CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
1520 West Adams St.
Phoenix, AZ 85007
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

PRINTED: 03-06-2008

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: MIDDLEMARCH MINE

ALTERNATE NAMES:
MISSOURI

COCHISE COUNTY MILS NUMBER: 102

LOCATION: TOWNSHIP 18 S RANGE 23 E SECTION 12 QUARTER E2
LATITUDE: N 31DEG 52MIN 49SEC LONGITUDE: W 109DEG 56MIN 53SEC
TOPO MAP NAME: COCHISE STRONGHOLD -7.5

CURRENT STATUS: PAST PRODUCER

COMMODITY:
LEAD
ZINC
COPPER SULFIDE
SILVER
GOLD LODE
COPPER OXIDE

BIBLIOGRAPHY:
USGS PP 281, P. 140
USGS PP 318, P. 96
ADMMR MIDDLEMARCH MINE FILE
ADMMR "U" FILE
NEW MEXICO BULL 66, P. 109
AZBM BULL 187, P. 10; P. 18 (ABRIL) P. 30
AZ MINERAL COMMODITY UPDATE ON ZINC, 11-3-77
D.D RABB, BUR OF GEO & MIN TECH.
THESIS - GEO OF THE CENTRAL DRAGOON MTNS. BY
D. J. CEDERSTROM (NOT IN ADMMR FILES)
KREIDLER, TERRY J., "MINERAL-RESOURCE POTEN-
TIAL OF THE DRAGOON MOUNTAINS RARE II
FURTHER PLANNING AREA, COCHISE CO, AZ" U S
BUR OF MINES MLA 35-82, 1981 ADMMR GEO FILE
SEGUIN, J.M., GEO REPORT ON THE MIDDLEMARCH
PROPERTY, 1989. GEO FILE

The Middlemarch Mine and Mill

By B. M. SNYDER

The Middlemarch mine is situated nine miles west of Pearce, Arizona, in the Dragoon mountains; it is one of the old copper mines of Arizona and was first operated about twenty years ago by Richard Gird and others. They built a small water-jacket furnace and made black copper from the oxidized ore of the Missouri claim, but when the low-grade sulphide ore was encountered at shallow depth, smelting was discontinued. Later they erected a small concentrating plant to treat the sulphide ore, but owing to the high specific gravity of the gangue (mainly garnet and epidote) and the tendency of the copper minerals to float, this mill proved a failure. The extraction was low and the concentrate contaminated with the heavy gangue-minerals. Later an attempt was made to operate the property as a shipping proposition and about 70 carloads of ore were shipped to the smelters at Douglas, for the most part at a loss.

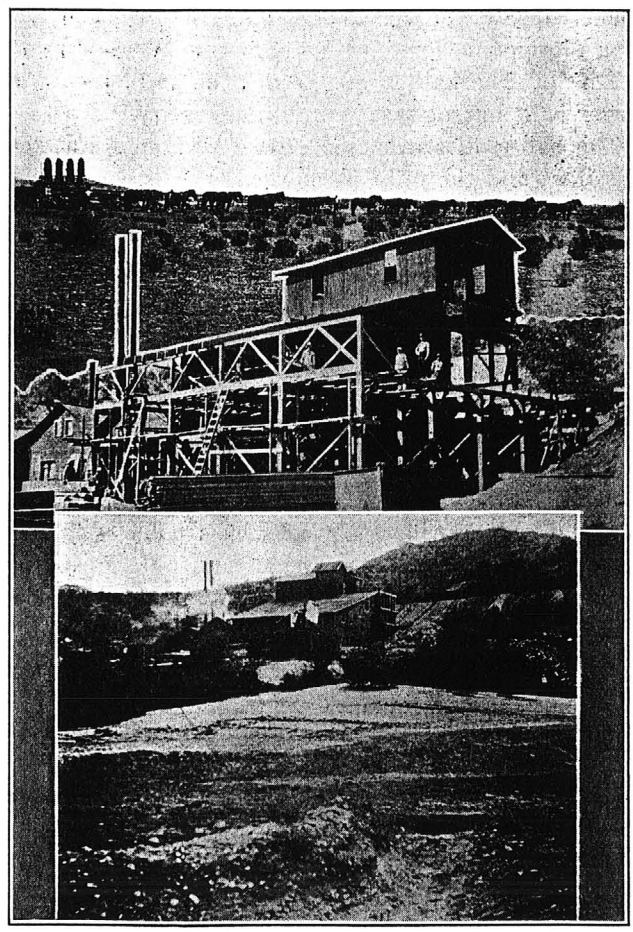
In the early part of 1917 the Arizona Middlemarch Copper Co. took over the property and now owns or controls a total of 43 claims, with an area of over 860 acres. This company is controlled by Los Angeles business-men. They have erected a flotation mill of 125 tons daily capacity, and have demonstrated that the ore is readily amenable to this treatment. Shortage of water, owing to several dry seasons, has prevented the mill running more than a small part of the time, but sinking to reach water at depth is now under way.

The geologic formation consists of a series of Paleozoic sedimentaries that have been extensively intruded by granitic stocks and porphyry dikes. The sedimentary rocks have been so metamorphosed as to obliterate any fossils they may have contained. By correlation with formations the age of which is known, it is believed that the sedimentaries are largely Cambrian. They consist of quartzite, lime-shale, silicious limestone, and clay-slate.

The intrusive granite occurs in stocks of considerable area and along the contacts of such intrusives with the sedimentaries are found altered zones within which orebodies occur. The latter are also found as veins on one or both sides of the strong rhyolite-porphyry (or quartz-porphyry) dikes that cut both the sedimentaries and the granite. There are three strong dikes running the full length of the property and most of the orebodies are found between two of these, or along their contact.

The orebodies are fairly typical contact-metamorphic deposits and are plainly the result of the action of vapors and solutions given off by the intrusives. On the upper end of the property the gossan is found along the contact of the granitic stock with slate and limestone. This gossan shows some copper carbonates and oxides with specular hematite, garnet, epidote, and pyroxene. A tunnel on the Cobreloma vein exposes a vein along the contact of granite and slate, from two to six feet wide, and showing commercial ore in places. This ore carries chalcopyrite, pyrite, and specular hematite, and several carloads of such ore have been shipped to the smelter.

The Missouri orebody is a contact-metamorphic deposit in calcareous quartzite, the shape of the ore being that of a chimney or pipe. On the fifth level this pipe has an area of over 2000 sq. ft., with an oval section and



a dip of about 45°. The ore is made up largely of finely crystallized garnet and epidote, with calcite and a little quartz, the metallic minerals being pyrite, chalcopyrite, and zinc-blende. The ore is low-grade, running from 0.5 to 4% copper and averaging, as delivered at the mill, about 2% copper. This is primary ore, showing no sign of enrichment or leaching below a depth of about 75 ft. The residual carbonate ores above this horizon were enriched somewhat and were smelted on the ground.

The Missouri workings reach a depth of about 250 ft. below the surface, and the orebody has been proved to

the sixth level. At about 50 to 60 ft. below the sixth level, the inclined shaft passes through a crushed zone (fault-breccia) and below this fault it passes into aplitic granite. At 100 ft. below the sixth level, a station will be cut and a cross-cut driven to the orebody on this level.

The ore has been mined heretofore in large open stopes by milling or similar methods, but a shrinkage stope is now being opened on the sixth level. The ore is drawn off through chutes and trammed to a pocket below the sixth level, and any large boulders are broken on a grizzley over this pocket. A measuring pocket is used to fill the one-ton skip and the latter delivers into a bin on the adit-level, from which the ore is trammed to the mill-bins.

The mill was designed and erected by me. It is a straight flotation mill of the simplest type possible, as shown by the flow-sheet. The ore is drawn to a Telsmith No. 5 gyratory crusher, set to deliver a 1½-in. maximum product. The crushed ore is elevated by a Telsmith bucket-elevator to the fine-ore bin, from which it is fed by a plunger-feeder to a Colorado Iron Works 6 by 6-ft. ball-mill. The balls used are of 2 in. and 2½ in. diam., larger balls having been found unnecessary.

The ball-mill is in closed circuit with an Akins 45-in. classifier, and the pulp discharged by it is elevated by a Byron Jackson 3-in. sand-pump to two launder (or Crerar) pneumatic flotation machines. The froth from these machines goes to a standard K & K flotation machine for cleaning. The finished concentrate from the latter is carried by launders to ponds outside the mill-building. When a pond is full, the concentrate is allowed to drain and dry for about two weeks. It is then trammed to a loading-pocket, from which it is drawn by gravity into motor-trucks for transportation to the railroad, nine miles distant. If the collodial gangue is eliminated thoroughly in the flotation cells, no trouble is found in getting a concentrate dry enough to handle during nine months of the year. During the wet season, this method is not satisfactory.

The tailings from the K & K machine are returned to the roughers for re-treatment, and the rougher tailing goes to a 24 by 8-ft. Dorr thickener for settling and recovery of water. The underflow of the thickener carries 55 to 70% solid, and the clear overflow is pumped back to the head of the mill by a 2-in. centrifugal sump-pump, which also returns all drainage of mill-floors, concentrate-pond overflow, etc. By such means the consumption of water is kept down to an average of 200 gal. per ton of ore treated.

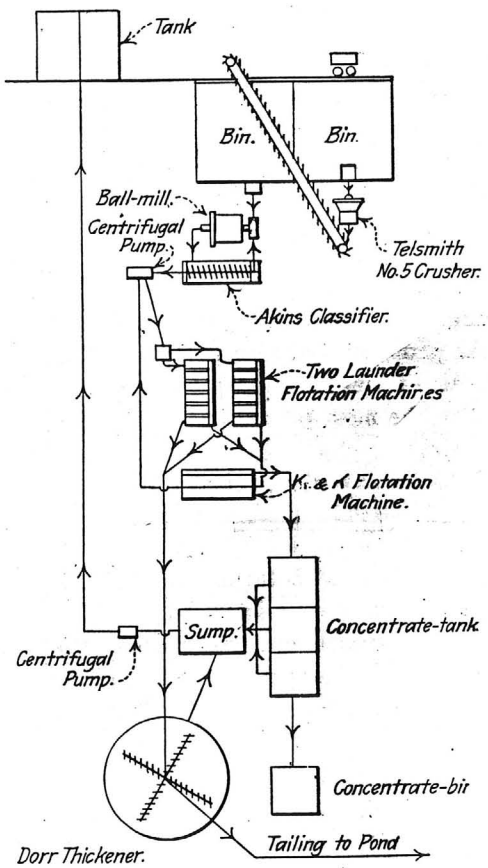
The flotation reagents used are coal-tar, No. 5 pine-oil (General Naval Stores), and coal-tar creosote. Coal-tar makes up 80% or more of the mixture. No acid is used, and the pulp is not heated. A little lime is added occasionally to assist settling in the Dorr thickener and this keeps the pulp slightly alkaline. No changes in the flow-sheet as originally designed have been found necessary, except the substitution of the Dorr thickener for settling-ponds, to recover water more completely.

The following results are averages for the past four months:

1918	Mill-heading %	Tailing %	Extraction %	Solid thickener-discharge %
August	1.49	0.14	91.07	62.8
September	1.64	0.185	89.69	64.8
October	1.92	0.215	89.73	62.8
November	1.64	0.152	91.57	63.0

Ball consumption, 1.23 lb. per ton ore
Flotation reagents, 0.86 lb. per ton ore

The following typical screen-analyses of tailings are given to show that the principal losses are in the coarser sizes, and that by still finer grinding and closer classification the extraction could be brought up to 95% or more. It is doubtful, however, if it would pay to make this addi-



FLOW-SHEET OF MIDDLEMARCH MILL

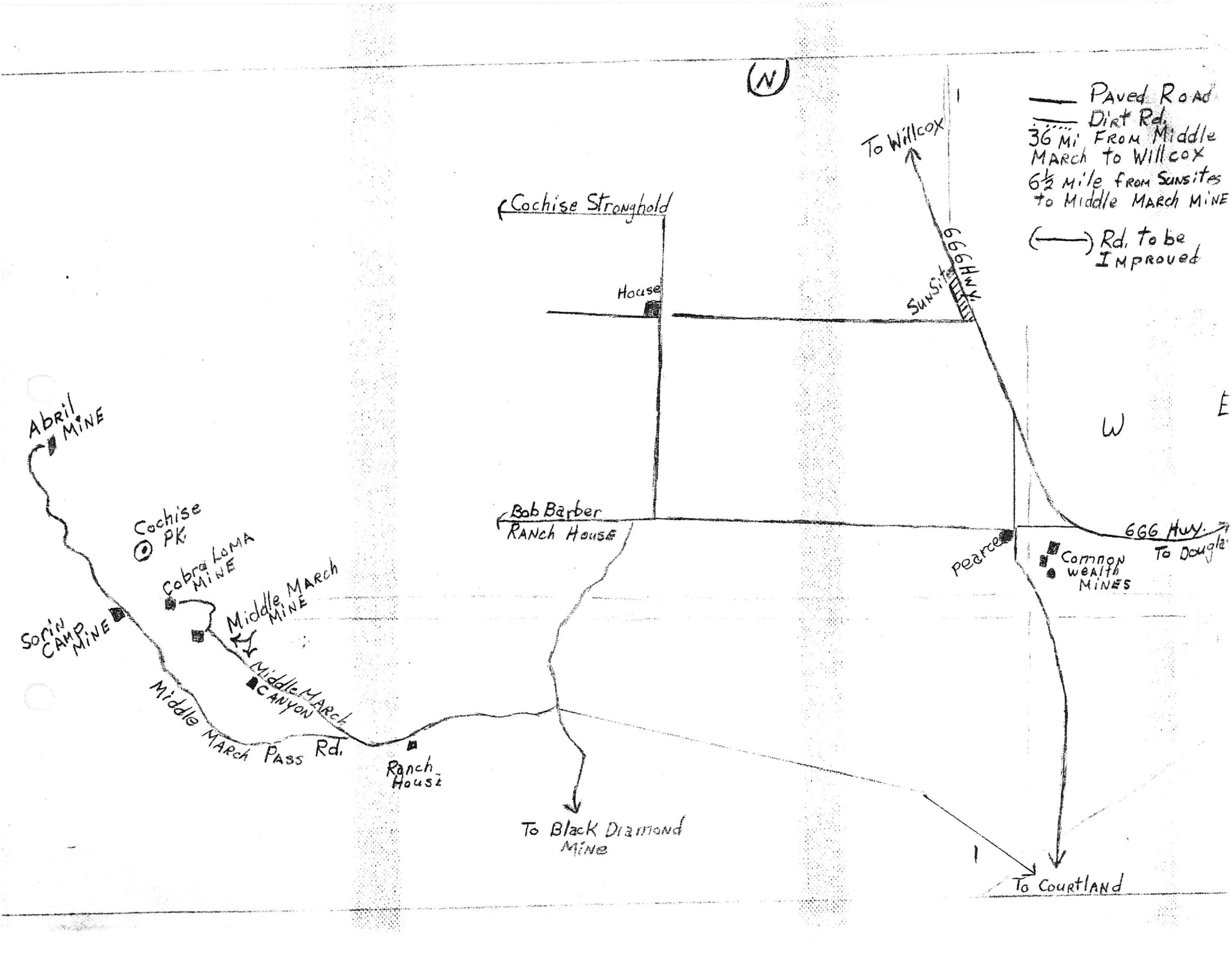
tional recovery at the expense of reduced capacity and increased grinding costs.

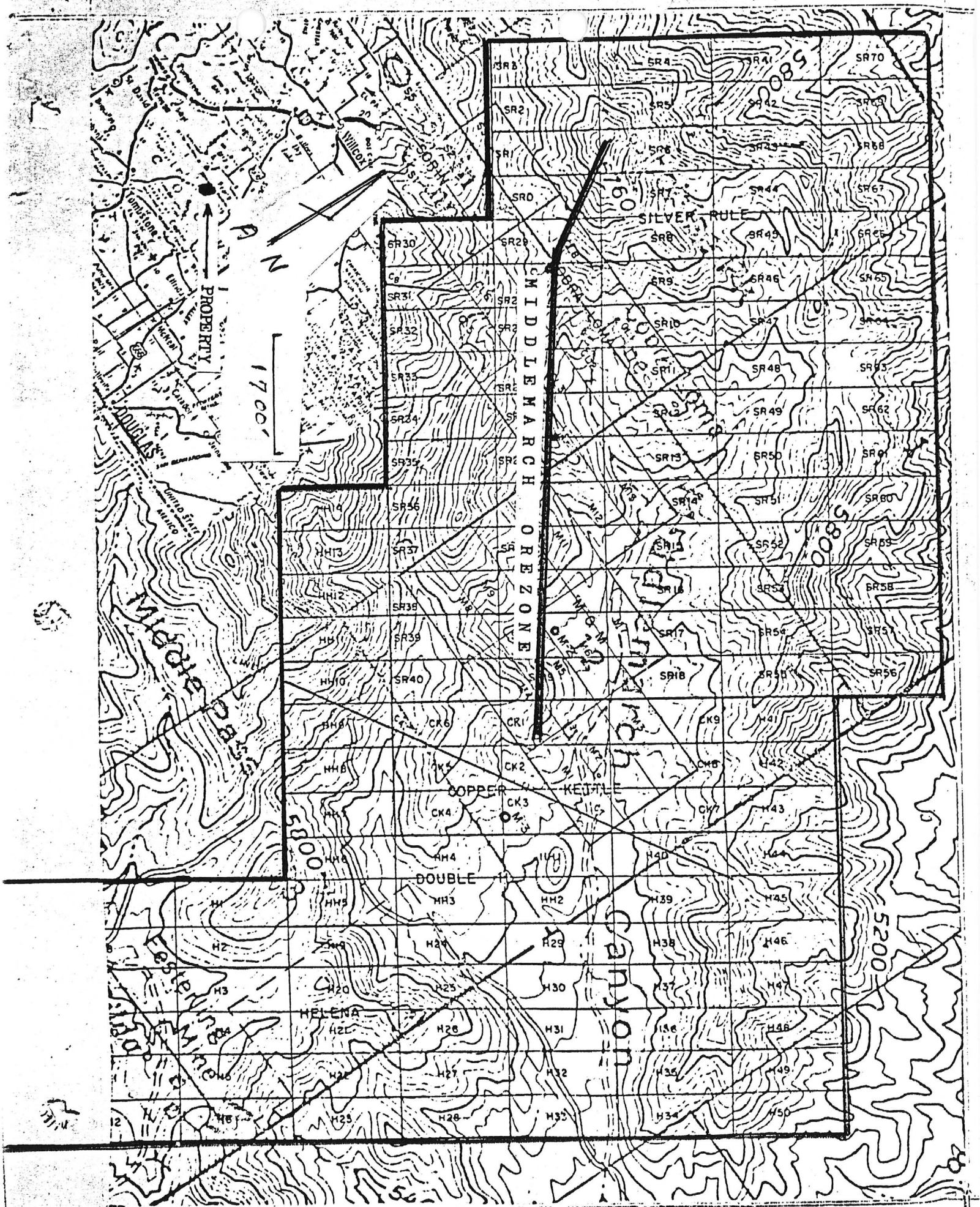
	Tailings weight %	Copper %	Tailings weight %	Copper %
On 65 mesh	3.46	0.77	0.66	0.66
" 100 "	16.26	0.22	6.88	0.19
" 150 "	16.48	0.11	16.31	0.15
" 200 "	19.50	0.04	13.50	0.16
Through 200 "	44.30	0.04	62.65	0.04

Tyler standard screens were used in above analyses.

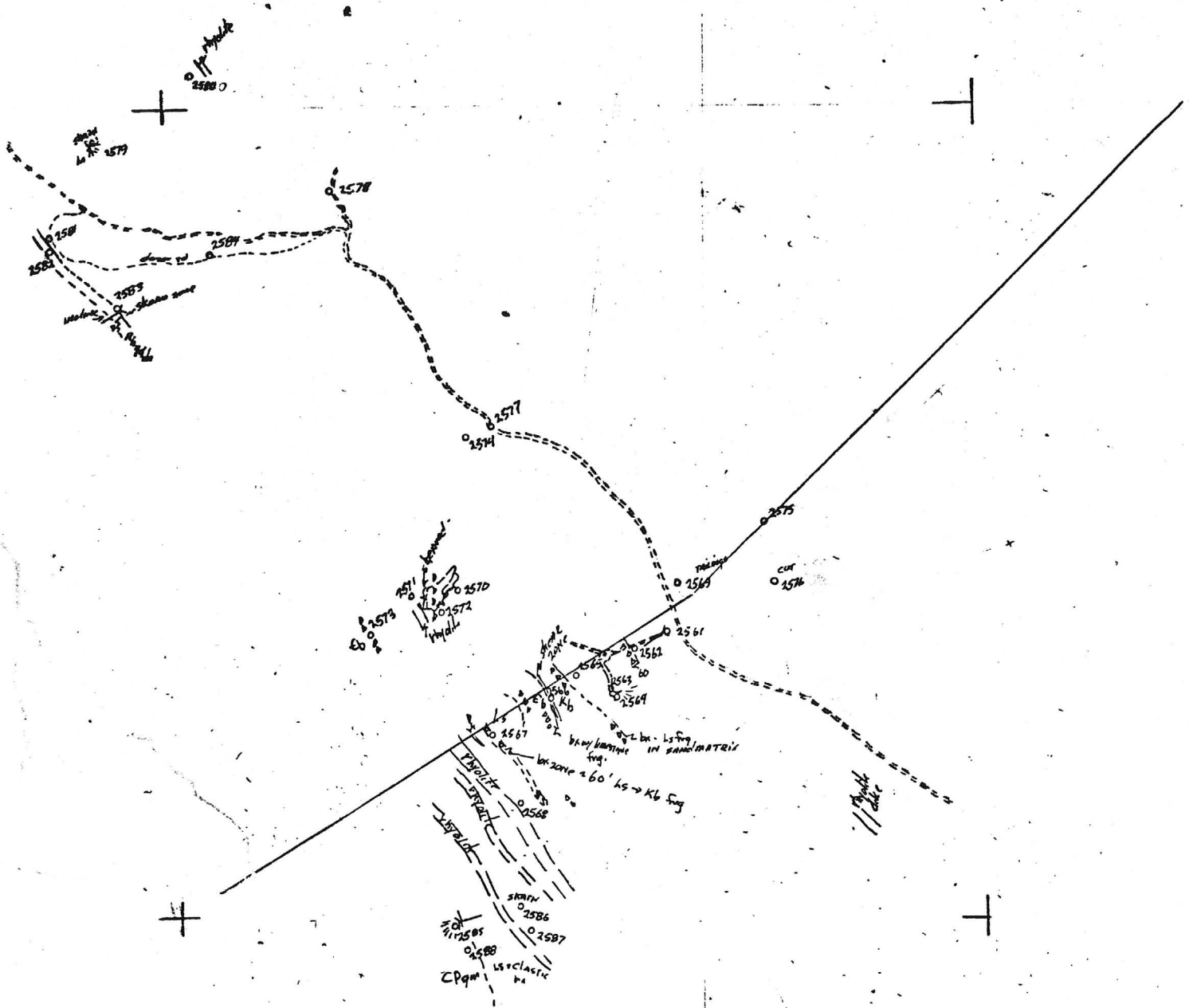
The concentrate is marketed under contract with the Copper Queen smelter, at Douglas, 60 miles south of the property. As showing its quality, the following assays of shipments are given:

Lot number	Moisture %	Silver oz.	Copper %	Silica %	Alumina %	Iron %	Lime %
33	10.9	5.30	17.63	13.8	1.2	21.6	4.6
34	9.2	5.78	16.90	14.6	6.5	22.8	4.5
35	12.0	6.30	15.62	15.2	7.1	21.4	3.8
36	13.2	7.30	15.05	13.0	7.8	21.6	3.2
37	11.7	6.34	14.96	18.0	6.9	21.6	3.6
38	16.0	6.12	13.20	15.2	8.2	17.0	5.7
39	13.8	8.20	18.08	7.8	4.6	21.4	3.3


N
Paved Road
Dirt Rd.
36 Mi From Middle March to Willcox
6½ Mile from Sunsites to Middle March Mine
Rd. to be Improved
To Willcox
Cochise Stronghold
House
666 Hwy.
Sunsites
Abril Mine
Cochise Pk.
Cobra Loma Mine
Middle March Mine
Middle March Canyon
Sorin Camp Mine
Middle March Pass Rd.
Ranch House
Bob Barber Ranch House
Pearce
Common Wealth Mines
666 Hwy.
To Douglas
To Black Diamond Mine
To Courtland
W
E



Gerald L. Kirwan



SAMPLE STATION LOCATIONS AND NUMBERS

SECTION 12 MIDDLEMARCH MINE AREA

SCALE 1" = 1000'

COBRELOMA CONSOLIDATED COPPER CO. ARIZONA.

Office; 212 Henne Bldg., Los Angeles, Cal. Mine office: Middlemarch, Cochise Co., Ariz. Richard Gird, president; M. M. O'Gorman, vice-president; Wm. J. Gird, secretary and treasurer; preceding officers, Robert C. Davis and Edw. C. Kelley, directors. Organized under laws of California, with capitalization $1,000,000, shares $50 par; issued, $500,000. Lands, 43 claims, in 9 groups, which have had more or less desultory development in the past, 9 miles west of Pearce, present terminus of the Arizona & Colorado railroad. Surface indications are promising, but development, which is to a limited depth only, has as yet shown no large ore bodies. Property is opened by the 165′ Ella shaft, showing 4% ore; the 105′ Emma shaft and the 120′ Emma tunnel, the 344′ Iron Age tunnel, crosscutting a 12′ vein, and the 386′ Carpena tunnel, planned to cut rich ore outcropping on the surface of Richmond Hill, and a 90′ tunnel on the Cobreloma claim, planned to penetrate Copper Glance Hill, which shows sulphide ore in a 70′ shaft. There also are several other shallow shafts. Ore occurs in a mineral zone carrying 6 distinct veins, which are substantially parallel, limestone and porphyry being the country rocks, with a garnet capping that is 200′ wide in places. Property has steam power and a telephone system, and is regarded as promising. It is planned to consolidate, 1906, with the Middlemarch Copper Co. Copper Handbook 1906

MIDDLEMARCH COPPER CO. ARI

Office: 212 [illegible] Los Angeles, Cal. Mine office: Middlemarch, Cochise Co., Ariz. Mine formerly owned by Gird Bros. and M. M. O'Gorman, of Los Angeles, Cal. Inc. April 26, 1907, in California. Cap., $1,000,000, increased March 28, 1906, to $3,000,000; shares $100 par. Absorbed Cobreloma Consolidated Copper Co., about 1907. Annual meeting, Monday in April. Reported to be under option for about $50,000 to [illegible] Mitchell, Jr., Los Angeles, Cal.

Property: 68 claims, 1,360 acres, in the Dragoon mountains, show several contact deposits between limestone and granite-porphyry, with general N. W. strike, and dip of 42 to 54°. The 2 orebodies under development, said to be 30 to 80′ wide, show oxidized ores succeeded by chalcopyrite, with some chalcocite.

Development: by 9 shafts, deepest 210′, and 6 tunnels, total workings being about 2 miles, estimated by management to show 200,000 tons of ore, with 100,000 tons blocked out for stoping in the Missouri mine, with ore in other properties, though not extensively developed.

Equipment: includes a 300-h. p. steam plant, 50-h. p. hoist and 4-drill Laidlaw air compressor. There are 12 buildings, including engine house, boiler house, machine shop and smithy. COPPER HANDBOOK 1916 MINES

MIDDLEMARCH COPPER CO. ARIZONA

Office, 212 Henne Bldg., Los Angeles, Cal. Mine office: Middlemarch, Cochise Co., Ariz. H. Bert Ellis, pres.; F. C. Austin, vice-pres.; Wm. King Gird, sec.; Wm. LeMoyne Wills, treas.; preceding officers, Mrs. M. M. O'Gorman and Mrs. Richard Gird, directors; Edw. J. Kelly, supt. Organized April 26, 1907, under laws of California, capitalization $1,000,000, increased March 28, 1906, to $3,000,000, shares $100 par. Absorbed the Cobreloma Consolidated Copper Co., about 1907. Annual meeting, first Monday in April.

Lands, 68 claims, 1,360 acres, in the Dragoon mountains, showing several contact deposits between limestone and granite-porphyry, having a generally northwest strike, with dip of 42 to 54°. The 2 orebodies under development, said to be 30 to 80′ wide, show oxidized ores succeeded by chalcopyrite, with some chalcocite.

Development is by 9 shafts, deepest 210′, and by tunnels of 625′, 450′ and 390′, with 3 others, the total workings being about 2 miles, estimated by management to show 200,000 tons of ore, with 100,000 tons blocked out for stoping in the Missouri mine, with ore in other properties, though not extensively developed.

Equipment includes a 300-h. p. steam plant, 50-h. p. hoist and 4-drill Laidlaw air compressor. There are 12 buildings, including a 30x38′ engine house, 32x38′ boiler house, 30x38′ machine shop and 20x30′ smithy.

The reduction plant includes a concentrator and smelter in a 40x100′ building. The mill of 50 tons daily capacity, receiving ore by a 300′ ground tram from the portal of the Missouri tunnel, has an 8x12″ Blake crusher, 2 Huntington mills, 2 rolls, 2 Bartlett tables, 1 slime table and 3 sizers. The smelter, when operated, made matte averaging 55 to 70% copper, 20 to 100 oz. silver and 0.25 to 2 oz. gold per ton. Work, 1912, was confined to the Cobreloma claim, about 200′ of new openings showing mainly bornite of about 5% copper tenor. Property considered promising.

ARIZONA MIDDLEMARCH COPPER CO. ARIZONA

Office: Middlemarch, Pearce, Ariz. MINES Handbook 61-XVI

Officers: W. A. Potter, pres.; D. B. Wellcome, v. p.; E. D. Elson, sec.-mgr., with F. C. Austin, D. R. Weller, H. H. Bones, Paul Legrande, W. E. Austin, J. W. A. Off, all of Los Angeles, Calif., directors. Geo. Brown, gen mgr.

Inc. Dec., 1916, to take over the property of Middlemarch Copper Co., under lease and bond. Has since acquired 8 additional claims adjoining. Cap. $1,000,000; $1 par; 700,000 shares issued April 1, 1919.

Property: 43 claims, over 860 acres, in Dragoon Mtns., 9 miles W. of Pearce, Ariz. Sedimentary rocks are intruded by granite stocks and quartz porphyry dikes of great width, making contact zones of garnet, epidote, pyroxene, etc., with limestone, hematite, copper oxides and carbonates. The Cobrelona workings show a 2′-4′ vein between granite and slate, with ore along a 200′ drift. 500 tons of commercial ore is blocked out in mine workings on Missouri.

Development: principal development on Missouri claim, shows a chimney of contact metamorphic ore. Stopes on fifth level 40 to 50′ in diameter. Oxidized ore was high-grade, but below a thin zone of enrichment primary chalcopyrite ore of approximately 2% copper was encountered. Workings include a 250′ incline and a 300′ vertical shaft.

Equipment: includes compressor, hoist and steam pump. Mill is a straight flotation plant of 100 tons daily capacity erected in 1917 and operated as steadily as the limited water supply permits. The ore is crushed to 1½″ max., then fed to 6′ ball mill in closed circuit with an Akins classifier, pulp going to 2 launder flotation machines. A K. & K. flotation machine is used as a cleaner. Tailing from roughers goes to a Dorr thickener for recovery of water. Power for mill and 25 k. w. alt. current generator is obtained from a 200-h. p. oil engine. Mill makes recovery of 90% of copper content, concentrates averaging 16% copper and 6 oz. silver per ton. Shipments to April 1919, total 51 cars concentrate and 3 cars crude ore, and mill continued to operate until September 1920, when water shortage compelled a shut-down. Idle save for assessment work 1921 to 1924. Enlargement of mill contemplated when mine development warrants. About 20 men employed.

N.

T-18 S.
R-23 E

Sec. # 2

Sec. # 1

T. 18 S
R. 23 E.

W

Sec #10

	Sorin #3	Cobra Loma #8	Cobra Loma #1
Sorin #5	Sorin #2	Cobra Loma #7	Cobra Loma #2
Sorin #4	Sorin #1	Cobra Loma #6	Cobra Loma #3
		Cobra Loma #5	Cobra Loma #4

Sec. #12

m-m #13		
m-m #12		
m-m #11	m-m #7	
m-m #10	m-m #6	m-m #3
m-m #9	m-m #5	m-m #2
m-m #8	m-m #4	m-m #1

E

T-18 S.
R-23 E.

T-18-S.
R-23-E.

Sec. # 11

S

---- Rd.
mines

By A.R. Smith
For Co-Poly.

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

January 19, 1968

Mr. Jack Still
5215 N. Oracle Road
Tucson, Arizona 85704

Dear Mr. Still:

We have much less information concerning the Middlemarch property than I thought. Copies of what we do have are enclosed.

There is a PhD thesis by D. J. Cederstrom, "Geology of the Central Dragoon Mountains, Arizona", that should cover the Middlemarch Mine. Also U.S.G.S. Professional Paper 281, "General Geology of Central Cochise County, Arizona", pages 140, 141, and 142 may be helpful and it has a geological map.

Sorry we have no further information.

Sincerely,

F. T. JOHNSON,
Field Engineer

FTJ:lm

Enc. 3

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

March 27, 1967

COPY

Mr. O. H. Smith
206 N. Cochise
Willcox, Arizona

Dear Mr. Smith:

We are sorry that the enclosed information on the Middlemarch and Cobreloma is all we have, except geological references, to send you in reply to your letter of March 23rd.

Geology of the area is written up in New Mexico Bureau of Mines Bulletin 66, Summary of Pennsylvania Sections in Southwestern New Mexico and Southeastern Arizona, 1960; and U. S. Geological Survey Professional Paper 281 (pages 81 and 141) entitled General Geology of Central Cochise County, Arizona.

These geological articles are not very helpful to a layman, since they do not go into the mineralization. However, we can photocopy the principal one if you think it will help you. It does mention the Cobre Loma and Soren Camp.

Sincerely yours,

FRANK P. KNIGHT, Director.

FKtp
Enc

In October, 1942, the Middlemarch property (which was idle) was owned by Mr. Gilmore of Douglas, Arizona, and Edward J. Kelly of Pearce. According to Mr. Kelly, to 1921, 300 cars of concentrates had been produced.

Character of the Ore: Low-grade sulphides of copper and zinc carrying some gold and silver.

General Information: This property produced high grade copper-gold-silver ore near the surface in late 1890 and early 1900. Ore was smelted at the mine. Ore occurs in a quartz-porphyry chimney that is about 40 to 50 feet wide in cross-section on 4th level. Ore dips at 45° and was opened up to 375 ft. by inclined shaft from which 5 levels were run below the 4th level, and all worked to some extent. Five samples taken at 4th level averaged 0.41% Cu, and 4.8% Zn over 5 ft. cuts. At the Cobreloma Tunnel 1 mi. W. a drift was driven on a vein. Only part of this drift is accessible. From a 50 to 60 ton pile of ore on the dump a grab sample gave 1.6% Cu and 0.1% Zn.

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

March 27, 1967

COPY

Mr. O. H. Smith
206 N. Cochise
Willcox, Arizona

Dear Mr. Smith:

We are sorry that the enclosed information on the Middlemarch and Cobreloma is all we have, except geological references, to send you in reply to your letter of March 23rd.

Geology of the area is written up in New Mexico Bureau of Mines Bulletin 66, Summary of Pennsylvania Sections in Southwestern New Mexico and Southeastern Arizona, 1960; and U. S. Geological Survey Professional Paper 281 (pages 81 and 141) entitled General Geology of Central Cochise County, Arizona.

These geological articles are not very helpful to a layman, since they do not go into the mineralization. However, we can photocopy the principal one if you think it will help you. It does mention the Cobre Loma and Soren Camp.

Sincerely yours,

FRANK P. KNIGHT, Director.

FK:p
Enc

In October, 1942, the Middlemarch property (which was idle) was owned by Mr. Gilmore of Douglas, Arizona, and Edward J. Kelly of Pearce. According to Mr. Kelly, to 1921, 300 cars of concentrates had been produced.

Character of the Ore: Low-grade sulphides of copper and zinc carrying some gold and silver.

General Information: This property produced high grade copper-gold-silver ore near the surface in late 1890 and early 1900. Ore was smelted at the mine. Ore occurs in a quartz-porphyry chimney that is about 40 to 50 feet wide in cross-section on 4th level. Ore dips at 45° and was opened up to 375 ft. by inclined shaft from which 5 levels were run below the 4th level, and all worked to some extent. Five samples taken at 4th level averaged 0.41% Cu, and 4.8% Zn over 5 ft. cuts. At the Cobreloma Tunnel 1 mi. W. a drift was driven on a vein. Only part of this drift is accessible. From a 50 to 60 ton pile of ore on the dump a grab sample gave 1.6% Cu and 0.1% Zn.

STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX, ARIZONA 85007

January 19, 1968

COPY

Mr. Jack Still
5215 N. Oracle Road
Tucson, Arizona 85704

Dear Mr. Still:

We have much less information concerning the Middlemarch property than I thought. Copies of what we do have are enclosed.

There is a PhD thesis by D. J. Cederstrom, "Geology of the Central Dragoon Mountains, Arizona", that should cover the Middlemarch Mine. Also U.S.G.S. Professional Paper 281, "General Geology of Central Cochise County, Arizona", pages 140, 141, and 142 may be helpful and it has a geological map.

Sorry we have no further information.

Sincerely,

F. T. JOHNSON,
Field Engineer

FTJ:lm

Enc. 3

04/16/90

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: MIDDLEMARCH MINE

ALTERNATE NAMES:
MISSOURI

COCHISE COUNTY MILS NUMBER: 102

LOCATION: TOWNSHIP 18 S RANGE 23 E SECTION 12 QUARTER E2
LATITUDE: N 31DEG 54MIN 36SEC LONGITUDE: W 109DEG 46MIN 24SEC
TOPO MAP NAME: PEARCE - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
LEAD
ZINC

BIBLIOGRAPHY:

USGS PP 281, P. 140
USGS PP 318, P. 96
ADMMR MIDDLEMARCH MINE FILE
ADMMR "U" FILE
NEW MEXICO BULL 66, P. 109
AZBM BULL 187, P. 10; P. 18 (ABRIL) P. 30
AZ MINERAL COMMODITY UPDATE ON ZINC, 11-3-77
D.D RABB, BUR OF GEO & MIN TECH.
THESIS - GEO OF THE CENTRAL DRAGOON MTNS. BY
D. J. CEDERSTROM (NOT IN ADMMR FILES)
KREIDLER, TERRY J., "MINERAL-RESOURCE POTEN-
TIAL OF THE DRAGOON MOUNTAINS RARE II
FURTHER PLANNING AREA, COCHISE CO, AZ" U S
BUR OF MINES MLA 35-82, 1981 ADMMR GEO FILE
SEGUIN, J.M., GEO REPORT ON THE MIDDLEMARCH
PROPERTY, 1989. GEO FILE

MIDDLEMARCH MINE

Cochise County
Dragoon District

CJH WR 3/4/80: Howard Birchfield, P.O. Box 116, Pearce, Arizona 85625. Holds Middlemarch Mine, Cochise County. Wants to buy milling equipment, i.e., rod mill, cone crusher, 24X24 float cells, two drum and two disc filters, 4 - 2" sand pumps, rubber tired 2 yd. loader.

GWI WR 5/6/80: Howard Birchfield in office regarding the Middlemarch Mine. The owners of record are: Bill Moores, Howard Birchfield and Keith McDaniels.

CJH WR 2/20/81: Mr. Keith McDaniel, P.O. Box 598, Pearce, Arizona 85625, telephone 826-3546, visitor in office. Mr. McDaniel and two other parties, Lloyd Richards, P.O. Box 143, Pearce, Arizona 85625, and William M. Moores, 3880 Sleepy Hollow Drive, Santa Rosa, California 95401, phone (707) 544-2166. With the exception of Mr. Richards, whose title is not quite cleared, these people own the Middlemarch Mine, Cochise County (Cu,Pb,Zn,Ag,Au). Their plans are to dewater the Missouri shaft, conduct a sampling program and, if the ore reserves warrant build a 250 TPD mill.

MG WR 5/6/83: Drove through the Middle Pass mining district and visited the Christmas, Festerling, Middlemarch and Stand Tungsten mines. There was no sign of activity at any of these mines.

MIDDLEMARCH MINE COCHISE

Gerry Kirwan (G.W. Mining & Minerals Co. file) stated that he is trying to negotiate lease on Middlemarch from Mr. Birchfield. Has plenty of money to open up, having problems clearing title at this time. 9/9/75 info. from Mr. Kirwan's office visit.

Birchfield, Jr., has approached Jerry McCollum to mill ore from the Middlemarch and Cobre Loma claims. We suggested: (1) a mill flow sheet for ores (2) an experienced metallurgist who can train mill employees (3) contracts for sale of products (4) and an "air tight" legally binding contract with Birchfield. VBD WR 8/20/75

Bob Lehner stopped at the office to pick up copies of reports (and add one) on the Middlemarch Mine per instructions from the owner, Howard Birchfield, Jr. Assumption is made that Freeport Minerals is examining the property with the idea of getting an option. VBD WR 11/13/75

Bill Edgemon called to report that he was still pumping water from underground workings at the Middlemarch Mine near Pearce. The water is now below the seventh level. Jay McLaughlin, former Bisbee foreman, is directing the work. VBD WR 1/6/77

Jack Hamilton reported Will Edgemon and Jim Hicks had delivered samples to the Tonto Mill from the Middlemarch mine in Cochise County for metallurgical tests. The ore is reported to carry two percent copper, eleven percent zinc and 3 to 5 ounces of silver. WR VD 2/28/77

Telephone conversation with Howard Birchfield, Jr.: The Middlemarch shaft has been dewatered to the 6th level and is expected to be pumped to the bottom eighth level in a few days. There are 130,000 tons estimated blocked ore on the 6th level which assays about 10 percent zinc, 3 percent copper and a few ounces of silver. WR VD 3/3/77

Birchfield expects to mine 150 tons per day from the shaft to be shipped to either ASARCO Mill at Deming, New Mexico or to Tonto Mining and Milling Company at Punkin Center. The shaft has been retimbered and new rail placed on the 600 level. The company hopes to develop water encountered in an exploration hole to 200 gallons per minute. A subcontract has been let on a decline 10 feet by 10 feet to test another part of the deposit. The decline will be 100 feet deep when completed. (1 hr.). WR VD 3/3/77

MIDDLEMARCH MINE COCHISE COUNTY

Mine visit to Co-Poly Chemical Mining Co. - Has been known as the Gorman and as the Middlemarch mine -no one around. GWI WR 5-7-67

Mine visit - Co-Poly Chemical Co. - no one around. (Middlemarch Canyon)
GWI WR 10-8-67

Basic Metals and Minibank hold a great number of claims from the San Juan thru Middlemarch pass, Sorens Camp and the Middlemarch mine, formerly known as the Gorman (1880's). They have built some roads and drilled a few holes. GWI QR 2-27-70

F. V. Owens who says he is 3/4 owner of the Middlemarch property visited the office. Reports reviewed. FTJ WR 10-30-70

Mr. Birchfield is reported to have the Middlemarch property and trying to raise money or option it. GWI QR 4-1-71

Mine visit - Middlemarch (Gorman) mine - shown around by H. Birchfield. GWI WR 4-12-71

Mr. H. Birchfield has been doing some drilling and blasting at the Middlemarch (Gorman) property that he has staked in Middlemarch Canyon and on the east slope of the Dragoon Mountains in that area. GWI QR 6-30-71

Mr. Harold Birchfield is doing some work at his (Gorman or Middlemarch) property. He made the Tucson Newspapers regarding forest damage. It has been reported that Mini-Bank who had a deal with him is suing in court. (No Confirmation) GWI QR 9/71

Mr. Harold Birchfield is reported to be continuing his assessment work at and around the old Gorman property (Middlemarch). GWI QR Oct-Dec '71

Mr. Harold Birchfield is working around the Gorman (Middlemarch) area. GWI QR Jan.-March '72

Mr. Harold Birchfield is still working at the Gorman (Middlemarch) mine area. GWI 4 ¼ 1972

Mine visit. Middlemarch mine (gorman). Mr. Howard Birchfield reports that he has optioned it to Homestake Mining Co. He also reported that Howard Birchfield Sr. was mining at the Lone Star Fluorspar mine, and that he had optioned the Red Bird mine - Red Bird Hills south of I'10 to Whitelock. (Conflict somewhere as Maurice Hedderman claims to have owned the Red Hills mine for several years and has faithfully executed the annual assessment work.)
GWI WR 1/17/73

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona

1. Information from: Various sources. Company called Co-Poly Chemical Mining Co.

   Address: O. H. Smith, 206 N. Cochise, Willcox, Arizona.

2. Mine: Known as Gorman in the 80's info from J. Escapule & A. Lamb.

3. No. of Claims - Patented _____ Unpatented ??

4. Location: In Middlemarch canyon Dragoon Mts. Cobra Loma Sec. 2, T18S, R23E

5. Sec 12 Tp 18S. Range 23E 6. Mining District Dragoon

7. Owner: Co-Poly Chemical Co. So far as I can find out.

8. Address: same as above.

9. Operating Co.: same.

10. Address: Red Cline, Les Kilpatric, and Omer H. Smith and a fourth partner, Chuck Mal a banker on the west coast who died.

11. President: _____ 12. Gen. Mgr.: _____

13. Principal Metals: Copper 14. No. Employed: _____

15. Mill, Type & Capacity: Don't know

16. Present Operations: (a) Down ☐ (b) Assessment work ☐ (c) Exploration ☐ (d) Production ☐ (e) Rate _____ tpd. ?

17. New Work Planned: _____

18. Miscl. Notes: Before World War 1, there had been a smelter & Table mill, later on a flotation mill. At present plastic pipe has been run into an adit, and connected to several leaching ponds below the adit level. The water can be pumped into these ponds. Some of the ponds have been bulldozed in the old tailings pond. Others have been made of concrete blocks. In either case they have been lined with plastic sheeting.

Heard that the company had been sold recently but have not been able to verify it.

Visited by engineer 5/11/67 No one around.

Date: 5/11/67

G W Imus
(Signature) (Field Engineer)

LLOYD RICHARDS
P.O. BOX 143
PEARCE, ARIZONA 85625
602-824-3576

GOLD - SILVER - ZINC - COPPER

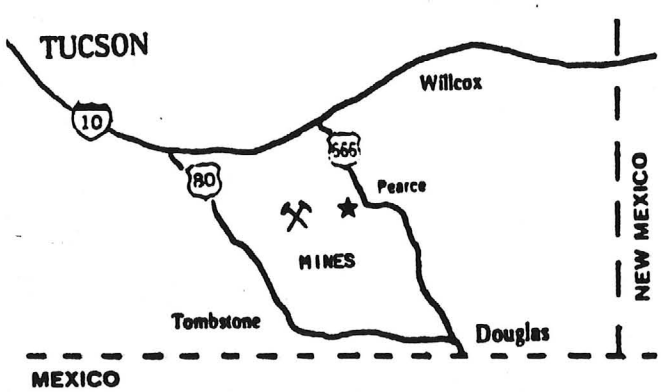
320 Contiguous Mining Claims

LOCATION

Middlemarch Pass in Dragoon Mountains
Elevation 5,200 feet
80 miles SE of Tucson / 15 miles east of Tombstone

ADVANTAGES

* *Easy Access*
  8 miles of good road to Highway 666
* *Nearby Transportation Facilities*
  22 miles from railroad
* *Water Rights / Ample Water*
* *Electric Power Near Property*
* *Operable 365 Days Per Year*
* *Existing Mine Shafts*



In October, 1942, the Middlemarch property (which was idle) was owned by Mr. Gilmore of Douglas, Arizona, and Edward J. Kelly of Pearce. According to Mr. Kelly, to 1921, 300 cars of concentrates had been produced.

Character of the Ore: Low-grade sulphides of copper and zinc carrying some gold and silver.

General Information: This property produced high grade copper-gold-silver ore near the surface in late 1890 and early 1900. Ore was smelted at the mine. Ore occurs in a quartz-porphyry chimney that is about 40 to 50 feet wide in cross-section on 4th level. Ore dips at 45° and was opened up to 375 ft. by inclined shaft from which 5 levels were run below the 4th level, and all worked to some extent. Five samples taken at 4th level averaged 0.41% Cu, and 4.8% Zn over 5 ft. cuts. At the Cobreloma Tunnel 1 mi. W. a drift was driven on a vein. Only part of this drift is accessible. From a 50 to 60 ton pile of ore on the dump a grab sample gave 1.6% Cu and 0.1% Zn.

MIDDLEMARCH MINE

COCHISE COUNTY
DRAGOON DISTRICT

COPPER HB (1908) p536-537 App. S12, T18S, R23E. (9 miles W. Pearce)

COBRELOMA CONS. COPPER CO, 212 Henne Bldg., Los Angeles and Middlemarch Ariz. Richard Gird, Pres. M. M. O'Gormon, V.P. - Wm. J. Gird Sec'y and Treas. organized under California Laws.

43 Claims in 9 groups which have more or less desultry development in past. Surface indications are promising, but development to a limited depth has revealed no large ore bodies. Opened by 160' Ella shaft showing 4% ore; the 105' Emma shaft and the 120' Emma tunnel; the 344' Iron Age tunnel, crosscutting a 12' vein, and the 386' Carpena tunnel planned to intersect rich ore on surface of Richmond Hill, and a 90' tunnel on the Cobreloma Claim, planned to cut Copper Glance Hill, which shows sulphide ore in a 70' shaft. There are several shallower shafts. Ore occurs in a mineral zone carrying 6 veins, substantially parallel, limestone & porphyry being the country rocks, with a garnet capping that is 200' wide, locally. Property has steam power and telephone system. In 1906 the company planned to consolidate with the Middlemarch Copper Co.

Taken from LAS reference cards.

Date Printed: 12/24/97

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION SUMMARY

Information from: **Walter Sonnenberg**

Company:

Address: N123 15 Wheeler Lane
City, State ZIP: Athelstone, WI 54104
Phone: 715-856-5798

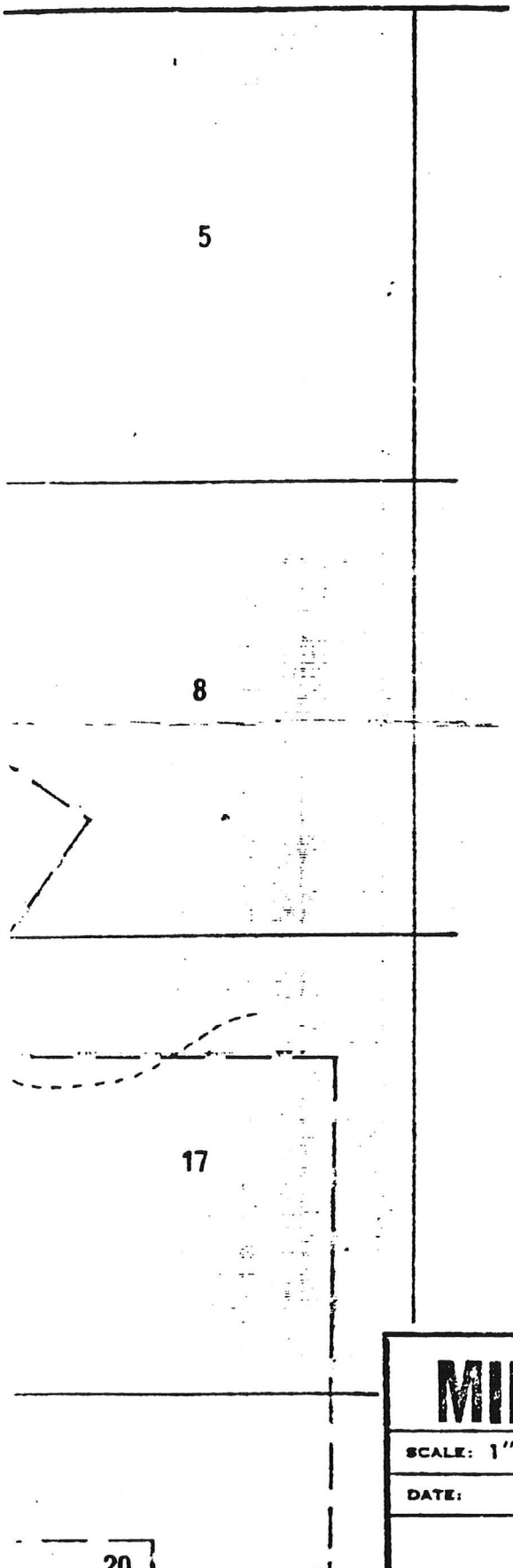
MINE: **Middlemarch**

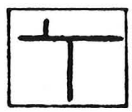
ADMMR Mine File: Middlemarch
County: **Cochise**
AzMILS Number: **102**

SUMMARY

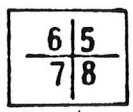
Walter Sonnenberg
715-856-5798
Walter Sonnenberg N123 15 Wheeler Lane, Athelstone, WI 54104, phone 715-856-5798, was in and reported that he has located six claims, the Missouri 1-6 at the Missouri shaft on the Middlemarch Mine [Cochise AZMILS # 102) property in the SE, Sec. 11, T18S,R23E. He explained that the lower levels are flooded and that he plans to set a pump and to muck out the portal over the next year. He also said he has obtained most of West Pride's previous drilling results.

Ken A. Phillips, Chief Engineer Date: December 24, 1997

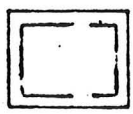




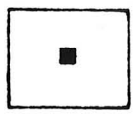
TWP BOUNDARY



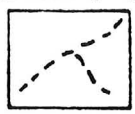
TWP SECTIONS



MIDDLEMARCH PROPERTY BOUNDARY
APPROXIMATE - UNSURVEYED



PAST MINING SITES - SHOWINGS
POSITION APPROXIMATE



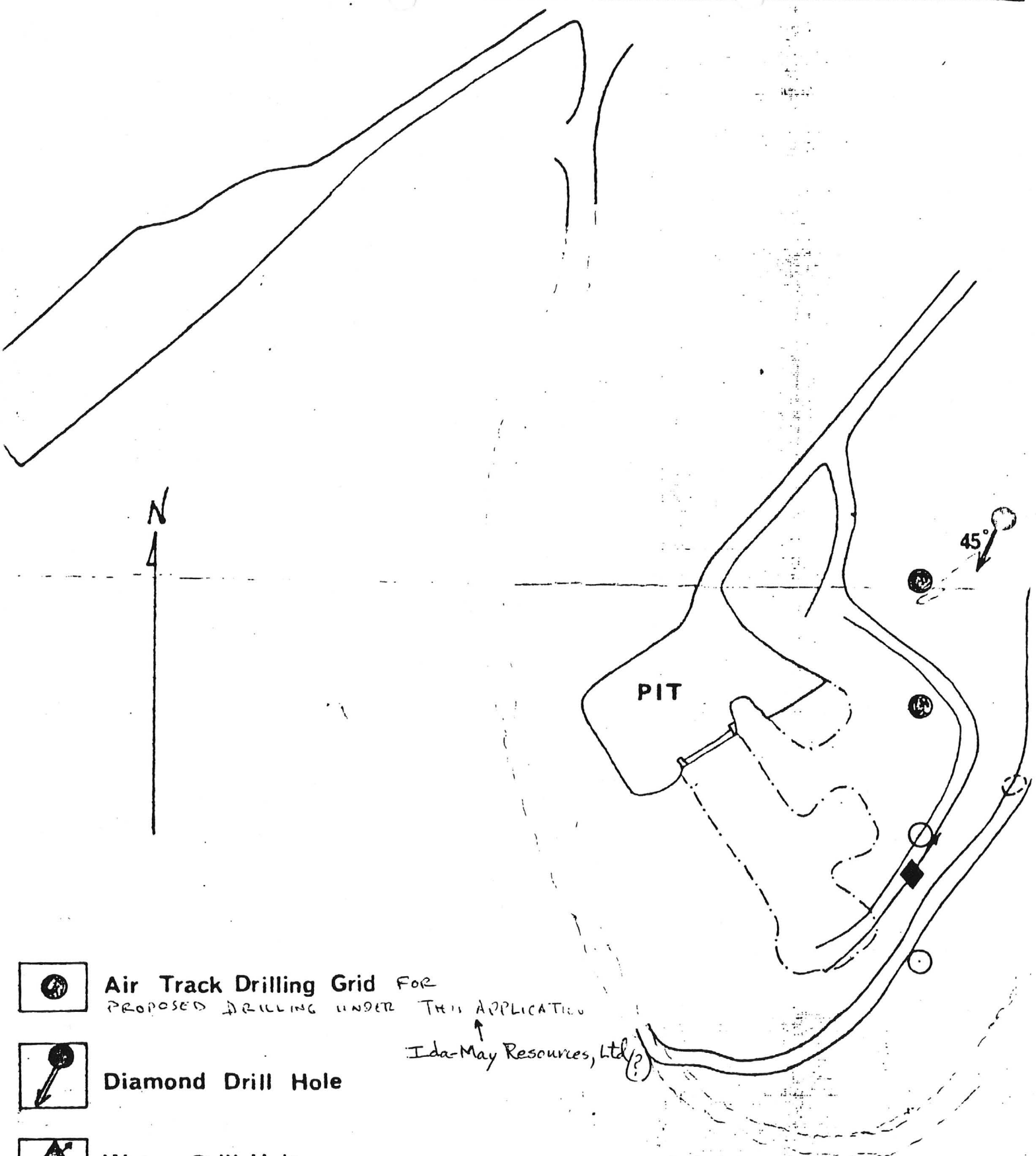
MAIN ACCESS ROADS
POSITION APPROXIMATE

MIDDLEMARCH PROPERTY

SCALE: 1" = 2000'	APPROVED BY:	DRAWN BY
DATE:		REVISED

CLAIM BOUNDARY

DRAWING NUMBER

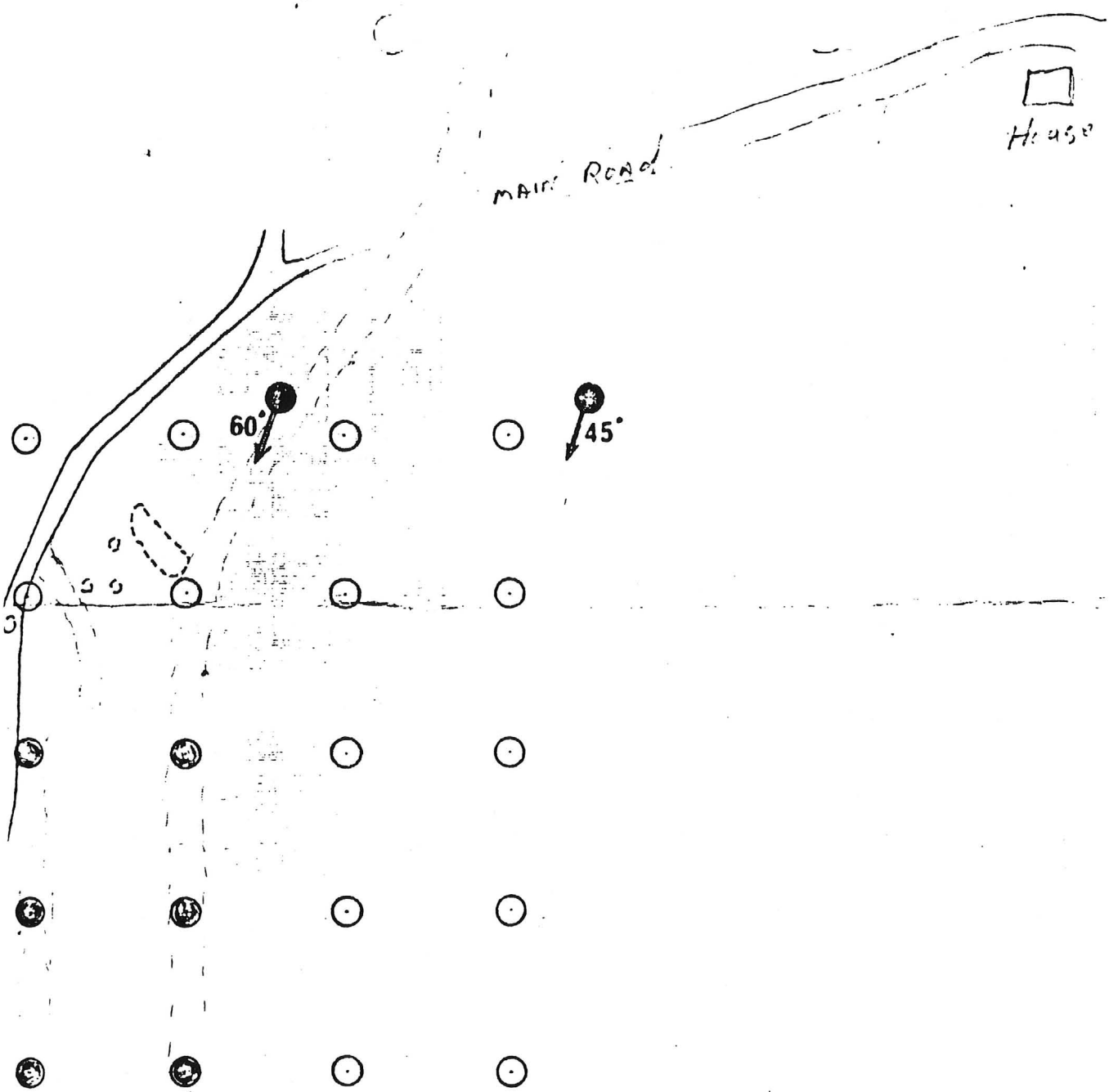


Air Track Drilling Grid FOR PROPOSED DRILLING UNDER THIS APPLICATION

Ida-May Resources, Ltd (?)

Diamond Drill Hole

Wagon Drill Hole



MIDDLEMARCH PROPERTY

SCALE: 1" = 40'	APPROVED BY:	DRAWN BY D.C.I.
DATE: MAR 28/82		REVISED

PIT AREA

DRILL HOLE PROPOSAL

DRAWING NUMBER

cc: ABD / Hon

VERITY & SMITH
ATTORNEYS AT LAW
SUITE 902 TRANSAMERICA BUILDING
177 NORTH CHURCH AVENUE
TUCSON, ARIZONA 85701

VICTOR H. VERITY
LEO N. SMITH
JOHN C. LACY
DESMOND P. KEARNS

AREA CODE 602
TELEPHONE 622-7445

March 2, 1973

Mr. George E. Reeves
Assistant Counsel
Homestake Mining Company
650 California Street
San Franciso, California 94108

Re: Birchfield, et al, Properties
Cochise County, Arizona

Dear George:

I am writing this letter pursuant to your letter to Victor H. Verity of this office of January 29, 1973 and in response to the questions raised therein.

The opinions expressed below are based on the assumptions set forth in your letter and are limited to the effect of the documents submitted as between the parties to the documents -- namely F. V. Owens, et ux, Howard A. Birchfield, Jr., Helen Birchfield Bailey and Basic Metals, Inc. or their successors in interest claiming by, through and under the named parties. For purposes of the opinions I am assuming that each of the documents was executed by each of the parties to the documents (even though some of the copies submitted did not contain signatures) and am assuming further that the individuals executing the documents on behalf of Basic Metals, Inc. had the necessary authorization and capacity to execute such documents on behalf of the corporation.

Question 1: What interests, if any, did Basic Metals acquire by virtue of Paragraph 3 of the Agreement (Howard A. Birchfield, Jr. - Basic Metals, Inc. Agreement of November 13, 1969)?

In my opinion, Basic Metals, Inc. can assert no interest under Paragraph 3 of the November 13 Agreement in and to the title to the unpatented claims described in the September 15, 1969 Mining Lease and Option to Purchase. Inasmuch as Howard A. Birchfield, Jr. was married to Helen Birchfield (Bailey) as of November 13, 1969, any attempt by Birchfield to convey an interest in the community real property would

be a nullity, since Howard A. Birchfield had neither title nor the right to possession at the time of the purported conveyance (title being in the community and right of possession being in Basic Metals). See A.R.S. § 33-452.

The Agreement recites that Howard A. Birchfield relinquished, disclaimed, renounced and assigned to Basic Metals, Inc. all of his "claims, interests, royalties or income" to be derived from the September 15, 1969 Mining Lease and Option Agreement. Although the word "claims" is used, it is not clear whether or not the word was intended to refer to "mining claims" or to "claims" of another nature (i.e., claims to proceeds or payments). The use of the word "claims" in conjunction with the words "interest, royalties or income" would favor a construction negating an intent to convey a real property interest (as contrasted to an intent to convey or assign payments of monies). A.R.S. § 25-211B vests in the husband, as the agent for the community, the right to dispose of personal property on behalf of the community. A.R.S. § 25-314 provides that after an action for divorce is filed, the husband shall not dispose of any community property. A phone call to the office of the Clerk of the Superior Court, Cochise County, reveals that the complaint in the Birchfield divorce action was filed on August 18, 1969. The language in A.R.S. § 25-314 would appear to void any conveyance by the husband after the filing of the divorce. However, the Arizona Supreme Court has indicated that the statutes cannot be construed as a flat prohibition against such a disposal but shifts the burden of proving the benefit to the community to the party asserting a community liability. (See, e.g., Spector v. Spector, 94 Ariz. 175, 382 P.2d 659 (1963). In view of the foregoing, it is my opinion, based solely on the documents submitted that the attempt by Howard A. Birchfield, Jr. to transfer his interest would come within the prohibition set forth in A.R.S. § 25-314. Extrinsic facts might be shown that would cause a different result but such a possibility is beyond the scope of this opinion.

Question 2: What interests, if any, did Basic Metals abandon by its letter of May 18, 1970?

Basic Metals recites that it is exercising "its right of abandonment as outlined in Paragraph 21" of the September 15, 1969 Mining Lease and Option Agreement. As between the parties described above, it would seem that Basic Metals intended to terminate the September 15, 1969 Mining Lease and Option Agreement. Nothing furnished to this office indicated that Basic Metals complied fully with the termination provisions -- however, based on our subsequent phone conversation, it is my understanding that none of the parties are making any claim that the September 15, 1969 Agreement is still in effect. The May 18, 1970 letter asserts a one-quarter interest

in and to the claims subject to the September 15, 1969 Agreement. In my opinion, Basic Metals acquired no such interest for the reason set forth in Question 1 above and therefore it would follow that Basic Metals has abandoned all interest in and to the Mining Lease and Option Agreement and the properties described therein with the possible exception of the twelve San Juan claims (to the extent that the twelve claims are the same San Juan claims as are described in the November 13, 1969 Warranty Deed). It is, of course, possible that acts of Helen Birchfield Bailey not appearing as part of the record submitted, could cause a different result. Such a possibility is beyond the scope of the facts assumed for purposes of the requested opinion.

Question 3: What is the effect of the judgment upon the title to:

(a) the claims listed in the Birchfield - Basic Metals Warranty Deed of November 13, 1969? and

(b) the interests, if any, which Basic Metals acquired by virtue of Paragraph 3 of the November 13, 1969 Agreement?

(a) The judgment in the action designated as Civil No. C-135-70, in the United States District Court for the District of Utah compels Basic Metals to quitclaim the property described in the Warranty Deed to Birchfield upon payment by Birchfield to Basic Metals of the judgment, interest and costs. As between Birchfield and Basic Metals and as to anyone having notice of the judgment, the effect of this judgment is to make Basic Metal's title to the claims described in the Warranty Deed subject to the right of Birchfield to a quitclaim deed to the claims upon satisfaction of the judgment, and thus affects Basic Metal's title.

(b) As pointed out above under Question 1, it is my opinion that Basic Metals acquired no interest by virtue of Paragraph 3 of the November 13, 1969 Agreement and thus there is nothing for the judgment to effect nor affect.

Question 4: Does the recording of an exemplified copy of the judgment constitute constructive notice of any interest of Howard A. Birchfield, Jr. in:

(a) the claims listed in the November 13, 1969 Warranty Deed? and

(b) the interests, if any, which Basic Metals acquired by virtue of Paragraph 3 of the November 13, 1969 Agreement?

(a) For purposes of this opinion I am assuming that the term "exemplified" copy means a duly certified copy of

the judgment. A.R.S. § 33-414 provides in part that any "judgment of a court by which title to real property is affected shall be recorded in the office of the county recorder of the county in which the property or part thereof is located. . . ." The judgment contains no description whatsoever of the properties described in the November 13, 1969 Warranty Deed and on its face does not even purport to affect any property in Cochise County, Arizona. Nonetheless, anyone dealing with the mining claims described in the November 13, 1969 Warranty Deed would, in my opinion, be put upon notice of the possible affect of the judgment on title to the claims. Specifically, anyone dealing with the interest of Basic Metals or Howard A. Birchfield, Jr. would, in examining the title, become aware of the November 13, 1969 Warranty Deed and would have constructive notice that the judgment purportedly affected a November 13, 1969 conveyance from Birchfield to Basic Metals. This, in my opinion, would at the very least require such a party to make further inquiry as to the subject matter of the judgment.

(b) In view of the opinions expressed above, to the effect that Basic Metals acquired no interest in real property pursuant to Paragraph 3 of the November 13, 1969 Agreement, the recording of the judgment would have no effect with respect to title to the claims subject to the September 15, 1969 Agreement.

Question 5: If, in your opinion, the answer to either 4(a) or 4(b) above is "no" would the recording of the Findings of Fact and Conclusions of Law and Memorandum and Supplemental Findings of Fact provide constructive notice?

As pointed out above, I am of the opinion that the recording of the judgment gives constructive notice of the interest of Howard A. Birchfield, Jr. in the claims listed in the November 13, 1969 Warranty Deed. The re-recording of a certified copy of the judgment together with certified copies of the Findings of Fact and Conclusions of Law and of the Memorandum and Supplemental Findings of Fact would eliminate the problem discussed above under Question 4 as to the failure of the judgment to described the properties affected. Perhaps a better method would be to record an abstract of the judgment under the provisions of A.R.S. § 33-414B. If such an abstract were prepared, it would have to be certified under the seal of the clerk of the court and would have to state the title of the court and of the action, the date of judgment, a description of the property and the name of the party to whom (and in this case the conditions under which) the property was decreed.

Question 6: What property rights or interests, if any, passed to Helen Birchfield by virtue of Paragraph 6 of the divorce decree?

As between Howard A. Birchfield, Jr. and Helen Birchfield Bailey, Helen acquired the interest of Howard in and to the claims listed in the September 15, 1969 Agreement, and would own an undivided 50% interest in and to such claims subject to the June __, 1970 Agreement for Sale of Mining Claims listed as Item 11 in your summary.

If you have further questions concerning the above or if we can be of further assistance, please let me know.

Very truly yours,,

Leo N. Smith

LNS:cfs

cc: John C. Ruckmick

When recorded mail to:

Robert F. Owens
Tanner, Jarvis, Owens & Hoyt
913 Del Webb Building
3800 North Central Avenue
Phoenix, Arizona 85012

QUIT CLAIM DEED

(Middlemarch Group)

For the consideration of Ten Dollars, and other valuable considerations, I or we, BASIC METALS INCORPORATED hereby quit-claim to FRANK V. OWENS and VELMA S. OWENS, his wife, all right, title, or interest in the following real property situated in the County of Cochise, State of Arizona:

The following unpatented mining claims located in the Dragoon Mining District, Cochise County, Arizona, more particularly described in the certificates of location thereof which appear on record in the office of the County Recorder of Cochise County, State of Arizona, under the following names:

Silver Rule	0 through 70
Copper Kettle	1 through 9
Birchfield	1 through 51
Double "H"	1 through 16
Helena	1 through 50
Wildcat	1 through 100
Empire	1 through 60
Owens	1 through 100
Silver Bell	1 through 75
Abril	1 through 16
Granite Springs	1 through 12

TOGETHER with all the dips, spurs, angles, ore dumps, and tailings situated thereon or therein, or appurtenant thereto.

DATED this _____ day of April, 1973.

BASIC METALS INCORPORATED

By _____

EXHIBIT E

STATE OF)
) ss.
County of)

On this the _____ day of April, 1973, before me, the undersigned officer, personally appeared _____ who acknowledged himself to be the _____ of BASIC METALS INCORPORATED, a corporation, and that he as such _____ being authorized so to do, executed the foregoing instrument for the purposes therein contained, by signing the name of the corporation by himself as _____.

In witness whereof, I hereunto set my hand and official seal.

_____
Notary Public

My Commission Expires:

_____

HOMESTAKE MINING COMPANY
650 CALIFORNIA STREET
SAN FRANCISCO, CALIFORNIA 94108

CABLE: HOMESTAKE
TELEPHONE (415) 981-8150

July 5, 1973

Mr. Howard A. Birchfield, Jr.
P. O. Box 166
Pearce, Arizona 85625

Dear Howard:

Enclosed is a copy of the letter opinion which we obtained from Mr. Leo Smith of Verity & Smith regarding the title to the Middlemarch claims. I understand that Bob Owens is proceeding to remove the clouds to the title to the Middlemarch property, particularly the interest of Basic Metals. After the title has been cleared I am sure that Homestake would be interested in negotiations with whomever appears to be the holder of the title at that time. I believe that before recording any affidavit of assessment work Homestake would like to be assured that it could obtain a lease and option from the record title owners.

I contacted John Ruckmick in Alaska regarding work done on the Middlemarch property. He did not have the records with him of course, but he said that it was his recollection that approximately $10,000 worth of work had been done.

Yours very truly,

George E. Reeves
Assistant Counsel

GER:ec
Enc.

cc: J. E. Dalzell
A. B. Drescher
J. C. Ruckmick

MIDDLEMARCH SAMPLES

SAMPLE NO. PIERCE	R+D	LOCATION		ASSAYS Cu	Pb	Zn	Au	Ag
MM1	8799	Loma Linda	76"	1.70	–	0.17	.004	1.10
MM2	8800	Cobre Loma	27'	.50	.04	0.016	.002	.50
MM3	8801	Middlemarch Oxide Ungrd	13'	2.42	–	2.22	.002	.54
MM4A	8802	DUMP Crushed-mixed	250T	1.44	.06	3.16	.002	.52
MM4B	8803	DUMP 2 portions	866T / 1,116T	1.88	.06	2.16	.002	.60

NOTE: MM4B assay is of weighted combine of MM4 & MM5

MM5	8805	Middlemarch Glory Hole oxide	21' vertical	1.32	.01	.09	.006	.37

NOTE: MM3 is in same structure but ± 50' down dip (45°)

MM6A	8806	Open pit 1st 18' E to W		.14			Tr.	.08
MM6B	8807	Open pit Next 21' E to W		.26			.002	.12
MM6C	8808	Open pit Next 9' E to W		.06			Tr	.09
		48'						

NOTE: MM6ABC Samples taken on strike exposure because dip dimension pitted was under water.

JCP 9-5-75

COMMONWEALTH MINE CONCENTRATOR

PEARCE, ARIZ. 8-30-75

Set up in 1974 to treat mill tailings

DRAGLINE
15-TON HOPPER
INCLINED BELT
GRIZZLY
HOPPER - 2 TON
4'x5' BALL MILL
54"x16' DORR RAKE CLASS.
PUMP
REAGENTS
CONDITIONER
6-3'x4' DENVER CELLS

The above is installed and a few short trial runs made.
A bank of 8 - 3'x4' DENVER CELLS, w/o motors, are in the building but not set.
A small tank with some plumbing has recently been installed in the floor in the bldg. and is reported to be a sump for final tailings.

The building housing the above is wood frame, sheet iron roofed, partially sheet iron sided about 65' long, 42' wide and sloping from 24' to about 12' high. (See photos)
A pre-existing steel, aluminum covered building (see photos) is 32'x32'x24' high on steel skids, housed an exotic, unsuccessful process and is an excellent structure that could house some of a restructured met. plant.

Condition of the installed and uninstalled (list follows) equipment varies from fair to poor, based on hasty look.

Access is excellent. Power, water installed and gas nearby.

NEXT

COMMONWEALTH MINE CONCENTRATOR

Partial list of uninstalled equipment:

1 - 4'x5' Marcy ball mill
1 - 9"x16" Hassell jaw crusher
2 - 3'x4' Denver float cells
1 - 20' bucket elevator 12x7 buckets w/motor drive
2 - thickener mechanisms for small thickeners
1 - vacuum pump.
2 - small slurry pumps
2 - reagent feeders
1 - double deck 3'x8" Cedar Rapids vibe. screen
1 - 6' long helical classifier.
Several small and 1 large (maybe 50 hp) electric motor
Misc. pipe fittings, tank sections, elect components, and junk.

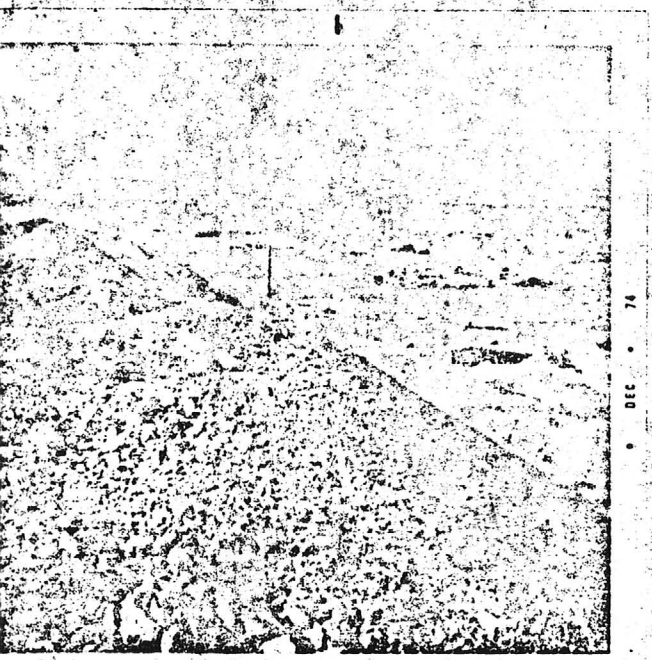
Presently installed in the mill bldg., set up to take ball mill discharge, is a new "corrugated belt gold saver" (?) and a small (± 3½' x 7') reciprocating table - new Carter. Understand the belong to other than concentrator owner (s).

PHOTOS ON PAGE 3

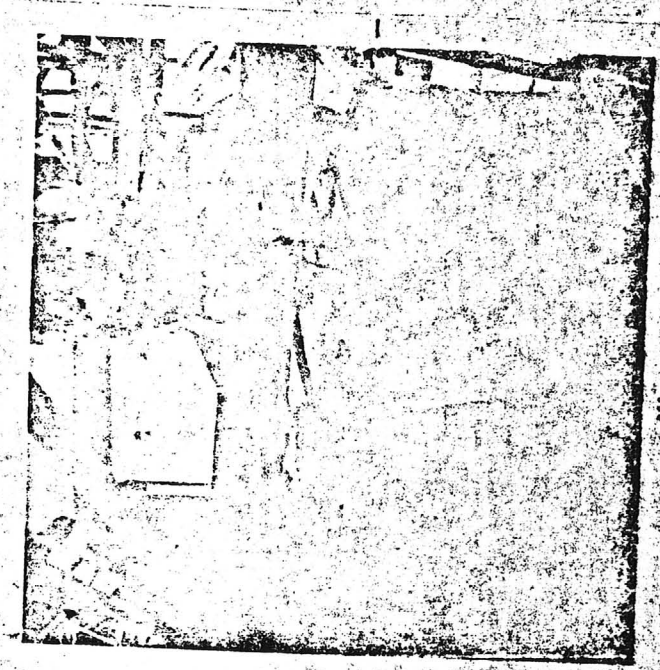
JCP 9-5-75

COMMONWEALTH MINE CONCENTRATOR.

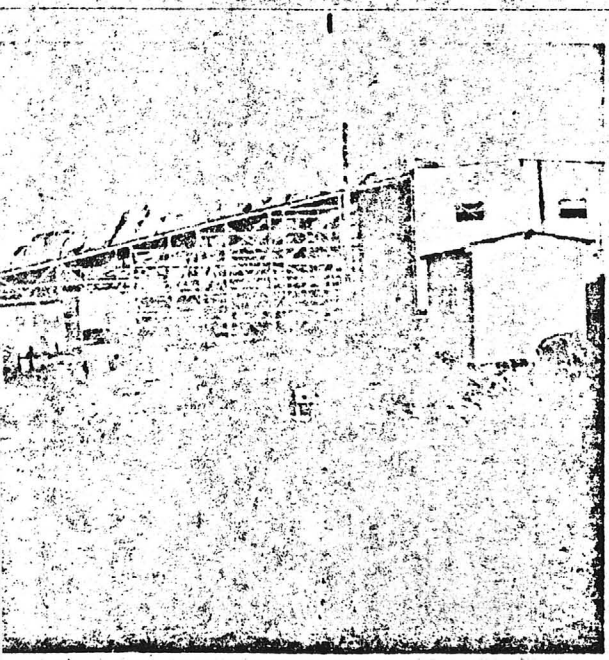
LOOKING SOUTHWESTERLY FROM MINE



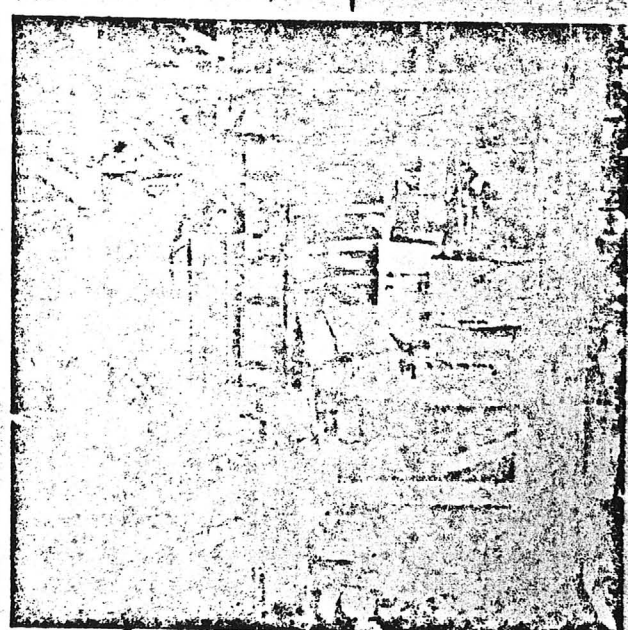
BALL MILL



LOOKING EASTERLY



REAGENT MIXERS RIGHT
CONDITIONER CENTER
FLOTATION CELLS LEFT



GERALD L. KIRWAN, B.Sc., P.Eng.

CONSULTING GEOLOGICAL ENGINEER

611 W. Gibraltar Ln.
Phoenix, Arizona 85023
(602) 993-1852

CONSULTING
EXPLORATION
ENGINEERING

MIDDLEMARCH PROPERTY

COCHISE COUNTY

STATE OF ARIZONA

Phoenix, Arizona,
October 20, 1975

C E R T I F I C A T E

I, GERALD, L. KIRWAN OF THE CITIES OF TORONTO, CANADA, AND PHOENIX, ARIZONA, CERTIFY AS FOLLOWS:

1. THAT I AM A CONSULTING GEOLOGICAL ENGINEER MAINTAINING OFFICES AT SUITE 2901-95 THORNECLIFFE PARK DRIVE, TORONTO, ONTARIO, AND 611 WEST GIBRALTER LN., PHOENIX, ARIZONA, 85023.

2. THAT I HAVE BEEN GRADUATED FROM CARLETON UNIVERSITY, B.SC., 1957, AND THAT I HAVE PRACTISED MY PROFESSION CONTINUOUSLY. A MINOR AMOUNT OF STUDYING AND TEACHING WAS PERFORMED IN 1958 AT THE STATE UNIVERSITY OF MISSOURI.

3. THAT I AM REGISTERED WITH THE ASSOCIATION OF PROFESSIONAL ENGINEERS OF THE PROVINCE OF ONTARIO AS A PROFESSIONAL ENGINEER. I AM A FELLOW OF THE GEOLOGICAL ASSOCIATION OF CANADA, AND A MEMBER OF THE CANADIAN INSTITUTE OF MINING AND METALLURGY.

4. THAT I RECEIVED PROFESSIONAL EXPERIENCE AND KNOWLEDGE WITH UNITED STATES STEEL CORP., NEWMONT MINING CORP., BRITISH PETROLEUM CORP., AND NORANDA MINES LTD., THE LATTER IN DEVELOPMENT OF UNDERGROUND GOLD ORE BODIES, ALL RELATIVE TO MOST PHASES OF EXPLORING-DEVELOPING-MINING.

5. THAT I HAVE BEEN A CONSULTANT FOR THE PAST 15 YEARS BOTH IN CANADA AND UNITED STATES.

6. THAT REPORT HEREIN HAS BEEN PREPARED BY MYSELF BASED UPON STUDY OF RELATIVE ENGINEERING DOCUMENTS AS PROFESSIONAL REPORTS, MAPS, DRILL LOGS, SURVEYS, AS WELL AS A STUDY OF PERTINENT DOCUMENTS CONTAINED IN THE FILES OF FEDERAL AND STATE GOVERNMENT OFFICES.

7. THAT I HAVE NO INTEREST OR EQUITY IN THE SUBJECT MIDDLEMARCH PROPERTY, OR ADJOINING LANDS OR LANDS IN THE VICINITY RELATIVE TO THIS PROPERTY.

8. THAT I PERSONALLY DID FIELD EXAMINE THE PROPERTY ON TWO SEPERATE OCCASSIONS, NAMELY AUGUST 20-21, AND SEPT. 2, 1975.

DATED AT PHOENIX, ARIZONA, THIS 20th DAY OF OCTOBER, 1975.

G.L. KIRWAN

REGISTERED PROFESSIONAL ENGINEER
G. L. KIRWAN
PROVINCE OF ONTARIO

RECOMMENDATIONS:

CONSIDERING THE NUMEROUS OPTIONS AND ALTERNATIVES WITH RESPECT TO PLACING THE MIDDLEMARCH OREZONE INTO IMMEDIATE PRODUCTION, IT IS JUDGED BEST POLICY TO CONCENTRATE WHERE MOST ORE IS KNOWN TO BE CURRENTLY AVAILABLE, WITH THE LEAST AMOUNT OF WORK AND EXPENSE TO ACQUIRE, WITH THE HIGHEST GRADE, TAKING FULL ADVANTAGE OF THE AREA OF MAXIMUM MINE DEVELOPMENT, ALL IN THE ZONE OF GREATEST METAL POTENTIAL.

IT IS RECOMMENDED THAT THE MISSOURI OR BRECCIA PIPE AREA EXISTING ON THE EXTREME SOUTHEAST PORTION OF THE 8,000 FT. LONG OREZONE BE DEWATERED TO BOTTOM OR 8TH LEVEL, AND BE REHABILITATED ALONG WITH WATER AND AIR PIPING IN ORDER TO IMMEDIATELY COMMENCE HOISTING BROKEN ORE ON STOPE FLOORS. ONE OF THE MAIN ADVANTAGES OF THIS PROGRAM IS TO INITIATE AN INSTANT FLOW OF CAPITAL, WHILE AT THE SAME TIME PERPETUATING THIS FLOW THROUGH THE MINING OF HIGH GRADE ORE EXISTING IN STOPES.

IT IS ESTIMATED THE ABOVE NOTED WORK PROGRAM SHOULD COST APPROXIMATELY $150,000.00.

UPON THE MIDDLEMARCH MINE BEING SELF-SUSTAINING CAPITALWISE FROM PROCEEDS FROM MISSOURI SHAFT PRODUCTION, CONSIDERATION CAN BE GIVEN TO EXPANDING PRODUCTION FROM ELSEWHERE ALONG THE 8,000 FT. LONG ORE BODY.

RESPECTFULLY SUBMITTED,

G.L. KIRWAN, B.Sc., P.E.
CONSULTANT

PROVINCE OF ONTARIO
G.L. KIRWAN
REGISTERED PROFESSIONAL ENGINEER

10. NEAR PERFECT WEATHER CONDITIONS.

11. BASIC LEACH PLANT ON PROPERTY FOR OXIDE ORES.

12. 130,000 TONS OF TAILINGS ON SURFACE REPUTED GOOD COPPER AND HIGH ZINC.

13. ABUNDANT WATER RESOURCES.

14. POSSIBLE 50,000 TONS BROKEN ORE UNDERGROUND.

15. 200,000 TONS ORE READILY AVAILABLE FOR MINING FROM 800 FT. SHAFT.

16. UNDERGROUND DEVELOPMENT OF SHAFT, HOIST, SKIP, DRIFTS, CROSSCUTS REPRESENTS DEVELOPMENT COSTS SAVINGS OF WELL OVER A MILLION DOLLARS.

17. NO METALLURGICAL PROBLEMS EXIST IN ORE.

18. POSSIBLE OPEN PIT MINING TO 50 FT. OR MORE OF OXIDE ORE ON SURFACE

19. WIDE OREZONE ALLOWS MUCH CHEAPER MINING METHODS AS SHRINKAGE MINING.

20. OREZONE APPARENTLY CONTINUOUS AND NOT DISRUPTED BY FAULTING.

21. 45° DIP OF OREZONE ALLOWS RELATIVELY EASY MINING.

22. TREMENDOUS SIZE OVERALL OF OREZONE.

23. COMPETENT ROCK AVOIDS USE OF TIMBERING IN MINING SAVING FUNDS AND THUS INCREASES PROFITS.

24. MULTIMETAL CONTRIBUTION IN ORE HEDGES AGAINST SINGLE METAL DOWN MARKET.

25. INITIAL CAPITAL OUTLAY SMALL IN ORDER TO INITIATE PRODUCTION.

26. ORE VALUES APPARENTLY INCREASE SUBSTANTIALLY WITH DEPTH.

27. HIGH RECOVERABILITY OF ALL METALS THROUGH FLOATATION.

28. RAIL SIDING AVAILABLE FOR TRANSPORTATION FOR CUSTOM MILLING.

29. FURTHER ORE POTENTIAL ALONG STRIKE IN BOTH DIRECTIONS, AND AT DEPTH.

30. MINE IS SELF-SUSTAINING CAPITALWISE UPON SALE OF ORE BROUGHT TO SURFACE, WHILE PROFIT IS DETERMINED FROM MINED ORE FROM THIS POINT FORWARD.

GLK

PERFECT WEATHER CONDITIONS, CLOSE TO TRANSPORTATION FACILITIES, ADJACENT TO CUSTOM MILLING FACILITIES IN THE REGION, AS WELL AS BEING SITUATED IN A MINING BELT THUS LABOR AND COMMODITY ARE READILY PROCURABLE. ELECTRIC POWER EXISTS 1.3 MILES FROM MISSOURI SHAFT.

A LEACH PAD EXISTS ON THE PROPERTY FOR PROCESSING NEAR SURFACE OXIDE ORES.

CONCLUSIONS

ALL MINING, DEVELOPMENT, GEOCHEMICAL, GEOPHYSICAL AND RELATED ENDEVOURS RELATIVE TO THE MIDDLEMARCH OREZONE HAVE CUMMULATIVELY ENHANCED THE PROPERTY GEOLOGICALLY INDICATING SOME 64 MILLIONS OF TONS OF COPPER, ZINC, SILVER, AND GOLD ORE WITH AN IN-PLACE VALUE OF OVER 6 BILLION DOLLARS.

THE ACCEPTED DIMENSIONAL PARAMATERS OF THE OREBODY TO DAY IS SOME 8,000 FT. IN LENGTH, 100 FT. IN WIDTH, AND A MINIMUM 800 FT. IN DEPTH. AT TODAY'S MARKET, EACH TON OF ORE EQUATES TO OVER $100.00.

THE MORE SALIENT FEATURES OF THE MIDDLEMARCH PROPERTY ARE THE FOLLOWING:

1. ABUNDANT ORE READILY ACCESSIBLE FROM 800 FT. SHAFT AFTER DEWATERING.
2. HIGH GRADE MARKETABLE COMMODITIES.
3. EXCELLENT FUTURE VALUES FOR METALS CONTAINED IN ORE.
4. AVAILABLE FUNDS TO PURCHASE ORE STOCKPILED.
5. CUSTOM MILLING FACILITIES IN REGION.
6. PROBABLE LEASE-PURCHASE ARRANGEMENT CAN BE MADE ON MILL AT PEARCE.
7. NEARBY SOURCE OF LABOR AND COMMODITY.
8. ELECTRIC POWER NEAR PROPERTY.
9. EASY ACCESS: NEARBY GOOD TRANSPORTATION FACILITIES.

GLK

LESS COSTS OF TRANSPORTATION AND MILLING FOR CASH FLOW IN HAND, SUCH FUNDS TO BE USED FOR ADDITIONAL ORE HAULAGE ONTO SURFACE. THUS, UNDER THESE CONDITIONS, THE MINE IS SELF-SUSTAINING ONCE A CERTAIN TONNAGE OF ORE HAS BEEN STOCKPILED, AND PROFIT FROM THIS POINT FORWARD IS REALIZED.

AN ALTERNATIVE OF SELLING ORE FUTURES IS CUSTOM MILLING WHICH MAY BE DONE AT TONTO BASIN, ARIZONA, 150 MILES NORTH OF PROPERTY FOR $25.00 PER TON PLUS 5¢ PER MILE HAULAGE PER TON. MIDDLEMARCH ORE IS APPARANTLY AMENABLE TO THE TONTO BASIS MILL.

FURTHER PROCESSING OPTIONS OF ORE MAY BE PERFORMED THROUGH CUSTOM MILLING AT CUSTER OR DEMMING, NEW MEXICO, FOR CERTAIN COSTS, TRANSPORTATION BY RAIL FROM SOUTHER PACIFIC SIDING AT COCHISE, 25 MILES FROM SUBJECT PROPERTY.

A 100 TON FLOAT MILL EXISTS AT PEARCE EIGHT MILES FROM THE MIDDLEMARCH PROPERTY, AND THIS EQUIPMENT AND SITE WITH ABUNDANT WATER MAY BE UTILIZED UNDER A LEASE-PURCHASE AGREEMENT.

THE MIDDLEMARCH COPPER, ZINC, SILVER, AND GOLD PROPERTY, LOCATED UNDER EASY ACCESS EIGHT MILES FROM PEARCE, ARIZONA, HAS PRESENT UNDERGROUND ESSENTIALLY READY FOR MINING AFTER DEWATERING AND PIPE INSTALLATION MAKING AVAILABLE CURRENTLY FOR MINING SOME 200,000 TONS OF READILY ACCESSIBLE ORE FROM PRESENT STOPES. THERE IS REPUTED TO BE A FURTHER 50,000 TONS OF ORE ON GROUND IN STOPES. IT IS NOTEWORTHY THAT ALTHOUGH MARKET PRICES OF METALS IN ORE AT THE MIDDLEMARCH PROPERTY ARE INCREASING IN VALUE, AND THUS FUTURES OF ALL METALS ARE CONSIDERED EXCELLENT, COSTS OF MINING ARE REMAINING RELATIVELY CONSTANT DUE TO ADVANCED TECHNOLOGY PRACTICED TODAY.

THE SUBJECT PROPERTY IS CHARACTERIZED BY BEING LOCATED IN AN AREA OF ALMOST

GLK

CLAIM SR 28, 2,300 FT. ALONG STRIKE FROM 4) IS THE 200 FT. COBRA LOMA INCLINE CUTTING OVER 80 FT. OF OREZONE, AND IN CLAIM SR 6, 1,600 FT. FURTHER ALONG ORE TREND IS AN 80 FT. SHAFT CUTTING 95 FT. OF ORE.

STRONG INDICATIONS EXIST THAT ORE VALUES INCREASE SUBSTANTIALLY WITH DEPTH.

TONNAGE POTENTIAL, DOLLAR VALUE, ECONOMIC CONSIDERATIONS:

CONSIDERING DIMENSIONAL PARAMETERS OF THE MIDDIEMARCH OREZONE FROM WORK COMPLETED TO DATE, INCLUDING FURTHER SUBSTANTIATION FROM POSITIVE RESULTS OF THE WELL RESPECTED GEOPHYSICAL TOOL INDUCED POLARIZATION, TO BE 8,000 FT. IN LENGTH, 100 FT. IN WIDTH, TAKEN ONLY TO KNOWN DEPTH OF 800 FT., THIS ORE BLOCK WOULD EQUATE TO SIXTY-FOUR MILLIONS TONS. FURTHER CONSIDERING THAT TOTAL METAL VALUE REMAINS CONSTANT RATHER THAN INCREASING WITH DEPTH, OR THAT MARKET VALUES DO NOT INCREASE, VALUE OF ORE IN PLACE IS WELL OVER SIX BILLION DOLLARS.

THERE IS EVERY GEOLOGIC REASON TO FIRMLY BELIEVE THAT THE KNOWN OREZONE PERSISTS SUBSTANTIALLY FURTHER DOWNDIP INTO THE GROUND THAN THE 800 FT. REALIZED FROM THE MISSOURI SHAFT. FURTHER, THE OREZONE HAS NOT BEEN DELIMITED LENGTHWISE, AND THUS POTENTIAL EXISTS FOR FURTHER TONNAGES TO EXIST IN BOTH OF THESE DIRECTIONS.

IT IS OBVIOUS THAT, SINCE PROCESSING HAS BEEN ACCOMPLISHED ON THE PROPERTY EMPLOYING A 125 TON FLOATATION MILL, THAT NO METALLURGICAL PROBLEM ESISTS WITH THE ORE AND THUS ESSENTIALLY ALL METALS ARE RECOVERABLE.

ORE MINED TO SURFACE MAY BE SOLD IN PLACE STOCKPILED AT TODAY'S MARKET PRICES

OVER 150 FT.

SURFACE MATERIAL ALONG TREND OF OREZONE IS CHARACTERIZED BY OXIDE AND CARBONATE MINERALS ALONG WITH SULPHIDE MATERIAL TO A DEPTH OF 75 FT. AT THIS POINT A THIN SECTION OF SECONDARY ENRICHMENT EXISTS, FOLLOWED BY THE MAIN SULPHIDE PRIMARY ZONE TO DEPTH.

CHALCOPYRITE, PYRITE, ZINCBIENDE, AND SILVER WITH GOLD ARE THE CHIEF ORE MINERALS, THE PRECIOUS METALS LIKELY ASSOCIATED WITH PYRITE.

AS DETERMINED FROM SMELTER RECEIPTS, RECORDS OF FORMER OPERATORS, SAMPLE ASSAY SHEETS, GOVERNMENT RECORDS, ENGINEERING REPORTS, AND PRESS PUBLICATIONS, THE AVERAGE ORE GRADES ARE CONSERVATIVELY TABULATED AT 1.5% COPPER, 10% ZINC, 2 OUNCES SILVER, AND 0.05 OUNCES GOLD PER TON FOR TOTAL METAL VALUE AT CURRENT MARKETS OF $110.30 PER TON, ALL AS BEING REPRESENTATIVE OF THE ENTIRE 8,000 FT. STRIKELENGTH OF THE MIDDLEMARCH OREBODY.

DETERMINATION AS WELL AS SUBSTANTIATION OF ABOVE FIGURES HAVE BEEN ASCERTAINED FROM THE FOLLOWING DEVELOPMENT WORK ALONG THE ENTIRE 8,000 FT. STRIKE LENGTH: 1) MISSOURI AREA, OR MAIN ZONE, 250 FT. OF ADIT CROSSCUT TERMINATED BY 45° INCLINE SHAFT TO THE 800 FT. LEVEL. EIGHT LEVELS FEED ORE FROM STOPES AND ORE POCKETS. DEVELOPMENT DRIVEN IN BRECCIA PIPE, ALL IN CLAIM CK 1. GLORY HOLE IS SURFACE EXPRESSION OF OREZONE FROM WHICH A LENGTHLY DRIFT EXISTS. 2) IN CLAIM SR 19 SOME 800 FT. ALONG STRIKE NORTHWESTWARD, TUNNELLING HAS INTERSECTED ORE VALUES OVER 100 FT. IN WIDTH, WHILE 3) 2,800 FT. ALONG STRIKE FROM 2) IS ANOTHER ORE CUT OF 100 FT. WIDE IN CLAIM SR 24. 4) 500 FT. FROM 3) IS A 300 FT. INCLINE SHAFT CROSSCUTTING 100 FT. OF GOOD ORE VALUES, ALSO IN CLAIM SR 24. 5) ON

GLK

IT IS ECONOMICALLY SIGNIFICANT TODAY THAT THE FLOATATION MILL WAS INEFFICIENT UNDER PRESENT STANDARDS, AND THERE IS A REPORTED 130,000 TONS OF TAILINGS AVERAGING 0.6% COPPER WITH HEAVY AMOUNTS OF ZINC ON GROUND ON THE SUBJECT PROPERTY.

GEOLOGY:

METASEDIMENTARY SEQUENCES, ESSENTIALLY CONSISTING OF SILICEOUS CRYSTALLINE LIMESTONES ALONG WITH PHYLLITES, SCHISTS, SLATE, AND QUARTZITES COMPRISE THE AREA NORTHEAST OF THE KNOWN OREZONE, WHILE ACID INTRUSIVES REPRESENTED BY GRANITE AND RELATED ROCK TYPES CHARACTERIZE THE GEOLOGY SOUTHWEST OF THE OREZONE. THUS THE MINERALIZED AREA IS ESSENTIALLY ON THE CONTACT OF THE METASEDIMENTARY AND INTRUSIVE ROCK TYPES. THE ENTIRE METAMORPHIC SEQUENCE, DIPPING SOUTHWEST 40° TO 60° IS CONSIDERED CAMBRIAN IN AGE, WITH INTRUSIVES LATER.

THE MIDDLEMARCH OREZONE IS A CLASSICAL EXAMPLE OF CONTACT-METAMORPHIC DEPOSIT CONTAINING METALS OF ECONOMIC IMPORTANCE IN ALTERED ZONES SANDWICHED BETWEEN THREE LARGE AND PERSISTENT PORPHYRY DIKES, ALL BETWEEN THE TWO MAIN ROCK TYPES. ACID INTRUSIVES MAY BE REGARDED AS THE MINERALIZERS FROM WHICH SUPERHEATED VAPORS AND SOLUTIONS CONTAINING METALS OBTAINED IN TRAVELLING FROM DEPTH INTRUDED AREAS OF LEAST RESISTENCE AS FRACTURES, FAULTS, BRECCIA ZONES, AND SOFTER LIMESTONE, COOLING AND THUS DEPOSITING COPPER, ZINC, SILVER, AND GOLD IN CURRENT CONDITIONS.

ON SURFACE, THE MAIN METAL ENRICHED ZONE IS CHARACTERIZED BY AN IMPRESSIVE 8,000 FT. LONG IRREGULARLY ALTERED ZONE VARYING IN WIDTH FROM 30 FT. TO

SITUATED IN THE EASTERN SLOPES OF THE DRAGOON MOUNTAINS EIGHT MILES WEST OF THE TOWNSITE OF PEARCE OVER GOOD SECONDARY ROADS, THE PROPERTY IS ACCESSIBLE FROM DOUGLAS, 60 MILES SOUTH BY U.S. HIGHWAY 66 AND FROM TUCSON SOME 130 MILES NORTHWEST OVER INTERSTATE 10 FREEWAY, THENCE ROUTE 66.

HISTORY:

THE MIDDLEMARCH ORE DEPOSIT WAS DISCOVERED SOME FEW YEARS PRIOR TO ITS OPERATION IN 1898-9 BY MESSRS. GIRD AND O'GORMAN WHO SMELTED RICH OXIDE ORE FROM SHALLOW DEPTHS, LATER ENCOUNTERING SULPHIDE ORES BELOW SMELTING GRADE. ATTEMPTS WERE MADE TO CONCENTRATE BUT FAILED DUE TO HIGH SPECIFIC GRAVITY OF GANGUE MATERIAL.

IN 1917 A GROUP OF LOS ANGELES BUSINESSMEN TOOK OVER OPERATION OF THE MINE UNDER ARIZONA MIDDLEMARCH COPPER COMPANY ERECTING A FLOATATION MILL, A NEW EXTRACTIVE AND CONCENTRATING METHOD AT THAT TIME, SUCCESSFULLY TREATING SULPHIDE COPPER ORES.

SOURCE OF THE RICH COPPER ORES WAS FROM THE MISSOURI PORTION OF THE MAIN OREZONE FROM A BRECCIA PIPE WHICH WAS EXPLORED TO THE 800 FT. LEVEL FROM AN INCLINE SHAFT AT THE END OF A 250 FT. ADIT, ALL OF WHICH APPEARS TO BE IN EXCELLENT CONDITION TODAY.

THERE IS A REPORTED 3.5 MILES OF DRIFTING AND SHAFTS ALONG THE OREZONE. LARGE GLORY HOLES, EQUATING SOMEWHAT TO PRESENT DAY SHRINKAGE MINING, WAS EMPLOYED AS THE METHOD OF MINING. HOIST AND SKIP BROUGHT ORE TO ADIT LEVEL WHICH WAS THEN TRAMMED TO THE FLOATATION MILL ON PROPERTY.

M I D D L E M A R C H P R O P E R T Y

C O C H I S E C O U N T Y

S T A T E O F A R I Z O N A

INTRODUCTION:

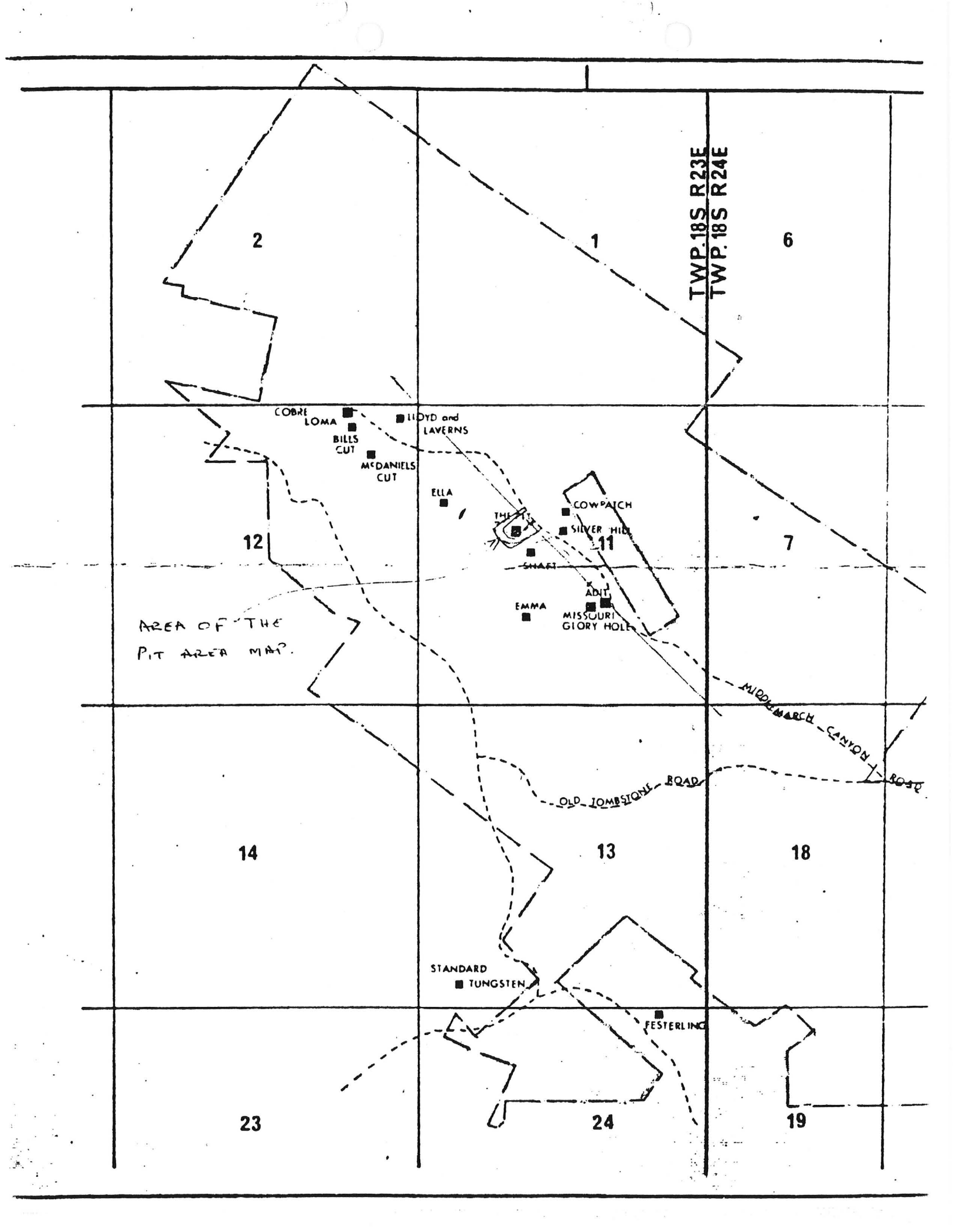
REPORT HEREIN IS RELEVANT TO THE ECONOMIC VIABILITY OF THE IMPRESSIVE MIDDLEMARCH COPPER, ZINC, SILVER AND GOLD DEPOSIT LOCATED IN THE SOUTH-EASTERN PORTION OF THE STATE OF ARIZONA.

AN APPRAISAL OF THE MINERAL POTENTIAL OF THE SUBJECT PROPERTY IS PRESENTED AND, BASED UPON THIS POTENTIAL, RECOMMENDATIONS ARE FOR IMMEDIATE PRODUCTION FROM THE MIDDLEMARCH PROPERTY.

PROPERTY, LOCATION, ACCESS:

THE MIDDLEMARCH MINE CONSISTS OF A TOTAL OF 144 CONTIGUOUS LOCATED OR LODE MINING CLAIMS, SOME 2,880 ACRES IN ALL, SITUATED IN COCHISE COUNTY AND COVER ALL OR PORTIONS OF SECTIONS 1, 2, 11, 12, 13, and 24, TOWNSHIP 18 S, RANGE 23 E G&SR B&M, AND A SMALL PORTION OF TOWNSHIP 17. THE ENTIRE PROPERTY HAS BEEN RECENTLY PROFESSIONALLY SURVEYED AND POSTS MOUNDED.

GLK


TWP. 18S R23E
TWP. 18S R24E
2
1
6
12
11
7
14
13
18
23
24
19
COBRE LOMA
BILLS CUT
McDANIELS CUT
LLOYD and LAVERNS
ELLA
THE PIT
COWPATCH
SILVER HILL
SHAFT
ADIT
EMMA
MISSOURI GLORY HOLE
AREA OF THE PIT AREA MAP.
MIDDLEMARCH CANYON ROAD
OLD IOMBSIONE ROAD
STANDARD TUNGSTEN
FESTERLING

TANNER, JARVIS, OWENS & HOYT
ATTORNEYS AT LAW
913 DEL WEBB BUILDING
3800 NORTH CENTRAL AVENUE
PHOENIX, ARIZONA 85012

TELEPHONE 264-5257

JARRETT S. JARVIS
MELVIN J. OWENS
WALLACE O. TANNER
ROBERT F. OWENS
FORREST T. HOYT
GEORGE E. JARVIS

September 13, 1971

Mr. Robert E. Cattany
Attorney at Law
2777 North Campbell Avenue
Tucson, Arizona 85719

Re: Dragoon Mining Claims

Dear Bob:

Received your letter of September 10, 1971, and I agree in general with the points which you made in the letter. I do not believe that under the circumstances it would be wise, however, to enter into an interim agreement and defer the accounting until later, since this could turn out to be a real bone of contention that would make any interim agreement meaningless. I believe this should be resolved at the time that the agreement is entered into. There will obviously be several different categories of expenses, with the question in each case whether the expenses were reasonably necessary to preserve the claims, and whether they should be charged against the joint venture or against the partner individually. To resolve it, it seems to me absolutely essential that we know the dollars involved, rather than trying to resolve it in the abstract. For example, how much did Howard's expenses amount to in his promoting a deal with Gordon Miles? How much did F. V. Owens pay for Howard's benefit to Salt Lake City attorneys to represent him in his litigation with Basic Metals? How much has been spent by either party for assessment work? I have asked my father for an accounting of his part, and hope to receive that in the next few days. I assume that you have requested an accounting also from Howard. If we could exchange accountings prior to a meeting, in order to give time to go over them and analyze them, it will make the meeting more productive.

Additional items for the agenda would be who has the responsibility for removing certain clouds or settling claims, and at whose expense this should be done. I am referring particularly to the Basic Metals, Gordon Miles and Helen Birchfield claims. Although both you and I are

optimistic that these can be successfully resolved, we should give some thought to the status of the parties in case any one of them are not, and a contingency clause should set forth the rights of the parties in such event. In this connection, I am enclosing herewith a copy of an analysis of the problem which I made just before going on vacation and sent to my father at that time. I have not discussed it with him as yet, so it does not necessarily represent his position. Its purpose at this point is to represent possible approaches to solving some of the problems.

According to my father, an agreement with Birchfield should also include an option given by Birchfield on his interest in the Tyrone claims. I understand that this has already been discussed.

Incidentally, I sent the purchase price for the six Barber claims in the sum of $12,000.00 to Mr. Verity last week. I instructed him to deed the claims to Frank V. Owens, in accordance with the understanding entered into while I was on vacation.

With respect to point 6 in your letter regarding future expenditures, I believe that it would tend to forestall future disputes if we could make a projection as to what such expenditures will be during the next year. Obviously assessment work will have to be done, but we should be able to do some advance planning on this and lay down some ground rules. If the negotiating function is centralized with respect to sale to lease of the claims, and authority is given, we should be able to spell this out in detail in the agreement. If this is done, there may be no need for the category of emergency expenditures.

Since the first step would appear to be an accounting, I will sent you a copy of an accounting as soon as I receive it, and request receiving the same from your client.

Very truly yours,

Robert F. Owens

RFO:pw
Enclosures
cc: F. V. Owens w/Cattany letter
William Porter w/Cattany letter & analysis

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA

IN AND FOR THE COUNTY OF COCHISE

F. V. OWENS and VELMA OWENS, his wife,

Plaintiffs,

-vs-

BASIC METALS, INC. a Utah corporation; HOWARD BIRCHFIELD; and JOHN DOES I THROUGH X,

Defendants

NO. 29329

SUMMONS

THE STATE OF ARIZONA to the above named Defendants;

YOU ARE HEREBY SUMMONED and required to appear and defend in the above entitled action in the above entitled court within TWENTY DAYS, exclusive of the day of service, after service of this summons upon you if served within the State of Arizona, or within THIRTY DAYS, exclusive of the day of service, if served without the State of Arizona, and you are hereby notified that in case you fail so to do, judgment by default will be rendered against you for the relief demanded in the complaint.

The name and address of Plaintiff's attorney is Robert F. Owens, of Tanner, Jarvis, Owens & Hoyt, 913 Del Webb Building, 3800 North Central Avenue, Phoenix, Arizona, 85012.

GIVEN under my hand and seal of the Superior Court of the State of Arizona in and for the County of Cochise this 12 day of July, 1973.

W. A. NOWLIN, Clerk

By Mark S. Ratan
Deputy Clerk

TANNER, JARVIS
OWENS & HOYT
ATTORNEYS AT LAW
913 DEL WEBB BUILDING
PHOENIX, ARIZONA 85012
264-5257

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA

IN AND FOR THE COUNTY OF COCHISE

F. V. OWENS and VELMA OWENS, his wife, Plaintiffs, -vs- BASIC METALS, INC., a Utah corporation; HOWARD BIRCHFIELD; and JOHN DOES I THROUGH X, Defendants.	NO. 29329 COMPLAINT (Quiet Title)

Plaintiffs allege:

I

Plaintiffs are residents of Maricopa County, State of Arizona. Defendants are all persons or corporations claiming a right or interest in the real property described herein, adverse to Plaintiffs' title.

II

The true names or capacities, whether individual, corporate, or otherwise, of the Defendants John Doe I through X are unknown to Plaintiff, who therefore sues said Defendants by such ficititious names, and asks leave to amend this Complaint to substitute their true names when ascertained.

III

Plaintiffs own and are in possession of certain unpatented mining claims in the vicinity of the Dragoon Mountains in Cochise County, Arizona, more fully described in Exhibit "A" annexed hereto and incorporated herewith.

IV

Each of the named Defendants may or does assert a claim or interest in one or more of said described unpatented mining claims, adverse to the ownership of Plaintiffs. Plaintiffs

ANNER, JARVIS
WENS & HOYT
TORNEYS AT LAW
8 DELWEBB BUILDING
ENIX, ARIZONA 85012

allege that such adverse claims are not valid, and that Defendants are without any right whatsoever, and that the Defendant Basic Metals, Inc. is also without rights because of failure to qualify as a foreign corporation under ARS 10-482.

V

On March 20, 1973, a Quit Claim Deed was tendered to the Defendant Basic Metals, Inc. along with the tender fee of $5.00 required under ARS 12-1103. On April 17, 1973, a second tender was made of a corrected deed, and the statutory fee. Neither deed was executed or returned within the time allowed by law, or to date of this Complaint. Under such circumstances, the Defendant Basic Metals, Inc. is liable for a reasonable attorneys fee incurred in prosecuting this action, which is alleged to be in the amount of $2,000.00. Said letters and deeds are attached as the following Exhibits:

Exhibit "B"	Letter of March 20, 1973
Exhibit "C"	Deed accompanying said letter
Exhibit "D"	Letter of April 17, 1973
Exhibit "E"	Deed accompanying said letter

WHEREFORE, Plaintiffs pray that:

(1) Defendants, and each of them, and all persons claiming under them, be required to set forth the nature of their claims to the said unpatented mining claims.

(2) All adverse claims be determined be a decree of this court.

(3) Said decree declare and establish Plaintiff's estate, and declare that Defendants be barred and forever estopped from having or claiming any right or title to the said claims adverse to Plaintiff.

(4) For costs of this action, and attorneys fee in the sum of $2,000.00.

(5) For such other relief as to the court seems proper.

INNER, JARVIS
WENS & HOYT
TORNEYS AT LAW
DEL WEBB BUILDING
INIX, ARIZONA 85012
264-8267

TANNER, JARVIS, OWENS & HOYT

By_____
Robert F. Owens
Attorneys for Plaintiffs

STATE OF ARIZONA)
) ss.
County of Maricopa)

Robert F. Owens, being first duly sworn upon oath, deposes and says: That he is the attorney for Plaintiff in the above entitled action; that he has read the foregoing Complaint and that the matters and things therein contained are true to the best of affiant's knowledge and information, except as to those matters alleged upon information and belief, and as to those matters he believes them to be true.

_____
Robert F. Owens

SUBSCRIBED AND SWORN to before me this _____ day of July, 1973.

_____
Notary Public

My Commission Expires:

_____

ANNER, JARVIS
IWENS & HOYT
TTORNEYS AT LAW
3 DEL WEBB BUILDING
NIX, ARIZONA 85012

The following unpatented mining claims located in the Dragoon Mining District, Cochise County, Arizona, more particularly described in the certificates of location thereof which appear on record in the office of the County Recorder of Cochise County, State of Arizona, under the following names:

Silver Rule	0 through 70
Copper Kettle	1 through 9
Birchfield	1 through 51
Double "H"	1 through 16
Helena	1 through 50
Wildcat	1 through 100
Empire	1 through 60
Owens	1 through 100
Silver Bell	1 through 75
Abril	1 through 16
Granite Springs	1 through 12

TOGETHER with all the dips, spurs, angles, ore dumps, and tailings situated thereon or therein, or appurtenant thereto.

EXHIBIT A

March 20, 1973

Mr. Fred J. Bacon, Jr.
Chairman, Executive Committee
Basic Metals, Inc.
2363 Foothill Drive
P. O. Box 8226
Salt Lake City, Utah 84108

Re: F. V. Owens/Dragoon Mountain Claims

Dear Mr. Bacon:

On February 13, 1973, I sent you a letter reminding you that Basic Metals, Inc. had given written notice exercising its rights of abandonment under the September 15, 1969, agreement.

I also enclosed a copy of page 11 of said agreement entitling F. V. Owens to a quit claim deed.

Since the quit claim deed did not accompany your notice of abandonment, as contemplated by the agreement, I made request for the deed in my letter of February 13, 1973, but have not received it to date.

You are hereby notified that the fact that the original agreement was recorded, coupled with the fact that we have received no quit claim deed in recordable form to consummate the abandonment, has created a cloud on the title of F. V. Owens which is hampering his attempts to deal with the property.

I am enclosing herewith a quit claim deed which I have prepared strictly in accordance with the provisions of the September 15, 1969, agreement. I

EXHIBIT B

request that it be executed by a corporate officer having authority to do so, and returned to me for recording. Also enclosed is a check for $5.00 as required by the statute for execution and delivery of the deed.

For failure to execute and return to us a sufficient quit claim deed under the agreement within 20 days from the date of this letter, we intend to file a quiet title action in Cochise County and seek recovery of costs and attorney's fees from Basic Metals, Inc., pursuant to the statutes. We anticipate attorney's fees in this quiet title action to run from $1,000.00 to $2,000.00. You are also hereby put on notice that should certain pending transactions not be consummated because of the existence of the cloud on the title, an additional claim for damages arising out of slander of title may be added as separate counts to the quiet title action.

I am hopeful that we can resolve this matter without the necessity of litigation, and strongly urge your giving it immediate attention because it has created and is creating a substantial problem for F. V. Owens in his current efforts to deal with this property.

Very truly yours,

Robert F. Owens

RFO:pw
Enclosures
cc: Bruce G. Cohne
bcc: F. V. Owens
George Reeves
John C. Ruckmick

When recorded mail to:

Robert F. Owens
Tanner, Jarvis, Owens & Hoyt
913 Del Webb Building
3800 North Central Avenue
Phoenix, Arizona 85012

QUIT CLAIM DEED

For the consideration of Ten Dollars, and other valuable considerations, I or we, BASIC METALS INCORPORATED hereby quit-claim to FRANK V. OWENS and VELMA S. OWENS, his wife, all right, title, or interest in the following real property situated in the County of Maricopa, State of Arizona.

An undivided one-half interest in the following unpatented mining claims located in the Dragoon Mining District, Cochise County, Arizona, more particularly described in the certificates of location thereof which appear on record in the office of the County Recorder of Cochise County, State of Arizona, under the following names:

Silver Rule	(71)	Owens	(100)
Copper Kettle	(9)	Silver Bell	(75)
Birchfield	(51)	Abril	(16)
Double "H"	(16)	Granite Springs	(12)
Helena	(50)	San Juan	(12)
Wildcat	(100)	Black Diamond	(50)
Empire	(60)		

including also an undivided one-half interest in all additional claims, if any, situated within three miles of the exterior boundaries of the above-described claims, which may have been located or otherwise acquired by Basic Metals Incorporated between September 15, 1969, and May 18, 1970, within the meaning of that certain agreement between the parties hereto, dated September 15, 1969, and recorded June 22, 1970, in Docket 644, pages 1 to 17, inclusive, in the records of the County Recorder of Cochise County, and including also an undivided interest in all claims, if any, in addition to the above, as indicated on Exhibit "A" of the said agreement,

TOGETHER with all the dips, spurs, angles, ore dumps, and tailings situated thereon or therein, or appurtenant thereto.

DATED this _____ day of March, 1973.

BASIC METALS INCORPORATED

By _____

EXHIBIT C

STATE OF)
) ss.
County of)

On this the _____ day of March, 1973, before me, the undersigned officer, personally appeared _____ who acknowledged himself to be the _____ of BASIC METALS INCORPORATED, a corporation, and that he as such _____ being authorized so to do, executed the foregoing instrument for the purposes therein contained, by signing the name of the corporation by himself as _____.

In witness whereof, I hereunto set my hand and official seal.

_____
Notary Public

My Commission Expires:

_____

April 17, 1973

Mr. Kay M. Lewis
Jensen & Lewis
Attorneys at Law
320 South 300 East
Suite 1
Salt Lake City, Utah 84111

Re: Basic Metals, Inc.
Dragoon Mountain Claims

Dear Mr. Lewis:

I assume you have not yet received any instructions from your client with respect to the Quit Claim Deed which I forwarded earlier, since I have received no further response from you.

Further investigation into the complex title problems involving the Dragoon Claims has led us to the conclusion that F. V. Owens now owns 100% of the group of claims which for convenience I shall refer to as the "Middlemarch Group" (as contrasted with the "San Juan Group"). We now intend to include in our quiet title action a separate count to confirm this ownership, should Basic Metals, Inc. not be willing to execute the separate Quit Claim Deed for that purpose, which I am enclosing herewith, along with the check for $5.00 required by statute.

So that you will be better able to advise your client as to what to do, I am outlining the facts which the position of F. V. Owens is based on. I assume you have copies of the agreements referred to. If not, I will be glad to furnish them.

EXHIBIT D

With respect only to the Middlemarch Group of claims:

A. Under the Cotenancy Agreement of January, 1969, these were owned 50% by F. V. Owens and 50% by Howard and Helen Birchfield. The latter ownership was community property since no other form of ownership (i.e. joint tenancy) was specifically stated as required by Arizona law.

B. The September 15, 1969, Agreement with Basic Metals recognized the interest in Howard and Helen Birchfield as an undivided one-half interest, which would be community property for reasons stated above.

C. The Birchfields had filed for divorce on August 18, 1969. Under A.R.S. 25-314, Howard Birchfield is prevented from unilaterally disposing of any interest in community property, either his or his wife's.

D. Basic Metals, Inc. apparently claims a 25% interest in the Middlemarch Group (see letter of abandonment, May 18, 1970, 2nd page, first paragraph). This claim is apparently based on paragraph 3 of the November 13, 1969, Agreement between Howard Birchfield and Basic Metals, Inc., in which Helen Birchfield did not join. Even assuming the word "claims" in that agreement was intended to refer to the unpatented mining claims in the Middlemarch Group (which is not free from doubt), a more formidable problem from the standpoint of Basic Metals arises from the fact that Birchfield at that point had no power to convey either a 25% or a 50% interest under Arizona law. The effect of the pending divorce was to make community property non-transferable, unless both spouses joined,

since the judge has discretion to award all of it to either party. (In fact, he subsequently did award all the Birchfield interest in the Middlemarch Group to Mrs. Birchfield.)

E. May 4, 1970, Birchfield Divorce granted, giving all Birchfield community interest in Middlemarch Group to Helen Birchfield.

F. May 18, 1970, Letter of Abandonment by Basic Metals, Inc. covers the entire September 15, 1969, Agreement.

G. June 10, 1970, Agreement, F. V. Owens and Velma Owens acquire from Helen Bailey, formerly Helen Birchfield, all her interest in the Middlemarch Group.

An additional factor which you should consider is that Basic Metals, Inc., a foreign corporation, engaged in a course of business in Arizona, but never qualified to do business here under A.R.S. 10-482, which makes all its acts void.

Would you please analyze these matters and discuss them with whomever are the present directors of Basic Metals with a view to reaching a decision as soon as possible. It seems to me that F. V. Owens' position as to the Middlemarch Group is clearcut, and an opinion has been obtained from a prominent Arizona mining title attorney confirming this. It would seem not to be in the interest of Basic Metals to drag its feet or do nothing at this point, since it would incur liability for my attorney's fees in a quiet title action, and possibly for very substantial damages should our present arrangements with a large mining company founder because of a delay in ability to furnish clear title.

I am enclosing a second Quit Claim Deed which concerns only the Middlemarch Group, but covers the entire interest in this group in accordance with the analysis set out above. In the event both this deed and the deed previously sent are not returned to me within 20 days, I shall

have to proceed with litigation. The effect of signing this deed would be to leave Basic Metals, Inc. with whatever interest it has in the San Juan Group and its claims against Howard Birchfield under the U.S. District Court judgment.

Indicentally, the previous Quit Claim Deed refers in line 5 to "Maricopa" County. This should read "Cochise."

Very truly yours,

Robert F. Owens

RFO:pw
Enclosure
bcc: F. V. Owens
George Reeves
John C. Ruckmick

Rocky Mountain Geochemical Corporation

2050 EAST 14TH STREET
TUCSON, ARIZONA 85719

Phone 622-5702
Area Code: 602

CERTIFICATE OF ANALYSES

Date November 19, 1971

Client Newmont Exploration, Ltd.
P.O. Box M
San Manuel, Arizona 85631

Report on: 28 Samples

Submitted by: Mr. Jim Guthrie

Date Received: November 10, 1971

Analysis: Copper, Lead, Zinc, and Silver

Remarks: All results were determined by atomic absorption.

Job No. 71-11-29T Invoice No. TU-2823
cc: Enclosed
RMGC: SLC
file
MHH:rg

Sample No.	ppm Copper	ppm Lead	ppm Zinc	ppm Silver
2561	100	50	130	3
2562	65	60	95	4
2563	+1000=1.80%	160	375	7
2564	+1000=0.25%	540	+1000=.11%	10
2565	100	60	120	3
2566	55	80	160	2
2567	20	60	170	2
2568	+1000=0.15%	+1000=2.51%	+1000=.38%	30

All values are reported in parts per million unless specified otherwise. A minus sign (-) is to be read "less than" and a plus sign (+) "grea than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the prot tion of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without writt permission.

ND = Non Detected 1 ppm = 0.0001% 1 Troy oz./ton = 34.28 ppm % Mo. x 1.6683 = %Mo

Sample No.	ppm Copper	ppm Lead	ppm Zinc	ppm Silver
2569	+1000=0.11%	320	+1000=.29%	5
2570	420	750	+1000=023%	4
2571	+1000=0.73%	180	+1000=.43%	18
2572	250	270	885	10
2573	60	60	180	-1
2574	20	+1000=0.57%	+1000=.52%	25
2575	50	110	90	2
2576	60	220	935	2
2577	20	1000	980	4
2578	5	20	25	-1
2579	15	+1000=1.97%	+1000=2.08%	130
2580	10	130	145	1
2581	+1000=0.33%	110	+1000=.12%	10
2582	40	30	115	-1
2583	+1000=0.23%	160	800	6
2584	35	90	180	1
2585	+1000=0.22%	+1000=.32%	+1000=1.27%	35
2586	770	+1000=2.16%	+1000=1.72%	125
2587	145	280	200	3
2588	10	40	65	1

ROCKY MOUNTAIN GEOCHEMICAL CORPORATION

Tucson, Arizona November 19, 1971

By Martin H. Hibbetts

Samples taken by H.J. Steele

1620	300	780	170
1621	25	30	90
1622	30	50	

ANALYSIS OF THE PROBLEM

1. Since both FVO and Birchfield own undivided interests, neither interest is saleable without the concurrence of the other.

2. Birchfield will not authorize FVO to represent him in sale negotiations, nor will FVO authorize Birchfield, so any serious negotiations would necessarily have to be conducted by a third party, who is authorized to represent both. At this point the logical third party, in my opinion, is Robert Cattany.

3. The negotiator must be given sole authority to negotiate, since any contacts by FVO or Birchfield will only hinder his efforts, and diminish his possibility of success.

4. The decision as to acceptance of terms should be arrived at by the consensus of all parties who have a financial stake in it. This would include William Porter, FVO, Howard Birchfield, and indirectly RFO, since I have over $3,000.00 invested in the yard which secures the Porter loan of ~~$2,500.00~~ $25,000.00. The decision should be made on the basis of sound business principles, which I believe are as follows:

Unless a deal is made soon, more investment will have to be pumped into the property to keep it alive. Also, the first half of the Porter loan ($12,500.00) is due on July 8, 1972. There are no funds available to pay it except from the property, or from further borrowings. Rather than drag out negotiations or wait for some eventual better deal, the parties should agree to make a deal now with the highest bidder on the best terms offered, whatever they may be.

5. The delays involved in past <u>independent</u> negotiations by FVO and Birchfield seem to have resulted in the following:

A. Inability to conclude any binding deal with any buyer of substance.

B. Pouring money into the property which has preserved it, but not proved it out.

C. Dilution of ownership interest of FVO through having to borrow. Clouding of the Birchfield Title through improvident deals with Basic Metals and Gordon-Miles.

D. No corresponding benefit to the property, or advantage from the time spent.

6. Birchfield-Owens agreement. Although a joint venture was apparently originally intended between Birchfield and Owens, it has not been operated as one by the parties, either from a business or legal point of view. Record keeping has been almost non-existent, and management has been divided with no formal agreements as to rights and duties. Both parties have expended funds on the property, and it is not clear whether these should be treated as loans to the venture, or should be added to capital accounts to vary the original 50/50 ownership ratio.

It is essential that this be resolved by mutual agreement as soon as possible. Litigation would make little sense because of (1) the additional delay, (2) the effect on the property, and (3) the cost.

Data which is needed from both parties is an itemized list of all funds expended, grouped by classification: assessment work, litigation, advances from one partner to the other, travel, etc. Then a meeting should be held to try to reach an agreement as to present interest, and a new formal agreement drawn up. It should recognize the additional interests which have arisen since the original agreement (William Porter) as well as how the various claims by Gordon-Miles, Helen Birchfield, and Basic Metals will be handled as between the partners, and in the event a lease or sale materializes.

7. The Helen Birchfield agreement. The divorce agreement is not clear as to whether Helen received an interest under it in the middle March claims. From information I have, it appears the two lawyers involved both interpret it differently. In litigation, it could go either way, I believe. If Helen loses, FVO would have nothing except the right to sue Helen for his $5,000.00 back. If Helen wins, FVO would have her interest but, under partnership law, he would probably be held to have acquired it for the partnership (Owens-Birchfield) rather than for himself, because of the fiduciary obligation. Birchfield would owe Owens $2,500.00 for his contribution.

I would suggest a three-way settlement: (1) get both Birchfields to agree the status of Helen's claim is disputed, and could go either way, and that Helen should settle for $5,000.00 rather than $10,000.00, and that Howard would recognize her claim to that extent; (2) get Howard to then agree to reimburse Owens for his one-half. This could be taken care of in the final accounting.

GEOLOGICAL REPORT

ON

THE MIDDLEMARCH PROPERTY

COCHISE COUNTY, ARIZONA

by

D. G. INNES AND ASSOCIATES LTD.

MARCH, 1982

Table of Contents

DBL

I N T R O D U C T I O N

During March, 1982, the writer carried out a field investigation of the Middlemarch copper - lead - zinc - silver property in Cochise County, southeastern Arizona. The results of this field examination together with a review of Government (State and Federal) and mining company data is herein presented.

The economic potential of this property is considered and recommendations for testing this potential are also given.

This report is considered part of a preliminary phase of exploration and additional, more detailed and specific work is planned for the immediate future.

Property Location and Access

The Middlemarch Property is located in the southeast part of the State of Arizona, approximately 12kms west of the Town of Pearce (fig. 1). Located in Cochise County, the property consists of ~~180~~ 320 contiguous claims in townships; 18 South, Range 23 East (of the Gila and Salt River Merdian), Sections 1, 2, 11, 12, 13, 14 and 24; 18 South, Range 24 East (of the Gila and Salt River Merdian), Sections 6, 7, 8, 17, 18, 19, and 20; and the northeast tip of Silver Rule Claim No. 70, enters Township 17, (fig. 2).

The claim block covers most of Middlemarch Canyon on the eastern slopes of the Dragoon Mountains. Good secondary roads leading from Highway 666 provide the principal access to the property, (Middlemarch Canyon Road and the Old Tombstone Road). Numerous other roads have been developed to access most of the known mineral showings.

Physical Environment

The Property is situated along the eastern slopes of the Dragoon Mountain Range which separates two great intermountain plains; the San Pedro Valley to the west; and the Sulphur Springs

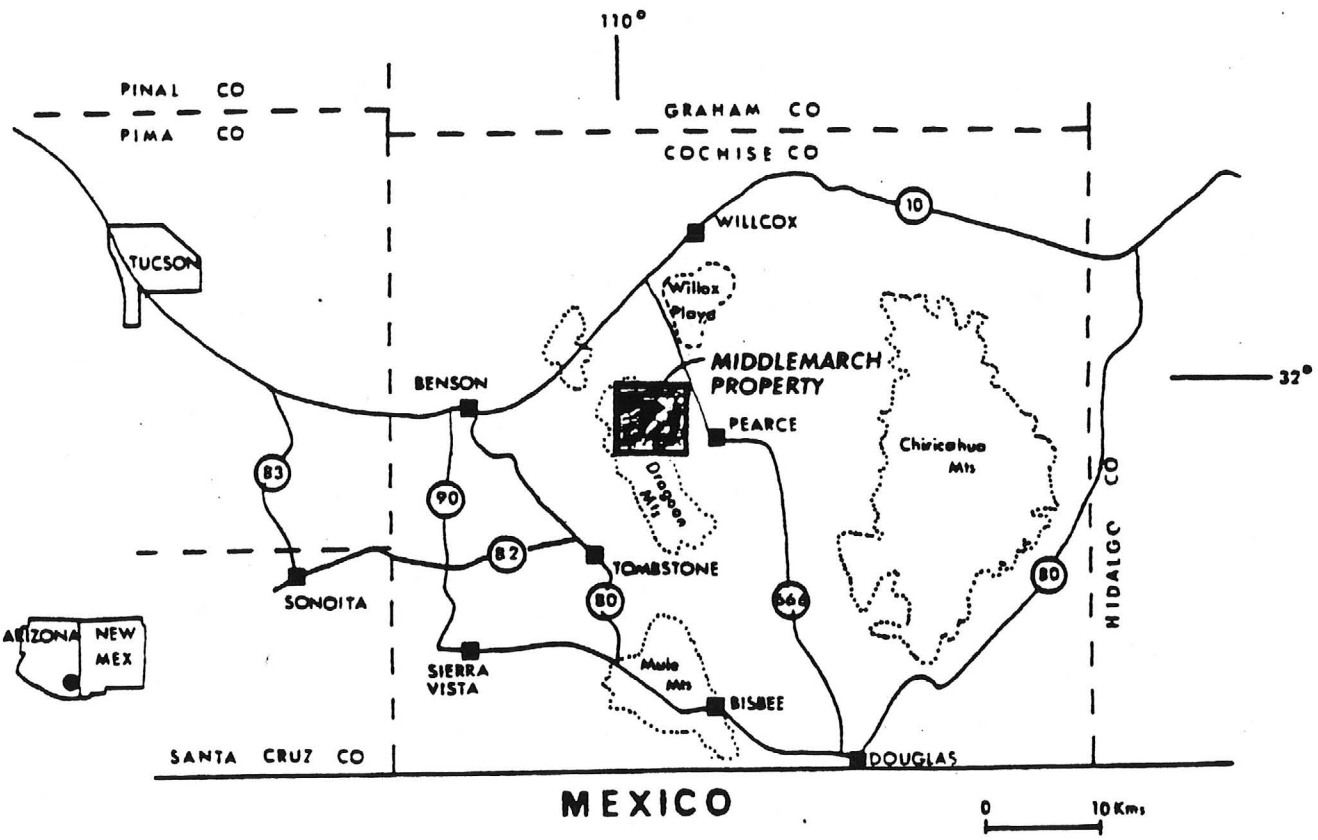


Figure 1 : Geographical location of the Middlemarch Property, Cochise County, Arizona.

Valley to the east. The Dragoon Mountains form a northwest trending Range approximately 32kms in length and up to several kms in width. In the vicinity of the Middlemarch Property the topography can be described as being rugged and Mount Glenn just to the north of Cochise Peak reaches an altitude of 2,284 meters. The topographic relief of this area is illustrated by the Pearce Quadrangle Topographic Sheet (1:62,500).

The climate is generally dry with precipitation varying with altitude; 25cm/yr in Benson (elevation 1,057m in the San Pedro Valley); to over 50cm/yr at Bisbee (elevation 1,628m in the southern Dragoon Mountains). Rainfall is concentrated during the period July to September. Temperatures range from 75°F to 90°F in the summer season and to 50°F during the winter months.

Vegetation varies as well with altitude and water availability. In the higher reaches, scattered growth of yellow pine, juniper, oaks, cedars and cottonwoods are common. Along the lower slopes, Yucca, Spanish-Bayonet, ~~Stel~~ Sotol and other scrub brush are common. Mesquite is the common cover of the lower flat country.

Water is available on the property; two waterfilled ponds occur near the pit area; the Missouri Mine workings are flooded to the third level; water wells have been dug near the Missouri Mine workings; local ranchers have established that an ample water table lies between 60m and 120m below the valley floor.

1961

History

The Middlemarch Property has been variously described as being part of the Middle Pass, Dragoon, Pearce or Turquoise mining districts. The Arizona Bureau of Mines considers the property as being part of the Middle Pass Mining District, (Keith, 1973). Between the late 1800's and 1970 the whole district produced about 76,000 tons of ore containing 1,005 tons of copper, 137 tons of lead, 4,626 tons of zinc, 337 ounces of gold and 147,000 ounces of silver, for a total value of about 1.725 million dollars (Keith, 1973). In addition, minor production of tungsten, barite and limestone are recorded.

Much of the following history of the Middlemarch deposit is taken from Kirwin, (1975) and Arizona Bureau of Mines file data.

The Middlemarch deposit was discovered in the late 1800's by Messrs. Gird and O'Gorman who extracted and smelted shallow oxide ores. A floation mill was set up in 1917 by the Arizona Middlemarch Copper Company. Between 1900 and the 1950's various companies explored the deposit to the 800 ft. level from an inclined shaft at the end of a 250 ft. adit. Considerable drifting is reported by Kirwin (1975) and more than 5,000 tons of ore was produced (ABM file data). The Cobre Loma Mine produced in excess of 5,000 tons of ore from adit workings between 1915 and 1920.

Only limited exploration has been carried out on the property since the 1950's. Kerr McGee put down 3 diamond drill holes and apparently one of these holes intersected high grade mineralization at depth in the area of the Missouri shaft. Core from this drilling

has been dumped and is not available for inspection. The pit area was developed in the 1970's and exposed considerable high-grade ore. Limited prospecting and testing by Big Sky Mining Company was carried out between 1980 and the present.

As far as can be determined the mineralized zones have never been drilled nor tested at depth. The deposit(s) must be considered to be open along strike and at depth.

The area was regionally mapped between 1936 and 1940 (Gilluly, 1956) and the structural geology of the Middle Pass area was studied by Cederstrom (1946). Reconnaissance mapping was carried out over the Dragoon Mountains by Darton, (1925) and Dumble, (1902). A statistical summary of mining production for the State of Arizona is given by Elsing et al (1936). Gilluly, (1956) offers an extensive bibliography of geological research in the area generally.

Regional Geological Setting

The Middlemarch Property lies within the Pearce-Benson Quadrangles of the Geological Survey's Topographical Atlas of the United States. Cochise County is located in the southeast corner of the State and embraces a part of the Mexican Highland section of the Basin and Range Province. The Property lies along the Middlemarch Canyon on the eastern slopes of the Dragoon Mountains. The Sulphur Springs and San Pedro intermountain valleys flank the Dragoon Mountains to the east and west respectively.

Rock formations of the area, range in age from the Precambrian

(Proterozoic) to Recent, (Plate 5, in Gilluly, 1956). The oldest rocks exposed are Precambrian age Pinal Schists locally present as thrust slices along the east slope of the Middlemarch Canyon. This unit strikes generally east, dips vertically and consists of thinly laminated chlorite - albite - quartz schists and amphiolitic schists of probable volcanic origin, (ie. basalt, andesite). The formation also contains several small intrusive masses of albite granite, quartz-diorite and gneissic granite.

Unconformably overlying the Pinal Schists are the Cambrian age Bolsa Quartzite and Abrigo limestones. The Bolsa quartzite has a basal unit of quartz pebble conglomerate which grades upward to pebbly rusty-brown weathering quartzite. The Bolsa grades conformably into well bedded micaceous sandstones through thin bedded limestones.

The Abrigo Limestone is overlain by Late Devonian limestones of the Martin Fm. These rocks are characterized by a few feet of basal dolomitic cobble conglomerate grading upwards into calcareous sandstones, limestones, dolostones and some shaley units. This stratigraphy is overlain by the thick bedded Mississippian Escabrosa limestone-dolostone. Limestones and dolostones of Pennsylvanian age are also represented. Between the Carboniferous and Permian Eras, limestones, dolostones, shales and lesser calcareous sandstones of the Naco Group were deposited.

At least five intrusive events during post-Paleozoic pre-Cretaceous time are represented by granitic, quartz monzonitic and alaskite to monzonite porphyry intrusions. There is also a

volcanic event referable to this age; the Sugarloaf quartz latite and andesitic rocks of Tertiary age outcrop in the southern part of the Dragoon Mountains, (S. O. Volcanics). During the Triassic-Jurassic eras, the Cochise Peak quartz-monzonite body was implaced in a belt extending from Cochise Peak southeast for approximately 4.5 kms to the divide at Middle Pass. Smaller equivalent intrusive dikes and sills are found in the thrust slivers near the head of Middlemarch Canyon (eg. Cowpatch).

During the Cretaceous, sediments of the Bisbee Fm., (Comanche Series) were laid down over much of the Middlemarch area. The base of the formation is marked by a series of limestone conglomerates (Glance Conglomerate) with the bulk of the formation represented by mudstones, sandstones, quartzites and thin beds of limestones. Near the Cobre Loma adit, rocks of the Bisbee Fm., are strongly hornfelsed, (calc-hornfels: wollastonite, diopside, calcite, quartz, epidote, tremolite and grossularite). As well, a 130m section of highly carbonaceous black shales overly the banded hornfels and may represent a younger stratigraphy.

The Stronghold Granite which was emplaced permissively during Tertiary time, forms domes and spires that rise above the canyons. This granite represents the youngest major intrusion of the region and cuts the Dragoon thrust sheets in many places. The intrusion consists of three facies; main, porphyritic and aplitic facies. The difference being mainly grain size. Contact metamorphic effects are represented by hornfels development. Related dikes of granite porphyry, quartz porphyry and rhyolite porphyry are abundant in the

Middlemarch Canyon area where they form a swarm trending northwest approximately parallel to the strike of the Bisbee Fm. A northwest trending coarse grained pyroxenitic dike (or sill) and a fine diabase dike were observed near the Cobre Loma Mine and may be part of the Tertiary intrusive episode. A spessartite-type lamprophyre dike trending north-northwest was observed near Cobre Loma Mine and cuts all rocks including the Stronghold Granite.

Flat lying sandstones, siltstones, clays, volcanic ash, fanglomerates of the Gila Conglomerate and alluvium of Quaternary age cover the floor of the Middlemarch Canyon and the Sulphur Springs Valley.

Regional Structural Setting

The dominant structural elements affecting the region are Basin and Range tectonics. The uplifted Dragoon Mountain block consists mainly of sedimentary and intrusive rocks cut by many thrust faults of north to northwest strike and later invaded by the Stronghold Granite.

Along its trend the range is divided into six structural segments of which the segment between Cochise Stronghold and Middle Pass is of primary interest to the Middlemarch Prospect. In the north part of this segment the stronghold granite causes broad gentle doming. Southward to the Gleeson Area, the dominant structural features are folded and imbricate low angle thrust sheets, many of which dip eastward, cut by the major Dragoon thrust which

dips steeply west.

Structurally significant, older steep dipping, north-northwest trending normal faults are mapped along the trace of Middlemarch Canyon. These structures are accompanied by significant zones of fault breccia as illustrated by Gilluly, Plate 5 (1956). Considerable offset (downthrow to the east) of up to 500m is postulated by Gilluly (1956). For example, near the mouth of the Middlemarch Canyon, limestone conglomerate of the Bisbee Fm., lies in fault contact with the Pinal Schist. This fault dips about 40° SW and strikes NW.

These structures are of importance with respect to localizing mineralization in the Dragoon Mountains generally and on the Middlemarch Property specifically.

Geology of the Middlemarch Mineralization

Keith (1973) classified the Cobre Loma mineralization as a pyrometasomatic tactite zone in limy hornfels of Cretaceous Bisbee Group along the contact with a porphyritic intrusive. The Missouri deposit is considered to be an oval shaped breccia pipe (chimney-type orebody) associated with lime silicates in a fault zone cutting Paleozoic and Cretaceous limestone beds. Kirwin (1975) considered all of the Middlemarch deposits to be of contact-metamorphic-type located at the contact of felsic intrusive rocks (to the west) and Cambrian metasediments (to the east).

Having examined the main Middlemarch deposits, the writer

would agree that at least some of the metal concentrations are of the contact-metasomatic or skarn-type and that the Missouri Glory Hole deposit occurs associated in part with a rather obvious diatreme breccia pipe. Furthur, the writer favours the Cretaceous Bisbee Group as the main host rocks for this mineralization as suggested by Kieth (1973). However, there is strong evidence to suggest that variations in deposit type are due to metal source and tectonic control. This aspect and its implications to the economic viability of the Middlemarch Property will be addressed at the close of this section.

An irregular oxidized and gossanous alteration zone trending 135° is traceable from the old Copper Glance Property northwest of the Cobre Loma adit to the Missouri Glory Hole for a potential strike length of 2,400m, (fig. 2). Recent explorations and excavations including; Bill's Cut, McDaniel's Cut, The Pit and Shaft, have verified the presence of mineralization along this strike length between the Cobre Loma and the Missouri Mine. Field work by the writer has shown that the surface gossan zone continues for at least 120m southeast of the Missouri Mine. In this area, an old pit was discovered and copper carbonate gossan observed. Another gossan zone was spotted approximately 350m further to the southeast and may be on the same structure. This gossan was not investigated. The NW and SE extensions of this mineralized zone have not been tested and are considered to be open.

This mineralized zone parallels a zone of intense structural deformation, mainly thin shallow angle imbricate thrust sheets

tilted more steeply against the major Dragoon thrust. Near verticle to 45° W dipping normal faults are also evidenced and probably served as conduits for the numerous intrusive rocks present in this area (mainly felsic intrusions). As well these faults were probably active over a considerable period of time and played a role in localizing diatreme breccia pipes and initiating hydrothermal activity.

The principal metals associated with this zone are sulphides, oxides, carbonates and silicates of copper, zinc, lead and silver. The near surface mineralization is variably oxidized and commonly shows white zinc and blue-green copper secondary mineral gossans. Below the oxidized zone (to 23m, Kirwan, 1975) sulphide minerals including chalcopyrite, bornite, sphalerite, galena and pyrite are easily identified. Interestingly, the copper and zinc are strongly partitioned suggesting a partitioning in the source of these metals.

More recent explorations by Big Sky Mining and Mr. E. J. Blanchard have resulted in the discovery of a different type of mineralization mainly to the east of the Cobre Loma - Missouri Zone. This mineralization (Cowpatch, Silver Hill and Lloyd and Lavern) is very inconspicuous occuring in Bisbee type limestones and dolostones. Here, mineralization consists of minor disseminated sphalerite and galena and some pyrite. On assay the mineralization consists of 3 to 4% Pb + Zn, very high silver (6 to 12oz /ton), and virtually no copper. This potential is only now being recognized and has never been explored.

All of the known areas of mineralization were reviewed either directly in the field or from various government reports and company files. The following observations are given for each of the deposits examined directly in the field.

Missouri Mine

Access to the Missouri deposit is gained through a 250 foot adit entering the ore body on the third level and via the Missouri Glory Hole above the adit. The mine workings are confined mainly to the upper oxidized zone but are reported to extend to the 800 foot level (Kirwan, 1975). At present everything below the third level is flooded and not accessable. The mineralization occurs in three environments; skarn-limestone host; a circular breccia pipe structure; in dark green (volcanic ?) host below the metasediments at depth (ie. below the 6th level). The "ore zone" is reported to dip 40° to the southwest, however the writers observations would suggest that a 40° to 45° southeast dip is more probable at least for the upper levels of limestone-skarn mineralization. The low angle thrust faulting together with associated tight folding could give the impression of a southwest dip. The breccia pipe structure appears to be nearly verticle cutting the metasediments. Large sub-angular blocks and smaller fragments within the structure have a distinctly verticle attitude supporting the verticle nature of the intrusive breccia. One section of drill core from below the sixth level shows a crude layering of the mafic host to the massive

sulphide mineralization at a high angle to the core axis suggesting a fairly steep dip to these rocks. SW-dipping normal faulting is also evidenced in the mine workings and probably controlled the emplacement of the breccia structure. There is a good possibility that this faulting resulted in an upthrusting of the Pinal Schist which is now unconformably overlain by the Bisbee Fm., lithologies as is the case near the mouth of the Middlemarch Canyon (Gilluly, 1956).

No information was found detailing the underground geology of the Missouri deposit. However, some highly mineralized sections were observed up to 150 feet in width. Underground workings are reported to be extensive suggesting a significant strike length. Mining company reports suggest that the mineralization both widened and increased in grade with depth. Kelly, (1913) reported that to the sixth level, between 125,000 to 200,000 tons of ore was available, grading from 2% to 4% Cu plus minor Au and Ag. It is interesting to note that Zn values are not reported, and that copper extraction was the primary objective as large sections of very high-grade (10 to 15% Zn) sphalerite mineralization was left untouched. In the skarn-type mineralization the zinc and copper mineralization is strongly partitioned, while the breccia pipe hosts primarily copper mineralization. The deeper mafic rock hosts an intimate association of chalcopyrite, galena and sphalerite. Au values are reported to 0.05 oz/ton but have not as yet been confirmed. Late carbonate + quartz filled veins striking NS and dipping vertically may provide the site for gold concentration. Ag values from both the skarn and breccia pipe zones commonly fall in the

range from 1oz to 2oz/ton. Substantially higher Ag values (to 50oz/ton, newspaper clipping) are reported from the deeper massive sulphide zones. Samples of this material discovered in a small ore pile near the campsite are currently being assayed.

It is quite remarkable that this ore body has not been explored to any degree. Mineralization is open on both ends and at depth.

Shaft Area

An old shaft northwest of the Missouri Mine was briefly examined. This shaft was reportedly put down 100 feet. Examination of dump material showed minor copper carbonate gossan in limestone skarn. Abundant fine grained quartz-feldspar porphyry material was also observed.

The Pit Area

The general geology of the pit area mineralization is illustrated by figure 3. The area was surveyed by pace and compass methods and is not reported as a precise survey.

Here, conglomerates (Glance Conglomerate), limestones, dolostones, calcareous sandstones and shales are intruded by medium grained quartz monzonite. The rocks strike 135° SE and dip 45° E. Mineralization at this location is essentially the same as the skarn-type observed at the Missouri Mine. In the pit area, the quartz monzonite forms the footwall of the mineralized

zone but is absent to the northwest in the Cut area. From the Cut, the epidote skarn is from 3m to 4m in width increasing to approximately 12m in width at the entrance to the adits in the Pit. Surface exposures and adit exposures suggest that the mineralized zone widens rapidly southeastward and may swing to the east as illustrated on Figure 4. Flat-lying dolomitic conglomerates and dolomite have been thrust over the pit ore zone effectively "hiding" the zone. Normal and strike-slip faulting is also evidenced in the Pit and Cut. Large blocks and horsts of quartz-monzonite occur in high grade skarn along the footwall in the Pit adit. A thin wedge-shaped unit of fine grained cherty fragmental lies along the fault plane in the Pit and may be intrusive. The unit which is mineralized with pyrite appears to have a chilled contact.

As was the case in the Missouri Mine, copper and zinc mineralization is strongly partitioned (fig. 4). As well, some of the clasts in the conglomeratic units are strongly mineralized with chalcopyrite suggesting that these sediments might have hosted syngenetic mineralization prior to their erosion.

The Pit showing has never been explored and the deposit must be considered open to depth and along strike. Surface exposures would suggest that the zone thins to the NW and thickens rapidly to the SE.

Ella's Pit and Shaft

According to Kelly (1913) the Ella shaft was put down on a thin zone of mineralization to a depth of 187 feet where " a large body of low-grade ore was encountered". Both copper and zinc rich skarn-type mineralization was observed in the dump material and in a small pit and in the opening to the inclined shaft. The mineralized skarn occurs at the contact with a fine-grained quartz-feldspar porphyry dike and dips steeply to the east. This felsite is crudely layered and resembles a fine-grained felsic crystal tuff. The felsite contains abundant pyrite disseminated throughout.

This same mineralization was followed to the southeast along strike (135°) for about 300m. The zone is marked by a very pronounced rusty gossan and by brecciation of the metasediment. To the southeast (over the hill towards the Pit area) the zone is up to 25m wide and the quartz-feldspar porphyry (1m thick) occurs in the centre of the skarn zone (dipping 60° E). Medium-grained to fine-grained quartz monzonite occurs on both the hanging wall and footwall areas of this skarn zone.

This skarn zone has never been tested along strike nor at depth and is considered to be open.

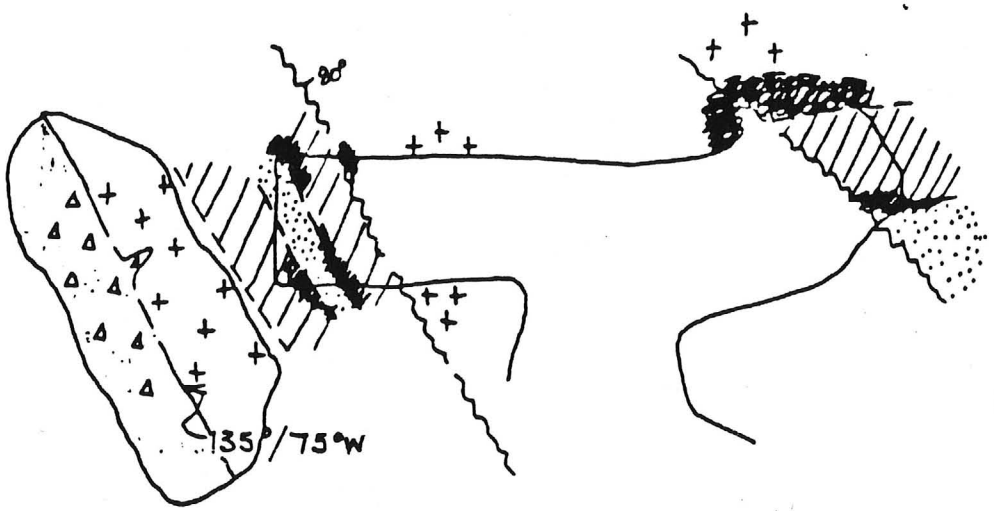
McDaniels Cut

At this location a recent cut along the side of a steep slope by Big Sky Mining has exposed a narrow zone of copper rich skarn

along the contact with the fine-grained quartz-feldspar porphyry. The zone trends 130° and dips steeply to the east. The metasediment skarn carries mostly copper sulphides and carbonates but some sphalerite and galena was observed.

Bill's Cut

Bill's Cut is located southeast of the Cobre Loma adit on strike with McDaniels Cut. Fig. 6 illustrates some of the geological features of this location. At this showing, a complex series of intrusives cut limestones and shales resulting in thin mineralized skarn development. The mineralized zones contain chalcopyrite, pyrite with lesser sphalerite and galena. Zones of quite massive earthy to radiating black-brown material thought to be manganite (or iron-siderite) occur marginal to a very coarse grained pyroxenitic intrusion. This is the first recognized pyroxenite on the property and this rock type is not described in any of the literature reviewed by the writer. Good contact and age relationships between the fine-grained quartz-feldspar porphyry and the coarse-grained quartz monzonite-granodiorite can be seen at this location. The porphyry clearly is intrusive (and invades) into the granodiorite. The pyroxenite apparently cuts the granodiorite as well. The shale facies is quite prominent at this location and represents a significant facies change in the Bisbee Fm. Gilluly, (1956) suggests that this unit might represent a younger formation. In the Cut area proper, the granitic rock is



Coarse grained pyroxenite

Fine grained quartz-feldspar porphyry

Medium to coarse grained granodiorite

Thin bedded shales

Mineralized skarn

Figure 6 : Bill's Cut, general geology.

intensly altered and somewhat brecciated along the NW fault shown on fig. 6.

Mineralization appears to be of low grade and rather narrow (to 1m) and broken up. However, the zone has not been tested along strike, nor at depth.

Cobre Loma

The following description of the Cobre Loma workings is taken from Kelly (1913).

"Several hundred feet beyond the Ella Shaft, in a northwestern direction, the vein as outlined on the surface by the iron croppings, turns slightly towards the north. Here, on the Cobreloma the out-croppings are quite pronounced, and a tunnel was started to cut the vein. This tunnel continued until it reached the Lacima claim, where the ore was finally cross-cut. After the ore was cross-cut, a drift on the ore was started and continued for a total of almost 200 feet. There is ore all the way. A cross-section of the ore in this drift may be likened to an inverted V. The ore pitches slightly towards the northeast, and from a width of one or two feet in the roof, it widened to four or five feet in the floor. The end of this drift is now all in ore. The assays varied from 2% to 11%, with an average of about 7% copper, and carrying some gold and silver. It also contains much black iron and fluorspar."

The mineralization at the Cobre Loma is quite different from that of the Missouri and Pit areas. There are some similarities to that found in the McDaniels and Bills Cuts. The dominant lithology is thinly laminated, highly carbonaceous shales with only minor thin dolostone intercalations. Grey-black chert beds

were also observed in outcrop. A fine-grained diabase dike cuts the shales at a shallow angle near the entrance to the adit. Immediately west of the adit, are outcrops of coarse-grained granodiorite cut by small lampyrophyre dikes. Thin felsic dikes cut the shales east of the adit.

From dump material examined the metasediments have been strongly hornfelsed (calc-hornfels) and diopside-wollastonite minerals are identified. The mineralization appears to be mainly chalcopyrite with abundant hematite. Only minor sphalerite and galena were identified.

Previous work would suggest that this mineralization is pod or lense-like, and these zones apparently continue along the northwest structural trend to the old Copper Glance showing. There has been very little exploration of this zone and the existence of other high-grade copper lenses is quite possible. The zone has never been tested at depth.

Cowpatch

The Cowpatch zone has only just been found and little is known about the extent of mineralization. The local geology is illustrated by fig. 7 and as can be seen on fig. 2 the showing lies well to the east of the Missouri-Cobre Loma zone.

Folded thin to thick-bedded limestone-dolostones cut by felsite porphyry (135°) are hosts to this mineralization. The showing occurs some distance from the felsite and there is no obvious skarn

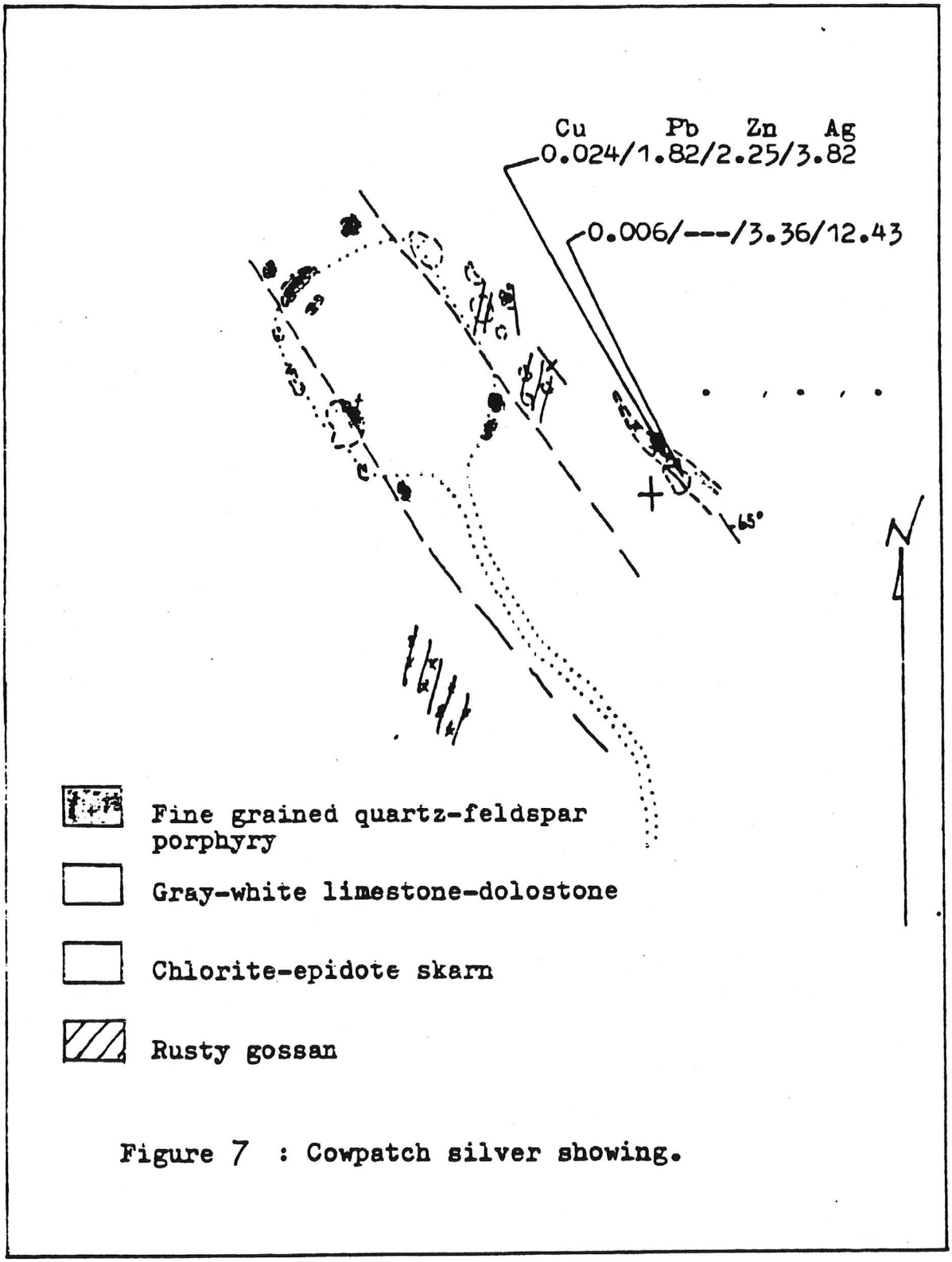


Figure 7 : Cowpatch silver showing.

developed along the contact of the felsite. The mineralized zone is skarn-type being heavily chloritized and epidote rich. There is some silisification within the zone and thin quartz + carbonate veins cut the host limestones at right angles to the mineralized zone. Pyrite, sphalerite and galena are observed in the skarn with only minor copper carbonate gossan. The zone trends 135° and dips 65° to 70° E. The west contact is exposed and shows a 7m wide zone of intense brecciation and secondary quartz carbonate veining. From the assay values shown on fig. 7, silver is apparently quite high and there does not appear to be enough sulphide to carry these values of silver. It is possible that the silver is present as silver chloride and silver manganese compounds. This possibility is currently being investigated.

The zone has not as yet been opened up but from surface exposures the mineralization thins to the northwest and widens along strike to the southeast (3m plus).

Silver Hill

This showing is similar to the Cowpatch showing being east of the Missouri-Cobre Loma zone and occurring in skarn limestone-dolostones. Again, this showing is newly discovered and its boundaries have not as yet been defined. Samples of limestone carrying minor disseminated sphalerite and galena gave silver values from (2)DDL to 6 oz/ton and lead + zinc values of 2 to 4%. Neither the Cowpatch nor the Silver Hill showings carry any copper mineralization.

DGL

Other showings known on the Middlemarch Property including the Emma, Lloyd and Lavern's pit and the Copper Glance were not visited. The reader is referred to the bibliography for information on these showings.

Other Economic Considerations

A small amount of ore-grade material is stockpiled at various locations on the Middlemarch Property. During the field investigation, a conservative estimate of available material was made;

Camp-Missouri Mine Area:	1,500 tons with the possibility of an additional 1,000 tons possible between the adit and leach basin areas.
Pit Area:	Approximately 5,000 tons.
All Other Areas:	Approximately 100 tons.

This material is somewhat leached due to exposure and the average grade is estimated to be 1.5% Cu + 6% lead + zinc and 1.5 to 2oz Ag/ton. Significant tonnages of ore-grade material could easily be realized from the Missouri Glory Hole area and from the Pit area both by open pit methods.

The nature of mineralization on the Middlemarch Property is favourable for good recoveries and metal extraction. Lower grade oxidized ores are suitable to leaching methods. Most of the mineralization is fairly coarse grained allowing for good flotation separation and recovery. The apparent partitioning of the copper

and zinc mineralization would also allow for some selection during both the mining and milling procedures.

A potentially significant deposit of gypsum is present on the Middlemarch Property and occurs on the east slope of Middlemarch Canyon, southeast of the Cobre Loma adit. This deposit was observed at only one locality and not examined in any detail. The deposit may be rather large being quite obvious as an extensive white area as seen from the Cowpatch hill. There is reported to be in excess of 1.8 million tons of high purity gypsum (K. McDaniels, per comm.). In hand specimen, the gypsum is a light amber brown in colour, coarse grained and massive. It weathers to a dull white standing out prominently along the hillside. The potential for this material as a major ingredient in fertilizer products remains to be tested.

Conclusions

The potential of the Middlemarch Property to host significant economically viable deposits of Cu, Pb, Zn and Ag must be considered to be high. Both the Pit and Missouri deposits have significant indicated tonnages and both are open at depth and along strike. The total zone from the Cobre Loma to the Missouri has never been drilled and other deposits like that found in the Pit and Missouri Mine areas are indicated.

The most promising environment in the writer's opinion is the "deep" zone underlying the skarn and breccia hosted ore at the

Missouri Mine. Samples of this mineralization closely resemble massive sulphide in a volcanic host. This mineralization might prove to be the source for much of the metals in the overlying sediments. The fact that metals are; partitioned in the ore zones; present away from the main mineralized zone (eg. Cowpatch and Silver Hill); and present in the clasts of some conglomerate beds would also suggest that the overlying sediments may well host significant syngenitic deposits of Cu and Pb + Zn + Ag. The Cowpatch and Silver Hill showings have potential for significant silver (lead and zinc) deposits and remains to be explored. Mineralization is far from obvious in this environment and deposits could easily have been missed.

Recommendations

The following recommendations are given with the objective of furthur defining the property's potential overall and also to assess the grade and tonnage of both the Missouri and Pit area deposits.

1. Two surveyed control baselines should be extablished on the property. The east baseline should be run NW from the NE corner of Helena Claim No. 40 to the NE corner of Silver Rule Claim No. 8. A parallel west baseline should be established from the NE corner of HH No. 4 claim to the NE corner of Silver Rule Claim No. 30. These control lines will allow for ground control and also help to tie in the claim boundaries. As well, the baselines will remain

outside of the main development area. A cross line grid should be established at 200' intervals.

2. A base map should be established to cover this grid initially and expanded to cover the total property at a later date. The base should include all access routes, topographic contours and mineral showings and workings.

3. A drilling program should commence immediately on the Pit showing. The projected mineral zone outlined on fig. 4 should be tested with a grid of verticle holes using air track drilling methods equipped with a sampling device. Samples should be taken at a minimum of 5' intervals. At least 3 angled diamond drill holes should be put down in the same area to establish geological control (fig. 5). Stripping of the Pit area is also recommended to expose more of the mineralized zone.

4. A series of diamond drill holes should be considered to test the Missouri mineralization especially that below the 6th level. The existing accessable workings should be surveyed and mapped.

5. Following this initial exploration, the total property should be mapped and sampled in detail.

References

Cederstrom, D. J.

1946: The Structural Geology of the Dragoon Mountains, Arizona; Am. Jour. Sci. V. 244

Darton, N. H.

1925: A Resume of Arizona Geology: Ariz. Univ. Bull. 119, Geol. Ser. No. 3.

Dumble, E. T.

1902: Notes on the Geology of Southeastern Arizona: Am. Inst. Min. Eng. Trans., V. 31.

Elsing, M. J., and Heineman, R. R. S.

1936: Arizona Metal Production: Ariz. Univ., Ariz. Bur. of Mines Bull. 140.

Gilluly, J.

1956: General Geology of Central Cochise County, Arizona; Geol. Surv. Prof. Paper 281.

Janes, H. L. (Managing Editor)

1978: Land of Cochise, Southeastern Arizona; New Mexico Geol. Soc., Ariz. Geol. Soc., 29th Field Conference.

Keith, S. B.

1973: Index of Mining Properties in Cochise County, Arizona: Ariz. Bureau of Mines, Bull. 187.

Kelly

1913: Mine developement report for Middlemarch Copper Co.

Kirwan, G. L.

1975: Engineering geology report on the Middlemarch Property.

Moore, R. T.

1975: One Hundred Arizona Minerals; Ariz. Bureau of Mines, Bull. 165.

Maps

1. Geologic Map of Cochise County, Arizona; Ariz. Bur. of Mines and Univ. of Arizona, 1959, scale 1:375,000.
2. Arizona Highway Geological Map; Arizona Geol. Soc., 1967, scale 1:1,000,000.
3. Geologic Cross Sections of Arizona, Sheets 1, 2, and 3. Arizona Bur. Mines, 1967, scale 1 inch = 3 miles.
4. Topographic map: Pearce, Arizona Quadrangle; scale 1:62,500.

BUDGET

1.	Surveyed baselines (3 miles)	$ 3,600.00
	Flagged grid (15 miles)	$ 1,800.00
2.	Preparation of Basemaps	$ 3,500.00
	Air photo coverage	$ 1,500.00
3.	Power stripping	$ 25,000.00
	Diamond drilling, Pit Area	
	3 holes x 500 feet x $30.00/foot ..... (includes assaying and supervision)	$ 45,000.00
	Air Track drilling, Pit Area	
	24 holes x 50 feet x $6.00/foot ..... (includes supervision)	$ 7,200.00
	Sampling: shipping & assaying	$ 6,000.00
	Preparation of drill sections and assay plans ...	$ 1,500.00
4.	Diamond Drilling, Missouri Mine	
	10 holes x 500 feet x $30.00/foot ..... (includes assaying and supervision)	$150,000.00
	Survey of Mine Workings	$ 3,500.00
	Dewatering and clean-up	$ 6,000.00
	Mapping of Mine workings	$ 4,500.00
	Preparation of drill sections	$ 1,500.00
5.	Detailed geological survey over grid	$ 15,000.00
	Reconnaissance mapping over rest of Property	$ 6,000.00
	Sampling: preparation, shipping, assaying	$ 6,000.00
	TOTAL	$287,600.00

C E R T I F I C A T E

I, DANIEL GRANT INNES, of the City of Sudbury, in the District of Sudbury, in the Province of Ontario, hereby certify as follows:

1. That I am a consulting geologist and reside at 8 Thorncliffe Court, Sudbury, Ontario.

2. That I hold a Master of Science degree in Geology from Laurentian University, Sudbury, Ontario.

3. That I am a Fellow of the Geological Association of Canada.

4. That I have been practising in my profession since 1968 in Canada.

5. That my report dated March 31, 1982 on the Middlemarch Property, Cochise County, State of Arizona, is based on personal examination, published government and University geological reports and maps and mining company files.

6. That the examination and field work on the property was made by me on March 23, 24 and 25, 1982 in my capacity as President, D. G. Innes and Associates Ltd.

7. That I have no interest or equity in the Middlemarch Property or adjoining lands or lands in the vicinity relative to this property.

D. G. Innes
H. B. Sc., M. Sc., F.G.A.C.
March 31, 1982