DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE — Idm-E NO. 733 — DMEA NO. 3266

Application
- [ ] Denied
- [ ] Withdrawn

Contract
- [ ] Terminated - Not Certified
- [ ] Terminated - Certified
- [ ] Cancelled
- [ ] Royalty Agreement

The records contained in this file are marked (x) and arranged in this order:

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [ ] Certification of Discovery
- [ ] Closing Letter
- [x] Cost Audits
- [x] Termination Notice or Agreement 7/25/56
- [ ] Recision Notice
- [ ] Assignment of Contract
- [x] Contract Amendments
- [x] Contract with all exhibits and annexes
- [ ] Owner's Consent to Lien and Subordination Agreement
- [x] Application and attachments

Right Side

- [x] Project summary (final) 7-25-57
- [x] Work Completed analysis (final)
- All other material filed in chronological order including the following reports if checked:
- [ ] Field Team Semi-Annual Report for Certified Project
- [x] Final Field Team Report (Tab) 6-13-57
- [x] Operator's Final Report (Tab)
- [ ] Interim Field Team Reports
- [ ] Operator's monthly reports and all attachments
- [x] On-site Exam Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. 2 : Reports
- [ ] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] Field Team Interim Reports
- [x] Operator's Monthly Reports with transmittal, narrative and maps.

Folders No. _____ : Maps (Use pocket folder or envelope)

Folders No. _____ : Settlement Sheets

Folders No. _____ : Drill Logs

Folders No. _____ : Royalty material

17963

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
	Selfridge	120
1/5	Johnson	110
		100
		220

JAN 6 1965

Big Indian Uranium Corporation
P. O. Box 351
Salt Lake City, Utah

Re: DMEA-3266 (Copper)
Big Indian Uranium Corporation
Big Indian Copper Mine
San Juan County, Utah
Contract Idm-E733

Gentlemen:

By the terms of the subject Exploration Project Contract, as amended, and the royalty agreement in Paragraph 4 of the Termination Agreement dated July 25, 1956, all minerals mined or produced from October 25, 1954, to October 25, 1964, were subject to the Government's percentage royalty as set forth in said contract.

As the period during which production was subject to royalty has now expired, the Government according to its present records retains no claim or lien against the property subject to the contract or any future production therefrom. We, therefore, are closing our books and records on this contract. Your attention, however, is called to the provisions of the contract which require the Operator to keep and preserve certain records for the periods indicated.

Sincerely yours,

George Fumich, Jr.

Acting Director

MMerrithew/mm
1/5/65
cc: Director's Reading File
Region III w/cy of incoming 63 dated 12/8/64
CA&A Division
Docket
Code 120M

23263

OFFICE OF MINERALS EXPLORATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Washington office pertaining to Contract Idm-8733, Docket DMEA-3266 (copper), dated October 25, 1954, with

Big Indian Uranium Corporation
944 South 13th East
Salt Lake City 5, Utah

for the purpose of determining the amount of royalty payable to the U. S. Government on sales of minerals from property referred to as the Big Indian Copper Mine located in San Juan County, Utah, during the period June 17, 1959, through September 22, 1962.

In accordance with the July 25, 1956, Termination Agreement and Article 7 of the contract, royalty is payable on all minerals produced from the land described in Article 2 of the contract for a period of 10 years from the date of the contract or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first. A Report of Review dated October 1, 1956, indicated accepted costs under the exploration contract amounting to $4,732.00 with the Government's contribution on a 50 percent basis being $2,366.00.

The status of the project, the scope of review, and the reasons therefor are stated on page 2.

This review established no sales subject to the Government's royalty subsequent to the period covered by a prior Report of Royalty Review which also found no sales subject to the Government's royalty through June 16, 1959. Accordingly, as of September 22, 1962, the royalty account of this project was found to be:

Total Royalty Payable	$ -0-
Total Royalty Paid	-0-
Balance of Royalty Due	$ -0-

E. D. Talbert
E. D. Talbert, OME Auditor

October 8, 1962

Idm-8733 Big Indian Uranium Corporation DMEA-3266

STATUS OF PROJECT, SCOPE OF REVIEW AND REASONS THEREFOR

This contract provides that the Operator, as principal if the producer or as surety if not the producer, shall pay to the Government a percentage royalty on all minerals produced from 11 patented and 2 unpatented claims located in secs. 27, 28, 33, and 34, T. 29 S., R. 26 E., S.L.M., Big Indian Mining District. At the time the contract was executed the Operator was the owner of the claims by purchase of the patented claims and by relocation of the unpatented claims.

Exploration work under the contract was suspended on May 10, 1955, and formally terminated effective June 1, 1955, by the July 25, 1956, Termination Agreement. No ores were produced during the exploration period. Subsequent examinations of the property and inquiries by DMEA and GMK regional representatives disclosed no production from the property through February 18, 1960.

In a September 22, 1962, reply to a MMK Form 63 inquiry, Leland W. Halvorsen, the Operator's secretary-treasurer, indicated that there had been no production since February 18, 1960. He also advised that the property had been leased to Anderson Bros., but they had not produced anything to that date.

This review was made in lieu of an on-site audit of the Operator's accounts and records for the following reasons:

(1) The files contain no indication of any production from the property since the date of the contract; and

(2) The administrative cost to the Government of an on-site royalty audit at this time would be excessive in relation to the amount of possible royalty which might be disclosed.

JUN 19 1959
O.M.E.

OFFICE OF MINERALS EXPLORATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Executive Officer, OME Field Team, Region III, Denver, Colorado pertaining to Contract Idm-E735, Docket No. IMEA 5866, dated October 25, 1954, with

Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

for the purpose of determining the amount of royalties due the U. S. Government on the sales of copper, from property referred to as Big Indian Copper Mine, located in San Juan County, Utah, during the period October 25, 1954 to June 16, 1959.

Pseudo Certification was effected in Termination Agreement dated July 25, 1956, and accordingly royalty is payable on all production from the land described in Article 2 of the contract for a maximum period of 10 years from the date of the contract. A Report of Review in lieu of Final Cost Audit dated October 1, 1956, indicated accepted costs under the exploration contract amounting to $4,732.00 with the Government's contribution on a 50 percent basis being $2,366.00.

No royalty has been paid to the Government to date in connection with this contract.

This review was made in lieu of an on-site audit of the Operator's accounts and records for the following reasons:

(a) According to the Field Team's Semi-Annual Report of certified project for the period July 1, 1957 to December 31, 1957, operation ceased about June 1, 1955; no ore has been shipped since October 25, 1954; (The date of the exploration contract). Subsequent semi-annual reports of Field Team during period January 1, 1958 to December 31, 1958, indicate the property inactive and no operations or ore shipments are anticipated in 1959.

(b) The administrative costs to the Government of an on-site royalty audit at this time would be excessive in relation to the amount of possible royalty which might be disclosed.

June 16, 1959

Donald T. Finch
Donald T. Finch
OME Auditor

224 New Customhouse
Denver 2, Colorado

August 29, 1957

Mr. E. N. Harshman,
Acting Executive Officer,
DMEA Field Team, Region III
Denver, Colorado

Re: Contract No. Idm-E733
Docket No. DMEA-3266 (Copper)
Big Indian Copper Mine
San Juan County, Utah

Dear Mr. Harshman:

Complying with instructions in letter dated August 26, 1957, from George C. Selfridge, Chairman, Operating Committee, regarding subject Operator, Report of Review dated July 3, 1957, is rescinded and original Report of Review dated October 1, 1956, is reinstated.

Yours very truly,

T H Breading

T. H. Breading, DMEA Auditor.

THB:hh
cc-J. L. Chambers
East/Christensen
DMEA/Gr. Jct.
Townsend (MF-104 File)
Subject
Chron.

DENVER MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REVIEWED REPORT OF REVIEW

7/12 WRB 500.

I have reviewed the Monthly Reports of:

Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

pertaining to Exploration Project Contract No. Idm-2733, Docket No. DMEX-3266, including Amendments Nos. 1 and 2, for the months of February to May, 1955, inclusive, covering a project for the exploration of copper on property known as Big Indian Copper Mine located in San Juan County, Utah.

My review included an examination of the Monthly Reports (Form NF-104) and supporting documents attached thereto, comparison of the costs claimed with the contract and pertinent schedules, consultation with the Executive Officer, DMEA Field Team, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the following reason:

> All of the costs incurred were under a contract provision for payment by the Government on the basis of fixed unit costs for work actually performed.

The review disclosed the following facts in regard to the amount paid or to be paid the contractor:

Total cost as billed by Contractor		$4,732.00
Exceptions: (Schedule attached)		
By DMEA Finance Officer	$ 0.00	
Herewith	500.00	500.00
Total Accepted Cost		$4,232.00

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payment to the contractor by the Government in the amount of Two thousand, one hundred sixteen, and 00/100ths Dollars

** $2,116.00 **

is considered valid and proper, provided that the Regional Executive Officer, the Administrator, or other competent official has accepted or will accept the project as having otherwise met the terms of the contract.

July 3, 1957

T. H. Breding, Auditor

SCHEDULE OF EXCEPTIONS

BIG INDIAN URANIUM CORPORATION

DOCKET NO. BMEA-3266 CONTRACT Iam-E733

Disallowance of $500.00 is made because Operator after repeated requests failed to render an acceptable final engineering and geologic report covering work performed under the Contract, as provided for in Article 6(c) of the contract.

(See letter from Chairman, Operating Committee, dated July 28, 1957 (June 28, 1957.)

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

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REPORT OF REVIEW

I have reviewed the Monthly Reports of:

Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

pertaining to Exploration Project Contract No. Idm-E733, Docket No. DMEA-3266, including Amendments Nos. 1 and 2, for the months of February to May, 1955, inclusive, and Termination Agreement dated July 25, 1956, covering a project for the exploration of Copper on property known as Big Indian Copper Mine, located in San Juan County, Utah.

My review included an examination of the Monthly Reports (Form MF-104) and supporting documents attached thereto, comparison of the costs claimed with the contract and pertinent schedules, consultation with the Executive Officer, DMEA Field Team, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the following reason:

> All of the costs incurred were under a contract provision for payment by the Government on the basis of fixed unit costs of units of work actually performed.

The review disclosed the following facts in regard to the amount paid or to be paid the contractor:

Total cost as billed by Contractor		$4,732.00
Exceptions:		
By DMEA Finance Officer	$0.00	
Herewith	0.00	0.00
Total Accepted Cost		$4,732.00

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payment to the contractor by the Government in the amount of Two thousand, three hundred sixty-six and no/100ths Dollars

** $2,366.00 **

is considered valid and proper, provided that the Regional Executive Officer, the Administrator, or other competent official has accepted or will accept the project as having otherwise met the terms of the contract.

October 1, 1956

T. H. Brading, Auditor

Docket copy

Rubin
Shroyer
"Appd. Sol. Off."
Jerauld
Chamberlin
Selfridge
Jefferson

TERMINATION AGREEMENT

It is agreed this 25th day of July, 1956, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and Big Indian Uranium Corporation, hereinafter called the "Operator," parties to Exploration Project Contract Idm-E733 (Docket No. DMEA-3266), dated October 25, 1954, hereinafter called the "Contract," that:

1. Effective June 1, 1955, the Contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated.

2. The Government shall contribute only to the fixed unit costs of work performed prior to said effective date.

3. The Operator shall promptly perform all winding-up and settlement actions provided for in the Contract, including the rendering of the final report and final account. All rights of the Government under the Contract with respect to records, audits, and recovery of any overpayment are preserved.

4. The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government the royalty on production as provided in the Contract, in the same manner and amount and for the same period as if certification of discovery or development had been made, such certification being hereby waived.

5. The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said Contract, except as otherwise provided in this termination agreement.

IN WITNESS WHEREOF, these parties have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

By C. Mutterdorf
Administrator, Defense Minerals
Exploration Administration

BIG INDIAN URANIUM CORPORATION

By Carl G. Harris

Title President

Hoffhund 2/15/55

No. 2

AMENDMENT OF CONTRACT: No. Idm-E733

Contract Docket No. DMEA 3266, dated October 25, 1954, between the United States of America and Big Indian Uranium Corporation is hereby amended as follows, effective as of the date of the contract:

1. Amendment No. 1, dated December 29, 1954, is cancelled effective as of its effective date.

2. Referring to "Article 3. The exploration project" of Exploration Project Contract Form MF-200(A) (Revised June 1954), following the words "The Operator on or before", delete "30 days from date" and in lieu thereof substitute "February 9, 1955"; following the words "and on or before" delete the figure "8" and in lieu thereof substitute the figure "10".

This amendment shall not be construed to increase the estimated total cost of the project, the amount of the Government's contribution, or any item of allowable cost which is expressly designated "allowable maximum".

DATED JAN 27 1955

BIG INDIAN URANIUM CORPORATION

By Carl J. Harris
Carl J. Harris, President

UNITED STATES OF AMERICA

By W. M. Trever
W.M. Trever, Executive Officer
DMEA Field Team, Region III

Seal

No. 1 Quinn 1/14/55

AMENDMENT OF CONTRACT: No. Idm-8733

Contract Docket No. DMEA 3266, dated October 25, 1954, between the United States of America and Big Indian Uranium Corporation is hereby amended as follows, effective as of the date of the contract:

> Referring to "ARTICLE 3. The Exploration Project" of Exploration Project Contract form MF-800(A) (Revised June 1954), following the words "The Operator on or before" delete "30 days from date" and in lieu thereof substitute "January 9, 1955."

This amendment shall not be construed to increase the estimated total cost of the project, the amount of the Government's contribution, or any item of allowable cost which is expressly designated "allowable maximum".

Dated DEC 29 1954

BIG INDIAN URANIUM CORPORATION

By [signature]
Carl J. Harris, President

UNITED STATES OF AMERICA

By W. H. King
W. H. King, Executive Officer
DMEA Field Team, Region IV

Seal

Docket copy

DEPARTMENT OF THE INTERIOR
Minerals Administration
RECEIVED
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MF-200A
(Revised June 1954)

Docket No. DMEA [redacted]

Commodity [redacted]

Contract No. Idm-E 733

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
EXPLORATION PROJECT CONTRACT[1]
(Short Form)

It is agreed this 25th day of October, 1954, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] [redacted], whose mailing address is [redacted], hereinafter called the "Operator," as follows:

ARTICLE 1. *This contract* is entered into under the authority of the Defense Production Act of 1950, as amended. It consists of this form (MF-200A), the attached Exhibit "A," Annex I, and .....

The Operator shall not transfer or assign this contract or any right thereunder without the written consent of the Government.

ARTICLE 2. *Operator's property rights.*—(a) The land which is the subject of this contract (hereinafter called "the land") is in the State of [redacted], County of [redacted], and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] [redacted] of [5] [redacted] in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] ....., [7] ....recorded in Book ....., page ....., official records of said County; and

(2) The Operator's right, title, or interest (whether as owner, lessee, or otherwise) is subject only to the following claims, liens, or encumbrances: [redacted]

(c) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above, and (if the Operator does not hold the legal title) the Consent to Lien of any holder of the legal title of the land (lessor, seller, optionor, etc.), are attached, as follows: .....

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] Insert name, and if an organization, its nature (corporation and place of incorporation, partnership with names of partners, etc.).
[3] State on a separate sheet marked "Annex I" the legal description or enough to identify the property, particularly excluding any areas from which the production is not to be subject to the Government's percentage royalty.
[4] Insert "owner," "lessee," "contract purchaser," "locator," etc.
[5] Insert "the entire interest," "the mineral rights," "an undivided one-third," etc.
[6] Insert "deed," "lease," "contract," "location notice," "patent," etc.
[7] If not recorded, so indicate by inserting "un."

(d) The Operator shall preserve and maintain his right, title, and interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. Until the lapse of the time within which the Government may make a certification of discovery or development without any such certification having been made, and after any such certification has been made, the Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof. If the Government makes no certification of discovery or development within the time limited in Article 7, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 7(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of [illegible] The work to be performed is described in Exhibit "A." The Operator on or before [illegible] shall commence the work, and on or before [illegible] (unless the Operator's obligation to complete the work is terminated—see Article 8) shall complete the work.

ARTICLE 4. *Performance of the work.*—(a) *Operator's responsibility.*—The work shall be performed with reasonable diligence, efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for liability insurance covering employment; and with suitable and adequate equipment, facilities, materials, supplies, and labor, to bring it to completion within the time fixed.

(b) *Government may inspect.*—The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract, and also after a certification of discovery or development to inspect production operations and underground workings. The operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 5. *Contribution by the Government.*—A fixed cost for each unit of work to be performed (per foot of drifting, per foot of drilling, per hour of operations, etc.) is hereby agreed upon, and is set forth in Exhibit "A" in connection with the estimated total cost of the project in the sum of $[illegible] The Government will contribute [illegible] percent of the fixed unit costs as work is performed, in a total sum not in excess of $[illegible]: *Provided,* That until the Operator has rendered to the Government his final report, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last voucher or vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 6(b), but all payments by the Government are provisional only, subject to audit, until the account between the Operator and the Government is finally audited and settled. To the extent that excesses over fixed unit costs or any excess over the estimated total cost may be necessary for the performance of the work, the Operator shall incur and pay such excesses for his own account without contribution by the Government. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Reports, accounts, audits.*—(a) *Operator's records.*—The Operator shall keep suitable records and accounts of the units of work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine any pertinent books, documents, papers, and records of the Operator. All of the Operator's vouchers and records and accounts relating thereto and the Government's payments thereof remain subject to adjustment until final audit by the Government.

(b) *Progress reports and vouchers.*—The Operator shall provide the Government with five copies of monthly progress reports in three sections as follows: (1) Operator's Monthly Report and Voucher showing a detailed statement of units of work performed during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and the fixed unit costs incurred for each type of work; and (3) a Narrative Report of the work

[illegible] The word "date" refers to the date of the contract.

performed during the reporting period including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground. (Forms for reporting under (1) and (2) above will be provided by the Government.)

(c) *Final report.*—Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with five copies of a final report (in addition to the final progress report and voucher). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and the unit costs thereof.

(d) *Report of sales.*—The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's percentage royalty relates, such as copies of smelter or concentrator settlement sheets, and certified accounts of production and sale or other disposition of production.

(e) *Compliance with requirements.*—If in the opinion of the Government any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the making or completion of such with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records or accounts.

ARTICLE 7. *Repayment by Operator.*—(a) *Certification.*—If the Government considers that a discovery or development from which production may be made has resulted from the work, the Government, at any time not later than six months after a sufficient final report and final account (see Article 6) has been rendered, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

(b) *Royalty on production.*—The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land, as follows: (1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery or development, within a period of ten years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

(c) *Basis for computation.*—The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent), at the point of delivery (the f. o. b. point); *except,* that charges of *the buyer* arising in the regular course of business, and shown as deductions on the buyer's settlement sheets, on account of the cost of treatment processes performed by *the buyer,* sampling and assaying to determine the value of the production sold, and freight paid by *the buyer* to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the crude ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing.

(d) *Unsold production.*—If any production (ore, concentrates, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used by the Operator in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrates, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used by the Operator in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value thereof in the form in which and at the time when it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination, or the market value, whichever is greater.

(e) *Percentages of royalty.*—The percentages of the Government's royalty shall be as follows:

One and one-half (1½) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half (½) percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.

(For instance: the royalty on an amount of five dollars ($5.00) per ton would be one and one-half (1½) percent; on an amount of ten dollars ($10.00) per ton, three and one-half (3½) percent.)

(f) *Time for computation and payment.*—The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be, as above provided in this article.

(g) *Lien for payment.*—To secure the payment of its percentage royalty, there is hereby granted to the Government a lien upon the land or the Operator's interest in the land and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(h) *Notice to purchasers.*—The Operator shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Administrator, Defense Minerals Exploration Administration, or his successor, and his estimate thereof shall be final and binding upon the Operator.

(i) *No obligation to produce.*—Nothing in this contract is to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

(j) *Government not obligated to buy.*—Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals mined or produced from the land.

ARTICLE 8. *Termination of the Government's obligations.*—(a) If in the opinion of the Government operations at any time have failed to achieve anticipated results that indicate the probability of making a worthwhile discovery, and in the opinion of the Government further operations are not justified, the Government may give the Operator written notice thereof, and thereupon the Government shall be free of all obligation to pay on account of units of work not then performed, and the Operator shall be free of all further obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting.

(b) If in the opinion of the Government the Operator is in any manner in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon the Government shall be relieved of all obligation to pay on account of units of work not performed when the notice was given, and the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting. The remedy provided for the Government in this paragraph "(b)" is in addition to any other remedy provided in this contract, and in addition to any other remedy the law may provide for breach of contract.

(c) The giving of any notice by the Government under the provisions of this Article 8 shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights shall be fully preserved.

ARTICLE 9. *Notices to be given by the Government* may be delivered to the Operator, or may be sent by registered mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 10. *Officials not to benefit.*—No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 11. *Changes and added provisions.*—

Nov 9, 1954

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By O. Mittendorf
Administrator, Defense Minerals Exploration Administration

Ching
Ellis
Hoffmeister
Alexander
Selfridge
W. J. Tuson

BIG INDIAN URANIUM CORPORATION
(Operator)

By Carl G. Harris
President

I, Wesley H. Ricks certify that I am the Assistant secretary of the corporation named as Operator herein; that Carl G. Harris who signed this contract on behalf of the Operator, was then President of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Wesley H. Ricks Secretary
Big Indian Uranium Corp.

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—70618-1

Minerals Administration
RECEIVED

EXPLORATION PROJECT CONTRACT
BIG INDIAN URANIUM CORPORATION
DOCKET NO. DMEA-3266

ANNEX I

The property referred to in Article 2 consists of the following claims:

Patented Mining Claims

DURANGO, ANACONDA, PACIFIC, TEXAS, MINERAL POINT, COPPER KING, DANDY JIM, and NEVADA lode mining claims, Survey No. 3995.

UTAH lode mining claim, Survey No. 3997.

FIVE and NINE placer mining claims, Survey Nos. 3996 and 3997, respectively.

Unpatented Mining Claims

Blue Jay or Eureka

La Sal

RECEIVED

EXPLORATION PROJECT CONTRACT
BIG INDIAN URANIUM CORPORATION
DOCKET NO. DMEA-3266

EXHIBIT "A"

Description of the Work

The work consists of exploration by diamond drilling on the land described in Article 2 of the contract and shown on the maps labeled Figure 2 and Figure 3, which are attached and made a part hereof. The drilling shall be subcontracted to an established drilling company and supervised by the Operator.

The drill holes are to test the Burro Canyon formation and Dakota sandstone along the Lisbon Valley fault for occurrences of copper, and the average depth of the holes will be approximately 400 feet. Drill holes shall be of AX core size or larger, and shall be cased where necessary. Both core and sludge samples shall be taken for study or analysis. All core indicating copper mineralization shall be split, one-half to be assayed and one-half to be stored in core boxes for Government use. All holes shall be logged geologically, and the results of such logging shall be submitted to the Government with the Operator's monthly reports. Chemical analyses shall be for copper.

The work shall be done in three stages. If, in the opinion of the Government, the results of each preceding stage warrants it, and the Government approves it in writing in advance, the work outlined in each succeeding stage shall be done. The location, direction, and extent of all work in all stages are subject to the approval of the Government.

STAGE I

Drill four holes to the Lisbon Valley fault at the approximate locations marked I B on Figure 3. The depth of these holes is expected to range from 200 to 500 feet and average about 400 feet. Total footage will amount to approximately 1600.

STAGE II

Drill up to twelve holes as offsets to Stage I holes which encounter ore in the Dakota sandstone or Burro Canyon formation. The number, location and depth of Stage II holes will be dependent on the results of Stage I work, but any offset holes shall be drilled approximately 100 feet from Stage I holes. The depth of Stage II holes is expected to range from 200 to 500 feet and average about 400 feet. The total footage shall not exceed 4800.

STAGE III

Drill up to twelve holes to test areas indicated as favorable by projection of drill hole data from Stages I and II. The number, location and depth of Stage III holes will be dependent on the results of work in Stages I and II. They shall be located approximately 100 feet from previously drilled holes and are expected to range from 200 to 500 feet, and average about 400 feet in depth. The total footage shall not exceed 4800.

Fixed Unit Costs

Stage I		
1600 feet diamond drilling @ $4.55/ft.	$ 7,280.00	
30 analyses for copper @ $1.50/ea.	45.00	$7,325.00
Stage II		
4800 feet diamond drilling @ $4.55/ft.	21,840.00	
85 analyses for copper @ $1.50/ea.	127.50	21,967.50
Stage III		
4800 feet diamond drilling @ $4.55/ft.	21,840.00	
85 analyses for copper @ $1.50/ea.	127.50	21,967.50
Estimated total cost of the project		$51,260.00
Government participation @ 50 percent		$25,630.00

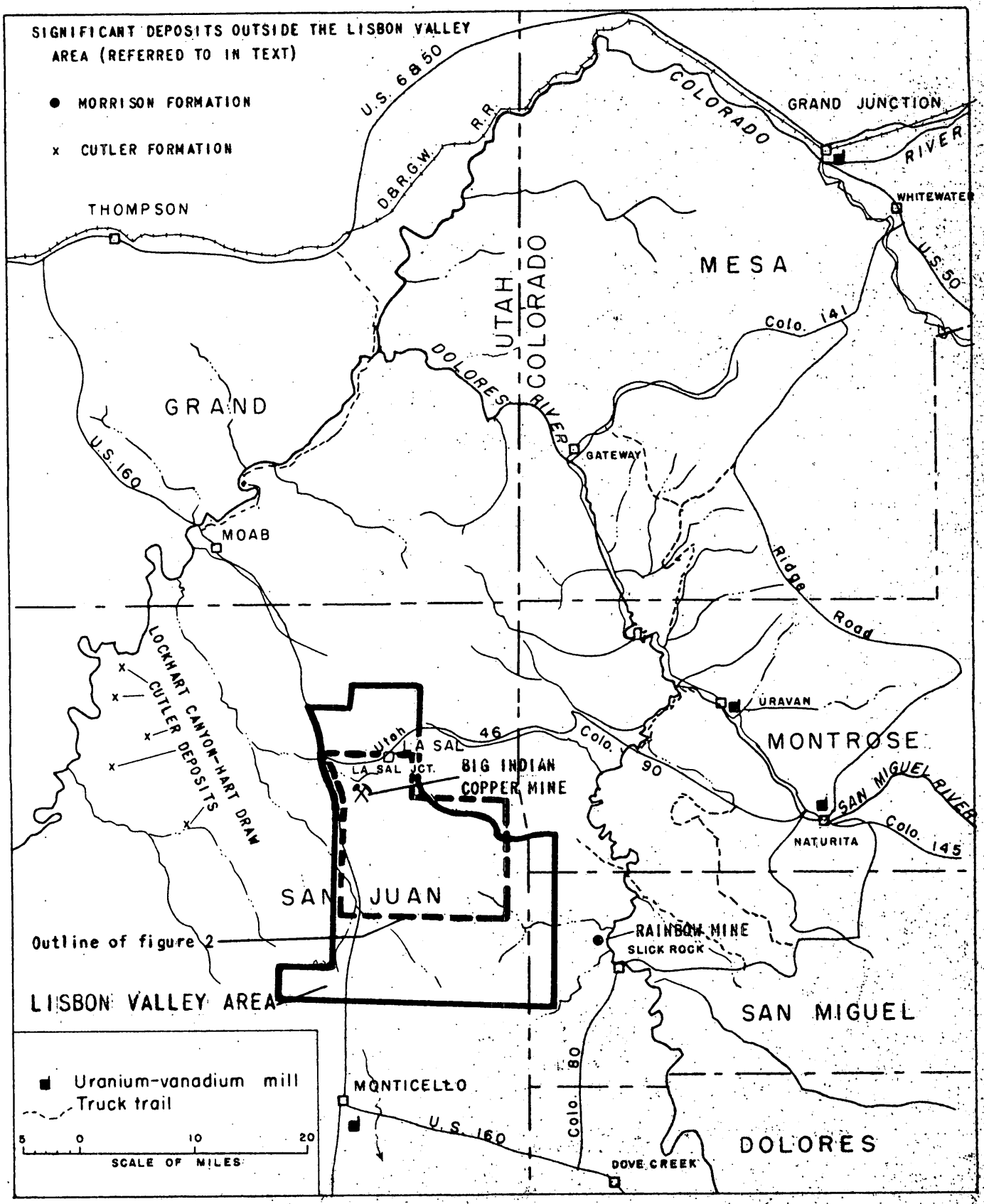

Figure 1. INDEX MAP OF PART OF THE COLORADO PLATEAU SHOWING THE LOCATION OF THE LISBON VALLEY AREA, BIG INDIAN COPPER MINE AND OUTLINE OF FIGURE 2, SAN JUAN COUNTY, UTAH

THE MOSS COPPER MINING COMPANY
ROOMS 9-10-11 NO. 8 WEST CENTER STREET
P. O. BOX 111 TELEPHONE 111
PROVO, UTAH

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 1 - 1954

URANIUM PROPERTIES:
SAN JUAN COUNTY, UTAH
COPPER PROPERTIES:
SAN JUAN COUNTY, UTAH
MINERAL COUNTY, NEVADA

Feb. 25, 1954

Defense Minerals Exploration Administration
Department of the Interior
Washington 25, D. C.

Gentlemen:

Inclosed herewith is our application for a DMEA loan to explore the uranium showings on our Big Indian Copper claims. These are located about three miles north of the now famous Utex (Steen) mine. Strikes of practically equal, if not superior, importance have been made recently in Cal-Uranium and Hudson properties less than a mile west of our property. The Big Indian Copper claims were reported to show uranium and vanadium by John M. Boutwell in 1904, but little value was attached to his report. He called our president's attention to the matter in the early part of 1953, and we were so impressed with his conviction that the Lisbon Valley Fault was a major factor in the uramium deposits of the Big Indian Mining District, that we arranged to buy the old patented claims; and we desire to prove the theory of this grand retired geologist by both drilling and mining methods. He is convinced that we shall find pitchblende on levels that have not been heretofore drilled or explored. Should he be right, such a discovery might well make the district the major producer of the world. We have the most intensely mineralized showing on the Fault.

We have been drilling since last June, chiefly on claims under lease that lie about one mile south of Utex, but shall now put our major effort on the Big Indian Copper claims, and will appreciate the Government's cooperation under the provisions of the DMEA set-up.

Respectfully

THE MOSS COPPER MINING COMPANY

Lyon Neuren

Secretary

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 1 - 1954

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

Not to be filled in by applicant

Docket No. 3266
Metal or Mineral Uranium
Date Received
Estimated Cost $142,798
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address:

INSTRUCTIONS ARE ANSWERED IN THE ATTACHED SHEETS.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.....

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☐ Money ☐ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated February 24, 1954

The Moss Copper Mining Company
(Applicant)

By Don Newren

Secretary

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

The Moss Copper Mining Company, Room 9, No. 8 W. Center St., Provo, Utah

APPLICATION FOR AID IN AN EXPLORATION PROJECT, Pursuant to DMEA Order 1, Under the Defense Production Act of 1950, as Amended

1. Name of applicant. The Moss Copper Mining Company
P. O. Box 111
Provo, Utah

(b) Applicant is incorporated under the laws of Utah and is in good standing.

(c) Officers and their addresses are as follows:

Name	Address	Position
Carl J. Harris	405 S. 4th W., Provo, Utah	President
Joseph Hafen	146 S. 4th W., " "	Vice President & Manager
Leon Newren	Room 9, #8 W. Center St., Provo	Secretary-Treasurer
Geo. A. Sims	278 Canyon Road, Salt Lake City	Director
Gordon C. Young	167 Third Avenue, " " "	"

The above five constitute the Board of Directors

2. General. This application is in quadruplicate with name and address of applicant on each sheet.

3. Applicant's property rights.

(a) Applicant has acquired under a contract of sale agreement eleven patented lode and placer mining claims in the Big Indian Mining District, San Juan County, State of Utah, designated as: Durango, Anaconda, Pacific, Texas, Mineral Point, Copper King, Dandy Jim, and Nevada lode mining claims, Survey No. 3995; and Utah lode mining claim, Survey No. 3997; and Piute and Mono placer mining claims, Surveys 3996 and 3997 respectively.

(b) The mine has a rather colorful past and is widely known as Big Indian Copper.

(c) Applicant's interest in the patented claims is as purchaser under contract with final payment of $4000 due July 1, 1954.

(d) Copies in quadruplicate of the "Option Agreement" covering the claims accompany this application.

(e) There are no past due taxes, liens, nor encimbrances on the claims.

(f) Not applicable.

4. Physical Description.

(a) Applicant has no maps nor data of predecessors' operations, but it is common knowledge that considerable shallow and surface mining was done by the original owners, the Loose-Smoot interests of Provo, Utah, and later by the Ohio Copper Co. under a lease agreement, to develop and mine the copper deposit. A large mill was erected by Ohio Copper Co., but the only evidence of it now is the concrete footings of the buildings and machinery and the open cut from which the crude ore was obtained to run the mill. Underground workings are inaccessible, but an incline shaft will be reopened and extended. A drill

rig is now drilling under a footage contract a 1000' hole. It is thought that the location will permit exploring the Brushy Basin, Salt Wash, and lower portion of the Morrision formation before the drill encounters the Lisbon Fault wall. Another crew is preparing to extend an old incline shaft, erecting a head frame, installing a pump, and a 500 c.f.m. portable air compressor. The incline is full of water and mill tailings and will have to be cleared before mining can be started. It should be accessible before the next ten days have ended.

(b) Applicantx has no record of past production and has not produced any ore since acquisition of the property in June 1953. The open-pit workings disclose a probable million tons of 2 to 3% copper, and a recent drill hole showed about 10 feet of a higher grade at about 160' with still more at 230 to 300 feet, the latter of more chalcopyrite showings. If these ore showings are in a sandstone bedding like the open-pit deposit, the copper reserves would be in the millions of tons. Applicant believes it is significant that the copper ore carries as high as .044% uranium.

(c) The geology of the property is discussed by Mr. Halvorsen in his accompanying geological report. With the report ix are maps of the district and of the propoerty, which you may retain.

(d) The property is crossed by the road going south from highway 46 at La Sal which continues southwesterly until it reaches highway 89 about 15 miles north of Monticello. If the ore found were amenable to the treatment at the AEC's mill at Monticello, it would be trucked to that point a distance of about 25 miles; if it were to be treated at other mills, it would likely to trucked to the RR at Thompsons about 85 miles. Some supplies are available at Monticello and Moab, but most of the equipment would be bought in Grand Junction, Colo., and Salt Lake City, Utah. Workers in the area are living as far away as Moab, but applicant expects the crew to be boarded and lodged in the house on the property. At present the men frequently drive home on weekends.

(e) Manpower is available from local settlements and applicant has several applications from men in the Tintic and Park City mining districts. Gas, diesel fuel, oil, grease, lumber and timber, and explosives are available In Monticello and Moab. Drill rig and accessories are also available in the area, but the other equipment will likely come from Grand Junction and Salt Lake City. Two wells on the property will supply all the water needed. Power will be furnished by diesel engines and gas engines. The Utah Power & Light Co. is considering extension of its power line from Moab, so electricity may later be available.

5. The exploration project.

(a) Applicant will explore for uranium.

(b) Applicant will explore by diamond drilling the Morrison and lower formations. The Lisbon Valley fault crosses the property and the holes will be drilled on the higher faulted segment. (One of these has already been drilled 225', another 300' in addition to two shorter holes on the lower faulted segment.) Map of plan accompanies this application and shows the sites of the proposed holes. One of the objectives is to determine whether uranium makes on the Lisbon Valley Fault - and if it becomes enriched at deeper levels. There is a distinct possibility of encountering pitchblende as depth is attained.

Another objective is to determine the area or lateral extent of the ore deposition.

(c) The work will start within 30 days and be completed within 24 months from the date of signing of contract.

(d) Applicant has already drilled 4 holes, two on each side of the fault, and has been engaged since June 1953 in drilling 1200 acres under lease agreements about 5 miles south of the Big Indian Copper and about 2 miles south of the Utex (Steen) mine. Most of the holes have been drilled by its own crew, but some by Minerals Engineering Co. under a drilling contract.

Joseph Hafen, general manager, is supervising operations. His driller is Eldred M. Garrick, an experienced operator. Mr. Hafen has had mining experience in (1) producing $170,000 of silver ore from the Tempiute Mine in Lincoln County, Nev.; (2) as a lessee in the silver-lead Pacific Mine of American Fork Canyon, Utah; (3) as manager of the Old English Gold mine in Nye County, Nev.; (4) as a contractor of the Morgan uranium mine at Leeds, Utah; and (5) as a manganese mine lessee in the Detroit Mining District, Millard County, Utah, and at the Battle Mountain deposit near Battle Mountain, Nevada. He has also been a trucking contractor, and a foreman for W. W. Clyde Construction Co. of Springville, Utah. He is experienced in the handling of men and equipment.

Office and clerical requirements will be handled by Leon Newren at Provo, Utah. He has been in the office of the Knight mining interests since 1913.

Financing arrangements are taken care of by directors, Gordon C. Young and Geo. A. Sims of Salt Lake City, Utah.

6. Estimate of costs:

(a) Does not intend to let contracts.

(b) Labor, supervision, consultants:

Drill Crew:

1 driller 500 days @ $20	$10,000.00	
overtime	840.00	
1 helper 500 days @ $16	8,000.00	
overtime	672.00	
1 supervisor, ½ time ($600 per mo.)	7,200.00	
1 consultant	2,000.00	$28,712.00

Mine Crew:

2 miners, 500 days @ $16	16,000.00	
overtime	1,344.00	
2 muckers, 500 days @ $15	15,000.00	
overtime	1,260.00	
1 hhoist-top man, 500 days @ $14	7,000.00	
overtime	588.00	
1 ~~supervisor~~ supervisor (½ $600 mo.)	7,200.00	$48,392.00
		$77,104.00

6. Estimate of costs (continued from page 3)

(c) Operating materials and supplies:

Drilling:

Gasolene, 6000 gal. @ 30¢	$ 1,800.00	
Grease for drill rods, etc.	600.00	
Oil	100.00	$ 2,500.00

Mining:

Explosives	6,200.00	
Track, 1200' Mine rail	150.00	
" ties	30.00	
" fittings & spikes	15.00	
Pipe, 3100' 2" Black @ 40¢	1,240.00	
" 3100' 3/4" " 20¢	620.00	
" 3100' 8" Vent @ 60¢	1,860.00	
Gasolene for hoist, 3000 gal.	900.00	
" " pump, 3000 "	900.00	
" " truck 1500 "	450.00	
Oil and grease	100.00	
Lumber and timber	200.00	
Carbide	100.00	12,765.00

(d) Operating equipment:

1 Standard Joy 22 HD Truck Mounted Core Drill (Overhauled in A1 condition)	10,000.00	
Rods, Core barrels, Casing, D.D. bits	5,000.00	
1 Mucking machine	3,000.00	
2 Rubber tired shuttle cars	5,000.00	
1 Mine hoist with gas engine	1,000.00	
Cable	150.00	
1 Skip	150.00	
		24,300.00

Depreciation on following:

	(Cost)		
1 Truck with water tank,	$1000.00	500.00	
1 500 c.f.m. Air compressor,	$7,000	3,500.00	
1 Jeep,	$ 700	350.00	
(Depreciation based on 25% annual)			
1 G-D Sinker air drill	$400.	400 .00	
1 Cleveland " "	600.	600.00	
1 Air blower & motor	150.	150.00	
1 Air receiver tank	100	100.00	
2 Pressure water tanks	100	100.00	
(Depreciation based on 50% annual) (for 2 years)			5,700.00

6. Estimate of costs (continued).

(e) Rehabilitation and repairs. None.

(f) New buildings, improvements, installations.

Equipment and machine shed	$ 800.00	
5 beds for bunkhouse	200.00	$1000.00

(g) Miscellaneous.

Repairs and upkeep:

Diamond drill bits	$5000.00	
Drill rig engine & pump	1000.00	
Air drill steel and bits	500.00	
Air & water hose	150.00	
Air hammer repairs	75.00	
Assaying	250.00	
Accounting	5000.00	
Workmen's compensation & liability insurance	3832.09	
Employers Soc.Sec. Tax	1540.00	
Unemployment Compensation tax	2082.00	19429.00

TOTAL. $142798.00

7. We are prepared to furnish our share of the cost of the proposed project in in accordance with the regulations on Government participation.

We will furnish in

Cash	30000.00
Use of equipment owned by us .	5700.00
	$35700.00

Addenda to Item 5 (b).

In addition to the drilling program, applicant proposes to extend by 300 feet an old incline shaft. At that depth the hole will have passed through the elevations at which the recent drill hole encountered copper ore at 160' and again at 230'. On account of the brecciated conditions and water course that were found between 230' and 300' the cores and drillings were very unsatisfactory, and it is therefore intended to drift from the incline shaft to explore this brecciated zone. As already mentioned drillings from it, showed nearly a pound of uranium per ton associated with the copper. This drift or crosscut is projected as 800 feet from the shaft. At the most favorable site in the drift, it is proposed to drift at approximately right angles both northerly and southerly along the course of the Lisbon Valley Fault 2000'. Total footage of shaft, crosscut and drifts, 3100 feet.

REPORT ON THE GEOLOGY OF MOSS COPPER MINING COMPANY PROPERTIES.

By L. D. Halvorsen

November 1953

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CHARACTERISTICS OF ORE DEPOSITION

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ILLUSTRATIONS

FIGURE ONE CROSS SECTION OF BASAL CHINLE ..... Text.

FIGURE TWO CHANNEL DEPOSITION ..... Text.

GEOLOGICAL MAP AND STRUCTURAL CROSS SECTION ..... Pocket.

PROPOSED CORE HOLE MAP. BIG INDIAN ..... Pocket.

STRATIGRAPHIC COLUMNAR SECTION ON GEOLOGICAL MAP.

Casper, Wyoming.
Dec. 16, 1953

TO: MOSS COPPER MINING COMPANY

SUBJECT: REPORT ON THE GEOLOGY OF MOSS COPPER MINING COMPANY PROPERTIES.

INTRODUCTION

Properties of the Moss Copper Mining Company lies in the Big Indian District, the site of previous important uranium discoveries. This area is rapidly becoming the most prolific uranium deposit in the United States. The Big Indian District is located in Southeastern Utah, approximately thirty-five miles south of Moab, Utah.

Moss Copper Mining Company properties include about eight hundred acres of leased land in sections 13, 14, 23, and 24 in T. 30 S., R. 24 E.; two hundred acres of patented mining claims in sections 27, 28, 33, and 34 in T. 29 S., R. 24 E., San Juan County, Utah.

The "copper" properties (patented mining claims) lie on and parallel the Lisbon fault, a major structural feature of the Big Indian District. The leased properties lie on the southwest flank of the Lisbon anticline and lie one mile south of the initial discovery of uranium in the district.

Four days were spent in the area, three of which were on the leased land and one on the Copper property. This work was done Nov. 10-13, 1953.

REGIONAL GEOLOGY

The main structural feature of the area is the Lisbon anticline trending northwest-southeast. The Lisbon fault is a longitudinal normal fault along the southwest limb near the crest of the structure. The fault has approximately 3200 + or - feet of displacement. The structure is bounded by Disappointment syncline four miles to the northeast, a Tertiary intrusion (La Salle Mountains) about fifteen miles northeast, a Tertiary intrusion several miles to the southwest. All of the mineralization of the area has

been confined to the southwest flank of the anticline near its northern extremity at the present time. Geological formations outcropping in the vicinity, range from Pennsylvanian to Cretaceous (Hermosa to Dakota) in age. Three of the four principal producing formations of uranium in the Colorado Plateau are present (Morrison, Entrada, and Chinle). Only the Chinle formation is producing ore at the present time within the Big Indian District. The Moenkopi formation has produced in several areas withing the Plateau Province and is commonly found associated with copper deposition. It is possible that a splinter of Moenkopi exists in the southern portion of the leased land. There is convergance between the base of the Chinle (Triassic) formation and the underlying Cutler formation (Permian).

The area lies in the Paradox Salt Basin.

CHARACTERISTICS OF ORE DEPOSITION

Leased Land and Chinle Deposition

Production of ore in the Chinle formation is usually confined to the basal part of the section which is composed of channel-type deposits. The basal sand section ranges from seventy-five feet thick to five feet thick. Mineralization occurs adjacent to or in old channel trends. Greater thicknesses of the basal sand section are favorable for deposition while the thinner sections rarely carry mineralized zones. In future exploration, thicknesses of the basal section should be watched carefully and plotted on an aerial mosaic. This information may be used to form an isopachous map which will show channel trends and possible sites of mineralization. Figure one shows a cross section from location X-1 (Steen's area) to X-5 location at the southern end of the leased land. These locations are shown on the Geological map. Mineralized zones can be noted in the thicker sections. X-2 and X-3 were on the south and north zones of the channel. Direction of flow of these channels is shown by the arrows on the geological map. A detailed sketch

(Fig. 2, A) of a channel found by the writer shows a mineralized zone in channel-type deposition at location X-3 (scale 1" = 4 ft.). The mineralization is along a bedding plane and has spread out into the adjacent sandstone from two inches to twelve inches. Determination of direction of flow if shown by sketch (Fig. 2, B and C). Change of direction of flow usually results in deposition of carbonaceous material which reacts as a precipitant, possibly through the agency of methane or hydrogen sulphide resulting from the reduction of the carbonaceous material. The two areas (X-3 and X-2) occured on the flanks of a channel and mineralization was found by the writer in the basal section of the Chinle. The lacustrine phase of the Chinle above the basal sand section has shown little or no mineralization. The small shows of mineralization below the basal sand section on the leased land is possibly in a sliver of the Moenkopi formation in typical coarse channel type sands. In figure one, the cross section shows convergence of the Chinle and Cutler formations using a massive sandstone as a datum plane. Due to the southwest dip of the strata, the ore-producing horizon of the Chinle lies buried by the younger Wingate (Jurassic) formation, therefore, neither thicknesses or channel trends in the western portion of the leased area could be obtained. The basal sandstone section could be thicker in this part of the leased land, but from indications of channel trends in the eastern part of the block, it is feasible to assume that they will be approximately the same or slightly thinner. The thinning of the basal sands in this area eliminates chances for a geological enviroment normal to one associated with uranium mineralization.

The trends of the ore bodies are hard to determine because of the lack of development at the present time. From indications of channel trends and reports from a few holes, the trend seems to be a little north of west (approximately N 75° W). This would mean that the Cal-Uranium discovery is a separate ore body from Steen's original discovery. The ore bodies are probably tabular with their long dimension in a westerly direction.

The most important feature of this type of deposition is the presence of channels in a zone of thickening of the basal sand section. The carbonaceous material should accompany this type deposition.

BIG INDIAN COPPER PROPERTIES

Only one day was spent by the writer in this area which was indufficient to evaluate this property; however, the following findings are included in this report. The map showing proposed core holes accompanying this report shows the maximum number of holes to fully evaluate the property. Some of the holes may be eliminated with additional geological investigation.

The fault plane and other minor fractures show mineralization of Azurite and Malachite with some native copper. Both tailings and water from the mine have shown considerable radio-activity. In a shallow core hole, 0.05% U_3O_8 was found in the oxidized zone. In studies of previous copper-uranium deposits, it has been noted that deposits assaying near c.15% U_3O_8 in the oxidized zone have proven commercial deposits in the unoxidized portions. Uranium minerals are very unstable and soluable in water which usually results in re-distribution by meteoric waters. Pitchblende is very susceptible to action of water and is usually redistributed in form of common secondary minerals. If the ore in this district were syngenetic, it is very unlikely that the pitchblende would still be in its original form. The occurence of pitchblende in the Big Indian District suggests a close proximity of source and possibly late Tertiary in age. The source of this mineralization could very well be the Lisbon fault. The writer feels that the age of the mineralization could be approximately the same as the nearby Tertiary intrusions. This is only the writer's opinion with insufficient facts, but should be investigated further.

The copper properties have two chances for possible ore deposition. One in the fault plane itself especially in the junctions of the cash fractures and joints with the fault plane. The other could occur in the typical host rocks of the Morrison formation in the hanging wall. The entire Morrison formation

lies in contact with the fault plane. This formation is one of the most common uranium-producing formations of the Colorado Plateau. The Entrada formation, another uranium host, will be in contact with the fault plane at deeper depths in the middle portion of the property.

The determination of the age of the fault and the mineralization is very important in future exploration.

MINERALOGY

Pitchblende, Autunite, and Tyuyamunite, are the most common minerals found in the area. The writer found some carnotite at location X-3 on the geological map. Pitchblende usually occurs in veins with sulphides, especially copper sulphides and hydrocarbons. Cobalt and nickel minerals are common associates. Many of the gangue minerals were found in the fracture planes within the fault zone. Silicification of the sands along with the fault trace is very common. Mineral assemblages suggest epithermal conditions. Reports of chalcopyrite in the deeper zones in one core hole shows possible sulphide deposition in the unoxidized zone.

Calcite is associated with the rich ores. This calcite seems to be of secondary origin when associated with the ores and appears to be deposited simultaneously with the ore or possibly slightly later. The poor mineralization found in the outcrop by the writer had no calcareous material of any type. The sandstone that it occured in was non-calcareous.

DRILLING

Drilling within the leased area should be confined to the western portion. This drilling should be confined, if possible, in drainages to eliminate unnecessary drilling. When holes are spudded in the Chinle, the upper Cutler formation should be checked when within reasonable drilling depths (500'). This area is worthy of fulfilling drilling commitments because of its position near known uranium production.

Drilling within the copper properties should test the fault plane and also all of the basal Morrison formation. The accompanying map of the copper

properties show a pattern for drill holes. The holes along the fault plane as far as the 400 ft. contour should be drilled first. The writer suggests that metal mud tanks be used with a minimum of three tanks for settling. All sludge should be caught and figured in with any assays along with the core. When going into the hole after changing bits or making connections, water should be circulated for a minimum of thirty minutes in order to clear hole of cavings.

All minerals should be identified for possible temperature guides or critical ore and gangue minerals. Proving up this property without additional geological work will require approximately thirty holes to check the fault plane and the Morrison formation. It is very important to follow drilling and locate all holes on a map or aerial photos. All holes should be logged carefully. The fault plane should be definately located by drilling. If mineralization is located by drilling, a closer drilling pattern should be set in order to determine the trend and ore body outline.

CONCLUSION

The copper property seems to be the more promising of the two properties. The copper property has all of the mineralogical assemblages and geological environment for uranium mineralization. The possibility of the fault providing the necessary solutions for mineral deposition causes this area to be very interesting as a uranium prospect.

Mineral assemblages suggest epithermal type deposition with possible depth limit between 1800' to 2500'. Present drilling will provide information in guiding future exploration.

A S S I G N M E N T

DEPARTMENT OF THE INTERIOR
Bureau Minerals Administration
RECEIVED
MAR 1 - 1954

For value received, I, CARL J. HARRIS, of Provo, Utah, do hereby sell, assign, and transfer to THE MOSS COPPER MINING COMPANY, a Utah corporation of Provo, Utah, all of my rights, title, and interest in that certain Option Agreement of July 23, 1953, between Anita P. Smoot and Harlow E. Smoot as "Optionors" and Carl J. Harris as "Optionee". Said Agreement is an option to buy the following lode and placer mining claims situate in the Big Indian Mining District, San Juan County, Utah, namely, Durango, Anaconda, Pacific, Texas, Mineral Point, Copper King, Dandy Jim, and Nevada lode mining claims, Survey No. 3995; Utah lode mining claim, Survey No. 3997; and Piute and Mono placer mining claims, Surveys 3996 and 3997 respectively; for and during a period of time to and including twelve o'clock midnight on July 1, 1954, subject to terms, conditions, agreements, covenants, and understandings specified therein. Dated, July 28, 1953.

Carl J. Harris

Witness:

Lyon Neuren

OPTION AGREEMENT

* * * *

WHEREAS, ANITA P. SMOOT, of Provo, Utah County, Utah is the owner of the hereinafter described mining claims, and HARLOW E. SMOOT, her husband, of the same place, joins with her in making this option agreement, in order to pass any rights he may have in said property, and, whereas said ANITA P. SMOOT, and HARLOW E. SMOOT are hereinafter referred to herein as the "OPTIONORS", and,

WHEREAS, one CARL J. HARRIS, of Provo, Utah County, Utah, is desirous of obtaining an option to purchase the said hereinafter described mining ground and mining claims, and whereas said CARL J. HARRIS is hereinafter referred to as the "OPTIONEE",

NOW THEREFORE, for and in consideration of the sum of one thousand dollars ($1,000.00) lawful money of the United States of America in hand paid by optionee to optionors, and receipt whereof is hereby acknowledged by optionors, the said optionors do by these presents give and grant to optionee, or his assigns, the exclusive option to purchase the following described lode and placer mining claims (all patented) situate in the Big Indian Mining District, San Juan County, Utah:

> DURANGO, ANACONDA, PACIFIC, TEXAS, MINERAL POINT, COPPER KING, DANDAY JIM, NEVADA lode mining claims, designated as Survey No. 3995,
>
> UTAH lode mining claim, designated as SURvey No. 3997,
>
> PIUTE and MONO placer mining claims, designated, respectively as Surveys No. 3996 and 3997;

for and during a period of time to and including twelve o'clock midnight on July 1st, 1954, strictly upon, subject, and conformable to the following terms, conditions, agreements, covenants, and understandings, to-wit:

(1) Optionors agree that optionee, or assigns, may purchase the above described lode and placer mining claims as a unit, during the period hereof, provided all the terms and conditions of this agreement to be kept and performed by optionee, or assigns, are well and truly and timely performed, but, said option is subject to sooner termination or forfeiture as hereinafter provided.

(2) Optionee, or assigns, is/are to pay for said mining ground and mining claims, the sum of ten thousand dollars ($10,000.00), in lawful money of the United

States of America, and a six percent (6%) interest in any corporation to which said option is assigned, or which may be formed to take over the same, provided, however, that if said corporation to which said option is assigned further transfers said option, or the deed to said ground, or title to said ground is transferred to another corporation or corporations, optionors, or assigns or successors of optionor to all or any of his shares of stock, shall upon surrender of same, be and become entitled to a proportionate part of the stock of such company which ultimately becomes the owner of said ground, as more fully hereinafter set out, said payments to be paid over to the optionors, or assigns, in the amounts, and at the times and places as hereinafter next set out:

(a) The one thousand dollars ($1,000.00 or $1000) paid simultaneously with the signing of this agreement shall be considered the first payment on and toward said ten thousand dollar total, and, there shall be likewise issued and delivered to the optionors, as soon as possible after the signing hereof, shares of stock equivalent to six-tenths (.6) of one percent (1%) of the capitalization of any company to which this option is or may be assigned.

(b) One thousand dollars to be padi on orbefore August 1st, 1953, together with an additional six-tenths (.6) of one percent (1%) of the shares of stock of the capitalization of any company to which this option is or may be assigned.

(c) One thousand dollars to be paid on or before August 10th, 1953, together with an additional six-tenths (.6) of one percent (1%) of the shares of stock of the capitalization of any company to which this option is or may be assigned.

(d) Three thousand dollars to be paid on or before January 2nd, 1954, together with an additional one and eight-tenths (1.8%) of the shares of stock of the capitalization of any company to which this option is or may be assigned. The three thousand dollars ($3,000.00) above to be paid in any event.

(e) Four thousand dollars to be paid on or before January 2nd, ? 1954, together with an additional two and four-tenths (2.4%) of the stock of the capitalization of any company to which this option is or may be assigned.

(f) All payments to be made when due, or within a grace period of ten (10) days thereafter, except as to the first payment made contemporaneously with the signing hereof.

(g) The six percent (6%) interest in any corporation to which the option is or may be assigned, is defined to mean an actual six percent (6%) of the outstanding, plus a like percentage of whatever additional stock is or may be issued or issuable in the future, and, if the authorized capitalization is increased from any initial base on which the percentage issued is figured, additional shares, proportional to the increase shall be issued and delivered to optionors, or assigns, in connection with any such increase, whether made before, during, or after the period of this option.

(h) All shares due hereunder to optionors, shall be issued to them in their joint names, as joint tenants with the right of survivorship, and not as tenants in common, but, optionors reserve the right to notify the optionee, or assigns, ten (10) days prior to due date of any payment, as to how any shares due them at that time shall be issued, together with the names and addresses of any persons, other than optionors, and the addresses of any such other persons, together with the shares to be issued to each of said other person(s).

(i) Any assignment of this option, shall be subject to, and require the prior written consent and approval of the optionors, but, failure to act in accepting or rejecting any proposed assignment for a period of ten days after its proffer to optionors shall be construed as an approval thereof.

(3) All payments to be made by virtue hereof shall be made to, or in the name of the optionors at such place, either bank, trust company, corporation, or individual receiving agent, as optionors may in writing, joined by optionee or assigns select or designate. Optionors or optionee or assigns of either, acting jointly, by a writing, may at any time terminate any such appointment of said receiving agent, with or without cause, and appoint a new receiving agent. In case the parties hereto, or assigns, are unable for a period of ten days or more to so agree on any receiving agent to be appointed hereunder, the senior vice-president of Zion's Savings Bank & Trust Company, of Salt Lake City, Utah, available shall as arbitrator, select some such agent.

(4) Optionors agree to deposit with any said receiving agent, so nominated, within twenty (20) days after the signing hereof:

(a) A good and sufficient quit-claim mining deed, conveying all the right, title, and interest(s) of the said optionors in, to, or upon said hereinabove described mining ground and mining claims (but subject to the applicable conditions of this agreement as to a percentage interest and otherwise) and passing or relinquishing any water right(s) appurtaining to said above described mining ground. In so passing or relinquishing title to said mining ground's appurtenant water, optionors make no representation(s) that they have any such, nor do they imply, nor have they represented to optionee, or assigns, as an inducement or basis for entering into this agreement that they have any such water right(s). Neither is said last preceding statement to be taken as a waiver, abandonment, renouncement or admission against interest, as to any interest they may have, own, or which may exist or be appurtenant to said mining claims and mining ground, or to which said optionors may be entitled under existing circumstances.

(b) An abstract of title, brought down to a date not earlier than the date of this option agreement, showing marketable title in the optionors.

(5) Optionee, assigns, or representatives of either may inspect or examine the said abstract of title, and upon giving proper receipt and safeguards suitable to the excrow agent's requirements, withdraw same for a reasonable time to permit of a title examination or opinion.

(6) In event of any change, as provided in paragraph three (3) hereof of the receiving or escrow agent, the deed and abstract, together with statement to date of any payments of any kind made to apply hereon, shall be delivered to any such new or substituted receiving agent.

(7) Upon receiving payment in full, and after five (5) days written notification to optionors, or assigns, of their intent to do so, receiving agent may then deliver said deed and abstract to the optionee, or assigns.

(8) It is further understood and agreed by the parties hereto:

(a) That it is the present intention of the optionee to assign this agreement to the MOSS COPPER MINING COMPANY, a Utah corporation, with a present capitalization: of 1,000,000 25¢ par value shares, and, as said company expects to continue to issue shares up to that limit, in case of consummation of such assignment to said company, optionors, or assigns, would be and become entitled

to a total of sixty-thousand (60,000) shares of the capital stock of said company, to be paid out in the proportions set forth in paragraph: 2(a) through 2(g) hereof, plus any additional stock that might thereafter accrue by reason of the operation of paragraph 2(g) hereof, should said capitalization be increased in the future.

(b) It is further understood and agreed by the parties hereto that in the event that this said option is not assigned to the Moss Copper Mining Company but to any other corporation, that in such event, optionors are to be and become entitled to the proportionate amount of the authorized capital stock of such other corporation.

(c) In the event that no assignment is made to any corporation, optionee or assigns agree, at the appropriate times mentioned in paragraph two, hereof, to furnish optionors with proper agreements or deeds relinquishing a like percentage of the title to said mining claims and ground to said optionors.

(d) (d) It is the intent of the parties hereto that the optionors shall retain throughout this option, and thereafter, a six percent (6%) interest in either the ground, or the corporation(s) afterward acquiring or owning said ground or claims, and, if any corporation to which said option is assigned, or to whom title to said above described mining ground is passed, thereafter sells or transfers the same, other than in a bona fide sale for money, that optionors, their successors and/or assigns, shall be and become entitled to a like percentage of the stock or shares of such other company to which title is passed.

(e) In implementation of the policy of paragraph 8(d) above, to permit optionors, or their successors or assigns, to maintain such proportionate interest in the property or stock of any corporation owning such property, it is agreed that any such shares of stock issued to optionors in any corporation taking over either this option, or the ground, other than one taking said ground on a bona fide purchase for cash or money, shall be (a) Either non-assessable, or (b) If assessable, or made assessable, that optionee, or any assignee corporation, or successor corporation, or other transferee corporation, shall agree to pay, or cause to be fully paid, or legally credited, to the account of the optionors, or their successors or assigns, or the holder of any such shares of stock, the amount of any such assessment and/or assessments levied against said, or any of said shares originally issued to optionors hereunder, and, irrespective of whether or not said shares, or any of them are, or

continue to be held by optionors or others. That any such assignee and/or transferee corporation of said mining ground will, from time to time, and as required by optionors, or successors, give proper assurance and such further writings or confirmation of this agreement as will evidence the fact to such transferees or any proposed transferee, all to the end that the optionors' interests shall be preserved in a percentagewise manner herein contemplated, without further expense, or expenditure, or necessity for expenditure of funds with relation thereto, either on their part, or on the part of any transferee. As a condition to any assignment hereof, and as a covenant to require like performance by any other assignee, each taker of this option, or any assignment thereof, or of the mining claims, agrees to covenant, to respect, observe, and comply with the terms hereof relating to the: payment of assessment on any shares received by optionors, or any assignee(s) of said optionors' stock.

(9) During the continuance of the term of this option, and while it is in full force, and not terminated and/or forfeited, the optionee, or assign(s) is/are granted the license or privilege of, and the right to enter upon the said optioned premises, and to conduct geological, exploratory, testing, boring, sampling, and initial development work, all at the expense of said optionee, or assigns, and without costs or liability of any kind to optionors.

(b) Before commencing any such work, however, optionee, or assign(s), or others going upon the ground shall comply fully with the provisions of the Utah Industrial Insurance and Occupational Disease Act requirements, and submit to optionors due proof of their compliance with said acts, and payment of the premiums for the insurance required thereunder, and shall submit and exhibit, and keep optionors advised from time to time of the compliance on his, its, or their part, and shall at any time, on request furnish proof of compliance in any or all particulars with the provisions of such act.

(c) Before commencing any such work, optionee, or assign(s), likewise shall provide or put in force adequate public liability, and accident indemnity insurance to provide against damage from injuries, accidents, and/or deaths that may or might occur during their, its, or his operations.

(d) All operations so conducted on the ground by optionee, his assigns, or the like shall be at his, its, or their own risk, expense, and liability, and

as independent contractors, and not for or on behalf of the optionors, or as agent of optionors, and said optionee, assigns, and like shall at all times save harmless the optionors and the title to the optioned property from, against, and free and clear from any and all liens for labor, machinery, equipment, supplies, power, services, and/or any other like or unlike items furnished to, taken upon, or used on or about or for said optioned premises, and all risk, liability, and responsibility for injuries, accidents, deaths, or other happenings arising out of such operations of optionee or assigns shall be at his, its, or their exclusive and sole risk, liability, and responsibility, which obligations or liabilities he, it, or they undertake to pay and discharge.

(e) Optionee, or assigns, shall post at entry-ways and entry-roads to the optioned premises, during any such work, notices of non-liability, and non-responsibility on the part of optionors, or assigns, and setting forth that optionee or assigns are conducting operations of their own, and are to remain and be solely and absolutely liable for any labor, services, material, equipment, power, machinery, supplies, and/or any other like or unlike items delivered to, upon, or used on or about said premises, and said optionee or assigns, shall cause to be posted at each and every working place where operations are conducted, similar notices of non-liability, furnish proof of so posting to optionors, stating the time and places of posting such notices, and attaching a copy of such notice(s) and to record a copy of such notice for the protection of title to the optioned property before commencing any such work.

(f) It is not contemplated hereby, that the optionors, or assigns, shall go beyond such geological survey, testing, or other exploratory work during the period hereof, and remove or ship any ores, minerals, metals, and/or other like or unlike substances from said optioned premises, without further written authorization from the optionors, but, should any such be found in any such geological, testing, or exploratory development work, and necessarily removed in the course thereof, the optionee or assigns shall preserve the same, protect the same, and if necessary to prevent loss, ship same in the names of optionors to a proper smelter, mill, reduction works, buying agency, or like, settlement therefore to be made by such works to optionors, any deficiency to be paid by optionee, or assigns. The whole proceeds of

any such shipments to be retained by optionors, or assigns, to be likewise credited upon any payments due or to become due hereunder.

(g) In performing such work, optionee or assigns, shall observe, and conform to all federal, state, county, and/or other jurisdictional authority's laws, regulations, rules, promulgations, decrees, and orders, as a condition required hereunder and hereby.

(10)Time is of the essence of this contract.

(11) In case of exercise of this option by payment in full of purchase price, it is understood and agreed that optionors will pay taxes levied on the five dollar per acre value of said mining ground for the year 1953 only, and, optionee or assigns, shall pay any other taxes on the surface rights after that year, and all net proceeds, occupation taxes, or personal property taxes accruing out of the operations, if any, under paragraph ninth hereof, shall be borne by optionee or assigns.

(12) (a) Failure on part of optionee or assigns to make any payment or payments, or delivery of any shares when due or within the ten days grace period allowed, shall automatically operate as a termination or forfeiture of this option, and all rights thereunder, and all payments theretofore made shall be retained by optionors, without liability on their party for the return of all or any part thereof.

(b) Failure on part of optionee or assigns to comply with any other provision hereof, after twenty days written notice to him, it, or them, has been given of the failure to comply with such provision, and demanding compliance with such deficiency or failure, shall likewise operate as termination hereof, of all rights hereunder, with like retention by optionors, to return or repay any or all of such payments heretofore made to them.

(13) In event that this option is relinquished, terminated, or forfeited, optionee, or assigns, shall furnish to optionors a statement setting forth such relinquishment, termination, or forfeiture, and renouncing or disclaiming any further interest in the ground, said statement to be in such form as to permit of its recording.

IN WITNESS WHEREOF, the parties hereto have set their hands to this agreement in triplicate, on this 23rd day of July, A. D. 1953, at Salt Lake City, Utah.

Anita P. Smoot, Optionor
Harlow E. Smoot, Optionor.
Carl J. Harris, Optionee.

Witness:
Mary Lee Smoot

~~Moon Optical Drawing Co.~~

~~Kraft~~

DMEA-3266.

Contents

Copy of application from Keser

Copy of application from Butler

THE MOSS OPTICAL MFG. COMPANY
PROVO, UTAH

DMEA Form. 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

PROJECT SUMMARY REPORT

By: W. R. Griswold July 25, 1957

1. Docket No. DMEA-3266 (Copper)
Contract No. Idm-E733
Location: Big Indian Copper Mine
San Juan County, Utah

Operator: Big Indian Uranium Corporation
575 South 9th E. Street
Salt Lake City 2, Utah

Operator's Property Rights: Owner

2. Contract dated October 25, 1954.

Work Authorized

11,200 feet diamond drilling @ $4.55/ft.	$50,960.00
200 samples for copper @ $1.50/sample	300.00
Estimated Total Cost of Project	$51,260.00
Government's participation, 50%	$25,630.00

Amendments

No. 1 Dated December 29, 1954.

Extends starting period from "30 days from date" to "January 9, 1955".

No. 2 Dated January 27, 1955.

Extends starting date to February 9, 1955 and extends completion period to ten months.

8623

Work Completed

1,040 Feet of diamond drilling @ $4.55/ft.	$ 4,732.00
Audit deduction, due to lack of Operator's final report	500.00
Net Cost of Project	$ 4,232.00
Government's participation, 50%	$ 2,116.00

Termination Agreement dated July 25, 1956.
Effective June 1, 1955.

Final Field Team report received June 13, 1957.

3. Revised report of review dated July 3, 1957.

4. Certification of Discovery or Development.

Pseudo certification included in termination agreement.

5. Comments

The two holes which were drilled gave negative results but the amount of work was so small that no conclusions could be reached. The project involved the exploration for copper ores in sedimentaries (sandstones and conglomerates), largely as impregnations. The project still might be attractive if in the hands of competent Operators, who were financially able to carry a comprehensive program.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Chron.

DMEA Form 17
Feb. 58

DEFENSE MINERALS EXPLORATION ADMINISTRATION

WORK COMPLETED ANALYSIS

After final audit or review report is received, prepare original only and file in official docket

Operator: Big Indian Uranium Corporation		Actual Cost	
State: Utah		Agreed Unit Cost	x
Final Report of Audit		Commodity: Copper	Docket No. DMEA-3266
Final Report of Review	X		Contract No. Idm-E733

Operation	Authorized by Contract and Amendments		Completed		Net cost after sale of Government Property
	Units	Cost	Units	Cost	
Drifting & Crosscutting					
Raising					
Shafts					
Winzes					
Drilling Diamond (Core) (Specify) (AX)	11,200' @ $4.55	$50,960.	1,040'	$4,732.00	$4,732.00
Surface Excavation					
Underground Excavation					
Roads and Trails					
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify) Assays -200 @ $1.50 ea.		300.00			
Totals		$51,260.00		$4,732.00	* $4,732.00

* Net cost total must agree with final report of audit or review.

Prepared by W. P. Klugescheid/er Date 4/2/58

31398

☒ Audited 10/1/56. W[redacted] ANALYSIS SHEET - DMEA PROJECT[redacted] ☐ Actual Cost

☒ Certified Pseudo in Term. Agree. Analysis as of 4/13/55 ☒ Agreed Unit Costs

Incl. Voucher for May-1955.

Name BIG INDIAN URANIUM CORPORATION. Rept of Review Docket No. 3,266

State UTAH Commodity COPPER Idm-E No. 733

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units	COMPLETED Cost	NET COST
Drifting & Crosscutting					
Raising					
Shafts					
Winzes					
Drilling (Specify) Reimbursable (Core) (AX)	11,200' @ 4.55	$50,960.00	1,040'	$4,732.00	$4,732.00
Surface Excavation					
Underground Excavation					
Roads and Trails					
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify) 200 Assays @ 1.50		300.00			
Totals		$51,260.00		$4,732.00 Checked w/ Audit.	$4,732.00

Contract Date: Oct. 25, 1954 Amend. Date: Aug 25, 1955.

Termination Agreement Dated July 25, 1956 Effective June 1, 1955.

Field Team Final Report received 6/17/57.

Operator's Final Report received 8/20/57. Prepared by W. H. Lungstaff

Two holes drilled gave negative results but property might have possibilities with financially competent operators.

Project Summary Report written

71626

E-733

Big Indian Uranium Corporation — Utah — 3266

Fixed Unit Costs

Stage I.

(AX) 1,600' D.D. @ 4.55 — $7,280.00

30 Assays for Cu @ 1.50 — 45.00

Stage II

(AX) 4,800' D.D. @ 4.55 — 21,840.00

85 Assays for Cu @ 1.50 — 127.50

Stage III.

(AX) 4,800' D.D. @ 4.55 — 21,840.00

85 Assays for Cu @ 1.50 — 127.50

$51,260.00

Starting Date Feb 9, 1955.

Completion Date 25 Oct 1957 + 10 mos = Aug 25th 1955.

OFFICIAL FILE COPY
O. M. E.
RECEIVED OCT 15 1962

DATE	INITIALS	CODE
10/15	[illegible]	500
		220

Building 20 - Federal Center
Denver 25, Colorado

October 11, 1962

Memorandum

To: Fiscal Section, Division of Administrative Services
Office of the Secretary, Department of the Interior
Washington 25, D. C.

From: Acting Field Officer, OME, Region III

Subject: DMEA-3266 (Copper)
Contract Idm-E733
Big Indian Uranium Corporation
(Big Indian Copper Mine)
San Juan County, Utah

Attached is the original Report of Royalty Review on the subject property dated October 8, 1962 covering the period June 17, 1959, through September 22, 1962.

Original signed

Hugh M. Connors

Attachment

HMC/lm
cc Chief, Division of Field Operations, OME
E. D. Talbert, Acting Chief
Contract Administration and Audit Division
Royalty Corres. E733
Chron

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
		220

October 8, 1962

Memorandum

To: Acting Field Officer, Region III

From: E. D. Talbert, Chief (Signed) E. D. Talbert
Contract Administration and Audit Division

Subject: DMEA-3266 (Copper)
Big Indian Uranium Corporation
Big Indian Copper Mine
San Juan County, Utah
Contract Idm-E733

The original and one copy of a Report of Royalty Review covering the subject contract are enclosed. If you concur in the facts stated therein, please make the following distribution:

(a) Original to the Fiscal Section, Division of Administrative Services, Office of the Secretary, Department of the Interior, Washington 25, D. C.; and

(b) One copy for your files.

This Report of Royalty Review is made for record purposes only; therefore, no copy for the Operator is provided.

As evidence of your concurrence, a copy of your memorandum transmitting the original report to the Fiscal Section should be furnished this Division. If for any reason you do not concur, both copies of the report should be returned to this Division with your comments.

Enclosures

EDTalbert/ama 10-8-62

cc:
Docket
Director's Reading File
CA & A Division
Fiscal Section

43683

OFFICIAL FILE COPY
O. M. E.
RECEIVED FEB 4 1960

DATE	INITIALS	
2/4	RCW	225
2/4	RCW	500
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		225

Building 20 - Federal Center
Denver 25, Colorado
February 1, 1960

Mr. Milt S. Rindskopf, President
Big Indian Uranium Corporation
1359 South 5th East
Salt Lake City, Utah

Re: Docket No. DMEA 3266 (Uranium-Copper)
Contract No. Idm-E733
(Big Indian Copper mine)
San Juan County, Utah

Dear Mr. Rindskopf:

Will you please advise the present status of operations on the captioned property, and whether or not there has been any production since January 1, 1959.

Very truly yours,

Original signed by

J. W. Townsend
Executive Officer, OME
Field Team, Region III

HMC:ltm

cc: Chmn. Op. Comm. (2)
Rey. Corres.
Chron.

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
6/22	a	220
6/23	[illegible]	500
		225

JUN 22 1959

Memorandum

To: Mr. Donald T. Finch, OME Auditor

From: E. D. Talbert, Acting Chief (Signed) E. D. Talbert
Contract Administration and Audit Division

Subject: Docket No. DMEA-3266 (Copper)
Big Indian Uranium Corporation
Contract No. Idm-E733

Your Report of Royalty Review on the subject contract is acceptable and distribution of the regional copies is authorized.

EDTalbert/ama
June 22, 1959

Copies to: Docket
Director's Reading File
Code 800

43683

EXTRA COPY
DMEA
RECEIVED 9 ... 1957

DATE		CODE
9/30	9[illegible]	110
9/30	[illegible]	500

224 New Customhouse
Denver 2, Colorado

September 24, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: Alternate Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3266 (Copper) Contract Idm-E733
Big Indian Uranium Corporation (Big Indian Copper mine) San Juan County, Utah - FINAL PAYMENT

Enclosed are two copies of a memorandum to T. A. Christensen, dated September 20, 1957, relative to final payment under the terms of the subject contract.

Original signed by
J. W. TOWNSEND
J. W. Townsend

Enclosures

JDC:hmh

cc: DMEA/DFC
MF-104 file, Reg. III
Corres.file, Reg. III
Chron

Dma 58-35

224 New Customhouse
Denver 2, Colorado

September 20, 1957

Memorandum

To: T. A. Christensen

From: Alternate Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3266 (Copper) Contract Idm-2733
Big Indian Uranium Corporation (Big Indian Copper mine) San Juan County, Utah - FINAL PAYMENT

Our memorandum to you dated July 16, 1957, relative to final settlement of the account is hereby rescinded.

An acceptable final report has now been submitted to the Government, by the subject Operator. Therefore, in accordance with instructions from the Chairman, Operating Committee, DMEA, and in compliance with a request by this office the revised Report of Review, dated July 3, 1957, has been rescinded and the original Report of Review, dated October 1, 1956, has been reinstated by the Contract Administration and Audit Division, DMEA. One copy each of the following items of relative correspondence is attached:

1. Letter of instructions, dated August 26, 1957, from the Chairman, Operating Committee, to this office.

2. Memorandum of request, dated August 28, 1957, from this office to T. H. Brading, DMEA Auditor.

3. Letter dated August 29, 1957, from T. H. Brading, DMEA Auditor, to this office rescinding the revised Report of Review and reinstating the original Report of Review.

Final payment to the Operator is to be made on the following basis, which is in accordance with the original Report of Review

of reported project expenditures by the Contract Administration and Audit Division, dated October 1, 1956.

Basis for Final Payment

Total accepted cost	$4,732.00
Government participation at 50%	2,366.00
Total prior payments	2,116.00
Balance due the Operator	$ 250.00

Original signed by
J. W. TOWNSEND

J. W. Townsend

Enclosures

JDC:hmh

cc: Chmn. Op. Comm. (2)
Harshman
Hasler
DMEA/BFC
DMEA/G.Jet.
Townsend
} w/copy of T.H.Brading's letter of 8/29/57

MP-104 file, Reg.III
Corres.file, Reg.III
Chron
} w/copy of all above listed items of corres.

PAID #250.00

RRC
Randel R. Cooper
Authorized Certifying Officer

SEP 24 1957

DMA-58-35

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

224 New Customhouse
Denver 2, Colorado

August 29, 1957

Mr. E. N. Harshman,
Acting Executive Officer,
DMEA Field Team, Region III
Denver, Colorado

Re: Contract No. Idm-E733
Docket No. DMEA-3266 (Copper)
Big Indian Copper Mine
San Juan County, Utah

Dear Mr. Harshman:

Complying with instructions in letter dated August 26, 1957, from George C. Selfridge, Chairman, Operating Committee, regarding subject Operator, Report of Review dated July 3, 1957, is rescinded and original Report of Review dated October 1, 1956, is reinstated.

Yours very truly,

T. H. Brading, DMEA Auditor.

THB:bh
cc-J. L. Chambers
East/Christensen
DMEA/Gr. Jct.
Townsend (MF-104 File)
Subject
Caron.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

OFFICIAL FILE COPY DMEA RECEIVED SEP 25 1957		
DATE	INITIALS	CODE
9/25	B	220
9/26	WPH	500

September 23, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: Alternate Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA 3266 (Copper), Contract No. Idm-E733, Big Indian Uranium Corporation (Big Indian Copper mine), San Juan County, Utah - Supplement to Field Team Final Report dated June 13, 1957.

The Operator has belatedly rendered an acceptable final report. Therefore, in reference to your letter of August 26, 1957, there follows a correction in the last paragraph of the memorandum from this office, dated July 16, 1957, which was forwarded as a supplement to the Field Team Final Report, dated June 13, 1957:

Final acceptable units of work completed under the Contract consist of the diamond drilling of two holes, aggregating 1,040 feet, at a total accepted cost of $4,732.00, toward which the Government contributed 50%, or an amount of $2,366.00.

J. W. Townsend

J. W. Townsend

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
9/10	Talbert	800
	Firnwell	500
9/11	[illegible]	130
	Johnson	110
9/12	[illegible]	220
		500

SEP 11 1957

Mr. E. N. Hershman
Acting Executive Officer
DMEA Field Team, Region III
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-3266 (Copper)
Big Indian Uranium Corporation
Big Indian Copper mine
San Juan County, Utah
Contract No. Idm-8733

Dear Mr. Hershman:

By memorandum dated September 3, 1957, you request to be advised when reinstatement of the amount of $250.00 is made to the project account covering the referenced contract.

This reinstatement is being processed. Your finance officer will be notified of the reinstatement by a copy of Obligation Document, DMEA Form 14, after release thereof through the Branch of Finance, Bureau of Mines.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

APPROVED:

Frank D. Lamb (FDL)
Member, Bureau of Mines

Thor H. Kiilsgaard (THK)
Member, Geological Survey

EDTalbert/wb
September 10, 1957

Copy to: Docket
Admr. Reading File
Operating Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Mr. Chambers

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

VIA AIR MAIL

September 3, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA 3266 (Copper), Contract No. Idm-E733, Big Indian Uranium Corporation (Big Indiam copper mine), San Juan County, Utah.

In reference to your letter of August 26, 1957, instructing us to reimburse the Operator the amount of $250.00 previously withheld in lieu of the final report, reimbursement cannot be made until the amount is reinstated to project allocations, since all excess funds have been withdrawn.

Please advise when the reinstatement has been accomplished so that we can process reimbursement to the Operator.

E. N. Harshman

E. N. Harshman

OFFICIAL FILE COPY
DMEA
RECEIVED SEP 5 1957

DATE	INITIALS	CODE
9/6	O	
9/6	WBY	220 500

OFFICIAL FILE COPY
D.M.E.A.
RECEIVED SEP 3 1957

DATE	INITIALS	CODE
9-3	C	220
9/3	[illegible]	800
9/4	[illegible]	500

224 New Customhouse
Denver 2, Colorado

August 28, 1957

Memorandum

To: T. H. Brading, DMEA Auditor - w/enclosure

From: Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA 3266 (Copper), Contract No. Idm-8733, Big Indian Uranium Corporation (Big Indian Copper mine), San Juan County, Utah

The Operator has rendered an acceptable final report as required by the contract. Therefore, in conformance with instructions in the Chairman's letter of August 26, 1957, a copy of which is enclosed, please forward a memorandum to this office rescinding the Revised Report of Review, dated July 3, 1957, and reinstating the original Report of Review, dated October 1, 1956.

Original signed by
E. N. HARSHMAN

E. N. Harshman

JWT:prl

cc: Chmn. Op. Comm. (2)
Finance Office, Reg. III)
MF-104 File, Reg. III) w/copy of
Harshman) Chairman's
DMEA/D&C) letter of
DMEA/Gr.Jct.) August 26,
Hasler) 1957.
Corres. file)
Townsend
Chron.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
8/26	Talbert	800
8-26	Chambers	800
8/26	Greenwald	500
8/26	GCS	130
"	Johnson	110
"	Whittenbury	100
8/26	Q	220
		500

AUG 26 1957

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

Re: Docket No. DMEA-3266 (Copper)
Big Indian Uranium Corporation
Big Indian Copper Mine
San Juan County, Utah
Contract No. Idm-E733

Dear Mr. King:

In your memorandum dated August 21, 1957, transmitting the original and one copy of the Operator's final report on the referenced project, advice is requested as to the procedure for settling the account.

As the Operator's final report is acceptable, payment of the $250.00 heretofore withheld is in order. Accordingly, you should request the DMEA auditor to rescind the Revised Report of Review dated July 3, 1957, and reinstate the original Report of Review dated October 1, 1956, after which payment of the $250.00 may be made by a supplemental voucher.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (SHB)

APPROVED:

P. F. Yopes (SHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (SHB)
Member, Geological Survey

EDTalbert/wb
August 23, 1957

Copy to: Docket
Admr. Reading File
Operating Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Mr. Chambers
Mr. Brading

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

August 21, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 23 1957

DATE	INITIALS	CODE
8/23	Q	220
		800
		500

Memorandum

To: Chairman, Operating Committee, DMEA

From: Alternate Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3266 (Copper) Contract Idm-E733, Big Indian Uranium Corporation (Big Indian Copper mine) San Juan County, Utah

Enclosed are the original and one copy of a final report, submitted by the Operator, pertaining to work completed under the subject contract.

In reference to the matter, please refer to your letter stamped July 28, 1957 (which should have been June 28, 1957) and the letter to the Operator from this office, dated July 1, 1957.

Since the sum of $250.00 was withheld from reimbursement to the Operator in lieu of the Operator's final report and the account closed on that basis, please advise how we should proceed now that the Operator has rendered its final report.

J. W. Townsend

J. W. Townsend

Enclosures

BIG INDIAN URANIUM CORPORATION

575 South 9th East Street
Telephone EM. 4-3068
SALT LAKE CITY 2, UTAH

OFFICERS
RALPH H. WALKER
PRESIDENT
MILT. S. RINDSKOPF
VICE PRESIDENT
LELAND W. HALVORSEN
SECRETARY & TREASURER

DIRECTORS
SCOTT LEDINGHAM
CARL HARRIS
LOEY NEWREN
W. A. SORENSEN

DMEA
ARTMENT OF THE INTERIOR
AUG 20 1957
EGION III
DENVER, COLORADO

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 23 1957

DATE	INITIALS	CODE

Second Floor
640 - 7th Avenue West
Calgary, Alberta

August 15, 1957

Mr. W. M. Traver,
Executive Officer, DMEA
Field Team, Region 111,
U.S. Department of the Interior,
224 New Customhouse
DENVER 2, Colorado

Dear Mr. Traver:

Enclosed please find five copies of the geological report on DMEA Drilling Contract Idm E-733 in compliance with the contract between Big Indian Uranium Corporation and the DMEA.

We apologize for the delay in this and ask you to appreciate the difficulties in getting this type of a report done so long after the drilling was completed.

We trust that this report will be satisfactory.

Yours truly,

Ralph H. Walker

Ralph H. Walker

RHW:ju
Encl.

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 23 1957

DATE	INITIALS	CODE

DMEA
DEPARTMENT OF THE INTERIOR
AUG 20 1957
REGION III
DENVER, COLORADO

OPERATOR'S FINAL REPT.

GEOLOGICAL AND ENGINEERING REPORT

ON

DMEA DRILLING CONTRACT IDM - E 733

FOR

BIG INDIAN URANIUM CORPORATION

L. D. Halvorsen, P. Eng.,
Consulting Geologist,
Calgary, Alberta,
August 10, 1957.

REPORT ON DMEA DRILLING CONTRACT IDM - E 733

INTRODUCTION:

A study has been made on the two holes drilled under the DMEA contract, Docket #DMEA - 3266. The original program was set up in three stages, none of which has been completed. Only two holes were drilled under the contract.

The holes were originally logged by Joseph Hafen, but were later logged by the A.E.C. geologists and also examined by the writer. Hole U-IA-I had a copper show in the Dakota Formation, but was not sampled. Neither hole had any mineralization in the deeper zones. Both holes were in or near the fault zone as evidenced by shearing, slickensides, and increased dips.

The property was first examined by the writer in November, 1953. The main purpose of this examination was to evaluate leases held by Moss Copper Mining Company. The writer spent one day on the copper property now held by the Big Indian Uranium Corporation.

LOCATION:

The property is located in southeastern Utah, thirty-five miles south of Moab, Utah. The property is readily accessible from paved U.S. Highway #160, paved Utah State Highway #46, and five miles of paved road to Indian Wash. The claims are in sections 27, 28, 33, and 34 of Twp. 29 S., Rg. 24 E., S.L.E.M., Big Indian Mining District, San Juan County, Utah.

The two holes, U-IA-I and U-IA-2, were drilled in section 34 of Twp. 29 S., Rg. 24 E. The accompanying map shows the location of the holes in relation to the ore bodies and land coordinates. U-IA-I is at an elevation of 6829.0 above sea level with coordinates N 101,684 and E 102,170. U-IA-2 is at an elevation of 6863.6 above sea level with coordinates of N 102,089 and E 101,268. Both holes were drilled to a total depth of 520 feet.

PURPOSE OF THE DMEA HOLES:

The two holes were drilled for the following reasons:

(1) To test for copper mineralization in the basal Dakota.

(2) To check deeper mineralization zones of the basal Burrow Canyon formation.

(3) To test for a possible secondary enrichment zone below the oxidized zone.

(4) To test for possible sulphide mineralization along the fault and the occurrence of copper mineralization in favorable host rocks contiguous to the fault plane.

The lithologies of the Cutler formation and the Brushy Basin member of the Morrison formation are very similar. It is extremely difficult to determine the fault plane when occuring in these two lithological units unless extreme shearing and brecciation is present. The Dakota is extremely silicified near the fault plane, but this may be due to the good primary porosity and permeability of this formation.

Some shearing with accompanying slickensides was noted in the U-IA-2 hole. Some silicification occurred in a very fine sand at a depth of 510 feet. This suggests that this hole bottomed in the fault zone or else in steeper dips that resulted from drag folding near the fault plane.

Hole U-IA-I exhibited some slickensides near the bottom of the holes, however, the sands are probably sands of the upper Salt Wash member of the Morrison formation.

Copper mineralization consisting of malachite and azurite has been found in the basal Burrow Canyon formation between the depths of 180 feet to 240 feet. This zone ranges in thickness from 75 feet to 150 feet, but is of lower grade. The two holes, U-IA-I and U-IA-2, did not encounter any copper mineralization within the basal Burrow Canyon formation.

Chalcocite has been noted during previous mining operations. It is possible that secondary enrichment consisting mainly of chalcocite and other secondary high grade ores could occur at the water table level or below the oxidized zone. This type of enrichment is characteristic of semi-arid and arid climates where the water table reaches great depths. Evidently the water table has reached depths greater than previously expected in this area.

It appears as if the fault carried the mineralized solutions. The fault and its associated fractures carry copper mineralization at the surface. It was proposed that the fault plane should be thoroughly explored at depth.

DRILLING COSTS:

The holes were drilled by CP-15 heavy duty drill rig mounted on a GMC-360 truck. Ax holes were cored completely. Drilling was curtailed due to cold weather, lost circulation, and hard drilling in the silicified sands of the Burrow Canyon formation. These problems have also been experienced by recent drilling. Recent drilling has costs as high as ten dollars per foot in the Burrow Canyon silicified zone.

Following is a list of the costs previously reported on monthly unit cost and progress report Form MF-104 A:

Date	Costs this Month	Units this Month	Costs to Date	Units to Date
February 5/55	$455.00	100	$ 455.00	100
March 5/55	$ 1,547.00	340	$2,002.00	440
April 5/55	$ 2,730.00	600	$4,732.00	1040

Total Footage Drilled - 1040 feet
Total Cost of Drilling - $ 4,732.00

Coring costs in the copper property run much higher than the uranium properties to the west because of the highly fractured rocks and silicification due to the Lisbon fault.

GEOLOGY:

Regional geology consists of two major structural features; the northwest trending Lisbon anticline, and the longitudinal Lisbon fault. The Lisbon fault is a normal fault occurring along the southwest limb near the crest of the anticline. The fault strikes parallel to the anticline, and dips 50-55° northeast. Small drag folds occur in both the upthrown and downthrown block. There is approximately 3200 feet of displacement.

The commercial copper mineralization has thus far been confined to rocks of the downthrown block of the fault. A few shows of copper have been found in shales of the Cutler formation in the upthrown block. The mineralization occurs in the Dakota, Burrow Canyon, and Morrison formations. The fault plane with its associated minor fractures contains azurite and malachite. Most of the joints of a conjugate joint system carry copper mineralization, some of which contain thin plates of native copper. Many of the sands that originally had primary porosity contain good mineralization in thickness ranging from one to thirty feet. Silicification is common in many of the sands near the fault zone and probably preceeded copper mineralization.

Geological findings suggest that the fault was the main channelway for mineralized solutions and it is feasible to expect mineralization in both the fault plane and favorable host rocks contiguous to the fault. A deep water table caused by the arid climate could give rise to oxidation in an excess of six hundred feet. Therefore, there are good possibilities of sulphides below the oxidized zone associated with the fault.

As previously mentioned, the two holes drilled under the contract were drilled to check mineralization in the Dakota, Burrow Canyon, and Morrison formations. These holes were also planned to check the fault plane down dip. Neither hole encountered any copper mineralization but were valuable for geological information. Information derived from the two holes is as follows:

(1) The holes gave control on the fault plane. The depth at which the holes reached the fault zone suggest a dip of 52°. Dips on the fault plane at the surface range from 46° to 55°; however, these dips are inaccurate because of the obscurity of the fault plane. Dips of the beds increase near the fault zone and suggest drag folding.

(2) The U-IA-1 hole defined the mineralized limits of Block "E". This hole also showed that the deep mineralized zone of the lower Burrow Canyon formation found in several holes is not present in this area. Hole U-IA-2 was drilled in a wildcat area and showed no mineralization. This indicates that the Block "D" mineralization is not continuous to Block "E".

(3) There is a notable lack of brecciation and strong shearing associated with the fault plane. The hole also showed that no mineralization is associated with the fault plane at this depth. The Brushy Basin shales and Cutler shales are in contact with the fault plane at this depth, and would not be favorable host rocks for copper mineralization. It may be possible that the more competent beds may exhibit brecciation and stronger fracturing. There was some evidence of secondary quartz causing a quartzitic texture to some of the sandstones and siltstones at the bottom of the holes.

Only two previous holes have been drilled deeper than U-IA-I and U-IA-2. U-6 was drilled to a depth of 950 feet, but the critical zones were drilled with a plug bit. The other hole, U-5, was drilled to a total depth of 740 feet. This hole cannot be correlated with the basal portion of U-IA-I and U-IA-2. This also suggests that both holes terminated in the fault zone.

CONCLUSION AND SUMMARY:

Even though the two holes drilled under the contract did not encounter mineralization, the geological information obtained is very valuable for future exploration. Information derived from these holes is being used in present drilling.

Both holes definitely reached the fault zone, but should have been drilled slightly deeper in order to penetrate the entire faulted zone. Future holes should be drilled in order to intersect the Salt Wash member of the Morrison contiguous to the fault plane.

Total footage drilled was 1040 feet at a total cost of $4,732.00. Geological information is summarized as follows:

(1) Fault plane dip is 52°.

(2) Minor amounts of shearing, brecciation, and silicification in the fault zone.

(3) No mineralization in the basal Burrow Canyon formation.

(4) Slight copper mineralization in the Dakota formation in hole U-IA-I and none in hole U-IA-2.

The two holes were drilled under contract No. IDM-733, and Docket No. DMEA 3266. The holes were cored and logged completely. Written logs, strip logs, location map, and geological map, are enclosed with this report. The geological map was constructed by William S. Young under the direction of the writer.

Respectfully submitted,

L. Don Halvorsen

L. Don Halvorsen, P. Eng.,
Consulting Geologist,
Calgary, Alberta.

BIG INDIAN URANIUM
COPPER KING CLAIM
SAN JUAN CO.,UTAH

Commenced - February 9, 1955
Completed - April 4, 1955
Elevation - 6829.0
T. D. - 520'

HOLE # 1 - A

DAKOTA SS.

Core #1	0 - 10'	58% Recovery
	10'	SS., gray, fine to medium grained, limonite stained w/some copper staining, few scattered quartz pebbles.
Core #2	10 - 20'	70% Recovery
	1.5'	Conglomerate, most quartz pebbles
	8.5'	Shale, grayish green, some gypsum at base
Core #3	20 - 30'	38% Recovery
	10'	SS., light gray, massive bedded fine grained, scattered orange specks.
Core #4	30 - 40'	30% Recovery
	9'	As above with some very friable zones
	1'	As above except fine to medium grained
Core #5	40 - 50'	22% Recovery
	2.2'	As above
Core #6	50 - 60'	36% Recovery
	3.6'	Conglomerate, grayish green, chert & quartz pebbles, some sandstone partings.
Core #7	60 - 70'	40% Recovery
	1.0'	Sandstone, grayish green, cross-bedded, medium coarse grained, mudstone balls
	3.0'	SS., white, coarse grained, carbonaceous specs.
	6.0'	Siltstone, grayish green,
Core #8	70 - 80'	20% Recovery
	9.0'	Shale, green,
	1'	SS., light gray, very fine grained, abundant pyrite

DAKOTA-BURROW CANYON
TRANSITION
TOP BURROW CANYON 64'

Core #9	80 - 90'	95% Recovery
	2.0'	Shale, grayish green, poor fissility
	1.0'	Siltstone, greenish gray
	6.0'	Shale, dark green, poor fissility
	1.0'	Siltstone, grayish green.
Core #10	90-100'	Full Recovery
	6.0'	Sandstone, grayish green, fine-medium grained
	4.0'	SS., reddish purple, very fine grained, w/some red chert grains
Core #11	100-110'	Full Recovery
	4.0'	Sandstone, reddish brown and purple (mottled), very fine grained
	2.0'	Siltstone, green, w/mud inclusions
	1.0'	SS., light reddish brown, very fine grained
	4.0'	SS., light gray, very fine grained, w/few dark gray streaks
Core #12	110-120'	Full Recovery
	4.0'	As above
	1.0'	Shale, light gray, poor fissility
	3.0'	SS., light gray, very fine grain, scattered cherts grains.
	2.0'	Conglomerate, light gray, chert pebbles, very fine sandstone matrix
Core #13	120-130'	
	2.0'	SS., mottled (purple & gray), very fine grained
	3.0'	SS., purple, fine grained
	1.0'	SS., mottled (green & purple), fine grained
	2.0'	SS., purple, very fine grained, few scattered chert grains
	4.0'	SS., mottled (purple & green), very fine grained, scattered chert grains

Core #14	130-140'	Full Recovery
	1.0'	SS., purple, fine grained
	5.0'	SS., mottled (purple & green), fine grained, scattered pebbles
	1.0'	SS., reddish brown, very fine grained, silty
	2.0'	SS., mottled (red & green) very fine grained
	1.0'	SS., Reddish brown, very fine grained
Core #15	140-150'	Full Recovery
	5.0'	SS., mottled (red & green), very fine grained w/scattered large quartz pebbles
	3.0'	SS., mottled (purple & green), fine grained
	2.0'	SS., green, fine grained, calcareous,scattered small pebbles
Core #16	150-160'	98% Recovery
	1.0'	Shale, green
	2.0'	SS., light green, very fine grained, scattered pyrite
	3.0'	SS., light gray, fine grained, calcareous, quartzitic, some pyrite
	1.0'	Conglomerate, chert pebbles, quartzitic matrix, hard
	2.0'	SS., purplish white, very fine grained.
	1.0'	SS., mottled (purple & green), very fine grained
Core #17	160-170'	Full Recovery
	2.0'	SS., medium green, fine grained, quartzitic, some pyrite
	1.0'	SS., light gray, fine grained, quartzitic, some pyrite
	2.0'	Shale, dark green, altered pyrite
	5.0'	SS., light gray, fine grained, calcareous, scattered blk. grains
Core #18	170-180'	95% Recovery
	10.0'	SS., light gray, very gine grained, calcareous, quartzitic at 178-179'

Core #19	180 - 190'	80% Recovery
	9.0'	SS., light green, fine grained, friable, scattered orange stain, some black specs.
	1.0'	Conglomerate, light gray, very fine grained matrix, quartzitic, chert pebbles
Core #20	190-200'	Full Recovery
	2.0'	Shale, light green
	1.0'	Conglomerate, light green
	2.0'	SS., light green, very fine grained
	1.0'	SS., light green, w/thin shale parting at top
	1.0'	Conglomerate, light gray
	3.0'	SS., light gray, fine grained, quartzitic, black grains
Core #21	200-210'	Full Recovery
	3.0'	SS., light gray, medium to coarse grained, black grains, last 1.0' very coarse
	1.0'	Conglomerate, red, chert & quartz pebbles
	3.0'	SS., light gray, medium grained.
	1.0'	SS., light gray, fine grained
	2.0'	SS., light gray, coarse grained
Core #22	210-220'	5.5 recovered
	6.0'	SS., light gray, medium grained
	3.0'	SS., light gray, coarse grained, friable
	1.0'	SS., light gray, fine grained, friable
Core #23	220-230'	
	1.0'	SS., light gray, thin-bedded, very coarse grained w/ scattered pebbles
	2.0'	SS., light gray, medium grained, very angular grains
	2.0'	Conglomerate, purplish green, very angular, siltstone matrix
	3.0'	SS., light gray, very fine grained, quartzitic pyrite
	2.0'	SS., light gray, coarse grained, some thin mudstone inclusions

re #24	230-240'	95% Recovery
	3.0'	SS., light gray, very fine grained, some mudstone inclusions
	1.0'	SS., white, medium green, orange limestone grains
	5.0'	SS., light purple, fine grained
	1.0'	SS., light green, very fine grained
Core #25	240-250'	Full Recovery
	5.0'	SS., light purple, very fine grained, reported metaline gray mineral
	5.0'	SS., light gray, fine to medium grained, scattered quartz pebbles, thin conglomerate at base
Core #26	250-260'	Full Recovery
	6.0'	SS., fine grained, light gray, 254-255 calcareous, last one foot quartzitic
	4.0'	SS., medium gray, fine grained
Core #27	260-270'	95% Recovery
	1.0'	SS., medium gray, medium grained
	2.0'	SS., medium gray, very fine grained
	1.0'	SS., medium gray, fine grained
	6.0'	Conglomerate, purplish gray, green mudstone inclusions
	270-280'	100% Recovery
	1.0'	As above
	7.0'	SS., light gray, very fine grained
	2.0'	Conglomerate, light gray, green mudstone spots
	280-290'	95% Recovery
	5.0'	SS., medium gray, mass., very fine grained
	1.0'	SS., light grayish green, calcareous, pyritic
	4.0'	SS., light gray, very fine grained

Core #27 (continued)

290-300'	95% Recovery
1.0'	As above (Note: reported green stain around pyrite. Could be chalcopyrite)
1.0'	As above, fine grained
3.0'	SS., light gray, very fine grained
2.0'	SS., gray green, purplish, coarse to very coarse grains, black grains, chalky material
3.0'	SS., light purple, medium to coarse grained
300-310'	95% Recovery
3.0'	Conglomerate, light gray
2.0'	SS., light gray, fine to medium grained, scattered black pebbles
2.0'	Conglomerate, very coarse limestone lenses, chert, chalky
1.0'	SS., light gray, very coarse grained
2.0'	Conglomerate, light purple
310-320'	95% Recovery
2.0'	As above
4.0'	Shale, dark green, TOP Brushy Basin 312
4.0'	Shale, reddish brown, slightly silty
320-330'	Full Recovery
7.0'	Shale as above
1.0'	SS., purplish gray, very fine grained
2.0'	Siltstone, reddish brown, argillaceous
330-340'	80% Recovery
1/2'	Conglomerate, purplish gray
9½'	Interbedded siltstone and shale, reddish brown

Core #27 (continued)

340-350'	80% Recovery
1.0'	As above
1.0'	Siltstone, mottled (red & green), argillaceous
8.0'	Interbedded siltstone & shale, reddish brown
350-360'	75% Recovery
10.0'	Interbedded siltstone and shale as above, Slickensides @ 362
360-370'	As above except mottled reddish brown & green
370-380'	90% Recovery
9.0'	As above
1.0'	Siltstone, grayish purple, w/thin interbedded limestone
380-390'	70% Recovery
4.0'	Siltstone, reddish brown, argillaceous w/some interbedded limestone
2.0'	Shale, light reddish brown
4.0'	Siltstone, light reddish brown, slickensides @ base
390-400'	90% Recovery
7.0'	Siltstone, reddish brown & green mottled, sandy streaks
3.0'	Siltstone, light reddish purple.
400-410'	95% Recovery
2.0'	As above
3.0'	Siltstone, dark purplish brown
5.0'	Siltstone, mottled (brown, purple, green), thin conglomerate streaks
410-420'	95% Recovery
1.0'	Siltstone, green
4.0'	Siltstone, reddish purple, slickensides, sandy
2.0'	Siltstone, reddish brown
3.0'	Siltstone, mottled reddish purple & green, sandy

Core #27 (continued)

420-430'	95% Recovery
5.0'	As above
5.0'	Siltstone, reddish brown
430-440'	95% Recovery
1.0'	As above
1.0'	Siltstone, mottled
3.0'	Siltstone, reddish brown, green
5.0'	Siltstone, mottled, reddish brown and green
440-450'	
3.0'	As above
1.0'	Siltstone, reddish gray
1.0'	Siltstone, light gray green
5.0'	Siltstone, purple
450-460'	90% Recovery
2.0'	As above
1.0'	Siltstone, grayish green
1.0'	Siltstone, reddish brown
6.0'	Siltstone, mottled
460-470'	85% Recovery
1.0'	As above
2.0'	light gray, very fine
7.0'	Siltstone, mottled (reddish brown & green), sandy, slickensides @ 468, 466
470-480'	90% Recovery
8.0'	As above
2.0'	Sandstone, light gray & reddish, fine grained with very coarse streaks, slickensides

Core #27 (continued)

480-490'	95% Recovery
1.0'	Siltstone, purplish green, slickensides
3.0'	Siltstone, purplish gray, slickensides
6.0'	Siltstone, purplish gray
490-500'	30% Recovery
	Interbedded ss. & siltstone, reddish brown
500-510'	95% Recovery
2.0'	SS., light gray, very fine
2.0'	Shale, light reddish brown
6.0'	SS., white, very fine grained
5.0-520'	75% Recovery
2.0'	SS., Dark purple, abundant biotite, very fine grained
2.0'	SS., bright purple, medium grained
2.0'	SS., green, medium grained, slickensides
4.0'	SS., Reddish brown, very fine grained.

T.D. 520'

BIG INDIAN URANIUM
Co-ordinates N102, 089
E101, 628
Nevada Claim
San Juan County, Utah

Commenced April 7, 1955
Completed May 10, 1955
Elevation 6863.6
T.D. 520

Hole U-1A-2 (Recoveries not listed on any logs.)

Core #1	0-10	Spud in DAKOTA
	6.0	SS, light buff, fine grained, calcareous cement, limonite stain, sub-rounded.
	4.0	As above
Core #2	10-20	
	5.0	SS, light gray to light buff, very fine-grained w/ few conglomerate streaks.
	1.0	Conglomerate, light buff, sub-angular pebbles, black grains.
	4.0	SS, as first 5.
Core #3	20-30	
	3.0	SS, medium buff, very coarse, few fine streaks.
	3.0	Conglomerate, orange, pebble size $\frac{1}{4}$ to 1/3 inch.
	3.0	SS, buff, fine-grained.
	1.0	Conglomerate, orange, $\frac{1}{2}$" pebbles, coarse.
Core #4	30-40	
	3.0	Mudstone, orange and green, calcareous, silty.
	7.0	Siltstone, green, calcareous cement, some disseminated pyrite, some black grains, and orange chert.
Core #5	40-50	
	10.0	As above, with streaks of SS, very fine-grained.
Core #6	50-60	
	10.0	As above
Core #7	60-70	
	2.0	As above

	8.0	SS, medium green, very fine, calcareous cement, some scattered pyrite, black and orange grains, silty.
Core #8	70-80	
	9.0	As above
	1.0	Siltstone, dark green, calcareous cement.
Core #9	80-90	
	6.05	Siltstone, dark reddish purple, w/ some streaks of fine and medium SS, some orange andblack grains, calcareous.
	1.0	Siltstone, green.
	4.0	Siltstone, dark reddish purple, calcareous, thin dendritic limestone beds.
Core #10	90-100	
	3.0	As above
	3.0	Siltstone, light green, w/ streaks of fine-grained SS.
	3.0	SS, dark purple, very fine w/ coarse gr. streaks, calcareous cement, chert and quartz grains, angular to sub-angular.
	1.0	SS, light green, very coarse
Core #11	100-110	
	1.0	As above
	2.0	Conglomerate, gray, chert and quartz pebbles.
	1.0	SS, gray, very fine
	6.0	Siltstone, light green, light gray and dark purple, interbedded, chert and black grains, sand streaks of fine and coarse gr. SS.
Core #12	110-120	
	10.0	Interbedded SS and siltstone, dark purple.
Core #13	120-130	
	10.0	As Above
Core #14	130-140	
	2.0	As abov e
	1.0	Siltstone, light green, calcareous cement.

Core #15	140-150	
	1.0	Conglomerate, orange chert, pebbles, black grains, quartz pebbles.
	3.0	SS, light gray, very fine grain w/ coarse gr. streaks.
	1.0	Conglomerate, mostly orange chert, breccia-like appearance.
	3.0	SS, light gray, very fine grain w/ coarse gr. streaks.
	2.0	SS, light green, very fine, calcareous cement, silty matrix w/ specks of black and orange, fine to very coarse gr.
Core #16	150-160	
	3.0	As above
	5.0	SS, light buff, fine to very fine, calc. cement, orange and black grains.
	2.0	SS, light gray to white, very fine, orange and black specks, chert.
Core #17	160-170	
	9.0	As above
	1.0	SS, light gray to white, coarse to very coarse, parts very friable.
Core #18	170-180	
	3.0	As above
	7.0	SS, light gray to white, fine to medium, calcareous cement.
Core #19	180-190	
	6.0	As above, w/ 1' coarse gr. SS in middle.
	1.0	Siltstone, green, $CaCO_3$ cement.
	3.0	Sandstone, light gray to white, very fine grain, calcareous cement.
Core #20	190-200	
	10.0	As above
Core #21	200-210	
	10.0	As above, scattered chert, very friable.

Core #22	210-220	
	10.0	As above
Core #23	220-230	
	10.0	As above
Core #24	230-240	
	10.0	As above
Core #25	240-250	
	10.0	As above
Core #26	250-260	
	10.0	As above
Core #27	260-270	
	4.0	As above, SS.
	1.0	SS, light green, calcareous, very fine.
	4.0	SS, light gray to white, very fine, calcareous cement.
	1.0	SS, buff, coarse grained, calcareous cement.
Core #28	270-280	TOP BRUSHY BASIN 271
	1.0	As above
	2.0	Siltstone, medium green to light green.
	4.0	SS, light green, very fine-grained, $CaCO_3$ cement.
	3.0	SS, mottled (light green purplish red), very fine to siltstone.
Core #29	280-290	
	9.0	Siltstone, purplish red, argillaceous.
	1.0	Siltstone, mottled (dark purple, red, light green, gray), argillaceous.
Core #30	290-300	
	6.0	As above
	1.0	Siltstone, dark purplish red, argillaceous.
	3.0	SS, dark purplish red, very fine grained, calcareous cement.

Core #31	300-310	
	7.0	Siltstone, dark purplish red, sand streaks, some thin limestone beds, some mottled w/ green, calcareous cement.
	3.0	SS, dark purplish red, very fine grained, calcareous cement, quartzitic.
Core #32	310-320	
	2.0	As above
	8.0	Siltstone, dark purplish red.
Core #33	320-330	
	8.0	SS, mottled (medium purple and light green,) fine to very fine grained.
	2.0	Siltstone, mottled (medium purple and light green), sandy streaks.
Core #34	330-340	
	10.0	As above
Core #35	340-350	
	10.0	As above, except no sandy streaks.
Core #36	350-360	
	10.0	Siltstone, purplish red w/ some light green ($\frac{1}{4}$" to $\frac{1}{2}$" zones), calcareous cement.
Core #37	360-370	
	10.0	As above
Core #38	370-380	
	4.0	As above
	1.0	Siltstone, light green, calcareous.
	5.0	Siltstone, purplish red, w/ light green spots ($\frac{1}{4}$" - $\frac{1}{2}$" spots.)
Core #39	380-390	
	10.0	As above, bottom 3 feet mottled and slightly sandy.
Core #40	390-400	
	10.0	As above, thin SS split at 397.

Core #41	400-410	
	10.0	As above, except dark purple w/ some light green.
Core #42	410-420	
	10.0	As above, few thin SS beds at base.
Core #43	420-430	
	5.0	As above
	1.0	SS, medium purple, very fine, friable, calcareous cement.
	4.0	Siltstone, medium purple w/ some light green mottled zones, calcareous.
Core#44	430-440	
	10.0	As above
Core #45	440-450	
	4.0	As above
	2.0	Siltstone, dark brownish purple, calcareous.
	4.0	Siltstone, dark purple with light green spots, calcareous.
Core #46	450-460	
	8.0	As above
	2.0	Siltstone, light purple, calcareous.
Core #47	460-470	
	10.0	As above
Core #48	470-480	
	7.0	As above
	3.0	Siltstone, light gray, calcareous cement.
Core #49	480-490	
	2.0	As above
	4.0	Siltstone, mottled (dark purple and light green), calc. cement.
	2.0	SS, mottled (dark purple and light green), very fine grained.
	2.0	Siltstone, mottled (dark purple and light green), calcareous cement, shear zone w/ slickensides.

Core #50	490-500	SHEAR ZONE WITH SLICKENSIDES 489-492
	5.0	As above
	4.0	SS, purple, fine grained, calcareous cement, resembles Cutter.
	1.0	Siltstone, brownish red and purple
Core #51	500-510	
	2.0	As above, slickensides at 502.
	3.0	SS, purple, fine grained.
	5.0	SS, mottled (purple, light green, dark reddish purple). SHEAR ZONE AT 509-510.
Core #52	510-520	
	2.0	Sandstone, purple, very fine, $CaCO_3$ cement, quartzitic.
	8.0	SS, light purple, very fine to fine, calcareous.

T.D. 520

EXTRA COPY
DMEA
RECEIVED JUL 26 1957

DATE	INITIALS	CODE
7/24	TJ	110
7/26	C	[redacted]
7/29	[illegible]	220
		500

224 New Customhouse
Denver 2, Colorado

July 24, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3266 (Uranium-Copper) Contract Idm-E733, Big Indian Uranium Corporation, (Big Indian Copper mine) San Juan County, Utah - FINAL SETTLEMENT

Enclosed are two copies of a memorandum to T. A. Christensen, dated July 16, 1957, relative to final settlement under the terms of the subject contract.

Original signed by
W. H. KING
W. H. King

Enclosures

JDC:hmh
cc: DMEA, DFC
DMEA, G.Jct.
MF-104 file, Reg. III
Corres. file, Reg. III
Chron.

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION III
[illegible] Denver 2, Colorado

Administrative Audit Difference Statement

[illegible] Mining Research Corporation
P. O. Box 111
Provo, Utah

Date: July 23, 1957
Payee's
Reference: _____

Gentlemen:

Upon examination of the above Payee's Reference a difference was found which made it necessary to suspend your account accordingly:

Amount Claimed $ _____

Difference $ _____

Amount Approved $ _____

The reason for the difference was due to:

Disallowance: $250.00 was withheld from the April 29 1955 voucher as the project was in unsatisfactory status. No additional work has been performed subsequent to May 1955, and the contract was terminated effective June 1, 1955.

The final report has not been submitted, therefore, the amount of $250.00 is to be retained by the Government in lieu of the final report.

Any reclaim for deductions made above must be supported by the ORIGINAL of this form.

Very sincerely yours,

N. E. Stokes
Audit Section

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D M E A
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DATE	INITIALS	CODE

R-III-B & F Form No. 4
4-15-52 D

224 New Customhouse
Denver 2, Colorado

July 16, 1957

EXTRA COPY DMEA RECEIVED 1957		
DATE	[illegible]	CODE

Memorandum

To: T. A. Christensen

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3266 (Uranium-Copper) Contract I(m-3733, Big Indian Uranium Corporation, (Big Indian Copper mine) San Juan County, Utah - FINAL SUPPLEMENT

Reference is made to our memorandum of August 23, 1955, whereby we transmitted final Form MF-104, Operator's Monthly Report and Voucher, for April and May, 1955, and requested that you withhold the amount of $250.00, from reimbursement to the Operator, to protect the Government's interest as the project was in unauthorized recess. No additional work under the contract was performed subsequent to May, 1955, and the contract was terminated effective June 1, 1955.

The Operator has failed to submit a final report as required under Article 6(e), of the contract form, therefore the amount of $250.00 is to be retained by the Government in lieu of the Operator's final report. Copies of the following relative correspondence are attached:

1. Letter of July 26, 1957 (June 26, 1957), from the Chairman, Operating Committee, to the Executive Officer, DMEA, Region III.

2. Letter of July 1, 1957, from the Executive Officer, DMEA Field Team, Region III, to the Operator.

Deduction of the amount withheld from the April and May, 1955, vouchers is in conformance with the revised Report of Review

No Payment
[illegible]

7/23/57

of reported project costs by the Contract Administration and Audit Division, dated July 3, 1957.

Basis for Final Settlement

Total accepted cost	$4,232.00
Government participation at 50%	2,116.00
Total prior payments	2,116.00
Balance due the Operator	$ 0.00

Original signed by
W. H. KING
W. H. King

Enclosures

JHC:hsh
cc: Chmn. Op. Comm. (2)
Hawkins
IRHA, IPC
IRHA, G.Jct.
Hesler
Townsend
Corwes.file,Reg. III
MF-104 file, Reg. III - w/copy of above mentioned letters
Chrom.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

July 16, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA 3266 (Uranium-Copper), Contract No. Idm-E733, Big Indian Uranium Corporation (Big Indian Copper mine), San Juan County, Utah - Supplement to Field Team Final Report, dated June 13, 1957.

In reference to your letter, dated July 28, 1957, which probably should have been June 28, 1957, we today processed final settlement of the subject account in conformance with the Revised Report of Review of Contract expenditures by the Contract Administration and Audit Division, DMEA, dated July 3, 1957, which was released to this office July 15, 1957.

Acceptable units of work completed consisted of the diamond drilling of two holes aggregating 1,040 feet, at a total accepted cost of $4,232.00, toward which the Government contributed 50%, or an amount of $2,116.00.

W. H. King

OFFICIAL FILE COPY
DMEA
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DATE	INITIALS	CODE
7/18	C	220
		225

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
7/11	Alley	800
7/11	Talbert	
7/11	C	220
		225

JUL 11 1957

Mr. T. H. Brading
DMEA Auditor
224 New Customhouse Building
Denver 2, Colorado

Re: Revised Report of Review
Idn-E733, DMEA-3266
Big Indian Uranium Corp.

Dear Mr. Brading:

Receipt is acknowledged of your Revised Report of Review covering the above-cited project.

The report is acceptable and normal distribution may be effected.

Sincerely yours,

(Signed) E. D. Talbert

E. D. Talbert, Acting Director
Contract Administration
and Audit Division

AMAlley/ama
July 11, 1957

Copy to: Docket
Admr. Reading File
Mr. Chambers

8623

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DMEA
RECEIVED 1957

DATE		CODE
7/5	C	220
7/8	MTS	800
		[illegible]
		225

224 New Customhouse
Denver 2, Colorado

July 1, 1957

Memorandum

To: T. H. Breding - w/enclosures

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA 3266 (Uranium-Copper), Contract No. Idm-E733, Big Indian Uranium Corporation (Big Indian copper mine), San Juan County, Utah

Enclosed is a copy of letter from the Chairman, Operating Committee, DMEA, dated July 28, 1957 (June 28, 1957), and a copy of a letter from this office to the Operator, dated July 1, 1957, both of which are self-explanatory.

Consistent with advice in the Chairman's letter, we will appreciate receiving a revision of the Report of Review, dated October 1, 1956.

Original signed by
W. H. King

W. H. King

JWF:prl

cc: Chmn. Op. Comm. (2)
Marshman) w/copy of Chairman's
DMEA/DFC) letter dated July 28
DMEA/Gr.Jct.) (should be June 28).
Hasler)
Townsend)
Corres. file)
Chron.

OFFICIAL FILE COPY
DMEA
RECEIVED 1957
DATE CODE

224 New Customhouse
Denver 2, Colorado

July 1, 1957

CERTIFIED MAIL

Mr. Ralph H. Walker, President
Big Indian Uranium Corporation
575 South 9th East Street
Salt Lake City 2, Utah

Re: Docket No. DMEA 3266 (Uranium-Copper)
Contract No. Idm-E755
Big Indian Uranium Corporation
(Big Indian copper mine)
San Juan County, Utah

Dear Mr. Walker:

Your company has, after repeated requests from this office, failed to render an acceptable final engineering and geologic report covering work performed under the Contract, as provided for in Article 6(c) of the Contract.

Therefore, under the circumstances, the sum of $250.00, withheld from reimbursement to your company in processing the final accounting report, Form MF-104, "Operator's Monthly Report and Voucher," for the month of April, 1955, is being retained by the Government in lieu of the Operator's final engineering and geologic report, so that procedures relative to closing the account can be initiated without further delay.

Very truly yours,

Original signed by
W. H. KING

W. H. King
Executive Officer, DMEA
Field Team, Region III

JWT:prl
cc: Chmn. Op. Comm. (2)
DMEA Auditor
Harshman
DMEA/DFC
DMEA/Gr.Jct.
Hasler
Townsend
Corres. file
Chron.

DMEA Form 7
(12-56)

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JUN 28 1957

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

Re: Docket No. DMEA-3266 (Copper)
Big Indian Uranium Corporation
Big Indian Copper Mine
San Juan County, Utah
Contract No. Idm-5733

Dear Mr. King:

We have your memorandum of June 13, regarding the lack of the Operator's final report on the cited project.

Since you state that your office has repeatedly requested the Operator to provide us with this report, no further action is necessary. You should make the deduction of the $250.00 which has been withheld and advise the auditor to revise the Report of Review of October 1, 1956.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

WRGriswold/er 6/27/57

Copy to: Docket
Admr R File
Op. Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Mr. Jay Chambers, DMEA
Chron.
Base Metals

APPROVED:

P. F. Yopes (GCS)
Member, Bureau of Mines

N. E. Nelson (GCS)
Member, Geological Survey

P. S. In line with the usual procedure, please advise the Operator that the Government is retaining the sum of $250.00 in lieu of its final report so that the books may be closed.

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

June 21, 1957
Re: DMEA 3266 ~~Idm-E733~~
Big Indian Uranium Corp.
San Juan County, Utah
Copper

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

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

Subject: Review of Field Team Final Report

The contract signed by the applicant, October 25, 1954, approved the expenditure of $51,260 in a search for 'blind' copper deposits in the Dakota and Burro Canyon formations where fractured near the Lisbon Valley fault.

Mining of rim exposures of copper-bearing rock produced, between 1929 and 1948, 160,104 tons of 1.67% ore, all from the Dakota sandstone. The mining is said to have removed all ore that could be recovered easily. Drilling 'behind' the open pit appears to have been unfavorable, although one hole, 'A', shows ore grade material. However, the Final Report says, p. 23, "Mr. Harris stated that ore reserves, drilled by the applicant, mostly on Mineral Point and Durango claims, amounted to 200,000 tons of ore containing 2 percent copper". The map, Fig. 2, and the notes, although not definitive, tend not to confirm this estimate, if the notes and Mr. Harris' statement apply to the same holes. The mining and the drilling, with the exception of one hole, are the southeast center of the project block. The southeasterly claims are on the footwall side of the Lisbon Valley fault and not of immediate interest. Some ore has been found in the Burro Canyon formation, but little or none seems to have been mined. The drilling recommendation was based in part on the possibility that the formation might be copper-bearing.

Only 2 holes were drilled and neither showed significant mineralization. The holes are 520 feet deep and they cost $4,732. The contract was terminated by mutual agreement July 25, 1956. The termination agreement contained a pseudo-certification.

In the opinion of the examiners, more encouraging results might have been obtained if the work provided for by the contract had been completed.

N. E. Nelson

N. E. Nelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

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June 13, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket No. DMEA 3266 (Uranium-Copper), Contract No. Idm-E733, Big Indian Uranium Corporation (Big Indian Copper mine), San Juan County, Utah

By memorandum of June 13, 1957, the DMEA Field Team, Region III, forwarded the original and three copies of a joint final engineering and geologic report, and summarized project activities as their final report.

Numerous efforts by this office, since the contract was terminated, to obtain an acceptable final report from the Operator have been unsuccessful, as copies of correspondence in your files will indicate.

Final payment to the Operator has not been accomplished, as the sum of $250.00 was withheld from reimbursement to the Operator in processing its form MF-104, "Operator's Monthly Progress Report and Voucher," for the month of April, 1955.

Because of the change in management of the property involved in the contract, it is doubtful that a report by the Operator at this late date would add anything of value to the information supplied in the joint engineering and geologic report by the Government field examiners. Under the circumstances, it is recommended that the Operator be contacted by your office with the proposition that either a final report be rendered immediately or that the Government will close the account, deducting the $250.00 withheld.

In the event the $250.00 is withheld permanently, it appears that the Report of Review, dated October 1, 1956, by the Contract Administration and Audit Division, DMEA, should be revised to reflect the difference in the total accepted cost.

W H King

W. H. King

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

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June 13, 1957

Memorandum

To: Chairman, Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Docket No. DMEA 3266 (Uranium-Copper), Contract No. Idm-E733, Big Indian Uranium Corporation (Big Indian Copper mine), San Juan County, Utah - FINAL REPORT

Enclosed are the original and three copies of a joint final engineering and geologic report, dated September 17, 1956, by G. W. Weir and Howard F. Albee, Geologists, Geological Survey, and Carl Belser, Mining Engineer, Bureau of Mines, pertaining to operations under the contract; and transmittal thereof, dated September 18, 1956, from John F. Shaw and E. N. Harshman.

The contract was terminated before completion of all work provided for, by a Termination Agreement, dated July 25, 1956, which was made effective June 1, 1955.

Acceptable units of work completed consisted of the diamond drilling of two holes aggregating 1,040 feet, at a total accepted cost of $4,732.00. The total accepted cost was confirmed by Report of Review of reported costs by the Contract Administration and Audit Division, DMEA, dated October 1, 1956.

The Operator has not rendered an acceptable final report as provided for under Article 5(c) of the contract. Therefore, final settlement of the account has not been effected.

Repayment of the amount of the Government's contribution to the costs of the work was provided for under item 4 of the Termination Agreement, to be accomplished in the same manner as if a Certification had been issued under the provisions of the contract, such a Certification being waived.

W H King
W. H. King

E. N. Harshman
E. N. Harshman

Reviewed by
DMEA OPERATING COMMITTEE
6-19-57
(date)

IN REPLY REFER TO:
DMEA
DEPARTMENT OF THE INTERIOR
SEP 20 1956
REGION III
DENVER, COLORADO

Final Field Rpt.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

September 18, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: John F. Shaw
E. N. Harshman

Subject: DMEA Docket 3266 (Copper), Contract Idm-E 733,
Big Indian Uranium Corporation (Big Indian copper mine)
San Juan County, Utah

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Enclosed are the original and 9 copies of a joint final report in which the results of exploration under the subject contract are described.

Contract Idm-E 733 authorized the drilling of 28 holes (11,200 feet of drilling) at an estimated cost of $51,260. Two holes were completed, each 520 feet deep, at a cost of $4,732. The contract was terminated by mutual agreement on July 25, 1956. A pseudo-certification was contained in the termination agreement.

Although no ore was found by the limited exploration program completed on the property, the ore potential of the area by no means can be considered disproven; with more competent management additional exploration on the property might be justified.

E. N. Harshman for
John F. Shaw
Supervising Mining Engineer

Reviewed by
DMEA OPERATING COMMITTEE
6-19-57
(date)

E. N. Harshman
E. N. Harshman
Member, Field Team

Enclosures (10)

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

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DMEA 3266

Contract Idm-E 733

Big Indian Uranium Corporation

Big Indian Copper Mine

San Juan County, Utah

FIELD TEAM FINAL REPORT

Copper

Joint Engineering and Geologic Final Report

by

G. W. Weir and
Howard F. Albee, Geologists
Geological Survey

Carl Belser, Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
6-19-57
(date)

September 17, 1956

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2.	Claim map of Big Indian Copper mine area, showing Stage I drilling completed, Big Indian Copper Corporation, San Juan County, Utah. DMEA 3266, Contract Idm-E733	25
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DMEA 3266

BIG INDIAN URANIUM CORPORATION
BIG INDIAN COPPER MINE
SAN JUAN COUNTY, UTAH

INTRODUCTION AND SUMMARY

The Moss Copper Company, P. O. Box 111, Provo, Utah, on February 4, 1954, made application for aid in an exploration drilling project on its Big Indian Copper mine in San Juan County, Utah. The project was estimated to cost $142,798. A field examination was made on May 19, 1954, by Gordon Weir of the Geological Survey and M. H. Salsbury of the Bureau of Mines. A contract was prepared authorizing a three-stage drilling project consisting of 11,200 feet (28 holes) of drilling at an estimated cost of $51,260.

The original application was for uranium exploration. It was changed by the examining team to uranium-copper, and by Washington to copper.

In the meantime, the name of Moss Copper Company was changed to Big Indian Uranium Corporation, and a DMEA contract was signed by the latter on October 25, 1954.

Actual drilling was started on February 9, 1955, and work was suspended on the contract about May 10, 1955.

The lower part of the Cretaceous sandstone, the upper part of the Cretaceous Burro Canyon formation, and part of the basal portion of the Permian Cutler formation are present on the Big Indian claims.

In the vicinity of the Big Indian Copper mine, uranium-vanadium deposits are found in the Salt Wash member of the Jurassic Morrison formation; the copper deposits are associated with faults and fractured ground in the Dakota and Burro Canyon formations.

The estimated thickness of the Dakota in this locality is 60 feet, the Burro Canyon 250 feet, the Brushy Basin member of the Morrison 420 feet, the Salt Wash member of the Morrison 325 feet, and the Cutler formation 1,000 feet.

The Big Indian claim group is located along the Lisbon Valley fault, a major northwest-trending structure at least 30 miles long. On the claims, the Dakota formation on the northeast has been dropped against the Cutler formation to the southwest. The throw of the fault is estimated by Weir to be 3,500 feet and the dip about 50° to the northeast.

Copper-bearing outcrops occur close to the fault, on the hanging wall side.

The examining team believed that there was a good possibility of finding copper ore at depth by a conservative drilling program.

The applicant stopped drilling on the project in May 1955 after two holes, each 520 feet deep, had been completed. The applicant failed to continue working on the project, and the contract was terminated by the Government on July 25, 1956. The total cost of the project was $4.55 a foot for 1,040 feet of drilling, or $4,732. Government participation was 50 percent, or $2,366.

No ore was found and no copper analyses were made. The holes were also barren of uranium mineralization.

A pseudo-certification is included in the termination agreement.

RECOMMENDATIONS

In view of the fact that the applicant has not been diligent in carrying out the terms of the contract, and that the two holes drilled were barren, the examining team believes that no further drilling is advisable while the property is under its present management.

LOCATION AND ACCESSIBILITY

The property consists of 11 patented and 2 unpatented claims in secs. 27, 28, 33, and 34, T. 29 S., R. 26 E., Salt Lake meridian, Big Indian mining district, San Juan County, Utah.

The property is 37 miles from Monticello, Utah, by road. Fifteen miles are over U. S. Highway 160 and the last 22 miles are over an unimproved county road. Moab, Utah, is 36 miles to the north, and the Denver and Rio Grande Western Railroad passes through at Crescent Junction, 68 miles to the north. Copper concentrates can be sold to the Garfield smelter which is 270 miles to the northwest. Uranium-ore recovery depots are at Monticello and Moab.

The property is on the northeast side of Lisbon Valley on the slope of a low northwest-trending ridge. The average altitude is

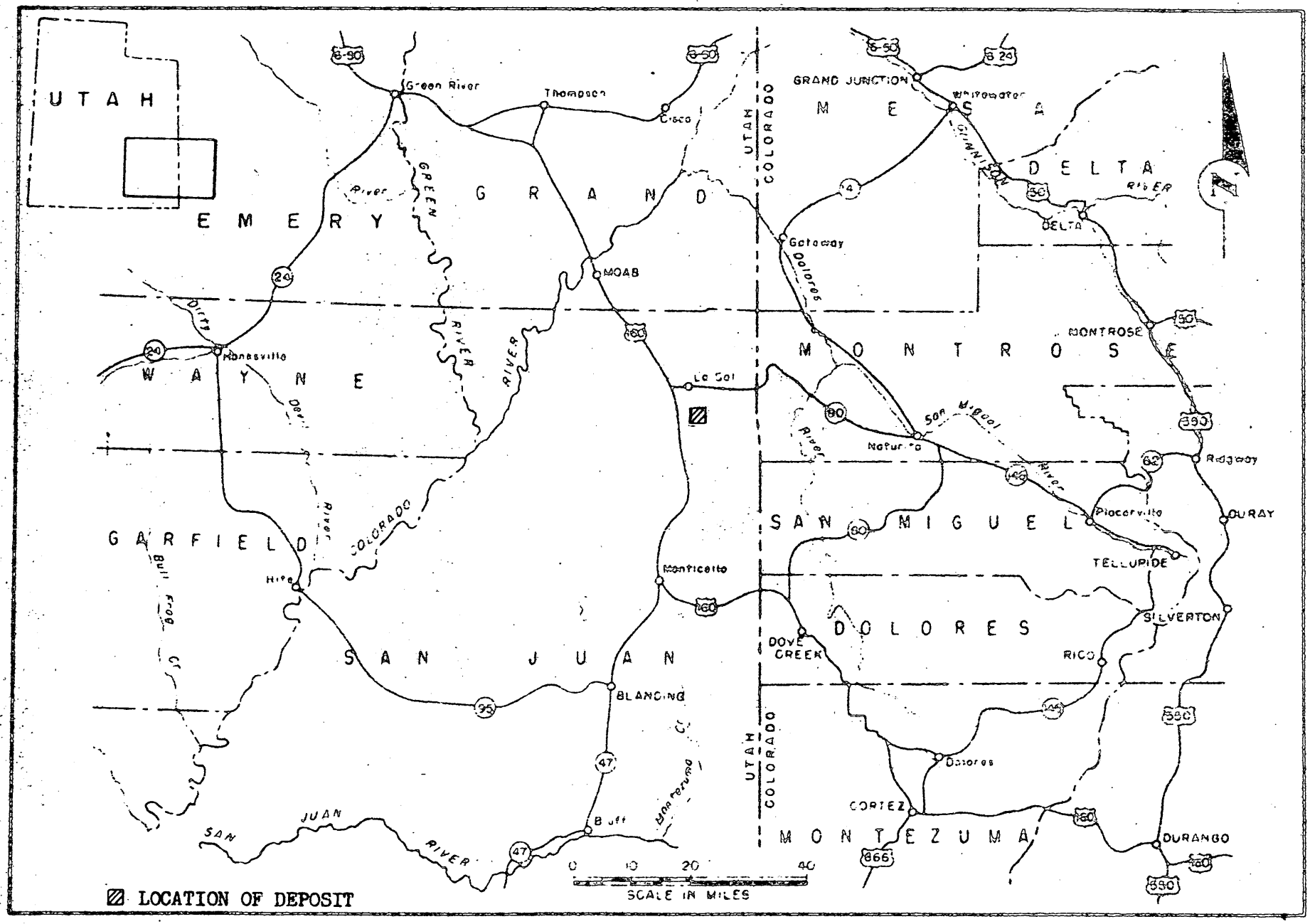

FIGURE 1 - LOCATION MAP, BIG INDIAN COPPER MINE, BIG INDIAN URANIUM CORPORATION, SAN JUAN COUNTY, UTAH.
DMEA 3266, CONTRACT Idm-E733

6,800 feet. Vegetation is sparse and the climate arid. Unimproved roads are sometimes impassable after heavy storms. Mining operations can be carried on the year around.

PROPERTY AND OWNERSHIP

The property consists of 11 patented claims and 2 unpatented claims. The patented claims are: The Durango, Anaconda, Pacific, Texas, Mineral Point, Copper King, Dandy Jim, and Nevada, all Survey No. 3995; the Utah, Survey No. 3997; the Piute placer, Survey No. 3996; and the Mono placer, Survey No. 3997. The patented property belonged to the heirs of the late Senator Smoot and were sold to Carl J. Harris, president of the Big Indian Uranium for $10,000. The final payment of $4,000 was due July 1, 1954. The Blue Jay and Eureka claims were located by the applicant.

HISTORY AND PRODUCTION

The Big Indian Copper mine was originally explored for gold and silver in 1881. Later, the copper deposits were explored. A 300-foot inclined shaft was sunk in 1900, and several adits were driven into the Burro Canyon and Dakota formations. In 1913 a 100-foot vertical shaft was sunk on the Blue Jay claim and reportedly cut good ore. In 1942, the Ohio Copper Company obtained control of the claims and worked the Copper King, Mineral Point, and Dandy Jim claims by a rim-cutting operation. Four mills have been built on the property at different times.

Production from 1929 through 1947 amounts to 158,175 tons containing 2,893 ounces of silver and 5,114,153 pounds (1.62 percent) of copper.

All underground workings are caved.

GEOLOGY

The geologic setting of the Big Indian group of claims is shown on figure 3. The claims lie at the north end of an important uranium-mining area, locally known as the Big Indian Wash mining area. The major uranium-ore deposits are in the basal beds of the Triassic Chinle formation. Smaller and lower-grade deposits are known in the upper beds of the Permian Cutler formation. South and northwest of the Big Indian Wash mining district significant uranium-vanadium deposits are found in the Salt Wash member of the Jurassic Morrison formation. Copper ore deposits are found associated with faults and fractured ground in the Upper Cretaceous Dakota formation and Lower Cretaceous Burro Canyon formation.

Stratigraphy

The Dakota sandstone of Upper Cretaceous age caps most of the claim area. It consists mainly of crossbedded and channeled light- to dark-brown sandstone and conglomerate with interbedded gray and brownish mudstone, dark-gray carbonaceous shale and lenses of impure coal. The Dakota, in part, resembles the underlying Burro Canyon

formation, but can be differentiated by the following characteristics of the Dakota: carbonaceous shale at or near the base, carbonaceous material as plant impressions and fragments in the sandstone, interbedded coal, and the absence of green mudstone. An estimated 60 feet of Dakota sandstone is exposed in the claim area; the top part of the formation has been eroded away. The Dakota sandstone is an important host rock for copper ore.

The Burro Canyon formation, of Lower Cretaceous age, is partly exposed on the steep slopes below the Dakota and in the underground workings on the claims. It consists mainly of crossbedded white and light- to dark-brown sandstone and conglomerate, bluish-gray limestone, and green and purplish-red mudstone. It is differentiated from the overlying Dakota sandstone by the absence of carbonaceous material and by the presence of green mudstone, and from the underlying Brushy Basin member of the Morrison formation by the presence of light-colored sandstone and conglomerate and green mudstone. On existing maps, as on figure 3, parts of the Burro Canyon have been included with the Dakota and parts with the Morrison formation. Logs of drill-hole cores on the Big Indian property indicate that the Burro Canyon formation is about 250 feet thick. The Burro Canyon is an important host rock of copper ore and is reported to contain some uranium.

The Morrison formation of Upper Jurassic age is not exposed on the Big Indian property, but is partly exposed a few miles to the northwest and southwest. The Morrison consists of two members, the

Brushy Basin above, and the Salt Wash below. The Brushy Basin member consists mainly of dark-red claystone and siltstone with minor dark-colored sandstone and conglomerate sandstone. The log of a deep drill hole in the Big Indian property shows that the Brushy Basin member is about 420 feet thick. The Brushy Basin appears to be an unfavorable host rock for uranium or copper minerals.

The Salt Wash member of the Morrison formation consists of interbedded, cross-stratified, channeled, light-colored sandstone and red and green mudstone. The Salt Wash member is estimated to be about 325 feet thick in the Big Indian Wash mining area. The Salt Wash is a potential host rock for uranium-vanadium ores and possibly for copper ores.

Only a few hundred feet of the lower part of the Cutler formation of Permian age is exposed on the Big Indian property. The Cutler formation consists of dark-red siltstone and sandstone with some thick beds of light-colored sandstone and thin lenses of bluish-gray limestone. The Cutler formation is estimated to attain a thickness of more than 1,000 feet. Although some beds near the top of the Cutler are locally uranium-vanadium bearing in the Big Indian Wash mining area, no occurrences of uranium, vanadium, or copper ores in the lower part of the formation in the area are known, and the Cutler formation on the Big Indian property is considered an unfavorable host rock.

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Structure

The Big Indian group of claims is located ~~along~~ the Lisbon Valley fault (fig. 3). The fault is a major northwest-trending structure about 30 miles long. Several miles ~~southeast~~ of the property the stratigraphic throw is estimated to be about 4,500 feet. At the property, the Dakota formation has been dropped against the Cutler formation and the throw is estimated to be about 3,500 feet. The Cutler is, at least locally, altered from red to green for a thickness of a few feet along the fault. A few miles northwest of the property the vertical displacement decreases to only a few hundred feet. At a few places on the property the fault plane is well exposed and dips about 50° northeasterly. Although the dip of the fault may vary along strike and at depth, the proposed drilling program was is based on the assumption of a uniform dip of 50° northeasterly.

A zone of minor fracturing, in places at least 800 feet wide, parallels the Lisbon Valley fault on its downthrown side. In this zone are a number of minor faults that rarely have displacements of more than a few tens of feet. Most of these minor faults are roughly parallel to the Lisbon Valley fault. The zone of jointing and fracturing probably represents small adjustments within the downthrown block. Probably none of these minor faults offset the Lisbon Valley fault plane.

The mineralized portion of the claims lies on the northeast side of the fault and on the southwest flank of the Lisbon Canyon anticline (fig. 3). The south flank of the anticline generally dips about 15° southeasterly toward the Lisbon Valley fault. Locally, as in the southeast part of the property, smaller flexures are superimposed on the Lisbon Canyon anticline.

The Cutler formation south of the fault dips southwesterly and forms part of the truncated nose of the Lisbon Valley anticline (fig. 3). The Lisbon Valley anticline lies entirely south of the fault and forms a prominent topographic feature southeast of the Big Indian property.

ORE DEPOSITS

The only prominent ore minerals in the surface workings of the Big Indian property are the copper carbonates, malachite($Cu_2CO_3(OH)_2$), and azurite ($Cu_3(CO_3)_2(OH)_2$). Chalcopyrite ($Cu\ Fe\ S_2$) and native copper are less abundant. Butler and others (1920) and Sample (1950) also report the following minerals: covelite? ($Cu\ S$), chalcocite (Cu_2S), tenorite (CuO), and cuprite (Cu_2O). The sulphides are presumably more common in the underground workings, although there are no reports of unoxidized ore bodies. The presence of native copper is significant because it has caused difficulty in milling the ore owing to its tendency to "ball up" and clog the crusher.

Assays of the ore show silver and gold in small concentrations, but no silver or gold minerals have been found. Uranium has been reported in one core from the oxidized zone, but no uranium minerals have yet been identified. No vanadium minerals have been found at the Big Indian property, but it may be significant that vanadium has been reported in small amounts from two somewhat similar copper ore deposits in Cretaceous rocks southeast of the Big Indian property, the Pioneer mine (Sample 1950), and the Lucky Strike prospect (Kirkpatrick 1944) (fig. 3).

Pyrite is the only common gangue sulphide. Limonite has stained much of the host rock a dark brown. Principal detrital minerals of the ore-bearing part of the host rock are quartz, chert, and feldspar; clay minerals are generally of minor importance.

The ore occurs in fractured ground mainly as layers of sandstone and conglomerate impregnated with azurite and malachite. Chalcopyrite, along with pyrite, is commonly disseminated in fine-grained rock. Veinlets of copper minerals partly fill fractures in sandstone, conglomerate, and siltstone. Small copper-bearing pyrite nodules are reported in all rock types. According to unverified reports, pockets of good copper ore have been found at depth along the Lisbon Valley fault. The bulk of the ore mined, however, has come from impregnated layers of sandstone and conglomerate near the surface.

The layered ore occurs at several horizons on the Big Indian group of claims. Most of the mining has been concentrated in the uppermost ore horizon, the base of the Dakota sandstone. Reconnaissance of the surface workings suggests that mineralized rock is relatively continuous along this uppermost horizon, but shows marked variations in grade. Lower ore horizons are in the Burro Canyon formation and are poorly known. They appear to be similar to the ore horizon in the Dakota. Mineralized rock in both formations appears to be restricted to a jointed and faulted zone on the north side of the Lisbon Valley fault. The fractured zone is at least 800 feet wide in places, but probably does not extend to the north boundary of the middle part of the property.

Minable ore bodies (including those now removed) in the Dakota sandstone near the surface range in size from mineralized layers a few feet thick and less than 100 feet in diameter to a number of mineralized layers aggregating many feet thick and many hundreds of feet in diameter. The limits of these ore bodies are generally defined by gradational to sharp decreases in grade; weakly mineralized rock is much more extensive.

Little is known about the extent or nature of ore bodies in the Burro Canyon formation, much of which is not exposed. None of the old underground workings that explored this formation are accessible for more than a few feet. Examination of the dump material and the limited exposures of the lower ore horizons suggest that ore bodies

in the Burro Canyon are probably similar in size and habit to those in the Dakota.

Reports of pods of ore along the Lisbon Valley fault are difficult to evaluate. Good ore on the dump from the Blue Jay shaft, which may have intersected the Lisbon Valley fault, lends credit to the unverified reports. Because even in bedded ore near the surface, copper minerals are found abundantly along small fractures, joints, and faults, it is believed that ore does occur in favorable beds in the Burro Canyon formation along the major fault. However, it seems permissible to draw the conclusion from the mining history of the property, that ore along the fault is not so abundant or so rich in grade as to be more attractive economically than the disseminated ore near the surface.

ORE RESERVES

Copper

Large scale open-cut mining has been done mainly on the Copper King and Mineral Point claims, and most of the impregnated sandstone ore in the Dakota sandstone near the surface has been removed. However, ore-bearing horizons in the Burro Canyon formation are believed to underlie these claims. The most promising exposures of ore near the surface appear to be those on the eastern part of the Blue Jay claim and the western part of the Nevada claim. These occurrences

are in the upper part of the Burro Canyon. Although a few copper prospects are known in the ground north of the Nevada and Mineral Point claims, the potential of this area is difficult to assess because much of the area is covered with surficial material. The ore is apparently restricted to a fractured zone parallel to the Lisbon Valley fault. Sample (1950) states that assays of drill-hole cores of the Ohio Copper Company showed that the ore grade diminishes northward away from the fractured zone. Thus it seems probable that the copper potential generally decreases northward away from the Lisbon Valley fault and that the Nevada and Mineral Point claims probably contain more favorable ground than the claims farther north.

The Utah claim and unclaimed land to the southeast contain several small prospects that suggest this ground is only weakly mineralized, but the amount of low-grade material here may be significant. The Mono Placer and the Piute Placer claims are located south of the major fault and are believed to be barren.

Practically all of the ore that could be mined easily has been taken from the basal part of the Dakota sandstone. It is believed that the copper potential of the Burro Canyon is equal to, and possibly greater than, that of the Dakota. The Brushy Basin member of the Morrison formation is composed mainly of siltstone and claystone and is believed to be an unfavorable host rock. The Salt Wash member of the Morrison is regarded as potentially copper-

bearing, because it is somewhat similar lithologically to the Burro Canyon and Dakota, but in this area no copper ore deposits are known in that formation. The Cutler formation on the south side of the fault is a barren unfavorable host rock and probably has no significant potential.

Assuming a grade cutoff of one percent copper, the grade of reserve and potential ore of the Big Indian property is estimated to be on the order of 3 percent copper. Because weakly mineralized material is abundant, a grade cutoff of 0.5 percent copper would probably result in an average grade of less than 1.5 percent copper. Past production (table 1) shows a grade ranging from about 1.2 percent to about 16 percent copper. This wide range is apparently due to differences in mining practices. The history of the Ohio Copper Company operation suggests that large amounts of ore cannot be mined selectively.

About 1943 the Ohio Copper Company blocked out, by drilling in the Dakota sandstone, an estimated 156,000 tons of ore with an average grade of about 2 percent copper. Sample (1950), using the same data supplemented by geologic mapping, estimated in 1943 that the total reserves of the Big Indian property amounted to 286,000 tons, comprising 126,000 tons having an average grade of 2 percent copper, 87,000 tons having an average grade of 1.25 percent copper, and 73,000 tons having an average grade of 0.5 percent copper. Practically all of this reserve ore was assigned to the Dakota; only

Table 1.--Recorded production of the Big Indian copper property for the period 1929-1952

Period	Crude ore produced (Dry tons) 1/	Copper (pounds) Gross in ore 1/	Per cent copper 2/	Silver (ounces) Gross in ore 1/	Ounces of silver per ton 2/
1929	362	53,378	7.37	75	0.21
1930	750	44,560	2.97	70	0.09
1931-1935	None	----	----	----	----
1936	38	12,133	15.96	27	0.71
1937	565	108,730	9.62	197	0.35
1938-1943	None	----	----	----	----
1944	8,009	397,246	2.48	270	0.03
1945	45,380	1,527,415	1.68	800	0.02
1946	46,333	1,751,387	1.89	700	0.02
1947	58,667	1,454,942	1.24	1,123	0.02
1948-1952	None	----	----	----	----
Total	160,104	5,349,791	1.67	3,262	0.02

1/ Data supplied by Paul D. Luff, Commodity-Industry Analyst, Bureau of Mines.

2/ Calculated by G. W. Weir.

5,000 tons of low-grade material was assigned to the Burro Canyon formation. Since these estimates were made, about 150,000 tons of ore having an average grade of about 1.7 percent copper were mined from the Dakota sandstone. Sample (1950) states that the deposits appear to have been stripped of all commercial ore.

Assuming a grade cutoff of one percent copper and a reasonable projection of the exposed ore, it is estimated that there are at least several thousand tons of indicated reserves and probably more than 10,000 tons of inferred reserves having an average grade of about 3 percent copper. More than half of this reserve ore is assigned to the Burro Canyon formation. If ore bodies in the Burro Canyon are similar in size and habit to those mined from the Dakota, or if, as seems less likely, large ore bodies are concealed in fractured portion of the Dakota, or if, as seems possible, ore is locally concentrated along the Lisbon Valley fault, the Big Indian property potentially contains between several hundred thousand and one million tons of ore. Much of this reserve and potential ore, however, must be in the Burro Canyon formation covered by a relatively thick overburden and may not be economically minable at present.

Uranium-vanadium

The chance of finding uranium-vanadium ore on the Big Indian group of claims is remote. In adjoining areas, uranium-vanadium ore has been mined from the Brushy Basin and Salt Wash members of

the Morrison formation, the basal part of the Chinle formation, and the upper part of the Cutler formation. Few of these deposits are associated with faults. The larger and higher-grade deposits are found in the Chinle formation. Significant production has come from the Salt Wash member. There has been but little production from the Brushy Basin member or from the Cutler formation. Of the important host rocks, only the Salt Wash member of the Morrison underlies the Big Indian property.

The Salt Wash is not exposed on or near the Big Indian group of claims. The closest exposure is about 5 miles northwest on the Rattlesnake group of claims. The Rattlesnake group lies in a zone of fractured ground along the Lisbon Valley fault. Exploration and development on these claims show that ore bodies are 3 to 5 feet thick and appear to be relatively continuous. Although the Rattlesnake group is far from the Big Indian property, the uranium-vanadium deposit lies in a structural and stratigraphic setting similar to the deeply buried Salt Wash on the Big Indian claims. The deposit at the Rattlesnake group suggests that similar uranium-vanadium deposits might exist at depth, in the fractured portion of the Salt Wash along the Lisbon Valley fault on the Big Indian property.

On the other hand, the exposures of ore at the Rattlesnake group of claims strongly suggest that the faults may be post-ore. The Lisbon Valley fault and associated faults may have no genetic connection with the uranium-vanadium ore. It is possible that the Lisbon Valley fault is much older than the associated faults.

Furthermore, the nearest exposures of the Salt Wash to the southeast, about 10 miles distant, are distinctly unfavorable. The sandstone ledges are thin, reddish in color, and contain only a few insignificant uranium-vanadium deposits. The Lisbon Valley and Lisbon Canyon anticlines may have formed a relatively positive area during Salt Wash deposition, and along the crest of this high, perhaps approximately the trace of the Lisbon Valley fault, the Salt Wash beds may be thinner and less favorable for ore. The Big Indian property probably lies near the northwest end of this positive area, and the Salt Wash here may be less favorable for ore than the Salt Wash farther northwest at the Rattlesnake claims.

A few feet of Salt Wash was exposed in a core taken from a deep hole on the Durango claim. This core consisted of fine-grained sandstone with a light reddish cast, a rock type that is generally considered unfavorable, or semi-favorable, for uranium-vanadium ore in the Salt Wash. However, because the character sandstones of the Salt Wash may change markedly within a short distance, the appearance of this core can be given but little importance.

According to the Atomic Energy Commission (1953), the break-even value for extraction of a 10,000-ton ore body having an average thickness of from 3 to 6 feet, and covered by from 500 to 800 feet of overburden must be from $33.50 to $41.00 a ton. Thus, it appears impractical to explore the deeply buried Salt Wash on the Big Indian group of claims for deposits of less than 10,000 tons. Assuming that

the ore body is about 3 feet thick and is approximately circular in plan, such a deposit would be about 775 feet in diameter.

Copper-uranium

Copper minerals are associated with uranium ores in many areas on the Colorado Plateau, but uranium-bearing copper ores are not common. In Utah only the White Canyon mining area, about 70 miles southwest of the Big Indian property, contains large deposits of copper-uranium ore. The White Canyon deposits are in the Triassic Shinarump conglomerate. In the Lockhart Canyon-Indian Creek area, about 25 miles west of the Big Indian property, copper occurs with uranium in many small deposits in the Cutler formation; some of these deposits contain about 1.5 ounce of silver a ton (Dix 1935b). In the Slick Rock mining district, about 25 miles southeast of the Big Indian property, specks of copper carbonates are commonly associated with the uranium-vanadium deposits found in the Salt Wash member of the Morrison formation. Specimens of copper sulphides have been collected from at least one Salt Wash uranium-vanadium deposit in the Slick Rock district, the Rainbow mine in the Lower group of claims (R. B. Raup, USGS, personal communication).

Copper in trace amounts has been found in some uranium-vanadium deposits in the Lisbon Valley area. Dix (1953a, p. 12, 13) reports copper sulphate, and copper-uranium minerals in the uranium deposits in upper part of the Cutler formation in Big Indian Wash. Raup

(personal communication) has found small nodules of an unidentified black mineral enclosed by a rim of malachite in the uranium-vanadium ore in Steen's Mi Vida mine in the Chinle formation along Big Indian Wash. The writer knows of no copper occurrences associated with the uranium-vanadium deposits in the Salt Wash member of the Morrison formation in the Lisbon Valley area.

Copper-uranium ore is not characteristic of the Lisbon Valley area. The applicants state that an assay of a core from the brecciated zone of the Big Indian property showed 0.044 percent uranium. It is not known whether this assay was of copper ore, but it was apparently from the Burro Canyon formation, an important host rock for copper. A traverse of parts of the property with a scintillometer revealed no radioactivity anomalies at the surface. Traverses with an ionization chamber, conducted by geophysicists under contract to the AEC, have detected some small radioactivity anomalies around the old workings (I. T. Fisk, AEC, personal communication).

The Lucky Strike copper prospect is the only occurrence of uranium-vanadium-bearing copper ore in the Lisbon Valley area known to the writer. This prospect is about 14 miles southeast of the Big Indian property. The deposit has formed in the Burro Canyon formation along a normal fault that has dropped the Burro Canyon against the Salt Wash member of the Morrison. Copper carbonates and oxides impregnate sandstone along the fault, along minor fractures in a zone parallel to the fault, and along bedding planes. Radioactive material

is concentrated in limonite-stained silicified sandstone along a fracture close to the major fault. Specimens of the radioactive rock show limonite, malachite, brochantite, and volborthite ($Co_3(VO_4)_2 \cdot 3H_2O$?) and minute quantities of a bright-yellow radioactive mineral, probably carnotite (M. E. Thompson, USGS, personal communication). Radioactivity along the mineralized fracture is as high as 10 milliroentgens an hour, which suggests that some of the material is of uranium-ore grade. The thickness of the radioactive rock is only a few feet; its length and breadth is probably measurable in a few tens of feet. Probably there are only a few tons, or tens of tons, of radioactive rock in the prospect. There apparently has been no mining at this prospect for many years, and it is unlikely that any ore was mined for its uranium or vanadium content.

Kirkpatrick (1944, p. 16) noted vanadium and uranium at the Lucky Strike prospect in 1944, but assumed that the uranium and vanadium were derived from a nearby carnotite deposit in the Salt Wash member of the Morrison on the footwall side of the fault. A similar interpretation could be applied to the occurrence at the Big Indian property where the Salt Wash is about 400 feet below the Burro Canyon on the downthrown side of the Lisbon Valley fault. Because the copper deposits of the Lisbon Valley area are all found along faults or in fractured ground, any copper-uranium deposits are likely to be found associated with faults. Because copper minerals are associated with some uranium-vanadium deposits in the adjacent Slick Rock mining

district, the Salt Wash member is a potential host rock for copper-uranium ore. On the other hand, if Kirkpatrick's interpretation is correct, the occurrence of uranium in the Burro Canyon formation at the Big Indian property may indicate the presence of uranium-vanadium ore bodies at depth in the Salt Wash.

THE PROJECT

Copper outcrops occur on surface at the Big Indian Copper mine. Close to the fault on the hanging wall side there is a zone of copper mineralization which appears to be higher in grade than the surface of the zones exploited in the past. It was believed that there would be a good possibility of finding copper ore at depth and the project was recommended.

The applicant proposed an extensive drilling program having an estimated total cost of $142,798. A modified three-stage program was prepared by the DMEA consisting of 11,200 feet (28 holes) of drilling at a total cost of $51,260. The first stage of this drilling program consisted of four holes, spaced about 700 feet apart, and drilled so that the fault would be cut at a depth of 400 to 500 feet. Drilling was started on February 9, 1955, and was suspended by the applicant on May 10, 1955, after two holes each 520 feet deep had been completed. No copper or uranium ore had been penetrated by the drill holes.

SUMMARY OF FACTUAL DATA

The completed work consists of 1,040 feet of core drilling at $4.55 a foot, at a total cost of $4,732. Government participation is 50 percent, or $2,366.

No ore was produced during the life of the contract, although Mr. Harris stated that ore reserves, drilled by the applicant, mostly on the Mineral Point and Durango claims, amounted to 200,000 tons of ore containing 2 percent copper. This drilling was not on the DMEA contract.

The applicant furnished all equipment, and the core drilling contract was for $4.55 a foot, plus 200 analyses for copper at $1.50 each. No assays were made from the core recovered. Probing of the two holes by the U. S. G. S. for uranium mineralization gave negative results.

DISCUSSION OF CONCLUSIONS

The operator was not experienced, and the two holes are reported to have cost over $12 a foot. Core recovery was fair to good. Work was constantly interrupted due to lack of water, casing, bits, etc.

The target area suggested in the original report was not explored. The examining team believes that no further drilling is advisable while the property is under the present management.

It is concluded that, although the results of DMEA drilling were negative, more encouraging results may have been obtained if the Big Indian Uranium Corporation had completed the work outlined under contract Idm-E 733 in an efficient manner. Because of the inadequate execution of the contract by the company, it is recommended that a discovery be certified on the property to protect the interests of the Government in case the price structure of copper should at a later date permit mining of the estimated reserves.

REFERENCES CITED

Atomic Energy Commission (1953) Guide to ore value required to extract uranium ore at break-even cost from ore bodies of varying depth and size, unpublished memorandum.

Butler, B. S., Loughlin, G. F., Heikes, V. C., and others (1920) The ore deposits of Utah: U.S.G.S. Prof. Paper III, p. 614-615.

Dix, G. P., Jr. (1953a) The uranium deposits of Big Indian Wash San Juan County, Utah: U. S. Atomic Energy Commission RME-4022.

Dix, G. P., Jr. (1953b) Reconnaissance of the uranium deposits of the Lockhart Canyon-Indian Creek area, San Juan County, Utah: U. S. Atomic Energy Commission RME-25.

Kirkpatrick, R. K. (1944) Monticello (Dry Valley) district, Green River Desert area, Utah-Colorado: Union Mines Development Corp. unpublished report.

Sample, R. D. (1950) Copper deposits of the Big Indian Wash-Lisbon Valley district, San Juan County, Utah: U. S. Geol. Survey unpublished file report.

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 1957

224 New Customhouse
Denver 2, Colorado

March 26, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED MAR 29 1957

DATE	INITIALS	CODE
4/1	C	220
4/1	[illegible]	800
		225

Mr. Leland W. Halvorsen, Secretary-Treasurer
Big Indian Uranium Corporation
575 South 9th East Street
Salt Lake City 2, Utah

Re: Docket MEA-3266 (Uranium)
Contract Idm-E733
Big Indian Uranium Corporation
(Big Indian mine)
San Juan County, Utah

Dear Mr. Halvorsen:

In response to your letter of March 25, 1957, to this office, enclosed are one copy of the following items which you requested, for each of the reporting periods: February, 1955; March, 1955; and April-May, 1955.

1. Form MF-104, Operator's Monthly Report and Voucher

2. Form MF-104A, Operator's Unit Cost and Progress Report

3. Operator's Narrative Report.

Also enclosed is a copy of R-IV-B and T Form No. 4, Administrative Audit Difference Statement, dated August 24, 1955, relative to the amount withheld from the April-May, 1955 Voucher.

JDC:hh

Yours very truly,

Original signed by
E. N. HARSHMAN
E. N. Harshman
Acting Executive Officer, MEA
Field Team, Region III

cc: Chmn.Op.Comm. (2)
Harshman
Shaw (2)
Townsend
Corres. E733
Chron.
) w/copy Oper. let. of 3/25/57

cc: Mr. Ralph H. Walker
670 7th Ave. West
Calgary, Alberta
Canada
) w/one copy each of above items

BIG INDIAN URANIUM CORPORATION

375 South 9th East Street
Telephone EM. 4-[illegible]
SALT LAKE CITY, UTAH

OFFICIAL FILE COPY
DMEA
RECEIVED MAR 29 1957

DATE	INITIALS	CODE

OFFICERS
RALPH H. WALKER
PRESIDENT
MILT. S. RINDSKOPF
VICE PRESIDENT
LELAND W. HALVORSEN
SECRETARY & TREASURER

DIRECTORS
SCOTT LEDINGHAM
CARL HARRIS
CORREY NEWREN
W. A. SORENSEN

DMEA
DEPARTMENT OF THE INTERIOR
MAR 26 1957
REGION III
DENVER, COLORADO

March 25, 1957

Defense Minerals Exploration Administration
224 New Customhouse
Denver 2, Colorado
Attention Mr. W. M. Traver

Re: Docket DMEA-3266
Contract IDM-E733

Dear Mr. Traver:

Mr. Ralph H. Walker, president of Big Indian Uranium Corporation of Calgary, Canada, called me today and requested a copy of the monthly progress reports and also, the financial reports that the Big Indian Uranium Corporation made under the DMEA loan.

We regret to say that the past officers conducted the company business in a very careless manner, therefore, we do not have duplicate copies of these reports mailed to you by the former officers of the company. We need these copies in order to complete the balance of the reports.

I contacted our company auditor and he recommended that I obtain duplicate copies of these reports from you and then he probably could supply us with the balance of our financial reports. As soon as I receive these reports from you I will contact the past general manager of the company and get the balance of the progress reports.

We will be gratefull to you if you will send us duplicate copies of both financial and progress reports from your files that the company mailed you. We are anxious to settle this matter and certainly will appreciate your help.

We would appreciate if you would mail one copy to Mr. Ralph H. Walker, 640 7th Ave. West, Calgary, Alberta, Canada, and one to Big Indian Uranium Corporation, 575 South 9th East, Salt Lake City, Utah.

Yours very truly,

Leland W. Halvorsen
Secretary-Treasurer

LWH:lk

We will be happy to pay for cost of obtaining duplicates.

BIG INDIAN URANIUM CORPORATION

OFFICERS

RALPH H. WALKER
PRESIDENT
MILT. S. RINDSKOPF
VICE PRESIDENT
LELAND W. HALVORSEN
SECRETARY & TREASURER

1375 South 9th East Street
Telephone EM. 4-3068
SALT LAKE CITY 2, UTAH

DIRECTORS

SCOTT LEDINGHAM
CARL HARRIS
LOEY NEWREN
W. A. SORENSEN

3266

OFFICIAL FILE COPY
DMEA
RECEIVED MAR 14 1957

DATE	INITIALS	CODE
3/14	C	220
3/15	[illegible]	800
		225

640 - 7th Avenue West,
Calgary, Alberta,
March 5, 1957.

DMEA
DEPARTMENT OF THE INTERIOR
MAR 11 1957
REGION III
DENVER, COLORADO

Mr. W. M. Traver,
Executive Officer, DMEA
Field Team, Region 111,
United States Department of the Interior,
224 New Customhouse,
DENVER 2, Colorado.

Dear Mr. Traver:

In reply to your letter of February 14th, I wish to thank you for your cooperation in forwarding to me the two logs on the holes concerned under the contract.

I have been out of town for most of the time since your letter was written, however, since returning I have contacted Mr. L. Don Halvorsen, a Consultant, who is familiar with the property involved under this contract and requested him to begin compiling the report covering the data necessary for your office. Time of completion will be dependent upon him but we shall attempt to expedite the matter.

Yours truly,

Ralph H. Walker

Ralph H. Walker

RHW/mmd

Copies sent 3/11/57 to
Chairman (2)
Hashman
Shaw (2)
Hasler
Townsend

224 New Customhouse
Denver 2, Colorado

February 14, 1957

OFFICIAL FILE COPY DMEA RECEIVED FEB 18 1957		
DATE	INITIALS	CODE
2-8	C	220
2/19	u	800
		225

Mr. Ralph H. Walker, President
Big Indian Uranium Corporation
640 7th Avenue West
Calgary, Alberta
Canada

Re: Docket DMEA -3266 (Copper)
Contract Idm-E733
Big Indian Uranium Corporation
(Durango et al claims)
San Juan County, Utah

Dear Mr. Walker:

In reply to your letter of February 7, 1957, we are enclosing one copy each of logs for the two holes which were completed under Contract Idm-E733.

Please advise this office by return mail of the date on or before which we may expect to receive the final report covering the project work.

Yours very truly,

Original signed by
W. M. TRAVER

W. M. Traver
Executive Officer, DMEA
Field Team, Region III

Enclosure

JDC:hh
cc:
Chmn. Op. Comm. (2))
Harshman)
Shaw (2)) with/
Hasler) copy Oper. letter
Townsend)
Corres. E733)
Chron.)

BIG INDIAN URANIUM CORPORATION

SALT LAKE CITY, UTAH

DMEA
DEPARTMENT OF THE INTERIOR
FEB 13 1957
REGION III
DENVER, COLORADO

OFFICERS
RALPH H. WALKER
PRESIDENT
MILT. S. RINDSKOPF
VICE PRESIDENT
LELAND W. HALVORSEN
SECRETARY & TREASURER

DIRECTORS
SCOTT LEDINGHAM
CARL HARRIS
LOEY NEWREN
W. A. SORENSEN

640 - 7th Avenue West,
Calgary, Alberta,
February 7, 1957.

Mr. W. M. Traver,
Executive Officer, DMEA
Field Team, Region 111,
224 New Customhouse,
DENVER 2, Colorado.

Re: Docket DMEA 3266 (Uranium-Copper)
Contract Idm-E733
Big Indian Uranium Corporation
San Juan County, Utah.

Dear Mr. Traver:

With reference to your previous letters, may I explain that we are attempting to once again reconstruct the reports which have been given by the previous officers of Big Indian Uranium Corporation, for submittal to you under the above named contract.

If it would be possible to obtain them, we would greatly appreciate the return of the logs which were filed with your office by Mr. Carl Harris on the drill holes pertaining to the above loan. It would seem that Mr. Harris or Mr. Hafen, the previous President and General Manager of Big Indian Uranium Corporation, did not keep records or files for the office on this particular project.

Any assistance which your office could render in helping us complete this report would be greatly appreciated.

Yours truly,

Ralph H. Walker

Ralph H. Walker.

RHW/rmd

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

224 New Customhouse
Denver 2, Colorado

February 1, 1957

Mr. Ralph H. Walker, President
Big Indian Uranium Corporation
504 Lancaster Building
Calgary, Alberta
CANADA

Re: Docket DMEA 3266 (Uranium-Copper)
Contract Idm-E733
Big Indian Uranium Corporation
San Juan County, Utah

Dear Mr. Walker:

Reference is made to our letter of January 7, 1957 and prior correspondence relative to the rendering by your company of a final joint engineering and geologic report, pertaining to work completed under the contract.

We will appreciate advice by return mail, as to the date on or before which we can expect to receive the required report.

Yours very truly,

Original signed by
J. W. TOWNSEND

W. M. Traver
Executive Officer, DMEA
Field Team, Region III

JWT:ytl
cc
Chmn. Op. Comm. (2)
Harshman
Shaw (2)
Hasler
Townsend
Corres. Idm-E733
Chron.

OFFICIAL FILE COPY
DMEA
RECEIVED FEB 4 1957

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2/4	[illegible]	800
2/5	[illegible]	225

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

1/14 800 225

224 New Customhouse
Denver 2, Colorado

January 7, 1957

Mr. Ralph H. Walker, President
Big Indian Uranium Corporation
504 Lancaster Building
Calgary, Alberta
CANADA

Re: Docket No. DMEA 3266 (Uranium-Copper)
Contract No. Idm-E733
Big Indian Uranium Corporation
San Juan County, Utah

Dear Mr. Walker:

Thank you for your letter of January 3, 1957, in reply to our inquiry of December 28, 1956 concerning the final engineering and geologic report to be submitted relative to the work performed under Contract No. Idm-E733.

In the matter of the final report, please refer again to our letter to you of November 8, 1956 concerning an inadequate report submitted by you November 5, 1956.

In further reference to your letter of January 3, apparently Mr. Harris, the previous President of Big Indian Uranium Corporation, was referring to the various monthly progress reports submitted in conjunction with work performed under the contract, as we have not received an adequate final engineering and geologic report, as provided for in the contract. The monthly progress reports and the final report serve different purposes; therefore, certain material furnished in the monthly reports must be duplicated for the final report.

Five copies of the report should be submitted, and the report should contain a summary of the work performed under the contract, the conditions encountered, and results thereof. Each copy of the report should contain a map or maps showing the location and extent of work performed, drill logs, records as to location and

results of samples taken, and any other data pertinent to the report. The report should be complete in such detail as to give a comprehensive picture of the work performed, the results of the work, and the costs thereof.

Very truly yours,

Original signed by
W. M. TRAVER

W. M. Traver
Executive Officer, [redacted]
Field Team, Region III

JWT:prl

cc: Chairman, Op. Comm. (2)) w/copy of
Harshman) Operator's
Shaw (2)) letter of
Hasler) January 3.
Townsend)
Corres. file)
Chron.

BIG INDIAN URANIUM CORPORATION

OFFICERS
RALPH H. WALKER
PRESIDENT
MILT. S. RINDSKOPF
VICE PRESIDENT
LELAND W. HALVORSEN
SECRETARY & TREASURER

375 South 9th East Street
Telephone EM. 4-1068
SALT LAKE CITY 2, UTAH

DIRECTORS
SCOTT LEDINGHAM
CARL HARRIS
LOEY NEWREN
W. A. SORENSEN

DMEA
DEPARTMENT OF THE INTERIOR
JAN 7 1957
REGION III
DENVER, COLORADO

504 Lancaster Building,
Calgary, Alberta,
January 3, 1957

Mr. W. M. Traver,
Executive Officer, DMEA
Field Team, Region 111,
United States Department of the Interior,
224 Customhouse,
DENVER 2, Colorado.

Dear Mr. Traver:

Re: Docket DMEA 3266 (Uranium - Copper)
Contract Idm - E733
Big Indian Uranium Corporation
San Juan County, Utah

Concerning your letter of December 28, 1956 and also your letter of November 28, 1956, with reference to the Engineering and Geologic Report which you advise me is required under Contract Idm-E733, I have been attempting to locate additional information since receiving your initial request.

Further discussions and correspondence with Mr. Carl Harris, who was the previous President of Big Indian Uranium Corporation, has brought the information to me that all logs and an Engineering Report on the drilling program under the loan made to Big Indian Corporation, had been forwarded to your office.

I would greatly appreciate your checking into this information and confirming same to me.

I would also greatly appreciate any additional information you could give me concerning the fulfillment of your request as to specifications required in this final report.

Yours truly,
Ralph H. Walker
Ralph H. Walker,
Vice President

RHW/rmd

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

224 New Customhouse
Denver 2, Colorado

December 28, 1956

31

Mr. Ralph H. Walker, President
Big Indian Uranium Corporation
575 South Ninth East Street
Salt Lake City 2, Utah

Re: Docket DMEA 3266 (Uranium-Copper)
Contract Idm-E733
Big Indian Uranium Corporation
San Juan County, Utah

Dear Mr. Walker:

Reference is made to our letter of November 8, 1956, concerning the rendering of five copies of a more adequate Engineering and Geologic Report pertaining to the work completed under Contract Idm-E733.

We will appreciate advice by return mail as to the approximate date we can expect to receive the required report.

When an adequate final report has been received we will then be in a position to make final payment to you of the amount withheld in processing the last accounting report.

Very truly yours,

Original signed by
W. M. TRAVER

W. M. Traver
Executive Officer, DMEA
Field Team, Region III

JWT:ewa
cc: Chm. Op. Comm. (2)
Harshman
Shaw (2)
Hasler
Townsend
Corresp.
Chron.

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

RECEIVED NOV 18 1956 D.M.E.A.

224 New Customhouse
Denver 2, Colorado

November 8, 1956

Mr. Ralph M. Walker, President
Big Indian Uranium Corporation
575 South 9th East Street
Salt Lake City 2, Utah

Re: Docket No. DMEA 3266 (Uranium-Copper)
Contract No. Idm-R733
Big Indian Uranium Corporation
San Juan County, Utah

Dear Mr. Walker:

Receipt is acknowledged of your letter of November 5, 1956 whereby you forwarded one copy of a report intended to be the final engineering and geologic report, as provided for under Article 6 (c) of Contract No. Idm-R733.

The report you forwarded discusses the DMEA work only in a general way. Therefore, it is necessary that the report be supplemented by a geologic and engineering report pertaining specifically to the DMEA work performed and the results thereof.

In addition, Article 6 (c) of the Contract provides that five copies of the report shall be rendered, each copy complete with maps and all pertinent data. We will appreciate your providing us with the required number of copies of a more adequate report at an early date.

Very truly yours,

Original signed by
W. M. TRAVER

W. M. Traver
Executive Officer, DMEA
Field Team, Region III

JWT:prl

cc: Chairman, Op. Comm. (2)
Harshman
Shaw (2)
Hasler
Townsend
Corres. file
Chron.

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

RECEIVED SEP 27 1956

224 New Customhouse
Denver 2, Colorado

CERTIFIED MAIL

September 25, 1956

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

Re: Docket No. DMEA 3266 (Uranium-Copper)
Contract No. Idm-E733
Big Indian Uranium Corporation
San Juan County, Utah

Dear Mr. Harris:

Reference is made to our letter of August 27, 1956 whereby we forwarded the "Operator's Copy" of the "TERMINATION AGREEMENT" executed to terminate Contract No. Idm-E733, effective June 1, 1955, and called your attention to the requirement for you to provide the final engineering and geologic report in compliance with Article 6(c) of the contract form.

We are desirous of closing this account at an early date. Therefore, please advise by return mail the date on or before which we can expect to receive your final engineering and geologic report pertaining to the work completed under the contract.

Very truly yours,

W. M. TRAVER

W. M. Traver
Executive Officer, DMEA
Field Team, Region III

JWT:prl

cc: Chairman, Oper. Comm. (2)
Harshman
Shaw
Hasler
Towndend
Corres. file
Chron.

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

224 New Customhouse
Denver 2, Colorado

August 27, 1956

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3266 (Uranium-Copper), Contract Idm-E733, Big Indian Uranium Corporation, San Juan County, Utah

Enclosed herewith are the Government's, Division, and Docket copies of the "TERMINATION AGREEMENT" which was forwarded by your letter of July 26, 1956, for signature by the Operator.

Copies of the "TERMINATION AGREEMENT" have been distributed to the Operator, the Finance Office, Region III, and others concerned.

W. M. Traver

W. M. Traver

Enclosures

RECEIVED
AUG 30 1956

File Copy
Surname

Chamber
Selfridge
Griswold

500

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

JUL 2 6 1956

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

Re: Docket No. DMEA-3266 (Copper)
Big Indian Uranium Corporation
Big Indian Copper Mine
San Juan County, Utah
Contract No. Idm-8733

Dear Mr. Traver:

We have your memorandum of July 3, with enclosures, referring to the cited project.

Since the two holes which were drilled under the DMEA contract were barren, we cannot issue a certification. We are therefore enclosing the original and five copies of a Termination Agreement, containing a pseudo-certification clause. Please present it to the Operator for signature. Since this company has signified its acceptance of a certification, we presume it will be agreeable to signing a termination agreement having the same effect.

When the agreement has been signed by the Operator, please distribute the copies in the usual manner.

Sincerely yours,
George C. Selfridge
Chairman, Operating Committee

Enclosures

APPROVED:
P. F. Yopes
Member, Bureau of Mines
N. E. Nelson
Member, Geological Survey

WRGRISWOLD/er 7/24/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Pennington, USBM
Mr. Kiilsgaard, USGS
Chron.

R.C.S.

File Copy
Surname
Nelson

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

500

July 24, 1956

Memorandum

To: The Administrator

From: Chief, Base Metals Division

Subject: Termination Agreement on Docket No. DMEA-3266 (Copper), Big Indian Uranium Corporation, Big Indian Copper Mine, San Juan County, Utah, Contract No. Idm-E733.

This project has been hanging fire for a long time. The company ran out of money after drilling two barren holes. The Termination Agreement, containing a pseudo certification, seems to be the only logical way to wind up the project.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Base Metals
Chron.

File Copy
Surname

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

500

July 18, 1956

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Chief, Base Metals Division

Subject: Preparation of Termination Agreement for Docket No. DMEA-3266, Contract No. Idm-K733, Big Indian Uranium Corporation, San Juan County, Utah, Copper.

Will you kindly prepare an agreement of mutual termination covering the cited contract. The agreement should contain a "pseudo-certification" clause.

Terminal date should be June 1, 1955.

W. R. Griswold

W. R. Griswold

WRG/er

Copy to: Docket
Base Metals
Chron.

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

RECEIVED
JUL 5 - 1956

224 New Customhouse
Denver 2, Colorado

July 3, 1956

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3266 (Uranium-Copper), Contract Idm-E733, Big Indian Uranium Corporation, San Juan County, Utah.

Reference is made to matters discussed in our memorandum of April 4, 1956 and the verbal discussion with members of your staff by J. W. Hasler when he was in Washington in April, regarding termination of the subject contract with certification. In conjunction therewith, we are enclosing the following material:

1. Original and three copies of a memorandum, dated June 8, 1956 from J. Wm. Hasler.

2. Original and three copies of an undated letter, received in this office June 27, 1956, from Carl J. Harris, President, Big Indian Uranium Corporation.

Inasmuch as the issuing of the certification of discovery or development appears to be a matter of DMEA policy, the material was forwarded without additional specific recommendations from this office.

W. M. Traver
W. M. Traver

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 360
Grand Junction, Colorado

MINERAL DEPOSITS
IN REPLY REFER TO:
DMEA
RECEIVED
JUN 12 1956
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO
DMEA
Date Rec'd.
JUN 14 1956
BUREAU OF MINES
Denver, Colorado
RECEIVED
JUL 5 - 1956

June 8, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

Through: E. N. Harshman
J. F. Shaw

From: J. William Hasler

Subject: DMEA docket 3266 (Uranium-copper), Idm-E 733
Big Indian Uranium Corporation, San Juan County, Utah

Pursuant to a request from Washington DMEA to review the above-mentioned contract with the applicant, a meeting was held in Provo, Utah, May 31, 1956. Present at the meeting were Mr. Carl J. Harris, president; Mr. Welby W. Ricks, secretary of Big Indian Uranium Corporation; and J. William Hasler, U. S. Geological Survey, representing the DMEA.

The applicant was informed that he has acted in violation of contract Idm-E 733, in that he failed to comply with the work stipulated in the last sentence of paragraph No. 1, under exhibit "A", Description of the Work; namely: "The drilling shall be subcontracted to an established drilling company and supervised by the operator." The applicant was also informed that even though he was reimbursed for work done under the contract, he would be liable for payment to the Government of these funds due to a violation of the contract and that the company could also be compelled to complete the work designated by the contract, if the Government deemed it advisable.

During the review of the contract with Mr. Harris and Mr. Ricks, I was advised that Mr. Joseph Hafen, also an officer in the company, had discussed the possibility of the company drilling the holes designated in the contract on their own, in view of the fact that they knew an experienced driller whom they thought would do a better job than someone under a subcontract. The discussion was with Mr. Gordon Weir, the project geologist in the area at the time the DMEA work was being carried on. Mr. Weir, according to Mr. Harris' story, more or less gave Mr. Hafen concurrence to have an individual do the drilling. Apparently Weir had not been informed of the procedure and policy by which approval of the amendments to the contract should be made. He was not aware of the fact that approval of this type could be given only by the Executive Officer of the Field Team or, if necessary, by the Washington office of DMEA. As a result of this discussion,

the company retained Mr. E. M. Garrick for a reported 25,000 shares of company stock, Mr. Garrick thus becoming a stockholder in the company. The company proceeded to drill, and did complete two holes under the DMEA contract. The drilling became difficult because of extremely fractured ground and the costs of the drilling, consequently, became rather excessive and the company reported a cost of some $12.00 per foot. During the course of the contract, the company had asked for two amendments to extend the length of the contract due to this difficulty, as well as an extension to wait for arrival of the diamond-drill rig they had purchased. These amendments were granted. The company also felt that their objective in the DMEA contract could not be reached with the funds available and asked for another amendment to give them time to obtain such funds.

In the meantime, however, they proceeded to drill on their own account a number of shallow holes in the Dakota sandstone above the area designated for DMEA drilling.

During the interview of May 31, Mr. Harris reported their objectives that were first sought in the DMEA loan were reached as a result of this shallow drilling, in that they have now blocked out several thousand tons of copper ore and are at present negotiating with the Continental Uranium, Incorporated, Grand Junction, Colorado, for purchase of this ore. The company did not realize that they could have asked for an amendment for the relocation of holes designated under DMEA to explore for uranium in the area they have drilled privately. The work, however, has been done and the DMEA work under contract Idm-E 733 remains incomplete.

In a memo of March 30, 1956, by J. William Hasler and M. H. Salsbury, a certification of discovery was recommended on the grounds that the ore reserves on the property had not changed as a result of the drilling, even though the results of the two holes drilled under Idm-E 733 were essentially negative.

Mr. Harris expressed the opinion that the company felt that there was enough ore discovered in these two holes to warrant a certification, and, in order to prove to the Government they had acted in good faith under the contract, they would agree to a certification of discovery. He stated that the board of directors had discussed the problem and agreed that they also would agree to a certification of development and discovery.

In view of the fact the company feels they have reached the objectives as mentioned previously, they were requested to send Mr. W. M. Traver, Executive Officer, Field Team Region III, six copies of a letter agreeing to the certification of discovery and termination of the contract, and in this letter to include all of the assay data of the holes drilled privately as well as those under DMEA and show the present reserve structure as they have presently calculated. An additional copy of this material

is also to be forwarded to the Grand Junction office of DMEA. The material is to be forthcoming within the next week or two. If this material is not received by June 22, we will contact the operator again.

J. William Hasler
J. William Hasler,
Geologist

JWH/mlr

cc: Thor H. Kiilsgaard)Washington
W. R. Griswold)

BIG INDIAN URANIUM CORPORATION
Box111, Provo, Utah

DMEA
Date Rec'd.
JUN 27 1956
BUREAU OF MINES
Denver, Colorado

Mr. W.M. Traver
Executive Officer, DMEA
Field Team, Region III
Denver, Colorado

Re: DMEA Docket 3266
Contract DmE733

RECEIVED
JUL 5 - 1956

Dear Mr. Traver:

On May 31 we met with Mr. J.Wm.Hasler from the Grand Junction office of the U.S.Geological Survey. He assisted us greatly in clarifying our position in relation to our DMEA Drilling Contract. Our company officers at the time stated they wished to file with your office a Certificate of Discovery request on the two holes drilled. This request has subsequently been endorsed by our board of directors.

This request is being made for the following reasons:

(1) The two holes drilled on stage I of the contract showed some copper but the heavy expense of drilling in this very broken and faulted formation did not vindicate the heavy expense we were put to in order to reach the required depth of the 500 feet per hole.

(2) It was felt by the company a larger territory of shallow drill holes would show up the copper beddings. This project was completed with about 55 holes drilled from 30 to 40 feet. This project proved a good milling reserve of commercial ore.

(3) At this time we had to slow up on our DMEA contract and were running short of funds to carry on the drilling on the first stage and the company officers felt that if we could prove enough copper ore in shallow inexpensive drill holes that we could raise enough funds to complete the contract regardless.

Due to the heavy break in uranium stock market quotations we were unable to continue and we also felt that with the showing on the two holes on Stage I that it would be a waste of money both to us and the government to complete the program set up in the contract.

The board therefore in the light of these circumstances would appreciate the your issuance of the Certificate of Discovery on the two holes as previously stated.

Very sincerely yours,

Carl J. Harris

Carl J. Harris, Pres.,
Big Indian Uranium Corporation

cc.J.Wm. Hasler
U.S. G.S. Grand Junction

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RECEIVED
MAY 28 1956

P. O. Box 360
Grand Junction, Colorado

May 23, 1956

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

3266

Dear Carl:

During the week of April 23, I was in Washington reviewing work relative to the Defense Minerals Exploration Administration on the Colorado Plateau with DMEA officials.

During the progress of our meetings, we rather thoroughly discussed the Big Indian Uranium Corporation, docket DMEA 3266, contract Idm-E 733. Several problems concerning this contract were discussed. It was deemed advisable, in view of the fact that three requests of you by DMEA have remained unanswered, that your company be contacted personally in the field.

It is my present plan to be in Provo, Utah on May 30, and I will be happy to review your contract under DMEA with you on Thursday, May 31. If I do not receive word to the contrary by May 28, I shall expect to meet you and possibly other officials of your company at your office at 8:30 Thursday morning, May 31. I believe we can more easily review your DMEA docket and contract in a meeting of this type rather than by a series of prolonged correspondence.

Sincerely yours,

J. William Hasler

J. William Hasler,
Geologist

JWH/mlr

cc: W. M. Traver
E. N. Harshman
Geo. Selfridge

IN REPLY REFER TO:

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

May 1, 1956

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: W. P. Williams, U. S. Geological Survey

Subject: Review of memorandum report, DMEA 3266, Contract Idm-E733 (copper-uranium), Big Indian Uranium Corporation, San Juan County, Utah.

In a memorandum dated March 30, 1956, personnel from Grand Junction recommend that the subject project be certified by DMEA as a discovery in order to protect the Government's interest.

Only two drill holes have been completed to date under the contract. No ore was discovered by the drilling. The project has been in unauthorized recess since May 10, 1955.

Since the project has, so far, discovered no ore, it does not seem feasible to certify the project as a discovery. Three principal courses of action seem indicated: 1) induce the Operator to complete at least the first stage of the work, 2) terminate the contract by mutual agreement under the terms of a pseudo-certification, 3) institute proceedings to recover the Government's financial participation in the project.

As a result of a conference in Washington on April 25, 1956, it was agreed between W. R. Griswold, DMEA, and E. N. Harshman, J. W. Hasler, and W. P. Williams, U.S.G.S., that field personnel in Grand Junction would contact the Operator with regard to the first two above enumerated alternatives.

W. P. Williams

W. P. Williams

RECEIVED
MAY 2 - 1956

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

RECEIVED
APR 27 1956

April 26, 1956

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: Commodity Industry Analyst, Branch of Base Metals

Subject: Review of Field Team memorandum (Dated March 30, 1956), Docket No. DMEA - 3266 (copper), Big Indian Uranium Corporation, San Juan County, Utah, Contract Idm-E733

The Field Team memorandum from J. William Hasler, Geological Survey, and M. H. Salsburg, Bureau of Mines, recommending Certification of Discovery at Big Indian Copper Mine has been reviewed.

According to the memorandum, a three-stage program consisting of 11,200 feet of drilling in 28 holes at an estimated cost of $31,260.00 was approved to explore the property.

Drilling started February 9, 1955 and was suspended about May 10, 1955 after two holes had been completed. Results of the drilling were essentially negative and no copper was discovered.

However, the work failed to attain the objectives of the proposed program, and the examiners believe that if the area had been adequately tested, copper ore may have been discovered. For these reasons they recommend that a Certification of Discovery be issued.

I do not agree with the recommendation of the Field Team and believe that a Certification of Discovery is not warranted as the work did not result in the discovery of any copper ore.

J. W. Pennington

J. W. Pennington

Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U.S.G.S.
R. W. Geehan
F i l e s

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

RECEIVED
APR 6 - 1956

224 New Customhouse
Denver 2, Colorado

April 4, 1956

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3266 (~~Uranium~~-Copper), Contract Idm-E733, Big Indian Uranium Corporation, San Juan County, Utah.

Enclosed are the original and three copies of a joint memorandum report, dated March 30, 1956, from J. Wm. Hasler, geologist, Geological Survey, and M. H. Salsbury, mining engineer, Bureau of Mines.

Also enclosed are two copies of a letter from this office to the Operator, dated September 7, 1955, and three copies of the Operator's letter of October 15, 1955, to this office, which should bring your files up to date, as copies of letters from this office to the Operator of October 3, October 20, and December 14, 1955, and of January 12, 1956, were forwarded to you at the time of writing.

The Operator did not reply to the last three of our letters. Therefore the matter is placed in your hands for review and appropriate action or advice to us as to how we should proceed.

In processing the Operator's claim for reimbursement for work performed during the period of April and May, 1955, an amount of $250.00 was withheld from reimbursement to him pending resumption of work after an unauthorized suspension of operations.

The examining geologist and engineer recommend in their memorandum of March 30, 1956, that even though the established reserves of copper ore are not a result of the DMEA exploration work performed, and even though the reserves cannot be mined profitably at this time, that the project be certified as a discovery or development to protect the Government's interest because the Operator defaulted under the terms of the contract.

In principle, this office concurs in the recommendations of the examining geologist and engineer. However, in view of the relatively small amount of the Government's participation in the

cost of the project work, and the relatively low metal content of the ore reserves, the return to the Government, if the project is certified, may not be equal to the cost of administering the project for a period of ten years.

W. M. Traver

W. M. Traver

Enclosures

MINERAL DEPOSITS
DMEA
RECEIVED
APR 2 1956
U. S.
GEOLOGICAL SURVEY
DENVER, COLORADO

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Box 360
Grand Junction, Colorado

March 30, 1956

DMEA
Date Rec'd.
APR 2 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

Through: E. N. Harshman
J. F. Shaw

BUREAU OF MINES
Denver, Colorado
RECEIVED
APR 6 - 1956

From: J. William Hasler
M. H. Salsbury

Subject: DMEA docket 3266 (Uranium-copper), Big Indian Uranium Corporation, San Juan County, Utah. Recommendation for certification of discovery at Big Indian Copper Mine.

The Big Indian Uranium Corporation, Provo, Utah, made application for aid in exploration for copper and uranium on their Big Indian Copper mine in the Lisbon Valley area, San Juan County, Utah.

The application was referred to the field and an alternative program was recommended and approved to test the possibility of occurrence of both copper and uranium at depth in the vicinity of the Lisbon Valley fault. A three-stage program consisting of 11,200 feet of drilling in 28 holes at an estimated cost of $31,260.00, was approved. Drilling commenced under the contract February 9, 1955, and work was suspended about May 10, 1955, after the applicant had completed only two holes. The results of the drilling performed under the contract were essentially negative, as the holes were found to be barren insofar as containing mineralized material was concerned, and no copper was discovered as well.

Despite the negative results of the DMEA drilling, copper reserves calculated in the report of examination remains the same and are as follows:

On the basis of the available data from holes previously drilled, no new estimates of ore reserves can be made. The records of holes drilled prior to the present operations are not available and those from recent exploration drilling are incomplete and unsuitable for this purpose. It is stated in the application that, in one drill hole, 10 feet of ore higher in grade than the open pit ore was encountered at 160 feet and some chalcopyrite ore at from 230 to 300 feet. No definite information concerning hole locations or logs is given. The application also states that the open pit workings disclose a probable million tons of 2 to 3 percent copper, without, however, any supporting data. The exploratory drilling carried on by the Ohio Copper Company, prior to construction, blocked out an estimated 156,000 tons of minable ore, and they produced nearly 160,000 tons. It is probably that most of the known ore of a profitable grade was mined during the operation.

Sample made an ore estimate on very incomplete data in 1943 as follows:

Measured ore		Indicated ore		Inferred ore	
Block	Tons	Block	Tons	Block	Tons
I	90,000	III	70,000	V-VI	68,000
II	26,000	IV	17,000	Brushy Basin	5,000
Tailings	10,000				
To tal	126,000	Total	87,000	Total	73,000
Average grade 2 percent copper		Average grade 1-1/4 percent copper		Average grade 1/2 percent copper	

The measured ore in this tabulation is included in the tonnage mined by the Ohio Copper Company,which averaged 1.62 percent copper, as computed from the production figures. The ore in the indicated and inferred blocks is probably not commercial at this time.

No sampling was done during the present examination.

The present management executed the DMEA project in an extremely inefficient manner, which resulted in not obtaining any of the objectives set forth in the proposed exploration program. Because of this fact, and that an efficient operator could have adequately tested the area and possibly have discovered other areas of minable ore, it is recommended that the property be certified for a discovery.

The property produced 5,349,791 pounds of copper from 160,104 tons of ore between 1929 and 1947, and present indications are that the Burro Canyon copper deposits are essentially mined out since the exploration has not been completed at depth to test the underlying Salt Wash member of the Morrison, and there may still be a chance of some ore being discovered.

It is concluded that results of DMEA drilling were essentially negative, but that more encouraging results may have been forthcoming had the Big Indian Uranium Corporation completed the work outlined under contract Idm-E 733 in an efficient manner. It is also concluded that the company failed to properly execute their contract and, consequently, fell short of their objectives. Because of these inadequacies it is recommended that a discovery be certified on the property to protect the interests of the Government, should the price structure of copper at a later date permit the mining of these reserves.

J. William Hasler,
U. S. Geological Survey

M. H. Salsbury,
U. S. Bureau of Mines

JWH/mlr

COPY

RECEIVED
APR 6 - 1956

224 New Customhouse
Denver 2, Colorado

September 7, 1955

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

Re: Docket DMEA 3266 (Copper),
Contract Idm-E733

Dear Mr. Harris:

The project completion date as extended by Amendment No. 2 was August 25, 1955. In order for the Government to participate in the costs of the project work completed after this date, another amendment will have to be processed that further extends the active life of the project. Before we can do this we will need a letter of request from you in sextuplet. We would appreciate hearing of your future plans.

Very truly yours,

W. M. Traver
Executive Officer
DMEA Field Team, Region III

WLD:prl
cc: Harshman
Shaw (2)
Hasler
Townsend
Corres. file
Chron.

DMEA
Date Rec'd.

OCT 19 1955

BUREAU OF MINES
Denver, Colorado

BIG INDIAN URANIUM CORPORATION
Box 111
Provo, Utah

October 15,1955

RECEIVED

APR 6 - 1956

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

Re: Docket DMEA 3266(Copper)
Contract Idm-E733

Dear Mr. Traver,

I understand that the Project completion date as extendedby #2 Amendement was on the August 25,1955.

Upon completion of the holes as reported to you on the previous progress reports and the logs the Company found it necessary to temporarily revise their drilling program in order to get the most ore blocked out in anticipation of a mill being put in to process the known copper ore proven. Some fifty shallower holes were drilled at lesser bedded depth that revealed a definite bedding of ore of sufficient grade to mill. We had reputable companies who were interested in putting up a mill to handle that ore and continuing the stages outlined were a great expense in fact far greater that was inticipated at the time the contract was worked out. The ground was highly broken up in that slip zone area on the fault necessitating casing and bedded frequently with extremely beddings requiring at times a full shift to go less than a foot. Through our large number of shallower holes we have accomplished part at least of the objective of the contract,ie., to prove a copper ore body of commercial value.

At the present time the company does not have sufficient funds to continue with the outlined drilling program and the directors are attempting to get our affairs inorder to get out of the present insufficency of funds. We do want to take advantage of the loan to do deeper drilling as soon as spossible .

At the present the company respectfully requests the extensionof the loan and the processing of an amendment to cover our present situation.

We are at present negotiating for the erection of copper mill on the property and the possible sale of the property. Lacking that the company has one and a half million shares whouh could be marketed pegding the change in the investors toward uranium securities.

I hope that this explanation will clarify our situation and that we may have the necessary amendment granted.

Sincerely,

Carl J. Harris, Presidant.

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

RECEIVED
JAN 16 1956

224 New Customhouse
Denver 2, Colorado

January 12, 1956

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

Re: Docket DMEA-3266 (Copper)
Contract Idm-E733

Dear Mr. Harris:

Reference is made to our letters of October 20, 1955 and December 14, 1955 which were in reference to your letter of October 15, 1955 requesting an amendment to Contract Idm-E733 to provide time for you to improve your financial affairs so that you might complete work under the contract.

We have received no answer as yet regarding the specific dates requested, ie., the date operations were suspended; the date on or before operations can be resumed; and the additional time required to complete the work.

The contract expired August 25, 1955; therefore, you are actually in default for not having completed the work by the stipulated time.

If we do not receive a reply to this letter by February 1, 1956, the matter will be referred to the Washington Office for appropriate action to protect the Government's interests in the matter.

JDC:jy
cc: Corresp. E733
Sec. Op. Comm. (2)
Harshman
Shaw (2)
Hasler
Townsend
Chron.

Yours very truly,

W. M. TRAVER

W. M. Traver
Executive Officer, DMEA
Field Team, Region III

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

RECEIVED
DEC 19 1955

December 14, 1955

214 New Customhouse
Denver 2, Colorado

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

Re: Docket DMEA 3266 (Copper), Contract
Idm-E733

Dear Mr. Harris:

Reference is made to our letter of October 20, 1955 in which we requested that you advise us of the time extension you contemplate will be necessary to improve your financial affairs to enable you to again resume work under the provisions of Contract Idm-E733.

As we have had no reply to our letter you are advised that DMEA contracts cannot be maintained in an indefinite status for any great period of time. Therefore, if you are desirous of maintaining the contract in force, it is important that you resolve the matter and provide us with the following information without further delay:

1. The date operations were suspended under the contract, and the date on or before which you contemplate they will be resumed.

2. The period of time after resumption of operations that will be required to enable you to complete the work authorized under the contract.

Very truly yours,

for E. H. Harshman
Acting Executive Officer, DMEA
Field Team, Region III

JWT:ab
cc: Corresp. E733
Chair. Op. Comm. (2)
Harshman
Shaw (2)
Hasler
Townsend
Chron.

RECEIVED
OCT 24 1955

224 New Customhouse
Denver 2, Colorado

October 20, 1955

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

Re: Docket DMEA 3266 (Copper)
Contract I6m-E733

Dear Mr. Harris:

In your letter of October 15, 1955, which is in reply to our letter of October 3, you request the extension of the contract by an amendment to provide time for you to improve your financial affairs, thereby enabling you to continue with the project work under Contract I6m-E733.

You failed to state the time extension that would be necessary. Therefore please advise us by return mail the amount of time you contemplate will be necessary.

Very truly yours,

W. M. Traver

W. M. Traver
Executive Officer, DMEA
Field Team, Region III

JWT:prl

cc: Chairman, Oper. Comm. (2)
Bavelman
Shaw (2)
Mealer
Townsend
Corres. file
Chron.

Arnswold
Betty

224 New Customhouse
Denver 2, Colorado

October 3, 1955

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
P. O. Box 111
Provo, Utah

Re: Docket [redacted] 3266 (Copper),
Contract Iam-K733

Dear Mr. Harris:

We are again calling your attention to the fact that contract K733 expired August 25, 1955. [redacted] Contracts cannot be maintained in an indefinite status. Therefore, we will appreciate advice from you by return mail as to your plans for the future regarding work under this contract.

Unless we hear from you by October 17, 1955, we shall take such steps to protect the Government's interest in the matter as are indicated.

Very truly yours,

W. M. Traver
Executive Officer
[redacted] Field Team
Region III

JMP:prl
cc: Chairman, Oper. Comm. (2)
[redacted]
[redacted] (2)
[redacted]
[redacted]
[redacted] file
[redacted]

224 New Customhouse
Denver 2, Colorado

August 9, 1955

Memorandum

To: John F. Shaw

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3266 (Copper), Contract Idm-E733, Big Indian Uranium Corporation, Big Indian mine, San Juan County, Utah - Progress Report for April-May, 1955

We are returning the subject report to your office because it does not contain a map showing locations, by number, of the two holes drilled to date. This map is required in the contract under Section 6(b), item 3. It is impossible for this office to check the actual work against that authorized in the contract without some method of locating the holes.

The two previous MF-104 forms were processed for payment even though the above section of the contract was not conformed with. It will be necessary that the April-May Report, as well as all future reports, include enough data, either in map form or as written descriptions, to tie each hole to the maps which are included in the contract.

W. M. Traver

W. M. Traver

Enclosures

JDC:sr

cc Subject
Sec. Op. Comm. (2)
Chron

RECEIVED
AUG 11 1955

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

Answered
Betty

224 New Customhouse
Denver, Colorado

August 24, 1955

3366

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Gamma-ray log interpretations
Docket 2771, Contract Idm-E577, Gramlich Exploration Company, Utah
Docket 3094, Contract Idm-E649, Camoose Uranium Mines of America, Inc., Colorado
Docket 3151, Contract Idm-E671, Four Corners Exploration Company, New Mexico
Docket 3190, Contract Idm-E672, Flattop Mining Company, New Mexico
Docket 3266, Contract Idm-E733, Big Indian Uranium Corporation, Utah
Docket 3297, Contract Idm-E800, Contenental Uranium, Inc., Utah
Docket 3360, Contract Idm-E723, Mid-Continent Uranium Corporation, Utah
Docket 3449, Contract Idm-E745, United States Uranium Company, Colorado
Docket 3475, Contract Idm-E760, Amuranium Corporation, Utah
Docket 3550, Contract Idm-E782, Radium Hill Uranium, Inc., Colorado
Docket 3565, Contract Idm-E778, The Golden Cycle Corporation, Colorado
Docket 3579, Contract Idm-E794, Eula Belle Uranium, Inc., Colorado
Docket 3582, Contract Idm-E796, Walter Duncan Mining Company, Utah
Docket 3620, Contract Idm-808, Uranium Prospectors Company, Ltd., Colorado

Base Metals

Enclosed are four copies of gamma-ray log interpretations for holes drilled on the subject properties, and transmittal by E. N. Harshman, Region III DMEA Field Team member.

/s/ W. M. Traver

W. M. Traver

Enclosures

Shaw (2)
Hasler
Harshman
Townsend Chron

c o p y

(Stamped) Recd. Aug 19, 1955

Bureau of Mines
Denver, Colorado

Received
Aug 29 1955

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

Denver Federal Center
Denver, Colorado

August 19, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman

Subject: Gamma-ray log interpretations

Enclosed are 9 copies of gamma-ray log interpretations on the following DMEA exploration projects:

Docket	Company
2771	Gramlich Exploration Company
3094	Camoose Uranium Company, Peanut Group
3151	Four Corners Exploration Company, Flat Top claims Nos. 4 and 5
3190	Richard Vopat, et al, Flat Top Nos. 1, 2, and 3
3266	Big Indian Uranium Corporation
3475	Amuranium Corporation
3579	Jerome Craig
3565	Golden Cycle Corporation
3550	Radium Hill Uranium Company
3582	Walter Duncan Mining Company
3360	Mid-Continent Uranium Company
3449	U. S. Uranium Company
3620	Uranium Prospectors
3297	Continental Uranium Company

I have discussed with Hasler the need for more frequent transmittal of these data, and in the future log interpretations will be transmitted about once each month.

Four copies each of the enclosures should be transmitted to the Chairman of the Operating Committee for information purposes.

/s/ E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures

E. N. Harshman:arh

c o p y

Big Indian Uranium Corp.
Big Indian Wash,
San Juan Co., Utah, DMEA 3264

GAMMA-RAY LOG INTERPRETATION

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
CU -A-#1	315.0	80.0 NX	6.7	313.1	Barren							

This hole is not believed to be DMEA, but it is in the immediate vicinity of existing DMEA contract.

* From top to bottom depths

GAMMA-RAY LOG INTERPRETATION

Big Indian Uranium Corp.
Moss Copper, Lisbon Valley -- DMEA

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
3A	900.0	720.0	7.3	728.4	Barren							

* From top to bottom depths

Big Indian Uranium Corp.
Big Indian Wash,
San Juan Co., Utah, DMEA 3266

GAMMA-RAY LOG INTERPRETATION

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
CU -A-#1	315.0	80.0 NX	6.7	313.1	Barren							
	This hole is not believed to be DMEA, but it is in the immediate vicinity of existing DMEA contract.											

* From top to bottom depths

GAMMA-RAY LOG INTERPRETATION Big Indian Uranium Corp.
Moss Copper, Lisbon Valley -- DMEA

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_eU_3O_8$	Remarks
3A	900.0	720.0	7.3	728.4	Barren							

* From top to bottom depths

Big Indian Uranium Corp.
Big Indian Wash,
San Juan Co., Utah, DMEA

3264

GAMMA-RAY LOG INTERPRETATION

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
CU -A-#1	315.0	80.0 NX	6.7	313.1	Barren							
	This hole is not believed to be DMEA, but it is in the immediate vicinity of existing DMEA contract.											

* From top to bottom depths

GAMMA-RAY LOG INTERPRETATION Big Indian Uranium Corp.
Moss Copper, Lisbon Valley -- DMEA

Hole No.	Depth Drilled	Depth Cased	Depth Logged From* To	Anomaly Detected From* To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_eU_3O_8$	Remarks
3A	900.0	720.0	7.3-728.4	Barren						

* From top to bottom depths

Big Indian Uranium Corp.
Big Indian Wash,
San Juan Co., Utah, DMEA

3266

GAMMA-RAY LOG INTERPRETATION

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
CU -A-#1	315.0	80.0 NX	6.7	313.1	Barren							

This hole is not believed to be DMEA, but it is in the immediate vicinity of existing DMEA contract.

* From top to bottom depths

GAMMA-RAY LOG INTERPRETATION

Big Indian Uranium Corp.
Moss Copper, Lisbon Valley -- DMEA

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
3A	900.0	720.0	7.3	728.4	Barren							

* From top to bottom depths

Copper King Claim
Big Indian Uranium Co.
Lisbon Valley -- DMEA

3266

GAMMA-RAY LOG INTERPRETATION

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
I-A	530.0	380.0 NX	2.6	530.0	Barren							

* From top to bottom depths

Reports

Copper King Claim
Big Indian Uranium Co.
Lisbon Valley -- DMEA

3266

GAMMA-RAY LOG INTERPRETATION

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
I-A	530.0	380.0 NX	2.6	530.0	Barren							

* From top to bottom depths

Copper King Claim
Big Indian Uranium Co.
Lisbon Valley -- DMEA

3264

GAMMA-RAY LOG INTERPRETATION

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
I-A	530.0	380.0 NX	2.6	530.0	Barren							

*From top to bottom depths

GAMMA-RAY LOG INTERPRETATION

Copper King Claim
Big Indian Uranium Co.
Lisbon Valley -- DMEA

3266

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
I-A	530.0	380.0 NX	2.6	530.0	Barren							

* From top to bottom depths

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver, Colorado

RECEIVED
JUN - 9 1955

June 3, 1955

Memorandum

To: Chairman, Operating Committee, DMEA

From: Field Team, Region III

Subject: Gamma-ray (Barnaby) log interpretations

Enclosed for your information are four copies of gamma-ray log interpretations of two holes drilled under Contract Idm-E733, Big Indian Uranium Corporation, Big Indian mine, San Juan County, Utah, DMEA Docket 3266.

W. M. Traver

W. M. Traver

E. N. Harshman

E. N. Harshman

Enclosures (4)

DAEA 3266

GAMMA-RAY LOG INTERPRETATION

Big Indian Uranium
San Juan County, Utah

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_eU_3O_8$	Remarks
1A	240.0	200NX	2.7	240.6	Barren							Mineral Point
C	315.0	0.0	2.0	135.3	Barren							Copper King 3995

* From top to bottom depths

DMEA 3266

GAMMA-RAY LOG INTERPRETATION

Big Indian Uranium
San Juan County, Utah

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
1A	240.0	200NX	2.7	240.6	Barren							Mineral Point
C	315.0	0.0	2.0	135.3	Barren							Copper King 3995

* From top to bottom depths

OMEA 3265

GAMMA-RAY LOG INTERPRETATION

Big Indian Uranium
San Juan County, Utah

Hole No.	Depth Drilled	Depth Cased	Depth Logged From*	Depth Logged To	Anomaly Detected From*	Anomaly Detected To	Anomaly Thickness	Counts per minute	CPM Corrected for Casing	CPM Corrected for G-M Tube	Grade $\%_e U_3O_8$	Remarks
1A	240.0	200NX	2.7	240.6	Barren							Mineral Point
C	315.0	0.0	2.0	135.3	Barren							Copper King 3995

* From top to bottom depths

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

February 16, 1955

Memorandum

To: Miss Curtin, Statistics and Control Division

From: Hazel Berry, Operating Committee

Subject: Amendment to Contract

Attached is the following docket copy of an amendment to a contract which has been reviewed and approved by the Commodity Division, Contract Administration and Audit Division, and by the Legal Division. The official docket is also attached.

BIG INDIAN URANIUM CORPORATION, DMEA-3266, Idm-E733, Amendment No. 2.

Attachment-1

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

224 New Customhouse
Denver 2, Colorado

January 27, 1955

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 3266 (Copper), Contract Idm-E733, Big Indian Uranium Corporation, San Juan County, Utah

Enclosed are the original and two copies of Amendment No. 2 to Contract Idm-E733 which has been executed to extend the period for start of the work to February 9, 1955, and extends the period for completion of the project work from 8 months to 10 months. Also enclosed are three copies of the operator's letter requesting the amendment.

Copies of the amendment have been given to the operator, the Finance Office, Region III, and a copy has been retained for our files.

W. M. Traver

W. M. Traver

Enclosures

RECEIVED
FEB 8 1955
GENERAL COUNSEL
DEFENSE MINERALS
ADMINISTRATION

Big Indian Uranium Corp.,
P.O. Box 111,
Provo, Utah.

Date Rec'd.
JAN 7 1955
BUREAU OF MINES
Denver, Colorado

To Executive Officer,
Field Team Region 4 - D.M.E.A.
New Customs House Bldg.,
Denver, Colorado.

Dear Sir:

Referring to Contract #I.B.M.- E733. We hereby request a thirty day extention from January 9, 1955, starting date, to February 9, 1955.

This request is made because the manufacturer is unable to make delivery on drill machine before Feb. 1st.

The manufacturer has verified today that the machine will be shipped from the factory on January 10th, which will make it possible for the contractor to commence work on or before February 9, 1955.

Yours very truly,

Joseph Hafen

Joseph Hafen,
Vice President-General Manager
Big Indian Uranium Corp.

JH:ED

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

224 New Customhouse
Denver 2, Colorado

December 29, 1954

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket DMEA 3266 (Copper), Contract Idm-E733, Big Indian Uranium Corp., San Juan County, Utah

Enclosed are the original and two copies of Amendment No. 1 to Contract Idm-E733 which has been executed to extend the period within which the project work is to be commenced from 30 days to on or before January 9, 1955. Also enclosed are three copies of the operator's letter requesting the extension of the period for commencement of work.

Copies of the amendment have been given to the operator, the Finance Office, Region IV, and a copy has been retained for our files.

W. H. King

W. H. King

Encls.

RECEIVED
JAN 11 1955
GENERAL COUNSEL
DEFENSE MINERALS
ADMINISTRATION

BIG INDIAN URANIUM CORPORATION
169 N. University Ave
P.O. Box 111
Provo, Utah

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 1 1955

December 6, 1954

U.N. King
Executive Officer, DMEA
Field Team, Region IV
224 New Customhouse
Denver 2, Colorado

Re: Contract Idm-8733

Dear Mr. King,

Reference is made to telephone conversation with you and Mr. Joseph Rafen as of ~~January~~ Dec. 6, 1954, requesting a little extension in time to begin drilling. According to our contract it was to begin not later than December 9, 1954. But due to the fact that Drill Rig will not be available till after the first of the year, we are requesting an extension of this time till January 9, 1955.

Sincerely yours,

Welby W. Ricks

Welby W. Ricks, Secretary
Big Indian Uranium Corp.

Surname 700

Ching

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

November 16, 1954

Memorandum

To: Robert E. Adams, Chief
Operations Control and Statistics Division

From: Ernest Wm. Ellis, Chief
Rare & Miscellaneous Metals Division

Subject: Transfer of Project to Base Metals Division
Docket No. DMEA-3266 (Copper)
Contract No. Idm-E733
Big Indian Uranium Corporation
Big Indian Mine
San Juan County, Utah

The original application was for a uranium exploration project. The Field Team recommended exploration for copper as well as uranium. Since the chances of finding uranium at the horizons recommended for exploration were poor the contract was drawn and executed for copper exploration only.

Accordingly, will you kindly transfer the subject docket to the Base Metals Division.

Ernest Wm. Ellis

Ernest Wm. Ellis

MChing:am
cc to: Admr. Reading File
Mails & Files
Mr. W. R. Griswold, Rm. 4444
Code 700
Mr. Ching

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

224 New Customhouse
Denver 2, Colorado

November 12, 1954

Memorandum

To: Chairman, Operating Committee

From: Executive Officer, DMEA Field Team, Region lV

Subject: Docket DMEA 3266, (Copper), Contract Idm-E733
Big Indian Uranium Corporation, San Juan County, Utah

Enclosed are the Government, Division, and Docket copies of Contract Idm-E733 which were forwarded by your letter of October 25, 1954 for signature by the Operator.

Copies of the Contract have been given to the Operator, the Finance Office, Region lV, and a copy retained for our files.

John F. Shaw
For W. H. King

Enclosure

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

Ching
Ellis
Hoffland
Cleaver
Selfridge
Johnson

OCT 25 1954

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

INTERIOR DEPT.
OCT 14 1954
SOLICITOR

Re: Docket No. DMEA-3266 (Copper)
Big Indian Uranium Corporation
Big Indian Mine
San Juan County, Utah

Dear Mr. King:

Enclosed are the original and five copies of a proposed short-form contract between the Government and Big Indian Uranium Corporation, executed by the Administrator.

Please note that the contract is drawn for copper exploration only, with Government participation at 50 percent. This modification was made because all the available data suggests that the possibility of finding significant quantities of uranium in the Dakota sandstone and Burro Canyon formation on this property is poor.

If you and the Applicant find the contract acceptable, please have the latter execute all copies and make the usual distribution thereafter.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (245)

Enclosures 6

MChing/gla
10/6/54
10/13/54

APPROVED:

J. H. Hedges
Member, Bureau of Mines (245)

Thor H. Kiilsgaard
Member, Geological Survey (245)

cc to: Admr. Reading File
Operating Committee
Docket ✓
Messrs. C. H. Johnson, Rm. 3621
A. P. Butler, Jr., Rm. 5222
T. H. Kiilsgaard, Rm. 5227
Code 700
Mr. Ching

11/5/54

The Secretary of Big Indian Uranium Corporation phoned from Provo, Utah, and advised Mr. Ching that they had not received the DMEA contract for signature. Mr. Ching supplied him with Mr. King's address in order that he might contact him.

gla

9/9/54 gla

Big Indian Uranium Corporation
169 N. University Ave., P.O. Box 111
Provo, Utah

September 4, 1954

SEP 7 1954

Defense Minerals Exploration Administration
Washington 25, D.C.

Re: Docket No. D.M.E. 3266 (Uranium,Copper)
Big Indian Mine
San Juan County, Utah

Mr. Ernest Wm. Ellis, Chief
Rare and Miscellaneous Metals Division

Dear Sir:

The modified program as stated in your letter of August 31, 1954 is satisfactory to us and we hope you will continue as quickly as feasible in the processing of our application.

In regard to the drilling subcontract , we have discussed this with the Joy Manufacturing Co. who are in the drilling business. Their bid is within the estimated cost you mention of $4.66 per foot for all drilling.

In regard to clarification on the points as follows:

(1). Ownership of Blue Jay and La Sal or Eureka Claims: We definitely desire these two claims to be included in this project. Therefore would you please enter them as such. We have in our files a letter from the A.E.C., Grand Junction office, written July 6, 1954, acknowledging receipt of the map of the Blue Jay and La Sal claims, a Recorders Certificate of recording of notice of lease application and the check to cover these. The Uranium mining lease on these two claims was mailed to the A.E.C. on July 16, 1954, completing the validation. The priority of interest in these tracts is March 13, 1954. These were recorded on September 2, 1953, Book 33, Page 330, San Juan County Recorders office. The withdrawal , and amendment forms necessary in compliance with Public Law 585 will be sent in as quickly as the printer can get these forms made up. This will complete validation of these claims.

(2). Option agreement Completion. Full payment for these claims was

made before January 2, 1954. The deed to these eleven patented claims has been delivered the Big Indian Uranium Corporation and is in our possession. A title opinion has been given on these claims by Jackson Howard, Counsel for this Company and Joseph Meservy atorney, which states that the title is clear and sole ownership rests with us. (see title opinion attached).

We hope these points cover the information needed. If anything additional is needed , please let us know. We appreciate your expediting of this application and hope for some early drilling action.

Very sincerely yours,

Welby W. Ricks

Welby W. Ricks, Secretary
Big Indian Uranium Corporation
P.O. Box 111, Provo, Utah

(Enclosure)

SANDGREN, HOWARD AND FRAZIER
ATTORNEYS AND COUNSELORS AT LAW
290 NORTH UNIVERSITY AVENUE
PROVO, UTAH

CLYDE D. SANDGREN
JACKSON B. HOWARD
LEON M. FRAZIER

TELEPHONES 269
270

July 18, 1954

Mr. Carl J. Harris, President
Big Indian Uranium Corporation
Provo, Utah

Dear Mr. Harris:

At your request, I am writing this letter as a supplemental title opinion to that written by Mr. Joseph R. Meservy, Attorney at Law, Provo Utah, to you bearing the date July 17, 1954, and covering the following described property in San Juan County, State of Utah:

Durango, Mineral Point, Copper King, Dandy Jim, Anaconda, Utah, Nevada, Texas, and Pacific Lode Claims, and the Piute and Mono Placer Claims

Because of current demands upon the abstractors in San Juan County, it is impossible to have the abstracts covering the above property brought up to date in time for your contemplated issue of securities, however, I have personally seen and recorded a deed bearing the date July 23, 1953, from Harlow E. Smoot and Anita P. Smoot, his wife, to Carl J. Harris covering the said property. In addition I have prepared and recorded a deed under the date of July 2, 1954, from Carl J. Harris and his wife to the Big Indian Uranium Corporation and, therefore, the legal title to the said property is in the Big Indian Uranium Corporation.

In addition, I have deduced under oath from Carl J. Harris, personally and as President of the Big Indian Uranium Corporation that there are no liens, defects or encumbrances of any kind against the property since the 23rd day of July, 1953, and that all taxes and assessments of any kind and nature have been paid.

SANDGREN, HOWARD & FRAZIER

By Jackson B Howard

JBH:nh

July 17, 1954

Mr. Carl J. Harris, President
Big Indian Uranium Company
Provo, Utah

Dear Mr. Harris:

I have examined the Abstract of Title under certificate dated June 16, 1942, and the Supplemental Abstract of Title thereto under certificate dated August 1, 1953, including entries 1 to 70 inclusive, covering the following described mining claims situated in the County of San Juan, State of Utah, to-wit:

Durango, Mineral Point, Copper King, Dandy Jim, Anaconda, Utah, Nevada, Texas, and Pacific Lode Claims, and the Piute and Mono Placer Claims.

I find the title in and to the above named mining claims is vested in Harlow E. Smoot and Anita P. Smoot, his wife, subject to the following encumbrances, defects and limitations:

1. Encumbrances - None

2. Defects - In entry 70, page 75, in the Supplemental Abstract of Title, the Release of Option by the Ohio Copper Company to Harlow E. Smoot and Anita P. Smoot, his wife, is dated May 25, 1938, which is a mistake, it appearing that the date should be May 25, 1948; however, this may be a typographical error and is not serious.

3. Limitations - None

Recommendation: That the property be checked for rights of parties in possession, taxes accrued since the date of the certificate, and as to whether fence line follow the survey lines.

Respectfully submitted,

Joseph R. Maservy

IN REPLY REFER TO:

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

August 31, 1954

Re: DMEA-3266
Big Indian Mine
San Juan Co., Utah
$9,320 - Copper-Uranium

Memorandum

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

From: E. L. Newcomb, U. S. Geological Survey

Subject: Recommendation for approval of a limited exploration project

The applicant requested assistance to explore the Big Indian copper mine by an extensive program of diamond drilling and underground development.

The Field Team has recommended a three stage program of diamond drilling be approved. Under their proposed project, all drilling would be limited to an average depth of about 400 feet. The deeper drilling (1,000 foot holes) recommended by the field examiners in their stages Ia, IIa, and IIIa have not been included in the Field Team recommendation.

The U.S.G.S. Uranium commodity geologist, A. P. Butler, Jr., in his review memorandum of August 17, 1954, has recommended this application be considered solely on its merit as a copper project and not as combined copper-uranium exploration.

Inasmuch as this property has produced considerable copper ore and is known to have inferred copper reserves, further exploration is warranted.

The highly speculative nature of drilling to the Salt Wash member of the Morrison formation cannot be justified as reasonable exploration for DMEA assistance. It is aimed at possible uranium mineralization which could occur conceivably anywhere within this member. The arguments in favor of deep drilling this particular property could be applied equally as well to much of the surrounding area.

The proposed (400 foot) drilling may indicate a significant amount of low grade copper ore. However, the probability of an important uranium-copper discovery is questionable.

In light of the field examiners recommendation for 62½ percent government participation and providing only a limited program is allowed, a combined copper-uranium project should be approved. About 5 holes (400 foot average) probably will be sufficient to test the target area. In order to assure satisfactory drilling under difficult conditions the work should be done by a private contractor.

E. L. Newcomb

E. L. Newcomb

3266

File Copy
Surname

700

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

Ching
Crawford
Newcomb
Johnson
Ellis
Mitchell

August 31, 1954

Big Indian Uranium Corporation
Post Office Box 111
Provo, Utah

Re: Docket No. DMEA-3266 (Uranium-Copper)
Big Indian Mine
San Juan County, Utah

Gentlemen:

We have recently received a report of examination in connection with the subject application from the DMEA Field Team, Region IV.

A modified exploration program is contemplated, consisting of diamond drilling to test the Burro Canyon formation and Dakota sandstone for occurrences of uranium and copper. The program would provide for the drilling of 28 holes in 3 stages, with an average depth of 400 feet, and totaling 11,200 feet. The estimated cost of the program at $4.66 per foot would be $52 192.00, provided the drilling is subcontracted to an established drilling company and supervised by you.

If the modified program and conditions for drilling are satisfactory to you, please advise us so we can continue to process your application. Please note, however, that there are two other points in connection with the project which require clarification.

(1) Your original application did not list the LaSal and Blue Jay or Eureka claims among those to be covered by this proposed project, but we understand that you now wish this to be done. From our standpoint, these two claims should be included since some of the proposed work is on or near them. However, we have no evidence of your property rights in connection with these two claims. Our field examiners report that the location of the claims had been allowed to lapse, and were later relocated by you. We understand that the claims are covered by prior oil and gas leases and the validity of your claims may be questionable. Please advise us the date of your relocation and what steps you have taken to validate the claims. In general such validation is covered by provisions of Public Law 250, 83d Congress, approved August 12, 1953, for mining claims located between July 31, 1939, and January 1, 1953. For claims located thereafter, AEC Circular No. 7, issued January 29, 1954, and Public Law 585, 83d Congress, approved August 13, 1954, provide means for validation.

R.G.S.

(2) The Option Agreement submitted with your application provides for full payment for 11 claims on or before January 2, 1954. Will you kindly advise if payment has been completed and if sole ownership now rests with you.

Sincerely yours,

Ernest Wm. Ellis

Ernest Wm. Ellis, Chief
Rare and Miscellaneous
Metals Division

MChing:ep

Copy to: Mails & Files (Docket)
Admr. Reading File
Mr. A. P. Butler, Jr., Rm. 3212, GSA
Mr. J. E. Crawford, Rm. 3642
Mr. C. H. Johnson, Rm. 3621
Mr. E. L. Newcomb, Rm. 5227
Mr. J. O. Hosted, Rm. 3210, GSA
Field Team, Reg. IV (2)
Mr. Ching
Code 700

9-1-54
Q. Cu.

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

August 30, 1954

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 31 1954

Memorandum

To: Ernest William Ellis, DMEA Member Uranium Commodity Committee, Room 4640

From: John E. Crawford, Bureau of Mines Member Uranium Commodity Committee

Subject: Docket No. 3266 (Copper-uranium), Big Indian Uranium Corp. (formerly Moss Copper Mining Co.) applicant

I have discussed the subject report with Joseph O. Hosted, representative of the Atomic Energy Commission.

It is my recommendation and concurrence with the field team that the application of the Big Indian Uranium Corporation be approved for uranium as well as copper exploration, entailing Government (DMEA) participation at 62½% of costs.

John E. Crawford

John E. Crawford

8-30-54
a.cu

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

August 27, 1954

Memorandum

To: E. W. Ellis, DMEA

From: C. H. Johnson, Bureau of Mines

Subject: DMEA-3266 (Copper-Uranium) Big Indian Uranium Corporation, San Juan County, Utah

In line with discussions this morning with Messrs. Ching, Newcomb, Hosford and Crawford in your office, I am in accord with the recommendation for a staged program of shallow drilling on this property. The prospects for finding a very large copper deposit of minable grade seem to me to be remote, but indications are that a sufficient tonnage of low-grade ore may be found to justify development, or possibly some "pods" of high-grade ore such as apparently have been encountered in the past. The program is so planned as to avoid excessive expenditure in the absence of encouraging results.

I cannot speak for the uranium prospects, but believe you will hear from Mr. Crawford on that subject.

It may be well to call attention to the drilling problem. The reports describe very difficult conditions such as would tend to result in high costs, slow progress, and poor core recovery. Under bad conditions "force account" drilling by individuals or small and poorly equipped firms is risky, and may fail completely. It is hoped that the applicant will be willing to contract the drilling as recommended by the field reports. If he is not, the project would seem to me to become less attractive.

C. H. Johnson

C. H. Johnson

Copy to - E. L. Newcomb, USGS
J. E. Crawford
Minerals Division
C. H. Johnson
Files

STANDARD FORM NO. 64

Returned by Andrew Brown 9-2-54

Office Memorandum • UNITED STATES GOVERNMENT

TO : Andrew H. Brown, TEPCO

DATE: August 23, 1954

FROM : Jo Boerngen

SUBJECT: DMEA Dockets which have been reviewed in Region IV

We are returning herewith DMEA Docket 3266 Field Team report which was received here today.

Arrangements have been made to carry out the instructions of a memorandum which was issued when Art first moved to Denver to have Region IV dockets sent directly to Art from the Region, rather than into Washington and then back out here.

This docket (3266) was reviewed and a memo written on it last week, and we are therefore, returning this copy of the Field Team report -- don't know exactly where it should go. Since the memo of transmittal from Region IV does not give any indication that we had received a copy, it is very understandable that you would have it routinely forwarded to us. We'll see if such information can be included on the transmittal letter from Region IV.

Enclosure

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : A. P. Butler

GEOLOGICAL SURVEY
TEPCO
RECEIVED
AUG 23 1954
Denver

DATE: August 19, 1954

FROM : Andrew Brown

SUBJECT: Documents on DMEA Docket 3266

Enclosed are reports of examination by field team of the property covered by DMEA Docket 3266 (uranium), Big Indian Uranium Corporation (formerly Moss Cooper Mining Company). Big Indian Mine, San Juan County, Utah.

Andy

Andrew Brown
Acting Chief, TEPCO

8-20-54
Q.G.

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : E. Wm. Ellis, DMEA Member, Uranium Commodity Committee

DATE: August 17, 1954

FROM : Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee

SUBJECT: Field Team Report of Examination, DMEA Docket 3266 (copper-uranium) Big Indian Uranium Corp. (formerly Moss Copper Mining Co.) applicant; Big Indian Mine and vicinity SE part T. 29 S., R. 24 E., San Juan County, Utah

Proposed Exploration

The examining members of the Field Team have recommended exploration by diamond drilling in three phases to explore for copper or copper and uranium ore in the Burro Canyon and Dakota formations and for uranium ore in the Morrision formation. The maximum total cost would be $132.284.00, Government participation $82,677.50.

Comment

The Big Indian mine, as reported by the Field Team examiners, has produced about 5,350,000 pounds of copper in about 160,000 tons of ore. The only tangible evidence of uranium is an assay of 0.044 U_3O_8 reported in a drill core by the applicant.

Most of the copper ore mined on the property came from the Dakota sandstone. Some may have come from the Burro Canyon formation and copper-bearing rock, if not, ore, is known in this formation. Few, if any, uranium ore bodies have been found in the Dakota sandstone of this general part of the Plateau, although some large ore bodies are known in it several hundred miles to the south. Locally the Burro Canyon formation contains uranium ore, but significant ore bodies in it are sparse. The geologist examiner points out that mixed copper uranium-ore is not characteristic of the Lisbon-Valley area, although sparse copper minerals are found in some uranium deposits. Dumps of the rock mined for copper are not appreciably radioactive. All these factors, together make distinctly unimpressive the possibility of finding significant amounts of uranium in the possible copper ore bodies of the Dakota sandstone and Burro Canyon formation.

The Salt Wash member of the Morrison formation is one of the principal host rocks for uranium ore bodies in this general area. The ore bodies generally occur in areas of favorable ground that can be distinguished from unfavorable areas by careful study of the rocks at the outcrop or in drill cores. The Salt Wash member is not exposed and has not been explored near the Big Indian mine. It is covered by about 1,000 feet of overlying rocks. The only reason for believing that the Salt Wash might be mineralized is the presence of copper ore in the overlying horizons. Because the favorability of the Salt Wash

member cannot be appraised, and because of its depth any exploration of it would be an out and out gamble in which there is no reason for choosing the Big Indian mine over any other spot of unknown favorability on the Plateau. It would seem that R. P. Fischer's statement with respect to the application DMEA Docket 3277, ". . . We lack sufficient understanding of the size and distribution . . . of the deposits that might be expected in this area, and we lack adequate knowledge of the geologic guides and the size and distribution of the patches of favorable ground that would contain most of the deposits. Lacking this information we (USGS) would not undertake exploration with widely spaced holes in the area . . . and we would not encourage others to undertake such exploration, with or without Government assistance . . ." applies equally well to the Big Indian mine area.

The available evidence suggests that the possibility of finding significant amounts of uranium by exploration at the Big Indian mine are distinctly unimpressive. In the absence of uranium minerals or any noteworthy amount of radioactivity associated with the copper ores, successful search for more copper ore in the Burro Canyon and Dakota formations is unlikely to reveal an appreciable amount of uranium. In the absence of positive or even suggestive evidence of favorability, exploration of the Morrision at a depth of 1,000 feet does not seem more justifiable here than at any other randomly selected point on the Plateau. For these reasons, I do not concur with the Field Team that the proposed exploration should be apportioned between the amount allowed for copper and that for uranium. I recommend that it be considered solely on its merit as exploration for copper.

Arthur P. Butler Jr.

Copy to: E. Wm. Ellis (2)

8-16-54
a.m.

ON SITE Report

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

224 New Customhouse
Denver 2, Colorado

August 9, 1954.

Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region IV

Subject: Report of Examination - DMEA Docket No. 3266 (Copper-Uranium), Big Indian Uranium Corporation (formerly The Moss Copper Mining Company), Big Indian mine, San Juan County, Utah.

Enclosed are the original and ~~two~~ 3 copies of the report of examination pertaining to the above application. Also enclosed are extra copies of maps for your use in preparing a contract.

We recommend that a modified diamond drilling exploration program to test the Burro Canyon formation and the Dakota sandstone for occurrences of uranium and copper be approved which would provide for the drilling of 28 holes estimated at 400 feet each or a total of 11,200 feet of drilling. The estimated cost of this program at $4.66 per foot would be $52,192.00 with diamond drilling being subcontracted to a reliable drilling company.

Based on the Geologic report, the desirability of the 1000 foot holes to test the Salt Wash formation is open to question. The Field Team does not recommend this drilling because the holes are too deep to be practical. Any ore deposits discovered at this depth would have to be of very good grade and size in order to be mined at a profit.

We recommend four holes for Stage I and twelve holes each for Stages II and III, and that Stages II and III must have prior written approval of the DMEA Field Team before work is started under these stages in order to validate any claims for costs incurred thereunder.

Your attention is called to the fact that the Bureau of Mines engineer recommends that the applicant be required to have the two unpatented claims validated by the A.E.C.

W H King
W. H. King

E. H. Koschmann
for A. H. Koschmann

Enclosures

Rec. by John E. Allyn Chm. 8-18-54

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

August 9, 1954.

Memorandum

To: DMEA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Report of Examination - DMEA Docket 3266 (Copper-Uranium), Big Indian Uranium Corporation (formerly The Moss Copper Mining Company), Big Indian mine, San Juan County, Utah.

Enclosed are eleven copies of the Summary, Conclusions, and Recommendations by M. H. Salsbury, Bureau of Mines, and Gordon Weir, Geological Survey, and eleven copies of the engineering report of an examination of the subject property in conjunction with DMEA application, Docket No. 3266.

The applicant requested $142,789.00 for exploration by surface diamond drilling and underground exploration which were to be performed concurrently.

We recommend surface diamond drilling to an estimated 400 foot depth to test the Burro Canyon formation and the Dakota sandstone only. The deeper, 1000 foot, holes are not considered warranted. A maximum of 11,200 feet of drilling in 28 holes, divided into three separate stages, should be provided for. Drilling should be on a contract basis with a reliable drilling company at an estimated cost of $4.66 per foot for a total cost of $52,192.00.

W. H. King

W. H. King

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20, Room 137
Denver Federal Center
Denver 14, Colorado
July 21, 1954

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Mineral Resources Branch, Mining Division, Region IV

Subject: DMEA 3266, Moss Copper Mining Company (Copper-uranium) Big Indian copper mine, San Juan County, Utah

Transmitted herewith are the original and ten copies of the "Summary, Conclusions, and Recommendations," by M. H. Salsbury, Bureau of Mines, and Gordon Weir, Geological Survey, and of M. H. Salsbury's engineering report on the above docket.

Salsbury concludes there is a reasonably good possibility of the discovery of commercial copper, or uranium, or both, by exploration at the Big Indian mine but questions the advisability of the third of three phases he has set the project up in. The revised program, acceptable to the applicant's representative and considered favorable by the Atomic Energy Commission personnel, eliminating underground exploration entirely, suggests core drilling in three phases to include 28,400 feet of drilling. Phase I comprises four holes to intersect the Lisbon Valley fault at a depth of 400 feet and four holes to intersect the fault and Salt Wash formation, the favorable host rock for uranium deposition, at depths of not less than 1,000 feet, or a total for the phase of about 5,600 feet of drill hole. The second phase calls for four offset holes to not more than two of the 1,000-foot holes and three of the 400-foot holes, a total of 12,800 feet of drilling, if approved by the Region IV Field Team on the basis of results obtained in the first phase. Phase III allows 15 holes totaling 10,000 feet of drilling, to further test areas proven favorable in the two previous phases. Contract drilling only is advisable with Phase I to cost an estimated $29,456.00, Phase II an estimated $57,728.00, and Phase III an estimated $45,100.00, or a total of $132,284.00.

While the proposed core drilling project may be entirely feasible if properly controlled by a DMEA contract, it is known that the nearest occurrences of uranium ore in the Salt Wash formation are at least 3 miles or more distant from the Big Indian mine. Under the circumstances, the deeper drilling can be classed only as an extremely long shot effort with a poorly defined target that may prove unattainable. Costs will prove excessive and results may not justify them. The shorter holes might result in the discovery of copper ore with a possibility of some associated uranium.

Whether the project should be approved or not is considered a question for administrative decision. Conditions to be anticipated are called to your attention in both the engineering report and the above paragraph.

The only brochure available was transmitted by you to the Geological Survey and it is presumed was returned by them.

W. M. Traver

W. M. Traver

enclosures

ec 10
DMEA 3266
DMEA Chron

WMT/pam

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

July 8, 1954

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 3266, Moss Copper Company, Big Indian group of claims, San Juan County, Utah

Enclosed are 11 copies of a geologic report by G. W. Weir of the U. S. Geological Survey covering the above docket.

Weir concludes that the copper ore potential of the Burro Canyon formation and the Dakota sandstone is good, that copper ore may be found in the Salt Wash member of the Morrison formation, and that uranium-vanadium ore may be found at depth in the Salt Wash in fracture zones along the Lisbon Valley fault. He recommends a program of diamond drilling to explore the Big Indian group of claims.

Exploration of the Burrow Canyon formation and the Dakota sandstone appears justified; exploration of the Salt Wash will require at least 4 holes averaging 1,000 feet in length and the advisability of this portion of the program is open to question.

Nine extra copies of the maps accompanying the report are transmitted herewith.

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

Enclosures (38)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. BOX 360
GRAND JUNCTION, COLO.

June 29, 1954

Memorandum

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

From: W. P. Williams, Colorado Plateau District

Subject: DMEA 3266, Moss Copper Company, Big Indian group of claims, San Juan County, Utah

Transmitted herewith are eleven copies of a geologic report by Gordon Weir, covering a field examination of the above-referenced property.

Weir recommends approval of a DMEA contract providing for a core-drilling exploration project on the applicant's mining claims. The proposed drilling for copper and uranium, as outlined by Weir, meets with the applicant's approval and should be on a basis of 62½ per cent Government participation.

We are also sending herewith 9 extra copies of maps accompanying the report.

W P Williams

W. P. Williams
Geologist

WPW/mlr

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 3266, Big Indian Copper Mine

Moss Copper Mining Company

San Juan County, Utah

Uranium-Copper

M. H. Salsbury, Mining Engineer
Bureau of Mines

Gordon Weir, Geologist
Geological Survey

July 2, 1954

DMEA 3266

BIG INDIAN COPPER MINE
MOSS COPPER MINING COMPANY
SAN JUAN COUNTY, UTAH

Summary, Conclusions, and Recommendations

By M. H. Salsbury
Mining Engineer
Bureau of Mines

Gordon Weir
Geologist
Geological Survey

DMEA 3266

BIG INDIAN COPPER MINE
MOSS COPPER MINING COMPANY
SAN JUAN COUNTY, UTAH

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By M. H. Salsbury and Gordon Weir

The Big Indian Copper mine, owned by the Moss Copper Mining Company, was visited by a Defense Minerals Exploration Administration examining team on May 19, 1954, to consider an application for exploration for uranium at an estimated cost of $142,798.00. The project turned out to be exploration for copper and uranium combined and a Government participation of 62-1/2 percent has been used in all calculations. The applicants' representative and manager had been notified of the impending visit but was not present during the field examination. He was contacted later by the Geological Survey participant in the field examination.

The proposed work consisted of diamond core drilling and underground exploration to be carried on as a company operation without any contracting.

The mine has been operated at intervals since 1898, and the most recent and most successful effort was an open pit mining and milling project of the Ohio Copper Company in 1943-1947 which produced some 5 million pounds of copper from 158,000 tons of surface ore averaging 1.62 percent copper.

The applicant company owns the property, subject to a final payment due July 1, 1954. There are 9 patented lode claims, 2 patented

placer claims, and 2 unpatented claims. Title is valid on all except the 2 unpatented claims which may require validation to establish mining rights.

The lower part of the Cretaceous Dakota sandstone, the upper part of the Cretaceous Burro Canyon formation, and part of the basal portion of the Permian Cutler formation are present on the Big Indian claims.

In the vicinity of the Big Indian Copper mine, uranium-vanadium deposits are found in the Salt Wash member of the Jurassic Morrison formation, and copper deposits are found associated with faults and fractured ground in the Dakota and Burro Canyon formations.

The Dakota sandstone is mainly cross-bedded, light- to dark-brown sandstone and conglomerate with interbedded gray and brownish mudstone, dark gray carbonaceous shale and coal lenses. The Dakota is estimated to be 60 feet thick on the claims. The Burro Canyon formation is mainly cross-bedded, white and light- to dark-brown sandstone and conglomerate, bluish-gray limestone, green and purplish-red mudstone. The estimated thickness of the Burro Canyon formation on the claims is about 250 feet. The Morrison Brushy basin formation is mostly dark-red claystone and siltstone with minor dark-colored sandstone and conglomerate and on the claims is about 420 feet thick. The Morrison Salt Wash member consists of interbedded, light-colored sandstone and red and green mudstone. The Salt Wash member is estimated to be about 325 feet thick on the claims. The Cutler formation is dark-red siltstone and sandstone with some thick beds of light-colored sandstone and thin lenses of bluish-gray limestone and is estimated to be more than 1,000 feet thick.

The Big Indian claim group is located along the Lisbon Valley fault, which is a major north-west-trending structure about 30 miles long. On the claims, the Dakota formation has been dropped down against the Cutler formation, and the throw is estimated to be about 3,500 feet. The fault plane is exposed on the property and the dip is about 50° northeasterly. The fault is a normal fault, and the Cutler formation is south of the fault, while the Dakota formation outcrops north of the fault.

There are known copper deposits at surface at the Big Indian Copper mine, although most of the available ore of mineable grade is gone. Close to the fault on the northeast or hanging wall side there is a mineralized zone where the copper content appears to be much higher than in the surface deposits which have been exploited. Oxidized copper minerals at surface probably grade into sulfides at depth. The mine was explored in the early days by underground methods including an inclined shaft near to the fault which is reported to have reached a depth of 300 feet. All underground workings are inaccessible; the ground water level, apparently controlled by the fault, is high and pumping would be necessary at very shallow depth in any underground exploration.

There is a good possibility of finding ore-grade copper by exploration of the zone near the fault at depth and perhaps in the sedimentaries farther from the fault, and underlying the surface deposits. In addition, the Salt Wash member of the Jurassic Morrison formation, a potential uranium-bearing rock in this area, occurs on the property

although at a depth of 800 to 900 feet. Both of these possibilities can be investigated by diamond core drilling from surface as proposed in part by the applicants. A revised drilling program has been outlined by the examining team in three phases which should permit evaluation of the property after the first phase, before the remainder of the project is authorized. Underground exploration is not included in this revision and it is not believed that such work should be done concurrently with surface drilling as proposed by the applicants. Joseph Hafen, vice-president and manager for the applicant company, has agreed to the revised program outlined.

The applicant company has been doing some preliminary core drilling with very poor results, probably attributable to inadequate equipment and inexperience in meeting the problems of shattered rock conditions and ground water which are known to exist. While they plan to obtain a suitable drill rig and do the work themselves, it is believed that employment of an experienced and responsible drill contractor would give more assurance of satisfactory hole completion and core recovery, which are essential if the work is to have any value.

A drilling project in three phases, totaling 28,400 feet of diamond core drilling at an estimated cost of $4.66 per foot, or $132,284.00, if completed--Government participation 62-1/2 percent or $82,677.50--is recommended. Employment of a contract driller is also recommended. Because of the known difficult drilling conditions, results of the first hole or so should be evaluated before authorizing further drilling. If the first holes do not provide satisfactory information, it would be useless to drill more.

UNITED STATES DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 3266, Moss Copper Company, Big Indian group of claims
San Juan County, Utah

Uranium-Copper

Geologic Report

by

G. W. Weir
U. S. Geological Survey

June 29,1954

MOSS COPPER COMPANY, BIG INDIAN GROUP OF CLAIMS
SAN JUAN COUNTY, UTAH

INTRODUCTION

The Moss Copper Mining Company, owner of the Big Indian group of claims, has applied (DMEA 3266) to the Defense Minerals Exploration Administration for a loan to explore by diamond drilling and drifting for uranium on these claims.

The Big Indian group of claims are in secs. 27, 28, 33, and 34, T. 29 S., R. 24 E., S.L.P.M. about 6 miles south of the town of La Sal in northwestern Big Indian Wash, Lisbon Valley area, San Juan County, Utah (fig. 1). Two partly improved access roads to the property branch off Utah Highway 46 about 1 and 3 miles west of La Sal. The nearest adequate supply point is Moab, Utah, about 35 miles northwest. Uranium-copper ore is purchased by the U. S. Atomic Energy Commission at the government-owned mill in Monticello, Utah, about 45 miles southwest. Uranium-vanadium ore is purchased by the A.E.C. at Monticello, and at Thompson, Utah, about 75 miles to the north and is accepted provisionally at a sampling plant site 3 miles north of Moab. The nearest railhead is at Thompson. In the past, some copper ore from the Big Indian mine has been shipped about 240 miles by rail from Thompson to the American Smelting and Refining Company copper mill at Garfield, Utah.

The Big Indian group of claims have produced copper ore intermittently for more than 50 years. Total production amounts to more than 160,000 tons of ore with an average grade of about 1.7 per cent copper.

The Big Indian property was examined by B. S. Butler in 1913 (Butler and others, 1920) and by R. D. Sample and others in 1943 (Sample, 1950). Parts of the present report are from these older reports.

The application was discussed on April 23, 1954, with R. A. Teichman, Jr., and J. I. McLelland, AEC field geologists for the Big Indian Wash mining area. Messrs. Teichman and McLelland believe that some exploration for uranium on the property may be justified, although there are no surface indications of uranium ore.

The Big Indian property was examined on May 19, 1954, by G.W. Weir and W. P. Williams, Geological Survey, and M. H. Salsbury, Bureau of Mines. The property was revisited by Weir on June 2, 1954, and the proposed exploration program was discussed with Mr. Joseph Hafen, representative of the applicants.

SUMMARY AND RECOMMENDATIONS

On the basis of the geologic features exposed at the property and a broad consideration of the habits of the ore deposits in the area, the examining geologist recommends that a loan for exploration on the Big Indian property be approved. Because the chance of discovering significant copper reserves appears much better than the chance of discovering significant uranium reserves, the examining geologist recommends that the proposed loan be for a combined copper-uranium project. The proposed exploration program consists of diamond drilling to be done in three stages; each stage of work is to be completed and evaluated before the next stage of work is begun. If the results of any stage of work are judged to be unfavorable by the Field Team, the project is to be terminated. The objectives of this program are to discover copper and/or uranium ore in and near the Lisbon Valley fault. The cost of the entire program is estimated to be about $119,200, of which the Government's share is $74,500 on the basis of participation at 62.5 per cent of the total cost of the combined copper-uranium project.

The Big Indian property, San Juan County, Utah, contains copper ore and a reported occurrence of uranium. Possibilities of finding significant deposits of copper in the Burro Canyon formation are considered good, in the Dakota sandstone good to fair, and in the Salt Wash member of the Morrison formation fair. Possibilities of finding uranium-vanadium deposits in the Salt Wash appear fair. Possibilities of finding copper-uranium deposits are highly speculative, but are judged to merit some exploration.

GEOLOGY

The geologic setting of the Big Indian group of claims is shown on plate 1. The claims lie at the north end of an important uranium mining area, locally known as the Big Indian Wash mining area. The important uranium deposits are in the basal beds of the Triassic Chinle formation. Smaller and lower-grade deposits are known in the upper beds of the Permian Cutler formation. South and northwest of the Big Indian Wash mining district significant uranium-vanadium deposits are found in the Salt Wash member of the Jurassic Morrison formation. Copper deposits are found associated with faults and fractured ground in the Upper Cretaceous Dakota formation and Lower Cretaceous Burro Canyon formation.

Stratigraphy.-- A generalized stratigraphic column for the Big Indian group of claims is given in table 1. Only the lower part of the Dakota sandstone, the upper part of the Burro Canyon formation and part of the basal portion of the Cutler formation are exposed on the claims. Data given on table 1 were compiled from the nearest available measured sections and logs of drill holes.

Table 1.--Generalized stratigraphic section of rocks exposed in and near Big Indian Wash, Lisbon Valley area, Colo.-Utah

System or series	Group	Formation	Estimated thickness (feet)	Character of rocks
Quaternary		Alluvium	0 - 100	Sandy and silty material in part cemented in streams and valleys
		Gravel	0 - 50	Boulders, cobbles, and pebbles in sandy matrix, unconsolidated; covers slopes of South Mountain
Upper Cretaceous		Mancos shale	200	Gray marine shale, fossiliferous at base; covers parts of mesas
Upper Cretaceous		Dakota sandstone	50- 100	Gray and brown sandstone, brown carbonaceous shale and impure coal caps mesas
Lower Cretaceous		Burro Canyon formation	250	Brown conglomerate and sandstone and bright green and reddish shale and mudstone; caps mesas
Upper Jurassic		Morrison formation	420	Brushy Basin member; varicolored mudstone, some sandstone and conglomerate lenses commonly near base; forms slopes.
			300 - 375	Salt Wash member; light colored sandstone and red and gray mudstone; forms cliffs and benches
	San Rafael group	Summerville formation	25 - 65	Red sandy mudstone

System or series	Group	Formation	Estimated thickness (feet)	Character of rocks
	San Rafael group	Entrada sandstone	300 - 400	Massive cross-bedded medium-grained sandstone; forms rounded cliffs. Includes lateral equivalent of Moab tongue of Entrada
Jurassic		Carmel formation		Irregularly-bedded red sandstone and mudstone
		Navajo sandstone	325	Massive cross-stratified buff medium-grained sandstone; forms cliff
Jurassic (?)	Glen Canyon group	Kayenta formation	250	Irregularly bedded fine- to coarse-grained red sandstone, red conglomerate, and red mudstone
Upper Triassic		Wingate sandstone	250 - 300	Massive cross-stratified red fine-grained sandstone; forms cliff
		Chinle formation	100 - 450	Red mudstone and irregularly bedded sandstone above; light colored sandstone and green mudstone below.
			3020 3085	

System or series	Group	Formation	Estimated thickness (feet)	Character of rocks
Lower and Middle Triassic		Moenkopi formation	Unknown*	Chocolate brown mudstone and sandstone, commonly ripple-marked (*Presumed to crop out around South Mountain)
Permian		Cutler formation	1,500	Buff, red, white, and purple sandstone and red and gray mudstone
Permian (?) and Pennsylvanian		Rico formation	600 (?)	Buff arkosic sandstone, gray shale, and fossiliferous marine limestone
Pennsylvanian		Hermosa formation	400 plus (?)	Fossiliferous marine limestone and buff arkosic sandstone and gray sandstone.

The Dakota sandstone of Upper Cretaceous age caps most of the claim area. It consists mainly of cross-bedded and channeled light- to dark-brown sandstone and conglomerate with interbedded gray and brownish mudstone, dark gray carbonaceous shale and lenses of impure coal. The Dakota, in part, resembles the underlying Burro Canyon formation, but can be differentiated by the following characteristics of the Dakota: Carbonaceous shale at or near the base, carbonaceous material as plant impressions and fragments in the sandstone, interbedded coal, and the absence of green mudstone. An estimated 60 feet of Dakota sandstone is exposed in the claim area; the top part of the formation has been eroded away. The Dakota sandstone is an important host rock for copper ore.

The Burro Canyon formation of Lower Cretaceous age is partly exposed on the steep slopes below the Dakota and in the underground workings on the claims. It consists mainly of cross-bedded white and light- to dark-brown sandstone and conglomerate, bluish-gray limestone, and green and purplish-red mudstone. It is differentiated from the overlying Dakota sandstone by the absence of carbonaceous material and by the presence of green mudstone, and from the underlying Brushy Basin member of the Morrison formation by the presence of light-colored sandstone and conglomerate and green mudstone. On existing maps, as on figure 2, parts of the Burro Canyon have been included with the Dakota and parts with the Morrison formation. Logs of drill core on the Big Indian property indicate that the Burro Canyon formation is about 250 feet thick. The Burro Canyon is an important host rock of copper ore and is reported to contain some uranium. It is also the chief aquifer at the Big Indian property.

The Morrison formation of Upper Jurassic age is not exposed on the Big Indian property, but is partly exposed a few miles to the northwest and southeast. The Morrison consists of two members, the Brushy Basin above and the Salt Wash below. The Brushy Basin member consists mainly of dark-red claystone and siltstone with minor dark-colored sandstone and conglomerate sandstone. A log of deep drill hole in the Big Indian property shows that the Brushy Basin member is about 420 feet thick. The Brushy Basin appears to be an unfavorable host rock for uranium or copper minerals.

The Salt Wash member of the Morrison formation consists of interbedded cross-stratified,channeled light-colored sandstone and red and green mudstone. The Salt Wash member is estimated to be about 325 feet thick in the Big Indian Wash mining area. The Salt Wash is a potential host rock for uranium-vanadium ore and possibly for copper ore. It may be an aquifer.

The formations below the Salt Wash member of the Morrison are not considered pertinent to the proposed exploration program, because most of these rocks are too deeply buried to explore. Of the older rocks, only a few-hundred feet of the lower part of the Cutler formation of Permian age is exposed on the Big Indian property. The Cutler consists of dark-red siltstone and sandstone with some thick beds of light-colored sandstone and thin lenses of bluish-gray limestone. The Cutler formation is estimated to attain a thickness of more than 1,000 feet. Although some beds near the top of the Cutler are locally uranium-vanadium bearing in the Big Indian Wash mining area, no occurrences of uranium, vanadium, or copper in the lower part of the formation in the area are known to the writer and the Cutler formation on the Big Indian property is considered an unfavorable host rock.

Structure.--The Big Indian group of claims is located along the Lisbon Valley fault (fig. 2). The fault is a major northwest-trending structure about 30 miles long. Several miles southeast of the property the stratigraphic throw is estimated to be about 4,500 feet. At the property, the Dakota formation has been dropped down against the Cutler formation and the throw is estimated to be about 3,500 feet. The Cutler is, at least locally, altered from red to green for a thickness of a few feet along the fault. A few miles northwest of the property the veritcal displacement decreases to only a few hundred feet. At a few places on the property, the fault plane is well exposed and dips about 50° northeasterly. Although the dip of the fault may differ along strike and at depth, the proposed drilling program is based on the assumption of a uniform projection of a 50° northeasterly dip.

A zone of minor fracturing, in places at least 800 feet wide, parallels the Lisbon Valley fault on the downthrown side of the fault. In the zone are a number of minor faults that rarely have displacements of more than a few tens of feet. Most of these minor faults are roughly parallel to the Lisbon Valley fault. The zone of jointing and fracturing probably represents small adjustments within the downthrown block. Probably none of these minor faults offset the Lisbon Valley fault plane.

The mineralized portion of the claims lies on the northeast side of the fault and on the southwest flank of the Lisbon Canyon anticline (fig. 2). The south flank of the anticline generally dips about 15° southeasterly toward the Lisbon Valley fault. Locally, as in the southeast part of the property, smaller flexures are superposed on the Lisbon Canyon anticline.

The Cutler formation south of the fault dips southwesterly and forms part of the truncated nose of the Lisbon Valley anticline (fig.2). The Lisbon Valley anticline lies entirely south of the fault and forms a prominent topographic feature southeast of the Big Indian property.

HISTORY AND PRODUCTION

Attempts to mine and process the Big Indian copper ores have been made sporadically for more than 50 years. The deposits were originally explored for gold and silver about 1881. Later, the deposits were explored and developed for their copper content by rim-cutting, drifting, and churn drilling. In 1900 a 300-foot inclined shaft was sunk east of the Lisbon Valley fault, presumably in the eastern part of the Copper King claim. This shaft reportedly cut ore-bearing material at depth along the fault. About the same time several adits were driven into the exposed mineralized beds of the Burro Canyon formation and Dakota sandstone on the Copper King and Mineral Point claims. Prior to 1913 a vertical shaft about 100 feet deep was sunk in the Burro Canyon formation on the Blue Jay claim and reportedly cut some good ore, possibly at the intersection with the Lisbon Valley fault. During the period 1900-1942, the property was mined intermittently from both underground and surface workings. In 1942 the Ohio Copper Company of Utah obtained control of the property and for several years mined the Copper King, Mineral Point, and Dandy Jim claims by a large scale rim-cutting operation. Material of much lower grade was mined than in any previous operation. The Moss Copper Company, applicants for the proposed loan, acquired the property in 1952, but have not yet begun mining.

Because of high transportation costs, most mining operations on the Big Indian property have involved processing of the ore on the property. At first, the ore was probably hand-sorted before shipment to mills in Salt Lake City, Utah. A small mill, which concentrated the copper minerals by a sulphuric acid process, was built on the property in 1916-1917. A similar plant was built in 1920. A third plant, which used acid leach and flotation methods for copper recovery, was built in 1925. In 1943, the Ohio Copper Company of Utah constructed a mill with a 250 ton daily capacity and which combined mechanical, acid leach, and flotation methods. This mill was torn down about 1948 and no milling facilities now exist on the property. The Moss Copper Company, present owner of the property, tentatively plans to construct a suitable mill on the property, if sufficient ore is found by the proposed exploration program.

No records of production are available for the years prior to 1929, but old descriptions of workings suggest that probably several thousand tons of ore were mined during this period. Table 2 shows recorded production of the Big Indian Copper property for the period 1929-1952.

Table 2.--Recorded production of the Big Indian copper property for the period 1929-1952

Period	Crude ore produced (Dry tons) 1/	Copper (pounds) Gross in ore 1/	Per cent copper 2/	Silver (ounces) Gross in ore 1/	Ounces of silver per ton 2/
1929	362	53,378	7,37	75	0.21
1930	750	44,560	2.97	70	0.09
1931-1935	None	----	----	----	----
1936	38	12,133	15.96	27	0.71
1937	565	108,730	9.62	197	0.35
1938-1943	None	----	----	----	----
1944	8,009	397,246	2.48	270	0.03
1945	45,380	1,527,415	1.68	800	0.02
1946	46,333	1,751,387	1.89	700	0.02
1947	58,667	1,454,942	1.24	1,123	0.02
1948-1952	None	----	----	----	----
Total	160,104	5,349,791	1.67	3,262	0.02

1/ Data supplied by Paul D. Luff, Commodity-Industry Analyst, Bureau of Mines

2/ Calculated by writer

ORE DEPOSITS

Mineralogy.--The only prominent ore minerals in the surface workings of the Big Indian property are the copper carbonates, malachite ($Cu_2CO_3(OH)_2$), and azurite ($Cu_3(CO_3)_2(OH)_2$). Chalcopyrite ($Cu\ Fe\ S_2$) and native copper are less abundant. Butler and others (1920) and Sample (1950) also report the following minerals: covellite? ($Cu\ S$), chalcocite (Cu_2S), tenorite (CuO), and cuprite (Cu_2O). The sulphides are presumably more common in the underground workings, although there are no reports of unoxidized ore bodies. The presence of native copper is significant because it has caused difficulty in milling the ore owing to its tendency to "ball up" and clog the crusher.

Assays of the ore show silver and gold in small concentrations, but no silver or gold minerals have been found. The applicants state that uranium has recently been found in one core from the oxidized zone, but no uranium minerals have yet been identified. No vanadium minerals have been found at the Big Indian property and probably vanadium has not been analyzed for, but it may be significant that vanadium has been reported in small amounts from two somewhat similar copper deposits in Cretaceous rocks southeast of the Big Indian property, the Pioneer mine (Sample 1950) and the Lucky Strike prospect (Kirkpatrick 1944).

Pyrite is the only common gangue sulphide. Limonite stains much of the host rock dark brown. Principal detrital minerals of the ore-bearing part of the host rock are quartz, chert, and feldspar; clay minerals are generally minor.

Ore bodies.--The ore occurs in fractured ground mainly as layers of sandstone and conglomerate impregnated with azurite and malachite. Chalcopyrite along with pyrite is commonly disseminated in fine-grained rock. Veinlets of copper minerals partly fill fractures in sandstone, conglomerate, and siltstone. Small copper-bearing pyrite nodules are reported to occur in all rock types. According to unverified reports, pockets of good copper ore have been found at depth along the Lisbon Valley fault. The bulk of the ore mined, however, has come from impregnated layers of sandstone and conglomerate near the surface.

The layered ore occurs at several horizons on the Big Indian group of claims. Most of the mining has been concentrated on the uppermost ore horizon, the base of the Dakota sandstone. Reconnaissance of the surface workings suggests that mineralized rock is relatively continuous along this uppermost horizon, but shows marked variations in grade. Lower ore horizons are in the Burro Canyon formation and are poorly known. They appear to be similar to the ore horizon in the Dakota. Mineralized rock in both formations appears to be restricted to a jointed and faulted zone on the north side of the Lisbon Valley fault. The fractured zone is at least 800 feet wide in places, but probably does not extend to the north boundary of the middle part of the property.

Minable ore bodies (including those now removed) in the Dakota sandstone near the surface range in size from mineralized layers a few feet thick and less than 100 feet in diameter to a number of mineralized layers aggregating many feet thick and many hundreds of feet in diameter. The limits of these ore bodies are generally defined by gradational to sharp decreases in grade; weakly mineralized rock is much more extensive.

Little is known about the extent or nature of ore bodies in the Burro Canyon formation. Much of the formation is not exposed. None of the old underground workings that explored this formation are accessible for more than a few feet. Examination of the dump material and the limited exposures of the lower ore horizons suggest to the writer that ore bodies in the Burro Canyon are probably similar in size and habit to those in the Dakota.

Reports of pods of ore along the Lisbon Valley fault are difficult to evaluate. Good ore on the dump from the Blue Jay shaft, which may have intersected the Lisbon Valley fault, lends credit to the unverified reports. Because even in bedded ore near the surface copper minerals are found abundantly along small fractures, and joints and faults, the writer believes that ore does occur in favorable beds in the Burro Canyon along the major fault. However, it seems permissible to draw the conclusion from the mining history of the property that ore along the fault is not so abundant or so rich in grade as to be more attractive economically than the disseminated ore near the surface.

RESERVES AND EXPLORATION POSSIBILITIES

This report is based on a brief reconnaissance by the writer of the principal accessible workings of the Big Indian group of claims, supplemented by a review of the available literature on the property. Because detailed maps and assays are lacking, the evaluation of the copper and uranium possibilities of the property, given below, must be regarded as only the writer's tentative opinion.

Possibilities exist at the Big Indian property for copper ore, for uranium-vanadium ore, and for copper-uranium ore. These possibilities are discussed separately below.

Copper.--Large scale open-cut mining has been done mainly on the Copper King and Mineral Point claims, and most of the impregnated sandstone ore in the Dakota sandstone near the surface has been removed from these claims. However, ore-bearing horizons below the surface in the Burro Canyon formation are believed to underlie these claims. The most promising exposures of ore near the surface appear to be those on the eastern part of the Blue Jay claim and the western part of the Nevada claim; these occurrences are in the upper part of the Burro Canyon. Although a few copper prospects are known in the ground north of the Nevada and Mineral Point claims, the potential of this area is difficult to assess because much of the area is covered with surficial material. As previously noted, the ore is apparently restricted to a fractured zone parallel to the Lisbon Valley fault. Sample (1950) states that assays of drill cores of the Ohio Copper Company showed that the ore grade diminishes northward away from the fractured zone. Thus it seems probable that the copper potential generally decreases northward away from the Lisbon Valley fault and that the Nevada and Mineral Point claims probably contain more favorable ground than the claims farther north.

The Utah claim and unclaimed land to the southeast contain several small prospects that suggest this ground is only weakly mineralized, but the amount of low-grade material here may be significant. The Mono Placer and the Piute Placer claims are located south of the major fault and are believed to be barren.

Practically all of the easily mined ore has been taken from the basal part of the Dakota sandstone. Sample (1950) was of the opinion that the copper ore was mainly in the Dakota and that only weakly mineralized rock was to be found in the Burro Canyon formation ("Morrison formation" of Sample). The writer of this report believes that the copper potential of the Burro Canyon is equal to, and possibly greater than, that of the Dakota. The Brushy Basin member of the Morrison formation is composed mainly of siltstone and claystone and is believed to be an unfavorable host rock. The Salt Wash member of the Morrison is regarded as potentially copper-bearing, because it is somewhat similar lithologically to the Burro Canyon and Dakota. However, no copper deposits in the Salt Wash in the area are known. The Cutler formation on the south side of the fault is a barren unfavorable host rock and probably has no significant potential.

Assuming a grade cutoff of one per cent copper, the grade of reserve and potential ore of the Big Indian property is estimated to be on the order of 3 per cent copper. Because weakly mineralized material is abundant, a grade cutoff of 0.5 per cent copper would probably result in an average grade of less than 1.5 per cent copper. Past production (table 2) shows a grade ranging from about 1.2 per cent to about 16 per cent copper. This wide range is apparently due to variations in mining practice. The history of the Ohio Copper Company operation suggests that large amounts of ore cannot be mined selectively.

About 1943 the Ohio Copper Company blocked out by drilling in the Dakota sandstone an estimated 156,000 tons of ore with an average grade of about 2 per cent copper. Sample (1950), using the same data supplemented by geologic mapping, estimated in 1943 that the reserves of the Big Indian property amounted to 286,000 tons consisting of 126,000 tons with an average grade of 2 per cent copper, 87,000 tons with an average grade of 1.25 per cent copper, and 73,000 tons with an average grade of 0.5 per cent copper. Practically all of this reserve ore was assigned to the Dakota; only 5,000 tons of low-grade material were assigned to the Burro Canyon formation. Since these estimates were made, about 150,000 tons of ore with an average grade of about 1.7 per cent copper have been mined from the Dakota sandstone. Sample (1950) states that the deposits appear to have been stripped of all commercial ore.

Assuming a grade cutoff of one per cent copper and a reasonable projection of the exposed ore on the Big Indian group of claims, the writer estimates there are at least several thousand tons of indicated reserves and probably more than 10,000 tons of inferred reserves with an average grade on the order of 3 per cent copper. More than half of this reserve ore is assigned to the Burro Canyon formation. If, as the writer believes, ore bodies in the Burro Canyon are similar in size and habit to those mined in the Dakota, or if, as seems less likely, large ore bodies are concealed in the Dakota in the fractured ground, or if, as seems possible, ore is locally concentrated along the Lisbon Valley fault, the Big Indian property potentially contains from several hundred thousand tons to one million tons of ore. Much of this reserve and potential ore, however, must be in the Burro Canyon formation covered by a relatively thick overburden and may not be economically practical to mine under existing price schedules.

In summary, the copper possibilities of the Burro Canyon appear good, of the Dakota sandstone good to fair, and of the Salt Wash member fair. To warrant further mining for copper, exploration must prove one of the following possibilities to exist: (1) presence of large ore bodies in the relatively unexplored Burro Canyon formation, (2) presence of concealed large ore bodies at the base of the Dakota sandstone, or (3) presence of significant ore bodies in all favorable formations along the Lisbon Valley fault plane.

Uranium-vanadium.--The uranium-vanadium possibilities of the Big Indian group of claims are highly speculative. In adjoining areas, uranium-vanadium ore has been mined from the Brushy Basin and Salt Wash members of the Morrison formation, the basal part of the Chinle formation, and the upper part of the Cutler formation. Few of these deposits are associated with faults. The largest and highest grade deposits are in the Chinle formation. Significant production has come from the Salt Wash member. There has been but little production from the Brushy Basin member and from the Cutler formation. Of the important host rocks, only the Salt Wash member of the Morrison underlies the Big Indian property.

The Salt Wash is not exposed on or near the Big Indian group of claims. The closest exposure is about 5 miles northwest of the Rattlesnake group of claims. The Rattlesnake group lies in a zone of fractured ground along the Lisbon Valley fault. The claims were staked in March 1954, and as of May 1, 72.77 tons of ore averaging 0.81 per cent U_3O_8 and 2.86 per cent V_2O_5 has been shipped. Exploration and development are continuing on these claims, but some ore exposures average 3 to 5 feet thick and appear to be relatively continuous. The ore is cut off by a fault and is offset in places by other minor faults. Although the Rattlesnake group is far from the Big Indian property, the uranium-vanadium deposit lies in a structural and stratigraphic setting similar to the deeply buried Salt Wash on the Big Indian claims. The writer believes that the deposit at the Rattlesnake group suggests that possibly similar uranium-vanadium deposits may exist at depth in the Salt Wash in the fractured zone along the Lisbon Valley fault on the Big Indian property.

On the other hand, the exposures of ore at the Rattlesnake group of claims to the northwest strongly suggest to the writer that the faults are post-ore. The Lisbon Valley fault and associated faults may have no genetic connection with the uranium-vanadium ore. Possibly, however, the Lisbon Valley fault is much older than the associated faults. The writer knows of no critical evidence bearing on this point.

Furthermore, the nearest exposures of the Salt Wash to the southeast about 10 miles distant, are distinctly unfavorable. The sandstone ledges are thin, reddish in color and contain only a few insignificant uranium-vanadium deposits. The Lisbon Valley and Lisbon Canyon anticlines may have formed a relatively positive area during Salt Wash deposition, and along the crest of this high, perhaps approximately the trace of the Lisbon Valley fault, the Salt Wash beds may be thinner and less favorable for ore. The Big Indian property probably lies near the northwest end of this positive area, and the Salt Wash here may be much less favorable for ore than the Salt Wash farther northwest at the Rattlesnake group of claims.

A few feet of Salt Wash was exposed in a core from a deep hole on the Durango claim. These few feet consisted of fine-grained sandstone with a light reddish cast, a rock type that is generally considered unfavorable or semi-favorable for uranium-vanadium ore in the Salt Wash. However, because the sandstones of the Salt Wash may change markedly vertically and laterally, little weight can be put on these few feet of core.

The size of any buried uranium-vanadium deposit in the Salt Wash cannot be guessed. The largest ore deposits in the Salt Wash of the Lisbon Valley area (fig. 2) are about 10,000 tons with an average grade of about 0.30 per cent U_3O_8 and 1.8 per cent V_2O_5 or an average value of about $35.00 a ton. According to the Atomic Energy Commission (1953), the break-even value for extraction of a 10,000 ton ore body with an average thickness of from 3 to 6 feet covered by from 500 to 800 feet of overburden is from $33.50 to $41.00 per ton. Thus, it appears impractical to explore the deeply buried Salt Wash on the Big Indian group of claims for deposits of less than 10,000 tons. Assuming that the ore averages about 3 feet thick and is approximately circular in plan, such a deposit would be about 775 feet in diameter. The diamond-drilling program recommended below is planned for deposits of about this size.

Copper-uranium.--Copper minerals are associated with uranium ore in many areas on the Colorado Plateau, but uranium-bearing copper ores are not common. In Utah only the White Canyon mining area, about 70 miles southwest of the Big Indian property, contains large deposits of copper-uranium ore. The White Canyon deposits are in the Shinarump conglomerate of Triassic age. In the Lockhart Canyon-Indian Creek area, about 25 miles west of the Big Indian property, copper occurs with uranium in many small deposits in the Cutler formation; some of these deposits contain about 1.5 ounces of silver per ton (Dix 1935b). In the Slick Rock mining district, about 25 miles southeast of the Big Indian property, specks of copper carbonates are commonly associated with uranium-vanadium deposits in the Salt Wash member of the Morrison formation. Hand samples of copper sulphides have been collected from at least one Salt Wash uranium-vanadium deposit in the Slick Rock district, the Rainbow mine in the Lower group of claims (O.B. Raup, USGS, personal communication).

Copper in trace amounts has been found in some uranium-vanadium deposits in the Lisbon Valley area. Dix (1953a, p. 12, 13) reports copper sulphate, and copper-uranium minerals in the uranium deposits in upper part of the Cutler formation in Big Indian Wash. Raup (personal communication) has found small nodules of an unidentified black mineral enclosed by a rim of malachite in the uranium-vanadium ore in Steen's Mi Vida mine in the Chinle formation along Big Indian Wash. The writer knows of no copper occurrences associated with the uranium-vanadium deposits in the Salt Wash member of the Morrison formation in the Lisbon Valley area.

Copper-uranium ore is not characteristic of the Lisbon Valley area. The applicants state that assay of a core from the brecciated zone of the Big Indian property showed 0.044 per cent uranium. The writer does not know whether this assay was of copper ore, but it was apparently from the Burro Canyon formation, an important host rock for copper. The writer traversed parts of the property with a scintillometer, but detected no radioactivity anomalies at the surface. Traverses with an ionization chamber by geophysicists under contract to the AEC have detected some small raioactivity anomalies around the old workings (I.T. Fisk, AEC, personal communication).

The Lucky Strike copper prospect is the only occurrence of uranium-vanadium bearing copper ore in the Lisbon Valley area known to the writer. The prospect is about 14 miles southeast of the Big Indian property. The deposit has formed in the Burro Canyon formation along a normal fault that has dropped the Burro Canyon against the Salt Wash member of the Morrison. Copper carbonates and oxides, chiefly malachite, impregnate sandstone along the fault, along minor fractures in a zone parallel to the fault, and along bedding planes. Radioactive material is concentrated in limonite-stained silicified sandstone along a fracture close to the major fault. Hand specimens of the radioactive rock show limonite, malachite, brochantite, and volborthite, ($Cu_3(VO_4)_2 \cdot 3H_2O$?) and minute quantities of a bright yellow radioactive mineral, probably carnotite (M. E. Thompson, USGS, personal communication). Radioactivity along the mineralized fracture is as high as 10 milliroentgens per hour, which suggests that some of the material is of uranium ore grade. The width of the radioactive rock is only a few feet; the length and thickness of the radioactive rock is probably measurable in a few tens of feet. Probably there are only a few tons, or tens of tons, of radioactive rock in the prospect. There apparently has been no mining at this prospect for many years, and it is unlikely that any ore was mined for its uranium or vanadium content.

Kirkpatrick (1944, p. 16) noted vanadium and uranium at the Lucky Strike prospect in 1944, but assumed that the uranium and vanadium were derived from a nearly carnotite deposit in the Salt Wash member of the Morrison on the footwall side of the fault. A similar interpretation could be applied to the occurrence at the Big Indian property where the Salt Wash is about 400 feet below the Burro Canyon on the downthrown side of the Lisbon Valley fault. However, the writer is inclined to view the Burro Canyon formation as a potential host rock for copper-uranium deposits. Because the copper deposits of the Lisbon Valley are all found along faults or in fractured ground, the writer expects that any copper-uranium deposits are most likely to be found associated with faults. Because copper minerals are associated with some uranium-vanadium deposits in the adjacent Slick Rock mining district, the writer also views the Salt Wash member as a potential host rock for copper-uranium ore. On the other hand, if Kirkpatrick's interpretation is correct, the occurrence of uranium in the Burro Canyon formation at the Big Indian property may indicate the presence of uranium-vanadium ore bodies at depth in the Salt Wash.

In summary, the writer believes that there is a fair chance of finding copper-uranium ore in the Burro Canyon formation and possibly in the Salt Wash member of the Morrison formation on the Big Indian property. The exploration program recommended to test the property for copper ore and uranium ore will also serve to test the property for copper-uranium ore.

PROPOSED EXPLORATION

Applicant's program

The Moss Copper Company proposes to explore the Morrison and lower formations by diamond drilling and by reopening, extending, and drifting from an old inclined shaft in the Burro Canyon formation. Objectives of the applicant's program are: (1) to determine whether uranium ore has been deposited along the Lisbon Valley fault, and, if so, (2) to determine whether the ore becomes enriched at depth, and (3) to determine the lateral extent of the ore.

Plans for the drilling project are not detailed on the application, but the accompanying geologic report by L. D. Halvorsen recommends drilling about 30 holes to the Lisbon Valley fault plane for initial exploration of the claims. The depths of these proposed holes range from about 200 to 1,000 feet deep. Halvorsen recommends that the shallower holes be drilled first. An estimate of the required footage is not given, but the accompanying map indicates that about 12,000 feet of wide-spaced drilling is planned. If mineralized rock is located by the wide-spaced drilling, Halvorsen recommends further closer-spaced drilling to determine the trends and outlines of ore bodies. In the examining geologist's opinion, core-drilling is the best way to explore the property, but fewer than 30 holes will be required to determine the ore potential and perhaps more than 30 holes will be required to prove a significant discovery.

The applicant also proposes to reopen, extend, and drift from an old inclined shaft to explore a brecciated zone in which a recent drill hole recovered some copper ore at depths of 160 feet and 230 feet, and to explore the Lisbon Valley fault. Total estimated footage of the shaft and drifts is 3,100 feet. The underground workings on the Big Indian property have been abandoned for at least 10 years and perhaps as many as 50 years. The location of the old shaft is not shown on the applicant's map. The location, extent, and condition of the shaft and other underground workings are poorly known by the writer, and apparently also by the applicant. In the examining geologist's opinion, exploration by drifting is unwarranted until more facts are known about the distribution of ore on the Big Indian property.

Alternate program

On the basis of the field examination and discussion with Mr. Joseph Hafen, acting for the Moss Copper Company, the following exploration program is recommended. Because the chance of discovering significant copper reserves appears much better than the chance of discovering significant uranium reserves, it is recommended that the proposed loan be approved for a combined copper-uranium project. The program is planned to test the Big Indian property for both copper and uranium, whether or not the two metals are associated.

The exploration program is similar to the drilling project proposed by the applicant except that the work is divided into three stages. Each stage of work should be completed and evaluated before the next stage of work is begun. No stage of the work should be started without prior written approval from the Field Team.

Stage I

Stage I work is divided into two parts which may be done concurrently or in any convenient order. For convenience of description, these two parts are called Stage Ia and stage Ib.

In stage I~~a~~b, four holes should be drilled to the Lisbon Valley fault on the Nevada, Copper King, and Utah claims. Recommended locations of these holes are shown approximately on figure 3. The objectives of stage I~~a~~b are to test the Burro Canyon formation, and, if feasible, the Dakota sandstone in the fractured ground and along the Lisbon Valley fault plane for copper and/or uranium deposits. The depth of these drill holes is estimated to range from about 200 to about 500 feet and to average about 400 feet and aggregate about 1,600 feet. A change in dip of the Lisbon Valley fault at depth will require a change in drilling footage. The estimated cost of drilling of stage I~~a~~b work is about $3.00 per foot.

The stage I~~b~~a four holes should be drilled to the Lisbon Valley fault on the Durango and Texas claims. Recommended locations of these holes are shown approximately on figure 3. Objectives of stage I~~b~~a are to test the Salt Wash member of the Morrison and overlying rocks for uranium and/or copper deposits. The depth of these drill holes is estimated to average about 1,000 feet and to aggregate about 4,000 feet. A change in dip of the Lisbon Valley fault will require a change in drilling footage. One hole, marked "Hole B" on figure 3, has already been drilled to a depth of about 750 feet by the operator. The hole is believed to be closed by caving, but, if feasible, this hole should be reopened and completed to the fault. The estimated cost of stage I~~b~~a drilling is about $5.00 per foot.

All holes of stage I work should be drilled to the Lisbon Valley fault. The fault probably can be recognized in the core by one or more of the following: (1) brecciated and slickensided sandstone, (2) fault gouge, (3) sediments from the Cutler formation. All holes in stage I should be cored their entire length because there is a chance that ore may occur at any horizon. Sludge samples should also be taken of each cored interval. All core and sludge samples should be carefully marked and stored by the operator for study by the DMEA team. Because the ground to be explored is badly fractured and water-saturated, all holes in stage I should be cased their entire length, if practicable. Drill holes should be two and three-eighths inches or larger in diameter (BX core) to accomodate AEC scintillation logging equipment that is expected to be available to log these holes. In general, because difficulties in drilling are to be expected because of the fractured nature of the ground and the presence of aquifers, special effort should be made to obtain the best possible samples of the rocks to be explored.

Total required footage to complete stage I drilling is estimated to be about 5,600 feet. Cost of stage I drilling is estimated to range from $3.00 to $5.00 per foot and to total about $24,800.

Stage I work should be completed before stage II work is begun, so that the project can be re-evaluated in the light of additional geologic information obtained and so that, if necessary, revised recommendations can be made as to the advisability and placing of drill holes of stage II. It is recommended that no further work be done, unless some material of ore grade and thickness be discovered in stage I. The examining geologist suggests that for the purposes of this work in the Burro Canyon formation and Dakota sandstone, "ore" be defined as copper-and/or uranium-bearing rock equivalent to material 3-feet thick with a value per ton of $18.00, and in the Morrison formation ore be defined as copper- and/or uranium-bearing rock equivalent to material 3-feet thick with a value per ton of $35.00.

Stage II

Stage II work is divided into two parts which may be done concurrently or in any order convenient to the operators. For convenience of description, these two parts are called stage IIa and stage IIb. The detailed planning of stage II is, however, wholly dependent on the results of stage I work.

In stage II~~1~~b, as many as four offset holes should be placed about 100 feet from any holes to stage I that cut ore in the Dakota sandstone or Burro Canyon formation. A suggested pattern for stage II~~1~~b drill holes is shown on figure 3. Objectives of stage II~~1~~b work are to explore further the Dakota and Burro Canyon for copper and/or uranium deposits and to determine the extent of ore discovered by stage I drilling, The holes should be bottomed at the base of the formation which contains ore as determined by stage I. Drilling depths of stage II~~1~~b are estimated to range from about 200 to 500 feet and to average about 400 feet. Total footage required is estimated to be about 4,800 feet. Estimated drilling cost of stage II~~1~~b work is estimated to be about $3.00 a foot.

In stage II~~0~~a, as many as four offset holes should be placed about 200 feet from any holes of stage I that cut ore in the Morrison formation. A suggested pattern for stage II~~0~~a drill holes is shown on figure 3. Objectives of stage II~~0~~a work are to explore further the Morrison and overlying formations and to determine the extent of ore discovered by stage I~~0~~a drilling. Drilling depths of stage II~~0~~a are estimated to range from about 800 feet to about 1,200 feet and to average about 1,000 feet. Total footage required is estimated to be about 8,000 feet. Estimated drilling cost of stage II~~0~~a work is estimated to be about $5.00 per foot.

Drilling procedures should be similar to those recommended for stage I, unless the results of stage I work indicate otherwise. For example, it may be feasible to restrict coring to favorable formations only.

Total required footage to complete stage II drilling is estimated to be 12,800 feet. Cost of stage II drilling is estimated to range from $3.00 to $5.00 per foot and to total about $54,400.

Stage II work should be completed before stage III work is begun, so that the project can be re-evaluated in the light of additional geologic information obtained and so that, if necessary, revised recommendations can be made as to the advisability and placing of drill holes of stage III. It is recommended that no further work be done, unless at least 25 per cent of the holes in stage II cut ore.

Stage III

The detailed planning of stage III work is wholly dependent on the results of stages I and II. Objectives of stage III drilling are to determine the probable extent of ore discovered in stages I and II and to test ground that is judged favorable for ore by projection of drill hole data. Holes drilled to test the Dakota or Burro Canyon should be placed about 100 feet from other drill holes. Holes drilled to test the Morrison formation should be placed about 200 feet from other drill holes. Drilling procedures should be the same as recommended for stage I, modified, if necessary, according to the results of stage I and II work. Drilling depths are estimated to range from about 150 feet to 1,400 feet and to average about 700 feet. Total footage required for stage III is estimated to be about 10,000 feet. Estimated drilling cost is about $4.00 per foot and totals about $40,000.

Total footage required in the exploration program is estimated to be about 28,400 feet. The cost of the entire exploration program is estimated to be about $119,200, of which the Government's share would be about $74,500 on the basis of participation at 62.5 per cent of the total cost of the combined copper-uranium project. Mr. M. H. Salsbury, U. S. Bureau of Mines, will submit a separate report on the engineering and cost of the proposed program.

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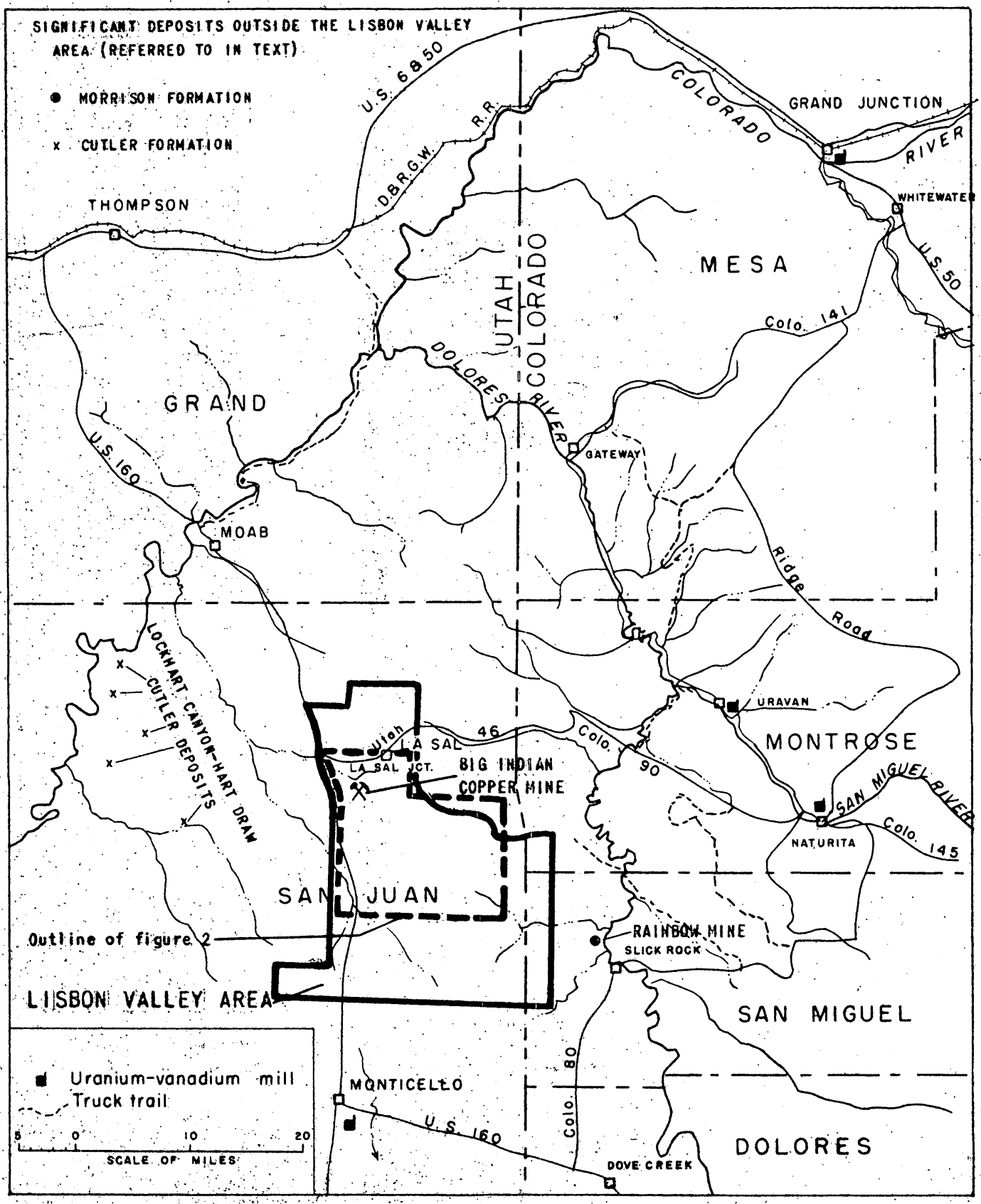

Figure 1. INDEX MAP OF PART OF THE COLORADO PLATEAU SHOWING THE LOCATION OF THE LISBON VALLEY AREA, BIG INDIAN COPPER MINE AND OUTLINE OF FIGURE 2, SAN JUAN COUNTY, UTAH

DMEA 3266

BIG INDIAN COPPER MINE
MOSS COPPER MINING COMPANY
SAN JUAN COUNTY, UTAH

Engineering Report

By M. H. Salsbury
Mining Engineer
Bureau of Mines

DMEA 3266

BIG INDIAN COPPER MINE
MOSS COPPER MINING COMPANY
SAN JUAN COUNTY, UTAH

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DMEA 3266

BIG INDIAN COPPER MINE
MOSS COPPER MINING COMPANY
SAN JUAN COUNTY, UTAH

ENGINEERING REPORT

By M. H. Salsbury

INTRODUCTION

The Big Indian Copper mine of the Moss Copper Mining Company was examined on May 19, 1954, by a Defense Minerals Exploration Administration Region IV examining team. They were accompanied by W. P. Williams of the Geological Survey, Grand Junction, Colo. Joseph Hafen, general manager for the applicants, lives at the property and had been notified personally of the impending visit by Gordon Weir, the Geological Survey member of the examining team, but was not present during the examination.

Government-assisted exploration, consisting of diamond drilling and underground exploration for both copper and uranium, was requested at an estimated cost of $142,798.00. The application, made for uranium only, would call for Government participation of 75 percent, or $107,098.50. Actually, the proposed work would explore for copper as well and Government participation on this basis would be the average of 50 percent (for copper) and 75 Percent (for uranium): 62-1/2 percent of $142,798.00, or $89,248.75.

ACKNOWLEDGEMENTS

Data on the property were obtained from a report by L. D. Halvorsen furnished by the applicants, other information in the

application, and an unpublished report dated 1943, by R. D. Sample, E. E. Gould, and H. H. Sullwold, Jr., of the Geological Survey titled: "Big Indian Mine and Vicinity."

The property is described briefly on pages 614-615 of Geological Survey Professional Paper 111, "Ore Deposits of Utah," in a section by B. S. Butler.

Richard Teichman and John McLelland of the Atomic Energy Commission were contacted by Weir and expressed a favorable opinion regarding a limited amount of drilling.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The property is located in the Big Indian mining district, San Juan County, Utah, secs. 27, 28, 33, and 34, T. 29 S., R. 26 E., of the Salt Lake meridian (fig. 1). The mine is 10 miles south of the LaSal Mountains. It is 15 miles by unimproved county road, thence 10 miles south over Utah surfaced Highway 89 to Monticello, Utah, the site of the nearest uranium ore treatment plant. Uranium ore might be delivered instead to a buying station recently established at Moab, Utah. Copper ores and concentrates can be sold to a copper smelter at Garfield, Utah, in the Salt Lake Valley, a distance of 270 miles, all over surfaced highway except the first 10 miles. An alternate shipping route is by truck to Crescent Junction, Utah, on the main line of the Denver and Rio Grande Western railroad, thence by rail to Garfield. The total distance is the same.

The property is on the northeast side of Lisbon Valley on the slope of a low ridge trending northwest and southeast. The average

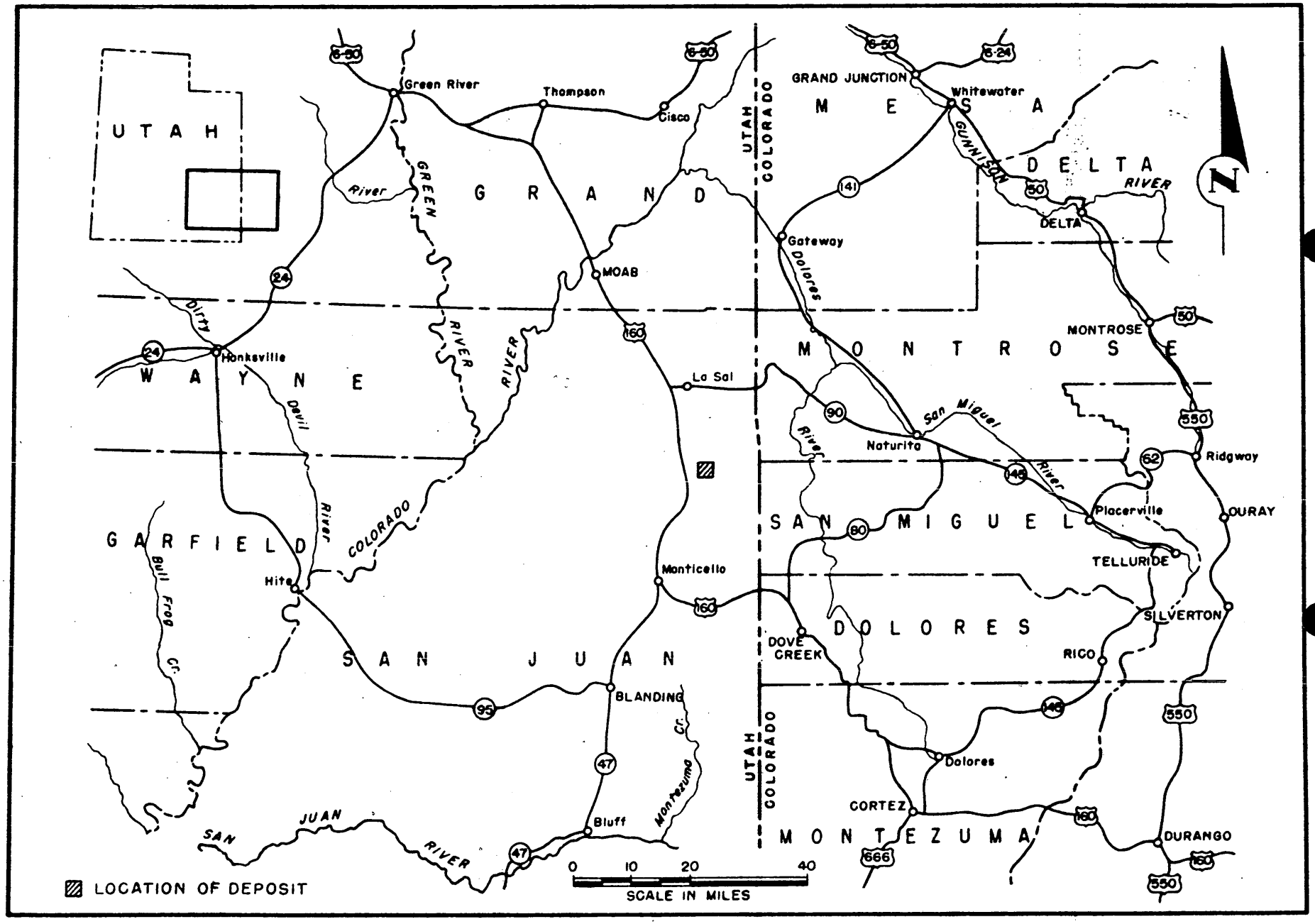

FIGURE 1 - LOCATION MAP, BIG INDIAN COPPER MINE, MOSS COPPER MINING CO., SAN JUAN COUNTY, UTAH (DMR 3286)

altitude is 6,800 feet. Vegetation is sparse, and the climate arid, with hot, dry summers and moderate to cold winters. Snow may accumulate on north slopes during a normal winter. Unimproved roads are passable with difficulty after heavy storms or in the spring. Water for mining purposes is obtained from drill holes tapping the shallow water table. Mining timber, fuel, and some other supplies can be obtained in Monticello or Moab, Utah. These towns are served by scheduled motor freight lines from Grand Junction, Colo., the nearest major supply center, a distance of 150 miles from the property.

LABOR AND LIVING CONDITIONS

The demand for labor caused by expanding uranium operations in the area is high, but there has been a fairly adequate supply to date. The hourly rate for semi-skilled labor is $1.75 to $2.00. The crew needed for preliminary exploration could probably be obtained without much difficulty.

A small crew could live in existing quarters on the property or commute from nearby towns. Men from outside the area would have difficulty in obtaining accommodations either in Monticello or Moab.

HISTORY, PRODUCTION, AND OWNERSHIP

The occurrence of copper at the Big Indian mine was noted as early as 1895, and mining has been carried on sporadically since that time. Exploration by churn drilling and underground work dates from 1898-1900. Treatment plants involving leaching and, later on, flotation processes were built in 1916, 1920, 1925, and 1943. There is no record of any of these operations having been profitable except the plant erected by the Ohio Copper Company in 1943 which was reported to have made a small

profit from operation of a 250-ton mill, supplied from an open pit. The available supply of suitable ore was exhausted in 1947, the operation was closed down, and the mill dismantled. The low-grade tenor of the ore and distance from ore markets have been adverse factors in past mining operations. During the last year, the present applicants have undertaken a core drilling program with unsatisfactory results, probably because of inadequate equipment and techniques. One deep hole, similar to those in the current exploration proposal, was lost before reaching its objective because of the heavy water flow encountered. However, with adequate equipment and techniques, the area can probably be drilled successfully, although the cost will be comparatively high.

According to the records of the Mineral Industry Division, Region IV, Bureau of Mines, the production of the Big Indian Copper mine since 1929 is as follows:

TABLE 1.

Year	Type of ore	Tons produced	Content: Silver (ounces)	Content: Copper (pounds)	Content: Copper (percent)
1929	crude	362	75	53,378	7.37
1930	crude	750	70	44,560	2.97
1931-35	none				
1936	crude	38	27	12,133	15.96
1937	crude	565	197	108,730	9.62
1938-43	none				
1944	mill feed	8,009	270	397,246	2.48
1945	mill feed	45,166	800	1,510,578	1.67
	crude	214	--	16,837	
1946	mill feed	46,333	700	1,751,387	1.89
1947	mill feed	58,667	1,123	1,454,942	1.24
Totals since 1944 (mill feed only)		158,175	2,893	5,114,153	1.62

No record of production prior to 1929 is available. The various crude ore shipments listed since 1929 probably represent carefully

sorted ore from the outcrop as well as some mined underground. Production of ore of very good grade is reported from underground operations in the early days. The 1937 production figures verify a statement by J. B. Skews of Moab, Utah, who told Weir that in that year he shipped 15 carloads of hand-sorted ore from surface which averaged 8 percent copper.

The patented ground controlled by the applicants includes 9 lode mining claims, the Durango, Anaconda, Pacific, Texas, Mineral Point, Copper King, Dandy Jim, and Nevada, survey No. 3995; the Utah, survey No. 3997; and the Piute and Mono placer claims, survey Nos. 3996 and 3997, respectively (fig. 3 with the geologic report). The property belonged to the heirs of Senator Smoot of Provo, Utah, and was sold to Carl J. Harris, president of the Moss Copper Mining Company, P. O. Box 111, Provo, Utah, under a contract-of-sale agreement calling for a total payment of $10,000.00 in 5 installments, and a 6 percent stock interest in any corporation to which the purchase option might be assigned. The loan application states that only the final payment of $4,000.00, due July 1, 1954, remains to be made. However, an unsigned copy of the sale agreement, furnished with the application, gives the date of the final payment as January 2, 1954. It is presumed that an extension of time was granted, but no mention of this or of an assignment of the sale agreement to the corporation was made by the applicants. Two unpatented claims, the Blue Jay or Eureka, and the LaSal, which had been allowed to lapse, were relocated by the applicants.

According to information furnished by the Salt Lake City branch office of the Bureau of Land Management, the area in which the claims are

located is covered by three oil and gas leases applied for on May 29 and October 20, 1947, and granted on August 1 and 2, 1949. The leases are listed in table 2.

TABLE 2. - Partial statement of oil and gas leases outstanding in T. 29 S., R. 24 E., Salt Lake meridian

Oil and Gas Lease No.	Date of issue	Period of issue	Area covered pertinent to Big Indian mine	Lessee	Remarks
SL067131	Aug. 1, 1949	5 years	Sec. 28 & part of sec. 27	Willie G. Hodges P.O. Box 671, Roswell, N.Mex.	
SL067131-A	Aug. 1, 1949	5 years	Sec. 33	H. A. Hanson P. O. Box 1864, Rapid City, S.D.	Lease extension applied for
SL068021	Aug. 2, 1949	5 years	Sec. 34	Sam D. Young El Paso National Bank Bldg. El Paso, Texas	Rental in arrears

These conflicts do not affect the patented claims which are deeded property, but the validity of the two located claims may be questionable inasmuch as the original locations were allowed to lapse. It would probably be advisable to require Atomic Energy Commission validation on these two claims.

DESCRIPTION OF THE DEPOSITS

The main geologic feature of the Big Indian Copper mine is the Lisbon Valley fault, striking southeast and northwest and dipping northeast, which can be traced for more than 10 miles. At the Big Indian Copper mine, the vertical throw of this normal fault is as much as 5,000 feet with the downthrow side to the northeast. The fault movement varies

greatly at different points along the strike. On the upthrow side of the fault opposite the mine, the Cutler formation of Permian age outcrops. No mineralization, either of copper or uranium, is in evidence. On the downthrow or northeast side where the Big Indian deposits are located, the outcropping formation is Dakota sandstone of Cretaceous age (fig. 2 with the geologic report).

Copper occurs as azurite, malachite, chalcocite, tenorite, chalcopyrite, and native copper, disseminated as cementing material in sandstone, and as joint and fissure filling. Presumably, most of the copper at depth occurs as sulfides. The ore deposit outcrops in a Dakota conglomerate not far from the fault. The mineable thickness of this deposit was 20 feet and furnished the ore mined in the Ohio Copper Company's open pit operation. The copper content decreases with distance from the fault and the cut off of ore-grade material appears to have been from 400 to 500 feet northeast of the fault outcrop. The surface workings extend along the fault about 800 feet. To the northwest and southeast no commercial mineralization in the favorable Dakota sandstone has been found to date.

The formation underlying the open pit was identified by Sample as the Jurassic Morrison formation but later work indicates it may be Cretaceous. It is mineralized but the copper content is low, except in or very close to the fault itself, so far as indicated by exploration to date.

Near the fault, the Dakota formation has been removed by erosion. The ore-bearing zone adjoining the fault may represent the migration path of mineralizing solutions. In the early days considerable under-

ground work up to a depth of 300 feet was done in this zone, and copper ore of excellent grade is reported as deep as exploration penetrated.

The Lisbon Valley fault apparently acts as a dam confining ground water in the area to the northeast and the water table is very high.

Prior to the current operation, the property had not been explored for possible uranium mineralization. Recently, uranium ore was discovered in the vicinity in the Salt Wash member of the Morrison formation, notably at the Rattlesnake mine operated by the Old Texas Mining Company, 3 miles north of the Big Indian Copper mine. Here the Salt Wash formation outcrops and an excellent grade of ore has been found at surface. The depth to the Salt Wash at the Big Indian Copper mine is estimated at 800 to 900 feet. It has not been explored here to date. The applicants report that samples of drill cores from shallower formations on the property contained as much as 0.044 percent U_3O_8 in addition to copper.

The Big Indian Copper mine was visited by B. S. Butler of the Geological Survey in 1913 and is described briefly on pages 614 and 615 of Professional Paper 111, "Ore Deposits of Utah." The property was not operating at the time and Butler's examination was incomplete. The Lisbon Valley fault had apparently not been recognized at that time, and the ore exposures were erroneously described as occurring in "Middle Triassic (at or near the horizon of the Shinarump conglomerate)." Butler states, "The most extensive development is at the Big Indian mine. . . . . Only part of the underground workings could be examined. Some good ore has been found, but the richer grade is in small bodies

and would be difficult to mine without mixing with poor ore or waste." Inasmuch as the mine was shut down, Butler probably did not see any of the deeper workings, which would have been flooded.

MINEABLE ORE RESERVES

On the basis of the available data from holes previously drilled, no new estimates of ore reserves can be made. The records of holes drilled prior to the present operations are not available and those from recent exploration drilling are incomplete and unsuitable for this purpose. It is stated in the application that, in one drill hole, 10 feet of ore higher in grade than the open pit ore was encountered at 160 feet and some chalcopyrite ore at from 230 to 300 feet. No definite information concerning hole locations or logs is given. The application also states that the open pit workings disclose a probable million tons of 2 to 3 percent copper, without, however, any supporting data. The exploratory drilling carried on by the Ohio Copper Company, prior to construction, blocked out an estimated 156,000 tons of mineable ore, and they produced nearly 160,000 tons. It is probable that most of the known ore of a profitable grade was mined during this operation.

Sample made an ore estimate on very incomplete data in 1943 as follows:

Measured ore		Indicated ore		Inferred ore	
Block	Tons	Block	Tons	Block	Tons
I	90,000	III	70,000	V-VI	68,000
II	26,000	IV	17,000	Brushy Basin	5,000
Tailings	10,000				
Total	126,000	Total	87,000	Total	73,000
Average grade 2 percent copper		Average grade 1-1/4 percent copper		Average grade 1/2 percent copper	

The measured ore in this tabulation is included in the tonnage mined by the Ohio Copper Company, which averaged 1.62 percent copper, as computed from the production figures. The ore in the indicated and inferred blocks is probably not commercial at this time.

No sampling was done during the present examination.

PRESENT STATUS

Exploration and Development

The Big Indian Copper mine has been developed by a number of shafts, tunnels, and surface workings. No maps of the underground workings are available, and none of them are accessible. Most of the underground exploration was done close to the fault where ore of much better grade than in the Dakota deposits is reported. The deepest shaft was reported to be 300 feet deep and to have encountered good mineralization in the fault at that depth. Ground water was encountered at shallow depths but there is no record of the flow.

The area has been drilled at various times by churn and diamond core drills. In 1943, the Ohio Copper Company drilled 35 core- and 12 churn-drill holes, 6 to 69 feet deep, in and around the surface deposit which was later mined. All but 2 were mineralized with an average copper content of 1 to 2 percent. Copper values decreased with distance from the fault.

One hole drilled for water in the arroyo east of the open pit was reported to have encountered the Lisbon Valley fault at 265 feet but this is unverified.

The applicants have drilled 5 core drill holes in the last year. Two shallow holes in the Cutler formation southwest of the fault were

barren. The deeper of 2 holes, 225 and 300 feet deep, drilled northeast of the fault, is reported to have encountered 10 feet of ore "higher in grade than 2 or 3 percent copper" at a depth of 160 feet, and mineralization between 230 and 300 feet, showing an increase of chalcopyrite content. Specific locations of these holes are not given in the application.

A hole planned for a depth of 1,000 feet on the Durango claim was being drilled at the time the application was made. Difficulties caused by ground water and inadequate drilling equipment caused abandonment at 750 feet, before the objectives, the Lisbon Valley fault and the Salt Wash formation, had been reached.

The records of drilling results are unavailable or incomplete. The applicants did not furnish hole logs, stating only that coring and drilling results were unsatisfactory because of water and brecciated ground conditions.

Rehabilitation of the 300-foot incline shaft has been planned but had not been started at the time of the investigation.

Mining and Milling and Other Facilities

The equipment on the property includes a portable air compressor of 500 c.f.m. capacity, automotive equipment, and miscellaneous mining equipment. A diamond drill rig, which has been used at the Big Indian mine and at a uranium property being explored by the applicants, is unsuitable for the proposed drilling. Very little of this equipment would be utilized in a surface drilling project.

There is no milling equipment on the property.

PROJECT PROPOSALS, WITH COSTS

The applicants' proposal consisted of the following:

(1) Diamond core drilling, consisting of 31 holes from 150 to 1,000-feet deep at locations shown on a map furnished with the application. All holes were projected to reach the Lisbon Valley fault. At least 4 of these holes should cut the potential uranium-bearing Salt Wash formation as well.

(2) Underground exploration consisting of rehabilitation of an old incline shaft, sinking an additional 300 feet, and 2,800 feet of lateral development at the most favorable points, including the horizons in which copper mineralization was indicated by the results of recent drilling.

Total drilling footage was not given, or the costs of the two types of exploration segregated. From the map data furnished, the drilling total appeared to be as follows:

	4 holes	1,000 feet deep or	4,000 feet
	5 holes	650 feet deep or	3,250 feet
	5 holes	425 feet deep or	2,125 feet
	8 holes	375 feet deep or	3,000 feet
	9 holes	200 feet deep or	1,800 feet
Totals	31 holes		14,175 feet

The applicants proposed carrying on all operations on company account. From the cost estimate submitted, the proportion which is allowed for drilling is about $57,600.00, or $4.06 per foot. This is about $1.00 per foot higher than a minimum figure used in this report and $0.60 per foot less than the estimated cost of drilling by contract.

The balance of $85,187.00 for underground exploration would allow $27.48 per foot for 3,100 feet of shaft sinking and lateral development, without considering any rehabilitation. This figure is also too low.

A revised program, acceptable to the applicants, eliminating underground exploration is proposed by the examining team. A core drilling project in three phases is suggested which, if completed, would require 28,400 feet of drilling. The first two phases, which are the most essential part of the work, total 18,400 feet of drilling. The three-phased program is suggested to keep the cost low until it is demonstrated that further exploration is justified.

In the first phase, 4 holes would be drilled to cut the Lisbon Valley fault and the Salt Wash formation at an estimated depth of 1,000 feet and 4 holes to cut the fault at a depth of 400 feet. The second phase calls for 4 offset holes around each of a maximum of 2 of the 1,000-foot holes and 3 of the 400-foot holes of phase I, if, in the opinion of the Defense Minerals Exploration Administration Field Team, Region IV, the results of phase I drilling justify it. Under phase III, there are 15 holes, totaling a maximum of 10,000 feet of drilling, to test areas which are indicated as favorable, from projection of drill holes in phases I and II. All drill holes, at least in phase I, should be cored throughout for maximum information.

Unless drilling under phase III can be set up as exploration without development aspects, it may not be justified. If a contract is approved, inclusion of phase III drilling is not necessarily essential in the exploration stage. Hafen, in a letter to R. P. Fischer of the Geological Survey, agreed to accept the revised program and 62-1/2 percent participation by the Government for copper-uranium exploration combined.

Estimated Cost

The first part of the cost estimate is based on a company operation as proposed by the applicants. The drilling equipment which they

plan to buy appears to be adequate, and Hafen states they have a competent driller. However, the drilling conditions which will be encountered are known to be difficult and the cost might easily be much more than the minimum figure which is used in the following estimate for a company operation. Employment of a contract driller appears to be preferable and an alternate estimate is made on this basis.

The estimated time for completion of 28,400 feet of drilling is 16-1/2 months, based on an average drilling rate of 70 feet per shift or 1,750 feet per month. This figure does not allow for more than normal delays. Possible need for fishing tools, or other special equipment or services, is not considered. The cost of a drill rig, drill rods, and casing are charged to phase I, because further drilling might not be required.

The cost estimates for a company operation and for alternate contract drilling follow:

Cost of a company operation

Phase I
(Estimated time for completion--3-1/2 months)
(5,600 feet of drilling in 8 holes)

Contracts		None
Labor		
1 driller, 48 hours per week at $2.50 per hour, time-and-one-half over 40 hours. 14 weeks at $130.00	$ 1,820.00	
1 helper, 48 hours per week at $2.00 per hour, time-and-one-half over 40 hours. 14 weeks at $104.00	1,456.00	
Total labor		$ 3,276.00
Supervision		
1 superintendent, at $600.00 per month, 3-1/2 months	2,100.00	
Total supervision		2,100.00

Technical services			
1 consulting geologist, part time, 4 days per month at $50.00 per day - 14 days		$ 700.00	
(Superintendent will do necessary mapping, sampling, and other services under direction of geologist)			
Total technical services			$ 700.00
Operating materials and supplies			
Gasoline, oil, grease, repair parts for truck and jeep, 3-1/2 months at $100.00 per month		350.00	
Gasoline, oil, repair parts for drill rig and pump, 3-1/2 months at $400.00 per month		1,400.00	
Diamond bits, including resetting and loss at $0.50 per foot of hole drilled - 5,600 feet		2,800.00	
Core barrels, auxiliary equipment, at $0.10 per foot for 5,600 feet		560.00	
1,000 feet casing (estimated)		1,300.00	
Total operating materials and supplies			6,410.00
Operating equipment			
Rental			None
Depreciation			
1 used tank truck valued at $1,000.00, depreciated at $16.70 per month, 3-1/2 months	$ 58.45		
1 Jeep valued at $700.00, depreciated at $12.00 per month, 3-1/2 months	42.00		
Total depreciation		100.45	
Purchased			
1 Joy 22 HD truck mounted core drill (used) (price quoted in application)	10,000.00		
1 pump (not mentioned in application)	675.00		
1,100 feet "A" drill rod and couplings	1,400.00		
500 feet "B" drill rod and couplings	900.00		
Total purchased		12,975.00	
Total equipment			13,075.45

Miscellaneous			
Bookkeeping		None	
(To be done by supervisor)			
Compensation insurance, Social Security, unemployment tax on supervision, labor--8 percent of $5,376.00		$ 430.08	
Sampling			
Core boxes, sacks, etc.	$ 300.00		
Estimated 75 samples of drill core and sludge analyzed for U_3O_8, V_2O_5, and lime at $5.00 each	375.00		
Estimated 100 samples of drill core and sludge analyzed for copper at $1.50 each	150.00		
Total sampling		825.00	
Total miscellaneous			$ 1,255.08
Estimated total cost of phase I, 5,600 feet of core drilling			$26,816.53
Estimated cost per foot of phase I drilling			$4.79
Estimated total cost of phase I (less equipment purchased, $12,975.00)			$13,841.53
Estimated cost per foot (less charge for equipment purchased)			$2.47

Note: cost per foot, without charge for equipment purchased, is used for estimating phases II and III.

Cost of phase I less direct drilling costs

Supervision		$2,100.00
Technical services		700.00
Supplies for automotive equipment		350.00
Depreciation on automotive equipment		100.45
Miscellaneous		
Compensation insurance, Social Security, unemployment tax on supervision, 8 percent of $2,100.00	$168.00	
Sampling (same)	300.00	
Sample analyses (same)	525.00	
Total miscellaneous		993.00
Total for 5,600 feet of drilling		$4,243.45
Estimated cost per foot of phase I drilling, less direct drilling costs		$0.76

Phase II
(Estimated time for completion--7-1/4 months)
(Estimated 12,800 feet of drilling in 20 holes)

Same cost per foot as phase I, less purchased equipment charged to phase I

12,800 feet at $2.47 per foot	$31,616.00

Phase III
(Estimated time for completion--5-3/4 months)
(Estimated 10,000 feet of drilling)

Same cost per foot used in phase II.

10,000 feet at $2.47 per foot	$24,700.00
Estimated total cost of phases I, II, and III computed as a company operation	$83,132.53
Estimated cost per foot for all three phases, 28,400 feet of drilling, assuming all phases are completed	$2.93

Note: This figure should be considered the minimum possible cost.

Cost of an operation with drilling contracted

Phase I
(Estimated time for completion--3-1/2 months)
(5,600 feet of drilling in 8 holes)

Contracts		
Drilling contract, minimum of 5,600 feet of cored hole, minimum size AX; casing possibly required for 500 feet or more of each hole; 85 percent core recovery required, at $4.50 per foot or	$25,200.00	
Other costs, including supervision, technical services, operating supplies and depreciation for automotive equipment, and miscellaneous at $0.76 per foot, the same figure used in computing comparable costs in a company operation. 5,600 feet at $0.76 per foot or	4,256.00	
Estimated total cost phase I (contracted)		$29,456.00
Estimated cost per foot for 5,600 feet (contracted)		$5.26
Estimated cost per foot for 5,600 feet, less sample analyses		$5.17

Phase II
(Estimated time for completion--7-1/4 months)
(Estimated 12,800 feet of drilling in 20 holes)

Contracts		
Drilling contract, 12,800 feet, minimum size AX; casing may be required for 400 feet or more of each hole; 85 percent core recovery required in mineralized sections; at $3.75 per foot or	$48,000.00	
Other costs, same as in phase I. 12,800 feet at $0.76 per foot or	9,728.00	
Eatimated total cost phase II (contracted)		$57,728.00
Estimated cost per foot for 12,800 feet (contracted)		$4.51
Estimated cost per foot for 12,800 feet, less sample analyses		$4.41

Phase III
(Estimated time for completion--5-3/4 months)
(10,000 feet of drilling in 15 holes)

Contracts		
Drilling contract, 10,000 feet minimum size AX, casing may be required for 400 feet or more of each hole; 85 percent core recovery required in mineralized sections; at $3.75 per foot or	$37,500.00	
Other costs same as in phases I and II. 10,000 feet at $0.76 per foot or	7,600.00	
Estimated total cost phase III (contracted)		$45,100.00
Estimated cost per foot for 10,000 feet (contracted)		$4.51
Estimated cost per foot for 10,000 feet, less sample analyses		$4.41
Estimated cost for all three phases under contract (if completed), 28,400 feet of drilling		$132,284.00
Estimated overall cost per foot for 28,400 feet of drilling (if contracted)		$4.66

The applicants have not obtained bids from drilling contractors, and the prices used in this estimate are based on some contracts for

limited amounts of drilling in deep holes which have been let by the Geological Survey. The usual bid prices in the Colorado Plateau area would not apply.

Summary of estimated costs

Phase	Footage	Computed as a company operation		Computed with drilling contracted	
		Per foot	Total	Per foot	Total
I	5,600	$4.79	$26,816.53	$5.26	$ 29,456.00
II	12,800	2.47	31,616.00	4.51	57,728.00
III	10,000	2.47	24,700.00	4.51	45,100.00
Totals	28,400	$2.93	$83,132.53	$4.66	$132,284.00
Government participation at 62-1/2 percent			$51,957.83		$82,677.50

While this comparison appears to favor a company operation, it must be remembered that the figures used in the company operation estimate are probably an absolute minimum. The operator has no assurance that the drilling can be done at this cost, or that results for which the Government will pay will be obtained. Doing the work with a competent contract driller would give some assurance of completing the contract with results acceptable to the Government, and the increased cost might be considered as an insurance item.

PRODUCTION PLAN

If completion of the proposed exploration should indicate the occurrence of ore-grade copper or uranium in commercial quantities, planning and execution of a development stage would require considerable time and capital outlay. Preparation of the ore body for mining and recovery of copper in a plant at the mine might involve difficult

mining and metallurgical problems, particularly if commercial quantities of copper and uranium occur together. The completion time and cost of this stage is hardly predictable at this time.

PROPOSED FINANCING

The applicants' statement of financing shows $30,000.00 to be furnished in cash and $5,700.00 for use of their equipment. Under the revised program, and with Government participation of 62-1/2 percent, the estimated maximum cost of a company operation is $83,132.53, of which their share would be $31,174.70. For work under a drilling contract the estimated maximum cost is $132,284.00, of which the applicants' share would be $49,606.50. In either case, all but $473.55 would have to be in cash, because most of the equipment owned by the applicants would not be used in a drilling project.

CONCLUSIONS

There is a reasonable possibility of finding commercial deposits of copper, or uranium, or both, at the Big Indian Copper mine. The full, revised exploration project in three phases may be too elaborate at this time, and phase III, while desirable, is not essential. If included, phase III would be subject to prior Defense Minerals Exploration Administration approval in any case.

The experience of the manager as described in the application appears to be adequate so far as supervision of the project is concerned.

The drilling would be meaningless, unless good coring and sampling results were obtained. This means that, under the difficult conditions which preliminary drilling has indicated will be met, a skilled,

experienced drill operator is essential. It would be advisable to consider contract drilling instead of a company operation, as proposed. Contract bids would probably be higher than the estimated cost of a company operation but there would be more assurance of satisfactory completion if a competent drilling contractor were employed.

Completion of the revised drilling program should establish the presence or absence of ore-grade copper and/or uranium in or near the Lisbon Valley fault or in the sedimentary beds down to and including the Salt Wash formation. The question as to what constitutes mineable ore in this case would involve not only grade and size of ore body in relation to depth and probable mining cost, but possibly metallurgical problems as well, if copper and uranium minerals should have to be separated. This cannot be readily answered on the basis of present information.

Underground exploration or development, as proposed by the applicants as part of the exploration project, should follow rather than run concurrently. It should be considered after completion of a drilling program.

RECOMMENDATIONS

It is recommended that a drilling project at a maximum cost of $131,987.00, Government participation 62-1/2 percent or $82,491.88, be approved and a contract prepared calling for a maximum of 28,400 feet of drilling in 35 holes to be done in three phases, approval of phases II and III by the Defense Minerals Exploration Administration Field Team, Region IV, to be required after completion and evaluation of the preceding phase. A suggested description of the work follows:

Description of the Work

The purpose of the work is to explore for uranium- and/or copper-bearing ore in the Lisbon Valley fault and down to and through the Salt Wash member of the Upper Jurassic Morrison formation on the north-east side of the fault.

The drilling shall be done in three phases as indicated in the drilling summary below, at locations shown on figure 3 with the geologic report. Phase II shall be performed if, in the opinion of the Government expressed in writing in advance, the results of phase I warrant it. Phase III shall be performed if, in the opinion of the Government expressed in writing in advance, the results of phases I and II warrant it.

In phase I(a) not more than 4 holes, or 4,000 feet of diamond core drilling, are to be done at locations indicated by the symbol $\bullet_{Ia}$ on figure 3 with the geologic report.

In phase I(b) not more than 4 holes, or 1,600 feet of diamond core drilling are to be done at locations indicated by the symbol O_{Ib} on figure 3 with the geologic report.

In phase II(a) not more than 8 offset holes, or 8,000 feet of diamond core drilling, are to be drilled in 2 groups of 4 each around, and a minimum of 200 feet away from, 2 of the holes drilled in phase I(a), at points to be designated, if phase I(a) drilling finds mineable-grade ore, symbol on figure 3 +IIa.

In phase II(b) not more than 12 offset holes, or 4,800 feet of diamond core drilling, are to be drilled in 3 groups of 4 each around, and a minimum of 100 feet away from, 3 of the holes drilled in phase I(b), at points to be designated if phase I(b) drilling finds mineable-grade ore, symbol on figure 3 +IIb.

In phase III, not more than 15 holes, or 10,000 feet of diamond core drilling are to be drilled in areas which are indicated as favorable from projection of drill hole results in phases I and II.

At the request of the Government, the operator shall furnish samples as required, including a boxed split of the diamond-drill cores. In phase I, not in excess of 75 samples are to be analyzed for U_3O_8, V_2O_5, and lime and not in excess of 100 samples for copper. In phase II, not in excess of 180 samples are to be analyzed for U_3O_8, V_2O_5, and lime and not in excess of 230 samples for copper. In phase III, not in excess of 135 samples are to be analyzed for U_3O_8, V_2O_5, and lime and not in excess of 180 samples for copper.

All drill-hole diameters, drill-hole depths, the method of all sampling, of all sample determinations, and of recovering drill-hole cores and sludges are subject to Government approval.

All diamond-drill sludges of suspected mineralized uranium-bearing material are to be sampled at not more than 1-foot intervals. All diamond drill sludges of suspected mineralized copper-bearing material are to be sampled at intervals of not more than 5 feet. Each mineralized sample is to be prepared and tested for equivalent U_3O_8 with a laboratory scaler, and weighted composites of adjacent samples from the same hole are to be analyzed chemically for U_3O_8, V_2O_5, and lime if the equivalent U_3O_8 determination indicates a significant content of uranium.

A supervising geologist-engineer approved by the Government shall be employed on a part-time basis and shall spend a minimum of one full working day at the property during each week this project is in

operation. The required accounting, surveying, mapping, preparation of reports, and supervision of coring and sampling procedures shall be done by a supervisor approved by the Government, in cooperation with the engineer-geologist.

This work is to be done on a basis of working with a full crew and one drilling rig not less than one 8-hour shift, 6 days a week.

The drilling to be done consists of the following, as shown on figure 3 with the geologic report:

Drilling summary

	Holes	Estimated depth	Total footage
Phase I			
(a)	4	1,000	4,000
(b)	4	400	1,600
Phase I total	8		5,600
Phase II			
(a)	8	1,000	8,000
(b)	12	400	4,800
Phase II total	20		12,800
Phase III	15		10,000
Phase III total	15		10,000

Agreed unit cost:

Phase I	
Diamond core drilling 5,600 feet at $5.17 per foot	$ 28,952.00
Phase II and III	
Diamond core drilling 22,800 feet at $4.40 per foot	$100,320.00
Chemical analyses for U_3O_8, V_2O_5, and lime 390 samples at $5.00 each	$1,950.00
Chemical analyses for copper 510 samples at $1.50 each	$765.00
Total	$131,987.00

It is recommended that the work be done by an experienced drilling contractor if it is possible, even though the cost will probably be higher (and that the applicants be required to obtain several bids from reputable firms). Minimum AX size core and core recovery of at least 85 percent throughout is desirable in phase I so that maximum geological information can be obtained. In phases II and III, minimum AX size core and core recovery of 85 percent in mineralized sections only may be satisfactory, at the discretion of the Government. This might permit some drilling without coring. Putting these requirements in specifications might cause contractors to raise their bids, and it is recommended instead that the Government authorize only one or, at the most, two holes until it is demonstrated that worthwhile drilling results can be obtained. This would also be essential if the applicants are permitted to carry on the work as a company operation.

The applicants should clarify the status of the agreement under which they are purchasing the property, by furnishing evidence of a transfer from Harris to the Moss Copper Mining Company, and an extension of the time limit for final payment to July 1, 1954, instead of January 2, 1954, as stated in the unsigned copy of an agreement-of-sale furnished with the application.

/kp

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

SOL. DEPT.
JUL 21 1954
SOLICITOR

JUL 29 1954

Ching
Elly
Butler
Hoffman
Selfridge
Johnson

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

Re: Change of name
Docket No. DMEA-3266 (Uranium)
Big Indian Uranium Corp.
(Formerly the Moss Copper Mining Co.)
Big Indian Mine
San Juan County, Utah

Dear Mr. King:

With reference to your letter of July 15, 1954, with attached letter of Lundgren, Howard & Frazier, attorneys for the Big Indian Uranium Corp., requesting and explaining a change in name from the Moss Copper Mining Company to the Big Indian Uranium Corporation, the requested change is agreeable to us and we have changed our records accordingly.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (246)

APPROVED:

J. H. Hedges
Member, Bureau of Mines (246)

T. P. Thayer
Member, Geological Survey (246)

MChing/gla
7/20/54

cc to: Admr. Reading File
Operating Committee
Docket

Messrs. A. P. Butler, Jr., Rm. 3212, GSA
J.O. Hosted, Rm. 3210, GSA
H. D. Keiser, Rm. 3641
Code 700
Mr. Ching

R.C.H.

Surname
Docket copy

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

Ching
Ellis

July 20, 1954

Memorandum

To: Robert E. Adams, Chief
Operations Control & Statistics Division

From:- Ernest Wm. Ellis, Chief
Rare and Misc. Metals Division

Subject: Change of name
Docket No. DMEA-3266 (Uranium)
Big Indian Uranium Corp.
(Formerly the Moss Copper Mining Co.)
Big Indian Mine
San Juan County, Utah

Please change your records on the subject docket to show the Applicant as the Big Indian Uranium Corporation in place of the Moss Copper Mining Company. A request for, and explanation of, the change is included in a letter dated July 7, 1954, from Sandgren, Howard & Frazier, attorneys for the Applicant, to W. H. King.

Ernest Wm. Ellis

MChing/gla
7-20-54
cc to: Admr. Reading File
Operating Committee
Docket
Code 700
Mr. Ching

R.C.

7/19/54 gla

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

224 New Customhouse
Denver 2, Colorado

July 15, 1954

Memorandum

To: Chairman, Operating Committee

From: Executive Officer, DMEA Field Team, Region IV

Subject: DMEA Docket 3266 (Copper-Uranium), The Moss Copper Mining Co., Big Indian mine, San Juan County, Utah

Mr. Joseph Hafen, Vice President and General Manager of Big Indian Uranium Corporation (formerly The Moss Copper Mining Company) advised this office by telephone conversation that steps were being taken to have their company name legally changed to the Big Indian Uranium Corporation, and asked that this change be made in connection with DMEA application Docket No. 3266.

Mr. Hafen was advised to submit a formal request to this effect that could b e forwarded to the Washington DMEA Office for consideration and appropriate action.

The enclosed letter was received from the applicant's attorney which we believe can be accepted as this request, although the information submitted was not requested from the applicant. We are also transmitting two additional copies of this letter, which were prepared in this office.

The field examination of this property has been completed, and the required reports will be submitted to you in approximately two weeks. An exploration contract will be recommended with the amount of Government participation if approved being in excess of our delegated authority.

W H King
W. H. King

Enclosures

JACKSON B. HOWARD
ATTORNEY AND COUNSELOR AT LAW
FIRST SECURITY BANK BUILDING
PROVO, UTAH
TELEPHONE 3045

Mining Division
Date Rec'd
JUL 12 1954
BUREAU OF MINES
Denver Colorado

July 7, 1954

Mr. W. H. King
Executive Officer-Denver Branch
D. M. E. A.
224 New Custom House Building
Denver, Colorado

Dear Mr. King:

In accordance with your instructions to Mr. Joseph Hafen, Vice President and General Manager of Big Indian Uranium Corporation, I am writing you this letter. I am advised that you require a statement from the company's attorney concerning the reasons for changing the name from the Moss Copper Co. to the Big Indian Uranium Corporation.

It was felt by the directors of the corporation that since the principal activity of the corporation was to be concentrated in the Big Indian mining district of southeastern Utah that this name would more fully describe the operation of the company. Furthermore, the Big Indian Mine has been an operating company since 1909 and that the reputation of the mine and its properties were as good as, if not better, than that of the Moss Copper Company. In addition, the principal activity of the company is to be directed toward the expropriation of uranium. Consequently, it was felt that the name of Big Indian Uranium Corporation would better serve the stockholders of the company and would give more complete notice and knowledge to any prospective purchasers of stock as to the nature and purpose of the company.

Our loan application number is 3266.

If you desire any further information or if I can be of any service to you please let me know.

Yours very truly,

SANDGREN, HOWARD & FRAZIER
Attorneys at Law

By Jackson B. Howard
Jackson B. Howard

700

Docket
Surname

Ching
Ellis
Selfridge
Freeman
Wadsworth

APR 1 1954

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
23d New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-3266 (Premium)
Nevada Copper Mining Company
Big Indian Copper Mine
San Juan County, Utah

Dear Mr. King:

Reference is made to Mr. Shay's memorandum of March 26, 1954, on the subject docket.

In answer to your question, a combined uranium-copper project would call for Government participation to the extent of 66⅔ percent and not 70 percent as stated by Mr. Newcomb.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (24)

APPROVED:

J. H. Hedges (24)
Member, Bureau of Mines

D. M. Larrabee (24)
Member, Geological Survey

M.Ching:fcc 3-30-54
cc to: Adm. Reading File
Operating Comm.
Docket
Messrs. H. D. Keiser, Rm. 3641
A. P. Butler, Rm. 3212 - GSA
M. Ching
Code 700
DMEA Field Team, Region IV

RC 4-1-54

3/29/54 gpa

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 29 1954

224 New Customhouse
Denver 2, Colorado

March 26, 1954

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMEA 3266 (Uranium), Moss Copper Mining Company, Big Indian Copper Mine, San Juan County, Utah

Reference is made to the review of the subject application by E. L. Newcomb, Geologist, which was forwarded with your letter dated March 23.

If it is found that a combined Uranium-Copper project is warranted, we believe that the Government's participation should be 62½ percent instead of 70 percent, as stated by Mr. Newcomb.

Will you please advise us if 62½ percent is correct in the event that it is to be a Uranium-Copper project.

John F. Shaw
For W. H. King

Surname
Docket copy

700

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

Ching
Ellis
Selfridge
Fleman

MAR 23 1954

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

Re: Docket No. DMEA-3266 (Uranium)
Moss Copper Mining Co.
Big Indian Copper Mine
San Juan County, Utah

Dear Mr. King:

The subject application is being referred to you for investigation and recommendations. A copy of the application has already been forwarded to you.

Enclosed are two copies each of comments relative to the application by the following members of commodity groups:

Arthur P. Butler, Jr.,	USGS Member,	Uranium Commodity Committee
H. D. Keiser,	USBM Member,	" " "
E. L. Newcomb,	USGS Member,	Copper Commodity Committee

Mr. Newcomb's comments are pertinent because of the past history of this property as a copper producer.

Please note that Applicant proposes to extend an old incline shaft which appears to be situated on the Blue Jay or Eureka claim, and to diamond drill on the Blue Jay and La Sal claims, both of which are not listed among the eleven claims covered by the application.

It is suggested that the Field Team consult with members of the Exploration Division, Grand Junction Operations Office, Atomic Energy Commission with respect to this application.

Sincerely yours,

George C. Selfridge

(GCS)

Chairman, Operating Committee

Enclosures: 6

MChing 3-19-43
gla
cc to Adm. Reading File
Operating Committee
Messrs. APButler, Jr. 3212, GSA
HDKeiser, Rm. 3641
ARKinkel, Jr. Rm. B-242A, GSA
JOHosted, Rm. 3210, GSA
DMEA Field Team, Region IV

Docket
Code 700
MChing

APPROVED:

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

D. M. Larrabee
Member, Geological Survey (GCS)

P.P. 3-23-54

Surname
Docket copy

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

Ching
Ellis
Larrabee
Hedges
Stafford
Johnson

MAR 23 1954

Mr. Leon Newren, Secretary
The Moab Copper Mining Company
Rooms 9-10-11, No. 8 West Center St.,
P. O. Box 111
Provo, Utah

Re: Docket No. DMEA-3266 (Uranium)
Big Indian Copper Mine
San Juan County, Utah

Dear Mr. Newren:

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

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

The Regional Office will contact you in the event they desire to obtain additional information.

Sincerely yours,

C. O. Mittendorf

Administrator

MChing/gla
3-19-54
cc to: Adm. Reading File
Docket
Code 700
MChing
DMEA Field Team, Region IV (2)

RCB
3-23-54

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : E. Wm. Ellis, DMEA Member, Uranium Commodity DATE: March 9, 1954

FROM : Arthur P. Butler, Jr., USGS Member, Uranium Commodity Committee Arthur P. Butler, Jr.

SUBJECT: Application - DMEA Docket 3266 (Uranium), The Moss Copper Mining Company, applicant, Box 111, Provo, Utah; Big Indian Mine and Associated Claims, Secs. 27, 28, 33 and 34, T. 29 S., R. 24 E., San Juan County, Utah

The application for Government assistance to explore the property described in the subject above has been reviewed.

Proposed Exploration

The applicant proposes to explore the Morrison formation mostly northeast of the Lisbon Valley fault in the vicinity of the Big Indian Copper Mine by an unspecified amount of diamond drilling and 300 feet of shaft sinking and 2800 feet of drifting and cross-cutting.

Comment

The Big Indian Mine is within 3 to 4 miles of two major uranium deposits discovered within the last year and a half. These deposits, however, have been formed in rocks older than the Morrison and more than a 1,000 feet lower in the section than the Morrison formation. Although the applicant gives uranium as his objective, the best assay that he quotes is only about .05 U_3O_8. The mine was opened chiefly to exploit copper ore. The applicant has estimated the copper content at 2 to 3 percent.

During World War II the Geological Survey examined the Big Indian Mine in the course of its Stratigic Mineral Investigations program and much data on the mine is available in the Survey's copper commodity file. The Atomic Energy Commission has made a reconnaissance radioactivity survey in the vicinity of the mine.

The data furnished by the applicant does not indicate that the property promises to be particularly favorable for uranium, but it might be favorable for discovery of more copper. Information in the Survey uranium files is inadequate for a definitive appraisal of this application. Because uranium and copper are associated in some deposits of the Colorado Plateau region its possible that the property may have promise for the discovery of uranium ore, but this possibility can be evaluated only by a thorough field examination and consultation

between the field team and geologists of the Atomic Energy Commission who have worked in the vicinity. On the face of the available information, the applicant's proposal seems to be of doubtful validity as a uranium exploration project, and excessively ambitious and costly.

Recommendations

I recommend that the application be referred first to the Survey member of the copper commodity committee and then to the field team for examination and review of its merits. I suggest further that the field team consult closely with geologists of the Grand Junction Operations Office of the AEC to gain the benefit of their information and suggestions.

Enclosure

Copies to: E. Wm. Ellis (2)

3/4/54 gla

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
MAR 3 - 1954

March 2, 1954

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4640

From: H. D. Keiser, Bureau of Mines Member
Uranium Commodity Committee

Subject: DMEA Docket 3266, Moss Copper Mining Co., P. O. Box 111, Provo, Utah

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

It is recommended that the application be forwarded to the Field Team for investigation and report, and that the Field Team be requested to discuss the application with Ernest R. Gordon, Director, Exploration Division, Grand Junction Operations Office, Atomic Energy Commission.

H. D. Keiser

Attachment

3/16/54 gla

IN REPLY REFER TO:

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

March 15, 1954

Memorandum

To: Mr. E. Wm. Ellis

From: E. L. Newcomb

Subject: Review of application

Re: DMEA-3266
Moss Copper Mining Co.
Big Indian District
San Juan County, Utah
$142,798
Uranium

We have been asked to comment on this application, because the Big Indian mine (Moss Copper Mining Co.) has a past history as a copper producing property.

In 1943 the Geological Survey made a strategic minerals investigation of the copper resources in the Big Indian district. At that time, the property had a 250-ton mill and sufficient ore reserves to operate about 1½ years. However, the Big Indian was operating under a Premium Price Contract for W. P. B. Copper production was obtained from surface and shallow underground workings in the Dakota sandstone. The strategic minerals investigation report recommended further drilling east of the Lisbon Valley fault in the Dakota sandstone and the upper part of the underlying Morrison formation.

The proposed drilling in the application would be in this same area, but would be deeper drilling in order to test the basal part of the Morrison. Though the objective of the proposed work is to explore for uranium, it would also serve to test for copper mineralization in the Dakota and Morrison formations.

A field team examination should be made of the property. It is possible that a combined uranium-copper project, with 70 per cent Government participation, can be justified for the Big Indian property.

E. L. Newcomb
E. L. Newcomb
Geologist

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

March 1, 1954
Subject: DMEA-3266
Re: Exploration Assistance
Big Indian Copper

Moss Copper Mining Co.
P. O. Box 111
Provo, Utah

Dear Sirs:

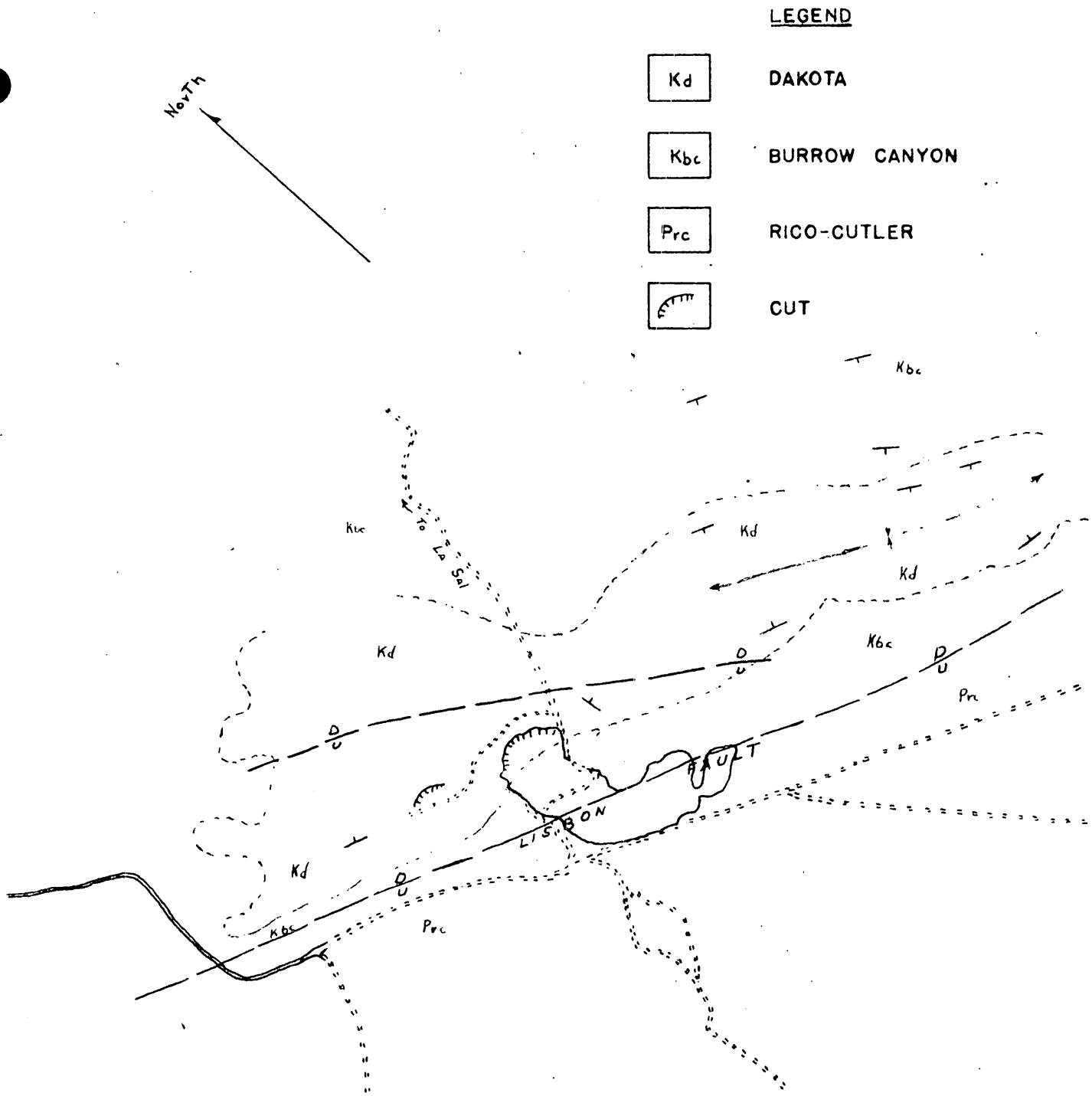
The receipt of your application dated February 24, 1954 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-3266 and referred to the Rare and Miscellaneous Metals Division.

Kindly refer to DMEA-3266 in any future correspondence relating to your application.

Sincerely yours,

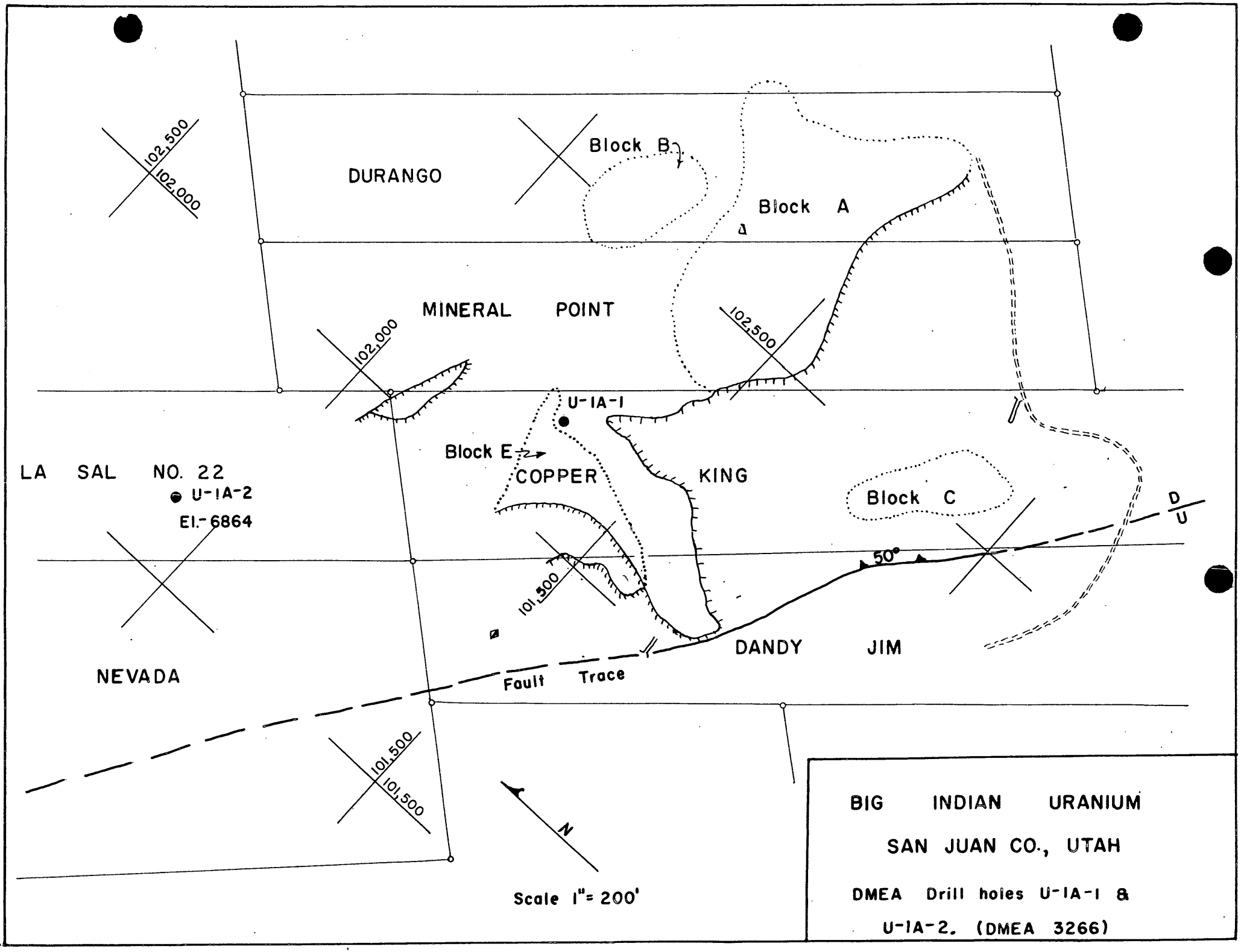
Robert E. Adams
Chief, Operation's Control
and Statistics Division



GEOLOGY OF BIG INDIAN

SCALE 1 = 15,360

WILLIAM S. YOUNG AUG. 1956


102,500
102,000
DURANGO
Block B
Block A
MINERAL POINT
102,000
102,500
U-1A-1
Block E
COPPER
KING
LA SAL NO. 22
U-1A-2
El.-6864
Block C
D
U
50°
101,500
DANDY JIM
NEVADA
Fault Trace
101,500
101,500
N
Scale 1"= 200'
BIG INDIAN URANIUM
SAN JUAN CO., UTAH
DMEA Drill holes U-1A-1 &
U-1A-2. (DMEA 3266)

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3266

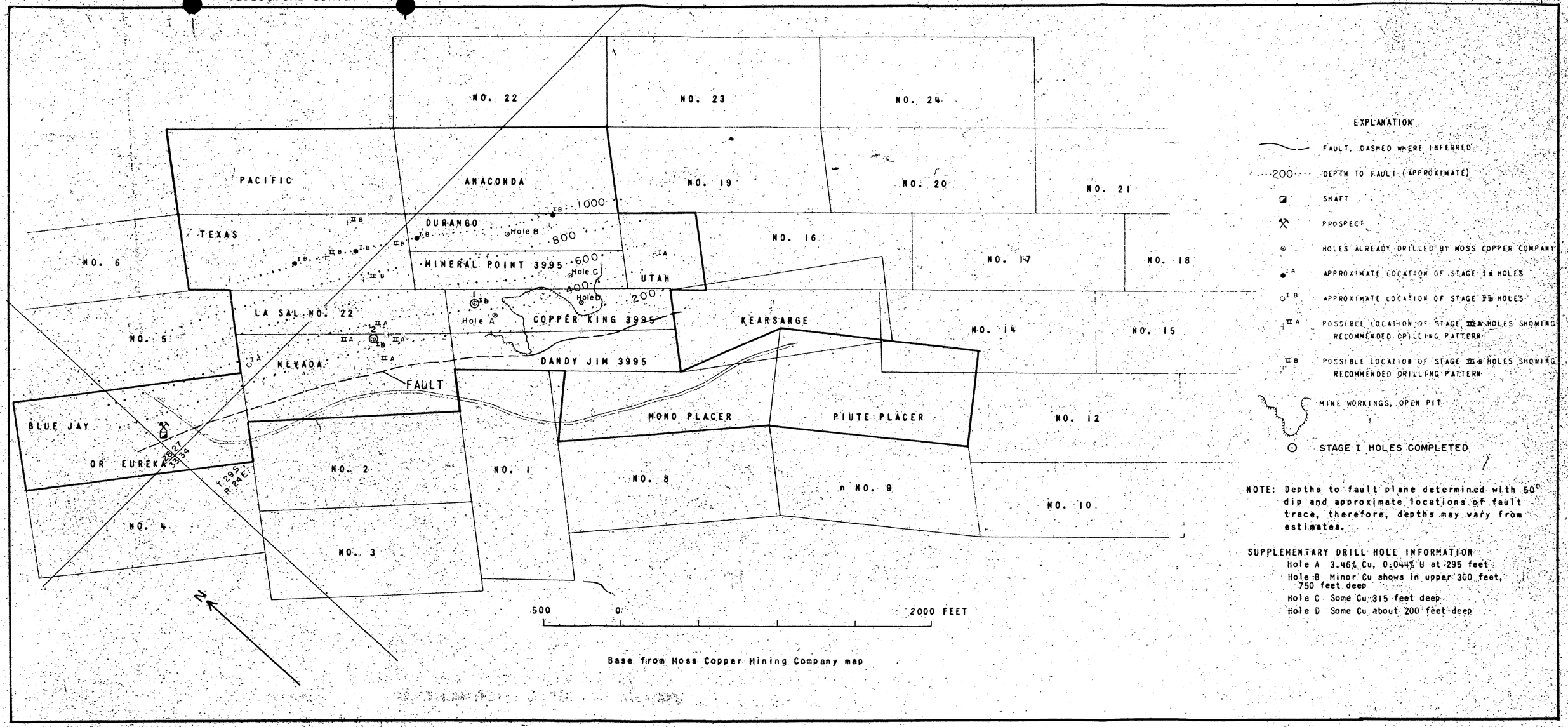


FIGURE 2 - CLAIM MAP OF BIG INDIAN COPPER MINE AREA, SHOWING STAGE I DRILLING COMPLETED, BIG INDIAN COPPER CORPORATION, SAN JUAN COUNTY, UTAH DMEA 3266, CONTRACT Idm-E733

DMEA 3266

HOLE NO. U-1A-2

PROJECT Big Indian Uranium Corp.

LOCATION sec. 34 T29S 24E CLAIM Copper King

ELEVATION 6863.6 T.D. 520

COORDINATES N 102,089 E 101,628

COMPLETED 7/ 7/55

COUNTY San Juan STATE Utah

CONTRACT Idm-E 733

CORE DESCRIPTION

Ss., lt.gy., buff, fn.gr., calc., Fe st., few stks. of congl.

Ss., buff, vy. coa. gr.,
Congl., lt. buff,
Interbedded ss. & congl.
Mudstone, orange & green, calc., silty.

Silts., gn., calc., pyritic, sm. orange. chert.

50

Ss., fn. gr., w/ interbedded silts. as above.

Ss., med. gy., vy. fn., calc., pyrite, blk. & orange grs.

Silts., dk. pur., calc., thin dendritic ls. beds.

Silts., lt. gn., w/stks. of ss.
Ss., dk. pur., fn gr. w/coa. stks.

100

Congl., gy., cht. & qtz. pebbles.

Silts., lt. gn., w/stks. of ss..

Interbedded ss. & silts., dk. pur.

Silts., lt. gn., calc..

Interbedded congl., orange chert pebbles, blk. grs. and ss., lt. gy, fn. gr. w/coa. stks.

150

Ss., lt. buff, fn. to vy. fn. gr., calc., orange & blk. grs.

Ss., lt. gy., vy. coa. gr., friable in part.

Ss., lt. gy, fn. gr., calc.

Silts., gn., calc.

Ss., lt. gy., vy. fn. gr., calc.

200

As above w/ scattered chert.

As above

250

Ss., lt. gy., vy. fn., calc.

Ss., coa. gr., calc.

Silts., med. gn., TOP BRUSHY BASIN 271'

Ss., mottled, vy. fn. gr..

Silts., pur. red., arg..

Silts., mottled (pur., red, gn., gy.), arg.
Silts., dk. pur. red, arg.
Ss., dk. pur. red, vy. fn. gr., calc..

300

Silts., dk. pur. red, ss. stks., sm. thin ls. beds.

Ss., dk. pur. red, vy. fn. gr, calc., qtzitic.

Silts., dk. pur. red.

Ss., mottled (med. pur., lt. gn.), vy. fn. gr.

Silts., mottled (pur. & gn.), calc., w/ss. stks.

As above.

350

Silts., pur. red, calc.

As above w/ ss. stks.

400

As above w/ thin ss. beds.

Silts., dk. pur. bn., calc..

450

Silts., lt. pur., calc..

Silts., lt. gy., calc..

Silts., mottled, calc..
Ss., mottled (dk. pur. & lt. gy..), vy. fn. gr.
Silts., mottled, calc., shear zone w/slickensides
SHEAR ZONE 489-492

Ss., pur., fn. gr., calc..

500

Silts., bn. red & purple., slickensides at 502'.
Ss, pur., fn. gr..

Ss., mottled (pur., lt. gn., dk. rd. pur.), SHEAR ZONE 509-510

Ss., pur., vy. fn., calc., qtz..

Ss., lt. pur., vy. fn. gr., calc..

T.D. 520'

DMEA 3266

HOLE NO. U-1A-1

PROJECT Big Indian Uranium Corp.

LOCATION sec. 34 T29S 24E CLAIM Copper King

ELEVATION 6829.0 T.D. 520

COORDINATES S N101,648 E 102,170

COMPLETED 4/4/55

COUNTY San Juan STATE Utah

CONTRACT Idm-E 733

	CORE DESCRIPTION
	Ss., gy., fn.-md. gr., limonite st., sm. Cu st..
	Congl., qtz. pebbles.
	Sh., gy. gn., sm. gypsum at base.
	Ss., lt. gy., fn. gr., orange specs.
	As above w/ friable zones. Poor recovery.
50	Congl., gy. gn., chert & qtz. pebbles, sm. ss. interbedded.
	Ss., gy. gn., X-bedded, mud galls, coa. gr.
	Silts., gy. gn. DAKOTA—BURROW CANYON TRANSITION
	Sh, gn.. TOP BURROW CANYON 64'
	Ss., lt. gy., vy. fn. gr., abd. pyrite.
	Interbedded sh. & silts., gn. gy..
	Ss, gy. gn., fn. gr..
100	Ss., rd. purp., fn. gr., rd. chert grs.
	Interbedded silts., gn., & rd. bn. ss., fn. gr.
	Sh., lt. gy.
	Congl., lt. gy., chert pebbles, fn. ss. matrix.
	Ss., pur., fn. gr.
	As above.
150	Ss., gn., fn. gr., calc., sc. qtz. pebbles.
	Sh., gn.
	Ss., lt. gn., fn. gr., calc., qtz., pyrite.
	Congl., chert pebbles, qtz. matrix.
	Ss., lt. gy., fn. gr., qtz., sm. pyrite
	Sh., dk. gn.
	Ss., lt. gy., vy. fn. gr., calc., qzt. in part.
	Ss., lt. gn., fn. gr., friable
	Congl., lt. gy., qtz., chert pebbles.
	Sh., lt. gn.
200	Interbedded ss. & congl.
	Ss., lt. gy., med. to coa. gr., streaks of congl.
	As above.
	As above
	As above with mud galls.
	Ss, lt. pur., vy. fn. gr.,
250	Ss., med. gy., med. gr.
	Congl., pur. gy., gn. mudstone inclusions.
	Ss., lt. gn. gy., calc., pyritic, w/ streaks of congl.
	Ss., lt. pur., coa. gr.
300	Interbedded congl. & ss., chert, ls. lenses.
	Shale, dk. gn.
	Sh., rd. bn., slt. silty.
	Interbedded rd. bn. silts. & sh.
350	As above
400	Siltstone, pur. bn., gn., rd. bn., in part sdy.
450	Silts., mottled (rd. bn. & gn.), sdy., slickensides
	Ss., lt. gy., fn. gr. w/coa. gr. streaks, slickensides.
	Silts., pur. gy., slickensides.
	Interbedded ss., silts., rd. bn.
500	Ss., lt. gy., fn. gr.,
	Ss., dk. pur., abd. biotite, fn. gr..
	Ss., gn., med. gr..
	Ss., rd. bn., vy. fn. gr.
T.D. 520	

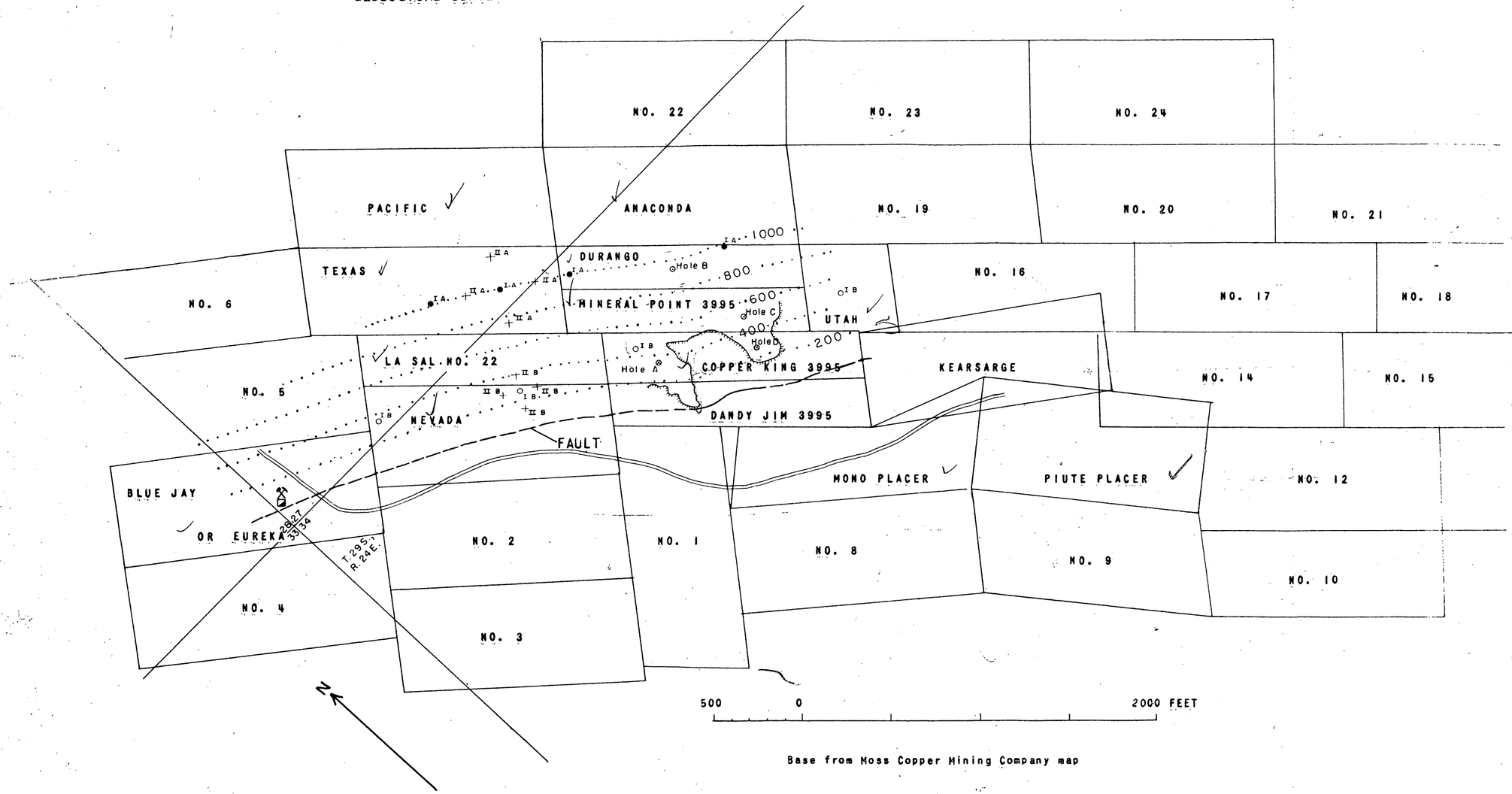
OFFICIAL FILE COPY
D M E A
RECEIVED AUG 23 1957

DATE	INITIALS	CODE

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3286

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 15 1954



Base from Moss Copper Mining Company map

EXPLANATION

- FAULT, DASHED WHERE INFERRED
- ····200···· DEPTH TO FAULT (APPROXIMATE)
- SHAFT
- PROSPECT
- HOLES ALREADY DRILLED BY MOSS COPPER COMPANY
- I A APPROXIMATE LOCATION OF STAGE I A HOLES
- I B APPROXIMATE LOCATION OF STAGE I B HOLES
- II A POSSIBLE LOCATION OF STAGE II A HOLES SHOWING RECOMMENDED DRILLING PATTERN
- II B POSSIBLE LOCATION OF STAGE II B HOLES SHOWING RECOMMENDED DRILLING PATTERN
- MINE WORKINGS, OPEN PIT

NOTE: Depths to fault plane determined with 50° dip and approximate locations of fault trace, therefore, depths may vary from estimates.

SUPPLEMENTARY DRILL HOLE INFORMATION

Hole A 3.46% Cu, 0.044% U at 295 feet
Hole B Minor Cu shows in upper 300 feet, 750 feet deep
Hole C Some Cu 315 feet deep
Hole D Some Cu about 200 feet deep

Figure 3. SKETCH MAP OF BIG INDIAN COPPER MINE AREA, SHOWING MOSS COPPER MINING COMPANY PROPERTIES, SAN JUAN COUNTY, UTAH.

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3266

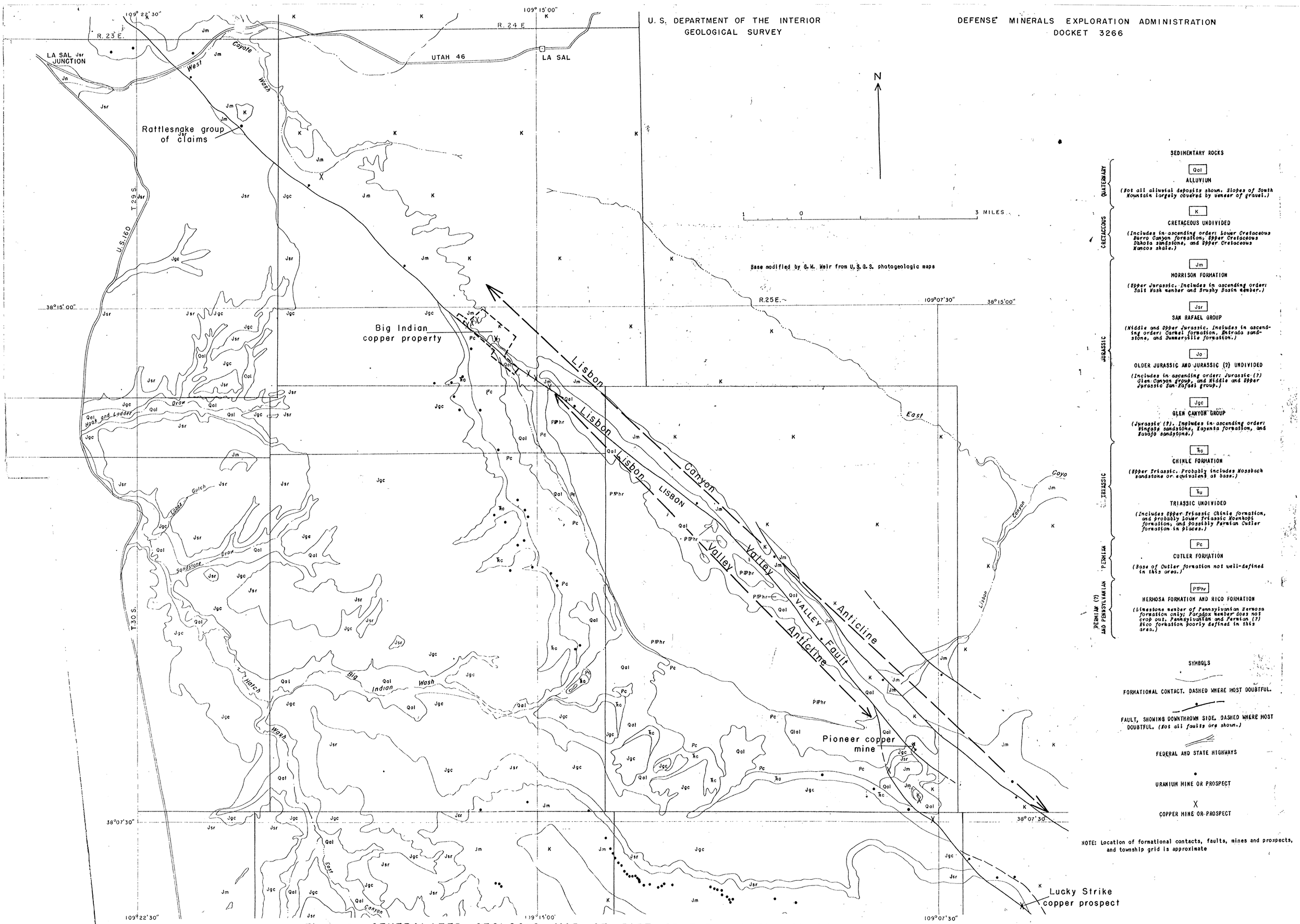
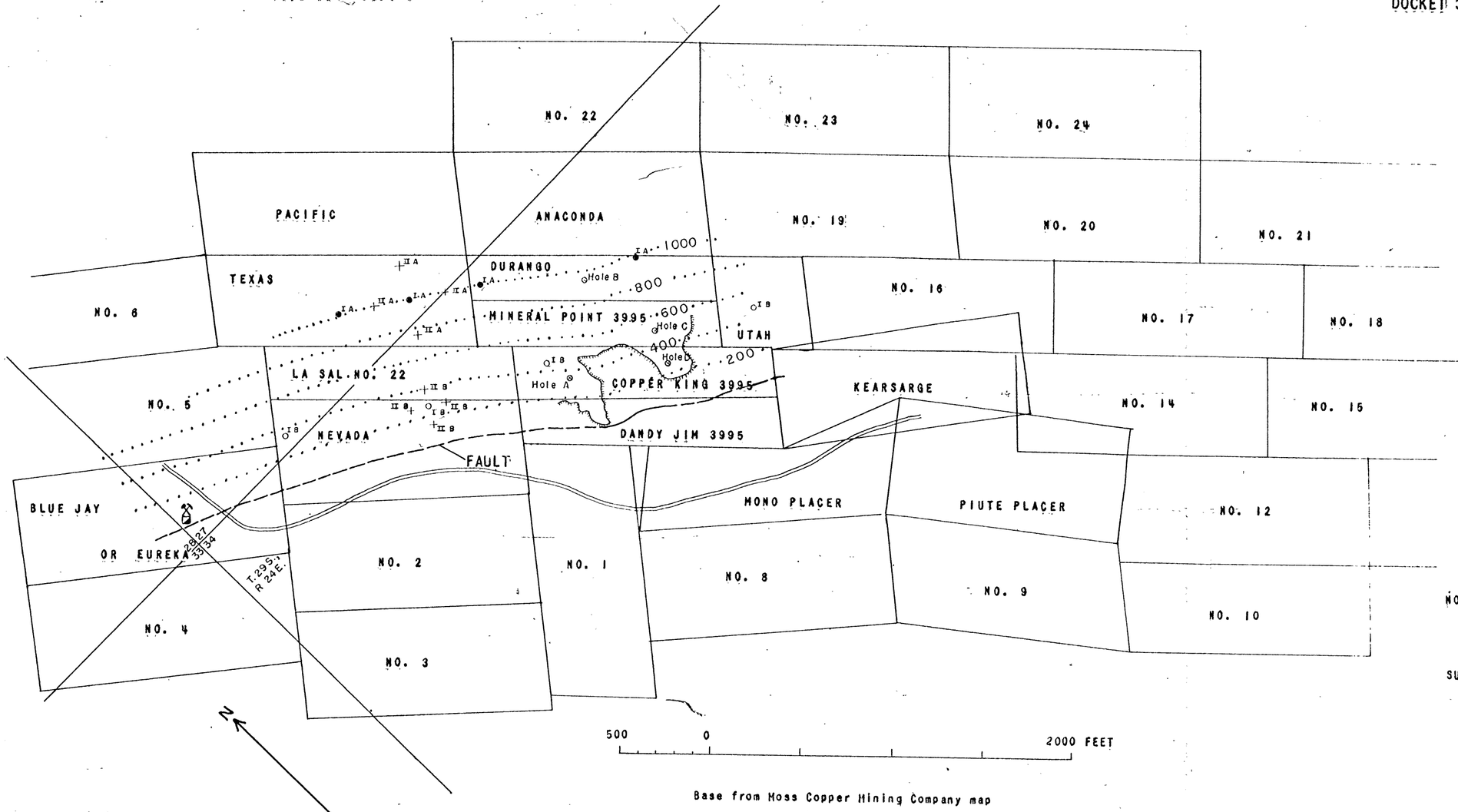


Figure 2. GENERALIZED GEOLOGIC MAP OF PART OF THE LISBON VALLEY AREA, UTAH

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGIC SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3266



Base from Moss Copper Mining Company map

EXPLANATION

- FAULT, DASHED WHERE INFERRED
- ····200···· DEPTH TO FAULT (APPROXIMATE)
- SHAFT
- PROSPECT
- HOLES ALREADY DRILLED BY MOSS COPPER COMPANY
- I A APPROXIMATE LOCATION OF STAGE I A HOLES
- I B APPROXIMATE LOCATION OF STAGE I B HOLES
- II A POSSIBLE LOCATION OF STAGE II A HOLES SHOWING RECOMMENDED DRILLING PATTERN
- II B POSSIBLE LOCATION OF STAGE II B HOLES SHOWING RECOMMENDED DRILLING PATTERN
- MINE WORKINGS, OPEN PIT

NOTE: Depths to fault plane determined with 50° dip and approximate locations of fault trace, therefore, depths may vary from estimates.

SUPPLEMENTARY DRILL HOLE INFORMATION

Hole A 3.46% Cu, 0.044% U at 295 feet
Hole B Minor Cu shows in upper 300 feet, 750 feet deep
Hole C Some Cu 315 feet deep
Hole D Some Cu about 200 feet deep

Figure 3. SKETCH MAP OF BIG INDIAN COPPER MINE AREA, SHOWING MOSS COPPER MINING COMPANY PROPERTIES, SAN JUAN COUNTY, UTAH.

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
APRIL 1956 DOCKET 3266 IDM E-733

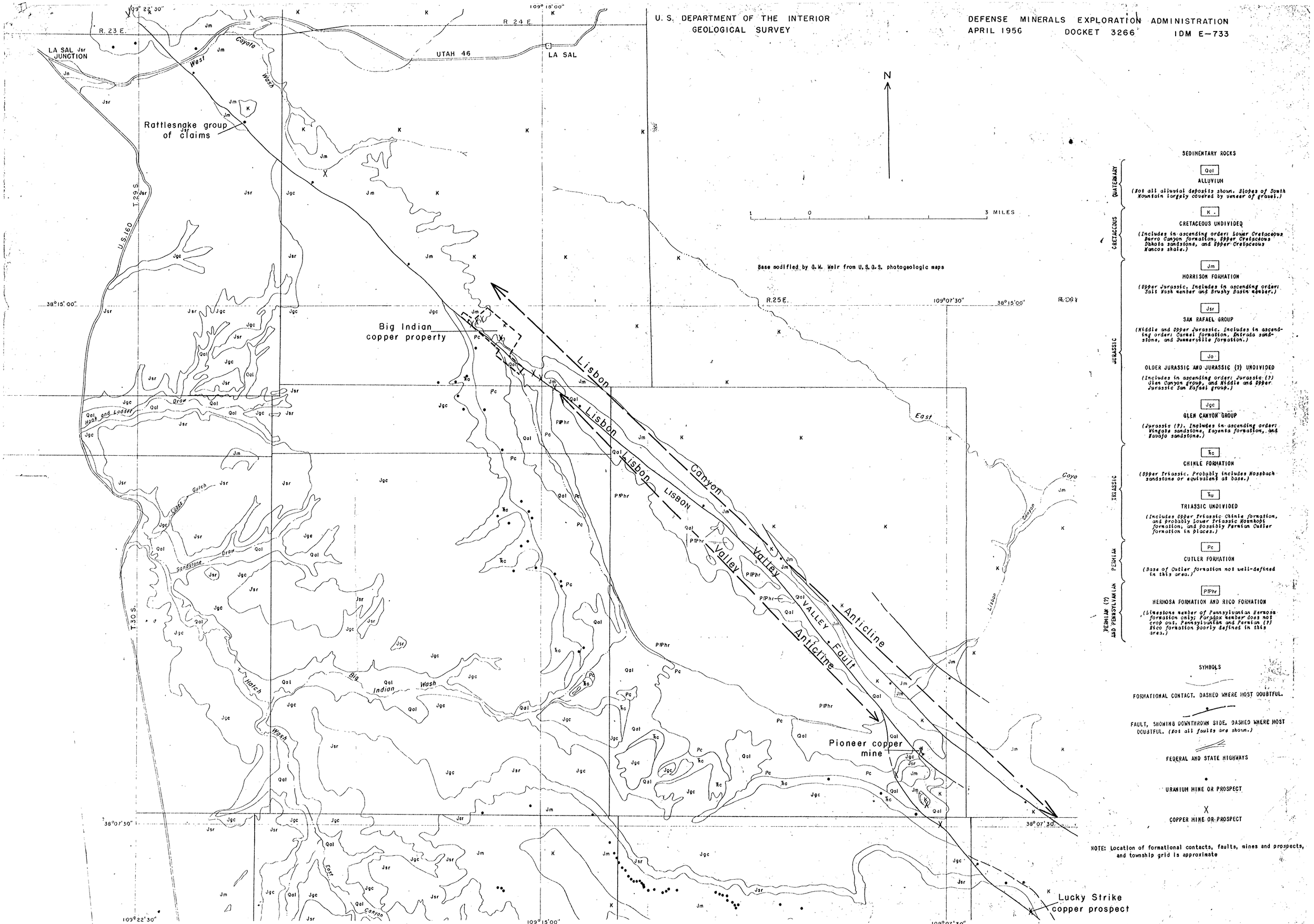
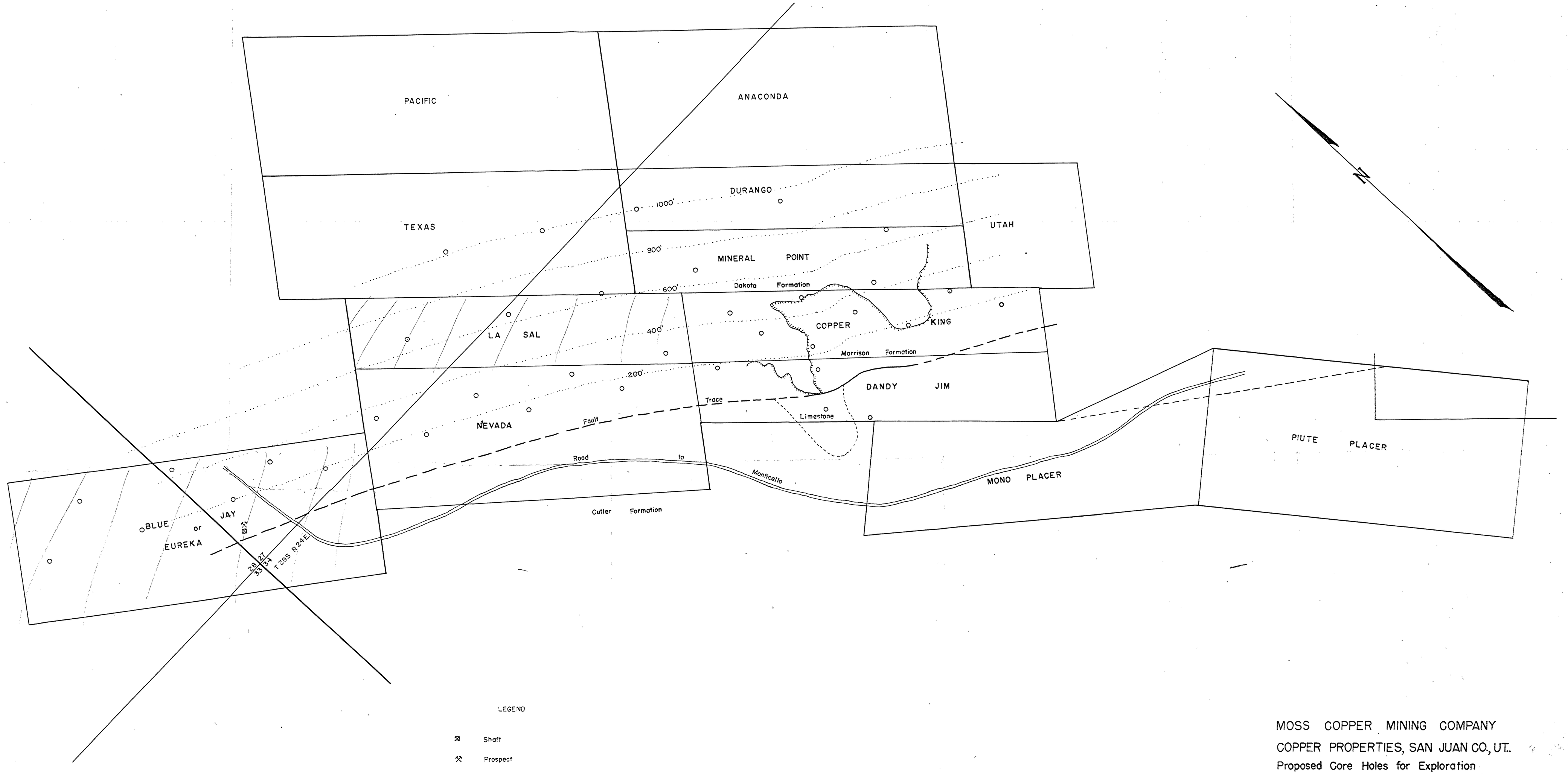


Figure 3. GENERALIZED GEOLOGIC MAP OF PART OF THE LISBON VALLEY AREA, UTAH



LEGEND

⊠	Shaft
⚒	Prospect
---200'---	Depth to fault (Approx.)
o	Proposed holes.
UTAH	Claim name
— — —	Fault infered

MOSS COPPER MINING COMPANY

COPPER PROPERTIES, SAN JUAN CO., UT.

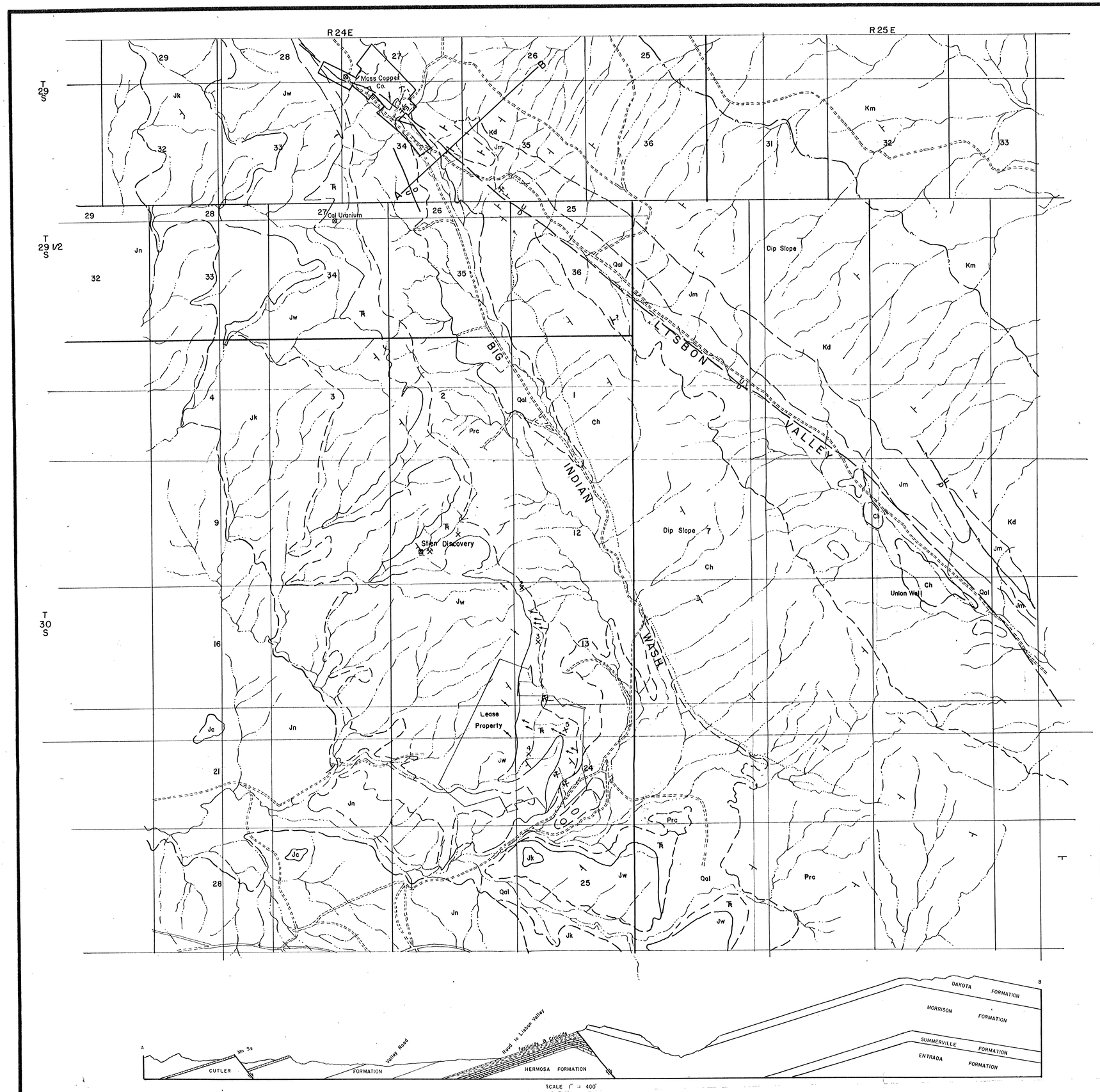
Proposed Core Holes for Exploration

Taken from previous Big Indian Copper map, 1926. Proposed core holes by L.D. Halvorsen.

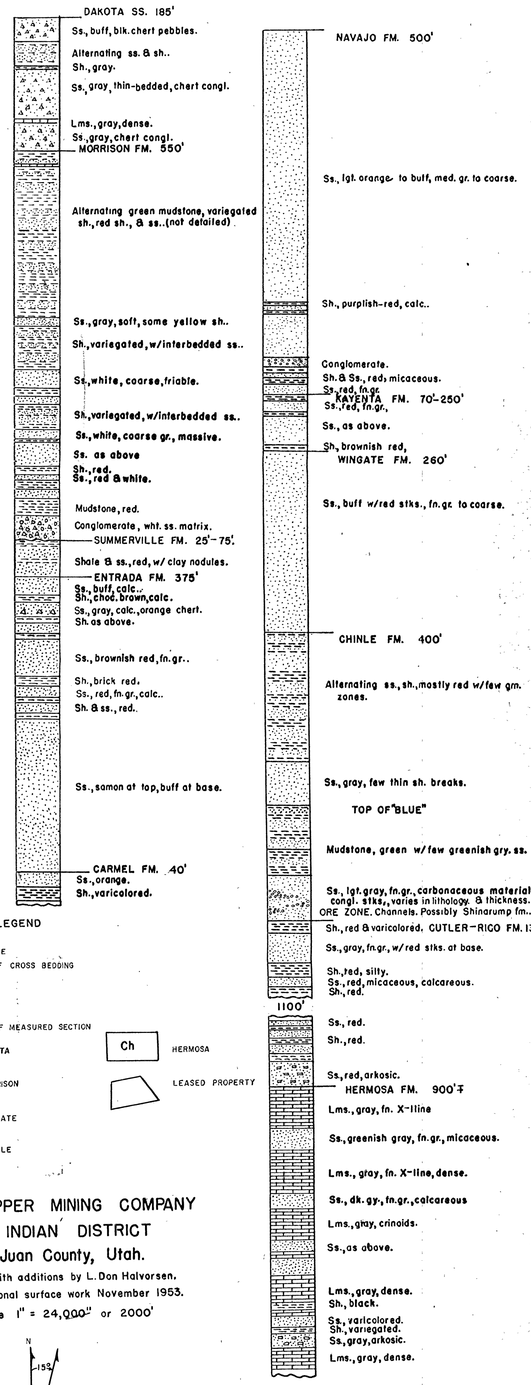
Scale 1" = 200'

200' 0 200 400 600 800 1000

NOTE! Depths to fault plane determined with 50° dip and approximate locations of fault trace, therefore, depths may vary from estimates.



COLUMNAR SECTION (Generalized)



LEGEND

- DIP & STRIKE
- DIRECTION OF CROSS BEDDING
- PROSPECT
- SHAFT
- JOINTS
- LOCATION OF MEASURED SECTION

Kd	DAKOTA	Ch	HERMOSA
Jm	MORRISON		LEASED PROPERTY
Jw	WINGATE		
TRc	CHINLE		

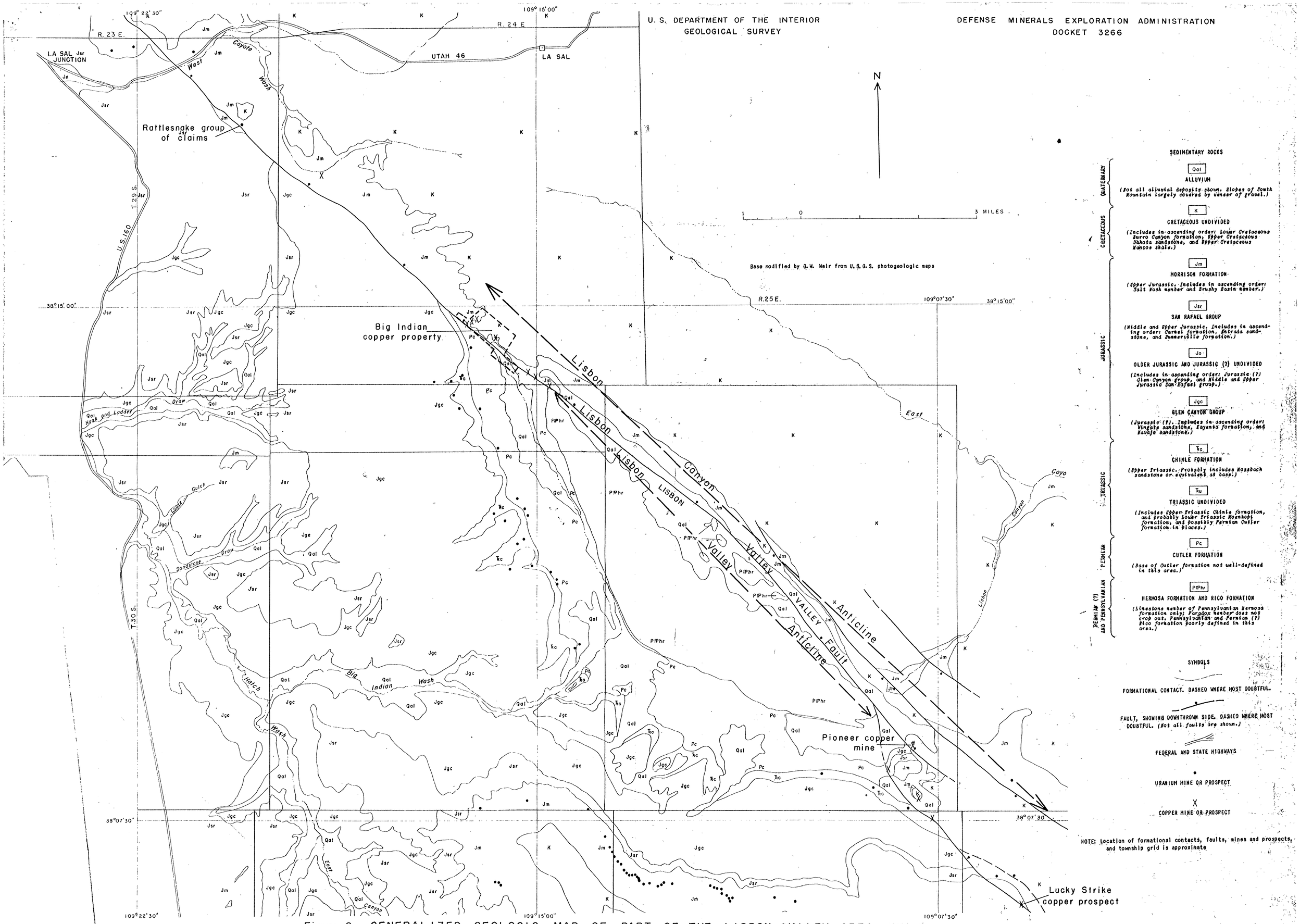
MOSS COPPER MINING COMPANY
BIG INDIAN DISTRICT
San Juan County, Utah.

Map from AEC with additions by L. Don Halvorsen.
Revised by additional surface work November 1953.
Scale 1" = 24,000" or 2000'

N
15°

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
DOCKET 3266



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