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

JUL 21 1955

Surname copy
A. A. Keating
Ellis
Geehan
Kiilsgaard
Martin
H. Johnson

Mr. H. Alan Stewart
Vice-President and General Manager
Demolan Mining Company
1117 Washington Avenue
Golden, Colorado

Re: Docket No. D[illegible]-670 (Uranium)
Colerco Claim Group
Fremont County, Colorado

Dear Mr. Stewart:

Your application for aid in an exploration project and other data available to us in Washington relative to the above-named property have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding material of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of all our information, although noting some mineralization on your property, indicates to us that the probability of disclosing minable ore reserves by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under those circumstances, that your application for exploration assistance is denied.

We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention.

Sincerely yours,

C. O. Mittendorf
Administrator

AGKeating:ai
7/14/55
cc to: Admr. Reading File
Operating Committee
Docket
Messrs. J. E. Crawford, Rm 3641 (USBM)
T. H. Kiilsgaard, Rm 5224 (USGS)
J. O. Hosted, Rm. 3210, GSA
Code 700
A. G. Keating
DMEA Field Team, Region III (2)

R.C.H.

7/12/55

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

RECEIVED
JUL 12 1955

July 11, 1955

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4445

From: Bureau of Mines Member
Uranium Commodity Committee

Subject: Report of Examination, DMEA Docket 3670, Benalan Mining Company, Colexco group, Fremont County, Colorado

I have reviewed the Field Team report of examination, Benalan Mining Company, DMEA Docket 3670; and I have discussed it with Joseph O. Hosted, Washington representative of the Atomic Energy Commission.

We concur with the recommendation of the Field Team that the application of the Benalan Mining Company be denied because of the poor possibility of the discovery of significant reserves of ore.

The report is being forwarded to the Chief, Division of Minerals, in accordance with the routing slip attached thereto.

John E Crawford
John E. Crawford

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BUREAU OF MINES
WASHINGTON 25, D. C.

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John R. Crawford

7/12/55 gla

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUL 11 1955

July 8, 1955

Re: DMEA 3670
Benalan Mining Co.
Colexco Claims
Fremont Co., Colo.
$188,101.33 - Uranium

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of Field Team report.

In view of the meagre results of much work by the applicant, the recommendation of denial of the inordinate application, by the Field Team is justified.

That a revised program would be acceptable by the applicant is not known, but one in keeping with the results of the pioneer work should receive consideration. A discovery of sorts was made by the Apex drilling and, accepting the information furnished, no trend was definitely established and the center of mineralization was not drilled out, which is regrettable. That the center could have been blown up to supply a large low-grade operation is most improbable, but the information from ten or twelve more holes would be useful.

I concur with the denial recommendation.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUL 11 1955

July 8, 1955

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I concur with the denial recommendation.

N. E. Nelson

N. E. Nelson

NENelson:iml
G-7/8/55

cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641
J. O. Hosted, 3210

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUL 11 1955

July 8, 1955

Re: DMEA 3670
Berralan Mining Co.
Colexoo Claims
Fremont Co., Colo.
$188,101.33 - Uranium

Memorandum

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N. E. Nelson

N. E. Nelson

NENelson:iml
G-7/8/55

cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641
J. O. Hosted, 3210

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
JUL 11 1955

July 8, 1955

Re: DMEA 3670
Zenalmt Mining Co.
Colemon Claims
Fremont Co., Colo.
$188,101.33 - Uranium

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

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Subject: Review of Field Team report.

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N. E. Nelson

NENelson:iml
G-7/8/55

cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641
J. O. Hosted, 3210

DOCKET COPY

A.G. Keating

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

WASHINGTON 25, D. C.

July 5, 1955

SUMMARY OF PROPOSED PROJECT

Subject: Denial of application for an exploration project.

Docket No.: DMEA 3670

Commodity: Uranium

Applicant: Benalan Mining Company - incorporated in state of Pennsylvania
1117 Washington Avenue
Golden, Colorado

Property: 56 contiguous unpatented lode mining claims consisting of Colexco No. 1 through Colexco No. 56 located in Secs. 7, 8, 17, and 18, T 17 S., R 70 W., Fremont County, Colorado

Date of Application: February 1, 1955

Amount of Application: $188,101.33

Work Proposed: Rotary air drilling spaced on 100 foot coordinate grid, 1,997 holes totaling 116,575 feet of rotary drilling. One hole cored for every 100 holes of non core drilling.

Estimated Cost of Work Proposed:

Independent Contracts - none	
Labor, supervision, consultants	$39,175.00
Operating materials and supplies	9,769.00
Operating equipment (use allowance)	109,307.25
New building and improvements	1,350.00
Miscellaneous, logging, accounting, taxes	11,399.76
Sub Total	$171,001.21
Contingencies at 10% of $171,001.21	17,100.12
Total estimated cost	$188,101.33

Field Team
Report: June 6, 1955. R. U. King, USGS
R. L. Bolmer, USBM

"Secondary uranium minerals occur sparingly in concretions. Uranophane is the chief uranium mineral. Many concretions that are radioactive contain no visible uranium minerals. Analysis of four check samples from the most radioactive exposures range from 0.02 to 0.136 per cent U_3O_8. The uranium content of mineralized rock is not likely to change markedly with depth.

"Thirty-four holes have been drilled by the applicant assumed to have penetrated the ore-bearing upper sandstone unit of the Dakota formation. Fourteen of these holes were drilled in a selected area, 50 x 200 feet. Four of the holes are inferred to have intersected 0.1 per cent or better equivalent uranium oxide, from 2 feet to 8 feet thick. Of the 20 other holes drilled at various locations on the property, none have intersected material of ore grade.

"The examining team concluded that there was little possibility of discovering a significant amount of uranium as a result of the proposed work and it is recommended that the application be denied."

Commodity Committee Members' Comments:

U. S. Geological Survey

N. E. Nelson, July 8, 1955. "In view of the meagre results of much work by the applicant, the recommendation of denial of the inordinate application, by the Field Team is justified.

"That a revised program would be acceptable by the applicant is not known, but one in keeping with the results of the pioneer work should receive consideration. A discovery of sorts was made by the Apex drilling and, accepting the information furnished, no trend was definitely established and the center of mineralization was not drilled out, which is regrettable. That the center could have been blown up to supply a large low-grade operation is most improbable, but the information from ten or twelve more holes would be useful.

I concur with the denial recommendation."

U. S. Bureau of Mines

J. E. Crawford, July 11, 1955. "We concur with the recommendation of the Field Team that the application of the Benalan Mining Company be denied because of the poor possibility of the discovery of significant reserves of ore."

Rare and Miscellaneous Metals Division - A. G. Keating, July 15, 1955

While radioactivity appears to be widespread on the property, it is confined to a narrow stratigraphic interval in the Dakota formation, localized in scattered concretions of small dimensions.

Although it is possible that 25 per cent of the total area within the property may have occurrences of uranium-bearing sandstone containing 0.05 to 0.8 per cent U_3O_8, the isolated deposits of minable material are estimated to be on the order of 100 ton deposits not exceeding 10 x 50 feet in area.

This Division concurs with the recommendations of the Commodity members that the subject application be denied.

Ernest Wm. Ellis

Ernest Wm. Ellis, Chief
Rare and Miscellaneous
Metals Division

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

RECEIVED
JUN 30 1955

224 New Customhouse
Denver 2, Colorado

June 15, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket DMEA-3670, Benalan Mining Company, Colexco group, Fremont County, Colorado

Enclosed are the original and three copies of the report pertaining to the above application.

We concur in the recommendations of the field examiners that the application be denied.

W. M. Traver

E. N. Harshman

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
7-6-55
(date)

RECEIVED

TRANSMITTED JUN 30 1955

JUN 15 1955

Region III

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
June 6, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw and E. N. Harshman

Subject: DMEA 3670, Benalan Mining Company (Colexco claim group)
Fremont County, Colorado

The Benalan Mining Company applied for exploration assistance in the amount of $188,101.33 to explore the Colexco group of claims by 116,575 feet of non-core drilling. The field examination was made on March 29-30, 1955 by R. U. King, Geological Survey, and R. L. Bolmer, Bureau of Mines. The examining team concluded that there was little possibility of discovering a significant amount of uranium as a result of the proposed work and it is recommended that the application be denied.

for Lewis King
John F. Shaw

E. N. Harshman
E. N. Harshman

cc 11
DMEA 3670
DMEA Chron.

JFS/pah

7-6-55

RECEIVED
JUN 30 1955
TRANSMITTED
JUN 15 1955

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 3670, Benalan Mining Company

Colexco Claim Group

Fremont County, Colorado

Uranium

R. U. King, Geologist
Geological Survey

R. L. Bolmer, Mining Engineer
Bureau of Mines

June 8, 1955

7-6-55

DMEA 3670

RECEIVED
JUN 30 1955

BENALAN MINING COMPANY
COLEXCO CLAIM GROUP
FREMONT COUNTY, COLORADO

Field Examination Report

By R. U. King
Geologist
Geological Survey

R. L. Bolmer
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
7-6-55
(date)

DMEA 3670

BENALAN MINING COMPANY
COLEXCO CLAIM GROUP
FREMONT COUNTY, COLORADO

CONTENTS

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ILLUSTRATIONS

Figure	Follows Page
1. Location map, Benalan Mining Company, Colexco claim group, Fremont County, Colorado	2
2. Geologic map of the Colexco group of claims, Fremont County, Colorado, Benalan Mining Company	2

DMEA 3670

BENALAN MINING COMPANY
COLEXCO CLAIM GROUP
FREMONT COUNTY, COLORADO

RECEIVED
JUN 30 1955

INTRODUCTION

The Benalan Mining Company, a Pennsylvania corporation with a mailing address of P. O. Box 509, Golden, Colorado, made application for aid in an exploration project, pursuant to DMEA Order 1, under the Defense Production Act of 1950, as amended. The application, dated February 1, 1955, was assigned Docket No. DMEA 3670.

In its application, the company proposed a project of exploration for uranium on some 875 acres of unpatented mining property in Fremont County, Colorado. The company proposed to explore the Dakota formation, which outcrops on the property, by means of 1,997 rotary, non-core, air drill holes spaced on a 100-foot coordinate grid. The 116,575 feet of drilling involved in the proposed project was estimated by the applicant to cost a total of $188,101.33.

The application was referred to the DMEA Field Team, Region III, on March 1, 1955, for field examination and recommendations. The property was examined March 29 and 30, 1955, by R. U. King, Geological Survey, and R. L. Bolmer, Bureau of Mines. Warren Mason, a representative of the applicant, was present during the examination.

This report is based on the results of the field examination and is prepared for the purpose of aiding the Field Team, and others concerned, in evaluating the applicant's request for exploration assistance.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The property is located about 9 airline miles (some 14 miles by road) north of the commercial center of Canon City in secs. 7, 8, 17, and 18, T. 17 S., R. 70 W., sixth principal meridian, Fremont County, Colorado. It is accessible via an unimproved road to Red Canon Park that branches from U. S. Highway 50 about 3 miles northwest of Canon City (fig. 1). The northern sections of the access road are impassable during inclement weather.

The claims are laid out over an isolated mesa of Dakota sandstone that lies immediately east of the road and just south of Red Canon Park. Prominent cliffs of massive sandstone rim the mesa. The topographic relief of the immediate area is indicated on figure 2. Elevations range from about 6,300 feet above sea level at the base of the mesa to over 7,000 feet at the northern limits of the property. The drainage of the intermittent streams dissecting the mesa is southerly into Wilson and Oil Creeks.

The mesa is covered by pine and cedar which are suitable for most mining purposes. The property, except for a few rough access roads to the earlier drill sites, is unimproved; it is without electrical power or other facilities. An uneven clearing on the mesa is said to be suitable for the landing of small aircraft.

HISTORY AND PRODUCTION

The deposit was discovered in the fall of 1953 during an aerial scintillometer survey of the area by the Colorado Exploration Company. This company immediately staked the ground, performed the preliminary discovery work, and recorded the locations of the Colexco Nos. 1-43 claims.

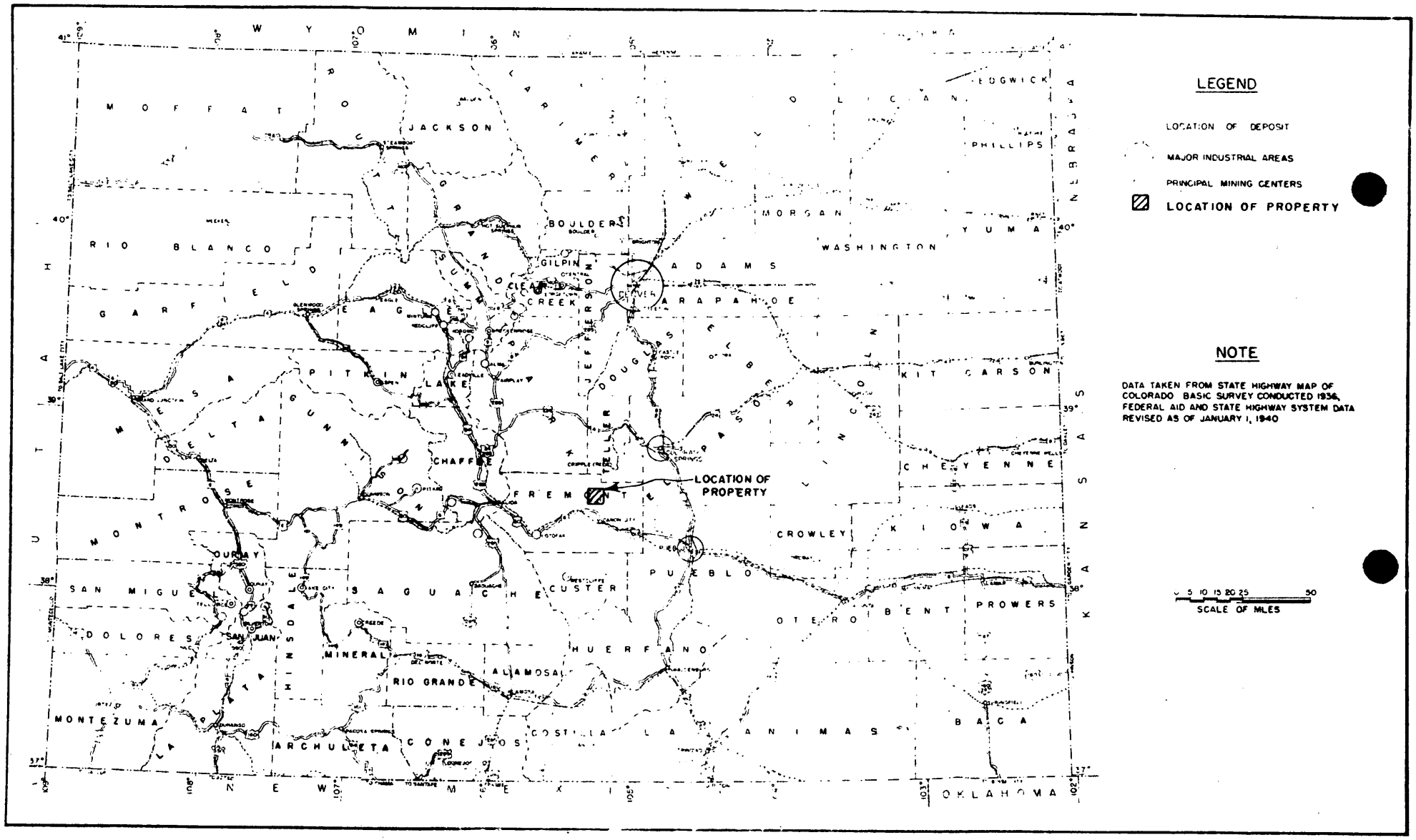
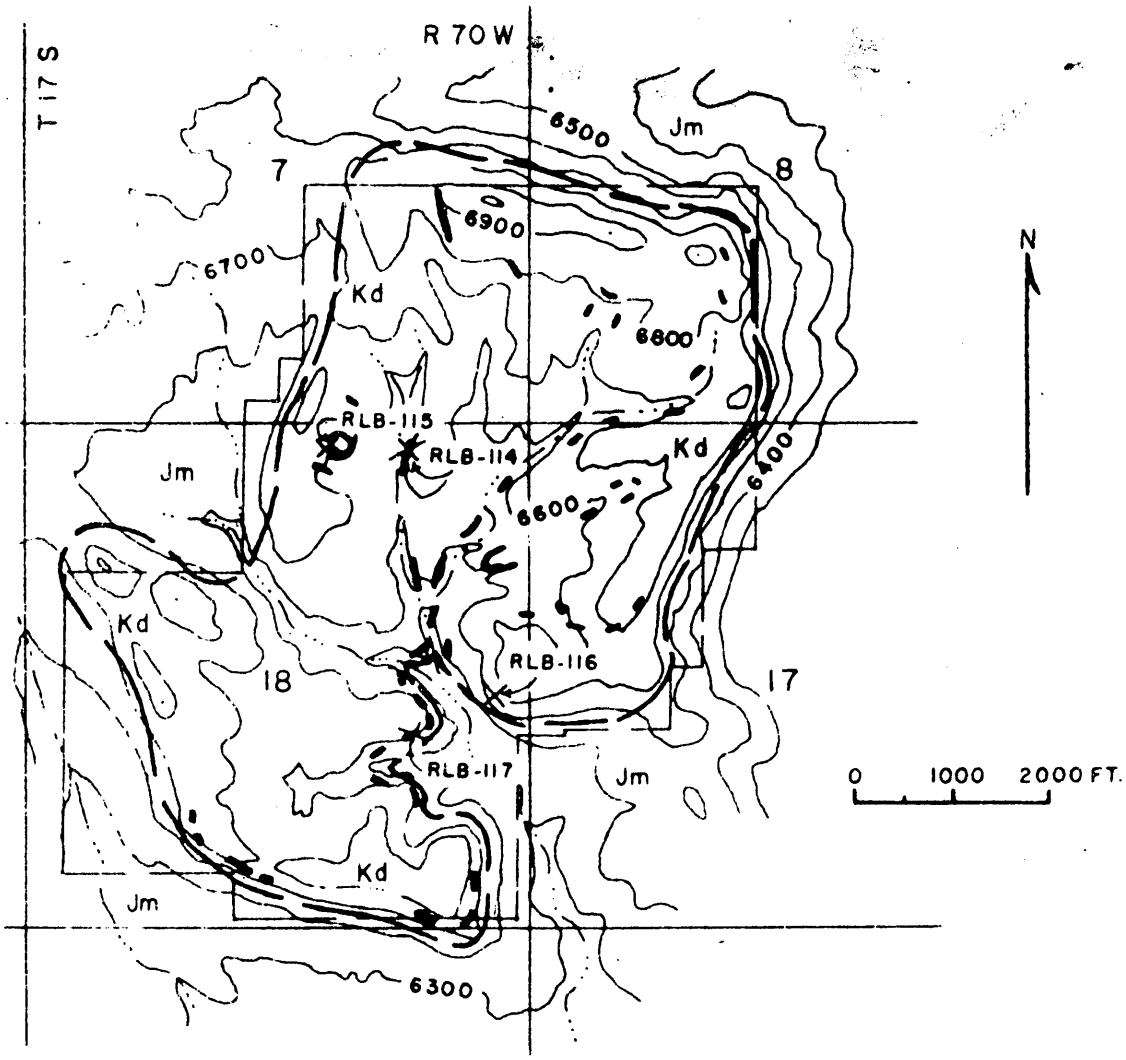


FIGURE 1 - LOCATION MAP, BENALAN MINING COMPANY, COLEXCO CLAIM GROUP, FREMONT COUNTY, COLO. DMEA 3670



EXPLANATION

Kd — Dakota formation — Cretaceous

Jm — Morrison formation — Jurassic

Contact, approximately located

Radioactive outcrop

X RLB-114 Sample locality

Claim boundary approximately located

AFTER WHITMAN CROSS, U.S.G.S. FOLIO 7.

R U. KING, MAY, 1955

FIGURE 2 -- GEOLOGIC MAP OF THE COLEXCO GROUP OF CLAIMS, FREMONT COUNTY, COLORADO

BENALAN MINING COMPANY

Preliminary surveying and mapping of the property was continued by this company during 1954.

The claims were transferred to the Benalan Mining Company in September 1954. The Colorado Exploration Company continued plane table mapping at the property and, during October 1954, drilled some 34 holes on the ground to obtain data for use in preparing an application for DMEA assistance. The mapping, road preparation, and drilling also served as assessment work at the property for the period July 1, 1954, to July 1, 1955. Certain adjoining claims, the Colexco Nos. 44-56, were located in the name of the Benalan Mining Company during January 1955.

The property has no recorded past production of uranium ore or other minerals or metals. It is not currently in production.

Application for aid in a DMEA exploration project at the property (Docket No. DMEA 3670) was submitted by the Benalan Mining Company in February 1955.

OWNERSHIP AND EXTENT

The property, on which the applicant proposes to explore for uranium, comprises a group of 56 contiguous, unpatented lode mining claims identified as the Colexco Nos. 1-56. The Colexco Nos. 1-43 are standard, 600- by 1500-foot lode mining claims; the Colexco Nos. 44-56 are fractional claims. The property boundaries are shown on Plate 1 (Topographic Map of the Colexco Claim Group) which accompanies the application for exploration assistance. The group comprises a solid block of ground approximating 875 acres in total area that covers the top and, to a minor extent, the flanks of an isolated mesa formed in the Dakota formation.

The Colexco Nos. 1-43 claims were located in November 1953 by the Colorado Exploration Company who transferred the property to the Benalan Mining Company by a quit claim deed dated September 21, 1954. The location certificates for these claims are recorded in Book 333 at pages 475-505 in the Fremont County Recorder's office, Canon City, Colorado. Amended location certificates for claims 41 and 42 are recorded in Book 333 at pages 539-540. The deed conveying the property to the applicant was filed for record September 25, 1954, in Book 339 at page 12. Affidavits of labor and improvement on the Colexco Nos. 1-43 claims, for the period July 1, 1954, to July 1, 1955, were recorded December 17, 1954, in Book 342 at page 156. The Colexco Nos. 44-56 claims were located January 15, 1955; location certificates in the name of the Benalan Mining Company are recorded in Book 344 at pages 215-227.

A representative number of the claims in the group were checked during the field examination of the property. The claims so checked appeared to be staked and posted properly and laid out on the ground as indicated on Plate 1. The discovery cuts on the claims (indicated by a black dash on Plate 1 of the application) were bulldozer trenches. The cuts were excavated 6 to 8 feet in width and to depths of from 3 to 5 feet below the surface. In most instances the cuts were in the overburden and had not been excavated deep enough to expose solid bed rock. No radioactivity or other evidence of mineralization could be detected in the discovery trenches that were observed during the examination.

GEOLOGY

Sedimentary rocks of Cretaceous and Jurassic age are exposed in the vicinity of the Colexco group of claims. The Cretaceous Dakota sandstone forms bold cliffs and overlies sandstone, marl, and shale of the Morrison formation of Jurassic age.

The Dakota sandstone forms an isolated bowl-shaped mesa that is dissected by small intermittent streams. The structure is an elongate closed syncline.

The Dakota sandstone, about 300 feet thick, is light colored and consists of nearly pure quartz sandstone. Massive white to buff beds are separated by thin beds of gray to black fissile shale layers. The sandstone is even-grained but commonly crossbedded.

Secondary uranium minerals are associated with iron and manganese concretions in the upper part of the Dakota sandstone. The concretions are elongate and tabular, and are irregularly distributed over a wide area in the uppermost sandstone bed. They appear to be generally confined to a single stratigraphic horizon near the top of a massive sandstone unit. The concretions range in size from less than 1 foot in diameter by 10 feet in length to as much as 10 feet by 50 feet.

Dark brown and black iron- and manganese rich concentric banding is characteristic of the concretions, and this feature makes them conspicuous on rubble-covered slopes and on cliff faces. They do not, however, appear to control the topography to any great extent. Almost without exception the concretions are slightly to moderately radioactive.

Yellow-colored secondary uranium minerals occur sparingly in concretions. Uranophane is the chief uranium mineral; carnotite is reported from the area. Many concretions that are radioactive contain no visible uranium minerals.

Analyses of four check samples collected from the most radioactive exposures range from 0.02 to 0.136 percent uranium oxide. The radioactivity of the samples ranges from 0.016 to 0.15 percent equivalent uranium oxide indicating that the uranium-bearing material is not greatly out of equilibrium with its disintegration products. From this evidence, it is

concluded that the uranium content of mineralized rock is not likely to change markedly with depth.

Thirty-four holes have been drilled by the applicant on the property that presumably have penetrated the ore-bearing upper sandstone unit of the Dakota formation. In one selected area 14 holes, spaced irregularly from 10 to 40 feet apart and covering an area of about 50 by 200 feet, were drilled to intersect a projected ore-bearing bed. Five of these holes are inferred to have intersected ore grade material (0.1 percent or better equivalent uranium oxide) in thickness ranging from 2 to 8 feet.

Of the 20 other holes drilled by the applicant at various localities within the limits of the claims, none are indicated to have intersected material of ore grade.

Calibration of drill hole radiometric logs to support the above inferences is provided only in a general way by five wet assays of drill cuttings.

Analyses of samples collected for check purposes on the Colexco claims are listed in the following table; their locations are shown on figure 2.

Sample No.	Location	Description	eU_3O_8 (percent)	U_3O_8 (percent)	V_2O_5 (percent)
RLB-114	50 feet east of disc. cut, claim No. 32.	Fe-Mn stained sandstone outcrop, grab sample.	0.058	0.050	0.01
RLB-115	400 feet N 70° W. of disc. cut, claim No. 2.	4-1/2 feet chip sample across Fe-Mn stained bed	0.080	0.078	0.01
RLB-116	1,200 feet east of disc. cut, claim No. 19.	5-foot chip sample across banded and iron cemented concretion.	0.016	0.020	0.01
RLB-117	400 feet S. 65° E. of disc. cut, claim No. 21.	Banded iron-stone concretion, 3 feet in diameter exposed for 10 feet along cliff, grab sample.	0.15	0.136	0.02

PROJECT PROPOSALS WITH COSTS

The applicant proposes to explore the Dakota formation, which is exposed on the Colexco group of claims, for uranium. Preliminary prospecting and exploration in several scattered areas of the property and the exposures of radioactive material along certain sections of the mesa rim had indicated the occurrence of low-grade uranium mineralization within a narrow horizon of the formation. The applicant apparently desires to develop sufficient tonnages of low-grade uraniferous sandstone (0.05 to 0.07 percent U_3O_8) in order to justify the construction of a local mill. The sale of uranium concentrates presumably would be negotiated with the A.E.C. The large tonnage, which the applicant hopes to develop, apparently would be the main factor in negotiating a sale of the concentrates at a price that would enable such a grade of material to be mined and concentrated at a profit.

The applicant proposes to drill the Dakota formation, which covers most of surface of the property, on 100-foot coordinate centers. A total of 1,997 individual drill holes, aggregating 116,575 feet of hole, are proposed. The work would be performed with dry, non-coring, rotary air drills. The applicant estimates the total cost of the exploration project at $188,101.38, which is equivalent to a unit cost of $1.61 per foot of hole to be drilled. It is stated that such a project could be started within 60 days and completed within a period of 13 months.

The type of drilling proposed at the property is technically feasible. The Dakota sandstone in the area apparently is free of water. The holes would be bottomed in the "Black Mudstone" unit of the Dakota formation, a prominent marker bed that occurs some 20 to 40 feet below the horizon in which radioactivity has been detected. The proposed locations of the holes are shown on Plate 3 that accompanies the application. The depths of the holes (from

data supplied on Plate 4) would range from 0 to 120 feet below the surface. The holes proposed in certain areas of the property, for which indicated depths to the mudstone range from 0 to about 30 feet, are not warranted as the uranium-bearing horizon in such areas has been eroded away. Such holes would be collared in and drilled through, the lower, unmineralized sections of the strata.

Inasmuch as exploration of the property is not being recommended, the details and the costs of the proposed project, as supplied by the applicant, are not especially pertinent and will be commented on, only briefly.

The proposed project work would be performed by the Colorado Exploration Company. This company is owned by W. Alan Stewart, who also is vice-president and general manager of the Benalan Mining Company. The project would utilize equipment owned by the Colorado Exploration Company and would be supervised by its personnel.

The company owns two, truck-mounted rotary air drills which it proposes to utilize for the project. The area to be drilled has fairly rough topography and, in most sections, is covered by a heavy growth of timber. It would be necessary to construct access roads to most of the 1,997 drill stations. Percussion-type, wagon drilling might prove just as feasible for this particular formation; it should give comparable results at a lower unit cost.

The over-all unit cost of $1.61 per foot of hole, as estimated by the applicant, is about average for the proposed type of drilling where only a few thousand feet of drilling is involved. In considering that more than 100,000 feet of drilling is involved in this particular project, it is believed

that some small reductions in the unit cost could be made which would result in a considerable reduction in the total cost of the project.

Some of the individual costs, as itemized in the application, are considered excessive or unwarranted; other costs, which are considered necessary, have not been itemized in the applicant's estimate.

The applicant includes a chief geological engineer, a resident geological engineer, and a surveyor-foreman in its labor schedule. One full-time engineer or geologist probably could handle the job.

The initial value of the equipment owned by the company and which would be used on the project (two rotary air drills, D8 bulldozer, water truck, jeep, pickup truck, Babbel counter and probe, etc.) was stated to be $100,000.00. The suggested use allowance for this equipment (presumably for a period of 11 months or less) which is included in the applicant's cost estimate, is $109,307.25. Although not so stated, the use allowance apparently includes repairs and upkeep on the equipment, drill bits, et cetera which are not itemized elsewhere. Operating labor and other supplies for the equipment are listed under separate categories. In addition to the cost of technical personnel and a use allowance on the detection equipment, the company will log the drill holes radiometrically for an additional $0.05 per foot. Contingencies for unforeseen expenses in the amount of 10 percent, or $17,100.12, also are included in the total estimated costs of the proposed project.

CONCLUSIONS AND RECOMMENDATIONS

Although radioactivity is widespread on the property, it is confined to a narrow stratigraphic interval in the Dakota formation and is localized in scattered concretionary structures of small dimensions.

It is possible that as much as 25 percent of the total area within the property will consist of uranium-bearing sandstone containing from 0.05 to 0.08 percent U_3O_8. The isolated occurrences of ore-grade material, which are indicated from natural exposures and from the drilling performed by the applicant, are expected to be in the order of 100-ton bodies not exceeding 10 by 50 feet in area.

It is concluded that uranium at the property occurs in small, low-grade bodies scattered throughout a narrow horizon in the Dakota sandstone. It is believed that the exploration project proposed for the property would not result in the discovery of significant reserves of minable uranium ore.

It is recommended that the applicant's request for exploration assistance be denied.

700

Surname copy

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

Ellis
Newcomb
Hedges
Selfridge
Johnson

MAR 1 - 1955

Mr. W. Alan Stewart
Vice-President and General Manager
Baralan Mining Company
1117 Washington
Golden, Colorado

Re: Docket No. DMEA-3670 (Uranium)
Colemco Claim Group
Fremont County, Colorado

Dear Mr. Stewart:

The application for assistance in exploring your property, under the captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. It has been referred for a field examination to the Executive Officer of Region III at the following address:

Mr. W. W. Traver
Executive Officer
DMEA Field Team, Region III
228 New Customhouse Building
Denver 2, Colorado

The Central Office will contact you at the earliest opportunity in regard to your project.

Sincerely yours,

C. O. Mittendorf

Administrator

EWEllis/gla
2-28-55
cc to: Admr.'s Reading File
Docket
Code 700
DMEA Field Team, Region III (2)

A. C. G.

700

Surname copy

Ellis
Selfridge
H. J. Brown

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

MAR 1 - 1955

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Building
Denver, 2, Colorado

Re: Docket No. DMEA-3670 (Uranium)
Beralan Mining Company
Colarco Claim Group
Fremont County, Colorado

Dear Mr. Traver:

The subject application is referred to Region III Field Team for a field examination and recommendation. A copy of the application was retained by your office.

Enclosed are copies of memoranda from J. E. Crawford, dated February 18, and R. D. Trace, dated February 23, 1955, members of the Uranium Commodity Committee.

A study of the logs of holes drilled by the Applicant should materially assist the field examiners in reaching a decision as to the worthiness of the proposed project or in recommending a modified program if such is indicated.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JB)

Enclosures

APPROVED:

J. H. Hedges (JB)
Member, Bureau of Mines

E. L. Newcomb (JB)
Member, Geological Survey

EWEllis/gla
2/28/55
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. J. E. Crawford, Rm. 3641
T. H. Kiilsgaard, Rm. 5224
J.O. Hosted, Rm. 3210, GSA
Code 700

R.C.L.

2/25/55 gla

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

February 23, 1955

Re: DMEA-3670
Benalan Mining Co.
Colexco group
Fremont Co., Colo.
$188,101.33 - Uranium

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

From: R. D. Trace, U. S. Geological Survey

Subject: Review of application

The occurrence of uranium on the Colexco group is in general similar to many of the Salt Wash deposits on the Colorado Plateau. The chief differences seem to be: 1) The occurrences are in the Dakota sandstone member of the Dakota formation of Cretaceous age; 2) Uranophane is the commonest uranium mineral; and 3) the average grade of the mineralized material may be somewhat lower than the average grade of the Plateau.

The application is well presented except that no drill logs are included, particularly of the wide-spaced holes that were drilled. Under item 4(a)4 the operator mentions that uranium is present in some of the wide-spaced holes, but the quantity is presumably negligible.

The results of the work done by the operator are sufficiently encouraging to warrant a Field Team examination. I doubt, however, that much if any exploration will be warranted.

The large number of occurrences of radioactivity (see plate 2) may or may not be significant. The cut-off used by the operator is 5 times normal background. This means that his cut-off in terms of equivalent uranium is approximately 0.01 percent. Also, I doubt that the average grade of the uranium found by drilling in The Apex area is quite 0.1 percent U, and no reason is given or is apparent to expect higher grades. The wide-spaced holes drilled by the operator, although not a systematic sample of the area, constitutes nevertheless a fairly well scattered pattern and some holes at least were drilled to test the area behind radioactive outcrops. I assume that all of these holes were barren or contained negligible quantities of uranium.

Incidentally: 1) I am wondering whether the drill holes in The Apex area cut the black mudstone underlying the Dakota sandstone member (see plate 5). 2) The circular outcrop of radioactivity puzzles me, particularly when compared with the results shown on plate 5. 3) I cannot find drill holes 12, 24, and 31 on the maps.

I recommend a Field Team examination. I hope that they will be able to obtain logs of all holes drilled.

Bob Trace

R. D. Trace

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Extra

February 23, 1955

Re: DMEA-3670
Benalan Mining Co.
Calamco group
Fremont Co., Colo.
$188,101.33 - Uranium

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

From: R. B. Trace, U. S. Geological Survey

Subject: Review of application

The occurrence of uranium on the Calamco group is in general similar to many of the Salt Wash deposits on the Colorado Plateau. The chief differences seem to be: 1) The occurrences are in the Dakota sandstone member of the Dakota formation of Cretaceous age; 2) Uraninite is the commonest uranium mineral; and 3) the average grade of the mineralized material may be somewhat lower than the average grade of the Plateau.

The application is well presented except that no drill logs are included, particularly of the wide-spaced holes that were drilled. Under item 4(a)4 the operator mentions that uranium is present in some of the wide-spaced holes, but the quantity is presumably negligible.

The results of the work done by the operator are sufficiently encouraging to warrant a Field Team examination. I doubt, however, that much if any exploration will be warranted.

The large number of occurrences of radioactivity (see plate 2) may or may not be significant. The cut-off used by the operator is 3 times normal background. This means that his cut-off in terms of equivalent uranium is approximately 0.01 percent. Also, I doubt that the average grade of the uranium found by drilling in The Apex area is quite 0.1 percent U, and no reason is given or is apparent to expect higher grades. The wide-spaced holes drilled by the operator, although not a systematic sample of the area, constitutes nevertheless a fairly well scattered pattern and some holes at least were drilled to test the area behind radioactive outcrops. I assume that all of these holes were barren or contained negligible quantities of uranium.

Incidentally: 1) I am wondering whether the drill holes in The Agex area cut the black mudstone underlying the Dakota sandstone member (see plate 5). 2) The circular anomaly of radioactivity puzzles me, particularly when compared with the results shown on plate 5. 3) I cannot find drill holes 18, 24, and 31 on the maps.

I recommend a Field Team examination. I hope that they will be able to obtain logs of all holes drilled.

R. D. Trace

RDTrace:hlm
G-2/23/55

Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

2-21-55

February 18, 1955

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 18 1955

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4445

From: Bureau of Mines Member
Uranium Commodity Committee

Subject: DMEA Docket 3670, Benalan Mining Company,
1117 Washington, Golden, Colorado

I have reviewed the application included in the subject docket and have discussed it with Joseph O. Hosted, representative of the Atomic Energy Commission.

It is recommended that the application be referred to the Field Team for investigation and report, and that the Field Team be requested to discuss the application with Ernest Gordon, Atomic Energy Commission, Grand Junction, Colorado.

J. E. Crawford
J. E. Crawford

Attachment

Copy to: Branch of Rare and Precious Metals
Division of Minerals
J. O. Hosted (2)
J. E. Crawford

February 8, 1955
Subject: DMEA 3670
Re: Exploration Assistance

Benalan Mining Company
1117 Washington Avenue
Golden, Colorado

Gentlemen:

The receipt of your application dated February 1, 1955 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA 3670 and referred to the Rare and Miscellaneous Metals Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

February 8, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region III.

DMEA - 3670 Benalan Mining Company

Robert E. Adams,
Chief, Operation's Control
and Statistics Division

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

224 New Customhouse
Denver 2, Colorado

February 3, 1955

Memorandum

To: Secretary to the Operating Committee
Defense Minerals Exploration Administration

From: Executive Officer, DMEA Field Team, Region III

Subject: (Uranium), Application for DMEA Assistance, Benalan Mining Company, Fremont County, Colorado

Enclosed please find three copies of an application from Benalan Mining Company for Government assistance in the amount of $188,101.33 for exploring a property in Fremont County, Colorado, for uranium. One copy of the application is being retained in our files.

Review of the application indicates that it is entirely in order and subject for processing through your office in the usual manner.

W. M. Traver

W. M. Traver

Enclosures

Copy to: Administrator, DMEA

DMEA
FEB 2 1955

APPLICATION FOR AID
IN AN EXPLORATION PROJECT
near Canon City
Fremont County, Colorado

Pursuant to DMEA Order 1,
Under the Defense Production Act of
1950 - As Amended

by
BENALAN MINING COMPANY
1117 Washington Ave.
Golden, Colorado

February 1, 1955

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved
Budget Bureau No. 42-R1035.2.

Minerals Administration
RECEIVED
FEB 7 1955

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. 3670
Metal or Mineral Uranium
Date Received 2-7-55
Estimated Cost $188,101.33
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Benalan Mining Company
1117 Washington
Golden, Colorado
(Incorporated in the State of Pennsylvania - see attached)

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract

(see attached application)

(*b*) State any mine name by which the property is known.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore .....

.....

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within ..... days and be completed within ..... months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[x] Money [x] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated February 1, 1955, 195__

BENALAN MINING COMPANY
(Applicant)

By W. Alan Stewart
W. Alan Stewart - Vice-President
and General Manager

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—66551-1

Benalan Mining Co.
1117 Washington Ave.
Golden, Colorado

D. M. E. A. LOAN APPLICATION

1 - NAME OF APPLICANT

(a) Benalan Mining Company
P. O. Box 509
Golden, Colorado

(b) A Pennsylvania Corporation

(c) President	Mr. J. R. Wylie, Jr. Benedum-Trees Building Pittsburgh, Pa.
Vice-President	Mr. Paul G. Benedum Benedum-Trees Building Pittsburgh 22, Pa.
Vice-President	Mr. O. D. Robinson Benedum-Trees Building Pittsburgh 22, Pa.
Vice-President and General Manager	Dr. W. Alan Stewart 1117 Washington Avenue Golden, Colorado
Secretary	Mr. David D. Johnson Benedum-Trees Building Pittsburgh 22, Pa.
Treasurer	Mr. Edward Kelley Benedum-Trees Building Pittsburgh 22, Pa.

(d) - - - -

2 - GENERAL

3 - APPLICANT'S PROPERTY RIGHTS

(a) The property consists of forty three standard 600 by 1500 foot lode claims and thirteen fractional claims located in Sections 7, 8, 17 and 18, Town-

ship 17 South, Range 70 West, 6th. Principal Meridian, Fremont County, Colorado. The claims are named COLEXCO NOS. 1 through 56.

(b) None

(c) Owner

(d) - - -

(e) No liens or encumbrances.

(f) The land consists of unpatented claims. The following documents are of record in the recorder's office at Canon City, Fremont County, Colorado:

Location Certificates:

Name of Claim	Locator	Date of Location	Book	Page
Colexco No. 1	Colo. Expl. Co.	11-17-53	333	475
Colexco No. 2	"	"	333	475
Colexco No. 3	"	"	333	476
Colexco No. 4	"	"	333	476
Colexco No. 5	"	"	333	477
Colexco No. 6	"	"	333	477
Colexco No. 7	"	"	333	478
Colexco No. 8	"	"	333	478
Colexco No. 9	"	"	333	479
Colexco No. 10	"	"	333	479
Colexco No. 11	"	"	333	480
Colexco No. 12	"	"	333	480
Colexco No. 13	"	"	333	481
Colexco No. 14	"	11-19-53	333	481
Colexco No. 15	"	"	333	482
Colexco No. 16	"	"	333	482
Colexco No. 17	"	"	333	483
Colexco No. 18	"	"	333	483
Colexco No. 19	"	"	333	484
Colexco No. 20	"	"	333	484
Colexco No. 21	"	"	333	485
Colexco No. 22	"	"	333	485
Colexco No. 23	"	"	333	486
Colexco No. 24	"	11-25-53	333	486
Colexco No. 25	"	"	333	487
Colexco No. 26	"	"	333	487
Colexco No. 27	"	"	333	488
Colexco No. 28	"	11-24-53	333	499
Colexco No. 29	"	"	333	499
Colexco No. 30	"	"	333	500

Colexco No. 31	Colo. Expl. Co.	11-24-53	333	488
Colexco No. 32	"	"	333	489
Colexco No. 33	"	"	333	501
Colexco No. 34	"	"	333	500
Colexco No. 35	"	"	333	501
Colexco No. 36	"	11-26-53	333	503
Colexco No. 37	"	"	333	502
Colexco No. 38	"	"	333	502
Colexco No. 39	"	"	333	504
Colexco No. 40	"	"	333	503
Colexco No. 41	"	"	333	505
Colexco No. 42	"	"	333	504
Colexco No. 43	"	"	333	505

Amended Location Certificates

		Amended Notice of Location		
Colexco No. 41	*Colo. Expl. Co.	1-15-54	333	539
Colexco No. 41	"	"	333	539
Colexco No. 42	"	"	333	540

*A trade name affidavit was filed in the recorder's office of Fremont County, Canon City, Colorado on September 25, 1954, certifying that Walter Alan Stewart is the full name of the person doing business under the name - Colorado Exploration Company, at 1117 Washington Avenue, Golden, Jefferson County, Colorado.

Quit Claim Deed (between Colorado Exploration Company and Benalan Mining Company, a Pennsylvania Corporation with offices in Golden, Colorado.)

This deed was filed for record September 25, 1954 and was recorded in Book 339, Page 12, Fremont County, Colorado, conveying all right and title to the Colexco Nos. 1 through 43 claims to the Benalan Mining Company.

Location Notices for the Colexco Nos. 44 through 56 claims have been posted on the ground by the Benalan Mining Company with a posting date of January 15, 1955.

Affidavit of Labor & Improvements

Colexco Nos. 1 through 43 (expenditure made at the expense of the Benalan Mining Company for assessment work at the rate of $100.00 per claim from July 1, 1954 to July 1, 1955) filed for record December 17, 1954.

4 - PHYSICAL DESCRIPTION

(a) No mining operations have been or are now being conducted upon the land. There are no existing mine workings or production facilities.

All exploration work performed on these claims was for the purpose of obtaining data for use in preparing this DMEA application. The following operations were performed in gathering this data:

(1) A triangulation network was established over the claims area. The network was used as control for subsequent mapping operations.

(2) A topographic contour map was first prepared, as shown on Plate 1. In addition to topography, this Plate shows the claim outlines, access roads built by the Benalan Mining Company and triangulation stations.

(3) During the plane table mapping of the claims the rod man carried a scintillometer and shots were taken on and along the extensive radioactive sandstone outcrops in the area. Plate 2 contains all the features of the map shown on Plate 1 and in addition it has plotted on it the radioactive sandstone outcrops detected throughout the claims area. No radioactive outcrops were mapped in which the radiation was less than five times normal background. On the 43 standard lode claims and the thirteen fraction claims included in this loan application, a total of nearly 15,000 linear feet of radioactive outcrop was mapped.

(4) A structure contour map was prepared using the top of the black mudstone unit of the Dakota formation as the mapping surface. A number of outcrops of this horizon were mapped during the plane table surveying and additional control points were available from wildcat exploration drilling throughout the claims. A rotary air drill was used in obtaining subsurface data.

The top of the black mudstone unit of the Dakota was chosen as the surface for structure contouring as a consequence of information gained from exploration drilling. In a number of holes throughout the claims a zone of uranium mineralization was detected in the 10 to 12 foot zone stratigraphically above this lithologic unit. All of the radioactive sandstone

or uranium mineralized sandstone detected within the claims, either on the surface or in the drill holes is in the sandstone section above the black mudstone. This sandstone section would corelate with the Dakota sandstone member of the Dakota group. It was therefore decided to bottom all future drill holes at the top of the black mudstone. This unit is tentatively correlated with the Fuson shale of the Dakota group.

Plate 3 is the structure contour map prepared by combining the surface control data with that obtained in the drill holes. A 100 foot coordinate grid is drawn on this Plate. Grid lines are shown on this map in the areas where erosion has cut down through the black mudstone and where no drilling is contemplated. Within the area of the Dakota sandstone outcrop the coordinate positions of the 100 foot centers are shown by dots. These are the proposed drilling locations included in this DMEA loan application.

(5) The topographic contour map shown on Plate 1 and the structure contour map of Plate 3 were combined and a depth line map prepared as shown on Plate 4. This depth line map contours the thickness of Dakota sandstone between the surface of the ground and the top of the black mudstone unit. From this map it was possible to determine an anticipated drilling depth for each of the drill locations included in this application.

Appendix A is a tabulation by coordinate lines of the drilling depths for all proposed holes. Drill holes with thin sand sections or in particularly inaccessable places were eliminated from the proposed exploration project. In addition, a potential ore body was discovered during exploration drilling in the east half of Claim No. 2 in an area which has been named "The Apex". A number of development drill holes were put down in this area. The 100 foot centers falling close to this development drilling have also been eliminated. The resulting proposed exploration project consists of 1,997 locations with an anticipated drilling footage of 116,575 or an average of 58.4 feet per hole.

(b) There has been no past and is no current production from any of the claims.

The development drilling around The Apex on Claim No. 2 has partially blocked out a possible ore body

in that area. A small reserve of commercial grade ore might be considered to exist there. Plates No. 5 and 6 are drawn to represent the subsurface conditions encountered by several holes drilled in uranium mineralized sandstone. Plate 6 is an isometric drawing of the potential ore body. Plate 5 is a cross section through the ore body into which the drill holes encountering ore have been projected on strike. The holes were probed by a Babbel Geiger Counter calibrated against a standard sample. Wet assays were made of a number of cutting samples from different holes. The values of the wet assays are plotted for comparison with a curve representing the probe data. By comparing wet assays with probe readings it was determined that a probe reading of 40 units corresponded closely to a wet assay of .10 percent from cuttings. Some coring was then attempted to determine what percentage loss in values was incurred when the fines of the cuttings were lost out the stack of the sample catcher. As nearly as could be determined a core will assay about 18% higher than cuttings for the corresponding interval. It is felt that there is at least 1,500 tons of mineralized sandstone in an area 150 ft. long by 30 feet wide which will average an assay of .10 percent or better. The most continuously mineralized zone averages about 4.4 feet in thickness.

(c) Geologic Features:

General Setting

The Colexco group of claims is located about 9 miles north of Canon City, Fremont County, Colorado. With respect to the regional geology of south central Colorado, they lie at the northwestern extremity of the Canon City embayment. This embayment is a large synclinal feature lying between the south plunging nose of the Front Range arch and the flank of the anticlinal Wet Mountains which lie to the west and en echelon to the Front Range.

The claims are laid out over a prominent mesa of Dakota sandstone. This mesa is part of a small synclinal extension of the Canon City embayment into the crystaline rocks of the pre Cambrian complex. The contact of the sediments around the mesa with the crystallines is largely a fault contact on both sides of the claim area. There are two major normal faults which, if extended on trend, are roughly radial to the Cripple Creek igneous center. The town of Cripple Creek is roughly 12 miles north and east of the claims area. It is possible that the intrusives of the Cripple Creek district are the genetic source of the initial or primary mineralizing fluids which moved

radially out toward the claims location through the fault complex mentioned above. The claims area was originally flown with a scintillometer because of the juxtaposition of the Dakota sandstone to Cripple Creek and the radial fault system.

Structure

The Colexco group of claims occupy a synclinally down folded mesa of Dakota sandstone. In the central part of the claims area the beds in the trough of the syncline are essentially flat. The dips increase to as high as 30 degrees on flanks of the syncline in the extremities of the claims. Plate 3 is the structure contour map prepared by combining surface elevations on the black mudstone unit of the Dakota formation with elevations on the same datum from the exploratory drill holes. As shown by this map the syncline is a closed structure with a possible structural relief of as much as 200 feet or more. The axial trend of the structure is about North 35 to 40 degrees East.

Stratigraphy

Mineralization within the claims area is restricted to the upper sandstone unit of the Dakota formation. Three lithologic units are recognized in the area, belonging to the Dakota formation. The upper unit shall be hereinafter referred to as the Dakota sandstone. The intermediate unit is a dark gray to black massive mudstone and could be properly correlated with the fire clay unit of the Dakota or the Fuson shale. The lower unit of the Dakota may be correlated with the Lakota sandstone.

The Dakota unit in general is a massive to cross-bedded, friable, creamy white to gray, sandstone. The molds, casts and impressions of tree trunks, branches and limbs are commonly found throughout this unit and at times concentrations of carbonaceous material. The Fuson material is a typical fire clay, being a rather uniform, massive, black claystone or mudstone. The lower part of the Dakota unit is transitional into the Fuson with a 20 to 25 foot zone containing interbedded sandstones and laminated gray shales. The basal unit of the Dakota formation or Lakota is coarse grained with numerous conglomeritic streaks. Pebbles of white chert become increasingly abundant toward the base of this unit. No radioactivity was

discovered in the Lakota and mineralization seems to be restricted to the Dakota unit.

Mineralization

As previously mentioned, the ground was staked as the result of an aerial scintillometer survey of the Canon City embayment. Using the proper precautions in this type of surveying, it would have been impossible to have missed this extensively uranium mineralized area. Plate 2 shows the extent of linear outcrop of radioactive Dakota sandstone on the claims. No radioactive outcrops were plotted on this map which showed a radiation of less than 5 times normal background. There is a total of slightly less than 15,000 of radioactive outcrop shown on the Plate.

There are at least three zones in the upper Dakota sandstone unit which were amenable to uranium mineralization. No attempt has been made on Plate 2 to correlate surface radioactive outcrops throughout the area with these zones. Drill holes Nos. 24 and 29 shown on Plate 5 detected mineralization in all three zones. These drill holes are part of The Apex area possible ore body.

In the surface outcrop uranium mineralized sandstone can normally be detected without the use of a radiation counter. In general uranium mineralization is associated with a high concentration of iron and manganese minerals. Radioactive outcrops are often a deep brick red from hematite or nearly black from some manganese mineral. Using surface samples, some correlation has been found between the concentration of uranium and a high iron assay. Some outcrops are a deep orange due to the limonite content. In other exposures a rhythmic banding of limonite and manganese minerals has been observed.

In a similar fashion mineralized zones may be detected in the subsurface by the change in color of the cuttings without the necessity of a geiger counter or scintillometer. The unweathered Dakota sandstone in drill holes is normally very light gray to white in color. As the mineralized zone is topped in the drill hole the cuttings turn light orange in color, becoming deeper orange as the radioactive part of the section is approached. The ore zone is normally a deep brownish purple in color. The base of the mineralized zone below the ore is a limonite color and the unmineralized sandstone below it is again light gray to white.

In general the concentration of iron and manganese is so dense in the mineralized sandstone that it is impossible to detect or identify the uranium mineral present. It is believed that the uranium minerals are disseminated throughout the iron and manganese minerals. Two uranium minerals have been identified both in surface outcrops and in drill cuttings. Uranophane is the mineral most commonly present and small amounts of carnotite have been detected. Wet assays on a number of samples have yielded a trace of vanadium oxide and occasionally some thorium is detected also as a trace. There is very little thorium present and it is not known in what mineralogical species it may exist. The best assay of thorium oxide obtained was .04 percent.

Of special note is the thickness of the radioactive interval in a number of the drill holes. In eleven of the holes drilled there was continuous radioactivity of from 39 to as much as 64 feet of the section. Rim exposures with as much as 40 feet of radioactive mineralization have been discovered on the surface of the claims. In addition to the build-up to commercial grade of uranium in some of the drill holes, the claims apparently contain a very large tonnage of low grade material. Assays of as high as .29 percent have been found in both drill cuttings and surface samples. Because of the small traces of vanadium and thorium so far detected in wet assays, it appears that uranium will be the only recoverable element from the claims.

Conclusions

The geologic reasons for wishing to explore the Colexco group of claims are as follows:

(1) It is believed that the Colexco group of claims represents the best possibility for economic uranium mining operations in an area extending from south of Colorado Springs around the nose of the Front Range arch, along the flanks of the Canon City embankment to Canon City, and south along the flank of the Wet Mountains. The above described area was flown by the Colorado Exploration Company with an airborne scintillometer. At least six other airborne radioactive anomalies were detected. A ground check of all anomalies resulted in the staking of the Colexco group of claims. It was felt that this group had by far the best possibilities for commercial ore bodies.

No attempt was made to stake or lease the other mineralized areas detected during the survey.

(2) A limited amount of exploration drilling on the Colexco group of claims has resulted in the discovery of a potential ore body on the Colexco No. 2 claim, as shown diagramatically on Plates 5 and 6. It is felt that this discovery vindicates the decision to stake the claims and indicates the possibilities for deposits of larger tonnage or higher grade within the claims area.

(3) The large cumulative total in linear feet of continuously radioactive outcrop shown on Plate 2 suggests possibilities for blanket type ore bodies of considerable areal extent.

(4) In some of the drill holes gamma radiation is logged over as much as 40 to 60 feet of the Dakota sandstone section. There are possibilities for a very large tonnage of low grade material which could not be mined and shipped at present AEC price schedules but which could be processed locally at a profit. One of the prime reasons for making this DMEA loan application is to determine if there is a large enough tonnage of low grade material to justify a small mill's construction. It is felt that several hundred thousand tons of uranium mineralized sandstone assaying between .05 and .07 percent may exist in the Colexco claims.

(5) Considering the geologic setting of the Colexco group of claims, it is felt that it lies in an excellent position with respect to igneous source areas of primary mineralizing fluids. The Colexco claims lie between the Cripple Creek igneous center in the southern end of the Front Range and the Rosita Hills igneous center along the axis of the Wet Mountains. They are in a position to receive mineralization from telethermal solution moving out of these centers and into the favorable Dakota sandstone host rock.

(6) Analysis of the stratigraphy along the east flank of the Rocky Mountains and particularly in the Canon City embayment area reveals that the Dakota formation contains the most favorable lithology for uranium deposition. It is a sandstone of continental origin containing petrified logs and carbonaceous material. It is a continuous sandstone deposit permitting migration of mineralizing fluids to a point of favorable deposition. It is sufficiently compacted to restrict mineralizing fluids to certain permeable channels so

that there will not be the dissipation of the uranium minerals so common in less compacted Tertiary continental formations.

(d) The Colexco group of claims lie 9 airline miles and about 14 road miles from Canon City, Colorado. The first 3 road miles are on U. S. Highway 50 going west from Canon City. From this point a graded and graveled county road leads to within 2 miles of the claims. The remaining 2 miles of road have been improved by bulldozer work into a passable access road. As shown on Plates 1 and 2 a network of drill access roads has been bulldozed in over the Colexco claims. Canon City is on the Denver & Rio Grande Western Railroad and would be the supply and residence center for the proposed exploration project.

(e) Canon City is the center of a residential area containing around 15,000 people. Material, supplies and equipment required by an exploration project could be readily obtained there or brought in by railroad from Pueblo or Denver. The Arkansas River flows through the city providing an ample supply of water, should a mill be considered for the area. There is very little water available at or near the claims. It is anticipated, however, that virtually all of the drilling will be dry air drilling and a close water supply to the claims is not critical. There is an ample supply of electrical power at Canon City and a power line comes within one mile to the east of the Colexco claims.

In the event that an exploration drilling program turned up enough ore to justify a mill, two sites could be considered. The first site would be at Canon City. There is ample frontage available along the Arkansas River and adjacent to the railroad tracks for industrial construction such as a uranium mill. During the original locating of the Colexco claims and subsequently during mapping and exploration drilling there was no difficulty in obtaining local labor. It is believed that any non-technical labor required either during the drilling program or mining operations or in milling could be readily obtained from the Canon City area. A second site which might be considered for a uranium mill would be in Parkdale, 9 miles west of Canon City on U. S. Highway 50. There is a mill at Parkdale which was formerly used to process feldspar, quartz, mica and other minerals mined from a pegmatite quarry about 5 miles to the west near the Royal Gorge of the Arkansas River. This mill is in excellent physical condition, is located

on the railroad and on the Arkansas River, and might readily be converted into a uranium processing mill.

5 - THE EXPLORATION PROJECT

(a) Uranium is that mineral to be explored for which is eligible for aid under the DMEA program.

(b) The work proposed to be done under the applied for exploration project loan will consist of a drilling program on 100 foot coordinate centers. Plate 2 is a topographic map of the Colexco claims, showing the orientation of the proposed coordinate grid with respect to topography, claim boundries, access roads, radioactive sand outcrops and the exploration drill holes completed in gathering data for this loan application. Plate 4 is a depth line map with the coordinate grid plotted with respect to the thickness of the Dakota sandstone to be drilled in the project. Each one of the proposed drill holes is plotted on this map at its correct coordinate position. As previously mentioned, the drilling depth for each coordinate location was determined from this depth line map and a tabulation of drill holes is included in this application as Appendix A. A cumulative total of 116,575 feet for 1,997 drill holes is proposed.

From the drilling exploration done by the Benalan Mining Company on these claims it was determined that there is not an excessive amount of water in the subsurface sands. The initial drill holes were put down with a rotary air drill, using a Duclone sample collector. It is felt that a satisfactory determination can be made of the thickness and grade of mineralized sandstone in the subsurface by combining gamma ray probe data with assays of cuttings supplemented by some coring. It is anticipated that about 1 hole will be cored for every 100 holes drilled with a rock bit. This type of exploration drilling is recommended for the following reasons:

(1) Speed and economy of dry hole, non-core, air drilling.

(2) Dry ground which permits a high recovery of cuttings by using a Duclone dust collector.

(3) Adequate data for complete evaluation of any ore bodies discovered during the drilling

may be obtained by continuous sampling in mineralized zones augmented by some coring and by radiometric logging of all holes. Lithologic logs will be made of all holes and the information obtained will be used to guide later development work and dictate the areas in which closer spacing of air holes in the more favorable mineralized ground will be placed.

(c) Work will start within 60 days and be completed within 13 months from the date of exploration project contract.

(d) The Benalan Mining Company is a recently formed Pennsylvania corporation, created for the purpose of exploring for uranium on certain properties assigned to the Company. It is at present engaged in an exploration drilling program, using rotary air drills on some of its properties in southwestern Colorado near Uravan. The Company has been engaged in exploration drilling for uranium deposits for seven months.

The Colexco claims were assigned to the Benalan Mining Company by W. Alan Stewart, then doing business under the name of the Colorado Exploration Company. Dr. Stewart is now Vice-President and General Manager of the Benalan Mining Company and is directly responsible for the supervision of the proposed exploration project for the Colexco claims.

Background on Supervisory Personnel

Dr. W. Alan Stewart will be the chief geological engineer in charge of directing the exploration drilling project. He has a Doctor of Science degree in geology from the Colorado School of Mines and taught for five years in the geology department of that institution. During his teaching tenure he was also a consulting geologist. For example, during the 1950 field season he was resident consulting engineer for the Monsanto Chemical Company on a joint exploration project conducted by that company and the J. R. Simplot Company for phosphate in Idaho. This project involved reconnaissance mapping, laying out a drilling program and supervising drilling operations for phosphate.

From June 1, 1952 to the present time he has done business under the name 'Colorado Exploration Company', a mining geophysical contract company. This Company has conducted geophysical surveys for the Colorado Fuel & Iron Corporation, the Bear Creek Mining Company, the Lewis Exploration Company and others. The Colorado Exploration Company has carried out uranium exploration programs on its own account since February 1953. These activities include ground radiometric surveying and geologic mapping, aerial scintillometer surveying and drilling. In addition to these company activities, Dr. Stewart has acted as a consultant in the uranium field to a number of individuals and companies.

Mr. Adam M. Thomas will serve as resident geological engineer for the project. Mr. Thomas graduated from the Colorado School of Mines in 1952 with an engineering degree in mining geology. From August 1, 1952 to the present time he has been employed by the Colorado Exploration Company. Mr. Thomas has had a varied experience in geological and geophysical prospecting. During the period of August 1952 to August 1953 he was a member of a geophysical crew prospecting for iron ore in the Hartville Uplift area of southeastern Wyoming. In the early fall of 1953 he was in charge of a geophysical crew prospecting for copper and other minerals in the Bonanza Mining District of south central Colorado. In November 1953 he was assigned to the aerial scintillometer prospecting team which discovered the radioactive outcrops now covered by the Colexco claims and included in this application. During the spring and summer of 1954 he was engaged in surveying, mapping and laying out drilling patterns for mining claims in the uranium belt of southwestern Colorado. During the fall of 1954 he supervised all of the mapping and drilling in preparation for this loan application.

6 - ESTIMATE OF COSTS

(a) Independent Contracts - None

(b) Labor, Supervision, Consultants:

1 Chief Geological Engineer (11-month salary @ $500/mo.)	$ 5,500.00
1 Resident Geological Engineer (11 months @ $575.00 mo.) -	6,325.00
1 Surveyor-Foreman (4 months @ $350.00 mo.) -	1,400.00

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1 Surveyor-Helper (4 months @ $300.00 mo.)	$ 1,200.00
1 Utility Man (Surveyor-Bulldozer Help.) (11 months @ $300.00 mo.)	3,300.00
1 Bulldozer Operator (11 months @ $425.00 mo.)	4,675.00
1 Superintendent Driller (11 months @ $525.00 mo.)	5,775.00
1 Driller (11 months @ $400.00 mo.)	4,400.00
2 Driller's helpers (11 months @ $300.00 mo. each)	6,600.00
	$39,175.00

(c) Operating Materials and Supplies:
(Fuel, Oil, etc.)

Automotive -	
50 miles per day for 232 days; 2 vehicles @ 3¢/mile (2x50x232x3)	$ 696.00
Drills - (232 days)	
1 Diesel Engine - 40 gal/day @ 17¢ gal.	1,577.60
1 Gas. Engine - 50 gal/day @ 28¢ gal.	3,248.00
Bulldozer - (232 days)	
40 gal./day @ 17¢ gal.	1,577.60
Miscellaneous -	
Grease & oil for dozer & drills (est)	600.00
Oil filters, air cleaners, etc.	400.00
Misc. Equipment -	
Log Sheets (10,000 @ 1¢ per sheet)	100.00
Maps, paper, etc.	100.00
Note books	40.00
Misc. supplies (pencils, etc.)	50.00
Paper for probe records (8,000 @ 1¢)	80.00
Blueprints	100.00
Hole plugs to preserve collar @ 40¢ ea.	800.00
Stakes for markers & fillers @ 20¢ ea.	400.00
	$9,769.20

(d) Operating Equipment:

Suggested Use Allowance -

Automotive (1 jeep & 1 pickup truck (@ 5¢ mile - 2x50x232x5) -	$ 1,160.00
Bulldozer - 232 da. @ $88/day -	20,416.00
Drills - 75¢/ft. x 116,575 -	87,431.25
Babble Counter & Probe -	300.00
	$109,307.25

(e) Rehabilitation & Repairs - None	.00

(f) New Bldgs, Improvements, Etc.:

Equipment Storage Shack	600.00
Engineering Shack - 12x12 Prefab -	750.00

(g) Miscellaneous:

Assaying (wet) 50 samples @ $5/ea. -	250.00
Radiometric logging (cost $150.00 moving & 5¢/ft. - logged) -	5,828.75
Accounting - 2 da/wk. for 46 weeks @ $12.00/day -	1,104.00
Use allowance - Lab. Autoscaler 10,000 samples @ 10¢/sample -	1,000.00
Workman's Compensation	1,157.20
Employer's FICA	670.00
Liability Insurance	1,389.81
	12,749.76
SUB-TOTAL	$171,001.21

(h) Contingencies:
(Includes cost of labor for unavoidable delay time due to accidents and breakdowns, maintenance of equipment & breakage of items not covered by insurance; allowance for drilling wet ground not amenable to air drilling; allowance for

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core drilling in mineralized sections, etc.);

10% of $171,001.21 (sub-total)	$ 17,100.12
TOTAL	$188,101.33

COST SUMMARY -

Total Cost	$188,101.33
Total Footage	116,575
Cost per Foot	$ 1.61

7 - (a) Yes.

(b) The Benalan Mining Company owns two rotary air drills, one D-8 bulldozer, one water truck, two field vehicles, a radiation probe and other equipment aggregating a total initial value of $100,000.00. All of this equipment is to be allocated for use on the project. In addition, the Company has trained and experienced geological engineers to supervise the project and any part of the Company's share of the costs not covered by use allowance on equipment will be paid out of it's treasury.

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- - APPENDIX A - -

- DRILLING DEPTHS -

COORDINATES North	COORDINATES East		DEPTH	
4	40		63	
"	41	2	61	124
5	37		93	
"	38		78	
"	39		65	
"	40		59	
"	41	5	47	342
6	30		91	
"	31		112	
"	32		113	
"	33		111	
"	34		114	
:	35		111	
"	36		91	
"	37		73	
"	38		61	
"	39		48	
"	40		42	
"	41	12	33	1,000
7	27		107	
"	28		107	
"	29		111	
"	30		117	
"	31		112	
"	32		103	
"	33		112	
"	34		118	
"	35		94	
"	36		73	
"	37		60	
"	38		48	
"	39		34	
"	40		31	
"	41		22	
"	42	16	9	1,258

COORDINATES North	COORDINATES East		DEPTH	
8	23		74	
"	24		96	
"	25		102	
"	26		103	
"	27		103	
"	28		102	
"	29		103	
"	30		96	
"	31		84	
"	32		103	
"	33		121	
"	34		114	
"	35		79	
"	36		58	
"	87		43	
"	38		32	
"	39		31	
"	40		33	
"	41		26	
"	42	20	23	1,526
9	20		116	
"	21		107	
"	22		93	
"	23		89	
"	24		89	
"	25		91	
"	26		95	
"	27		96	
"	28		94	
"	29		86	
"	30		79	
"	31		95	
"	32		113	
"	33		130	
"	34		101	
"	35		73	
"	36		47	
"	37		19	
"	38		27	
"	39		33	
"	40		37	
"	41		35	
"	42	23	31	1,776

COORDINATES North	East		DEPTH	
10	16		128	
"	17		138	
"	18		133	
"	19		125	
"	20		117	
"	21		100	
"	22		87	
"	23		84	
"	24		84	
"	25		85	
"	26		83	
"	27		84	
"	28		79	
"	29		81	
"	30		92	
"	31		104	
"	32		126	
"	33		127	
"	34		97	
"	35		66	
"	36		28	
"	37		18	
"	38		27	
"	39		34	
"	40		40	
"	41		41	
"	42	27	37	2,245
11	15		110	
"	16		135	
"	17		141	
"	18		135	
"	19		115	
"	20		110	
"	21		96	
"	22		81	
"	23		84	
"	24		86	
"	25		82	
"	26		76	
"	27		64	
"	28		83	
"	29		100	
"	30		112	
"	31		125	
"	32		138	
"	33		133	
"	34		100	
"	35	21	63	2,169

COORDINATES North	East		DEPTH	
12	14		62	
"	15		97	
"	16		113	
"	17		134	
"	18		131	
"	19		115	
"	20		100	
"	21		93	
"	22		74	
"	23		83	
"	24		83	
"	25		78	
"	26		66	
"	27		63	
"	28		98	
"	29		114	
"	30		129	
"	31		137	
"	32		146	
"	33		143	
"	34		107	
"	35	22	65	2,231
13	14		65	
"	15		81	
"	16		96	
"	17		114	
"	18		123	
"	19		110	
"	20		98	
"	21		83	
"	22		70	
"	23		79	
"	24		79	
"	25		67	
"	26		58	
"	27		87	
"	28		111	
"	29		113	
"	30		118	
"	31		132	
"	32		146	
"	33		149	
"	34		119	
"	35	22	75	2,173

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COORDINATES North	East		DEPTH	
14	13		40	
"	14		54	
"	15		73	
"	16		87	
"	17		100	
"	18		119	
"	19		113	
"	20		103	
"	21		88	
"	22		71	
"	23		66	
"	24		61	
"	25		47	
"	26		66	
"	27		80	
"	28		87	
"	29		90	
"	30		100	
"	31		127	
"	32		144	
"	33		150	
"	34		138	
"	35	23	93	2,097

COORDINATES North	East		DEPTH	
16	14		32	
"	15		48	
"	16		62	
"	17		77	
"	18		91	
"	19		103	
"	20		93	
"	21		80	
"	22		70	
"	23		60	
"	24		44	
"	25		44	
"	26		48	
"	27		43	
"	28		34	
"	29		42	
"	30		46	
"	31		54	
"	32		84	
"	33		124	
"	34		118	
"	35		110	
"	36	23	85	1,682

15	13		15	
"	14		40	
"	15		60	
"	16		76	
"	17		89	
"	18		106	
"	19		120	
"	20		101	
"	21		87	
"	22		74	
"	23		60	
"	24		49	
"	;25		52	
"	26		62	
"	27		63	
"	28		60	
"	29		55	
"	30		59	
"	31		77	
"	32		124	
"	33		134	
"	34		146	
"	35		125	
"	36	24	63	1,897

17	13		16	
"	14		38	
"	15		55	
"	16		64	
"	17		74	
"	18		84	
"	19		96	
"	20		90	
"	21		80	
"	22		70	
"	23		60	
"	24		45	
"	25		30	
"	26		21	
"	32		46	
"	33		87	
"	34		93	
"	35		79	
"	36	19	51	1,179

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COORDINATES North	East		DEPTH	
18	13		27	
"	14		52	
"	15		65	
"	16		60	
"	17		71	
"	18		79	
"	19		92	
"	20		93	
"	21		80	
"	22		69	
"	23		57	
"	24		30	
"	25		35	
"	26		54	
"	87		55	
"	28		44	
"	29	17	40	1,003
19	13		29	
"	14		53	
"	15		64	
"	16		62	
"	17		62	
"	18		74	
"	19		82	
"	20		91	
"	21		78	
"	22		63	
"	23		52	
"	24		49	
:	25		56	
"	26		77	
"	27		91	
"	28		87	
"	29		72	
"	30	18	60	1,202
20	13		18	
"	14		30	
"	15		40	
"	16		44	
"	17		46	
"	18		62	
"	19		76	

COORDINATES North	East		DEPTH	
20	20		84	
"	21		70	
"	22		66	
"	23		65	
"	24		61	
"	25		66	
"	26		87	
"	27		103	
"	28		105	
"	29		102	
"	30		84	
"	31		70	
"	32	20	12	1,291
21	14		17	
"	15		21	
"	16		42	
"	17		58	
"	18		68	
"	19		79	
"	20		92	
"	21		88	
"	22		82	
"	23		75	
"	24		72	
"	25		71	
"	26		95	
"	27		107	
"	28		115	
"	29		111	
"	30		105	
"	31		88	
"	32		70	
"	33		39	
"	34	21	24	1,519
22	14		14	
"	15		34	
"	16		65	
"	17		74	
"	18		82	
"	19		86	
"	20		100	

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
22	21		95	
"	22		88	
"	23		84	
"	24		80	
"	25		83	
:	26		98	
"	27		115	
"	28		120	
"	29		121	
"	30		122	
"	31		113	
"	32		98	
"	33		84	
"	34		76	
"	35		82	
"	36	23	64	1,978
23	14		21	
"	15		58	
"	16		84	
"	17		85	
"	18		87	
"	19		88	
"	20		90	
"	21		98	
"	22		91	
"	23		88	
"	24		88	
"	25		88	
"	26		104	
"	27		115	
"	28		120	
:	29		121	
"	30		123	
"	31		126	
"	32		129	
"	33		123	
"	34		114	
"	35		114	
"	36		108	
"	37		89	
"	38	25	54	2,414
24	14		28	
"	15		67	
"	16		75	
"	17		80	
"	18		85	
"	19		88	

COORDINATES North	East		DEPTH	
24	20		97	
"	21		101	
"	22		95	
"	23		93	
"	24		91	
"	25		96	
"	26		103	
"	27		114	
"	28		119	
"	29		121	
"	30		122	
"	31		127	
"	32		133	
"	33		128	
"	34		122	
"	35		124	
"	36		129	
"	37		118	
"	38	25	66	2,522
25	14		24	
"	15		43	
"	16		58	
"	17		70	
"	18		81	
"	19		87	
"	20		94	
"	21		104	
"	22		95	
"	23		95	
"	24		93	
"	25		101	
"	26		108	
"	27		114	
"	28		119	
"	29		117	
"	30		117	
"	31		119	
"	32		121	
"	33		119	
"	34		122	
"	35		130	
"	36		129	
"	37	24	104	2,364
26	15		21	
"	16		40	
"	17		56	
"	18		69	
"	19		82	

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
26	20		89	
"	21		99	
"	22		94	
"	23		91	
"	24		92	
"	25		97	
"	26		103	
"	27		110	
"	28		116	
"	29		115	
"	30		112	
"	31		112	
"	32		109	
"	33		113	
"	34		118	
"	35		119	
"	36		112	
"	37	23	99	2,166
"				
27	16		17	
"	17		36	
"	18		56	
"	19		63	
"	20		70	
"	21		82	
"	22		85	
"	23		86	
"	24		90	
"	25		96	
"	26		100	
"	27		106	
"	28		117	
"	29		123	
"	30		121	
"	31		102	
"	32		99	
"	33		104	
"	34		111	
"	35		106	
"	36		87	
"	47		21	
"	48	24	18	2,070
28	17		18	
"	18		30	
"	19		44	
"	20		60	
"	21		68	
"	22		69	

COORDINATES North	East		DEPTH	
28	23		74	
"	24		82	
"	25		99	
"	26		94	
"	27		101	
"	28		115	
"	29		122	
"	30		126	
"	31		90	
"	32		71	
"	33		78	
"	34		86	
"	35		76	
"	36		62	
"	46		37	
"	47		40	
"	48		29	
"	49	24	13	1,674
29	18		29	
"	19		55	
"	20		67	
"	21		66	
"	22		58	
"	23		51	
"	24		48	
"	25		56	
"	26		71	
"	27		82	
"	28		90	
"	29		96	
"	30		90	
"	31		70	
"	32		46	
"	33		54	
"	34		56	
"	35		54	
"	46		71	
"	47		74	
"	48		49	
"	49		28	
"	50	23	14	1,375
30	18		47	
"	19		74	
"	20		70	
"	21		62	
"	22		51	
"	23		39	

Benalan Mining Co.
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COORDINATES North	East		DEPTH	
30	24		34	
"	25		36	
"	26		19	
"	27		32	
"	28		43	
"	29		55	
"	30		56	
"	31		46	
"	46		90	
"	47		94	
"	48		76	
"	49		49	
"	50		27	
"	51	20	12	1,012
31	17		32	
"	18		70	
"	19		83	
"	20		75	
"	21		53	
"	22		38	
"	23		23	
"	24		13	
"	38		32	
"	46		87	
"	47		96	
"	48		87	
"	49		72	
"	50		45	
"	51	15	29	835
32	16		26	
"	17		62	
"	18		80	
"	19		86	
"	20		68	
"	21		35	
"	22		14	
"	37		41	
"	38		46	
"	46		87	
"	47		91	
"	48		86	
"	49		80	
"	50		74	
"	51	15	52	928

COORDINATES North	East		DEPTH	
33	15		18	
"	16		58	
"	17		60	
"	18		72	
"	19		74	
"	20		46	
"	32		46	
"	33		62	
"	34		65	
"	35		59	
"	36		62	
"	37		68	
"	38		25	
"	45		90	
"	46		93	
"	47		92	
"	48		85	
"	49		76	
"	50		77	
"	51	20	58	1,286
34	16		26	
"	17		34	
"	18		37	
"	19		34	
"	29		62	
"	30		53	
"	31		46	
"	32		65	
"	33		86	
"	34		96	
"	35		95	
"	36		85	
"	37		58	
"	44		93	
"	45		106	
"	46		104	
"	47		97	
"	48		83	
"	49		75	
"	50	20	44	1,379

Benalan Mining Co.
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COORDINATES North	East		DEPTH	
35	16		20	
"	17		28	
"	18		42	
"	19		41	
"	20		16	
"	27		28	
"	28		69	
"	29		93	
"	30		75	
"	31		67	
"	32		83	
"	33		107	
"	34		111	
"	35		92	
"	36		73	
"	37		48	
"	43		96	
"	44		96	
"	45		99	
"	46		98	
"	47		87	
"	48		76	
"	49		63	
"	50	24	43	1,651
36	17		12	
"	18		25	
"	19		21	
"	25		44	
"	26		57	
"	27		68	
"	28		80	
"	29		101	
"	30		87	
"	31		95	
"	32		113	
"	33		132	
"	34		107	
"	35		81	
"	36		63	
"	37		25	
"	44		72	
"	45		75	
"	46		74	
"	47		72	
"	48		59	
"	49		45	
"	50		20	
"	57		21	

COORDINATES North	East		DEPTH	
36	58		28	
"	59	26	16	1,602
37	25		53	
"	26		71	
"	27		80	
"	28		92	
"	29		99	
"	30		98	
"	31		108	
"	32		127	
"	33		130	
"	34		104	
"	35		72	
"	36		52	
"	37		42	
"	38		31	
"	39		24	
"	44		29	
"	45		38	
"	46		46	
"	47		45	
"	48		37	
"	49		28	
"	54		26	
"	55		57	
"	56		42	
"	57		40	
"	58		43	
"	59		33	
"	60		29	
"	61	29	10	1,685
38	24		35	
"	25		67	
"	26		78	
"	27		88	
"	28		91	
"	29		94	
"	30		100	
"	31		111	
"	32		120	
"	33		123	
"	34		98	
"	35		67	
"	36		35	
"	37		42	
"	38		46	

Benalan Mining Co.
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COORDINATES North	East		DEPTH	
38	39		43	
"	40		40	
"	41		11	
"	46		23	
"	47		29	
"	48		26	
"	49		13	
"	52		11	
"	53		27	
"	54		47	
"	55		71	
"	56		64	
"	57		66	
"	58		54	
"	59		48	
"	60		33	
"	61		35	
"	62	33	35	1,871
39	24		62	
"	25		74	
"	26		83	
"	27		87	
"	28		90	
"	29		95	
"	30		100	
"	31		106	
"	32		120	
"	33		107	
"	34		86	
"	35		61	
"	36		59	
"	37		55	
"	38		61	
"	39		61	
"	40		64	
"	41		40	
"	47		17	
"	48		18	
"	49		12	
"	52		21	
"	53		38	
"	54		60	
"	55		45	
"	56		44	
"	57		34	
"	58		28	
"	59		34	
"	60		49	

COORDINATES North	East		DEPTH	
39	61		29	
"	62		31	
"	63	33	31	1,902
40	24		78	
"	25		80	
"	26		83	
"	27		87	
"	28		90	
"	29		94	
"	30		96	
"	31		98	
"	32		97	
"	33		79	
"	34		65	
"	35		52	
"	36		44	
"	37		58	
"	38		71	
"	39		75	
"	40		66	
"	45		40	
"	46		37	
"	48		24	
"	49		17	
"	50		15	
"	51		11	
"	52		21	
"	53		33	
"	54		35	
"	55		21	
"	56		8	
"	57		18	
"	58		25	
"	59		28	
"	60		30	
"	61		32	
"	62		30	
"	63	33	28	1,766
41	23		66	
"	24		88	
"	25		88	
"	26		86	
"	27		89	
"	28		88	
"	29		91	

Benalan Mining Co.
1117 Washington
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COORDINATES North	East		DEPTH	
41	30		87	
"	31		89	
"	32		72	
"	33		65	
"	34		54	
"	35		33	
"	36		34	
"	37		64	
"	38		81	
"	39		66	
"	40		23	
"	46		30	
"	47		29	
"	48		22	
"	49		20	
"	50		10	
"	51		9	
"	52		8	
"	53		11	
"	54		13	
"	55		12	
"	56		12	
"	57		23	
"	58		25	
"	59		22'	
"	60		42	
"	61		38	
"	62		27	
"	63		30	
"	64	37	22	1,669
42	23		64	
"	24		80	
"	25		90	
"	26		80	
"	27		80	
"	28		79	
"	29		92	
"	30		85	
"	31		67	
"	32		63	
"	33		57	
"	34		48	
"	35		40'	
"	36		41	
"	37		71	
"	38		91	
"	39		68	
"	40		15	

COORDINATES North	East		DEPTH	
42	42		47	
"	43		55	
"	44		58	
"	45		57	
"	46		45	
"	47		48	
"	48		42	
"	49		30	
"	50		16	
"	56		11	
"	57		20	
"	58		13	
"	59		13	
"	60		17	
"	61		23	
"	62		25	
"	63		26	
"	64	36	28	1,812
43	23		62	
"	24		80	
"	25		86	
"	26		88	
"	27		86	
"	28		90	
"	29		93	
"	30		90	
"	31		76	
"	32		55	
"	33		51	
"	34		44	
"	35		36	
"	36		38	
"	37		83	
"	38		79	
"	39		53	
"	40		11	
"	44		23	
"	45		31	
"	46		46	
"	47		60	
"	48		62	
"	49		51	
"	50		29	
"	51		11	
"	53		8	
"	54		8	
"	55		16	
"	56		19	
"	57		33	

Benalan Mining Co.
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COORDINATES North	East		DEPTH	
43	58		26	
"	59		16	
"	60		16	
"	61		20	
"	62		20	
"	63		25	
"	64		25	
"	65	39	11	1,757
44	23		59	
"	24		69	
"	25		74	
"	26		80	
"	27		86	
"	28		86	
"	29		91	
"	30		93	
"	31		80	
"	32		56	
"	33		43	
"	34		38	
"	35		29	
"	36		36	
"	37		91	
"	38		97	
"	39		82	
"	40		30	
"	41		12	
"	42		8	
"	46		19	
"	47		46	
"	48		73	
"	49		73	
"	50		50	
"	51		23'	
"	54		15	
"	55		31	
"	56		42	
"	57		47	
"	58		37	
"	59		26	
"	60		22	
"	61		24	
"	62		28	
"	63		27	
"	64		27	
"	65	38	25	1,875

COORDINATES North	East		DEPTH	
45	23		45	
"	24		54	
"	25		62	
"	26		70	
"	27		78	
"	28		84	
"	29		86	
"	30		89	
"	31		89	
"	32		58	
"	33		42	
"	34		35	
"	35		20	
"	36		37	
"	37		87	
"	38		110	
"	39		74	
"	40		55	
"	41		46	
"	42		44	
"	43		47	
"	44		41	
"	45		22	
"	47		45	
"	48		81	
"	49		91	
"	50		76	
"	51		43	
"	52		18	
"	55		25	
"	56		45	
"	57		47	
"	58		33	
"	59		15	
"	60		21	
"	61		24	
"	62		31	
"	63		30	
"	64		32	
"	65	40	26	2,058
46	23		29	
"	24		37	
"	25		45	
"	26		60	
"	27		67	
"	28		67	
"	[illegible]			

Benalan Mining Co.
1117 Washington
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COORDINATES North	East	DEPTH	
46	29	79	
"	30	81	
"	31	82	
"	32	55	
"	33	37	
"	34	30	
"	35	22	
"	36	48	
"	37	93	
"	38	112	
"	39	92	
"	40	74	
"	41	60	
"	42	48	
"	43	62	
"	44	39	
"	45	15	
"	46	18	
"	47	55	
"	48	83	
"	49	92	
"	50	85	
"	51	65	
"	52	39	
"	53	18	
"	56	14	
"	57	20	
"	58	22	
"	59	13	
"	60	14	
"	61	16	
"	62	24	
"	63	32	
"	64	31	
"	65	29	
"	66 41	22	1,961
47	23	16	
"	24	14	
"	25	27	
"	26	35	
"	27	58	
"	28	62	
"	29	69	
"	30	76	
"	31	74	
"	32	28	
"	33	31	

COORDINATES North	East	DEPTH	
47	34	25	
"	35	26	
"	36	68	
"	37	99	
"	38	113	
"	39	112	
"	40	110	
"	41	81	
"	42	57	
"	43	41	
"	44	40	
"	45	8	
"	46	34	
"	47	65	
"	48	85	
"	49	92	
"	50	89	
"	51	78	
"	52	61	
"	53	40	
"	54	20	
"	55	8	
"	61	8	
"	62	37	
"	63	45	
"	64	37	
"	65	34	
"	66 39	35	2,042
48	26	19	
"	27	35	
"	28	48	
"	29	56	
"	30	72	
"	31	61	
"	32	34	
"	33	25	
"	34	20	
"35	35	34	
"	36	86	
"	37	110	
"	38	111	
"	39	112	
"	40	112	
""	41	86	
"	42	58	
"	43	30	
"	44	9	

Benalan Mining Co.
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COORDINATES North	East	DEPTH	
48	45	13	
"	46	44	
"	47	69	
"	48	83	
"	49	87	
"	50	84	
"	51	80	
"	52	73	
"	53	64	
"	54	55	
"	55	42	
"	56	30	
"	57	18	
"	58	9	
"	61	19	
"	62	38	
"	63	39	
"	64	24	
"	65	26	
"	66	18	
"	67 40	14	2,048
49	28	16	
"	29	25	
"	30	30	
"	31	24	
"	32	17	
"	33	18	
"	34	28	
"	35	44	
"	36	88	
"	37	110	
"	38	114	
"	39	115	
"	40	114	
"	41	79	
"	42	51	
"	43	27	
"	45	14	
"	46	44	
"	47	50	
"	48	77	
"	49	81	
"	50	81	
"	51	79	
"	52	75	
"			

CORRDINATES North	East	DEPTH	
49	53	63	
"	54	59	
"	55	55	
"	56	58	
"	57	48	
"	58	35	
"	59	19	
"	62	12	
"	63	16	
"	64	25	
"	65	20	
"	66	26	
"	67	31	
"	68 37	17	1,884
50	31	12	
"	32	17	
"	33	23	
"	34	25	
"	35	42	
"	36	78	
"	37	103	
"	38	111	
"	39	114	
"	40	112	
"	41	76	
"	42	47	
"	43	23	
"	47	16	
"	48	30	
"	49	64	
"	50	72	
"	51	73	
"	52	71	
"	53	73	
"	54	72	
"	55	72	
"	56	70	
"	57	65	
"	50	54	
"	59	36	
"	60	14	
"	64	24	
"	65	34	
"	66	41	
"	67	51	

Benalan Mining Co.
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COORDINATES North	East		DEPTH	
50	68		61	
"	69	33	46	1,822
51	31		30	
"	32		38	
"	33		32	
"	34		25	
"	35		34	
"	36		67	
"	37		96	
"	38		113	
"	39		116	
"	40		109	
"	41		72	
"	42		44	
"	43		17	
"	44		8	
"	45		15	
"	46		8	
"	47		16	
"	48		23	
"	49		32	
"	50		41	
"	51		42	
"	52		48	
"	53		62	
"	54		71	
"	55		77	
"	56		79	
"	57		75	
"	58		66	
"	59		54	
"	60		27	
"	61		31	
"	62		23	
"	63		10	
"	64		35	
"	65		45	
"	66		46	
"	67		52	
"	68		58	
"	69		49	
"	70	39	37	1,923
52	30		30	
"	51		78	
"	35		26	
"	36		42	

COORDINATES North	East		DEPTH	
52	37		85	
"	38		110	
"	39		113	
"	40		115	
"	41		62	
"	42		36	
"	43		11	
"	44		12	
"	45		48	
"	46		40	
"	47		9	
"	49		8	
"	50		15	
"	51		18	
"	52		19	
"	53		35	
"	54		66	
"	55		65	
"	56		79	
"	57		85	
"	58		78	
"	59		66	
"	60		58	
"	61		49	
"	62		45	
"	63		31	
"	64		36	
"	65		47	
"	66		47	
"	67		25	
"	68		25	
"	69		45	
"	70	37	36	1795
53	30		52	
"	31		63	
"	34		27	
"	35		23	
"	36		36	
"	37		71	
"	38		102	
"	39		109	
"	40		103	
"	41		68	
"	42		31	
"	43		8	
"	44		44	
"	45		70	
"	46		57	

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East	DEPTH	
53	47	32	
"	48	8	
"	49	8	
"	53	17	
"	54	40	
"	55	65	
"	56	75	
"	57	86	
"	58	87	
"	59	82	
"	60	68	
"	61	66	
"	62	65	
"	63	45	
"	64	47	
"	65	46	
"	66	44	
"	67	37	
"	68	29	
"	69	22	
"	70	22	
"	71 36	23	1,878
54	30	33	
"	31	38	
"	33	23	
"	34	36	
"	35	27	
"	36	25	
"	37	54	
"	38	80	
"	39	104	
"	40	104	
"	41	69	
"	42	37	
"	43	7	
"	44	47	
"	45	87	
"	46	75	
"	47	42	
"	48	20	
"	49	38	
"	50	46	
"	51	28	
"	54	21	
"	55	44	
"	56	68	
"	57	80	
"	58	92	

COORDINATES North	East	DEPTH	
54	59	98	
"	60	92	
"	61	84	
"	62	78	
"	63	66	
"	64	55	
"	65	46	
"	66	36	
"	67	24	
"	68	16	
"	69	7	
"	70	15	
"	71 39	23	1,975
55	30	34	
"	31	25	
"	32	28	
"	33	58	
"	34	64	
"	35	36	
"	36	17	
"	27	40	
"	38	74	
"	39	100	
"	40	102	
"	41	83	
"	42	39	
"	43	11	
"	44	33	
"	45	84	
"	46	85	
"	47	51	
"	48	31	
"	49	49	
"	50	66	
"	51	42	
"	52	10	
"	55	24	
"	56	45	
"	57	61	
"	58	76	
"	59	84	
"	60	78	
"	61	70	
"	62	72	
"	63	53	
"	64	36	
"	65	27	
"	66	18	

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
55	69		10	
"	70		26	
"	71		30	
"	72	39	37	1,909
56	31		18	
"	32		46	
"	33		78	
"	34		75	
"	35		50	
"	36		22	
"	37		25	
"	38		58	
"	39		87	
"	40		101	
"	41		96	
"	42		52	
"	43		18	
"	44		10	
"	45		59	
"	46		82	
"	47		57	
"	48		36	
"	49		61	
"	50		60	
"	51		43	
"	52		18	
"	56		18	
"	57		38	
"	58		46	
"	59		49	
"	60		47	
"	61		44	
"	62		34	
"	63		22	
"	64		13	
"	69		25	
"	70		26	
"	71		35	
"	72		40	
"	73	35	35	1,578
57	31		24	
"	32		56	
"	33		79	
"	34		77	
"	35		47	
"	36		25	

COORADINATES North	East		DEPTH	
57	37		15	
"	35		42	
"	39		78	
"	40		94	
"	41		95	
"	42		63	
"	43		28	
"	44		7	
"	45		46	
"	46		67	
"	47		66	
"	48		46	
"	49		51	
"	50		55	
"	51		47	
"	52		26	
"	57		7	
"	58		24	
"	59		31	
"	60		23	
"	61		14	
"	69		22	
"	70		37	
"	71		40	
"	72		40	
"	73	32	40	1,412
58	31		18	
"	32		56	
"	33		73	
"	34		66	
"	35		37	
"	36		26	
"	37		8	
"	38		24	
"	39		57	
"	40		87	
"	41		92	
"	42		84	
"	43		36	
"	44		19	
"	45		38	
"	46		66	
"	47		69	
"	48		58	
"	49		56	
"	50		55	
"	51		45	
"	52		30	

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East	DEPTH	
58	70 23	28	1,128
59	31	23	
"	32	55	
"	33	64	
"	34	50	
"	35	19	
"	38	8	
"	39	32	
"	40	70	
"	41	83	
"	42	82	
"	43	46	
"	44	15	
"	45	35	
"	46	63	
"	47	70	
"	48	65	
"	49	59	
"	50	57	
"	51	52	
"	52 20	40	988
60	31	23	
"	32	47	
"	33	49	
"	34	33	
"	39	9	
"	40	48	
"	41	75	
"	42	80	
"	43	52	
"	44	17	
"	45	28	
"	46	59	
"	47	80	
"	48	67	
"	49	64	
"	50	62	
"	51	59	
"	52	50	
"	53	21	
"	56	28	
"	57	23	
"	58	28	
"	59	36	
"	60	39	
"	61	41	
"	62	39	
"	63	32	
"	64	27	

COORDINATES North	East	DEPTH	
60	65	20	
"	66 30	9	1,245
61	31	10	
"	32	28	
"	33	26	
"	34	8	
"	40	32	
"	41	64	
"	42	73	
"	43	61	
"	44	21	
"	45	21	
"	46	54	
"	47	68	
"	48	71	
"	49	68	
"	50	69	
"	51	66	
"	52	60	
"	53	33	
"	54	14	
"	57	45	
"	58	51	
"	59	47	
"	60	46	
"	61	48	
"	62	49	
"	63	46	
"	64	45	
"	65	46	
"	66	40	
"	67 30	17	1,827
62	40	21	
"	41	56	
"	42	67	
"	43	64	
"	44	29	
"	45	12	
"	46	48	
"	47	68	
"	48	74	
"	49	75	
"	50	73	
"	51	62	
"	52	67	
"	53	57	
"	54	38	
"	55	11	

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
62	57		31	
"	58		40	
"	59		44	
"	60		48	
"	61		50	
"	62		48	
"	63		49	
"	64		50	
"	65		51	
"	66		51	
"	67	27	29	1,313
63	36		12	
"	37		8	
"	40		28	
"	41		54	
"	42		66	
"	43		52	
"	44		34	
"	46		39	
"	47		65	
"	48		75	
"	49		79	
"	50		77	
"	51		79	
"	52		74	
"	53		67	
"	54		56	
"	55		24	
"	57		10	
"	58		34	
"	59		32	
"	60		46	
"	61		48	
"	62		47	
"	63		47	
"	64		50	
"	65		53	
"	66		54	
"	67	29	40	1,356
64	35		11	
"	43		62	
"	44		34	
"	46		32	
"	47		60	
"	48		75	
"	49		81	
"	50		81	
"	51		78	
"	52		74	

COORDINATES North	East		DEPTH	
64	53		65	
"	54		68	
"	55		31	
"	58		29	
"	59		38	
"	60		41	
"	61		44	
"	62		44	
"	63		46	
"	64		46	
"	65		48	
"	66		53	
"	67		41	
"	70		16	
"	71	30	28	1,408
65	34		9	
"	35		11	
"	36		7	
"	37		7	
"	39		14	
"	40		39	
"	41		52	
"	42		52	
"	43		45	
"	44		27	
"	46		26	
"	47		57	
"	48		77	
"	49		77	
"	50		76	
"	51		76	
"	52		74	
"	53		64	
"	54		53	
"	55		32	
"	57		8	
"	58		25	
"	59		31	
"	60		34	
"	61		37	
"	62		37	
"	63		44	
"	64		45	
"	65		46	
"	66		50	
"	67		44	
"	68		17	
"	70		46	
"	71		48	
"	72	35	32	1,419

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
66	39		20	
"	40		28	
"	41		47	
"	42		42	
"	43		31	
"	46		17	
"	47		51	
"	48		67	
"	49		68	
"	50		68	
"	51		68	
"	52		67	
"	53		60	
"	54		45	
"	55		30	
"	56		16	
"	57		8	
"	58		22	
"	59		25	
"	60		28	
"	61		31	
"	62		37	
"	63		41	
"	64		46	
"	65		44	
"	66		47	
"	67		46	
"	68		29	
"	70		48	
"	71		60	
"	72	31	50	1,287
67	38		11	
"	39		27	
"	40		35	
"	41		37	
"	42		38	
"	43		10	
"	46		8	
"	47		43	
"	48		49	
"	49		44	
"	50		43	
"	51		59	
"	52		57	
"	53		46	
"	54		36	
"	55		30	
"	56		36	
"	57		30	

COORDINATES North	East		DEPTH	
67	58		16	
"	59		20	
"	60		22	
	61		28	
"	62		34	
"	63		40	
"	64		45	
"	65		44	
"	66		43	
"	67		41	
"	68		33	
"	69		15	
"	70		50	
"	71		67	
"	72	33	67	1,204
68	38		13	
"	39		20	
"	40		25	
"	41		20	
"	42		7	
"	47		17	
"	48		18	
"	49		23	
"	50		54	
"	51		52	
"	52		45	
"	53		33	
"	54		24	
"	55		33	
"	56		53	
"	57		59	
"	58		39	
"	59		20	
"	60		18	
"	61		21	
"	62		29	
"	63		39	
"	64		43	
"	65		41	
"	66		38	
"	67		38	
"	68		31	
"	69		21	
"	70		50	
"	71		68	
"	72	31	68	1,060

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
69	38		8	
"	39		9	
"	40		9	
"	44		12	
"	49		7	
"	50		47	
"	51		44	
"	52		33	
"	53		23	
"	54		25	
"	55		45	
"	56		64	
"	57		71	
"	58		61	
"	59		40	
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"	61		15	
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"	64		39	
"	65		42	
"	66		40	
"	67		38	
"	68		28	
"	69		34	
"	70		45	
"	71		63	
"	72	28	67	785
70	43		15	
"	44		17	
"	49		10	
"	50		31	
"	51		29	
"	52		25	
"	53		25	
"	54		35	
"	55		45	
"	56		75	
"	57		82	
"	58		74	
"	59		49	
"	60		34	
"	61		20	
"	62		18	
"	63		26	
"	64		36	
"	65		41	
"	66		42	
"	67		39	
"	68		37	

COORDINATES North	East		DEPTH	
70	69		33	
"	70		36	
"	71		58	
"	72	26	57	989
71	43		18	
"	44		17	
"	49		20	
"	50		26	
"	51		29	
"	52		28	
"	53		31	
"	54		42	
"	55		67	
"	56		83	
"	57		88	
"	58		84	
"	59		70	
"	60		52	
"	61		37	
"	62		25	
"	63		25	
"	64		30	
"	65		38	
"	66		41	
"	67		46	
"	68		43	
"	69		42	
"	70		38	
"	71	25	37	1,057
72	43		22	
"	44		17	
"	49		21	
"	50		30	
"	51		35	
"	52		40	
"	53		42	
"	54		57	
"	55		74	
"	56		88	
"	57		94	
"	58		91	
"	59		82	
"	60		70	
"	61		54	
"	62		36	
"	63		25	
"	64		30	
"	65		37	
"	66		43	

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
72	67		47	
"	68		49	
"	69		52	
"	70		52	
"	71	25	41	1,229
73	43		18	
"	44		40	
"	48		15	
"	49		23	
"	50		30	
"	51		40	
"	52		50	
"	53		61	
"	54		70	
"	55		82	
"	56		91	
"	57		100	
"	58		98	
"	59		92	
"	60		78	
"	61		66	
"	62		47	
"	63		28	
"	64		26	
"	65		36	
"	66		42	
"	67		48	
"	68		55	
"	69		59	
"	70	25	56	1,351
74	43		47	
"	44		34	
"	45		25	
"	46		18	
"	47		17	
"	48		15	
"	49		22	
"	50		33	
"	51		44	
"	52		55	
"	53		70	
"	54		72	
"	55		84	
"	56		99	
"	57		107	
"	58		107	
"	59		99	
"	60		89	

COORDINATES North	East		DEPTH	
74	61		72	
"	62		60	
"	63		37	
"	64		26	
"	65		30	
"	66		40	
"	67		47	
"	68		58	
"	69	27	68	1,475
75	42		23	
"	43		48	
"	44		43	
"	45		33	
"	46		26	
"	47		28	
"	48		29	
"	49		30	
"	50		39	
"	51		49	
"	52		63	
"	53		74	
"	54		80	
"	55		90	
"	56		100	
"	57		112	
"	58		118	
"	59		108	
"	60		92	
"	61		75	
"	62		56	
"	63	21	34	1,307
76	42		34	
"	43		43	
"	44		43	
"	45		40	
"	46		35	
"	47		36	
"	48		26	
"	49		38	
"	50		44	
"	51		56	
"	52		73	
"	53		84	
"	54		88	
"	55		92	
"	56		98	
"	57		105	

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

224 New Customhouse
Denver 2, Colorado

February 3, 1955

DMEA-3670

Memorandum

To: Secretary to the Operating Committee
Defense Minerals Exploration Administration

From: Executive Officer, DMEA Field Team, Region III

Subject: (Uranium), Application for DMEA Assistance, Benalan Mining Company, Fremont County, Colorado

Enclosed please find three copies of an application from Benalan Mining Company for Government assistance in the amount of $188,101.33 for exploring a property in Fremont County, Colorado, for uranium. One copy of the application is being retained in our files.

Review of the application indicates that it is entirely in order and subject for processing through your office in the usual manner.

W. M. Traver

W. M. Traver

Enclosures

Copy to: Administrator, DMEA

sub
chron

WMT:ld

Benalan Mining Co.
1117 Washington
Golden, Colorado

COORDINATES North	East		DEPTH	
76	58		108	
"	59		100	
"	60		72	
"	61	20	32	1,247
77	42		33	
"	43		37	
"	44		37	
"	45		38	
"	46		38	
"	47		40	
"	48		38	
"	49		41	
"	50		55	
"	51		68	
"	52		80	
"	53		87	
"	54		89	
"	55		88	
"	56		88	
"	57	16	87	944
78	42		27	
"	43		29	
"	44		33	
"	45		35	
"	46		38	
"	47		45	
"	48		51	
"	49		56	
"	50		65	
"	51		79	
"	52		85	
"	53		88	
"	54		86	
"	55	14	78	795
79	41		10	
"	42		23	
"	43		34	
"	44		43	
"	45		52	
"	46		55	
"	47		64	
"	48		64	
"	49		70	
"	50		75	
"	51	11	76	566

COORDINATES North	East		DEPTH	
80	41		20	
"	42		42	
"	43		49	
"	44		55	
"	45		58	
"	46	6	59	283
81	41	1	20	20

Benalan Mining Co.
1117 Washington
Golden, Colorado

RECAP OF STATIONS AND DRILL DEPTHS

N LINE	STA. NO.	FOOTAGE	LINE	STA. NO.	FOOTAGE
4	2	124	53	36	1,878
5	5	342	54	39	1,975
6	12	1,000	55	39	1,909
7	16	1,258	56	35	1,578
8	20	1,526	57	32	1,412
9	23	1,776	58	23	1,128
10	27	2,245	59	20	988
11	21	2,169	60	30	1,245
12	22	2,231	61	30	1,327
13	22	2,173	62	27	1,313
14	23	2,097	63	29	1,356
15	24	1,897	64	30	1,408
16	23	1,682	65	35	1,419
17	19	1,179	66	31	1,287
18	17	1,003	67	33	1,204
19	18	1,202	68	31	1,060
20	20	1,291	69	28	985
21	21	1,519	70	26	989
22	23	1,978	71	25	1,057
23	25	2,414	72	25	1,229
24	25	2,522	73	25	1,351
25	24	2,364	74	27	1,475
26	23	2,166	75	21	1,307
27	24	2,070	76	20	1,247
28	24	1,674	77	16	944
29	23	1,375	78	14	795
30	20	1,012	79	11	566
31	15	835	80	6	283
32	15	928	81	1	20
33	20	1,286		1,997 Sta.	116,575 Footage
34	20	1,379			
35	24	1,651			
36	26	1,602			
37	29	1,685			
38	33	1,871			
39	33	1,902			
40	35	1,766			
41	37	1,669			
42	36	1,812			
43	39	1,757			
44	38	1,875			
45	40	2,058			
46	41	1,961			
47	39	2,042			
48	40	2,048			
49	37	1,884			
50	33	1,822			
51	39	1,923			
52	37	1,795			

Average - 58.4/Hole

THIS DEED, Made this 21st day of September in the year of our Lord one thousand nine hundred and fifty four, between COLORADO EXPLORATION COMPANY, an unincorporated association of Golden, Colorado, of the first part and BENALAN MINING COMPANY, a Pennsylvania corporation with offices in Golden, Colorado, of the second part,

WITNESSETH, That the said party of the first part, for and in consideration of the sum of Ten and more Dollars, to the said party of the first part in hand paid by the said party of the second part, the receipt whereof is hereby confessed and acknowledged, has remised, released, sold, conveyed and QUIT CLAIMED, and by these presents does remise, release, sell, assign, convey and QUIT CLAIM unto the said party of the second part, its successors and assigns, forever, all the right, title, interest, claim and demand which the said party of the first part has in and to the following described unpatented lode mining claims situate, lying and being in the County of Fremont and State of Colorado, to-wit:

Name of Claim	Locator	Date of Location	Book	Page
Colexco No. 1	Colorado Exploration Co.	11-17-53	333	475
Colexco No. 2	" " "	11-17-53	333	475
Colexco No. 3	" " "	11-17-53	333	476
Colexco No. 4	" " "	11-17-53	333	476
Colexco No. 5	" " "	11-17-53	333	477
Colexco No. 6	" " "	11-17-53	333	477
Colexco No. 7	" " "	11-17-53	333	478
Colexco No. 8	" " "	11-17-53	333	478
Colexco No. 9	" " "	11-17-53	333	479
Colexco No. 10	" " "	11-17-53	333	479
Colexco No. 11	" " "	11-17-53	333	480
Colexco No. 12	" " "	11-17-53	333	480
Colexco No. 13	" " "	11-17-53	333	481
Colexco No. 14	" " "	11-17-53	333	481
Colexco No. 15	" " "	11-17-53	333	482
Colexco No. 16	" " "	11-17-53	333	482
Colexco No. 17	" " "	11-17-53	333	483
Colexco No. 18	" " "	11-17-53	333	483
Colexco No. 19	" " "	11-17-53	333	484
Colexco No. 20	" " "	11-17-53	333	484
Colexco No. 21	" " "	11-17-53	333	485
Colexco No. 22	" " "	11-17-53	333	485
Colexco No. 23	" " "	11-17-53	333	486
Colexco No. 24	" " "	11-17-53	333	486
Colexco No. 25	" " "	11-17-53	333	487
Colexco No. 26	" " "	11-17-53	333	487
Colexco No. 27	" " "	11-17-53	333	488
Colexco No. 28	" " "	11-17-53	333	499
Colexco No. 29	" " "	11-17-53	333	499
Colexco No. 30	" " "	11-17-53	333	500
Colexco No. 31	" " "	11-17-53	333	488
Colexco No. 32	" " "	11-17-53	333	489
Colexco No. 33	" " "	11-17-53	333	501
Colexco No. 34	" " "	11-17-53	333	500
Colexco No. 35	" " "	11-17-53	333	501
Colexco No. 36	" " "	11-17-53	333	503
Colexco No. 37	" " "	11-17-53	333	502
Colexco No. 38	" " "	11-17-53	333	502
Colexco No. 39	" " "	11-17-53	333	504
Colexco No. 40	" " "	11-17-53	333	503
Colexco No. 41	" " "	11-17-53	333	539
Colexco No. 42	" " "	11-17-53	333	540
Colexco No. 43	" " "	11-17-53	333	505

All of the lode mining claims hereinabove described are located in Township 17 South, Range 70 West. There are no reservations.

TO HAVE AND TO HOLD the same, together with all and singular the appurtenances and privileges thereunto belonging or in anywise thereunto appertaining, and all the estate, right, title, interest and claim whatsoever, of the said party of the first part, either in law or equity, to the only proper use, benefit and behoof of the said party of the second part, its successors and assigns forever.

IN WITNESS WHEREOF, The said party of the first part has hereunto set its hand and seal the day and year first above written.

COLORADO EXPLORATION COMPANY

By Walter Alan Stewart

STATE OF COLORADO)
City + COUNTY OF Denver : ss.

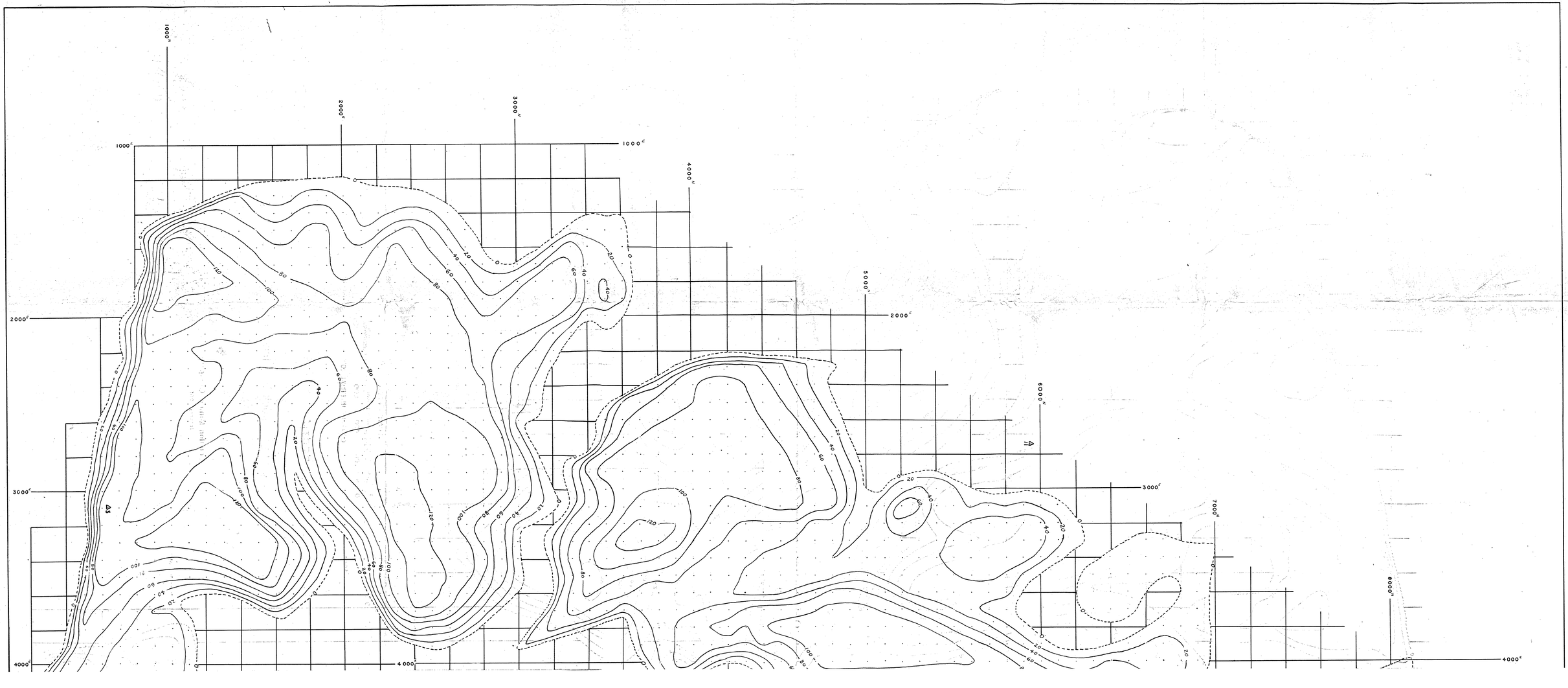
The foregoing instrument was acknowledged before me this 21st day of September, 1954 by Walter Alan Stewart.

Witness my hand and official seal.

My commission expires:

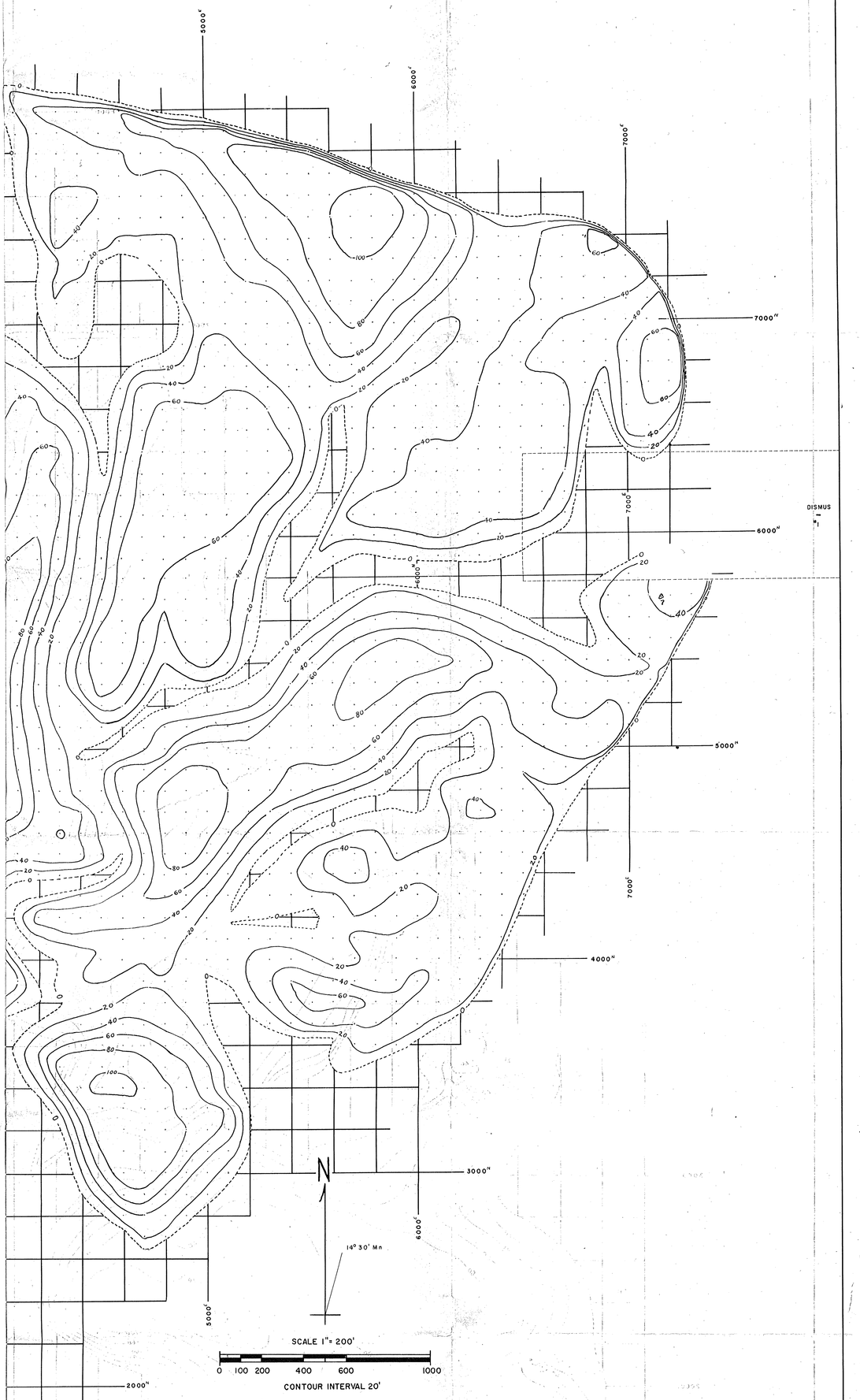
October 13, 1954

Bernice E. Ford
Notary Public


1000"
2000"
3000"
4000"
5000"
6000"
7000"
8000"
1000'
2000'
3000'
4000'
Δ3
Δ4

BENALAN MINING CO.
1117 Washington Ave.
Golden, Colorado.

PLATE 4



DEPTH LINE MAP

to the

Top of the Black Mudstone Unit

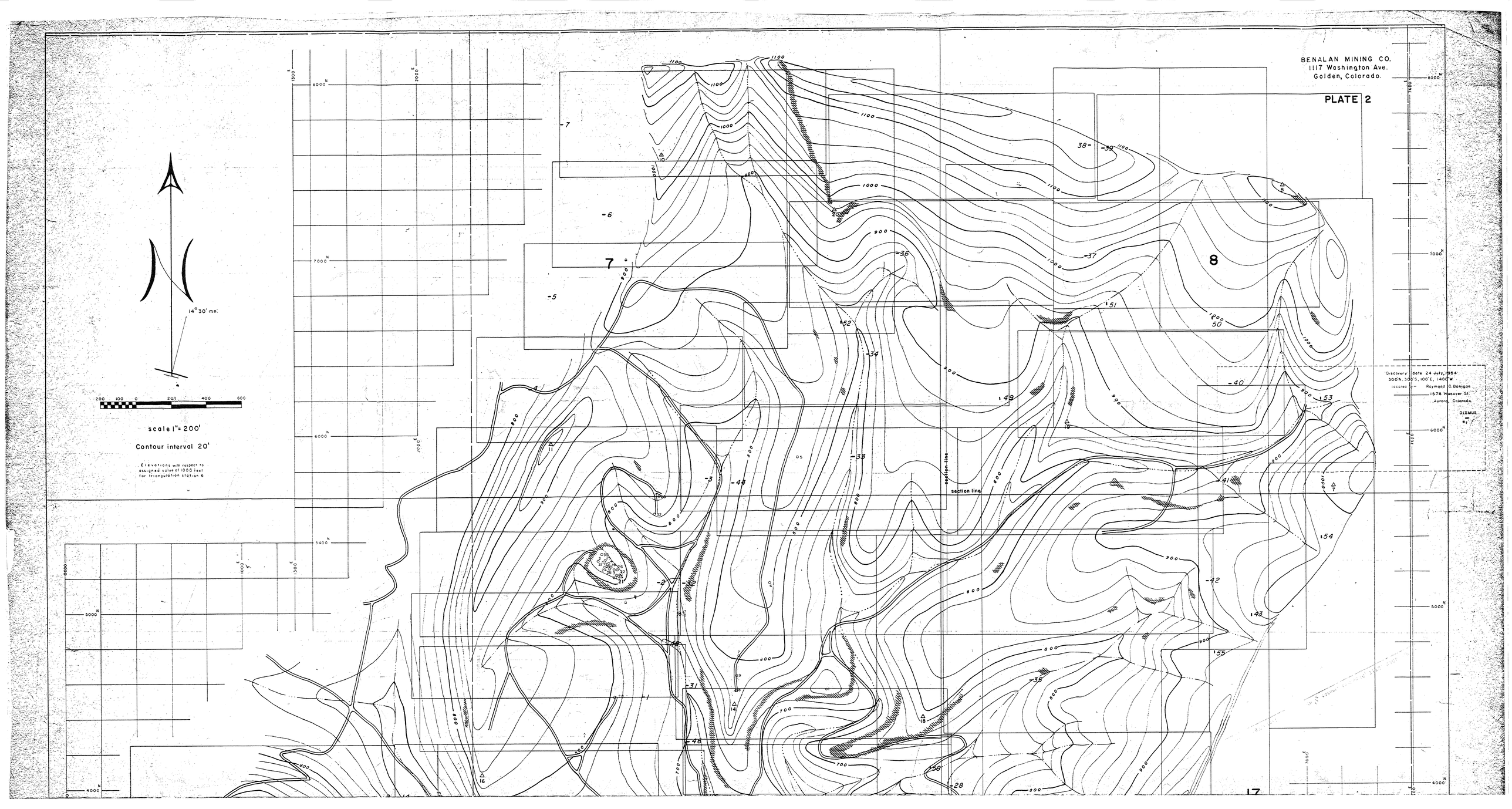
of the

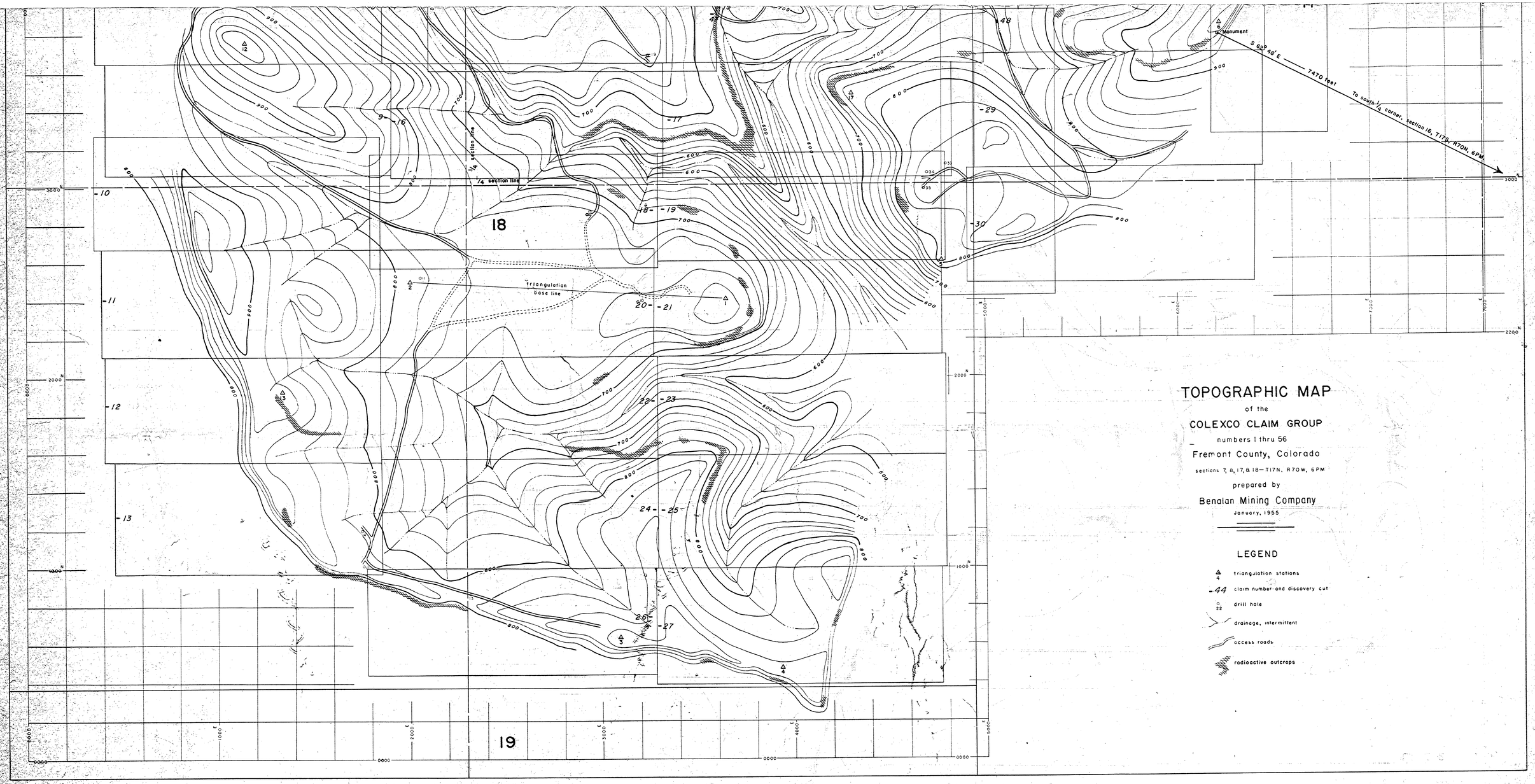
Dakota Formation

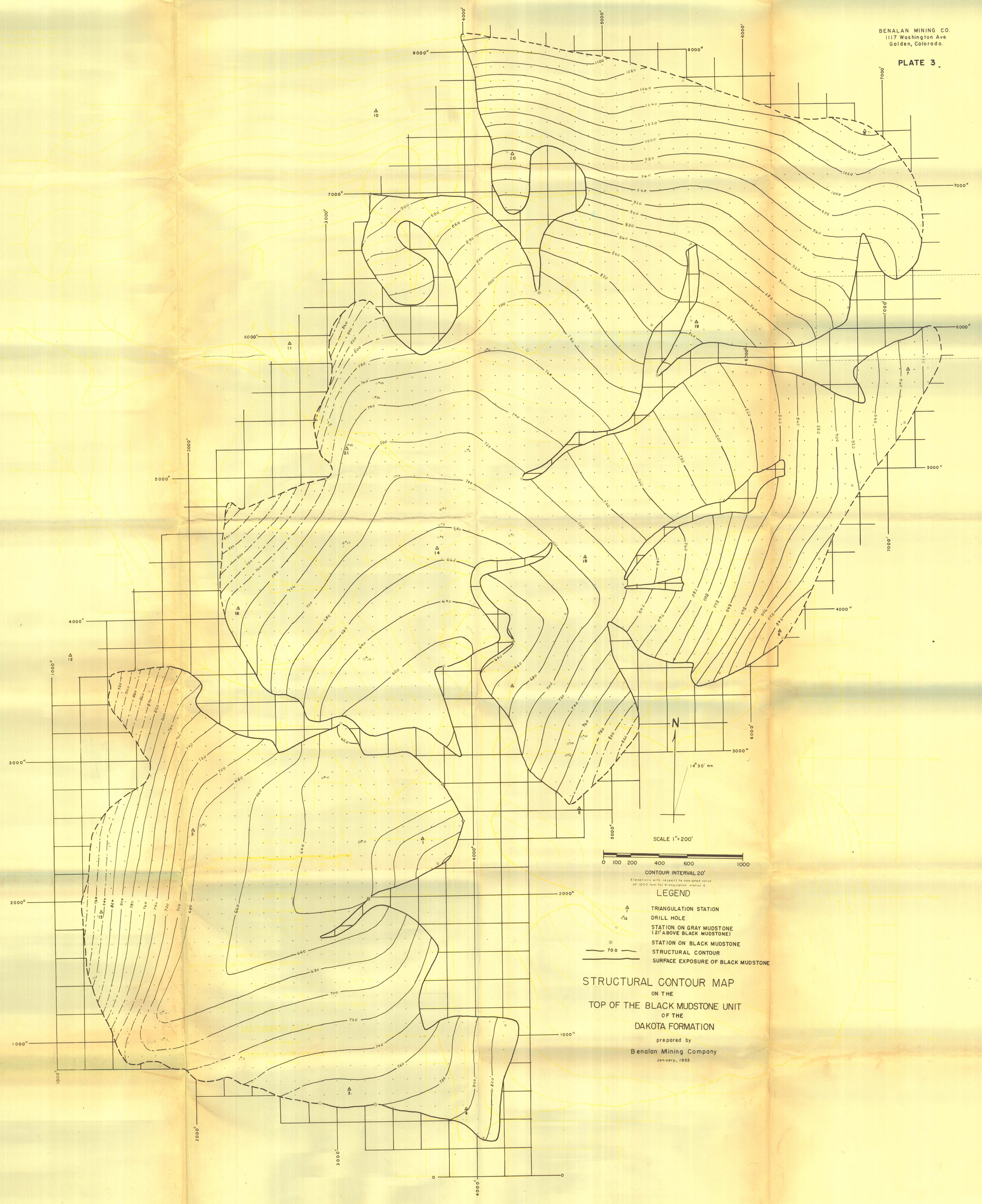
prepared by

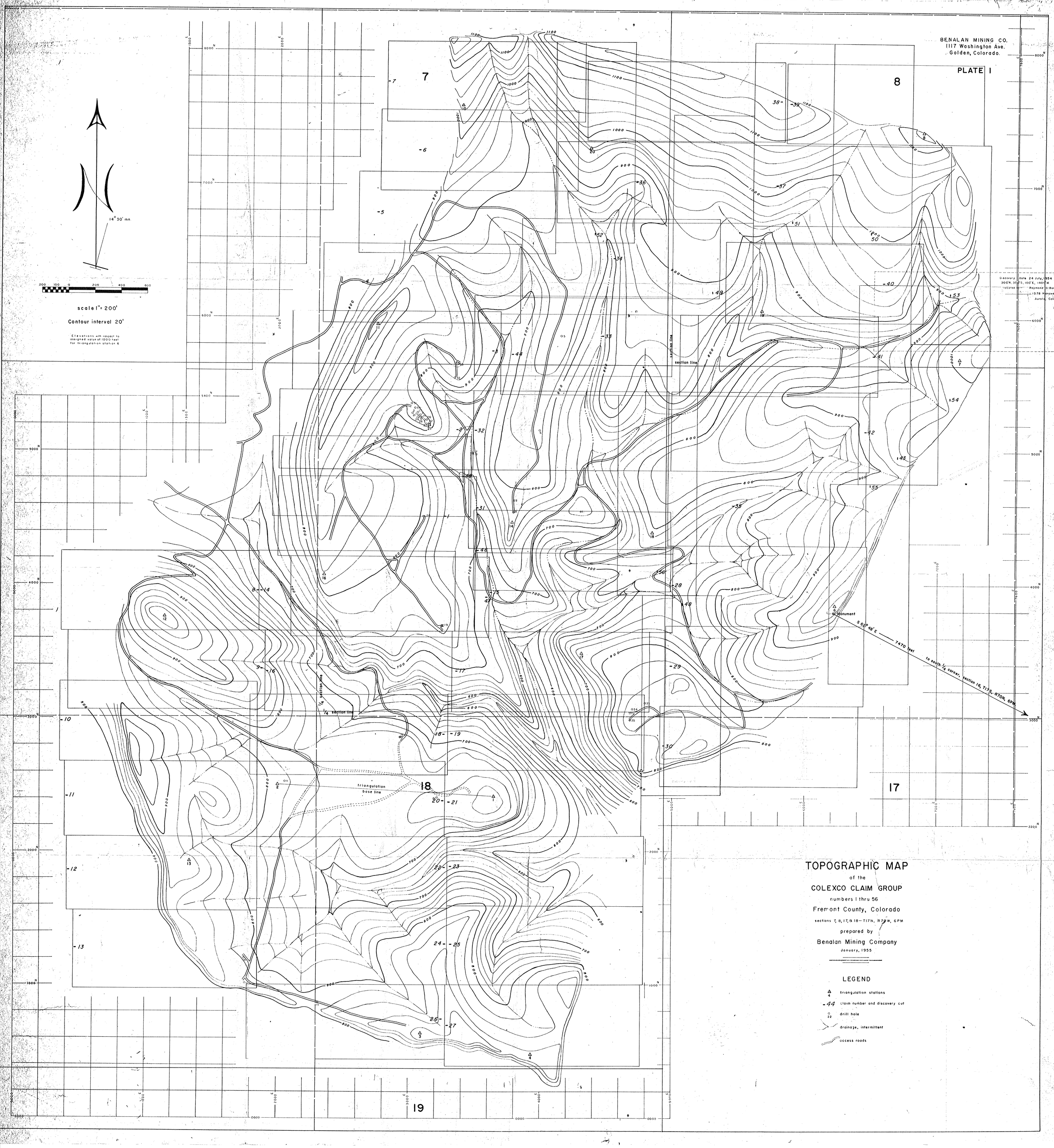
Benalan Mining Company

January, 1955


BENALAN MINING CO.
1117 Washington Ave.
Golden, Colorado.
PLATE 2
14° 30' mn.
scale 1" = 200'
Contour interval 20'
Elevations with respect to assigned value of 1000 feet for triangulation station 6
section line
Discovery date 24 July, 1954
300'N, 300'S, 100'E, 1400'W
located by — Raymond C. Bonigan
1578 Hoover St.
Aurora, Colorado.
DISMUS
7
8
17

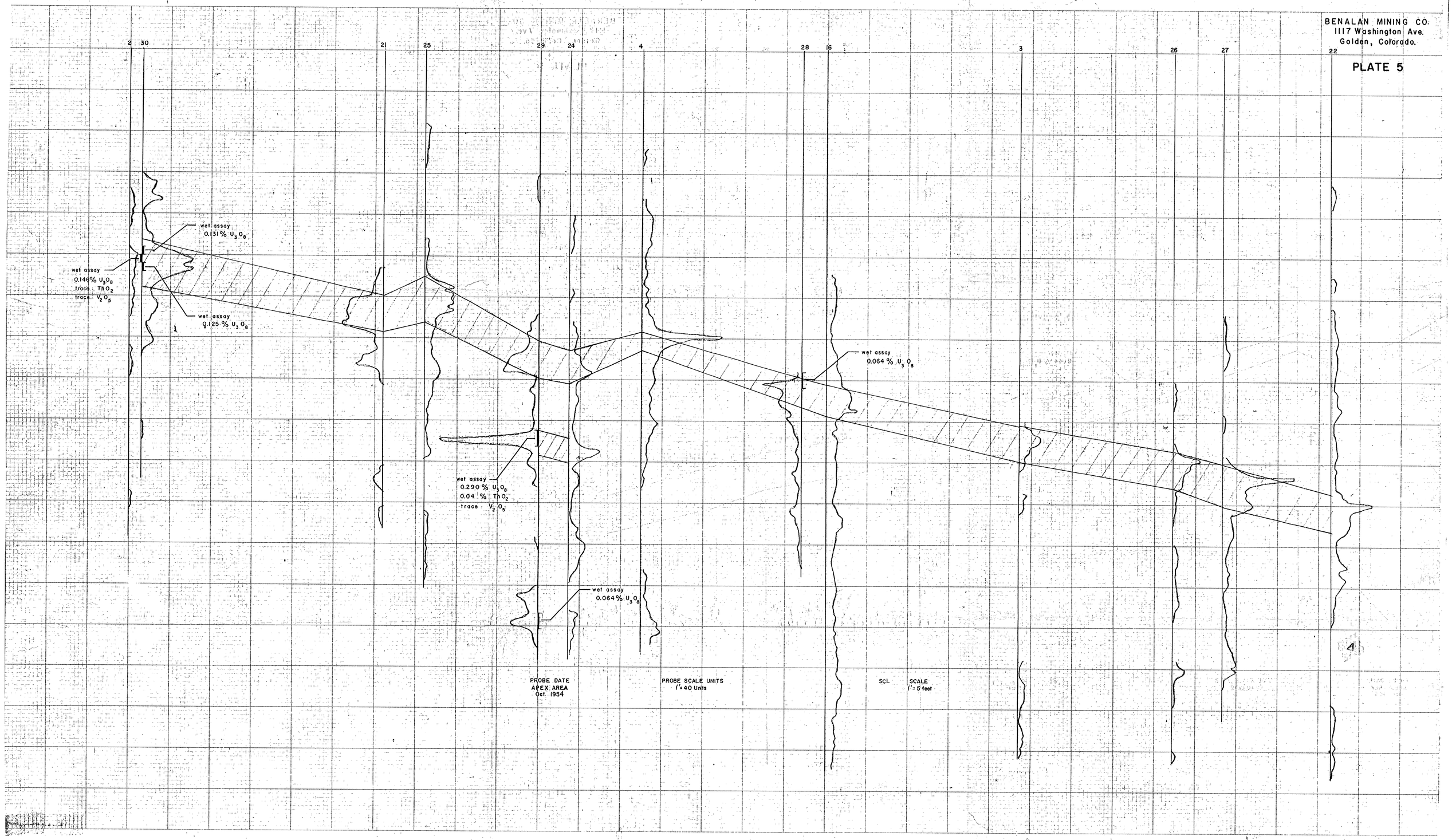

TOPOGRAPHIC MAP
of the
COLEXCO CLAIM GROUP
numbers 1 thru 56
Fremont County, Colorado
sections 7, 8, 17, & 18—T17N, R70W, 6PM
prepared by
Benalan Mining Company
January, 1955
LEGEND
triangulation stations
claim number and discovery cut
drill hole
drainage, intermittent
access roads
radioactive outcrops
Monument
S 62° 48' E
7,470 feet
To south 1/4 corner, section 16, T17S, R70W, 6PM
1/4 section line
Triangulation base line
18
19


BENALAN MINING CO.
1117 Washington Ave.
Golden, Colorado.
PLATE 3
N
14° 30' mn.
SCALE 1" = 200'
0 100 200 400 600 1000
CONTOUR INTERVAL 20'
Elevations with respect to assigned value of 1000 feet for triangulation station 6
LEGEND
TRIANGULATION STATION
DRILL HOLE
STATION ON GRAY MUDSTONE (21' ABOVE BLACK MUDSTONE)
STATION ON BLACK MUDSTONE
700
STRUCTURAL CONTOUR
SURFACE EXPOSURE OF BLACK MUDSTONE
STRUCTURAL CONTOUR MAP
ON THE
TOP OF THE BLACK MUDSTONE UNIT
OF THE
DAKOTA FORMATION
prepared by
Benalan Mining Company
January, 1955


BENALAN MINING CO.
1117 Washington Ave.
Golden, Colorado.
PLATE I
14° 30' mn.
scale 1" = 200'
Contour interval 20'
Elevations with respect to assigned value of 1000 feet for triangulation station 6
Discovery date 24 July, 1954
300'N, 300'S, 100'E, 140'W
Indicated by Raymond C. Banks
1578 Hanover
Aurora, Colorado
section line
1/4 section line
triangulation base line
Monument
S 82° 48' E
7470 feet
to south 1/4 corner, section 16, T17S, R70N, 6PM
7
8
17
18
19
TOPOGRAPHIC MAP
of the
COLEXCO CLAIM GROUP
numbers 1 thru 56
Fremont County, Colorado
sections 7, 8, 17, & 18 — T17N, R70W, 6PM
prepared by
Benalan Mining Company
January, 1955
LEGEND
triangulation stations
-44 claim number and discovery cut
drill hole
drainage, intermittent
access roads

BENALAN MINING CO.
1117 Washington Ave.
Golden, Colorado.

PLATE 5



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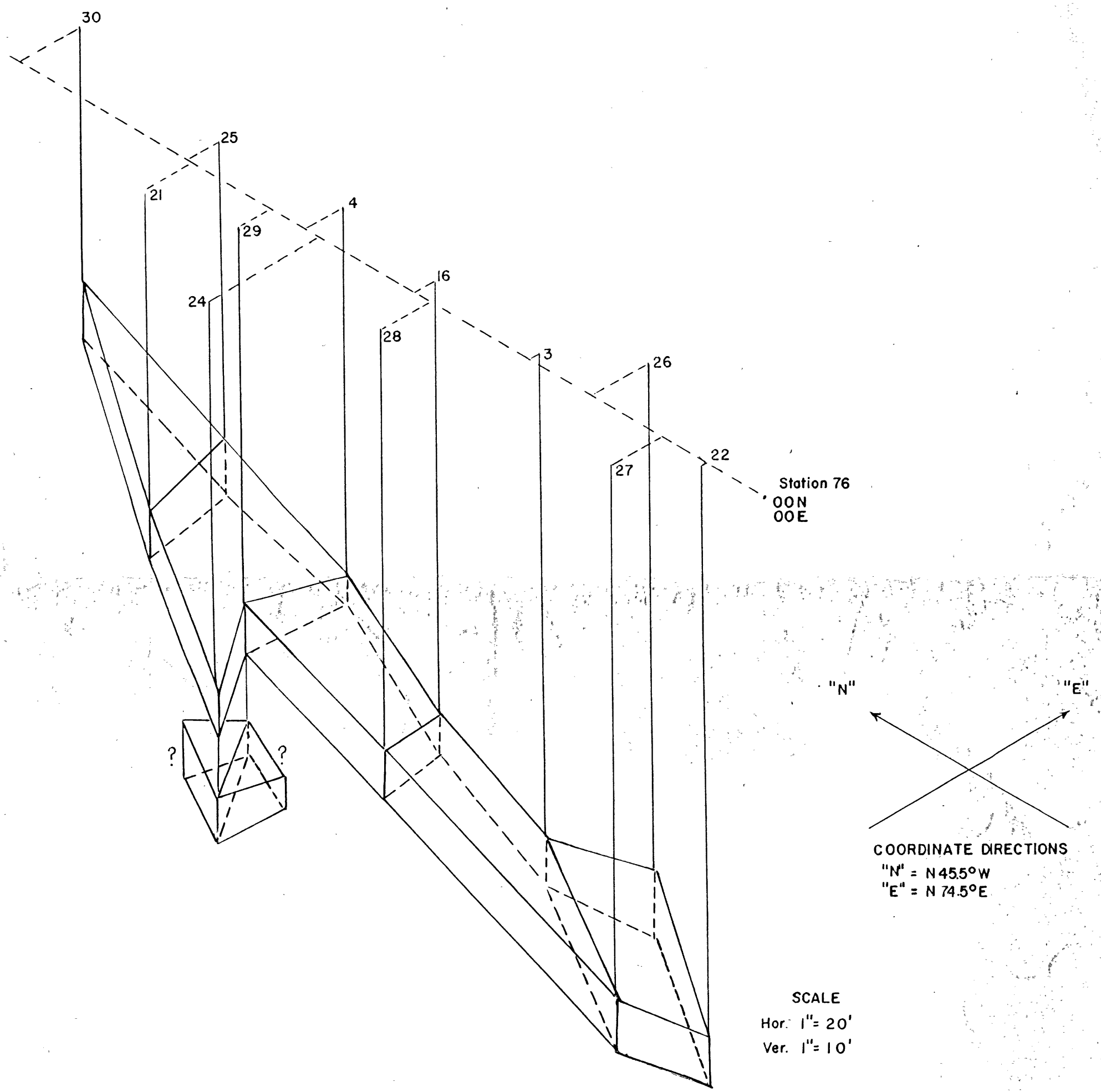
BENALAN MINING CO.
1117 Washington Ave.
Golden, Colorado.

PLATE 6



ISOMETRIC DIAGRAM
of
Probable Ore Body
Apex Area