700
Mining Division
Date Rec'd.
APR 13 1953
BUREAU OF MINES
Denver, Colorado

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

Mr. W.H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

APR 9 1953

Re: Docket No. DMEA-1478 (Uranium)
Hinds Uranium Mining & Rare Metals
Horse Canyon No. 1, and Silver Fall
1 and 2, Circle Cliffs Mining District
Kane and Garfield Counties, Utah

Dear Mr. King:

Replying to your inquiry of March 31, 1953, please be advised that since we received no response to our request of February 14, 1952, to the Applicant for copies of the leases and subordination agreements for the above-named claims, the docket was subsequently closed on our records.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

APPROVED:

J. N. Hedges
Member, Bureau of Mines

A R Kirkell
Member, Geological Survey

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

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
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Denver 2, Colorado

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Chairman, Operating Committee

APPROVED:

W. E. Hedges

Member, Bureau of Mines

A. R. Kinkel, Jr.

Member, Geological Survey

224 New Customhouse
Denver 2, Colorado

March 31, 1953

Memorandum

To: Chairman, Operating Committee

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMEA - 1478 (Uranium), Horse Canyon No. 1, and Silver Fall 1 and 2, Circle Cliffs Mining District, Kane and Garfield Counties, Utah

Reference is made to a letter dated February 14, 1952 signed by the Acting Chief, Non-Metallic Minerals Division to The Hinds Uranium Mining Company and Rare Metals Company. This letter stated that if copies of the leases and subordination agreements were not received by March 15, 1952 the application would be closed. We have not received any further information. Kindly advise us the status of this application.

W. H. King

W. H. King

JFS:fwo J.F.S.

cc SRWilson
Subject
Chron
Koschmann (2)

RDB. Hmc

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C. 600

FEB 18 1952
DENVER
FEB 14 1952

The Hinds Uranium Mining and
Rare Metals Company
P. O. Box 191
Richfield, Utah

Subject: Docket No. DMEA-1473 - Uranium
Horse Canyon No. 1, and
Silver Falls 1 and 2
Circle Cliffs Mining District
Kane and Garfield Counties, Utah

Gentlemen:

Reference is made to our request that you supply us with copies of the leases and subordination agreements on the Horse Canyon No. 1, and Silver Falls 1 and 2 claims in the Circle Cliffs Mining District in Kane and Garfield Counties, Utah.

Inasmuch as considerable time has elapsed, and we have had no information on the ownership of the claims under lease, we assume you are no longer interested in obtaining exploration assistance. The Defense Minerals Exploration Administration wishes to allow you ample time but if the requested subordination agreements, and copies of leases, are not received in this office by March 15th, your application will be closed.

Sincerely yours,

Lawrence G. Houk, Acting Chief
Non-Metallic Minerals Division
Defense Minerals Exploration
Administration

LGHouk:gad
2/13/52
Copy to: Region IV (2)
Mr. Kauffman, 1347
Mr. A. P. Butler, Naval Gun Factory
Admin. Reading File
Docket File
Mr. Houk

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

Sorsen Williams Mining Co.
Box 1431
Globe, Arizona

Mar. 16, 1953

Mr. W. H. King
U. S. Bureau of Mines
224 New Customhouse
Denver, Colorado

Re: DMEA Docket 1776X
Contract IDM E 419

Mining Division
Date Rec'd
MAR 20 1953
BUREAU OF MINES
Denver, Colorado

Dear Mr. King,

I have discussed the matter of royalty on ore sold with Mr. Stewart. He advises that I should send you a check for the 5% royalty at the time of each sale.

Referring to my progress report dated Mar. 3, 1953, you will note that we have sold ore amounting to $976.80 to date. 5% of this amount is $48.84. I herewith transmit a check for that amount to your office.

I wish to thank you for your prompt handling of our stage 1 payment. The check arrived just in time to avert a catastrophe. The reason we were in such bad shape is the fact that we are encountering extremely heavy and caving ground on our Stage 2 tunneling. We have had 6 bad zones to pass through which necessitated timbering above the drift timber to catch up bad ground. Spiling is impossible because of the blocky nature of the ground with fine material filling the voids. It is therefor necessary to empty the crack and sometimes muck for several shifts without making any advance. This week we made a total of 12 feet with 30 man shifts. All of the work must be timbered, sometimes on 2"foot centers. We are hopeful that we have passed thru the worst of it, and have occasional showings of fibre along with a strong zone of serpentine. Had I foreseen these conditions, I would have bid timber separately. Perhaps this should be done in future contracts. My costs to date approximate $39 per foot. Since the 1st of the month we have advanced 38 feet. This is a very poor showing.

I hope my next report to you will be on a more optimistic level.

Sincerely yours,

Wm H. Sorsen

JH

Mining Division
Region IV

November 7, 1951

Memorandum

To: DMA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMA Docket 3178-5, Fred Black, applicant, Black Uranium Mining and Rare Metals Syndicate, Blackfield, Utah

The application of the subject docket was for an exploration loan of $[illegible].

The company did not submit a definite program of exploration other than a general statement proposing "core drilling, bulldozing, and other preliminary mining to determine the extent of the ore bodies."

Uranium minerals consisting of autunite, torbernite, and meta-autunite in the upper Triassic Chinle Formation, limited exploration on the principal claims by the applicant disclosed probable widespread occurrence of uranium mineralization in the Chinle Formation. It is expected that the uranium mineralization, all known to occur in the claimed and located area is penetrated. The geological probability of discovery of important reserves is favorable.

The attached loan proposes a core exploration program consisting of pneumatic-pits and adits at an estimated total cost of $[illegible], and they recommended approval of the loan, with [illegible] as amended.

Paul T. Allemann

WDM:oj
cc: DMA Subject, Chron.

Mining Division
Date Rec'd.
DEC 3 1951
BUREAU OF MINES
Denver, Colorado

November 29, 1951
Air Mail
Special Delivery

Memorandum

To: Laurence Houk, Defense Minerals Administration, Washington, D. C.

From: Chief, Utah-Wyoming Branch, Mining Division

Subject: DMA-1478X, Hinds Uranium Mining Co., Garfield and Kane Counties, Utah

Ralph Roberts has asked that I supply you with information, as per your telephone conversation with him, on estimated costs which were contained in the engineering report on the subject property. The following is a breakdown of the items in question:

Truck rental and transportation

3 pickup trucks at $8.00 per day each for 60 days	$1,440.00
Operating supplies for 3 pickups at $2.00 per day each for 60 days	$ 360.00
Transportation of supplies and equipment to projects from purchasing points	$1,700.00
Total	$3,500.00

Supervision

1 Superintendent, 2 months at $600.00 per month	$1,200.00
1 Foreman, 2 months at $500.00 per month	$1,000.00
Total	$2,200.00

1 Assistant foreman at $450 per month, prorata, for direct supervision of all projects (900 feet of adits over the 2-month period, or $1.00 per foot).

Labor

6 crews:	1 miner at $12.50 per day + O.T., etc.	$14.55
each :	2 muckers at $12.00 per day + O.T., etc.	$28.10
Total		$42.65

Costs estimated on basis of 5 feet advance per shift.

At the time the property was examined by the field team, Horse Canyon No. 1, and Silver Falls Nos. 1 and 2 claims were among those held by lease, according to information supplied by the applicant. Copies of the lease were not available during the examination period, and none has been submitted to this office. Undoubtedly the applicant now has his leases in proper order and will be able to submit the necessary copies.

Stephen R. Wilson

cc: Paul T. Allsman

[redacted]
Denver 2, Colorado

[redacted]

[redacted]

The [redacted]

From [redacted]

Subject: Final Report, DMA Contract 1478-2, Fred Hinds, [redacted] Hinds Uranium Mining and Bare Metals Deposit, [redacted], Utah

Enclosed herewith are the original and two copies of the report on the subject contract.

We concur with the conclusions and recommendations of the consulting team that the exploration loan of $[redacted] be approved.

The inventory has been checked, and upon receipt of it in this office, it will be forwarded to you.

J. H. EAST, JR.

[redacted]

A. H. Koschmann

[redacted]

WDM:oj
cc: DMA Subject and Chron.
AHKoschmann

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

DIRECTOR'S OFFICE
JUN 25 1951
BUREAU OF MINES
DENVER, COLORADO

June 19, 1951

DMA

Mr. Fred Lee
[illegible]
[illegible]
[illegible], Utah

Dear Mr. Lee:

[illegible] exploration project [illegible] has been [illegible] the [illegible] available [illegible] Division.

[illegible] be purchased at your [illegible] we find it [illegible] located under [illegible] your property. [illegible] Colorado [illegible] of the [illegible] Field Office, [illegible], Utah, which [illegible] requests [illegible] supplies.

[illegible]

[illegible], Director
[illegible] Division

[illegible]
cc: [illegible]
[illegible]
Lyon
Field Office IV
Bourret
Wills

Routine

224 New Customhouse
Denver, Colorado

June 28, 1951

Memorandum

To: S. R. Wilson

(Through Chief, Mining Division) PTA

Ralph Roberts (with brochure)

From: DMA Field Team, Region IV

Subject: DMA 1478K, Fred Hines, Richfield, Utah

Herewith is the brochure and the examiners review of the application on the above docket.

The same procedure should be followed in making this examination as those already submitted to you.

P. T. Allsman, Alternate

A. H. Koschmann

Attachments
PTA/al ~~to dma~~ files, koschmann

New Customhouse
Denver 2, Colorado

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

November 7, 1951

Memorandum

To: Executive Secretary, Defense Minerals Administration

From: DMA Field Team, Region IV

Subject: Final Report, DMA Docket 1478-X, Fred Hinds, applicant; Hinds Uranium Mining and Rare Metals Deposit, Richfield, Utah

Enclosed herewith are the original and two copies of the report on the subject docket.

We concur with the conclusions and recommendations of the examining team that the exploration loan of $49,778 be approved.

The brochure has been mislaid, and upon receipt of it in this office, it will be forwarded to you.

J. H. East, Jr.

A. H. Koschmann

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

November 7, 1951

Memorandum

To: DMA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMA Docket 1478-X, Fred Hinds, applicant; Hinds Uranium Mining and Rare Metals Deposit, Richfield, Utah

The application of the subject docket was for an exploration loan of $500,000.

The company did not submit a definite program of exploration other than a general statement proposing "core drilling, bulldozing, and other preliminary mining to determine the extent of the ore bodies.

Uranium minerals consisting of torbernite, carnotite, and uranophane in the upper Triassic Shimarump formation. Limited exploration on the principal claims by the applicant indicated probable widespread occurrence of uranium mineralization in the Shinarump formation. It is expected that the uranium mineralization will increase in grade as the oxidized and leached zone is penetrated. The geological probability of discovery of important reserves is favorable.

The examining team proposes a more moderate program consisting of rim-stripping and adits at an estimated total cost of $49,778, and they recommended approval of the loan, with which we concur.

Paul T. Allsman

Paul T. Allsman

UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES
1600 EAST FIRST SOUTH STREET
SALT LAKE CITY 1, UTAH

Mining Division
Date Rec'd
NOV 5 1951
BUREAU OF MINES
Denver, Colorado

November 2, 1951

Memorandum

To: Paul T. Allsman, Chief, Mining Division, Region IV

From: Chief, Utah-Wyoming Branch, Mining Division

Subject: DMA-1478-X, Hinds Uranium Mining Co., Garfield and Kane Counties, Utah

Enclosed are the original and nine copies of the subject report, with a section on Summary, Conclusions and Recommendations.

The Survey report covering the property, with the brochure, was submitted September 13, 1951. This report outlined proposed exploration at a total cost of $64,645. Subsequent revised estimates and proposals resulted in an overall exploration total of $49,778, as shown in the attached engineering report.

I concur with the recommendations in the engineering report.

Stephen R. Wilson
Stephen R. Wilson

Enclosures - 2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Defense Minerals Administration
200 New Customhouse
Denver 2, Colorado

September 17, 1951

Memorandum

To: DMA Field Team, Region IV

From: A. H. Koschmann

Subject: DMA Docket 1478X, Fred Hinds, Richfield, Utah (Uranium)

Enclosed are eight copies of the geologic report by H. K. Thurber of the U. S. Bureau of Mines and R. W. Osterstock of the U. S. Geological Survey, covering the above docket.

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

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Room 307, 320 South Main
Salt Lake City 1, Utah
12 September 1951

Memorandum

To: A. H. Koschmann, Region IV Field Team

From: Ralph J. Roberts

Subject: Docket DMA-1478X, Fred Hinds, Richfield, Utah (Uranium)

Enclosed are eight copies of a geologic report on Docket DMA 1478X, Fred Hinds, Richfield, Utah Uranium Corporation claims.

The ore deposits of the Circle Cliffs district appear to be confined to the upper (?) Triassic Shinarump formation. The ore is found in thin-bedded lenticular red sandstones, sandy siltstones, and sandy shales in erosion channels within the Shinarump formation.

The ore minerals have been tentatively identified as carnotite, torbernite, and uranophane. It is estimated that the ore bodies will contain about 0.20 percent U_3O_8. The lack of exploratory data does not permit the calculation of ore reserves, but there may be substantial tonnages of ore below some of the leached surface outcrops containing ore minerals.

A suggested exploratory program consisting of rim-clearing and drifting to define the limits of the ore bearing zones has been outlined. It is recommended that the Defense Minerals Administration enter into a contract with the Hinds Uranium Corporation for an exploratory loan in the amount of $64,645. On the 90 percent participation basis the government will contribute as its share $58,181.

I concur with the conclusions and recommendations of the examining geologist.

Ralph J. Roberts

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

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

Docket DMA 1478X, Fred Hinds,

Richfield, Utah

(Uranium)

H. K. Thurber, Mining Engineer
U. S. Bureau of Mines

R. W. Osterstock, Geologist
U. S. Geological Survey

September 11, 1951

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By. E. L. Thurber, Jr., and
E. W. Osterstock

The Winda Uranium Mining Co., with mining claims in Garfield and Kane Counties, Utah, has applied for a DMA exploratory loan under Docket 1478-K. The property was examined by personnel of the Geological Survey and Bureau of Mines during July, 1951, at the request of the DMA Field Team, Denver, Colorado.

Uranium deposits in the area appear to be confined to the upper (?) Triassic Shinarump formation which unconformably overlies the lower Triassic Moenkopi formation and conformably underlies the upper Triassic Chinle formation. The Shinarump was deposited on an irregular erosional surface of the Moenkopi. Channels cut in the Moenkopi have been filled with Shinarump grits and sands, in some areas 50 feet deep and 100 yards wide.

Uranium minerals consisting of torbernite, autunite and uranophane occur in thin-bedded sandstone and siltstone in the bottom of the channels. Secondary copper minerals and carbonaceous material are commonly associated with the uranium minerals.

Definite exploratory proposals were not made by the company in the application. The examining team suggests that an exploratory program on the property consist of approximately 10,000 linear feet of rim stripping by bulldozer, and 900 feet of adits on the Red Head

No. 27, Horse Canyon No. 1, Silver Falls No. 1 and Silver Falls No. 2 claims. Limited exploration on these claims accomplished by the operator indicates the probable widespread occurrence of uranium mineralization in the Shinarump formation. It is expected that the uranium mineralization will increase in grade as the oxidized and leached zone is penetrated.

It is concluded that the Circle Cliffs area is a potential producer of uranium. A DMA loan of $49,778 for the Hinds Uranium Mining Company is recommended.

TABLE OF CONTENTS

	Page
Geology	1
Moenkopi formation	1
Moenkopi-Shinarump erosion interval	2
Shinarump conglomerate	2
Chinle formation	3
Structure	3
Ore Deposits	4
Ore Reserves	6
Table I, Sample assays taken from the Shinarump formation in the Circle Cliffs district	6
Proposed Exploration	7
Red Head No. 27, Lampstand area	7
Horse Canyon No. 1	8
Silver Falls No. 1	8
Silver Falls No. 2	9
Summary and Conclusions	10

LIST OF ILLUSTRATIONS

Figure 1. Location map, Hinds Uranium Mining Company, Circle Cliffs area, Garfield County, Utah.

Figure 2. Silver Falls No. 2 Uranium prospect, Garfield County, Utah.

Figure 3. Geology between Escalante River and Halls Creek, Garfield and Kane Counties, Utah.

Docket DMA 1478X, Fred Hinds,

Richfield, Utah

(Uranium)

GEOLOGY

The ore deposits in the Circle Cliffs district (see fig. 1) appear to be confined to sedimentary rocks of Triassic age. The formations that have potential economic significance are, in decreasing order of age: the Moenkopi, the Shinarump, and the Chinle.

Moenkopi formation.—The lower Triassic Moenkopi formation forms an almost continuous floor in the Circle Cliffs district (see fig. 3). Underlying the Moenkopi unconformably is the Permian Kaibab limestone. A distinct erosion interval separates the upper Moenkopi from the overlying Shinarump formation. The thickness of the Moenkopi varies from 304 to 500 feet [1]; the wide variation

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[1] Gregory, H. E., The Kaiparowits Region, A geographic and geologic reconnaissance of parts of Utah and Arizona: U. S. Geol. Survey Prof. Paper 164, pp. 47-52, 1931

---

is ascribed mainly to erosional unconformities at the top and bottom of the formation.

The Moenkopi formation consists dominantly of interlaminated mudstones, sandy micaceous shales, thin-bedded platy sandstones, and lenses of fine- to medium-grained sandstone. Grits, conglomerates, and clay shales are generally lacking. A few thin discontinuous beds of the sandstone are calcareous. Very little gypsum is present in the beds in the Circle Cliffs district, although to the north, in the Capitol Reef region, gypsum is quite abundant. Ripple marks

and very fine cross-bedding are common. The color of the formation varies from brick-red to reddish brown and chocolate brown, with some beds weathering buff or cream. Immediately underlying the erosion surface at the top of the Moenkopi the sandy shales and mudstones are locally bleached and altered to grayish-green.

The weathered slopes of the Moenkopi are generally uniform but are occasionally broken by small benches. The uppermost beds often form a cliff where the more resistant overlying Shinarump acts as a protective cap.

Moenkopi-Shinarump erosion interval.—An interval of erosion after the deposition of the Moenkopi is indicated by the removal of parts of the upper Moenkopi beds, the bevelling of these beds, erosion channels, and a marked change in sedimentation above and below the erosion surface. In the Circle Cliffs district channels carved in the Moenkopi 10 to 50 feet deep and 50 to 100 yards wide are filled with Shinarump siltstones, grits, and coarse sandstones.

Shinarump conglomerate.—The upper (?) Triassic Shinarump conglomerate unconformably overlies the Moenkopi formation and conformably underlies the Chinle formation. In the Circle Cliffs district (see fig. 3) it is a gray irregularly cross-bedded massive sandstone with few conglomeratic lenses. Most exposures include a lower soft sandstone bed, a middle group of greenish-gray shale, and an upper massive cross-bedded sandstone that forms a resistant ledge. The ore zone appears to be confined to the lower, soft, massive, brown sandstone and grayish siltstone locally containing thin grayish-green sandy shales. The lateral extent of the various beds is limited by their lens-like nature. H. E. Gregory [1] has stated that from the head of Halls Creek and along

[1] Gregory, H. E., op. cit., pp. 52-53.

Capitol Reef Wash the Shinarump ranges in thickness from less than 30 feet to more than 100 feet.

Chinle formation.—The upper Triassic Chinle formation (see fig. 3) conformably overlies the Shinarump conglomerate. A. A. Baker [1], E. T. McKnight [2], C. H. Dane [3], and H. E. Gregory [4] all believe that the Shinarump

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[1] Baker, A. A., Geology of the Monument Valley-Navajo Mountain Region, San Juan County, Utah: U. S. Geol. Survey Bull. 865, pp. 44-47, 1936.

[2] McKnight, E. T., Geology of the area between the Green and Colorado Rivers, Grand and San Juan Counties, Utah: U. S. Geol. Survey Bull. 908, pp. 63-66, 1940.

[3] Dane, C. H., Geology of the Salt Valley anticline and adjacent areas: U. S. Geol. Survey Bull. 863, pp. 54-65, 1935.

[4] Gregory, H. E., op. cit., p. 52.

---

conglomerate grades laterally and vertically into the lowermost beds of the Chinle. Consequently, the Shinarump is often regarded as the basal conglomerate of the Chinle formation. The thickness of the Chinle in the Circle Cliffs district averages about 600 feet.

The Chinle is generally composed of two parts, the lower consisting of dark-red sandy beds and the upper of calcareous lighter-colored beds. The lower sandy beds, although persistent regionally, show considerable local variation in composition and color. Individual beds can rarely be traced more than a few hundred feet. The most distinctive features of the Chinle are abundant fossil trees and the variegated colors of the shales.

Structure.—Regionally, the Circle Cliff district exhibits a gentle upwarp to the east with a more distinct monoclinal flexure downward near Halls

Creek. Gentle westerly dips are dominant over the area with which this report is concerned.

ORE DEPOSITS

All of the ore deposits examined in the Circle Cliffs district are in the lower portion of the Shinarump conglomerate, though it is reported by Fred Hinds, the applicant, that the Chinle and Wingate formations also contain ore in the form of "blankets".

The extremely fine grained ore minerals which have been tentatively identified by the naked eye are: carnotite ($K_2O \cdot 2UO_3 \cdot V_2O_5 \cdot 2H_2O$), torbernite ($CuO \cdot UO_3 \cdot P_2O_5 \cdot 12H_2O$), uranophane ($CaO \cdot 2UO_3 \cdot 2SiO_2 \cdot 6H_2O$). The operators have reported tyuyamunite ($CaO \cdot 2UO_3 \cdot V_2O_5 \cdot nH_2O$) to be associated with carnotite. Malachite ($CuCO_3 \cdot Cu(OH)_2$) and azurite ($2CuCO_3 \cdot Cu(OH)_2$) are commonly found in association with uranium minerals, but a higher concentration of these brilliantly colored copper minerals does not necessarily indicate the presence of a higher proportion of uranium. Considerable black carbonaceous material in seams, stringers, and blebs accompanies the uranium minerals. Cross-bedded sandstones overlying the ore zones show much iron stain, mostly limonite, as flecks, blebs, small concretion-like bodies and thin coats on fracture surfaces. Gypsum is not uncommon in thin stringers which are generally parallel to the bedding.

The ore minerals appear to be confined to the lowest sandy beds of the Shinarump formation. Channels cut into the Moenkopi are commonly filled with alternating beds of medium- and coarse-grained sandstones and grits with some thin sandy shales and sandy siltstones. The ore is generally restricted to individual beds in the channel fillings. About 1 to 1-1/2 feet above the top

of Moenkopi thin-bedded red to brown to tan sandstones underlie about 6 inches of greenish-gray shale; this shale zone is reported by the operators to contain the highest-grade ore. Cross-bedding on a small scale is common in the lower Shinarump.

Fracture surfaces (see fig. 2) sometimes have thin coats of ore minerals, but the wall-rock adjoining the fractures is generally unmineralized.

It is believed that meteoric waters, possibly somewhat activated by nearby hydrothermal activity, deposited the ore minerals in particular beds of sandstone, siltstone, and shale that were especially porous and permeable. Whether or not favorable composition of the sandstones was a factor during the ore mineral deposition is not known at this time; however, higher concentrations of carbonaceous material do not seem to indicate higher concentrations of ore minerals. The original source of the uranium is unknown.

Oxidation and leaching of the outcrops containing uranium minerals, according to Phillip Dodd [1], can reduce the U_3O_8 content as much as 0.15 percent;

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[1] Dodd, Phillip, Preliminary report on copper-uranium mineralization of the White Canyon-Happy Canyon type: Colorado Scientific Society, 1951.

---

leaching may extend inward about 5 to 20 feet and oxidation as much as 75 feet inward from the rim outcrops. Strong radiometric indications along the rim may be the result of emanations from disintegration products of the original uranium, so that highly radioactive samples may give low uranium assays.

Each mineralized zone is limited in lateral extent by the lens-like form of the ore-bearing bed; the thickness of the zone is limited to the thickness of the individual ore-bearing bed, which has not been seen to exceed 4 feet. How far the mineralized beds extend inward has not yet been determined, but it

seems reasonable to assume that the inward extent will be at least as great as the lateral extent.

ORE RESERVES

No reserve tonnages have been calculated for any of the four claims examined. At the present stage of development work there is no plausible basis upon which estimates of the lateral, inward, and vertical dimensions of the ore-bodies can be made. It is possible that substantial tonnages of ore may exist behind some of the surface exposures. In the Circle Cliffs district the Shinarump, which is potentially the largest producer, has been at least 80 percent removed by erosion.

The grade of the deposits may be inferred from assays of samples taken from oxidized and leached exposures at the surface.

TABLE I

Sample assays taken from the Shinarump formation in the Circle Cliffs district

Sample Number		U_3O_8 (percent)	Type	Description
USBM 1		0.040	chem.	2.5' cut taken at small opening, Red Head No. 27
" 2		0.047	"	1.5' cut taken at surface, Horse Canyon No. 1
" 3		0.096	"	Ore pile grab, Silver Falls No. 1
" 4		0.055	"	3.5' cut taken at surface, Silver Falls No. 1
" 5	(see fig. 2)	0.222	"	2.5' cut taken in adit, Silver Falls No. 2
" 6	"	0.175	"	2.5' cut taken in face of adit, Silver Falls No. 2
" 7	"	0.037	"	2.0' cut taken in crosscut, Silver Falls No. 2
" 8	"	0.421	"	Ore pile grab, Silver Falls No. 2

Sample Number	U_3O_8 (percent)	Type	Description
Smith-Emery			
338125	1.11	(?)	Red Head No. 143
" 338125	1.00	spectro.	Red Head No. 29
" 339302	5.00	Geiger	Red Head No. 68
	4.77	chem.	
" 339301	1.14	umpire (?)	Silver Falls No. 2
" 339300	0.33	umpire (?)	Silver Falls No. 2

Three U. S. Bureau of Mines samples taken from widely separated areas of mineralization (Red Head No. 27, USBM 1; Horse Canyon No. 1, USBM 2; Silver Falls No. 1, USBM 4; see fig. 3) indicate an average outcrop assay of about 0.047 percent U_3O_8; with an expected increase of about 0.15 percent U_3O_8 beyond the leached zone, the ore-bearing beds may contain about 0.20 percent U_3O_8. Development workings have penetrated the leached zone on only one claim, the Silver Falls No. 2 (see fig. 2), USBM samples No. 5 and 6, taken in the adit, assay 0.222 and 0.175 percent U_3O_8 respectively. These assays tend to substantiate the overall average content of about 0.20 percent U_3O_8.

Samples taken by the Hinds Uranium Corporation and assayed by the Smith-Emery Company of Los Angeles, California, average about 1.67 percent U_3O_8. These assays have not been considered in arriving at the average grade of 0.20 percent U_3O_8, because the method of sampling is unknown.

PROPOSED EXPLORATION

No exploration program has been proposed by the Hinds Uranium Corporation; the following program is therefore suggested.

Red Head No. 27, Lampstand area (see fig. 3).—This claim has an opening extending about 8 feet inward from the face of the cliff. Most of the mineralization is in a lens of thin-bedded, brown sandstone and a thin grayish-

green sandy shale. It is suggested that about 2000 feet of rim-clearing in this area may expose some hitherto unidentified channels, some of which may contain ore minerals. It is also suggested that the present small opening be extended about 100 feet farther inward. Another 100-foot drift should be driven along a mineralized zone not more than 300 yards along the rim from the opening already started. The exact location of the second adit may be designated by the operators, on the basis of radiometric indications and assay data.

The rim-clearing should precede the inward exploration, because the accuracy of radiometric determinative methods increases rapidly as the ore-bearing ledges are exposed; thus the location of the new adit may be determined by more accurate radiometric and assay data.

Horse Canyon No. 1 (see fig. 3).—About 30 feet of rim-clearing comprises the total amount of exploration work on this claim. Thin-bedded brownish-red sandstone and a few thin shales at the base of the Shinarump formation appear to contain the ore minerals. It is suggested that about 1500 feet of rim-clearing may expose further ore-mineral bearing beds. It is also suggested that two 100-foot drifts, not more than 400 feet apart along the rim, be driven on this claim. The exact locations of the drifts, based on radiometric indications and assay data, may be designated by the operators, but the rim-clearing should precede the drifting.

Silver Falls No. 1 (see fig. 3).—The ore on this claim is in the lowest Shinarump in beds of bleached sandstone and grit. About 300 feet of cliff-face has been cleared by bulldozer. It appears that the lens-like beds containing

ore minerals have a lateral extent of at least 250 feet. The lateral extent of these beds may be more accurately determined and new ore-bearing beds may be exposed by about 3000 feet of rim-clearing in this area. It is also suggested that two adits, each 100 feet long, be driven about 100 feet apart; about 50 feet from their portals these adits should be connected by a crosscut. The exact locations of the adits, chosen on the basis of radiometric indications and assay data, may be designated by the operators, but the rim-clearing program should be completed before the drifts are located.

Silver Falls No. 2 (see figs. 2 and 3).—The ore minerals on this claim are in beds of grayish sandstone, sandy siltstone, and gray-green sandy shale in the Shinarump. An adit about 45 feet long has penetrated beyond the leached zone. About 250 feet north of the adit along the rim an adit 10 feet long was driven along a fissure coated with ore minerals. The 45-foot adit appears to be on the northwest flank of a large northeasterly trending channel. It is suggested that about 3500 feet of rim-clearing in this area may aid in delimiting the lateral extent of the mineralized zone now under exploration and may uncover new mineralized channels. It is also suggested that the present 45-foot adit be extended about 75 feet; and about 100 feet south of the present adit a new adit (125 feet long) may be nearer the center of the channel. About 50 to 75 feet from the portal of the new adit a crosscut should be driven to connect with the present adit about 50 to 75 feet from its portal. The exact locations of the new adit and the crosscut, on the basis of radiometric indications and assay data, may be designated by the operators. The rim-clearing program should be completed before driving the new adit, because the increased accuracy of radiometric methods will permit more accurate location of the portal.

It is believed that the suggested exploration program will provide valuable information regarding the lateral and inward persistence of the ore-bearing beds. Penetration beyond the leached and oxidized zones should provide additional information regarding the expected increased U_3O_8 content in the unleached, unoxidized zones. The goals of the suggested program can be accomplished efficiently only by drifting and crosscutting; extremely rough terrain and lack of water make diamond-drilling impracticable. Radiometric investigations are not feasible except for roughly defining ore-zones near the surface or along the rims.

If possible the drifts should stay on the particular beds or channels in which they were started. The crosscuts, generally normal to the axes of the channels, should not attempt to follow high-grade zones; thus the crosscuts will provide a statistical basis for the calculation of the frequency of high-grade zones paralleling the axes of the channels.

The total cost of the exploration program suggested will be $64,645.

SUMMARY AND CONCLUSIONS

The ore deposits of the Circle Cliffs district appear to be confined to the upper(?) Triassic Shinarump formation, which unconformably overlies the lower Triassic Moenkopi formation and conformably underlies the upper Triassic Chinle formation. The Shinarump was deposited on a very irregular erosion surface of the Moenkopi; channels cut in the Moenkopi and filled with Shinarump grits and sandstones may be as much as 50 feet deep and 50 to 100 yards wide.

Most of the ore is in thin-bedded lenticular, brown, gray-green, and red sandstones, sandy siltstones, and sandy shales in the bottoms of the channels. It is believed that porosity, permeability and possibly the favorable composition of individual beds have served to localize the mineralization, but abundant

carbonaceous material does not indicate high concentrations of uranium. Meteoric waters, possibly somewhat activated by nearby hydrothermal action, probably served as the mineralizing solutions.

The ore minerals that have been tentatively identified are carnotite, torbernite, and uranophane. The operators report that tyuyamunite is associated with carnotite. Secondary copper minerals, limonite, gypsum, and carbonaceous material are commonly associated with the uranium minerals. Oxidation and leaching apparently reduce the U_3O_8 content in the surface exposures by about 0.15 percent. Samples taken from the rims assay about 0.05 percent U_3O_8. It is believed, therefore, that the average ore body will contain about 0.20 percent U_3O_8. No ore reserve tonnages have been calculated because there has not been enough exploration work to delimit any ore bodies. There may be substantial tonnages of ore behind some of the leached surface outcrops containing ore minerals.

The suggested exploration program, consisting of rim-clearing and drifting on four claims, is designed to define the limits of the ore-bearing beds known to contain ore minerals along the rim. Further information regarding the expected increase of uranium content beyond the leached and oxidized zone will be provided by drifting. It is also possible that additional ore-bearing channels, thus far undiscovered, will be exposed by the rim-clearing. The Hinds Uranium Corporation property is only in the initial stages of development, it is, therefore, deemed advisable to continue exploration in a more prudent and methodical fashion than the large-scale $500,000 operation outlined by the applicant.

It is recommended that the Defense Minerals Administration enter into a contract with the Hinds Uranium Corporation for an exploratory loan in the amount of $64,645. On the 90 percent participation basis the government will furnish as its share $58,181.

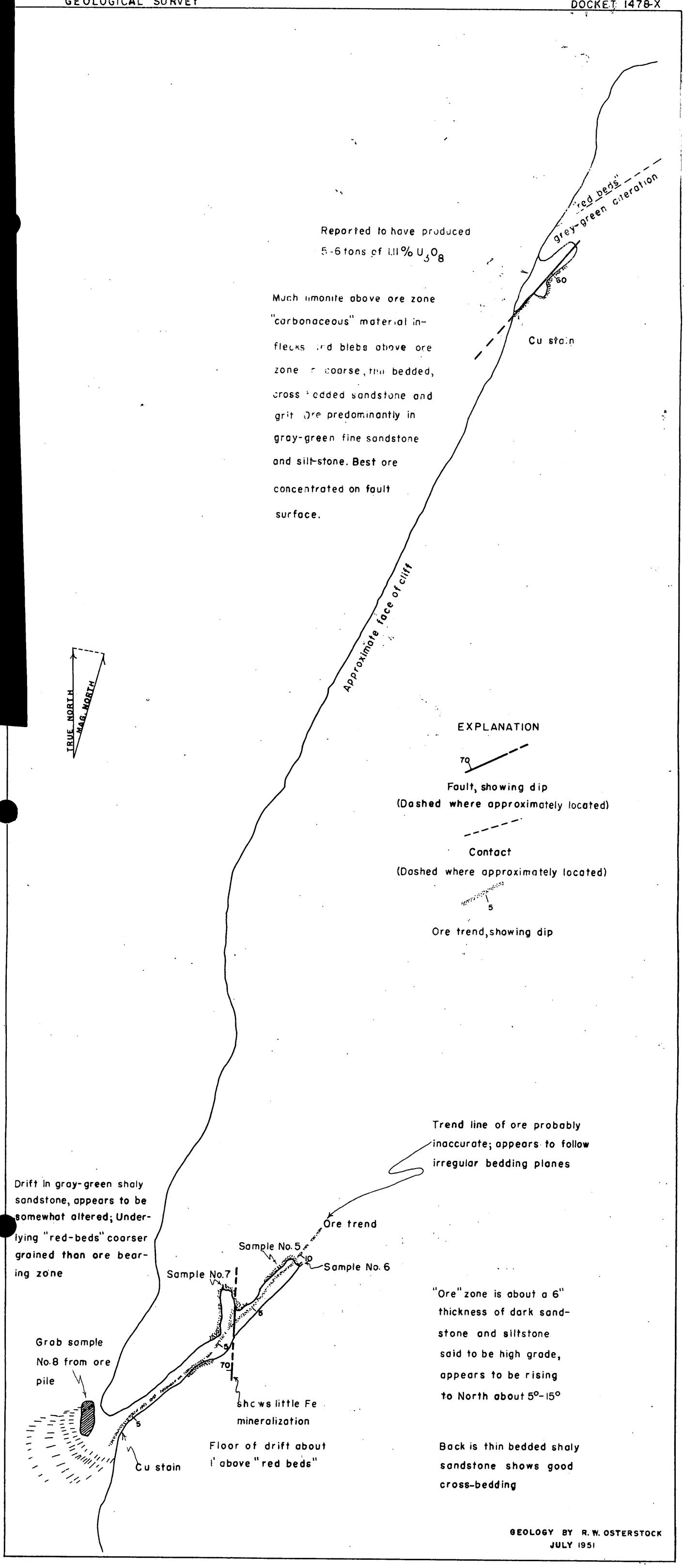

FIG. 2 SILVER FALLS NO. 2 URANIUM PROSPECT
GARFIELD COUNTY, UTAH
(URANIUM)

0 20 40 FEET
Scale

MINES URANIUM MINING CO.
GARFIELD AND KANE COUNTIES, UTAH
DMA-1473-X
Uranium

Engineering Report

by E. K. Thurber, Jr.
Mining engineer
U. S. Bureau of Mines

KINGS MARKET MINING CO.
GARFIELD AND KANE COUNTIES, UTAH

CONTENTS

	Page
Engineering report	
Introduction	1
Acknowledgments	1
Location and physical features	1
History and production	2
Geologic and output	3
Description of the deposits	4
Kinds and reserves	5
Present status	5
Project proposals with costs	6
Proposed financing	13
Conclusions and recommendations	14

ILLUSTRATIONS

Fig. 1 Location map, Kings Uranium Mining Co., Garfield County, Utah

Fig. 2 Silver Falls No. 2 Uranium Prospect, Garfield County, Utah

Fig. 3 Geology between Escalante River and Halls Creek, Garfield and Kane Counties, Utah

Fig. 4 View of camp looking southwest, Kings Uranium Mining Co., Cedar Cliffs unit, Garfield County, Utah

INTRODUCTION

The Hinds Uranium Mining Co., Commercial Bank Building, Richfield, Utah, has requested a DMA exploratory loan of $500,000, Docket 1476-X, to explore the company's uranium properties in the Circle Cliffs area 35 miles east of Escalante, Utah.

No program of exploration has been advanced by the company, with the exception of proposals for clearing ore horizons in accessible areas and driving adits to explore the deposits at depth beyond outcrops.

The property was examined July 1951 by a team consisting of a geologist of the U. S. Geological Survey and a Bureau of Mines engineer. This report appraises the engineering feasibility of proposed exploration on the property and the advisability of a DMA exploratory loan.

ACKNOWLEDGMENTS

The Bureau of Mines wishes to acknowledge the aid given by the representatives of the company in conducting the examining team over the property, and to Mr. Hinds for providing maps and other factual data concerning claims, equipment and assays.

LOCATION AND PHYSICAL FEATURES

The numerous claims held by the company cover a large area in the vicinity of the Circle Cliffs, Garfield and Kane Counties, Utah (fig. 1). The exploration proposed in this report, however, is confined to three areas in which some previous exploration has been done. One of these areas is in Sec. 33, T. 32 S., R. 7 E. The other areas

are on land that has not been surveyed, but probably will be in Secs. 1 and 2, T. 36 S., R. 7 E., and Sec. 13, T. 34 S., R. 6 E., when a survey is made. The camp site, also on land which has not been surveyed, is approximately 44 miles by primitive road from Escalante, Garfield County, Utah.

The Circle Cliffs area is an anticlinal valley trending approximately N. 25° W. and flanked by upper Permian Kaibab limestone and lower Triassic Moenkopi sandstone and shale. The valley is cut by washes that develop into canyons where intermittent streams flow westward to the Escalante River through the younger sediments on the gently-sloping west limb of the anticline. Erosional remnants of Triassic Shinarump and Chinle formations, capped in some places by Jurassic Wingate, form mesas rising from the valley floor. These conditions are illustrated in figure 4.

HISTORY AND PRODUCTION

During most of 1949 and 1950 Mr. Hinds prospected the area of Circle Cliffs and south to the Colorado River for outcrops of ore-bearing lenses of the Shinarump formation. As a result of this prospecting, he located 645 claims in two groups along outcrops of the Shinarump formation.

The Hinds Uranium Mining Co. was formed in February 1951, and exploration was begun a short time later. At the time of the examination the company employed 8 men in exploration and mining operations.

A total of 60 tons of uranium-bearing material has been shipped from the deposits, but only 4.21 tons contained sufficient U_3O_8 to be classed as ore, the remainder being below the minimum grade of 0.10 percent U_3O_8 established by the Atomic Energy Commission. The accepted ore was paid for at the rate of $26.87 per ton, including development bonus, premium payment, and haulage allowance of $0.06 per ton mile for the first 100 miles. The total payment on the shipment was $113.11. This represents the only production from the Hinds property. Other properties in the area are reported to have shipped approximately 500 tons of uranium ores which averaged 0.12 to 0.64 percent U_3O_8.

OWNERSHIP AND EXTENT

The Hinds Uranium Mining Co. holds by location two groups of claims, the Red Hand Nos. 1 to 300, and the Rusty Hand Nos. 1 to 345 inclusive. The company also has leasing arrangements on approximately 2,500 claims in the area.

The claims are located along outcrops of the Shinarump formation and at areas where the Shinarump formation may be covered by younger rocks. The claims are not contiguous and do not cover the entire area. The northernmost group lies in unsubdivided T. 32 S., R. 7 E. The southernmost of the claims lies in unsubdivided T. 39 S., R. 10 E., S.L.B. & M.

It is well to note that the work proposed by the examining team is confined to small areas that are accessible by existing roads and upon

which some work has been done. Figure 3 shows locations of proposed exploration.

DESCRIPTION OF THE DEPOSITS

The Triassic and lower Jurassic rocks of the western limb of the anticline in the Circle Cliffs area dip gently to the west. The ore deposits lie at or near the base of the upper Triassic Shinarump formation. Channels in the Moenkopi are filled with coarse sandstone, conglomerates and sandy shales of the Shinarump formation and have provided favorable conditions for deposition of uranium minerals. In many areas this "channeling" is very readily observed and serves as an apparently reliable guide in prospecting.

The ore horizon sampled in the adit on the Silver Falls No. 2 claim consists of dark sandstone and siltstone showing some carbonaceous material and occasional secondary copper minerals. The horizon lies immediately above a gray-green, sandy siltstone which forms the contact with the underlying Moenkopi formation. In this area the "channeling" is evident in the difference in elevation of the two adits shown on figure 2. The northernmost adit is approximately 25 feet above the main adit, but immediately above the formation contact, yet the bedding in the underlying formation is nearly horizontal. The main adit apparently is near the lowest elevation in this channel.

The locations of samples taken on Silver Falls No. 2 claim are shown on figure 2, and these, with others taken on other claims, are listed below:

Sample No.	Location	Length	Percent Pyr. Sn.	Percent Zinc	Remarks
1	Adit, Red Road No. 27	2.5' cut	0.040	—	Cut in face of adit
2	Surface, Seven Canyon No. 1	1.5' cut	.047	2.15	Cut in outcrop
3	Ore pile, Silver Falls No. 1.	Grab	.096	—	Grab sample of ore stock
4	Open cut, Silver Falls No. 1	3.5' cut	.055	—	Cut in altered zone near vertical "rimrock"
5	Adit, Silver Falls No. 2	2.5' cut	.032	—	Cut in north wall near face
6	Adit, Silver Falls No. 2	2.5' cut	.175	—	Cut in face
7	Crosscut, Adit Silver Falls No. 2	2.0' cut	.057	—	Cut in face of crosscut
8	Ore pile, Silver Falls No. 2	Grab	.421	—	Grab sample of ore stockpile.

MINABLE ORE RESERVES

In view of the few openings that have been made on the property and the limited penetration in the outcrops, a reliable estimate of minable ore reserves is not possible.

PRESENT STATUS

Work accomplished to the time of the examination consisted of cutting a camp (fig. 4), building access roads to various working places, incomplete construction of a road from the area north through Ninde National Forest to Grover, and driving a few short adits on widely-separated claims. Only the main adit on Silver Falls No. 2 claim has been advanced sufficiently to indicate the presence of minable vein ore (fig. 2).

In addition to the above work, some equipment to be installed in a concentrating plant has been purchased and delivered to the camp. This consists of a 15" x 30" jaw crusher, and a pulverizer of undetermined capacity. A Diesel-electric power plant has been purchased but not delivered.

PROJECT PROPOSALS WITH COSTS

The company has not advanced definite exploratory proposals in the application other than a general statement proposing "core drilling, bulldozing and other preliminary mining to determine the extent of seam of the ore bodies..." The cost estimate for this work and supporting activities, including salaries, engineering and management, is $500,000.

Much of the outcrop of the ore horizon is covered by blocky talus from the thick overlying sandstones. The use of a bulldozer to expose fresh faces of the outcrop is a logical beginning of an exploratory program.

Exploratory work on the Silver Falls No. 2 claim and other deposits in the area present evidence that soluble uranium minerals have been leached from the ore horizons at or near the surface. Therefore, the exploratory program proposed for this property includes adits to penetrate outcrops which are known to contain small amounts of uranium minerals.

The equipment on the property at the time of the examination is listed as follows:

2 compressors, 125 cfm., portable rubber-tired, Jaeger
2 jackhammers, dry, with hose and extensions, hand held
1 bulldozer, D-7, Caterpillar and tractor
1 crawler, crawler type, HD-15, with loader attached
1 light plant, 5-kw., gasoline-driven
1 ea. 1,000-gallon water tank, 1,000-gallon gasoline tank, 1,000-gallon diesel fuel tank
2 long stakes wagon, 4-wheel drive
Cook house and camp installation for approximately 20 men
Miscellaneous tools, welding equipment, and grease facilities for equipment and in use

Some milling equipment has been delivered to the camp site, but a consideration of milling is beyond the scope of this report.

A plan for exploratory work on certain areas suggested by the examining team, to require approximately 40 days, follows:

Bin stripping by bulldozer as indicated by ——— $5,000.00
geologic conditions on and near the Red Road No. 27 claim, the Brown Copper No. 1 claim, and the Silver Falls Nos. 1 and 2 claims, 16,000 linear feet at $0.30 per foot

Red Road No. 27 Claim, Longitudinal Area

2 adits, 100 ft. long, 200 ft. total ——————— $4,712.00
at $23.56 per foot

The cost per foot is broken down as follows:

Labor ———————————	$ 6.53
OAI, employment insurance, ———————	.85
workmen's compensation, etc.	
Explosives ———————————	3.18
Caps and fuse ———————————	.48
Repairs to equipment ———————————	1.00
Steel and bits ———————————	.75
Gasoline and lubricants ———————————	.70

Maintenance of drift	$ .56
Pipe (air and water) and track	1.49
Hand tools and miscellaneous hardware	.10
Water haulage	.79
Total direct cost per foot	$ 18.14

Overhead Costs

Engineering, sampling, and analyses	$ 2.30
Supervision	1.00
Camp and commissary	.90
Bookkeeping and office	.40
Sales and use tax	.86
Surface preparation, bulldozing, and labor	.95
Total per foot of overhead	$ 5.41
Total cost per foot of adit	$ 23.55

Lenora Caverns No. 1 Claim

Two adits, each 100 feet long, are proposed on this claim.

Underground exploration conditions are similar to those on the Red Hood No. 27 claim, thus the cost per foot is estimated to be $23.55 per foot x 200 feet ——— $4,710

Silver Falls No. 1 Claim

Two adits, each 100 feet long, are proposed, with a crosscut approximately 50 feet from the portals, a total of 250 feet. Underground exploration conditions are similar to those on the Red Hood No. 27, thus the cost of the proposed work would be $23.55 per foot x 250 feet ——— $5,888

Silver Falls No. 2 Claim

Two adits, each 100 feet long and connected with a crosscut approximately 50 feet from the portals, are proposed on this claim. Underground exploration conditions are similar to those on the Silver Falls No. 2 claim, thus the cost of the proposed adits would be $23.55 per foot x 250 feet, ———————————— $ 5,888

Depreciation on equipment owned by Company

Equipment used in connection with actual exploration:

2 compressors, 185 cfm., portable, rubber-tired - Jaeger, $5,800 ea.	$11,600
2 jackhammers, dry, with hose and accessories — $375 ea.	750
1 bulldozer, Caterpillar, D-7 ————————	13,000
1 tractor-loader, Allis-Chalmers, HD-7 tractor —	6,000
Total cost of equipment used in exploration	$31,350

Allowable depreciation on above equipment:

$31,350 x $\frac{1}{60}$ = $522.50 per month

Allowable depreciation for length of project:

$522.50 x 2 months = $1,045

Equipment used in support of actual exploration:

1 Jeep station wagon, 4x4 ————————	$ 1,400
1 electric generating plant, 5 k.w. ———— gasoline driven	1,500
1 1,000-gallon water tank, 1 1,000-gallon ——— diesel fuel tank, and 1 1,000-gallon gasoline tank, $150 ea.	450
Camp and cooking equipment, approx. value ———	1,500
Total value of equipment owned by the ——— company used in support of exploration	$ 4,850

Allowable depreciation per month on above equipment:

$\$4,500 \times \frac{1}{60} = \$66.67$

Allowable depreciation for length of project:

$\$66.67 \times 2$ month $= \$133$

Equipment that must be procured on a rental basis:

3 compressors, 315 cfm., portable, gasoline, $192 per month x 2 months x 3	$ 1,728
4 jackhammers, wet, mounted with compressors, $66.75 per month x 2 months x 4	534
4 vibrators, air, 3HP x 7" $33 per month x 2 months x 4	264
8 saws, disc, 24 in. ft. $26 per month x 2 months x 8	416
1 bulldozer, D-8 Caterpillar $651 per month x 2 months	1,302
Total rental of equipment on project	$ 4,244

Expenditures in Support of Implementing Work

Improvements at main camp and establishment of existing camps	$ 2,000
Cook and helper (2 months)	1,125
Sanitation for men not engaged in actual exploration	1,200
Water supply development	800
Supervision (superintendent and foremen)	2,800
Engineering (aerial mapping)	3,750
Mechanic and equipment maintenance man and helper	1,400
Truck pushed and transportation	3,500
Miscellaneous bulldozer work clearing camp sites and improving access roads	900
Manager, $600 per month x 2 months	1,200
Office expense (accounting, etc., other than chargeable to units)	500
Sampling and laboratory not chargeable to units	[illegible]
	$27,725

SUMMARY

Direct costs of stripping rims with bulldozer	$ 5,000
Underground adits on Red Road No. 27 claim	4,710
Underground adits on Beaver Canyon No. 1 claim	4,710
Underground adits on Silver Falls No. 1 claim	5,000
Underground adits on Silver Falls No. 2 claim	5,000
Total allowable depreciation on equipment owned by the company	1,307
Rental of equipment	4,672
Expenditures in support of exploration work	32,[illegible]
Total estimated cost of proposed exploration project	$60,779

The most traveled route to the property is by an unimproved road from Escalante via Harris Wash and Silver Falls Creek. This road is dangerous or impassable during flood periods. A second road into the area from Boulder, Garfield County, is traversable in dry weather by four-wheel-drive vehicles only. This route is impractical for continuous heavy hauling.

The distance to the railhead at Marysvale via Escalante, Antimony, and Junction is 136 miles. A road under construction by the company from the area of the Longstaff north across the east side of the Dixie National Forest to the railhead at Sigurd, Sevier County, via Torrey and Lea, would reduce the ore haul to 107 miles.

The company has built an airstrip at the main camp suitable for small aircraft.

The employees of the company live in Escalante and Richfield. It will be necessary to recruit some of the skilled laborers required for the project from larger centers of population in the state.

Any power required for the camp or shop equipment must be generated

at the project, since no power lines cross the area. The present generator capacity is probably sufficient for limited lighting or shop use anticipated on the proposed exploratory project.

Water supply in the Circle Cliffs area represents a major problem. At present, the culinary water is hauled from Escalante, 44 miles distant, and other water is hauled from the Escalante River, a distance of 10 miles. The examining team observed the possibility of developing water in Silver Falls Creek near its junctura with the Escalante River. An item of expense for such development was included in the cost of the proposed project.

It is estimated that the exploratory program as outlined will require approximately 45 days, but delays in procuring equipment and supplies may extend the time to as much as 60 days. Bin clearing and underground exploration may be carried on simultaneously as circumstances dictate.

No plan of development or mining after the exploratory program is completed can be advanced, since the size and character of the ore bodies cannot be accurately predicted. Moreover, the average grade of the ores cannot be estimated from the small amount of work done.

A recapitulation of the costs of the proposed exploratory program from the section on project proposals follows:

Underground and surface exploration	$ 32,075
Activities in support of actual exploration, including camp, commissary, water, transportation, etc.	17,703
Total cost of exploratory program	$ 49,778

The total above represents the entire cost of the program outlined in other sections of the report. No sound estimate can be made of either actual operating costs or possible profit until the exploratory program is complete to indicate the areal extent of the mineralization, the minable thickness, and possible discontinuity of the apparently lenticular ore bodies.

The only criterion for judging possible profit or loss is contained in a settlement sheet furnished the company by an authorized ore purchaser. This sheet showed that 4.22 tons of ore containing 0.23 percent U_3O_8 and 0.07 percent V_2O_5 was paid for at the rate of $26.87 per ton, or $113.12 for the shipment. This included a development allowance of $0.50 per pound of U_3O_8 contained, a premium for U_3O_8 in excess of 4 pounds per ton at $0.75 per pound, and a haulage allowance of $0.06 per net ton mile for 105 miles. No deductions were made for excess lime.

RECENT FINANCING

The physical assets owned by the company and the company's financial statement indicate ability to furnish the 30 percent of the project cost required under DMS regulations.

CONCLUSIONS AND RECOMMENDATIONS

The limited underground work on the Silver Falls No. 2 claim and the surface work accomplished on the Silver Falls No. 1, the Red Mesa No. 27 claim, and the Kenny Canyon No. 1 claim indicate the widespread occurrence of uranium mineralization in the Circle Cliffs area. The ore in the adit on Silver Falls No. 2 claim exhibits apparent increase in grade as the leached and oxidized surface zone is penetrated, a condition noted in other deposits in the Shinarump Formation. Samples in this adit show that ore well above the minimum acceptable grade may be mined on this claim.

In view of the above facts, it is concluded that the Circle Cliffs area is a potential producer of uranium. Thus, it is recommended that a DMA exploratory loan of $49,776 be made to the Kinda Uranium Mining Co.

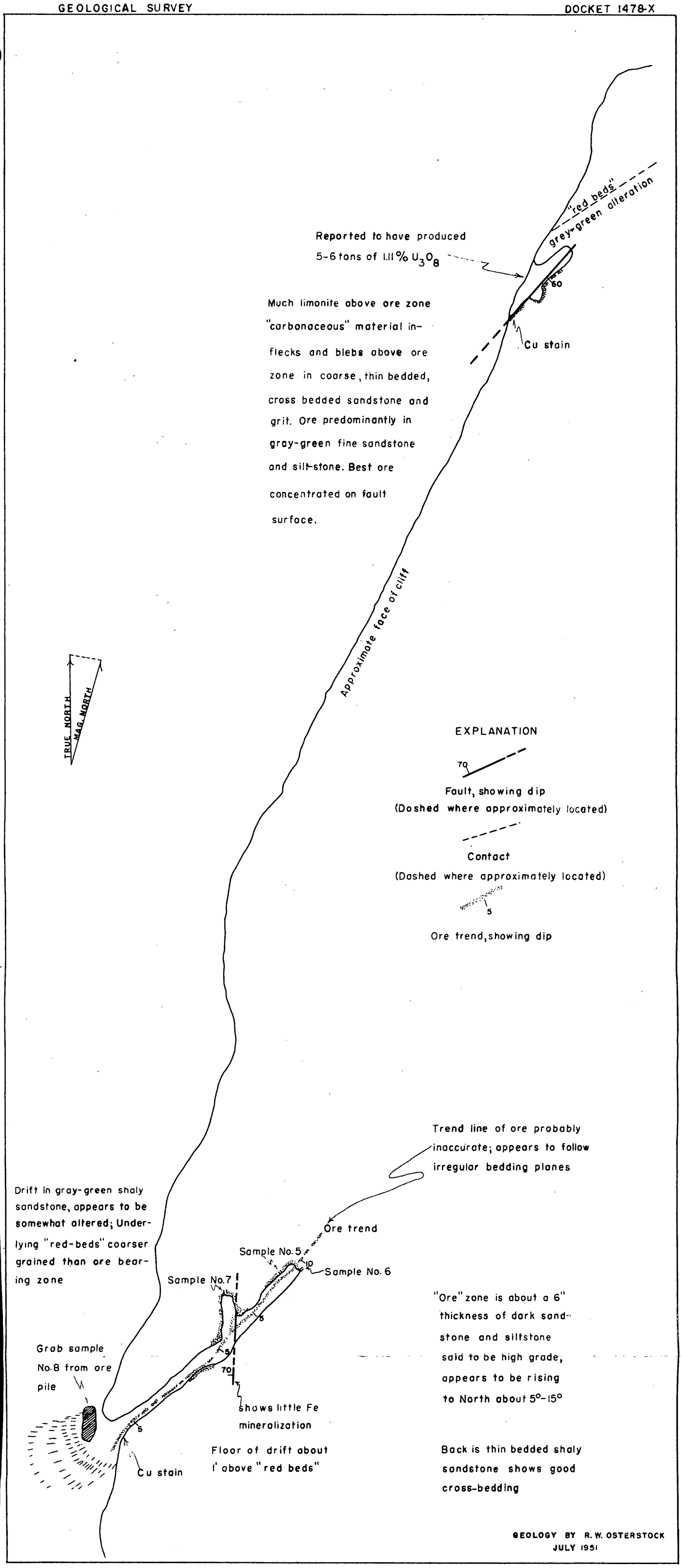

FIG. 2

SILVER FALLS NO. 2 URANIUM PROSPECT
GARFIELD COUNTY, UTAH
(URANIUM)

0 20 40 FEET
Scale

Fig. 4 View of camp looking westwardly, Hinds Uranium Co., Circle Cliffs area, Garfield County, Utah