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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03/20/90

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: CATOCTIN

ALTERNATE NAMES:

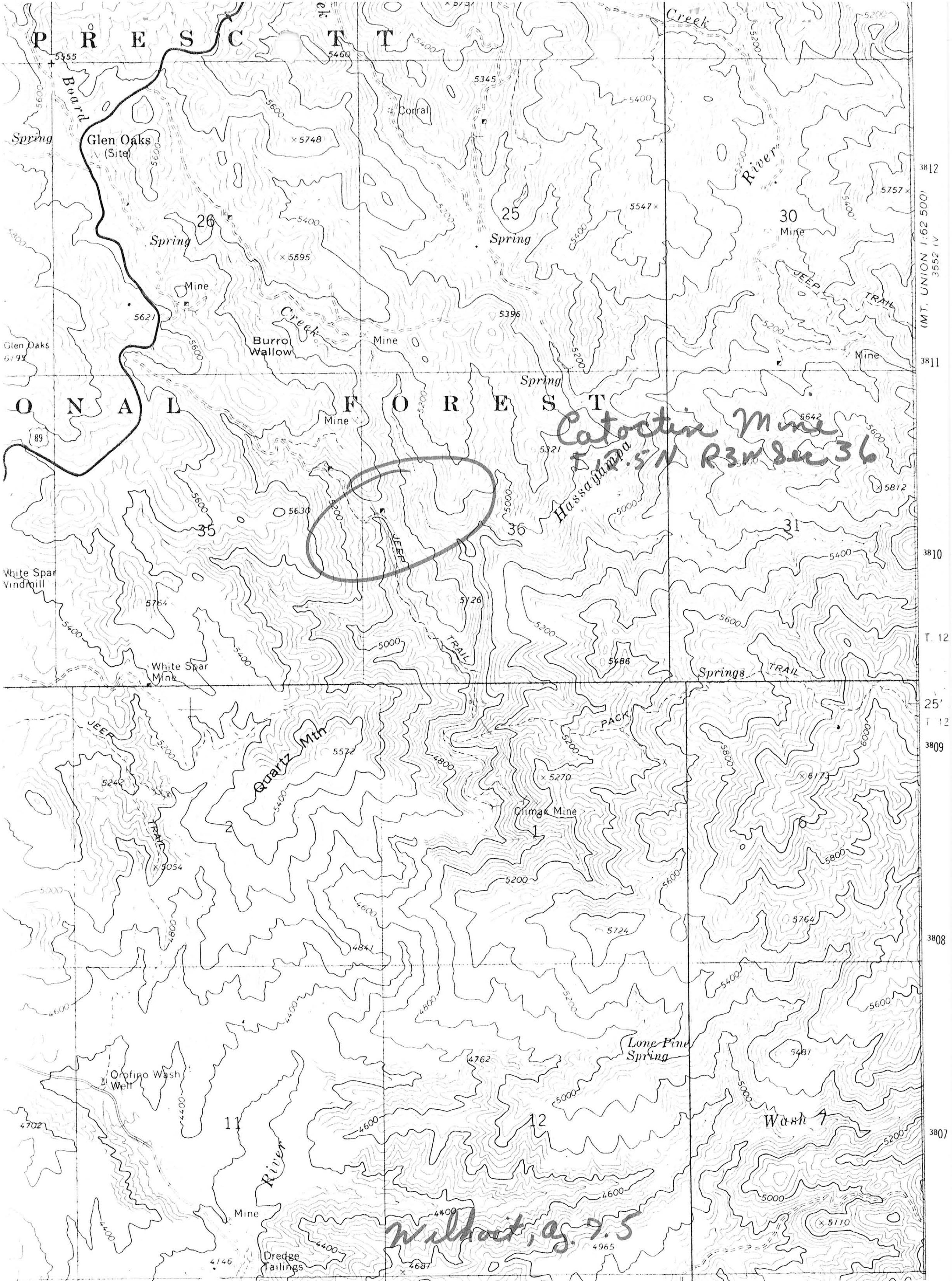
YAVAPAI COUNTY MILS NUMBER: 242A

LOCATION: TOWNSHIP 12.5N RANGE 3 W SECTION 36 QUARTER NW
LATITUDE: N 34DEG 25MIN 33SEC LONGITUDE: W 112DEG 31MIN 50SEC
TOPO MAP NAME: WILHOLT - 7.5 MIN

CURRENT STATUS: DEVEL DEPOSIT

COMMODITY:
GOLD
SILVER
COPPER
LEAD

BIBLIOGRAPHY:
ADMMR CATOCTIN MINE
ADMMR CATOCTIN MINE COLVO FILE



PRESCOTT
ONAL FOREST
Glen Oaks (Site)
Board
Spring
Corral
Creek
River
Mine
Burro Wallow
Glen Oaks
89
Hassayampa
JEEP TRAIL
White Spar Windmill
White Spar Mine
Quartz Mtn
Climax Mine
PACK
Springs TRAIL
Lone Pine Spring
Orofino Wash Well
Wash
Dredge Tailings
35
36
31
26
25
30
2
1
6
11
12
7
3812
3811
3810
3809
3808
3807
T. 12
25'
(MT. UNION 1:62 500)
3552 IV
Catoctin Mine
T 12.5 N R3W Sec 36
Wilhoit, Az. 7.5

COTACTON
CATA CLIMAX

982-313

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Thumb Butte Ranger District
Highway 69 - Dewey Route
Prescott, Arizona 86301

Have some mill slimes

2810

March 26, 1979

RON MILLER TELE 1252
Bureau of Water Quality Control

Mr. William Kirtland
619 South Copper Lane
Apache Junction, Arizona 85220

Will sand compact & stop percolation

Dear Mr. Kirtland:

I have reviewed your Plan of Operation, dated February 13, 1979, and it is approved per the conditions of the attached "Approval" sheet. If the stipulations as listed are agreeable to you, please sign all copies and return the two copies to this office in the enclosed envelope. The third copy with an attached copy of your Operating Plan is your copy for your files.

I wish you good luck in this venture and should you have any questions concerning this matter, please feel free to contact Sig. Palm of my District Staff.

Sincerely,

LEE E. POAGUE
Thumb Butte District Ranger

Enclosure

File
COTOCKIN CLAIM
Mr KIRTLAND

xRef.

6200-11 (1/69)

982-3131
Apache Jct

2810

WILLIAM KIRTLAND
JACK R. KIRTLAND
GORDON HENDRY
RICHARD A. HENDRY
JOHN P. TRUFFA

1. Approval of this Operating Plan:

   A. Does not constitute recognition of certification of ownership by any person named as owner herein.

   B. Does not constitute now or in the future recognition or certification of the validity of any mining claim to which it may relate or to the mineral character of the land on which it lies.

2. When another party asserts a title interest in the area covered by this plan, it will be the sole responsibility of the concerned parties to resolve such conflict before proceeding with claim development.

3. The required bond, to assure reclamation of the disturbed area, in the amount of $1,000.00 (cash deposit) per the attached Bill for Collection, issued February 16, 1979, paid February 21, 1979, is attached to this approved plan.

4. Other Stipulations:

   A. Improve the access route to the extent that reasonable access can be accomplished, per our discussions on the ground and our letter of 2/20/79. Clearing and widening is permitted to a maximum of 12 feet and the existing route must be followed. Efficient drainage can be accomplished by constructing the "rolling-dip" type water bar rather than installing culvert devices.

   B. Installation of the milling equipment per your submitted plan is acceptable.

C. The specifications of the primary leaching pad will have to be modified to include approximately two feet of clay in the bottom covered by at least one foot of sand, followed by the sealed reinforced "Griffolyn T-85" mat. This should be covered by at least one foot of sand.

Your planned method of filling the pond with crushed material to be leached is satisfactory. The outer berm must be of hard core composition to prevent slippage.

D. The size and location of the two safety "catch" basins will have to be located and agreed upon out on the ground before construction. Your idea of providing the emergency chlorine treatment at the primary "catch" basin appears to be an adequate safety measure.

E. The primary leaching pad, the safety catch basins and the treatment plant will have to be fenced and signed adequately to protect and warn the user public.

F. Rehabilitation requirements and standards will have to be evaluated and developed as this venture progresses.

6. The remainder of this Operating Plan is satisfactory, however, before each phase of this operation develops, an on-the-ground evaluation and clearance will be necessary.

7. Furnish this office a copy of your chlorine treatment logs on a bi-weekly basis.

Proposal Evaluated by: _____ Date 3-23-79
Signature of Forest Service Evaluator

Approved by: _____ Date 3/3A-79
Signature of Authorized Officer

ACCEPTANCE OF STIPULATIONS:

The stipulations and/or modifications to this plan attached has been reviewed, and will be incorpirated into and become a part of this Operating Plan.

_____ Date _____
Signature of Operator

In conclusion, the Bureau and the Department of Mineral Resources hope to have other opportunities to meet with the U.S. Forest Service personnel to discuss similar situations.

Paid

~~CLIMAX MINE~~ Catoctin Mine YAVAPAI COUNTY

NJN WR 11/4/83: Chris French, a geologist, Ph: 445-0026, in Prescott, called seeking data for a report he was writing on the Peck Mine, Yavapai County. He reported the recent heavy rains have caused much damage to the Climax Mine road, Yavapai County. He now has to walk about one mile to his mapping/work area there. Fortunately their current phase there is nearly complete.

NJN WR 2/10/84: Chris French (c) brought in a geologic abstract of the Climax Mine (AKA Catoctin) property, Hassayampa District, Yavapai County. A copy has been placed in the file. Mr. French reports they are going to submit the property to mining companies. He believes the property contains 500,000 tons at an average grade of .05 oz Au/ton (unproven however) which could be available by open pit methods. This would consist of high grade veins, low grade disseminated values.

4/15/85: Mr. John Truffa, 277-6451, was in to let us know that his claim the Climax-Catoctin was for sale or lease. Anyone interested should contact him at the above phone number.

KAP WR 5/24/85: Data on the Climax Mine in Sec 1, T12N R3W and the Catoctin Mine Sec 35 and 36, T12.5N R3W have been placed in the same file known as the Climax for many years. As the properties are separate and distinct, two files, the Climax and the Catoctin Mine, both in the Hassayampa Mining District, Yavapai County, have been established. It is possible that each file may continue to have data pertinent to the property covered by the other.

KAP WR 5/31/85: In the company of Harold Linder a visit was made at the Catoctin Mine in Secs 35 and 36, T12.5N R3W, Hassayampa District, Yavapai County. Here the remains of the circa 1979 heap leach operation are still evident. All that remain is the concrete lined ponds, the leach pad and some trash. The amount of erosion of berms and roads indicates it has been sometime since any mining or prospecting activity has taken place.

KAP WR 11/7/86: John Truffa (c), visited and reported that he would like to sell the Catoctin Mine (file) Yavapai County. There has been little activity on the property since attempts to set up a heap leach operation circa 1979-80. There has been minor exploration activity since that time.

CLIMAX MINE Yavapai County

CJH WR 7/18/80: Phone Call from Bill Kirtland, 619 S. Copper, Apache Junction, Arizona 85220, phone 982-3131. He wanted to talk to Mr. Jett about the sale of his large size Escapule gold recovery unit at his Catoctin Mine near Wilhoit, Yavapai County. On Dr. Brown's (ASU) advice, they have abandoned the cyanide leach and going to flotation. Mr. Kirtland reported that the Catoctin ores are very similar to those at the Button Mine which is successfully employing flotation techniques.

KAP WR 8/1/80: George Wantz, phone 800-227-3163, who heads an investment firm in San Francisco, requested assistance in evaluating the current status of Catoctin Mine in Yavapai County. He is the lead investor for a group that has previously invested in the property through the 4-K Corporation. Past work on the property so far has not produced any income.

KAP WR 11/12/82: Chris French, 3030 E. Clarendon, 7A, Phoenix, Arizona 85016 phone 957-6922 is evaluating the Climax Mine (near Wilhoit) as a possible gold mine venture with a mill. He reported the upper 350' is oxidized. Lower workings contains arsenopyrite and cholcopyrite with gold. He explained he has financial backing to finance trenching and sampling of dumps and to start underground exploration. He feels there is some ore left in the old stopes.

NJN WR 12/31/82: Chris French, now in Prescott, phone 445-0026 reported he has a 320 acre lease which includes the Climax Gold, Catoctin Silver and some placer ground on the Hassayampa River in Yavapai County. Mr. Franch is also looking for an 8" dredge.

NJN WR 2/11/83: John Truffa, owner of the Climax Gold Mine, Yavapai County, reported that Lee Smart had staked over some of his claims. Mr. Truffa's mine is currently under lease to Chris French till May, 1983. Following the end of Mr. French's option, Mr. Truffa would like to see the property.

NJN WR 9/16/83: Chris French reported he is putting together a report on the Climax Mine, Yavapai County, which will be used to generate about $250,000.00 venture capital for a detailed sampling/mapping program to be followed up by drilling.

CLIMAX MINE YAVAPAI COUNTY

4422 N 18th Place 10-22-79

John P. Truffa, T & R Land & Land Mining Co., ~~2921 W. Rancho Drive~~, interested in this property. LP 5-20-64

No work has been done on this property - Mr. Truffa trying to sell. EGW 7-17-64

Lessor: Mr. John Truffa and T&R Land Mining Co.
Lessee: Commodities Unlimited, Inc., P.O. Box 3025, Scottsdale, Arizona

Gentlemen came into the office and gave us this information 2-28-67

Mr. Troy Reeves, Phoenix, came in for information on the old Climax Au property on the Hassayampa River about 6 miles SE of Wilhoit. He is considering buying the 4 unpatented claims from John Truffa, Phoenix. The office file was shown to Mr. Reeves and some assay results were duplicated for him. He said he intends to clean out some of the adits and sample the exposures of the veins (3). GW WR 8/7/73

Bill Reeves, along with his father, STATED THEY owns the Climax and Catoctin mine in the Hassayampa district (near Prescott). Bill Dusenberry, who is the promoter, is encouraging Reeves to build a mill on the property and Reeves is so planning. KAP WR 7/29/74

USGS Bull. 782, p. 113

COTOCTIN & YAVAPAI

John Truffa
602-277-6451

4422 N. 18 PL.
PHOENIX, AZ 85016

Climax and Cotocton Mines located approx 15 miles S of Prescott Hillary 89 on Bradshaw Mtn Range.

Climax Blm Serial No AMC - 34127 ET AL 9 Claims

Cotocton Blm Blm Serial No AMC-34123 ET AL 5 Claims

Sell or lease prefer to sell

11/7/94

Frank Cobb V.P.
Western-12 Metals Corp.
706 E Ball Road
Phoenix, Ariz 85022

T&R Land & Mining Co
4422 N 18th Pl.
Phoenix, Az 85016
Oct 19, 1994

Dear Mr Frank Cobb: V.P.

In accordance with the Default Provision under Section 14 Default of the Mining lease and option Lessors John P Truffa dba T&R Land & mining Co and Frank Cobb (Western-12 Metals Lessee's. Dated May 9, 1994 the T&R Land and Mining Co has the right to terminate the agreement upon Ten (10) days notice to you in the event you should be in default.

Section 3 Royalty Payments. Part A Quote: On the seventh (17th) date of every month the Lessee will pay the Lessor the sum of Five hundred $500.00 dollars.

May 17, 1994 a check in the amount of $500.00 dollars Ck No 3073 signed by Teresa Cobb was payment for May 17th to June 17, 1994 to days date Oct 19, 1994 and no payment has been received by Lessee You are certainly in default.

Section 14, Default: If Lessee fails to correct a default in any provision of this agreement within Ten (10) days after Lessor gives written notice of the default by certified mail and Lessee fails to correct the default in ten (10) days after the certified letter is mailed. Lessee shall in that event have no further claims or rights under this agreement and shall immediately surrender possession of the claims to Lessor without any legal action or order of any court.

Sincerely T&R Land & Mining Co
John P. Truffa
Lessor

Mr Frank Cobb V.P.
Western 12 Metals Corp.
706 E Bell Road
Phoenix Ariz. 85016

dba T & R Land & Mining Co
4422 N 18th Pl
Phoenix, Ariz 85016
Nov 1, 1994

Dear Mr Frank Cobb V.P.

Under Provision 14 of the May 9, 1994 Mining Lease and Option the T & R Land and Mining Co has the right to terminate the base, upon Ten (10) days certified written notice to you in the event you should be in default. You are certainly in default and failed to correct said default in a reasonable manner.

The notice of termination has been given to you and sent to Western 12 Metals Corp 706 E Bell Road, Phoenix Arizona 85022 the address given in this Agreement notice Provision 16.

The Ten (10) days have expired on Oct 28. you have failed to do anything about this. It would appear to be too late to correct any default.

You may therefore consider that the Mining Lease and Option of May 9, 1994 cancelled.

Please acknowledge receipt of this cancellation.

Very Truly Yours
John P. Duffy
Lessor

JOE STOCKS
JAN. 26, 1993
PH# (602) 992-8767
FAX 1-702-798-4118
1-702-798-0945

ATTN: TED BROOKS
STARCREST CREST MGT.
LAS VEGAS, NV.
FAX #798-4118 (702)

REF: CLIMAX MINE - LOCATED SECTION 1, T-12-1/2N., R2W. YAVAPAI COUNTY, AZ., LOCATED ON FORREST SERVICE GROUND.

DEAR TED:

THIS MINE APPEARS VERY LUCRATIVE TO ME. I HAVE HAD A FORMATION AND TAPE SURVEY MADE OF THE FOURTH LEVEL, AND I HAVE INCORPORATED THAT MAP ONTO AN OLD LONG SECTION MAP OF THE PROPERTY. WE HAVE TAKEN MANY SAMPLES AND THE RESULTS ARE GOOD. I AM AWAITING ASSAY RESULTS ON THE LAST GROUP OF SAMPLES. (MARKED ON MAP SAMPLE A TO P EXH. #1) THE SAMPLES WERE GROUND AND SPLIT THREE WAYS. I HAVE HAD 1/2 OF THEM ASSAYED. THE EARLIER SAMPLES ARE MARKED ON THE MAP ALONG WITH ASSAY RESULTS, FROM THIS INDEPENDENT ANALYSIS OF THIS PROPERTY BY ME, I BELEIVE THAT AT LEAST 50,000 TONS OF .40 TO .50 OZ PER TON GOLD CAN BE RECOVERED FROM THIS ORE LEVEL. THIS MINE IS OPEN AND REHABILITATING IT WILL BE RELATIVELY SIMPLE AND INEXPENSIVE.

ADDIITIONALLY, 250,,000 TON OF ORE DUMPS IN A REPORT BY L.B. GASKILL (SEE ENCLOSED EXH. #2). HOWEVER, FOR CONSERVATIVE REASONS I ESTIMATE A MINUMUN OF 50,000 TONS OF .15. I PANNED TWO DUMPS AND ESTIMATED THE GRADE, AS YOU KNOW I HAVE BEEN SUCESSFUL AT THE MYSTIC MINE BY PANNING. (MYSTIC MINE IS PRESENTLY SHIPPING 100 TONS PER DAY OF SOLID ORE).

FURTHER, ONE MILLION TONS OF ORE, .20 OZ TON GOLD, IS ESTIMATED (EXH.111, PAGE 11, LINES 26,27,,28) OF A REPORT TO CLIMAX MINING COMPANY DIRECTERS DATED AUGUST 15, 1911. THE ESTIMATED ORE RESERVE IS UNTOUCHED AS FAR AS I CAN TELL FROM DIRECT OBSERVATION. IT CAN BE EASILY MINED FROM UNDERGROUND SHRINKAGE STOPES IN ORDER TO AVOID THE STIGMA OF STRIP MINING.

ADDITIONAL HIGH GRADE VEINS ARE TRACED FOR 13,000 FEET ON THE PROPERTY. THE ORE IS NOT MINED TO DEPTH. SULFIDE ORES APPEAR TO BE BETTER THAN THE OXIDE ORES. THE SULFIDE COULD GO TO THE 4000 FOOT DEPTHS.

THE INITIAL DEVELOPMENT WILL COST AT LEAST $50,000 FOR, ROAD REPAIR, OPENING THE MINE AND STOCKPILING 100 TONS OF ORE, ASSAYING ORE AND DUMPS, AMENDABILITY TESTS WITH VARIOUS MILLS, ETC.

PHASE 11 - PRODUCTION

MINING $50,,000 PRODUCTION AND STARTUP, AND $50,000 PER MONTH TO CASH FLOW FOR HIGH GRADE (2,000 TONS PER MONTH) ESTIMATED TOTAL $200,000.00.

PHASE 111 - MILLING

$160,000 FOR INITIAL ORE HAUL COSTS AND INITIAL MILL START UP COSTS AND $60,000 FOR PROPERTY BUYOUT. NOTE; IF THE VENTURE BOUGHT OR BUILT A MILL, THIS MILL COULD EASILY COST IN EXCESS OF $1,000,000.

TIME

HI-GRADE - 50,000 TONS, 2,000 TPM, 100TPD = 30 MONTHS
LOW - 50,000 TONS, 2,000 TPM, 100TPD = 30 MONTHS
MEDIUM - 1 MILLION T, 500 TPD---------- = 9 YEARS
ESTIMATED LIFE OF THE PROJECT - 10 TO 12 YEARS

TERMS

INITAL $50,000 PHASE 1 INVESTOR, 25% OF THE PROFITS UNTIL $75,000 IS REPAID, THEN DROPPING DOWN TO 10% OF PROFITS.

PHASE 11 - $360,000, 50% OF PROFIT UNTIL $390,000 IS REPAID.THEN DROPPING TO 40% OF THE PROFIT. THE 25% BEFORE REPAYMENT WILL BE RETAINED BY F.C., J.S. GROUP, AFTER COST REPAYMENT. FRANK COBB GROUP AND JOE STOCKS GROUP WILL RETAIN 50%.

LEASED BY FRANK COBB JR., PEORIA AZ., WHO WOULD PARTICIPATE IN THE OPERATION. THE LEASE TERMS ARE 10% N.S.R. ROYALTY, WITH A $60,000 END PRICE, AND $500 PER MONTH MIN. ROYALTY PAYMENT. THE ROYALTY DOES NOT APPLY TO THE END PRICE.

COST (PROFITS)

HIGH GRADE - .40 AU PER TON

I FEEL $50,000 WILL REPAIR THE ROAD SUFFICIENT FOR PRELIMINARY MINING AND ANAYLSIS OF ORE DUMPS. A MILL HAS TO BE FOUND TO PROCESS THE HIGH GRADE ORE AT A PROJECTED COST OF $29.00 PER TON ORE, $8.00 PER TON FREIGHT, AND 423.00 PER TON MINING COSTS, TOTAL - $60.00 PER TON. ESTIMATED PROFIT, $3.5 MILLION.

DUMPS - 50,000 TONS - LOW GRADE

I ESTIMATE FREIGHT, MILLING AND MINING TO BE $30.00 PER TON FOR THIS ORE FOR A PROJECTED PROFIT OF FROM $900,000 TO $1 MILLION.

MEDIUM GRADE - 1,000,000 TONS

.20 OZ PER TON, ESTIMATED FREIGHT $8.00 PER TON, MILLING $29.00 PER TON, MINING (DUE TO SHRINK STOPES-VOLUME MINING)$13.00 PER TON - TOTAL $50.00 PER TON. ESTIMATED PROFIT $15,600,000.00.

TOTAL ESTIMATED PROFIT $20,000,000

THE LENGTH OF THE PROJECT WOULD BE INFLUENCED BY THE MILLING CAPACITY. IF THE ORE VEINS EXTEND FOR 10,000 FEET THIS COULD BE A 50 YEAR PROJECT.

THIS PROJECT IS STRUCTERED ON ESTIMATED COST AND PROFIT @ ($328.00 PER OZ GOLD)

I ENVISION A HOLDING COMPANY:

1. FRANK COBB GROUP
2. JOE STOCKS GROUP
3. INVESTORS WHICH WILL JOINT VENTURE
   - A. INITIAL DEVELOPMENT
   - B. MINING
   - C. MILLING

J. Jett
D/MR

State of Arizona
Bureau of Geology and Mineral Technology

Mineral Technology Branch
University of Arizona
Tucson, Arizona 85721
(602) 626-1943

March 26, 1979

COTOCTON Climax
FILE

TRIP REPORT

By: David D. Rabb DR

To: Department of Mineral Resources
Phoenix, AZ on March 20, 1979

Purpose: Meeting with U.S. Forest Service Officials
to Discuss Heap Leaching with Cyanide Solutions

On Tuesday, March 20, 1979 Mike Greeley and Dave Rabb met U.S. Forest Service officials at the Department of Mineral Resources office in Phoenix. The meeting had been set up by John Jett and hopefully there will be more of this kind of cooperative exchange of ideas and information.

The specific problem at hand was the application by Bill Kirtland to operate a cyanide leach operation on the Cotockin claim, Hassayampa Mining District, south of Highway 89. The material to be leached was to come from old surface dumps in the area, plus possibly some dumps and some ore from the Old Climax Mine nearby. Location: Sections 1, 35, 36, T 12½N, R 2-3W.

The proposed site has "live" water in a stream bed only a few hundred feet distant seven months out of the year, plus potential flash floods from seasonal cloudbursts.

The country bedrock was reported to be schist and granitic igneous rock, weathered, and permeable to shallow depth with a slight soil cover. It sounds as though the surface detritus is sufficiently permeable that some form of stable impervious pad or shield would be required before a leach sump could be implaced and operated with safety (i.e. no leakage out of the dump).

Kirtland proposed to devegetate and level the slope, cover the area with one foot of sand and cover with a layer of "Rip-Proof" plastic. The sample sheet was a relatively tough rubbery material but it was only about 10 mils thick in the one layer.

He was then going to cover the plastic sheet with six inches of sand.

The pad was to be approximately 200x200 feet and vary in height from a few feet to perhaps 40 feet. The sketch of the cross-section indicated an even 10 percent slope under the pad. The estimated amount of ore in a dump of this size and configuration is about 50,000 tons.

Comments and Questions:

1. It is my definite feeling that the relatively thin layers of sand above and below the plastic will not preserve the integrity of the barrier film. He needs a better pad. Plastic has never proven satisfactory under a large high dump. Also 40 or even 20 feet is too high to constrict in one lift and, if you use a multi-lift installation, you will end up with impervious layers of old truck runs. Trucks (and wheeled front-end loaders) exert a relatively high ground pressure per square inch and packing is inevitable. Packing means lateral movement of leach solutions and encourages side leakage and slope failure. If the ore has a schisty clayey character, it's really going to pack. Full-track crawlers are better because of lower psi contact. Conveyors or belt stackers or clam shells are even better. The ideal dump is about 6 or 8 feet high, put down on the pad by rear-dump trucks that back up to the dump to unload and neven get on top. Trucking over "protected" plastic tends to split the seams and rocks tumbling down dump slopes punch through the top sand cover.

   A time-tested proven method of pad construction is a two-foot layer of bentonitic clay installed in 1 foot layers, each leveled, rolled and compacted. Then add another 2 or 3 feet of crushed ore (say 1 inch maximum size). Then implace your dump--in <u>one</u> lift. If you have to top-load the dump, do it in one lift, level with a full track dozer, and then deep-rip the surface with a 6 or 8 foot ripper on the back of a full-track dozer.

2. Second, Kirtland's proposed design needs a larger catch-basin down-slope from the whole operation, large enough to hold the entire preg storage pond, plus circulating load, <u>plus</u> all run off from a cataclysmic downpour. This insurance or safety basin must also be leak or seepage proof and, again, clay is better than plastic.

3. Before roads, pads, ponds, etc. go in, any such operation should have a reason or justification for go-ahead. If an operation does not have a good sampling of his material to be leached and if he does not know if the ore is amenable to leaching, why in the world should he go ahead, not knowing if it's all worthwhile. All successful leach operators run a small pilot test first. It is simple and easy to take a few hundred pounds of ore sample and assay to determine what values are there to start and then conduct a simulated leaching test to see if the metal values can be dissolved. If the ore does not respond to a ideal controlled leach, the whole venture is unreasonable and should stop right there.

   The second proposed leach operation at the Golden Idol in the Cherry Mining District sounded like an ultra-safe expensive way to go. The concrete pads and walls should provide solution control during leaching. The only question was how does the operator propose to wash all preg out of the leached tails and how does he propose to neutralize or control any cyanide remaining in the tails? What is the flood control situation? Where do the leach tails drain?

In conclusion, the Bureau and the Department of Mineral Resources hope to have other opportunities to meet with the U.S. Forest Service personnel to discuss similar situations.

MNG

PERSONNEL

Sig G. Palm, Forester, U.S. Forest Service, Thumb Butte District, Prescott National Forest

Jim Shores, Assistant Ranger, U.S. Forest Service, Camp Verde District

Lee Poague, Assistant Supervisor, U.S. Forest Service, Prescott National Forest
...and newly appointed supervisor of Coronado National Forest. Poague will move to Tucson April 1st to assume his new duties, vice David Wisenborn, transferred.

Mike Greeley, Geological Engineer, Tucson Office, Department of Mineral Resources

Cliff Hicks, Engineer, Phoenix Office, Department of Mineral Resources

Glenn Miller, Engineer, Phoenix Office, Department of Mineral Resources

Dave Rabb, Bureau of Geology and Mineral Technology

...and for part of the session, John Jett.

* GENERAL REFERENCES

REFERENCE 1 F1 <USBM - ABGMT FILE DATA> Climax Mine File

REFERENCE 2 F2 <ABGMT CLIPPINGS FILE DATA> File Data

REFERENCE 3 F3 <>

REFERENCE 4 F4 <>

A82 < DUE WEST OF MAVERICK MOUNTAIN >

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

*RECORD NUMBER B10 <>
*RECORD TYPE B20 <X,1,M>
DEPOSIT NUMBER B40 <>
*REPORT DATE G1 <8,1,X,1,1> (YR. MO.)
*INFORMATION SOURCE B30 <1,2>
*FILE LINK IDENT. B50 <USBM-004 025 0411>

*REPORTER(SUPERVISOR) G2 <LABADA, PETER (last, first, middle initial)> <DEWITT, ED (last, first, middle initial)>

*REPORTER AFFILIATION G5 <ABGMT>
*SITE NAME A10 <CATOCTIN MINE>
SYNONYMS A11 <>

LOCATION

MINING DISTRICT/AREA A30 <LITTLE COPPER CREEK DISTRICT>
COUNTY A60 <YAVAPAI>
*STATE A50 <A,Z,>
*COUNTRY A40 <U,S,>
PHYSIOGRAPHIC PROV A63 <1,2,X,>
DRAINAGE AREA A62 <1,5,0,7,0,1,0,3,X,>
*LAND STATUS A64 <0,0,X,,X,(,,,,,)>
QUADRANGLE NAME A90 <WILHOIT (1969)>
*QUADRANGLE SCALE A100 <2,4,0,0,0,>
SECOND QUAD NAME A92 <(,,,,,)>
SECOND QUAD SCALE A91 <,,,,,,,>
ELEVATION A107 <,5,0,8,0,X,F,T,>

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

*ACCURACY
ACCURATE (ACC) (circle)
ESTIMATED EST <>

GEODETIC
*LATITUDE A70 <,,-,,-,,N,>
*LONGITUDE A80 <,,-,,-,,W,>

CADASTRAL
TOWNSHIP(S) A77 <12.5N,X,,X,,X,,>
*RANGE(S) A78 <003W,X,,X,,X,,>
SECTION(S) A79 <36,X,,X,>
SECTION FRACTION(S) A76 <SW OF SW OF NW>
MERIDIAN(S) A81 <GILA AND SALT RIVER>

POSITION FROM NEAREST PROMINENT LOCALITY A82 <7.4 MILES W NW OF MT. UNION LOOKOUT TOWER. 3.3 MILES>
LOCATION COMMENTS A83 <LOCATED ON SSE-FLOWING TRIBUTARY TO HASSAYAMPA RIVER, 0.6 MILES UPSTREAM FROM CONFLUENCE OF TRIBUTARY WITH THE HASSAYAMPA>

ESSENTIAL INFORMATION
ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

*COMMODITIES PRESENT C10 <CU, AU, AG, PB, >
*ORE MINERALS C30 <UNKNOWN Au>
COMMODITY SUBTYPES C41 <>
*GEN. ANALYTICAL DATA C43 <>
COM. INFO. COMMENTS C50 <>

* SIGNIFICANCE

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

*PRODUCTION

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

EXPLORATION OR DEVELOPMENT

*STATUS

PRODUCER	NON-PRODUCER
STATUS AND ACTIVITY A20 <4>	STATUS AND ACTIVITY A20 <>

*DISCOVERER L20 <>
*YEAR OF DISCOVERY L10 <> *NATURE OF DISCOVERY L30 <B> *YEAR OF FIRST PRODUCTION L40 <1927> *YEAR OF LAST PRODUCTION L45 <1937>
*PRESENT/LAST OWNER A12 <GOLD BEND PARTNERS (1952)>
*PRESENT/LAST OPERATOR A13 <CATOCTIN MINING CO.; C.W. WALKER>
EXPL./DEV.COMMENTS L110 <MEMBER OF THE WHITE FEATHER CLAIMS (UNPATENTED)>

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40 <VEIN>
DEPOSIT FORM/SHAPE M10 <TABULAR>
*DEPTH TO TOP M20 <> *UNITS M21 <> *MAXIMUM LENGTH M40 <> *UNITS M41 <>
*DEPTH TO BOTTOM M30 <400> *UNITS M31 <FT> *MAXIMUM WIDTH M50 <> *UNITS M51 <>
*DEPOSIT SIZE M15 (SMALL) M15 (MEDIUM) M15 (LARGE) (circle one) *MAXIMUM THICKNESS M60 <10> *UNITS M61 <FT>
*STRIKE M70 <> *DIP M80 <>
*DIRECTION OF PLUNGE M100 <> *PLUNGE M90 <>
*DEP. DESC. COMMENTS M110 <NEARBY (EAST) PATENTED CLAIMS TREND NE; VEINS OF CATOCTIN POSSIBLY TREND N TO NE
NO GOOD MINE DESCRIPTIONS AVAILABLE>

DESCRIPTION OF WORKINGS

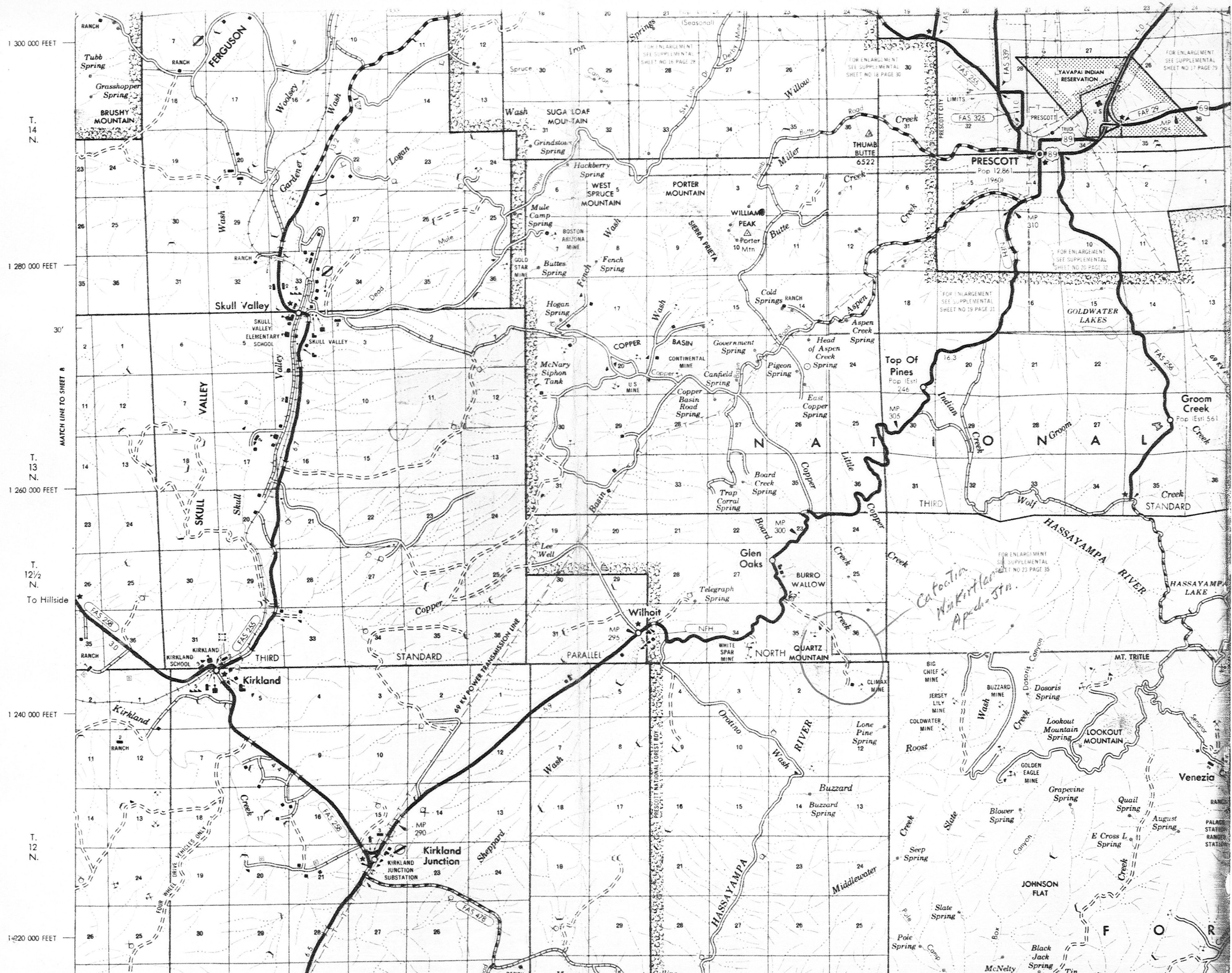
*Workings are: SURFACE M120 UNDERGROUND (M130) BOTH M140 (circle one)
*DEPTH BELOW SURFACE M160 <400> *UNITS M161 <FT> *OVERALL LENGTH M190 <> *UNITS M191 <>
*LENGTH OF WORKINGS M170 <300> *UNITS M171 <FT> *OVERALL WIDTH M200 <> *UNITS M201 <>
*OVERALL AREA M210 <> *UNITS M211 <>
DESC. OF WORK. COM. M220 <1,000 FT OF DEVELOPMENT>

GEOLOGY

AGE OF HOST ROCK(S) K1 <P.R.O.T.; T.E.R.T., W. U/PB GREATER THAN 1760 MILLION YEARS; UNDATED, PROBABLY 65-75 MILLION YEARS>
HOST ROCK TYPE(S) K1A <GRANODIORITE, SCHIST; LATITE AND LATITE BRECCIA>
AGE OF IGNEOUS ROCK(S) K2 <P.R.O.T.; T.E.R.T., W, AS LINE K1>
IGNEOUS ROCK TYPE(S) K2A <GRANODIORITE; LATITE AND LATITE BRECCIA>
AGE OF MINERALIZATION K3 <L.C.R.E.T.-T.E.R.T., W, UNDATED, PROBABLY PALEOCENE>
PERT. MINERALS (NOT ORE) K4 <QUARTZ, PYRITE>
ORE CONTROL/LOCUS K5 <FAULTING, SHEARING, IGNEOUS ACTIVITY, ESPECIALLY DIKE EMPLACEMENT>
MAJ. REG. TRENDS/STRUCT. N5 <FOLIATION IN PROTEROZOIC ROCKS TRENDS N 20 E>
TECTONIC SETTING N15 <>
SIGNIFICANT LOCAL STRUCT. N70 <MINERALIZATION IN BRECCIA PIPES AND DIKE-RELATED VEINS>
SIGNIFICANT ALTERATION N75 <SERICITE, CLAY>
PROCESS OF CONC./ENRICH. N80 <OXIDATION AT NEAR-SURFACE>
FORMATION AGE N30 <P.R.O.T., W,>
FORMATION NAME N30A <>
SECOND FM AGE N35 <, W,>
SECOND FM NAME N35A <>
IGNEOUS UNIT AGE N50 <P.R.O.T., W, U/PB GREATER OR EQUAL TO 1760 MILLION YEARS>
IGNEOUS UNIT NAME N50A <UNNAMED GRANODIORITE PROBABLY EQUIVALENT TO PRESCOTT GRANODIORITE>
SECOND IG. UNIT AGE N55 <L.C.R.E.T.-T.E.R.T., W, UNDATED, PROBABLY 65-75 MILLION YEARS>
SECOND IG. UNIT NAME N55A <UNNAMED LATITE AND LATITE BRECCIA>
GEOLOGY COMMENTS N85 <DEPOSIT APPEARS TO BE VEIN IN PROTEROZOIC CRYSTALLINE ROCKS.>

GENERAL COMMENTS

GENERAL COMMENTS GEN <>


1 300 000 FEET
1 280 000 FEET
1 260 000 FEET
1 240 000 FEET
1 220 000 FEET
T. 14 N.
T. 13 N.
T. 12½ N.
T. 12 N.
30'
To Hillside
MATCH LINE TO SHEET 8
RANCH
Tubb Spring
Grasshopper Spring
BRUSHY MOUNTAIN
FERGUSON
Woolsey
Wash
Logan
Gardener
Mule
Dead
Skull Valley
SKULL VALLEY ELEMENTARY SCHOOL
VALLEY
SKULL
Skull
Copper
Kirkland
KIRKLAND SCHOOL
Kirkland Junction
KIRKLAND JUNCTION SUBSTATION
FOUR WHEEL DRIVE VEHICLES ONLY
69 KV POWER TRANSMISSION LINE
Sheppard
Creek
FAS 258
FAS 255
FAS 478
THIRD
STANDARD
PARALLEL
NORTH
Spruce
Iron
Springs (Seasonal)
Canyon
FOR ENLARGEMENT SEE SUPPLEMENTAL SHEET NO 16 PAGE 29
FOR ENLARGEMENT SEE SUPPLEMENTAL SHEET NO 18 PAGE 30
Willow
SUGAR LOAF MOUNTAIN
Grindstone Spring
Hackberry Spring
WEST SPRUCE MOUNTAIN
PORTER MOUNTAIN
Mule Camp Spring
BOSTON ARIZONA MINE
GOLD STAR MINE
Buttes Spring
Fench Spring
Fench Wash
SIERRA PRIETA
WILLIAMS PEAK
Porter Mtn
Butte
Miller
Thumb
THUMB BUTTE 6522
Cold Springs
Hogan Spring
COPPER
BASIN
CONTINENTAL MINE
U S MINE
Government Spring
Canfield Spring
McNary Siphon Tank
Copper Basin Road Spring
Pigeon Spring
Head of Aspen Creek Spring
Aspen Creek Spring
Aspen
East Copper Spring
Board Creek Spring
Trap Corral Spring
Little
Lee Well
Glen Oaks
BURRO WALLOW
Telegraph Spring
Wilhoit
WHITE SPAR MINE
QUARTZ MOUNTAIN
CLIMAX MINE
MP 295
MP 300
MP 290
NFH
PRESCOTT NATIONAL FOREST BDY
Oratino
Wash
HASSAYAMPA
RIVER
Lone Pine Spring
Buzzard
Buzzard Spring
Middlewater
Collins
PRESCOTT
Pop 12,861 (1960)
YAVAPAI INDIAN RESERVATION
PRESCOTT CITY LIMITS
FAS 339
FAS 255
FAS 325
FAP 29
FOR ENLARGEMENT SEE SUPPLEMENTAL SHEET NO 17 PAGE 29
FOR ENLARGEMENT SEE SUPPLEMENTAL SHEET NO 20 PAGE 32
FOR ENLARGEMENT SEE SUPPLEMENTAL SHEET NO 19 PAGE 31
FOR ENLARGEMENT SEE SUPPLEMENTAL SHEET NO 23 PAGE 35
MP 310
MP 305
GOLDWATER LAKES
Top Of Pines
Pop (Est) 246
Indian Creek
Groom Creek
Pop (Est) 561
Groom
N A T I O N A L
Wolf
Creek
THIRD
STANDARD
HASSAYAMPA RIVER
HASSAYAMPA LAKE
MT. TRITLE
BIG CHIEF MINE
JERSEY LILY MINE
COLDWATER MINE
BUZZARD MINE
Dosoris Canyon
Dosoris Spring
Lookout Mountain Spring
LOOKOUT MOUNTAIN
Roost
GOLDEN EAGLE MINE
Grapevine Spring
Blower Spring
Quail Spring
August Spring
E Cross L Spring
Venezia
Seep Spring
Slate
JOHNSON FLAT
Slate Spring
Pole Spring
Black Jack Spring
McNelty
Tin
F O R
Catastin W. Kirtland Apch.-Jtn.

CLIMAX MINE YAVAPAI COUNTY

GM/WR 3/20/79 - Purpose of meeting Forest Service officials along with Dave Rabb was to help the Forest Service evaluate a mining plan submitted to them by Bill Kirtland of Prescott. He wants to heap leach the dumps from two mines, the Old Climax and the Cotoctin (Sec. 1, 35 & 36, T121/4 N, R2W and R3W). Dave Rabb pointed out that safety is the most important consideration and should come first in any operation. With this in mind, Dave discussed two areas where potential problems could occur in this or similar type of operations: (1) Prepare a proper base for leach pad and (2) A proper secondary containment area for pregnant solutions should overflow occur from primary solution pond. A general discussion of these points followed and a consensus was reached regarding a proper pad base for operations of this nature. The area to be overdumped should be cleared of all vegetation and compacted. Then a base of clay material, a minimum of 2-feet thick must be laid and compacted.
4/18/79 a.p.

CJH/WR 10/23/79 - Mr. Edward J. Lowell reported extensive leach pad operations going on at the Catoctin (Climax) Mine in Yav. Co. Hassayampa District. This operation was the subject of a meeting of Department Engineers, Forest Service Officials, and Dave Rabb in Mr. Jett's Office, March 20, 1979.

CH/Report 11/23/79 - Visited the Catoctin Mine, Held discussion with Jack Kirkland. William Kirkland (father) was away from the property trying to buy a crusher and ball mill. Mr. Kirkland said that Dr. Brown of ASU was developing a flow sheet for the gold ore. The Catoctin Mine adit was being cleaned out.

KAP WR 3/31/80: John Truffa, 4422 North 18th Place, Phoenix, Arizona 85016, phone 277-6451, reported he owns the Climax Mine in Yavapai County, which he has leased to the 4-K Corporation (the Kirklands).

On the Catoctin (JC 1/11/82)

JHJ Memo 7/9/80: Stopped at the Catoctin Mine. It is still shut down. The caretaker was working on the road. He stated that a bed had been made on a flotation plant for installing at the mine. An attempt is being made to obtain additional funding.

KAP WR 6/27/80: A California steel mill owner is reported to have invested $70,000 into the Catoctin Mine of 4-K Corporation in Yavapai County. A cyanide leaching operation was constructed but was reportedly not successful.

Bureau of Geology and Mineral Technology
Mineral Technology Branch
University of Arizona
Tucson, Arizona 85721
(602) 626-1943

March 26, 1979

TRIP REPORT

By: David D. Rabb

To: Department of Mineral Resources
Phoenix, AZ on March 20, 1979

Purpose: Meeting with U.S. Forest Service Officials to Discuss Heap Leaching with Cyanide Solutions

On Tuesday, March 20, 1979 Mike Greeley and Dave Rabb met U.S. Forest Service officials at the Department of Mineral Resources office in Phoenix. The meeting had been set up by John Jett and hopefully there will be more of this kind of cooperative exchange of ideas and information.

The specific problem at hand was the application by Bill Kirtland to operate a cyanide leach operation on the Cotockin claim, Hassayampa Mining District, south of Highway 89. The material to be leached was to come from old surface dumps in the area, plus possibly some dumps and some ore from the Old Climax Mine nearby. Location: Sections 1, 35, 36, T 12½N, R 2-3W.

The proposed site has "live" water in a stream bed only a few hundred feet distant seven months out of the year, plus potential flash floods from seasonal cloudbursts.

The country bedrock was reported to be schist and granitic igneous rock, weathered, and permeable to shallow depth with a slight soil cover. It sounds as though the surface detritus is sufficiently permeable that some form of stable impervious pad or shield would be required before a leach sump could be implaced and operated with safety (i.e. no leakage out of the dump).

Kirtland proposed to devegetate and level the slope, cover the area with one foot of sand and cover with a layer of "Rip-Proof" plastic. The sample sheet was a relatively tough rubbery material but it was only about 10 mils thick in the one layer.

He was then going to cover the plastic sheet with six inches of sand.

The pad was to be approximately 200x200 feet and vary in height from a few feet to perhaps 40 feet. The sketch of the cross-section indicated an even 10 percent slope under the pad. The estimated amount of ore in a dump of this size and configuration is about 50,000 tons.

Comments and questions:

1. It is my definite feeling that the relatively thin layers of sand above and below the plastic will not preserve the integrity of the barrier film. He needs a better pad. Plastic has never proven satisfactory under a large high dump. Also 40 or even 20 feet is too high to constrict in one lift and, if you use a multi-lift installation, you will end up with impervious layers of old truck runs. Trucks (and wheeled front-end loaders) exert a relatively high ground pressure per square inch and packing is inevitable. Packing means lateral movement of leach solutions and encourages side leakage and slope failure. If the ore has a schisty clayey character, it's really going to pack. Full-track crawlers are better because of lower psi contact. Conveyors or belt stackers or clam shells are even better. The ideal dump is about 6 or 8 feet high, put down on the pad by rear-dump trucks that back up to the dump to unload and neven get on top. Trucking over "protected" plastic tends to split the seams and rocks tumbling down dump slopes punch through the top sand cover.

   A time-tested proven method of pad construction is a two-foot layer of bentonitic clay installed in 1 foot layers, each leveled, rolled and compacted. Then add another 2 or 3 feet of crushed ore (say 1 inch maximum size). Then implace your dump--in <u>one</u> lift. If you have to top-load the dump, do it in one lift, level with a full track dozer, and then deep-rip the surface with a 6 or 8 foot ripper on the back of a full-track dozer.

2. Second, Kirtland's proposed design needs a larger catch-basin down-slope from the whole operation, large enough to hold the entire preg storage pond, plus circulating load, <u>plus</u> all run off from a cataclysmic downpour. This insurance or safety basin must also be leak or seepage proof and, again, clay is better than plastic.

3. Before roads, pads, ponds, etc. go in, any such operation should have a reason or justification for go-ahead. If an operation does not have a good sampling of his material to be leached and if he does not know if the ore is amenable to leaching, why in the world should he go ahead, not knowing if it's all worthwhile. All successful leach operators run a small pilot test first. It is simple and easy to take a few hundred pounds of ore sample and assay to determine what values are there to start and then conduct a simulated leaching test to see if the metal values can be dissolved. If the ore does not respond to a ideal controlled leach, the whole venture is unreasonable and should stop right there.

   The second proposed leach operation at the Golden Idol in the Cherry Mining District sounded like an ultra-safe expensive way to go. The concrete pads and walls should provide solution control during leaching. The only question was how does the operator propose to wash all preg out of the leached tails and how does he propose to neutralize or control any cyanide remaining in the tails? What is the flood control situation? Where do the leach tails drain?

June 19, 1952

Field Engineer: Mark Gemmill

Mine -	CATOCTIN
Location -	12 m. south of Prescott near Climax
Owner -	Gold Bend Partners
Address -	Box 701, Prescott, Arizona
Operating Co. -	Same
Genl. Mgr. -	C. W. Gabrielson
Men Employed -	3
Production Rate	None
Power, Amt. & Type -	Gas Comp.
Present Operations -	Have done in the past year about 1000' of development work consisting of tunnel, xcuts and drifts.
New Work Planned -	Expect to continue development in an effort to prove enough ore for a mill.

Believed to be 1910

REPORT OF THE PROPERTY OF THE CLIMAX MINING COMPANY
AT
Prescott, Arizona

by J. K. Truman

PROPERTIES

The property consists of twelve (12) full claims 600 x 1500 feet as shown by the foregoing plat, No. 1, besides some valuable claims not shown on maps, but known as the Catoctin Group.

SITUATION

This property is situated on the left bank of the Hassayampa River, and on the south and southwest slope of what is known as Quartz Mountain,, in the Hassayampa Mining District, Yavapai County, Arizona Territory, and about 14 miles southwest of Prescott, at an elevation of about 4500 feet. However, by road it is 18 miles. I understand that arrangements are under way to shorten the road about 4 or 5 miles.

TITLE

Titles to the various lode claims are held by location, possession and compliance with the Laws of the United States, with no dispute or incumbrance. Arrangements are now under way to patent.

GEOLOGY AND TOPOGRAPHY

The locations are situated on an abrupt precipitoun mountain side deeply out in many places by deep gulches and canyons thus exposing the vein in many places for quite a distance. The country formation is mostly composed of metamorphosed gneiss and granite, traversed from the northeast to the southwest by an immense intrusive dike of larasitic Porphyry. This intrusive dike varies from 300 to 400 feet in width, and in places is highly mineralized . Inside of this large dike, and running parallel with it, are two secondary, highly colored foruginous porphyry dikes; one on or near the east or foot wall side or contract, and one on or near the west of hanging-wall side or contact, and is intersected in all directions by small stringers of quartz and iron, carrying good values in gold, and which will be more fully described hereafter.

SURFACE IMPROVEMENTS

The surface improvements consist of a good ten (10) stamp mill with concentrator plant, capable of handling from twenty to twenty five tons of ore per day, through a 40 mesh screen. It is furnished with good solid cement battery-blocks and cement floors. All machinery, belthing and piping is in place and in good working order and ready for immediate use.

There is a good gravity trumway in good working order, with steel rope and double core, over which all ores developed in the Climax and No. 4 tunnel, together with all other levels, up to the top of the mountain, are handled and delivered to the top of the mill without rehandling. At the head of the tramway is located a hundred ton ore bin to receive the products from the

different parts of the works.

There is a good supply of all mill and mining tools, sufficient for repairing and running the mill and mine. There are, also, four good ore cars, together with about 8,000 feet of iron rails, laid and in good working order and repair.

There is, also, a good office; assay office, with outfit complete; tool house, boarding house, bunk house and dwelling houses, in good order and repair, and capable of accommodating from 20 to 26 men. All tanks and pipe line for conveying water to the mill and boarding house.

DEVELOPMENT

The development, at the present time, consists of about eight thousand feet of tunnels, cross-cuts, drifts and uprises, with chutes and tract, all in place and in good working order to handle the products of the mine, which will be more fully understood by examining the accompanying diagram marked No.2, which gives the siditional view of the entire length of the property, commencing at the north end of the Rand lode and passing through the Cub, Climax, Lion and Leopard lodes and the level of the mill, to the top of the mountain at an elevation of 1000 feet above the level of the mill. The tunnels, cross-cuts and chutes are all clear of debris and in good immediate working order.

THE VEIN SYSTEM

in a large andositic dike, with varying width, averaging about 400 feet and traversing the property with slight variation, from the north to the south, through the entire length of the property. There is evidence in the mine that the formation of the ore deposits extends over a long period, with many distrubances and interruptions. The order of the eruptions are: First, the earlier Andesites; Second, the later Andesites; third, the Rhyolite and Diorite dikes, and recently, the great east and west faults with little or no intrusions.

The earlier adnesites are of a light greyish color and break with a rough fracture, and are of no economic value, showing little or no mineralization.

The later adesites, which occur in the form of intrusive dikes, at or near the foot-wall and hanging-wall of the older andesitic uprising, are much darker, and weathering near the surface to a dark brown or purple tint, so that it is easily distinguished from the other from the fact that it carries considerable quantities of iron sulphide mixed with some chalcopyrite which in places is of sufficient amount to make it of some economic value.

The rhyolite and greenstone dikes are instrusive, and in most cases, almost at right angles to a vein system. The rhyolites are mostly fine-grained of a greenish grey color, except where weathered near the surface, and break with a close grained fracture, while the diorites are a coarse green stone and break with a coarse grained flaky fracture.

The general dip of the granite are to the W, NW at an angle of about 15 degrees, as do the veins. The rhyolite dikes

being intrusive does not conform to the trend or dip of the andesites, but in most cases, cut the vein system at an angle of about 65 degrees, and dip to the north at from 30 degrees to 60 degrees; but in some cases where they cut through the veins, it spreads out in a wide sheet and follows the line of the vein for some distance. A detailed geologic examination might show a genetic relation between this intrusion and the extensive rhyolite bodies to the east of the Rand and Cub lodes, and to the west of the Lion and Leopard lodes. Besides these, there are several extensive faults of more recent date, which cut through the country at right angles to the vein system, which show considerable movement both in the throw and the upward movement, but show very little if any intrusive, but are filled with calcareous matter, and in places highly kaolinized. These faults havi-g been taken advantage of in running the long cross-cuts to intersect the different veins.

In this district, the late andesites are the principal ore bearing formation and for this reason all the development carried on for workable deposit of ore, are run along the line of these dikes, which are all the way from a few feet to sixty feet in width, carrying perceptible quantities of mineral and in places (which will hereafter be more fully dealt with) large bodies of workable low-grade ores. Owing to causes not necessary here to discuss , the ore deposits are very much larger and more regular when traversing the andesitic dikes, where they attain their greatest width and almost, if not entirely, pinch out, when the dikes narrow down.

A well defined fissure follows the general trend of these dikes, in which occur numerous enrichments in the shape of chimneys, lenses or shoots, averaging from fifty feet to two hundred feet in length and varying in thickness, from which high assay results are obtained and mill-runs of from fifty tons to seventy-five tons, show an average in free milling of from fifty-three dollars to fifty-five dollars in gold per ton.

Over ninety per cent of the output of the mine in the past, has been extracted from these lenses, or shoots, these lenses or shoots occur in pairs and might be termed twin shoots, and they occur at more or less regular intervals of about 200 or 300 feet, and dip slightly to the south, along the trend of the vein or dike.

The numerous rhyolite dikes, heretofore mentioned, although they seem to cut through the richest portion of the ore bodies, seem to bear no generic relation to the ore deposits. They being very much later and cuting through the ore bodies and displacing the, with no apparent enrichment or mineralization of the dikes themselves.

Owing to the fact that the ore veins are much older than the rhyolitic dikes, many faults occur in the veins and ore-bodies which inearlier working of the mine retarded the development to a considerable extent, but as the movement of the fault lines are not very great, it has been found very easy to follow the veins--the throw being always to the right, varying from 2 to 12 feet, and the downward movement following the natural law of faultings. The only apparent exception to these is found in the south or Lion workings, where the ore vein strikes at an angle of 45 degrees to the regular trend of the veins; but as further development is carried on, allowing a more thorough examination, I believe

that it will be found that the vein at this point is broken, and through some dynamic action a portion of the vein has become displaced.

ORES

The ores are largely composed of quartz of some kind, in their native state, carrying tellurium, iron sulphides and perceptible quantities of chalcopyrite, which together carry the gold. At the surface and for a depth of 400 feet in places, the ores have become highly oxidized leaving the gold in a free state and subceptible of amalgamation. Beyond that depth, the ores are in their original state and will require different treatment.

In the oxide zone, the quartz in places is full of course flakes of gold from which some very rich specimens have been taken. Some of these specimens carry as high as 25% gold. In others, the sulphide bearing quartz has become thoroughly leached, leaving the free gold in vugs and cavities in the quartz, while in others, sulphides have been changed to iron oxides, carrying the gold finely disseminated through the iron, which is imperceptible to the naked eye, but by "panning" shows it to be rich in free gold.

With present development, the ore bodies are opened up about the course of the belt for over a mile in length, and cover a wide area. The veins vary widely in width, but the extent of the mineral deposits as yet not determined. With continuous stopes and levels from 400 feet level, through the Climax, Lion and Cub Lodes, to the surface, with the same ores opened up in the 500 foot level it would show it to be a continuous, well defined fissure vein.

In the departure from the oxide to the sulphide zones, the ores as is generally supposed, do not drop in value, but rather increase, and the ore bodies themselves, become more regular and of greater extend, thus showing that the most productive and richer part of the mine can be looked for at some greater depth.

GENERAL DESCRIPTION AND CONDITION OF THE MINE

For convenience, in presenting you with a detailed description of the underground workings of the property, I will take each section by itself, beginning at the north end of the Rand lode, and continuing on throughtto the south end of the Leopard lode, describing such work as may seem to be of economic interest.

Near the middle of the Rand lode, there is quite prominent outcrop of quartz and iron, showing very rapid oxidation; some of the quartz which has formerly been heavy with sulphide is burned to a black scoria. Some little development has been carried on, in the shape of a shaft and a short tunnel and some very good ore taken out and run through the old Wiswell mill at a good profit, but no development of any consequence has been carried on in that part of the ground for a number of years, and the works have gone to decay, rendering it unsafe for examination; but from surface appearances, it would be alikely place to develop a body of ore when reasonable depth is gained.

Passing from the Rand on the north end of the Cub lode, there is a short tunnel about 100 feet long driven in on the vein, which is quite strong and well defined at this point, but no ore of any particular value has as yet developed.

From here, we pass to the crest of the mountain on the south end of the Cub lode. Owing to the extensive workings at this point, which includes part of the Cub, Climax and Lion Claims, they will have to be taken together.

The workings on this part of the property consit of many thousand of feet of tunnels, cross-cuts, drifts, uprises and stopes, but the principal part of the development, which I will dwell upon will be tunnels No. 5 and the Climax adit and Lion tunnels.

Tunnels Nos. 1, 2, and 3, I will not dwell upon, for, although there are quite considerable bodies of low-grade ores, with an occasional pocket of high-grade, still, to be had, yet, during the many years that the mine has been worked, the greater portion of the highgrade ore has been mined and run through the mill, and owing to the condition of the works, with its high stopes and decaying timbers, I did not care to dwell long in their examination.

Tunnel No. 4--Diagram No. 3, given a ground pland of Tunnel No. 4 together with the Climax drift. or adit, which branches off from the No. 4 tunnel, and running to the south of the hanging wall and west faults, and cuts clear across the whole series of dikes. Near the face of the tunnel it cuts through the hanging wall dike, which will be mentioned later, under the Climax drift; from here, the tunnel cuts through the andesitic formation for 350 feet, where it penetrates the ore zone on the footwall side, which is directly under the works, in tunnels No. 1, 2, and 3, and on the same ore shoots. Here, some very high grade ore was encountered, running $300 per ton. An uprise was carried up 160 feet, connecting No. 3 tunnel level, which is used as to pass all the mineral products from the upper works to No. 4 level, which connects with the head of the tramway. Some stoping was done from this upraise, which produced some very high grade ore. On the north side of the tunnel a drift was run along the line of the vein for 300 feet, uncovering some very fine ore. On the north side of the tunnel a drift was run along the vein for 300 feet. (From here, two small stopes were carried up to the No. 3 level, and considerable high grade ore taken out and milled. The work was carried on by leasers and in order to get at the high-grade ores, hundreds of tons of low-grade was thrown over the dump on account of the expense of milling it under the present expense of fuel, etc. which under more favorable conditions would have been run through the mill and more than paid the expenses of mining and milling the high-grade ore.)

The ores on this level are oxide ores, carrying coarse free gold, easily amalgamated and milling about $50.00 per ton in gold. Some of the richest ore taken out of the mine was taken out of this stope. No great amount of overhead stoping was been done from this level as yet, and no under-hand stoping has been allowed.

There is considerable low-grade ore to be had in these stopes, besides considerable good milling ore, samples of which ran from $10.00 to $150.00 per ton, besides large areas of unexplored territory. I took two general samples from the floor of the tunnel which ran respectively $50.00 and $240.00. There is a well known ore shoot, which is developed in the No. 1 tunnel, which should pass down the end of the drift, but as yet, it has not been penctrated.

The chutes and upraises, as well as the track in this part of the mine, are all clear and in good shape for the further exploration of the mine.

The Climax drift--as heretofore stated, the Climax drift is on the handling wall dike for about 400 feet, cutting two distinct high grade ore shoots which you will better understand by examing Diagram No. 2. This part of the works is in virgin ground and no stoping of any kind has been done. The drift follows in on the foot wall of the dike about 150 feet on some low grade ore, and then turns to the south end of the ore shoot. Here an upraise is carried up to connect with the Lion tunnel, which is 100 feet overhead, and on the same vein, where some very good ore is developed, as well as some very large bodies of low grade ore which will be mentioned later on. From here, the drift follows the hanging wall for about 150 feet, where it develops another high-grade ore shoot, which it follows for over a hundred feet more.

The first ore shoot is mostly quartz, carrying iron, with some very heavy sulphides. Samples of the quartz assayed on an average of $32.00 per ton, and the sulphide ores assayed $60.00 to $72.00 per ton. The quartz is mostly free milling, while the thesulphides are base and will have to be treated in some other way. The second ore shoot is quartz and oxide of iron, and although the gold is fine, it is a good free milling ore. Four samples ran respectively $60.00, $43.00, $102.00 and $27.00. The ore is very much similar to the ore in the old works in No. 1, 2, and 3 tunnels and is a good milling ore. These works are also clear and in first-class order for future work.

Tunnel No. 5 is a new cross-out tunnel, run in on the same level as the mill, and is 200 feet lower in elevation than any other workings on the property, and being situated about the middle of the group; it is the intention when completed to make it the future main working tunnel of the property. It is practically run on the same fault as the No. 4 tunnel, and owing to the inclination of the fault it is about 150 feet to the north of and vertically, 200 feet lower than No. 4. It gains a depth of 600 feet beneath the crest of the Cub and Lion Mills, and when completed will be 1000 feet beneath the top of the Leopard Hill.

Diagram No. 4 gives a ground plan of the No. 5 tunnel, with proposed drifts, as well as those already started.

The tunnel runs straight for 275 feet, when it strikes the fault, and turns to the left and follows it for 700 feet. At 480 feet from the face, it penetrates the hanging wall of the mineral zone or the same vein that the Climax drift is run on, but

200 feet north of the Climax work. Here a low grade vein was struck, which only carried about $7.00 per ton, and lies very flat. A drift was started to the south from this point, with the expectation of striking some ore at a point about 150 feet from the tunnel, but a 30 feet in, ore running from $12.00 to $350.00 was struck, averaging a little over a foot in thickness, and was followed for 70 feet, with ore still in the breast. As this drift is run on the same vein as the Climax drift overhead, and the shoots developed in that drift dip slightly to the south along the trend of the vein, the same ore shoots should be encountered in this drift, at intervals of about 150 to 175 feet. This drift is like the one above. It is in virgin ground and when finished, together with the Climax drift, will give over 450 feet of stoping ground in height and 600 feet long.

I took a great many samples from this drift, and the average value of the assorted ore was $87.00, while the low-grade ore, with the best ore sorted out, averaged $16.00 per ton. I made a small mill run of 500 lbs. of this low-grade stuff to see whether it was feasible to concentrate with success. The result was a heavy concentrate, running $84.00 per ton.

On the north of the tunnel almost opposite the south drift, another drift was started, and soon developed a good ore shoot, similar to that in the south drift. This drift is in new territory, where no previous work has ever been carried on, so that nothing is known as to the extent of the ore bodies, but it is presumed that it is similar to that on the south side.

From here, we pass to the foot wall side of the dike, 380 feet distant, and about 210 feet beneath the Cub workings. Here, two drifts were started, one running to the south and one to the north, and the same vein as the Cub workings. The drift to the south very soon broke into a rich shoot of sulphide ore, somewhat similar to that in the south drift on the hanging wall, only running higher in free gold. I took two samples from the face of the drift, and one ran $140.00 free milling gold and $230.00 by fine assay, while the low-grade material ran $12.00. Heretofore, no ore has ever been found to the south of this east and west fault, so that the importance of this strike is quite encouraging. The ore is about of the same character as that found on the upper side of the fault, where it was cut off in the faulting. It carries some little tellunium, as well as iron and some chalcopyrite. This drift should develop some very rich ore shoots.

The drift started to the north has not as yet developed any ore, but as it is directly under the rich shoots that was worked in the No. 4 level, good ore can be looked for at any time.

Besides these veins just mentioned, along the line of the tunnel, there are evidences of some other veins of ore on this level, which do not show in any of the surface workings, nor crop in the surface; and future development may disclose many good veins in this dike which heretofore have been unsuspected.

MOUTH WORKINGS

From these workings we pass over the Lion Hill to a gulch which lies between the Lion and Leopard Hills, and is known as the south workings. Here is Genung and others first discovered the rich ore and extracted many thousand dollars from the open workings along the face of the hill, which are still in evidence. The principal works at this point consist of two tunnels and large surface open work. The tunnel running north into the Lion Hill is in 120 feet, and was in ore all the way. Some little stoping was done near the mouth of the tunnel, where some very high-grade ore was taken out. There is considerable ore in sight in this stope, and ore still in the breast. The breast of this tunnel is distant 150 feet from the breast of the Climax drift.

The tunnel running south is in about 400 feet and a great deal of ore has been stoped and run through the mill. The ore from this vein is a quartz carrying course gold, and the mill runs show a saving of over $100.00 per ton. This vein, unlike the other works cuts the main dike at an angle of about 45 degrees and dips to the southwest. There are evidences of a great deal of disturbance at this point, and the vein may have bbeen crowded out of its general course, the ore from this shoot has been mostly stoped out down to a point ten or twelve feet below the surface of the tunnel. But owing to the peculiar condition of the ground at this point, with many intrusive dikes and cross faults, the vein has been shifted, and up to the present date, no systematic prospecting has been carried on to locate the continuance of the vein. When the vein is finally located, I have good reason to believe that it will develop an ore shoot of great value.

From here, we climb to the north slope of Leopard Hill to a point about half way where there are a number of long trenches dug across the face of the hill. In early days it is claimed that Mr. Genung and others picked up a great number of rich boulders, some weighing half a ton, and packed them to the mill, and these trenches were dug trying to locate the vein from which they came. It strikes me that the trenches were dug parallel to the expected course of the vein, and there was about one chance in a hundred to strike the vein and they did not seem to have struck the one chance. Continuing up the hill to the top of the mountain 1000 feet above the mill level, we find several prospect holes which show some little stringers of ore, but no well defined veins yet, Passing down the south slope of the mountain, we come to a bold outcrop of quartz, with an open cut. A sample from this quartz ran $6.20. Further down the slope, well toward the end of the property, is another tunnel which is in some 60 feet, showing a small vein running $25.00 per ton in free gold. There is no extensive developments on the Leopard Hill, so that but very little is known as to the extent of the ore veins.

LOW GRADE ORES

As heretofore mentioned, there are several bodies of low-grade ore in connection with the high-grade shoots, which cannot be utilized because of the expense of milling and a great deal of it has to be thrown over the dump when handling the milling ores. Besides, these, there are several surface croppings of large low-grade dikes, notably, the one on the Lion Hill which crops on the surface 400 or 500 feet in length, and somewhere about

100 feet in width. Very little development has been done on this body of ore. I have taken several samples from different parts of the outcrop but they vary to such a degree that it is impossible to base any calculation on them. I, also took one general sample across the middle of the outcrop, but as there are no works or other clearings, it was impossible to get a fair sample under such conditions from so large a proposition. The sample gave me a little over $7.00 per ton. Others have taken samples here with varying results. But I would say that it would be safe to put it at $5.00 per ton.

Allowing the ore to be only $5.00 ore (in 1938 - $8.75 per oz.), it is of such a nature that fully 30% of the country rock can be readily thrown out as it is handled, without any loss of time or labor, thus raising the value of the ore sent to the mill to about $6.50 per ton, which under favorable conditions could be slightly increased.

I believe it would be to the advantage of any company contemplating the thorough working of the mine to look into this vein more thoroughly and make thorough tests, which can only be done by repeated mill tests, which would take some time to accomplish.

ROADS

There is at present, a comparatively good wagon road from Prescott to the mine, and with a small additional outlay, say $1000.00 it can be made a good mountain road for light and heavy freight wagons. The road passes over a high divide and in winter, it sometimes gets blocked with snow and impedes traffic for a couple of months. By expending $6,000.00 or $8,000.00 in building a road up the Hassayampa River for a distance of 4 miles, and connecting with the Jersy Lily Road, a good wagon road would be secured which would shorten the distance from the mine to Prescott by four miles, and would be low down in the foothills, so that snow would not bother in winter, and would very much lessen the freight rates to Prescott, as well as to cheapen the price of fuel and timbers.

WATER

There is an abundance of water which comes from tunnel No.5, which runs into tanks and is piped to the boarding house and mill giving sufficient for all domestic purposes, as well as furnishing considerable for the mill. When running the mill, the water is pumped from the Hassayampa River, where there is always sufficient for all purposes nine months in the year. This water could easily be piped to the mill and save the expense of pumping. The expense would not exceed $500.00.

FUEL AND TIMBERS

There is a good supply of timbers and good for fuel within six miles of the property. Wood will cost about $6.00 per cord, and timbers and lagging in proportion.

FUTURE DEVELOPMENT

After making a careful examination of the property and many surveys, as well as hundreds of tests, I would resommend that the future development of the mine be carried on, on the following lines: viz.

First: That the north drift in No. 4 tunnel be carried 100 feet further to connect with the ore shoot that is developed in the tunnel No. 1 overhead.

Second: That the Climax drift be run ahead and connected with the South Lion tunnel for air, as well as to open up the ore shoot about 100 feet farther ahead. Also, this tunnel being on the same level as the south workings, all ore that might be mined on that side of the mountains should be brought through the tunnel and dumped in the bin at the head of the tramway instead of having to haul or pack it to the mill.

Third: That the principal development on the property be done in tunnel No. 5 as follows: (1) That the first drift running to the south of the hanging wall be carried ahead at least 600 feet, open up the four well known ore shoots that have been developed overhead, in the Climax drift and the Lion tunnel, and also, the South Lion tunnel. (2) That the North drift on the same vein be carried ahead for some distance to develop the ore shoot now opened and to prospect the ground for other mineral deposits. (3) That the second drift on the south, which is the Cub vein, be driven ahead 200 feet underneath the upper workings to cut to the two rich ore shoots that are developed in the works above. (4) That the north drift on the same vein be drifted or driven ahead 200 feet for (not completed).

Besides these points, there might be some little prospecting done to develop the vein in the south workings or on Leopard Hill. This work would open up an immense amount of stoping ground on well known developed ore shoots. And, last, but by no means the least, before any amount of milling is contemplated, the water power proposition should be looked into for the mere economical handling of the low grade ores heretofore mentioned.

WATER POWER.

It is somewhat of a conumdrum to me with all the conditions available to understand why this phase of cheap power has heretofore never been taken into serious consideration by the different companies in possession of the property for the more economical treatment of the low grade bodies of ore.

For eight months in the year there are from 1000 to 5000 miner's inches of water going to waste in the river, when by running a ditch or pipe line up the stream for 2,500 feet and putting in a four foot dam, an elevation of about 80 feet can be gained which would easily furnish ample power to run the mill and ar air compressors for the mine or an electric generator could be put into furnish power for the whole works and use power drills which a are badly needed in the lower works, as the formation is very close and hard. Within a few minutes' though, you will readily see the great advantage gained in running with water power over that of steam, not taking into consideration the many uses it could be put to , besides. The mill run by water power will develop fully 25% more efficiency than a steam power plant in a small plant, with less wear and tear on both machinery and man. In taking into consideration the treatment of the low-grade ores the difference in the expense in the two systems would be about as follows for each 24 hours run:

By steam, you would have two mill men, $10.00; one

crusher man $3.00; one laborer, $2.50; five cords of wood @ $6.00 per cord, $30.00; wear and tear, $6.00, oil, etc., $1.00; making a total of $60.50 for 20 tons treated.

By water you would have two mill men, $10.00; one crusher,man $3.00; wear and tear, $5.00; oi, etc., $1.00; making a total cost of $19.00 for 25 tons treated.

RECAPITULATION

Power Used	Steam Power	Water Power
2 mill men at $5.00 per day of 12 hrs.	$10.00	$10.00
1 crusher man @ $3.00 per day of 12 hrs.	3.00	3.00
Wear and tear on machinery	6.00-	5.00
Oil etc.	1.00	1.00
1 laborer to help engineers	2.00	
5 cords of wood @ $6.00 per cord	380.00	
2 engineers @ $4.00 for 12 hrs.	8.00	
Total expense per day of 24 hours	$60.50	
Tons of ore treated	20	25

TREATMENT

Heretofore all ores treated at the mine have been surface ores or free milling ores and with the exception of a few tons of concentrates, the future treatment of the baser ores have not been as yet taken into consideration. But as a depth is gained, the free milling ores begin to lessen until now in thelower works, the greater portion of the ores are base, so that there will have to be other processes used for the extraction of the precious metals. The ore could be hand sorted and the high-grade ore shipped direct to the smelter or as there is about 10% or 15% of free gold in the base ore, it could be run through the mill and coarse free gold saved by amalgamation, and the concentrates subsequently roasted and treated by the chlorination process on the ground, thus saving the cost of transportation.

OUTPUT

In conversation with Messrs. Genung, Thompson, Lewis and Roew, it is claimed: that the mine before the present company got possession of the property, produced from its surface workings with the arastra and other modes of milling in the neighborhood of $300,000.00. The present company from the mint returns, which are on file, since the property came into its possession, recovered $25,000.00 or more.

Respectfully submitted,

J. K. TRUMAN