IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

August 22, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shea
E. N. Harshman

Subject: DMEA Docket 4833 (Uranium), Uranium Corporation of America (Trix and Cora claims), Campbell County, Wyoming

Enclosed are the original and nine copies of a joint report by R. U. King, Geological Survey, and Edward W. Buel, Bureau of Mines, covering their examinations of the subject property.

The applicant proposes a drilling program, estimated to cost $22,751.20, to explore for uranium deposits in the Lance formation underlying the Cora and Trix claims.

The examiners conclude that small deposits of ore-grade material are limited to a zone 1,[illegible] feet long and about 150 feet wide which traverses the subject claims from east to west. They further conclude that the ore-bearing zone has been adequately explored by the applicant and that additional drilling would be in the nature of development work.

Considerable delay in preparation of the report resulted from the inability of the examiners to obtain pertinent information from the applicant on the results of drilling by him. A claim map requested at the time of the second examination (July 11, 1956) was received on August 7, 1956.

We concur with the recommendation that the application, DMEA Docket 4833 be denied.

for W. H. King
John F. Shea
Superintendent of the Denver
Experiment Station

E. N. Harshman
E. N. Harshman
Manager, Field Team

Enclosures (20)
EHarshman:mp

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 4299

Uranium Corporation of America

Trix and Cora Claims

Campbell County, Wyoming

Uranium

Joint Engineering and Geological Report

by

Robert U. King, Geologist
Geological Survey

Edward W. Buel, Mining Engineer
Bureau of Mines

August 21, 1956

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DMEA 4259

URANIUM CORPORATION OF AMERICA
TRIX AND CORA CLAIMS
CAMPBELL COUNTY, WYOMING

SUMMARY

The Uranium Corporation of America, Casper, Wyoming, requested DMEA assistance in the amount of $22,531.50 to explore for uranium by non-core drilling on their Trix and Cora claims in the Pumpkin Buttes district, Campbell County, Wyoming.

Because the information supplied by the applicant was inadequate and exposures on the claims were poor during an examination made on June 12, 1956, a second examination was made on July 11, 1956. Claim maps were not received from the applicant until August 7, 1956.

Uranium occurs on the Trix and Cora claims disseminated in bedded deposits in sandstone beds in the Wasatch formation of Tertiary age. The presence of a mineralized zone about 1,800 by 150 feet and 4 feet thick is indicated by the applicant's drilling and open pitting. The average grade of the zone is estimated to be around 0.05 percent U_3O_8.

The examining team concludes that the probability of finding significant uranium ore bodies on the Trix and Cora claims is poor and recommends that the application for DMEA assistance be denied.

INTRODUCTION

Uranium Corporation of America applied for DMEA assistance to explore for uranium on the Trix and Cora claims. Total cost of the exploration is given as $22,531.50, with the Government's share being $16,898.62.

An examination was made by Edward W. Buel, mining engineer, Bureau of Mines, on June 12, 1956. Mr. John Sargent, geological consultant for the applicant, was present during the investigation.

An examination of the property revealed, that even though a considerable amount of exploratory drilling (non-core) had been done, geological information required for an appraisal of the property generally was lacking. Except for one bulldozer trench the excavated areas did not permit a viewing of the geological features. Another examination was made of the property on July 11, 1956, by a DMEA examining team of Robert U. King, Geological Survey, and Edward W. Buel, Bureau of Mines. The team was accompanied by John Sargent.

The applicant had done a considerable amount of stripping and open pitting since the first visit, and the property was sufficiently exposed to permit a close scrutiny of the salient geological features.

Conversations held with representatives of the applicant and personal observations indicate that the exploration and mining

are being carried on in somewhat of a disorganized fashion. Geological, exploration, and claim maps, as well as drill hole data were not made available during the initial investigation nor during the second examination. Claim maps were furnished on August 7, 1956. More than 100 holes had been drilled by the applicant, but chemical assays were available for only three holes. Representatives of the applicant, however, said that they intend to have chemical assays made of the drill hole material.

Personnel of the Atomic Energy Commission's offices in Denver, Colorado, and Casper, Wyoming, were contacted with reference to the property. Messrs. Eugene W. Grutt, Jr. and Ray Lindlof of the Atomic Energy Commission's office in Casper stated that radiometric probing of drill holes in the Pumpkin Buttes area was adversely affected by radon gas, and that chemical assays were the only effective check for uranium content. Casper office personnel who had conducted an examination of the property on April 5, 1956, concluded that "the sporadic distribution of the highly radioactive areas and their small size in addition to the limited amount of uranium-mineralized host rock both on the surface and in drill hole cuttings suggest that this claim group will not produce an ore body of commercial size" (A.E.C. Reconnaissance Report DEB p. 2, 2/86).

LOCATION AND ACCESSIBILITY

The Trix and Cora claims are in sec. 29, T. 43 N., R. 75 W., 6th principal meridian, Campbell County, Wyoming (fig. 1). The claims lie less than 3 miles southwest of South Butte of the Pumpkin Buttes area.

The property is accessible from Midwest which is a small town at the junction of U. S. Highway 87 and State Highway 387. From Midwest, Highway 387 is followed eastward for about 29 miles to an unimproved road on the Earl Brown Ranch. This unimproved road passes through the ranch to the Pumpkin Buttes area and to Uranium Corporation of America's trailer camp. Distance from Highway 387 to the camp is 9 miles.

GEOGRAPHY

Prominent physiographic feature of the area are the buttes, geographically referred to as Pumpkin Buttes, which are near the divide between the drainage basins of the Powder and Belle Fourche Rivers. These landmarks rise about 1,000 feet above the gently rolling and grass covered land to the west and southwest. Locally this land is incised into by deep gullies and ravines into badlands.

Average altitude of the property is estimated at 5,100 feet.

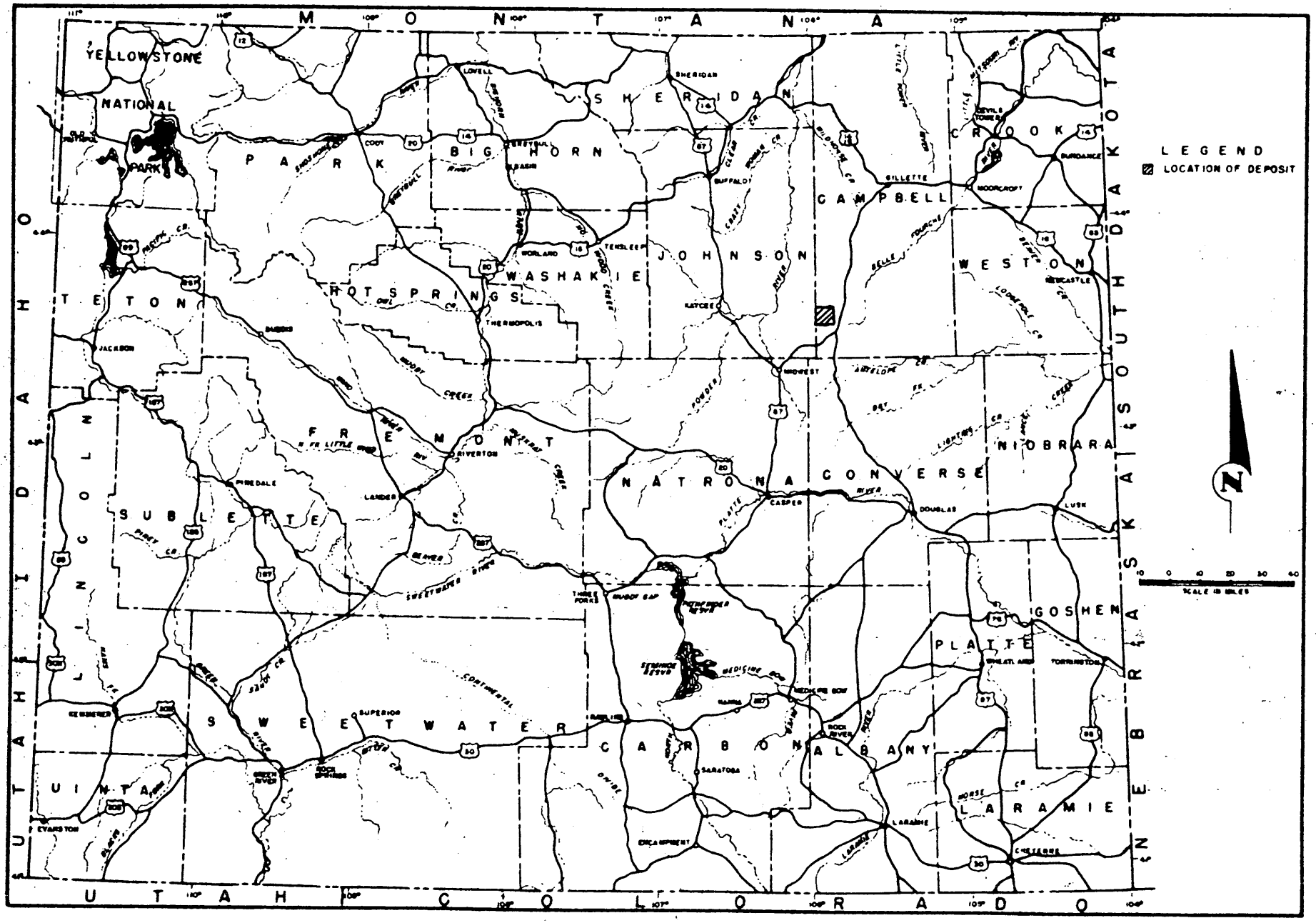

FIGURE 1 - INDEX MAP SHOWING LOCATION OF TRIX AND CORA CLAIMS, URANIUM CORPORATION OF AMERICA, CAMPBELL COUNTY, WYOMING. DMEA 4259

The area containing the Trix and Cora claims is drained by an ephemeral tributary of Cottonwood Creek. Water for drilling needs is available at the trailer camp site on the property.

Vegetation consists principally of grass and sage brush with small conifers along the upper slopes of the buttes and cottonwood trees growing in the areas containing water.

The climate is semi-arid with frequent extremes in weather and temperature.

Living conditions are suitable for trailers at the company camp.

Mining supplies, in part, can be secured from Casper which is nearly 30 miles from the property.

All power needs are supplied by portable equipment.

PROPERTY

The property consists of the Trix 1, 2, 4, and 5, and the Cora 7, 8, 9, 10, and 11 unpatented lode claims. The claim map submitted by the applicant on August 7, 1956, shows that the Cora claims in part overlie the Trix claims. Sizeable gaps as much as 80 feet in width exist between the Cora claims, placing parts of the area of proposed exploration on and near apparently open ground.

The property is owned by Uranium Corporation of America, Star Building, Casper, Wyoming.

The claims are recorded in Campbell County Courthouse as follows:

Claim	Book	Pages
Corm 7, 8, 9, 10, 11	21	289-297
Trix 1, 2, 4, 5	21	527-531

The Corm claims which overlie the Trix claims, were owned formerly by Robert Ackerson, but quitclaim deeds have been issued to the applicant. Rather than involve itself in any legal entanglements, Uranium Corporation of America traded several of its claims with Ackerson, who owns claims adjacent to the applicant's property.

HISTORY AND PRODUCTION

Prior to November 17, 1955, the Atomic Energy Commission withdrew (Public Land Withdrawal Order 811) 100 square miles, more or less, in the Pumpkin Buttes area following the discovery of uranium minerals. Investigations of the uranium and selenium potentials within the area were conducted by the U. S. Geological Survey in 1952 and by the U. S. Bureau of Mines in 1955. Results of these investigations are given in "Summary of Investigations of Uranium Deposits in the Pumpkin Buttes area, Johnson and

Campbell Counties, Wyoming" Geological Survey Circular 330, p. 17, 1954, and "Selenium Investigation of the Pumpkin Buttes district, Johnson, Campbell, and Converse Counties, Wyoming" Bureau of Mines Confidential Final Report, p. 24, 1955. Results of these investigations showed that many localities contain visible uranium mineralization and have anomalous radioactivity, and that selenium occasionally occurs closely allied with the uranium. The selenium, however, was not present in sufficient concentrations to be considered as an independent source of ore. Several thousand tons of uranium ore have been mined from an area adjacent to and north of the Pumpkin Buttes. Estimated production of uranium, however, from the area west and southwest of the buttes is believed to be less than 100 tons. Principal production has been obtained from properties other than the applicant's. The applicant has made two shipments of unknown quantities to buying stations at Edgemont, South Dakota and Riverton, Wyoming.

It is reported that 10 tons of uranium ore valued at $20,000 were produced during 1954 from a disseminated type ore body in sandstone at the School Section mine about 2 miles to the southwest of the applicant's property.

APPLICANT'S PROPOSAL AND DISCUSSION

The applicant's proposed exploration program under phase I is given as ".....drilling 151 drill holes to the water table within the area of the airborne anomaly and above the elevation of uranium mineralization outcroppings. Also proposed are 21 holes to be drilled in the same area on a 400-foot center grid pattern and to a depth of 100 to 200 feet through the strata described in Geological Survey Circular 339 as being ore-bearing horizons". Drill-hole access road construction is also proposed by the applicant.

Phase II proposed exploration is given by the applicant as ".....drilling holes to the water table on a 50-foot grid pattern in areas where significant radioactivity is detected in drill holes on the 100-foot grid pattern. Deep holes (100 to 200) are proposed at 200-foot intervals in areas where significant radioactivity is detected in holes drilled during Phase I".

Costs of the drilling in Phases I and II proposed by the applicant is $22,551.50 of which the Government's participation is $16,895.62.

The applicant's proposed exploration program lacks such essential details as the size of holes, depths of holes, approximate elevation of "ore-bearing horizons", amount of core and/or

non-core, depth to water table,.....to name but a few. In addition to the above, the applicant does not have a geologic map nor sufficient chemical assay data to lay out an intelligent exploration drilling program. The exploration program as proposed by the applicant appears to be poorly planned and much of the program more than likely would constitute offset drilling, and prospecting in unknown ground outside of and below the mineralized zone.

Many of the holes proposed by the applicant are outside of the expected limits of mineralized rock and the collars of a number of the proposed holes are lower than the elevation of the bottom of the ore-bearing sandstone bed in which the uranium ore is expected to be found.

PRESENT STATUS

The property has been explored by over 100 non-core drill holes whose depths are reported to range from 50 to 110 feet. The holes are from 25 to 100 feet apart, in an irregular pattern.

In addition to the drill holes, the property has been explored by a small bulldozer trench and developed by a large opencut.

The applicant has engaged a road construction company to mine a mineralized showing exposed in the large opencut. It is reported that two shipments of uranium ore-bearing material was removed principally from this area.

Any uranium ore produced from the Pumpkin Buttes district is shipped to buy stations at Edgemont, South Dakota, or Riverton, Wyoming; both towns are more than 200 miles by road from the district. Shipping costs, therefore, restrict production to ore of 0.20 percent U_3O_8 or better.

Sampling and ore estimated

The applicant reported that large areas gave readings on scintillation detectors and Geiger counters of three to four times background count and that smaller areas showed readings from 10 to 30 times background count. He also stated that representative samples taken from the smaller areas assayed from 1.11 percent U_3O_8 and 0.04 percent V_2O_5 to 4.06 percent U_3O_8 and 0.14 percent V_2O_5. Drill hole and sample assay data are given by the applicant as follows:

Drill Hole	Sample No.	Depth	U_3O_8%	eU_3O_8%	V_2O_5%
D 1/2, 14 3/4	1	18'	0.06	0.03	trace
" " "	2	19'	0.26	0.14	trace
" " "	3	20'	0.6[illegible]	0.23	0.07
" " "	4	20'6"	1.85	0.62	0.4[illegible]
" " "	5	21'	0.97	0.35	0.12
D 5/8, 14 5/8-14 3/4	6	15'	trace	trace	trace
" " " "	7	20'6"-21'	0.29	0.10	0.02

Sample locality	Sample No.	Description	U_3O_8%	mU_3O_8%	V_2O_5%
D 14 5/8	1	bottom foot	0.03	0.04	---
" "	2.	second foot	0.02	0.02	---
" "	3	third foot	0.02	0.02	---
" "	4	fourth foot	0.02	0.02	---
" "	5	top 10 inches	0.01	0.01	---
D 14 3/4	6	bottom foot	0.01	trace	---
" "	7	second foot	0.01	0.01	---
" "	8	third foot	0.02	0.01	---
" "	9	fourth foot	0.03	0.01	---

The applicant reported that he has probed the drill holes and that probing shows from zero to more than 10 times background count.

Samples taken of select uraniferous material during the UMEA investigation are tabulated as follows:

Sample	Description	U_3O_8%	$*U_3O_8$%
EB-17	4-foot chip sample taken in small hole along bottom of large opencut. Small disseminations of a secondary uranium mineral (tyuyamunite) in a friable sandstone.	0.202	0.17
EB-18	From company's ore stockpile	1.05	0.72
EB-19	Grab from unconsolidated sands located along a small gully. Sands display conspicuous secondary uranium mineral (tyuyamunite ?)	0.310	0.41
EB-23	Grab, same location as EB-17, buff sandstone, no visible uranium minerals	0.127	0.11
A.E.C.	Grab of selected high-grade mineralized sandstone from Trix claims, V_2O_5=0.1 percent $CaCO_3$=0.7 percent.	2.70	1.39

Inasmuch as the geologic character of the deposit is not too well known and for which few samples have been assayed the making of ore estimates is not practicable.

GEOLOGY

The geology and uranium deposits of the Pumpkin Buttes area, have been described by Sharp, et al., (U. S. G. S. Bulletin in preparation) and the general geology in the following account is largely taken from that report.

The Trix and Cora claims in the South Central Pumpkin Buttes area are underlain by the Wasatch formation of Eocene age. Within this region the Wasatch formation consists of about 1,500 feet of siltstone, claystone, and carbonaceous shale beds with randomly spaced buff and reddish sandstone lenses ranging from 10 to 100 feet in thickness. Although the sandstone is moderately cemented in some exposures, the sediments for the most part are poorly consolidated. In most places bedrock is concealed by a thin veneer of soil and grass and outcrops are found chiefly in the heads of small draws where erosion has been most active.

Very coarse-grained siliceous sandstone of the White River formation of Oligocene age overlies the Wasatch formation and caps South Butte about 5 miles northeast of the Trix and Cora claims.

The Fort Union formation of Paleocene age, underlies the Wasatch formation, and is exposed on Great Pine Ridge about 15 miles southwest of the Pumpkin Buttes. The Fort Union consists of 2,000 feet of light colored sandstone, gray shale and coal beds.

Regional dip in the South Central Pumpkin Buttes area, which is east of the Powder River basin axis, is only 30 to 100 feet per mile, or generally less than 1° to the northwest, the sandstone lenses thicken to the northwest and apparently wedge out within a few miles southeast of the area.

One of the chief prospecting guides to uranium ore in this area is a favorable stratigraphic interval that extends from 450

to 900 feet above the base of the Wasatch formation. Most of the sandstone lenses in this interval are in whole or in part reddish. The red color does not extend into the adjacent claystone and siltstone. Host rock for the uranium deposits is either the red iron-stained sandstone or a gray to buff-colored sandstone associated with the iron-stained sandstone.

According to the applicant the stratigraphic horizon at the highest elevation on the Trix and Cora claims is about 800 feet below the base of the White River formation and about 700 feet above the Fort Union formation of Paleocene age. The applicant further states that "approximately 100 to 200 feet of the ore-bearing strata have been removed by erosion in the vicinity of the Trix claims, leaving only 100 to 200 feet of the ore-bearing strata intact."

According to Sharp, et al. there are at least two thick sandstone units within the 100- to 200-foot stratigraphic interval that underlies the applicant's property.

Three radioactivity anomalies with sparse uranium mineralization have been found on the surface and one locality containing visible uranium minerals is known within one mile of the claims.

Drab to buff porous sandstone, pink to reddish sandstone and clay-pellet conglomeratic sandstone crop out and are exposed on

the Trix and Core claims. At the east end of the property green to gray clay underlying the sandstone beds is exposed in a 10- by 70-foot trench (fig. 2).

Ore deposits

The ore deposits are generally restricted to the sandstone units in a limited zone in the Wasatch formation, and to those units that are red or partly red in color or to drab and buff sandstone near the color change to pink and red.

Three types of uranium occurrences are recognized in the Pumpkin Buttes area based on their physical habit and mineralogic associations: (a) oxidized uranium minerals disseminated in porous sandstone, (b) manganese oxide nodular concretions, and (c) nodular concretions of uraninite with pyrite (W. N. Sharp and E. J. McKay, U. S. Geological Survey, T. E. I. Report 428, in preparation). Most of the production for the Pumpkin Buttes district to date has come from the disseminated type of occurrence; the deposits on the applicant's property belong to the first type.

Yellow to greenish-yellow uranium minerals are disseminated in a buff to drab porous sandstone bed near a color change to red sandstone in exposures along the crest of a ridge that trends easterly across the applicant's claims.

Ore-grade uranium mineralization has been exposed on the property at three places in pits excavated by the applicant; in the

main pit near the northwestern part of the mineralized zone, in an opencut at about the center and along the south side of the mineralized zone; and in a small pit near the southeastern end of the mineralized zone (fig. 2). A trench excavated by previous operators near the small pit but at a lower elevation at the southeastern end of the zone exposes the contact of the ore-bearing sandstone bed with underlying barren clay.

In the bottom of the main pit, over an area 30 by 50 feet, yellow to yellowish-green oxidized uranium minerals are disseminated in buff to drab friable sandstone. A selected sample of sandstone with visible uranium minerals (ZB-17) contained 0.202 percent U_3O_8. Sandstone from the same locality in which uranium minerals were not visible megascopically (sample ZB-23) contain 0.127 percent U_3O_8. The mineralized sandstone is as much as 4 feet thick at this locality.

In the opencut, which is not over 2 feet deep, yellow secondary uranium minerals are disseminated in buff to white, medium grained, poorly cemented sandstone over a 10-square foot area. A sample collected from the weathered outcrop at this locality (ZB-19) contained 0.31 percent U_3O_8; the applicant reports that they shipped 2 tons of ore from this locality.

In the small pit at the eastern end of the mineralized zone on the Cora No. 11 claim a small pod of buff to brown sandstone is exposed that is highly mineralized with secondary yellow uranium

minerals. A trench 20 feet southeast of this locality exposes the lower contact of pink to red sandstone; the sandstone in the trench is not appreciably mineralized.

The location of holes drilled by the applicant that are stated to have encountered mineralized sandstone are shown on figure 2. The position of these holes and the mineralized exposures indicate the presence of a mineralized zone about 150 feet wide by 1,800 feet long. The average grade of this mineralized zone probably would not be higher than 0.05 percent U_3O_8.

The applicant postulates the mineralized zone occupies a channel in the sandstone. However, a channel structure was not visible in the exposures at the time of the examinations.

CONCLUSIONS AND RECOMMENDATIONS

From present exposures, the uranium mineralization appears to be confined to a relatively narrow and shallow zone perhaps 1,800 feet long by 150 feet wide by 4 feet thick. This zone has been sufficiently drilled and the holes probed by the applicant to indicate the trend, approximate limits, and location of ore-grade material that may be present within the zone. Additional drilling as proposed by the applicant would not materially add to the present knowledge of the deposit on the basis of the quality of information obtained to date and largely would be on less than 100-foot centers. It is concluded that

the chances for finding significant uranium deposits on the applicant's claims are poor, and it is recommended that the application for DMEA assistance to explore for uranium on the Trix and Cora claims be denied.

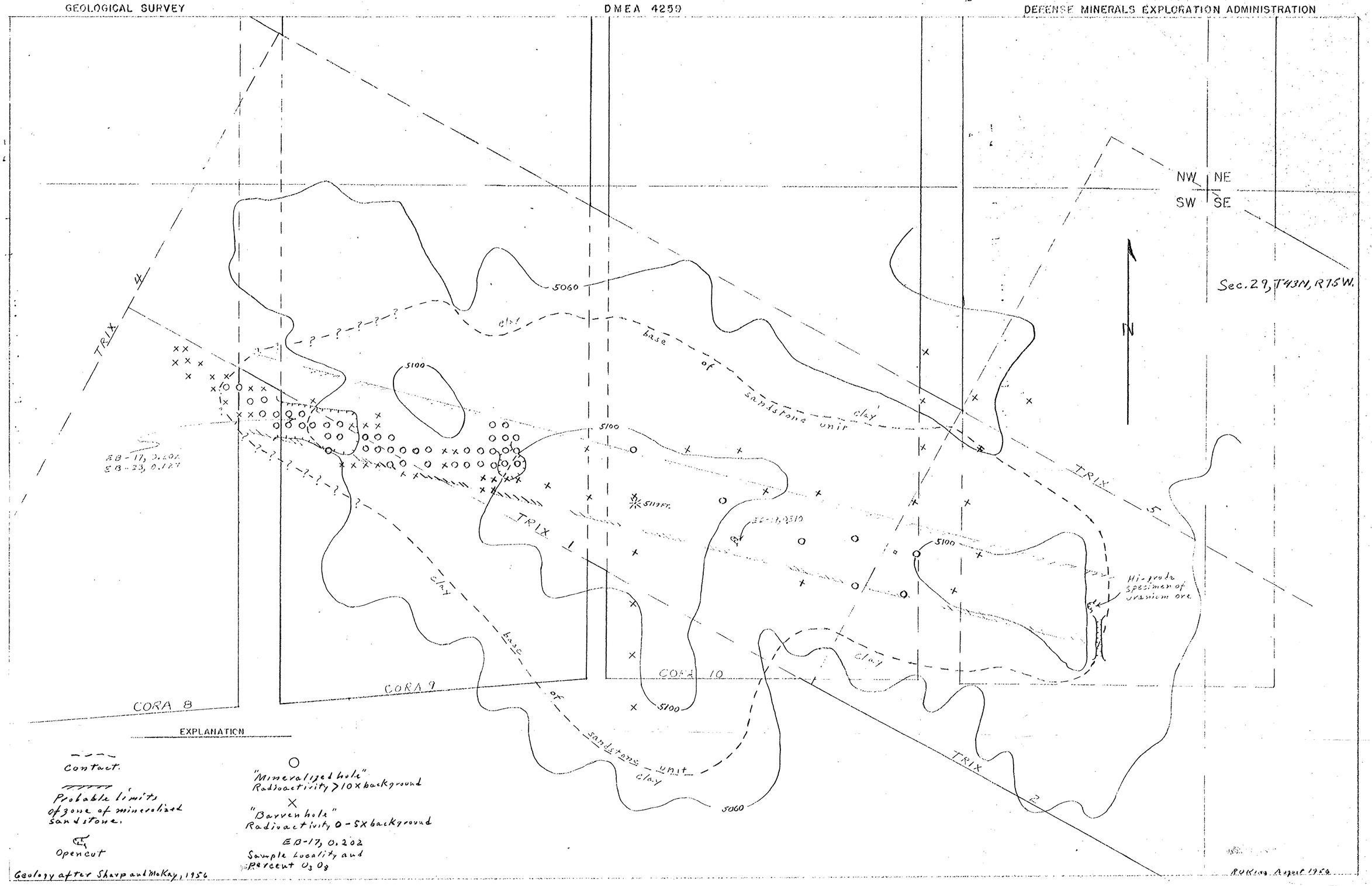

FIGURE 2 -- GEOLOGIC MAP OF PART OF TRIX AND CORA CLAIMS, URANIUM CORPORATION OF AMERICA, PUMPKIN BUTTES AREA CAMPBELL COUNTY, WYOMING.