2/23/54 gla

E. Wm. Ellis, DMEA Member, Uranium Commodity Committee

February 11, 1954

Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee

Report of examination, DMEA Docket 2528 (Uranium) The Bachelor Corp., White Star and Black King claims, San Miguel County, Colorado

The Field Team report concerning exploration on the property identified above has been reviewed. Although the applicant apparently is no longer interested in Government participation to explore this property and the docket has been closed, I concur with the Field Team recommendation that a modified exploration program as set forth in the report is justified.

Copies to: E. Wm. Ellis (2)

E. Wm. Ellis, DMEA Member, Uranium Commodity Committee

February 11, 1954

Arthur P. Butler, Jr., DMEA Member, Uranium Commodity Committee

Report of examination, DMEA Docket #322 (Uranium) The Bachelor Corp., White Star and Black King claims, San Miguel County, Colorado

The Field Team report concerning exploration on the property identified above has been reviewed. Although the applicant apparently is no longer interested in Government participation to explore this property and the docket has been closed, I concur with the Field Team recommendation that a modified exploration program as set forth in the report is justified.

Copies to: E. Wm. Ellis (2)

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : E. Wm. Ellis, DMEA Member, Uranium Commodity Committee

DATE: February 11, 1954

FROM : Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee

SUBJECT: Report of examination, DMEA Docket 2522 (Uranium) The Bachelor Corp., White Star and Black King claims, San Miguel County, Colorado

The Field Team report concerning exploration on the property identified above has been reviewed. Although the applicant apparently is no longer interested in Government participation to explore this property and the docket has been closed, I concur with the Field Team recommendation that a modified exploration program as set forth in the report is justified.

Arthur P. Butler, Jr.

Copies to: E. Wm. Ellis (2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

January 28, 1954

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Report of Examination-Docket No. DMEA 2522 (Uranium), The Bachelor Corporation, White Spar & Black King Claims, San Miguel County, Colorado.

Enclosed are four copies of Report of Examination on the subject docket.

We presume that the applicant is no longer interested in this exploration project since he has failed to reply to our letters. Therefore, the docket has been closed.

W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
2-5-54
(date)

Mining Division
Region IV

July 9, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2522, (Uranium) The Bachelor Corporation, White Spar & Black King Claims, San Miguel County, Colorado

Enclosed are eleven copies of the final engineering report on DMEA 2522.

The estimated cost of the proposed work is $10,000. The work consists of deepening the incline shaft 50 feet and drifting along the bottom of the ore horizon 150 feet.

The examining engineer recommends the proposed work.

We concur in his recommendation.

W. H. King
W. H. King

Reviewed by
DMEA OPERATING COMMITTEE
2-5-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.
200 New Customhouse
Denver 2, Colorado

July 3, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2522, The Bachelor Corporation, Placerville, San Miguel County, Colorado

Attached are 10 copies of the geologic report by D. R. MacLaren covering DMEA Docket 2522, The Bachelor Corporation, Placerville, San Miguel County, Colorado.

The applicant has proposed to sink 285 feet of shaft and drift a total of about 225 feet to explore for uranium ore on two claims, the White Spar and the Black King, about 1½ miles apart. Although a pod of ore has been found on the White Spar claim, there are no other apparent favorable areas on this claim and no further exploration is recommended there.

On the Black King claim, uranium-bearing carbonaceous nodules occur (1) in small pod-like concentrations scattered along northwest-trending, high-angle faults, and (2) adjacent to the faults along the bedding in limey siltstone. Although it appears unlikely that a significant discovery will be made here, MacLaren recommends a modified exploration program to cost about $10,000, to determine whether the small relatively high grade pods become larger and/or more numerous at depth.

I concur in this recommendation.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (10)

Reviewed by
DMEA OPERATING COMMITTEE
2-5-54
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20
Denver Federal Center
Denver 14, Colorado
July 8, 1952

Memorandum

To: Acting Chief, Mining Division, Region IV

From: Chief, Colorado Branch, Mining Division, Region IV

Subject: DMEA 2522 (Uranium), The Bacheler Corporation, White Spar and Black King claims, San Miguel County, Colorado

Please find enclosed the original and ten copies of the "Summary, Conclusions, and Recommendations", by R. R. McLellan and D. R. MacLaren, and of the "Engineering Report", by McLellan, on the above docket.

The applicant submitted a request for a loan of $26,832.50 to perform a rather excessive amount of work that is not justified. McLellan estimates a modified program can be accomplished for $10,000.00, including deepening of the present inclined shaft 50 feet or to the bottom of uranium mineralization and drifting along the bottom of the ore horizon to the mineralized limits or 150 feet, all work to be on the Black King claim.

I concur with McLellan's recommendations.

The brochure submitted with the Region IV Field Team's instructions for examination is returned also.

W. M. Traver, Jr.

W. M. Traver, Jr.

enclosures

WMT/dd

cc 10
DMEA 2522
Chron.

Reviewed by
DMEA OPERATING COMMITTEE
7-5-54
(date)

THE BACHELOR CORPORATION

PLACERVILLE

SAN MIGUEL COUNTY, COLORADO

DMEA DOCKET 2522

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By D. R. MacLaren, U. S. Geological Survey
and
R. R. McLellan, U. S. Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
2-5-54
(date)

THE BACHELOR CORPORATION
PLACERVILLE, SAN MIGUEL COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Bachelor Corporation of Placerville, Colorado, has requested the Defense Minerals Exploration Administration to assist in a program to explore for uranium in the Lower San Miguel Mining District, San Miguel County, Colorado. The applicant proposes to sink 285 feet of shaft and drive 225 feet of drift on the White Spar and Black King claims, about 1½ miles apart, in sec. 35, T. 44 N., R. 11 W., New Mexico Principal Meridian. He estimates this work will cost $20,707.50, of which the Government is to put up $18,636.25.

Carbonaceous nodules, probably containing thucholite, uraninite, and pitchblende, occur in small pod-like concentrations scattered along northwest trending, high angle faults. The solutions that have mineralized the faults have also penetrated the adjacent beds of limey siltstone for an undetermined distance. Although some of the nodules contain up to 9% U_3O_8, the veins as a whole are very low grade.

A limited exploration program is feasible and can be accomplished for approximately $10,000, based on an estimated cost of $71 per foot for sinking and $43 per foot for drifting, estimates include the cost of labor, supplies, and equipment.

The Denver Equipment Company conducted mill tests on ore averaging .565% U_3O_8, from which they were able to produce an ash concentrate containing 10% U_3O_8. However, with mine heads expected to average not more

than .300% U_3O_8, the cost of mining and sorting will be approximately $7,450, plus an additional milling cost of $300, for each ton of 10% ash concentrate worth only $1,600. Therefore, unless the technical problems can be satisfactorily overcome, any discovery would have to be exceptionally large, or of very high grade to be of economic value.

The only justification for further work on this property is the desirability of determining whether or not the carbonaceous nodules become larger or more concentrated with depth. Should the proposed work indicate that they do, then a deep drilling program might be considered with some possibility of discovering a large deposit. Therefore, it is recommended that the application be approved for $10,000, the Government's share to be $9,000, to do the following work on the Black King claim:

1. Deepen the inclined shaft 50 feet, or until the ore is bottomed.

2. Drift along the bottom of the ore, or at the bottom of the shaft, for 150 feet, or until the ore limits are reached.

No further work is recommended on the White Spar.

THE BACHELOR CORPORATION

PLACERVILLE

SAN MIGUEL COUNTY, COLORADO

DMEA DOCKET 2522

Geologic Report

By D. R. MacLaren
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE

2-5-54
(date)

THE BACHELOR CORPORATION
PLACERVILLE, SAN MIGUEL COUNTY, COLORADO

INTRODUCTION

The Bachelor Corporation of Placerville, Colorado, has requested the Defense Minerals Exploration Administration to assist in a program to explore for uranium in the Lower San Miguel Mining District, San Miguel County, Colorado. The applicant proposes to sink 285 feet of shaft and drive 225 feet of drift at an estimated cost of $26,832.50, the Government's share to be $24,149.25. Included in the estimate are:

Revamp mine rails at tunnel, winze, etc.	$ 800
Ore chute and loading bins	450
Blacksmith shop, including welding equipment	1,250
Improvement of 1½ miles of road	1,625
Consulting services	1,500
Not accounted for	500
TOTAL	$6,125

None of these items are necessary requirements of this exploration program and should be deducted from the requested amount, reducing it to $20,707.50, the Government's share to $18,636.25.

The proposed work is to be done on two claims, the White Spar and the Black King, about 1½ miles apart in sec. 35, T. 44 N., R. 11 W., New Mexico Principal Meridian. A northwest striking fault with dips varying from 60° to 85° northeast cuts sediments of the Cutler and the overlying Dolores formations. Along the fault widely scattered small irregular pods of ore have been exposed by pits and trenches.

On the White Spar claim a pod of ore has been outlined by holes drilled from the walls and sides of a 50 foot inclined shaft. The holes

were spaced at five foot intervals down the shaft, and show the deposit to be about 20 feet long, 15 feet thick, and 35 feet deep along the dip of the vein. No other favorable areas for exploration were indicated on this claim.

On the Black King claim there are two areas in which a small tonnage of low grade ore might be developed. One is the possible downward extension of a pod 6 feet long and 2 feet wide, exposed in the tunnel, that has been estimated to contain 10 tons of 1 percent ore for every 10 feet of depth. The other is a bedded deposit that has been exposed about 75 feet north of the fault along which the tunnel has been driven. It has been estimated that possibly 8,000 tons of ore averaging .006% U_3O_8 might be developed for every ten feet of thickness of the deposit.

Although the chances of making a significant discovery on this property are not considered too good, it is recommended that this application be approved for $10,000, the Government's share $9,000, to permit the following work:

1. Deepen the inclined shaft 50 feet, or until the ore is bottomed.
2. Drift along the bottom of the ore for 100 feet, or to the ore limits.

GEOLOGY

The rocks of the district are flat lying sandstones, shales, conglomerates, and a few limey beds of the Cutler, Dolores, Entrada, and Morrison formations. These have been intruded by a few laccolithic masses of diorite porphyry and numerous basic dikes from 3 to 10 feet thick. High angle faults of small displacement are common. Uranium is found

associated with vanadium in the upper 10 to 15 feet of the Entrada, and associated with sulfides along some of the faults.

In the Entrada the ore is in lenticular masses generally bounded above and below by thin shaley seams of barren rock. A few feet below the ore horizon is a prominent light green sandstone bed that contains a finely divided chromium mineral. Uranium occurs as carnotite in sparsely disseminated flakes associated with carbonaceous material and vanadium minerals.

Along the faults the ore is in occasional small pod-like bodies generally favoring the hanging wall. Uranium is in an asphaltic to carbonaceous material, probably a mixture of thucholite, uraninite, and pitchblende, and as fuchsite, associated with chalcopyrite, tennantite, galena, and sphalerite in a gangue of calcite and barite.

On the White Spar claim a northwest trending fault, dipping from 61° to 72° northeast, cuts beds of the Cutler formation. Along the fault shallow pits and trenches have exposed a vein of calcite containing small amounts of chalcopyrite, tennantite, galena, and sphalerite. A shaft has been put down 50 feet along the dip of the vein. In addition to the sulfides of copper, lead, and zinc, an asphaltic, radio-active material occurs as specks and nodules in bits of coarsely to finely ground rock. The Bachelor Corporation has drilled the walls and sides of the shaft at five foot intervals, measured down the dip, and has outlined the limits of the ore body. The latter is a pod-like mass, about 20 feet long, 35 feet deep, and 15 feet thick. No other exposures of the vein were inspected as the applicant stated that they did not show any evidence of uranium mineralization, and were of no interest to the Corporation.

On the Black King claim a fault, probably an extension of the one on the White Spar, strikes northwest and dips from 70° to 85° northeast. It is a normal fault that has dropped the Dolores formation on the hanging wall into contact with the Cutler on the foot wall. A 150 foot tunnel along the fault shows the mineralization to be similar to that on the White Spar with one notable difference. Along the hanging wall, a zone about 35 feet long is heavily impregnated with a light green mineral, probably fuchsite. A few tons of ore have been mined, mostly from the hanging wall, but the exact tonnage and grade are not available. During the summer of 1951, V. R. Wilmarth and R. C. Vickers of the U. S. Geological Survey took 12 channel samples from the tunnel. The highest assay showed only 0.014% U_3O_8. A specially picked sample of one small hydrocarbon pod exposed on the hanging wall assayed 9.00% U_3O_8.

About 25 feet west of the portal of the tunnel is an inclined shaft said to be 48 feet deep. Most of the ore on the stock pile supposedly came from a pod at or near the bottom of the shaft. At the time of the visit, the shaft was flooded to within 15 feet of the collar and was inaccessible. From a pit about 75 feet north of the fault two samples taken by George E. Morehouse of the Division of Raw Materials, Exploration Branch, AEC, assayed 0.45% and 0.88% U_3O_8. The higher assay came from a small steeply dipping vein; the lower from a typical bedded deposit. Both exposures are in the same pit, but the exact relation between the two occurrences is not clear. Wilmarth and Vickers estimate the bedded deposit to be about 8,000 tons from which can be sorted 160 tons of hydrocarbonaceous material, occurring as nodular replacements in limey sediments, that will average 0.300% U_3O_8.

A stock pile, said by the applicant to contain 122 tons of ore averaging 0.663% U_3O_8, has been gathered from the tunnel, the shaft and the pit.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that uranium bearing minerals occur in small pod-like bodies scattered along northwest trending faults, and along the bedding of adjacent limey siltstone. Although there are a few fairly high grade concentrations, they must be measured in terms of pounds rather than tons. Some of the ore bearing nodules are of relatively high grade, but most of the vein is low in uranium content.

Although it appears unlikely that a significant discovery will be made, enough additional work to determine whether or not the small relatively high grade pods might become larger or more concentrated at depth is desirable. Accordingly, it is recommended that a $10,000 exploration loan, the Government's share to be $9,000, be approved to do the following work on the Black King claim:

1. Deepen the inclined shaft 50 feet, or until the ore is bottomed.
2. Drift along the bottom of the ore for 100 feet, or to the ore limits.

No further work is recommended on the White Spar claim.

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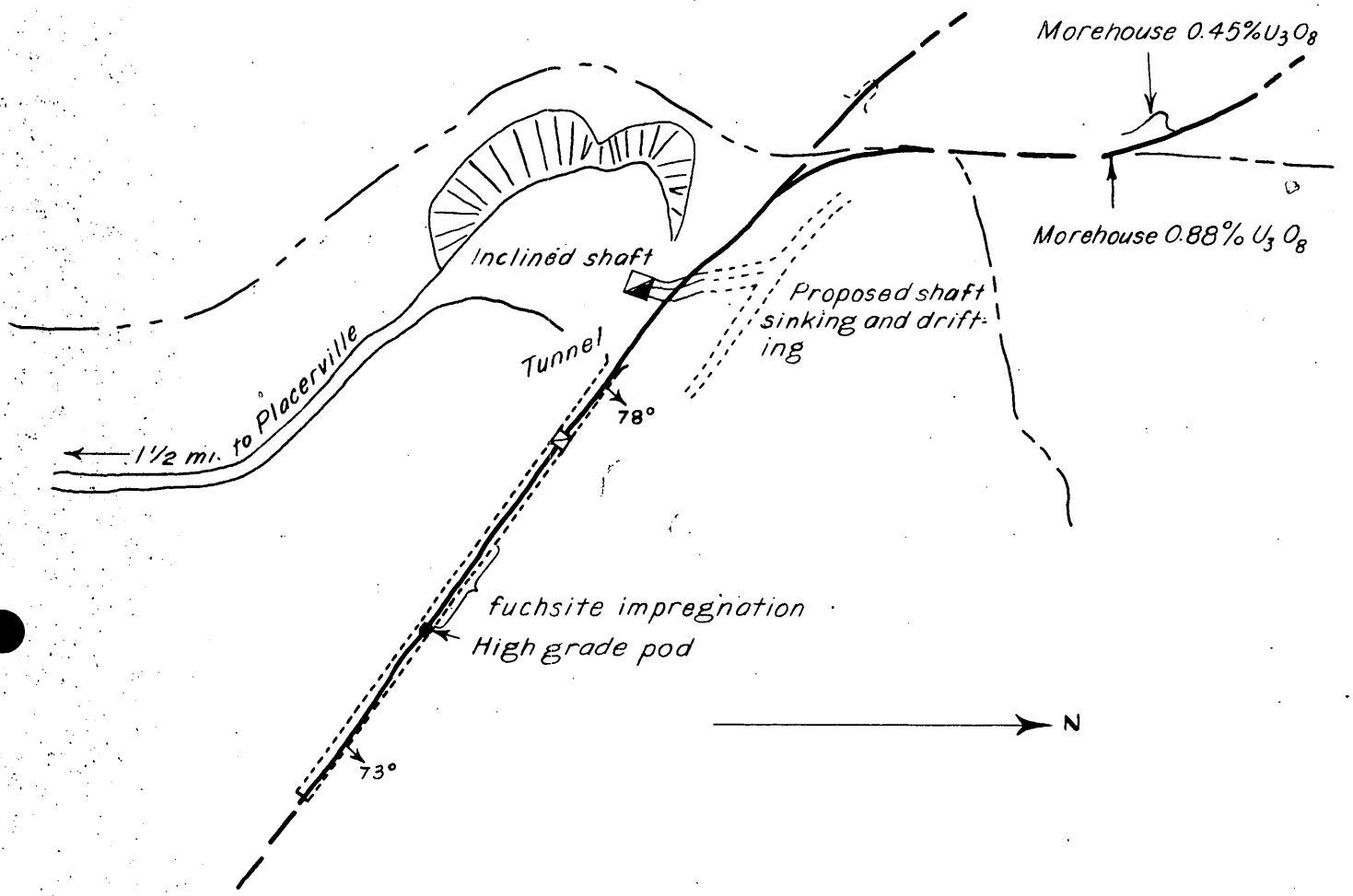
Hess, F. L., Notes on the vanadium deposits near Placerville, Colo.: U. S. Geol. Survey Bull. 530, pp. 150-151, 1911.

Fischer, R. P., Sedimentary deposits of copper, vanadium-uranium, and silver in southwestern United States: Econ. Geology vol. XXXII, pp. 922-930, 1937.

Vanadium deposits of Colorado and Utah: U. S. Geol. Survey Bull. 936-P, pp. 367-371, 1942.

Wilmarth, V. R., and Vickers, R. C., Uranium-bearing hydrocarbon deposits near Placerville, San Miguel County, Colorado: U. S. Geol. Survey, Trace Elements Investigations Report, unpublished.



Department of Interior
U.S. GEOLOGICAL SURVEY

BACHELOR CORPORATION
BLACK KING No. 5 CLAIM

Fig. 2

By D.R. MacLaren after Morehouse

DMEA Docket 2522

June 1952

SCALE

50 0 50 FT.

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 2522, The Bachelor Corporation

White Spar and Black King Claims

San Miguel County, Colorado

Uranium

R. R. McLellan, Mining Engineer
Bureau of Mines

D. R. MacLaren, Geologist
U. S. Geological Survey

July 2, 1952

DMEA 2522

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

Summary, Conclusions, and Recommendations

By R. R. McLellan
Mining Engineer
Bureau of Mines

and

D. R. MacLaren
Geologist
U. S. Geological Survey

DMEA 2522

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By: R. R. McLellan and D. R. MacLaren

The Bachelor Corporation, of Placerville, Colo., has requested the Defense Minerals Exploration Administration in docket 2522 to assist in a program to explore for uranium in the Lower San Miguel Mining District, San Miguel County, Colo. The applicant proposes to sink 285 feet of shaft and drive 225 feet of drift on the White Spar and Black King claims, about 1-1/2 miles apart, in sec. 35, T. 44 N., R. 11 W., N.M.P.M., at an estimated cost of $20,707.50, of which the Government's participation would be $18,636.25.

Carbonaceous nodules, probably containing thucholite, uraninite, and pitchblende, occur in small pod-like concentrations scattered along northwest-trending, high-angle faults. The solutions that have mineralized the faults have also penetrated the adjacent beds of limey siltstone for an undetermined distance. Although some of the nodules contain up to 9 percent U_3O_8, the veins as a whole are very low grade.

A limited exploration program is feasible and can be accomplished for approximately $10,000.00, based on an estimated cost of $71.00 per foot for sinking and $43.00 per foot for drifting; estimates include the cost of labor, supplies, and equipment.

The Denver Equipment Company conducted mill tests on ore averaging 0.565 percent U_3O_8 from which they were able to produce an ash concentrate containing 10 percent U_3O_8. However, with mine heads expected to average

not more than 0.300 percent U_3O_8, the cost of mining and sorting will be approximately $7,450.00 plus an additional milling cost of $300.00, or a total cost of approximately $7,750.00 for each ton of 10 percent ash concentrate worth only $1,600.00. Therefore, unless the technical problems can be satisfactorily overcome, any discovery would have to be exceptionally large or of very high grade to be of economic value.

The only justification for further work on this property is the desirability of determining whether or not the carbonaceous nodules become larger or more concentrated with depth. Should the proposed work indicate that they do, then a deep drilling program might be considered with some possibility of discovering a large deposit. Therefore, it is recommended that the application be approved for $10,000.00, the Government's share to be $9,000.00, to do the following work on the Black King claim:

1. Deepen the inclined shaft 50 feet, or until the ore is bottomed.

2. Drift along the bottom of the ore, or at the bottom of the shaft, for 150 feet, or until the ore limits are reached.

No exploratory work is recommended on the White Spar claim.

DMEA 2522

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

Engineering Report

By R. R. McLellan
Mining Engineer
Bureau of Mines

DMEA 2522

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

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ILLUSTRATIONS

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2. Black King No. 5 claim showing proposed exploration	*

* See figure following geologic report.

DMEA 2522

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

ENGINEERING REPORT

By

R. R. McLellan

INTRODUCTION

The Bachelor Corporation, of Placerville, Colo., has applied for Government assistance to explore for uranium in the Black King and White Spar mines, San Miguel County, Colo. The applicant proposes under Defense Minerals Exploration Administration docket 2522 to spend approximately $26,832.00 for rehabilitation, construction, drifting, and sinking. The Government's share of the cost will be $24,149.00, or 90 percent of the total.

The mines were inspected on May 15, 1952, by D. R. MacLaren, of the U. S. Geological Survey, and S. W. Hazen, Jr., and R. R. McLellan, of the Bureau of Mines, in company with R. I. Ludwig, vice president of the Bachelor Corporation. It was concluded that the proposed exploration would contribute little toward making a significant discovery but that a modified program in the Black King mine would be of definite geological and mineralogical value.

ACKNOWLEDGMENTS

All information, reports, and maps pertaining to the program were provided by R. I. Ludwig who made himself available as a guide to the engineers and the geologist. His cooperation is gratefully acknowledged.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The White Spar mine is 1/2 mile by mine road northeast of Placerville, Colo., in sec. 35, T. 44 N., R. 11 W., N. M. P. M. The Black King No. 5 mine is 2-1/2 miles northwest of Placerville, Colo., in sec. 27, T. 44 N., R. 11 W., N. M. P. M. It is accessible by two mine roads, one leaving State Highway 62 and one leaving State Highway 145. Both junctions are less than a mile from Placerville. The mines, approximately 1-1/2 miles apart, are on the steep north slope of the San Miguel River valley (fig. 1).

Small supply items may be obtained at Telluride, Colo., 16 miles away. Heavy mining and milling equipment may be obtained at Montrose, Colo., 49 miles away, or at Grand Junction, Colo., 112 miles away. There is sufficient water on the Black King No. 5 claim for mining purposes. All water would have to be hauled to the White Spar mine. Electric power is not available or necessary at either mine. Living accomodations are available at Placerville or Telluride.

HISTORY AND PRODUCTION

In 1902, the Black King No. 5, formerly known as the Evens property, allegedly produced a carload of ore averaging 0.11 ounce gold and 3.5 ounces silver per ton, and 14.8 percent copper. Production from 1902 to 1951 amounted to approximately 600 pounds of specimen material. Previous to 1951, the White Spar mine had no recorded production. According to Ludwig, from October 1951 to February 1952, the mines produced a total of 122 tons of ore which averaged 0.663 percent U_3O_8. Most of this ore has been stockpiled on the claims and in Placerville.

OWNERSHIP

The Black King claims Nos. 1, 4, and 5 and the Black King mill site are owned by H. G. Weatherly and J. B. Weatherly, of Grand Junction, Colo., and by G. E. Weatherly, of New Castle, Colo. The group was leased to R. I. Ludwig on October 4, 1951, for a period of five years.

The White Spar claim and the adjacent Barbara Jo, New Discovery, El Capitan, and Angel group 2, 3, 7, and 8 are owned by Boyd and Teresa B. Robinson, of Grand Junction, Colo. The entire group was leased to R. I. Ludwig on October 5, 1951, for a period of five years.

Both leases were assigned to the Bachelor Corporation by Ludwig.

DESCRIPTION OF THE DEPOSITS

The Black King No. 5 and the White Spar prospects are on a major fault that roughly parallels the San Miguel River valley. In the Black King mine, uranium-bearing asphaltic material called thucholite occurs in the fault zone and in the hanging wall zone, the combined thickness of which reached a maximum of 5 feet. Little or no radioactive material was located in the footwall zone. Stringers and isolated pods and lenses of thucholite were encountered for a strike distance of approximately 170 feet and were reported to exist to a known vertical depth of approximately 30 feet in a water-filled incline shaft.

In the White Spar mine, stringers and pods of thucholite have been traced for a strike distance of approximately 20 feet and to a depth of 35 feet in a shaft. The thickness of the mineralized zone does not exceed 3 feet. There is no evidence of radioactive material in the bottom

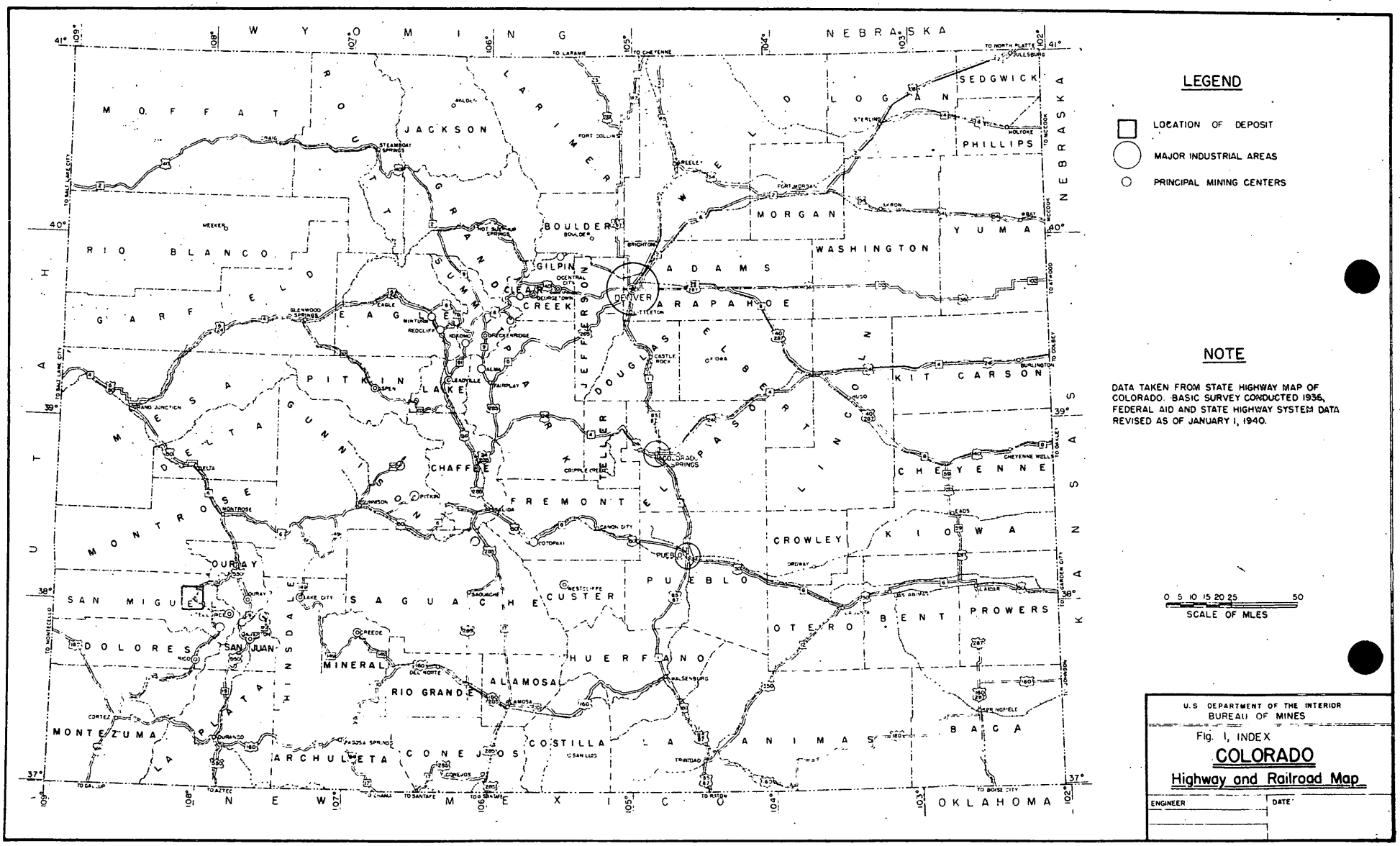

Fig. 1, Location Map, Bachelor Corporation, White Spar and Black King Mines, San Miguel County, Colorado, DMEA 2522

of the 50-foot shaft. The uranium mineralization apparently did not extend beyond the length of 6-foot drill holes that were drilled at regular intervals in the fault zone exposed by the shaft.

The deposits appear to be extremely limited, containing a complex mixture of thucholite, chalcopyrite, pyrite, sphalerite, tetrahedrite, and smaller amounts of numerous other minerals. A radiometric survey conducted by the Atomic Energy Commission failed to indicate the presence of additional uranium-bearing material along the fault between the two mines.

MINEABLE ORE RESERVES

Mineable ore reserves cannot be determined due to the spotty occurrence of the thucholite and due to the fact that the material cannot be classifed as ore until the applicant successfully and economically produces a marketable concentrate. The Atomic Energy Commission has estimated that at the Black King mine there is available approximately 8,000 tons of rock that could be sorted to produce 160 tons of ore containing 0.300 percent U_3O_8.

PRESENT STATUS

Exploration and Development

Exploration and development to date on the Black King No. 5 claim consists of two inclined shafts, one 24 feet deep and one 40 feet deep on the incline at 40°; two drifts, one approximately 150 feet long and one 10 feet long; several open-cuts; and several exploratory jackhammer holes. The applicant was preparing to unwater one incline.

Exploration and development on the White Spar claim consists of one old shaft of unknown depth, one new shaft approximately 50 feet deep, and a few open-cuts along the fault. No additional work was in progress at the mine.

The Atomic Energy Commission has investigated the properties and is contemplating a limited diamond drilling program for the Black King mine.

Mining and Milling Equipment and Other Facilities

Mining equipment and facilities on hand at the examination date consisted of one 220 c.f.m. portable compressor, mine shaft track, winze track, 200 feet of air pipe, 40 feet of jointed jackhammer steel, four tungsten carbide bits, 60 feet of jackhammer steel, small tools, and supplies, one compressor house, one change room and tool shed, one powder house, one mine car, one radiometric geiger scaler, and one assay laboratory.

A 25-ton mill is under construction. Completion is expected in July 1952 at a total cost of $30,000.00. The application implies that the mill is being constructed solely for treatment of White Spar and Black King ore. Ludwig personally stated that custom milling of gold-silver-lead-zinc ores is under consideration. A one-shift, 8-ton-per-day operation is planned for the mill. Rock containing a minimum of 0.300 percent U_3O_8 is considered to be mill grade ore. Denver Equipment Company tests have shown that, with efficient milling of thucholite ore containing 0.565 percent U_3O_8, a carbon and sulphide concentrate may be obtained which, upon ignition, will produce an ash concentrate containing approximately 10 percent U_3O_8. Providing the applicant's milling is as thorough and efficient, approximately 45 tons of crude ore averaging 0.300 percent

U_3O_8 would have to be treated to obtain one ton of ash containing 10 percent U_3O_8. It is estimated that approximately 10 tons of rock would have to be mined and sorted to recover 1 ton of mill-grade ore. Sorting will be a major problem and will have to be accomplished at the rate of at least 80 tons of rock per day to keep the mill in operation.

PROJECT PROPOSALS, WITH COSTS

Proposed Exploration

The applicant has submitted the following proposals for the Black King No. 5 mine:

1. Drive present tunnel 100 additional feet, $3,600.00.
   This proposal is not approved due to a lack of uranium mineralization throughout the final 100 feet of the tunnel.

2. Drive winze an additional 175 feet, $6,482.50.
   A modification of this proposal is recommended in which the footage is reduced to a maximum of 50 feet.

3. Drive 100-foot tunnel in ore face of upper gulley, $3,600.00.
   This proposal is not recommended as the area can be explored to better advantage by drifting from the bottom of the incline.

4. Improve 3/4 mile of new road, $875.00.
   This work is not considered necessary for completion of an exploration project.

5. Open new exploration holes in new ore showings in gulley area, $2,400.00.
   This proposal is not recommended as the area can be explored to better advantage by drifting from the bottom of the incline.

6. Revamp mine rails at tunnel, winze, and gulley, $800.00.
   This work must be done by the applicant in any event and should not be included in the exploration program.

For the White Spar mine the applicant has proposed 50 feet of sinking, 50 feet of drifting, road repairs, and construction of an ore chute and loading bin, at a total cost of $5,825.00. This work is not recommended for approval due to a pronounced lack of favorable geologic evidence for continuation of uranium mineralization beyond the present limit of mine development.

The applicant has submitted an estimate of $1,250.00 for a blacksmith shop, and an estimate of $1,500.00 for consulting services, both of which are not justifiable within the scope of the proposed program.

The total expenditure for the above proposals as submitted by the applicant amounts to $26,832.50. A recommended revised program consists only of sinking and drifting from the Black King No. 5 incline (fig. 2 with geologic report) which should be completed within 4 months. Additional sinking of the incline should not exceed the lower limit of uranium mineralization or exceed a maximum footage of 50 feet. The direction of drifting from the bottom of the incline should be determined by the more promising face, and the amount should not exceed the limit of uranium mineralization or a maximum footage of 150 feet. The cost of sinking is estimated at $71.00 per foot and the cost of drifting at $43.00 per foot for a total expenditure of $10,000.00 which will be distributed as follows:

Labor and Supervision for 4 months:

1 Mine superintendent, $400.00 per month, plus social security and compensation	$1,672.00	
2 Miners, $1.65 per hour, 48-hour week, time and one half for over 40 hours, plus social security and compensation.	1,544.00	
2 Laborers, $1.50 per hour, 48-hour week, time and one half for over 40 hours, plus social security and compensation	1,440.00	$ 4,616.00

Operating materials and supplies:

Timber	$ 200.00	
Explosives, caps and fuse, $2.50 per foot of drift	375.00	
Explosives, caps and fuse, $3.00 per foot of shaft	150.00	
Track, used, 200 feet complete, $0.50 per foot	100.00	
Gasoline, 2,560 gallons, $0.20 per gallon	512.00	
Oil, 20 gallons, $1.20 per gallon	24.00	
Spikes, 4 kegs, $13.00 per keg	52.00	
Bits, 600 throwaway, $0.35 each	210.00	
Pipe, 300 feet, assorted sizes, average $0.55 per foot	165.00	
150 feet assorted drill steel, $1.25 per foot	188.00	
750 feet no.10 waterproof wire, $45.00 per thousand feet	34.00	
Small tools	114.00	
500 feet 3/8-inch wire rope	100.00	$ 2,224.00

Operating equipment: The following equipment will be obtained under a rental-purchase agreement whereby 90 percent of the monthly rental will apply toward the purchase price.

	Monthly rental	Purchase price	
1 210 c.f.m. diesel-driven portable compressor	$342.00	$7,540.00	
1 3-KVA, single-phase, 60-cycle, 120-volt, gas-driven generating plant	51.25	779.00	
1 Air-driven, 1-1/2-inch centrifugal pump	112.00	305.00	
1 55-pound jackhammer with jackleg, complete	86.00	511.00	
100 feet 3/4-inch air hose with couplings	13.20	72.00	
100 feet 3/4-inch water hose with couplings	11.00	80.00	
1 16 hp. gas-driven tugger hoist	73.00	911.00	
3 Mine cars	10.00	540.00	
Total per month	$698.45		
4 months' rental at $698.45 per month, rounded to			$ 2,794.00

Contingencies: Transportation, insurance, and miscellaneous charges should not exceed 366.00

The applicant has indicated that no charges will be claimed for general supervision, accounting, depreciation of equipment, or assaying.

Total $10,000.00

The Government's participation will amount to $9,000.00, or 90 percent of the total expenditure.

CONCLUSIONS

Exploration on the Black King and White Spar properties in the amount of $26,832.50 is not considered justifiable. In the White Spar shaft, uranium mineralization ended at a depth of approximately 35 feet. Systematic drilling of the walls by the applicant determined the strike length of the mineralization. The proposed exploration would serve only to develop the known body of potential ore. Geologic evidence is not favorable for a significant discovery at either mine; however, a revised program for the Black King mine will be of value to obtain geological and mineralogical information at a greater depth along the fault.

It is the opinion of the Bureau engineer that the combined daily production of both mines will not be sufficient to justify or to maintain the milling operation planned by the applicant. By admission of R. I. Ludwig of the Bachelor Corporation, the properties probably will not produce sufficient mill-grade ore to keep the mill in operation for more than 2 weeks of each month.

Mining and milling costs will be so high that the operation cannot hope to succeed on straight thucholite production. Combined mining costs for drifting and stoping probably will average $35.00 per foot, or approximately $15.00 per ton of rock. Approximately 10 tons of rock will have to be sorted to obtain 1 ton of ore containing at least 0.300 percent U_3O_8 for milling purposes. The cost per ton for sorting will be approximately $1.25. With a 75 percent recovery, approximately 45 tons of 0.300 percent ore will have to be milled to obtain 1 ton of ash concentrate

containing 10.0 percent U_3O_8. Each ton of concentrate would be worth approximately $1,600.00 and would be produced at a mining cost of about $6,700.00, at a sorting cost of about $750.00, and at a milling cost of about $300.00, or at a total cost of approximately $7,750.00.

In order to obtain continued production from these deposits, the Government would have to subsidize the operation indefinitely.

RECOMMENDATIONS

It is recommended that a revised exploration program be approved at a cost of approximately $10,000.00. The Government's participation will amount to $9,000.00, or 90 percent of the total. The exploration should be confined to sinking and drifting from the Black King No. 5 incline. Sinking should not progress below the lower limit of uranium mineralization or beyond a maximum depth of 50 feet below the present bottom of the incline. Drifting along the fault in either direction from the lowest point of advance in the incline should not exceed the limit of uranium mineralization or a total footage of 150 feet.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

January 28, 1954

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Report of Examination-Docket No. DMEA 2522 (Uranium), The Bachelor Corporation, White Spar & Black King Claims, San Miguel County, Colorado.

Enclosed are four copies of Report of Examination on the subject docket.

We presume that the applicant is no longer interested in this exploration project since he has failed to reply to our letters. Therefore, the docket has been closed.

W. H. King

W. H. King

Enclosures

Mining Division
Region IV

July 9, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2522, (Uranium) The Bachelor Corporation, White Spar & Black King Claims, San Miguel County, Colorado

Enclosed are eleven copies of the final engineering report on DMEA 2522.

The estimated cost of the proposed work is $10,000. The work consists of deepening the incline shaft 50 feet and drifting along the bottom of the ore horizon 150 feet.

The examining engineer recommends the proposed work.

We concur in his recommendation.

W. H. King

W. H. King

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

200 New Customhouse
Denver 2, Colorado

July 3, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2522, The Bachelor Corporation, Pleasanville, San Miguel County, Colorado

Attached are 10 copies of the geologic report by D. R. MacLaren covering DMEA Docket 2522, The Bachelor Corporation, Pleasanville, San Miguel County, Colorado.

The applicant has proposed to sink 285 feet of shaft and drift a total of about 225 feet to explore for uranium ore on two claims, the White Spar and the Black King, about 1½ miles apart. Although a pod of ore has been found on the White Spar claim, there are no other apparent favorable areas on this claim and no further exploration is recommended there.

On the Black King claim, uranium-bearing carbonaceous nodules occur (1) in small pod-like concentrations scattered along northwest-trending, high-angle faults, and (2) adjacent to the faults along the bedding in limy siltstone. Although it appears unlikely that a significant discovery will be made here, MacLaren recommends a modified exploration program to cost about $10,000, to determine whether the small relatively high grade pods become larger and/or more numerous at depth.

I concur in this recommendation.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (10)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20
Denver Federal Center
Denver 14, Colorado
July 8, 1958

Memorandum

To: Acting Chief, Mining Division, Region IV

From: Chief, Colorado Branch, Mining Division, Region IV

Subject: DMMA 2322 (Uranium), The Bachelor Corporation, White Spar and Black King claims, San Miguel County, Colorado

Please find enclosed the original and ten copies of the "Summary, Conclusions, and Recommendations", by R. R. McLellan and R. R. Mackaron, and of the "Engineering Report", by McLellan, on the above docket.

The applicant submitted a request for a loan of $26,832.50 to perform a rather excessive amount of work that is not justified. McLellan estimates a modified program can be accomplished for $10,000.00, including deepening of the present inclined shaft 50 feet or to the bottom of uranium mineralization and drifting along the bottom of the ore horizon to the mineralized limits or 150 feet, all work to be on the Black King claim.

I concur with McLellan's recommendations.

The brochure submitted with the Region IV Field Team's instructions for examination is returned also.

W. M. Traver, Jr.

W. M. Traver, Jr.

enclosures

WMT/dd

cc 10
DMMA 2322
Chron.

THE BACHELOR CORPORATION

PLACERVILLE

SAN MIGUEL COUNTY, COLORADO

DMEA DOCKET 2522

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By D. R. McLaren, U. S. Geological Survey
and
R. R. McLellan, U. S. Bureau of Mines

THE BACHELOR CORPORATION
PLACERVILLE, SAN MIGUEL COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Bachelor Corporation of Placerville, Colorado, has requested the Defense Minerals Exploration Administration to assist in a program to explore for uranium in the Lower San Miguel Mining District, San Miguel County, Colorado. The applicant proposes to sink 285 feet of shaft and drive 229 feet of drift on the White Spar and Black King claims, about 1½ miles apart, in sec. 35, T. 44 N., R. 11 W., New Mexico Principal Meridian. He estimates this work will cost $20,707.50, of which the Government is to put up $18,636.25.

Carbonaceous nodules, probably containing thucholite, uraninite, and pitchblende, occur in small pod-like concentrations scattered along northwest trending, high angle faults. The solutions that have mineralized the faults have also penetrated the adjacent beds of limey siltstone for an undetermined distance. Although some of the nodules contain up to 9% U_3O_8, the veins as a whole are very low grade.

A limited exploration program is feasible and can be accomplished for approximately $10,000, based on an estimated cost of $71 per foot for sinking and $43 per foot for drifting, estimates include the cost of labor, supplies, and equipment.

The Denver Equipment Company conducted mill tests on ore averaging .365% U_3O_8, from which they were able to produce an ash concentrate containing 10% U_3O_8. However, with mine heads expected to average not more

than .300% U_3O_8, the cost of mining and sorting will be approximately $7,450, plus an additional milling cost of $300, for each ton of 10% ash concentrate worth only $1,600. Therefore, unless the technical problems can be satisfactorily overcome, any discovery would have to be exceptionally large, or of very high grade to be of economic value.

The only justification for further work on this property is the desirability of determining whether or not the carbonaceous nodules become larger or more concentrated with depth. Should the proposed work indicate that they do, then a deep drilling program might be considered with some possibility of discovering a large deposit. Therefore, it is recommended that the application be approved for $10,000, the Government's share to be $9,000, to do the following work on the Black King claim:

1. Deepen the inclined shaft 50 feet, or until the ore is bottomed.

2. Drift along the bottom of the ore, or at the bottom of the shaft, for 150 feet, or until the ore limits are reached.

No further work is recommended on the White Spar.

THE BACHELOR CORPORATION

PLACERVILLE

SAN MIGUEL COUNTY, COLORADO

DMEA DOCKET 2522

Geologic Report

By D. R. MacLaren
U. S. Geological Survey

THE BACHELOR CORPORATION
PLACERVILLE, SAN MIGUEL COUNTY, COLORADO

INTRODUCTION

The Bachelor Corporation of Placerville, Colorado, has requested the Defense Minerals Exploration Administration to assist in a program to explore for uranium in the Lower San Miguel Mining District, San Miguel County, Colorado. The applicant proposes to sink 285 feet of shaft and drive 225 feet of drift at an estimated cost of $26,832.50, the Government's share to be $24,149.25. Included in the estimate are:

Revamp mine rails at tunnel, winze, etc.	$ 800
Ore chute and loading bins	450
Blacksmith shop, including welding equipment	1,250
Improvement of 1½ miles of road	1,625
Consulting services	1,500
Not accounted for	500
TOTAL	$6,125

None of these items are necessary requirements of this exploration program and should be deducted from the requested amount, reducing it to $20,707.50, the Government's share to $18,636.25.

The proposed work is to be done on two claims, the White Spar and the Black King, about 1½ miles apart in sec. 35, T. 44 N., R. 11 W., New Mexico Principal Meridian. A northeast striking fault with dips varying from 60° to 85° northeast cuts sediments of the Cutler and the overlying Dolores formations. Along the fault widely scattered small irregular pods of ore have been exposed by pits and trenches.

On the White Spar claim a pod of ore has been outlined by holes drilled from the walls and sides of a 50 foot inclined shaft. The holes

were spaced at five foot intervals down the shaft, and show the deposit to be about 20 feet long, 15 feet thick, and 35 feet deep along the dip of the vein. No other favorable areas for exploration were indicated on this claim.

On the Black Kieg claim there are two areas in which a small tonnage of low grade ore might be developed. One is the possible downward extension of a pod 6 feet long and 2 feet wide, exposed in the tunnel, that has been estimated to contain 10 tons of 1 percent ore for every 10 feet of depth. The other is a bedded deposit that has been exposed about 75 feet north of the fault along which the tunnel has been driven. It has been estimated that possibly 6,000 tons of ore averaging .005% U_3O_8 might be developed for every ten feet of thickness of the deposit.

Although the chances of making a significant discovery on this property are not considered too good, it is recommended that this application be approved for $10,000, the Government's share $9,000, to permit the following work:

1. Deepen the inclined shaft 30 feet, or until the ore is bottomed.
2. Drift along the bottom of the ore for 100 feet, or to the ore limits.

GEOLOGY

The rocks of the district are flat lying sandstones, shales, conglomerates, and a few limey beds of the Cutler, Dolores, Entrada, and Morrison formations. These have been intruded by a few laccolithic masses of diorite porphyry and numerous basic dikes from 3 to 10 feet thick. High angle faults of small displacement are common. Uranium is found

associated with vanadium in the upper 10 to 15 feet of the Entrada, and associated with sulfides along some of the faults.

In the Entrada the ore is in lenticular masses generally bounded above and below by thin shaley zones of barren rock. A few feet below the ore horizon is a prominent light green sandstone bed that contains a finely divided chromium mineral. Uranium occurs as carnotite in sparsely disseminated flakes associated with carbonaceous material and vanadium minerals.

Along the faults the ore is in occasional small pod-like bodies generally favoring the hanging wall. Uranium is in an asphaltic to carbonaceous material, probably a mixture of thucholite, uraninite, and pitchblende, and as fuchsite, associated with chalcopyrite, tennantite, galena, and sphalerite in a gangue of calcite and barite.

On the White Spar claim a northeast trending fault, dipping from 65° to 72° northeast, cuts beds of the Cutler formation. Along the fault shallow pits and trenches have exposed a vein of calcite containing small amounts of chalcopyrite, tennantite, galena, and sphalerite. A shaft has been put down 30 feet along the dip of the vein. In addition to the sulfides of copper, lead, and zinc, an asphaltic, radioactive material occurs as specks and nodules in bits of coarsely to finely ground rock. The Bachelor Corporation has drilled the walls and sides of the shaft at five feet intervals, measured down the dip, and has outlined the limits of the ore body. The latter is a pod-like mass, about 20 feet long, 30 feet deep, and 15 feet thick. No other exposures of the vein were inspected as the applicant stated that they did not show any evidence of uranium mineralization, and were of no interest to the Corporation.

On the Black King claim a fault, probably an extension of the one on the White Spar, strikes northeast and dips from 70° to 85° northeast. It is a normal fault that has dropped the Dolores formation on the hanging wall into contact with the Cutler on the foot wall. A 150 foot tunnel along the fault shows the mineralization to be similar to that on the White Spar with one notable difference. Along the hanging wall, a zone about 35 feet long is heavily impregnated with a light green mineral, probably fuchsite. A few tons of ore have been mined, mostly from the hanging wall, but the exact tonnage and grade are not available. During the summer of 1951, V. R. Wilmarth and R. C. Vickers of the U. S. Geological Survey took 12 channel samples from the tunnel. The highest assay showed only 0.014% U_3O_8. A specially picked sample of one small hydrocarbon pod exposed on the hanging wall assayed 9.00% U_3O_8.

About 25 feet west of the portal of the tunnel is an inclined shaft said to be 48 feet deep. Most of the ore on the stock pile supposedly came from a pod at or near the bottom of the shaft. At the time of the visit, the shaft was flooded to within 15 feet of the collar and was inaccessible. From a pit about 75 feet north of the fault two samples taken by George E. Moreheuse of the Division of Raw Materials, Exploration Branch, AEC, assayed 0.4% and 0.08% U_3O_8. The higher assay came from a small steeply dipping vein; the lower from a typical bedded deposit. Both exposures are in the same pit, but the exact relation between the two occurrences is not clear. Wilmarth and Vickers estimate the bedded deposit to be about 8,000 tons from which can be sorted 160 tons of hydrocarbonaceous material, occurring as nodular replacements in limey sediments, that will average 0.300% U_3O_8.

A stock pile, said by the applicant to contain 122 tons of ore averaging 0.663% U_3O_8, has been gathered from the tunnel, the shaft and the pit.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that uranium bearing minerals occur in small pod-like bodies scattered along northeast trending faults, and along the bedding of adjacent limey siltstone. Although there are a few fairly high grade concentrations, they must be measured in terms of pounds rather than tons. Some of the ore bearing nodules are of relatively high grade, but most of the vein is low in uranium content.

Although it appears unlikely that a significant discovery will be made, enough additional work to determine whether or not the small relatively high grade pods might become larger or more concentrated at depth is desirable. Accordingly, it is recommended that a $10,000 exploration loan, the Government's share to be $9,000, be approved to do the following work on the Black King claim:

1. Deepen the inclined shaft 50 feet, or until the ore is bottomed.

2. Drift along the bottom of the ore for 100 feet, or to the ore limits.

No further work is recommended on the White Spar claim.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 2522, The Bachelor Corporation

White Spar and Black King Claims

San Miguel County, Colorado

Uranium

R. R. McLellan, Mining Engineer
Bureau of Mines

D. R. MacLaren, Geologist
U. S. Geological Survey

July 2, 1952

DMEA 2302

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

Summary, Conclusions, and Recommendations

By R. R. McLellan
Mining Engineer
Bureau of Mines

and

D. R. Mackeran
Geologist
U. S. Geological Survey

DMEA 2522

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By: R. R. McLellan and D. R. MacLaren

The Bachelor Corporation, of Placerville, Colo., has requested the Defense Minerals Exploration Administration in docket 2522 to assist in a program to explore for uranium in the Lower San Miguel Mining District, San Miguel County, Colo. The applicant proposes to sink 265 feet of shaft and drive 225 feet of drift on the White Spar and Black King claims, about 1-1/2 miles apart, in sec. 35, T. 44 N., R. 11 W., N.M.P.M., at an estimated cost of $20,707.50, of which the Government's participation would be $18,636.25.

Carbonaceous nodules, probably containing thucholite, uraninite, and pitchblende, occur in small pod-like concentrations scattered along northwest-trending, high-angle faults. The solutions that have mineralized the faults have also penetrated the adjacent beds of limey siltstone for an undetermined distance. Although some of the nodules contain up to 9 percent U_3O_8, the veins as a whole are very low grade.

A limited exploration program is feasible and can be accomplished for approximately $10,000.00, based on an estimated cost of $71.00 per foot for sinking and $43.00 per foot for drifting; estimates include the cost of labor, supplies, and equipment.

The Denver Equipment Company conducted mill tests on ore averaging 0.565 percent U_3O_8 from which they were able to produce an ash concentrate containing 10 percent U_3O_8. However, with mine heads expected to average

not more than 0.300 percent U_3O_8, the cost of mining and sorting will be approximately $7,450.00 plus an additional milling cost of $300.00, or a total cost of approximately $7,750.00 for each ton of 10 percent ash concentrate worth only $1,600.00. Therefore, unless the technical problems can be satisfactorily overcome, any discovery would have to be exceptionally large or of very high grade to be of economic value.

The only justification for further work on this property is the desirability of determining whether or not the carbonaceous nodules become larger or more concentrated with depth. Should the proposed work indicate that they do, then a deep drilling program might be considered with some possibility of discovering a large deposit. Therefore, it is recommended that the application be approved for $10,000.00, the Government's share to be $9,000.00, to do the following work on the Black King claim:

1. Deepen the inclined shaft 30 feet, or until the ore is bottomed.

2. Drift along the bottom of the ore, or at the bottom of the shaft, for 150 feet, or until the ore limits are reached.

No exploratory work is recommended on the White Spar claim.

DMEA 2302

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

Engineering Report

By R. R. McLellan
Mining Engineer
Bureau of Mines

DMEA 2522

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

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ILLUSTRATIONS

Figure	Follows Page
1. Location map, Bachelor Corporation, White Spar and Black King Mines, San Miguel County, Colorado	2
2. Black King No. 5 claim showing proposed exploration	*

*See figure following geologic report.

DMEA 2582

THE BACHELOR CORPORATION
WHITE SPAR AND BLACK KING CLAIMS
SAN MIGUEL COUNTY, COLORADO

ENGINEERING REPORT

By

R. R. McLellan

INTRODUCTION

The Bachelor Corporation, of Placerville, Colo., has applied for Government assistance to explore for uranium in the Black King and White Spar mines, San Miguel County, Colo. The applicant proposes under Defense Minerals Exploration Administration docket 2582 to spend approximately $36,832.00 for rehabilitation, construction, drifting, and sinking. The Government's share of the cost will be $24,149.00, or 50 percent of the total.

The mines were inspected on May 15, 1952, by D. R. MacLaren, of the U. S. Geological Survey, and S. W. Bacon, Jr., and R. R. McLellan, of the Bureau of Mines, in company with R. I. Ludwig, vice president of the Bachelor Corporation. It was concluded that the proposed exploration would contribute little toward making a significant discovery but that a modified program in the Black King mine would be of definite geological and mineralogical value.

ACKNOWLEDGMENTS

All information, reports, and maps pertaining to the program were provided by R. I. Ludwig who made himself available as a guide to the engineers and the geologist. His cooperation is gratefully acknowledged.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The White Spar mine is 1/2 mile by mine road northeast of Placerville, Colo., in sec. 35, T. 44 N., R. 11 W., N. M. P. M. The Black King No. 5 mine is 2-1/2 miles northwest of Placerville, Colo., in sec. 27, T. 44 N., R. 11 W., N. M. P. M. It is accessible by two mine roads, one leaving State Highway 62 and one leaving State Highway 145. Both junctions are less than a mile from Placerville. The mines, approximately 1-1/2 miles apart, are on the steep north slope of the San Miguel River valley (fig. 1).

Small supply items may be obtained at Telluride, Colo., 16 miles away. Heavy mining and milling equipment may be obtained at Montrose, Colo., 49 miles away, or at Grand Junction, Colo., 112 miles away. There is sufficient water on the Black King No. 5 claim for mining purposes. All water would have to be hauled to the White Spar mine. Electric power is not available or necessary at either mine. Living accomodations are available at Placerville or Telluride.

HISTORY AND PRODUCTION

In 1902, the Black King No. 5, formerly known as the Evans property, allegedly produced a carload of ore averaging 0.11 ounce gold and 3.5 ounces silver per ton, and 14.8 percent copper. Production from 1902 to 1951 amounted to approximately 600 pounds of specimen material. Previous to 1951, the White Spar mine had no recorded production. According to Ludwig, from October 1951 to February 1952, the mines produced a total of 122 tons of ore which averaged 0.663 percent U_3O_8. Most of this ore has been stockpiled on the claims and in Placerville.

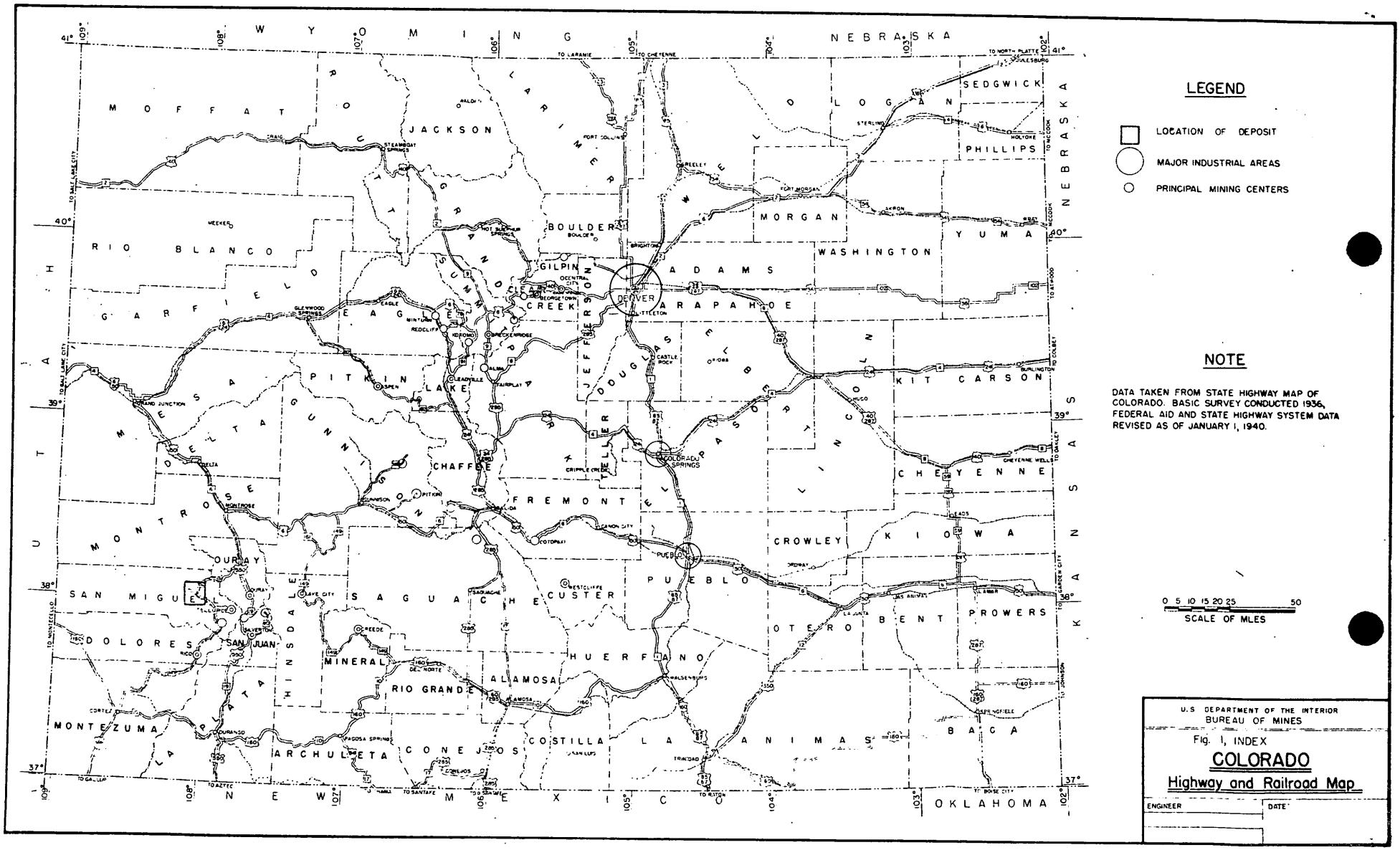

Fig. 1, Location Map, Bachelor Corporation, White Spar and Black King Mines, San Miguel County, Colorado, DMEA 2522

OWNERSHIP

The Black King claims Nos. 1, 4, and 5 and the Black King mill site are owned by H. G. Weatherly and J. B. Weatherly, of Grand Junction, Colo., and by G. E. Weatherly, of New Castle, Colo. The group was leased to R. I. Ludwig on October 4, 1951, for a period of five years.

The White Spar claim and the adjacent Barbara Jo, New Discovery, El Capitan, and Angel group 2, 3, 7, and 8 are owned by Boyd and Teresa B. Robinson, of Grand Junction, Colo. The entire group was leased to R. I. Ludwig on October 5, 1951, for a period of five years.

Both leases were assigned to the Bachelor Corporation by Ludwig.

DESCRIPTION OF THE DEPOSITS

The Black King No. 5 and the White Spar prospects are on a major fault that roughly parallels the San Miguel River valley. In the Black King mine, uranium-bearing asphaltic material called thucholite occurs in the fault zone and in the hanging wall zone, the combined thickness of which reached a maximum of 5 feet. Little or no radioactive material was located in the footwall zone. Stringers and isolated pods and lenses of thucholite were encountered for a strike distance of approximately 170 feet and were reported to exist to a known vertical depth of approximately 30 feet in a water-filled incline shaft.

In the White Spar mine, stringers and pods of thucholite have been traced for a strike distance of approximately 20 feet and to a depth of 35 feet in a shaft. The thickness of the mineralized zone does not exceed 3 feet. There is no evidence of radioactive material in the bottom

of the 50-foot shaft. The uranium mineralization apparently did not extend beyond the length of 6-foot drill holes that were drilled at regular intervals in the fault zone exposed by the shaft.

The deposits appear to be extremely limited, containing a complex mixture of thucholite, chalcopyrite, pyrite, sphalerite, tetrahedrite, and smaller amounts of numerous other minerals. A radiometric survey conducted by the Atomic Energy Commission failed to indicate the presence of additional uranium-bearing material along the fault between the two mines.

MINEABLE ORE RESERVES

Mineable ore reserves cannot be determined due to the spotty occurrence of the thucholite and due to the fact that the material cannot be classified as ore until the applicant successfully and economically produces a marketable concentrate. The Atomic Energy Commission has estimated that at the Black King mine there is available approximately 8,000 tons of rock that could be sorted to produce 160 tons of ore containing 0.300 percent U_3O_8.

PRESENT STATUS

Exploration and Development

Exploration and development to date on the Black King No. 5 claim consists of two inclined shafts, one 24 feet deep and one 40 feet deep on the incline at 40°; two drifts, one approximately 150 feet long and one 10 feet long; several open-cuts; and several exploratory jackhammer holes. The applicant was preparing to unwater one incline.

Exploration and development on the White Spar claim consists of one old shaft of unknown depth, one new shaft approximately 50 feet deep, and a few open-cuts along the fault. No additional work was in progress at the mine.

The Atomic Energy Commission has investigated the properties and is contemplating a limited diamond drilling program for the Black King mine.

Mining and Milling Equipment and Other Facilities

Mining equipment and facilities on hand at the examination date consisted of one 220 c.f.m. portable compressor, mine shaft track, winze track, 200 feet of air pipe, 40 feet of jointed jackhammer steel, four tungsten carbide bits, 60 feet of jackhammer steel, small tools and supplies, one compressor house, one change room and tool shed, one powder house, one mine car, one radiometric geiger scaler, and one assay laboratory.

A 25-ton mill is under construction. Completion is expected in July 1952 at a total cost of $30,000.00. The application implies that the mill is being constructed solely for treatment of White Spar and Black King ore. Ludwig personally stated that custom milling of gold-silver-lead-zinc ores is under consideration. A one-shift, 8-ton-per-day operation is planned for the mill. Rock containing a minimum of 0.300 percent U_3O_8 is considered to be mill grade ore. Denver Equipment Company tests have shown that, with efficient milling of thucholite ore containing 0.565 percent U_3O_8, a carbon and sulphide concentrate may be obtained which, upon ignition, will produce an ash concentrate containing approximately 10 percent U_3O_8. Providing the applicant's milling is as thorough and efficient, approximately 45 tons of crude ore averaging 0.300 percent

U_3O_8 would have to be treated to obtain one ton of ash containing 10 percent U_3O_8. It is estimated that approximately 10 tons of rock would have to be mined and sorted to recover 1 ton of mill-grade ore. Sorting will be a major problem and will have to be accomplished at the rate of at least 80 tons of rock per day to keep the mill in operation.

PROJECT PROPOSALS, WITH COSTS

Proposed Exploration

The applicant has submitted the following proposals for the Black King No. 5 mine:

1. Drive present tunnel 100 additional feet, $3,600.00.
   This proposal is not approved due to a lack of uranium mineralization throughout the final 100 feet of the tunnel.

2. Drive winze an additional 175 feet, $6,482.50.
   A modification of this proposal is recommended in which the footage is reduced to a maximum of 50 feet.

3. Drive 100-foot tunnel in ore face of upper gulley, $3,600.00.
   This proposal is not recommended as the area can be explored to better advantage by drifting from the bottom of the incline.

4. Improve 3/4 mile of new road, $875.00.
   This work is not considered necessary for completion of an exploration project.

5. Open new exploration holes in new ore showings in gulley area, $2,400.00.
   This proposal is not recommended as the area can be explored to better advantage by drifting from the bottom of the incline.

6. Revamp mine rails at tunnel, winze, and gulley, $800.00.
   This work must be done by the applicant in any event and should not be included in the exploration program.

For the White Spar mine the applicant has proposed 50 feet of sinking, 50 feet of drifting, road repairs, and construction of an ore chute and loading bin, at a total cost of $5,825.00. This work is not recommended for approval due to a pronounced lack of favorable geologic evidence for continuation of uranium mineralization beyond the present limit of mine development.

The applicant has submitted an estimate of $1,250.00 for a blacksmith shop, and an estimate of $1,500.00 for consulting services, both of which are not justifiable within the scope of the proposed program.

The total expenditure for the above proposals as submitted by the applicant amounts to $26,332.50. A recommended revised program consists only of sinking and drifting from the Black King No. 5 incline (fig. 2 with geologic report) which should be completed within 4 months. Additional sinking of the incline should not exceed the lower limit of uranium mineralization or exceed a maximum footage of 50 feet. The direction of drifting from the bottom of the incline should be determined by the more promising face, and the amount should not exceed the limit of uranium mineralization or a maximum footage of 150 feet. The cost of sinking is estimated at $71.00 per foot and the cost of drifting at $43.00 per foot for a total expenditure of $10,000.00 which will be distributed as follows:

Labor and Supervision for 4 months:

1 Mine superintendent, $400.00 per month, plus social security and compensation	$1,672.00	
2 Miners, $1.65 per hour, 48-hour week, time and one half for over 40 hours, plus social security and compensation.	1,344.00	
2 Laborers, $1.30 per hour, 48-hour week, time and one half for over 40 hours, plus social security and compensation	1,440.00	$ 4,616.00

Operating materials and supplies:

Timber	$ 200.00	
Explosives, caps and fuse, $2.50 per foot of drift	375.00	
Explosives, caps and fuse, $3.00 per foot of shaft	150.00	
Track, used, 200 feet complete, $0.50 per foot	100.00	
Gasoline, 2,560 gallons, $0.20 per gallon	512.00	
Oil, 20 gallons, $1.20 per gallon	24.00	
Spikes, 4 kegs, $13.00 per keg	52.00	
Bits, 600 throwaway, $0.35 each	210.00	
Pipe, 300 feet, assorted sizes, average $0.55 per foot	165.00	
150 feet assorted drill steel, $1.25 per foot	188.00	
750 feet no.10 waterproof wire, $45.00 per thousand feet	34.00	
Small tools	114.00	
500 feet 3/8-inch wire rope	100.00	$ 2,224.00

Operating equipment: The following equipment will be obtained under a rental-purchase agreement whereby 50 percent of the monthly rental will apply toward the purchase price.

	Monthly rental	Purchase price	
1 210 c.f.m. diesel-driven portable compressor	$342.00	$7,540.00	
1 3-KVA, single-phase, 60-cycle, 120-volt, gas-driven generating plant	51.25	779.00	
1 Air-driven, 1-1/2-inch centrifugal pump	112.00	305.00	
1 55-pound jackhammer with jackleg, complete	86.00	511.00	
100 feet 3/4-inch air hose with couplings	13.20	72.00	
100 feet 3/4-inch water hose with couplings	11.00	80.00	
1 16 hp. gas-driven tugger hoist	73.00	911.00	
3 Mine cars	10.00	540.00	
Total per month	$698.45		
4 months' rental at $698.45 per month, rounded to			$ 2,794.00

Contingencies: Transportation, insurance, and miscellaneous charges should not exceed 366.00

The applicant has indicated that no charges will be claimed for general supervision, accounting, depreciation of equipment, or assaying.

Total $10,000.00

The Government's participation will amount to $9,000.00, or 90 percent of the total expenditure.

CONCLUSIONS

Exploration on the Black King and White Spar properties in the amount of $26,832.50 is not considered justifiable. In the White Spar shaft, uranium mineralization ended at a depth of approximately 35 feet. Systematic drilling of the walls by the applicant determined the strike length of the mineralization. The proposed exploration would serve only to develop the known body of potential ore. Geologic evidence is not favorable for a significant discovery at either mine; however, a revised program for the Black King mine will be of value to obtain geological and mineralogical information at a greater depth along the fault.

It is the opinion of the Bureau engineer that the combined daily production of both mines will not be sufficient to justify or to maintain the milling operation planned by the applicant. By admission of R. I. Ludwig of the Bachelor Corporation, the properties probably will not produce sufficient mill-grade ore to keep the mill in operation for more than 2 weeks of each month.

Mining and milling costs will be so high that the operation cannot hope to succeed on straight thucholite production. Combined mining costs for drifting and stoping probably will average $35.00 per foot, or approximately $15.00 per ton of rock. Approximately 10 tons of rock will have to be sorted to obtain 1 ton of ore containing at least 0.300 percent U_3O_8 for milling purposes. The cost per ton for sorting will be approximately $1.85. With a 75 percent recovery, approximately 45 tons of 0.300 percent ore will have to be milled to obtain 1 ton of ash concentrate

containing 10.0 percent U_3O_8. Each ton of concentrate would be worth approximately $1,600.00 and would be produced at a mining cost of about $6,700.00, at a sorting cost of about $750.00, and at a milling cost of about $300.00, or at a total cost of approximately $7,750.00.

In order to obtain continued production from these deposits, the Government would have to subsidize the operation indefinitely.

RECOMMENDATIONS

It is recommended that a revised exploration program be approved at a cost of approximately $10,000.00. The Government's participation will amount to $9,000.00, or 90 percent of the total. The exploration should be confined to sinking and drifting from the Black King No. 5 incline. Sinking should not progress below the lower limit of uranium mineralization or beyond a maximum depth of 30 feet below the present bottom of the incline. Drifting along the fault in either direction from the lowest point of advance in the incline should not exceed the limit of uranium mineralization or a total footage of 150 feet.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

January 27, 1954

Memorandum

To: C. O. Mittendorf, Administrator, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: DMEA Docket No. 2522, Bachelor Corporation, San Miguel County, Colorado

We have received no reply from the applicant to our letters of August 19 and December 23, 1953.

We are, therefore, closing this docket.

W. H. King

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 1 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
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RECEIVED
FEB 1 1954

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Defense Minerals
RECE
DEC 28 1953

224 New Customhouse
Denver 2, Colorado

December 23, 1953

Mr. Robert I. Ludwig, Vice President
Bachelor Corporation
P. O. Box 40
Placerville, Colorado

Re: Docket No. DMEA 2522

Dear Mr. Ludwig:

We have had no reply to our letters of August 19, 1953 and September 9, 1953 in which we requested additional information on the Black King and White Spar Mines.

If we do not receive a reply to this letter within thirty (30) days, we will assume that you are no longer interested in this exploration program and we will close the docket.

Yours very truly,

W H King

W. H. King
Executive Officer, DMEA
Field Team, Region IV

HMC:fwe

cc COMittendorf
WMTraver
AHKoschmann
Subject
Chron
Connors

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

July 9, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration
Attention: Code 210

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2522 (Uranium) The Bachelor Corporation, White Spar & Black King Claims, San Miguel County, Colorado

The application for Government assistance in exploration work estimated to cost $10,000 has been approved by us and a contract is being prepared.

Government participation will be 90 percent, or $9,000.

Four copies of the Final Report will be forwarded when the contract is processed.

The original and one copy of Form 3b is attached.

W. H. King
W. H. King

Donald R. Mackaven
for
A. H. Koschmann

DEPARTMENT OF THE INTERIOR
Bureau of Mines
[illegible]
JUL 14 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

July 9, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration
Attention: Code 210

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2522 (Uranium) The Bachelor Corporation, White Spar & Black King Claims, San Miguel County, Colorado

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W. H. King
W. H. King

Donald R. Macharen
for
A. H. Koschmann

DEPARTMENT OF THE INTERIOR
Denver, Colorado
JUL 1 / 1952

DMEA Form 3b
(Revised)

DEFENSE MINERALS EXPLORATION ADMINISTRATION

CONTROLLED DOCUMENT
Revised Abstract

DMEA Docket No. 2522

Name of Applicant The Bachelor Corporation

Change:	From		To		
	III 1	☐	III 1	☒	7-9-52
	III 2	☐	III 2	☐	
	III 3	☐	III 3	☐	
	III 4	☒	III 4	☐	
	III 5	☐	III 5	☐	

Add:

II 7 $ 26,832.50

II 8 $ 10,000.00

II 8a % _____

Remarks:

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 14 1952

Initials of person preparing sheet H.M.C.

Date sheet prepared 7-9-52

17367

DMEA Form 3b
(Revised)

DEFENSE MINERALS EXPLORATION ADMINISTRATION

CONTROLLED DOCUMENT
Revised Abstract

DMEA Docket No. 2522

Name of Applicant The Bachelor Corporation

Change:	From		To	
	III 1	☐	III 1	☒ 7-9-52
	III 2	☐	III 2	☐
	III 3	☐	III 3	☐
	III 4	☒	III 4	☐
	III 5	☐	III 5	☐

Add:

II 7 $ 26,832.50

II 8 $ 10,000.00

II 8a %

Remarks:

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 14 1952

Initials of person preparing sheet H.M.C.

Date sheet prepared 7-9-52

17367

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

May 9, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration, Attention: Code 210

From: Executive Officer, Field Team, Region IV

Subject: Docketing for Exploration Assistance

Enclosed in duplicate are the applications and Forms 3a pertaining to the following applications for Government assistance in exploration work.

Bachelor Corporation P. O. Box 40 Placerville, Colorado	DMEA-2522
Paragon Mines, Inc. Ophir, Colorado	DMEA-2521

W. H. King
W. H. King for
J. H. East, Jr.

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 12 1952

Returned to Region IV - DMEA-2521 - One copy MF-103 with attachments and 2 maps.
DMEA-2522 - One copy each MF-103 and 100 with attachments, 2 Lease Agreements and 3 maps.

DMEA-2522

U.S.Department of The Interior,
Defense Minerals Production Authority,
Denver, Colorado.

Gentlemen:

Attached hereto you will find our completed application consisting of forms MF-100 and MF-103 requesting U.S.Government assistance in the amount of $ ~~27366~~ $26,832.50 on a 90-10 participating basis. The complete detailed information requested together with supplemental data is included. This supplemental data will, we beleive, be of considerable interest to your examining staff.

You will note in examining the specifications submitted that this company is presently spending more than $ 30,000.00 in the construction of a processing mill to handle the output of the properties in question. You will also note that development work on the properties since October 1951 to the extent of more than $ 20,000.00 has been completed and that this company is continuing with this work.

Another point of interest which we call to your attention is the fact that this company will absorb all expense of administrative costs, assays, accounting, supervision (other than Mine Superintendent and small Consulting fees), power, water and as well furnish our existing facilities without cost or depreciation allowance. This means that every dollar of Government investment with us isma productive dollar and el iminates the usual overhead costs which could well run 30% of cost.

COPY

We realize, after six months of exploration work, that qualified technical assistance is necessary in order to layout the best and most economical program. To lend assistance in a manner suitable to the work planned we have arranged for the services of Mr. George D. Schrieber, Mining Engineer, of Leadville and Mr. Arch Sweet, of Denver to help us with our technical and practical problems. These services are covered in the attached application at a cost not to exceed $1500.00 ~~$750.00~~.

From our contacts and conversations with the U.S.Atomic Energy Commission officials at Grand Junction, Colorado we feel they too are very interested in this project. In fact a drilling program is scheduled for the near future and to that end we are preparing adequate housing facilities,etc., for their crew without cost to them.

This project offers several major values. The extreme economy of the work to be done, our absorbtion of non-productive costs and the value to the Atomic Program by reason of another major raw and processed material supply is the true basis of our request for your consideration and favorable decision at your earliest possible convenience.

Respectfully submitted this 15 day of ~~April~~ MAY A.D. 1952.

Bachelor Corporation

Robert I. Ludwig
Vice President

Enclosures: MF-100
MF-103
Supplemental Data.

COPY

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF103D.

Bachler Corporation
Placerville, Colorado

April 25, 1952

COPY

Attention: Mr. R. I. Ludwig, Vice President

Gentlemen:

In accordance with your telephone request, we are pleased to quote rental and purchase prices on the following equipment, which we understand will be used at the Black King Mine near Placerville, Colorado:

Qty.	Description	Rental Rate Per Mo. - Ea.	Sale Price - Ea.
1 -	JOY Model 210 Diesel Portable Air Compressor. NEW. Mounted on 4 pneumatic tires. Minimum rental period - three months.	$ 342.00	$ 7,540.00
1 -	MASTER, 3KVA Generating Plant. NEW. Minimum rental - three months.	51.25	779.00
1 -	THOR 2-1/2" Air Driven Sump Pump, Model 361-T. NEW. Minimum rental period - three months.	112.00	305.00
2 -	JOY L-47 (47lb.) Jackhammers, 7/8" chuck (wet or dry). Used but in excellent condition.	33.00	275.00
2 -	THOR Jackleg, Model 64 with hose assembly. New. Minimum rental period - four months.	45.00	208.00
2 -	10 ft. lengths of 3/4" air hose whips for use in connection with oil Liners complete with couplings.	3.00	9.00
2 -	JOY L-09 Oil Liners. NEW. Minimum rental - three months	5.00	19.25

Cont'd Page Two.

Qty.	Description	Rental Rate Per Mo. - Ea.	Sale - Price - Ea.
4 -	50' lengths 3/4" Air Hose coupled.	6.60	36.00
2 -	50' lengths 1/2" Water Hose.	5.50	40.00
1 -	JOY Model F-113 Air Tugger Hoist rated at 2000 lbs. at 125 ft. per min. Rope capacity of 700 ft. of 3/8" rope. Rope not included. Minimum rental four months. NEW.	73.00	911.00

We offer the following timken drill steel for outright sale with no rental involved:

2' length of 7/8" hollow drill steel with timken thread		4.00 per length
4'	ditto	5.35 " "
6'	ditto	6.65 " "
8'	ditto	8.15 " "

The following are prices for Timken Side Hole Drill Bits - 4 point.

1-3/4 side hole timken drill bit		.55¢
1-7/8"	ditto	.56¢
2"	ditto	.57¢
2-1/8"	ditto	.58¢

We are quoting below selling price and rental rates for equipment as requested for your property known as the White Spar Mine, likewise located near Placerville, Colo.

Qty.	Description	Rental Rate Per Mo. Ea.	Sale Price - Ea.
	Inasmuch as we are unable at this time to furnish you with a 160' gas portable from our stock, we are taking the liberty of quoting the following:		
1 -	Ingersoll-Rand Portable Compressor mounted on four pneumatic tires. Used. Model 210 Gas Driven.	$ 288.00	$ 3,100.00
1 -	JOY L-47 Jackhammer (47lb) with 7/8" chuck (wet or dry) Used but in excellent condition.	33.00	275.00

Cont'd Page Three

COPY

1 -	THOR Jackleg, Model 64 with hose assembly. NEW. Minimum rental period - four months	45.00	208.00
1 -	JOY L-89 Oil Liners. NEW. Minimum rental - three months	5.00	19.25
2 -	50' lengths 3/4" Air Hose coupled	6.60	36.00
1 -	10 ft. length 3/4" air hose whip for use in connection with oil Liners complete with couplings.	3.00	9.00
1 -	JOY Model F-113 Tugger Air Hoist rated at 2000 lbs. at 125 ft. per min. Rope capacity of 700 ft. of 3/8" rope. Rope not included. Minimum rental four months. NEW.	73.00	911.00

All of the equipment quoted above we will rent with a minimum period as stated and with 90% of the rentals paid to apply against the purchase price if rental option is desired. However, under no circumstances will we wave the minimum rental period.

All rentals are payable in advance; that is, the first month, and a 10% charge of the total monthly rentals of the equipment involved will be required as a guarantee of return of such equipment, and will be applied against the final settlement.

All the above equipment is quoted f.o.b. our Plant - Salt Lake City.

Trusting this information is satisfactory, and that we may be able to fill your needs, we are,

Yours very truly,

FOULGER EQUIPMENT CO.

W. D. Archer,
Vice President

WDA:d

COPY

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF103B

JAMES H. PERSHING (1863-1948)
ROBERT G. BOSWORTH
LEWIS A. DICK
CLYDE C. DAWSON, JR.
FRITZ A. NAGEL
SAMUEL S. SHERMAN, JR.
WINSTON S. HOWARD

LAW OFFICES
PERSHING, BOSWORTH, DICK & DA
EQUITABLE BUILDING
DENVER, COLORADO

February 25, 1952

COPY

Bachelor Corporation
El Paso, Texas

Gentlemen:

THIS IS TO CERTIFY that we have examined the instruments hereinafter described relating to the hereinafter described mining property located in Lower San Miguel Mining District, San Miguel County, Colorado, and from our examination thereof submit the following opinion:

Description of Property

The following lode mining claims:

Name	Recorded Book	Recorded Page	Date Recorded
Barbara Jo	174	402	Nov. 18, 1947

Instruments Examined

1. Original records of the location certificate.

2. The indexes and records in the County Clerk and Recorder's office of San Miguel County, Colorado, pertaining to said property.

3. Lease Agreement dated October 5, 1951, from Boyd Robinson and Teresa B. Robinson, husband and wife, to Robert I. Ludwig for a period of five years from the date thereof subject to renewal for a like period upon completion of the minimum requirements stated in the lease, recorded October 5, 1951, in Book 216, page 105.

TITLE

The possessory title to said lode claim is in

BOYD ROBINSON and
THERESA B. ROBINSON,
as joint tenants.

The property is not patented. It was located under the mining laws of the United States and of the State of Colorado.

COMMENTS

1. Under the laws of Congress One Hundred Dollars worth of work or improvements must be expended annually upon or for the benefit of each unpatented lode mining claim. The year for such purposes begins July 1st at twelve o'clock M. of the calendar year and ends the following July 1st at twelve o'clock M. The Colorado statutes (4-A C.S.A. 110-185) provides that within six months after any set time or annual period allowed for the performance of labor or making improvements there may be recorded in the County Clerk and Recorder's office wherein such claim is situated an affidavit showing the performance of the work or making the improvements. Such affidavit, when recorded, shall be prima facie evidence of the performance of such labor or the making of such improvements. The annual labor need not be performed for the year in which lode claims are actually located. It will be necessary, however, to perform such annual labor upon or for the benefit of the above described lode claim by July 1, 1952.

2. We recommend that an actual survey be made of this lode claim when the snow is sufficiently off the ground to permit the same, and then an amended location certificate be prepared including description by the surveyor and recorder.

3. All necessary affidavits of labor for prior years have been recorded.

Respectfully submitted,

PERSHING, BOSWORTH, DICK & DAWSON

HEP:WH

JAMES H. PERSHING (1863-1948)
ROBERT G. BOSWORTH
LEWIS A. DICK
CLYDE C. DAWSON, JR.
FRITZ A. NAGEL
SAMUEL S. SHERMAN, JR.
WINSTON S. HOWARD

LAW OFFICES
PERSHING, BOSWORTH, DICK & D
EQUITABLE BUILDING
DENVER, COLORADO

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF103C.

COPY

February 25, 1952

Bachelor Corporation
El Paso, Texas

Gentlemen:

THIS IS TO CERTIFY that we have examined the instruments hereinafter described relating to the hereinafter described patented lode mining claims situate in Lower San Miguel Mining District, in San Miguel County, Colorado, and from our examination thereof submit the following opinion:

Description of Property

The following Lode Mining Claims, to-wit:

White Spar	U. S. Survey No. 4819
New Discovery	U. S. Survey No. 4819
El Capitan	U. S. Survey No. 17285
Angell No. 2	U. S. Survey No. 17285
Angell No. 3	U. S. Survey No. 17285
Angell No. 7	U. S. Survey No. 17285
Angell No. 8	U. S. Survey No. 17285

Instruments Examined

1. Abstract of title to the White Spar Lode last certified to February 20, 1952, at 5:00 o'clock P.M. by San Miguel County Abstract Company.

2. Indexes and records in the County Clerk and Recorder's office of San Miguel County covering all of said mining claims from the time of issuance of tax deeds to February 21, 1952, at 5:00 o'clock P.M.

3. Lease Agreement dated October 5, 1951, from Boyd Robinson and Teresa B. Robinson, husband and wife, to Robert I. Ludwig for a period of five years from the date thereof subject to renewal for a like period upon completion of the minimum requirements stated in the lease, recorded October 5, 1951, in Book 216, page 105.

TITLE

Title to all of said mining claims is in

BOYD ROBINSON and
THERESA B. ROBINSON,
as joint tenants,

by tax deeds.

A tax deed was issued to County of San Miguel for the White Spar and New Discovery claims January 19, 1943, and was recorded January 23, 1943, in Book 209, page 103. From the County title descended by mesne conveyances to Boyd Robinson and Theresa B. Robinson.

A tax deed was issued to County of San Miguel October 2, 1942, and recorded October 21, 1942, in Book 209, page 50, for the El Capitan and Angell Nos. 2, 3, 7 and 8 Mining Claims. From the County title descended by mesne conveyances to Boyd Robinson and Theresa B. Robinson.

COMMENTS

1. Inquiry should be made at the County Treasurer's office concerning taxes. The property is subject to the 1951 General Taxes now payable unless the same have been paid.

2. The property is subject to the Lease Agreement described in paragraph number 3 of Instruments Examined.

3. Tax deeds in Colorado initiate a new fee title, and since these tax deeds have been of record for more than nine years, the title is presumptively good and marketable, and no persons formerly interested in the properties can maintain any action against owners in possession.

Respectfully submitted,

PERSHING, BOSWORTH, DICK & DAWSON

HEP:WH-8

BACHELOR CORPORATION
CERVILLE COLORADO

EXHIBIT MF 1034

JAMES H. PERSHING (1863-1948)
ROBERT G. BOSWORTH
LEWIS A. DICK
CLYDE C. DAWSON, JR.
FRITZ A. NAGEL
SAMUEL S. SHERMAN, JR.
WINSTON S. HOWARD

LAW OFFICES
PERSHING, BOSWORTH, DICK & D
EQUITABLE BUILDING
DENVER, COLORADO

February 25, 1952

COPY

Bachelor Corporation,
El Paso, Texas.

Gentlemen:

THIS IS TO CERTIFY that we have examined the instruments hereinafter described relating to the hereinafter described mining property located in Lower San Miguel Mining District, San Miguel County, Colorado, and from our examination thereof submit the following opinion:

Description of Property

The following lode mining claims and mill site:

Name	Recorded Book	Recorded Page	Date of Location Certificate
Black King No. 1	122	404	October 27, 1949 Amd.
Black King No. 4	204	518	June 22, 1950
Black King No. 5	204	518	June 22, 1950
Black King Mill Site	204	545	July 14, 1950.

Instruments Examined

1. The original records of all location certificates involved.

2. The indexes and records in the County Clerk and Recorder's office of San Miguel County, Colorado, pertaining to said property.

3. Lease Agreement dated October 4, 1951 between H. G. Weatherly, J. B. Weatherly and G. E. Weatherly of the first part and Robert I. Ludwig of the second part, recorded October 5, 1951 in Book 216 at Page 103 for a term of five years from the date thereof, subject to

renewal for a like period upon completion of the minimum requirements therein stated to be performed by the lessee.

TITLE

The possessory title to all of said property is in

HUGH G. WEATHERLY
J. B. WEATHERLY AND
GUY E. WEATHERLY.

None of said properties are patented.

COMMENTS

1. Under the laws of Congress One Hundred Dollars worth of work or improvements must be expended annually upon or for the benefit of each unpatented lode mining claim. The year for such purposes begins July 1st at twelve o'clock M. of the calendar year and ends the following July 1st at twelve o'clock M. The Colorado statutes (4-A C.S.A. 110-185) provides that within six months after any set time or annual period allowed for the performance of labor or making improvements there may be recorded in the County Clerk and Recorder's office wherein such claim is situated an affidavit showing the performance of the work or making the improvements. Such affidavit, when recorded, shall be prima facie evidence of the performance of such labor or the making of such improvements. The annual labor need not be performed for the year in which lode claims are actually located. All necessary affidavits of annual labor have been recorded.

2. With reference to the Black King Mill Site, there is no provision of law requiring annual labor to be performed.

3. In addition to staking the boundaries of a lode claim, it is essential to have sufficient ties by which to identify the claim in the location certificate. None of the claims in this group are sufficiently tied to

any natural monument or marking or object. In locating claims by individuals it is not expected or required that they be tied to mountain peaks or other such permanent monuments as a surveyor would use, but they should be tied to some monument, such as marks on a permanent boulder or blazed trees, major buildings or mine workings or anything which is a natural object or permanent monument.

(a) The Black King No. 4 is not sufficiently tied to a natural monument.

(b) The ground embraced in the Black King No. 5 was originally located in August, 1948, as Green Mountain Copper Mine Vein. Two amended location certificates were later made in 1949 and on June 22, 1950 the ground was covered by a new location certificate as Black King No. 5, which states that the purpose of the latter certificate was to change the name only. It therefore seems that the rights under this claim go back to the original location certificate dated August 20, 1948 and recorded in Book 174 at page 456.

(c) The location certificates for the Black King No. 4 lode and Black King Mill Site attempt to tie to Black King No. 5 lode, but there is grave doubt if that location certificate is sufficiently tied to a natural monument.

The lack of such ties does not necessarily invalidate the locations, but in case some third person should make a new location covering part of the ground, his rights might be superior to the rights claimed under the present location.

In view of the foregoing, we recommend that actual surveys be made of the three lode claims and the mill site as soon as the snow is sufficiently off the ground to permit the same, and then amended location certificates be prepared, including descriptions by the surveyor, and recorded.

4. Property subject to the Lease Agreement described in Paragraph 3 of Instruments Examined.

In this instrument Hugh G. Weatherly appears

as H. G. We advise obtaining an affidavit of identity as to the two names and the person involved.

5. Writ P. Peterson, one of the original locators of the Black King No. 1, conveyed September 13, 1949 as W. P. Peterson. The deed is recorded in Book 115 at page 403. We advise obtaining an affidavit of identity as to the two names and the person involved.

6. Dallas Divide Mining Co., C. A. Crow, Ruth Bailey and W. P. Peterson were the original locators of the Green Mountain Copper Mine Lode, later renamed Black King No. 5. The location certificate was dated August 20, 1948 and recorded in Book 174 at Page 456. On August 9, 1949 an amended location certificate was made for Green Mountain Copper Mine Lode and recorded in Book 204 at Page 461. This amended location was by C. A. Crow, Ruth Bailey and W. P. Peterson doing business as Dallas Divide Mining Co., and the certificate is signed by the three individuals. Apparently Dallas Divide Mining Co. was a trade name or it may have been a partnership. If any affidavit was filed in the County Clerk's office of Mesa County where these people resided concerning this company, a certified copy thereof should be furnished us. If no such affidavit is of record in that county, then an affidavit should be secured from one or more of the three persons, explaining that the name was simply a trade name and the parties interested in the company as such.

7. With reference to the Black King No. 5, Hugh Weatherly acquired a two-thirds interest August 10, 1949 by deed recorded in Book 115 at Page 402, and thereafter deeded a one-third interest. He still owned a one-third interest when he joined in a new location certificate for the Green Mountain Copper Mine Lode as Hugh G. Weatherly, which certificate was recorded in Book 204 at Page 467. We advise obtaining an affidavit of identity as to the two names and the person involved.

Yours very truly,

PERSHING, BOSWORTH, DICK & DAWSON

HEP:BBR

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

MF-103 Should Be Filed With General Technical Data Form MF-100

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

Not To Be Filled in by Applicant

Docket No. DMEA-2522
Metal or Mineral
Date Received 5-12-52
Amount $
Participation (Government %)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 1952

BACHELOR CORPORATION
P.O.BOX 40,
PLACERVILLE COLORADO

May 1,1952

MMay 1, 1952

Name and address of applicant

Date

990-10 participation under DMA Order #5.

If you have already filed MF-100, give date filed ....., type of assistance requested .....,

DMA Docket Number (if available) .....

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four copies each, of the signed application form, General Technical Data Form MF-100, and answers to questions as specified, to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive office thereof, with your name and address on each sheet of the application and all accompanying papers. If you have previously filed MF-100, it is not necessary to file it again. However, you should indicate in space provided above the type of assistance previously applied for (loans, procurement contracts, etc.) and DMA Docket Number, if available. *When a question is inapplicable it should be so stated in the form.* Additional sheets should be attached in answering any questions or in supplying additional information. IF YOU CANNOT ANSWER A QUESTION, SO STATE.

1. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.

   (*b*) If you are not the owner of the property, submit a copy of the lease, purchase option, or other agreements under which you are authorized to operate the property with each copy of your application.

   (*c*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

   NOTE: (1) If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*c*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

   (2) If applicant is not the owner of the property or if there are any liens or encumbrances against the property, copy of agreements of claimants, lienors, encumbrances, and lessors subordinating their interests in the property to the interest of the Government under the Exploration Project Contract will be required for attachment to the Contract.

2. (*a*) What metals or minerals do you expect to find?

   (*b*) Furnish statement of the geologic features of your property, giving type of ore deposit and reasons for expecting to find commercial ore bodies. Illustrate with maps or sketches. If you have a geologic or engineering report, or assay maps showing width and grade, please send them with application, stating whether or not you wish to have them returned.

The information requested in questions 3, 4, 5, 6, 7, 8, and 9 below should be answered specifically and in detail, as this information will be attached to and incorporated as part of the Exploration Project Contract, if such contract is entered into with you by the Government.

ANSWER EACH QUESTION ON SEPARATE SHEETS OF PAPER AND SUBMIT A COPY OF EACH ANSWER FOR EACH COPY OF YOUR APPLICATION.

3. (*a*) Describe fully the proposed work and give the total cost of the project.

   (*b*) State the time required to start the project and to complete it.

4. Submit a map or sketch of the property involved showing a plan (and cross section, if needed) of the present mine workings and the *location of the proposed exploration work* as related to geologic features, such as contacts, veins, ore-bearing beds, etc.

5. Furnish an itemized list of existing facilities, buildings, installations, and fixtures with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition.

6. Furnish a detailed list of additional facilities, buildings, and fixtures to be purchased, installed, or erected by you, with the estimated cost of each item.

7. Furnish a detailed list of operating equipment, separated into items to be—

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

   with the rental, purchase price, or depreciation of each item, as the case may be, to be charged as a cost of the project.

8. Furnish an itemized schedule of labor, by numbers and classes (miners, muckers, etc.) and of supervisors by numbers and positions, with the maximum wages or salaries to be paid to each.

9. Furnish a detailed list with estimated cost of each item for materials, supplies, engineering, assaying, accounting, power, water, utilities, and any other items not provided for above.

10. (*a*) How much are you prepared to invest in the proposed project?

    (*b*) Is this amount sufficient to pay your part of the cost of the project, in accordance with the regulations on Government participation (Sec. 9 of MO–5)?

11. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

Bachelor corporation
(Name of company)

By R. I. Ludwig
(Signature of authorized official)
Vice President
(Title)

May 1, 1952
(Date)

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—64067-2

1. LEGAL DESCRIPTION OF PROPERTY:

(a) The legal description of the properties involved in the application herewith tendered is generally described in MF-100 supported by maps, plats and descriptive matter rendereed in A.E.C. Reports.

We attache hereto Examination of Titles as prepared by Pershing, Bosworth, Dock and Dawson, Attorneys of Denver Colorado under the signature of Mr. Harold E. Popham who personally made these opinions. (Exhibit MF 103)ABC

Full descriptions of the actual parcels involved are fully described in MF-100.

(b) Copies of leases from Boyd and Theresa Robinson covering the White Spar claims, and J.B.,H.G., andG.E.,Weatherly covering the Black King claims. MF100F&G

These leases have been duly recorded in San Miguel County and are current in all respects at this time. You will note that these leases are made out in the name of Robert I. Ludwig of Salt Lake City, Utah. These have recently been assigned to the Bachelor Corporation and notification given to the Lessor's. Confirmation of assignment can be obtained from Pershing, Bosworth, Dick and Dawson of Denver.

(c) The exact parcel upon which exploration work proposed herein is to be conducted are the two mine sites described throughout these reports, however, for the purpose of repayment of this loan the entire group of claims may, at the Government's option, be included if desired.

COPY

2. WHAT METALS DO YOU EXPECT TO FIND: This questions is, we beleive, fully answered in data submitted under MF-100 together with geological reports, maps, plats and surveys.

It is not required that these reports or Exhibits be returned.

COPY

3. DESCRIBE FULLY PROPOSED WORK AND COST OF SAME: The work proposed to be done under this application is as follows, together with the costs thereof as set forthe beside each item:

BLACK KING MINE:	Unit	Total
(1). Drive the present tunnel 100 additional feet from present present length. Cost-	$ 36.00 ft	$ 3,600.00
(2). Drive winse an additional 175 feet from present depth	$ 37.50	6,482.50
(3). Drive 100 foot new tunnel in open face upper gulley. This is new ore face not previously worked.	$ 36.00	$ 3,600.00
*** (4). Improve 3/4 mile new road from pavement to mine eliminating 1 1/2 mile hazardous travel.		$ 875.00
(5). Open new exploration holes in new ore showings in gulley area consisting of 60 feet of prospect shaft (no timbering)	$ 40.00	$ 2,400.00
*** (6). Revamp mine rails at tunnel, winse and gulley to efficiently handle ore and waste.		$ 800.00
Total at Black King Mine		$17,757.50
Total preparation costs		- 1,675.00
Total productive costs		16,082.50

*** Indicate preparation costs

COPY

WHITE SPAR MINE:	Unit	Total
(1). Deepen present prospect shaft 50 feet below present depth.	$ 70.00	$ 3,500.00
(2). Drift each side of shaft extension a distance of 25 feet at point of greatest ore showing.	$ 45.00	$ 1,125.00
*** (3). Rebuilt 1/2 mile mine to mill road changing switchbacks so ore trucks can properly operate.		$ 750.00
*** (4). Construct ore chute and loading bin.		$ 450.00
Total at White Spar		5,825.00

*** Indicate preparation costs.

Total preparation costs	-1,200.00
Total productive costs	4,625.00

*** FACILITIES FOR BLACK KING AND WHITE SPAR:

(1). Set up blacksmith shop at millsite to care for both Black King and White Spar operations, includes welding equipment.	1,250.00
(2). Consulting services for mining engineers Schrieber and Sweet as noted in report MF-100	1,500.00
Total facility costs	$ 3,250.00

COPY

SUMMARY OF COSTS:

Black King Mine:	
Preparation costs	$ 1,625.00
Productive costs	16,082.50
White Spar Mine:	
Preparation costs	1,200.00
Productive costs	4,625.00
Facilities costs	
Serving both operations	3,250.00
Total amount of loan requested	$ 26,832.50
Government participation 90%	24,149.25
* Applicant's participation	2,683.25

* At no cost applicant contributes all field engineering, assaying, accounting and other non-productive costs outlined in MF-100

3. (b) STATE TIME REQUIRED TO START AND COMPLETE WORK: The above described work can immediately start upon execution of this loan committment and can be completed within 120 days.

COPY

4. SUBMIT MAPS AND SKETCHES OF PROPERTIES INVOLVED:

Maps, sketches, plats and other data submitted as Exhibits Listed attached to MF-100.

COPY

5. ITEMIZED LIST OF EXISTING FACILITIES AVAILABLE:

Without cost to the project, either as capital investment of depreciation the following listed facilities are available:

Black King:

Compressor house (new)

Change Room and tool shed (new)

Mine rail in place

Mine car

Electric Wiring

Powder house (Insulated)

White Spar:

Mine head frame. (new)

Ore chute. (new)

General Facilities:

Radiometric assaying equipment

Laboratory facilities.

Use of automotive equipment to and from mines for personel.

Ore haulage which we consider in this operation part of milling cost.

COPY

6. DETAILED LIST OF ADDITIONAL FACILITIES:

As outlined under MF-103 Item 3 the following additional facilities are requested in order to reduce productive costs to the lowest possible degree:

Black King:	
Improve 3/4 mile new road	$ 875.00
Revamp mine rail at tunnel, winse and gulley	$ 800.00
White Spar:	
Rebuild 1/2 mile road	$ 750.00
Construct ore chute and bin	$ 450.00
Joint Facilities:	
Blacksmith and welding shop including equipment	$ 1,250.00
Total to be spent in new facilities	$ 4,125.00

COPY

7. LIST OF RENTAL AND PURCHASED EQUIPMENT:

(a) Rental equipment.

Black King Mine:

1-215 c.f. deisel driven air compressor.

1-5 kva 1p 60c 120v gasoline driven light plant.

1- Air driven 1 1/2" centrifugal pump.

2-55#Jackhammers with jack legs.

100-feet 3/4" air hose.

100-feet 3/4" water hose

1- 16 h.p. gasoline driven tugger hoist with cable.

Total estimated monthly rental for this unit- - $ 800.00
(MF103-D)

White Spar:

1-165 c.f. compressor,gasoline driven.

1-16 h.p. tugger hoist and cable

1-55# jackhammer and jack leg.

100-feet 3/4" air hose

100-feet 3/4" water hose

Total estimated monthly rental for this unit - - $ 500.00
MF103-D

(b) Purchased equipment:

Black King:

150 feet assorted drill steel

White Spar:

100 feet assorted drill steel.

Priced on quotations attached.
MF103D

COPY

8. SCHEDULE OF LABOR BY NUMBER AND CLASSES:

Black King:

2/3 Mine Superintendent @ $ 400.00 per month.

2-Drillers @ $ 1.65 per hour

2-Muckers @ $ 1.50 per hour

2-Laborers @ $ 1.25 per hour

Geologists and Mining Consultants @ $ 50.00 per day.

White Spar:

1/3 Mine Superintendent @ $ 400.00 per month.

1-Driller @ $ 1.65 per hour

1-Mucker @ $ 1.50 per hour

1-Laborer @ $ 1.25 per hour

Geologists and Mining Consultants @ $50.00 per day.

Note: In accordanace with information given in MF-100 no charge for supervision by corporation personal administrative will be charged against this project.

It should be noted that the Mine Superintendent's time is divided between the two portions of the work in relation to that which appears appropiate for the time to be spend on each seperate operation.

COPY

9. DETAILED ESTIMATE OF MATERIALS AND SUPPLIES:

Black King:

17-b.f.m. native lumber @ $60.00 b.f.m.	$ 1,020.00
4000-ft fuse inc. caps @ $0.07 per ft.	560.00
1200-pds Powder in cases @ $ 10.25 case	246.00
5120-gallons gasoline @ $0.30 per gallon	1,536.00
40-gallons lubricating oil @ $1.20 gallon	48.00
8-kegs mine spikes @ $ 13.00 keg	104.00
1280- asstd Throwaway bits @ $0.26 ea.	316.80
100-asstd drill steel @ $1.25 per foot	125.00
750-feet black iron pipe, asstd size @ $0.55 ft	75.00
75-pds asstd pipe fittings @ $0.23 pd	17.25
600-feet (used) mine rail @ $.25 foot	150.00
300-rail spikes @ $15.00 C	45.00
200-18 ga. rail ties @ $).25 ea	50.00
1500-feet #10 N.P.wire @ $45.00M'	60.00
7-miners picks @ $4.00 ea	28.00
7-shovels @ $4.50 ea	31.50
4-wheel barrows @ $ 33.00 ea	132.00
2-long bars @ $ 5.25 ea	10.50
Total for Black King	$ 4,555.05

White Spar:

7-b.f.m. native lumber @ $60.00 b.f.m.	320.00
1500- feet fuse inc caps @$0.07 ft	105.00
800-pds powder in cases @ $10.25 case	164.00
2100-gallons gasoline @ $0.30 per gallon	630.00
15-gallon lubricating oil @ $1.20 gallon	18.00
3-kegs mine spikes @ $13.00 keg	39.00
280-asstd Throwaway bits @ $0.26 ea	72.80
75-ft asstd drill steel @ $1.25 per ft	93.75
150-ftblack irn pipe, asstd sizes @ $0.55 per ft	82.50
30-pds asstd pipe fittings @ $0.23 per pd	6.90
3-miners picks @ $4.00 ea.	12.00
3-shovels @ $ 4.50	13.50
2-long bar @ $ 5.25	5.25
1-wheel barrow @ $33.00	33.00
Total for White Spar	$ 1,595.70

9.a. CONTRACT LABOR:

Black King Mine: 40 hrs D8 dozer @ $12.00 hr	480.00
White Spar Mine: 16 hrs D8 dozer @ $12.00 hr	192.00
Total contract	$ 672.00

COPY

9 b. **Blacksmith Shop:**

2-b.f.m. native lumber @ $ 60.00 b.f.m.	$ 120.00
1-keg nails @ $ 13.00 keg	13.00
20-sq. roofing @ $ 3.50 sq	70.00
1-150# anvil	145.00
1-236H Buffalo Forge	205.00
3-asst'd sledged @ $10.00 ea	30.00
3- asst'd hot chisels @ $4.00 ea	12.00
3-asst'd hardies @ $4.00 ea	12.00
1-6" vise	90.00
1-#162X Pipe vise @ $ 32.00	32.00
Assorted hand tools not to exceed	250.00
Oxweld Acy. Gas welding outfit with generator complete with hoses, tips, torches,,etc	425.00
Total for shop equipment	1,404.00

Summary:

Black King Materials and Supplies	4,555.05
White Spar Materials and Supplies	1,595.70
Blacksmith Shop	1,404.00
Contract work on Black King Mine	480.00
Contract work on White Spar Mine	192.00
Preparation costs Black King Mine	1,675.00
Preparation costs White Spar Mine	1,200.00
Rental equipment Black King Mine	2,400.00
Rental equipment White Spar Mine	1,500.00
Total less direct labor	$ 15,001.75

Direct labor:
(Based upon 48 hour week, total monthly payrool hours equivelent straight time basis - 208 hrs. per mo.)

Black King Mine:	2 drillers, per mo. ea.	343.00	$ 687.00	
	2 muckers , per mo. ea	312.00	624.00	
	2 laborers, per mo. ea	260.00	520.00	
	2/3 Mine Supt per mo.	265.00	265.00	$ 2,087.00

COPY

9. Summary (con't d):

Balances brought forward			$ 15,001.75
Black King Mine direct labor:		$	
For one month	$ 2,087.00		
For three months		6,261.00	
Direct labor:			
White Spar Mine:			
1 driller, per month	$ 343.00		
1 mucker , per month	312.00		
1 laborer, per month	260.00		
1/3 Mine supt per month	135.00		
Total one month	$ 1,050.50		
Total for three months		$ 3,150.00	
Total direct labor less taxes		$ 9,411.00	
6% to cover Ind. Insurance, payroll taxes and other indirect costs		564.66	
Total direct labor		$ 9,975.66	$ 9,975.66
Professional services as outlined MF-103-3A			1,500.00
Reserved for small contingencies			355.09
GRAND TOTAL EXPENSE/TOTAL AMOUNT REQUESTED			$ 26,832.50

COPY

SUMMARY OF COSTS OF THIS PROJECT

This application considers the following footages to be mined in exploration either as shaft, winze, drift or tunnel:

Operation	Drift	Shaft	Winze	Tunnel
Black King Mine - MF-103-3				
Item (1)				100
Item (2)			175	
Item (3)				100
White Spar - MF-103-3				
Item (1)		50		
Item (2)	50			
	50	50	175	200
				175
				50
				50
Total footage				475

Tabulation of costs on footage basis show following results:

Cost of materials	$ 7,554.75					
Cost contract work	672.00.	672.00				
Cost preparation work	2,875.00		2,875.00			
Cost direct labor	9,975.66			9,975.66		
Cost equipment rentals	3,900.00				3,900.00	
Cost consulting services	1,500.00					1,500.00
**Total cost	$ 26,477.41					

** Does not include $ 355.09 reserve

Indicates:

Cost per foot, materials only	$ 15.90
Cost per foot, contract work	1.43
Cost per foot, preparation work	6.05
Cost per foot, professional services	3.15
Cost per foot, direct labor	21.00
Cost per foot, equipment rentals	8.32
Total per foot	$ 55.85

Not included in above figures are charges which the applicant agrees to absorb such as assay, ore haul, supervision, accounting, use of present facilities, etc.

COPY

10. AMOUNT WE ARE PREPARED TO SPEND ON PROJECT:

The corporation and its officers have already spent in excess of $ 25,000.00 in this project not including the present progressive expenditure of some $ 30,000.00 in the mill under construction.

We are prepared to spend that amount of money necessary to successfully complete the project.

10 (b). The amount stated above is considerably more than the required 10% and with the capital contributions included in our operations as set forth herein our actual contribution will more nearly approach 30% than the 10% required under Mineral Order 5.

COPY

11. EXPLANATORY CONDITIONS NOT INCLUDED HEREIN:

To the best of our knowledge and beleif no conditions or circumstances not explained in MF-100 or MF-103 exist.

COPY

Form MF-100
(May 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Form approved.
Budget Bureau No. 42-R1026.

GENERAL TECHNICAL DATA
FOR USE UNDER THE
DEFENSE PRODUCTION ACT OF 1950

NOT TO BE FILLED IN BY APPLICANT

Docket No. DMEA-2522

Date received 5-12-52

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 12 1952

BACHELOR CORPORATION
P.O.BOX 40
PLACERVILLE, COLORADO

Name and address of applicant

Date MAY 1,1952

INSTRUCTIONS

This form is to be filed with Defense Minerals Administration, Department of the Interior, Washington 25, D. C. It should be accompanied by appropriate application form when a specific type of Government assistance is requested, in the form of (1) loan, (2) purchase contract, (3) Government guarantee of a private loan, (4) priorities or allocation of mining equipment, and maintenance, repair and operating supplies, and (5) other forms of Government assistance that might arise under the Act. Submit four (4) signed copies of the form and accompanying papers. Name and address should be stamped or typed on each sheet of this form and all accompanying papers. *When a question is inapplicable it should be so stated on the form.* Additional sheets may be attached in answering any questions or in supplying additional information. (IF YOU CANNOT ANSWER A QUESTION, SO STATE.) If a question is answered elsewhere indicate where answered. It is not necessary to answer it again.

GENERAL TECHNICAL DATA

Supply the following information on separate sheets, arranged, numbered, and lettered as indicated:

1. Materials produced:
   (*a*) What are the chief mine, mill, or smelter products?
   (*b*) What are the byproducts, if any?
2. Name(s) and type(s) of mine(s), mill(s), smelter(s), refinery(ies), pit(s), quarry (ies), drilling operation(s). Include old names of property, if any. Show extent of workings, including the following:
   (*a*) Linear feet of shafts.
   (*b*) Linear feet of drifts and crosscuts.
   (*c*) Linear feet of tunnels or adits.
   (*d*) Linear feet of other mine openings (explain briefly).

   Indicate whether mine is flooded or not. Describe any pumping problems. Give size or productive capacity.
3. For each operation listed above supply the following:
   (*a*) Distance and direction from nearest town and shipping point.
   (*b*) Mining district.
   (*c*) Township, Section, Range.
   (*d*) County, State.
4. (*a*) State whether or not property is now in operation, and if in operation, by whom operated.
   (*b*) Are you operating this property as:
   - ☐ Owner.
   - ☐ Lessee.
   - ☐ Contractor.
5. Number of years in production _____

   If not in production or operation, estimated date when production will begin _____
6. Experience of operators:
   Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who manage the project.
7. History:
   (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for suspension of operation.
   (*b*) State briefly the known history and production of adjoining and neighboring properties.
   (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

8. Names and addresses of Officers, Directors, or Partners, and in addition thereto, the five largest stockholders if applicant is a corporation.

Name and Address (a)	Official Title (If officer is also director indicate by "D") (b)	Total of Annual Salary, Commissions, Bonuses, Etc., Received From Applicant and Affiliates During Last Fiscal Year (c)	Estimated Net Worth Outside of Interest in Applicant (d)	Number of Shares Held in Applicant Corporation: Common (e)	Number of Shares Held in Applicant Corporation: Preferred (f)	Life Insurance Carried for Benefit of Applicant: Amount (g)	Life Insurance Carried for Benefit of Applicant: Net Cash Surrender Value After Loans (h)
J.D.Schwartz, President	D	None	$100,000	8 1/2	10	None	
P.O.Box 1702 El Paso Tex				$100 par	$100 par		
R.I.Ludwig,Vice President	D	None	$ 5,000	245	95	None	
P.O.Box 40 Placerville Colo							
R.F.Monsen, Secretary	D	None	$200,000	76 1/2	45	None	
515 S Hague, El Paso Tex							
A.B.Poe,Jr. Treasure	D	None	$200,000	10	50	None	
601 Texas St El Paso Texas							
K.C.Griffith, Director							
1057 So 4 West Salt Lake City	D	None	75,000	127 1/2	20	None	
H.M.Daugherty,Jr							
226 Pennsylvania E L Paso		None			50	None	
W.P.Rabb							
2809 N. Florence,ElPaso Tex		None		12 1/2	25	None	
	Total		x x x x x			x x x x x	x x x x x

If more lines are needed continue on separate sheet.

9. Capital Stock Issues: Fully paid in and non assessable. For corporate applicants

Item	Authorized (a)	Outstanding (b)	Par Value (c)	Number of Shares Outstanding (d)	Dividend Rate Last Paid* (e)
Common stock	$ 50,000	$ 50,000	$ 100.00	500	none
Preferred stock	$ 50,000	$ 50,000	$ 100.00	500	none

*Indicate period covered.

New corporation.

10. Production:

Item	Kind of Product (a)	1948 Total (b)	1949 Total (c)	1950 Total (d)	Present Average Monthly (e)
1. Quantity of product mined or quarried (Short, long, metric tons; barrels; pounds; etc.)					
2. Quantity of product processed (specify unit of measure and type of process)	No. 10 answered on attached				
3. Quantity and grade of product sold or shipped (specify units of measure)					

11. Do you contemplate a change in the present average monthly rate of production? If so, state estimated maximum monthly production and basis of change.

12. Ore or Mineral Reserves:

(a) Describe the ore or mineral deposit briefly. Accompany the application by any available report on the geology and ore reserves.

MATERIALS PRODUCED:

(a) The chief mine product is a primary uranium bearing ore which has been termed 'THUCHOLITE' by examining authorities. Upon mineral study it has been determined this ore is not a true thucholite but rather a modified mineral containing large porportions of Urananite and a lesser volume of Pitchblende.

A complete analysis of samples taken by A.E.C. mineralogists is set forth in the Dr. Kerr-Dr.Razor Report attached (Exhibit MF100A).

The mill product is a uranium concentrate, available either as a high grade moist pulp or a dried and ignited powder. The wet pulp, after concentration will average plus 5% U_3O_8 and the ignited powder plus 12.0% U_3O_8.

(b) At present no byproducts are contemplated although silver values up to 11 oz. per ton are assayed. An attempt to recover these values within the process will be made although no special effort will be made at the beginning of this operation.

Some gold has been assayed and a mercury trap will be installed in anticipation of some recovery of this product. Gold assays have run as high as $9.00 per ton.

COPY

Note: Exhibit MF100B attached describes complete mill process and flow sheet.

2. NAMES AND TYPES OF MINES AND MILLS:

(a) The properties involved in this application consists of a total of 12 claims further herein described by legal description.

The active mines are locally known as the Black King Mine and the White Spar Mine.

The Black King Mine is located on Black King Claim No.5.

The White Spar Mine is located on the White Spar claim.

The concentration mill is located within the townsite of Placerville on leased property. Lease runs for a period of 25 years.

(aa) The present shaft location is shown on the attached U.S.Atomic Energy Commission Map (Exhibit MF100C) and has been sunk to a depth of approximatelu 50 feet. This shaft will not be used except for ventilation purposes.

The White Spar shaft refered to in A.E.C.Report (Exhibit MF100D) has been sunk to a depth of approximately 26 feet. This shaft has been utilised strictly as a prospect shaft. It anticipated this shaft will be used for mining purposes. The further sinking of this shaft is now going forward for an additional 25 feet.

(b) There are no drifts or cross cuts on the Black King. A winse has been driven some 65 odd feet at about a 45° angle and shown extremely high assays and substantial ore volume.

No drifting, cross cuts or winses have been made on the White Spar.

(c) The Black King Tunnel has been carried to a total length approaching 150 feet and it is contemplated to extend same an additional 100 feet.

The White Sapr has no tunnel at this time.

(d) On the Black King two additional openings are being worked. In the 'gulley' above the winse and shaft a face of ore measureing about 4'6" x 7'3" is exposed

COPY

and from which channel samples average .32% U_3O_8. Near this face in the bed of the gulley drill hole assays as high as 6.23% have been obtained.

On the White Spar adjacent to the shaft two other prospect holes have been opened both with good showings of value.

Neither of the workings present any water difficulties. Black King winse requires constant pumping but will be 'piped off' with future drilling and exploration work.

Regarding the size and productive capacity of the Black King our experience indicates we can depend upon this Mine to produce a major porportion of the 25 ton per day mill capacity.

The White Spar has indications, if the trend follows, to produce a large volume of mill grade ore.

NOTE: New prospects by other owners have within the past few weeks produced other showing of simular ores from locations along the fault line. These prospectors are now doing development work on these showings.

COPY

3. FOR-EACH OPERATION ABOVE LIST THE FOLLOWING:

(a) The Black King Mine is located by temporary road about 2 1/2 miles from the Placerville Millsite. A new road which will shorten this distance more than 50% is contemplated under this program .

The White Spar Mine is located by road developed by us a short 1/2 mile from the Millsite. This raod is a good mine road and is constantly maintain.

The San Miguel County Highway Department has been and always is most helpful in maintaining roads which benifit working conditions for its people. They have assisted materially in helping us maintain these roads during the heavy winter just passed.

(b) Both the Black King and White Spar properties are located in the Lower San Miguel Mining District.

(c) The Black King claims are located in Sec. 27,T. 44N., R 11 W, New Mexico preincipal Meridan.

The White Spar claim is located in Sec. 27,T. 44 N., R 11 W, New Mexico principal Meridian.

(d) All claims refered to herein are located in San Miguel County, State of Colorado.

NOTE: Location map is a part of the George G. Moorehouse Report (A.E.C., attached hereto as Exhibit MF100D.

Maps of Black King claims also included in above reports.

Maps showing claim locations of White Spar are attached as Exhibit MF100E

COPY

4. STATE WHETHER PROPERTIES ARE NOW IN OPERATION: Both the Black King and White Spar properties have been in operation thsoughout the winter except for shut downs occassioned by severe weather. Presently both properties are being cleaned up for complete operation beginning April 25th 1952

(b) The corporation has the entire 12 claim under lease and as Lessee is carrying on operations outlined within the attached data summary.

NOTE: The eases covering these claims are not the ordinary mineral leases which pay to the Lessor certain royalties based on values of raw ore, rather these leases base the Lessors earnings on the value of the concentrates sold from the mill. This royalty is on a sliding scale basis.

We beleive these leases are of major value to the corporation wherein the ore is a base product for this mill and the Lessor shares in all values other than recovered uranium. (Exhibit MF 100 F&G)

COPY

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We beleive these leases are of major value to the corporation wherein the ore is a base product for this mill and the Lessor shares in all values other than recovered uranium.

COPY

5. NUMBER OF YEARS IN PRODUCTION:

(a) Other than the production which has been occassioned by the exploratory work involved neither of these properties have been producing properties.

Exploration work has, however, produced about 100 tons of mill grade ore including about 20 ton which average plus 2.0%.

It is anticipated that, by the work included and proposed within this application volume production will be possible within 90-120 days after work is started.

COPY

6. EXPERIENCE OF OPERATORS: The business experience of the corporate officers is both comprehensive as well as successful.

Mr. J.D.Schwartz,President; Mr. Schwartz is President of J.D.Schwartz Chemical Company and Vice President of Air Reduction Magnolia Company of El Paso. Both of these firms are representative industrial firms in the El Paso area.

Mr. Ruben F. Monsen, Secretary: Mr. Monsen is Vice President of Monsen, Ryan, Dunnigan Company of El Paso, a firm which has been in the import and export business successfully in that area for a considerable period. Mr. Monsen also has other business connections in El Paso and is a well known citizen of that City.

Mr. A.B.Poe, Treasurer: Mr. Poe has for a number of years been among the more successful automobile distributors of the Southwest. His firm is distributors of Chrysler Plymouth motor cars.

Mr. Robert I. Ludwig,Vice President: Mr. Ludwig, before becoming assocaated with the uranium mining business in 1950 practiced as an Industrial Consultant and was the original owner of the Tide and Bay Companies of Tacoma Washington who operated an engineering-construction service in the Pacific Northwest building chemical and metallurgical reduction plants.

Since 1950 he has been associated with major uranium projects and as well carried on the operation of Rare Metals and Minerals, a commercial production kaboratory refining the rare earth elements in Salt Lake City, Utah.

(b) The mining and milling construction, processing and operations is in charge of Mr. Ludwig who is assisted as required by consultants with the required technical skills.

As Consultants for the company's operations, as indicated in letter of transmittal Mr. George D. Schrieber and Mr. Arch Swett are assisting in the guidance of this operation.

COPY

As Consultants for the processing operations the company has obtain the assistance of Mr. Harry D. Brown of Brown Laboratory, Grand Junction Colorado and

Mr. Lionel Booth of Booth Engineers, Salt Lake City, Utah.

Mr. Brown is well known for his chemistry of uranium and Mr. Booth in the field of flotation is as well considered a competent technician.

The combination of technical skills and wide experiences offered by this staff should lend weight towards an economical and well designed operation.

Further, and of importance, the Atomic Energy Commission through the Office of Chief of Raw Materials at Grand Junction field geologists and staff technicians have always offered great assistance to us in our previous work here. We have every reason to beleive this assistance will continue and in fact increase with our increased activities.

COPY

7. HISTORY: Until the Black King and White Spar Mines were taken over in October 1951 by principals who now are officers of the applicant corporation no work other than prospect work had been done on these properties. During the past six months development work to the extent of more than $ 20,000.00 has been done resulting in the proof that these properties are more than just prospects.

Through this work various ore showing found were explored both by actual mining on the ore and as well with drilling by jackhammer to hole depths up to 34 feet.

There has been no suspension of activities. When weather conditions at the Mines prevented work at those locations the labor was utilized in preliminary survey work on the millsite.

(b) The history of adjoining properties is mostly in gold, silver, lead and zinc. Placer operations have for many years been conducted on the San Miguel River which runs through the town of Placerville.

The noble metal production of San Miguel County is too well know to require emphasis in this report

(c) The following listed reports prepared by the U.S.Atomic Energy Commission are attached hereto:

MF100A 'Uranium in Black King Prospect' Dr's. Kerr and Razor and Hamilton. Dated-Columbia University June 1951

MF100J 'Investigation of Thucholite Deposit Near Placerville' George E. Morehouse, July,1951

Includes Index Map
Generalized Geol. Map.
Claim Map

MF100 C Division of Raw Materials Map A.E.C. Dated Aug. 1951 showing exploration drill holes and float sample assays, Black King.

MF100 H U.S.Geological Survey Report- White Spar and Black King.

MF100 E Photostat-U.S.Land office Maps-White Spar and claim group.

MF100 J Brown Lab Assays

COPY

Attached hereto Denver Equipment Company's Report on Laboratory Tests of Process (Exhibit _____).

Also attached (Exhibit_____) Report of Mill Concentration Process prepared by applicant for this report.

To our knowledge no other exploratory program has at any time been recommended for these properties other than the drilling program proposed by the U.S.Atomic Energy Commission. We are not familiar with the exact recommendations of the Commission, altho we have been advised they expect to drill with the coming good weather. To this end we are preparing to provide crew housing, roads and water delivery without cost to the Commission.

We have had the benefit of numerous suggestions from A.E.C. field representatives and acting upon these suggestions have developed worthwhile ore showings. We sincerely solicite the continued interest of the Commission.

The program outlined under MF-103 attached is the program recommended by our Consultants Messrs. Schrieber and Sweet after several surveys of the property and discussions with all interested parties.

We beleive this program a technically good one and a program which will be most economical as well as productive of sound results.

COPY

10. PRODUCTION:

In explanation of Question No. 10 of this report (MF-100) the following production history from October 1951 to this date is the result strictly of exploration work:

Mineral Product: Modified THUCHOLITE

Tons Mined: October-November 12 ton average assay 2.77% U_3O_8.

December to February, 60 ton average .565% "
50 ton average .275% "

We are now beginning to prepare for the seasons first productive effort which we beleive will, with the production contemplated from work outlined in this program, furnish our mill with no less than it's capacity of 25 ton per day of mill grade ore (.30%).

This plant capacity will produce approximately 2 1/2 tons per day of concentrate of plus 10% U_3O_8 contained.

On April 25th we anticipate starting work on the White Spar shaft. This will be followed as papidly as is possible with a more productive program at the Black King. Present work at the Black King is confined to revoval to millsite of ore mined last year and a sound clean up and make ready program for the more productive work contemplated.

COPY

11. DO YOU CONTEMPLATE CHANGE IN PRODUCTION:

In accordance with various explanations and statements concerning other questions answered herein and as shown on MF-103 submitted herewith we do contemplate a substantian increase in production.

The increase in production will be more or less automatic bebause the work contemplated is designed to ' stay on the ore' and develop volume rather than to carry forward strictly prime prospecting.

The prospect angle will be rather well taken care of by the drilling program contemplated by the Atomic Energy Commission.

COPY

12. DESCRIBE THE MINERAL DEPOSIT BRIEFLY:

The reports, maps and sketches attached hereto give this information more fully, no doubt, than we would be able to so do without complete duplication and use of materials so contained.

It should, at this point however, be of interest to the examining staff to know additional showings of silular ores are being found in this immediate locality on properties belonging to others.

For this reason the Commission has seen fit to modify our linense permitting us to purchase these ours for our mill.

12b. IF DEPOSIT IS OTHER THAN PLACER:

There is no actually measured tonnage figures available. The prospect and explorative drilling which was accomplished during the past fall and winter show holes with ore from 4 to 9 foot in depth, numerous holes show streaks of high grade ore from one to six inches in depth.

From these tests and observations made during this work we are fully satisfied we can recover without further exploration several hundred ton of mill grade ore.

The estimated cost per ton laid down at the millsite is $ 17.00 based uppn no allowance from A.E.C. for milage hauling allowance. This cost we expect to reduce considerably by increased man/day yeilds under the new work program.

COPY

13. ACCESS ROADS:

(a) From the Black King Mine to the millsite the distance is approximately 2 1/2 miles by good mine road and paved hiway. A new road into this property is contemplated with this program which will make this an all-weather road and shorten the distance to about 1 1/4 miles.

(b) From the White Spar Mine to the millsite a mine road has been developed by us a total distance of about 1/2 mile. This road is also to be improved for all-weather use.

(c) The millsite is located 17 miles from the town of Telluride, 17 miles from the town of Norwood, 49 miles from the town of Montrose and 112 miles from Grand Junction.

Mining supplies are available a most of these points with the wholesale houses and machinery companies mostly located in Grand Junction.

Fast freight truck service is handled between these points by the Telluride Truck and Transfer Company of Telluride, Colorado.

All roads to the stated towns are hard surfaced.

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14. **WATER SUPPLY:**

The water supply to the Black King is ample all year for all ordinary mining and potable requirements. This water is good, being developed from an underground source in the winze of the Black King Mine.

For the White Spar operations water must be trucked. Ample water for all purposes is available at the millsite and returning ore and supply trucks will maintain an adequate supply at the property at all times.

COPY

15. POWER:

Power is available from the San Miguel Power Association (REA) withing 1/2 mile of both properties and the gross user rate is very attractive. However, it is not contemplated that power from any Public Service source will be used until such time as the development warrants same.

COPY

16. **LABOR:**

During the period October 1951 and April, 1952 the following number and classification of employees were used:

1	Mine Superintendent	Rate per Month	$ 400.00
3	Miners	Rate per day	$ 12.00
2	Muckers	Rate per day	$ 10.00

Beginning with the survey and construction of mill factilities in February 1952 the following additional classifications and number have been employed:

2	Mill men	Rate per month	$ 300.00
1	Laborer	Rate per hour	$ 1.00

It is anticipated that with the mill and mine work contemplated by June 1952 the following classifications and numbers will be employed without any general rate change:

1	Mine Superintendent
4	Miners
2	Muckers
2	Truck drivers
1	Mill foreman
3	Mill shift operators
1	General Maintenance man

To the above will of course be added the customary administrative and non-productive employees. As stated, non-productives are not charge for.

COPY

17. EQUIPMENT AND FACILITIES:

The following buildings and facilities are immediately available at the Black King Mine:

Compressor and equipment house.

Change Room

Tool Shed

Hoist Shelter

Powder House

These buildings are new, owned by the applican and available for use without cost or depreciation charges.

Facilities available at the Black King Mine which are also immediately available without cost to this project are:

Mine Shaft Track

Winse Track

200 feet air piping

40 feet jointed jackhammer steel (exploration)

4 new tungsten carbide bits (exploration)

60 feet jach hammer steel.

Small tools and supplies.

At the millsite, available without charge to this project is now or will be complete the following:

Radiometric Geiger Scaler.

Chemical assay laboratory.

Small tool and equipment repair facilities.

All production equipment is contemplated to be obtained on a rental-purchase contract wherein 90% of rentals apply on purchase.

COPY

18. CIRCUMSTANCES EFFECTING OPERATION:

There are no circumstances effecting these operations not reported herein by detailed explanation.

The applicant corporation is presently expending approximately $ 30,000.00 in mill construction to especially handle the ores from the properties herein discussed as well as such ores of a like nature as may be locally developed.

Present scheduling is towards a June 15 1952 mill completion and starting of processing operations.

COPY

(*b*) If deposit is other than placer:

(1) Submit assay plans and/or sections showing location and size of proved (measured) and probable (indicated) ore or mineral reserve.

(2) State the tonnage (indicate type of ton) and grade of each class of ore reserve, as above, and show how computed. Tabulated total ore reserve as follows:

TOTAL ORE OR MINERAL RESERVES

Ore or Mineral Reserve	Estimated Tons (a)	Metal or Mineral Content Per Ton (Grade) (b)	Gross Value Per Ton (c)	Recoverable Unit Value Per Ton (d)	Estimated Cost of Production Per Ton (e)
Measured (proved)					
Indicated (probable)					

(*c*) If placer:

(1) Give estimated total yardage and average marketable mineral content of each deposit.

(2) Submit map showing location of placer deposit and surrounding area, with all test holes or pits. Submit logs of each hole and test pit with depth and average value of each.

(3) Describe gravel, stating whether fine, medium or coarse; loose, tight, cemented, or frozen, and whether it contains stumps or boulders more than 1 foot in diameter; if so, how large, and in what proportion.

(4) Describe bedrock, giving type (granite, sandstone, shale, etc.) and state whether it is hard or soft, smooth, uneven or rough.

(5) Describe overburden, stating whether loose, tight, or cemented; fine or coarse textured; furnish estimate of average thickness and total amount.

(6) Tabulate the reserves using the form outlined above for ore or mineral reserves.

13. Access Roads:

Give road distances to shipping, supply and residence points, stating kind and condition of roads.

14. Water Supply:

State source and quantity of water available for operations and whether sufficient for all seasons of year.

15. Power:

State amount of power used, rate per hour, and source thereof.

16. Labor:

State number and classes (miners, muckers, millmen, etc.) of men employed during a recent representative payroll period.

17. Equipment and Facilities:

Describe present equipment on the property, including buildings. (State condition.) List major pieces of equipment now owned or controlled and in serviceable condition available for this operation.

18. Are there any particular conditions or circumstances affecting your operations that are not described above? If so, explain.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

BACHELOR CORPORATION (Name of Company)

By Robert I. Ludwig (Signature of authorized official)

ROBERT I. LUDWIG

MAY 1, 1952 (Date)

VICE PRESIDENT

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—63792-1

REPORT ON MILL CONCENTRATION PROCESS

1. The following report concerns the reasons behind the applicants decision to build a mill for the exclusive concentration and processing of this THUCHOLITE ore. Careful and exhaustive studies of processing proceedures permit the efficient and economical concentration and ultimate chemical extraction of uranium oxide from this type of ore.

2. Careful study of the Kerr-Rasor-Hamilton Report, and the report of Geo. ,ore-house was taken seriously and the exploration carried to the point which, in our opinion, the major gamble of furnishing a mill with ore was reduced to a minimum.

3. This ore when mined is not amenable to present Carnotite Processing Plants without penalties for lime and other impurities. The 'as kined' lime content runs as high as plus 60%. Substantial amounts of Fe and MnO_3 are at times present. Also strong traces of Cr.

The process developed, as shown by exhibit ME100B proves the lime can be reduced to a very low figure and other impurities , for all practical purposes, be removed and the U_3O_8 grade increased ten fold in the wet pulp and thirty fold in the ignited product.

4. As a result of these studies it was decided to go ahead with the plant investment with corporation capital and request Government assistance with the mining program.

5. A twenty five ton per twenty four capacity mill is therefore under construction consisting of the following main components and supplementary equipment:

4'6" x 16" Hardinge Conical Ball Mill

9" x 12" Blake Type Jaw Crusher

1000 cu. ft. fine ore storage bin

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18" x 5'0" Wemco Feeder with Varidrive motor.

4' x 4' Super agitator and conditioner.

6 cell flotation machine consisting of 22" x22" cells arranged for seperation cleaning and recleaning.

12S Wilfley Table

Denver Type "C" Sand Pumps

Specially designed filtering equipment.

Specially designed ignition furnace.

Flotation and assay laboratory.

6. The total cost of this plant installed and ready for operation will approach $ 30,000.00.

7. Attached hereto as Exhibit MF100B is the complete report of Denver Equipment Company's laboratory test work on the process. Other technical data is available and being prepared for further negotiations with the U.S.Atomic Energy Commission relative to full chemical extraction

8. It is estimated this mill will be in complete operation during the month of June.

Finally, this report and the attached Exhibits are ~~is~~ submitted along with MF-100 and MF-103 together with the statements contained herein that the non-productive expense will be borne by the corporation as proof that our firm is seriously interested in this activity as a production unit and not as a promotional venture.

COPY

LEASE AGREEMENT

This agreement, made and entered into this 2 day of October, 1951, by and between Boyd Robinson, husband, and Teresa B. Robinson, wife, jointly, both of 1639 Cannon Avenue, Grand Junction, Mesa County, Colorado, hereinafter referred to as the Lessors, and Robert I. Ludwig, 16 East First North, Salt Lake City, Salt Lake County, Utah hereinafter referred to as the Lessee.

WITNESSETH:

That the Lessors are the owners of certain mineral claims hereinafter described in detail and desire to obtain the services of the Lessee in mining, concentrating, and milling valuable minerals from ores on such claims, and

Whereas, the Lessee is desirous of mining, concentrating, and milling said minerals from said claims under terms fully set forth herein.

Now, therefore, in consideration of one dollar ($1.00) and other good and valuable consideration by each of the parties to the other in had paid, receipt of which is hereby acknowledged, and of the covenants and agreements hereinafter contained to be kept and performed by said Lessee, the said Lessors have granted, demised, and let, and by these presents do grant, demise, and let unto the said Lessee all of the following described mining property, mining rights, premises, and property in San Miguel County, Colorado:

Barbara Jo

White Spar

New Discovery

El Capitan

Angel Group, 1, 2, 3, and 4.

For a more particular description of these properties reference is here made to Addenda A to this agreement signed by the parties hereto.

Term:

The term of this agreement shall be for the period of five (5) years from the date first herein written, like period upon completion of the minimum stated to be performed by the Lessee.

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100G.

Exhibit G.

Minimum Requirements for Renewal:

In the event that the Lessee shall have mined from within the described claims during the last year of this term, ore in the amount of two thousand (2,000) tons, this lease shall, at the Lessee's option, be automatically extended for an additional five (5) years.

Requirements of Lessee:

The requirements of the Lessee to perform the following definite work shall be executed fully as stated hereunder. Failure to fully execute these performance requirements shall violate the terms of this lease and shall be sufficient grounds for cancellation by Lessors upon written notice as called for herein:

(1) To, within ninety (90) days from the date first herein written, the Lessee will begin the actual mining operations on the claims herein described. Actual mining operations shall consist of a minimum of one (1) mining crew suitably equipped to remove ore from the mine site and make same ready for transport to the Lessee's concentrator.

(2) To, thereafter maintain not less than one (1) properly equipped mining crew aggressively working said mining claims, this work to consist chiefly of exploration mining with a view toward establishing the size and volume of the ore body.

Performance Delay:

This lease agreement requires the Lessee to perform certain specific requirements with a definitely defined time limit. It is hereby agreed by the Lessors that in the event delay is occasioned by weather conditions, such delay shall not be considered as sufficient grounds for cancellation of this agreement, and in lieu thereof, the performance time shall be extended by the period of this delay

Compensation of Lessor:

The Lessors compensation shall be a royalty based upon the assay values of the mineral concentrates produced by the Lessee's concentrating plant in accordance with the following schedule:

(1) Until the Lessee has created ten (10) tons of concentrate from ores mined and received from the claims herein described, the royalty shall be seven and one-half per cent (7½%) of the assayed values of the concentrate, including all premiums or bonuses set up by the U. S. Atomic Energy Commission covering these ores or concentrates.

(2) After the above mentioned concentrate has been produced the following schedule of royalty shall apply:

(a) For those ores fifty (50) tons or less per day, or seven hundred and fifty (750) tons per month, the royalty shall be fifteen (15) per cent of the assayed values as described in (1) above.

(b) For those ores produced from fifty one (51) tons to one hundred (100) tons per day or two thousand five hundred (2,500) tons per month, the royalty shall be seventeen and one-half percent (17½%) of the assayed values as described in (1) above.

(c) For all ores produced from one hundred and one (101) tons per day and over, the royalty shall be twenty per cent (20%) of the assayed values as described in (1) above.

The payment of the royalty shall be made by the Lessee to the Lessor on or beforethe tenth (10th) day of the month following the assay of the concentrate, provided however, that the Lessee shall not be obligated to assay or pay royalty on any concentrate until a concentrate stock pile of twenty (20) tons has been established. The purpose of this stock pile is to attempt to qualify for the U. S. Atomic Energy Commission bonus for twenty (20) tons of twenty per cent (20%) uranium bearing concentrate.

Lessor's Requirements:

The Lessor hereby warrants that the above described calims are properly staked, location and claim markers are properly placed and that all location and assessment work is and has been performed and recorded and isin good standing as of this date.

The Lessor agrees to assist the Lessee to the fullest extent by providing all information which they possess regarding geological, mineroligical, concentrating and processing reports. Further, the Lessor agrees to visit the property occasionally andlend whatever assistance they can, or may be able to contribute by reason of their experience on this property.

Rights of Lessor:

The Lessor may visit the property at all reasonable times for the purpose of inspection of the work, and to audit the books of the Lessee at any reasonable time, but in no event more often than once each four months, cost of said audit to be paid by the Lessor.

The Lessor may visit the concentrating plant of the Lessee at all reasonable times and examine head ores, concentrates, and tails, and to check weight records, assays, andother concentrator records.

The Lessor is entitled to, and the Lessee will furnish, monthly reports showing the approximate tonnage and the approximate valuesof the ores mined, milled, andconcentrated.

Reports of other progress being made on the said claims will be made to the Lessor in a manner enabling the Lessor to have full knowledge of the mining and concentrating operations.

Cancellation:

This lease may be cancelled by either party for reasons of non performance of the conditions specifiec herein. Cancellation shall be effected by giving thirty (30) days written notice sent via registered U. S. Mail by either party hereto to the other. Said notice of cancellation shall outline the specific reason for such cancellation.

Upon the cancellation or expiration of this agreement for any purpose, the Lessee shall have sixty (60) days in which to remove all equipment, buildings, tools, machinery, supplies, and other personal property (put on the property by the Lessee) whether attached to the realty or not, and likewise shall have the same period of time in which to remove, concentrate, market,

mill, or otherwise dispose of any andal l ores mined upon said premises and remaining in or upon said premises at the cancellation or expiration of this lease.

Assignment:

The Lessor herein grants the Lessee the right to assign this agreement to a corporation, organized for the purpose of minerals exploration, mining, milling, or cnncentrating in which the Lessee is a prind pal stokholder, but to no other firm or individual without prior written consent of the Lessor.

Claims and Taxes:

During the period of this lease, Lessee, or his assignes, shall carry Workmen's Compensation for all of his employees and shall furnish Lessors with written evidence of same ano upon his failure to do so, this lease shall become null andvoid without any demand or notice to Lessee.

And during the period of this lease, Lessee shall comply with al l laws and regulations pertaining to the mining and milling operations carried on hereunder by him. He Shall promptly pay and discharge all claims and accounts incurred by him hereunder and shall indemnify and save harmless Lessors from all actions and causes of a ction of any nature whatsoever, which may or might arise out of mining or milling operations hereunder.

Lessee shall promptly pay, when due, all State and federal taxes and exactions, particularly any and all production taxes assessed against said mining and milling operations.

The terms and conditions of this agreement shall extend to, and be binding upon, the heirs, executors, administrators, and assignees of both parties hereto.

In witness whereof, the parties hereto have caused their respective names and seals to be hereunder affixed the day and year first above written.

WITNESS:

Boyd Robinson

Boyd Robinson

Teresa B. Robinson

Robert I. Ludwig

ACKNOWLEDGEMENT

STATE OF Colorado)
COUNTY OF Montrose) SS.

On the 5th day of October, A. D. 1951, personally appeared before me Boyd Robinson, Thereon B. Robinson, and Robert I. Ludwig, the signers of the above intrument, who duly acknowledge to me that they executed the same.

Alice E. Bruni
Notary Public

My Commission expires April 16, 1955.

STATE OF)
COUNTY OF) SS.

On the _____ day of _____, A. D. 1951, personally appeared before me _____, the signers of the above instrument, who duly acknowledge to me that they executed the same.

_____
Notary Public

My commission expires _____.

STATE OF)
COUNTY OF) SS.

On the _____ day of _____, A. D. 1951, personally appeared before me _____, the signers of the above instrument, who duly acknowledge to me that they executed the same.

_____
Notary Public

my commission expires _____

ADDENDA "A"

This addenda, dated October 6, 1951, signed this date by Theresa B. Robinson, Boyd Robinson, and Robert I. Ludwig, refers to the description of claims noted on page one of the lease agreement between the above parties dated October 5, 1951 and hereby becomes a part of the lease agreement above referred to as follows:

The Barbara Jo mining claim, for a more particular description of which reference is here made to the Orignial Location Certificate of record in book 174, Page 402, of the records of San Miguel County, Colorado, which was recorded on November 18, 1947 in the office of the county clerk thereof at Telluride, Colorado.

The White Spar mining claim and the New Discovery mining claim, for a more particular description of both reference is here made to the Original Location Certificate of record in book 52, page 72, of the records of San Miguel County, Colorado, which was recorded on December 30, 1887 in the office of the county clerk thereof at Telluride, Colorado.

The El Capitan mining claim, for a more particular description of which reference is here made to the Original Mining Certificate of record number 1814, General Land Office number 44623, of record in book 91, page 43 of the records of San Miguel County, Colorado, which was recorded on March 24, 1906 in the office of the county clerk thereof at Telluride, Colorado.

The Angell Group. On page one (1) of the lease agreement referred to in paragraph one above referrence was made to the "Angel group 1, 2, 3, and 4". Upon examination of the records of San Miguel County, book 91, page 43, mining certificate number 1814, General Land office number 44623, which was recorded on March 24, 1906 in the office of the county clerk of San Miguel County, Telluride, Colorado, and upon examination of maps of Sec. 35, T.44N, R11W, and of Sec. 1, T.43N, R.11 W., it was determined that these four claims as referred to in the lease were incorrectly named and should be described as Angell 2, 3, 7, and 8.

In witness whereof, the parties hereto have caused their respective names to be hereunder affixed the day and year first above written.

WITNESS:

R. Johnson

Boyd Robinson

Theresa B. Robinson

Robert I. Ludwig

LEASE AGREEMENT

This agreement, made and entered into this 4th day of October, 1951, by and between H. G. Weatherly and J. B. Weatherly, both of Grand Junction, Mesa County, Colorado, and O. E. Weatherly, of New Castle, Garfield County, Colorado, all hereinafter referred to as the Lessors, and Robert I. Ludwig, 16 East First North, Salt Lake City, Salt Lake County, Utah, hereinafter referred to as the Lessee.

WITNESSETH:

That the Lessors are the owners of certain mineral claims and millsite hereinafter described in detail and desire to obtain the services of the Lessee in Mining, concentrating, and milling valuable minerals from ores on such claims, and

Whereas, the Lessee is desirous of mining, concentrating, and milling said minerals from said claims under terms fully set forth herein.

Now, Therefore, in consideration of one dollar ($1.00) and other good and valuable consideration by each of the parties to the other in hand paid, receipt whereof is hereby acknowledged, and of the covenants and agreements hereinafter contained to be kept and performed by said Lessee, the said Lessors have granted, demised, and let, and by these presents do grant, demise, and let unto the said Lessee all of the following described mining property, mining rights, premises, and property in San Miguel County, Colorado, described as follows, to-wit:

The Black King Number One mining claim, for a more particular description of which reference is here made to the Original Location Certificate, number 96582, of record in book 122, page 404, of the records of San Miguel County, Colorado, which was recorded on October 29, 1949, in the office of the County Clerk thereof at Telluride, Colorado.

The Black King Number Four mining claim, for a more particular description of which reference is here made to the Original Location Certificate, number 97949, of record in book 204, page 518, of the records of San Miguel County, Colorado, which was 1950 in the office of the County Cl Telluride, Colorado.

and

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100 F.

H. G. W.

J. B.

Exhibit H.

The Black King Number Five mining claim, for a more particular description of which reference is here made to the Original Location Certificate, number 97950, of record in book 204, page 518, of the records of San Miguel County, Colorado, which was recorded on June 24, 1950 in the office of the County Clerk thereof at Telluride, Colorado.

The Millsite, for a more particular description of which reference is here made to the Original Location Certificate, number98328, of record in book 204, page 545, of the records of San Miguel County, Colorado, which was recorded on August 17, 1950 in the office of the County Clerk thereof at Telluride, Colorado.

The general location of the said mining claims and Millsite being near Placerville, San Miguel County, Colorado, which is near the intersection of Colorado Highway number 145 and Colorado Highway number 62, in South-Western Colorado.

Term:

The term of this agreement shall be for the period of five (5) years from the date first herein written, subject to renewal for a like period upon completion of the minimum requirements herein stated to be performed by the Lessee.

Minimum Requirements for Renewal:

In the event that the Lessee shall have mined from within the described claims during the last year of this term, ore in the amount of two thousand (2,000) tons, this lease shall, at the Lessee's option, be automatically extended for an additional five (5) years.

Requirements of Lessee:

The requirements of the Lessee to perform the following definite work shall be executed fully as stated hereunder. Failure to fully execute these performance requirements shall violate theterms of this lease and shall be sufficient grounds for cancellation by Lessor upon due notice as called for herein:

(1) To, within thirty (30) days from date first herein written, complete all engineering surveys desired by Lessee and to begin actual mining operations. Actual mining operations shall consist of a minimum of one mining crew suitably equipped to remove ore from the mine site and make same ready for shipment to the Lessee's concentrator.

and

(2) To, within thirty (30) days thereafter, (sixty (60) days from date first herein written) begin the actual construction of an ore concentrating plant on a site selected by Lessee.

(3) To, within thirty (30) days thereafter, (ninety (90) days from date first herein written) begin the actual concentration of ores mined from claims herein described.

(4) To, thereafter maintain not less than one (1) properly equipped mining crew aggressivley working said claims, this work to consist chiefly of exploration mining with a view toward establishing the size and volume of the ore body.

Compensation of Lessor:

The Lessor's compensation shall be a royalty based upon the assay values of the mineral concentrates produced by the Lessee's concentrating plant in accordance with the following schedule:

(1) Until the Lessee has created ten (10) tons of concentrate from ores mined and received from the claims herein described, the royalty shall be seven and one-half per cent (7½%) of the assayed values of the concentrate, including all premiums or bonuses set up by the U. S. Atomic Energy Commission covering these ores or concentrates.

(2) After the above mentioned concentrate has been produced the following schedules of royalty shall apply:

(a) For those ores fifty (50) tons or less per day or seven hundred and fifty (750) tons per month, the royalty shall be fifteen (15) per cent of the assayed values as described in (1) above.

(b) For those ores produced from fifty one (51) tons to one hundred (100) tons per day or two thousand five hundred (2,500) tons per month, the royalty shall be seventeen and one-half percent (17½) of the assayed values as described in (1) above.

and

(c) For all ores produced from one hundred and one (101) tons per day and over, the royalty shall be twenty per cent (20%) of the assayed values described in (1) above.

The payment of the royalty shall be made by the Lessee to the Lessor on or before the tenth (10th) day of the month following the assay of the concentrate, provided however, that the Lessee shall not be obligated to assay or pay roylaty on any concentrate until a concentrate stock pile of twenty (20) tons has been established. The purpose of this stock pile is to attempt to qualify for the U. S. Atomic Energy Commission bonus for twenty (20) tons of twenty per cent (20%) uranium bearing concentrate.

Lessor's Requirements:

The Lessor hereby warrants that the above described claims and millsite are properly staked, location and claim markers are properly placed and that all location and assessment work is and has been performed and recorded and is in good standing as of this date.

The Lessor agrees to assist the Lessee to the fullest extent by providing all information which they possess regarding geological, mineralogiwal, concentrating and processing reports. Further, the Lessor agrees to visit the property occasionally and lend whatever assistance they may be able to contribute by reason of their experience on this property.

Rights of Lessor:

The Lessor may visit the property at all reasonable times for the purpose of inspection of the work, and to audit the books of the Lessee at any reasonable time, but in no event more often than once each four months, cost of said audit to be paid by the Lessor.

The Lessor may visit the concentrating plant of the Lessee at all reasonable times and examine head ores, concentrates, and tails, and to check weight records, assays, and other concentrator records.

RJL

The Lessor is entitled to, and the Lessee will furnish, monthly reports showing the approximate tonnage and the approximate values of the ores mined, milled and concentrated.

Reports ofother progress being made on the said claims will be made to the Lessor in a manner enabling the Lessor to have full knowledge of the mining and concentrating operations.

Cancellation:

This lease may be cancelled by either party for reasons of non-performance of the conditions specified herein. Cancellation shall be effected by giving thirty (30) days written notice sent via Registered U. S. Mail by either party hereto to the other. Said notice of cancellation shall outline the specific reason for such cancellation.

Upon the cancellation or expiration of this agreement for any purpose, the Lessee shall have sixty (60) days in which to remove all equipment, buildings, tools, machinery, supplies, and other personal property (put on the property by the Lessee) whether attached to the realty or not, and likewise shall have the same period of time in which to remove, concentrate, market, mill, or otherwise dispose of any and all ores mined upon said premises and remaining in or upon said premises at cancellation or expiration of this lease.

Performance Delay:

This lease agreement requires the Lessee to perform certain specific requirements within a definitely defined time limit. It is hereby agreed by the Lessor that in the event delay is occasioned by weather conditions, such delay shall not be considered as sufficient grounds for cancellation of this agreement, and in lieu thereof, the performance time shall be extended by the period of this delay.

Assignment:

The Lessor herein grants to Lessee the right to assign this agreement to a corporation, organized for the purpose of minerals exploration, mining, milling, or concentrating in which the Lessee is a principal stockholder, but to no other firm or individual without prior written consent of the Lessor.

RJL

During the period of this lease, Lessee, or his assignee, shall carry Workmen's Compensation for all of his employees and shall furnish Lessors with written evidence of same and upon his failure to do so, this lease shall become null and void without any demand or notice to Lessee.

And during the period of this lease, Lessee shall comply with all laws and regulations pertaining to the mining and milling operations carried on hereunder by him. He shall promptly pay and discharge all claims and accounts incurred by him hereunder and shall indemnify and save harmless Lessors from all actions and causes of action of any nature whatsoever, which may or might arise out of mining or milling operations hereunder.

Lessee shall promptly pay, when due, all state and federal taxes and exactions, particularly any and all production taxes assessed against said mining and milling operations.

The terms and conditions of this agreement shall extend to, and be binding upon, the heirs, executors, administrators, and assignees of both parties hereto.

In Witness Whereof, the parties hereto have caused their respective names and seals to be hereunder affixed the day and year first above written.

WITNESS:

H. G. Weatherly
H. G. Weatherly

_____

J. B. Weatherly
J. B. Weatherly

_____

G. E. Weatherly
G. E. Weatherly

R. Y. Ludwig
R. Y. Ludwig

ACKNOWLEDGEMENT

STATE OF UTAH,
COUNTY OF SALT LAKE, } SS.

On the 1st day of October A. D. 1951, personally appeared before me Robert J. Ludwig the signers of the above instrument, who duly acknowledge to me that they executed the same. A. Reed Reynolds

ACKNOWLEDGEMENT

STATE OF COLORADO,
COUNTY OF M E S A, } SS.

On the 4th day of October, A. D. 1951, personally appeared before me H.G.Weatherly, J. B.Weatherly, and Guy E. Weatherly, also known as G. E. Weatherly, the signers of the above instrument, who duly acknowledge to me that they executed the same.

Maxedie Murphy
Notary Public

My Commission Expires Feburary 19, 1953.

STATE OF
COUNTY OF } SS.

On the _____ day of _____, A. D. 1951, personally appeared before me _____ the signers of the above instrument, who duly acknowledge to me that they executed the same.

_____
Notary Public

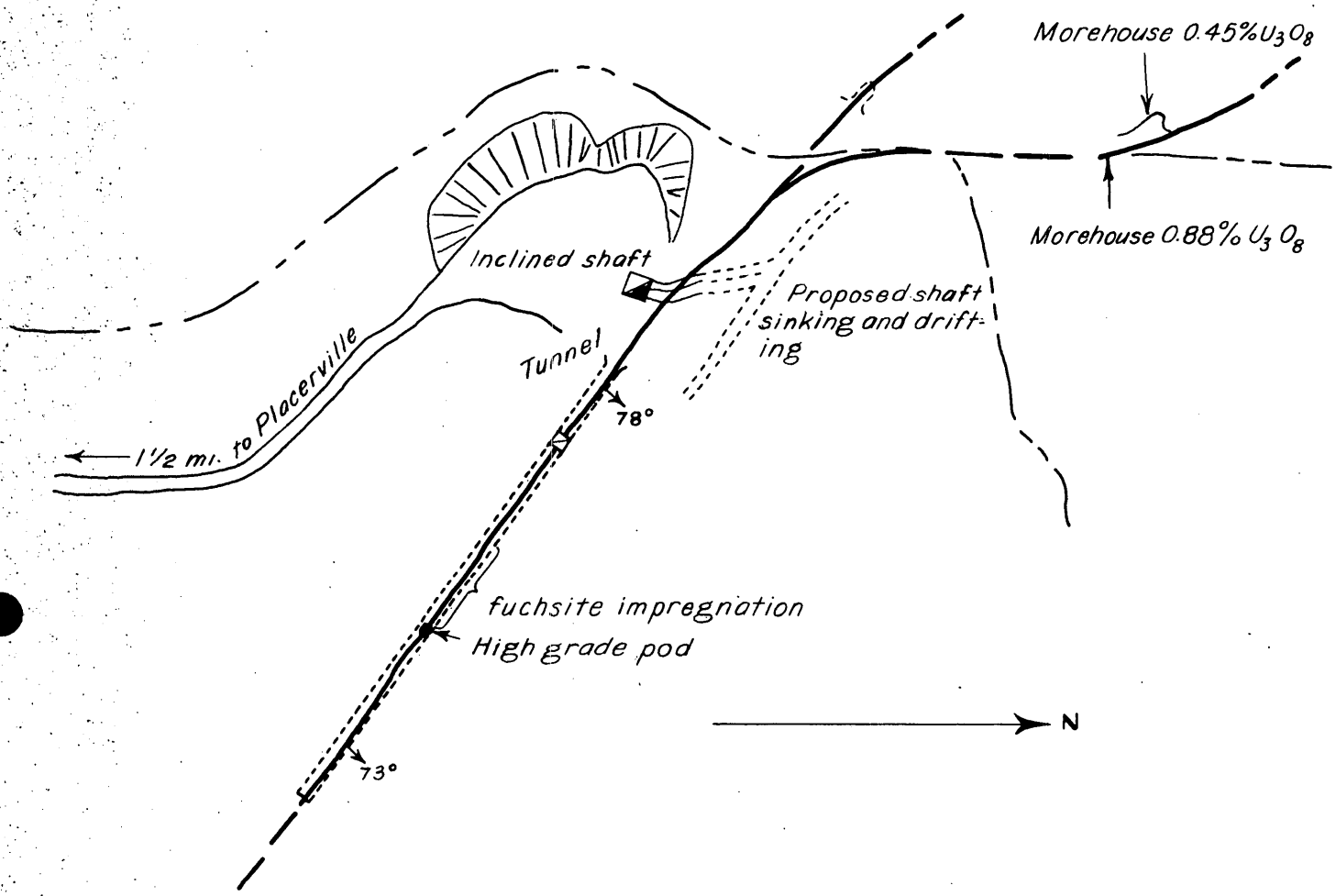
My Commission expires _____.

STATE OF
COUNTY OF } SS.

On the _____ day of _____, A. D. 1951, personally appeared before me _____, the signers of the above instrument, who duly acknowledge to me that they executed the same.

_____
Notary Public

My Commission expires _____.



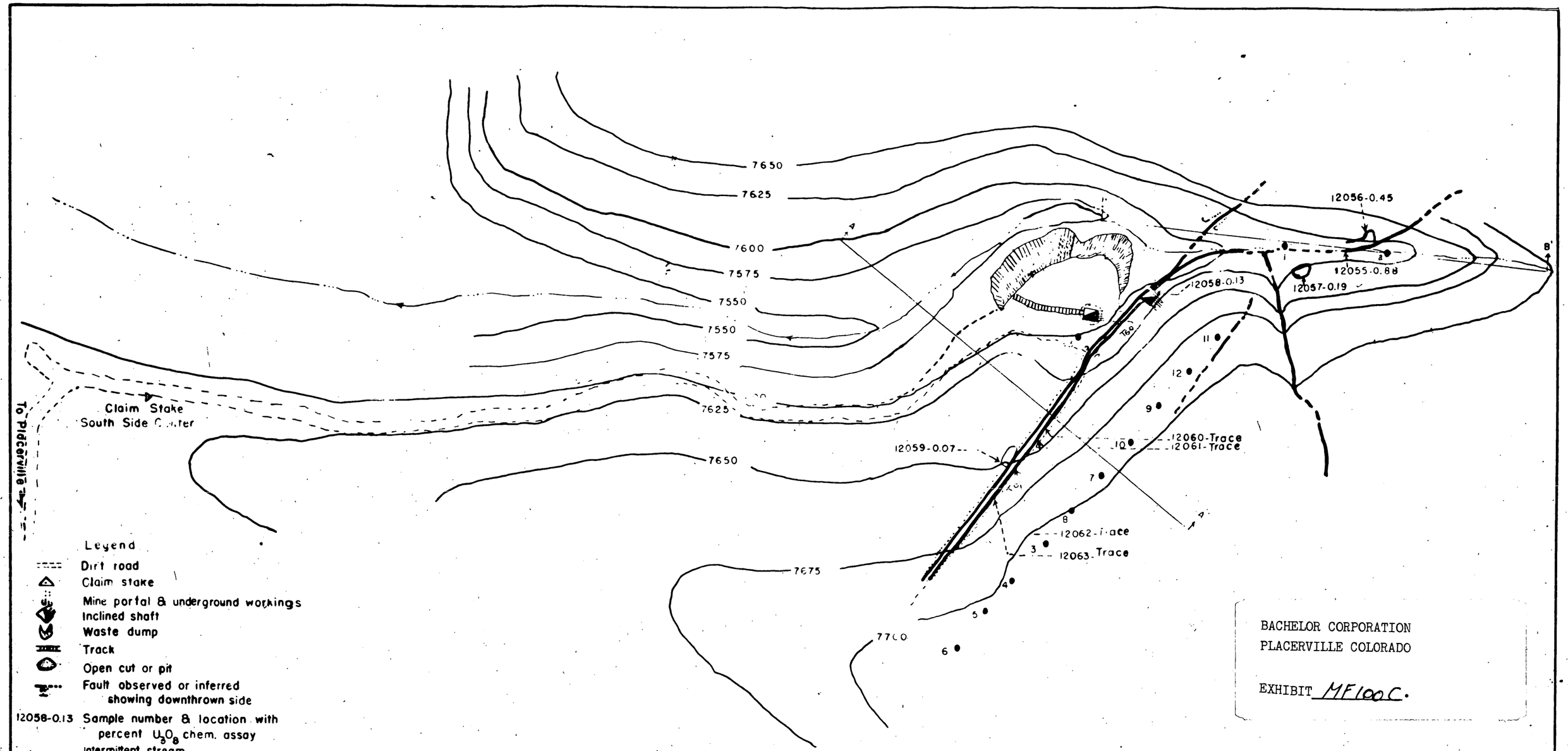
Department of Interior
U.S. GEOLOGICAL SURVEY

BACHELOR CORPORATION
BLACK KING No. 5 CLAIM

Fig. 2

By D. R. MacLaren after Morehouse
DMEA Docket 2522
June 1952

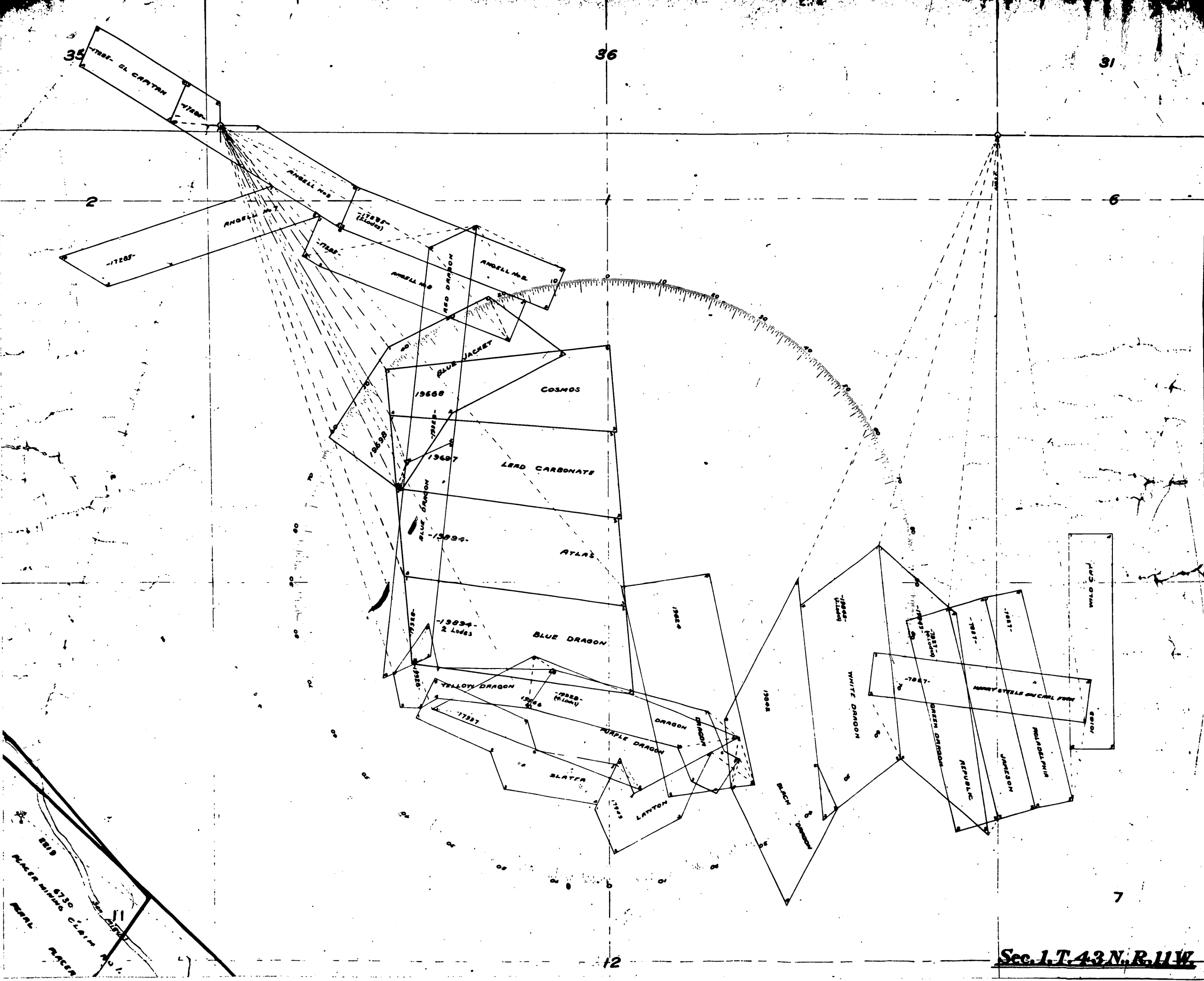
SCALE
50 0 50 FT.

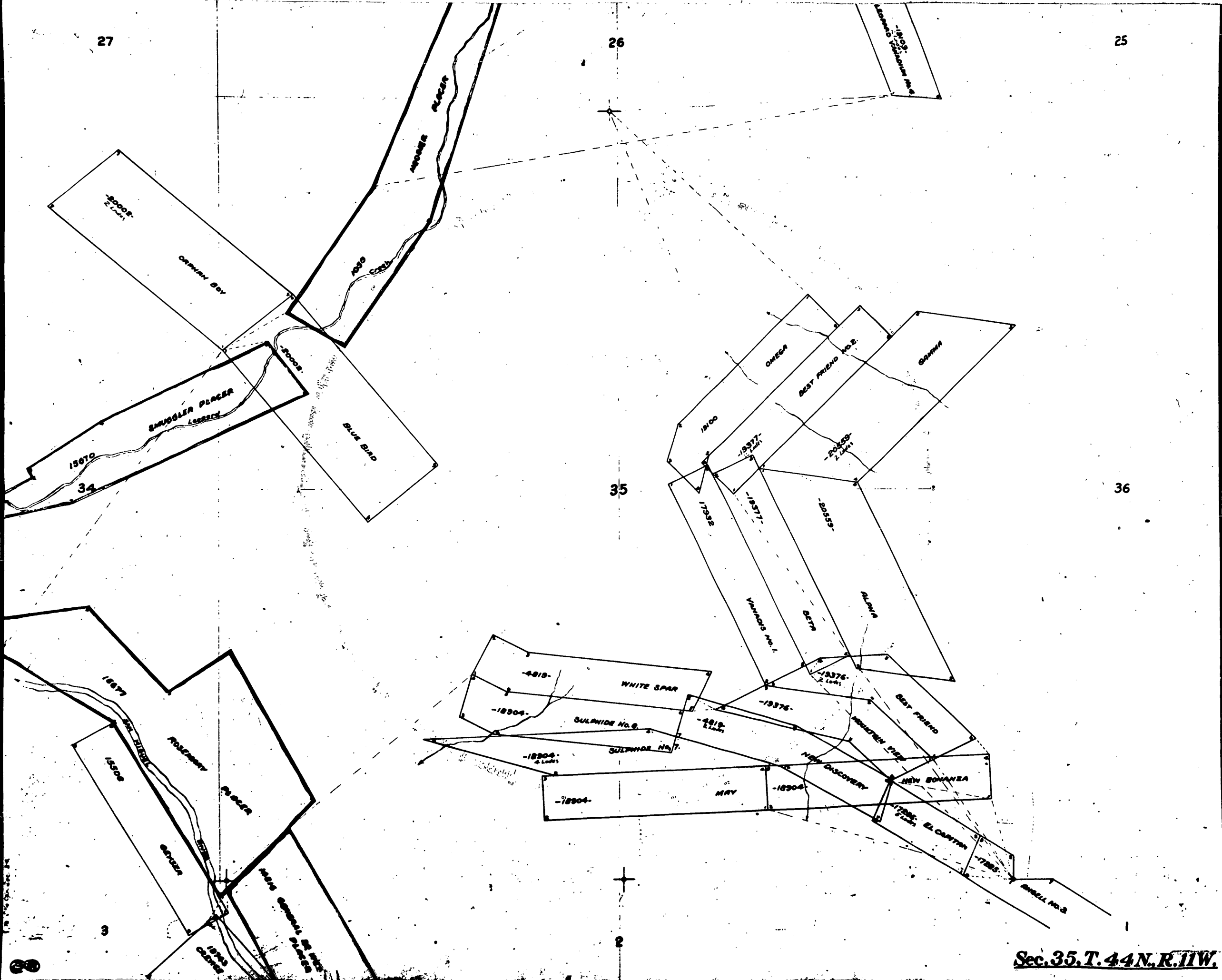


BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100C.

GRAND JUNCTION EXPLORATION BRANCH DIVISION OF RAW MATERIALS		
SKETCH MAP OF BLACK KING # 5 PLACERVILLE, COLORADO		
SCALE: 1" = 50'		CONTOUR INTERVAL:
GEOL. BY:	ACCOMPANIES:	
TOPO. BY:	CHECKED: E.V.R	DATE: AUGUST 6, 1951
DRAWN BY: G.E.M.	CORRECT:	CHARGE:
TRACED BY: K.L.MC	APPROVED: T.W.O.	FILE INDEX:


35
36
31
2
1
6
7
12
11
-17285-
OL CAPTAN
ANGELL No 5
ANGELL No 7
ANGELL No 6
ANGELL No 8
ANGELL No 9
RED DRAGON
BLUE JACKET
19668
COSMOS
19698
19697
LEAD CARBONATE
BLUE DRAGON
-19694-
ATLAS
-19694-
2 Lodes
BLUE DRAGON
YELLOW DRAGON
-19328-
(4 Lodes)
19686
-17937
PURPLE DRAGON
DRAGON
SLATER
LAWTON
19684
19682
WHITE DRAGON
BLACK DRAGON
GREEN DRAGON
REPUBLIC
JAMESON
PHILADELPHIA
ORION
HARRY STEELE ON CHIEL FORK
PLACER MINING CLAIM
PEARL PLACER
Sec. 1, T. 43 N., R. 11 W.



Sec.35,T.44N.,R.11W.

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100 E

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100B

DENVER EQUIPMENT COMPANY
ORE TESTING DIVISION
Denver, Colorado

March 27, 1952

Mr. Robert I. Ludwig
16 East 1st North
Salt Lake City, Utah

Reference: Ore Test DW-21495

Dear Mr. Ludwig:

We are pleased to submit the following report of the results of laboratory flotation test conducted upon your sample of carboniferous uranium ore.

SAMPLE IDENTIFICATION

These tests were conducted upon the sample of ore consisting of four burlap bags, having a total weight of 245 pounds which were delivered personally by yourself on January 28, 1952.

OBJECT OF TESTS

The object of the tests was to determine the amenability of the ore represented by the sample submitted to concentration by gravity and flotation to produce concentrates which after ignition would contain a minimum of 10.0% U_3O_8.

A large portion of the uranium content of the ore was shown by previous test work to be closely associated with the carbon content so that a concentration of the carbon automatically would concentrate the uranium which could be recovered in a higher grade product by burning of the carbon. It is desirable to obtain the concentrate as free as possible from lime carbonate and iron.

SAMPLE PREPARATION

The entire contents of the four bags which consisted of lump ore with maximum size pieces of 4-inch was crushed to minus 3/4 inch and after thorough mixing this product was split by means of the Jones Sampler. One-half was then further crushed to minus 10 mesh by means of crushing rolls in closed circuit with the Denver-Dillon Screen and a head sample and working charges were cut from the minus 10 mesh portion by repeated passes over the sampler. A portion of the head sample weighing 15 pounds was reserved for your own use. All reject

ALL RECOMMENDATIONS AND OPINIONS EXPRESSED IN THIS REPORT ARE BASED ON METALLURGICAL RESULTS OBTAINED IN THE ORE TESTING LABORATORY OF THE DENVER EQUIPMENT COMPANY, AND APPLY ONLY TO THE TREATMENT OF MATERIAL CONFORMING TO THE SAMPLE SUBMITTED BY THE SUBJECT COMPANY

portions of the sample were stored for possible future use.

DESCRIPTION OF THE ORE

The ore represented by the sample submitted contains uranium minerals associated for the most part with coal-like carbon. There is also present an appreciable content of pyrite with which some of the uranium minerals are very closely associated. The gangue rock consists of lime carbonate and siliceous minerals. While previous chemical analyses were said to show a low content of molybdenite, this mineral was not identified in our preliminary examination. A closely panned concentrate consists mostly of pyrite with scattered grains of galena and shows by chemical test a trace of copper. There are also present a few scattered grains of minerals that fluoresce yellowish green under ultra violet light.

The specific gravity of the ore is 2.55 and a portion pulped with Denver City water having a pH of 7.4 produced a pulp water having a pH of 7.9.

Following is a partial analysis of the head sample:

Percent U_3O_8	0.565
Percent $CaCO_3$	39.70
Percent Fe	1.26
Percent Acid Insoluble	41.60
Percent S	0.68

RESULTS OF TESTS

The results of two complete Denver "Sub-A" flotation tests are shown in detail on the following Data Sheets Nos. 1 to 4 inclusive.

In the first test the flotation tailings were subjected to gravity table concentration for informational purposes. Flotation was carried out in two stages with the unit cell in the grinding circuit to remove the most readily floatable carbon followed by regular carbon flotation to complete the first stage. The second stage was used to float sulphides with additional uranium.

Following is a resume of the results of the tests.

TEST NO. 1

UNIT CELL, REGULAR TWO STAGE DENVER "SUB-A" FLO* TATION AND GRAVITY TABLE CONCENTRATION OF FLOTATION TAILING

The results of this test reported in detail on Data Sheets No. 1 and No. 2 show the production of a carbon concentrate by the unit cell representing a ratio of concentration of 8.76 to 1 that assayed 2.93% U_3O_8 0.96% Fe, 1.0% sulphur, and 10.9% $CaCO_3$ and which contained 60.33 percent of the total U_3O_8 in the head ore. This concentrate when burned slowly in the electric muffle with rabbling produced an ash product representing 3.609 percent of the original head ore weight that assayed 9.86% U_3O_8.

Continued flotation for recovery of carbon from the unit cell tailing after grinding to minus 65 mesh produced an additional carbon concentrate which after cleaning once by reflotation represented a ratio of concentration of 41.7 to 1, assayed 3.45% U_3O_8, 1.85% Fe, 2.11% sulphur, 40.8% ash and 10.4% $CaCO_3$ and contained 14.91 percent of the total u_3O_8.

After recovery of the carbon concentrates, flotation was continued with reagents to produce a pyritic concentrate. This concentrate was assayed as a rougher sulphide concentrate, represented a ratio of concentration of 62.5 to 1, assayed 2.13% U_3O_8, 13.26% Fe, 15.64% sulphur and 21.0% $CaCO_3$ and contained 6.15 percent of the total U_3O_8 in the head ore.

The flotation tailing was subjected to gravity table concentration for informational purposes which operation produced a small amount of concentrate that was predominately pyrite and amounted to 0.22 percent of the original head ore weight. It assayed 2.37% U_3O_8 and contained 0.94 percent of the total U_3O_8.

While this table concentrate was largely pyrite there was observed a tiny thread-like streak of heavy velvety black mineral above the pyrite streak which is thought to be pitchblend.

TEST NO. 2

UNIT CELL FLOTATION AND TWO STAGE DENVER "SUB-A" FLOTATION WITH CLEANING OF THE UNIT CELL AND REGULAR CARBON CONCENTRATES COMBINED.

This test was conducted in a similar manner to Test No. 1 except that a larger initial charge of ore was used to provide

more concentrates for cleaning and the unit cell concentrate and regular carbon float concentrate were produced and cleaned separately by reflotation but were combined as one product for assay. The cleaner tailing from the unit cell portion of the carbon concentrate in this operation was returned to the rougher cell before floating the remainder of the carbon concentrate.

The final carbon concentrate and sulphide concentrate were cleaned separately by reflotation.

The results of this test reported in detail on Data Sheets No. 3 and No. 4 show the production of a total cleaned carbon concentrate representing a ratio of concentration of 8.46 to 1 that assayed 3.51% U_3O_8, 1.54% Fe, 1.32% sulphur, 5.7% $CaCO_3$ and 24.48% ash and which contained 67.73 percent of the total U_3O_8 in the head ore.

A portion of this concentrate was burned in the electric muffle with rabbling and produced an ash that represented 3.076 percent of the original head ore weight when calculated upon the total weight of concentrate. The ash assayed 13.65% U_3O_8, 5.12% Fe, 12.8% CaO and 48.85% Insol.

The sulphide concentrate after cleaning once by reflotation represented a ratio of concentration of 54.4 to 1, assayed 2.67% U_3O_8, 16.67% Fe, 19.38% S, 16.10% $CaCO_3$, 78.55% ash 28.7% Insol and 0.93% Pb and contained 8.01 percent of the total U_3O_8.

The total recovery of U_3O_8 in the total carbon and sulphide concentrates was 75.74 percent of the total. A combined ash, using the ash percent shown for the sulphide concentrate and our ash product from burning the carbon is calculated to assay 10.4% U_3O_8.

ENGINEERING DATA

A third test was conducted, the results of which are not reported other than under this heading as the concentrate was used to determine filtering rates of the concentrate.

A total carbon and sulphide concentrate combined was produced by grinding a charge of 2500 grams of head ore with 1.0 lb/ton sodium silicate and 0.32 lb/ton kerosene and floating with the same reagents used in Test No. 2 in the same order of addition. The grind was all 65 mesh and the total combined carbon

and sulphide concentrate was cleaned once by reflotation.

The concentrate froth as produced had a content of 22.0% solids and was filtered on the Denver laboratory pan filter from which the following data was obtained.

Feed to filter, percent solids	22.0
Filter area, sq. ft.	0.5
Vacuum, inches Hg.	19.0
Time to form cake - min.	3.0
Suction drying time, min.	6.0
Total filter time, min.	9.0
Cake thickeness, inches	0.5
Weight wet cake, grams	550.0
Weight dry cake - grams	420.0
Percent H_2O in wet cake	21.85
Indicated filter capacity lbs. dry cake/ sq. ft./24 hours	296.0

Thickening of the filter feed was considered but the froth product presented some difficulty in obtaining rates upon which to base the capacity of a thickener. The carbon concentrate is difficult to break down and forms a dense froth on the thickener and the water is very cloudy and would need to be returned to the circuit. A thickener of at least 10 sq. ft./ton of concentrate per 24 hours would be required.

The ore represented by the sample tested is classed by comparison of the grinding time in our standardized ball mill with that required for our standard ores as being medium soft ore to grind. Grinding to all minus 65 mesh is recommended.

RECOMMENDATIONS AND CONCLUSION

The flowsheet recommended for treatment of the ore represented by the sample submitted is shown on Print No. A-5474. This flowsheet shows a unit cell in the grinding circuit to concentrate a portion of the most easily floatable uranium carbon and reduce the carbon content in pulp going to the conditioner and thus reduce the absorption of xanthate and other reagents used for sulphide flotation.

The pilot table shown treating the flotation tailing may not produce much additional concentrate but will act as a pilot for observation by the flotation operator.

Reagents and conditions shown in Test No. 2 are recommended.

A regular Denver Disc Filter is shown. However, for a small pilot operation on a few tons of head ore per day pan filters may be adequate. The extra labor necessary for pan filter operation will be a considerable item and since the vacuum system will be necessary a small disk filter would be most advantageous.

Respectfully submitted,

DENVER EQUIPMENT COMPANY

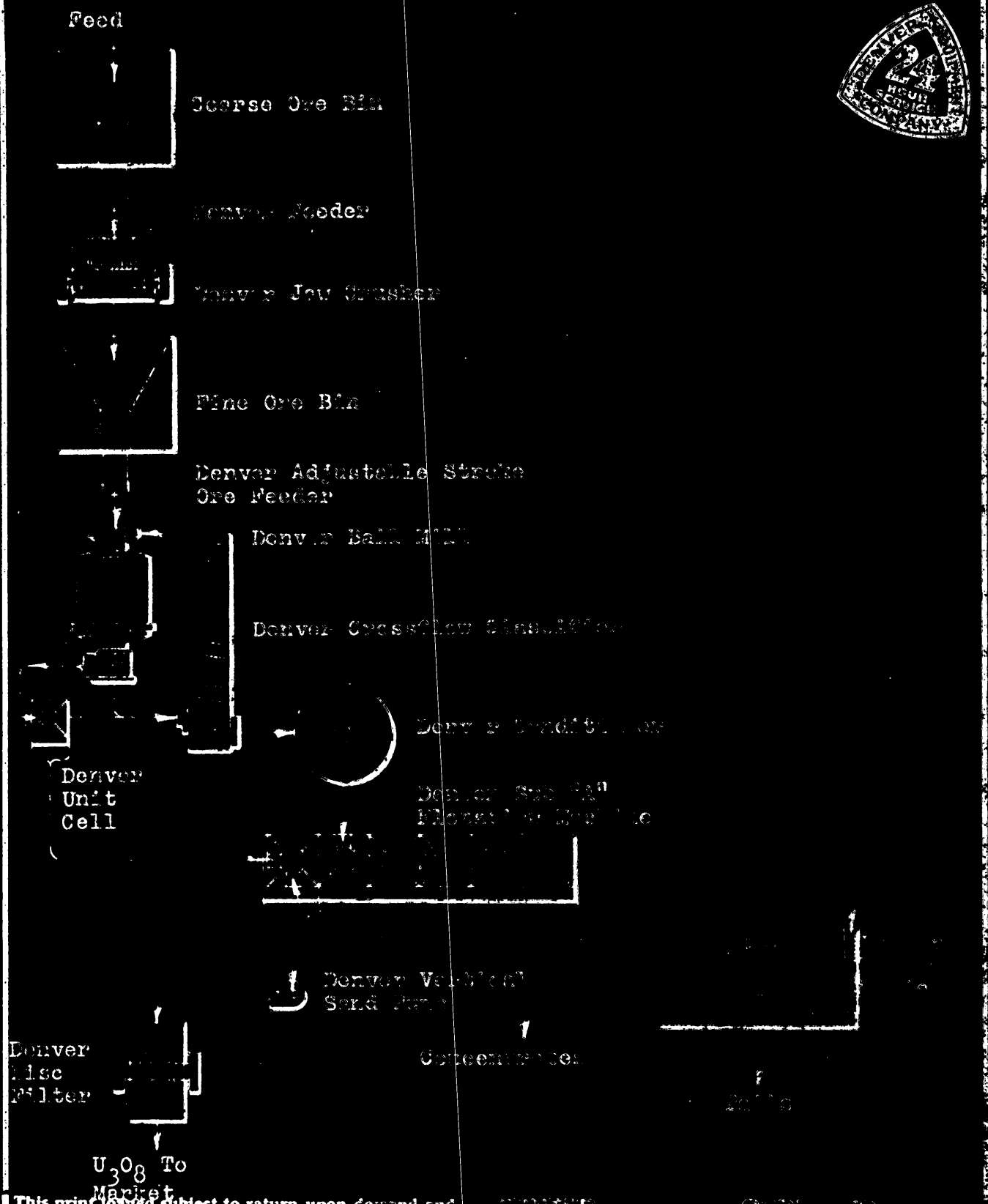
Clarence Thom

Clarence Thom, Director
Ore Testing Division

Henry J. Gisler By Shilson

Henry J. Gisler, Manager
Ore Testing Division

Two copies to customer



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PRINTED MAR 26 1952

DENVER EQUIPMENT CO.
1400 - Seventeenth St. - Denver Colo.

SCALE

A-5474

A.

DENVER EQUIPMENT COMPANY ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: CONDITIONS AND REAGENTS

SAMPLE IDENTIFICATION Uranium Ore Received From Mr. R. I. Ludwig 1/28/52 REPORT NO. DW-21495 TEST NO. 1

TEST PROCEDURE: A charge of 2500 grams of the head ore crushed to minus 10 mesh was ground 6 minutes at 67.0% solids to approximately 28 mesh with reagents shown below and subjected to unit cell flotation in the Denver "Sub-A" laboratory 1000 gram machine. The resulting unit cell concentrate was dried, weighed and a portion burned to ash in the electric furnace at maximum temperature of 700°C. The unit cell tailing was classified at 65 mesh and the resulting sand ground to minus 65 mesh and the total pulp subjected to two stage flotation in the 2000 gram machine. The No. 1 carbon concentrate was cleaned one time in the 500 gram machine. No. 2 sulphide concentrate produced as a rougher concentrate for informational purposes was assayed as produced. The flotation tailing was Tabled for additional information.

Grinding and Treatment				Reagents: Pounds per ton heads—(2)								
Operation	Time Min.	Percent Solids	pH	K	P.O.	Z-5	S.S.					
Grinding (1)	21	67	7.8	0.32			1.0					
Unit Cell Flotation	1½	42.0	7.8		0.032							
Regular CarbonFlot	4	22.0	7.5		0.032							
Sulphide Flot.	3	21.0	7.5		0.016	0.04						
#1 Cleaner	3	5.0	7.5		No Reagents							

NOTES: GRINDING PERFORMED IN STANDARD DENVER 12"x 5" 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 - 6
Classification, mesh - 65
Sands reground, minutes -15

(2) Reagent Symbols:

K - Kerosene
P.O. Yarmor "F" Pine Oil
Z-5 Potassium Amyl Xanthate
S.S. Sodium Silicate

DATA SHEET NO. D-1

B.

DENVER EQUIPMENT COMPANY ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: METALLURGICAL RESULTS

SAMPLE IDENTIFICATION See Data Sheet No. 1 REPORT NO. DW-21495 TEST NO. 1

PRODUCT	Percent Weight	% U_3O_8	% Fe	% Insol	% S	% $CaCO_3$	% Ash				
		ASSAYS									
Head Sample Assay		0.565	1.26	41.6	0.68	39.7					
Calculated Head Assay	100.0	0.555	-	-	-	-					
Unit Cell Concentrate	11.42	2.93	0.96		1.00	10.9	30.8				
#1 Cleaned Carbon Conct.	2.40	3.45	1.85		2.11	10.4	40.8				
#1 Flot. Cl. Midd.	1.20	1.63	3.23		3.35						
#2 Sulphide Conct.	1.60	2.13	13.26		15.64						
Table Concentrate	0.22	2.37									
Table Sand Tailing	41.00	0.08									
Table Slime Tailing	42.16	0.109									
Burned UC conct. ash	3.609	9.86									
Ignition loss	7.811	-									

PRODUCT	Percent Weight	PERCENT RECOVERY U_3O_8				
Calculated Head Assay	100.0	100.00				
Unit Cell Concentrate	11.42	60.33				
#1 Cl. Carbon Concentrate	2.40	14.91				
#1 Flot. Cl. Middling	1.20	3.46				
#2 Sulphide Concentrate	1.60	6.15				
Table Concentrate	0.22	0.94				
Table Sand Tailing	41.00	5.92				
Table Slime Tailing	42.16	8.29				

SCREEN ANALYSIS OF Table Tailing

Mesh	Percent Weight	ASSAYS None
+65	0.25	
+100	2.09	
+150	7.76	
+200	9.46	
-200	80.44	
	100.00	

DATA SHEET NO. D-2

A.

DENVER EQUIPMENT COMPANY — ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: CONDITIONS AND REAGENTS

SAMPLE IDENTIFICATION Uranium Ore Received from R. I. Ludwig 1/28/52 REPORT NO. DW-21495 TEST NO. 2

TEST PROCEDURE: A charge of 3000 grams of the head ore crushed to minus 10 mesh was ground 12 minutes at 67.0% solids to approximately 28 mesh with reagents shown below and subjected to unit cell flotation in the Denver "Sub-A" Laboratory 1000 Gram Machine. The resulting unit cell concentrate was cleaned by reflotation in the 500 gram machine. The cleaner tailing was combined with the unit cell tailing and the total pulp classified at 65 mesh. The classifier sands were reground to all minus 65 mesh and total pulp subjected to regular Denver "Sub-A" flotation in the 2000 gram machine producing a carbon concentrate No. 1 and a sulphide concentrate, each of which was cleaned by reflotation in the 500 gram machine. The unit cell concentrate and No. 1 carbon concentrate were dried and weighed separately and combined in proportion as produced for assay.

Grinding and Treatment				Reagents: Pounds per ton heads—(2)			
Operation 3000 grams	Time Min.	Percent Solids	pH	K.	P.O.	Z-5	S.S.
Grinding (1)	35	67.0	7.6	0.40			1.00
Unit Cell Flot.	2	47.5	7.6		0.03		
Unit Cell Cleaner	2	8.5	7.6	No Reagents			
#1 Carbon Flot.	5	28.5	7.6	0.15	0.07		
#2 Sulphide Flot.	7	26.0	7.5		0.02	0.13	
#1 Carbon Cleaner	2½	10.0	7.6	No Reagents			
#2 Sulphide Cl.	3	5.0	7.5	No Reagents			

NOTES: GRINDING PERFORMED IN STANDARD DENVER 12"x 5" 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.

A charge of 100 grams of the combined concentrates was burned in the electric muffle at maximum temperature at 800°C and the ash sent to assay.

Grinding (1)

Time, minutes - 12
Classification, mesh - 65
Sands reground, minutes - 23

(2) Reagent Symbols:

K - Standard Kerosene
P.O. Yarmor "F" Pine Oil
Z-5 Amyl Xanthate
S.S. Sodium Silicate

DATA SHEET NO. D-3

B.

DENVER EQUIPMENT COMPANY — ORE TESTING DIVISION

Denver, Colorado

FLOTATION TEST DATA: METALLURGICAL RESULTS

SAMPLE IDENTIFICATION See Data Sheet No. 3 — REPORT NO. DW-21495 — TEST NO. 2

PRODUCT	Percent Weight	% U_3O_8	% Fe	% $CaCO_3$	% S.	% ASSAYS Ash	% Insol	% Pb
Head Sample Assay		0.565	1.26	39.7	0.68			
Calculated Head Assay	100.00	0.613						
Cleaned Unit Cell Carbon Ct	5.33	3.51	1.54	5.70	1.32	24.48		
#1 Cl. Carbon Conct.	6.50							
#2 Cl. Sulphide Conct.	1.84	2.67	16.67	16.10	19.38	78.55	28.70	0.93
#1 Carbon Cl. Midds.	2.00	0.62						
#2 Sulphide Cl. Midds.	1.33	0.52						
Rougher Flot. Tailing	83.00	0.156						
Total Carbon Conct. Ash	3.076	13.65	5.12		CaO 12.8		48.85	
Total Carbon Ignition loss Wt.	8.754							

PRODUCT	Percent Weight	PERCENT RECOVERY U_3O_8
Calculated Head Assay	100.00	100.0
Total Carbon Cl. Conct.	11.83	67.73
#2 Cl. Sulphide Conct.	1.84	8.01
#1 Carbon Cl. Middling	2.00	2.02
#2 Sulphide Cl. Middling	1.33	1.13
Rougher Flotation Tailing	83.00	21.11

SCREEN ANALYSIS OF Rougher Flot. Tailing

Mesh	Percent Weight
+65	0.5
+100	1.65
+150	5.00
+200	13.00
-200	79.85
	100.00

ASSAYS None

DATA SHEET NO. D-4

C
O
P
Y

UNITED STATES ATOMIC ENERGY COMMISSION

DIVISION OF RAW MATERIALS

EXPLORATION BRANCH

INVESTIGATION OF THUCHOLITE DEPOSITS

NEAR

PLACERVILLE, COLORADO

by

George E. Morehouse

July 12, 195
(Grand Junction, C

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100D.

ADDRESS REPLY TO:

COLORADO EXPLORATION BRANCH
NEW YORK RAW MATERIALS OPERATIONS
U. S. ATOMIC ENERGY COMMISSION
P. O. BOX 270
GRAND JUNCTION, COLO.

AND REFER TO: GJEB:RPD:dee

UNITED STATES
ATOMIC ENERGY COMMISSION
GRAND JUNCTION, COLORADO

November 6, 1951

Mr. Hugh G. Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Dear Mr. Weatherly:

In compliance with your request enclosed is a copy of a USAEC report entitled "Investigation of Thucholite Deposits near Placerville, Colorado," by George E. Morehouse, dated July 12, 1951.

Very truly yours,

Thomas W. Oster

Thomas W. Oster, Chief
Grand Junction Exploration Branch

Encl:
Copy of report (1)

C
O
P
Y

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INVESTIGATION OF THUCHOLITE DEPOSITS NEAR PLACERVILLE, COLORADO

ABSTRACT

Near Placerville, Colorado, two somewhat unusual occurrences of uranium are found in an extensive fault zone which cuts the Dolores formation. The uranium mineral, which has been identified as uraninite, is intimately associated with asphaltic material. This combination of radioactive organic material has been considered to be thucholite.

At the Black King prospect, thucholite is found in the fault associated with primary sulphides of copper, lead, zinc, molybdenum, and antimony. Thucholite is also found in the adjacent hanging wall beds which have been highly altered. At the White Spar prospect, 1-1/2 miles southeast, the mineral assemblage and occurrence is similar to that of the Black King, but the exposed wall rock is less altered. A radiometric survey along the fault zone between the two deposits failed to indicate the presence of additional uranium-bearing material. Although no uranium ore has been shipped from either property, material of commercial grade exists.

INTRODUCTION

Two uraninite deposits near Placerville, Colorado, (fig. 1) were investigated for several days during June 1951. These properties, known as the Black King No. 5 and the White Spar prospects, have been previously described by Hess (1913), Gruner (1950), and Kerr (1951). The accompanying sketch maps (figs. 4, 8) and cross sections (figs. 5, 6, 9) were made from Brunton and tape surveys. During the examination, 13 channel samples and one 100-pound metallurgical sample were taken.

GENERAL GEOLOGY

In the Placerville area, flat-lying sedimentary formations ranging in age from Permian to Upper Cretaceous (tab. 1) are deeply dissected by the San Miguel River and its tributaries. Within the area are found many faults and several basic dikes. The Black King No. 5 and the White Spar prospects, which are about 1-1/2 miles apart, appear to be located on one major fault which trends northwest between the San Miguel River and the Entrada cliffs that form the northeast rim of the San Miguel River valley (fig. 2). The structure has been previously described as continuous between the two properties. Although the outcrop of the fault is partially covered, surface indications noted during a general reconnaissance of the area suggest that the two prospects are located on the same fault.

Table 1. Sedimentary Formations Near Placerville, Colorado (after Mastrovich, 1945)

Name and Age	Thickness, Feet	Description (Summarized)
Dakota Upper Cretaceous	250-300	Massive, fine-to medium-grained, buff sandstone with lenses of gray to green shales.
Morrison Upper Jurassic	750	Containing Wanaka, Salt Wash, and Brushy Basin members: Wanaka member includes the Todilto or Pony Express limestone at base, the Bilk Creek sandstone, and the Wanaka Marl units.
Entrada Upper Jurassic	40-80	Fine- to medium-grained, hard massive, somewhat cross-bedded sandstone.
Wingate Jurassic	± 100	A red-brown fine-grained, hard massive somewhat cross-bedded sandstone.
Chinle (Dolores)*	± 225	The lower portion of the Chinle consists of red and red-brown sandstone, more or less shaly, with thin beds and lenses of conglomerate, made up chiefly of small limestone pellets and fragments. The upper portion is a fine, even-grained, poorly bedded, bright red sandstone and shale.
Probably Cutler	600-700	Alternating beds of red sandstone, sandy shale and coarse conglomerate with a little limestone.

* In this area, the name "Dolores" was originally used for all units between the Cutler and the base of the LaPlata (Entrada). Previous writers in discussing the Black King have used the term Dolores; it will be so used in this report.

BLACK KING NO. 5 PROSPECT

The Black King No. 5 prospect is located about one mile northwest from the junction of Leopard Creek and in the San Miguel River, San Miguel County Colorado, in Sec. 27, T. 44 N., R. 11 W., New Mexico principal meridian. From Placerville the property may be reached by following State Highway 62 northeast for about 0.8 miles, at which point a dirt road leads 2 miles northwest to the mine (fig. 2). This prospect (fig. 3), which is inactive at present, is owned by Hugh G. Weatherly and H. B. Weatherly, Grand Junction, and Guy E. Weatherly, New Castle, Colorado.

The Black King No. 5 was formerly known as the Evans property. Hess (1913) reported that "Milton Evans, the owner of the claims, stated that a carload of ore from the vein, shipped in 1902, carried 14.8 per cent of copper, and 0.11 ounces of gold and 3.5 ounces of silver to the ton." This shipment, together with a 600-pound lot sold recently by the present owners, reportedly to an eastern mineral supply house, is the only known production from the property.

The mine workings consist of two inclined shafts, two drifts, and several small surface pits (fig. 4). The shaft farthest north was sunk 42 feet on the vein; however, the bottom 17 feet have been filled by subsequent operations, and water, encountered while sinking, now stands at 22 feet from the surface. The shaft south of the fault is inclined about 30° north and intersects the north shaft just below the water level. About 200 feet east from the collar of the incline, a drift was started from the surface and driven 135 feet along the fault. At places in the drift, stoping operations have left the present back 15 to 18 feet above track level. Another drift, of unknown extent, started 80 feet west from the incline, is now partially caved and practically inaccessible. There has been no previous exploration by drilling.

Ore Deposits

The presence of asphaltic material containing uranium and vanadium associated with primary sulphides in the Placerville area was first noted by Hess (1913). The report by Gruner (1950) states that the uranium mineral is pitchblende. Kerr (1951), in continuing mineralogical studies of the deposits, found that the Placerville material very closely resembled thucholite from Parry Sound, Ontario. Table 2 lists the associated minerals reported by these three writers.

Table 2. Minerals Identified from Black King Prospect

Hess (1913)	Gruner (1950)	Kerr (1951)
Asphaltic Material	Chalcopyrite	Radioactive hydrocarbons (Thucholite)
Chalcopyrite	Pyrite	Uraninite
Chalcocite	Erythrite	Chalcopyrite
Malachite	Malachite	Tetrahedrite
Azurite	Azurite	Malachite
Molybdenite		Azurite
Molybdic ocher		Pyrite
Galena		Sphalerite
Erythrite (Cobalt Arsenate)		Barite
Autunite		Calcite (2 ages)
Gold		Fuchsite (Chrome Mica)
Silver	Erythrite	
Vanadium (minerals)		
Calcite		
Barite		

Concerning the Placerville material, Kerr states: "The radioactive organic material from Placerville has been examined optically as well as by X-ray fluorescence, X-ray diffraction, and chemical analysis. Several polished surfaces of this material were examined which show a number of interesting features. It has been noted megascopically that thre are at least two types of black organic material, one with a rather lustrous black appearance, the other with a somewhat dull luster. Microscopic examination of the polished surfaces revealed the existence of three physically differing types of radioactive hydrocarbon material. This relationship, it will be noted, has also been found by Davidson and Bowie. The lustrous material in reflected light appears to be light gray, anisotropic, pleochroic, with comparatively high relief. Specks believed to be uraninite occur in these grains and also elsewhere in the sample, although they are so small that positive identification has not been possible with the microscope. The lustrous material appears to be the earliest of the three types as it occurs in larger grains which have been cracked and invaded by the other two types of hydrocarbon.

"The sooty material appears to be darker gray in reflected light, is isotropic, and non-pleochroic. It is more fine-grained than the lustrous material, but also contains scattered specks of uraninite. The third and latest type is light gray and surrounds the grains of the earliest material. It is anistropic, pleochroic, and tends to be banded. It forms in veinlets which cut the earlier two types. Uraninite is much less abundant in this latest stage of radioactive hydrocarbon . . . The name "thucholite" has been quite generally applied to radioactive hydrocarbons which correspond in many respects to the Black King material. Thucholite (from Th, U, C, H, O-lite) was first applied by Ellsworth (1928) to a radioactive hydrocarbon occurring in pegmatite dikes at Parry Sound, Ontario."

Kerr also states: "Other minerals associated with the thucholite include chalcopyrite, pyrite, sphalerite, and tetrahedrite. These have been identified on the basis of polished surface examination, chemical analysis and X-ray diffraction . . . Polished surfaces show a few scattered specks of white metallic mineral which may be skutterudite ($CoAs_3$). Since the fluorescence curves show arsenic and cobalt this seems feasible."

At the Black King property, the mineralized fault strikes N. 45° - 50° W., and dips about 60° NE. As a result of displacement, basal and upper units of the Dolores formation lie on opposite sides of the fault at the mine workings, indicating a throw in excess of 100 feet. Beds on the hanging wall are altered for several hundred feet away from the fault. This alteration, which appears to have resulted from hydrothermal activity, has changed the color of the Dolores formation from bright red to gray-buff.

As shown on Figure 4 and indicated in Table 3, uranium-bearing material is found in sedimentary beds on the northeast (hanging wall) side of the fault and in the fault zone. No radioactive material has been found on the southwest (footwall) side of the fault.

In the hanging wall deposit, thucholite occurs in dark gray limestone about 3 feet thick and in limy shale that appears to be about 2 feet thick. Distribution of uranium-bearing material within the vein is spotty and values are somewhat lower in grade there than in the hanging wall deposit. The associated sulphide minerals and their secondary products (tab. 2) apparently occur only in the vein deposit.

The vein was sampled at the north shaft and at accessible points in the 135-foot drift. Hanging wall samples are from surface cuts. Samples (12053 to 12063) taken during the Black King investigations, are located on the sketch map of the property, Figure 4, and described in Table 3. A qualitative and semi-quantitative analysis of a composite (13928) of these samples is given in Table 4. The difference between radiometric and chemical assays suggests "out of equilibrium" conditions. In this respect, the deposit is comparable to certain other near-surface occurrences of uranium.

Table 3. Samples Taken During Investigation of the Black King No. 5

Sample	Length of Channel	Occurrence	U_3O_8 Radiometric	U_3O_8 Chemical
12055	0.2 ft.	Hanging wall	1.07	0.88
12056	2.0 "	" "	0.52	0.45
12057	1.5 "	" "	0.39	0.19
12058	2.5 "	Vein	0.18	0.13
12059	2.2 "	"	0.22	0.07
12060	2.2 "	"	Trace	Not Run
12061	2.5 "	"	"	" "
12062	2.8 "	"	0.14	0.08
12063	2.0 "	"	Trace	Not Run
12053	3.0 "	"	0.02	" "
12054	2.5 "	"	0.01	" "

Table 4. Analysis of Composite (13928) of Samples 12053 to 12063

Copper	0.16%
Vanadium (V_2O_5)	0.04%
Uranium (U_3O_8)	0.14%

Qualitative and Semi-Quantitative Analysis

Iron	2.5%
Manganese	Present
Lead	Trace
Zinc	None
Arsenic	Trace
Lime ($CaCo_3$)	24.5%
Sulfur	0.6%
Magnesium	Trace
Molybdenum	Present
Titanium Oxide (TiO_2)	0.4%
Carbon (Elemental)	Present
Cobalt	Present
Silver	0.8 (Oz/ton)
Gold	Trace

Metallurgical Research

Material from the Black King prospect was tested for amenability by the Metallurgical Division of the U. S. Bureau of Mines, Salt Lake City, in 1950. The results of the tests are described in letter reports

*By Brown Laboratory, Route 3, Grand Junction, Colorado

attached as Enclosures 1 and 2, pages 12 and 13. Inasmuch as in these preliminary tests uranium extraction was low and acid consumption high, further experimental work by the Bureau of Mines will be conducted on samples taken during this investigation. J. L. Chapman, Metallurgist, Colorado Raw Materials Office, is of the opinion that the sodium carbonate-sodium bicarbonate leach process being developed for the limestone ore of the Grants district, New Mexico, may prove satisfactory for the Black King ore.

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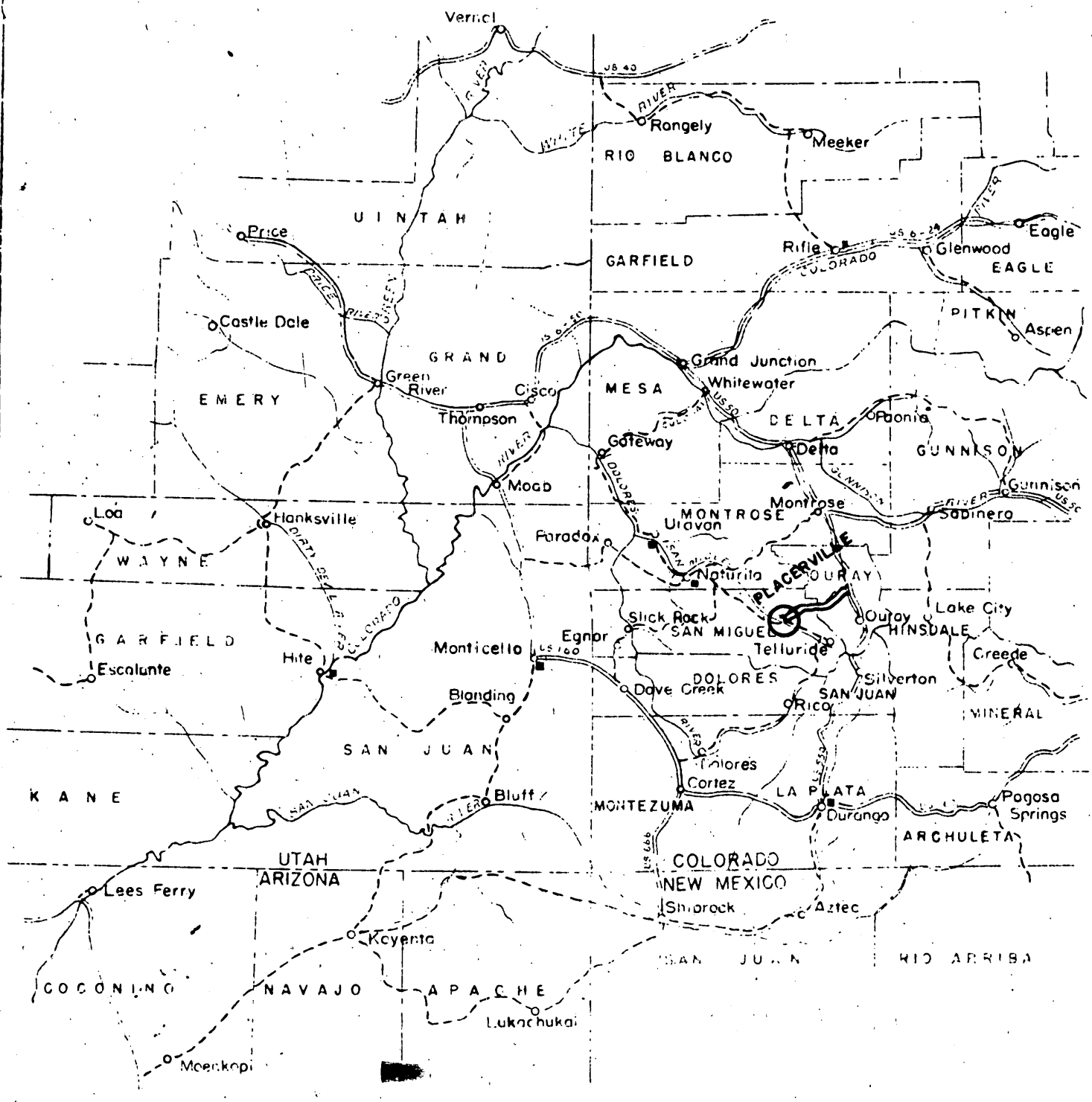

Paved Roads

Unimproved Roads

Fig. I

INDEX MAP
PLACERVILLE AREA

Scale 1" = 40 mi.

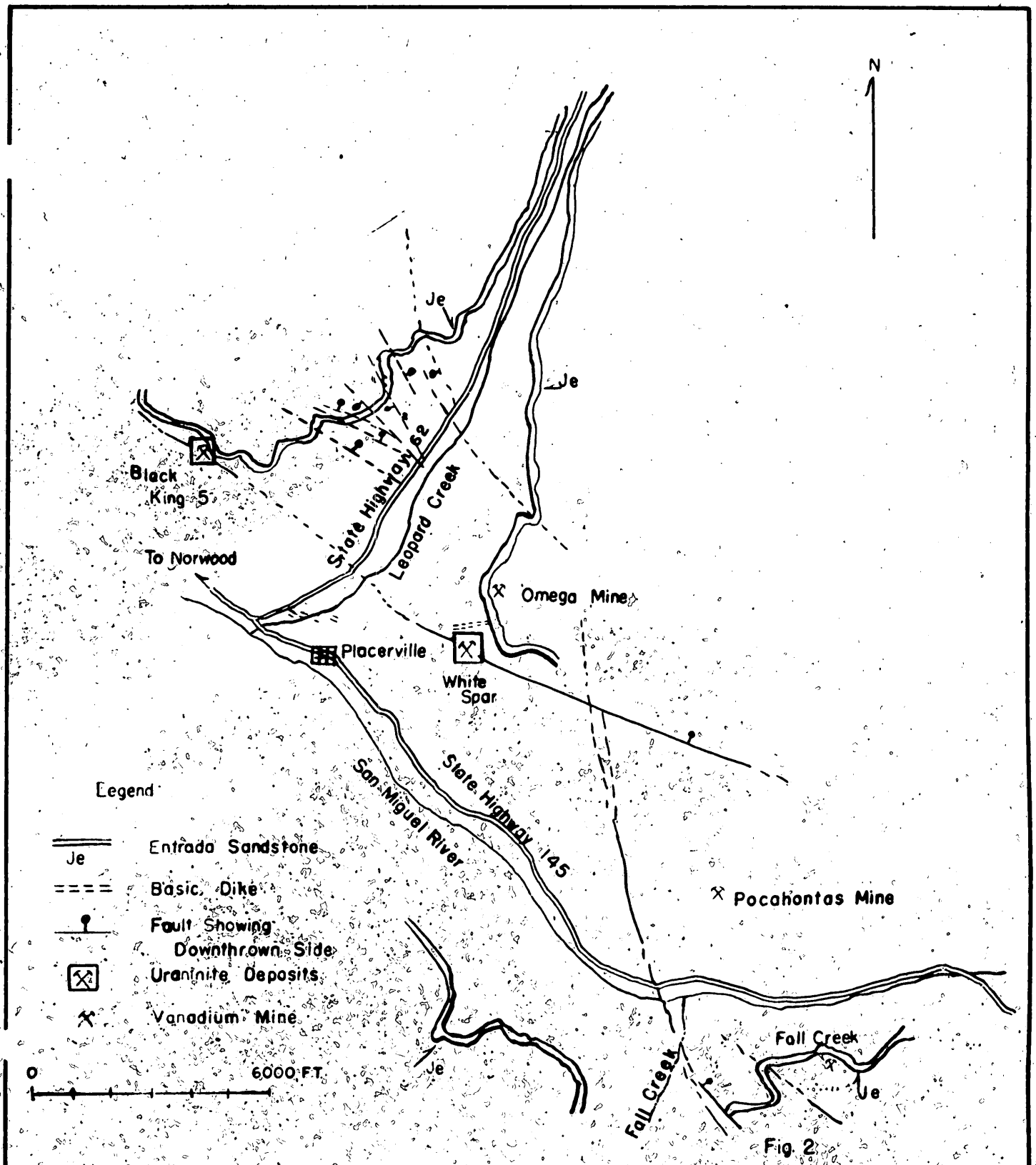

Fig. 2

U.S. ATOMIC ENERGY COMMISSION GRAND JUNCTION EXPLORATION BRANCH DIVISION OF RAW MATERIALS		
GENERALIZED GEOLOGIC MAP PLACERVILLE AREA, COLORADO		
SCALE:	CONTOUR INTERVAL:	
GEOL. BY:	ACCOMPANIES:	
TOPO. BY:	CHECKED: E.V.R.	DATE: AUGUST 6, 1951
DRAWN BY: G.E.M.	CORRECT:	CHARGE:
TRACED BY: K.L.MC	APPROVED: T.W.O.	FILE INDEX:

BASE FROM MAP BY FISCHER 1942
© MASTROVICH 1945

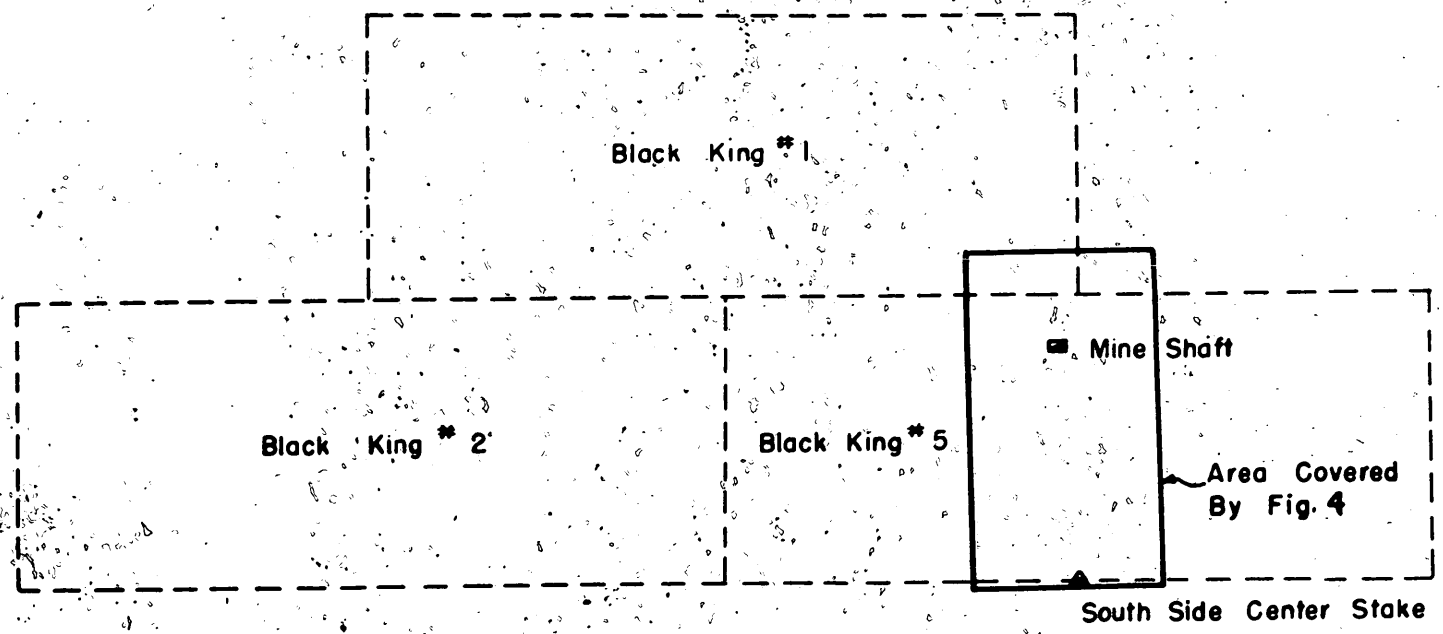

Fig. 3

U.S. ATOMIC ENERGY COMMISSION GRAND JUNCTION EXPLORATION BRANCH DIVISION OF RAW MATERIALS		
CLAIM MAP BLACK KING GROUP PLACERVILLE, COLORADO		
SCALE: 1" = 400'		CONTOUR INTERVAL:
GEOL. BY:	ACCOMPANIES:	
TOPO. BY:	CHECKED: G.E.M.	DATE: JULY 5, 1951
DRAWN BY: G.E.M.	CORRECT:	CHARGE:
TRACED BY: J.R.K.	APPROVED: T.W.O.	FILE INDEX:

URANIUM IN BLACK KING PROSPECT, PLACERVILLE, COLORADO

by

Paul F. Kerr, C.A. Rasor, and P.K. Hamilton

Columbia University
New York
June, 1951

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100A.

Uranium in Black King Prospect, Placerville, Colorado

by

Paul F. Kerr, C. A. Rasor,
and P. K. Hamilton

Abstract

The Black King prospect represents an interesting occurrence which may contribute in part to a better understanding of the origin of the uranium deposits in the plateau area. Tetrahedrite, chalcopyrite, sphalerite, and possibly shutterudite occur along faults of considerable displacement which exhibit both pre-mineral and post-mineral movement. Masses and segregations of an uranium-bearing hydrocarbon corresponding in many respects to thucholite is found both in the sedimentary strata and along fissures. A chromian mica, identified as fuchsite, is also distributed through sedimentary strata and in veinlets.

Minute specks of uraninite occur disseminated through the hydrocarbon. Earlier hydrocarbons appear to have been replaced by later generations, forming micro-textures indicative of chemical replacement.

In view of these circumstances, it is believed that a portion of the mineralization at least is due to hydrothermal activity. It seems most likely that sedimentary strata, containing an accumulation of vegetal matter, have been cut by faulting and subsequently influenced by hydrothermal solutions, carrying uranium.

Introduction

The Black King prospect is located near Placerville, in San Miguel county, southwestern Colorado, on the western side of the Rocky Mountains. It was visited during the summer of 1950 when the various workings were examined, and specimens were collected for laboratory study.

At the time the property was visited, the workings consisted of a forty-two foot inclined shaft, an adit (Fig.1) extending into the hill along a fissure for about one hundred feet, and several surface pits.

Geology

The Black King workings lie along a fault which has caused a displacement of several hundred feet in strata of the Entrada formation. The main fault (Fig.2) has truncated a conglomerate bed which forms a prominent marker on the footwall side. This bed, twenty feet in thickness, is not observable on the hanging wall side of the fault. Parallel to the main fault and about eighty feet distant is a second fissure along which uranium mineralization has also been found. The dip of the main fissure is about seventy degrees toward the northeast, and judging from the drag, the hanging wall side has moved downward relative to the footwall.

The fissures connected with fault movement have been filled with calcite and also copper and iron sulphides. Radioactive organic material is distributed horizontally and is also found in segregations, associated with the fractures. The same may be said for chromian mica. Apparently, fault movement both preceded the deposition of the copper minerals, and judging from slickensided surfaces, followed emplacement as well. Oxidation has resulted in the formation of such later secondary minerals as erythrite, azurite, limonite, calcite and barite.

The deposits of this area have been discussed previously by Hess (1911), and Fischer (1937, 1942, and 1947). In general, the Placerville area is underlain by nearly horizontal sedimentary rocks of Permian to Cretaceous age, which have been intruded by Tertiary igneous rocks and cut by numerous faults. The vanadium-uranium deposits occur in the Entrada sandstone, of Upper Jurassic age, which is 35-70 feet thick. The igneous rocks in the region are a dioritic or monzonitic stock, several basic dikes 1-10 feet thick, and some intrusive bodies of undetermined form. According to Fischer et al. (1947) the faults in the area are normal, with dips of 55° to 85°. The displacement on most of them is less than ten feet, but on a few it is several hundred feet.

Origin

The origin of this deposit has been variously considered. Hess (1911) suggested a hydrothermal origin on the basis of the alteration (quartzite) near the deposits, and the fact that the deposits seem to follow a line which apparently indicates an unconformity in the sandstone. Later (1933) he pointed out that in general the deposits follow the cross-bedding of the sandstone beds which occupy such a width as would correspond to a beach on which wave-washed vegetal debris was deposited. Many of the deposits are confined to replaced logs and halos around them. Tiny uranium-bearing veinlets are present, but these often stop abruptly at cracks. Hess (1933) also pointed out that there is present day migration away from fossilized vegetal matter, which means that plant material formed the nucleus for original deposition. He concluded that these deposits are not connected with igneous rocks nor were they invaded by solutions accompanying them. The metals are presumed to have had their source in the highlands of southwestern Utah, and to have weathered down into local basins in which the vegetation acted as a precipitating agent.

Fischer (1937) suggested that these deposits owe their origin to concentration at the time of deposition of the ore-bearing beds, although the processes of concentration are not explained. Later, Fischer et al. (1947) somewhat modified this to account for the lack of geologic control of the ore. It was noted that the ore is displaced by faults and cut by dikes, but neither the distribution of the ore bodies nor variations in the grade of the ore suggest any genetic relationship between the ore and faults or dikes. They postulate that since the layer of impregnated sandstone in places cuts across the bedding, the minerals in their present form must have been deposited from solutions after the sands had accumulated. Since the deposits lie within a relatively permeable layer not conformable with the bedding in many places, it is suggested that mineralization occurred at a slightly uneven water table, or at the contact between ground waters

of two types. Under these conditions, the ore bodies might have been localized at places where ground water circulation was relatively active, particularly where the water table, or the contact between the two kinds of ground water, cut across the beds.

It is difficult to reconcile certain features of the Black King occurrence with either of the above interpretations. The distribution of various copper sulphides along fractures would seem to preclude an origin other than precipitation from solution. Likewise, the fact that tetrahedrite and chalcopyrite are prominent copper minerals is not too easily reconciled with secondary transportation and deposition. Further, the distribution of fine crystals of uraninite through the organic material itself is a feature which should receive consideration. Uraninite is a mineral so commonly associated with hydrothermal activity that the presumption of the existence of such uranium-bearing solutions at one time in the history of the deposit seems hard to overlook.

It seems likely that at least a certain amount of hydrothermal activity contributed to the mineralization at the Black King prospect. The extent to which organic material previously accumulated as a result of sedimentary processes may have been affected by the hydrothermal solutions has not been ascertained. It would appear, however, that extensive destruction of the original vegetal textures has occurred, and accompanying this destruction uraninite has been crystallized.

Thucholite

The name "thucholite" has been quite generally applied to radioactive hydrocarbons, which correspond in many respects to the Black King material. Thucholite (from Th, U, C, H, O-lite) was first applied by Ellsworth (1928) to a radioactive hydrocarbon occurring in pegmatite dikes at Parry Sound, Ontario. Spence (1930) in describing Parry Sound thucholite hypothesized that radioactive emanations from uraninite have polymerized these hydrocarbons to form thucholite. Davidson and Bowie (1951) in studying the uraniferous hydrocarbons from the South African goldfields noted that thucholite replaces uraninite, the distribution and chemistry of the hydrocarbon are controlled by the distribution and chemistry of the pre-existing radioactive minerals, and the presence of a radioactive mineral is a prerequisite for the formation of thucholite. The hydrocarbon could have been formed by the polymerization of natural gases, but Davidson and Bowie explain that this is probably not the only process involved. Thus if it is hypothesized that methane and other gaseous hydrocarbons are polymerized by alpha particles, partly to a fluid and partly to a more viscous phase, the fluid may be able to remove part of the uranium in solution thereby making [illegible] available. Within the more highly polymerized hydrocarbon, [illegible] in dispersion, and at a later stage, following [illegible] thucholite separates into two phases, one forming [illegible] of pitchblende and the other, a hydrocarbon [illegible] contained uranium. This is seen microscopically where [illegible] the process of replacement by the hydrocarbon while elsewhere the uranium mineral is clearly deposited from the hydrocarbon. Davidson and Bowie conclude that although chemical analyses of thucholite are few and do not lend themselves to comparative study, it seems likely

that this substance is not of a constant composition. The nature of the original hydrothermal gases, the temperature of polymerization, and the extent of aging may all have influenced the composition of the hydrocarbon. Their mineralogical studies indicate that several different hydrocarbon compounds may be present in a single specimen. These different types are not to be regarded as mineral species, as they probably are simply selections from a wide range of organic compounds.

Thucholite from Placerville

The radioactive organic material from Placerville has been examined optically as well as by x-ray fluorescence, x-ray diffraction, and chemical analysis. Several polished surfaces of this material were examined which show a number of interesting features. It has been noted megascopically that there are at least two types of black organic material, one with a rather lustrous black appearance, the other with a somewhat dull luster. Microscopic examination of the polished surfaces revealed the existence of three physically differing types of radioactive hydrocarbon material. This relationship it will be noted, has also been found by Davidson and Bowie. The lustrous material in reflected light appears to be light gray, anisotropic, pleochroic with comparatively high relief. Specks believed to be uraninite occur in these grains and also elsewhere in the sample, although they are so small that positive identification has not been possible with the microscope. The lustrous material appears to be the earliest of the three types and it occurs in larger grains which have been cracked and invaded by the other two types of hydrocarbon.

The sooty material appears to be darker gray in reflected light, is isotropic, and non-pleochroic. It is more fine grained than the lustrous material, but also contains scattered specks of uraninite. The third and latest type is light gray and surrounds the grains of the earliest material. It is anisotropic, pleochroic, and tends to be banded. It forms in veinlets which cut the earlier two types. Uraninite is much less abundant in this latest stage of radioactive hydrocarbon.

Observation of the thin sections shows that veinlets of this material have been formed which indicate movement in and precipitation from solutions. Hess (1933) concluded that this movement is, in general, away from the fossilized vegetal matter which formed the nucleus of original deposition.

In order to determine which of these types contains the most radioactive material a radiogram (Fig.3) was made of a small polished surface placed face down on x-ray film and developed after one week. The accompanying picture shows that two types may be recognized on the basis of film darkening (which appears white in the print). The lustrous material produces somewhat more radioactivity than the sooty. Minute specks of uraninite are masked by general radiation.

Four specimens were submitted to Dr. C.J. Rodden of the New Brunswick Laboratory for Microchemical analysis of C and H_2 content. Samples were dried at 110° C before analysis.

	Surface seam	Shiny	Sooty	Mixture
C	47.6	44.8	55.0	69.2
H_2	2.27	2.20	2.27	3.08

These figures seem to indicate that the sooty, in addition to having somewhat less radioactivity, contains a higher percentage of hydrocarbon, whereas the shiny is lower in hydrocarbon, and correspondingly higher in radioactivity as confirmed by the radiogram. These results also indicate that there is a considerable range in the composition of thucholite as has been indicated previously in the literature (Davidson and Bowie).

An x-ray diffraction pattern was made of the raw, shiny and sooty samples. The former, which contains the greatest amount of radioactivity, gives a weak pattern even without heating which compares favorably with that of standard uraninite. The sooty material has spacings which, although somewhat obscured by quartz, also compare favorably with standard uraninite. On the basis of such observations this material may be considered to correspond to thucholite, or a mixture of uraninite with hydrocarbon.

Examination by x-ray fluorescence (Fig. 4) reveals the presence of iron, nickel, copper, and lead in addition to uranium. The tungsten peaks are a secondary effect produced by the target and are not inherent in the samples. Before analysis the samples were heated to redness for about one half hour in order to drive off the hydrocarbons and thereby increase the peak heights for the various elements. No quantitative estimate was made of these elements, since standardization curves have not been completed.

Minerals at Placerville

Other minerals associated with the thucholite include: chalcopyrite, pyrite, sphalerite, and tetrahedrite. These have been identified on the basis of polished surface examination, chemical analysis and x-ray diffraction. As noted above the presence of copper, lead and iron is confirmed by fluroescence. The tetrahedrite was tested qualitatively for antimony and arsenic. It gives a strong reaction for antimony and a somewhat weaker test for arsenic. Since tetrahedrite and tennantite form an isomorphous series with tetrahedrite the antimony member and tennantite the arsenic member, it was considered advisable to examine these members briefly by means of x-ray diffraction. The Placerville material seems to compare more closely with x-ray patterns of reference tetrahedrite than tennantite. Polished surfaces show a few scattered specks of a white metallic mineral which may be skutterudite. Since the fluorescence curves show arsenic and cobalt this seems feasible.

Secondary mineralization associated with the thucholite and these sulphides includes barite, azurite, and malachite which have been confirmed optically.

The thin sections from this locality which have been examined exhibit a quartz-sericite matrix with a clay which was thought previously to be roscoelite, but later investigation by Sterling Hendricks, as described by

Fischer (1942), indicates that it belongs to the "hydrous-mica group of clay minerals". These have been invaded by the previously described sulphides and thucholite. The thucholite shows definite signs of migration as several sections show veinlets which cut the primary sandstone. Secondary calcite is also present, and although the genesis is not definite some of the quartz is shattered and invaded by calcite, which appears to be somewhat later than the thucholite migration. A few grains of apatite are present together with some chloride. The limestone consists mainly of fine-grained calcite with some quartz and a small amount of pyrite and black opaque material, thought to be thucholite. The fine-grained calcite has also been invaded by coarser grained secondary veinlets of calcite. In some cases the pyrite has weathered to limonite.

Chromian Mica

The green material from Placerville has been called mariposite, but as Fischer (1937) pointed out the optical properties of this mica do not match those of mariposite. For this reason it was felt that further investigation of these specimens was warranted.

Fuchsite

This material, a chrome mica, first recognized at Schwarzenstein in the Zillerthal was named by Schafhautl (1842) after the chemist, J.N. von Fuchs. Dana (1892) recorded several chemical analyses of chrome micas in which the Cr_2O_3 content ranges from 0.84. to 3.95 percent. Wherry (1916) described a fuchsite from Marble, Colorado (which is about 85 miles north east of Placerville) with 6.08 percent Cr_2O_3, although no optical data were given. On the basis of optical studies, Szadeczky-Kardoss (1937) concluded that fuchsite is a mica, with optical properties which vary with depth of color and therefore, presumably with the Cr_2O_3 content, and that both refractive indices and birefringence increase with increasing color.

Partridge (1936) reporting on chrome-mica from South Africa preferred the term chrome-muscovite to fuchsite. Odman (1938) favored the term mariposite for a low chrome-mica, although his material is essentially identical optically with low chrome-fuchsite. Hutton (1940) recommended that the term mariposite be abandoned and that chromian muscovite be used for chrome-micas containing 1 percent or less of Cr_2O_3 and fuchsite for chrome micas with greater amounts of Cr_2O_3.

Mariposite

Silliman (1868) described an apple-green micaceous mineral which was found on the Mariposa estate in the southern part of the Mother Lode district, California. Analyses by Hillebrand quoted by Turner (1890) included a white non-chromium-bearing mica and a green mica with 0.18 percent Cr_2O_3. Winchell (1925) related mariposite to phengite, a white muscovite with a high silica content, but Volk (1939) pointed out that the analyses of phengite do not satisfy the formula which must be modified to include another molecule of H_2O and FeO or MgO in order to leave the silica ratio constant in the muscovite series.

Status of Chromian Mica

X-ray studies by Whitmore, Berry and Hawley (1946) using single crystal techniques demonstrated that fuchsite and muscovite give diffraction photographs which are identical in spacing and intensity. Lack of good crystals or satisfactory isolated fragments of mariposite have prevented examination in the current study of this material.

Whitmore et al. (1946) on the basis of chemical analyses found that the chromium content of fuchsite varies from 0.06 to 1.03 atoms per unit cell, the equivalent of 0.27 to 4.81 percent by weight. The averages Si = 12.0, Al (tetrahedral coordination) = 4.0, Al Cr, etc. (octahedral) = 7.92, K, Na, etc. = 3.64, and (OH, F) = 9.39, all agreeing well with the ideal structural formula of muscovite. Fuchsite covering this range of composition is said to be identical with muscovite.

Analyses of mariposite by Hillebrand (Turner, 1895) and Mauzelhouse (Moore, 1936) show a low Cr_2O_3 content (0-0.78 % by weight). The analyses as pointed out by Whitmore et al., show a consistently low Al:Si ratio as compared with fuchsite. In mariposite the Al:Si ratio for atoms in tetrahedral coordination is between 2:14 and 1:15 as against 4:12 in fuchsite. They conclude that mariposite is essentially a chromian phengite.

The indices of refraction of fuchsite according to Whitmore et al. (1946) range from α - 1.559 to γ - 1.6116. The average β is 1.598. In general the indices rise with increasing Cr_2O_3. Birefringence is strong, 0.035-0.042. The optic angle (2V) varies from 32°- 42° with an average of 36°. Some fuchsite is pleochroic α - 1.56-1.565, β - 1.601-1.624, γ - 1.60-1.63. Some of the indices for mariposite overlap those of high chrome-fuchsite, although in general they are greater than for fuchsites of comparable Cr_2O_3 content, and in some cases even exceed those with large amounts of chromium. Some mariposite shows pleochroism X = deep blue green, and Y = Z paler green.

On the basis of x-ray, chemical, and optical studies, Whitmore et al. identify fuchsite with a range in composition of 0.27-4.81 percent Cr_2O_3 as chromian muscovite, and suggest the varietal term chromian muscovite rather than fuchsite. Mariposite conforms chemically with phengite and is regarded as a chromian variety of this mica. The indices of mariposite are higher than for fuchsite of similar Cr_2O_3 content, and in some cases are even higher than for Cr_2O_3 - rich fuchsite.

Placerville, Colorado Fuchsite

The thin sections of this material show large quartz grains which are cut by stringers of calcite. Pyrite is altering to limonite and there is a small amount of thucholite present. The fuchsite occurs in veinlets surrounding the quartz grains, and there is some secondary barite. Under the microscope it has an aggregate appearance with the indices α - 1.556 and γ -1.595 which compare favorably with those of fuchsite. It is non-pleochroic and due to its aggregate structure no interference figure could be obtained. Fluorescence analysis (Fig. 4) shows that the following elements are present: iron, copper, lead, nickel together with chromium. The height of the chromium peak is indicative of substantial chromium content (several

percent), although the percent Cr has not been determined. X-ray diffraction patterns of reference specimens of fuchsite and mariposite have been made. It appears that the Placerville material compares favorably with reference fuchsite rather than mariposite.

According to Whitmore et al. the minerals associated with these chromian micas suggest formation from moderate to fairly high temperatures and pressures. They note that either fuchsite or mariposite may be present, although there is no record of their being found together in a single specimen, or does there appear to be any reason for one forming in preference to the other. They point out that as a product of hydrothermal metasomatism, and possibly also as a true vein mineral, the chrome-micas may owe some of their constituents to the primary rocks which they replace or in which they are found as vein fillings, but that most of the constituents and particularly the chromium have had their origin in solutions derived from magmatic source. The fuchsite from Placerville seems to be related to the sulphide mineralization, and as noted above to be present in definite veinlets. This seems to indicate a hydrothermal origin.

Erythrite

This mineral occurs at Placerville and is associated with black organic material. An amount sufficient for optical and x-ray diffraction study was separated by hand picking. It was found that optical and x-ray data matched those of reference erythrite. The sample as a whole including the thucholite was examined by x-ray fluorescence (Fig. 4) which shows that the following elements are present: cobalt, manganese, iron, nickel, copper, zinc and arsenic. It is interesting to note that uranium does not appear on the curve, which seems to indicate that it is either a minor constituent of the particular sample or is not present. This is consistent with the conclusion that uranium is more abundant in specimens with a high hydrocarbon content.

Source of solutions

A major problem concerning not only the Black King prospect but other uranium occurrences throughout the region concerns the source of the uranium-bearing solutions. As Fischer (1947) has so ably pointed out, abundant criteria exist to demonstrate that uranium has been deposited in the sands of the plateau strata by precipitation from solution. There is, however, a great paucity of criteria bearing on the source of the solutions.

While the occurrence of uranium at the Black King prospect is not typical of the normal plateau deposit, it may have a significance, worthy of wider application than the Black King locality alone. The evident action of solutions, resulting in products which one would normally assume to be hydrothermal, may be more than a limited local feature. While no direct connection with igneous activity may be observed, one cannot overlook the possibility that a remote igneous source could exist. The discovery of uranium of late in quantities comparable to the Morrison formation occurrences of the plateau in considerably older strata tends to project the originating source of solutions downward.

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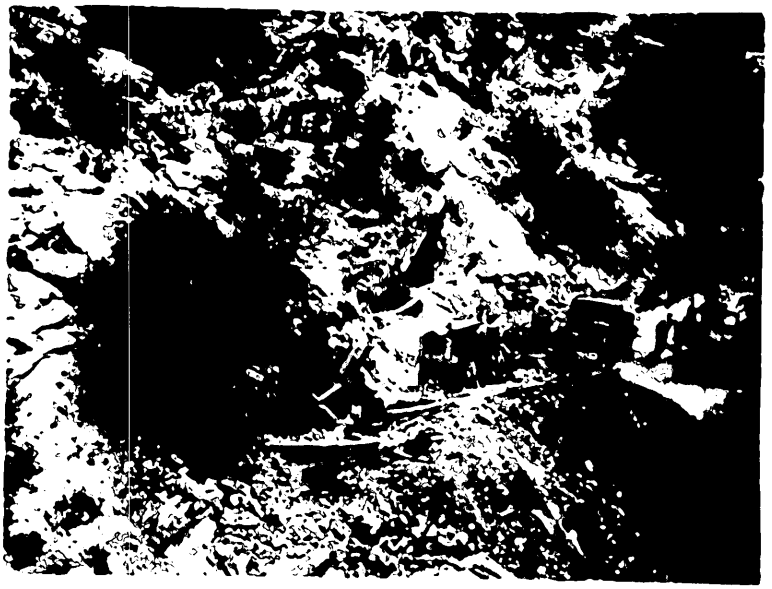

Fig. 1. The inclined shaft and adit

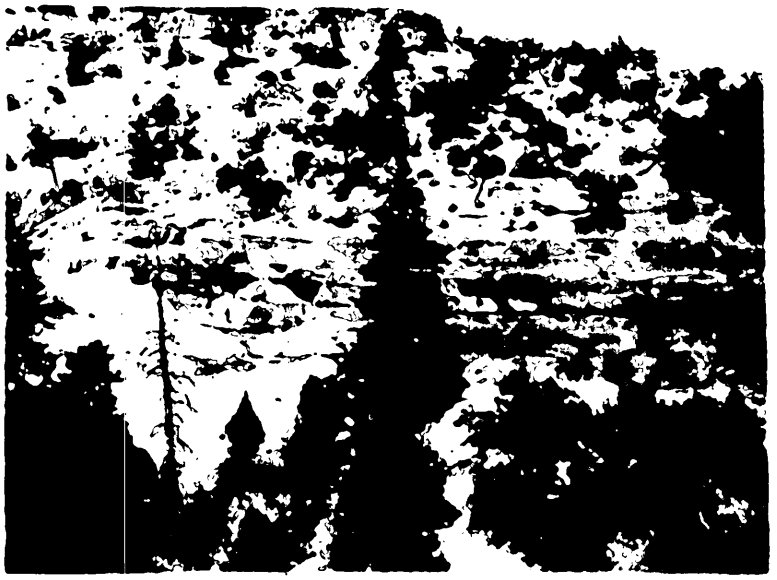

Fig. 2. The main fault which truncates the conglomerate stratum.

BLACK KING MINE, BLACKVILLE

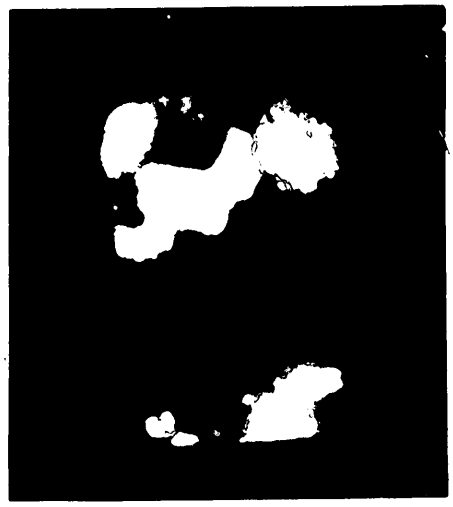

Fig. 3. The bright white areas are the lustrous material, the gray, sooty. Dark areas are gangue.

RADIOGRAM OF PLACERVILLE THUCHOLITE

Fig. 4 X-Ray fluorescence charts of Placerville specimens
The tungsten peaks are a secondary effect produced by the tungsten target and are not inherent in the samples.

THE BROWN LABORATORY

ROUTE 3

GRAND JUNCTION, COLORADO

ANALYTICAL DEPARTMENT

Phone 0522-J4

CERTIFICATE OF ANALYSIS

To Hugh Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Date 12/31/49

Material: Uranium Mineral
Received: 12/30/49
For: Uranium Determination

Order No.

Lab No.	Your No.	Description	Result
1040-J	--	Flotation Concentrate - Panned	92.00% U_3O_8

BACHELOR COSPORATION
PLACERVILLE COLORADO

EXHIBIT MF100 J.

H. E. Brown
Analyst

THE BROWN LABORATORY

ROUTE 3

GRAND JUNCTION, COLORADO

ANALYTICAL DEPARTMENT

Phone 0522-J4

CERTIFICATE OF ANALYSIS

To Hugh Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Date 1/16/50

Material: Uranium Bearing Ore - Test Work
Received: 1/14/50
For: UraniumDeterminations

Order No.

Lab No.	Your No.	Description	Result
1052A-1	--	Flotation Concentrates 'A'	
		Total U_3O_8 - - - - - - - - - - -	7.90% U_3O_8
		Soluble U_3O_8 - (Dilute HCl) - -	4.88% U_3O_8
		Percent Soluble - - - - - - - - - -	61.8 %
1052A-2	--	Flotation Tailings 'B'	
		Total U_3O_8 - - - - - - - - - - -	0.90% U_3O_8
		Soluble U_3O_8 - (Dilute HCl) - -	0.31% U_3O_8
		Percent Soluble - - - - - - - - - -	34.5 %

Above Samples from Test T9

Indicated Possible Over-All Recovery by Tabling Tails would be approximately 80.0%

H. D. Brown
Analyst

H. M. OCHS
CHEMIST & SPECTROGRAPHER
P. O. BOX 924
DENVER 1, COLO.

September 18, 1951

Mr. Hugh G. Weatherly
1147 Hill Ave.
Grand Junction, Colorado

COMPLETE QUALITATIVE SPECTROGRAPHIC ANALYSIS

[redacted]

Figures are percentage estimates

	Antimony	.1	Molybdenum
.1	Arsenic		Neodymium
1	Aluminum	.1	Nickel
	Boron		Osmium
.001	Barium		Palladium
	Beryllium	.01	Potassium
	Bismuth		Praseodymium
Major	Calcium		Platinum
	Columbium		Radium
	Cadmium		Rubidium
	Cerium		Rhenium
.1	Cobalt		Rhodium
.01	Chromium		Ruthenium
	Caesium		Scandium
.01	Copper	Major	Silicon
	Dysprosium		Samarium
	Erbium		Strontium
	Europium	1 oz.	Silver per ton
	Gallium	.01	Sodium
	Gadolinium		Tantalum
	Germanium		Terbium
	Gold		Thallium
	Hafnium		Thulium
	Holmium		Thorium
	Indium		Tin
10	Iron	1	Titanium
	Iridium		Tungsten
	Lanthanum	2	Uranium
.5	Lead	.1	Vanadium
	Lithium	.001	Yttrium
	Lutecium		Ytterbium
1	Magnesium	.01	Zinc
.1	Manganese	.01	Zirconium
	Mercury		

A geiger counter test shows moderate radioactivity.

H M Ochs

THE BROWN LABORATORY

ROUTE 3

GRAND JUNCTION, COLORADO

ANALYTICAL DEPARTMENT

PHONE 0331-J4

CERTIFICATE OF ANALYSIS

To Hugh Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Date 6-10-51

Material: Weatherlyite Ore
Received: ~~XXXXX~~ 6-9-51
For: Titanium Assay

Order No. 1723-SA

Lab No.	Your No.	Description	Result
1723-2	--	1.78% U_3O_8 Ore	1.79% TiO_2

Note: Acid Earths Approximately 0.10%

G. O. Brown

Analyst

THE BROWN LABORATORY

ROUTE 3

GRAND JUNCTION, COLORADO

ANALYTICAL DEPARTMENT

Phone 0522-J4

CERTIFICATE OF ANALYSIS

To Hugh Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Date 3/22/50

Material: UO_2 Concentrate
Received: 3/22/50
For: Uranium Assay

Order No.

Lab No.	Your No.	Description	Result
1104-1	--	Tabled Concentrate - Panned	85.2% U_3O_8

H. L. Brown
Analyst

BROWN LABORATORY
Route # 3
GRAND JUNCTION, COLORADO

Phone 0522J4

October 3, 1949

CERTIFICATE OF ANALYSIS

To: Hugh Weatherly
1147 Hill Avenue
Grand Junction, Colo.

Material: Uranium Bearing Ore Sample
Received: October 1, 1949
For: Molybdenum Determination

ANALYSIS

Lab. No.	Your No.	Description	Result
918/1	883/1	_____	9.44% MoO_3

By H. D. Brown

H. D. Brown
Analyst

PAID

THE BROWN LABORATORY

ROUTE 3

GRAND JUNCTION, COLORADO

ANALYTICAL DEPARTMENT

[redacted]
PHONE 0331-J4

CERTIFICATE OF ANALYSIS

To Hugh Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Date 6/14/50

Material: Weatherlyite Ore Samples - 2
Received: 6/10/50
For: Uranium and Cobalt Determinations

Order No. 1218-S

Lab No.	Your No.	Description	Result
1218-1	1	Blue Shaley Lime - - - - - - - - - -	0.08% U_3O_8
1218-2	2	Erythrite Impregnated - - - - - -	1.69% Co_3O_4 1.24% CO

Analyst

THE BROWN LABORATORY
ROUTE # 3
GRAND JUNCTION, COLORADO

Phone 0522J4

June 25, 1949

CERTIFICATE OF ANALYSIS

To: H. G. Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Material: Uranium Bearing Ore
Received: June 21, 1949
For: Uranium and Vanadium Determinations

ANALYSIS

Lab. No.	Your No.	Description	Result
743/1	- - -	- - - - -	0.98% U_3O_8 Nil V_2O_5

By H. D. Brown
H. D. Brown
Analyst

PAID

THE BROWN LABORATORY
Route # 3
GRAND JUNCTION, COLORADO

Phone 0522J4

October 27, 1949

CERTIFICATE OF ANALYSIS

To: Hugh Weatherly
1127 Hill Avenue
Grand Junction, Colorado

Material: Uranium Bearing Ore Sample
Received: October 26, 1949
For: Uranium Assay

ANALYSIS

Lab. No.	Your No.	Description	Result
948/1	---	Carbonaceous Material - Black - High Luster	6.23% U_3O_8

By H. D. Brown
H. D. Brown
Analyst

THE BROWN LABORATORY

ROUTE 3

GRAND JUNCTION, COLORADO

ANALYTICAL DEPARTMENT

Phone 0522-J4

CERTIFICATE OF ANALYSIS

To Hugh Weatherly
1147 Hill Avenue
Grand Junction, Colorado

Date 1/3/50

Material: Uranium Mineral
Received: 1/2/50
For: Uranium Determination

Order No.

Lab No.	Your No.	Description	Result
1044-1	--	Raw Ore - Pannings - - - - - - - - - - (Concentrates Leached Free of Impurities with Dilute Acid)	101.5% U_3O_8 97.6% UO_2

H. D. Brown

Analyst

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

D-225

TRACE ELEMENTS PRELIMINARY RECONNAISSANCE REPORT

DATE: 8/22/51

EXAMINED BY: V. R. WILMARTH & R. C. VICKERS

STATE: Colorado

DATE EXAMINED: 8/26/51

COUNTY: San Miguel

DISTRICT:

1. NAME OF PROPERTY: Black King No.1, 4 & 5. SEC. T. 42 N. R. 11 W.

2. DIRECTIONS TO PROPERTY: 1 Mile north-northwest of Placerville, Colorado

3. OWNER OR LESSEE: Mr. Hugh Weatherly and brothers.
ADDRESS: 1147 Hall Ave., Grand Junction, Colorado.

4. PUBLISHED REFERENCES: U. S. Geol. Survey Bull. 530, pp. 142, 156, 1911

5. MINE WORKINGS: 140 foot adit, two inclined shafts and several prospect pits.

6. TYPE OF EXAMINATION: Radiometric and geologic.

7. RADIOACTIVE DEPOSIT: TYPE AND AGE: Tertiary vein.

WALL ROCKS: Triassic Dolores. Basal conglomeratic and Permian? Cutler formation.

ORE MINERALS, PRIMARY: Thucolite, chalcocite, pyrite, tetrahedrite, galena, sphalerite.

ORE MINERALS, SECONDARY: Autunite, malachite azurite, erythrite, azurite.

GANGUE MINERALS: Calcite, dolomite, barite.

ORE-GANGUE RELATIONSHIP: Thucolite occurs in fault gouge and as replacement pocket in a hydrothermal marble adjacent to the fault.

ATTITUDE: N 70-80°W. SHAPE: Tabular to irregular

LENGTH (STRIKE OR OTHER): 60-80 feet. WIDTH: 2-3 feet, THICKNESS: 2-3 feet.

8. COUNTER TYPE: Nuclear BACKGROUND: 2 div. on 0.2 scale

9. SAMPLE INFORMATION

Av. reading for deposit: 20 to 4 div. on 2.0 scale

SAMPLE NO.	TYPE	EU (PERCENT) OR C/M	CHEM. ASSAY (PERCENT)

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF100H.

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TRACE ELEMENTS PRELIMINARY RECONNAISSANCE REPORT
SUPPLEMENTARY LABORATORY DATA

USGS-PRR D-225 SLD

DATE: OF PRR Aug. 22, 1951

DATE OF SLD: Nov. 19, 1951

REPORT BY: V. R. Wilmarth

STATE: Colorado

COUNTY: San Miguel

DISTRICT:

1. NAME OF PROPERTY: Black King No. 1, 4 & 5. SEC. T. 44 N. R. 11 W.

2. OWNER OR LESSEE: Mr. Hugh Weatherly & Bros.
ADDRESS: 1147 Hall Ave., Grand Junction, Colo.

3. ASSAYS

SAMPLE NO.	LOT NO.	TYPE OF SAMPLE	MATERIAL SAMPLED	EU OR EU3O8	(PERCENT) U	(PERCENT)	(PERCENT)
51-W-6	1634	Channel	Fault gouge	0.002	0.001		
51-W-7	do.	do.	do.	0.001	0.001		
51-W-8	do.	do.	do.	0.002	0.001		
51-W-9	do.	do.	do.	0.001	0.001		
51-W-10	do.	do.	Cutler, sandstone.	0.001	0.001		
51-W-11	do.	do.	Fault gouge	0.001	0.001		
51-W-12	do.	do.	Cutler sandstone.	0.002			
51-W-13	do.	do.	do.	0.001			
51-W-14	do.	do.	Cutler shale.	0.004			
51-W-15	do.	do.	Cutler sandstone.	0.003			
51-W-16	do.	do.	Cutler conglomerate.	0.002			
51-W-17	do.	do.	Cutler limestone.	0.002			
51-W-18	do.	do.	Cutler limestone.	0.003			
51-W-19	do.	do.	Fault gouge	0.003	0.004		
51-W-20	do.	do.	Fault gouge	0.001	0.001		
51-W-21	do.	do	Fault gouge	0.001	0.001		
51-W-22	do.	do.	Limestone.	0.003	0.003		
51-W-23	do.	do.	Chrome bearing conglomerate.	0.006	0.006		
51-W-24	do.	do.	Fault gouge	0.003	0.003		
51-W-25	do.	do.	do.	0.001	0.002		
51-W-26	do.	do.	do.	0.017	0.014		
51-W-27	do.	do.	do.	0.003	0.001		
51-W-28	do.	do.	do.	0.003	0.001		
51-W-29	do.	do.	Limestone	0.002	0.001		
51-W-30	do.	do.	Fault gouge	0.001	0.001		
51-W-31	do.	do.	Fault gouge	0.001	0.002		
51-W-32	do.	do.	Barite vein	0.001	0.001		
51-W-34	do.	do.	Barite vein	0.001	0.001		
51-W-35	do.	do.	Fault gouge	0.003	0.002		
51-W-36	do.	do.	Thucolite	0.52	0.70		

(see other side)

ASSAYS (continued)

SAMPLE NO.	LOT NO.	TYPE OF SAMPLE	MATERIAL SAMPLED	EU OR EU_3O_8	(PERCENT) U	(PERCENT)
51-W-37	1634	Channel	Thucolite	0.59	0.24	
51-W-38	do.	do.	Limestone	0.015	0.007	
51-W-39	Grab.	do.	Thucolite ore.	1.10	1.33	
51-W-40	Channel	do.	Limestone	0.009	0.008	
51-W-41	do.	do.	Cutler sandstone/	0.002	0.002	
51-W-42	do.	do.	Cutler sandstone.	0.003	0.002	
51-W-43	Grab	do.	Cutler sandstone.	0.001	0.001	
51-W-44	do.	do.	Cutler sandstone.	0.002	0.001	
51-W-45	do.	do.				
51-W-45	do.	do.	Cutler sandstone.	0.001	0.001	
51-W-47	1634	do.	Limestone	0.023	0.019	
51-W-48	do.	do.	Thucolite	0.27	0.23	
51-W-49	do.	do.	Limestone	0.043	0.033	
51-W-50	do.	do.	Fault gouge	0.019	0.015	

BACHELOR CORPORATION
PLACERVILLE COLORADO

EXHIBIT MF 100 K.

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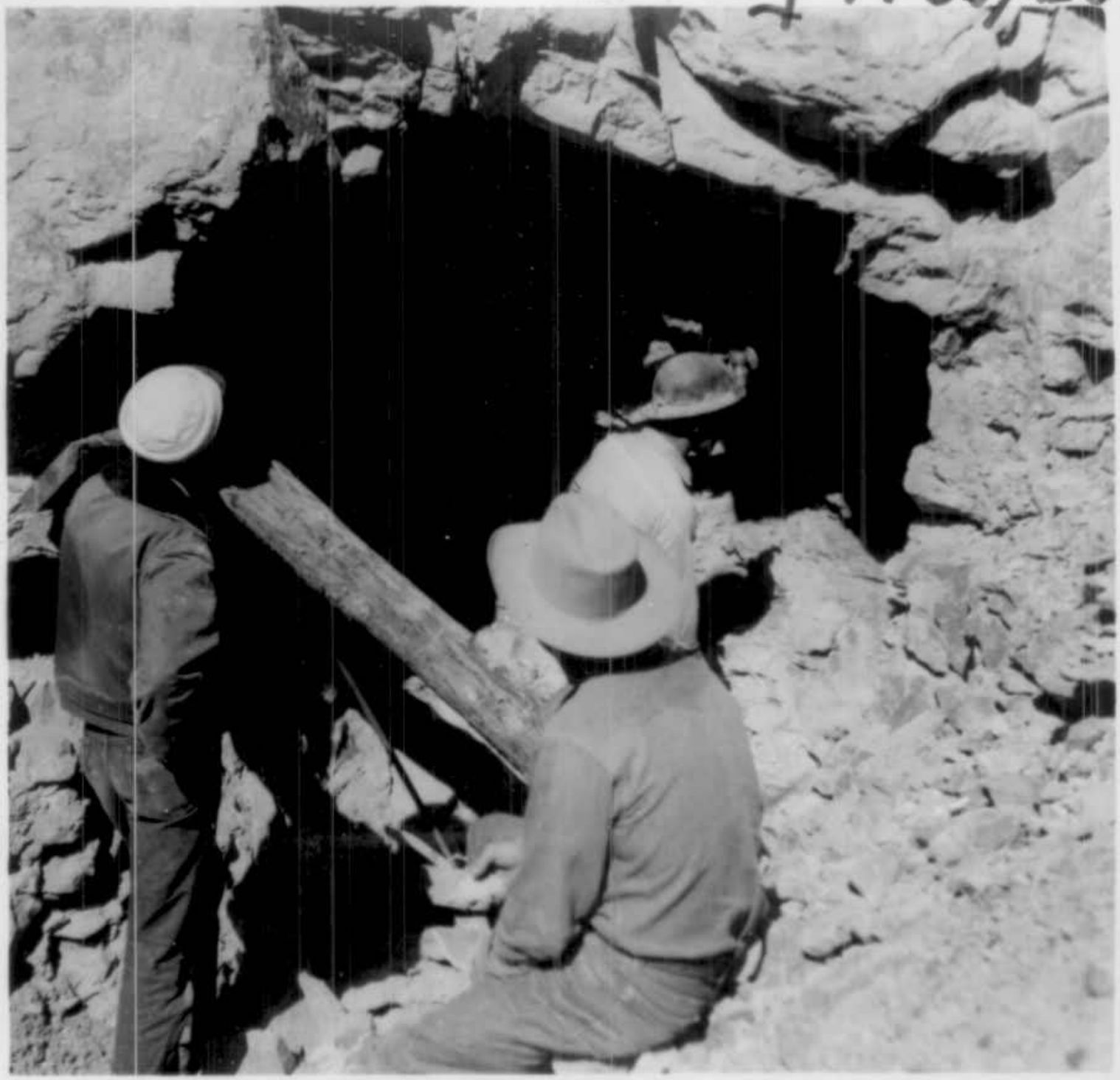
BLACK KING "Gulley Prospect"



BLACK KING TUNNEL

BLACK KING STOCKPILE & COMP. HOUSE

BLACK KING (ditto

RAIL TO TUNNEL & DUMP

QUILLEY STOCK PILE

SAME

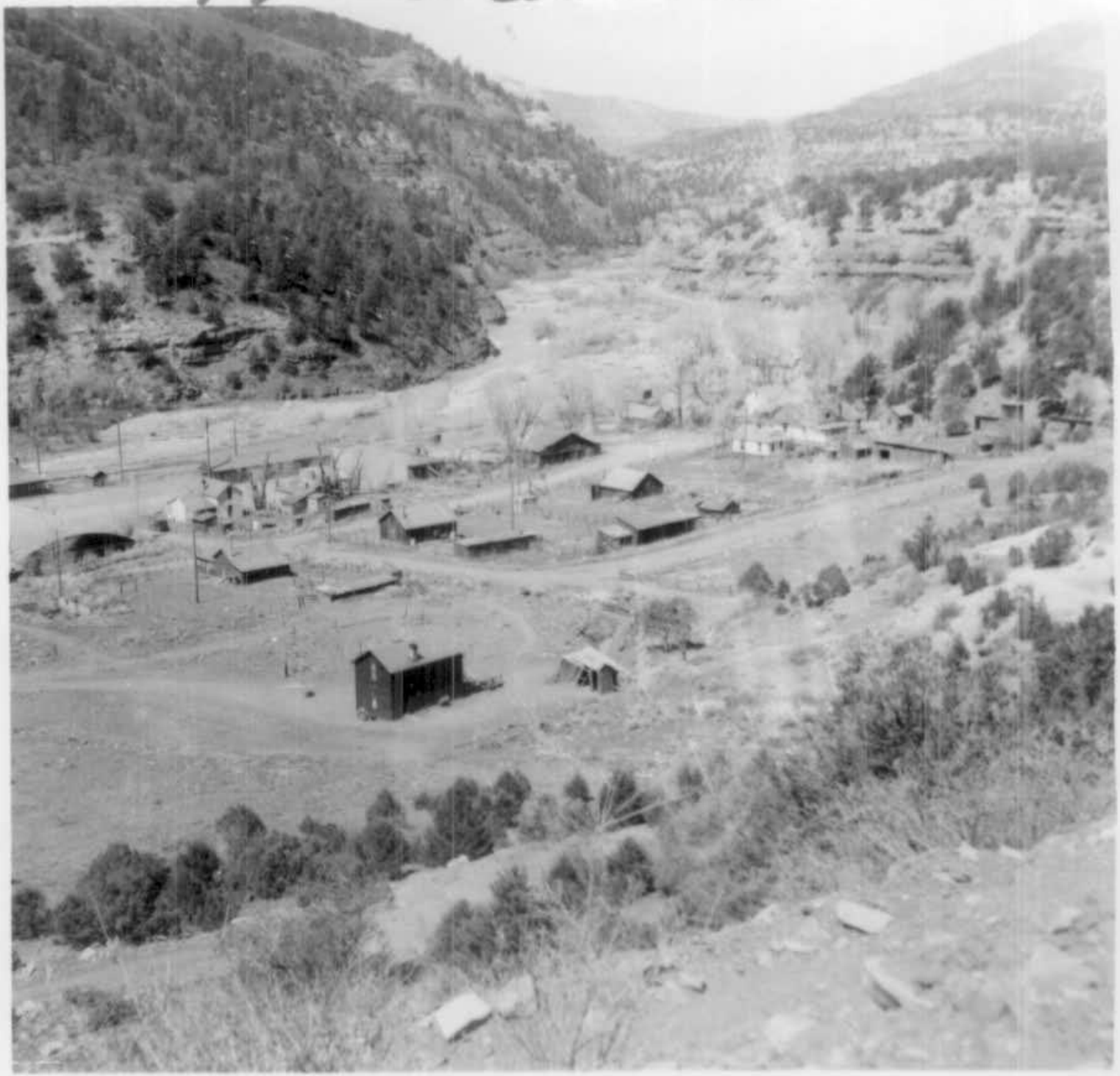
dop

dup

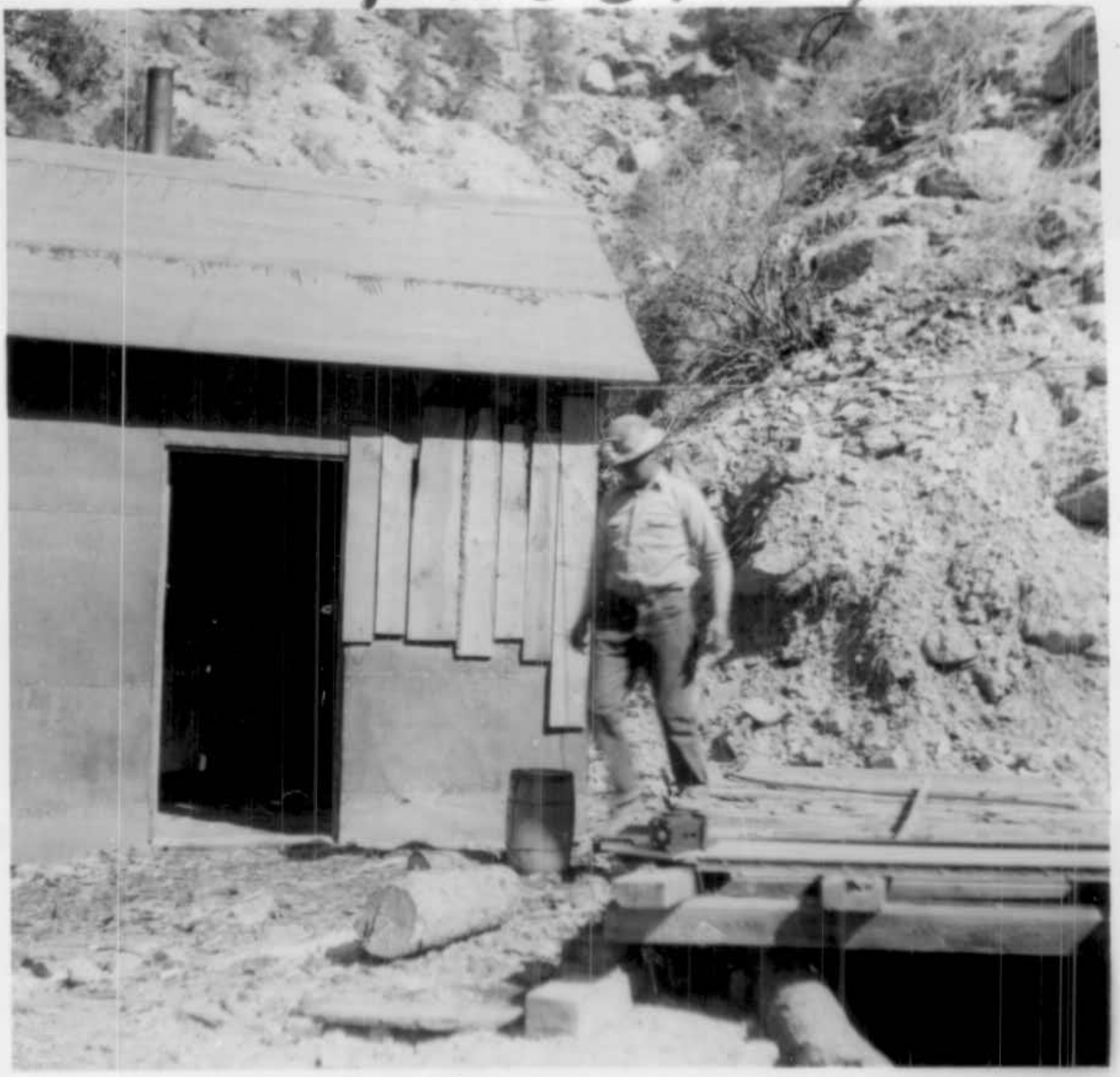
Looking from Gulley to Shaft
B.K.

Same

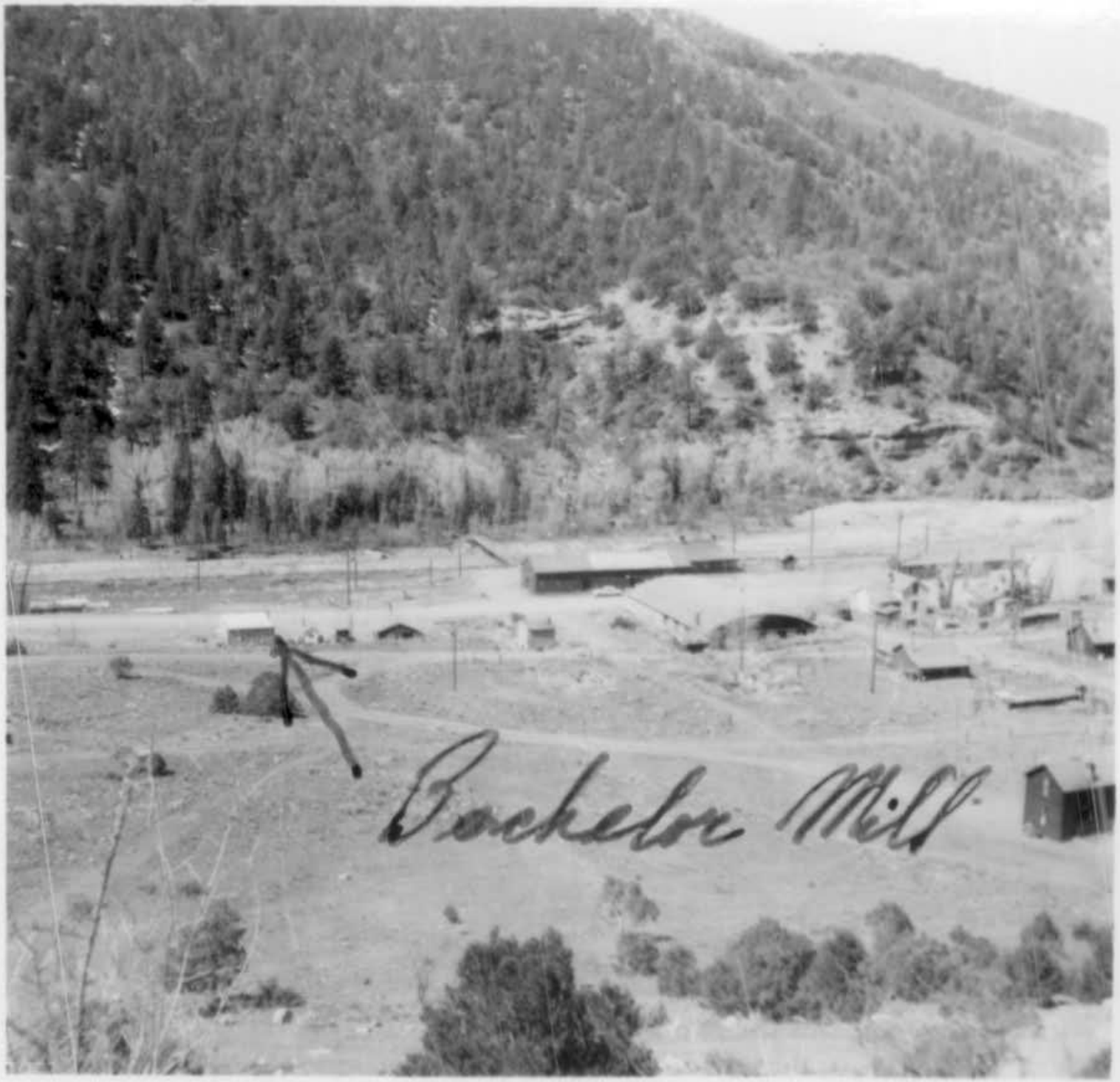
Placerville



Block King



→ Winze


Bachelor Mill

White 5 for 5 haft.