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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: DIXIE QUEEN

ALTERNATE NAMES:
MONTE CRISTO PEGMATITE

YAVAPAI COUNTY MILS NUMBER: 339

LOCATION: TOWNSHIP 12 N RANGE 5 W SECTION 34 QUARTER SW
LATITUDE: N 34DEG 20MIN 06SEC LONGITUDE: W 112DEG 46MIN 00SEC
TOPO MAP NAME: WEAVER PEAK - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
FELDSPAR
SILICON
MICA
BERYLLIUM

BIBLIOGRAPHY:
USGS WEAVER PEAK QUAD
ADMMR DIXIE QUEEN FILE
USBM IC 8298 RECON OF BERYL-BEARING PEGMATITE
DEPTS 1966 P 21
AZ MINE INSPECTOR OFFICE 1979 MINE START FILE
BLM AMC FILE 39682
CLAIMS ALSO IN SEC. 3 &N 4 T11N-R5W

See: ABM Bull. 180, p. 108, 400, 403
IC 8298 p. 21

Thesis: by MOHON, John Penrod, Comparative Geothermometry for the Monte Cristo Pegmatite, Yavapai County, Arizona

AZ Mine Inspector's office 1979 Mine Start file

Weaver Mountain Mining Company (file)

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

YAVAPAI COUNTY

DIXIE QUEEN MINE

MM 1344 Massive Beryl
6258 Muscovite
6259 Muscovite
6260 Muscovite

MILS #339
1-AKA
Dixie Queen(fib)

ARIZONA

Yavapai Co.

N. of Yarnell

Monte. Cristo Mine
now Dixie Queen Mine

MM-9233 Beryl
9234 "
9235 "
9236 "
9237 "
9392 "
9394 "
9395 "

MILS #339

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

MM 6676 Feldspar

Yavapai County

Monte Cristo Mine
(near Yarnell)

MILS #339

1-AKA

Dixie Queen(lab)

DIXIE QUEEN YAVAPAI COUNTY

KAP WR 12/7/84: George Ryberg of Prescott reported that the Horsting's of Chicago are still trying to interest a buyer of developer into becoming involved in the Monte Cristo pegmatite, AKA Dixie Queen Beryl Mine (f).

KAP WR 6/28/85: Dick Meritz reported he is evaluating the Dixie Queen Mine (f) Yavapai County for a Mr. Sam Bitner. Mr. Bitner has a deed circa 1981 from Dr. Ross and it was apparently Bitner who had leased the claims to the Horstings (see previous notes in the file). Dick Meritz wanted some suggested laboratories where he can have samples run for the rarer elements. He wants to verify or disprove for his client the presence of rare element minerals as reported by E. Erickson. neither Mr. Meritz nor any of the ADMMR engineers that have been to the property have noted any such minerals except beryl.

KAP WR 6/3/88: Bob Hanmore, P O Box 2094, South Padre Island, Texas 78597, (512) 761-2198 called regarding the Monte Cristo Pegmatite (Dixie Queen - file) Yavapai County. He explained that he was one of the major investors, under the name of Weaver Mountain Mining attempting to produce feldspar, quartz and beryl from the property. He was interested in whether or not markets remain for the minerals. He plans to visit the property in the near future to assure the assessment work is continued tin the name of Weaver Mountain Mining.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine: Dixie Queen
aka Monte Cristo Pegmatite
District: Kirkland, Yavapai County

Date: May 10, 1983
Engineer: Ken A. Phillips, Nyal J. Niemuth

Subject: Field Visit

In the company of H. Mason Coggin we met with H. (Harty) Schweigart, President of Calspar (address on file) at the Dixie Queen Mine. Mr. Schweigart was present to evaluate the quartz and feldspar for possible purchase and grinding at the Kingman Feldspar Mill (file).

Since last visit, a contractor, Tim Callahan for Bi Metals Recovery System (operator for Weaver Mountain mIning Company) has begun stripping of country rock (granite, quartz, feldspar and mixed pegmatite material at the deposit.

Construction of two working benches was underway. The rock is drilled with an airtrack, shot using prill and cleared with a 1½ yard loader. A crudely sorted quartz stock-pile contaminated with granite and dirt has been made. This material may form the working base or floor for a future quartz sorting operation. An attempt will also be made to sort clean, unaltered feldspar. Approximately 10,000 tons of material has been broken.

No beryl has yet been produced. The most significant exposure of beryl has been buried by broken muck. A photograph of the base of one large (14" across) beryl crystal in place was taken. A sample of hand selected mica was taken for submission to E M Industries.

Mr. Schweigart explained that the quartz must contain less than 0.05% iron and other discoloring impurities. Such material would be bought at his Kingman Feldspar Mill for $16 to $20 per ton. Good, clean,white feldspar would similarily be worth $25-$30 per ton. Both must be minus 15 inches.

Future plans are dependent upon Weaver Mountain Mining initiating production if above terms are satisfactory.

DIXIE QUEEN YAVAPAI COUNTY

NJN WR 4/8/83: It was reported that operations are soon to begin at the Dixie Queen, Yavapai County. The operator for Weaver Mountain will be Timothy Callahan of Parachute, Colorado.

NJM WR 5/13/83: Went to the Dixie Queen Mine, Yavapai County, with Ken Phillips. A separate report has been written.

NJN WR 12/2/83: Willy Moulder reported that Calspar is mining silica at the Dixie Queen, Yavapai County and shipping it to their mill in Kingman.

KAP WR 2/3/84: Scott Horsting, 770 Frontage Road, Suite 124, Northfiedl, Ill. 60093 explained a current problem involving Weaver Mountain Mining Company and the Monte Cristo (Dixie Queen) pegmatite deposit. Mr. Horsting was the organizer for the group of investors which undertook the project to develop the property for quartz, feldspar and beryl production. Mr. Horsting explained that the mine was just ready to ship to Cal-Spar who was operating the Kingman feldspar mill when Cal-Spar shut down the mill and ownership of the mill reverted to IMP Inc. who has put it up for sale. Mr. Horsting would like to find a method by which the mill could again be operated or some other market for crude quartz and feldspar.

NJN WR 5/11/84: Lorraine Burgin, U. S. Dureau of Mine, Arizona Liason Officer, reported Sam Bitner (712-328-1557) Council Bluff, Iowa, and 4 others contacted her seeking federal money to put the Dixie Queen Beryl Prospect (file) Yavapai County into production.

RRB WR 8/31/84: Sam Bitner, Council Bluffs, Iowa reports that he with others own 12 claims at the Monte Cristo, Peeples Valley, Yavapai County. Exxon has them leased and has subleased to others. Mr. Bitner thought that assessment work had to be filed by September 1st and was concerned that the subleasee had not yet filed. The work has been done and Mr. Bitner will file it himself.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Dixie Queen

Date April 1, 1982

District Kirkland, Yavapai County

Engineer Ken A. Phillips, Dick Beard

Subject: Property visit in the company of H. Mason Coggin, Consultant for Weaver Mountain Mining Company

A visit was made to the Dixie Queen pegmatite deposit to collect representative samples of hand sorted beryl.

Weaver Mountain Mining Company is considering operating the property through a contractor. They hope to be able to produce hand sorted beryl, clean quartz and clean feldspar. This visit was to collect beryl samples for analysis by Brush-Wellman and to verify that zones of clean quartz, feldspar and mica exist in the deposit.

A single main beryl zone with a cross section at the face of about 6' x 8' was sampled. This face contained about 50% by area beryl. Three samples of material were obtained for analysis and about 60 pounds of hand cobbed beryl was dug in about 30 minutes from this zone. Localized areas of beryl were found at two other sites.

Observations at the property agree with information contained in the consulting engineers report by Richard Meritz. However, the rare and valuable minerals mentioned in various reports by Erickson could not be found.

KAP WR 2/12/82: Bill Horsting, 770 Frontage Road, Northfield, Ill 60093 is reportedly doing business as Weaver Mountain Mining Corporation and is planning to mine the Dixie Queen-Monte Cristo pegmatite deposits in Yavapai County. Supposedly, plans include the erection of a 200 ton per day mill.

KAP WR 2/19/82: An unidentified eastern banker requested information on beryl mining. Apparently Weaver Mountain Mining is pursuing some financing for their planned operation at the Dixie Queen-Monte Cristo pegmatite deposit. Some of the special considerations pertinent to beryl-pegmatite mining were discussed.

KAP WR 4/16/82: Plans were made to meet H. Mason Coggin, consulting engineer for Weaver Mountain Mining Company in Peeples Valley and visit the Dixie Queen Mine.

KAP WR 5/21/82: Brush Wellman reported the results of assays on four beryl samples. They are as follows: Samples NO. 7, 8, and 9 are from the Monte Christo-Dixie Queen Mine. The results are:

#7	13.7±1.4% Beo
#8	8.8±0.9% Beo
#9	11.3±1.2% Beo

KAP WR 12/17/82: Henry T.Eyrich, V.P. Mining, Continental Materials, 2002 Forbes Blvd., Suite 101, P.O. Box 50726, Tucson, Arizona 85703 discussed a copy of an investment proposal brochure for Weaver Mountain Mining Company. The proposal brochure involves mining beryl and other pegmatite minerals at the Dixie Queen Mine in Yavapai County. Included in the proposal is their expectation to produce 7 to 10 tons of hand sorted beryl daily without a picking belt.

KAP WR 3/4/83: Scott Horsting, Weaver Mountain Mining Company reported the Dixie Queen Mine beryl project is still alive and soon to be financed.

KAP WR 3/25/83: Tim Callahan, Colorado, explained he is considering operating the Dixie Queen pegmatite beryl deposit for Weaver Mountain Mining Company.

DIXIE QUEEN YAVAPAI COUNTY

WR KP 11-11-77 - The Monte Cristo pegmatite property, Dixie Queen file, is being evaluated by Bob Languth. Languth, along with some help from Hugh Smith of Buckeye Mica Co., are trying to determine if the property can be profitably mined for mica. The pegmatite also contains quartz, feldspar, bismuth minerals, beryl, columbium-tantalum minerals, and reportedly sheet mica. Languth is in partnership with Chet Cheetwood, the present owner of the mine. Cheetwood has reportedly obtained the property from Dove White. 12-8-77 bh

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KP/WR 1/19/79 - Chet Cheatwood, is the owner of the Monte Cristo Mine, a pegmatite deposit also known as the Dixie Queen Mine, Kirkland Dist., Yav. Co. Mr. Cheatwood has developed the dike by open cuts, benching and drifting. He has driven one drift a distance of 110 feet totally in plagioclase feldspar. He is also pursuing the high purity quartz, mica, beryl and rare pegmatite minerals potential of the property. He is investigating supplying quartz to a Zeb Butler for delivery to the mirror plant in Chandler. Cheatwood has previously sold quartz through Butler to Kachina Stone and to Les Maddison for crushed landscape stone in the Sun City area. Possible outlets for feldspar which he is pursuing are Highway Ceramics in Yuma and Westwood Ceramics in Los Angeles. His contact at Westwood Ceramics is John Pitman. He reported he has discovered an occurrence of barite with a specific gravity of something greater than 4 in the Colorado River region of the state. He has not yet located any claims on the occurrence. 2/21/79 a.p.

KP WR 5/17/79 - Chet Cheetwood reported that Dr. Ralph Gaines of Kawecki Beryleo Industries, Inc., P.O. Box 1462, PA 19603, has visited the Dixie Queen - Monte Cristo Mine (pegmatite) in Yav. Co. Dr. Gaines was reported very interested in the deposit's potential to produce beryllium. 6/26/79 a.p.

KAP WR 7/18/80: Mr. Fowler of Arizona Mica Company (Tanner Companies) was in and discussed the status of the Mica Mule Mine, Yavapai County, and the Arizona Mica Grinding Plant in Buckeye. The mine is still down and they are continuing to research potential recovery systems. The grinding plant in Buckeye is grinding feldspar from the Monte Christo or Dixie Queen Mine in Yavapai County and is shipping the material to California buyers.

DIXIE QUEEN BERYL PROSPECT

KIRKLAND DISTRICT
YAVAPAI COUNTY

Interviewed Floyd Kent, address: Box 87, Yarnell, at Arrowhead Station re the captioned property. Mr. Kent furnished the following information:

He located the property in 1953 (15 claims) then sold (in 1957) to Dixie Queen Mining Corp. (John Phillips, recently deceased, was the principal in the venture.)

The Dixie Queen Company performed a considerable amount of surface work including a hillside cut some 500' long with a face 30' to 40' high, several shallow shafts and a 110' foot tunnel, also some rotary drilling (700' total?). An Engineer, Einar C. Erickson of Utah examined the property reporting very favorably to them. He inferred a large tonnage of high grade beryllium ore - beryl, chrysoberyl and phenacite - principally in the form of large crystals. He also called attention to appreciable amounts of recoverable zinc, nickel, etc. and a number of the rare earth minerals. The corporation terminated activities within a short time and allowed the claims to lapse. Thereupon Mr. Kent relocated them as the Monte Cristo Nos. 1 to 15 in the name of his wife Wyona Kent.

On March 3, 1961, Kent granted a lease with option to purchase to Robt. L. Ross who transferred the agreement to "Alberco" (Allied Beryllium Co.) a Calif. Corp. which he had organized. The new company is reported to have spent to date some $25,000. for geologic studies, sampling, roads, etc., but no actual exploration work has been started as yet.

Memo - Interview - 10-10-61 - Travis P. Lane

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine DIXIE QUEEN BERYL PROSPECT Date September 25, 1957

District Kirkland - YAVAPAI COUNTY Engineer B. J. Squire

Subject: REPORT OF VISIT TO PROPERTY

Property consists of 15 unpatented mining claims covering a large pegmatite area 6 miles Northwest of Peeples Valley. To reach property go 5 miles Southwest of Kirkland Junction on the Highway and turn right 1/4 mile beyond the State Highway road camp. One and one-half miles on this road take left fork, then at the Game Warden's cabin about 4 miles on road take the right fork through a wire gate to a padlocked gate. Property is on right about 3/4 mile beyond last gate.

The owner is Floyd Kent of Yarnell, Arizona. Mr. Jack Phillips of 323 N. 2nd St., Phoenix, has a lease arrangement with the owner.

The pegmatite has been opened with several shallow shafts which were subsequently filled by the bulldozer work done by Mr. Phillips. One shaft in the beryl mica zone showed 50 foot vertical of beryl crystals in the mica zone. The streak where numerous pockets of beryl occur is about 150 feet long and five feet wide. There is of course a limited amount of beryl scattered throughout the feldspar zone which is quite wide. Columbium-tantalum and bismuth are present in limited amounts.

The property is commercial for hand sorting of beryl crystals in the pockets, using cheap labor and limited production. The total size and potential tonnage of the pegmatite is unknown but probably to support a mill the property will have to be worked for feldspar with the other products as limited tonnage by-products.

MONTE CRISTO MINE

YAVAPAI COUNTY
HASSAYAMPA DISTRICT

Visited Thomas H. Barkdull, 102 Pioneer Bank Bldg., Prescott, Arizona. Mr. Barkdull is a registered land surveyor as well as U. S. mineral surveyor. He has been surveying the Monte Cristo Mine and laying out additional claims for Associated Petroleum and Mining Co., 317 W. Broadway, Cushing, Oklahoma. Col. A. C. Giliam, President. Others in the company are James Wornstaff who appears to be manager and W. J. Goss, Office held not learned. All are from Cushing, Oklahoma. They have been drilling at the Monte Cristo for the last 6 months and are said to be mining beryl. Recently unearthed a 1000# crystal.

FTJ WR 1/21/66

Visited Dan Jacobs, Arrowhead Service Station near Congress Jct. He is having a controversy with Associated Petroleum and Mining of Cushing, Okla. over the Monte Cristo mine 11 miles from Yarnell. 12 claims involved in the dispute. Joe Eaton is watchman for Associated.

FTJ WR 2/18/66

Stopped at the old Dixie Queen or Monte Cristo pegmatite deposit about 6 miles NW of Peeples Valley. The pegmatite has been obviously mined for the mica and beryl as the entire length has been slabbed off. Most of the blasted material is quartz with a very low content of mica and/or beryl, however, 3 beryl crystals in excess of 1 foot in diameter were noted. It appears that most of the remaining solid portion of the deposit is good quality potash feldspar. That part above ground level probably contains 6500 tons of feldspar. GW WR 1/14/75

References: ABM Bull. 180, p. 400, 403
IC 8298, p. 21

File Monte Cristo claim or Dixie Queen or both

February 3, 1982

Mr. Ted Housley
P.O. Box 2296
Wickenburg, Arizona 85358

Dear Ted:

I have checked BLM mining claim microfiche and have talked with the State BLM office regarding the Monte Cristo claim on the Dixie Queen pegmatite deposits. The following appears to be the situation:

Twelve claims, the Monte Cristo #1 thru 12 are located on the deposit. The AMC # lead file is AMC 81977 and the owner is listed as Robert L. Ross, P.O. Box 2040, Grass Valley, California. The microfiche notes that 1980 assessment work affidavit has been received (it is apparently too early to find out if the BLM has the 1981 assessment work - but check with the county recorder in Prescott). The claims were located September 1, 1965.

Also:

Fifteen claims, the Monte Cristo #1 thru 15 are located on the same area. The AMC # lead file is AMC 39681 and the owner is listed as Chet Cheatwood, 3244 W. Yucca, Phoenix, Arizona 85029. The microfiche notes that the last assessment work affidavit received was for 1979 year. A telephone call to the BLM was made. They reported that no 1980 assessment affidavit for the Cheatwood claims was received. That probably means those claims are invalid. Check with recorder's office also. The claims were located January 31, 1979.

Good luck,

Ken A. Phillips
Mineral Resources Engineer

KAP:at

Collection Item: Payable at 15 days sight on approval of title.

Pay through REPUBLIC NATIONAL BANK OF ENGLEWOOD, COLORADO

DR DPT	17	18-20	26-27	28-31	32-36	TAX ID/SOC. SEC. NO.	DATE
	6	8,3,4			5779		February 13, 1982

82-135
1070

M 5779

PAY TO THE ORDER OF Texas and Southern Co. $ 12,000.00

VALUE RECEIVED Twelve thousand and 00/100---------- DOLLARS

IN PAYMENT OF Initial consideration for Mining Property Lease and Purchase Option on Pinon, Project M-5983, Yavapai Co., Az.; 12 unpat. mining claims in T12N-R5W, Sec. 34; U.S. (240.0)

ADDRESS OF PAYEE 770 Frontage Rd., Northfield, Illinois 60093

TO: EXXON CORPORATION
c/o EXXON COMPANY, U.S.A.
750 WEST HAMPDEN AVE., ENGLEWOOD, COLO.

Steven H. Humphreys
MINERALS DEPARTMENT
Steven H. Humphreys

ACCEPTED
EXXON CORPORATION
NOT VALID OVER $100,000
BY
193-0006B

:1070=0135:

MINING PROPERTY LEASE AND PURCHASE OPTION

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned, Texas and Southern Company

WHOSE ADDRESS IS 770 Frontage Road, Northfield, Illinois 60093,

hereinafter called OWNER (whether one or more), for and in consideration of the sum of ----Twelve Thousand ----

and No/100------- Dollars ($ 12,000.00) in hand paid, receipt of which is hereby acknowledged, and other good and valuable consideration, hereby give(s) and grant(s) to Exxon Corporation whose address is

c/o Exxon Minerals Company, P.O. Box 120, Denver, CO 80201,

hereinafter called OPTIONEE, an exclusive and irrevocable option to purchase for the sum of ---Six Hundred Thousand

and No/100-------- Dollars ($ 600,000.00) all those mining claims and mining properties situate in the County of Yavapai, State of Arizona, more particularly described on Exhibit A hereto attached and by this reference made a part hereof, upon the following terms and conditions, to-wit:

1. TERM OF OPTION

This Option shall continue so long as the payments to OWNER, either minimum or otherwise, are accruing or may accrue pursuant to the provisions of the following Paragraph 7.

2. EXERCISE OF OPTION

OPTIONEE may exercise this Option by delivering to OWNER at the address specified above written notice of the exercise of the Option herein contained, or by mailing such notice to OWNER by registered mail addressed as aforesaid; provided however, that in the event OPTIONEE has not so exercised this Option at such time as the payments made to OWNER hereunder equal the total purchase price specified in Paragraph 4 hereof, then this Option shall for all purposes be deemed to be exercised at the time such payments equal the total purchase price.

3. PAYMENT OF PURCHASE PRICE AND DELIVERY OF DEED

Upon exercise of this Option, OPTIONEE shall pay to OWNER any balance remaining of the total purchase price specified in Paragraph 4 hereof. Upon such payment of the total purchase price to OWNER by OPTIONEE, title shall be conveyed from OWNER to OPTIONEE by good and sufficient deed or deeds containing covenants of warranty.

4. TOTAL PURCHASE PRICE

The total purchase price for the properties described on Exhibit A shall be the purchase price first above stated, less and except the following deductions:

A. The sum of money paid as consideration for this instrument;
B. All payments made in accordance with the provisions of the within Paragraph 7;
C. That part of the general ad valorem taxes upon the property for the tax year in which the deed is delivered prorated to the date of delivery of deed; and
D. The amount necessary to pay and discharge any documentary stamp tax upon the warranty deed or deeds or excise tax assessed or assessable by reason of transfer of title.

5. PROPERTIES AND RIGHTS INCLUDED IN OPTION

The properties covered by this instrument of lease and purchase option shall include all and singular the OWNER'S mines, minerals, lodes and veins, dips and spurs, all dumps, plants, fixtures, improvements, water rights or other rights, easements and appurtenances whatsoever either upon, in or under or belonging to or associated with or used or useable in connection with the properties described on Exhibit A hereof whether heretofore or hereafter acquired. The designation of specific improvements, rights or appurtenances or other items, if any, on Exhibit A shall not be deemed to be a limitation upon the generality of the foregoing sentence.

6. LEASE OF PROPERTIES

For the same considerations and for and during the term of the option above provided, OWNER has granted, demised and leased, and by these presents does grant, demise and lease, exclusively unto OPTIONEE, the above mentioned properties and interests which are made subject to the option hereby created with the exclusive rights and privileges to explore for, develop, mine (by open pit, underground, strip mining, solution mining, or any other method), extract, mill, beneficiate, store, remove and market, all of the minerals, metals, ores, materials of whatsoever nature or sort found thereon, therein or thereunder or on, in or under other lands.

7. PAYMENTS

OPTIONEE shall make the following payments to OWNER and all of the same shall apply against the total purchase price stated in the introductory paragraph hereof in the event purchase is elected by OPTIONEE:

A. Payments based on production in accordance with the provisions of Exhibit B attached hereto and by reference made a part hereof.
B. The minimum annual payments for the years and in the amounts specified on Exhibit C attached hereto and by reference made a part hereof reduced by the payments based on production accruing during the year, if any.

The amount of the payments based on production made for any year in excess of the minimum annual payment herein provided shall be credited against minimum annual payments that may accrue in subsequent years. Each minimum annual payment, if applicable, shall be due and payable within thirty (30) days after the end of the year for which it is made. No minimum annual payment shall be due for the year if on or before the last day of that year the OPTIONEE releases its rights hereunder. There shall be no further obligation to make said payments under the foregoing subparagraphs A or B, either in minimum annual amounts or based on production, after said total purchase price has been paid to OWNER or after the exercise of the purchase option herein contained.

8. DEPOSITORY BANK

Any and all payments of monies due or payable by OPTIONEE to OWNER under the terms hereof shall be paid or tendered to OWNER or to the credit of OWNER in the _____ Bank of _____, which bank is designated as the depository and the agent of the OWNER for the purpose of receiving such payments.

9. LESSER INTEREST PROVISION

Without impairment of the warranties of title contained in this instrument, if OWNER owns less than the entire and undivided mineral estate in the properties above mentioned and described on Exhibit A, then the total purchase price and all other payments herein provided shall be proportionately reduced and payable to OWNER only in the proportion which the OWNER'S interest bears to the entire undivided mineral estate therein.

10. WARRANTY

OWNER hereby warrants and agrees to defend the title to the patented mining claims or other patented lands referred to on Exhibit A, and with respect to each unpatented mining claim described therein warrants unencumbered ownership of the claim and represents and warrants that the same was validly located upon lands open to mining location by OWNER or a predecessor, that the same is valid and subsisting and that all assessment work for prior years has been done and proof thereof recorded as required by law. OPTIONEE shall have the optional right to redeem for the OWNER by payment any mortgage, tax or other lien upon said properties subject hereto in the event of default of payment by OWNER and be subrogated to the rights of the holder thereof. OPTIONEE shall also have the right to retain from any payment which would otherwise become due or payable to OWNER hereunder and thereby reimburse OPTIONEE for payment of any such tax, mortgage or other lien and the retention of such sum or sums for payment shall have the same effect as if the amounts thereof were paid directly to the OWNER in whose behalf such payment was made. In case of a suit, adverse claim, dispute or question as to the ownership of the properties described on Exhibit A or the right to receive any of the monies payable under this instrument, OPTIONEE shall not be in default in payment of any sum due hereunder until thirty (30) days after OPTIONEE has been furnished with original or certified copies of instrument or instruments disposing of such suit, claim or dispute with proof sufficient, in OPTIONEE'S opinion, to settle such question.

11. RELEASE

OPTIONEE may at any time mail to OWNER at the address specified above written notice releasing all or part of the properties described on Exhibit A and thereby surrender the lease and option hereby created as to all such properties effective as of the date of mailing and thereby terminate all obligations relating thereto except the payment obligations due and payable on the day of mailing. OPTIONEE shall within a reasonable time after each mailing of a notice of release place on the county records an instrument evidencing such release.

In the event of a partial release, the amounts payable under Paragraph 7 hereof and the total purchase price payable in the event of the exercise of the option to purchase shall be reduced proportionately.

As to any properties released under this Paragraph 11, OPTIONEE shall have the right at any time or within six (6) months after the termination or expiration of the rights granted by this instrument to remove all property including mine tailings, fixtures or structures erected or placed by OPTIONEE on such properties except the timbering in tunnels, shafts and openings.

12. TITLE

Upon request by OPTIONEE, OWNER shall furnish promptly to OPTIONEE all abstracts of title in OWNER'S possession covering the properties described on Exhibit A in whole or in part, the recorded notice of location, prior deeds, if any, proofs of annual labor and all other data and material in OWNER'S files relative thereto.

13. DUTIES

The provisions for annual minimum and other payments contained in the foregoing Paragraph 7 and in Exhibit B are intended to exclude and negative any implied duty or obligation to perform exploration or development work or to mine at any rate or in any manner. The activities of OPTIONEE, if any, shall be only to the extent and at the locations, times and methods and in the manner that OPTIONEE shall determine in OPTIONEE'S sole discretion. However, with respect to all such work as OPTIONEE shall determine to perform, it is specifically agreed as follows:

A. OPTIONEE, in all operations under this instrument, will comply with all applicable state and federal laws, including the social laws relative to employment, workmen's compensation insurance, social security, unemployment tax and tax withholding. OPTIONEE shall hold OWNER harmless from claims of damage to persons or property arising from OPTIONEE'S operations under this instrument, except only that any right of access to the properties by OWNER or OWNER'S representatives shall be at OWNER'S risk.

B. If the payments provided in Paragraph 7 and in Exhibit B are determined in whole or in part by the amount or value of mineral production from the premises, then, until all of those payments have been made; (1) OWNER shall have access to the operations upon the properties at OWNER'S own risk and to the records and accounts thereof at reasonable times to the end that OWNER might verify that the specified payments are being made properly; and (2) ore, substances or materials from the properties which is mixed or commingled with ore, substances or materials from other lands shall be determined as to quantity and grade by the OPTIONEE through procedures consistent with practices in the mining industry, such as truck factors, skip factors, and volumetric surveys.

C. At the termination of this lease and option, in the event the purchase option is not exercised, OPTIONEE shall, upon written request from OWNER, supply to OWNER copies of any analyses of cores taken from the premises if those copies are then available.

MEMORANDUM OF MINING PROPERTY LEASE AND PURCHASE OPTION

THIS MEMORANDUM witnesses that:

Name(s) of OWNER and mailing address. If married, names of both spouses. If corporation, full corporate name, state of incorporation and address of office.

Texas and Southern Company

770 Frontage Road

Northfield, Illinois 60093

hereinafter called "OWNER," whether one or more, in consideration of the covenants and agreements contained in the Mining Property Lease and Purchase Option of even date hereinafter identified, hereby grants to EXXON CORPORATION, a New Jersey corporation with an address c/o Exxon Minerals Company, Post Office Box 120, Denver, Colorado 80201, hereinafter called "OPTIONEE," an exclusive and irrevocable option to purchase and hereby leases to OPTIONEE for mining purposes that property situate in the County of Yavapai, State of Arizona, described as follows:

SEE ATTACHED COPY OF EXHIBIT "A"

Said property is optioned and leased upon and subject to all of the terms and conditions set out in the Mining Property Lease and Purchase Option of even date, executed by OWNER and delivered to OPTIONEE, to which Mining Property Lease and Purchase Option kept in the office of OPTIONEE reference is hereby made for a complete statement of rights and obligations of OWNER and OPTIONEE, including, but without limitation, the following:

The term of the purchase option may extend for _____ years.
The term of the mining lease may extend for _____.

IN WITNESS WHEREOF, this memorandum has been duly executed by OWNER and delivered to OPTIONEE as of the _____ day of _____, 19 82.

WITNESSES:

TEXAS AND SOUTHERN COMPANY

_____ BY: _____
Title

Address: _____ ATTEST:

_____

_____ BY: _____
Owner Title

Address: _____

_____

This instrument was prepared by William S. Livingston, P.O. Box 120, Denver, Colorado 80201.

(Append acknowledgment form for state in which lands are situate.)

EXHIBIT A

to

MINING PROPERTY LEASE AND PURCHASE OPTION

dated....., 19 82

from Texas and Southern Company OWNER

to Exxon Corporation OPTIONEE

The properties covered by the within instrument of lease and purchase option are described as follows, to-wit:

Twelve unpatented lode mining claims located in Yavapai Co., Arizona described as follows:

Claim Names	Location Date	Loc. Cert. Recorded Book/Page	BLM MC No.	Sec/Twp/Rg	1981 Affid. Labor Book/Page
Monte Cristo #1	9/1/65	371/389	81977	34-12N-5W	1402/912
Monte Cristo #2	9/1/65	371/390	81978	34-12N-5W	1402/912
Monte Cristo #3	9/1/65	371/391	81979	34-12N-5W	1402/912
Monte Cristo #4	9/1/65	371/392	81980	34-12N-5W	1402/912
Monte Cristo Extension #5	9/1/65	371/393	81981	34-12N-5W	1402/912
Monte Cristo Extention #6	9/1/65	371/394	81982	34-12N-5W	1402/912
Monte Cristo Extension #7	9/1/65	371/395	81983	34-12N-5W	1402/912
Monte Cristo Extension #8	9/1/65	371/396	81984	34-12N-5W	1402/912
Monte Cristo #9	9/1/65	371/397	81985	34-12N-5W	1402/912
Monte Cristo #10	9/1/65	371/398	81986	34-12N-5W	1402/912
Monte Cristo #11	9/1/65	371/399	81987	34-12N-5W	1402/912
Monte Cristo #12	9/1/65	371/400	81988	34-12N-5W	1402/912

And the foregoing particular descriptions shall be deemed (without increase in the considerations stated in the within instrument) to include all interests of OWNER now owned or hereafter acquired in lands which are:

A. Contiguous with or cornering the particularly described properties; or within mining claims or mill sites which conflict with or overlie the same in whole or in part, or within the area bounded by straight lines around the exterior limits of the above described properties.

B. Within an area extending one miles from the exterior lines of the properties particularly described or included under the provisions of the foregoing subparagraph A; provided, however, that the inclusion of after acquired interests under the terms of this subparagraph B shall apply only to acquisitions consummated within one years after the date of the within instrument.

Initial for identification:.....

EXHIBIT A

to

MINING PROPERTY LEASE AND PURCHASE OPTION

dated....., 19 82

from Texas and Southern Company OWNER

to Exxon Corporation OPTIONEE

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Monte Cristo #4	9/1/65	371/392	81980	34-12N-5W	1402/912
Monte Cristo Extension #5	9/1/65	371/393	81981	34-12N-5W	1402/912
Monte Cristo Extention #6	9/1/65	371/394	81982	34-12N-5W	1402/912
Monte Cristo Extension #7	9/1/65	371/395	81983	34-12N-5W	1402/912
Monte Cristo Extension #8	9/1/65	371/396	81984	34-12N-5W	1402/912
Monte Cristo #9	9/1/65	371/397	81985	34-12N-5W	1402/912
Monte Cristo #10	9/1/65	371/398	81986	34-12N-5W	1402/912
Monte Cristo #11	9/1/65	371/399	81987	34-12N-5W	1402/912
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And the foregoing particular descriptions shall be deemed (without increase in the considerations stated in the within instrument) to include all interests of OWNER now owned or hereafter acquired in lands which are:

A. Contiguous with or cornering the particularly described properties; or within mining claims or mill sites which conflict with or overlie the same in whole or in part, or within the area bounded by straight lines around the exterior limits of the above described properties.

B. Within an area extending one miles from the exterior lines of the properties particularly described or included under the provisions of the foregoing subparagraph A; provided, however, that the inclusion of after acquired interests under the terms of this subparagraph B shall apply only to acquisitions consummated within one years after the date of the within instrument.

Initial for identification:.....

EXHIBIT B

to

MINING PROPERTY LEASE AND PURCHASE OPTION

Dated _____, 1982

from Texas and Southern Company OWNER

to Exxon Corporation OPTIONEE

For all purposes of the attached Mining Property Lease and Purchase Option, the Mine Value of uranium ore shall be determined solely in the manner set forth in this Exhibit B.

A. Payment for uranium-bearing ores, waters and solutions

Part One. For all uranium-bearing ores (i.e., mineral-bearing materials that are mined primarily for their uranium content) which are mined, produced, saved and removed from the Premises by OPTIONEE hereunder for sale or processing, the payment to OWNER shall be five percent (5%) of the Mine Value of such ores in raw, crude form, and shall be determined according to the following Parts Two and Three, below:

Part Two. The Mine Value of uranium-bearing ores which are not sold in their raw form but which are processed in a mill owned or controlled, wholly or partly, by OPTIONEE or which are processed in a custom mill for OPTIONEE, shall be determined from the following price schedule with application of the deductions set out in paragraph (4) below.

Grade of Ore [Uranium (U_3O_8) Assay]	Mine Value per Dry Short Ton of Ore
0.10% U_3O_8	$ 3.00
0.15	7.00
0.20	14.00
0.30	21.00
0.40	28.00
0.50	35.00
0.60	42.00
0.70	49.00
0.80	56.00
0.90	63.00
1.00 and more	70.00

5% NSR on all ores

(1) The Mine Value of ore with a grade intermediate to those specified above shall be determined on a pro rata basis under the above schedule.

(2) The Mine Value of ore with a grade less than 0.10% U_3O_8, if initially processed by OPTIONEE for recovery of uranium, shall be $1.50 per pound of U_3O_8 recovered by OPTIONEE therefrom.

(3) The Mine Value of mine waters and leaching solutions (natural or introduced) if initially processed by OPTIONEE for recovery of uranium, shall be $3.50 per pound U_3O_8 recovered by OPTIONEE therefrom.

(4) The value of the ore, determined as provided above, shall have deducted therefrom (a) the cost of transporting the ore from the mine to the mill, (b) deductions for sampling, assaying, penalties and impurities, not to exceed those which would be made for such ore at independent processing plants; and (c) all taxes on the ore, the U_3O_8, or production or sale thereof.

(5) In the event the price received by OPTIONEE for U_3O_8 sales is either more or less than $8.00 per pound for the deliveries of all sales made during the calendar month in which said uranium-bearing ores, mine waters or solutions are processed (or for the last month in which U_3O_8 deliveries were made if none were made in said month), then the Mine Value will be adjusted in the proportion that the price for average U_3O_8 deliveries bears to $8.00 per pound.

Part Three. The Mine Value of uranium-bearing ores sold by OPTIONEE in raw, crude form, prior to initial processing, shall be the actual net proceeds received for such ores by OPTIONEE after the deductions permitted, listed in paragraph (4) of Part Two above.

Part Four. In the event OPTIONEE recovers and markets valuable constituents other than uranium from said uranium-bearing ores, waters and solutions as by-products during the processing of such ores, waters and solutions, then OWNER shall receive five percent (5%) of the proceeds received by OPTIONEE from the sale of such by-products less in their unprocessed form before upgrading or beneficiation the applicable deductions provided in paragraph (4) of Part Two, above.

B. Payment for other ores, waters and solutions

For all ore other than uranium-bearing ore (i.e., mineral-bearing materials that are mined, produced, saved and removed by OPTIONEE from the Premises for sale or processing primarily for recovery of valuable constituents other than uranium), the payments to OWNER shall be five percent (5%) of the actual net proceeds from sale of such ore in its raw, crude form before any processing or beneficiation, less the deductions set out in paragraph (4) of Part Two, above.

C. Settlement period

All of the payments provided in this Exhibit B shall be due and payable within thirty (30) days after the end of each calendar quarter within which ores, concentrates, mine waters or solutions have been mined or removed from the properties and sold or used. Such payments shall be accompanied or preceded by statements indicating the quantities and values of the ores mined and removed. Payment of the amount due under any statement shall not prejudice the right of OWNER to protest or question the correctness thereof. All statements rendered to OWNER by OPTIONEE shall be conclusively presumed to be true and correct after sixty (60) days from the end of the calendar quarter to which such statement applies, unless within said sixty-day period, OWNER takes exception thereto and makes written claim on OPTIONEE for adjustment. Failure on the part of OWNER to make claim on OPTIONEE for adjustment in such period shall establish the correctness and preclude the filing of exemptions thereto or making of claims for adjustment thereon. No adjustments favorable to OPTIONEE shall be made unless within the prescribed period or unless in connection with a claim of OWNER.

Initialed for Identification

_____

EXHIBIT C

Attached to and made a part of
Mining Property Lease and Purchase Option
Dated ....., 1982

By and between Texas and Southern Company, as Owner

and

Exxon Corporation, as Optionee

The minimum annual payments referred to in Paragraph 7 shall be as follows, subject to all of the terms, conditions and provisions of the within agreement:

	Amount of Minimum Annual Payment
For the year ending one year from the date hereof	$ 20,000.00
For the year ending two years from the date hereof	$ 30,000.00
For the year ending three years from the date hereof	$ 60,000.00
For the year ending four years from the date hereof	$ 120,000.00
For the year ending five years from the date hereof	$ 176,500.00
For the year ending six years from the date hereof ~~and each ensuing year thereafter during the term of this option~~	$ 181,500.00

Initial For Identification _____

(For use where land is located in t. ollowing states: Arizona, Colorado, Connecticut, l da, Illinois, Kansas, Kentucky, Maine, Michigan, Minnesota, Nebras ew Hampshire, New Mexico, North Dakota, Ohio, Oklahoma h Carolina, Virginia, West Virginia, Wisconsin.)

(Attorney In Fact)

STATE OF _____ }
} ss.
COUNTY OF _____ }

The foregoing instrument was acknowledged before me this _____ day of _____,
19____, by _____
as Attorney in Fact on behalf of _____.

_____
(Signature of Person Taking Acknowledgment)

_____
(Print or Type Name and Show Official Designation)

My commission expires:

_____
(Serial Number, if any)

_____

(For use where land is located in the following states: Arizona, Colorado, Connecticut, Florida, Illinois, Kansas, Kentucky, Maine, Michigan, Minnesota, Nebraska, New Hampshire, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, Virginia, West Virginia, Wisconsin.)

(Corporate)

STATE OF Illinois }
} ss.
COUNTY OF _____ }

The foregoing instrument was acknowledged before me this _____ day of _____,
19 82, by _____,
_____ of _____
_____, a
_____ corporation, on behalf of the corporation.
(state of incorporation)

_____
(Signature of Person Taking Acknowledgment)

_____
(Print or Type Name and Show Official Designation)

My commission expires:

_____
(Serial Number, if any)

_____

(For use where land is located in the following states: Arizona, Colorado, Connecticut, Florida, Illinois, Kansas, Kentucky, Maine, Michigan, Minnesota, Nebraska, New Hampshire, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, Virginia, West Virginia, Wisconsin.)

(Public Officer, Trustee, or Personal Representative)

STATE OF _____ }
} ss.
COUNTY OF _____ }

The foregoing instrument was acknowledged before me this _____ day of _____,
19____, by _____
as _____.
(title of position)

_____
(Signature of Person Taking Acknowledgment)

_____
(Print or Type Name and Show Official Designation)

My commission expires:

_____
(Serial Number, if any)

_____

D. For the assessment yea[illegible]cing September 1, 1981 and each year there[illegible]r du[illegible] the term hereof, OPTIONEE shall, with respect to ea[illegible]patented mining claim described on Exhibit A, end[illegible]avor i[illegible]d faith to do and perform the assessment work as required by law for the maintenance of the claim and to file reports and affidavits as required by law with respect thereto. It is provided, however, that OPTIONEE shall have no assessment work obligation for the then current assessment year with respect to any unpatented mining claim which is released from this agreement not later than July 1st of any year.

E. The OPTIONEE shall pay an equitable compensation to OWNER for actual damages to OWNER'S property rights in the property described in Exhibit A, including damage to crops, grazing values, fences, gates, reservoirs, roads and structures, and damage sustained by reason of injury or loss of livestock.

F. OWNER and OPTIONEE shall each pay all taxes and other assessments levied or assessed against their respective interests in the property described in Exhibit A and those taxes and other assessments levied or assessed against their respective personal properties on or about the said property. Such obligations shall include, but not be limited to, the obligation that OWNER'S production royalty shall bear its proportionate share of any applicable tax upon the ownership, mining, production, processing, or severence of the minerals and ores covered herein, or upon total or net proceeds from extraction of such minerals and ores, other than federal or state income taxes or state franchise taxes measured by income. OWNER'S proportionate share of each tax described in the immediately previous sentence shall be in the same proportion as the total of OWNER'S royalty (or minimum annual payments treated as advances against production royalties) received during the tax period bears to the revenue received by the OPTIONEE from sales of minerals and ores hereunder during the tax period.

14. INUREMENT

The provisions hereof are intended to be specifically enforceable and shall inure to the benefit of and shall bind the parties hereto, their heirs, devisees, personal representatives, successors and assigns; but no change in the ownership of the properties or in the right to receive the payments made hereunder shall be binding upon OPTIONEE until thirty (30) days after OPTIONEE shall have received the original or certified copies of all instruments necessary, in OPTIONEE'S opinion, to evidence the transfer.

15. FAILURE TO MAKE PAYMENTS

OWNER shall not claim or assert either a termination or an impairment of any of the rights and privileges granted to OPTIONEE by the terms of this instrument, unless the payments provided herein are not made as specified. And, if, in the opinion of OWNER, there has been a failure to make a payment or an erroneous payment (whether the payment is claimed to be late, insufficient in amount, to the wrong person, or otherwise), then OWNER shall notify OPTIONEE in writing by registered mail, stating specifically the asserted neglect or error. If OPTIONEE within a period of thirty (30) days after the receipt of notice corrects an erroneous payment or makes a payment theretofore neglected, then the additional or delayed payment shall have the same force and legal effect as if the payment had been made properly and timely in the first instance.

16. RELOCATION AMENDMENT, CLAIM MARKINGS AND MONUMENTS

OPTIONEE shall have the right at any time or times during the term of the Mining Property Lease and Purchase Option to amend the location of any one or more of the unpatented mining claims made subject hereto whenever in its discretion OPTIONEE deems such amendment desirable to perfect the claim, to include ground not previously located or to avoid overlaps. OPTIONEE shall have the further right to relocate any one or more of said claims should it determine to relocate rather than amend. All such relocations or amendments which OPTIONEE elects shall be done by OPTIONEE at its expense but as agent for the OWNER. OPTIONEE shall have the further right at its discretion to repair or replace any claim location monument or marking which has been damaged or destroyed, but OPTIONEE shall not be obligated to perform such repairs or replacements.

17. FORCE MAJEURE

OPTIONEE shall not be deemed in default or to have ceased performance or operations hereunder during any period in which performance or operations are prevented by any cause reasonably beyond OPTIONEE'S control, each of which causes is called "force majeure." Force majeure shall include, without limitation, fire, floods, windstorms, other damage from the elements, strikes, labor disputes, inability to obtain competent workmen, riots, unavailability of transportation or necessary equipment, lack of a market reasonably satisfactory to OPTIONEE for product from the property, action of governmental authority, failure to receive required governmental approvals, litigation, Acts of God and acts of the public enemy. All periods of force majeure shall be deemed to begin at the time OPTIONEE is prevented from commencing or stops performing operations hereunder by reasons of force majeure.

Nothing contained in this Paragraph 17 shall limit OPTIONEE'S obligation to make any minimum annual payment provided for in this Mining Property Lease and Purchase Option.

18. JOINDER

The joinder herein by the spouse of OWNER or of one or more of the parties who constitute the OWNER is with the intent and for the purpose of committing to this agreement and releasing and waiving any and all dower, homestead exemption and other rights conferred upon or reserved to such spouse by the laws of the state in which the properties described on Exhibit A are located and all rights which such spouse has or might obtain in and to the said properties are committed to and bound by this agreement.

19. HEADINGS

The headings to the paragraphs of this instrument constitute no part of the agreement between the parties, having been inserted for convenience only.

20. COUNTERPARTS AND MEMORANDUM

This instrument may be executed in any number of counterparts, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument. No party who executes a counterpart need execute the same counterpart as any other party and this instrument shall be binding upon each party who executes a counterpart notwithstanding the fact that one or more of the parties in interest do not execute a counterpart. Owner shall execute upon request of OPTIONEE a memorandum of this instrument for recording upon the county records.

IN WITNESS WHEREOF, this option has been executed and delivered by OWNER to OPTIONEE this _____ day of _____, 19 82

WITNESS:

_____ TEXAS AND SOUTHERN COMPANY

WITNESS:

_____ BY: _____

~~Owner~~ Title

I.D.

~~Owner's Social Security~~ No. _____

ACKNOWLEDGMENT FOR NATURAL PERSONS

(For use in Idaho, Kansas, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington and Wyoming)

STATE OF _____ }
COUNTY OF _____ } ss.

I, the undersigned Notary Public, do hereby certify that on the _____ day of _____, 19___, personally and in person appeared _____ and _____ his/her wife/husband, the signer___ of the above instrument, and personally known to me to be the person___ described in and who executed the foregoing instrument and whose name___ is/are subscribed thereto and duly acknowledged to me that _____ freely and voluntarily signed, sealed, executed and delivered the same as _____ free and voluntary act and deed for the uses and purposes therein specified and set forth.

Given under my hand and official Notarial seal this _____ day of _____, 19___.

My commission expires: _____

_____
Notary Public, whose place of residence is

_____

_____

UNIFORM RECOGNITION OF ACKNOWLEDGMENTS ACT

(For use where land is located in the following states: Arizona, Colorado, Illinois, Maine, Michigan, Minnesota, Nebraska, New Hampshire, North Dakota, Ohio, Oklahoma, South Carolina, Virginia, Wisconsin.)

(URAA — Individual)

STATE OF _____ }
COUNTY OF _____ } ss.

The foregoing instrument was acknowledged before me this _____ day of _____, 19___, by _____.

_____
(Signature of Person Taking Acknowledgment)

_____
(Title or Rank)

My commission expires: _____. _____
(Serial number, if any)

(URAA — Corporate)

STATE OF _____ }
COUNTY OF _____ } ss.

The foregoing instrument was acknowledged before me this _____ day of _____, 19___ by _____, _____, of _____, a _____ (state of incorporation) corporation, on behalf of the corporation.

_____
(Signature of Person Taking Acknowledgment)

_____
(Title or Rank)

My commission expires: _____. _____
(Serial number, if any)

MINING PROPERTY LEASE AND PURCHASE OPTION

FROM

TO

STATE OF _____ }
COUNTY OF _____ } ss.

This instrument was filed for record this _____ day of _____, A.D. 19___, at _____ o'clock ___M., and duly recorded in Book _____, on Page _____

Clerk

By _____ Deputy

RETURN TO

10-78 BRADFORD PRINTING DENVER

ENGINEERING

GEOLOGY

REPORT

Monte Christo Mine, Peeples valley, Yarnell,
Yavapai County, Arizona.

W. J. SALISBURY,

Mining Engineer.

INDEX

Compañia Minera Los Angeles, S. A.

APARTADO POSTAL 306 TEGUCIGALPA, HONDURAS, C. A. TEL. No. 2-4017
POR CABLE "COMPANGELES"

WSJ/j
August 1, 1965

Mr. Daniel C Jacobs
Vice-President
Arizona Beryllium Corporation
Box 53, Congress, Arizona, U.S.A.

Dear sir:

As requested by you, and Mr.Melvin H Jones, I hereby submit my Preliminary Evaluation Report on the Monte Christo mine at Peeples Valley, Arizona. As you will recall, I made my examination of the mine in the company of you and Jones on May 8, 1965. I also visited the mine several times previous to this on a reconnaissance basis and garnered much information on these visits, in addition to perusing a previous geology study. I apologize for the delay in submitting this report, but, as you know, I was engaged as a mining engineer with Compania Minera Los Angeles,S.A. and left shortly after my last examination of the Monte Christo, for Honduras. I have made this report from the notes I have, and have had the ore samples assayed in our laboratory. This latter action has saved you some expenses, as BeO assays come rather high in the States.

Th ere are twelve(12) lode mining claims that are owned by Arizona Beryllium Corporation, and are now understood to be under lease to Allied Beryllium Company of California. It is also understood that the latter company drilled five(5) holes on the property for testing purposes and supposedly found chrysoberyl at lower levels, although the drill logs and other data, confirming this information have not been made available to Arizona Beryllium Corporation, nor to the writer.

The mine is on a "U" shaped heterogenous (non-lithium) berylliferous pegmatite formation located in a granite batholith in the Weaver mountains. It is about five(5) miles Westerly from U.S. highay 89, in Peeples Valley, North of Yarnell, Arizona (Yavapai county). The highway is a first class paved road, and the five(5) miles to the mine (off the highway) is a good and well maintained county dirt road. The Monte Christo mine was formerly called the Dixie Queen and in the past was operated for mica and possibly some "Hand cobbed" beryl was taken out.

GEOLOGY. This mine, as I mentioned before, is in the Weaver mountains located in the Mountain region of the Basin and Range province. The mountains in the vicinity of the mine are an extension of the Yavapai series, which dates prior to the Mazatzal revolution and compares with the Vishnu formation of the Archean era (1 and1/2 billion years). The pegmatic formation is plutonic of hypergene origin and was formed at magmatic temperatures(higher than hypothermal). Near the Monte Christo is an old diggings of which the writer was told contains scheelite, thatwas mined to a small extent during WWII. Tungsten is another element that commonly occurs in granitics. I have also been told that there are some old gold prospect holes in the vicinity. While pegmatites

are normally lens shaped, the extent of this deposit(that is about 300 feet in length) cannot be determined without drilling data or other geophysical research.

MINERALOGY. This is one phase of this examination in which I differ from the previous results of my colleagues. In fact one previous investigator says the berylliferous formation is not a pegmatite and that the big hexagonal chrystals in sight are not beryl ??? The obviously beryl ($Be_3AL_2(SiO_3)_6$ chrystals are in evidence in the open cut facies on a sparse and sporatic basis. Some of these chrystals are twelve inches(12') in diameter and are of the heliodor(yellow) category, but none were seen that are gem quality. Large vugs of muscovite mica ($(OH)_2KAl_2(AlSi_3O_{10})$ can be seen in some portions of the formation. Some of this mica is in books of about eight inches (8') diameter, but the mentioned vugs are scarce. I do not want to present an over optimistic picture of these minerals, as they are like sparse raisens in a loaf of raisen bread. In other scarce pockets, there are small beryl chrystals in a matrix of perthite and sericite.

The gangue of the pegmatite is basically quartz and perthite (and not albite as identified by others). On the contacts of the pegmatite there is a fine-crystalline phase that has the appearance of, but is not, aplite. In the vicinity of the Southwesterly end of the formation is a brown material intermixed with quartz that is garnet. It is reported that there is a small vein of Bismuthite in the North zone that purportedly contains rare earths and is radio-active. As this area is in a pit filled with water, the alleged vein was not examined by the writer.

SAMPLING. No samples were taken from the main pegmatitic facies, as this would have taken several days of labor to clean off the formation so that channel cuts could be taken, and I did not have time to do this. Further, this type of sampling from the surface would still be of limited value. However, in order to get some idea of the values, three(3) samples were taken from equally spaced intervals on the rather extensive tailings pile that is a residue from former mica recovery operations and it is to be understood that the larger pieces of beryl were "hand cobbed" and removed during the processing. The samples that I took were "grab" samples of about ten(10) pounds each. Prior to leaving for Honduras I carefully mixed each of the respective samples and quartered the same and had these quarters with me for testing in our laboratory. Sample A is from the Southwesterly zone of the dump, Sample B is from the approximate center, and Sample C is from the Northerly zone. Chemical assays of BeO content follow:

Sample A	Sample B	Sample C
nil	.40 %	.22 %

No tests were made for mica content, that would be a secondary saleable mineral. The mica content is estimated by me to be from five(5) to ten(10) % of the ore deposit. (I note that one of my predecessors makes an estimate of twelve(12) %).

DEVELOPMENT. Unless substanciated drilling data in the hands of officials of the Allied Beryllium Company can be obtained, the claims should be re-drilled under the direction of a capable

Geologist or Mining Engineer. The data obtained, along with carefull sampling and testing will indicate the values and probable reserves in tonnage. It may also reveal that the property is extremely marginal and that expenditure of time and funds for further development is not justified under present economics. The writer considers that the alleged deposit of chrysoberyl at depths of 116 to 152 feet, with a thickness of 36 feet, is questional. In lieu of the suggested drilling, it would be an excellent gamble to drive an adit into the bottom layer of the deposit from the lower level of one of the ravines below the present "open cut". This would enter the mineralized zone in excess of one hundred (100) feet below the old workings and a cross cut could be made at right angles for further exploratory purposes and for easy removal of the ore. The cost of this would compare very favorably with drilling costs, and the finished facility would be most advantageous for the immediate removal of ore (in the event a good grade of ore is found) and would save tunneling costs that would follow successfull drilling. Assuming an efficient operation of this type, the adit will cost about thirty dollars ($30.00) per foot, including track and pipe.

ECONOMIC CONSIDERATIONS. At this stage of the study, it should be thoroughly understood that we have no firm information on the ore values and the amount of available ore. No one with a sound mind would seriously consider putting a mill on the property, or to commence mining operations based on the meager data available. Nor should anyone spend money on the property for other than exploratory and testing work.

Recent mining journals show that BeO concentrates with BeO content of 10 to 12 % is worth $45.00 per unit. Scrap mica is worth 7 to 12 cents a pound. Present indications reveal that the BeO content of the Monte Christo ore will be in the neighborhood of a fraction of 1 % per ton and the mica might reach 100 pounds in each ton. The stockholders should realize that the mine is no bonanza although there is a strong possibility that it may be able to operate at a profit at sometime in the future. The following factors are submitted for consideration and should have a bearing on managerial action:

a There is one Canadian mine that is operating with ore that averages .25% BeO and this means that at the present day price of BeO, the ore brings $11.25 gross, per ton, from which has to be deducted the mining, milling and transportation costs. Thusly, the profit from this mine must be small, if any. It is not known at the present time as to whether the Monte Christo ore will average the mentioned .25% .

b If the mica in the Monte Christo deposit averages 5% of the total ore, then 100 pounds will be obtained from each ton of ore processed. And this will have a gross value of $7.00 to $12.00 per ton from which a proportionate portion of mining and milling costs will have to be deducted.

c The total gross profit of beryl and mica will be between $18.25 to $23.25 per ton. While I do not have any firm costs of mining and milling this ore, I will make a conservative estimate of $5.00 per ton for these activities. Thusly, the overall profit will be small and insufficient to interest large investors to put up the necessary capital. Milling equipment will be expensive and there are no large quantities of reserve tonnage in sight that might make a large investment feasible in considering many years of operation.

d The c[illegible] of a mill to process the beryl and mica will probably be in excess of $2000.00 per ton day. Therefore, a comparatively small 50 ton a day mill will cost $100,000.00 or more. This makes for a must costly operation. It is now reported that the Russians have developed a method of floating beryl by treating it with caustic soda, which renders beryl amenable to floatation by altering the crystal surfaces. This may somewhat cut the costs of future beryl processing in the U.S.

e A market can be readily found for the mica. But the matter of developing a market for the BeO presents another serious problem. While I have misplaced the exact reference in my notes, that I have, there is a Bureau of Mines report entitled "Report on beryllium Production - 1964", that was published in 1965, and this report reveals that during the full year 1964, there was only one(1) ton of BeO concentrates mined and sold in the entire country. This indicates that Brush Beryllium, Beryllium Corporation of the U.S., and other major processors and users of BeO are not buying their requirements on the open market. In most cases, they have their own mines and/or buying additional requirements from the U.S. government. This same mentioned report reveals that the U.S. government traded several millions of dollars in surplus food produced by farmers, for beryllium concentrates produced in foreign countries, thusly negating the opportunity for privately owned mines in the U.S. to operate and find a market for their BeO. In other words, the U.S. government is putting beryl mine owners out of business with surplus food exchanges. I have not received word on how the situation is today, but this is a matter for serious consideration by the stockholders.

f If the Monte Christo mine is to be again operated on the past open pit basis, it should be understood that this will mean prohibitively high stripping ratios. In the suggested operation (under Development, above) the adit cutting the ore body at right angles should be 7 feet by 8 feet for ease of operation and low cost mining.

CONCLUSION. It is hoped by me, that it is realized by all readers of this report, that I spent only a short period of time in examining the Monte Christo property and that some of my opinions and observations are based on this rather cursory investigation. I hope that I can be proved wrong on some of the pessimistic findings, as I would be greatly pleased to see the mine operating at a profit for the benefit of some of my friends, who are stockholders and officers of the Arizona Beryllium Corporation. This report is meant to be a preliminary evaluation report, and this is what it is. If drilling and other exploratory action reveals an abundant and higher grade of ore, then an Economic study should be made, and this report should give detailed information on mining and metallurgy actions and costs, outline all marketing opportunities, and give full information on reserves of ore.

RECOMMENDATION. In the opinion of the undersigned, the Monte Christo mining claims are marginal under present economic and marketing conditions. They may prove to be very valuable (or worthless) following further exploration and development action. For the present, the claims should be retained and the required annual

assessment work should consist of test drilling under the direction of a qualified mining engineer or geologist, geophysical testing, and/or driving an exploratory adit into the orebody.

Respectfully submitted,

W. J. SALISBURY
Mining Engineer
AIME

Arizona Beryllium Corporation

P. O. Box 513
PRESCOTT, ARIZONA

MONTE CHRISTO MINE
PEEPLE'S VALLEY
YARNELL, ARIZONA

June 20, 1964.

MEMORANDUM TO THE OFFICERS AND DIRECTORS OF ARIZONA BERYLLIUM CORPORATION.

Your attention is invited to the attached assay report from Hawley and Hawley-

HAWLEY & HAWLEY
ASSAYERS AND CHEMISTS, INC.
1700 W. GRANT RD. at AZTEC • BOX 5934, ANNEX STATION • Main 2-4836
TUCSON, ARIZONA 85703

BRANCHES: DOUGLAS, ARIZONA; HAYDEN, ARIZONA; EL PASO, TEXAS; AMARILLO, TEXAS

IDENTIFICATION	GOLD OZS	SILVER OZS	LEAD %	COPPER %	ZINC %	INSOL. %	IRON %	BeO
Sample AA								nil
BB								0.03
CC								nil
DD								0.02

CC: Attn: Mr. Lee ~~Hammons~~ Hammons
ADD: Arizona BeCorp
CITY: 6243 West Missouri Avenue
ST: Glendale, Arizona
CC: ARIZONA BECORP

REMARKS:
$3.00 Preparation
$40.00 Analysis

ANALYSIS CERT. BY

DATE SPL. RECEIVED 6-8-64 | DATE COMPL. 6-24-64 | $43.00 PAID TUC322453

These samples were carefully taken and submitted by Lee Hammons (Geologist). They are from channel cut trenches equi-spaced on the dump of the Monti Christo and must be considered as accurately reflecting the BeO values of the same. There is an extremely wide gap between those reported earlier by Dr.Einar C. Erickson in his report "The Economic geology of the Dixie Queen Claims (page 14)". It would appear that Dr. Erickson is in error. This spells the difference between an economical feasible operation of the mine and its being operated at a loss. Further, no one else has found the Chrysoberl the Dr. Erickson talks about. Maybe its at depth ?

Melvin H. Jones

MELVIN H. JONES, Mining Geologist.

Harry E. Nelson
1018 East Norman Ave.
Las Vegas, Nevada

April 25, 1957

NOTES ON THE DIXIE QUEEN (PEGMATITE) MINE
YAVAPAIE COUNTY, ARIZONA

The Dixie Queen Mine on the Dixie Queen Claim No. 1 was examined on April 13, and 14, 1957. The property is located 6.3 miles northwest of U. S. Highway 89 at 6.5 miles northeast of Yarnell, Arizona, in Sec. 34, T. 11 N., R. 5 W., Gila and Salt River Meridian. This is on the east flank of the Weaver Mountains at approximately 5,000 feet elevation.

During the morning of April 13, 1957 this property was examined by C. L. Oldham of the Pan American Co. of Tuscon, Arizona. Accompanying Mr. Oldham were three men, one of whom was Hector Rochin, Consulting Mining Engineer, of Tuscon, Arizona. Mr. Rochin formerly worked for Cananea Consolidated Copper Company, Sonora, Mexico.

No published literature regarding this property or area has been found to the present time. An unpublished report "The Economic Geology of the Dixie Queen Claims, Yavapaie County, Arizona, A Preliminary Report on the Ore Deposits" by Einar C. Erickson, 771 West Sunny Lane, Orem, Utah, dated Nov. 6, 1956 was given to me when Mr. John Phillips, 618 N. Flyn Lane, Phoenix, Arizona (the present owner) conducted me on a tour of the mine on the afternoon of April 13, 1957.

History of the Property:

The following historical data is taken from the report by Einar C. Erickson:

Prior to 1917, a Mr. Regan worked the area, for what is not mentioned. In 1917 a Mr. W. Young took up much of the land for cattle and agricultural purposes. In the early 1920's mica is supposed to have been mined from the property. Mr. A. Flagg examined the property in 1928. During this period two of the "Regan boys"

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Las Vegas, Nevada

April 25, 1957

NOTES ON THE DIXIE QUEEN (PEGMATITE) MINE (continued)

removed some 400 sacks of beryl - they are also supposed to have mined some euxenite. Mr. Westover relocated the property during the 1940's and in 1947 a Mr. H. G. Smith bought half a claim and installed a mill for the recovery of mica. Some attempt was made at this time to recover gold and bismuth - the success or failure is not mentioned. A Mr. Kent, in 1953, leased the claims from Mr. Smith and located the additional claims which now comprise the present group. The property was leased to a Mr. B. Doolin, who did not perform , consequently the property was turned over to the Dixie Queen Mining Corporation. A Mr. G. A. Tognoni is supposed to have prepared a map of the claims (no such map has been seen).

The latest work apparently was done by the son-in-law of Mr. John Phillips in January of 1957. It consisted of bulldozing around the face of the open pit. According to Mr. Phillips, during this last period of operation, they collected 18 tons of beryl crystals for which they received $ 530 per ton. Mr. Phillips estimates that prior production of beryl amounted to about 60 tons of beryl crystals.

Geology of the Area:

No sedimentary rocks were seen in the area. The rock type in the area and as far west as the mountains just east of Congress Junction appear to be mainly granite or granodiorite. According to the U. S. Geological Survey, "Geologic Map of the United States, 1932", this area is shown as precambrian granite and other intrusive rocks.

Geology of the Dixie Queen Mine:

The open pit area of the Dixie Queen Claim No. 1 is considered to be a

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April 25, 1957

NOTES ON THE DIXIE QUEEN (PEGMATITE) MINE (continued)

complex zoned felsic pegmatite with an added hydrotherml stage. Note - this doesnot agree with Einar C. Erickson, who states, "The emplacement is not pegmatitic, etc."

By definition a pegmatite is an igneous intrusive of relative small size characterized by a certain or specific minerals having a coarse grain or generally irregular texture. This deposit fits the definition.

The deposit was mapped on a scale of 1-inch to 50-feet, by means of a Brunton and tape survey. This shows that, in all probability, approximately one-half of this zoned pegmatite has been removed by erosion, because now the gray massive quartz now exposed on the surface formerly was the core. The remains of the quartz core is ±60-feet long, strikes N. 35° E., and apparently plunges to the southwest about 10°. The massive gray quartz core appears to be barren and is thought to be approximately 50-feet wide.

Surrounding the barren quartz core are two zones. The zone in contact with the core is, on the most northern exposure, an altered, soft, white to cream colored feldspar, thought to be microcline with some coarse grained muscovite occurring as rosetts and along fracture planes. About 150 feet south of the most northern exposure in the small pit on the surface the microcline appears to be unaltered, light tan in color, and has scattered rosetts of muscovite exposed. It is about 40 feet wide.

The zone separating the microcline-muscovite zone and the precambrian (?) granite appears to be composed of graphic granite (microcline and quartz intergrown) with some quartz and fine-grained muscovite. This zone appears to be about 20-feet thick.

Near the north end of the pegmatite, just five feet south of the incline,

Harry E. Nelson
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Las Vegas, Nevada

April 25, 1957

NOTES ON THE DIXIE QUEEN (PEGMATITE) MINE (continued)

an altered, soft, brown, iron stained igneous dike (andesite ?) cuts the pegmatite. It strikes N. 75° W. and dips 75° to the southwest, and is about 6-feet thick. It is in the footwall of this dike in the incline that bismuth minerals are supposed to be found. It is to be noted that the soft, highly altered feldspar in this area does have a straw colored film on some of the fractures, that could be bismite.

Near the center of the pegmatite as exposed on the dozer bench is a fault that trends N. 70° W. and dips 70 to 90° to the southwest. This same structure is observed in the small pit on the surface above the main dozer bench. This fault apparently offsets the southern half of the pegmatite to the northwest. The fault zone, as seen on the dozer bench, is filled with broken, iron-stained quartz. It is in close proximity to this structure, in the highly altered microcline zone, that the beryl crystals embedded in mica are found. This structure, the related hydrothermal alteration plus the added beryl crystals is considered to be the added hydrothermal stage. In this area too, were found what is thought to be small garnet crystals along with the scrap mica (muscovite).

Economic Significance of Deposit:

This prospect is considered to be a small zoned felsic pegmatite with an added hydrothermal stage. Five small faults and one major fault cut the pegmatite. These faults formed the avenue for the later hydrothermal stage. It is considered that the greater portion of the beryl and the scrap mica will be found in close proximity to the major structure and the replacement zone that has been formed around it.

Harry E. Nelson
1018 East Norman Ave.
Las Vegas, Nevada

April 25, 1957

NOTES ON THE DIXIE QUEEN (PEGMATITE) MINE (continued)

Suggested exploration would consist of excavation both by open trench and by underground methods on the major structure trending N. 70° W. If this proved successful then the minor structures trending N. 70° W. could also be prospected for beryl and possibly scrap mica.

This is considered a good little prospect for beryl and possibly scrap mica. It is considered an ideal small lease type of operation.

It is thought that the production will be limited by the size of the replacement area in the microcline zone (core margin zone) and that the tonnage will be small.

The small size plus the intergrowth of quartz and feldspar is thought to limit the possible economic production of the feldspar.

Government Purchase Program:

The Defense Materials Procurement Agency proposed an interim Beryllium Ore Program on August 9, 1951, which was approved in final form May 19, 1952. It provided for: (1) A purchase plan with payment as high as $ 50 per unit for domestically produced concentrates, (2) loans, (3) geological investigations and process development, and (4) procurement from abroad.

To implement item 3, the DMPA entered an agreement with the Bureau of Mines in September 1952 that provided for the Bureau to investigate the possibility of recovering beryl concentrates of commercial grade from the pegmatites of the Kings Mountain area of North Carolina.

On October 7, 1952, The General Services Administration announced a program for purchasing beryl from small domestic producers at prices higher

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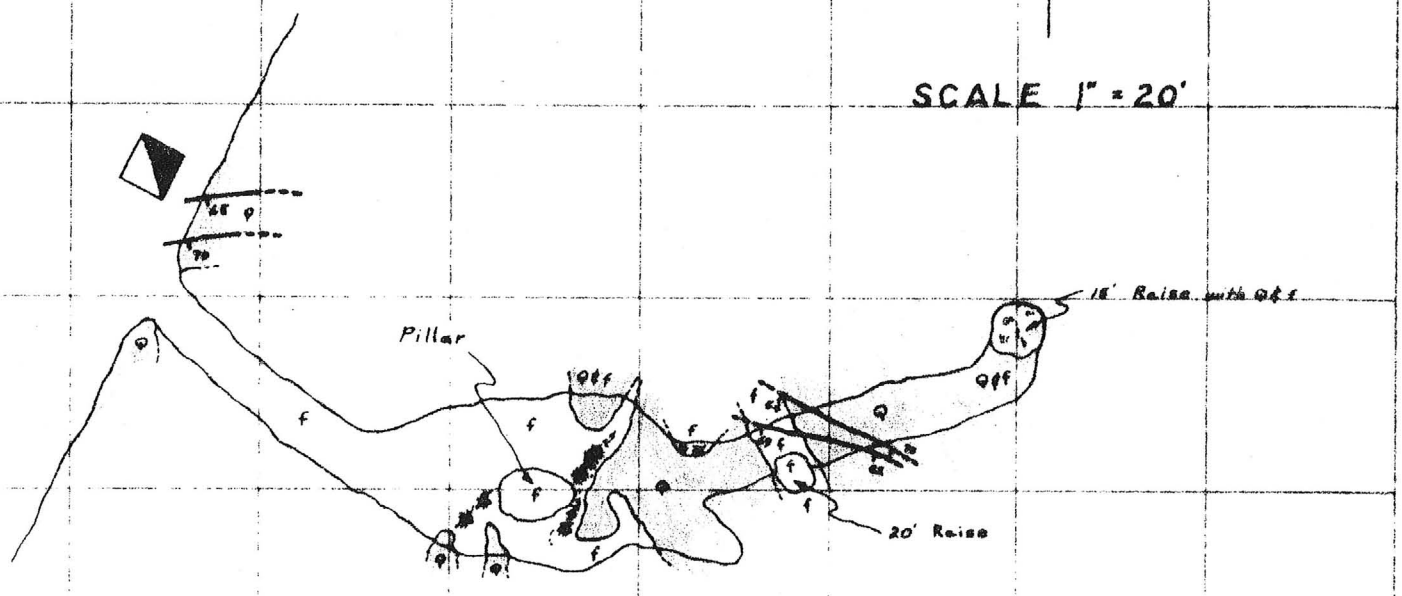
April 25, 1957

NOTES ON THE DIXIE QUEEN (PEGMATITE) MINE (continued)

than those prevailing in the market. Purchase depots, at Spruce Pine (N.C.), Custer (S.Dak.), and Franklin (N.H.) were authorized to accept up to 25 tons of beryl a year from an individual producer. It was stated under the program that sales of larger quantities by single producers must be negotiated with DMPA, and producers wishing to participate in the beryl program must notify GSA not later than June 30, 1955. The program, under an order issued October 7, 1952, was to terminate on June 30, 1957, or when 1,500 dry short tons of ore were received. GSA purchase program for domestically produced beryl has been extended to June 30, 1962, or when deliveries total 4,500 short tons, whichever occurs first.

To be accepted by the Government, ore must contain not less than 8 percent beryllium oxide by weight and must be in the form of clean crystals, cobbed free from waste. Shipments up to 500 pounds each are accepted or rejected on the basis of visual inspection. The Government will pay a flat price of $ 0.20 a pound or $ 400 a ton for ore accepted on the basis of visual inspection. The price of the ore subjected to chemical analysis will be predicated on the number of short ton units of beryllium oxide contained in the ore. For ore containing 8.0-8.9 percent BeO, the price will be $ 40 per unit; for 9.0-9.9 percent BeO, $ 45 per unit; and for ore containing 10 percent or more BeO, $ 50 per unit.

Note - the closest purchaser of beryl is the Beryl Ores Co., Arvada, Colorado(about 20 miles west of Denver, Colorado)



SKETCH MAP OF TUNNEL AT DIXIE QUEEN MINE

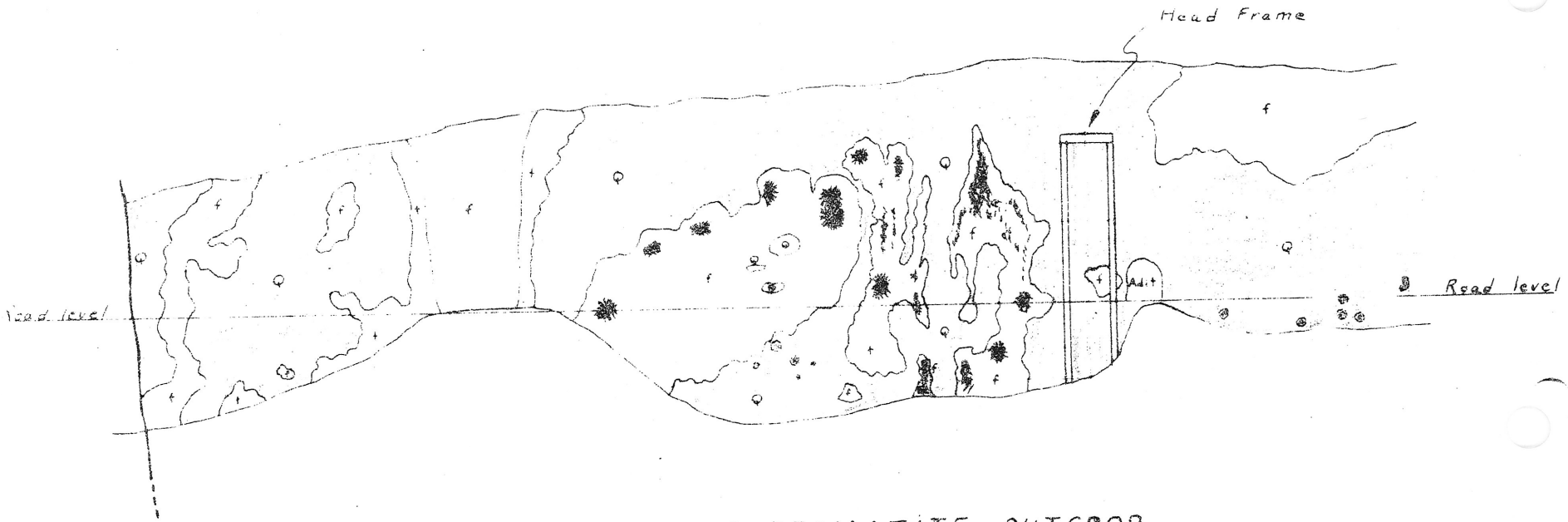
EXPLANATION

- Q — Quartz
- f — Feldspar
- Muscovite pods
- Fault
- Contact
- Shaft

MINE Dixie Queen LOCATION Weaver Mts, Ariz. LEVEL

GEOLOGY BY L. H. Laabe SURVEY Sketch Map SCALE DATE 1/6/61

Brunton & Pace



SKETCH OF PEGMATITE OUTCROP
AT DIXIE QUEEN SHAFT

View looking SE from road near shaft

EXPLANATION

- Beryl crystals
- Muscovite clusters
- f Feldspar
- Q Quartz
- Fault

SCALE 1" = 20'

Intra-Company Correspondence

SHATTUCK DENN MINING CORPORATION

and

SUBSIDIARIES

Engineering/Geology ..... Office

Date January 9, 1961

TO: D. M. Kentro

SUBJECT: Report on examination of the Dixie Queen Mine, Weaver, Mts., Yavapai County, Arizona--(quartz, feldspar, mica and beryl prospect).

Summary

A pegmatite deposit in the Weaver Mountains near Yarnell, Arizona was examined and found to contain large volumes of relatively unmixed quartz and feldspar. Muscovite pods up to 2 feet across are locally included in the feldspar and a small volume of beryl crystals occur in the quartz. Feldspar and quartz may be of economic importance depending on the chemical composition of the feldspar and the purity of the quartz. Muscovite, beryl, and other rare minerals occur in this deposit and will be of economic importance if the feldspar and quartz can be profitably mined.

This property deserves careful consideration.

General

On January 4, 1961 the Dixie Queen Mine was visited with Mr. Kent of Yarnell, Arizona, (Box 31). This property consists of 15 unpatented lode claims.

The Dixie Queen Mine is 11.2 miles from Yarnell in the Weaver Mountains, Yavapai County, Arizona. The claims are in sections 3 and 4, T 10 N, R 5 W, and section 34, T 11 N, R 5 W.

The mine is reached via a good gravel road that intersects State Highway 89 about 6 miles NE of Yarnell and 11.7 miles SW of Wilhoit, Arizona. At the intersection turn west; take the left fork a 1.5 miles; take the right fork at 3.2 miles; arrive at Mr. Kent's cabin below the mine 5.3 total miles from Highway 89.

History

E. C. Erickson (consulting geologist) in his report to Kent (1956) stated in brief: "The Dixie Queen was worked prior to 1920 for beryl-mica and bismuth-gold in bull quartz. During the 1920's some mica was mined; in 1928 400 sacks of beryl were removed and euxenite was also mined. In 1947 a mill for mica was installed (no longer present) and an attempt was made to recover bismuth-gold."

Mr. Kent stated during the examination that several shipments of hand cobbed beryl and mica were made during the 1950's.

Geology

The main rock type of the Weaver Mountains and the Dixie Queen Mine area is preCambrian granite. A pegmatite intrusive emplaced in the granite (Fig. 1) contains minerals of economic interest, viz., beryl, muscovite mica, feldspar, and quartz which were observed in place. Other minerals and metals, viz., chrysoberyl, phenacite, bertrandite, bismuth, columbite-tantalite, euxenite, yttrium, strontium, zinc, and nickel have been reported (E. C. Erickson report to Kent, 1956) but were not observed in place during the examination. This is not to suggest these minerals and metals do not occur in the pegmatite, as it is probable they do, but in quantities comprising less than 1 percent of the deposit.

Essentially the pegmatite is an aggregate of four minerals--quartz with accessory beryl and feldspar with lessor muscovite mica (Figs. 2 & 3). The spatial relationship of the mineral constituents is striking--large zones of relatively pure quartz and feldspar comprise the bulk of the rock. Clusters of muscovite up to 2 feet across are contained in the feldspar. Locally the feldspar contains smaller disseminated mica flakes; however, most of the feldspar is mica free. Beryl crystals in quartz exposed in the outcrop face, conspicuous because of their size, comprise a small percentage of the pegmatite (Fig. 3). The basal sections of these crystals have an average diameter of 8 to 9 inches--eight of the crystals measured not less than 1 foot across. The lengths of the crystals were not exposed, but in all probability would have a dimension at least twice that of their base.

> The beryllium mineral specimens taken at the Dixie Queen Mine are assumed to be beryl (SG 2.66) rather than chrysoberyl--the specimens floated in acetylene tetrabromide (SG 2.9)--chrysoberyl has a specific gravity of 3.76

Commercial Minerals

Silica

The massive bull quartz in this deposit appears to be free of other minerals and in all probability is essentially pure silica.

E&MJ price quote, Dec. 29, 1960:

Silica: st, air-floated,
92-99½% through 325 mesh:
in bags.....$22-$35
Glass sand, f.o.b. mine or mill, st, bulk, depending on grade...$1.50-$5

Feldspar

Probably both potash and sodic feldspars are present in this deposit (orthoclase $KAlSi_3O_8$ and an albitic plagioclase $NaAlSi_3O_8$). The composition can be easily determined by chemical analysis. Commercial grades of feldspar having a potash-soda (K-Na) ratio of at least 2:1 and containing not more than 0.10% iron (Fe_2O_3) is generally considered the best grade; however, today sodic feldspars for some purposes are ranked equal with potash feldspar. The feldspar in the Dixie Queen Mine appears to be exceptionally clean and would carry little if any iron.

Feldspar is used in the glass, enamel, tile, and ceramic industries.

E&MJ price quote, Dec. 29, 1960:

Feldspar: st, f.o.b. shipping point, North Carolina bulk
200 mesh.....$17-$20.50
325 mesh.....$20.50-$23.50
20 mesh.....$9.00
40 mesh glass.....$13.50

Mica

The muscovite appears to suitable for a wet or dry ground grade of mica which is used in the paint and roofing industries. Some of this mica may rate a higher classification depending on color, size of sheets, and physical imperfections.

E&MJ price quote, Dec. 29, 1960:

Mica: N. Carolina district, wet ground, st, depending on grade...$140-$155
Dry ground.....$30-$55
Scrap, depending on grade.....$20-$30

Beryllium

The important commercial ore of beryllium is beryl (14% BeO). Chrysoberyl (7.1% BeØ) is acceptable but less common. Phenacite, a beryllium minerals contains 45.6% BeO.

The standard specifications for beryl ore call for 10-12% BeO (theoretically beryl contains 14% BeO).

E&MJ price quote, Jan. 5, 1961:

Beryllium.....97%...$71.50/lb.
Beryllium ore: stu, BeO 10-12%, domestic f.o.b. mine or mill, depending on quantity.....$46-$48

Conclusions

The pegmatite at the Dixie Queen Mine as exposed is roughly half quartz and half feldspar. Beryl is included in the quartz and muscovite mica in the feldspar and together do not exceed 1% of the visible portion of the pegmatite.

Mr. Kent, the owner, emphasized that smaller crystals of beryl (about finger-size) and more of the large variety and also crystals of phenacite (a beryllium mineral) are numerous in a zone or horizon several feet below the outcrop of large beryl crystals (Fig. 3). These minerals are said to appear in the 50 foot shaft. Mr. Kent exhibited samples of finger-size beryl minerals and also smaller crystals of columbite-tantalite with which they are said to occur.

Pegmatites have such a great vertical range that no mine is likely to reach a depth too deep for further deposits, but pegmatites are also noted for their irregular structure and may pinch out with little or no warning. In general the minerals commonly occur in small pockets which are quickly exhausted and the cost of looking for more may exceed that of extracting the minerals when they are found.

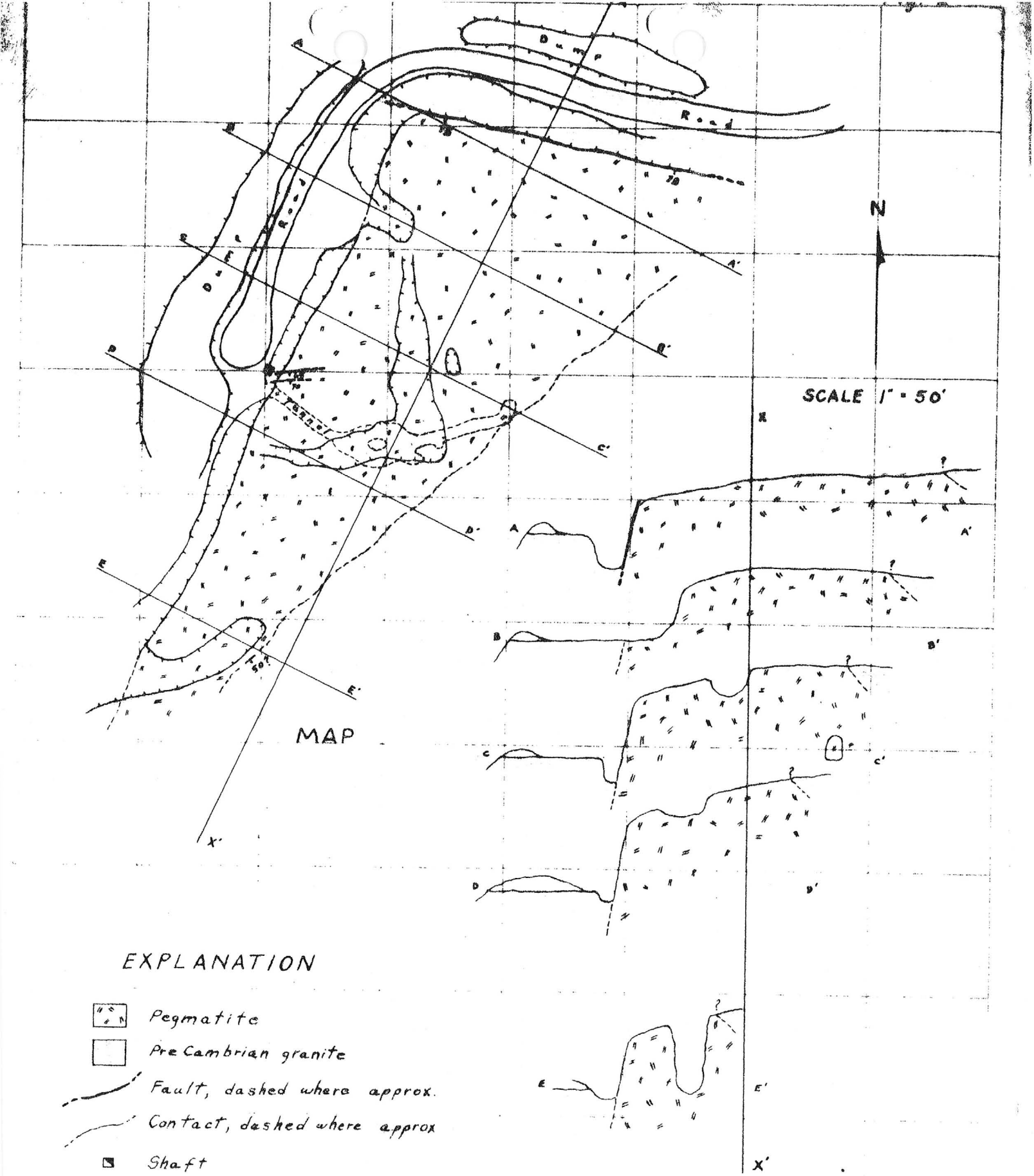
Should the feldspar, quartz, and muscovite at the Dixie Queen Mine prove to be of commercial grade, assuming a market exists for these minerals and mining and transportation costs are not prohibitive, this deposit would most certainly be a valuable one. It would indeed be a lucrative venture if the industrial minerals (quartz, feldspar, and muscovite) could be mined at a profit because the mine would always be in "ore" and the occassional occurrence of beryl and other valuable rare minerals would constitute a bonus.

The key minerals are feldspar and quartz--if these minerals can be mined and shipped at a profit from the Weaver Mountains the Dixie Queen Mine is a good prospect.

RGR

Robert G. Raabe

Robert G. Raabe



MINE Dixie Queen LOCATION Weaver Mts. Ariz LEVEL

GEOLOGY BY E.G. Cook SURVEY Sketch Map SCALE DATE 1/5/61

Brunton & Pace

DENVER EQUIPMENT COMPANY
ORE TESTING DIVISION
Denver, Colorado
January 9, 1964

Arizona Beryllium Corporation
P. O. Box 513
Prescott, Arizona

Reference: Order No. RW-76128
BERYLLIUM ORE

Gentlemen:

We are hereby submitting the following report of beneficiation tests conducted on your sample designated as dump material from the Monte Cristo claims.

Sample Identification

We received on August 23, 1963, six bags and one can of sample having a gross weight of 247-pounds. The sample was from Arizona Beryllium Corporation, P. O. Box 513, Prescott, Arizona. Sample Number 3412 was assigned to this sample for purposes of identification.

Object of Tests

The purpose of the test work covered by this report was to establish a flowsheet and determine the conditions necessary for the separation and recovery of the beryllium, bismuth, mica, rare earth minerals and any other values that might be profitably recovered. No specifications were given in regard to the grades of concentrates required or to the minimum mineral recoveries needed for economic treatment of the dump material. However on the basis of the current market requirements for beryllium it is assumed that a beryllium concentrate containing 8 to 10-percent BeO would be required.

Sample Preparation

The entire sample as received was thoroughly mixed and about one-half split out by coning and quartering. This material was jaw crushed to minus 3/8-inch, then screened at 1/2-inch to recover the plus 1/2-inch mica. The minus 1/2-inch product from the screen was passed several times through Denver Crushing Rolls set at an opening of 1/8-inch or less. The rolls were operated in closed circuit with a 10-mesh vibrating screen. The plus 10-mesh material was further screened at 3, 4, 6 and 8-mesh. The minus 10-mesh product was thoroughly mixed,

then fractionally sampled with a Jones sample splitter to obtain a head sample for analysis and a work sample for laboratory test purposes.

Following are the percentages of mica recovered in the various screen sizes when crushing the sample to 90.39-percent minus 10-mesh.

Product	Percent Weight
Mica plus 1/2-inch	0.28
Mica plus 3-mesh	1.55
Mica plus 4-mesh	1.14
Mica plus 6-mesh	1.74
Mica plus 8-mesh	2.11
Mica plus 10-mesh	2.79
Heads minus 10-mesh	90.39
Total	100.00

Sample Description

The sample submitted represents a pegmatite material having a specific gravity of 2.67 and a partial chemical analysis as follows:

BeO*	0.43%
Fe_2O_3	2.02%
SiO_2	65.50%
Na_2O	7.63%
K_2O	3.05%
Al_2O_3	22.50%
Bi	0.09%

*Analysis by gammaneutron beryllium analyzer.

A fluorescent x-ray spectrographic analysis of the head sample provided the following data in regard to the estimated percentages of the metal equivalent of the metals indicated. No check was made for elements with atomic numbers less than 22 (below titanium).

Element	Estimated Percentage
Copper	0.031
Zinc	0.011
Lead	0.017
Bismuth	0.063
Iron	1.0

Element	Estimated Percentage
Cobalt	0.004
Nickel	0.007
Rubidium	0.048
Strontium	0.004
Titanium	0.070
Zirconium	.0.027
Hafnium	.0.004
Columbium	0.078
Tantalum	.0.025
Chromium	0.040
Tungsten	.0.053
Manganese	.0.43
Yttrium	.0.08

The sample submitted contained mica, feldspar and beryl as the minerals of primary importance. The heavy mineral concentrate obtained by panning a portion of the minus 10-mesh material consisted primarily of garnet and small amounts of ilmenite and a straw-yellow mineral tentatively identified as bismite, which is a bismuth oxide.

Discussion of Tests

The test work conducted on the sample submitted followed beneficiation procedures which were considered as conventional for the selective recovery of mica, feldspar and beryl by flotation.

The test conditions, reagents used and results obtained are shown on the attached data sheets numbered one through six inclusive. A brief discussion of these tests is given below.

Test Number 1 Flotation and Magnetic Separation

In this test a charge of minus 10-mesh ore which had been ball-mill ground to essentially all minus 48-mesh and deslimed at 20-microns was subjected to selective flotation for the recovery of a mica and beryl concentrate. The flotation tailing remaining after the beryl flotation represented a mixed feldspar-quartz product essentially free of mica, beryl and iron impurities. An amine acetate (Armour Chemical Co. Armac T) was used as the collector for the mica and American Cyanamid Reagents 801 and 825 as collectors for the beryl. Conditioning of the solids with the reagents for flotation of the mica and beryl was accomplished in a pulp made acidic with sulphuric acid. Complete details of the test procedure, reagents and conditions for this test are shown in detail on Data Sheet No. 1.

Metallurgical data from this test summarized on Data Sheet No. 2

revealed that by intensive flotation 51.3-percent of the total BeO was recovered in a rougher flotation concentrate that assayed 3.23% BeO. High intensity magnetic separation of the cleaned beryl concentrate to remove iron-bearing impurities produced a finished non-magnetic beryl product that contained 18.1-percent of the total BeO in the head ore at a grade of 7.99-percent BeO.

It will be noted that the rougher flotation tailing obtained in this test at a 48-mesh grind contained 31.0-percent of the total BeO. This product represented the greatest loss of BeO.

Test Number 2 — Flotation

In view of the relatively high BeO loss in the rougher flotation tailing from Test Number 1, Test Number 2 was conducted to evaluate the possibility of reducing the loss of BeO in the feldspar and silica products through the use of a finer grind for the feldspar-beryl separation.

In this test a charge of minus 10-mesh ore, which had been rod-mill ground to 20-mesh and deslimed at 20-microns, was subjected to rougher flotation for the recovery of a mica concentrate. The rougher tailing, which represented a mica-free product, was ball mill ground to 100-mesh, deslimed to remove a second minus 20-micron slime, then subjected to flotation to recover the beryl and feldspar. The beryl was floated first with American Cyanamid reagents 801 and 825 in a circuit made acidic with sulphuric acid. A feldspar concentrate was floated from the tailing remaining from the beryl flotation by the addition of the amine acetate salt, Armac T, in a circuit made acidic with hydrofluoric acid.

Metallurgical data from this test show an excellent liberation of the beryl and feldspar at a 100-mesh grind. However, a substantial loss of the total BeO was incurred in the second minus 20-micron slime obtained at the finer grind.

The cleaned beryl concentrate obtained in this test contained 64.8-percent of the total BeO in a product that assayed 3.72-percent BeO and 0.618-percent bismuth. Magnetic separation of the beryl concentrate was not investigated in this test; however, in view of the effectiveness of magnetic separation in Test Number 1, it is expected that a product containing 8.0-percent BeO could be obtained by removing the magnetic constituents.

The feldspar concentrate represented 29.1-percent by weight of the feed material and assayed 0.02-percent BeO, 67.80-percent SiO_2, 20.79-percent Al_2O_3 and 0.098-percent Fe_2O_3.

The rougher flotation tailing (silica product) represented 6.6-percent by weight of the total feed material and assayed 0.02-percent BeO, 89.17-percent SiO_2, 6.58-percent Al_2O_3 and 0.058-percent Fe_2O_3.

Test Number 2 is described in detail on Data Sheets Number 3 and 4.

Test Number 3 — Flotation

Tests Number 1 and 2 investigated flotation of the beryllium minerals with American Cyanamid reagents 801 and 825 in an acidic pulp. Test Number 3 reported in detail on Data Sheets 5 and 6 was an investigation to evaluate the amenability of the beryllium minerals in this sample to flotation with fatty acids in an alkaline pulp.

A representative sample of the minus 10-mesh ore was rod-milled to 20-mesh, deslimed at 20-microns and then subjected to flotation to recover the mica. The rougher tailing was dewatered, then ball-mill ground to 100-mesh. This pulp was conditioned with the reagents shown on Data Sheet Number 5 and subjected to flotation to obtain a beryl concentrate and a rougher tailing.

Metallurgical results show no concentration of the beryl by this procedure.

Remarks and Conclusions

Laboratory batch tests have shown that the sample submitted can be beneficiated to recover about 64.8-percent of the total BeO in a cleaned flotation concentrate that analyzed 3.72-percent BeO and 0.618-percent bismuth. A beryllium concentrate analyzing 8.0-percent BeO probably could be obtained by magnetic separation of the flotation concentrate.

Mica and feldspar concentrates obtained in the batch tests had the following analysis:

	Mica Concentrate	Feldspar Concentrate
BeO - %	0.06	0.02
SiO_2 - %	44.88	67.80
Al_2O_3 - %	33.82	20.79
Fe_2O_3 - %	4.66	0.098

The concentrations of bismuth and rare earths in the ore were quite low. Consequently, the profitable recovery of these constituents from ore of the type submitted is considered to be impractical.

Data from Tests Number 1 and 2 show that liberation of the mica was obtained at a grind of 20-mesh, but a grind of approximately 100-mesh was needed to obtain a satisfactory libertion of the beryl and feldspar.

This sample is considered to be of medium hardness when grinding to 100-mesh.

The flotation test procedures that required a slime-free product for flotation showed an appreciable loss of BeO in the slime fractions at 100-mesh grind. This is clearly shown in Test Number 2 where 10.4-percent of the total BeO was contained in the primary slime and 18.8-percent in the secondary minus 20-micron slime.

Test Number 3, which investigated the feasibility of floating the beryllium minerals in an alkaline circuit and without desliming for flotation, showed no selectivity and a low recovery of the beryllium minerals.

The flowsheet which we are recommending for the treatment of ore of the type submitted is shown on the attached print number B-9001. This flowsheet is, in general, based on the procedure of Test Number 2 for the recovery of separate concentrates of mica, feldspar and beryl. It consists of the following principal steps:

1. Crushing the ore.
2. Open circuit wet rod mill grinding of the crushed ore to approximately 20-mesh.
3. Desliming of the rod mill discharge.
4. Conditioning and mica flotation.
5. Wet ball mill grinding the mica rougher tailing to about 100-mesh.
6. Single stage desliming of the ground product.
7. Conditioning and beryl flotation.
8. Dewatering, conditioning and feldspar flotation.

9. Magnetering of the mica, beryl and feldspar concentrates.

10. Drying and magnetic separation of the beryl concentrate.

All remaining portions of the sample tested under this order will be discarded six months from the date of this report unless otherwise notified.

Yours truly

DENVER EQUIPMENT COMPANY

Richard W. Flagg

Richard W. Flagg
Chief Metallurgist

Henry C. Hurd Jr

Henry C. Hurd, Jr.
Project Engineer

A.

DENVER EQUIPMENT COMPANY ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: CONDITIONS AND REAGENTS

SAMPLE IDENTIFICATION: Minus 10-mesh head ore. REPORT NO. RW-76128 TEST NO. 1

TEST PROCEDURE: A representative sample of the minus 10-mesh ore was ground to 95.5 % minus 48-mesh, then classified by sedimentation procedures to remove a minus 20-micron slime. The sand product from classification was subjected to flotation to obtain a cleaned mica concentrate, a mica cleaner tailing and a rougher tailing. The rougher flotation tailing was de-reagentized by the addition of calcium hypochlorite, then washed twice by re-pulping and decantation. This product was then subjected to conditioning and flotation to obtain a cleaned beryl concentrate, a cleaner tailing and a rougher tailing. The dried concentrate was subjected to high intensity magnetic separation to obtain a magnetic and non-magnetic product.

Grinding and Treatment				Reagents: Pounds per ton heads—(2)								
Operation	Time Min.	Percent Solids	pH	S.S.	H	A.T.	BC	CH	800			
Grinding (1)	35	50	7.6	--	--	--	--	--	--			
Classification - Micron	20			1.60	--	--	--	--	--			
Mica Conditioner	2	35	2.6	--	5.0	0.75	0.16	--	--			
Mica Rougher Flot.	6	21	2.8	--	--	0.30	0.06	--	--			
Mica Cleaner Flot.	4	5	2.8	--	2.0	--	--	--	--			
Deactivation of Tail	5	16	7.8	--	--	--	--	0.20	--			
Beryl Conditioner	4	56	2.1	--	2.5	--	0.06	--	1.0			
Beryl Rougher Flot.	3	35	2.6									
Beryl Cleaner Flot.	2	16	2.6									

NOTES: GRINDING PERFORMED IN STANDARD DENVER 12"x5" DENVER BALL MILL. BALL CHARGE = 40 POUNDS, R.P.M. = 54.

CLASSIFICATION BY DECANTATION THROUGH LIMITING SCREEN, UN-DECANTED SANDS REGROUND.

FLOTATION PERFORMED IN DENVER "SUB-A" LABORATORY FLOTATION MACHINE.

Grinding (1)

Time, minutes 35
Classification, mesh 48
Sands reground, minutes --

(2) Reagent Symbols:

S.S. - Sodium Silicate
H - Sulphuric Acid
AT - Armour Industrial Chemical Co. Armac T
BC - Methyl Isobutyl Carbinol
CH - Calcium Hypochlorite
800 - 50-50 mixture of American Cyanamid Promoter 801 and 825

DATA SHEET NO. 1

B.

DENVER EQUIPMENT COMPANY — ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: METALLURGICAL RESULTS

SAMPLE IDENTIFICATION: Minus 10-mesh head ore

REPORT NO. KW-76128 TEST NO. 1

	PRODUCT	Percent Weight	% ASSAYS BeO*	% SiO2	% Al2O3	% Fe2O3	% L.O.I.	**
	Assayed Head	--	0.43	65.5	22.5	2.02	--	--
	Calculated Head	100.0	0.44	---	---	--	--	
1	Primary Slime	21.1	0.28	---	---	--	--	
2	Cleaned Mica Conct.	13.2	0.06	44.88	33.82	4.66	4.84	
3	Mica Cleaner Tailing	4.1	0.27					
4	Beryl Conct. Non-Magnetic	1.0	7.99					
5	Beryl Conct. Magnetic	2.5	1.33					
6	Beryl Cleaner Tail	3.5	3.22					
7	Rougher Tailing	54.6	0.25	69.76	19.10	0.176	--	
	Combine No. 4 and 5	3.5	3.23					
	Combine No. 4, 5 and 6	7.0	3.23					

** L.O.I. Loss on Ignition -- at 1000 oC.

*BeO Analysis with a gamma-neutron beryllium analyzer, in all tests.

	PRODUCT	Percent Weight	PERCENT RECOVERY BeO
	Calculated Head	100.0	100.0
1	Primary Slime	21.1	13.4
2	Cleaned Mica Conct.	13.2	1.8
3	Mica Cleaner Tailing	4.1	2.5
4	Beryl Conct-non-magnetic	1.0	18.1
5	Beryl Conct-magnetic	2.5	7.6
6	Beryl Cleaner Tailing	3.5	25.6
7	Rougher Tailing	54.6	31.0
	Combine No. 4 & 5	3.5	25.7
	Combine No. 4, 5 & 6	7.0	51.3

SCREEN ANALYSIS OF

Mesh	Percent Weight	ASSAYS
35	Trace	
48	4.5	
65	20.0	
100	23.5	
150	21.2	
200	12.0	
-200	18.8	
Total	100.0	

A.

DENVER EQUIPMENT COMPANY ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: CONDITIONS AND REAGENTS

SAMPLE IDENTIFICATION: Minus 10-mesh hed ore

REPORT NO. RM-76128 TEST NO. 2

TEST PROCEDURE: A representative sample of the minus 10-mesh ore was stage ground to all minus 20-mesh, then classified by sedimentation procedures to remove a minus 20-micron slime. The sand fraction from classification was subjected to conditioning and flotation to remove the mica as a rougher froth concentrate. The rougher tailing was ground to minus 100-mesh, then classified to remove a second minus 20-micron slime. The sand fraction was conditioned with reagents and subjected to flotation to obtain a rougher beryl concentrate which was cleaned one time to obtain a cleaned concentrate and cleaner tailing. The rougher tailing from the beryl flotation was dewatered, conditioned with reagents and subjected to flotation to obtain a feldspar concentrate.

Grinding and Treatment				Reagents: Pounds per ton heads—(2)							
Operation 3000 grams	Time Min.	Percent Solids	pH	D	H	FO	P.O	AT	800	BC	HF
Grinding (1) *	10	50	7.6	--	--	--	--	--	--	--	--
Classification -20 micron split				0.35							
Mica Conditioner	2	40	3.0	--	2.10	0.20	0.28	0.28	--	--	--
Mica Rougher Flot.	6	25	3.6	--	1.40	--	0.07	0.45	--	--	--
Beryl Conditioner	2	50	2.3	--	1.60	--	--	--	0.60	0.05	--
Beryl Rougher Flot.	3	33	2.8	--	0.53	--	--	--	--	--	--
Beryl Cleaner Flot.	3	10	2.8	--	0.27	--	--	--	--	--	--
Feldspar Cond.	3	50	2.8	--	--	--	--	0.13	--	0.08	0.53
Feldspar Rougher Flot.	4	33	3.5	--	--	--	--	0.04	--	0.03	--

NOTES. GRINDING PERFORMED IN STANDARD DENVER 12"x5" DENVER BALL MILL. BALL CHARGE = 40 POUNDS, R.P.M. = 54.

CLASSIFICATION BY DECANTATION THROUGH LIMITING SCREEN, UNDECANTED SANDS REGROUND.

FLOTATION PERFORMED IN DENVER "SUB-A" LABORATORY FLOTATION MACHINE.

Grinding (1)

Time, minutes 10

Classification, mesh

Sands reground, minutes

* The tailing from the mica flotation was ground to minus 100-mesh

(2) Reagent Symbols:

D - Daxad 11
H - Sulphuric Acid
F.O - No. 2 Fuel Oil
P.O - Yarmor F Pine Oil
AT - Armour Industrial Chemical Co. Armac T
800 - 50-50 Mixture of American Cyanamid Promoters 801 and 825
BC - Methyl Isobutyl Carbinol
HF - Hydrofluoric Acid-49%

B.

DENVER EQUIPMENT COMPANY — ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: METALLURGICAL RESULTS

SAMPLE IDENTIFICATION: Minus 10-mesh head ore

REPORT NO. RM-76128 TEST NO. 2

	PRODUCT	Percent Weight	% BeO	% SiO_2	% Al_2O_3	% Fe_2O_3	% ASSAYS % Bi
	Assayed Head		0.43	65.5	22.5	2.02	0.09
	Calculated Head	100.0	0.44	--	--	--	--
1	Primary Slime	17.3	0.27	--	--	--	--
2	Mica Concentrate	18.1	0.10	--	--	--	--
3	Secondary Slime	17.0	0.49	--	--	-	--
4	Cleaned Beryl Conct.	7.7	3.72	--	--	--	0.618
5	Beryl Cleaner Tail	4.2	0.03	--	--	--	--
6	Feldspar Concentrate	29.1	0.02	67.80	20.79	0.098	0.004
7	Rougher Tailing	6.6	0.02	89.14	6.58	0.058	
	Combine Nos. 6 and 7	35.7	0.02	71.80	18.45	0.091	

	PRODUCT	Percent Weight	PERCENT RECOVERY BeO
	Calculated Head	100.0	100.0
	Primary Slime	17.3	10.4
	Mica Concentrate	18.1	4.1
	Secondary Slime	17.0	18.8
	Cleaned Beryl Conct.	7.7	64.8
	Beryl Cleaner Tail	4.2	0.3
	Feldspar Concentrate	29.1	1.3
	Rougher Tailing	6.6	0.3

SCREEN ANALYSIS OF Beryl Flot. Feed

Mesh	Percent Weight	ASSAYS
48	Trace	
65	0.3	
100	3.0	
150	14.2	
200	17.8	
325	34.7	
-325	30.0	
Total	100.0	

A.

DENVER EQUIPMENT COMPANY — ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: CONDITIONS AND REAGENTS

SAMPLE IDENTIFICATION: Minus 10-mesh head ore — REPORT NO. RM-76128 — TEST NO. 3

TEST PROCEDURE: A representative sample of the minus 10-mesh ore was stage ground to minus 20-mesh, then classified by sedimentation procedures to remove a minus 20-micron slime. The sand fraction from classification was conditioned with reagents, then subjected to flotation to remove the mica as a rougher froth concentrate. The flotation tailing was dewatered, then ground to minus 100-mesh. The resulting pulp was conditioned with the reagents shown below and subjected to flotation to obtain a rougher concentrate and a rougher tailing.

Grinding and Treatment				Reagents: Pounds per ton heads—(2)							
Operation 3000 Grams	Time Min.	Percent Solids	pH	D	H	F.O	P.O	AT	S.S.	Na	A
Grinding (1) *	10	50	7.6	-	-	--	--	--	--	--	-
Classification 20 Micron Split				-0.35-		--	--	--	--	--	-
Mica Conditioner	2	40	3.0	-	2.10	0.20	0.28	0.28	--	--	-
Mica Rougher Flot	6	25	3.6	-	1.40	--	0.07	0.45	--	--	-
Beryl Conditioner1	1	50	9.0	-	--	--	--	--	0.25	--	-
Beryl Conditioner2	2	50	9.7	-	--	--	--	--	--	0.14	0.32
Beryl Rougher Flot	3	33	9.7	-	--	--	0.02	--	--	--	-

NOTES: GRINDING PERFORMED IN STANDARD DENVER 12"x5" DENVER BALL MILL. BALL CHARGE = 40 POUNDS, R.P.M. = 54.

CLASSIFICATION BY DECANTATION THROUGH LIMITING SCREEN, UNDECANTED SANDS REGROUND.

FLOTATION PERFORMED IN DENVER "SUB-A" LABORATORY FLOTATION MACHINE.

Grinding (1)

Time, minutes 10
Classification, mesh 20
Sands reground, minutes

* The tailing from the mica flotation was ground to minus 100-mesh

(2) Reagent Symbols:

D - Daxad II
H - Sulphuric Acid
F.O - No. 2 Fuel Oil
P.O - Yarmor F Pine Oil
AT - Armour Industrial Chemical Co. Armac T
S - Sodium Sulfide
Na - Sodium Hydroxide
A - Aeintol PA-2

DENVER EQUIPMENT COMPANY — ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: METALLURGICAL RESULTS

SAMPLE IDENTIFICATION: Minus 10-mesh head ore

REPORT NO. RM-76128 TEST NO. 3

PRODUCT	Percent Weight	ASSAYS % BeO
Assayed Head	-	0.43
Calculated Head	100.0	0.45
Primary Slime	17.3	0.27
Mica Concentrate	18.1	0.10
Rougher Beryl Concentrate	8.1	0.65
Rougher Tailing	56.5	0.60

PRODUCT	Percent Weight	PERCENT RECOVERY BeO
Calculated Head	100.0	100.0
Primary Slime	17.3	10.1
Mica Concentrate	18.1	4.0
Rougher Beryl Concentrate	8.1	11.6
Rougher Tailing	56.5	74.3

SCREEN ANALYSIS OF Beryl Flot. Feed

Mesh	Percent Weight	ASSAYS
48	Trace	
65	0.3	
100	3.0	
150	14.2	
200	17.8	
325	34.7	
-325	30.0	
Total	100.0	

Dale No. 208

6-803
(January 1952)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

~~Note: attach Copies of sample results~~

SUMMARY REPORT OF MINERALS EXAMINATION

State Ariz. County Yavapai Mineral Products Beryl, feldspar, mica, silica

Name of property or deposit Dixie Queen #2

Date examined 3/31/59 Engineer V. B. Dale Date of this report 6/10/59 ~~5/26/59~~

Reason for examination In vicinity of tungsten deposits, Rg. III, Auth. 3423

Engineer accompanied by No one Address

Extent of property Nine unpatented lode claims

Owner John H. Phillips estate, Major shareholder, Dixie Queen Corp. Address 618 W. 7 Lynn Ave. Phoenix, Ariz.

Leased or optioned to unknown Address

Location of property (be specific) Sec. 34, T. 12 N. R. 5 W., in the Weaver Mountains about 8 map miles west of Yarnell.

Type of deposit and mineralogy (brief description) An elliptical-shaped mass of pegmatite carries feldspar, quartz, mica, and beryl. Country rock is Precambrian granite.

Known dimensions of the deposit: major and minor axes, approximate
Length 350 ft. Width 110 ft. Depth plus 60 feet

Attitude of the deposit (strike, dip, etc.) The major axis strikes about N. 65° E.

Possible extensions; correlation of known showings ~~See previous examination Report to W. R. Adams.~~

Mine workings (brief description or attach map or sketch) (indicate whether accessable)
A hillside opencut on northwest facie about 300 feet long and probably 40 feet wide with a face about 30 feet high, are inaccessible but at least 25 feet deep; an accessible adit 100 feet long with 2 - 15-foot raises, and numerous (over) shallow surface workings.

Mining and milling equipment on property A small headframe, a 1,000-pound ore bucket, and 4 shacks about 12 x 12 feet, all in bad state of repair.

Past production (if any) Unknown, but reported to be some mica and 400 sacks of beryl - weight and content unknown.

Present rate of production (if any) None.

Sampling (describe briefly, or attach sketch) Four samples were collected from dumps. See attached sheets for results

Tentative Estimate of Reserves ~~See memorandum report.~~
(Subject to revision when assays are received or after engineering calculations)

Measurable None	tons	Grade
Indicated 30,000	tons	Grade Feldspar - 60% Quartz - 17% Muscovite - 10%
Inferred	tons	~~Grade~~

Mining method (actual or suggested) Open-pit.

Milling or processing method (actual or suggested) Selective flotation.

Processing tests suggested

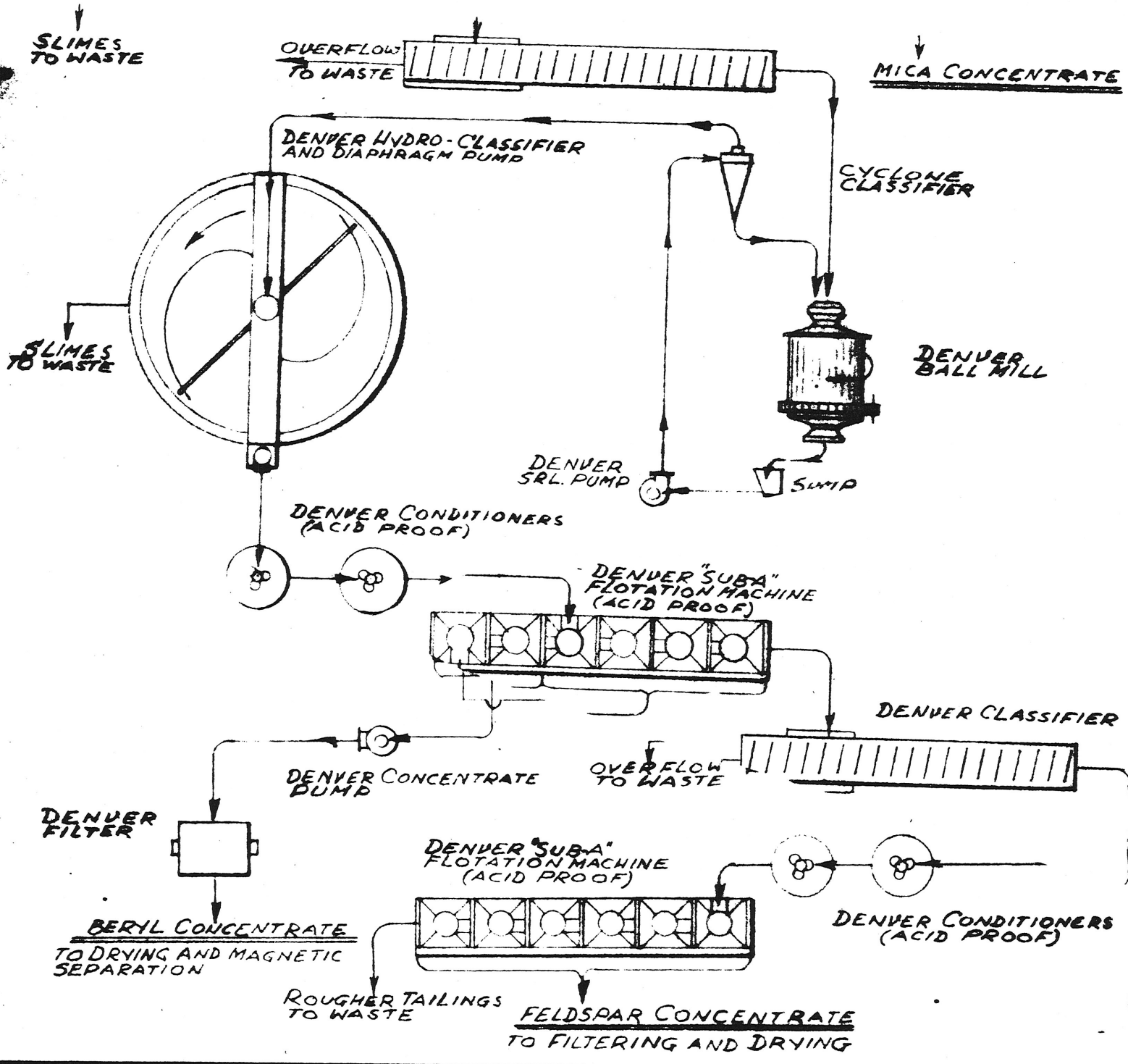
Tentative conclusion and decision A zone of beryl mineralization is worthy of further exploration to determine its extent and content

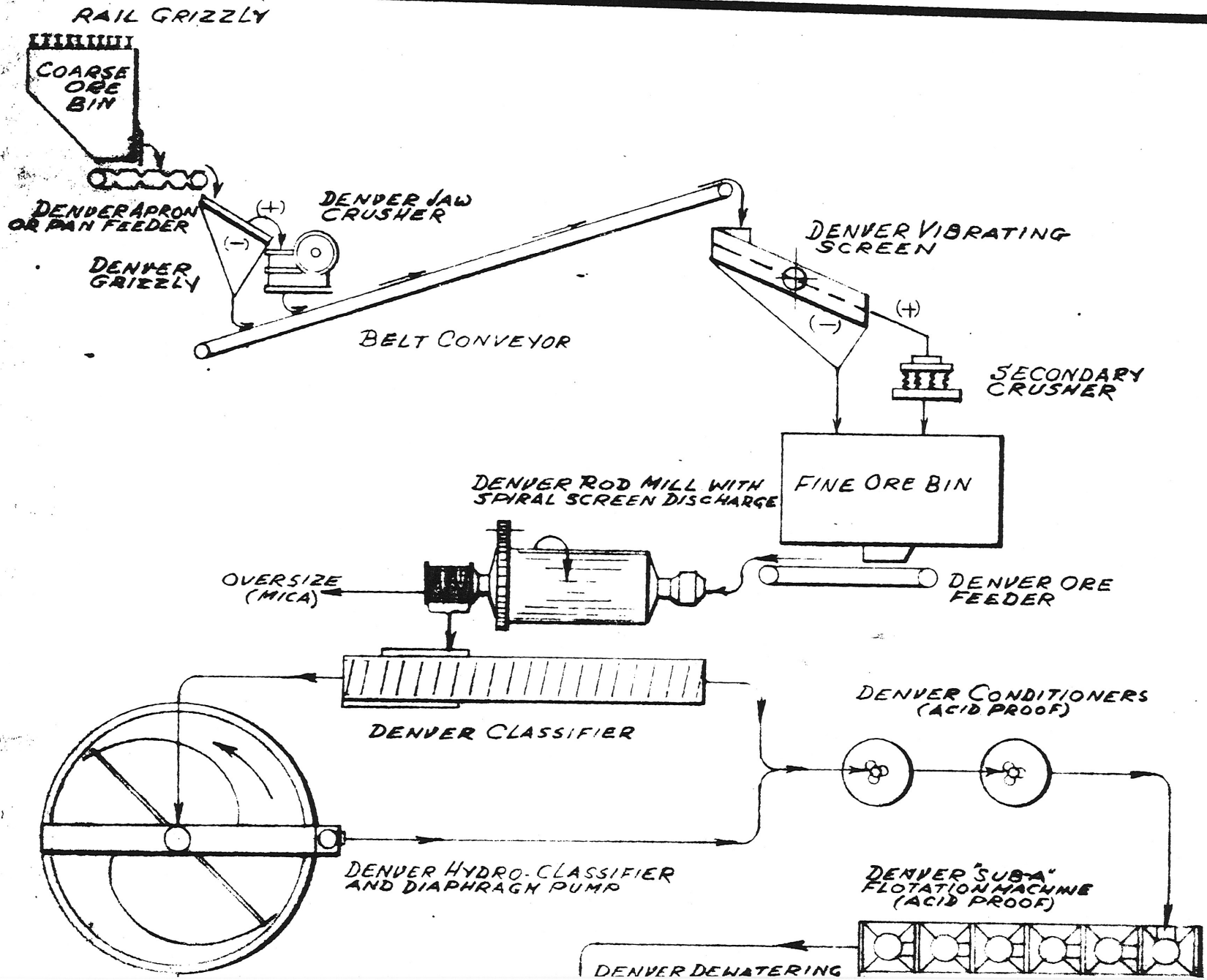
To be accompanied by brief letter giving examining engineer's general impression of the deposit, his impression of the owner, and any other confidential information he may care to submit. Refer to any known prior examinations and reports. May be executed in pencil. Should be mailed within 24 hours after examination is completed.

Send original and one copy to Washington Office.

Interior--Duplicating Section, Washington, D. C.

76412




RAIL GRIZZLY
COARSE ORE BIN
DENVER APRON OR PAN FEEDER
DENVER GRIZZLY
(+)
(−)
DENVER JAW CRUSHER
BELT CONVEYOR
DENVER VIBRATING SCREEN
(+)
(−)
SECONDARY CRUSHER
FINE ORE BIN
DENVER ROD MILL WITH SPIRAL SCREEN DISCHARGE
OVERSIZE (MICA)
DENVER ORE FEEDER
DENVER CLASSIFIER
DENVER CONDITIONERS (ACID PROOF)
DENVER HYDRO-CLASSIFIER AND DIAPHRAGM PUMP
DENVER "SUB-A" FLOTATION MACHINE (ACID PROOF)
DENVER DEWATERING

A

Arizona Beryllium Corporation

P. O. Box 513
PRESCOTT, ARIZONA

MONTE CHRISTO MINE
PEEPLE'S VALLEY
YARNELL, ARIZONA

June 20, 1964.

MEMORANDUM TO THE OFFICERS AND DIRECTORS OF ARIZONA BERYLLIUM CORPORATION.

Your attention is invited to the attached assay report from Hawley and Hawley-

HAWLEY & HAWLEY
ASSAYERS AND CHEMISTS, INC.
1700 W. GRANT RD. at AZTEC • BOX 5934, ANNEX STATION • MAin 2-4836
TUCSON, ARIZONA 85703

BRANCHES
DOUGLAS, ARIZONA
HAYDEN, ARIZONA
EL PASO, TEXAS
AMARILLO, TEXAS

IDENTIFICATION	GOLD OZS	SILVER OZS	LEAD %	COPPER %	ZINC %	INSOL. %	IRON %		
Monti Christo									
#1									
#2									
#3									
#4									

CC: Attn: Mr. Lee ~~Hammons~~ Hammons
ADD: Arizona BeCorp
CITY: 6043 West Missouri Avenue
DD: Glendale, Arizona
ITY:
ACC: ARIZONA BECORP

REMARKS:
$2.00 separation
$40.00 Analysis

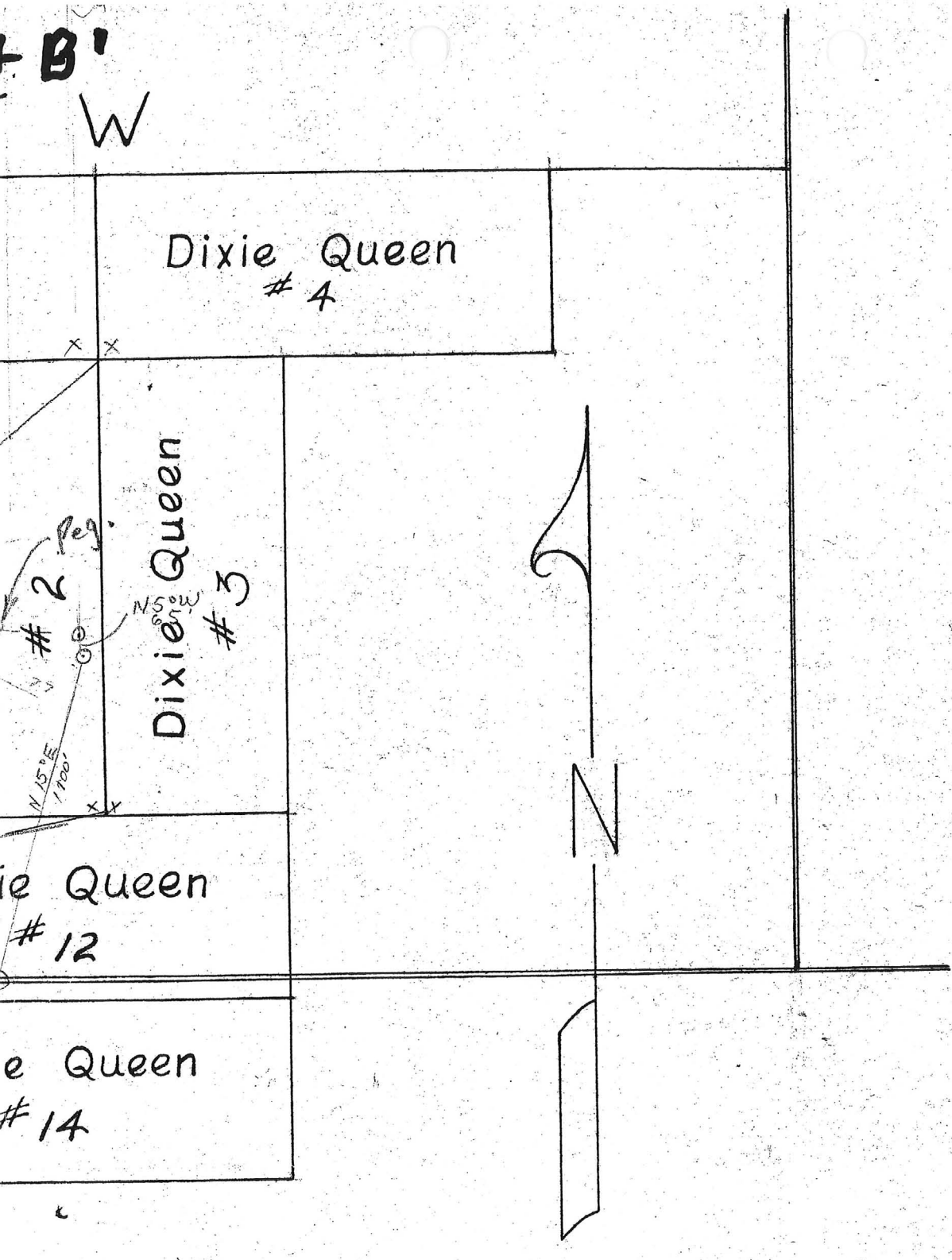
ANALYSIS CERT. BY

DATE SPL. RECEIVED 6-8-64
DATE COMPL 6-24-64
$ $42.00 PAID

These samples were carefully taken and submitted by Lee Hammons (Geologist). They are from channel cut trenches equi-spaced on the dump of the Monti Christo and must be considered as accurately reflecting the BeO values of the same. There is an extremely wide gap between those reported earlier by Dr.Einar C. Erickson in his report "The Economic geology of the Dixie Queen Claims (page 14)". It would appear that Dr. Erickson is in error. This spells the difference between an economical feasible operation of the mine and its being operated at a loss. Further, no one else has found the Chrysoberl the Dr. Erickson talks about. Maybe its at depth ?

Melvin H. Jones

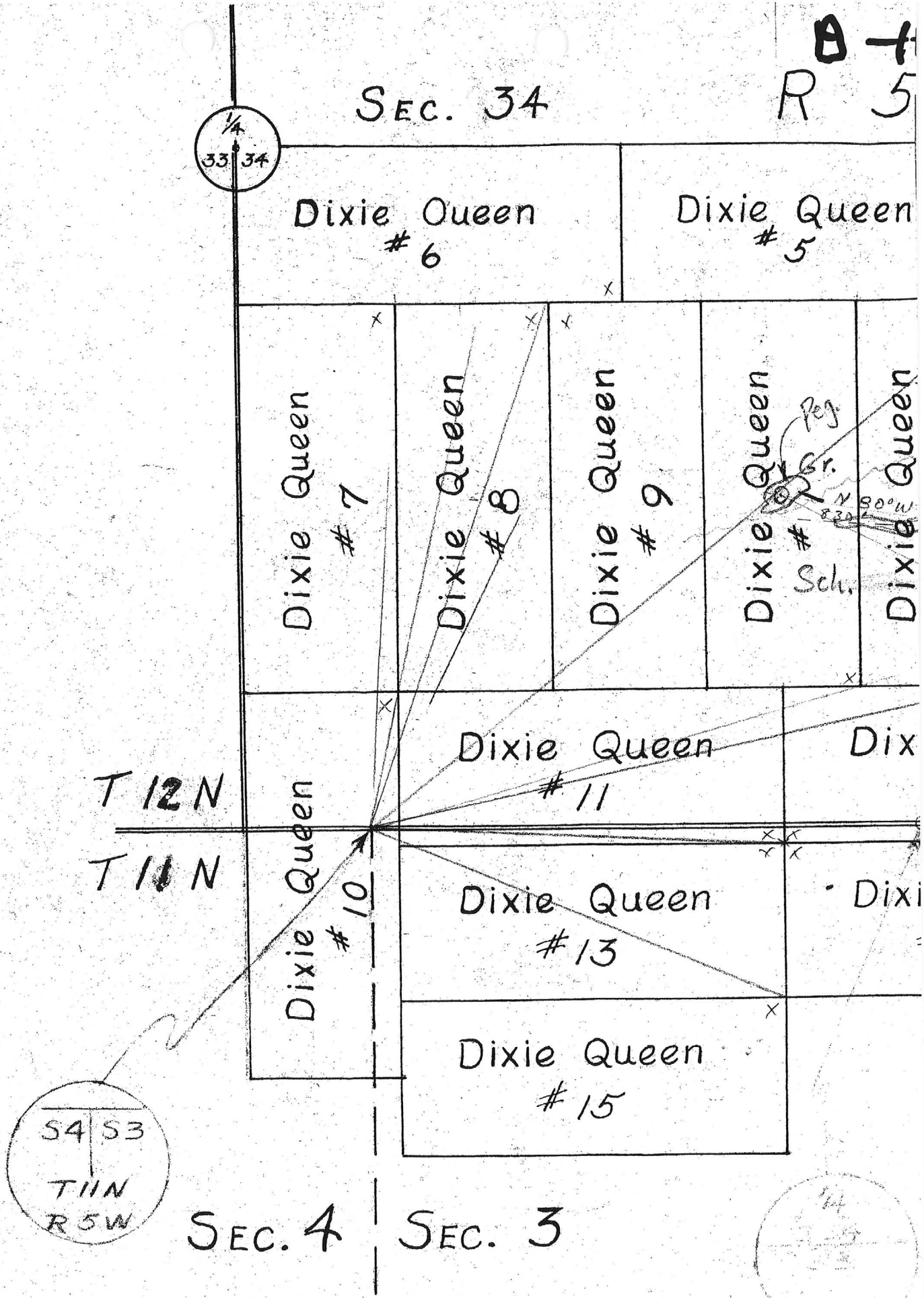
MELVIN H. JONES, Mining Geologist.



SMITH + KENT MINING CLAIMS
Sold to BILL DOOLIN
April 14, 1956

SCALE
1" = 500'

DRAWN BY
G. A. Tognoni


SEC. 34
R 5
1/4
33 34
Dixie Queen #6
Dixie Queen #5
Dixie Queen #7
Dixie Queen #8
Dixie Queen #9
Dixie Queen #
Peg.
Gr.
N 80°W
830'
Sch.
Dixie Queen
Dixie Queen #11
Dix
T 12 N
T 11 N
Dixie Queen #10
Dixie Queen #13
Dixi
Dixie Queen #15
S4 S3
T11N
R5W
SEC. 4
SEC. 3

Dixie Queen No. 5

.52 (not including large crystals)

Bec Crystals

Sec. 34 T. 11 N. R. 51

xTends South ward.

QTz : Boll Quartz Cappin
gR. : Granitized Material-
pegr: Pre Cambrian Granit
A : Altered Matrix Ore.

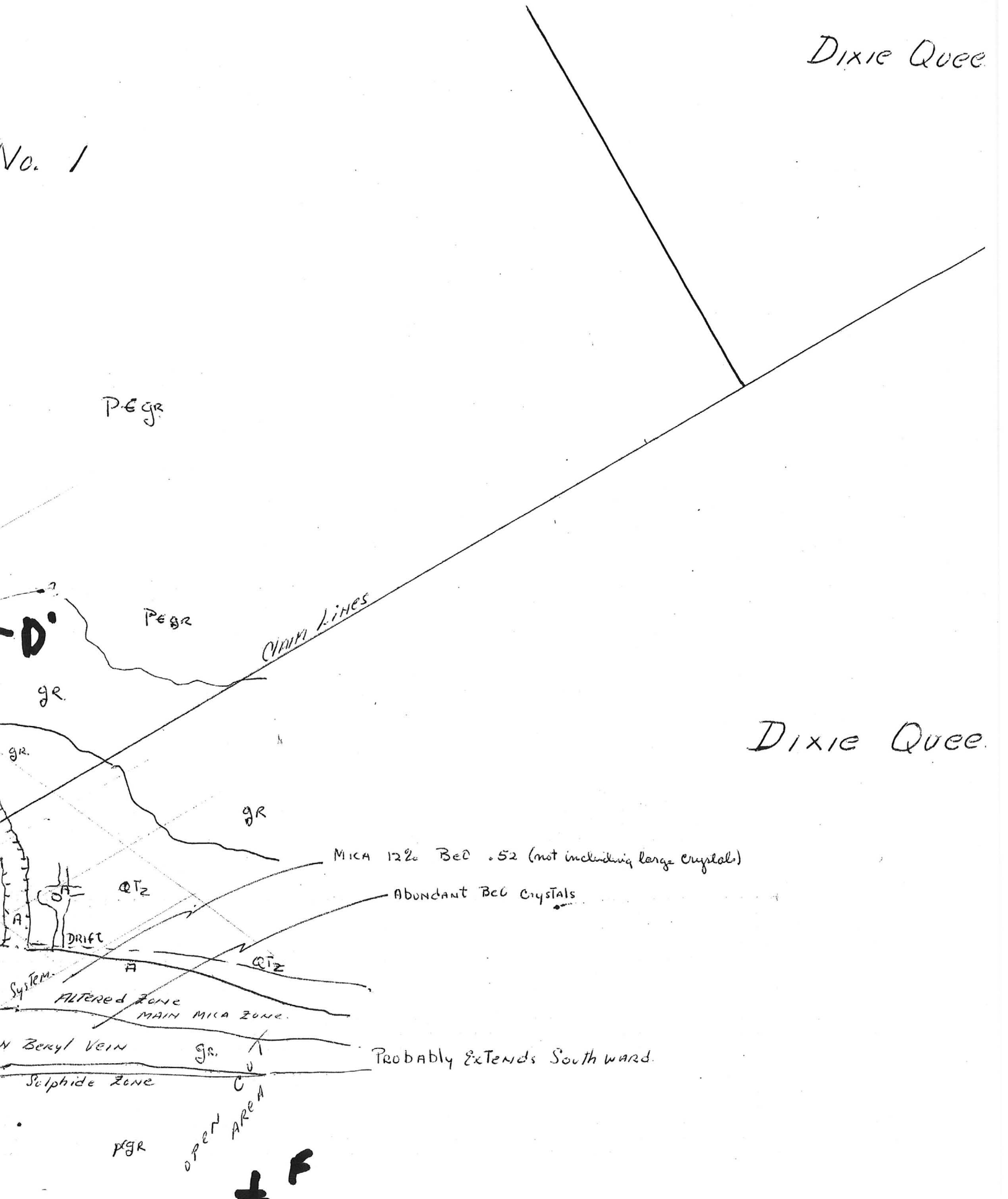
Brunton + Pace Mapping
Oct 23, 1956

DIXIE QUEEN MINE

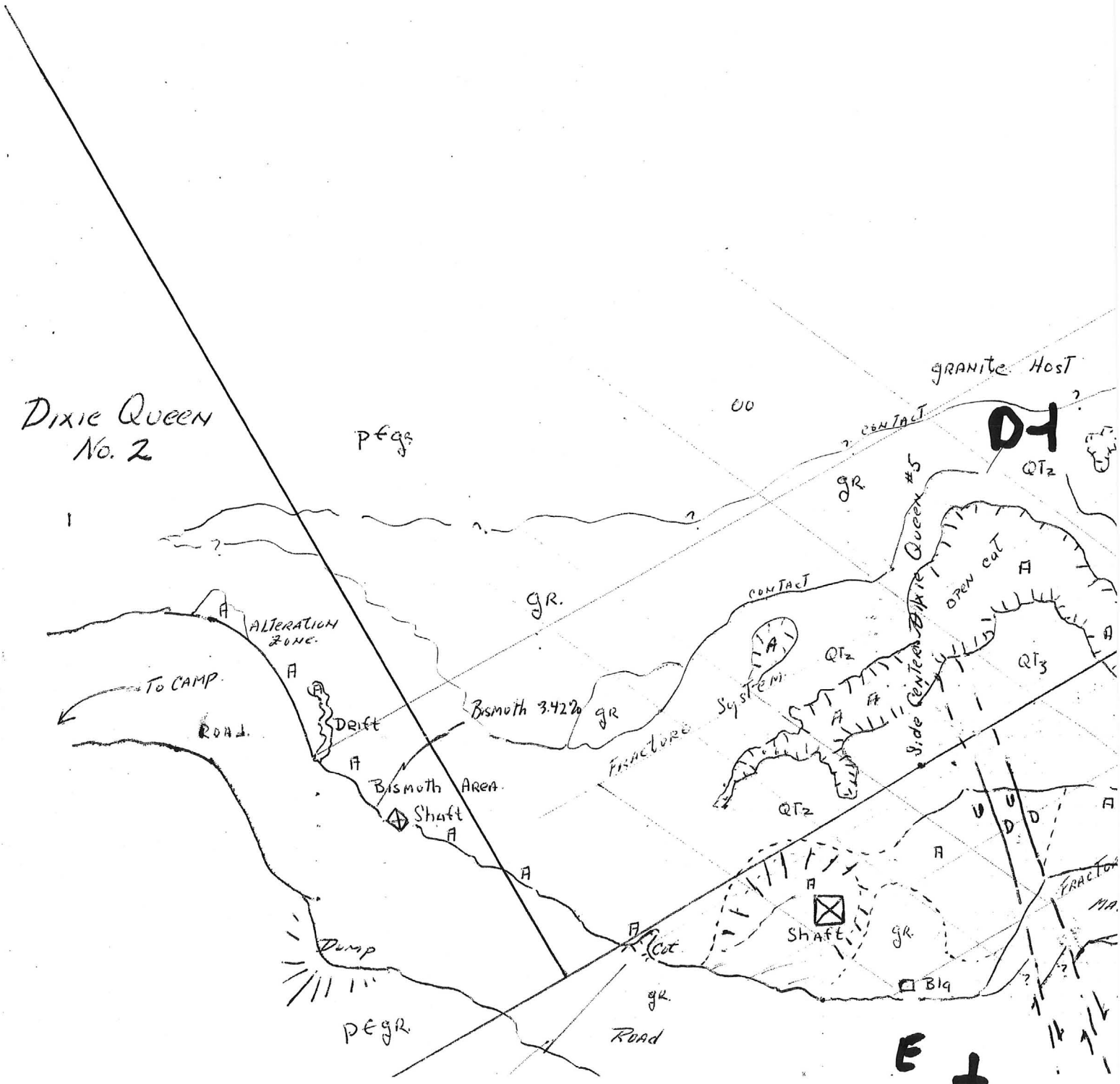
C'

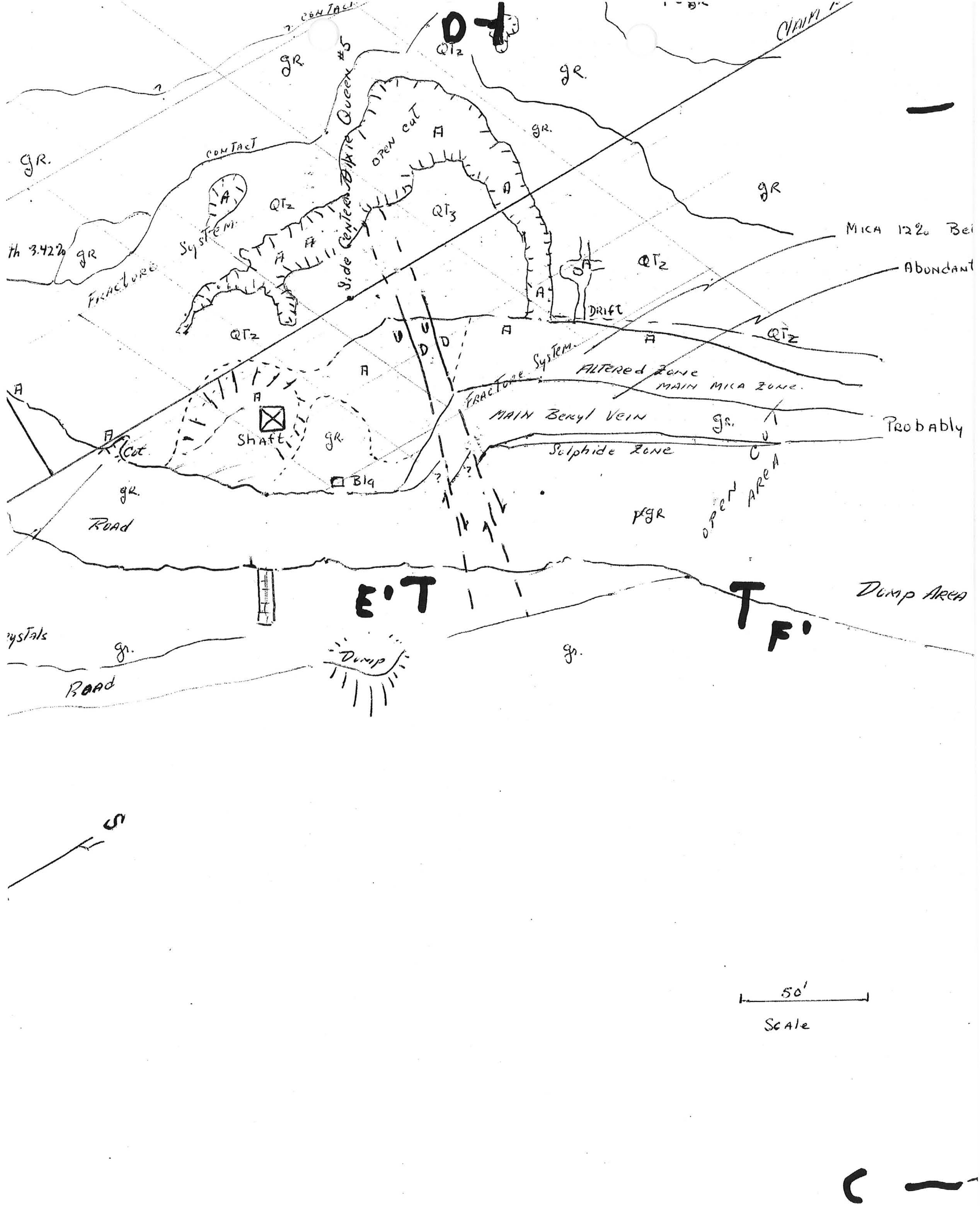
Preliminary Map of Workings

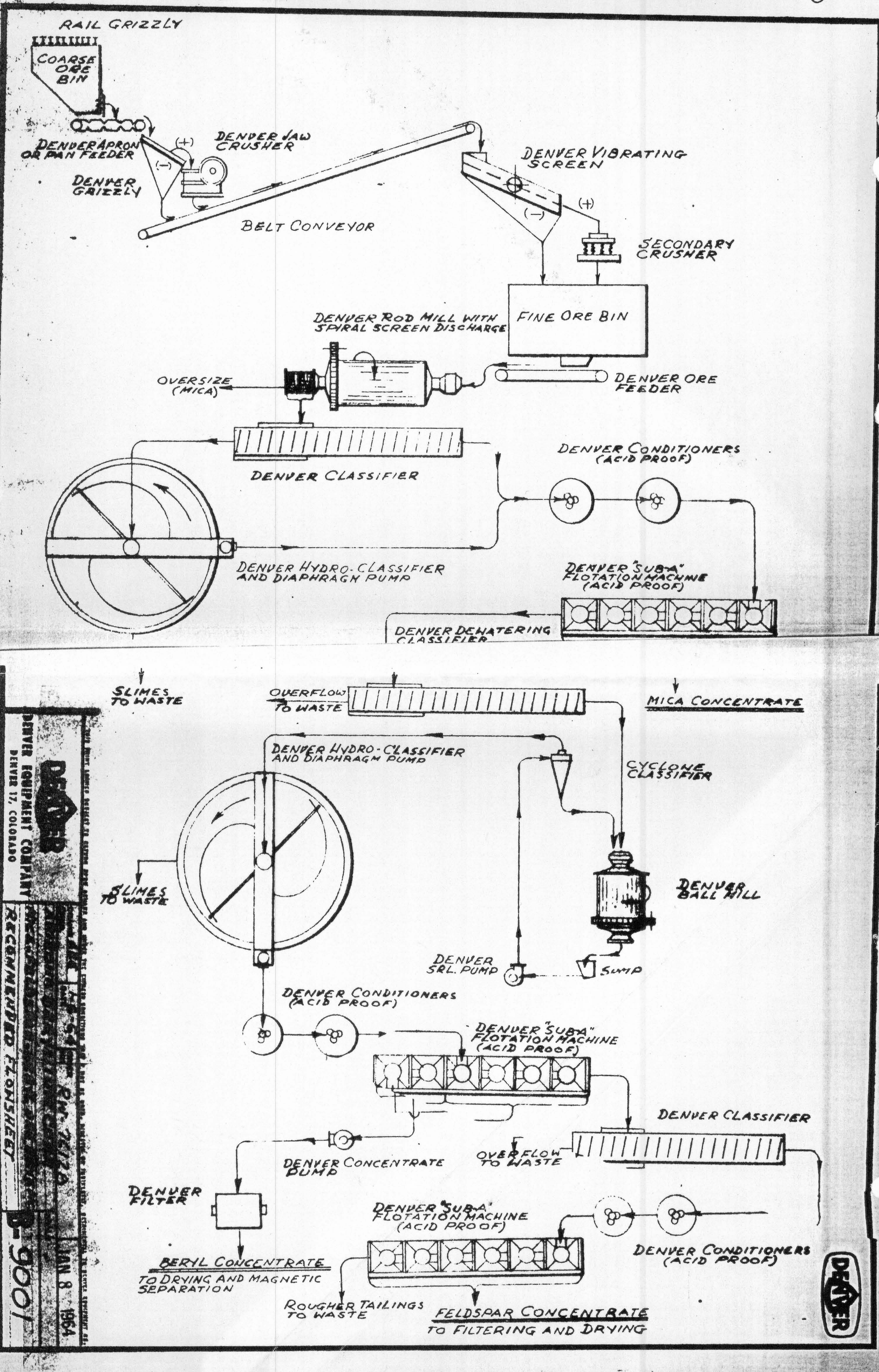
Imon C Gudison, Geo

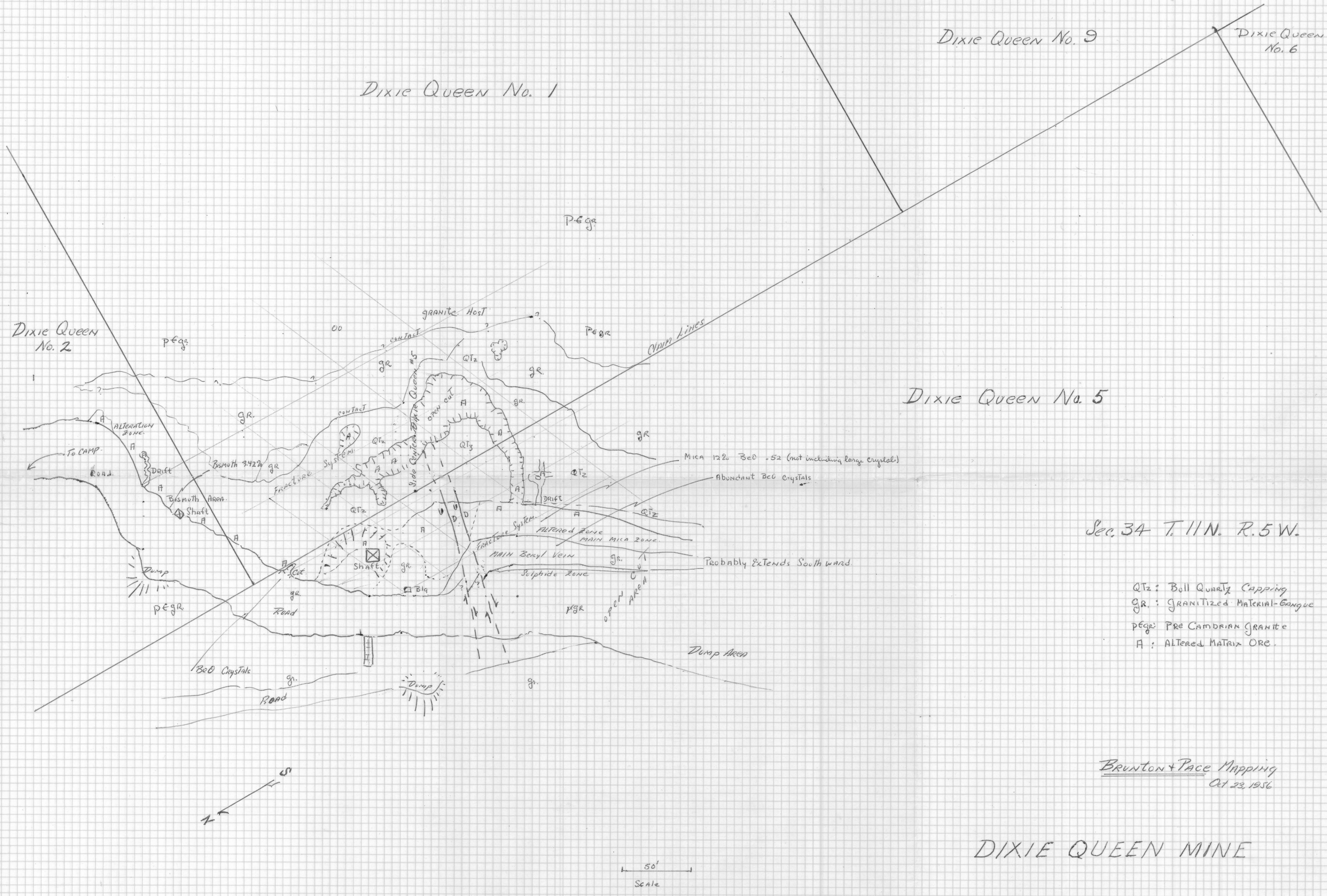

Dixie Quee
No. 1
P.E gr
D'
PEgr
Claim Lines
gr.
gr.
gr
Dixie Quee
MICA 12% BeO .52 (not including large crystals)
Abundant BeO Crystals
QTz
A
DRIFT
QTz
System
ALTERed ZONE
MAIN MICA ZONE.
N Beryl VEIN
gr.
Probably ExTends SouthWard
Sulphide ZONE
C
pegr
OPEN AREA
F

Dixie Queen


Dixie Queen No. 2
granite Host
pegs
CONTACT
gR.
Queen #5
QT2
Alteration Zone
To Camp
Road
Drift
Bismuth 3.42%
Bismuth Area
Shaft
Fracture System
Open cut
Side Center
QT3
Dump
PEGR.
Cut
Shaft
Blg
Road


D
CONTACT
gR.
Queen #5
QTz
gR.
gR.
Dixie Center Side
OPEN CUT
A
gR.
CONTACT
A
QTz
QT3
A
gR
Fracture System
A
A
A
th 3.42%
gR
QTz
MICA 12% Be
Abundant
DRIFT
QTz
U
U
D
D
QTz
A
A
FRACTURE System
ALTERED ZONE
MAIN MICA ZONE
A
A
A
Shaft
gR.
MAIN Beryl VEIN
gR.
Probably
Cut
Sulphide Zone
C
Blg
gR.
pegR
OPEN AREA
ROAD
E' T
T
F'
Dump Area
ystals
gR.
Dump
gR.
ROAD
S
50'
Scale
C


RAIL GRIZZLY
COARSE ORE BIN
DENVER APRON OR PAN FEEDER
DENVER JAW CRUSHER
(+)
(−)
DENVER GRIZZLY
BELT CONVEYOR
DENVER VIBRATING SCREEN
(+)
(−)
SECONDARY CRUSHER
FINE ORE BIN
DENVER ROD MILL WITH SPIRAL SCREEN DISCHARGE
OVERSIZE (MICA)
DENVER ORE FEEDER
DENVER CLASSIFIER
DENVER CONDITIONERS (ACID PROOF)
DENVER HYDRO-CLASSIFIER AND DIAPHRAGM PUMP
DENVER "SUB-A" FLOTATION MACHINE (ACID PROOF)
DENVER DEWATERING CLASSIFIER
SLIMES TO WASTE
OVERFLOW TO WASTE
MICA CONCENTRATE
DENVER HYDRO-CLASSIFIER AND DIAPHRAGM PUMP
CYCLONE CLASSIFIER
DENVER BALL MILL
SLIMES TO WASTE
DENVER SRL. PUMP
SUMP
DENVER CONDITIONERS (ACID PROOF)
DENVER "SUB-A" FLOTATION MACHINE (ACID PROOF)
DENVER CLASSIFIER
OVERFLOW TO WASTE
DENVER CONCENTRATE PUMP
DENVER FILTER
DENVER "SUB-A" FLOTATION MACHINE (ACID PROOF)
DENVER CONDITIONERS (ACID PROOF)
BERYL CONCENTRATE
TO DRYING AND MAGNETIC SEPARATION
ROUGHER TAILINGS TO WASTE
FELDSPAR CONCENTRATE
TO FILTERING AND DRYING
DENVER
DENVER EQUIPMENT COMPANY
DENVER 17, COLORADO
RECOMMENDED FLOWSHEET
B-9001
JAN 8 1964
DENVER



Sec. 34 T. 11N. R. 5W.

QTz : Boll Quartz Capping
gR. : Granitized Material-Gangue
pEgr: Pre Cambrian Granite
A : Altered Matrix Ore.

Brunton + Pace Mapping
Oct. 23, 1956

DIXIE QUEEN MINE

Preliminary Map of Workings

Jason C. Anderson, geologist

SEC. 34 R 5 W

1/4 33 34

Dixie Queen #6

Dixie Queen #5

Dixie Queen #4

Dixie Queen #7

Dixie Queen #8

Dixie Queen #9

Dixie Queen #1

Dixie Queen #2

Dixie Queen #3

Peg.

Gr.

Sch.

N 80° W 830'

N 5° W 660'

N 15° E 1100'

N

T 12 N

T 11 N

Dixie Queen #10

Dixie Queen #11

Dixie Queen #12

Dixie Queen #13

Dixie Queen #14

Dixie Queen #15

S4 S3 T11N R5W

SEC. 4 | SEC. 3

1/4

SMITH + KENT MINING CLAIMS

Sold to BILL DOOLIN

April 14, 1956

SCALE 1" = 500'

DRAWN BY G. A. Tognoni