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

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

W. M. Traver

E. N. Harshman

E. N. Harshman

Enclosures

DMEA
Date Rec'd.
JUN 14 1955

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JUN 30 1955
BUREAU OF MINES
Denver, Colorado

Region III

TRANSMITTED
JUN 15 1955

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 R U King
John F. Shaw

E. N. Harshman
E. N. Harshman

cc 11
DMEA 3670
DMEA Chron.

JFS/pah

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

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JUN 30 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

TRANSMITTED
JUN 15 1955

DMEA 3670, Menalan Mining Company

Colesco Claim Group

Fremont County, Colorado

Uranium

R. U. King, Geologist
Geological Survey

R. L. Solmer, Mining Engineer
Bureau of Mines

June 8, 1955

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JUN 30 1955

BMRA 3670

MONALAN MINING COMPANY
COLORADO CLAIM GROUP
FREMONT COUNTY, COLORADO

Field Examination Report

By R. U. King
Geologist
Geological Survey

R. L. Bolmer
Mining Engineer
Bureau of Mines

DMEA 3670

BEMALAN MINING COMPANY
COLEXCO CLAIM GROUP
FREMONT COUNTY, COLORADO

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DMEA 3670

BERNALAN MINING COMPANY
COLEXCO CLAIM GROUP
FREMONT COUNTY, COLORADO

INTRODUCTION

The Bernalan 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 $188,131.33.

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 mest 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 Solance Nos. 1-43 claims.

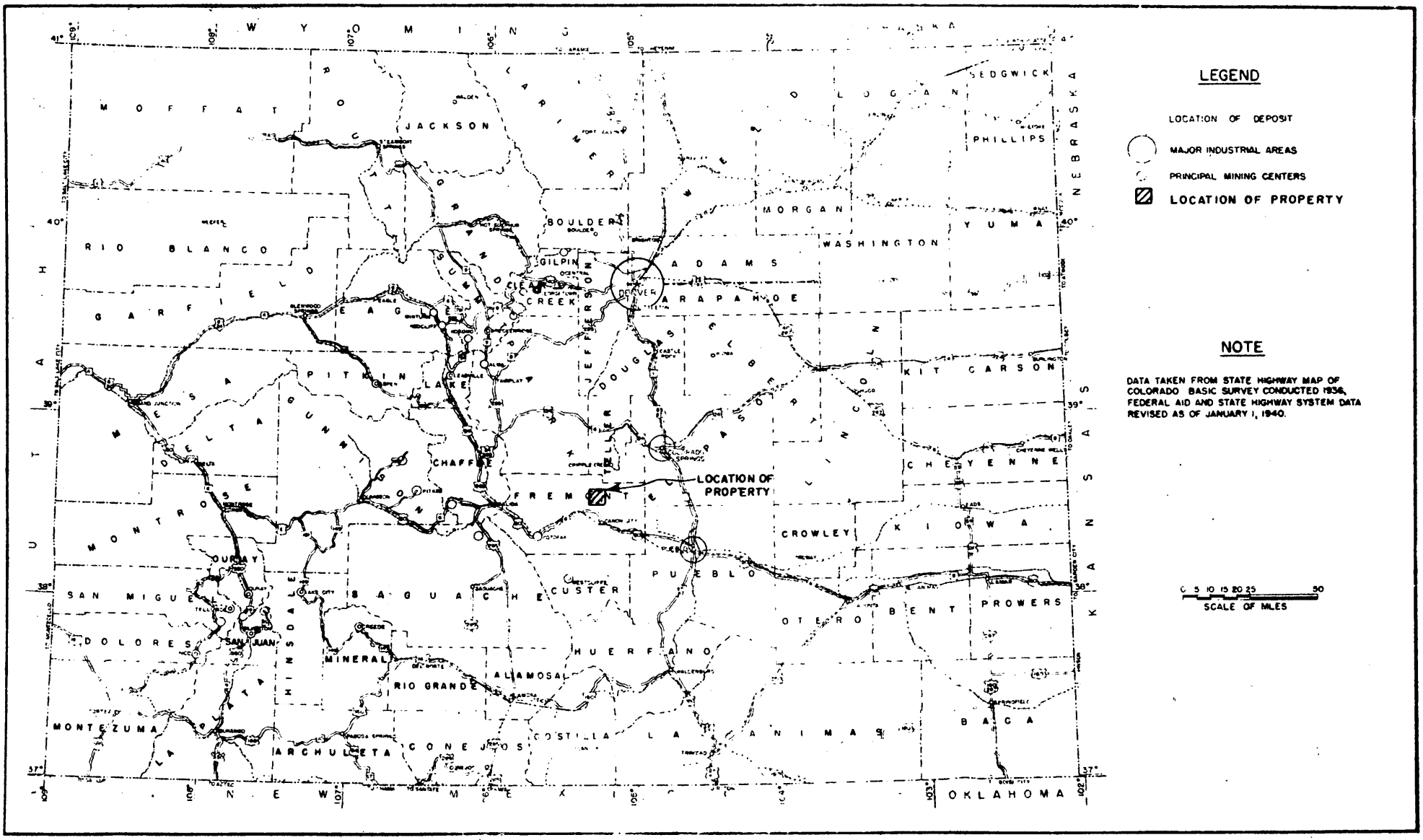
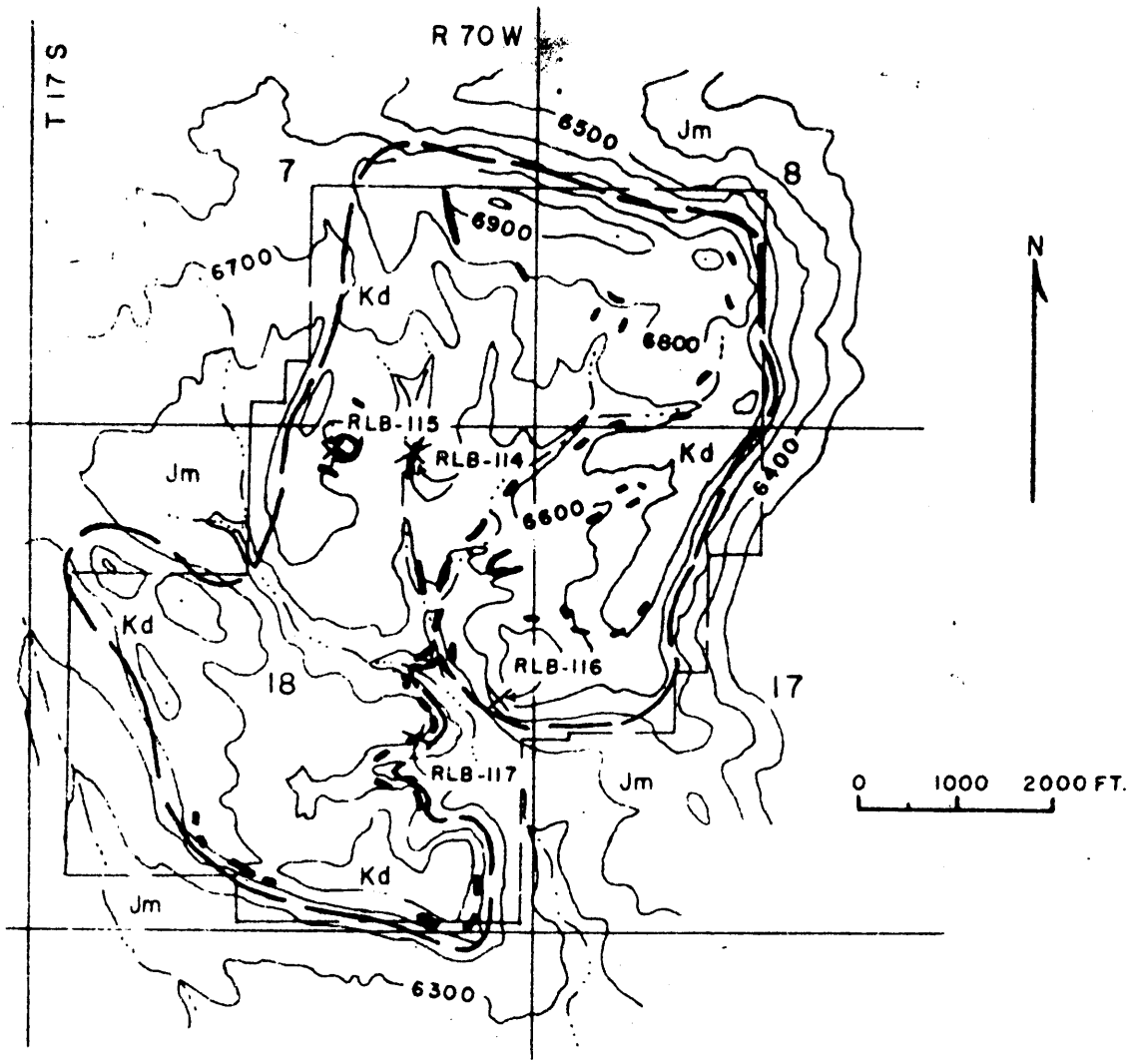


FIGURE 1 - LOCATION MAP, BENALAN MINING COMPANY, COLEXCO CLAIM GROUP, FREMONT COUNTY, COLO. DMEA 3670



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 Bonalan 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 Colesmo Nos. 44-56, were located in the name of the Bonalan 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 Bonalan Mining Company in February 1955.

OWNERSHIP AND ACCESS

The property, on which the applicant proposes to explore for uranium, comprises a group of 56 contiguous, unpatented lode mining claims identified as the Colesmo Nos. 1-56. The Colesmo Nos. 1-43 are standard, 600- by 1500-foot lode mining claims; the Colesmo Nos. 44-56 are fractional claims. The property boundaries are shown on Plate 1 (Topographic Map of the Colesmo 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 18. 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 mass 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

that the uranium content of mineralized rock is not likely to 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 thicknesses 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 Colenso 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. 38.	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.	0.116	0.120	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 Colorado 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 Renalan 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, Bubbel 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.