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

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Arizona Department of Mines and Mineral Resources Mining Collection

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PRINTED: 05/14/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: BLACK DYKE GROUP

ALTERNATE NAMES:
PRINCESS GOLD MINE
GILBERT GROUP

MOHAVE COUNTY MILS NUMBER: 82C

LOCATION: TOWNSHIP 21 N RANGE 21 W SECTION 2 QUARTER SW
LATITUDE: N 35DEG 13MIN 55SEC LONGITUDE: W 114DEG 29MIN 42SEC
TOPO MAP NAME: UNION PASS - 7.5 MIN

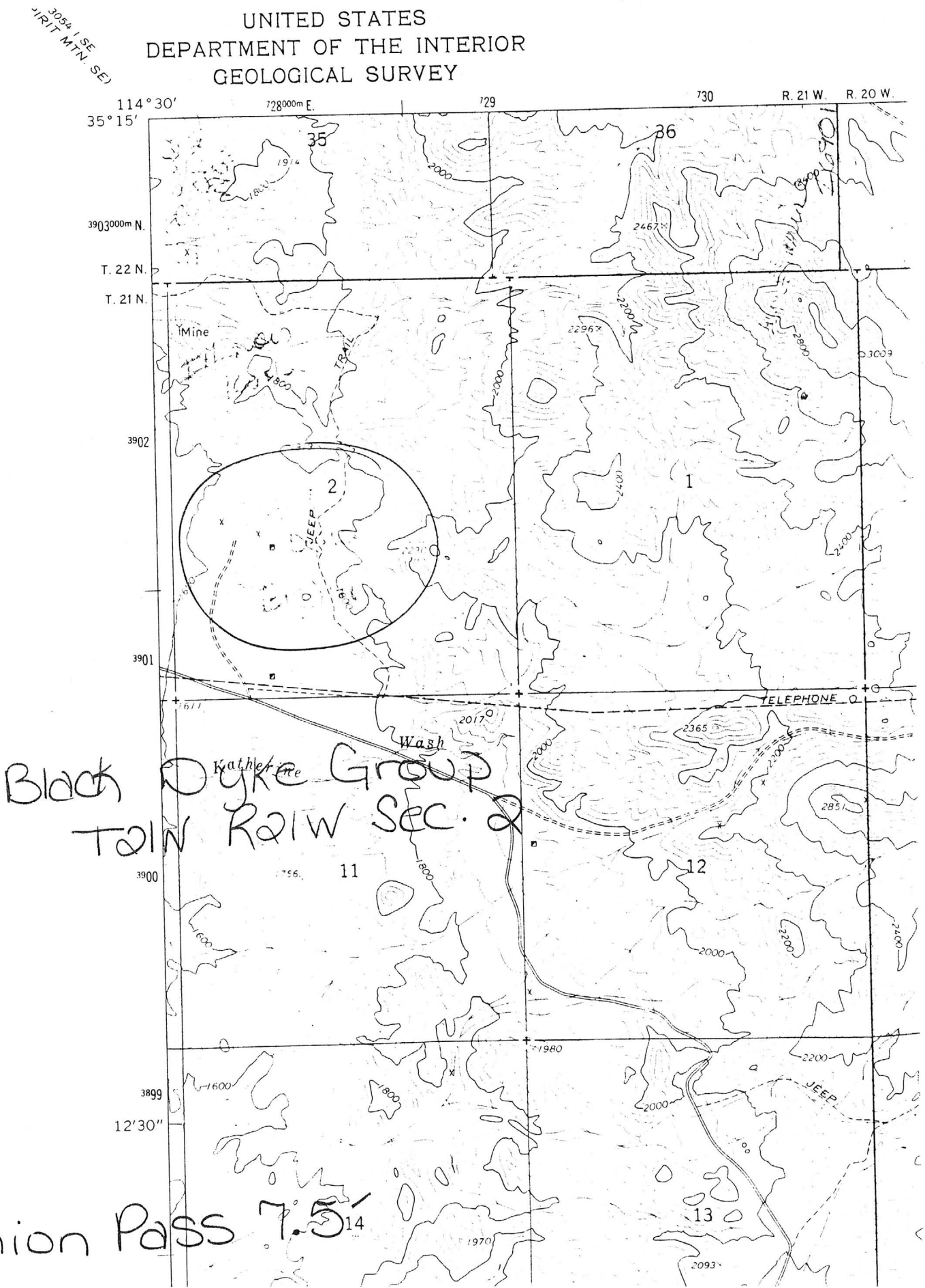
CURRENT STATUS: PAST PRODUCER

COMMODITY:
GOLD LODE
SILVER

BIBLIOGRAPHY:
ADMMR BLACK DYKE MINE FILE
HAUSEN, C. "GEOL. & ORE DPSTS OF OATMAN & KAT HERINE DIST, AZ" AZBM BULL 131, P. 119, 1931
WILSON, E.D. "AZ LODE GOLD MINES" AZBM BULL 137, P. 102, 107, MAP, 1967
GARDNER, E.D. "GOLD MNG & MLLNG IN BLCK MTNS, AZ" USBM IC 6901, P. 8 (MAP), 1936
MALACH, R "MOHAVE CTY MINES" P 52, 1977
ADMMR TYRO MINE FILE
ADMMR MOHAVE CUSTOM MILL PROJECT
GREAT BASIN GEM JOINT VENTURE, VOL 5 (ADMMR GEOLOGY FILE)

MOHAVE CO. MILS

NUMBER: 82C
NAME:BLACK DYKE GROUP
ALTERNATE NAMES:
PRINCESS GOLD MINE
GILBERT GROUP
CURRENT STATUS:PAST PRODUCER MAP NAME:UNION PASS - 7.5 MIN
LATITUDE:N 35DEG 13MIN 55SEC LONGITUDE:W 114DEG 29MIN 42SEC
TOWNSHIP:21 N RANGE:21 W SECTION: 2 QTR.:SW
COMMODITY:
GOLD-(M)LODE-PRIMARY
SILVER-COPRODUCT
BIBLIOGRAPHY:
USGS UNION PASS QUAD
WILSON, E.D., AZBM BULL 137, P. 102, 107, MAP
LAUSEN, CARL, AZBM BULL 131, P. 119
ADMR BLACK DYKE MINE - MINE FILE
MALACH, R., MOHAVE CO. MINES, MOHAVE COUNTY
BOARD SUPERVISORS, P. 52
GARDNER, E.D., USBM IC 6901, P. 8 (MAP)
ADMR MOHAVE CUSTOM MILL PROJ. CARD FILE
Tyro Mine (f)
Great Basin GEM Joint Venture, Vol. 5
ADMMR PHOTOS


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
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SPIRIT MTN. SE)
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T. 21 N.
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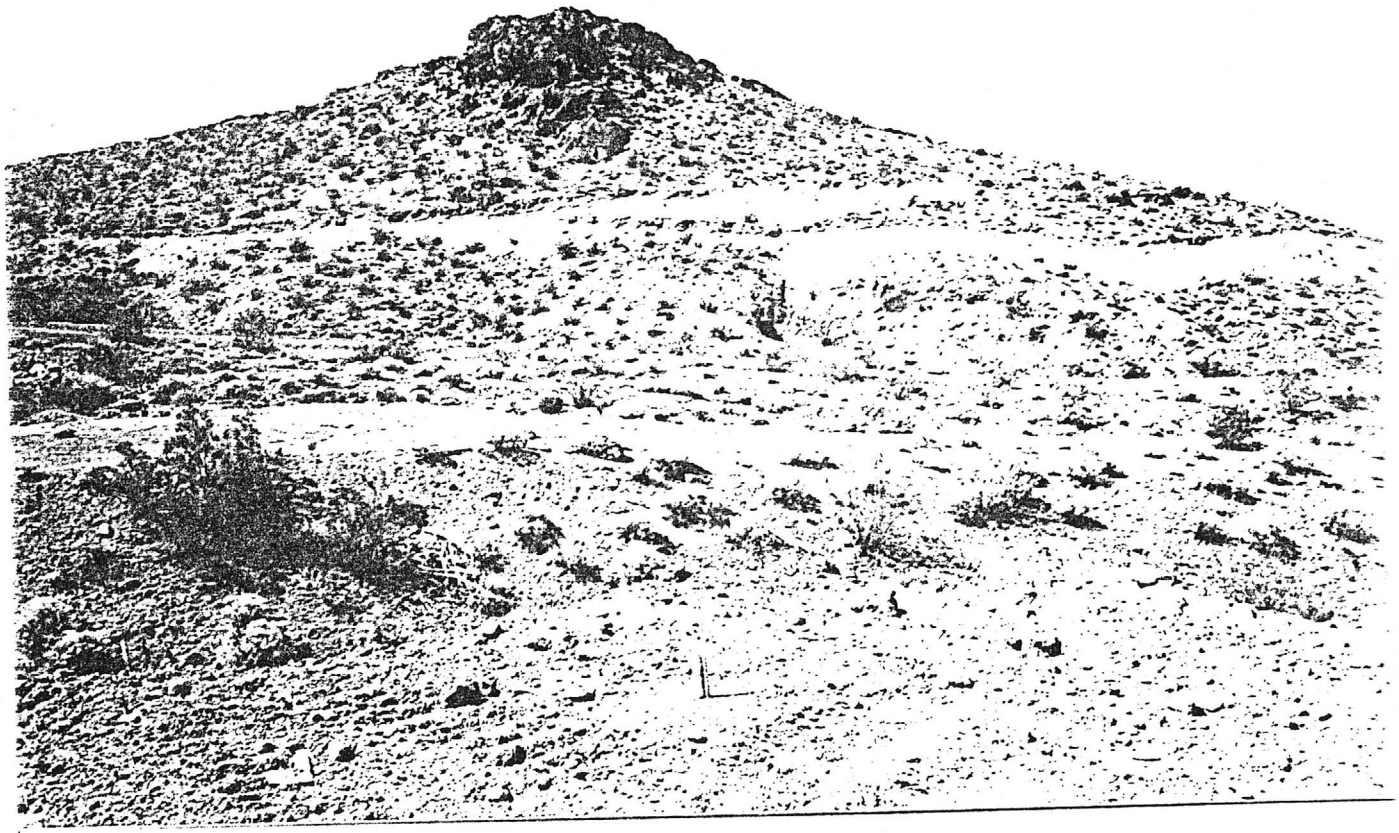
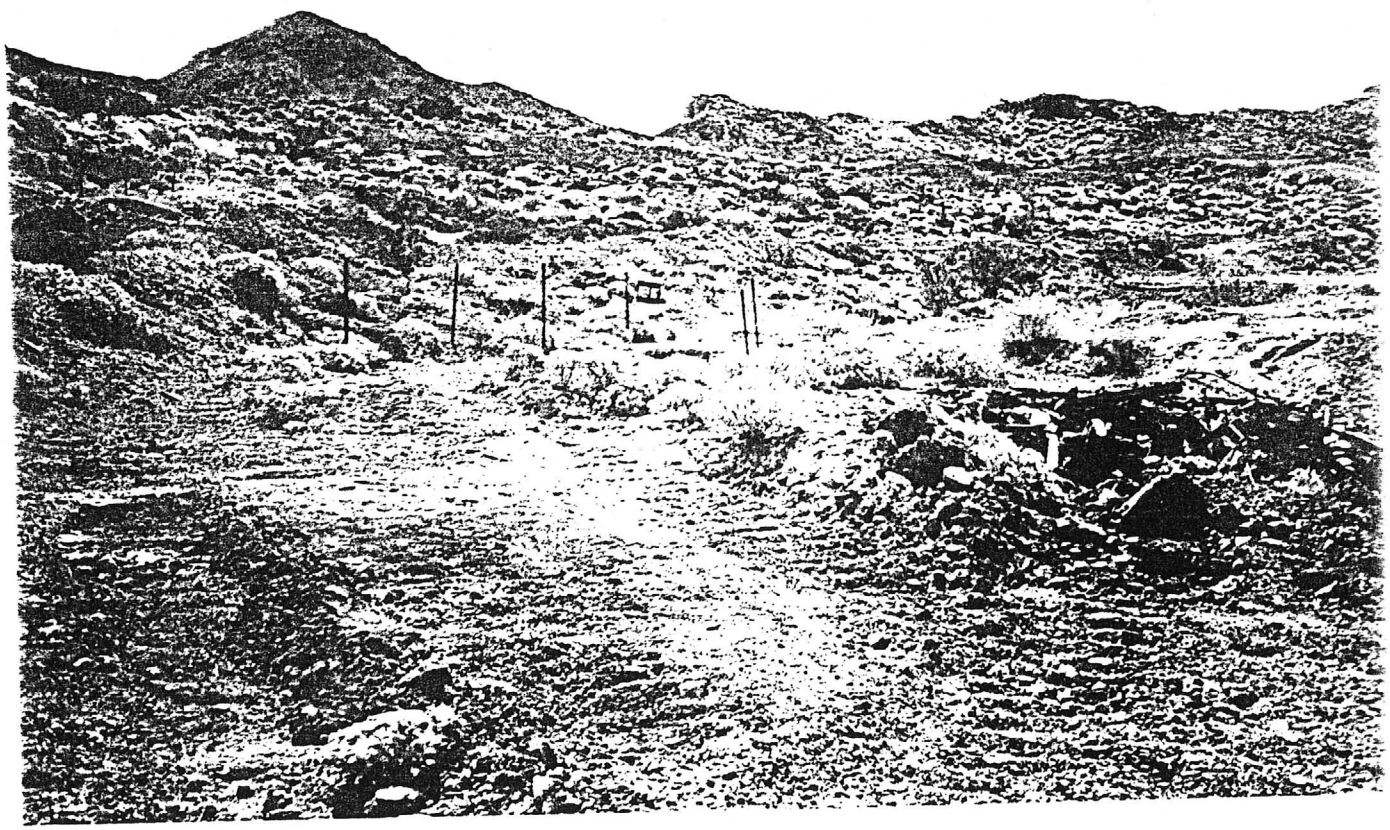
1
2
11
12
13
14
TELEPHONE
Wash
Katherine
3902
3901
3900
3899
12'30"
1980
1970
2093
Black Dyke Group
T21N R21W Sec. 2
Union Pass 7.5'



A-10-30
1988



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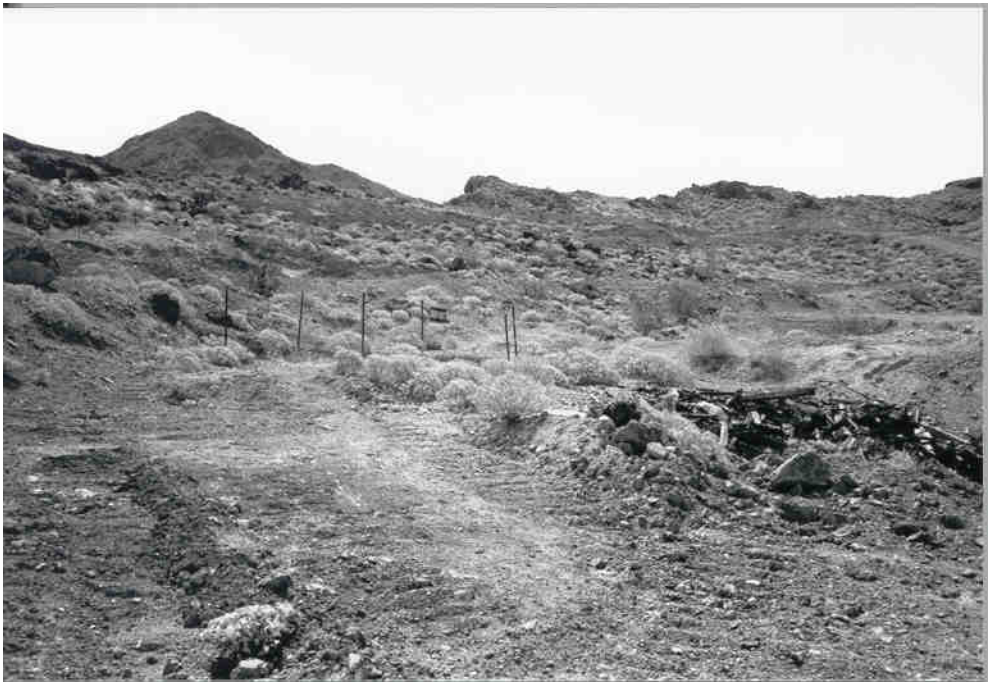
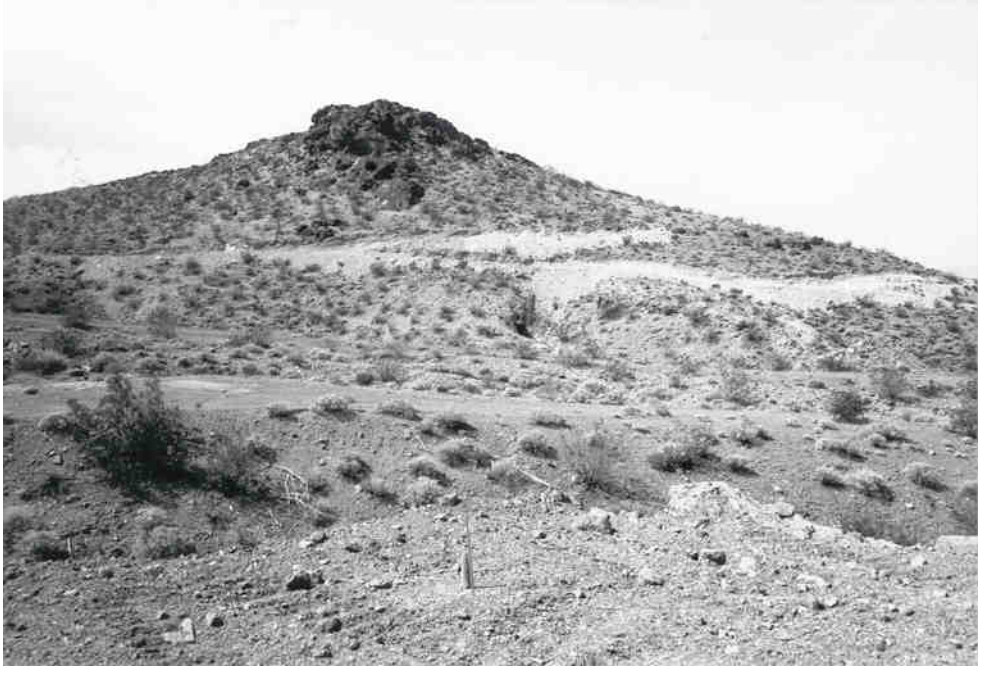
1988





Name of Mine or Prospect:	Township	Range	Section	Priority
Black Dike Group	21N	21W	2 cca	A
Principal Minerals: Gold	1:250,000 Quad: Kingman		7.5' - 15' Quad: Union Pass	
Associated Minerals: Calcite, Quartz	District: San Francisco		Principal Product: Gold	
Type of Operation: Underground: Shafts, drifts	County: Mohave	State: Arizona	Type of Deposit: Vein	

Ownership or Controlling Interest:
Jack Alton, 318 W. 9th Street, Los Angeles[1] Denys K. Poyner (1976)[3]

Access: From state route 68, proceed north on Katherine Wash Road for 3.5 miles. Turn left on unimproved road for .5 miles. Mine is located (unnamed) east of the road on the topographic quadrangle.

Structural Control or Geological Association:

"The surrounding country rock is locally described as porphyry-granite of probable Precambrian age; the vein which was originally mainly calcite has largely been replaced by quartz, carrying gold values. It strikes northwest and dips SW at 30°. The vein is large, not less than 50 ft. wide and traceable for 3000 ft."[1]

"The most notable difference from the surface outcrop(vs. in shaft) is the increase in the ratio of quartz-calcite."[8]

Age of Mineralization: Miocene

Production History

No production to date.
"Tonnage potential: 500,000 tons per 100 feet vertical."[7]

Geochemical Analyses

Assay #5 (1931)

$2.40 gold per ton

"Iron stained streaks have been found to assay $50 gold ton (1931)".[5]
Assay #1 (1935)[6] $0.95 gold per ton

Assay (1979)[3,4]

Random Samples	Gold	Silver
16 XII-79-5	0.04 oz/ton	0.2 oz/ton
16 XII-79-6	0.02	-
16 XII-79-7	0.06	0.3

Assay (1976)[7]

Surface	0.08 oz/ton
in drift	0.15 oz/ton gold

References

1) ADMR file, Phoenix, Arizona.
2) CETA map file Rack #3, claim map.
3) Crutchfield, Liggett & Elliott (1979), Field Reconnaissance.
4) Liggett (1980), letter to Wm. Crutchfield (January)
5) Lausen (1931), p. 119.
6) Gardner (1936) p. 51.
7) Poyner (1979) written communication.
8) Poyner (1980) geologic map and underground assay data.
9) Exploration Research Associates Incorporated (1981) Reconnaissance Geologic Map of the Union Pass 7.5' Quadrangle, Mohave County, Arizona.

Name of Mine or Prospect:	Township	Range	Section	Priority
Gilbert Group	21N	21W	2 c	C
Principal Minerals:	1:250,000 Quad		7.5' - 15' Quad	
	Kingman		Union Pass	
Associated Minerals:	District		Principal Product	
	San Francisco			
Type of Operation:	County	State	Type of Deposit	
	Mohave	Ar.		

Ownership or Controlling Interest:
Consult current USBLM mining claim records

Access: From the intersection of Route 68 and Katherine Wash Road proceed northwest on Katherine Wash Road for 3.5 miles. Shaft is shown (unnamed) on the topographic quadrangle.

Structural Control or Geological Association:

"Tertiary Age, Rhyolite, Tuff and Agglomerate."[2]
"More specifically assigned as Miocene."[3]

Age of Mineralization:

Production History	Geochemical Analyses

References

1) CETA map file Rack #3, claim map.
2) Wilson & Moore (1959) Geologic map.
3) Liggett & Childs (1974) 28 p.
4) Exploration Research Associates Incorporated (1981) Reconnaissance Geologic Map of the Union Pass 7.5' Quadrangle, Mohave County, Arizona.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine BLACK DYKE MINE Date April 20, 1955

District UNION PASS DISTRICT, MOHAVE COUNTY Engineer Mark Gemmill

Subject:

Property inactive.

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

September 25, 1958

To the Owner or Operator of the Arizona Mining Property named below:

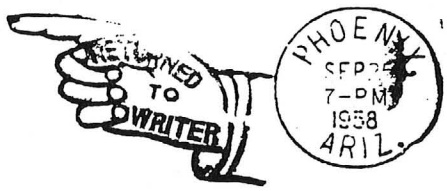
BLACK DYKE MINE (Mohave County) GOLD
(Property) (ore)

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.



To Sender

Mr. Jack Alton
~~318 West 9th Street~~ not here
Los Angeles, Calif.

NOT FOUND
TWELVE STORY BLDG

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

August 21, 1958

To the Owner or Operator of the Arizona Mining Property named below:

Black Dyke Mine (Mohave County) gold
(Property) (ore)

We have an old listing of the above property which we would like to have brought up to date.

Please fill out the enclosed Mine Owner's Report form with as complete detail as possible and attach copies of reports, maps, assay returns, shipment returns or other data which you have not sent us before and which might interest a prospective buyer in looking at the property.

Frank P. Knight

FRANK P. KNIGHT,
Director.

ERAL RESOURCES
rizona
Fairgrounds
RIZONA

PHOENIX
AUG 21
6:30PM
1958
ARIZ.

Order Expired
10-2-58

Mrs. Anita G. Williams

NOT HERE ~~Mrs. Anita G. Williams~~

Compton, Calif.

Returned to Writer

REASON CHECKED
Unclaimed ..... Refused....
Unknown .....
For better address .....
Moved, Left no address .....
No such office in state .....

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

1. Mine file: 1. BLACK DYKE 2. PORTLAND
2. Mine name if different from above:
3. County: Mohave
4. Information from: Charlie Dalrymple

   Company: Western States Minerals

   Address: 4975 Van Gordon

   Wheatridge, CO 80033

   Phone: 303-425-7042

5. Summary of information received, comments, etc.:

Mr. Dalrymple reports Western States Minerals attitude towards Montana has cooled slightly and they have now decided to keep their Mohave County properties and increase their interest in the rest of Arizona. They are retaining the Black Dyke and are seeking to add to the 250,000 ton reserve identified there. The company would be interested in receiving submittals on other Arizona precious metal properties (place on 2 buy list, remove from 4 sale list). Western States produced over 30,000 ounces of gold from their leaching at the Portland Mine.

Date: November 7, 1988

Nyal J. Niemuth, Mining Engineer

RIH

BLACK DYKE MOHAVE COUNTY

NJN WR 3/4/88: It was reported that Western States Minerals (card) has been drilling at the Black Dyke (file) Mohave County.

NJN WR 6/17/88: Bill Vanderwall (card) reports that Western States Minerals conducted an approximately 20 hole drill program on the Black Dyke (file) Mohave County with holes to 250 feet deep. The drilling tested an area of quartz/calcite brecciated vein mineralization in the hanging wall of a hematized volcanic upper detachment plate. This work has indicated a geologic reserve of 1 million tons 0.04 oz ton/Au and having an approximate 9:1 strip ratio. An economic reserve would be perhaps 250,000 tons grading 0.04 oz/ton Au.

Voluminous report available for inspection

More information on the Gold Chain, Roadside, and Black Dyke properties, Mohave Co. is available for your review.. Data (total of about 7 inches thick) of geochemical and drill lithologic and assay data plus interpretation is available in staff member Nyal Niemuth's office. The data is compiled from work by American Copper and Nickel and Ivy Minerals and other company efforts. As this material is unbound it has not yet been placed in the file collection. Sorry for the inconvenience. 10-91-NJN

John Moss

Resources of Ariz Patrick Hamilton
Guided to mine by Mohave Indian 1862

USGS Bull 397 2 mi NW of Cabot Range, Black Mts etc
Mine ± 4 mi NW of Gold Road and 2¼ mi west of Moss Back
mine, to the N of Silver Creek — on SE slope of the Moss Hills

Moss took out $8,240 from Lode about 10 ft deep + 6 ft dia.
Died in poverty.
Mine worked by Moss Bros.

Hist. of Mng in Mohave Co. E.M. Butler Min Jour Oct 15 1928

Moss rich outcrop - ± 5½ mi NW of Oatman in Black Mts.

Bancroft's History of Ariz + N.M.

IC 6901 p. 39
See: ABM Bull. 131, p. 9, 12, 44 52, 59, 60, 67, 74, 84, 85, 113, 114
ABM Bull. 137, p. 94
ABM Bull. 140, p. 96 USGS Bull. 743 - Pages 30-50
USGS - 340 p 57-8
- - 397 p 170

Alton, G. Jack ~~-cancelled~~ 9-7-58
318 West 9th Street
Los Angeles, California 10-10-40

See Black Dyke Mine (Mohave Co) - Re Field Engineers Report
(Co-owners Howard Williams and Anita G. Williams)

See PHILADELPHIA MINE (Mohave Co) - Re Field Engineers Report
(Owners-P.L.Mullen, Leoluca Patella, Howard Williams and
Jack Alton.)

Williams, Howard
P. O. Box 190
Kingman, Arizona 10-10-40

See - Black Dyke Mine (Mohave County)
Re - Field Engineers Report (Co-owners G. Alton and
Anita G. Williams)

See PHILADELPHIA MINE (Mohave Co.) - Re Field Engineers Report
(Owners-P.L.Mullen, Leoluca Patella, Howard Williams and
Jack Alton) 10-10-40

COPY

P.O. Box 288
Kingman, Arizona
Oct. 10, 1940

To: J. S. Coupal, Director
Department of Mineral Resources
Capitol Bldg., Phoenix, Ariz.

From: Elgin B. Holt, Field Engr.

Subject: Philadelphia & Black Dyke Mines.

At the suggestion of J. Hubert Smith, on October 8th I made an investigation of the Philadelphia and Black Dyke mines, located in the Union Pass District, Mohave County, and belonging to : P. L. Mullen, Leoluca Patella, Howard Williams and Jack Alton.

Any correspondence you may later have regarding these properties should be addressed to Mr. Howard Williams, P.O. Box 190, Kingman, Arizona, or to Mr. G. Jack Alton, 318 West 9th Street Los Angeles, Calif.

I am herewith enclosing reports on both these properties, together with a news item concerning the Philadelphia

PHILADELPHIA MINE: It has occurred to me that you might pass my report on the Philadelphia to the parties who are looking for a 100 to 150 ton per day milling proposition - gold, silver or copper. While owners are not offering this mine for sale, inasmuch as they are now working it themselves, I take it they are looking for additional finance; so something might come of it if you would call the attention of the people to this property, as per your memorandum of October 4th.

BLACK DYKE: Suggest that you look over my report on this property carefully, as it presents a very large showing of low grade gold ore. Would say off-hand that probably around 1,000,000 tons of ore could be removed by open pit mining and power shovels; and if, as per Lausen's statement this ore will average $3.00 per ton, old price, or $4.90, new value of gold, I believe this property would pay if operated in a large way; but the capacity of mill would have to be large - 500 to 1,000 tons daily, as mining and milling costs, by open pit, should not exceed $2.25 per ton, including tails losses.

I know the Bradleys of San Francisco have for years been looking around for a large gold deposit that will average around $2.50 per ton; so you might contact them.

P. R. Bradley is President of the Alaska Juneau Gold Mining Co.; his office being somewhere in San Francisco.

One more point: Black Duke ore is clean oxidized white quartz and calcite, carrying free gold, so values could be readily recovered by cyanidation, with a low consumption of cyanide. Also the mine is only 4 miles from the Colorado River; hence plenty of water is available for large milling operations.

cc - G. Jack Alton.

Elgin B. Holt.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine BLACK DYKE (Princess) - (12 claims). Date October 9, 1940

District San Francisco, Mohave County. Engineer Elgin B. Holt

Subject: SYNOPSIS REPORT

OWNER: Anita G. Williams, 309 So. Poinsettia Ave., Compton, Calif.

METALS: Gold.

LOCATION: Property is located, in the Union Pass District, 30 miles westerly from Kingman and four miles east of the Colorado River. The mine was inspected by me on October 8, in company with co-owners, Messrs. Howard Williams and G. Jack Alton. As I took no samples, this brief statement merely deals with a physical description of the mine.

GEOLOGY: The surrounding country rock is locally described as porphyry-granite, of probable pre-Cambrian age.

VEIN: The vein, which was originally mainly calcite has largely been replaced by quartz, carrying gold values. It strikes northwest and southeast and dips southwest at an angle of 30 degrees from the horizontal. In places the vein lies flat on the hill side, leading to exaggerated opinions concerning its width. However, the vein is huge and I would estimate its width at not less than 50 feet. Also it is traceable on the surface for around 3,000 feet.

DEVELOPMENT WORK: Consists of a double compartment timbered shaft, which was sunk to a depth of 150 feet at a point about 300 feet southwest of the main vein outcrop. This shaft penetrated the vein at a depth of 40 feet and passed through the foot wall of vein at 90 feet, showing vein at this point to have a width of 50 feet. At bottom of shaft a drift was run 450 feet in a westerly direction; ore being found 150 feet from shaft; the last 300 feet of this drift is, therefore, in ore. Other work consists of 8 test pits, one tunnel and a number of open cuts, all in vein material, showing gold values.

ASSAYS: I looked over reports on this property by a number of engineers and geologists, who quote random assays from surface openings on vein, running all the way from less than one dollar to $112.44 gold per ton. Such assays as these, of course, mean nothing, as they only indicate the presence of gold.

However, Carl Lausen, who made a careful examination of this property in 1931, states: "This vein is said to have been thoroughly sampled and found to average $3.00 per ton." As gold at that time was only worth $20.67 per ounce, according to the statement just quoted, the vein should now sample around $4.90 gold per ton.

TONNAGE: At the present time there is no great amount of ore blocked out in the mine. However, from facts herein set forth and considering the large surface outcroppings of vein material exposed, I do not hesitate to say that this mine looks to me like a very large low grade milling proposition indeed. Furthermore, I recommend it for a careful investigation by any company that may be in the market for such a property.

E. B. Holt

Elgin B. Holt,
Field Engineer.

COPY

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine - Black Dyke (Princess) - (12 claims). Date October 9, 1940

District - San Francisco, Mohave County Engineer - Elgin B. Holt

Subject: SYNOPSIS REPORT

OWNER: Anita G. Williams, 309 S. Poinsettia Ave., Compton, California

METALS: Gold.

LOCATION: Property is located, in the Union Pass District, 30 miles westerly from Kingman and four miles east of the Colorado river. The mine was inspected by me on October 8, in company with co-owners, Mr. Howard Williams and Mr. G. Jack Alton. As I took no samples, this brief statement merely deals with a physical description of the mine.

GEOLOGY: The surrounding country rock is locally described as porphyry-granite, of probable pre-Cambrian age.

VEIN: The vein, which was originally mainly calcite has largely been replaced by quartz, carrying gold values. It strikes northwest and southeast and dips southwest at an angle of 30 degrees from the horizontal. In places the vein lies flat on the hill side, leading to exaggereated opinions concerning its width. However, the vein is huge and I would estimate its width at not less than 50 feet. Also it is traceable on the surface for around 3,000 feet.

DEVELOPMENT WORK: Consists of a double compartment timbered shaft, which was sunk to a depth of 150 feet at a point about 300 feet southwest of the main vein outcrop. This shaft penetrated the vein at a depth of 40 feet and passed through the foot wall of vein at 90 feet, showing vein at this point to have a width of 50 feet. At bottom of shaft a drift was run 450 feet in a westerly direction; ore being found 150 feet from shaft; the last 300 feet of this drift is, therefore, in ore. Other work consists of 8 test pits, one tunnel and a number of open cuts, all in vein material, showing gold values.

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(SIGNED) Elgin B. Holt,
Field Engineer.

COPY

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

MINE BLACK DYKE (Princess) - (12 claims). DATE October 9, 1940

DISTRICT San Francisco, Mohave County. ENGINEER: Elgin B. Holt.

SUBJECT: SYNOPSIS REPORT

OWNER: Anita G. Williams, 309 S. Poinsettia Ave., Compton, Calif.

METALS: Gold.

LOCATION: Property is located, in the Union Pass District, 30 miles westerly from Kingman and four miles east of the Colorado River. The mine was inspected by me on October 8, in company with co-owners, Messrs Howard Williams and G. Jack Alton. As I took no samples, this brief statement merely deals with a physical description of the mine.

GEOLOGY: The surrounding country rock is locally described as prophyry-granite, of probable pre-Cambrian age.

VEIN: The vein, which was originally mainly calcite has largely been replaced by quartz, carrying gold values. It strikes northwest and southeast and dips southwest at an angle of 30 degrees from the horizontal. In places the vein lies flat on the hill side, leading to exaggerated opinions concerning its width. However, the vein is huge and I would estimate its width at not less than 50 feet. Also it is traceable on the surface for around 3,000 feet.

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Elgin B. Holt,
Field Engineer.

13 March 1941

Mr. Arthur J. Edwards,
417 South Hill Street,
Los Angeles, California.

My dear Mr. Edwards:

Complying with request contained in your letter of March 6, I am enclosing herewith a copy of Field Enginners Report on the BLACK DYKE MINE in the San Francisco Mining District, Mohave County, Arizona, as prepared by one of our field engineers, Mr. Elgin B. Holt.

In a note from Mr. Holt, he suggests that any correspondence regarding these properties should be addressed to Mr. Howard Williams, P. O. Box 190, Kingman, Arizona, or to Mr. G. Jack Alton, 318 West 9th Street, Los Angeles, California.

Trusting that the information contained in this report may be of value to your client, I am

Yours very truly,

J. S. Coupal
Director

JSC-jrf
encl.

ARTHUR J. EDWARDS
ATTORNEY AT LAW
442 SUBWAY TERMINAL BUILDING
417 SOUTH HILL STREET
LOS ANGELES
MUTUAL 1511

March 6, 1941

Department of Mineral Resources
Capitol Building
Phoenix, Arizona

Gentlemen:

I have a client who is interested in obtaining whatever bulletins or other literature you may have for distribution which would give any information concerning the Black Dyke mining property, which I am informed is somewhere in the Katherine District, west of Kingman, near the Colorado River.

If you have any other interesting mining literature for distribution, we would be glad to receive it.

Thanking you for the courtesy, I am

Yours very truly,

Arthur J. Edwards

AJE:B

REPORT ON
BLACK DYKE GROUP
BY
E. ROSS HOUSHOLDER

HISTORY

To prevent Arizona from falling into the hands of the irregulars during the Civil War, there was stationed at Fort Mojave, a few miles southwest of what is now known as the Katherine Section, on the Colorado River, the Fifth California Volunteers, under the command of General J. H. Carelton. Many of his men were experienced miners and so they varied the monotony of garrison duty with prospecting. The surrounding country including what is now the Katherine Section, the Secret Pass Section, and the Oatman Section, soon became known as the San Francisco Mining District.

The first discovery of any importance in the Katherine district was made in 1865 by Capt. Jack Mellon, a steamboat operator running on the Colorado River. Much ore was subsequently mined and milled from this property, known as the Sheeptrail, which lies to the southeast of the Black Dyke Group. Following the close of the Civil War activity in prospecting subsided in the entire San Francisco Mining District. Several other important gold bearing ledges were discovered between 1893 and 1896 in the eastern portion of what was later to be designated as the Katherine district. Then in 1900 a young mule driver named S. C. Baggs, hauling ore to the mill at the river from the Sheeptrail mine, brought in some rock that he had picked up in the western part of the district. He pulverized it in a mortar as he had noticed the older men do, and endeavored to pan it. To his delight he found "good colors" in the pan. The Katherine mine was located by him next day, and from this property the present operators are milling about 300 tons per day.

Within a few weeks after the location of the Katherine, this same S. C. Baggs, also discovered ore carrying high gold value on the outcrop of a large dyke in the central part of the district. This property has since become known as the Black Dyke, because of the dark colored outcrop that is so prominently exposed above the surrounding country. Baggs was forced to give up the Black Dyke Group, as it was then too far off the road than in use in the district. However, he has expressed himself on several occasions to the writer as holding the opinion that the Black Dyke with proper developemnts would open up into a much larger mine even than the Katherine.

As years went by the Black Dyke passed into other hands. Finally the late N. C. Bishop, who was being grub-staked by Henry Lovin of Kingman, the man who originally located the famous Goldroad mine, held the Black Dyke for a number of years by little work and frequent locations. Finally, however, Lovin interested Johnny Munds, a well known mining man in Arizona, who went with Bishop at the expiration of one of these 90 day periods, and located it in his name. Several years ago (Bert) H. J. Gilbert acquired title through a trade with Lovin & Munds, and he has held the group since that time.

LOCATION AND TRANSPORTATION The Black Dyke group is located in the central part of the Katherine section of the San Francisco Mining District, Mojave County, Arizona, about four miles east of the Colorado River and at approximately 1250 to 1600 feet above sea level, which is about 600 feet above the mean level of the river.

The main Katherine-Kingman county highway traverses the Katherine townsite which borders the Black Dyke group. A good road of easy grade connects the present mine workings with this county highway, which leads to Kingman, Arizona, the county seat and chief distributing center of

northwestern Arizona, a distance of less than 30 miles away, where the main line of the Atchinson, Topeka & Santa Fe R. R. is reached.

TOPOGRAPHY In the western and northern portion of this group the hills, carved from granite porphyry are comparatively low, rising for the most part less than 500 feet above the adjacent drainage channels and broad washes comprising the remainder of the estate. The accompanying photographs will give one an excellent idea of the topography of the group. Due to the easy slopes of the group's topography most every part of the estate could be reached with auto trucks with but little grading.

WATER SUPPLY Domestic water can be secured from the Colorado River or from fine mountain springs a few miles distant from the mine. Water for preliminary development will be obtained from the river, but as development proceeds sufficient water will be obtained from the deeper workings for this purpose.

CLIMATE The district has a healthful climate with mild winters, although the summers are hot, which permits good working conditions the year round. The rain fall is about 8 inches a year. The vegetation is typical of semi-arid regions.

DEVELOPMENT The deepest workings are on the Gold Dyke claim, where there has been sunk a number of shallow shafts, opencuts and trenches for the purpose of prospecting the outcrop. One of these shafts is 32 feet deep, another is 20 feet deep, while the others less. The work on the other claims for the most part consists of shallow shafts and opencuts together with several short tunnels, comprising the necessary location and assessment work. The installation of suitable heavy mine machinery, such as hoists, compressors, engines, etc., will be necessary to carry the new development to a depth of 500 feet or more.

MATERIAL AND STRUCTURE OF THE VEINS IN THE DISTRICT The Katherine section veins are mineralogically of simple character, consisting mainly of quartz, calcite, and adularia, associated, in the ore shoots, with free gold. As a rule only quartz and calcite are recognizable with the naked eye. The adularia occurs generally in microscopic crystals, and in gold is visible only in unusually rich ore. Fluorite occurs in some of the veins but apparently is not particularly significant as to the presence of gold. The proportion of quartz and calcite in the veins varies widely. A wide range may also be found in different parts of the same vein. As a rule the gold is found where both minerals are present. Much of the quartz that was deposited nearly or contemporaneously with the gold has clearly replaced older calcite. Some of it, moreover, appears to have crystallized simultaneously with calcite. This indicates at least three generations of calcite. The conclusion reached is that during the middle stage of vein formation quartz and also they were at times deposited simultaneously and some calcite was replaced with quartz. Deposition of calcite has probably continued up to the present time. The cause of the tint and lustre accompanying the gold bearing quartz has not yet been ascertained.

GEOLOGY OF THIS GROUP The country is red, coarse grained pre-Cambrian pressed granite and consists essentially of orthoclase, quartz, biotite, and microline; belonging to that group of rocks known as the pre-Cambrian complex, which is typical of the Katherine section of the San Francisco Mining District. Locally the granite has a porphyritic structure and is therefore often designated as a porphyry-granite. In the northwestern portion of the group there is an area of exposed rhyolige of comparatively small dimensions.

This granite complex has suffered considerable fracturing. In fact the extensive shear zone that is recognized to extend from the

western part of the district through the Katherine Mine estate eastward into the foothills, is found here on the Black Dyke, It is within the same shear zone that the large massive structure known as the Black Dyke lode is found.

THE BLACK DYKE LODE The Black Dyke Lode is promintly exposed mainly on the Gold Dyke and Gold Dyke No. I claims, where it protrudes high above the surrounding country as is evidenced in the accompanying photographs. This lode having been formed in a shear zone where there was first a replacement of the feldspathic granite-porphyry, in which the feldspars were later replaced into a coarse, crystalline sugary quartz of drusy appearance containing little or no values; and finally there was alternate deposition of calcite and quartz, in which part of the calcite was replaced by quartz. The resulting structure has a greenish, waxy, banded structure containing good gold values, which is typical of the ore bearing formation of the district.

The vein has a west-northwesterly strike and dips to the southwest at about 60 degrees to 65 degrees, although it is my opinion that the vein will straighten up as depth is obtained, judging from the similar surface conditions. The vein is prominently exposed for over 3000 feet, and its width varies from 50 to 250 feet. The surface exposure just above the location of the Gold Dyke claim on over to the footwall is 152 feet and there is no question but that this ledge extends at least 100 feet more in the opposite direction where it is more or less covered with accumulated deterial material. The vein is apparently unaccompanied with an gouge, but is cut obliquely by a few minor faults that have shattered the quartz. In some parts of the vein the deposition of the different layers have been shattered and the fragments cemented by similar quartz of a later period. Calcite occurs in distinct veinlets younger than the quartz and, so far as known is barren. Some adularia is associated with the quartz but is recognizable only under the microscope. Some of the quartz is cellular, the little cavities being lined with projecting crystals of quartz and fluorite. The croppings consist of quartz and silicified rock stained by iron and manganese.

The vein is composed principally of quartz and bunches of light colored crystalline calcite and occasional spots of fluorspar, together with some altered rock, which seems to be micropegmatite. Much of the quartz near the new shaft has replaced calcite, after which is pseudomorphic. The occurrence of what seems to be altered micropegmatite in association with the vein suggests that the fissure now occupied by the vein may formerly have been occupied b y a dyke of the micropegmatite, which the later vein replaced.

This exposed vein after entering the west portion of the estate apparently traverses the length of the group to the southeast although obscured by gentle sloping washes.

Where this vein has been opened by open cuts, shafts, and trenches samples have been obtained that show good gold content far above that usually found on the surface in the district. The deposits were probably formed by circulating thermal solutions and accompanied and followed the invasion of the intrusives.

OTHER VEINS ON THIS PROPERTY Although the largest, the Black Dyke vein, is by no means the only promising vein on this estate. In fact there are several likely veins having the same general strike as the major vein, occuring in the same formations, and under conditions recognized as favorable in which to expect ore bodies of remunerative value. In this report the value and extent of these other veins will not be taken up as the development of the Black Dyke will itself prove to be an undertaking of every effort of the owners and operators at this time, leaving the development of the additional

veins for future exploration and consideration.

SAMPLES AND ASSAYS From the various opencuts, trenches and shafts on the Gold Dyke claims samples were taken to check up on the results obtained at the time the work was prosecuted, with the thought in mind to obtain an average of the ore exposed on the surface. The assay results of the seven samples are here tabulated.

No.	Ounces Gold	Value Gold	$20.67 per oz.
1	0.23	$ 4.75	Outcrop 30 feet north new shaft.
2	0.04	$ 0.83	15 feet shaft 100 NW N. I.
3	0.42	$ 8.68	Opencut between 1 and 2
4	0.10	$ 2.07	Long trench 200 feet NW N.I.
5.	0.05	$ 1.03	Grab sample dump above shop.
6	0.44	$ 9.09	Big out average dump av. loc.
7.	5.44	$112.44	Highgrade 8 inches SE new shaft.

This gives an average of $19.48 for the seven samples taken.

An analysis of the samples taken as illustrated in the accompanying photograph gives an average of $9.05 per ton (valued @ $20.67 per oz.) excluding the high grade sample of $112.44 per ton. For surface values that is exceptional for the entire San Francisco Mining District, and is far above those usually obtained.

$8.50 $16.94 $8.68 $2.07 $9.09 $112.44

Black Dyke Outcrop (Site of New Shaft)

Looking from a high point on the Black Dyke group northerly across the mammoth big vein outcrop, showing the numerous shallow cuts, trenches and shafts on the vein, from which many good samples of gold ore can be obtained.

SUMMARY

After a careful preliminary examination of the nine lode mining claim, comprising the estate of the Black Dyke Group located in the central part of the Katherine Section of the San Francisco Mining District, Mojave County, Arizona, it would seem that the indications on the property, such as the prominent main Black Dyke vein, whose characteristics are similar to the production veins of the district, the same general strike and dip of the veins to those in the district that have been so renumerative, which occurs in the geological formations recognized as the most favorable in which to expect commercial ore deposits in the district, and to the discovery of ore over a large area carrying above the average gold content of the districts veins; warrants further exploration and development to open up the ore bodies on the group, especially that in the Black Dyke exposure on the Gold Dyke claim, that has already exposed ore of a commercial value at or near the surface.

Because the ores of this mine already show a value in excess of the known costs of mining and milling in the district, that indicate the existence of a very large ore body of commercial value, that with a development program such as has been outlined, will bring in a producer that undoubtedly will prove profitable to the owners.

In going over this property and examining the large vein having a width up to 250 feet, and obtaining samples carrying from 83¢ to$112.44 in gold values alone, supplemented by the favorable geological conditions, one cannot but be impressed with the favorable possibilities of this property. It is my opinion that when this ore body is opened up to a few hundred feet in depths, supplemented with suitable lateral work, that it will prove to be one of the more important mines of the district, as is attested by the persistent length and width of the outcrop and the type of deposition.

This vein is strong and well defined, and there is no question as regards its permanency and continuity to a very great depth. It can be expected that the gold content will materially increase as the openings penetrate below the leached surface area. This has already been proven in the shallow openings already made. Then too, samples taken from the Black Dyke has been examined by a number of mining engineers and mine geologists of importance and there has not been a one of them that has ever expressed anything but praise and a bright future for the property following an intelligent development program.

Material costs, transportation rates, and many other items have been considerably reduced during the past few years, in this district, which means that ores from the mine can be treated at much less expense than has heretofore existed in the district, permitting a greater net return to the owners.

PRESENT ESTIMATED COSTS:

The estimated operating costs shown heretofore have been greatly reduced during the past four years. Costs of timber, explosives, mechanical rubber, steel, fuel oils, etc., have been reduced from 15% to 20%. The mining costs in particular undoubtedly will fall considerably below the tabulated costs, because of the vast tonnage that will be made available over a much larger stoping width.

Taking all cost reductions into consideration it is safe to

assume that the total will be 20% less than those indicated in the tables, which indicates that the mining and milling costs will not exceed $4.20 per ton.

ESTIMATED TONNAGE:

Notwithstanding the present small amount of development, the surface croppings are so large and of so obvious an extent that a possible tonnage of ore might reasonably run for over 3000 feet and varying from 50 to 250 feet in width, for the purpose of conservative calculation a length of 1500 feet and an average width of 50 feet could safely be assumed. This would indicate a minimum amount of 625,--- tons for each 100 feet of development.

(Signed) E. ROSS HOUSHOLDER E.M.

Kingman, Arizona
March 11, 1927

INTRODUCTION

GOLD IS KING! With this in mind and the fact that the price for gold has increased 75% and may go higher, the rush for the King of all metals is on again and it is up to the man with money and gambling spirit to help the prospectors and miners in their search for gold.

Gold is where you find it. But where is it? This question shall be answered in the following geological report made for the owners of the Princess Gold Mine, Arizona.

In prospecting for gold two ways are open, one to prospect in absolutely unknown territory, the other in known territory and around producing districts. It is like drilling for oil in proven or wildcat territory. The shot most people are going to take is, of course, in proven territory. So in gold mining.

Each state has certain mining districts in which again certain localities are highly mineralized. In California the Mother-Lode district, in Nevada the districta around Virginia City, Goldfield, Tonopah are well known the world over. In Colorado it is Cripple Creek and Leadville; in Arizona the well known camps of Oatman and Katherine.

Both of these camps have been in the production of gold and silver for many years. Millions of tons of ore and millions of dollars have been mined, milled and produced and on account of these known facts, and the high price of gold, mining has again taken on new life here. Every part of the district is looked over again; prospectors and mining engineers are trying to find new mines close to the old one, if possible. Shafts are sunk, tunnels driven and is not unlikely that a new and rich discovery will electrify the mining world again like thirty years ago.

One of the latest discoveries is the Black Dyke Mine in the so called San Francisco mining district, Mojave County, Arizona.

GENERAL OUTLINE

The Oatman-Katherine mining district lies in the western part of Mojave County, Arizona, bordering California and Nevada on the west along the Colorado River. It is geographically known as the Black Mountain Range.

This Range is the Southern extension of the Muddy Range in southern Nevada from which it is separated on the north by the Boulder Canyon. This chain of mountains is very irregular in width and heighth. The topography, is , in the main, that typical of a mass of volcanic flows eroded into rugged peaks, ridges, canyons and gorges. The most striking feature of the area is the great trough of the Colorado River extending north and south between the Black Mountains on the east and the Newberry Mountains on the west. Its great sides, sloping from the crests of the Mountains, five to six thousand feet high, meet in the bed of the river only about five hundred feet above sea level.

The principal rocks of this region lie between the Pre-Cambrian, the Tertiary Lavas and Quatenary and later sediments. Though locally concealed, the Pre-Cambrian complex underlies the entire a area as a whole and constitutes the uneven floor upon which all the other formations rest and over which the lavas of pre and post

Tertiary periods flowed out of numerous large and small craters in vast, vast masses with great force.

The gneussoid granite ans shist complex of the Cambrian and pre-Cambrian age are intruded in numerous places by ignicous masses and dykes, older than the masses of the volcanic rocks overlying them.

These rocks of the Tertiary period consist of Andesite-Latite Trachyte and Rhyolite. They compose the bulk of the Range is this locality and are important economically as they contain most of the mineral deposits in this district and probably played an important part in the genesis of these ore-bodies.

The Andesite in which the largest orebodies have been found so far is exposed over a very irregular area. It consists of flows, tuffs and oreccias and is, as a whole, fairly uniform and not difficult to identify in the field. The rock is more porphyric than the others it is in contact with and large crystals of phenocrysts of feldspar are particularly conspicuous in this lava rock.

The Rhyolite plays a very important part in the Tertiary lava complex of this district. It not only overlies the Andesite in great masses but cuts nearly all the underlying volcanic rocks as well as the enormous Cambrian complex in form of large dikes and rounded stocklike masses (Lacolite). It extends interruptedly throughout the length of Black Mountains and is known as "the water rock" from springs that occur in it.

The Rhyolite rocks are generally light colored, reddish or pink (with small phenocrysts of Biotite - feldspar and quartz). The veins or oreshoots are of simple character, consisting mainly of quartz, calcite and adularia, associated in the oreshoots with free gold. The adularia occurs generally in microscopic crystals and gold is visible only in unusually rich ore.

Pyrites, that almost invariable constituent of ores in other districts, are almost absent.

The proportion of quartz and calcite in the veins or oreshoots varies widely; some veins are chiefly quartz, others more calcite; as a rule, the ore is found where both minerals are present.

Not all the vein or orebodies crop out, and the least sign of gold in any outcroppings is important enough to follow up. It may disappear entirely only to reappear later on at depth and at a zone of greater enrichment. The United Eastern vein, for instance, the richest ore body found in the entire district, is marked by very discouraging vein material at its out-croppings. This vein would probably never have been recognized as a gold vein had it not been discovered by mining operations through the Tom Reed vein depth.

HISTORY

In 1862 General Carlton with his Fifth California Volunteers occupied Arizona, preventing it falling into the hands of the Confederates Irregulars. Many of his soldiers were miners who in their spare time went prospecting. The district between Gold Road and Katherine, the Silver Creek district, was the first settlement. Here water could be obtained close to the surface. Numerous stone cabins are still standing, built by those pioneer miners-soldiers around 1862

In 1865 John Moss found free gold in a large outcropping now known as Moss-vein. It is reported that he mined close to $250,000.00. First an Arastre, later a ten stamp mill helped the development of the first producing gold mine in this district. Slowly the prospectors and miners from other States and mining camps moved into this newly discovered mining camp, new out-croppings were examined, locations made, but nothing of great importance was found until about forty years later the Gold-road, Oatman and Katherine districts were discovered. Prospectors, mining men, engineers flocked into this advertised mining camp again; mining began in earnest and production of gold and silver began to increase with the finding and developing of more and richer prospects.

The Victor Virgin, Leland, Vivian, Tom Reed, Goldroad, United Eastern, Big Jim, Aztec and the Katherine are just a few of the well known mines which have attracted the attention of mining people at that time and which, today, are pulling new prospectors and new capital into this area again in the hope offinding a new bonanza, becuase it is known as the bonanza camp of Arizona.

PETROGRAPHIC GEOLOGY

Three rock formations play an important part in the mineralization of the Oatman-Katherine district; the granite, the Andesite and Rhyolite. The underlying, fundamental rock which the lavas of pre and post Tertiary times (the Andesite and Ryolite) rest, is a granitic rock of Cambrian or Silurian age.

Diamond coring in different parts of the district showed that the Andesite or its varieties lies directly on the old, highly sheared granite.

The granite is coarse grained and weathers easily, due to ferromagnesian constituents. Exposed on the surface it is highly altered and crumbles easily. Even in deeper workings of the mines, it seems impossible to obtain specimens that do not show intense alteration. Clorite in quantities gives the rock a greenish color.

Microscopic findings show quartz with micracline, orthaclase oligaclase feldspar. Intense shearing has crushed the large crystals of Quartz and feldspar and produced a granite of gneissic structure.

Large phenocrysts of microcline are embedded in the matrix of the rock and crystals of two inches in size are frequently found. The feldspar is more or less kaolinized. Amongst the accessory minerals we find magnetite, pyrite, apatite and Zircon quite frequently. A striking feature of the rock is the entire absence of micaceous minerals such as biotite or muscovite. Dikes of pegmatite are quite common in the granite of the Katherine district. They do not present any features of special interest.

Overlying directly the granite are the different varieties of the Tertiary lava flows, the Andesite and Rybolite. The Andesite is of great interest from the standpoint of minerology as in it most of the orebodies have been found. Schrader differentiates three classes of Andesite:

"Basal-Andesite" or "older Andesite", named by Ransome Aloyone Trachyte, then the green olonitic Andesite, and the undifferentiated volcanic rocks. The Andesite, rock appears generally dull green to greenish gray. It is a highly altered prophyry rock with abundant phenocrysts of orthoclase and plagioclase. Iron ore and apatite and a n accessory minerals with an abundance of clorite, caloite, epidote and syr.

abundance of clorite, calcite, epidote and pyrite. Quartz is present with clorite and calcite as filling material. The groundmass in which the crystals are set is quite dark in color and dense in texture.

In the upper part of the Andesite complex we find a variation in texture and composition. It is darker in color and contains large well developed crystals of feldspar; Sparkling flakes of biotite are always present. The groundmass is always either stony or glassy. This part of the Andesite is part of Schrade's so-called "undifferentiated volcanic rock" which Ransome gave the technical name "Goldroadlatite" because it plays such an important role in the Goldroad mining district.

Above the Andesite complex we find a series of lavas composed of tuffs, flows and breecias similar to the Rhyolites in other districts. These Rhyolite tuffs are abundantly exposed all along the western slope of the Black Mountains and attain a greater thickness in the Katherine district where erosional remnants of both flows and tuffs are covering the sides of numerous and smaller granite ridges. It is a pinkish gray dense rock containing crystals of orthoclase, biotite and albite in a microcrystaline ground mass of orthoclase and quartz.

MINERAL DEPOSITS

Series of fissures cutting the lavas of Andesite and granite far into depth are filled with quartz adularia and calcite in which gold as free metal is very finely disseminated. The most favorable ore-horizon seems to be found in the green chloritic Andesite as also in the upper member of the series of lava rock, the Ryolite. The oxydation extends to a depth of six to seven hundred feet. As a rule, no su;phides are found.

Some of the veins have well defined walls, but most of the ore deposits are lodes in which a number of stringers or veinlets of various width and shape are separated from each other by barren rock. Sore ore deposites take the form of ore-shoots in which numerous stringers traverse the country rock. We find this type of deposits expecially in the mines of the Katherine district.

Ore has been found in various kinds of rocks. In the Katherine district primary ore occurs in fissures in the granite and the overlying Rhyolite. In the Oatman district mostly in the green Andesite.

The chemical composition of the rock, therefore, does not appear to have been an important factor in the localization of ore-shoots.

The shape of the individual ore-shoots is usually quite irregular, in general lenticular. What has produced the ore in these fissures and shoots I leave to the imagination of scientists.

Volcanic action, gas explosions and their after effects, acid gasses inclosed in the magma, sulphur vapor, superheated steam (fumeroles) during the last activity of the magma flow, all combined have done their part, creating and furnishing to the world today the minerals, we, men, are looking for.

BLACK DYKE MINE

The foregoing general report was necessary in order to give the reader an outline about the entire meneral area from a geological standpoint so comparison can be made of the Black Dyke Mine, so far only in a state of development, with the others already developed and on production.

The mineral belt of the Oatman-Katherine district lies in a northwesterly-southeasterly direction along the west slope of the Black Mountain Range paralleling the channel of the Colorado River. The Oatman district lies near the southern end of these mountains; the Katherine district about twelve miles farther north.

The Black Dyke Mine is situated in the Katherine mining district and belongs to that group of claims which is known as the "Black Dyke" group.

Outcroppings all along a horseshoe-shaped ridge have attracted propsectors for some time. The rock is a Rhyolite Porphyry composed principally of quartz and calcite, the quartz predominating. The color is light gray and pinky in a new breakage but the outcroppings appear dark from the distance. The north side of the ridge descends steeply into a channel floor, the east side gradually climbs up to the higher levels of the Mountains. Several higher ridges lie to the north and south of it. One small, 30 foot inclined shaft has been sunk by early prospectors following up stringers which showed fairly good pannings all along the surface.

Encouraged by this, they started to sink a straight working shaft about 50 feet south of their inclined shaft in the hope of strinking the orebody farther down. All this work was abandoned some time ago, farther down. Machinery for hoisting compressor, drill sharpening machine, electric lighting plant, etc., were installed and it must be stated that the prospect is very well equipped for doing development work.

The showings at the outcrops and the good pannings obtained all along and in different places lead the observer to the assumption that the prospect is over or close to a mineralized zone which may open up at my depth or at any distance from the shaft. My mentioning of the United Eastern vein, the richest in the district, was done in order to show that not all, in fact, most of the orebodies do not crop out but are found by later and deeper development work. The same holds good for the Katherine mine too, only about three miles west of this prospect.

The granite ridges in the district show a trend generally in direction east-west and I am of the opinion that the different orebodies or the cones of enrichment run in direction east-west too. The zone of greater mineralization we will find the closer we come to the underlying granite complex, the dominant rock in this district.

As the Princess Mine is today in a state of development, opinion about its mineralization and future outlook can only be formed by comparing it with other mines in the near vicinity which have been worked, developed and are on production.

About three miles west, close to the Colorado River lies the Katherine mine which has been working for years and can boast of production of over three millions of dollars.

A small knob of granite protruding out of the surrounding gravel level gave first indication to the prospector that something of interest was there. Work started and in time following up exploration and developing work a vertical shaft to 900 foot level was sunk and levels run every 100 feet.

According to Buttler, the Katherine vein is a stringer lode with a width of over 60 feet. It has been explored underground to a distance of over 1700 feet. Vein filling usually was quartz and calcite. An intergrowth of quartz and adularia occurred in many places and formed some of the important ore-shoots. It is very similar in appearance to some of the important ore-shoots in the Oatman mines. Sometime the adularia was rather coarse grained and the associated quartz was of deep greenish color. Some of the smaller stringers frequently showed a fine banding and were usually frozen to the somewhat silicious granite wall. Enriched orebodies were found at the 300 foot level in reddish silicified granite.

Today the mine is idle on account of fire some years ago which destroyed not only the shaft and entire workings but the enormous complex of houses and machinery overground. A new 200 ton mill is treating ore from nearby mines.

About three miles to the east of the Princess mine lies the Tyro mine, the country rock is gneissic granite. Numerous narrow dikes of Rhyolite-Porphyry occur in the vicinity of the mine. The vein, which consists of a large number of stringers in the granite varies in width from a few feet up to sixty feet. Production of the mine was only from small pockets found near the surface. Lately new work has been started and today the mine is shipping ore to the Katherine Mill.

Several other mines in that district are working and some of them have succeeded in opening up new orebodies. So the Arabian mine, whose condition is very identical to this prospect. Rhyolite-Porphyry dike intrudes granite, a mineralized zone--about thirty feet wide consisting of numerous stringers of quartz occurs in the Rhyolite dike and, to a certain extent, in the granite footwall. Assays showed an average to $8 to $10 per ton, and some ran as high as $20.

CONCLUSION Summarizing all the findings and analyzing all the points carefully I come to the firm conclusion that the Black Dyke group, located between two known producing mines, lies inside a zone of mineralization with only that one question open of how deep does the mineralized ore body lie below the surface showings. The Rhyolite flow which cuts and overlies the granite complex below is, in my opinion, not very thick, judging from other ridges around where the granite protrudes out of the surrounding Rhyolite lava. A 100 to 150 foot shaft should strike zone of mineralization from where drifting should start in direction west, towards the orebodies of the Katherine mine.

I have been approached with the question of whether the erection of a concentrating mill would be advisable. This question cannot be answered off hand. As I am firmly convinced that the prospect in question will develop into a good producing mine in time of developing, at the present time the prospect itself does not produce enough ore to warrant the erection of a mill, but

taking into consideration the time of building a mill (six to eight months, during which time the Black Dyke might be sufficiently developed for a mill) mill on hand, a new and modern hundred ton mill would be a Godsend right now and appreciated and supported by all men, miners and prospectors and life anew would start again.

Signed (Erich Schleiff)

C O P Y

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ERICH SCHLEIFF
Mining Engineer and Geologist
Room 328 - 510 Battery St.
San Francisco, California

Phones EXbrook 0764
" 7572

August 24, 1936

Messrs. Oie and Williams,
Huntington Park, California.

Gentlemen:

I wish to submit the following amendment to my report of April 17, 1936, on the Black Dyke mine:

The Black Dyke mine, as explained in my report of April 17, 1936, lies in a favorable location, which I may call "Zone of Mineral Enrichment." The outcroppings all along the Dyke show mineralization throughout. It is hard to give an average estimate of the entire Dyke outcropping itself. The figure of eight dollars per ton may be too high and four dollars too low.

I believe that 600,000 tons of gold bearing ore can be mined along the Rhyolite Dyke and, taking the low estimate of five dollars per ton, will give you the basis on which you can figure the future development of your enterprise.

The complete installation of a 200 ton mill, including a pipe line for pumping water from the Colorado river about five miles distant, should not reach the sum of $125,000.

Mining of ore, per ton, should not cost more than 50 cents per ton for surface mining, and 90 cents per ton underground mining. Milling should not exceed One dollar per ton. With these figures in mind, mining and milling must be done with a high degree of efficiency.

I have been informed that the shaft has reached the depth of 150 feet and that you are now drifting in a westerly direction. I am convinced that you will not only hit the ore bodies you encountered in the shaft above, but several more, as in my opinion, the farther west you drift, the closer you will come to the actual zone of mineral enrichment, which in the great mines at Oatman have produced such riches that even today the mining world is talking about it.

Very truly yours,

(Signed) Erich Schleiff.

ASSAYS OF THE BLACK DYKE MINE

ASSAYER	GOLD		SILVER		TOTAL
Ed Eisenhauer, Jr.	.30	$10.50	1.30	$1.01	$13.00
"	.04	1.40	trace		1.40
"	.025	.88	"		.88
"	.54	18.90	1.03	.80	19.70
"	.24	8.40	.08	.06	8.46
"	.32	11.20	.15	.10	11.30
"	.28	9.80	1.78	1.39	11.19
Gold Standard Mines Corporation	.37	12.95	1.23	.95	13.90
Kingman Assay Office	.09		trace		3.15
"	1.58		1.62		56.34
"	.10		.98		4.14
G. H. Pratt & Co.	.20	7.00			7.00
Atkin & McRae	4.92	172.20			172.20
"	.24	8.40	trace		8.40
"	.14	4.90			4.90

SURVEY OF
THE PRINCESS GOLD MINE
OF THE
BLACK DYKE GROUP
BY
P. L. MULLEN

The lands comprising the holdings of the Princess Gold Mine, are situated in the San Franci co mining district-Mojave County, State of Arizona, about 32 miles due west from the town of Kingman, the County seat of said county, and is located on the west slope of the Black Mountain Range in what is locally known as the Union Pass section. This section is Northwest continuation of the famous Oatman district. The Princess Gold Mines, Inc. Company owns outright nine claims or about 180 acres which contains a large vein of free milling gold ore. This vein varies in width from 300 feet to 60 feet and is exposed on the surface of the claims for a distance of 5,000 feet. 70% of the vein will average 250 feet in width. Free gold can be obtained with the pan from the entire length and width of this vein. Owing to the extensiveness of the outcropping this vein has not been thoroughly sampled only with the mortar and pan, consequently an estimate of the surface ores cannot be given. However, some assaying has been done showing values from $3.00 to $12.60 per ton with a few samples running as high as $112.00 per ton. Those samples are surface samples. Practically no development of any consequence has been done on this property except at the present time a shaft is being sunk and has reached a depth of 50 feet. This shaft shows assay values ranging from $2.75 to $1.82.20 with the improvement in values as depth is attained. I wish to state here that 90% of the commercial ore mined in the Oatman Union Pass sections has been found below the permanent water level. This level will be reached in the Princess property at about 150 feet in depth. In the opinion of the writer a systematic sampling and assaying of this immense cropping has a reasonable chance of showing a good tonnage of commercial ore. However, to do this the cost would be about $5,000.00. This money would be better spent in the sinking of a shaft to below the water level. For the geology of this section I refer you to Bulletin 397 - U. S. Geological Survey by F. C. Schrader and Bulletin 131 - University of Arizona by Carl Lousen.

In conclusion I wish to state that I have mined in this district thirty seven years and have been employed from a mucher to Supt. of Mines, and I have been fortunate in being connected with the best producing mines in the district during this period. I have observed closely the ore occurrences, geology and country rock formation in those producing mines. In my examination of the Princess property I find the identical conditions as to the character of the ore, the geology and country rock as I found in the other great producing mines of the district excepting that the Princess vein is six times as extensive and I may reasonably say six times better values on the surface than those other mines had. Consequently, I do not hesitate to state here that the Princess will develop into as good a mine as those others and in comparison, if indications count for anything, the Princess will make a more intensive and better grade ore mine than any mine that has been opened up in the district to date. Why do I make this broad state-

ment? First, there is no doubt in my mind but the Princess vein is a continuation of the Great Oatman and Gold Road system. Second, compare the Princess with its extensive vein of fair values, with, say for example, the Tom Reed and United Eastern mines that to my personal knowledge would not assay $1.00 per ton on the surface and at depth produced millions, as in the case will all the other great producing mines of the district including our immediate neighbouring mines. Then again, the peculiar condition in this district, the wider the vein the higher the grade of the ore. Very few of the producing mines had veins to exceed 40 feet in width. Then take the Princess vein, with its width of approximately 200 feet and higher surface values than those other mines, we must reasonably expect a greater tonnage and higher values than the other mines had, and again I want to state that a chemical analysis of the gold and vein material of the Princess vein checks with the Gold and vein material of the other producing mines which shows conclusively that the Princess vein is of the same enrichment as the other mines of the district, and as the map in Bulletin 131 will show the Princess is surrounded on all sides and ends by producing mines, and as it has much better surface showing in the district, then it would have to be a freak of nature if it would not make a producer. And as the Princess vein is an open-fissure vein and compact (showing plenty slicken-sides, which indicates great depth) it can be developed at a very small cost.

Respectively submitted by,

(Signed) P. L. MULLEN

Los Angeles, California
Dated: November 30, 1934

REPORT ON PRINCESS GOLD MINE AND THE BLACK DYKE

BY

JOHN A. QUIGLEY

LOCATION

The Princess Gold Mine is located in the Black Mountains of Mojave County, Arizona, about 32 miles westerly from Kingman, and practically three miles due East from the Katherine Mine. This group comprises eight full mining claims and one fraction and is situated in the San Francisco Mining District. The present owner is the Princess Gold Mines, Inc. The approximate altitude of the mine is 1500 feet.

ROADS

The property is reached by a good country road from Kingman, a distance of 32 miles.

No surface water is available on the property. The nearest proximity of water is the Colorado River, a distance of three miles. Judging from the elevation of the water - table in the Katherine Mine and also the Roadside and the Gold Chain Mines, along the strike of the Princess Lode, it is my guess that water will be encountered in mining operations at a depth of 150 feet.

Water for domestic purposes could be piped from springs near the Gold Chain property, about three miles distant.

TIMBER

No timber is available on the property.

TOPOGRAPHY

The general trend of the Black Mountains is North Northwest, and their present topography seems to be due in general to erosion. At the Princess Mine faulting does not seem to have been of such proportions as to have caused a general deformation in the mountain ranges. The altitude ranges from 700 feet at the Colorado River to an altitude of 5500 in Mount Perkins and Mount Wilson. The drainage of this section has a gentle slope westward to the Colorado River.

GEOLOGY

The fundamental and oldest rocks of the area are those of the pre-Cambrian crystalline complex, which consists essentially of coarse, more or less porphyritic and roughly gneissoid granite rocks, with gneiss and schist of various kinds. It contains numerous quartz veins or lodes, in which occur the mineral deposits mined in the Berbat Range and Crhd Wash Cliffs and also part of the Black Mountains. These pre-Cambrian rocks are coarse-grained, usually gray or reddish in color, and consists of the quartz, mocroline, orthoclase, oligoclase and small amounts of biotite. Pegmatites and aplites are noted from many places and are evidently merely products of differentiation of the prevailing rocks.

The most important of the intrusive following the pre-Cambrian complex are granite porphyries of varying types and dark lamprophyric dike rocks, such as minettes and vegesites. The larger stocks of granite porphyry are in places difficult to distinguish and separate from the pre-Cambrian complex, as they are similar in composition, generally show a close jointing or schistosity, and are nearly everywhere strongly sheeted. These intrusives are found in the more important mining districts and are probably connected with the genesis of the ore deposits.

Amongst the Tertiary volcanic rocks are found andesite, trachytes, rhyolites, and basalts, lying in broad superimposed sheets or flows with intercalated beds of ash, tuff, and breccia. They are best developed in the Black Mountains, particularly in the

southern part, contain most of the mineral deposits of the range, and probably played an important part in the genesis of these deposits.

The rhyolite series is the most important in the Princess Lode area, as it is on the contact of the rhyolite and pre-Cambrian granite that the vein occurs. The rhyolites extend interruptedly throughout the length of the Black Mountains, and in some localities the series attain a thickness of 1000 feet or more. The rhyolites are as a rule light colored reddish or pink rocks, with small phenocrysts of biotite, foldspar and quartz.

A more complete and detailed description of the geology of this section will be found in U.S.G.S. Bulletin #497, by F. C. Schrader.

VEIN SYSTEM

The veins are a series of fissures parallelling each other with a general northerly or northwesterly strike and steel dip. The fissure filling is quartz, adularia and calcite, and in many places the first two minerals have replaced the calcite. The veins are fairly regular, but the walls are usually rough and broken and full of stringers from the main vein. The veins cut through the great mass of Tertiary volcanic rock which characterize the Black Range, but undoubtedly continue in depth into the underlying pre-Cambrian granite rocks.

The Princess vein on the whole, has an average width of 40 feet, with the swells along the strike attaining a width of 200 in places. The general strike is N 65 W and an approximate dip of -55 SW.

GANGUE

The gangue of the Princess ledge is quartz, adularia and calcite, with the first two minerals replacing the calcite. Silicification has extended back into the rhyolite in some instances to a depth of 200 feet.

Generally speaking, a slickensides separation marks the hanging wall of the vein. Better values exist along the hanging, rather than on the foot-wall of this ledge.

MINERALS

The precious metals found are gold with a low content of silver, the gold is associated with the quartz, is very fine-grained, is amenable to the cyanide process, and is more abundant where the quartz has more completely displaced the calcite.

SAMPLING

Samples taken across the ledge disclose an average of $4.00 per ton. Numerous samples taken at various points along the hanging wall show values ranging from one to five ounces.

DEVELOPMENT

There has been no underground development worthy of mention on this property. Numerous cuts and trenches along the ledge represents the location and assessment work. However, pannings from the majority of these disclose the presence of gold. A small incline, with a dip of -60, practically cross cuts the ledge. A two compartment shaft was sunk a depth of 31 feet, when operations ceased. Judging from the proximty of the shaft to the ledge, this shaft will require an additional 150 feet in depth to completely pass through the ledge.

EQUIPMENT

The buildings consist of a hoist-house, blacksmith shop and three small cabins for lodging purposes.

The property is equipped with a Chicago Pneumatic Air compressor, #117396 - 12 10 NSB, and also a West Coast Hot Head Gas Engine Noise, #0589 - 40 HP - RPM.

DISCUSSION

In a discussion of this property, it must be borne in mind that this group is still in the prospective stage. The vein is wide and strong being traceable on its course for a distance of six or more miles. These two factors argue for depth. The mineralization is persistent as is evidenced by prospects along the strike. Numerous panningsand assays taken along the lode also disclose the presence of Gold.

CONCLUSION

It is my firm belief that the Princess Group offers an attractive proposition to the prospective investor. This property requires a comprehensive study of field conditions and a knowledge of geological features to be found in this district. A comparison of formations of this district and the Oatman district disclose their similarities and proves them identical in character. The presence of gold in the numerous cuts on the Princess show this prospect to be in a mineralized zone. Its proximity to the Katherine, which has proven to be a producer, argues for the exploration and ultimate development of Princess in to the producing class.

It is for these reasons that I recommend this prospect, and urge a vigorous campaign of exploration.

Respectfully submitted by,
(Signed) JOHN A. QUIGLEY

Los Angeles, California
Dated: March 15, 1934.