which explains why more work has not been done on them, and the fine ore showings in the several different places already described, more rapidly developed. For instance, when the water drove them out of the Exposed Reef Shaft, where they had encountered a paying body of good grade shipping ore, they did not have the necessary funds to purchase and install a pumping plant to handle the water properly. In other places, where large tonnages of good milling ore have been demonstrated, they are likewise without the capital to put in and operate a concentrating and leaching plant. Realizing the value of their property, they manage by concentrating their labor for annual assessment work, in the most favorable places, to develop more ore year by year, at the same time maintaining a legal title to the properties until they may be enabled through mutual work and savings to accumulate sufficient capital to operate more successfully on a commercial or paying basis.