UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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January 16, 1957

Memorandum

To: Executive Officer, DMEA Field Team, Region III
Through: E. N. Harshman
J. F. Shaw

From: J. William Hasler

Subject: Transmittal of a denial Geologic report on the Colorado Exploratory Development Company, Docket 4526 (Uranium), Section 28, T. 14 N., R. 11 W., McKinley County, New Mexico

Enclosed is a denial geologic report on the subject property.

The Colorado Exploratory Development Company applied for assistance to explore for uranium on sec. 28, T. 14 N., R. 11 W., McKinley County, New Mexico. The property was examined in the field prior to a Washington request for a field examination as R. F. Albee was in the area on other DMEA business.

The applicant wishes to explore the Westwater Canyon member of the Morrison formation of Jurassic age by diamond drilling. Four widely spaced non-core holes have been drilled on the property and cuttings assaying as much as 0.023 percent U_3O_8 were reported. The cuttings from the four holes were examined by the examining geologists and the cuttings showed a favorable color through parts of the Westwater Canyon sandstone, however, most of the mudstone associated with the sandstone was red.

Personnel of the Atomic Energy Commission were consulted and the Commission's reconnaisance work in the area is in preparation, however occurences of mineralization in the Morrison formation both north and southeast of the property are noted in the report but mention is made primarily of the Todilto formation in so far as the subject property is concerned.

Inasmuch as the outcrops on the property do not appear favorable, cuttings from the drill holes show the mudstone to be dominantly red, and that occurrences of mineralized material are sparse and low-grade to non-existant, denial of the application is recommended.

A United States Bureau of Mines engineer was not in the area at the time of the field examination, and it was decided that due to the imminent denial of the application, that it was not necessary to require a field examination by the Bureau of Mines.

I concur with the conclusion that the property does not warrant Government assistance, and unless further private drilling proves encouraging results, that the application be denied without prejudice.

J. William Hasler

J. William Hasler
Geologist

JWH/bh
Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 4526

Colorado Exploratory Development Company

Section 28, t. 14 N., R. 11 W.

McKinley County, New Mexico

Uranium

Geologic Report

by

H. F. Albee, Geologist
Geological Survey

January 1957

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DMEA 4526

Colorado Exploratory Development Company
Section 28, T. 14 N., R. 11 W.
McKinley County, New Mexico

INTRODUCTION AND SUMMARY

The Colorado Exploratory Development Company, 105½ East Pikes Peak Avenue, Colorado Springs, Colorado, applied to Defense Minerals Exploration Administration for assistance to explore for uranium on the Anne group of claims which lies in Section 28, T. 14 N., R. 11 W., McKinley County, New Mexico. The applicant proposes to explore the Jurassic Morrison formation by 36,180 feet of core and non-core drilling in 108 holes at an estimated cost of $87,941.57.

The property was examined on December 12, 1956 by J. William Hasler and Howard F. Albee, U. S. Geological Survey, accompanied by Carl F. Myers, representative for the applicant, and Larry Wiskirchen of Marshall and Wiskirchen Drilling Company.

Four widely spaced, non-core holes have been drilled on the property. Cuttings of the Westwater from one hole is reported to have assayed 0.023 percent U_3O_8. Copies of gamma ray logs by Century Geophysical Corporation are available for the four drill holes. The gamma ray logs are not interpreted but they do not appear to show any positive anomalies.

Cuttings from the four drill holes showed a favorable color through parts of the Westwater sandstone, however most of the mudstone associated with the sandstone was red.

A sample taken from an outcrop indicated by the representative of the applicant showed no count on a scintillation counter although the rock in place was about 10 times above background.

Personnel of the Atomic Energy Commission were consulted regarding the applicant property. The AEC has done reconnaissance work in the area and a report is in preparation. Occurrences of mineralization in the Morrison formation both to the north and to the southeast of the property are noted in the AEC report but mention is made of mineralization on the property only in the Todilto formation.

Inasmuch as the outcrops on the property do not appear favorable, cuttings from the drill holes show the mudstone to be dominantly red, and occurrences of mineralized material are sparce and low-grade to non-existant both on the property and on adjoining sections, denial of the application is recommended.

LOCATION AND ACCESSIBILITY

The Anne group of claims comprises all of section 28, T. 14 N., R. 11 W., in the Grants area, McKinley County, New Mexico (fig. 1). Section 28 lies about 3½ miles northeast of Prewitt, New Mexico, which is about 20 miles northwest of Grants, New Mexico on U. S. Highway 66. The property may be reached by going north from Prewitt for about 5½ miles on a graveled road then easterly and southeasterly for 7.3 miles on an unimproved dirt road.

GEOLOGY AND ORE DEPOSITS

The property is located in the Grants district, New Mexico, which lies on part of the northeast flank of the Zuni uplift. The uplift is a broad asymmetrical dome which comprises an area of about 2,000 square miles and extends for a distance of about 60 miles from Grants, New Mexico, on the east, to Gallup, New Mexico, on the west. The beds in the area generally dip northeastward at a low angle into the San Juan Basin. The rocks are folded broadly and high angle faults are common. Two normal faults trend northerly through the section (fig. 2), the opposing sides of which are down thrown, thus forming a graben.

Rocks exposed in the vicinity of the property range in age from Triassic through Upper Cretaceous, but significant deposits have been found in the district only in Jurassic rocks. The Jurassic rocks are, in ascending order, the Todilto limestone, the Summerville formation, the Bluff sandstone, and the Morrison formation. A few small deposits have been found in the Cretaceous Dakota sandstone, but because of the scattered distribution and small size of the ore bodies, exploration for them is not economical.

The Morrison formation in the district comprises three members which are, in ascending order, the Recapture shale, the Westwater Canyon sandstone, and the Brushy Basin shale.

The Recapture member is composed of interbedded fluvial sandstone and mudstone units. The sandstone strata are fine-to medium-grained and locally contain granules and pebbles disseminated in the sandstone or concentrated along laminations. The sandstone is friable, and sedimentary structures are poorly displayed. The Recapture is about 100 feet thick and contains alternating red, brown, and light gray units.

The Westwater Canyon member consists predominantly of medium- to coarse-grained fluvial sandstone units, locally arkosic, with interbedded gray, gray-green, and red-brown mudstone strata. The sandstone may be yellowish gray, grayish green, red or reddish brown.

The thickness of the Westwater, penetrated in four holes on the property, ranges from 137 feet to 190 feet. The member intertongues with the overlying Brushy Basin member and the top contact is often questionable.

The Brushy Basin member is composed of claystone containing varying amounts of silt and sand and much bentonitic clay. Lesser amounts of medium-grained sandstone occur as lenses and as tongues of the underlying Westwater. Crossbedding and scour-and-fill features indicate a fluvial origin. Carbonaceous debris, claystone lenses, and pebbles are present locally. The Brushy Basin averages about 110 feet thick on the applicant property.

The Todilto, Morrison, and Dakota formations are all exposed on the property. The applicant proposes to drill one hole to test the Todilto limestone.

The Todilto limestone is exposed at the surface over a large part of the area west of the westernmost fault (fig. 2),and has been extensively prospected with negative results by the Anaconda Company (I. J. Rappaport, personal communication), and where mining has been attempted, the rock, rather than having been shipped, is stockpiled because of its low grade.

The Westwater has been found to be generally unfavorable where it has been drilled in the westernmost part of R. 10 W. and in R. 11 W. Where the change from a generally favorable to a generally unfavorable aspect occurs is indefinite because of lack of intervening drill hole information. Parts of the cuttings of the Westwater sandstone from the four drill holes were yellowish gray which is usually considered a favorable color. The color may or may not have been affected by long exposure to the weather, however the cuttings of mudstone above, below, and within the sandstone were red-brown, which usually is an unfavorable color. No ore deposits are known in the Westwater in the vicinity of the property nor are any significant deposits known in the Westwater west of a line that lies about in the middle of R. 10 W.

A sandstone unit that crops out in the Brushy Basin member was sampled because, when in place, it showed a count of about 10 times above background. The sample, however, shows no count when away from the outcrop. Both red and green mudstone is associated with the Brushy Basin sandstone.

The Alta, Evelyn, and Francis mines are located in the Brushy Basin member about 3½ miles north of the applicant property. According to AEC production data, the mines have produced the following tonnages and average grades of ore:

Mine	Tons	$\%U_3O_8$	$\%V_2O_5$
Alta	1,471	0.48	0.34
Evelyn	1,793	0.28	0.46
Francis	361	0.31	0.65

These mines are in a local favorable area that has not been found to extend any distance from the vicinity of the mines. If the Brushy Basin were assumed to be favorable on the applicant claims, the size of an expected ore deposit would be in the 2,000 ton class. Inasmuch as the Brushy Basin on the property is not strongly favorable, ore deposits of the above size would not be expected.

PROPOSED EXPLORATION

The applicant proposes a drilling program to explore for uranium mainly in the Westwater Canyon member of the Morrison formation. One hole is proposed on the eastern part of the section to test the Todilto limestone. The applicant also proposes one exploratory tunnel, but no specifications are given nor are any costs included in the estimate of costs.

The drilling proposal consists of 108 drill holes, to average 340 feet deep, spaced from about 200 feet to 700 feet in offset fences. The cost of the program is estimated at $87,941.57.

The applicant states that the initial drilling program is to consist of 36,180 feet, however 108 drill holes drilled to an average depth of 340 feet totals 36,720 feet. Inspection of the applicants drilling grid shows 108 holes, 4 of which have been drilled. The total footage shown on the map then, less these 4 holes, is 35,360 feet.

A multi-stage program is not proposed by the applicant, but is implied. The applicant also proposes to give consideration to a geo-thermal survey which is included in the estimate of costs.

CONCLUSIONS AND RECOMMENDATIONS

The applicant property lies in an area that is considered generally unfavorable for the occurence of uranium deposits. The Westwater member of the Morrison formation is considered generally unfavorable and the Brushy Basin is only locally favorable for ore deposits up to the 2,000 ton class. It is therefore concluded that the chance of finding significant quantities of ore grade material is not good and it is therefore recommended that the application be denied and that the applicant should substantiate any request for further work by added drilling.

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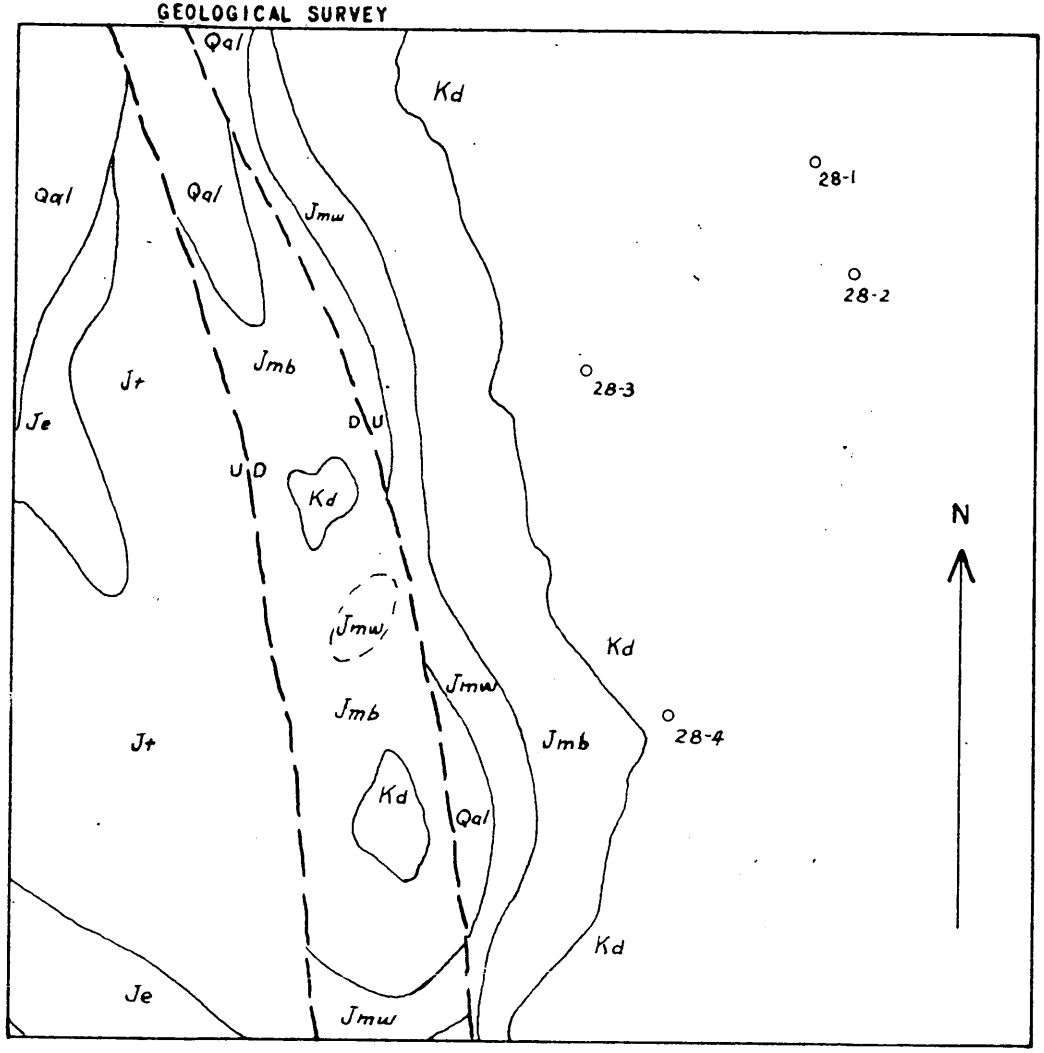

EXPLANATION

Qal	QUATERNARY ALLUVIUM
Kd	CRETACEOUS DAKOTA SANDSTONE
Jmb	BRUSHY BASIN MEMBER OF JURASSIC MORRISON FORMATION
Jmw	WESTWATER CANYON MEMBER OF JURASSIC MORRISON FORMATION
Jt	JURASSIC TODILTO LIMESTONE
Je	JURASSIC ENTRADA SANDSTONE
	GEOLOGIC CONTACT, DASHED WHERE INFERRED
U/D	TRACE OF FAULT SHOWING RELATIVE MOVEMENT
o	DRILL HOLE

Note: BASE FROM APPLICANTS MAP.

1000 0 2000 FEET

FIGURE 2.--GEOLOGIC SKETCH MAP OF SEC. 28, T. 14 N., R. 11 W., N.M.P.M., COLORADO EXPLORATORY DEVELOPMENT COMPANY, McKINLEY COUNTY, NEW MEXICO.

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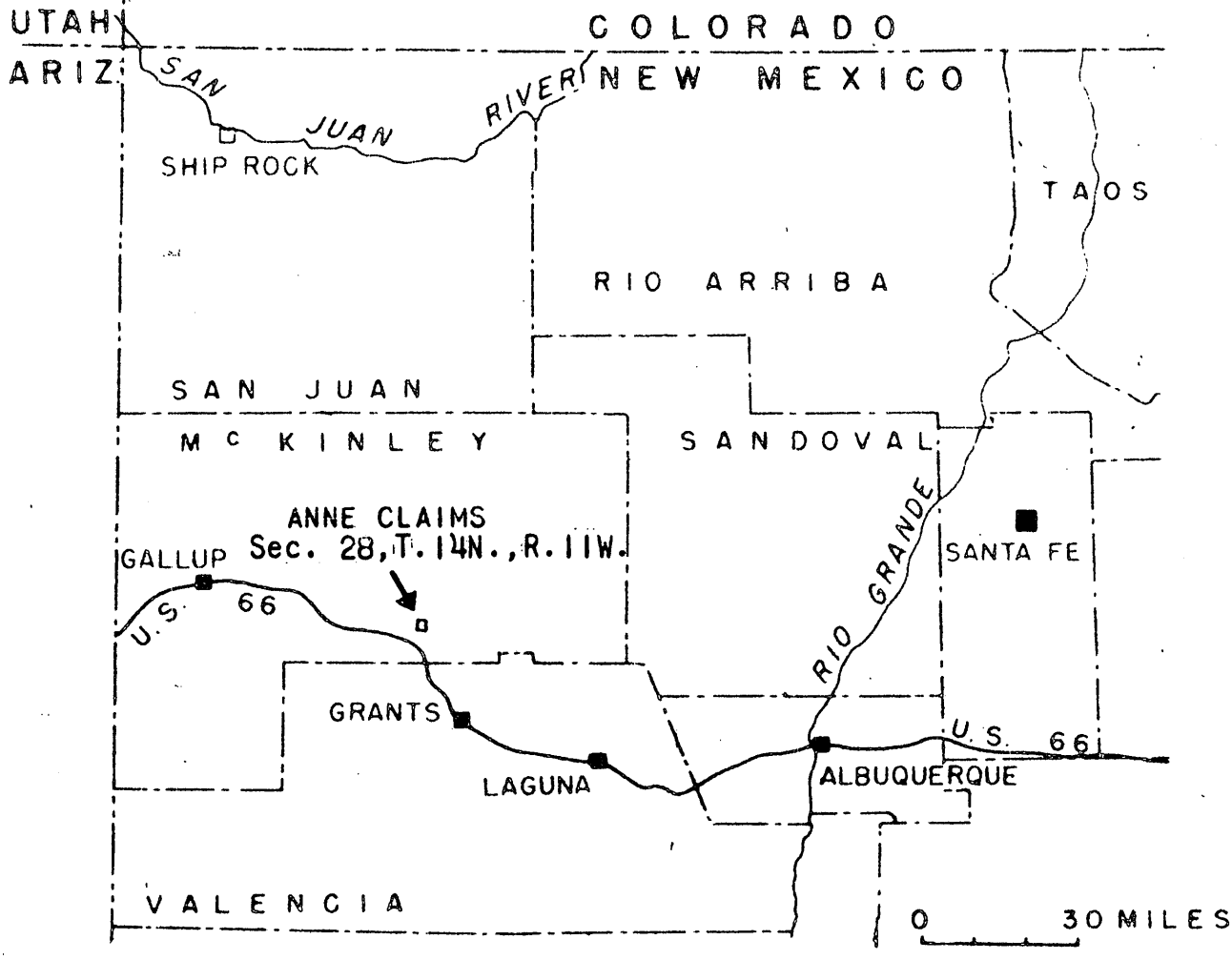

FIGURE 1. INDEX MAP OF PART OF NEW MEXICO SHOWING LOCATION OF COLORADO EXPLORATORY DEVELOPMENT COMPANY PROPERTY, McKINLEY COUNTY, NEW MEXICO.