DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE Idm-E NO._____ DMEA NO. 4872

Application
- [x] 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- [ ] Withdrawn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
- [ ] Cost Audits
- [ ] Termination Notice or Agreement
- [ ] Recision Notice
- [ ] Assignment of Contract
- [ ] Contract Amendments
- [ ] Contract with all exhibits and annexes
- [ ] Owner's Consent to Lien and Subordination Agreement
- [x] Application and attachments

Right Side

- [x] Project summary (final)
- [ ] Work Comoleted analysis (final)

All other material filed in chronological order including the following reports if checked:

- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] Final Field Team Report (Tab)
- [ ] 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._____: 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
- [ ] Operator's Monthly Reports with transmittal, narrative and maps.

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

Folders No._____: Settlement Sheets

Folders No. 2 : Drill Logs + Map

Folders No._____: Royalty material

17963

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

RECEIVED NOV 12 1957 D.M.E.A.

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. 4872
Metal or Mineral Uranium
Date Received 11-12-57
Estimated Cost $108,303.60 X 2=
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: RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

(*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 NOVEMBER 1, 1957

RARE METALS CORPORATION OF AMERICA
(Applicant)

By John R. Reynolds

JOHN R. REYNOLDS, CHIEF ENGINEER

EXPLORATION DEPARTMENT

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

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY, UTAH

FORM
MF-103

UNITED STATES DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

RECEIVED
DATE

I. NAME OF APPLICANT

(A) RARE METALS CORPORATION OF AMERICA

TENTH FLOOR, FIRST SECURITY BUILDING

SALT LAKE CITY 11, UTAH

(B) A CORPORATION, INCORPORATED IN THE STATE OF DELAWARE AND QUALIFIED TO CONDUCT BUSINESS IN THE STATE OF NEW MEXICO.

(C) *PAUL KAYSER, CHAIRMAN OF THE BOARD

*C. L. PERKINS, PRESIDENT

*HOWARD BOYD, VICE PRESIDENT

*FRED T. WAGNER, VICE PRESIDENT

**M. H. KLINE, VICE PRESIDENT

*H. F. STEEN, VICE PRESIDENT

*VIRGIL RITTMANN, SECRETARY AND TREASURER

*M. C. NORWOOD, CONTROLLER

*W. B. WARREN, ASSISTANT SECRETARY AND ASSISTANT TREASURER

*A. C. MARTCH, ASSISTANT SECRETARY AND ASSISTANT TREASURER

*J. M. EVANS, ASSISTANT SECRETARY

**H. ANNE KIDD, ASSISTANT SECRETARY

(D) NOT APPLICABLE.

*BOX 1492, EL PASO, TEXAS

**TENTH FLOOR, FIRST SECURITY BUILDING, SALT LAKE CITY, UTAH

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY II, UTAH

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3. APPLICANT'S PROPERTY RIGHTS.

(A) ALL OF SECTION 16, T.13N., R.8W., NMPM, MCKINLEY COUNTY, NEW MEXICO.

(B) SPURRIER TRACT.

(C) THIS IS A SCHOOL SECTION OWNED BY THE STATE OF NEW MEXICO AND NOW HELD UNDER A GENERAL MINING LEASE SERIAL NO. 60-5-445, DATED MARCH 28, 1955, BY RARE METALS CORPORATION OF AMERICA ON ASSIGNMENT FROM W. T. OLD, JR.

(D) SEE EXHIBIT "A"

(E) NOT APPLICABLE

(F) NOT APPLICABLE

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

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4. PHYSICAL DESCRIPTION.

(A) THERE HAS BEEN NO EXPLORATION OR DEVELOPMENT WORK PERFORMED ON THE PROPERTY TO DATE.

(B) NO ORE HAS BEEN PRODUCED FROM SECTION 16, AND THERE ARE NO DEVELOPED ORE RESERVES. CONSIDERABLE EXPLORATION AND DEVELOPMENT IS CURRENTLY BEING DONE IN THE GENERAL VICINITY.

ON OCTOBER 15, 1957, THREE ROTARY DRILL RIGS WERE OBSERVED TO BE WORKING ON SECTION 9 WHICH ADJOINS 16 ON THE NORTH. THIS WORK IS BEING DONE BY RIO DE ORO MINING COMPANY. ACCORDING TO VERBAL COMMUNICATIONS FROM THE MANAGEMENT OF RIO DE ORO, ALL OF THE HOLES COMPLETED BY THEM IN THIS SECTION HAVE SHOWN MEASURABLE AMOUNTS OF URANIUM MINERALIZATION. IN SOME HOLES THIS MINERALIZATION WAS COMMERCIAL IN GRADE. EVEN MINERALIZATION IN TRACE AMOUNTS IS CONSIDERED TO BE HIGHLY SIGNIFICANT IN THE AMBROSIA LAKE AREA. THE FOLLOWING DATA WAS FURNISHED BY RIO DE ORO ON TWO HOLES THAT WERE DRILLED ADJACENT TO THE LINE BETWEEN SECTIONS 9 AND 16: SEE EXHIBIT "C".

HOLE NO. 16 WAS DRILLED 1,770 FEET EAST AND 50 FEET NORTH OF THE NORTHWEST CORNER OF SECTION 16. (NO FORMATIONAL DATA GIVEN)

DEPTH, FT.	THICKNESS, FT.	RADIOMETRIC (PROBE) VALUE
1,760	4	.015% U_3O_8
1,805	2	.016% U_3O_8
1,970	2	.017% U_3O_8

4. PHYSICAL DESCRIPTION.

(B) (CONTINUED)

HOLE NO. 17 WAS DRILLED 3,900 FEET EAST AND 150 FEET NORTH OF THE NORTHWEST CORNER OF SECTION 16. IN THIS HOLE THE TOP OF THE DAKOTA SANDSTONE WAS AT 1,695 FEET, THE BRUSHY BASIN AT 1,749, AND THE WESTWATER AT 1,819.

DEPTH, FT.	THICKNESS, FT.	RADIOMETRIC (PROBE) VALUE
1,871	4	.02% U_3O_8
1,902	3	.02% U_3O_8
1,919	6	.04% U_3O_8

IN ADDITION TO RIO DE ORO'S EXPLORATION IN SECTION 9, DRILLING PROGRAMS ARE CURRENTLY BEING CONDUCTED ON SECTIONS 5, 6, AND 15, T. 13 N., R. 8 W. IT IS RUMORED THAT A HOLE DRILLED IN THE NORTHWEST QUARTER OF SECTION 15, QUITE CLOSE TO THE LINE BETWEEN SECTIONS 15 AND 16, ENCOUNTERED A CONSIDERABLE THICKNESS OF COMMERCIAL GRADE MINERALIZATION.

APPROXIMATELY 3 MILES TO THE SOUTHWEST OF SECTION 16, CALUMET AND HECLA HAVE DEVELOPED APPROXIMATELY 500,000 TONS OF ORE IN SECTIONS 23 AND 24, T. 13 N., R. 9 W. IN SECTIONS 29 AND 30, T. 13 N., R. 8 W., LESS THAN 2 MILES SOUTHWEST OF THE SUBJECT SECTION 16, RARE METALS CORPORATION OF AMERICA IS CURRENTLY DEVELOPING AN ORE BODY CONTAINING NOT LESS THAN 500,000 TONS AND PROBABLY AS MUCH AS 1,000,000 TONS OF ORE

4. PHYSICAL DESCRIPTION.

(B) (CONTINUED)

THAT WILL AVERAGE NOT LESS THAN 0.20% U_3O_8.

(C) THE GEOLOGICAL FEATURES OF THE AMBROSIA LAKE AREA ARE WELL KNOWN AND HAVE BEEN DESCRIBED IN NUMEROUS RECENT TECHNICAL PUBLICATIONS. A COPY OF ONE OF THE BETTER OF THESE, "GEOLOGY OF THE AMBROSIA LAKE AREA URANIUM DEPOSITS," BY MASTERS, GROTH, AND WEBB, IS APPENDED TO THIS APPLICATION. SEE EXHIBIT "B".

DRILLING BY RIO DE ORO IN SECTION 9, NEAR THE LINE BETWEEN SECTIONS 9 AND 16, INDICATED THAT IN THIS AREA THERE IS NO WELL-DEFINED POISON CANYON MEMBER AS THERE IS FARTHER TO THE WEST AND SOUTH. INSTEAD, THERE IS A MORE OR LESS CONTINUOUS SERIES OF SAND AND SHALE BEDS FROM THE NORMAL POSITION OF THE POISON CANYON TO THE BASE OF THE WESTWATER. THIS SAND-SHALE SERIES IS OVER 200 FEET THICK. IN RIO DE ORO'S HOLE 16, THE LOCATION OF WHICH IS DESCRIBED IN 4 (B), THE FOLLOWING LITHOLOGIC SECTION WAS ENCOUNTERED:

DEPTH INTERVAL	THICKNESS, FT.	LITHOLOGY
1760 - 1800	40	SANDSTONE
1800 - 1820	20	SHALE
1820 - 1850	30	SANDSTONE
1850 -1860	10	SHALE

4. PHYSICAL DESCRIPTION.

(c) (CONTINUED)

DEPTH INTERVAL	THICKNESS, FT.	LITHOLOGY
1860 - 1885	25	SANDSTONE
1885 - 1900	15	SHALE
1900 -1970	70	SANDSTONE

RIO DE ORO'S DRILLING IN SECTION 9 HAS INDICATED THAT ANY OR ALL OF THIS PORTION OF THE STRATOGRAPHIC COLUMN MAY BE MINERALIZED. IT IS THIS THICK SERIES OF SAND AND SHALE BEDS THAT THE PROPOSED DRILLING PROGRAM IS TO EXPLORE. REASONS FOR BELIEVING SUCH AN EXPLORATION PROGRAM IS JUSTIFIED INCLUDE THE FOLLOWING: SEE EXHIBIT "D"

1. THE NATION'S LARGEST URANIUM ORE BODIES OCCUR IN NEARLY IDENTICAL GEOLOGICAL SETTINGS IN THE SAME GENERAL AREA.
2. RECONNAISSANCE DRILLING BY OTHERS IN ADJOINING SECTIONS HAS SHOWN THE PRESENCE OF URANIUM MINERALIZATION IN FAVORABLE SANDSTONE HORIZONS.
3. THE PROPERTY IS READILY ACCESSIBLE.
4. ALTHOUGH THE AVERAGE DRILLING DEPTH WILL BE ABOUT 2,000 FEET, THE UNIT COST IS LOW ENOUGH SO THAT THE TOTAL COST PER HOLE IS NOT PROHIBITIVE.
5. THE PROPERTY IS IN CLOSE PROXIMITY TO SEVERAL MILLS, AN AEC BUYING STATION, AND EXPERIENCED LABOR MARKET.
6. THERE IS A CLEAR TITLE TO THE PROPERTY, AND IT IS HELD UNDER A REASONABLE ROYALTY AGREEMENT.

4. PHYSICAL DESCRIPTION.

(c) (CONTINUED)

7. RARE METALS CORPORATION IS AN EXPERIENCED OPERATING COMPANY WITH OTHER HOLDINGS IN THE VICINITY WHICH WILL SOON BECOME PRODUCTIVE.

(D) SECTION 16 IS ACCESSIBLE BY TRAVELING WEST FROM GRANTS, NEW MEXICO, ON U.S. HIGHWAY 66 A DISTANCE OF 4 MILES TO THE SAN MATEO-AMBROSIA LAKE ROAD. THIS ROAD IS PAVED FOR A DISTANCE OF 19 MILES TO THE JUNCTION OF THE SAN MATEO AND AMBROSIA LAKE ROADS. THE SAN MATEO ROAD IS FOLLOWED FOR ABOUT 5 MILES TO THE FLOYD LEE RANCH, APPROXIMATELY 3 MILES WEST OF SAN MATEO, WHERE A FARM ROAD TRAVERSES MR. LEE'S RANCH FROM THE SAN MATEO ROAD TO SECTION 16. PERMISSION HAS BEEN GRANTED BY MR. LEE TO TRAVERSE THIS 3 MILES OF PRIVATE ROAD.

THE RAPIDLY GROWING MINING TOWN OF GRANTS, NEW MEXICO, IS THE SOURCE OF SUPPLY AND RESIDENCE FOR MOST OF THE MINING PERSONNEL IN THE DISTRICT. ORE WOULD BE SOLD TO EITHER ONE OF THE FOUR CUSTOM MILLS IN THE AREA OR TO THE ATOMIC ENERGY COMMISSION'S BUYING STATION AT GRANTS.

(E) EXPERIENCED MINING PERSONNEL, ALTHOUGH CURRENTLY IN SOMEWHAT SHORT SUPPLY, IS AVAILABLE AT GRANTS. MOST ORDINARY SUPPLIES SUCH AS FOOD, GASOLINE, HARDWARE, SMALL TOOLS, ETC. CAN BE PROCURED IN GRANTS. THERE IS AN R.E.A. ELECTRIC POWER LINE WITHIN ABOUT TWO MILES OF THE PROPERTY THAT COULD SUPPLY POWER FOR

4. PHYSICAL DESCRIPTION.

(E) CONTINUED

LIGHTING AND CAMP NEEDS. ANY LARGE AMOUNTS OF POWER COULD PROBABLY BEST BE GENERATED ON THE PROPERTY. DOMESTIC WATER IN THE VICINITY IS SECURED FROM WELLS.

RECEIVED NO

DATE		

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

FORM
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5. THE EXPLORATION PROJECT.

(A) THE PROJECT IS PROPOSED FOR THE EXPLORATION OF URANIUM AND VANADIUM.

(B) IT IS PROPOSED TO EXPLORE FOR URANIUM BY ROTARY DRILLING USING BOTH WATER AND COMPRESSED AIR AS CIRCULATING MEDIA. IT IS PROPOSED THAT THE DRILLING PROGRAM CONSIST OF TWO STAGES. UNDER STAGE I DRILLING WOULD BE ON A MODIFIED GRID SYSTEM WITH HOLES SPACED ON FROM 800- TO 1,000-FOOT CENTERS. DRILLING WOULD BE INSTIGATED ALONG THE NORTH LINE OF THE SECTION NEAR TO WHERE SIGNIFICANT MINERALIZATION HAS BEEN ENCOUNTERED IN THE ADJOINING SECTION 9 BY RIO DE ORO MINING COMPANY. SEE EXHIBIT "C". THE EXACT LOCATION OF INDIVIDUAL HOLES WOULD BE DEPENDENT UPON THE RESULTS OBTAINED IN PRECEEDING HOLES, THE PROXIMITY TO KNOWN GEOLOGICAL FEATURES SUCH AS MAJOR FAULTS, AND ACCESSIBILITY AS GOVERNED BY TOPOGRAPHIC FEATURES. A TOTAL OF 25 HOLES WOULD BE REQUIRED TO COMPLETE STAGE I. EXHIBIT "C" SHOWS AN IDEALIZED PLAN VIEW OF SECTION 16 WITH THE HOLES ON AN ARBITRARY 1000-FOOT GRID. THE GEOLOGICAL FEATURES SHOWN HAVE BEEN SKETCHED FROM U.S. GEOLOGICAL SURVEY OIL AND GAS INVESTIGATIONS MAP NO. 158.

STAGE II WOULD CONSIST OF DRILLING HOLES AS OFFSETS TO PREVIOUSLY DRILLED HOLES SHOWING SIGNIFICANT MINERALIZATION.

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY II, UTAH

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5. THE EXPLORATION PROJECT.

(B) (CONTINUED)

OFFSET HOLES WOULD BE DRILLED APPROXIMATELY 200 FEET FROM PREVIOUSLY DRILLED HOLES. IT IS ESTIMATED THAT 25 HOLES WOULD BE REQUIRED TO COMPLETE STAGE II.

ALL HOLES WOULD BE DRILLED TO THE CONTACT BETWEEN THE WESTWATER AND RECAPTURE FORMATIONS. THE HOLES WILL BE PROBED AND LOGGED. SAMPLES WILL BE TAKEN AT FROM 2- TO 5-FOOT INTERVALS AND RADIOMETRICALLY CHECKED. CHEMICAL DETERMINATIONS WILL BE MADE AT RARE METALS' LABORATORY IN MURRAY, UTAH, OF A SUFFICIENT NUMBER OF MINERALIZED SAMPLES TO ARRIVE AT AN ACCURATE CHEMICAL-RADIOMETRIC RATIO FOR ANY ORE ENCOUNTERED.

(C) THE WORK WILL START WITHIN 30 DAYS AND STAGE I WILL BE COMPLETED WITHIN SIX MONTHS FROM THE DATE OF AN EXPLORATION CONTRACT. STAGE II WILL BE COMPLETED WITHIN AN ADDITIONAL SIX-MONTH PERIOD.

(D) RARE METALS CORPORATION IS AN OPERATING MINING COMPANY WITH A COMPETENT STAFF OF EXPERIENCED ENGINEERS, GEOLOGISTS, AND OPERATING PERSONNEL. THE ACTUAL EXPLORATION WORK WILL BE UNDER THE SUPERVISION OF HAROLD HORST, AREA SUPERINTENDENT, EXPLORATION DEPARTMENT, RARE METALS CORPORATION. MR. HORST GRADUATED IN GEOLOGY FROM THE UNIVERSITY OF INDIANA IN 1949. FROM 1949 TO 1954 HE WORKED AS A MINING ENGINEER AND COMMODITY-INDUSTRY ANALYST

5. THE EXPLORATION PROJECT.

(D) (CONTINUED)

FOR THE U. S. BUREAU OF MINES. IN 1954 MR. HORST JOINED RARE METALS CORPORATION OF AMERICA. FROM 1951 TO THE PRESENT MR. HORST HAS SPENT MOST OF HIS TIME IN EXPLORATION FOR URANIUM AND THORIUM ORES.

RARE METALS CORPORATION OF AMERICA
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6. ESTIMATE OF COSTS.	STAGE I	STAGE II
(A) INDEPENDENT CONTRACTS	$ 89,000.00	$ 89,000.00
(B) LABOR, SUPERVISION, CONSULTANTS	13,680.00	13,680.00
(C) OPERATING MATERIALS AND SUPPLIES	1,050.00	1,050.00
(D) OPERATING EQUIPMENT	NONE	
(E) REHABILITATION AND REPAIRS	NONE	
(F) NEW BUILDINGS, IMPROVEMENTS, INSTALLATIONS	NONE	
(G) MISCELLANEOUS	2,450.00	2,450.00
(H) CONTINGENCIES	2,123.60	2,123.60
TOTAL	$108,303.60	$108,303.60

(DETAIL OF ABOVE ESTIMATES FOLLOWS)

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY 11, UTAH

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6. ESTIMATE OF COSTS.

(A) INDEPENDENT CONTRACTS.

1. DRILLING 25 HOLES, 2000' DEEP @ $1.65/FOOT	$ 82,500.00
2. PROBING 25 HOLES, 2000' DEEP @ $0.10/FOOT	5,000.00
3. BULLDOZING ROADS & DRILL SITES 100 HOURS @ $15.00/HOUR	1,500.00
TOTAL INDEPENDENT CONTRACTS	$ 89,000.00

(B) LABOR, SUPERVISION, CONSULTANTS.

1 SUPERVISING ENGINEER-GEOLOGIST 6 Mo. @ $600/Mo.	$ 3,600.00
EXPENSE ACCOUNT, 180 DAYS @ $12/DAY	2,160.00
2 SAMPLERS 6 Mo. @ $450/Mo. X 2	5,400.00
EXPENSE ACCOUNT, 30 DAYS @ $12/DAY X 2	720.00
150 DAYS @ $ 6/DAY X 2	1,800.00
TOTAL LABOR, SUPERVISION, & CONSULTANTS	$ 13,680.00

(C) OPERATING MATERIALS AND SUPPLIES

1 PICKUP TRUCK, 150 DAYS, 50 MILES PER DAY @ 8¢/MILE = 150X50X8¢	$ 600.00
1 PASSANGER CAR, 150 DAYS, 50 MILES PER DAY @ 6¢/MILE = 150X50X6¢ ?	450.00
TOTAL OPERATING, MATERALS AND SUPPLIES	$ 1,050.00

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
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6. ESTIMATE OF COSTS. (CONTINUED)

(D) NONE

(E) NONE

(F) NONE

(G) MISCELLANEOUS

EMPLOYMENT TAXES, INSURANCE AND BENEFITS

15% OF TOTAL WAGES - 15% X $9,000.00	$ 1,350.00
ASSAYING.	
ESTIMATE 100 SAMPLES @ $5.00 EACH	500.00
ACCOUNTING, 6 MONTHS @ $100/Mo.	600.00
TOTAL MISCELLANEOUS	$ 2,450.00

(H) CONTINGENCIES.

TWO PERCENT OF ESTIMATED COST BEFORE 6(H)	$ 2,123.60
TOTAL COST STAGE I	$108,303.60
TOTAL COST STAGE II	$108,303.60
GRAND TOTAL FOR PROJECT	$216,607.20

COMPANY PARTICIPATION 50% = $ 108,303.60

DMEA PARTICIPATION 50% = $ 108,303.60

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY II, UTAH

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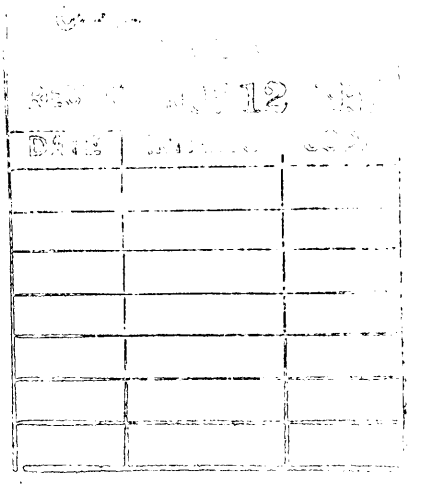
7. (A) THE APPLICANT WILL BE PREPARED TO FURNISH ITS SHARE OF THE COST OF THE PROPOSED PROJECT IN ACCORDANCE WITH THE REGULATIONS ON GOVERNMENT PARTICIPATION.

(B) THE APPLICANT PROPOSES TO FURNISH ITS SHARE OF THE COSTS BY MONEY.



RECEIVED NOV 12 1957

DATE	INITIALS	CODE

EXHIBIT "A"

SECTION 3 (D)

CONTRACT

THIS CONTRACT, made and entered into this 6th day of April, 1957, by and between W. T. OLD, JR. and PATRICIA M. OLD, his wife, hereinafter called "Sellers", and RARE METALS CORPORATION OF AMERICA, a Delaware Corporation, hereinafter called "Rare Metals",

WITNESSETH:

THAT WHEREAS, Sellers are Assignees of State of New Mexico Mining Lease bearing Serial No. 60-5-445, dated March 28, 1955, for a primary term of five years and as long thereafter as minerals are produced, insofar as it covers the following tract of land located in McKinley County, New Mexico, to wit:

> Section 16, Township 13 North, Range 8 West, N.M.P.M., containing 640 acres, more or less,

(hereinafter referred to as the "subject land"), which mining lease (hereinafter referred to as "said lease") provides for a royalty of five percent (5%) payable to the Lessor, and

WHEREAS, Rare Metals desires to acquire the said lease, but only on the terms and conditions hereinafter set forth and subject to certain reservations by Sellers upon the hereinafter specified terms and conditions.

NOW THEREFORE, the parties hereto, for and in consideration of the premises, the agreements, and obligations hereinafter contained, the receipt and sufficiency of which are mutually acknowledged, do agree as follows:

1. Sellers have furnished to Rare Metals all abstracts, rental receipts, copies of lease and assignments and other title data in their possession covering title to said lease covering the subject land. Rare Metals shall have a period of ten (10) days from the execution hereof within which to have the title thereto examined by its attorneys and to obtain, at its expense, such additional title data

as it may desire, and shall either approve or reject Sellers' title within said ten (10) day period. If Rare Metals rejects Sellers' title, then this agreement shall be terminated forthwith, and Rare Metals shall return to Sellers the title data furnished, and neither party shall be under obligation to the other by reason of this agreement.

2. Unless Rare Metals does so reject Sellers' title within said period, it will, on or before the expiration, pay to Sellers in cash the sum of Thirty Two Thousand Dollars ($32,000.00), and Sellers shall concurrently therewith execute and deliver to Rare Metals an assignment of said lease in form required by the Commissioner of Public Lands of the State of New Mexico. Sellers shall retain by the terms of said assignment an overriding royalty of five percent (5%) of the market value at the mine of all minerals mined, produced, and marketed from the subject land, free and clear of all costs of exploration, development, and production, except Sellers' proportionate share of all production, severance, and ad valorem taxes assessed against said minerals.

By "market value at the mine" of uranium ore is meant the amount payable to the producer pursuant to the provisions of Circular 5 issued by the Atomic Energy Commission, including all bonuses (excluding mine development allowances and hauling allowances). When the fixed price provisions of Circular 5 shall expire, market value at the mine shall thereafter mean the market value paid for uranium ore of similar quality by the mill purchasing such ore; provided that if Rare Metals takes such ore for processing, the price shall not be less than the average price paid by all mills for ore of similar quality within a radius of fifty (50) miles from the subject land. On all other products produced and sold from the subject land, market value at the mine shall mean the actual price obtained for such products at any mill, buying station, or smelter less any costs of transportation, beneficiation, and marketing.

Concurrently with the assignment of said lease, Rare Metals and Sellers shall execute an agreement in form required by the Commissioner of Public Lands of the

State of New Mexico, specifying the interest of each party in and to said mining lease as herein more particularly provided.

3. Unless Rare Metals shall complete not less than fifteen thousand (15,000) feet of exploratory drilling on subject land on or before two years from the date of this agreement, it shall reassign and reconvey said lease to Sellers without warranty of title, but free and clear of all encumbrances and liens caused or created by Rare Metals, and Rare Metals shall have sixty (60) days thereafter within which to remove materials, equipment, and personal property placed upon the subject land by Rare Metals. Upon reassignment, this agreement shall be terminated and shall be of no further force and effect; provided that neither party hereto shall be relieved of any obligation accruing during the term of this agreement and prior to such termination.

4. If Rare Metals shall have completed not less than fifteen thousand (15,000) feet of exploratory drilling on subject land on or before two years from the date of this agreement, it shall thereupon elect whether it shall reassign said lease, as provided above, or shall conduct mining operations upon subject land. In the event that Rare Metals elects to conduct mining operations upon subject land, it shall promptly commence and diligently prosecute such operations in a good and miner-like fashion to the end that the greatest ultimate recovery of economically recoverable uranium bearing ores shall be realized therefrom within a reasonable time; provided that Rare Metals shall have the right to abandon mining operations on subject land at any time it deems such operations economically impracticable, and thereupon it shall reassign and reconvey said lease to Sellers, at their request, in the manner provided above.

5. In the event that Rare Metals elects to conduct mining operations on subject land, Rare Metals and Sellers shall thereupon jointly determine the economically recoverable reserves of uranium bearing ores underlying subject land. If said parties cannot agree on such reserves, they shall jointly employ a qualified independent mining engineer whose determination of such reserves shall be binding upon both

parties hereto.

6. Upon its election to conduct mining operations upon subject lands, Rare Metals shall have eighteen (18) months in which to place the premises in condition to produce and market uranium bearing ores therefrom. Thereafter, Rare Metals shall pay to Sellers a five percent (5%) advance royalty based upon the current market value at the mine of .833% of the economically recoverable reserves underlying subject lands, determined in accordance with paragraph 5 above, during each month in which Rare Metals shall fail or refuse to produce and market uranium bearing ores from subject lands, as provided in paragraph 4 hereof; provided that Rare Metals shall have no obligation to pay said advance royalty during any month in which its failure to produce and market uranium bearing ores from subject lands is due to lack of market or other force majeure conditions described in paragraph 10 hereof. All advance royalties thus paid shall be credited against fifty percent (50%) of the overriding royalty payable to Sellers hereunder upon the commencement or resumption of production and marketing operations during subsequent months until such advance royalty payments have been liquidated.

7. In conducting mining operations hereunder, Rare Metals shall comply with the applicable laws and regulations of all state and federal authorities having jurisdiction in the premises, and shall pay and discharge all claims for labor, materials, equipment, rental, and contractor's fees which might constitute a lien upon subject lands or said leases.

8. Rare Metals shall permit Sellers, their designated agent or agents, or assigns, at all reasonable times to have access to the subject lands for the purpose of inspecting, surveying, and sampling, and shall keep accurate records relative to the ores extracted and shipped from the subject lands, but Rare Metals shall have the exclusive supervision of the subject lands and all persons thereon during the term of this agreement. Rare Metals shall deliver to Sellers copies of all drill records, assay reports, test results, and other data obtained in exploration or operations on the

subject lands, and shall further keep true and correct books of account showing the amount of all ores mined by Rare Metals from the leased premises, together with the buying station, mill, smelter, and/or market returns therefrom and supply Sellers a monthly report incorporating such data, and keep full, true, and correct records of all treatment, transportation, and marketing costs on all products, and keep books of account and supporting data open for inspection by Sellers at all reasonable times.

9. Rare Metals shall hold Sellers harmless against all loss, damage, liens, claims, costs, and expenses and liability therefor growing out of exploration, development, and mining operations on the subject land and shall, on or before the tenth (10th) day of each month, pay all advance royalties due Sellers during the preceding month and all royalties due Sellers on all products taken by Rare Metals or purchased and paid for by others during the preceding month.

10. Neither party shall be liable to the other for any delay or default in performance hereunder (except for payment of monies due) which is the result of any cause beyond such party's control, including but not limited to acts of God, or of the public enemy, or regulations of the federal or state government, or of any federal or state officer or agent purporting to act under duly constituted authority, floods, wars, fires, storms, strikes, lockouts, interruptions of transportation, freight embargoes or failures, exhaustion or unavailability on the open market, or delays in delivery of material, equipment, or services necessary to the performance of any provision hereof, or the happening of any unforeseen acts, misfortunes, or casualties whereby performance hereunder is terminated or prevented; provided that nothing herein contained shall be construed to require either party to settle a labor dispute.

11. This contract shall inure to the benefit of and be binding upon the heirs, executors, administrators, or assigns of the parties hereto.

16

WITNESS our hands and seals the day and year first above written.

W. T. Old, Jr.

Patricia M. Old

Sellers

STATE OF NEW MEXICO
COUNTY OF McKINLEY } ss.
Filed for record in the Clerk's office
the 13th day of April
A. D. 1957 at 9:00 o'clock A M.
and recorded in Book 29
of MMRC on page 281-286
County Clerk

RARE METALS CORPORATION OF AMERICA

By
Vice President

Secretary

STATE OF NEW MEXICO)
)
COUNTY OF SANTA FE)

The foregoing instrument was acknowledged before me this 6th day of April, 1957, by W. T. Old, Jr. and Patricia M. Old, his wife.

Notary Public

My Commission expires:
My Commission Expires July 15, 1959

STATE OF Texas)
)
COUNTY OF El Paso)

The foregoing instrument was acknowledged before me this 6th day of April, 1957, by H. F. Stein, Vice President of RARE METALS CORPORATION OF AMERICA, a Delaware Corporation, on behalf of said Corporation.

Louise M. Cress
Notary Public

My Commission expires:

LOUISE M. CRESS
Notary Public, in and for El Paso County, Texas
My Commission Expires June 1, 1957

17-

STATE LAND OFFICE

Santa Fe, New Mexico

MURRAY E. MORGAN
COMMISSIONER OF PUBLIC LANDS

October 1, 1957

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

CERTIFICATE

I, Murray E. Morgan, duly elected, qualified and acting Commissioner of Public Lands in and for the State of New Mexico, do hereby certify that the attached and foregoing photostatic copy of assignment #2 General Mining Lease 60-5445, dated April 18, 1957 is a full, true and complete copy of the original thereof as it appears on file in the State Land Office.

IN WITNESS WHEREOF, I have hereunto set my hand and Seal of Office on this the 1st day of October, 1957.

MURRAY E. MORGAN
Commissioner of Public Lands

Form M-3 Individual

RECEIVED
STATE LAND OFFICE
SANTA FE, N. M.

1957 APR 17 AM 10 : 17

ASSIGNMENT OF MINERAL LEASE

KNOW ALL MEN BY THESE PRESENTS:

That W. T. OLD, JR., a married man,
(state whether married or single)

and PATRICIA M. OLD, his wife,
(wife if any)

hereinafter called "Assignor s ," part ies of the first part, for and in consideration of the sum of One Dollar, and other good and valuable consideration paid by RARE METALS CORPORATION OF AMERICA, a Delaware corporation,

whose postoffice address is P.O. Box 1492, El Paso, Texas

hereinafter sometimes called the "Assignee ___," party of the second part, have sold, transferred, set over and assigned, and by these presents do ___ sell, transfer, set over and assign to the Assignee , its _____ heirs, successors and assigns, all of the assignors' right, title, interest and claim in and to that certain Mineral Lease No. 60-5445 made by the State of New Mexico to General Uranium Corporation under date of March 28, 1955 , and more particularly described as follows:

INSTITUTION	SEC.	TWP.	RGE.	SUBDIVISION	ACRES
Common Schools	16	13N	8W	ALL	640.00

The Assignee assumes and agrees to perform all obligations to the State of New Mexico insofar as said described lands are affected, and to pay such rentals and royalties, and to do such other acts as are by said lease required as to the above described subdivisions, to the same extent and in the same manner as if the provisions of said lease were fully set out herein.

It is agreed that the Assignee shall succeed to all the rights, benefits and privileges granted the Lessee by the terms of said lease, as to the lands above described.

IN WITNESS WHEREOF, the said parties of the first part have hereunto set their hands and seals on this the 6th day of April, 1957 .

W. T. Old, Jr.

Patricia M. Old

FROM NO. 1
TO NO. 2

ASSIGNMENT FEE $10.00
ASSIGNMENT NO. 2
H. C. 109350

RECEIPT NO. 8280

STATE OF NEW MEXICO)
County of Santa Fe) ss

On this 6th day of April, 19 57, before me personally appeared W. T. OLD, JR. and PATRICIA M. OLD, his wife, to me known to be the person s described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate above written.

Nash Hancock
Notary Public

My Commission expires My Commission Expires July 15, 1959

Office of Commissioner of Public Lands
Santa Fe, New Mexico

I hereby certify that the within assignment was filed in my office on the 17th day of April, 19 57, and approved by me on April 18, 19 57.

M. Morgan
Commissioner of Public Lands

INSTRUCTIONS AND INFORMATION

1. All assignments must be filed in the State Land Office within 100 days from date of issue and accompanied by Cashier's Check, Bank Draft, P. O. or Express Money Order.

2. Recording and approval fees are $10.00 for each Assignment

3. When assignments are accompanied by personal check, the Commissioner of Public Lands reserves the right to withhold approval of assignment until checks are paid.

4. Assignments will not be approved when assigned to more than One person.

5. Assignments must show complete postoffice address of assignee.

6. Assignments must be executed before an officer authorized to take acknowledgments of deeds. Corporations must use corporate form of acknowledgment.

7. Assignments must show whether assignors are married or single; if married, both husband and wife must sign the assignment, and certificate of acknowledgment must show marital status of assignors.

8. All official business, letters and communications must be addressed to and sent direct to the Commissioner of Public Lands.

9. Make all payments for annual rental and recording and approval fees, to

COMMISSIONER OF PUBLIC LANDS
SANTA FE, NEW MEXICO

STATE LAND OFFICE

Santa Fe, New Mexico

MURRAY E. MORGAN
COMMISSIONER OF PUBLIC LANDS

October 1, 1957

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

CERTIFICATE

I, Murray E. Morgan, duly elected, qualified and acting Commissioner of Public Lands in and for the State of New Mexico, do hereby certify that the attached and forgoing photostatic copy assignment #1 General Mining Lease 60-5445, dated January 19, 1956, is a full, true and complete copy of the orgnial thereof as it appears on file in the State Land Office.

IN WITNESS WHEREOF, I have hereunto set my hand and Seal of Office on this the 1st day of October, 1957.

MURRAY E. MORGAN
Commissioner of Public Lands

Form M-3 Corporation

RECEIVED
STATE LAND OFFICE
JAN 19 9 10 AM '56
SANTA FE, N. M.

ASSIGNMENT OF MINERAL LEASE

KNOW ALL MEN BY THESE PRESENTS:

That General Uranium Mining Corporation

a corporation,

hereinafter sometimes called "Assignor___," party of the first part, for and in consideration of the sum of One Dollar, and other good and valuable consideration paid by

W. T. Old, Jr.

whose postoffice address is P. O. Box 4095, Santa Fe, New Mexico

hereinafter sometimes called "Assignee___," party of the second part, has sold, transferred, set over and assigned, and by these presents does sell, transfer, set over and assign to the Assignee his successors and assigns, all of the assignor's right, title, interest and claim in and to that certain Mineral Lease No. 60-5445

made by the State of New Mexico to General Uranium Mining Corporation

under date of _____, 19____,

and more particularly described as follows:

INSTITUTION	SEC.	TWP.	RGB.	SUBDIVISION	ACRES
Common Schools	16	13N	8 W	All	640.00

1/20/56

The Assignee assumes and agrees to perform all obligations to the State of New Mexico insofar as said described lands are affected, and to pay such rental and royalties, and to do such other acts as are by said lease required as to the above described subdivisions, to the same extent and in the same manner as if the provisions of said lease were fully set out herein.

It is agreed that the Assignee shall succeed to all the rights, benefits and privileges granted the Lessee by the terms of said lease, as to the lands above described.

IN WITNESS WHEREOF, the said party has hereunder caused these presents to be signed and sealed by its proper officers by authority of its Board of Directors this the 11th day of December, 1955.

ATTEST:

B B Johnson
Secretary

General Uranium Mining Corp.

By Eugene Adamson
President

ASSIGNMENT FEE $10.00
ASSIGNMENT NO. 1
H. C. 71794

RECEIPT NO. 110184

FROM NO. 0
TO NO. 1

STATE OF ~~NEW MEXICO~~ Colorado)
County of Denver) ss.

On this 11th day of January, 1956, before me personally appeared E. H. Sanders (he is) to me personally known, who being by me duly sworn did say that the President of the GENERAL URANIUM MINING CORPORATION and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said E. H. Sanders acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on this, the day and year first above written.

Mildred J. Cram
Notary Public

My Commission expires November 9, 1956

My Commission expires _____

Office of Commissioner of Public Lands
Santa Fe, New Mexico

I hereby certify that the within assignment was filed in my office on the 19th day of January, 1956, and approved by me on January 19, 1956.

E. S. Walker
Commissioner of Public Lands

INSTRUCTIONS AND INFORMATION

1. All Assignments must be filed in the State Land Office within 100 days from date of issue and accompanied by Cashier's Check, Bank Draft, P. O. or Express Money Order.

2. Recording and approval fees are $10.00 for each Assignment.

3. When assignments are accompanied by personal check, the Commissioner of Public Lands reserves the right to withhold approval of assignment until checks are paid.

4. Assignments will not be approved when assigned to more than two persons.

5. Assignments must show complete postoffice address of assignee.

6. Assignments must be executed before an officer authorized to take acknowledgments of deeds. Corporations must use corporate form of acknowledgment.

7. Assignments must show whether assignors are married or single; if married, both husband and wife must sign the assignment, and certificate of acknowledgment must show marital status of assignors.

8. All official business, letters and communications must be addressed to and sent direct to the Commissioner of Public Lands.

9. Make all payments for annual rental and recording and approval fees, to

COMMISSIONER OF PUBLIC LANDS
SANTA FE, NEW MEXICO

STATE LAND OFFICE

Santa Fe, New Mexico

MURRAY E. MORGAN
COMMISSIONER OF PUBLIC LANDS

October 1, 1957

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

CERTIFICATE

I, Murray E. Morgan, duly elected, qualified and acting Commissioner of Public Lands in and for the State of New Mexico, do hereby certify that the attached and foregoing photostatic copy of General Mining Lease 60-5445, dated the 28th day of March, 1955, is a full, true and complete copy of the original thereof as it appears on file in the State Land Office.

IN WITNESS WHEREOF, I have hereunto set my hand and Seal of Office on this the 1st day of October, 1957.

MURRAY E. MORGAN
Commissioner of Public Lands

APPLICATION NO. 297 LEASE NO. 60-5445

GENERAL MINING LEASE

RECEIVED
STATE LAND OFFICE
OCT 17 3 09 PM '55
SANTA FE, N. M.

THIS AGREEMENT, dated this 28th day of March 19 55, made and entered into between the State of New Mexico, acting by and through the undersigned, its Commissioner of Public Lands, hereinafter called the "lessor", and General Uranium Mining Corporation, Santa Fe, New Mexico hereinafter called the "lessee".

WITNESSETH:

THAT WHEREAS, the said lessee has filed in the State Land Office an application for a lease for the purpose of prospecting, mining, development, and production of all minerals except potassium, sodium, phosphorus and other minerals of similar occurrence, and their salts and compounds, oil and gas, salt, coal, shale, clay, gravel, building stone and building materials upon the lands hereinafter described, and has tendered the sum of $ 32.00 which sum includes first annual rental thereof, together with the sum of $5.00 application fee, and the sum of $ nil representing bid bonus, evidenced by official receipt No. 103938 B;

NOW, THEREFORE, in consideration of the above tender, receipt of which is acknowledged, and the covenants herein, the lessor does hereby grant, demise, lease and let to the lessee, exclusively, for the sole and only purpose of prospecting for, exploration, mining, development, production, and removal of the aforesaid minerals, in, upon, from and under the following described lands situated in the State of New Mexico:

INSTITUTION	SEC.	TWP.	RGE.	SUBDIVISION	ACRES
Common Schools	16	13N	8 W	All	640.00

together with the right to use so much of the surface as may be reasonably necessary to prospect for, mine and remove the minerals therefrom.

TO HAVE AND TO HOLD the said lands and privileges granted hereunder for a term of three (3) years and so long thereafter as the said minerals or any of them in paying quantities shall be produced or mined from the leased lands, subject to all the terms and conditions as hereinafter set forth.

In consideration of the premises, the parties covenant and agree as follows:

1. Lessee shall pay to the lessor as royalty two per cent (2%) of the gross returns from the smelter, mill, reduction process or other sale, less reasonable transportation and smelting or reduction charges, if any, of all ores and materials mined and extracted from the land and two per cent (2%) of any and all premiums and bonuses received by lessee in connection with the discovery, production or marketing of such ores or materials. Provided, that on deposits of rare earths, precious stones or semi-precious stones, and all uranium, thorium, plutonium, or any other material which may have been or may hereafter be determined by the Atomic Energy Commission of the United States to be peculiarly essential to the production of fissionable materials, lessee shall pay a royalty of five per cent (5%) of the gross returns from the smelter, mill, reduction process or other sale, less reasonable transportation and smelting or reduction charges, if any, of all such ores or materials mined and extracted from the land, and five per cent (5%) of any and all premiums and bonuses received by the lessee in connection with the discovery, production or marketing of such ores or materials.

No work on this Lease 2/8/57

DI-28
(Feb. 1950)

UNITED STATES
DEPARTMENT OF THE INTERIOR

OFFICE DIRECTORY

NAME _____
(Surname first)

DIVISION, BRANCH, SECTION, OR UNIT _____

OFFICIAL DESIGNATION _____

ROOM NO. _____ OFFICE TELEPHONE _____

HOUSE ADDRESS _____

HOUSE TELEPHONE _____

_____, 19____

The Chief Clerk MUST be kept informed of addresses, and this form should be filled out as often as is necessary for that purpose.
One name only should be written on a card.

16—30661-3 U. S. GOVERNMENT PRINTING OFFICE

2. Lessee agrees to make full settlement for all royalties on the twentieth (20th) day of the month following the month of sale or receipt of premium or bonus.

3. The consideration hereinbefore specified is a good and valid consideration, subject in all respects to support each and every covenant herein, including specifically the option granted the lessee to prevent the termination of this lease from year to year by payment or tender of further rental as hereinafter provided.

4. An annual rental at the rate of five cents (5¢) per acre shall become due and payable to the lessor by the lessee, or by any transferee or assignee of the same or any part hereof where such transferee or assignee has been recognized, and such transfer or assignment approved by the lessor as hereinafter provided, upon each acre of the land described and then claimed by such lessee, transferee or assignee hereunder, and the same shall be due and payable in advance to the lessor on the successive anniversary dates of this lease, but the annual rental on any lease or assignment shall in no event be less than ten dollars ($10.00).

5. If lessee shall fail to discover and produce minerals in paying quantities during the primary term of this lease, the lessee may continue this lease in full force and effect for an additional or secondary term of two (2) years, and as long thereafter as any mineral or minerals in paying quantities be produced from the land, by paying each year in advance ten times the rental provided in the primary term.

Provided, further, that if for any reason beyond the control of the lessee production of minerals in paying quantities shall cease after the secondary term has expired, a producing lessee may, with the written permission of the commissioner, continue said lease in operation and effect from year to year for an additional period of not to exceed three (3) years by continued payment in advance of annual rentals at the rate provided in the secondary term of the lease.

6. With the consent of the lessor and upon payment of all rentals due and a fee of ten dollars ($10.00), the lessee may surrender or relinquish this lease, in whole or in part, to the lessor; provided, however, that no relinquishment of an undivided interest herein nor less than a legal subdivision shall be approved or recognized by the lessor; provided, further, that this surrender clause shall become absolutely inoperative immediately and concurrently with the filing of any suit in any court of law or equity by the lessee, lessor, or any assignee, to enforce this lease or any of its terms, express or implied.

7. The lessee, with the consent of the lessor, may assign this lease, in whole or in part; provided, however, that no assignment of any undivided interest in the lease, or any part thereof, nor any assignment of less than a legal subdivision, shall be recognized or approved by the lessor. Upon approval of an assignment in writing by the lessor, the assignor shall stand relieved from all obligations to the lessor with respect to the lands embraced in the assignment, and the lessor shall likewise be relieved from all obligations to the assignor as to such tracts, and the assignee shall succeed to all of the rights and privileges of the assignor with respect to such tracts and shall be held to have assumed all of the duties and obligations of the assignor to the lessor as to such tracts.

8. After production is once had, lessee shall use reasonable diligence in prospecting for and developing all commercial deposits of mineral or minerals upon the land, and lessee shall market all mineral or minerals so produced within a reasonable time after production is had.

9. The lessor may cancel this lease for nonpayment of rentals, nonpayment of royalties, or for violation of any of the terms, covenants or conditions thereof; provided, however, that before any such cancellation shall be made, the lessor must mail to the lessee or assignee, by registered mail, addressed to the post office address of such lessee or assignee, shown by the records, a thirty-day notice of intention to cancel said lease, specifying the default for which the lease is subject to cancellation. No proof of receipt of notice shall be necessary and thirty days after such mailing, the lessor may enter cancellation unless the lessee shall have sooner remedied the default.

10. The lessor shall have the right to inspect all records, books or accounts pertaining to the mining, extraction, transportation and returns of ores taken from the lands, and, at the request of the lessor, lessee shall furnish such reports, samples, logs, assays or cores

within reasonable bounds, as the lessor may deem to be necessary to the proper administration of the lands.

11. Lessee may make or place such improvements and equipment upon the land as may be reasonably necessary to explore for, mine and remove the minerals, and upon termination of this lease for any reason, lessee may remove such improvements and equipment as can be removed without material injury to the premises; provided, however, that all rentals and royalties have been paid and that such removal is accomplished within two years of the termination date or before such earlier date as the lessor may set upon thirty days' written notice to the lessee. All improvements and equipment remaining upon the premises after the removal date, as set in accordance with this paragraph, shall be forfeited to the lessor without compensation.

12. Before lessee shall commence development or operations upon the lands embraced herein, he shall execute and file with the lessor a good and sufficient bond in an amount of five thousand dollars ($5,000.00) in favor of the State of New Mexico, for the benefit of the lessor, its surface lessee, patentee or contract purchaser, to secure the payment of such damage to the livestock, water, crops, or other tangible improvements on the lands as may be suffered by reason or development, use and occupation of the lands by the said lessee, and the lessee shall be liable and agrees to pay for all such damages to the livestock, growing crops, or other improvements upon the land. In addition, lessor may, upon notice given to lessee, require lessee to furnish a bond in a reasonable amount to guarantee payment of royalties to become due under the lease.

13. This lease is made subject to all the provisions and requirements applicable thereto which are to be found in various acts of the legislature of New Mexico, the same as though they were fully set forth herein, and said laws, so far as applicable to this lease, are to be taken as a part hereof.

14. All the obligations, covenants, agreements, rights and privileges of this lease shall extend to and be binding upon and inure to the benefit of the lawful and recognized assigns or successors in interest of the parties hereto.

15. Nothing herein contained shall be held or construed to prevent the lessor from leasing or letting the said lands or any portion thereof for grazing or agricultural purposes, or for leasing them for the exploration, development and production of products from deposits other than the item, including oil and gas, potash, coal, salt, or for leasing them for the operation of a business, or for selling them under a deferred purchase contract with minerals reserved, or for patenting them with minerals reserved, or for the issuance of rights of way, and easements over, upon or across them for public highways, railroads, tramways, telegraph, telephone and power lines, irrigation works, mining, logging and for any of the purposes mentioned hereinabove in this paragraph, and for other purposes.

16. The lease herein is issued subject to all valid existing rights and with special but not exclusive reference to the present existence of any of the matters mentioned in the paragraph next above.

17. All mining operations hereunder shall conform with good mining practices, shall be carried on in a workmanlike manner, and shall conform with all of the laws of the State of New Mexico and all rules and regulations of the State Land Office as may be issued from time to time under authority of law for the protection of valuable deposits of other minerals in or upon the lands but not covered by this lease.

18. Payment of all sums due the lessor by the lessee under the terms of this lease, including but not limited to payment for rentals, royalties, bonuses, and fees shall be made at the office of the Commissioner of Public Lands, State Capitol, Santa Fe, New Mexico, and, after notice given, lessor may require such payments to be made in cash or certified exchange.

IN WITNESS WHEREOF, the State of New Mexico has hereunto signed and caused its name to be signed by its Commissioner of Public Lands thereunto duly authorized, with the seal of his office affixed, and the lessee has signed this agreement to be effective the day and year above written.

STATE OF NEW MEXICO

By Ed Walker

COMMISSIONER OF PUBLIC LANDS

Lessor.

GENERAL URANIUM MINING CORPORATION

attest
B. Johnson
Secretary

W. H. Sandler

PRESIDENT

Lessee (SEAL)

Distributed this the 20 day of OCT 1955 19_____.

(PERSONAL ACKNOWLEDGMENT)

STATE OF _____)
) ss:
COUNTY OF _____)

On this the _____ day of _____ 19___, personally appeared before me
to me known to be the person who executed the foregoing instrument as lessee, and acknowledged that _____ he _____ executed the same as _____ free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate above written.

My Commission Expires:

_____
Notary Public

(ACKNOWLEDGMENT BY ATTORNEY)
IN FACT

STATE OF _____)
) ss.
COUNTY OF _____)

On this the _____ day of _____ 19___, personally appeared before me
to me known to be the person ___ who executed the foregoing instrument in behalf of
_____
and acknowledged that ___ he ___ executed the same as the free act and deed of said

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate above written.

My Commission Expires:

_____
Notary Public

(ACKNOWLEDGMENT BY CORPORATION)

STATE OF NEW MEXICO)
) ss:
COUNTY OF BERNALILLO)

On this the 12th day of August 19 55, personally appeared before me E. H. SANDERS
to me personally known, who being by me duly sworn did say that he is the _____
PRESIDENT of GENERAL URANIUM MINING CORPORATION
_____
and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors, and said E. H. SANDERS
_____
acknowledged the said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate above written.

My Commission Expires: Feb. 14, 1959

_____
Notary Public

NOV 18

EXHIBIT "B"

SECTION 4 (c)

The largest uranium deposits in the United States lie in a barren northwestern section of uranium-rich New Mexico. Kerr-McGee spokesmen reveal their findings concerning the . . .

RECEIVED NOV 12 1957
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GEOLOGY of the AMBROSIA LAKE AREA Uranium Deposits*

McKinley County, New Mexico

By
RICHARD T. ZITTING

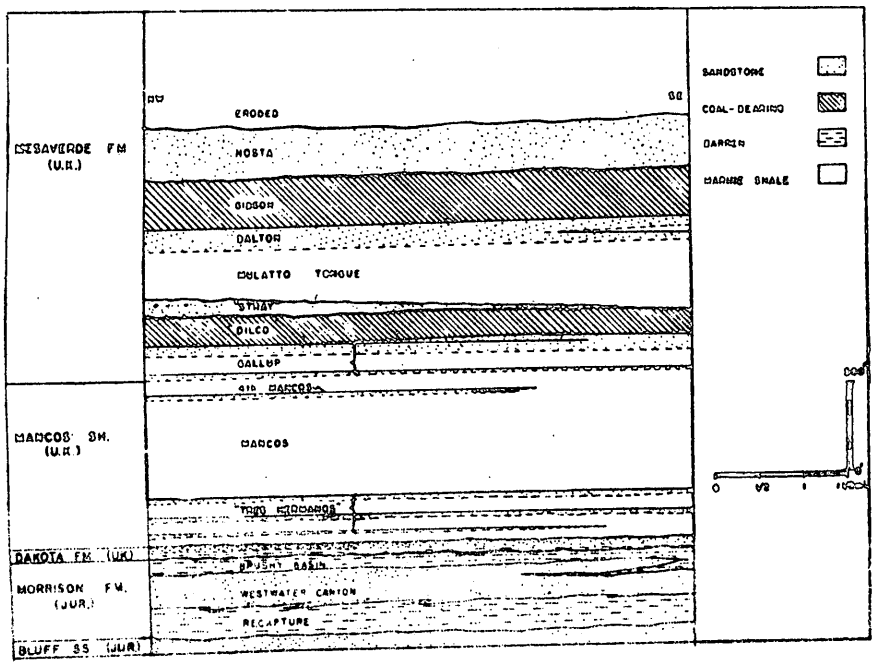
Co-Authors
J. A. MASTERS, F. A. GROTH, and M. D. WEBB
Kerr-McGee Oil Industries, Inc.

This paper is based on the work of the Kerr-McGee Uranium Exploration staff in the Ambrosia Lake area. The properties of Kerr-McGee, Pacific Uranium, and Anderson Development Corp., in the Ambrosia Lake area, were recently combined to form Kermac Nuclear Fuels Corp., and this new company has been active in the area for the past six months. Kermac Nuclear also operates the properties of Ambrosia Lake Uranium Corp., and for the purposes of this paper all of the properties operated by Kermac are treated collectively.

The discovery and subsequent development of the Ambrosia Lake deposits, which are the largest in the United States, has served to revolutionize the uranium industry in several respects. Kermac and other operators are now planning operations on a long term basis, looking ahead to competing for a commercial market. The expected profits from these reserves can support private research and expansion which will allow the companies involved to become more fully integrated.

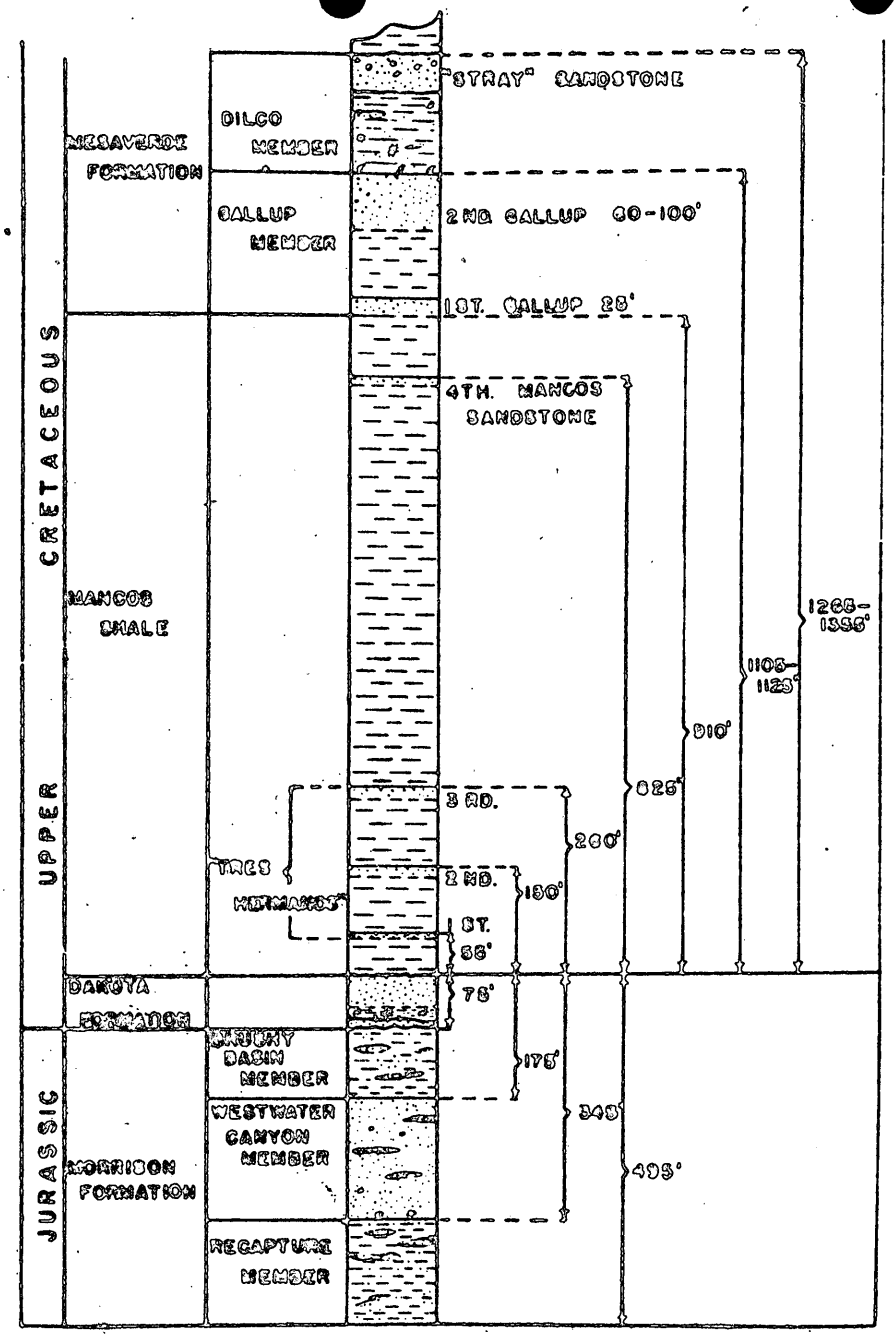
Conditions encountered at Ambrosia Lake have fostered the development of new exploration techniques and concepts which should aid in locating deposits in other localities. Investors in the development and production of nuclear power reactors can proceed with assurance of a large domestic supply of the nuclear fuel materials. Finally, the value of the Ambrosia Lake reserves and the income provided for a large number of people will greatly help the uranium industry assume a position of permanent importance to our national economy.

The Ambrosia Lake area is lo-



Section showing Stratigraphic relations in the rich Ambrosia Lake area of New Mexico.

* Presented at the National Western Mining Conference, Feb. 7-9, Denver Colo.



▽ Generalized Stratigraphic section of Ambrosia Lake.

cated in McKinley County, in northwestern New Mexico. The town of Grants, which is the headquarters of most of the people working in the district, is located approximately 25 miles south on Highway 66 about mid-way between Gallup and Albuquerque. The Ambrosia Lake area as used herein is intended to include only the deposits occurring in the Morrison formation.

Description of Deposits

Information recently released by the Atomic Energy Commission reported that New Mexico has 68.4 per cent of the total known U. S. uranium ore reserves, nearly all of which are located at Ambrosia Lake and in the Laguna area. Further developments in the Ambrosia Lake area since the time of the AEC report, and unreported reserves, may have increased this percentage to as much as 72 per cent at the present time. At least half of the known U. S. uranium reserves are located at Ambrosia Lake, and future development of potential ore indicated by drilling to date will further increase the prominence of this district.

The majority of the uranium ore at Ambrosia Lake occurs in a huge ore trend which has been extended a distance of approximately eight miles from Section 15, T14N, R10W, southeast to Section 35 in T14N, R9W. Exploration drilling along this trend is at the present incomplete and as this work is continued, the deposits which now appear to be scattered along this trend will probably connect into a gigantic almost continuous ore body, perhaps 10 miles in length.

This ore body is very irregular and sinuous and pinches out entirely in places, while at other locations it is nearly one mile wide. Ore found in individual drill holes varies in thickness from less than one foot to over 100 feet, and throughout the deposit averages well over 10 feet thick.

Other important deposits have been found north of the main trend in Sections 10, 11, and 12, T14N, R10W, and to the southeast in the vicinity of Poison Canyon (T13N, R9W). These areas have not been explored as extensively as the main Ambrosia trend, and the size and extent of these deposits has not yet been determined.

In evaluating the Ambrosia Lake deposits, three classifications of reserves have been used: (1) Proven ore is ore that has been blocked out by close spaced drilling. (2) Probable ore is calculated for short extensions of proven ore bodies and ore which is outlined by wide spaced drilling. (3) On the basis of experience in the area, potential ore is estimated as extensions of known ore trends and as projections between known deposits.

Exploration drilling to date on Kermac Nuclear Fuels properties has found 14 million tons of proven ore, and an estimated 9 million tons of probable ore for a total of 23 million tons. This tonnage averages .32 per cent U_3O_8 and includes all ore down to a cut off of four feet of .10 per cent U_3O_8. Potential ore on Kermac properties is presently estimated at 9 million tons. These figures total 32 million tons. Other operators in the Ambrosia area have developed approximately 10 million tons of proven and probable ore averaging .27 per cent U_3O_8, and their potential ore is estimated as at least an additional 5 million tons.

These figures combined give the district an estimated proven and probable reserve of 33 million tons and an additional potential of 14 million tons. This 47 million-ton reserve averages over .30 per cent U_3O_8 in the ground, but will probably be diluted to approximately .24 per cent during mining.

Geology of the Area

All of the known deposits in the Ambrosia Lake district occur in the Westwater Canyon sandstone member of the Morrison formation. The Morrison in this area is approximately 450 feet thick and is late Jurassic in age. The Morrison is divided into three members:

1. Recapture Creek Member (lower Morrison.)

The Recapture Creek member is the lowermost member of the Morrison formation in this area and is composed of interbedded shale, siltstone, and very fine-grained sandstone. The predominant color is red with occasional lighter hues of red, gray and white. In general the Recapture is less porous and permeable than the overlying Westwater Canyon sandstone.

2. Westwater Canyon Sandstone Member (middle Morrison).

The Westwater is generally a poorly cemented, fine to very coarse grained, arkosic sandstone and contains occasional thin green or red shale beds. The sandstone varies in color from light gray or white to hematitic red. The member varies in thickness from less than 100 feet to nearly 300 feet. The lower contact with the Recapture member is often gradational and in some areas intertongued. An Upper Westwater sandstone lense intertongues with the overlying Brushy Basin shale member over extensive areas of the district, and is locally known as the "Poison Canyon sandstone."

3. Brushy Basin Shale Member (upper Morrison).

The Brushy Basin is composed of green and red bentonitic shales with interbedded sandstone or siltstone lenses. In general these sandstone lenses are light gray or white, but in some limited areas are brown or red. The Brushy Basin ranges in thickness from 60 to 160 feet. This variation in thickness is due to changes of thickness of the Poison Canyon sandstone.

The Dakota sandstone disconformably overlies the Brushy Basin and averages approximately 80 feet in thickness throughout the area. The sandstone is gray with interbedded black carbonaceous shales and coals.

The Mancos conformably overlies Dakota and outcrops over most of the Ambrosia area. The lower Mancos is characterized by thick black marine shales with sandstone interbedded near the bottom of the formation, while the upper Mancos shales intertongued with the lower sandstones of the Mesaverde group. The lower Mancos is about 800 feet thick below the lowermost Mesaverde tongue.

Important Local Structures

The Ambrosia Lake district is situated on the northeast flank of the Zuni Uplift, which forms the southwest rim of the San Juan Basin. Regionally, the sediments dip 2 or 3 degrees to the northeast into the basin.

The important local structures are the Ambrosia anticline and syncline and Ambrosia fault, in the center of the area, the Bluewater fault, which forms the western limit of the area, the San Mateo fault and San Mateo Dome which lie in the northeastern part of the area. Many other small unnamed faults are present throughout the area. All of these structures are believed to be Laramide or later in age, since none of them appear to have affected the deposition of the Jurassic or Cretaceous sediments.

The Ambrosia Lake area is located in a long strike valley which has been eroded in the lower Mancos shale formation. The valley strikes northwest and is bounded on the south by the rim formed by the outcrop of the Dakota sandstone, and on the north by the high sandstone cliffs and steep shale slopes of the Mesaverde outcrop. The surface of the valley is generally flat or gently rolling, broken only by an occasional dry wash or outcrop of thin Mancos sandstone. Access to drilling locations is good and very little expense has gone into road building for this purpose.

Geology of the Deposits

All of the ore found to date at Ambrosia Lake is associated with what is loosely called asphaltic residue in the Westwater sandstone. In this area, the term asphalt describes a black carbonaceous residue identified as a humic acid. This material is believed to have been formed by oxidation of an asphalt accumulation.

No significant ore has been found which does not contain asphalt and little asphalt has been found which is not mineralized. Coffinite is the only uranium mineral that has been identified thus far. The exact relationship of the Coffinite to the asphalt is not yet understood, but it is believed that the asphalt has acted as the reducing agent in the precipitation of the uranium.

The thickness and grade of the ore is proportional to the thickness and amount of asphalt present in the sandstone. Most of the asphalt in the area is mineralized indicating that an abundant and widespread supply of uranium bearing solution has been available.

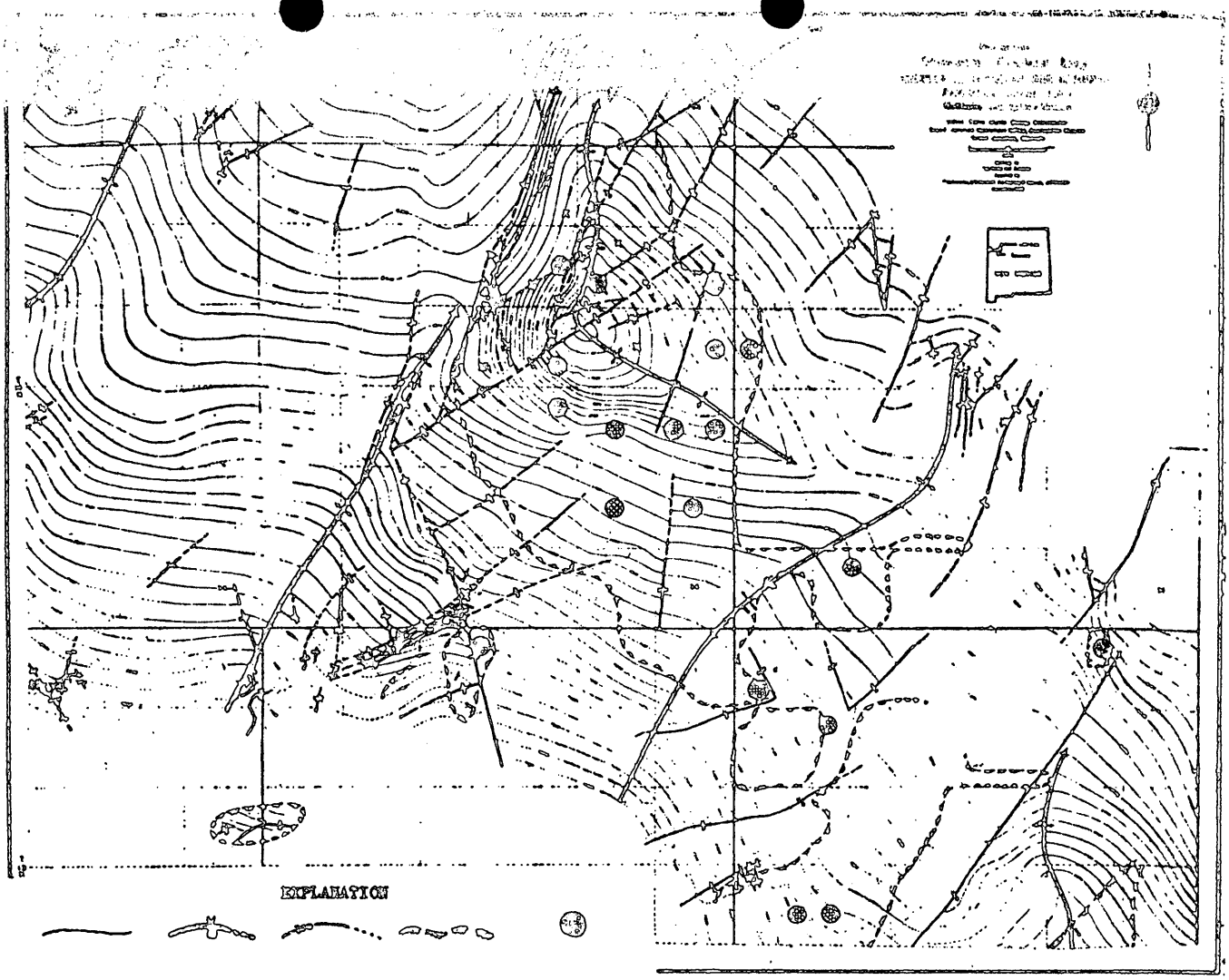
The origin of the mineralizing solutions, the emplacement of the asphaltic host, and the formation of the deposits can be explained as follows:

In Morrison time, a high land mass composed of granitic rocks and sediments (including a large amount of volcanic debris) existed southwest of Ambrosia Lake. These rocks contained a considerable amount of uranium as part of their normal composition. The Morrison streams eroded this land mass, and in the process much of the uranium was taken into solution. Since the Morrison was deposited in a shallow continental basin rather than in a marine environment, the uranium bearing stream waters were trapped in the sediments, as formation water, rather than dissipated in the ocean.

During Cretaceous time, the Morrison was buried by a thick section of marine and marginal marine sediments.

Near the end of Cretaceous time, the Laramide orogony produced the major structural features of the area; that is, the present Zuni Uplift and the San Jaun Basin. The Ambrosia anticline and many of the faults of this area were probably formed at this time.

After the Ambrosia anticline had been formed, liquid petroleum which may have been derived from the green shales of the Brushy Basin accumulated in the porous Westwater sands at the top of the structure. Subsequent erosion of the rim of the San Juan Basin during tertiary time lowered the spill point of the basin and subsequently lowered the water table in the Ambrosia area. As the water table lowered, the oil slipped down the flanks of the Ambrosia anticline and spread out along the Ambrosia syncline. Escape of volatiles due to the decreased pressure, oxidation of the oil by contact with oxidizing ground waters and possibly adsorption of the heavier fractions of the hydrocarbons on active quartz grains caused the formation of asphaltic residue. The asphalt was left as a



Structure contour map of the Ambrosia Lake area, showing ore deposit locations and general structural contours. Prepared by the Grand Junction office of the AEC.

coating on the sand grains, somewhat retarding but not preventing the movement of fluids through the sandstone beds.

Since the deposition of the asphalt, a large volume of the slightly uraniferous ground water has passed through the permeable Westwater sands. The reducing environment accompanying the asphalt has caused the uranium to be precipitated or possibly adsorbed by the asphalt, forming the deposits we find today. Later faulting occurred, probably at the time of the Mt. Taylor volcanism, which may have influenced the structural setting slightly.

The above explanation is somewhat idealized and based almost entirely on observable field relationships, but several undeniable facts are noted which support a history of genesis very similar to the one suggested.

The work of Dr. J. W. Gruner at the University of Minnesota, and the Kerr-McGee research staff on the mineralogy and petrology of these deposits supports the field observations of the close association between uranium and asphaltic material. Mineralogical work has determined that the amount of uranium is proportional to the amount of asphalt present, i. e., the highest grade ore is found in the heaviest concentrations of asphalt. Dr. Gruner believes the asphalt is definitely of an earlier age than the uranium.

The relationship of the asphalt deposits to the Ambrosia dome becomes more obvious when the deposits are plotted on a structural contour map of the area. This map shows that the highest open point on the anticline is located in the north part of Section 22, T14N, R10W. This is the point where the hydrocarbons could first escape from the anticline as the water table lowered and probably where they first came in contact with the environment which would cause the formation of asphalt. Drilling suggests that this has been the case, since the thickest deposits of ore and asphalt in the area are at this location.

From Section 22 the deposits extend eastward parallel to the structure contours along the north side of the Ambrosia syncline across Section 23. In the western part of Section 24, the oil encountered a faulted zone which impeded its movement to the east and caused it to spread to the south to Section 26. The hydrocarbons then resumed an eastward course across Section 25 to Section 30, T14N, R9W, along the same structural contour as before but on the south side of the Ambrosia syncline. On Section 30

the syncline plunges to the west forming a closed basin. As the water table continued to lower, a large amount of the petroleum was trapped in this basin and covered almost all of Section 30 and parts of surrounding sections with asphaltic deposits.

East of Section 30, the area has only been drilled in spots and detailed structure and distribution of deposits cannot yet be accurately mapped. However, the work to date indicates that the band of asphalt extends to the east slipping down dip somewhat, probably due to the strong stratigraphic control and the declining water table.

At the north end of the dome on Sections 10, 11, and 12, a similar band of asphalt appears to exist which extends east and west across the axis of the anticline and finally appears to follow the strike. This area is only sparsely drilled at present and no definite conclusions can be made as to the control of these deposits.

This striking conformity of the asphalt to structure, together with the fact that the greatest volume of asphalt is present nearest the dome, leads to the belief that the asphaltic deposits were derived from oil which had accumulated in the dome.

A consideration of the vertical distribution of uranium deposits in the stratigraphic section supports the theory that the uranium has been derived from the connate waters of the formations.

Almost all of the sedimentary sandstone uranium ore deposits known in the United States are located in a select few formations, including the Shinarump formation, Chinle formation, Morrison formation, and several tertiary formations. These formations are similar in that they are all continental deposits in which the sediment was eroded from granitic and/or sedimentary land masses. They all have associated shales in part derived from volcanic ash, and all have been deposited in closed continental basins where uraniferous waters remained with the sediment and were not dissipated in the ocean.

Several of the marine and marginal marine formations of the Grants area are very similar to these continental deposits in composition and sedimentary structure, yet they have not been found to contain important concentrations of uranium. Comparing the Westwater sandstone and the continental sandstones of the Mesaverde Group, both contain thick porous and permeable light colored sandstone beds, both are associated with bentonitic shales, both contain abundant uranium precipitating agents in the form of carbonaceous materials. It is apparent that the Mesaverde was derived from a land mass very similar in composition to the one from which the Morrison originated. It can also be assumed that the Mesaverde streams carried uranium in solution in approximately the same concentrations as the Morrison streams. However, the Mesaverde is different in that it was deposited along the margins of the sea and its uraniferous waters were dissipated into the sea. For this reason sizable Mesaverde deposits have not formed. It is also apparent that if ascending hydrothermal solutions were the source of the uranium, it would be unreasonable for favorable host rock in the Westwater to be mineralized while equally favorable hosts in the Dakota and Mesaverde are not.

In conclusion it is believed that the uranium in these deposits was derived from the Morrison connate waters.

Since the Westwater sandstone is a stream laid deposit, variations in sand grain size, sorting, bedding, and the resulting variation in porosity and permeability can be seen both vertically and laterally throughout the member. These sedimentary features have had a considerable effect on the size, shape and distribution of the deposits at Ambrosia Lake.

The ore in the area occurs in several zones from the top to the bottom of the Westwater. As many as six of these ore zones can be recognized in parts of the area, while at other places only one zone is present. In the areas where the thickest ore is found, several of these zones have merged forming a single zone as much as one hundred feet thick. These zones are controlled by vertical variations in the permeability of the host rock and extend laterally essentially parallel to the bedding.

In order to establish mappable units that could be used throughout the area, several of the closely spaced ore zones were combined and the Westwater was divided into three units as follows:

1. The Poison Canyon sandstone is the upper unit and is generally separated from the main body of the Westwater by a shale. This unit is practically absent in parts of the area and is up to 100 feet thick in other places. The base of the Poison Canyon is consistently 160 feet below the base of the Dakota.

2. The Upper Westwater is a blanket sand across the area that averages about 80 feet in thickness.

3. The Lower Westwater unit is a sandstone that is present only where the member thickens at the expense of the underlying Recapture shale. In these areas the Lower and Upper Westwater are commonly separated by thin shale lenses.

The distribution of the deposits in these three units has been mapped separately in order to recognize trends and controls which might develop in one unit and not be reflected in the other two.

Generally, ore bodies in the lower two units are very closely related and follow the same trends.

Though the deposits in the Poison Canyon sandstone are found overlying deposits in the lower units in parts of the area, the trends which develop in this unit vary considerably from those of the lower units, particularly in the eastern part of the area. From this it is concluded that the distribution of the deposits of asphalt and uranium in the Poison Canyon are much more greatly affected by sedimentary features than are those of the lower units.

The direction of Westwater sedimentation in this area is generally eastward. In the Westwater member, the direction of greatest permeability is assumed to be parallel to this sedimentary trend. This feature has affected the distribution of deposits in all of the units in that the asphalt tended to string out in a rather narrow band to the east in the direction of highest permeability, rather than spreading in all directions and forming a uniform deposit around the dome. The structural control of asphalt accumulation was therefore strongly modified by stratigraphic features.

All of the deposits at Ambrosia Lake are located in areas where the Westwater sandstone section is light gray in color. The iron in these light sandstones occurs in the form of pyrite. Laterally westward from the deposits, the sandstone becomes red in color and the iron forms hematite. These features are used as an exploration guide on the fringes of the known ore bearing area. The color changes are on a sufficiently broad scale that a few holes drilled per section in a new area can often eliminate large parts as red and unfavorable, or can indicate bleached areas where further exploration is justified.

Exploration Methods Used

Since the first discovery in the Ambrosia Lake area was made early in 1955, the area has been the scene of exploration activity unprecedented in the history of U. S. uranium exploration. Since Ambrosia Lake deposits are found in remnants of an ancient oil field, exploration methods common to the oil industry are used. Property is normally obtained by leasing or buying large tracts consisting of several sections of land. Principals of sedimentary and structural geology used in petroleum exploration can be applied to guide exploration in this area.

In the past 18 months, a total of more than 1,600,000 feet of drilling has been done on Kermac properties at a total cost of more than $2 million. This represents approximately 2,500 individual holes. Other operations in the area have at least equalled this amount of work, which means that over 3 million feet of drilling has been completed for a total investment of nearly $5 million. This work is continuing at a rate of over 150,000 feet of drilling per month and several million dollars more will be invested for exploration and development drilling before the area reaches its full production potential.

The ore in this area lies buried from 300 to 1,200 feet below the surface. These unusually deep drilling depths and the fact that such a large area had to be explored required the use of some method for obtaining reliable subsurface information which would be less expensive than the traditional method of taking cores.

It was found that non-core rotary drilling could be done at a relatively low cost (usually less than $1 per foot), and that a combination gamma-ray-resistivity log of the hole provided the necessary assay information as well as showing the lithology of rocks drilled. This type of log has been found to be reliable and easily interpreted. The various formational contacts and lithological units each show a very characteristic pattern on the gamma-ray-resistivity log charts. The color of the units is determined by an examination of the drill cuttings.

As would be expected, any uranium mineralization encountered by the drill holes shows up as an area of high gamma radiation on the gamma log As is commonly known, there is a direct relationship between the amount of gamma radiation and the grade of the uranium mineralization. In order to establish an accurate method for determining the thickness and grade of ore shown by an anomaly on the gamma ray log, approximately 20 per cent of the holes in the ore bodies have been cored. These holes are gamma logged and the cores are sampled and assayed on one-foot intervals. The assays of a single core interval are averaged together to determine the true thickness and average grade of the ore. The average intensity of radiation in counts per second is determined for the identical interval from the gamma log of the core hole.

These values are plotted on a graph with the x axis calibrated in per cent U_3O_8 and the y axis calibrated in gamma radiation counts per second. When a number of these points have been established, an average curve is plotted which can be used to determine the amount of ore found in holes where no core was taken.

It has been found that the relationship of radiation intensity to grade of ore varies somewhat across the area, probably due to differences in the equilibrium state of the ore at different locations. Therefore, a separate interpretation curve is constructed for each section on which major reserves are found.

As can be seen by the foregoing discussion of the size of the Ambrosia Lake deposits, initial exploration drilling on an unexplored property can be done with relatively wide spaced drill holes. A typical drilling project on one of the Ambrosia Lake sections would proceed as follows:

1. A wide spaced pattern is first drilled across the section. In areas where the ore trend direction is known, the holes are arranged in a fence pattern with 400 to 600 foot spacing across the trend and 1,000 to 1,500-foot spacing along trend. In areas where no ore trend has been established, a staggered grid pattern is used for the wide spaced drilling. These wide spaced holes, along with occasional additional fill-in holes locate and roughly indicate the extent of the ore deposit. No cores are taken from the wide spaced holes.

2. Next, the holes containing significant mineralization are offset with close spaced drilling on a rectangular pattern. Offsets measuring 150 feet in the larger ore bodies and 100 foot offsets in the smaller ones are used for this phase of the drilling. This offsetting is continued until the ore body has been completely blocked out.

3. Finally, a number of core holes between these close spaced offset holes are drilled throughout the ore body in order to verify the results of the non-core drilling, and to provide the necessary information for gamma log interpretation. It is believed that reserve figures calculated from information gained in this manner are as reliable as those outlined entirely by core drilling would be.

In order to gain an understanding of the nature of the deposits and the geologic features which control their distribution, it has been found that it is important to map such features as structure, lithology, and sand color, as well as distribution of mineralization, on an area-wide scale. This work has made possible the prediction of trend directions in undrilled areas, the recognizing of possible extensions of known trends, and provides a basis for estimating the favorability of a property before drilling is undertaken.

The wide use of gamma-ray-resistivity logs for determining stratigraphic unit boundaries, lithology, and quality of mineralization has greatly facilitated the preparation of these regional maps. By largely eliminating human error and individual interpretation in this manner, comparable information can be obtained from widely separated drilling, and regional maps can be compiled with accuracy.

Conclusion

At the present time, one mine is producing on a limited basis at Ambrosia Lake. Six shafts are being sunk to gain access to the newly discovered ore bodies and at least eight additional shafts will be started during the coming spring and summer.

A contract for one new mill has been approved and signed, and contracts for three additional mills are in various stages of negotiation.

The rate of production from the Ambrosia area will be governed largely by milling capacity, and as new facilities are completed, production will probably reach a rate of approximately 6,000 to 7,000 tons per day.

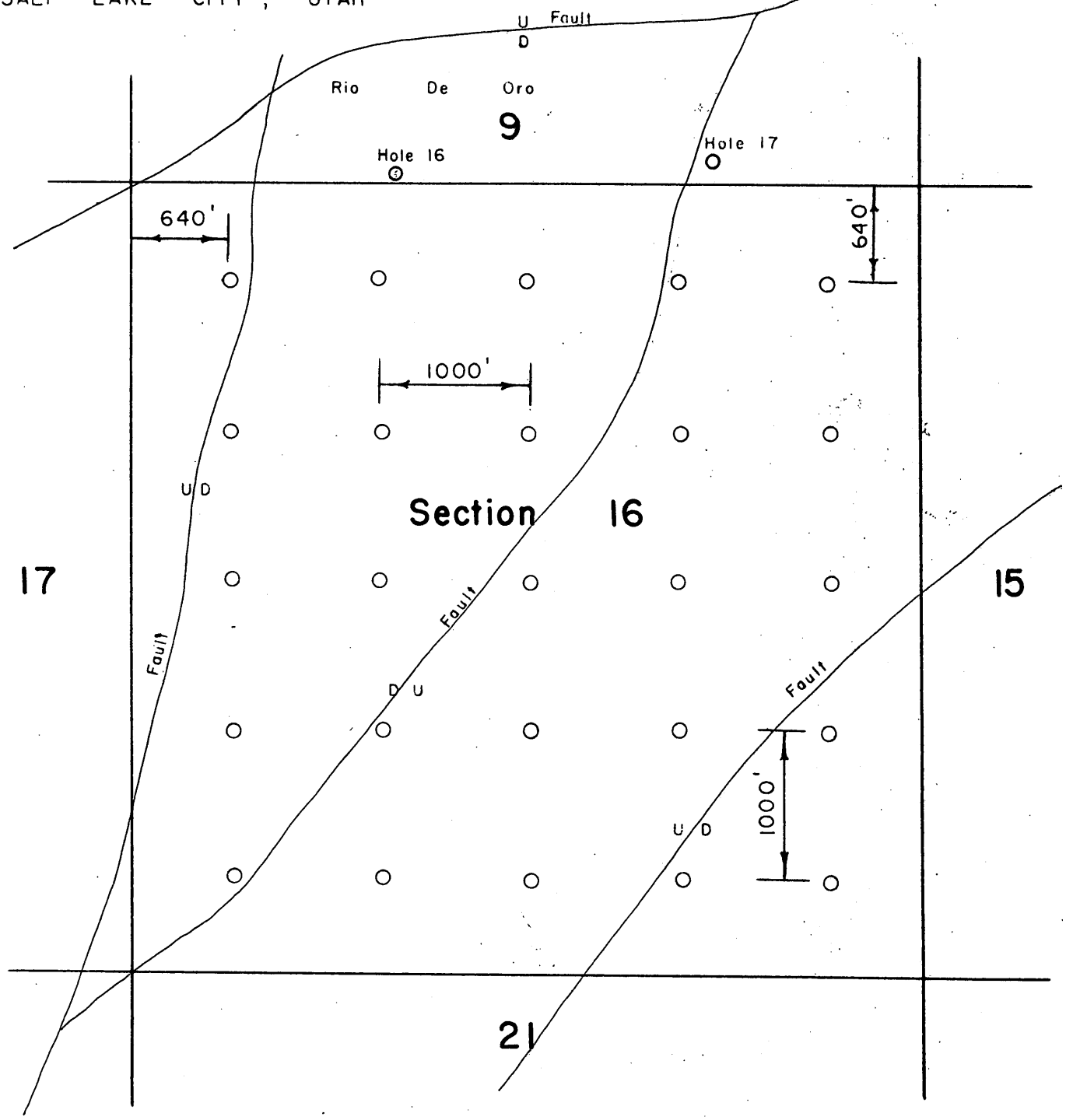
Development of mines and construction of milling facilities will require approximately two years to complete. The total capital investment by operators in the district will likely exceed $75 million before full production is obtained. However, the indicated profit potential of the area more than justifies this large investment.

RECEIVED NOV 19 1957

EXHIBIT "C"

SECTIONS 4 (c) & 5 (B)

RARE METALS CORPORATION OF AMERICA
TENTH FLOOR, FIRST SECURITY BUILDING
SALT LAKE CITY, UTAH



PLAN MAP OF PROPOSED STAGE I DRILL HOLES
SECTION 16, T 13 N, R 8 W, NMPM
McKINLEY COUNTY, NEW MEXICO
SCALE 1" = 1000'

EXHIBIT "D"

SECTION 4 (c)

Docket

May 21, 1958

Murphy
Ellis

Summary of Proposed Project

Object: Denial of application for exploration aid.

Docket No.: DMEA-4872

Commodity: Uranium

Amount of Application: $216,607.20 ($216,606.00)

Applicant: Rare Metals Corporation of America
Tenth Floor, First Security Bldg.
Salt Lake City 11, Utah

Property Rights: Lease on State School Land consisting of all of sec. 16, T. 13 N., R. 8 W., N.M.P.M., McKinley County, New Mexico

Date of Application: November 1, 1957

Referred to Region III: November 25, 1957

Field Examination made: January 14, 1958

Field Team Report received: March 24, 1958

Work Proposed: Stage I, 25 rotary drill holes to an average depth of 2,000 feet. The holes to be spaced on 800 to 1000-foot centers.

Stage II, 25 offset holes.

Estimated Costs:

Stage I -	Independent Contracts	$89,000.00	
	Labor, supervision, consultants	13,680.00	
	Operating materials and supplies	1,050.00	
	Miscellaneous	2,450.00	
	Contingencies	2,123.00	
	TOTAL		$108,303.00
	Same costs for Stage II		108,303.00
	Total cost of Project		$216,606.00
	Government Participation @ 50%		$108,303.00

Excerpts from the Joint Report of Examination, by F.R. Shawe, USGS, and H.F. Robertson, USBM:

The field examiners recommended a modified program consisting of 15 holes in Stage I and 15 offset holes at distances of 250 to 500 feet in Stage II. Total cost of the program was estimated at $82,125.00.

In recommending the project the examiners state (page 23) in part----

> "The Applicant's property is located at the southeastern end of a southeasterly trending belt of large (500,000 to 1,000,000 ton) uranium ore deposits. Exploratory drilling across the southern end of sec. 9, T. 13 N., R. 8 W., by the Rio de Oro Uranium Mines, Inc., showed thicknesses of Westwater Canyon member averaging about 200 feet, thus suggesting that the Applicant's sec. 16 is probably underlain by a favorable thickness of ore-bearing sandstone."

> "Evaluation of the available information leads the examining team to conclude that there is a reasonable possibility of discovering large deposits of uranium ore at depths averaging 1,700 feet on the subject property.---"

The Field Team (W.H. King and E.N. Harshman) in a memorandum, dated March 20, 1958, note that the section 16 appears to be between two generalized ore trends. The trend of more important ore deposits being to the north of the property in the Westwater Canyon sandstone and the trend of the ore-bearing Poison Canyon formation to the south of the property. Because of this, the Field Team noted that it took a dim view of the proposed project especially as holes 1800 feet deep would be required, and the work appeared to be in the nature of prospecting rather than exploration. The Field Team stated that if a contract was approved, the drilling should favor the northern part of sec. 16.

Commodity Members' Comments:

In a memorandum, dated March 31, 1958, N.E. Nelson, USGS, suggested that more information concerning the Rio de Oro drilling in sec. 9 should be sought. He also suggested that possibly final action on the application be delayed pending results of drilling under DMEA-4842, to the north, but if this was not possible, drilling of the 3 core holes on sec. 16 should be considered.

In a memorandum, dated March 26, 1958, James Paone, USBM, noted that the northern part of sec. 16 appeared to be the most favorable area to explore and suggested that a revision of the project proposed by the field examiners should be considered.

Division of Rare & Misc. Metals, F. M. Murphy, May 21, 1958:

M.H. Kline, vice president of the Applicant, was in the Division office on the day the Field Team Report of Examination was received. He mentioned then that if more information was required he would appreciate a telephone call so as to expedite the processing of the application.

Based on the views of the field examiners' report on the property, the memoranda by the Commodity Members' and my own conclusions on the merits of the property, I drafted a proposed

contract somewhat modifying the examiners' proposal.

I agreed with the Field Team that the northern part of sec. 16 appeared more favorable, however, since the section had not been drilled, I included the three preliminary core holes suggested by the examiners. The location of remaining holes under Stage I were left to the decision of the Field Team and the Applicant.

Mr. Selfridge returned the proposed contract to me stating that in his opinion the contract could not be approved under the DMEA program, since the information submitted did not indicate that either the north or south mineralization trends from Ambrosia Lake Dome would enter the property; moreover, the information submitted on drilling in sections adjacent to 16 were only hearsay.

In view of this and the previous request of Mr. Kline, I called him (collect) at Salt Lake City and asked him if he could submit any authentic data on drilling in sections adjacent to sec. 16. This data was submitted and covered by a letter, dated May 5, 1958.

After reviewing the data, the material was forwarded to Mr. Kiilsgaard's office (USGS). Mr. W. P. Williams reviewed the supplementary data and in a memorandum, dated May 12, 1958, recommended that the drilling project as outlined in the examining team's report should be approved.

In a conference May 21, with Mr. Mittendorf, Mr. Johnson, Mr. Selfridge, and Mr. Murphy, it was decided that the new information did not indicate that sec. 16 was definitely in either the north or south ore trends from the Ambrosia Lake Dome, therefore, the proposed project would be prospecting, at least in part of the first stage.

In summary, the conclusion reached in the meeting was that the Applicant should drill a few holes on sec. 16, first and if favorable criteria for ore deposition was shown by these holes, then a new application would receive consideration.

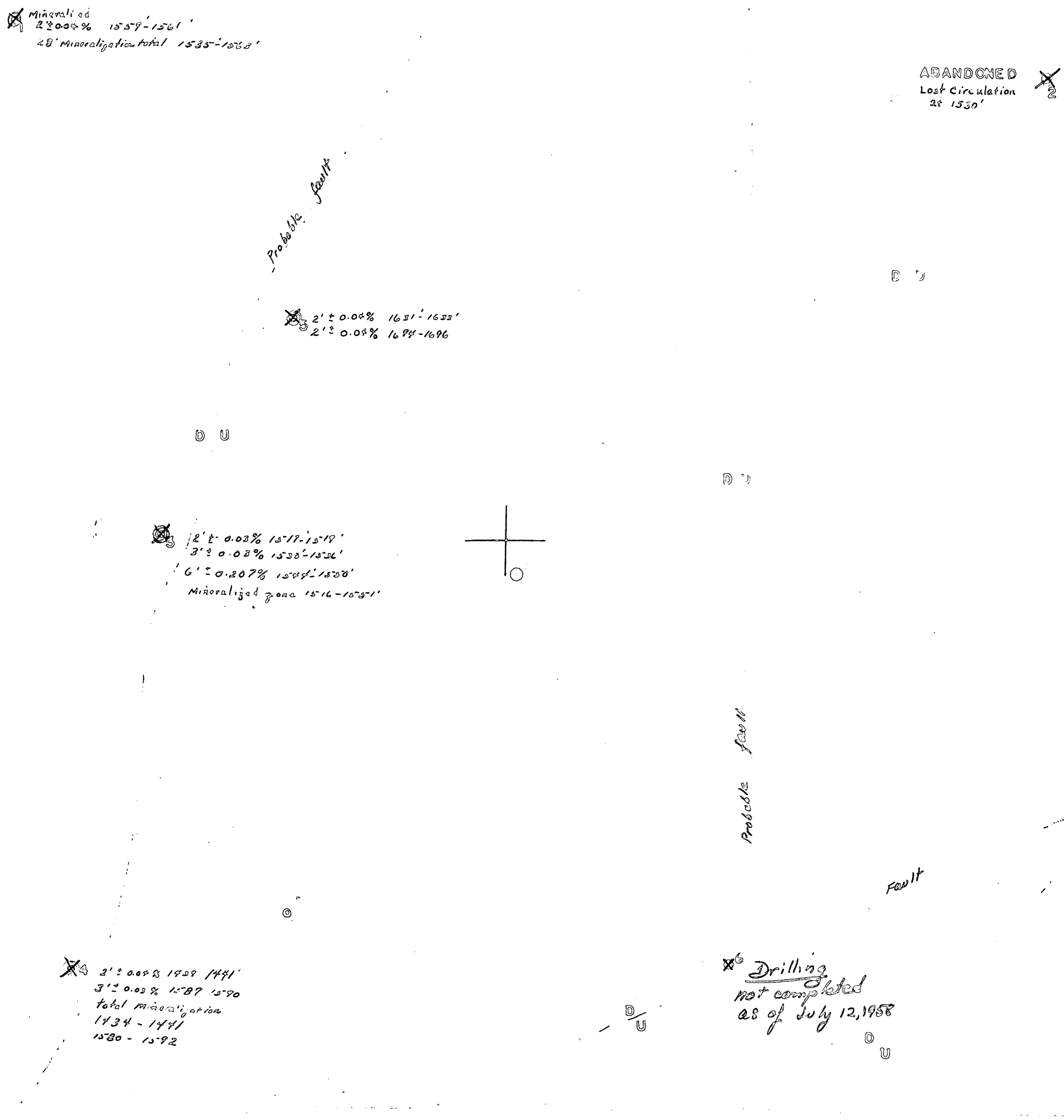
Conclusions and Recommendations:

The information available pertaining to the San Mateo Dome area, within which sec. 16 is situated, lacks sufficient data to indicate that either of the two ore trends might enter the section. Therefore, this Division recommends that application DMEA-4872 be denied without prejudice at this time. If a new application containing more favorable information is presented as a result of some drilling by the Applicant, it should receive consideration.

Ernest Wm. Ellis

Ernest Wm. Ellis, Director
Division of Rare & Misc. Metals

DMEA-4872



RARE METALS CORPORATION OF AMERICA

DMEA-4872

PROJECT U-32

SCALE 1" = 500'

Sperrier Section 16 in 13-8

DMEA Form 7
(5-56)

OFFICIAL FILE COPY

Date	Surname	Code
5/23	Murphy	700
5/23	Ellis	700
5/23	Lethridge	130
"	[illegible]	110
"	[illegible]	100
5/23	Lauer	130
5/23	Killsgaard	130
		220
		225

MAY 26 1958

Mr. M. H. Kline, Vice President
Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City 11, Utah

Re: Docket No. DMEA-4872 (Uranium)
Sec. 16, T. 13 N., R. 8 W., N.M.P.M.
McKinley County, New Mexico

Dear Mr. Kline:

Your application for aid in an exploration project and other information available to us in Washington concerning the above-named property have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of all our information indicates that the probability of disclosing significant ore reserves is not sufficiently promising to justify Government participation. We regret to advise you that, under these circumstances, your application for exploration assistance is denied. Such denial, however, is made without prejudice to the property. In the event a limited amount of drilling on your part discloses new and more favorable geologic evidence that could alter our opinion, we will be pleased to consider a new application.

We wish to thank you for your interest in the Defense Minerals Exploration Program and for bringing your property to our attention.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

FMMurphy/gla/izm
5-23-58 (5-21-58)
cc: Mr. Murphy
Admr.'s Reading File
Operating Committee
THKillsgaard, 5224
DMEA FT Reg. 3 (2)

8623

HMurphy/gle/ian
5-23-58 (5-21-58)
cc: Mr. Murphy
Adm. to Reading File
Operating Committee
Unclassified, 5254
USDA NY Reg. 3 (2)

Form 7
-56)

OFFICIAL FILE COPY

Date	Surname	Code
5/21/58	Murphy	700
5/22	Ellis	700
		130
		110
		100
		220
		225

Mr. M. H. Kline, Vice President
Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City 11, Utah

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Sec. 16, T. 13 N., R. 8 W., N.M.P.M.
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We wish to thank you for your interest in the Defense Minerals Exploration Program and for bringing your property to our attention.

Sincerely yours,

Administrator

FMMurphy/gla
5/21/58
cc to: Admr.'s Reading File
Operating Committee
THKiilsgaard, 5224
Mr. Murphy
DMEA Field Team, Region III (2)

8623

Form 7
(5)

OFFICIAL FILE COPY

Date	Surname	Code
4/18	Murphy	700
4/18	Ellis	700
4-18	Chambers	700
		130
		110
		100
		220
		700

Mr. M. H. Kline, Vice President
Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City 11, Utah

Re: Docket No. DMEA-4872 (Uranium)
Sec. 16, T. 13 N., R. 8 W., N.M.P.M.
McKinley County, New Mexico

Dear Mr. Kline:

This is to acknowledge your letter of April 10, 1958, forwarding the subordination agreements of the sub-lessors.

Copies of a proposed contract to explore the above-referenced property were forwarded to Region III, Field Team today. I have signed the contract subject to the attachment of the Performance Bond mentioned in your letter. The sum of the bond will be $41,063.00, or the Government's 50 percent share of the total costs.

It is suggested that you request our Field Team to forward a copy of the proposed contract to assist you in obtaining the bond. The bond should show the contract number and be dated the same day as the contract.

Two copies of the bond should be forwarded to the Executive Officer, DMEA Field Team, Region III, 224 New Customhouse Building, Denver 2, Colorado. Then, if you and the Field Team have found the proposed contract in order, the Field Team will forward the copies for the corporation's signature.

Sincerely yours,

Administrator

FMMurphy/izm 4-18-58
cc: Mr. Murphy
Admr.'s Reading File
THKiilsgaard, 5224
Operating Committee
DMEA FT Reg. 3 (2)

8623

Form 7
(56)

OFFICIAL FILE COPY

Date	Surname	Code
4/18	Murphy	700
4/18	Ellis	700
4-18	Chamber	800
		136
		110
		100
		2B
		220
		700

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

Re: Docket No. DMEA-4872 (Uranium)
Rare Metals Corporation of America
Sec. 16, T. 13 N., R. 8 W., N.M.P.M.
McKinley County, New Mexico

Dear Mr. Harshman:

Enclosed are the original and four copies of a proposed long-form contract. Attached to each contract form MF-200 are Annex I (1 page), Annex II (1 page), Exhibit "A" (5 pages), map Figure 3, and a MF-205 form signed by the sub-lessors. Also enclosed for Field Team use are two extra copies of Annex I and II, Exhibit "A," and map Figure 3.

The Administrator has signed the proposed contract subject to the attachment of the Performance Bond mentioned in Annex I.

You will note that the Stage I as recommended by the field examiners has been divided into two phases in the proposed contract. The second phase will allow more freedom in locating the additional holes in Stage I to take advantage of any new information developed in the area while the subject application has been under consideration.

If you and the Applicant find the proposed contract in order, please attach the above-mentioned Performance Bond, and insert in Article 3 of the contract form the date work shall commence. Then have an authorized representative of the corporation sign the original and four copies; thereafter, kindly distribute the copies in the usual manner.

Sincerely yours,

Chairman, Operating Committee

Enclosures
APPROVED:

Member, Bureau of Mines

Member, Geological Survey

FMMurphy/izm 4-18-58
cc: Mr. Murphy
Admr.'s Reading File
Operating Committee

THKillsgaard, 5224

8623

Government's copy

MF-200
(Revised June 1954)

Docket No. DMEA 4872

Commodity Uranium

Contract No. Idm-E

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

EXPLORATION PROJECT CONTRACT[1]

It is agreed this ..... day of ....., 195..., between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] Rare Metals Corporation of America, a Delaware corporation, whose mailing address is Tenth Floor, First Security Building, Salt Lake City 11, Utah, 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-200), the attached Exhibit "A," Annex I, ~~and~~ Annex II and a map entitled "Figure 3."

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 New Mexico, County of McKinley, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] Lessee of [5] mineral rights in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] See Annex I, [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: Interests of Lessors and Assignors (See Annex I.)

(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

[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."

of the land (lessor, seller, optionor, etc.), are attached, as follows: Consent to lien and subordination agreement executed by W. T. Old, Jr., and Patricia M. Old, his wife

(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 8, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 8(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of Uranium The work to be performed is described in Exhibit "A." The Operator on or before shall commence the work, and on or before January 1, 1959 (unless the Operator's obligation to prosecute the work is terminated—see Article 10) shall ~~either~~ have completed the work ~~or shall have incurred allowable costs (see Article 6) in an amount not less than the estimated total allowable cost set forth in Exhibit "A"~~, except as otherwise provided in Exhibit "A" with respect to stages of work. See Annex II.

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) *Independent contracts.*—To the extent that the allowable costs are estimated in Exhibit "A" with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed; but if the reference in Exhibit "A" to any such independent contract requires the Government's approval thereof, payments under such contract will not be allowable costs unless the Government gives its written approval of the contract. Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract and regardless of the Government's approval thereof, the Government will participate in payments to the independent contractor only on account of work performed in accordance with the provisions of this exploration project contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) *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.*—The estimated total allowable cost of the project, set forth in Exhibit "A," is the sum of $82,125.00 The Government shall contribute 50 percent of the allowable costs as they are incurred in a total sum not in excess of $41,063.00 (rounded): *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 or not in excess of the amount of the Government's contribution to the cost of property which is or may become subject to disposal as provided in Article 9(c), whichever is greater. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 7(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. "Costs incurred" mean costs that have been paid or have become due and payable, or that in the opinion of the Government have become an obligation. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Estimated costs.*—(a) *Categories of costs.*—The allowable costs of the work to which the Government shall contribute are limited to those that are direct, reasonable, necessary, and that are estimated in Exhibit "A" by categories as specified in this article. If any category or subcategory is omitted from the estimate of costs, or if the word "none" is annexed to the listing thereof, costs under such category or subcategory are not allowable. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost, and any excess over the estimated total allowable cost of the work, shall not be allowable. Any excess over the estimate of any category, subcategory, or item, either as to requirement or related cost, not indicated as a maximum shall be allowable within the limit of the estimated total allowable cost of the work. To the extent that excesses over maximums other than the estimated total allowable cost of the work may be necessary for the performance of the work, the Operator shall incur such excesses for his own account without contribution by the Government; ~~but except for any such necessary excesses in categories, subcategories, or items thereunder the Operator is not obligated to incur more than his agreed percentage of the estimated total allowable cost of the work.~~ See Annex II

To the extent specified in this article or in Exhibit "A" the following categories, subcategories, and elements thereof are maximums; but if not so specified either here or in Exhibit "A" they are not maximums, and may be exceeded within the limit of the estimated total allowable cost of the work:

CATEGORY (1)—INDEPENDENT CONTRACTS.—Work to be performed under independent contracts (see Article 4(b)). The estimated total amount of this category and the estimated cost of each unit of work for performance under an independent contract are maximums.

CATEGORY (2)—PERSONAL SERVICES.

Subcategory (a)—Supervision.—All elements of this subcategory (number of supervisors, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)—Technical services.—All elements of this subcategory (number of technicians, periods of employment, rates of pay, and total) are maximums.

Subcategory (c)—Labor.

CATEGORY (3)—OPERATING MATERIALS AND SUPPLIES.—Includes such items as drill bits and steel, explosives, fuel, pipe, power, small tools costing less than $50 each, timber, track.

CATEGORY (4)—OPERATING EQUIPMENT.

Subcategory (a)—Rental.—The number of each object to be rented [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)—Purchases.—The estimated total of this subcategory is a maximum.

Subcategory (c)—Depreciation.—All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)—INITIAL REHABILITATION AND REPAIRS.—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

Subcategory (a)—Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).—The estimated total of this subcategory is a maximum.

Subcategory (b)—Initial rehabilitation and repairs of operating equipment.—The estimated total of this subcategory is a maximum.

CATEGORY (6)—NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

CATEGORY (7)—MISCELLANEOUS.—Repairs and maintenance (other than initial) of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, communications, and any other items of requirement or cost that do not fall within any of the first 6 categories.

THE ESTIMATED TOTAL ALLOWABLE COST of the work is a maximum.

(b) *Nonallowable costs.*—The following costs are not allowable for contribution by the Government:

(1) *Costs of the land,* such as rental, depreciation, depletion, or other cost of acquiring, owning, or holding possession;

(2) *Indirect costs,* such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) *Previous work* performed or costs incurred before the date of this contract; and

(4) *Deferred payments.*—Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods; unless the purchase agreement is approved by the Government in writing.

(c) *Reductions in costs.*—The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original estimated total cost. This provision does not apply to receipts from production which are subject to the Government's percentage royalty under the provisions of Article 8. See Annex II.

ARTICLE 7. *Reports, accounts, audits.*—(a) *Operator's records.*—The Operator shall keep suitable records and accounts of the 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. If the Government elects to audit said records and accounts relating to the exploration work by certified public accountant, it may do so as a cost of the work to which the Operator shall contribute. 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. If work under this contract is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved 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 detailed costs incurred during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and costs incurred for each type of work; and (3) a Narrative Report of the work 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 related costs incurred.

(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 8. *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 7) 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 therof 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 9. *Interests in purchased property.*—(a) *Title and ownership.*—All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions, although title thereto shall be taken in the name of the Operator.

(b) *Preservation of property.*—Until the final disposal of any property in which the Government has an interest the Operator shall preserve and protect same for the best interest of the Government, any reasonable and necessary costs thereof to be treated as an allowable cost of the project. After the completion of the work or termination of the Government's obligation to contribute, or when such property is not in use for or needed for the work, the Operator shall neither use it without the written consent of the Government nor without paying a reasonable rental to be fixed by the Government for its interest.

(c) *Disposal of property.*—Upon the completion of the work or termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator or the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government the Operator shall not sell at any price any item of property the cost of which was more than $500, and shall not sell at less than 25 percent of the purchase price any item of property which cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or himself cares to give. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, or explosives, or pipe, or rails), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the project.

(d) *Default of the Operator re disposal.*—If within 90 days after the completion of the work or termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, or after such further time as the Government may in writing allow, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may pursue one of the following two courses: (1) the Government, by written notice to the Operator, may place upon such property what in its opinion is a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the

date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; or (2) the Government may enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 10. *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: (1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) 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.

(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: (1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) 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 10 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 11. *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 12. *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 13. *Changes and added provisions.*—
See Annex II.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Administrator, Defense Minerals Exploration Administration

RARE METALS CORPORATION OF AMERICA
(Operator)

By .....

Title .....

I, ..., certify that I am the ..... secretary of the corporation named as Operator herein; that ..... who signed this contract on behalf of the Operator, was then ..... 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.

.....

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—70617-1

Long
Sanger
App'd. Sol. Off.
Murphy
Ellis
Chamberlin

EXPLORATION PROJECT CONTRACT
RARE METALS CORPORATION OF AMERICA
DOCKET NO. DMEA-4872

ANNEX I

The land referred to in Article 2 of the Contract is New Mexico State school land and comprises all of section 16, T. 13 N., R. 8 W., N.M.P.M., McKinley County, New Mexico.

The land was leased to General Uranium Mining Corporation by the State of New Mexico under General Mining Lease No. 60-5445, dated March 28, 1955, which, with the approval of the State Commissioner of Public Lands, was assigned to W. T. Old, Jr., and reassigned by the latter, with the State's approval, to the Operator.

W. T. Old, Jr., retained a 5 percent overriding royalty on production. General Uranium Mining Corporation retained no interest in the land. Copies of all assignments are contained in Docket No. DMEA-4872.

Attached hereto and made part hereof are a Consent to Lien and Subordination Agreement executed by W. T. Old, Jr., and Patricia M. Old, his wife, and a Performance Bond in the sum of $41,063.00, which the Government has accepted in lieu of the owner's consent to lien.

MF-205
(Combines and supercedes MF-201 and MF-203)
June 1956

RECEIVED
APR 17 1958

Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator Rare Metals Corporation of America
Docket No. DMEA- 4872
Contract No. Idm-E Uranium
Contract Date

CONSENT TO LIEN and SUBORDINATION AGREEMENT 1/

To the United States of America:

Referring to that certain land in the County of McKinley, State of New Mexico, described as follows: 2/

sec. 16, T. 13 N., R. 8 W., N.M.P.M.

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom, to secure the payment to the Government of a percentage royalty on production as may be provided for by the Contract;

3. Subordinates the undersigned's right, title, claim, or interest in or against the land and in any production therefrom to the rights of the Government under the contract with respect to royalty on production and liens to secure same;

4. Represents and undertakes that there is no claim, lien, or encumbrance upon the undersigned's right, title, claim, or interest in or against the land other than the following: (If "none" insert the word "none." Do not leave lines blank.)

None

1/ Mining or production from the land is not required, and in the absence of production there is no obligation to pay royalty to the Government.

2/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in Book _____, Page _____, official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

5. Undertakes and agrees (a) neither to commit any act nor assert any claim in conflict with the provisions of this Agreement; and (b) to give advance notice of the Government's rights under this Agreement to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, claim, or interest in or against the land, or any production therefrom furnishing the Government with two copies of such notice; and

6. Consents to all amendments (including an agreement of termination) and assignments of the contract without notice thereof, and undertakes and agrees that this Agreement shall extend and apply thereto.

7. Added provision: _____ (State "None" or "See Annex No.____")

Dated this 17th day of April, 1958.

W. T. Old, Jr.	[Seal]	Box 4095 Santa Fe N.M.	[Address]
Patricia M. Old	[Seal]	" " " "	[Address]
	[Seal]		[Address]
	[Seal]		[Address]
	[Seal]		[Address]
	[Seal]		[Address]

I, _____ certify that I am the _____ _____ (Secretary, etc.) of the corporation named herein; that _____ _____ who signed this agreement was then _____ (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

_____

[Corporate Seal]

EXPLORATION PROJECT CONTRACT
RARE METALS CORPORATION OF AMERICA
DOCKET NO. DMEA-4872

ANNEX II

Article 13. Changes and added provisions.--

(a) That part of the last sentence of Article 3 beginning with the word "either" is deleted and replaced by the words "have completed the work, except as otherwise provided in Exhibit 'A' with respect to stages of work."

(b) That part of the last sentence in the first paragraph of Article 6(a) commencing after the semicolon is deleted.

(c) Categories (2) through (6) of Article 6(a) are deleted.

(d) In addition to the costs of work estimated in Exhibit "A" by categories of actual costs, the costs of work requirements specified in Exhibit "A" as "Fixed Unit Costs" are allowable costs of the project. The Government will contribute to the fixed unit costs as work units are performed. A "Fixed Unit Cost" is an agreed price for each unit of work to be performed regardless of costs incurred by the Operator. Costs set forth in Exhibit "A" include all allowable costs of the work to be performed under the Contract.

(e) In the last sentence of Article 6(c), the words "Article 8" are substituted for the words "Article 9."

(f) Notwithstanding any other provision of the Contract, the allowable unit cost per foot of a drilling item is the average unit cost per foot computed on the basis of all the actual unit costs of said drilling item incurred by the Operator: Provided, That the Government will not contribute to any portion of an average unit cost of a drilling item that exceeds the estimated unit cost of said item set forth in the Contract.

EXPLORATION PROJECT CONTRACT
RARE METALS CORPORATION OF AMERICA
DOCKET NO. DMEA-4872

EXHIBIT "A"

Description of the Work

General Provisions

The object of this project is to explore for uranium ore deposits by non-core and core drilling in the Westwater Canyon member of the Jurassic Morrison formation. It is estimated that drill holes averaging 1,700 feet in depth will be required to penetrate the target horizon.

All holes shall be drilled through the Westwater Canyon member and penetrate not more than 20 feet of the underlying Recapture member of the Morrison formation.

The three holes provided for in Phase A, of Stage I, shall be drilled non-core to within 20 feet of the estimated top of the Westwater Canyon member and then core-drilled from that point. All of the other holes in Stages I and II shall be drilled non-core for their entire depth.

Core recovered shall be tested for radioactivity. Any core showing significant radioactivity shall be split; one half of the split shall be chemically assayed for uranium; the remaining half shall be stored in boxes properly identified as to hole number with markers placed in the core sections to indicate the depth represented.

Cuttings from the non-core portions of all holes shall be sampled at intervals not to exceed 5 feet and tested for radioactivity. Samples showing significant radioactivity shall be split. One half of the split shall be chemically assayed and the other half shall be stored

in a suitable container properly identified as to drill hole number and the depth interval that the sample represents.

The stored samples are for Government inspection and possible use. With Government approval the Operator may dispose of the stored samples.

Core and cuttings recovered from the drill holes shall be logged geologically. Gamma-ray and resistivity logs of each hole shall be made as soon as possible after completion of the hole. Records of such logging, together with the assay certificates of the core and cuttings samples, shall be submitted with the Operator's monthly progress report. The monthly report shall also include a map or sketch showing the location of all holes drilled during the reporting period.

The Government will not contribute to the cost of an incomplete hole, a hole that cannot be probed for radioactivity and resistivity, or a hole that is closer than 200 feet to the boundary of the project area.

The Operator shall provide a full-time supervisor and such other technical services and labor as are required to complete the project work.

All bulldozer work shall be performed with a D-7 Caterpillar dozer or an equivalent unit of any other make.

The locations, directions, and extent of all work under this Contract are subject to Government approval.

The work is divided into two stages. The Operator shall perform all of the work in Phase A of Stage I, and as much of Phase B of Stage I and of Stage II as are approved in writing in advance by the Government.

Stage I

Phase A. Prepare access roads and drill sites, and drill three (3) holes which will be cored through

the Westwater Canyon member as described in General Provisions. The holes shall be drilled at the approximate locations marked "X-core," shown on the map entitled, "Figure 3.--Plan Map of Section 16, T. 13 N., R. 8 W., . . . Showing the Proposed Location of Stage I Drill Holes."

Upon completion of Phase A, the Government shall be furnished all information relating to each hole drilled, including geologic logs, probing results, and chemical assay certificates.

Phase B. Prepare access roads and drill sites, and drill not in excess of twelve (12) holes at the locations marked X on map, Figure 3. The locations of the holes as shown are tentative and may be changed with prior written Government approval. No hole drilled in Stage I shall be closer than 1,000 feet to any other hole drilled in this stage.

It is estimated that 30 hours of bulldozer time, 24,900 feet of non-core and 600 feet of core drilling, 60 core boxes, 25,500 feet of Gamma-ray and resistivity logging, 15 hours of standby time for probing, and chemical analyses for the uranium content of 30 samples will be required to complete Stage I. However, in the event that these estimates are insufficient, then with previous written Government approval additional units of work and funds may be transferred and deducted from Stage II.

Stage II

Prepare access roads and drill sites, and drill not more than fifteen (15) non-core holes as offsets to any previously drilled holes that have penetrated significant mineralization in the potential ore-bearing sandstones.

No hole drilled in Stage II shall be less than 250 feet nor more than 500 feet from any hole drilled under this Contract.

Stage II work shall not exceed 30 hours of bulldozer time, 25,500 feet of non-core drilling, 25,500 feet of Gamma-ray and resistivity logging, 15 hours of standby time for probing, and the chemical analyses for the U_3O_8 content of 30 samples.

Estimated Costs of the Project

Stage I - 15 holes

Actual Costs

Category (1) Independent Contracts

Bulldozing access roads and drill sites, 30 hours @ $15.30/hr.	$459.00	
Drilling, non-core, 24,900 feet @ $1.30/ft.	32,370.00	
Drilling, core, 600 feet @ $7.14/ft.	4,284.00	
Standby time, 15 hours @ $10.20/hr.	153.00	
Logging (Gamma ray, resistivity) 25,500 feet @ $0.102/ft.	2,601.00	$39,867.00

Categories (2) through (6)

None

Category (7) Miscellaneous

None except:

60 core boxes @ $1.25 each	$75.00	
Chemical analyses for U_3O_8 content of 30 samples @ $3.50/sample	105.00	$180.00

Fixed Unit Costs (See Article 13)

Incidental allowance 1/ for each foot of drill hole completed, 25,500 feet @ $0.11/ft.	$2,805.00	$2,805.00

Total Estimated Cost Stage I $42,852.00

Stage II - 15 holes

Actual Costs

Category (1) Independent Contracts

Bulldozing access roads and drill sites, 30 hours @ $15.30/hr.	$459.00	

Drilling, non-core, 25,500 feet @ $1.30/ft.	$33,150.00	
Standby time, 15 hours @ $10.20/hr.	153.00	
Logging (Gamma ray, resistivity) 25,500 feet @ $0.102/ft.	2,601.00	$36,363.00
Categories (2) through (6) None		
Category (7) Miscellaneous		
None Except: Chemical analyses for U_3O_8 content of 30 samples @ $3.50/sample	$105.00	$105.00
Fixed Unit Costs (See Article 13)		
Incidental allowance 1/ for each foot of drill hole completed, 25,500 feet @ $0.11/ft.	$2,805.00	$2,805.00
Total Estimated Cost Stage II		$39,273.00

SUMMARY

Total Estimated Cost Stage I	$42,852.00	
Total Estimated Cost Stage II	$39,273.00	
Total Estimated Cost of Project		$82,125.00
Government Participation @ 50% (rounded)		$41,063.00

1/ Includes all costs whatsoever that might otherwise have been allowable costs of the Contract under Categories (2) through (6) of Article 6(a) which have been deleted from this Contract.

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
MARCH 1958
DOCKET 4072

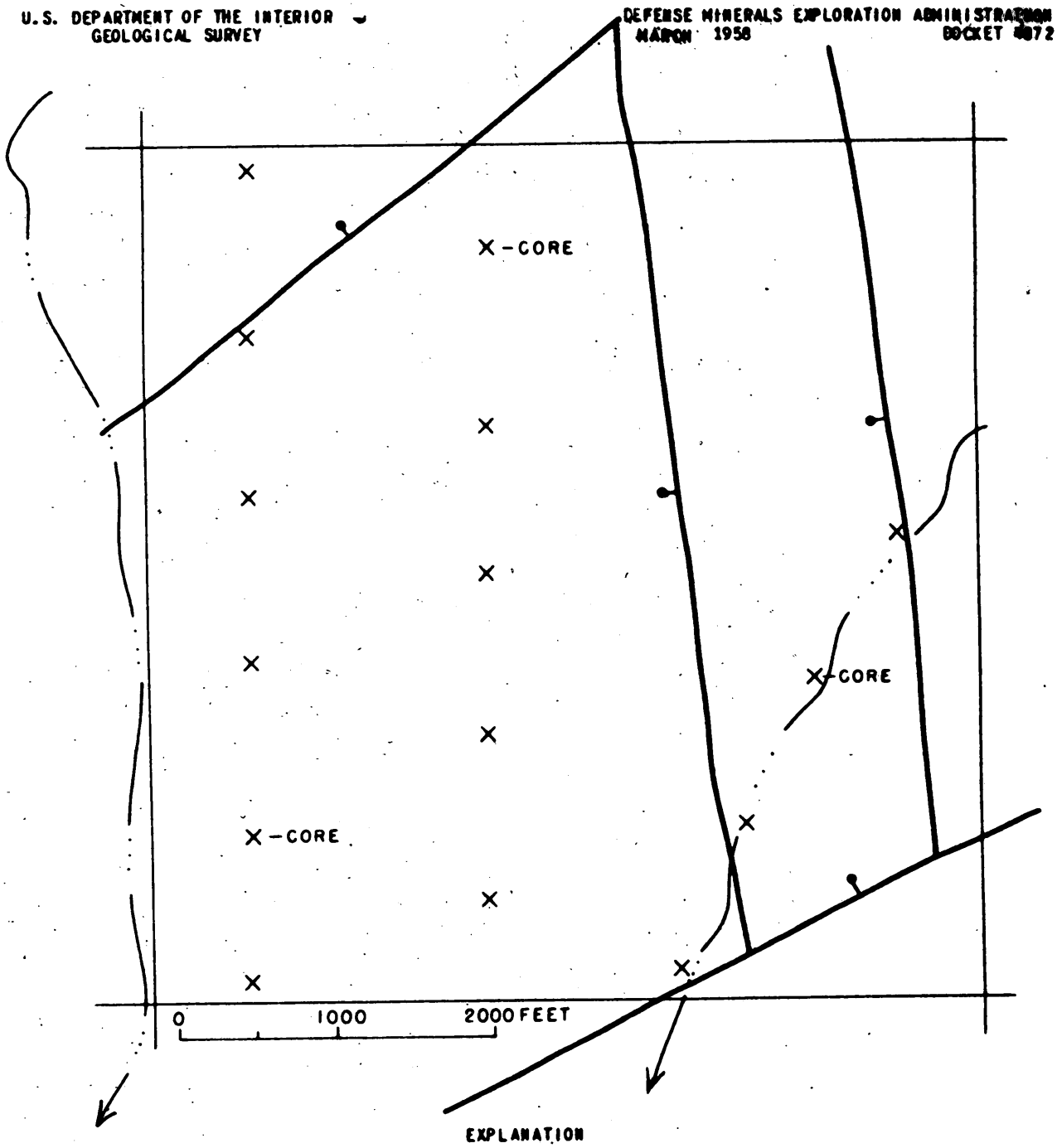


Figure 3.--PLAN MAP OF SECTION 16, T. 13 N., R. 8 W., RARE METALS CORPORATION OF AMERICA, MCKINLEY COUNTY, NEW MEXICO, SHOWING THE PROPOSED LOCATION OF STAGE I DRILL HOLES.

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 13 1958
5/13 C 220 700

IN REPLY REFER TO:

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

May 12, 1958

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

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

Subject: Supplementary information, DMEA 4872 (Uranium) Rare Metals Corporation of America, Sec. 16, T.13N., R.8W., McKinley County, New Mexico

In an effort to supplement his application the applicant has submitted new information consisting of maps showing known ore bodies and previous drilling in the vicinity of his land, and radiometric logs of drill holes in the vicinity.

After field examination, the examining team recommended approval of a DMEA contract that would provide for an exploration drilling project on the applicant's property. There does not, however, appear to be full accord with the merits of the property. There are several favorable features which might be enumerated:

1. Exploratory drilling on Section 9 immediately north of the applicant's Section 16 indicates that the characteristics of the potential ore zone, the Westwater Canyon member, are locally favorable. No drilling has been done on the applicant's property.

2. Ore deposits in the Ambrosia Lake area seem to be trending toward the north part of the applicant's land section. ?

3. Significant ore deposits are known north and south of the applicant's property.

4. Previously drilled holes immediately north and east of the applicant's land section are favorable and mineralized.

5. While it is true that drilling depths would be great, on the other hand, the size of the potential ore bodies is great.

DMEA FORM 6

REFERENCE SLIP

REV. 12-56 DEFENSE MINERALS EXPLORATION ADMINISTRATION

TO:

	INITIALS	DATE
1. Mr. Frank Johnson, Rm. 4460		5/13
2. Mr Selfridge		120
3.		
4.		
5.		

FROM: Ernest Wm. Ellis

FOR: Check items for action desired

___ Action
___ Approval
___ Comment
___ Conference
___ Instructions
___ Reply for signature of
___ Investigate
___ Recommendations
___ Rewrite
___ Your information
___ Surname
___ Signature
___ File

REMARKS:

For review and recommendations

Will discuss

INT.-DUP. SEC., WASH., D.C.

M8278

Study of all available information has led the examining team to conclude that there is a reasonable possibility of discovering large deposits of uranium ore at depths averaging 1,700 feet on the subject property. I find myself in agreement with the findings and recommendations of the examining team and recommend approval of a DMEA contract that would provide for a drilling project as outlined in the examining team's report.

W. P. Williams

W. P. Williams

RARE METALS CORPORATION OF AMERICA

TEXAS STREET AT STANTON • POST OFFICE BOX 1492 • EL PASO, TEXAS

ADDRESS REPLY TO:
TENTH FLOOR, FIRST SECURITY
SALT LAKE CITY 11, UTAH

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 7 1958

DATE	INITIALS	CODE
5/7	C	220
"	FAM	700

May 5, 1958

Mr. C. O. Mittendorf
Administrator
Defense Minerals Exploration
U. S. Department of the Interior
Washington 25, D. C.

Re: Docket DMEA-4872,
Rare Metals Corp.
McKinley County, New Mexico

Dear Mr. Mittendorf:

Under separate cover we are air mailing some additional data to supplement our application for DMEA assistance on the subject property which we trust will be of value to you in considering our application. We believe that the presence of a thick section of favorable Westwater sandstone under this property, as shown by drilling on adjacent properties, is quite significant. With great thicknesses of the favorable Westwater sands already proven and logged on three sides of Section 16, it seems pretty obvious that this formation must underlie the Section and encourages drilling in the area. Some of these drill holes showed mineralization of near ore grade.

The supplemental data being forwarded to you are as follows:

1. Map of Ambrosia Lake District showing principal ore bodies and sections upon which DMEA loans have been granted.

2. Drilling map showing the location of holes drilled by other companies in the vicinity of the subject property. The thickness of the favorable Poison Canyon or Westwater sandstone members is shown for each hole.

   It should be noted that in a number of the holes the shale parting that usually separates the Poison Canyon and Westwater is missing, resulting in a thick, continuous sand member similar to that which contains the largest ore bodies in the Ambrosia Lake area.

Items 2 + 3 in folder

3. Copies of drill logs for most of the holes shown on the drilling map.

The Atomic Energy Commission is familiar with all exploration in this vicinity. It was suggested by Harold D. Wolfe, chief geologist of the Grants office of the AEC, that, if additional information as to the presence of a favorable sands such as the Westwater is required by the DMEA in the immediate vicinity of the subject application, the DMEA should contact that office of the AEC and information in addition to that being supplied by us could be made available to you.

If you require or need any additional information, we would welcome the opportunity to discuss any of these matters with you.

Very truly yours,

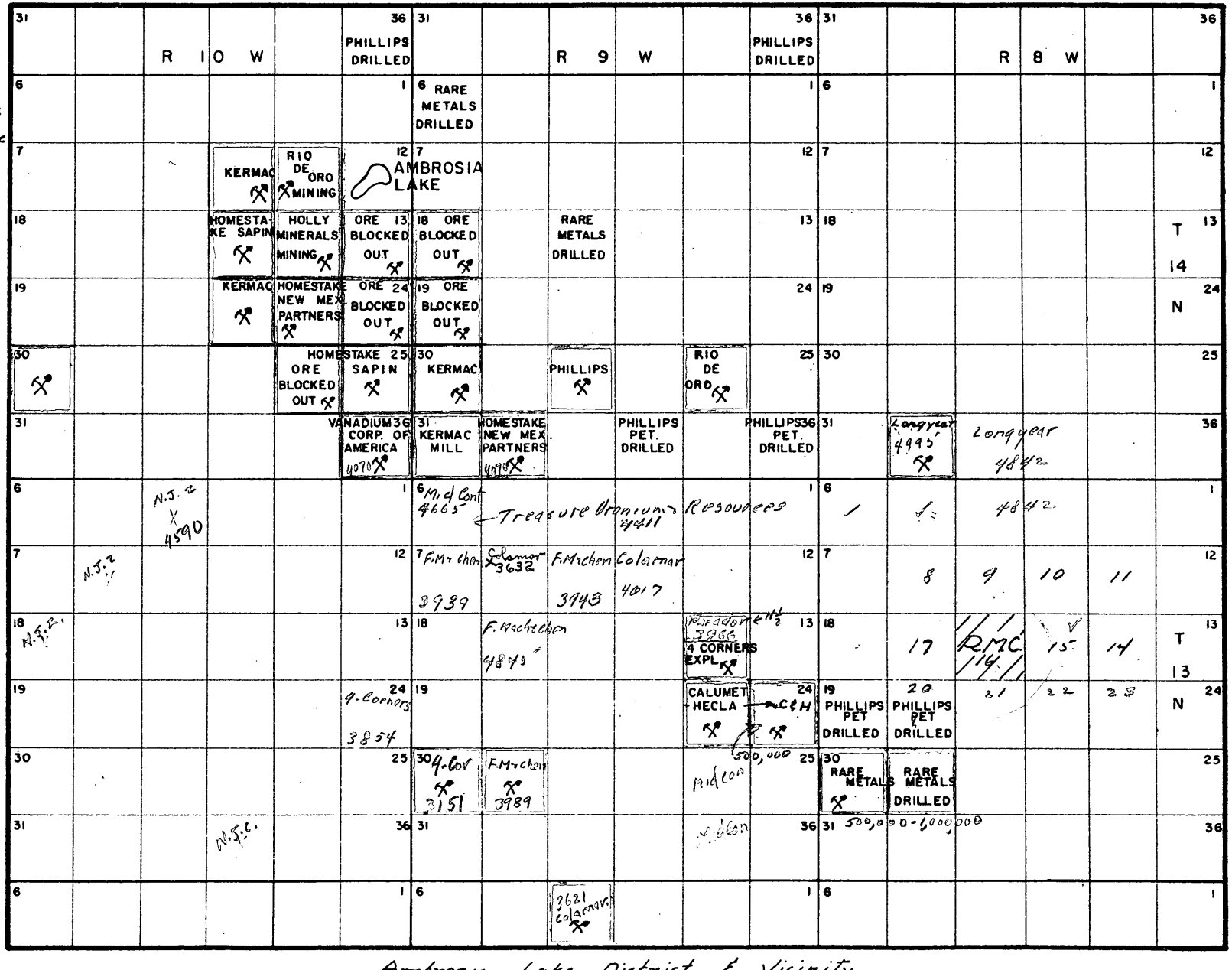
M H Kline

M. H. Kline
Vice President

MHK:JRR:ak

LEGEND

- Sections in which DMEA Loans have been granted.
- Rare Metals Section for which DMEA Loan is Requested.
- Know Ore Bodies



Ambrosia Lake District & Vicinity
McKinley & Valencia Co, New Mexico
Based on Map Published In Uranium Information 12/10/57

RARE METALS CORPORATION OF AMERICA

TEXAS STREET AT STANTON • POST OFFICE BOX 1492 • EL PASO, TEXAS

ADDRESS REPLY TO:
TENTH FLOOR, FIRST SECURITY BLDG.
SALT LAKE CITY 11, UTAH

April 14, 1958

DMEA
RECEIVED APR 17 1958

DATE	INITIALS	CODE
4/17	C	220

Mr. C. O. Mittendorf
Administrator
Defense Minerals Exploration
Administration
U. S. Department of Interior
Washington 25, D. C.

Dear Mr. Mittendorf:

As requested in your letter of April 1, 1958, regarding Docket No. DMEA-4872 (Uranium), I am attaching five copies of the subordination agreement executed by W. T. Old, Jr., and Patricia M. Old, his wife.

As I mentioned in my letter to you of April 10, I shall await your advice regarding the approval of our application and the amount of the loan to be granted so that Rare Metals can obtain the bond required under the terms of the contract.

Very truly yours,

M H Kline

M. H. Kline
Vice President

MHK:ak

Enclosures

RARE METALS CORPORATION OF AMERICA

TEXAS STREET AT STANTON • POST OFFICE BOX 1492 • EL PASO, TEXAS

ADDRESS REPLY TO:
TENTH FLOOR, FIRST SECURITY BLDG.
SALT LAKE CITY 11, UTAH

April 10, 1958

OFFICIAL FILE COPY
DMEA
RECEIVED APR 14 1958

DATE	INITIALS	CODE
9/15	D	220
"	[illegible]	700

Mr. C. O. Mittendorf
Administrator
Defense Minerals Exploration
Administration
U. S. Department of Interior
Washington 25, D. C.

Dear Mr. Mittendorf:

Reference is made to your letter of April 1, 1958, regarding Docket No. DMEA-4872 (Uranium), Sec. 16, T. 13 N., R. 8 W., N.M.P.M., McKinley County, New Mexico.

I have contacted the officers of the El Paso Natural Gas Company regarding the suggested third-party guaranty to the preceeding DMEA loan. The El Paso Company prefers to have Rare Metals make the required guaranty by a bonding company. Under these circumstances, I am returning to you the Guaranty of Royalty forms submitted with your letter.

In the meantime, we will obtain the subordination agreements requested in your letter.

It will be appreciated if you will continue to process our application and advise us the amount of the loan that has been granted so that the bond required can be obtained.

Your cooperation in this matter is very much appreciated.

Very truly yours,

MHKline

M. H. Kline
Vice President

MHK:ak

Enclosure

Mr. Selfridge -

Possible pinchout favorable formation.

Projected ore trends miss property entirely.

No work performed on property.

Closest drilling is more unfavorable than favorable in light of ore trend.

Phase A of Stage I is work that should be done by applicant before applying to DMEA.

Denial without prejudice is more consistent with DMEA policy.

FEJohnson. OK

DRAFT
FMMurphy/izm
4-2-58

MF-200
(Revised June 1954)

Docket No. DMEA 4872

Commodity Uranium

Contract No. Idm-E

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

EXPLORATION PROJECT CONTRACT[1]

It is agreed this ..... day of ....., 195...., between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] Rare Metals Corporation of America, incorporated in the State of California.,

whose mailing address is Tenth Floor, First Security Building Salt Lake City 11, Utah,

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-200), 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 New Mexico, County of McKinley, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] Lessee of [5] mineral rights in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] seeAnnex I, [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: Interests of Lessors, see Annex I

(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

[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."

of the land (lessor, seller, optionor, etc.), are attached, as follows: .....

.....

.....

(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 8, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 8(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of Uranium The work to be performed is described in Exhibit "A." The Operator on or before ..... shall commence the work, and on or before January 1, 1959 (unless the Operator's obligation to prosecute the work is terminated—see Article 10) shall ~~either have completed the work or shall have incurred costs in excess of Article 6 (b) (1) but less than the estimated total allowable cost set forth in~~ See Annex II

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) *Independent contracts.*—To the extent that the allowable costs are estimated in Exhibit "A" with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed; but if the reference in Exhibit "A" to any such independent contract requires the Government's approval thereof, payments under such contract will not be allowable costs unless the Government gives its written approval of the contract. Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract and regardless of the Government's approval thereof, the Government will participate in payments to the independent contractor only on account of work performed in accordance with the provisions of this exploration project contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) *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.*—The estimated total allowable cost of the project, set forth in Exhibit "A," is the sum of $82,125.00 The Government shall contribute 50 percent of the allowable costs as they are incurred in a total sum not in excess of $41,063.00 (rounded) : *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 or not in excess of the amount of the Government's contribution to the cost of property which is or may become subject to disposal as provided in Article 9(c), whichever is greater. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 7(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. "Costs incurred" mean costs that have been paid or have become due and payable, or that in the opinion of the Government have become an obligation. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Estimated costs.*—(a) *Categories of costs.*—The allowable costs of the work to which the Government shall contribute are limited to those that are direct, reasonable, necessary, and that are estimated in Exhibit "A" by categories as specified in this article. If any category or subcategory is omitted from the estimate of costs, or if the word "none" is annexed to the listing thereof, costs under such category or subcategory are not allowable. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost, and any excess over the estimated total allowable cost of the work, shall not be allowable. Any excess over the estimate of any category, subcategory, or item, either as to requirement or related cost, not indicated as a maximum shall be allowable within the limit of the estimated total allowable cost of the work. To the extent that excesses over maximums other than the estimated total allowable cost of the work may be necessary for the performance of the work, the Operator shall incur such excesses for his own account without contribution by the Government; ~~but except for any such necessary excesses in categories, subcategories, or items thereunder the Operator is not obligated to incur more than his agreed percentage of the estimated total allowable cost of the work.~~ see Annex II

To the extent specified in this article or in Exhibit "A" the following categories, subcategories, and elements thereof are maximums; but if not so specified either here or in Exhibit "A" they are not maximums, and may be exceeded within the limit of the estimated total allowable cost of the work:

CATEGORY (1)—INDEPENDENT CONTRACTS.—Work to be performed under independent contracts (see Article 4(b)). The estimated total amount of this category and the estimated cost of each unit of work for performance under an independent contract are maximums.

CATEGORY (2)—PERSONAL SERVICES.

Subcategory (a)—Supervision.—All elements of this subcategory (number of supervisors, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)—Technical services.—All elements of this subcategory (number of technicians, periods of employment, rates of pay, and total) are maximums.

Subcategory (c)—Labor.

CATEGORY (3)—OPERATING MATERIALS AND SUPPLIES.—Includes such items as drill bits and steel, explosives, fuel, pipe, power, small tools costing less than $50 each, timber, track.

CATEGORY (4)—OPERATING EQUIPMENT.

Subcategory (a)—Rental.—The number of each object to be rented [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)—Purchases.—The estimated total of this subcategory is a maximum.

Subcategory (c)—Depreciation.—All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)—INITIAL REHABILITATION AND REPAIRS.—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

Subcategory (a)—Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).—The estimated total of this subcategory is a maximum.

Subcategory (b)—Initial rehabilitation and repairs of operating equipment.—The estimated total of this subcategory is a maximum.

CATEGORY (6)—NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).—Estimates under this category include all requirements and related costs, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The estimated total of this category is a maximum.

CATEGORY (7)—MISCELLANEOUS.—Repairs and maintenance (other than initial) of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, communications, and any other items of requirement or cost that do not fall within any of the first 6 categories.

THE ESTIMATED TOTAL ALLOWABLE COST of the work is a maximum.

(b) *Nonallowable costs.*—The following costs are not allowable for contribution by the Government:

(1) *Costs of the land,* such as rental, depreciation, depletion, or other cost of acquiring, owning, or holding possession;

(2) *Indirect costs,* such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) *Previous work* performed or costs incurred before the date of this contract; and

(4) *Deferred payments.*—Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods; unless the purchase agreement is approved by the Government in writing.

(c) *Reductions in costs.*—The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original estimated total cost. This provision does not apply to receipts from production which are subject to the Government's percentage royalty under the provisions of Article 18. **See Annex II**

ARTICLE 7. *Reports, accounts, audits.*—(a) *Operator's records.*—The Operator shall keep suitable records and accounts of the 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. If the Government elects to audit said records and accounts relating to the exploration work by certified public accountant, it may do so as a cost of the work to which the Operator shall contribute. 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. If work under this contract is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved 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 detailed costs incurred during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and costs incurred for each type of work; and (3) a Narrative Report of the work 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 related costs incurred.

(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 8. *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 7) 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 therof 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 9. *Interests in purchased property.*—(a) *Title and ownership.*—All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions, although title thereto shall be taken in the name of the Operator.

(b) *Preservation of property.*—Until the final disposal of any property in which the Government has an interest the Operator shall preserve and protect same for the best interest of the Government, any reasonable and necessary costs thereof to be treated as an allowable cost of the project. After the completion of the work or termination of the Government's obligation to contribute, or when such property is not in use for or needed for the work, the Operator shall neither use it without the written consent of the Government nor without paying a reasonable rental to be fixed by the Government for its interest.

(c) *Disposal of property.*—Upon the completion of the work or termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator or the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government the Operator shall not sell at any price any item of property the cost of which was more than $500, and shall not sell at less than 25 percent of the purchase price any item of property which cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or himself cares to give. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, or explosives, or pipe, or rails), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the project.

(d) *Default of the Operator re disposal.*—If within 90 days after the completion of the work or termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, or after such further time as the Government may in writing allow, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may pursue one of the following two courses: (1) the Government, by written notice to the Operator, may place upon such property what in its opinion is a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the

date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; or (2) the Government may enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 10. *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: (1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) 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.

(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: (1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) 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 10 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 11. *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 12. *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 13. *Changes and added provisions.*—

See Annex II

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By .....

.....
(Operator)

By .....

.....

I, ..., certify that I am the ..... secretary of the corporation named as Operator herein; that ..... who signed this contract on behalf of the Operator, was then ..... 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.

.....

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—70617-1

EXPLORATION PROJECT CONTRACT
RARE METALS CORPORATION OF AMERICA
DOCKET NO. IMEA-4872

ANNEX I

The land referred to in Article 2 of the contract is State school land and consists of section 16, T. 13 N., R. 8 W., N.M.P.M., McKinley County, New Mexico.

The land was conveyed to General Uranium Mining Corporation by the State of New Mexico under General Mining Lease No. 60-5445, dated March 28, 1955.

On January 19, 1956, the Commissioner of Public Lands approved the assignment of the lease to W. T. Old, Jr.

On April 6, 1957, W. T. Old, Jr., assigned the lease to Rare Metals Corporation of America, retaining a 5 percent overriding royalty on production. The assignment was approved on April 18, 1957, by the Commissioner of Public Lands.

Attached hereto and made part hereof are a Consent to Lien and Subordination Agreement signed by W. T. Old, Jr., and Patricia M. Old, his wife; and a Guaranty of Royalty, signed by El Paso Natural Gas Company, which the Government accepts in lieu of the owner's consent to lien.

General Uranium Mining Corporation retained no interest in the land under its assignment to W. T. Old, Jr.

ANNEX II

(a) That part of the last sentence of Article 3 beginning with the word "either" is deleted and replaced by the words "have completed the work, except as otherwise provided in Exhibit 'A' with respect to stage of work."

(b) That part of the last sentence in the first paragraph of Article 6(a) commencing after the semicolon is deleted.

(c) Categories (2) through (6) of Article 6(a) are deleted.

(d) In addition to the costs of work estimated in Exhibit "A" by categories of actual costs, the costs of work requirements specified in Exhibit "A" as "Fixed Unit Costs" are allowable costs of the project. The Government will contribute to the fixed unit costs as work units are performed. A "Fixed Unit Cost" is an agreed price for each unit of work to be performed regardless of costs incurred by the Operator. Costs set forth in Exhibit "A" include all allowable costs of the work to be performed under the Contract.

(e) In the last sentence of Article 6(c), the words "Article 8" are substituted for the words "Article 9."

(f) Notwithstanding any other provision of the Contract, the allowable unit cost per foot of a drilling item is the average unit cost per foot computed on the basis of all the actual unit costs of said drilling item incurred by the Operator: <u>Provided</u>, That the Government will not contribute to any portion of an average unit cost of a drilling item that exceeds the estimated unit cost of said item set forth in the contract.

EXPLORATION PROJECT CONTRACT
RARE METALS CORPORATION OF AMERICA
DOCKET NO. DMEA-4872

EXHIBIT "A"

Description of the Work

General Provisions:

The object of this project is to explore for uranium ore deposits in the Westwater Canyon member of the Jurassic Morrison formation by non-core and core drilling. It is estimated that drill holes averaging 1,700 feet in depth will be required to penetrate the target horizon.

All holes shall penetrate the Westwater Canyon member and end in not more than 20 feet of the underlying Recapture member of the Morrison formation.

Core drilling, in the three holes mentioned in Phase A, Stage I, shall be drilled non-core to within 20 feet of the estimated top of the Westwater Canyon member and then core-drilled from that point. The other holes in Stage I and II will be drilled non-core for their entire depth.

Core recovered shall be tested for radioactivity. Any core showing significant radioactivity shall be split, the Operator using one-half for chemical assay purposes; the other half shall be stored in boxes properly identified as to hole number and with markers placed in the core sections to indicate the depth represented.

Samples of the cuttings from the non-core portions of all holes shall be taken at not more than 5-foot intervals and tested for radioactivity. Cuttings samples showing significant radioactivity shall be split, the Operator using one-half for chemical assay

purposes; the other half shall be stored in a suitable container properly identified as to drill hole number and the depth interval that the sample represents.

The stored core and cuttings are for Government inspection and possible use. With Government approval the Operator may dispose of the stored coreand cuttings.

Core and cuttings recovered from the drill holes shall be logged geologically. Gamma-ray and resistivity logs of each hole shall be made as soon as possible after completion of the hole. Records of such logging, together with the assay certificates of the core and cuttings samples, shall be submitted with the Operator's monthly progress report. The monthly report shall also include a map or sketch showing the location of all holes drilled during the reporting period.

The Government will not participate in the cost of an incomplete hole, a hole that cannot be probed for radioactivity and resistivity, or a hole that is closer than 200 feet to the outer boundary of the project area.

The Operator shall provide a full-time supervisor and such other technical services and labor as are required to complete the project work.

All bulldozer work shall be done with a D-7 dozer or an equivalent unit of any other make.

The locations, directions, and extent of all work under this contract are subject to Government approval.

The work is divided into two stages. The Operator shall perform all the work in Phase A of Stage I, and as much of Phase B of Stage I and [redacted] as much of Stage II as are approved of in advance in writing by the Government.

Stage I

Phase A shall consist of preparing access roads and drill sites, and drilling three (3) holes which will be cored through the Westwater Canyon member as described under General Provisions. The holes shall be drilled at the approximate locations marked X-core, shown on the map entitled "Figure 3.-Plan Map of Section 16, T. 13 N., R. 8 W., ----, Showing the Proposed Location of Stage I Drill Holes."

Upon completion of Phase A, the Government shall be furnished all information relating to each hole drilled. The information shall include geologic logs, probing results, and chemical assay certificates.

Phase B shall consist of preparing access roads and drill sites, and drilling not in excess of twelve (12) holes at the locations marked X on map Figure 3. The locations of the holes as shown are tentative and may be changed with prior written Government approval. No hole drilled under Stage I shall be closer than 1,000 feet to any other drilled in this stage.

It is estimated that 30 hours of bulldozer time, 24,900 feet of non-core and 600 feet of core drilling, 60 core boxes, 25,500 feet of Gamma-ray and resistivity logging, 15 hours of standby time for probing, and that chemical analyses for the uranium content of 30 samples will be required to complete Stage I. However, if these estimates are too low, then with previous written Government approval a part of the units of work and their costs may be used from those allowed in Stage II, with corresponding reductions in that stage.

Fixed Unit Costs (See Article 13)

Incidental allowance[1] for each foot of drill hole completed, 25,500 feet @ $0.11/ft.	2,805.00	2,805.00
Total Estimated Cost Stage I		$42,852.00

Stage II - 15 holes

Actual Costs

Category (1) Independent Contracts

Bulldozing access roads and drill sites, 30 hrs. @ $15.30/hr.	459.00	
Drilling, non-core, 25,500 ft. @ $1.30/ft.	33,150.00	
Standby time, 15 hrs. @ $10.20/hr.	153.00	
Logging (Gamma ray, resistivity) 25,500 ft. @ $0.102/ft.	2,601.00	$36,363.00
Categories (2) through (6)	None	

Category (7) Miscellaneous

None except:

Chemical analyses for U_3O_8 content of 30 samples @ $3.50/sample	105.00	105.00

Fixed Unit Costs: (See Article 13)

Incidental allowance[1] for each foot of drill hole completed, 25,500 ft. @ $0.11/ft.	2,805.00	2,805.00
Total Estimated Cost Stage II		$39,273.00

S U M M A R Y

Total Estimated Cost Stage I	$42,852.00
Total Estimated Cost Stage II	$39,273.00
Total Estimated Cost of Project	$82,125.00
Government Participation @ 50% (rounded)	$41,063.00

1/ Includes all costs whatsoever that might otherwise have been allowable costs of the contract under Categories (2) through (6) of Article 6(a) which have been deleted from this contract.

Stage II

The work shall consist of preparing access roads and drill sites, and drilling not more than fifteen (15) non-core holes to offset any previously drilled holes that have penetrated significantly mineralized intervals in the potential ore-bearing sandstones.

* Stage II work shall not exceed 30 hours of bulldozer time, 25,500 feet of non-core drilling, 25,500 feet of Gamm-ray and resistivity logging, 15 hours of standby time for probing, and the chemical analyses for the U_3O_8 content of 30 samples.

* Insert: No hole drilled in Stage II shall be less than 250 feet nor more than 500 feet from any hole drilled under this contract.

Estimated Costs of the Project

Stage I - 15 holes

Actual Costs

Category (1) Independent Contracts		
Bulldozing access roads & drill sites, 30 hrs. @ $15.30/hr.	459.00	
Drilling, non-core, 24,900 ft. @ $1.30/ft.	32,370.00	
Drilling, core, 600 ft. @ $7.14/ft.	4,284.00	
Standby time, 15 hrs. @ $10.20/hr.	153.00	
Logging (Gamma ray, resistivity) 25,500 ft. @ $0.102/ft.	2,601.00	$39,867.00
Categories (2) through (6)	None	
Category (7) Miscellaneous		
None except:		
60 core boxes @ $1.25 each	$75.00	
Chemical analyses for U_3O_8 content of 30 samples @ $3.50/sample	105.00	180.00

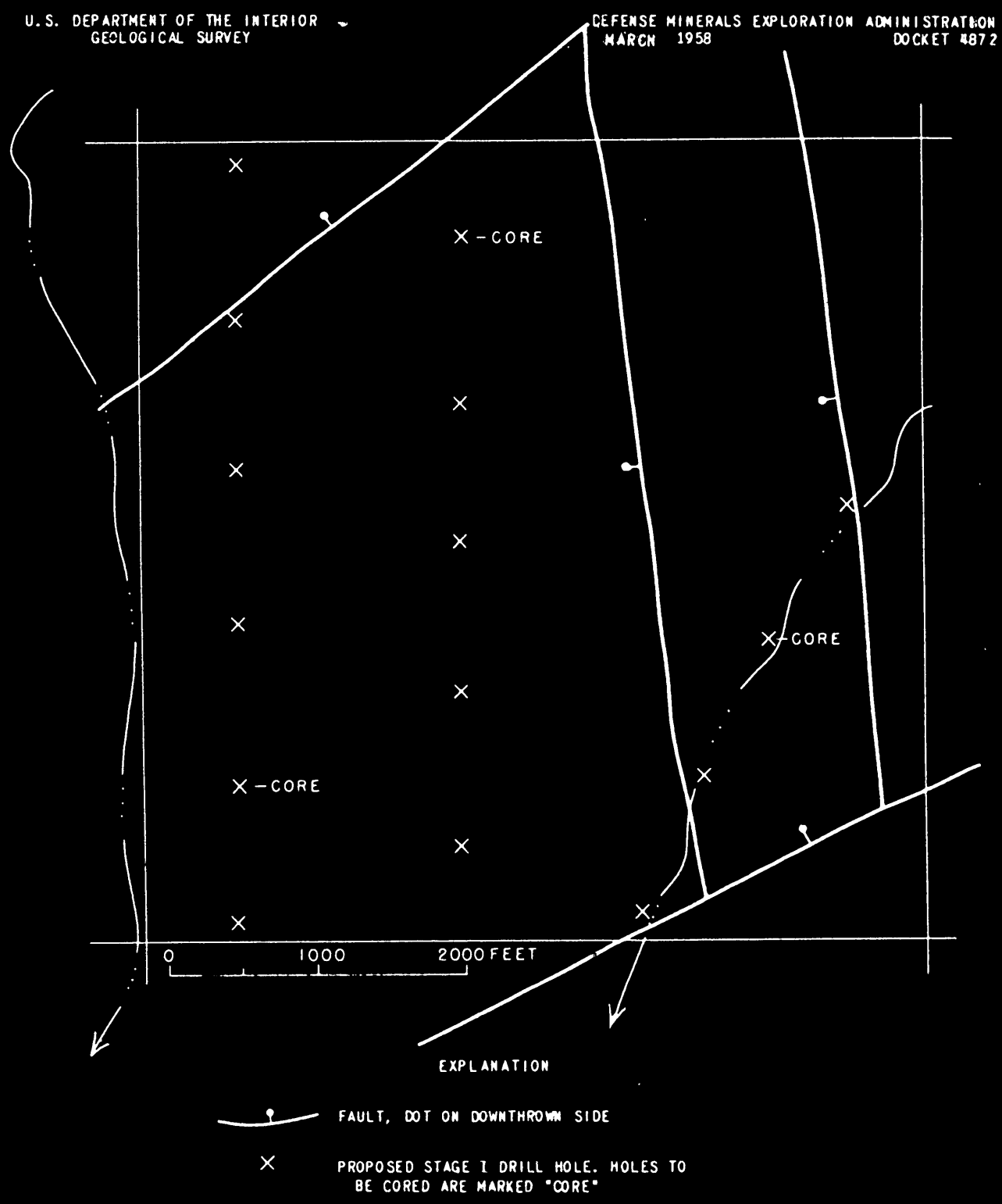


Figure 3.--PLAN MAP OF SECTION 16, T. 13 N., R. 8 W., RARE METALS CORPORATION OF AMERICA, McKINLEY COUNTY, NEW MEXICO, SHOWING THE PROPOSED LOCATION OF STAGE I DRILL HOLES.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
3/27/58	Murphy	700
3/31	Ellis	700
		140
4/1		140
"	Appr. Sol. Off.	110
"		100
		220
		700

APR 1 1958

Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City 11, Utah

Re: Docket No. DMEA-4872 (Uranium)
Sec. 16, T. 13 N., R. 8 W., N.M.P.M.
McKinley County, New Mexico

Gentlemen:

Mr. M. H. Kline, vice president of your corporation, visited this office on March 26 to discuss the guaranties required by the Government in the event a contract to explore the subject property is approved.

Since the property is on state land and a consent to lien cannot be obtained, we agreed to waive this requirement and in lieu accept a third-party guaranty by El Paso Natural Gas Company. Also, we will require a subordination agreement signed by W. T. Old, Jr., and Patricia M. Old, his wife.

Enclosed are six copies each of the two forms for execution by the interested parties. We require five signed copies of each set; the extra copies may be retained by the signers.

The signed copies should be returned to this office as soon as possible. If more than two weeks from the date of this letter are required to obtain the signatures, then the signed copies should be forwarded to W. H. King, Executive Officer, DMEA Field Team, Region III, 224 New Customhouse Building, Denver 2, Colorado.

Sincerely yours,

(sgd)
Administrator

SOLICITOR

MAR 31 1958

INTERIOR DEPT.

RECEIVED

MAR 31 1958

ASSOC. SOLICITOR
MINERAL RESOURCES

Enclosures

FMMurphy/gla
3-27-58
cc to: Admr.'s Reading File
THKiilsgaard, 5224
FMMurphy
DMEA Field Team, Region III (2)

8623

IN REPLY REFER TO:

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

March 31, 1958
Re: DMEA 4872
Rare Metals Corp. of America
Sec. 16 R 13N, 8W
McKinley County, New Mexico
$216,607 Appl. Est.
$ 82,437 Rec'd " Uranium

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

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

Subject: Review of Field Team Report

The applicant requested assistance in prospecting, by deep core and non-core drilling, for ore bodies in the Westwater formation. The applicant has applied for assistance in doing slightly less prospective drilling in a larger block of ground one mile to the north. The application, DMEA 4842, is still in process.

DMEA has participated in 12 exploration projects 5 to 10 miles west and southwest of the project area on the flank of the San Mateo dome. Six projects have been certified. Some of the successful projects located ore in the Poison Canyon unit of the Brushy Basin member (Morrison). Other drilling failed to find the Poison Canyon unit and pinchouts are inferred. Apparently its presence in the project block is considered unlikely.

A drill hole in Section 9 to the north of the project section 16 is reported to have penetrated 12 feet of ore, 0.357% eU_3O_8 at a depth of 1596.9 feet, and 2 holes near the 9-16 line are reported to have penetrated weak mineralization in the Westwater member. Origin of the reports, locations and other more exact data, are not given.

The examiners recommend a 2-stage drilling program. The Field Team does not concur. Work under DMEA 4842, if done, will tend to confirm the inferred extension of the important Ambrosia Lake ore run or trend. If a substantial ore body (or ore bodies) is encountered, drilling to widen the belt would be warranted.

Therefore, I recommend that approval of this application be delayed until information concerning drilling under 4842 is available. Also, more exact information concerning the Rio de Oro drilling in Section 9 should be sought.

If a delaying action is not suitable, then a somewhat abbreviated Stage I program consisting of the 3 designated core holes, the equivalent of which prospecting should have been done by the applicant, is recommended. The other holes of the examiner's program could follow as Stage II, if warranted.

N. E. Nelson

N. E. Nelson

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DMEA
RECEIVED MAR 27 1958

DATE	TIME	CODE
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11	7MM	70C

March 26, 1958

4872

Uranium
Rare Metals Corp. of America
Sec. 16 T 13 N, R. 8 W.
McKinley County, N. Mex.
$82,473.00

state of Delaware

Ernest William Ellis, DMEA Member
Uranium Commodity Committee
James Paone, Bureau of Mines Member
Uranium Commodity Committee

Field Team Report

1. Date of initial document: 3/20/58 2. Date received by [illegible] 3/25/58

3. Major [illegible] on this property known to reviewer: Yes [ ] No [ ]

4. Major [illegible] in money proposition known to reviewer: Yes [ ] No [ ]

5. Information available on past production: Yes [ ] No [ ]

6. Other potential factors known to reviewer: Yes [ ] No [ ]

7. Explain items marked yes above:

8. Factors meeting special consideration:
   a. Location [ ]
   b. Ownership [ ]
   c. Evidence of mineralization [ ]
   d. Geology [ ]
   e. Proposed exploration method [ ]
   f. Alternate exploration method [ ]
   g. Costs [ ]
   h. [illegible] [ ]

9. Action advised:
   a. Obtain information from applicant [ ]
   b. Refer to Field Team [ ]
   c. Denial [ ]
   d. Agree with Field Team x [ ]
   e. Disagree with Field Team [ ]
   f. Suggest alternate plan [ ]
   g. Request another consideration [ ]
   h. Approval x [ ]
   i. Consult with Mr. [illegible] at [illegible]

10. Remarks: (Use back of page if necessary) From data presented in the report and in the charts, it appears that the most favorable area to explore is the northern part of the area. Revision of proposed project should be considered.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

224 New Customhouse
Denver 2, Colorado
March 20, 1958

DMEA
RECEIVED MAR 24 1958

DATE		
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3/26	JHB	130
3/26	C	220
R	TMM	7 C

Memorandum

To: Secretary to the Operating Committee

From: DMEA Field Team, Region III

Subject: Docket No. DMEA 4872 (Uranium) Rare Metals Corporation of America (Sec. 16 T 13 N., R. 8 W.) McKinley County, New Mexico

Enclosed are the original and two copies of a joint engineering and geological report by F. R. Shawe, USGS, and H. F. Robertson, USBM. Also enclosed are the original and two copies of a review of the proposal by E. N. Harshman, USGS.

The examiners propose a drilling program consisting of three core and twelve non-core holes. The drilling program is designed to explore the Westwater Canyon sandstone in that area. A study of Figure 2 indicates that the area is between two generalized ore bearing trends. The trend of more important deposits appears to be north of the property involved and points toward the San Mateo Dome, Docket No. DMEA 4842. The ore bearing trend to the south is of substantial size but is in the Poison Canyon formation and there is no indication that it will enter into the project area.

The proposed drilling is deep, approaching 1800 feet. Based on these presumptions, the Field Team takes a rather dim view of the project as a whole. It appears to be in the nature of prospecting rather than exploration. However, if the project were successful and an ore body discovered, it might be of substantial magnitude. The Field Team further believes that if a contract is prepared, the drilling should favor the northern part of the area rather than southern as indicated on Figure 3.

W. H. King
W. H. King

Reviewed by
DMEA OPERATING COMMITTEE
3-26-58
(date)

E. N. Harshman
E. N. Harshman

ON-SITE EXAM

IN REPLY REFER TO:

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

DMEA
DEPARTMENT OF THE INTERIOR
MAR 18 1958
REGION III
DENVER, COLORADO

OFFICIAL FILE COPY
RECEIVED MAR 24 1958

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		220

March 17, 1958

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 4872 (Uranium), Rare Metals Corporation of America (Sec. 16, T. 13 N., R. 8 W.), McKinley County, New Mexico

Enclosed are nine copies of an examination report by F. R. Shawe, U. S. Geological Survey, and H. F. Robertson, U. S. Bureau of Mines, in which a two-stage program of exploration on the subject property is recommended.

A similar program of deep exploration (DMEA Docket 4842) has been recommended 1 to 3 miles north of the subject property on sections 27, 33, and 34, T. 14 N., R. 8 W., and sections 3 and 4, T. 13 N., R. 8 W. Approval of that program was based on the position of the property on the southeasterly extension of a major belt of ore deposits and by the favorable character of the Westwater in several holes drilled by the applicant.

For the following reasons I find it difficult to justify, as exploration, the drilling program recommended in the enclosed report:

1) The major belt of known ore deposits in the Westwater, as shown on Figure 2 in the enclosed report, if extended southeasterly, would pass north of the subject property. A secondary belt, about 4 miles south of the main belt, if projected, would pass south of the property (fig. 2). Although the examiners conclude (page 23) that "The applicant's property is located at the southeastern end of a southeasterly trending belt of large (500,000 to 1,000,000 ton) uranium ore deposits," they imply doubt as to its location with respect to this belt by the statement on page 15 that "The subject property may be in this belt or on the southern edge of it."

Reviewed by
DMEA OPERATING COMMITTEE
3-26-58
(date)

TRANSMITTED
MAR 20 1958

2) Critical data are lacking on the results of drilling on section 9 immediately north of the subject property. The very general statements on page 15 regarding this drilling leave much to the imagination, particularly as to the location of the one hole reported to have penetrated 12 feet of ore (0.375 percent eU_3O_8). The applicant shows the location of two holes drilled on section 9 immediately north of the subject property. Both contained slightly mineralized sandstone in thin zones at depths of from 1,760 to 1,970 feet. Data such as the number of holes drilled, the approximate location of the holes, ratio of barren holes to ore holes or mineralized holes, etc., are lacking and apparently not available to the applicant nor to the examiners.

3) If we assume, as I believe we must from data given in the report, that the property is south of or near the southern edge of the extension of the major belt of significant deposits, any divergence from grid drilling should favor Stage I exploration in the northern part of the section. In order to lessen average drilling depths (from 2,000 feet in the application to 1,700 feet in the recommended program) the examiners have unbalanced the program to favor the southern part.

If drilling is believed to be warranted, I suggest that the program be revised to favor exploration of the northern part of the section. However, I suggest that the Field Team consider denial of the application (EMEA 4872) without prejudice pending more data on the relative position of section 16 with respect to the major belt of ore deposits.

E. N. Harshman

E. N. Harshman
Member, Field Team

ENHarshman:arh

DMEA
RECEIVED MAR 24 1958

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IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P. O. Box 360
Grand Junction, Colorado

RECEIVED
MAR 14 1958
GEOLOGICAL SURVEY
DENVER, COLORADO

March 13, 1958

Memorandum

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

Through: E. N. Harshman noted

From: J. William Hasler

Subject: Transmittal of a joint report of examination on DMEA docket 4872 (Uranium), Rare Metals Corporation of America, Sec. 16, T. 13 N., R. 8 W., McKinley County, New Mexico.

Transmitted herewith is a joint engineering and geologic report by H. F. Robertson, U. S. Bureau of Mines and F. R. Shawe, U. S. Geological Survey on DMEA docket 4872, Rare Metals Corporation of America, sec. 16, T. 13 N., R. 8 W., McKinley County, New Mexico.

Rare Metals Corporation of America, First Security Building, Salt Lake City, Utah, applied for Government assistance on November 1, 1957, to explore for uranium on section 16, T. 13 N., R. 8 W., NMPM, McKinley County, New Mexico. The application was referred to the field and an examination was made on January 14, 1958, by an examining team consisting of H. F. Robertson and F. R. Shawe. The examining team was accompanied by Mr. Harold Horst, area superintendent for Rare Metals Corporation.

The property included in the application consists of one full-sized school section leased from the state of New Mexico and located about 17 airline miles northwest of Grants, New Mexico and is located in the Mt. Taylor mining district about 3 to 10 miles southeast of the Ambrosia Lake district. Sedimentary rocks of marine and terrestrial origin ranging in age from Pennsylvanian to late Cretaceous underlie the area with a gentle southeast dip. North and northeast trending normal faults of probably less than 100 feet displacement cut the area.

The Westwater Canyon sandstone member of the Morrison formation of Jurassic age is the principal ore-bearing horizon in the Ambrosia Lake-San Mateo dome area. Exploratory drilling on section 9, immediately north of the applicant's section 16, indicates that the characteristics of the potential ore-bearing Westwater Canyon member are locally favorable. No drilling has been done on the applicant's property to date.

TRANSMITTED

Reviewed by
DMEA OPERATING COMMITTEE
3-26-58
(date)

DMA
MAR 20 1958

On the basis of the apparent trend of ore deposits from the Ambrosia Lake area and the favorableness of ground in the immediate vicinity, the examining team concludes that there is a reasonable probability of finding large tonnages of average grade ore at a depth of about 1,700 feet on the section included in this application.

The examining team recommends approval of a two-stage drilling program requiring an estimated 50,400 feet of non-core drilling and 600 feet of core drilling in a maximum of 30 holes at an estimated cost of about $82,437.00. Government participation at 50 percent would be $41,218.50.

The exploration work herein outlined is a more modified program than the one presented in the original DMEA application, and has been discussed and approved by the applicant's representative. I concur with the conclusions and recommendations of the examining team and consequently recommend that a contract be prepared to perform the work outlined in this report of examination. The Atomic Energy Commission was consulted relative to the appraisal of the subject property and personnel of the U. S. Geological Survey who have worked in the area were also consulted, and data obtained from them was used in the preparation of this report. Memoranda of review from James Paone, USBM and W. P. Williams, USGS were also noted. Results of exploratory drilling in sec. 9, T. 15 N., R. 8 W., were obtained from the personnel of Rio de Oro Uranium Mines, Inc.

Enclosed are 10 copies of figure 1, index map of northwest New Mexico showing the location of sec. 16, T. 13 N., R. 8 W., NMPM, Rare Metals Corporation of America, McKinley County, New Mexico; figure 2, map of the Ambrosia Lake-San Mateo area showing the structure around the Ambrosia dome and San Mateo dome and the approximate position of the known deposits of the area, sec. 16, T. 13 N., R. 8 W., NMPM, Rare Metals Corporation of America, McKinley County, New Mexico. Enclosed are 21 copies of figure 3, plan map of sec. 16, T. 13 N., R. 8 W., showing proposed location of Stage I drill holes, Rare Metals Corporation of America, McKinley County, New Mexico. The additional copies of figure 3 are included for the purpose of possible preparation of a DMEA contract. Enclosed also is the applicant's brochure and related material.

J. William Hasler

J. William Hasler,
Geologist

JWH/bh
Enclosures

RECEIVED MAR 24 1958
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UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY EXAMINING TEAM
REGION III

TRANSMITTED

MAR 20 1958

DMEA 4872

Rare Metals Corp. of America

Sec. 16, T. 13 N., R. 8 W.

McKinley County, New Mexico

Uranium

Joint Engineering and Geologic Report

by

F. R. Shawe
U. S. Geological Survey

H. F. Robertson
U. S. Bureau of Mines

March 1958

Reviewed by
DMEA OPERATING COMMITTEE
3-24-58
(date)

DMEA 4872
RARE METALS CORP. OF AMERICA
SEC. 16, T. 13 N., R. 8 W.
McKinley County, New Mexico

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Joint Geologic and Engineering Report

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ILLUSTRATIONS

Figure		Follows page
1.	Index map of northwest New Mexico showing location of sec. 16, T. 13 N., R. 8 W., NMPM, Rare Metals Corp. of America, McKinley County, New Mexico	24
2.	Map of Ambrosia Lake-San Mateo area showing the structure around the Ambrosia dome and San Mateo dome and the approximate position of the known deposits of the area, sec. 16, T. 13 N., R. 8 W., NMPM, Rare Metals Corp. of America, McKinley County, New Mexico	24
3.	Plan map of sec. 16, T. 13 N., R. 8 W., showing proposed location of Stage I drill holes, Rare Metals Corp. of America, McKinley County, New Mexico	24

DMEA 4872
RARE METALS CORP. OF AMERICA
SEC. 16, T. 13 N., R. 8 W.
McKINLEY COUNTY, NEW MEXICO

INTRODUCTION AND SUMMARY

The Rare Metals Corporation of America, First Security Building, Salt Lake City, Utah, applied for Government assistance on November 1, 1957, to explore for uranium on section 16, T. 13 N., R. 8 W., NMPM, McKinley County, New Mexico. Exploratory drilling on the section is proposed at an estimated cost of $216,607.20. The application was filed after October 22, 1957, so would received only 50 percent Government participation, if approved. The depth of the potential ore horizon would average about 1,700 feet, so minable deposits would necessarily have to be large.

A field examination was made on January 14, 1958, by a DMEA examining team consisting of H. F. Robertson, Bureau of Mines and F. R. Shawe, Geological Survey, accompanied by Harold Horst, area superintendent for Rare Metals Corporation.

The property included in the application consists of one full-sized (640 acres) school section leased from the state of New Mexico and located about 17 airline miles northwest of Grants, New Mexico.

Section 16, T. 13 N., R. 8 W. is located in the Mt. Taylor mining district about 3 to 10 miles southeast of the Ambrosia Lake district. Sedimentary rocks of marine and terrestrial origin ranging in age from Pennsylvanian to late Cretaceous underlie the area with a gentle southeast

dip. North and northeast trending normal faults of probably less than 100 feet displacement cut the area.

The Westwater Canyon sandstone member of the Morrison formation of Jurassic age is the principal ore-bearing horizon in the Ambrosia Lake-San Mateo dome area. Exploratory drilling on section 9, immediately north of the applicant's section 16, indicates that the characteristics of the potential ore-bearing Westwater Canyon member are locally favorable. No drilling has been done on the applicant's property.

On the basis of the apparent trend of ore deposits from the Ambrosia Lake area and the favorableness of the ground in the immediate vicinity, the examining team concludes that there is a reasonable probability of finding large tonnages of average grade ore at a depth of about 1,700 feet on the section included in this application.

The examining team recommends approval of a two-stage drilling program requiring an estimated 50,400 feet of non-core drilling and 600 feet of core drilling in a maximum of 30 holes at a cost of $82,437.00. Government participation at 50 percent would be $41,218.50.

ACKNOWLEDGMENTS

Rare Metals Corporation of America submitted with the application a brief report with maps and drilling plans, 4 drilling bids from independent contractors, appropriate legal documents, and a cost estimate. Data from a recent application (4842, San Mateo Dome Project), from Geological Survey and A.E.C. investigations, and from A.E.C. production and reserve records

were available to the examining team.

Memoranda of review from James Paone, USBM and W. P. Williams, USGS were noted. Results of exploratory drilling in section 9, T. 13 N., R. 8 W. were obtained from personnel of Rio de Oro Uranium Mines, Inc.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The subject property consists of the entire section 16, T. 13 N., R. 8 W., NMPM, McKinley County, New Mexico (figs. 1 and 2) and can be reached by traveling about 4 miles west from Grants, New Mexico, on U. S. Highway 66 to it's junction with New Mexico Highway 53; thence northeasterly and easterly about 20 miles to the Floyd Lee Ranch (Fernandez Co.) about 3 miles west of the village of San Mateo. A private farm road is followed about a mile across the ranch to section 16. The first 14 miles of Highway 53 have been recently paved.

Topographic relief in section 16 is moderate with altitudes ranging from about 7,000 feet to about 7,400 feet. The surface is mostly low, rounded hills dipping gently southward to the main San Mateo valley. Two moderately deep arroyos, bounding a low mesa, essentially divide the area into three parts.

Extreme ranges of temperature and precipitation during both winter and summer are experienced in the Grants area, but year-round operations are generally feasible except for periods during and following storms when roads may become impassable. The area is subject to flash-floods with subsequent road destruction during the summer months.

Because of the excessive drilling depths to the potential ore-bearing Westwater Canyon member of the Morrison formation, proposed drilling sites have been limited to the lower parts of the section where the depth to the potential ore deposits is estimated to be approximately 1,700 feet.

There are no unusual problems of supply, power, labor, or transportation involved in exploration work in the subject area. Access to project areas sometimes becomes a major problem due to unbroken fence lines several miles in length. Ranchers in the area frequently request exorbitant fees for allowing access across leased grazing lands.

Water for drilling purposes is scarce in the immediate area and must be purchased from local ranchers and hauled several miles. For this reason, dry non-core methods of drilling are utilized as much as possible.

The proposed drilling would be done by independent contractors who maintain equipment and personnel in the Grants area. Current labor and housing shortages would not materially affect the program especially since such contractors usually furnish house trailers for operating personnel.

Limited tonnages of ore can be marketed at the Grants buying station of the Atomic Energy Commission or at one of the other mills in operation or under construction. However, the privately owned plants will do only a limited amount of custom milling since their facilities are committed for treatment of ore already developed. Greater milling capacity is required if any additional large ore reserves in the Grants area are to be treated in the near future.

HISTORY, PRODUCTION, AND OWNERSHIP

The history of the uranium industry in the Grants area dates from 1949 when a party of California geologists noted uranium minerals in the Todilto limestone of Jurassic age. The first discovery of ore in commercial quantities was made by an Indian sheepherder in 1951. Extensive exploration since that date has resulted in a high rate of discovery and development of large uranium reserves in both the Todilto limestone and the Morrison formation. Exploration drilling has been intensive northwest, west, and southwest of the applicant's property where drilling depths to the potential ore-bearing formations are considerably less.

Activity in the San Mateo dome area dates from 1955 and was based on surface geology and two oil exploration drill holes. Continued success in finding commercial-grade ore as exploratory drilling progressed easterly from Ambrosia dome to San Mateo dome has encouraged drilling to greater depths than was previously considered feasible.

DMEA has participated in at least 12 exploration projects in the Ambrosia Lake area 5 to 10 miles west and southwest of the San Mateo dome. Six of these projects have been certified as discoveries of significant amounts of uranium ore. Proposals on exploring in the immediate vicinity of San Mateo dome have been scarce to date due to the average drilling depths of 1,400-2,000 feet. However, an application (DMEA 4842) concerning an area one to two miles north of the applicant's section 16 has been recommended for approval and is presently being processed.

There has been no production from the San Mateo dome area and no definite reserves have been computed on the results of exploration to date. An inferred 500,000 ton ore body has been discovered by Calumet and Hecla in sections 23 and 24, T. 13 N., R. 9 W. (fig. 2), about 3 miles southwest of the applicant's sec. 16. Rare Metals Corporation is currently sinking a shaft on an estimated 500,000 to 1,000,000 ton ore body discovered by them in sections 29 and 30, T. 13 N.,R. 8 W., slightly less than two miles southwest of section 16. Immediately north of the subject property, in section 9, T. 13 N., R. 8 W., Rio de Oro personnel report one exploratory drill hole which penetrated 12 feet of ore grade material averaging 0.357 percent eU_3O_8 at a depth of 1,596.9 feet below the surface.

The applicant's property rights in section 16, T. 13 N., R. 8 W., are vested in a general mining lease from the state of New Mexico. Transactions involving the lease are listed below.

Date	Transaction
March 28, 1955	General mining lease no. 60-5445 awarded to General Uranium Mining Corporation.
January 19, 1956	General mining lease no. 60-5445 assigned to W. T. Old, Jr.
April 6, 1957	Contract whereby Rare Metals Corporation of America is given ten-day option on purchase of lease.
April 17, 1957	General mining lease no. 60-5445 assigned to Rare Metals Corporation of America.

It appears that the applicant has a valid controlling interest in the property. Overriding royalties on future production from the section are retained by the following:

	Royalty on production
State of New Mexico	5%
General Uranium Mining Corp.	0%
W. T. and Patricia M. Old	5%
Total	10%

A Consent to Lien and Subordination Agreement signed by W. T. Old, Jr., and his wife, Patricia M. Old, would be required, in addition to a Performance Bond equal to the amount of the Government's share of the cost of the project work.

PRESENT STATUS

Exploration and Development

There has been no exploratory drilling to date on the subject property. Two holes have been drilled very near to the line between section 16 and section 9 by Rio de Oro Uranium Mines, Inc. and are reported to have penetrated weak mineralization (0.01 to 0.04 percent eU_3O_8) in the Westwater Canyon member. Other exploration projects are in progress on nearby sections but no information as to results obtained is available at the present time.

Mining Equipment and Other Facilities

The applicant maintains no equipment or other facilities on section 16. Exploration equipment for the proposed project would be furnished by the drilling contractor.

GEOLOGY

Introduction

Section 16, T. 13 N., R. 8 W., NMPM, McKinley County, New Mexico, is in the Mt. Taylor mining district and about 3-10 miles southeast of the Ambrosia Lake district that lies southwest of the Zuni uplift. San Mateo dome, a small dome on the southwest flank of the San Juan Basin, is about 5 miles north of the area included in the application. Sedimentary rocks of marine and terrestrial origin ranging in age from Pennsylvanian to late Cretaceous underlie the area with gentle southeast dips. North and northeast trending normal faults of probably less than 100 feet displacement cut the area.

The Westwater Canyon sandstone member of the Morrison formation of Jurassic age is the principal ore-bearing horizon in the Ambrosia Lake-San Mateo dome area and is present on the property at depths ranging from 1,500 to 2,200 feet.

Stratigraphy

Wind-blown sand up to 50 feet thick covers most of section 16. The Gallup sandstone member of the Crevasse Canyon formation and Mancos shale of Cretaceous age (Table 1) underlies the unconsolidated sand. Table 1 shows a generalized stratigraphic section of Cretaceous and Jurassic rocks for this area.

Table 1.--Jurassic and Cretaceous formations in the vicinity of Section 16, T. 13 N., R. 8 W., NMPM, McKinley County, New Mexico. 1/

Age	Formation	Approximate Thickness	Description
Late Cretaceous Mesa Verde group	Menefee	500+ feet	Gray and dark gray carbonaceous shale with thin sandstone and coal beds.
	Point Lookout	75-100'	Point Lookout sandstone member: Medium- to coarse-grained, thick-bedded, light-colored sandstone.
		0-75'	Satan shale member: Gray marine shale. Absent in southern part of the area where the Point Lookout formation is not divided into members.
		75-150'	Hosta sandstone member: medium-grained, cross-bedded, light-colored sandstone.
	Crevasse Canyon	250-350'	Gibson coal member: Gray to black carbonaceous shale with thin sandstone beds. Thin, discontinuous coal beds in the middle part of the member.
		60-100'	Dalton sandstone member: White, massive, medium-grained sandstone, moderately cross-bedded.
		250-300'	Mulatto shale member: Gray, marine shale with thin interbedded sandstone layers.

Mesa Verde group
1/adapted from report by V. C. Kelley, 1956.

Table 1. (con't.)

Age		Formation	Approximate Thickness	Description
Late Cretaceous	Mesa Verde group	Crevasse Canyon	140-180'	Dilco coal member: Thin-bedded shale, siltstone, and sandstone with local thin beds of coal and carbonaceous shale.
			65-150'	Gallup sandstone member: Thick-bedded white to light gray, medium- to coarse-grained sandstone. Many cross-bedded layers.
		Mancos	885-1000'	Dark gray to black marine shale with thin, persistent sandstone layers. Local thin beds of siltstone and limestone. Fossiliferous.
			UNCONFORMITY	
Early Cretaceous		Dakota	75-160'	Cross-bedded, medium- to fine-grained quartzose sandstone in top part. Gray to black silty carbonaceous shale in lower part.
			UNCONFORMITY	
Late Jurassic		Morrison	100-160'	Brushy Basin member: Gray, green, and reddish mudstone with minor lenses of sandstone and conglomerate. Interfingers with Westwater Canyon member.
			110-250'	Westwater Canyon member: Medium to coarse-grained sandstone with minor intercalated mudstone layers. Locally arkosic or conglomeratic.

Table 1. (con't.)

Age	Formation	Approximate Thickness	Description
		150-175'	Recapture member: Grayish green mudstone with minor lenses of sandstone. Interfingers with Westwater Canyon member.
	Bluff	200'	Massive, light-colored cross-bedded sandstone.
	Summerville	100'	Reddish brown, thinly-bedded siltstone.
	Todilto	20-50'	Dense, dark gray limestone. Thinly bedded, massive, or recrystallized.
	Entrada	?	Massive, light reddish brown, quartzose sandstone.

The oldest formation to be penetrated in exploring section 16 is the Morrison formation of Jurassic age. The Morrison formation is divided into three members in the Ambrosia Lake-San Mateo dome-Grants area of New Mexico and are named from oldest to youngest, the Recapture member, the Westwater Canyon member, and the Brushy Basin member; the Westwater Canyon member is the principal ore-bearing unit in this general area and is the target horizon under the subject application.

The Recapture member consists of interbedded light red-brown sandstone and siltstone, and light gray mudstone. The sandstone is fine- to medium-grained and locally has granules and pebbles disseminated in a sand matrix or concentrated along laminations; it is generally friable and sedimentary structures are poorly displayed.

The Westwater Canyon member overlies the Recapture member and consists mostly of medium- to coarse-grained yellowish gray to yellowish orange or brown fluvial sandstone, locally interbedded with gray, greenish gray and reddish brown mudstone and in places it is friable and arkosic. Contacts with the underlying Recapture and overlying Brushy Basin members are interfingering and consequently are indefinite. The thickness of the Westwater Canyon member ranges from about 30 feet to slightly more than 200 feet. Extremely large uranium deposits are found in the Westwater Canyon member.

The Brushy Basin member is composed principally of red and green mudstone and claystone containing various amounts of white to orange siltstone and sandstone. Impure bentonitic clay predominates; the lesser amounts of

medium-grained sandstone occur as lenses that range from less than a foot to as much as 90 feet. Carbonaceous debris and claystone lenses and pebbles are locally present in the sandstones and crossbedding and scour and fill features are common. The Brushy Basin member is from about 125 feet to about 175 feet thick; variations in thickness may be partly the result of differential erosion prior to Dakota time. Locally, a sandstone unit of the Brushy Basin, commonly referred to as the "Poison Canyon sandstone" contains uranium ore deposits of considerable size. This sandstone is usually about 20 feet above the base of the Brushy Basin member and is from 30 to 90 feet thick. Drilling data indicate this "Poison Canyon sandstone" is a tongue of the underlying Westwater Canyon member and pinches out a few miles to the north and northeast.

Structure

The area lies between the Zuni uplift toward the southwest and the San Juan Basin toward the northeast and the area has a gentle regional dip toward the northeast. Locally, small domes such as the Ambrosia Lake dome and San Mateo dome modify the regional dip. The subject property is about 5 miles south of the San Mateo dome in an area much modified by the San Mateo domal uplift.

Dips vary slightly but are generally about 5 or 6 degrees toward the southeast. Four normal faults cut the area; two of them trending a little south of west intersect the northwest and southeast corners of the section and dip toward the north (fig. 2). The other two faults trend northerly

and dip westerly in the eastern part of the section. Movement along these faults is less than 100 feet and more probably is in the order of magnitude of only a very few tens of feet. All these faults are a part of a complex system of normal faults of small displacement that bound the San Mateo dome area.

ORE DEPOSITS

Uranium ore deposits are known to occur in several formations in the general area of Grants, New Mexico; production is from mines in the Dakota, Morrison, and Todilto formations. The deposits in the Dakota formation are small, widely scattered, and essentially insignificant and do not warrant large-scale exploration programs. Deposits in the Todilto limestones, although of better than average grade, are also small and are too deep on the subject property to be considered a reasonable target. Therefore, the proposed exploration program is to search for ore deposits in the Morrison formation.

Known uranium ore deposits in the Morrison formation are in the Westwater Canyon member and in the "Poison Canyon sandstone" of the Brushy Basin member (or the "Poison Canyon tongue" of the Westwater Canyon member). Large deposits are found in a belt that extends southeastward from the Ambrosia Lake dome area to the San Mateo dome area. This belt is at least 12 miles long and is about 3 miles wide at Ambrosia Lake; it apparently narrows toward the southeast. However, the southeast end is only partly explored and this narrowing may be only apparent. Individual deposits within this

belt contain from a few tons to several million tons of ore of an average grade of 0.25 to 0.30 percent U_3O_8. The subject property may be in this belt or on the southern edge.

Several holes drilled by Rio de Oro Uranium Mines, Inc. in section 9 adjoining the subject property on the north penetrated from about 175 to 210 feet of favorable Westwater Canyon sandstone. A few of these holes were mineralized and one hole penetrated 12 feet of 0.375 percent eU_3O_8 ore. Average depth of these holes to the base of the Westwater Canyon sandstone was about 1,750 feet.

About 4 miles south of the main ore-bearing belt, there is a parallel belt in which the ore deposits are in the "Poison Canyon sandstone". This belt is about one mile wide and the ore deposits in it are smaller and more scattered than in the main ore-bearing belt. However, several of the deposits in this secondary belt are of major economic importance.

Uranium ore in the Morrison formation is mainly sandstone impregnated with uranium and vanadium minerals; some replaced carbonaceous material is present. Individual ore bodies have an irregular, lenticular shape and are flat-lying; occasionally the ore changes vertical position within the sandstone by a few feet. Ore deposits consist of clusters of these bodies which usually overlap and coalesce, but may be separated by barren sandstone. Deposits range in thickness from less than a foot to slightly over 80 feet and are as much as 2,000 feet wide and 5,000 feet long. Because of their large lateral size, these deposits make very good drilling targets.

The origin of the ore is not well understood and no relationship between tectonic structure and ore deposits has been established. Individual ore bodies seem to be related to certain sedimentary features such as crossbedding, festoon bedding, and shale interbeds in the host sandstone. The following criteria are useful in exploring the Westwater Canyon member (including the "Poison Canyon tongue") for uranium ore deposits: (1) deposits seem to favor the thicker parts of the sandstone where few shale layers are present, (2) the host sandstone is altered from yellowish orange and reddish brown to light gray and yellowish-gray in the vicinity of ore deposits, (3) near the deposits, the shale in and beneath the host sandstone is altered from reddish-brown to green or gray, and (4) ore deposits are in sandstone containing more than normal amounts of carbonaceous material, asphaltite, and limonite and/or pyrite.

PROPOSED EXPLORATION

The applicant proposed to explore the property by rotary drilling in two stages. Stage I of this proposal would consist of 25 holes on a modified grid system with holes spaced on 800 to 1,000-foot centers. Stage II would consist of offsetting, on 200-foot centers, previously drilled holes showing significant mineralization; 25 holes were allowed for Stage II. All holes would be drilled non-core to the contact between the Westwater Canyon and Recapture members of the Morrison formation, an average estimated depth of 2,000 feet. All holes would be radiometrically and lithologically logged and samples taken at 2 to 5-foot intervals. Any

significantly mineralized samples would be assayed chemically. A simplified estimate of costs for this proposed exploration is given below.

	Stage I	Stage II
Independent Contracts	$89,000.00	$89,000.00
Labor, Supervision & Consultants	13,680.00	13,680.00
Operating Materials and Supplies	1,050.00	1,050.00
Operating Equipment	none	
Rehabilitation and Repairs	none	
New Buildings, Improvements, Installations	none	
Miscellaneous	2,450.00	2,450.00
Contingencies	2,123.00	2,123.00
Sub-total	$108,303.00	$108,303.00
Total	$216,606.00	

Government participation at 50 percent would be $108,303.00.

The applicant's field representatives, Mr. Harold Horst and Mr. Ted Schow, in a conference with the DMEA examining team, suggested revising the proposed exploration program. A modified exploration program was discussed and agreed upon; this program, a combination core and non-core drilling program in two stages, is recommended by the examining team.

Stage I would consist of 15 holes averaging 1,700 feet deep, requiring an estimated 600 feet of core drilling and 24,900 feet of non-core drilling. Figure 3 shows the approximate location of the 15 Stage I drill holes. Two N-S fences approximately 1,500 feet apart with holes approximately 1,000

feet apart along the fence line will explore the western half of the section. Another fence bearing approximately N.20°E. and with holes on approximately 1,000-foot centers along the fence line will explore the eastern half of the section. This pattern of holes was chosen to take advantage of local topography and thus reduce drilling depths and may be expected to find any ore deposit large enough to be of significance at the proposed drilling depth. The three core holes (fig. 3) are to be cored in the Westwater Canyon sandstone interval and are considered necessary to establish stratigraphic control for subsequent drilling and should be among the first holes drilled. The core recovered will be lithologically and radiometrically logged and any core showing anomalous radioactivity will be split and chemically assayed.

Stage II is to consist of 15 non-core holes of an average depth of 1,700 feet and will require an estimated 25,500 feet of non-core drilling. No core drilling will be done in this phase of the project. The second stage holes will offset any previously drilled holes that have penetrated significantly mineralized intervals in the ore-bearing sandstone. Offset distances should not be less than 250 feet nor more than 500 feet.

The use of a logging service to supply strip logs of gamma-ray and resistivity readings on all holes as proposed by the applicant is recommended as the information obtained is considered to be essential in identifying formations penetrated and determining formational contacts. This type of log has been found to be reliable and easily interpreted.

The applicant's estimate of costs for the proposed exploration is reasonable insofar as actual drilling items and supplementary services are concerned. Minor revisions are made by the examining team in accordance with drilling bids received and to include certain allowable items not shown in the applicant's estimate. The following cost estimate is based on employment of one full-time supervisor-geologist with one assistant.

Four drilling bids from independent contractors were received from the applicant. The lowest of the four was submitted by Spence and Son Drilling Company and is used in the computation of the estimated cost of the proposed project. Following is a summary of the prices quoted by the low bidder.

Interval	Price per foot Non-core	Price per foot Core
0-1000	$1.15	$5.00
1000-1500	1.40	6.00
1500-1750	1.65	7.00
1750-2000	1.90	8.00
2000-2250	2.15	8.00
2250-2500	2.40	8.00

Standby time - $10.00 per hour

The following cost estimate is based on the use of two rigs operating one shift per day, 25 days per month, with the average drilling rate estimated at 275 feet per shift per rig. On this basis, the total time

required to complete the proposed 51,000 feet of drilling is estimated at four months including preliminary work and evaluation between stages.

Cost Estimate

(1) Independent Contracts

Drilling, non-core		
0-1000 - 30,000 feet at $1.15/ft.	$34,500.00	64,410
1000-1500 - 15,000 feet at $1.40/ft.	21,000.00	
1500-1750 - 5,400 feet at $1.65/ft.	8,910.00	
Drilling, core		
1500-1750 - 600 feet at $7.00/ft.	4,200.00	
Logging, gamma-ray, resistivity		
51,000 feet at $0.10/ft.	5,100.00	
Bulldozing, Caterpillar D-7 or equiv.		
60 hours at $15.00/hr.	900.00	
Standby time, drilling crew		
1 hour/hole or 30 hours at $10.00/hr.	300.00	
Total independent contracts		$74,910.00

(2) Labor, Supervision, and Consultants

1 supervising engineer-geologist		
4 months at $750.00/mo. ?	$ 3,000.00	
1 assistant		
4 months at $400.00/mo.	1,600.00	
Total labor, supervision, consultants		$ 4,600.00

(3) Operating Materials and Supplies

Office and field supplies (including fuel and repairs on vehicles)		
4 months at $75.00/mo.	$ 300.00	
Total operating materials and supplies		$ 300.00

(4) Operating Equipment

Depreciation - 2 vehicles valued at $2,500 each, depreciated on 60 mo. basis - 4 months at $41.67/mo. each	$ 333.36	
Total operating equipment		$ 333.36

(7) Miscellaneous

Direct accounting costs 4 months at $50/mo.	$ 200.00	
Payroll taxes and insurance at 7 percent of $4,600.00	322.00	
= sales tax New Mexico school tax at 2 percent of $74,910.00	1,498.00	
Chemical assays, 60 samples analyzed for U_3O_8 at $3.50/sample	210.00	
Core boxes 60 boxes at $1.25 each	75.00	
Total miscellaneous		$ 2,305.00

Total estimated cost of project	$82,448.36
Average cost per foot, non-core drilling only	$ 1.28
Average cost per foot, core drilling only	$ 7.00
Average overall cost per foot of drilling	$ 1.62

Incidental allowance (all costs less independent contracts, chemical analyses, and core boxes

per foot $\frac{\$7,253.36}{51,000 \text{ ft.}}$ = $ 0.14222

sales tax
7253.36
− 1498.00
5,755.36
51,000 ft
= $ 0.11285

Summary of Costs Suggested for Contract Use

Stage I - 15 holes

includes 2% sales tax

Actual Cost Items

Drilling, non-core 24,900 feet at $1.28/ft. 1.30	$31,872.00	32,370.00
Drilling, core 600 feet at $7.00/ft. 7.14	4,200.00	4284.00
Standby time 15 hours at $10.00/hr. 10.20	150.00	153.00
Logging (gamma-ray, resistivity) 25,500 feet at $0.10/ft. 0.102	2,550.00	2601.00
Bulldozing (Caterpillar D-7 or equiv.) 30 hours at $15.00/hr. 15.30	450.00	459.00
Total actual cost items, Stage I		$39,222.00 39,867.00

Fixed Unit Costs

60 core boxes at $1.25 each	$ 75.00	
30 chemical assays for U_3O_8 at $3.50 each	105.00	
Incidental allowance, 25,500 feet at $0.14/ft. 0.11 2800 ice	3,570.00	2985.00
Total fixed unit cost items, Stage I		$ 3,750.00
Total Stage I		$42,972.00 42,852.00

Stage II - 15 holes

Actual Cost Items

Drilling, non-core 25,500 feet at $1.28/ft. 1.30	$32,640.00	33,150.00
Standby time 15 hours at $10.00/hr. 10.20	150.00	153.00
Logging (gamma-ray, resistivity) 25,500 feet at $0.10/ft. 0.102	2,550.00	2601.00
Bulldozing (Caterpillar D-7 or equiv.) 30 hours at $15.00/hr. 15.30	450.00	459.00
Total actual cost items, Stage II		$35,790.00 36,363.00

Fixed Unit Cost Items

30 chemical assays for U_3O_8 at $3.50 each	$ 105.00	
Incidental allowance, 25,500 feet at $0.~~24~~/ft. 0.11	2805.00 ~~3,570.00~~	
Total fixed unit cost items, Stage II		2,910.00 $ ~~3,675.00~~
Total Stage II		39,273.00 $39,465.00
Total for Project		82,125.00 $82,437.00
Government participation at 50 percent		41,063.00 $41,218.50

CONCLUSIONS AND RECOMMENDATIONS

The applicant's property is located at the southeastern end of a southeasterly trending belt of large (500,000 to 1,000,000 ton) uranium ore deposits. Exploratory drilling across the southern end of section 9, T. 13 N., R. 8 W., by the Rio de Oro Uranium Mines, Inc., showed thicknesses of Westwater Canyon member averaging about 200 feet, thus suggesting that the applicant's section 16 is probably underlain by a favorable thickness of the ore-bearing sandstone.

Evaluation of the available information leads the examining team to conclude that there is a reasonable possibility of discovering large deposits of uranium ore at depths averaging 1,700 feet on the subject property. The team recommends that the DMEA participate in a two-stage exploration program consisting of a maximum of 30 drill holes containing 50,400 feet of non-core and 600 feet of core drilling, at an estimated cost of $82,437.00. Government participation would be 50 percent of the total estimated cost of the project or a maximum of $41,218.50.

The following specifications are suggested for incoporation in a possible contract:

1. Core drilling in the three holes concerned should commence within 20 feet of the estimated top of the Westwater Canyon member of the Jurassic Morrison formation and end in not more than 20 feet of the underlying Recapture member. The cores should be geologically and radiometrically logged and any core showing anomalous radioactivity should be split and chemically assayed.

2. Samples of the cuttings from the non-core portions of the holes should be taken at not more than 5-foot intervals and radiometrically checked. Lithologic logs of all holes should be recorded.

3. Gamma-ray and resistivity logs of all completed holes should be recorded.

4. Provision should be made in the contract for transfer of Stage II footage to Stage I if required for completion of Stage I.

5. Relocation or deletion of holes to take advantage of local topography should require DMEA Field Team approval.

U.S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
MARCH 1958
DOCKET 4872

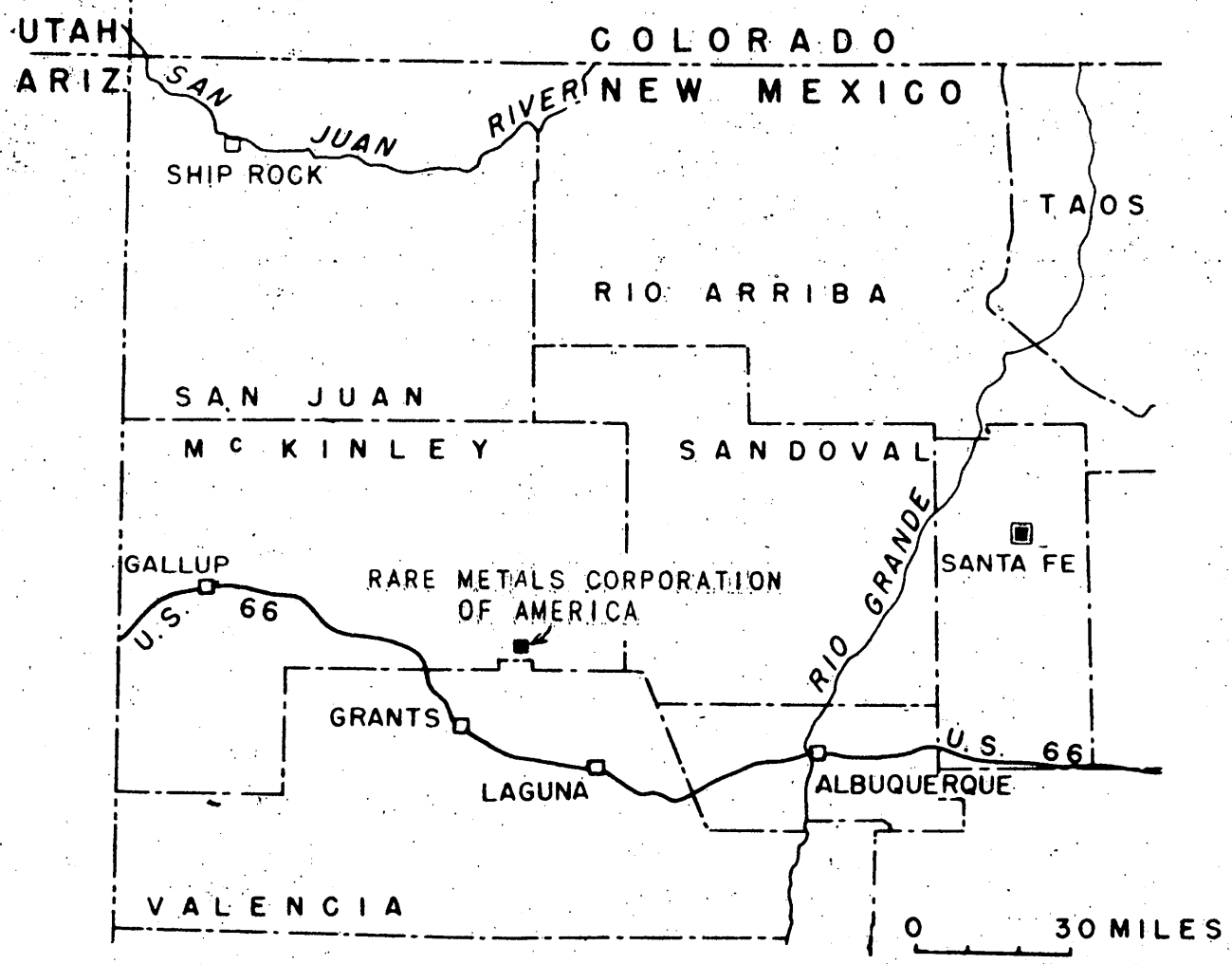

Figure 1.--INDEX MAP OF NORTHWEST NEW MEXICO SHOWING THE LOCATION OF SECTION 16, T. 13 N., R. 8 W., N.M.P.M., RARE METALS CORPORATION AMERICA, McKINLEY COUNTY, NEW MEXICO.

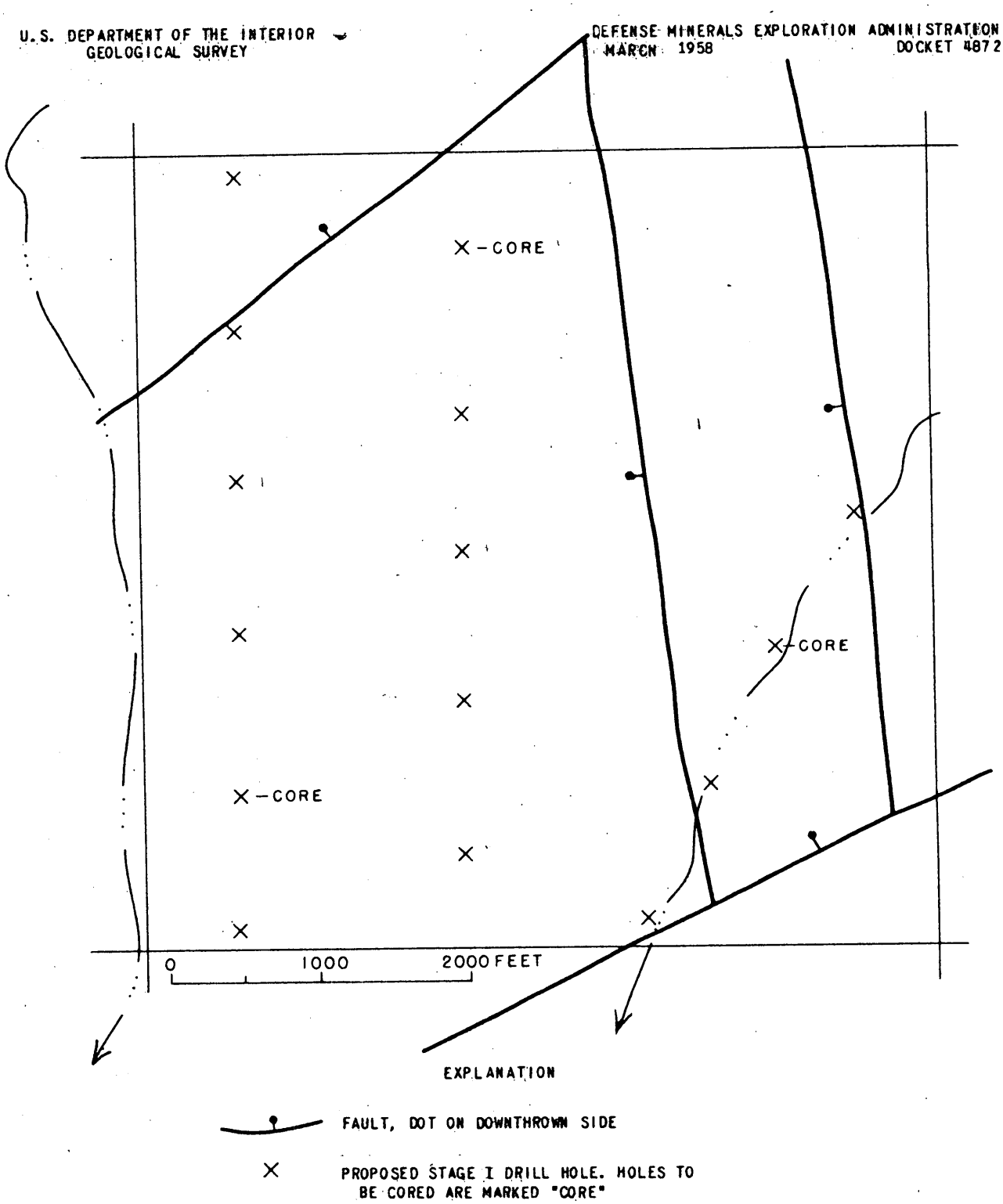

Figure 3.--PLAN MAP OF SECTION 16, T. 13 N., R. 8 W., RARE METALS CORPORATION OF AMERICA, MCKINLEY COUNTY, NEW MEXICO, SHOWING THE PROPOSED LOCATION OF STAGE I DRILL HOLES.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEFENSE MINERALS EXPLORATION ADMINISTRATION
MARCH 1958

DOCKET 4872

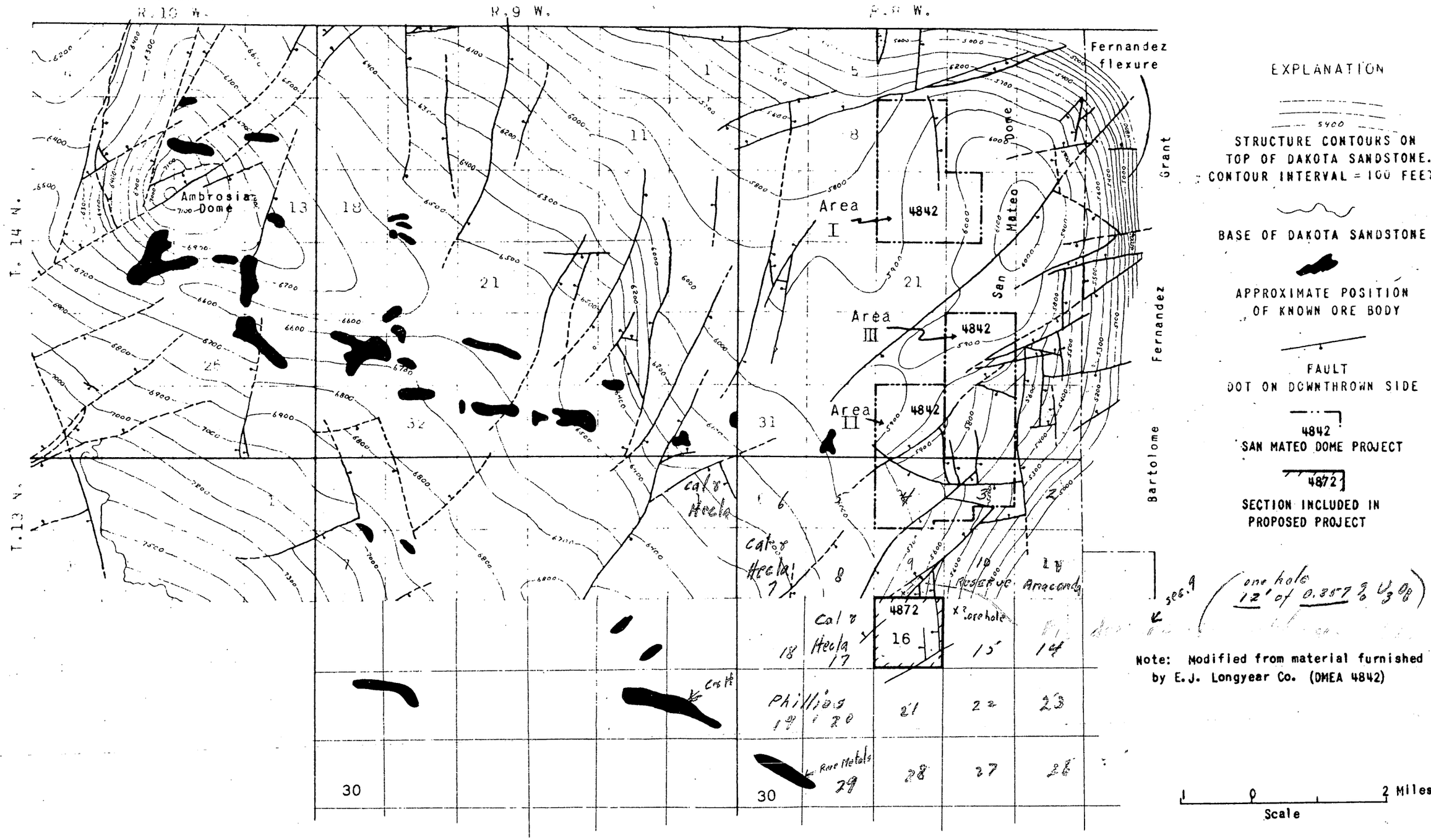

FIGURE 2.--MAP OF THE AMBROSIA LAKE-SAN MATEO DOME AREA SHOWING THE STRUCTURE AROUND THE AMBROSIA DOME AND THE SAN MATEO DOME AND THE APPROXIMATE POSITION OF THE KNOWN ORE DEPOSITS OF THE AREA, SECTION 16, T.13 N., R.8 W., N.M.P.M., RARE METALS CORPORATION OF AMERICA, McKINLEY COUNTY, NEW MEXICOO

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DMEA
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12-9 | C | 220
" | ~~Murphy~~ | 700

224 New Customhouse
Denver 2, Colorado

December 5, 1957

Memorandum

To: J. W. Hasler
M. H. Salsbury

From: DMEA Field Team, Region III

Subject: Docket No. DMEA 4872 (Uranium) Rare Metals Corporation of America (Sec. 16, T. 13 N., R. 8 W.) McKinley County, New Mexico

Mr. John R. Reynolds, Chief Engineer for the subject Applicant called this office and informed us that the subject application will be handled by their New Mexico office.

When the examination of this property is scheduled, please notify Mr. Harold Hurst, 207 Sunshine Building, Albuquerque, New Mexico, who will arrange for a representative to accompany the field examiners.

W. H. King
Executive Officer

cc: John R. Reynolds, Chief Engineer, Rare Metals Corporation, 10th Floor, First Security Building, Salt Lake City 11, Utah
Harold Hurst, 207 Sunshine Building, Albuquerque, New Mexico

HMC:sh

cc: Sec. Op. Comm. (2)
Harshman
Docket
Chron.

OFFICIAL FILE COPY
DMEA
RECEIVED DEC 6 1957

DATE	INITIALS	CODE
12/6	C	220
	~~EMM~~	~~700~~

224 New Customhouse
Denver 2, Colorado

December 3, 1957

Memorandum

To: J. Wm. Hasler) with enclosures
M. H. Salsbury) Items 1 to 5, below

From: DMEA Field Team, Region III

Subject: Docket No. DMEA 4872 (Uranium), Rare Metals Corporation of America (Sec. 16, T 13 N, R 8 W) McKinley County, New Mexico

Enclosed is the following material relating to the subject docket:

(1) Copy of application for Government assistance in exploration work under the DMEA program.

(2) Memorandum of review by James Paone, USBM.

(3) Memorandum of review by W. P. Williams, USGS.

(4) Letter of transmittal of the foregoing, to this office, dated November 25, 1957, from the Chairman, Operating Committee, DMEA.

(5) Routing Control Sheet

A field examination of the property and a joint report of findings and recommendations pertaining to the Applicant's work proposal are requested.

If the Field Examiners recommend Government participation in the proposed exploration program, please submit 11 extra copies of each map used in the joint report, which show the land to be subordinated and the location and extent of the recommended work relative to property boundaries.

The Bureau of Mines' copy of the application should not be returned to this office, but is to be kept for the Examining Engineer's file. The Routing Control Sheet, however, is to be completed, detached from the application, and forwarded to the Executive Officer, with the joint report of examination. The Survey's copy of the application is to be returned to Mr. Harshman's office.

HMC:bh
cc-Sec. Op. Comm. (2)
DMEA/DFC (2)
Harshman - w/encls Items 2, 3 & 4
Docket
Chron.

Original signed by
W. H. KING

W. H. King
Executive Officer

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
11-25	Murphy	700
11-26	[illegible]	700
11/25	[illegible]	130
"	Johnson	110
"	Blattendorf	100
11/26	gb	200
		700

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

NOV 25 1957

Re: Docket No. DMEA-4872 (Uranium)
Rare Metals Corporation of America
Sec. 16, T. 13 N., R. 8 W., N.M.P.M.
McKinley County, New Mexico

Dear Mr. Harshman:

The captioned application is referred to Region III Field Team for investigation, a field examination if deemed advisable, and recommendations.

Enclosed are copies of memoranda, dated November 14 and 20, 1957, by James Paone, USBM, and W. P. Williams, USGS, respectively, relating to the application. Also enclosed for Field Team use are two extra copies of the application.

The Field Team should advise the Applicant that, if a contract is approved, DMEA will require 5 copies of a Consent to Lien and Subordination Agreement signed by W. T. Old, Jr., and his wife Patricia M. Old, who retained an overriding royalty of 5 percent when they assigned the State Lease. Also, that we will require a Performance Bond equal to the amount of the Government's share of the cost of the project work.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures
APPROVED:

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

Thor H. Kiilsgaard (THK)
Member, Geological Survey

FMMurphy/izm 11-22-57
cc: Mr. Murphy
Admr.'s Reading File
Operating Committee
THKiilsgaard, 5224

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
11-25	Murphy	700
11-25	Ellis	700
11/25	Selfridge	220
"	Johnson	110
"	Mittendorf	110
		210
11/26	gb	220
		700

NOV 25 1957

Rare Metals Corporation of America
Tenth Floor, First Security Building
Salt Lake City 11, Utah

Re: Docket No. DMEA-4872 (Uranium) 11/25 Lamb 130
Sec. 16, T. 13 N., R. 8 W., N.M.P.M.
McKinley County, New Mexico
11/25 Gilegaard 130

Gentlemen:

The application for assistance in exploring your property, under the captioned docket number, has been reviewed by the Division of Rare and Miscellaneous Metals of the Defense Minerals Exploration Administration. It has been referred to:

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

The Regional Office will contact you in regard to your project if additional information is required.

Sincerely yours,

C. O. Mittendorf (for)
Administrator

FMMurphy/izm 11-22-57
cc: Mr. Murphy
Admr.'s Reading File
DMEA FT Reg. 3 (2)

IN REPLY REFER TO:

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

November 20, 1957

Memorandum

To: E. W. Ellis, Defense Minerals Exploration Administration

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

Subject: Review of application, DMEA 4872 (uranium), Rare Metals Corporation of America, Sec. 16, T.13N., R.8W., MaKinley County, New Mexico

The applicant proposes to explore for uranium ore deposits on a full section of land located in the Grants district of New Mexico.

The proposed work would consist of a total of 50 drill holes, a total of 100,000 feet of drilling, at a total estimated project cost of $216,607. The proposed holes are laid out on a rectangular grid pattern with the initial holes on 1,000 foot centers.

The property is situated near the eastern extremity of the district. Drilling would be deep. The applicant estimates that the average hole depth would be 2,000 feet.

I know of no large ore deposits very near the applicant's land. On the other hand, this might be an opportunity to extend production in the district to the eastward. I recommend that the application be referred to the Field Team for appraisal and report.

DMEA
RECEIVED NOV 22 1957

DATE	INITIALS	CODE
11/22	C	220
"	~~EWE~~	700
	FMM	
Complete		

W. P. Williams

W. P. Williams

OFFICIAL FILE COPY
DMEA
RECEIVED NOV 15 1957

DATE	INITIALS	CODE
11/15	C	220
11	Ellis	700
	Murphy	

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

Date November 14, 1957

DMEA Docket No. 4872
DMEA Contract No.
Commodity Uranium
Name of applicant Rare Metals Corp. of America
Name of property
Location of property McKinley County, N. Mex.
Estimated cost of project $108,303.60

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Member

From: James Paone, Bureau of Mines Member
Uranium Commodity Member

Subject: Review of Application
(Application, Field Team Report, etc.)

1. Date of subject document: 11/12/57. 2. Date received by reviewer: 11/14/57.

3. Prior reports on this property known to reviewer: Yes ☐ No ☐

4. Prior reports on nearby properties known to reviewer: Yes ☒ No ☐

5. Information available on past production: Yes ☐ No ☐

6. Other pertinent factors known to reviewer: Yes ☐ No ☐

7. Explain items marked yes above: Area lies in the most favorable uranium area in the U. S.

8. Factors needing special consideration:
   a. Location ☐
   b. Ownership ☐
   c. Evidence of mineralization ☐
   d. Geology ☐
   e. Proposed exploration method ☐
   f. Alternate exploration method ☐
   g. Costs ☐
   h. ☐

9. Action advised:
   a. Obtain information from applicant ☐
   b. Refer to Field Team ☒
   c. Denial ☐
   d. Agree with Field Team ☐
   e. Disagree with Field Team ☐
   f. Suggest alternate plan ☐
   g. Request another examination ☐
   h. Approval ☐
   i. Consult with Mr. _____ at _____ AEC office.

10. Remarks: (Use back of page if necessary)

16 13N 8W

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

November 13, 1957

Rare Metals Corporation of America
Tenth Floor
First Security Building
Salt Lake City 11, Utah

Subject: DMEA-4872

Gentlemen:

Your application for exploration assistance, dated November 1, 1957 submitted to our office at Washington, D. C. has been assigned Docket Number DMEA-4872 and referred to the Rare and Miscellaneous Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to: Region III

RARE METALS CORPORATION OF AMERICA

TEXAS STREET AT STANTON • POST OFFICE BOX 1492 • EL PASO, TEXAS

ADDRESS REPLY TO:
TENTH FLOOR, FIRST SECURITY BLDG.
SALT LAKE CITY 11, UTAH

November 7, 1957

RECEIVED NOV 12 1957
DATE | INITIALS

Mr. C. O. Mittendorf, Administrator
Defense Minerals Exploration Administration
U. S. Bureau of Mines
Washington 25, D. C.

Dear Mr. Mittendorf:

There are enclosed four copies of an application for a D.M.E.A. loan to cover a proposed exploration program for uranium on the Spurrier Tract, Section 16, T. 13 N., R. 8 W., McKinley County, New Mexico.

If you should desire, or require, any additional information, we will be pleased to try and furnish it to you.

Very truly yours,

M. H. Kline
Vice President

MHK:ak

Encls. 4

LOGGING DATA

DMEA-4872-denied

PROBE SIZE: 1 3/8 | CALIBRATION: 400
DATE: 6-21-58 | FIELD HOOTRS: Grants

	INITIAL RUN	RE-RUN	RE-RUN	RE-RUN	RE-RUN	RE-RUN	RE-RUN
HOLE NO.	16-3-3						
HOLE DIA.	5 7/8 B.I.T.						
DRILLED DEPTH	1770 ft						
LOGGED DEPTH	1136 ft	11	12	10		1822	
GAMMA SCALE	25 cps	1K	250	100			
TIME CONSTANT	3 sec	2	2	2			
PAPER SPEED	10 ft/in	5	5	5			
LOGGING SPEED	10 ft/m	ft/m	ft/m	ft/m	ft/m	ft/m	ft/m
RESISTANCE SCALE	50Ω						
SELF POT SCALE	mv/in NoSP		SELF POT T.D.				
BORE HOLE MEDIUM	H2O	WITH					
MUD READINGS	RESISTIVITY		TYPE BASE				
	VISCOSITY		SALINITY				
	WEIGHT	LBS/GAL	LBS/CU FT				
CALIPER SCALE	INCH	LOG SIZE	PAPER SCALE				
TIME IN	0315	CASED TO		I.D.	IN		
TIME OUT	0500	CORE INT.		DIAM	IN		

LOCATION	TIME
SEC 16 TWP 13 RGE. 8	OFFICE:
COUNTY McKinley	DRIVE: 3.0
STATE New Mexico	STANDBY: 3.3
AREA:	FIELD: 1.3
CLIENT: Rare Metals	TOTAL: 2.1
Dr. Contractors [illegible]	BREAKDOWN:
LOG REC'D BY:	OPERATOR: Marsh [illegible]
[signature]	PARTY NO: 2-1

Century GEOPHYSICAL CORP.

TULSA, OKLA., U.S.A.

EXPLORATION LOG

COMPANY: Rare Metals Corp. of America
BORE HOLE NO.
FIELD
COUNTY
LOCATION: SEC. TWP. RGE.
LOG MEAS. FROM ... FILE NO.
ORLO. MEAS. FROM ...

DATE:
FOOTAGE
TOTAL DEPTH (DR)
HOLE DIAM.
LOGGING SPEED
TIME CONSTANT
MUD TYPE
CASED TO

LOCATION OF HOLE
ELEVATION KB GL
BKGRD. COUNT
SLUSH PIT CT.

REMARKS: Reruns!

1554 - 1540 1K 102
1540 - 1528 250 "
1522 - 1512 100 "

50' @ 1180 104

MINERALIZATION OR DIRECTIONAL DRIFT METER

COUNTS PER SEC.	BED THICKNESS	K KO	CORR. CPS.	% U3O8
Obs No.	Depth	Drift	Mag Brng	True Bearing

RADIOMETRIC % VALUES COMPUTED WITHOUT BENEFIT OF LOCAL ORE EQUILIBRIUM FACTOR

INTERPRETATION BY: [signature]

GEOLOGIC TOPS

FORMATION	DEPTHS	THICKNESS
Kd	1402 - 1467	
Jmbb	1467 - 1516	
Jmww	1516 - 1705	
Jmr	1705-	

SELF POTENTIAL

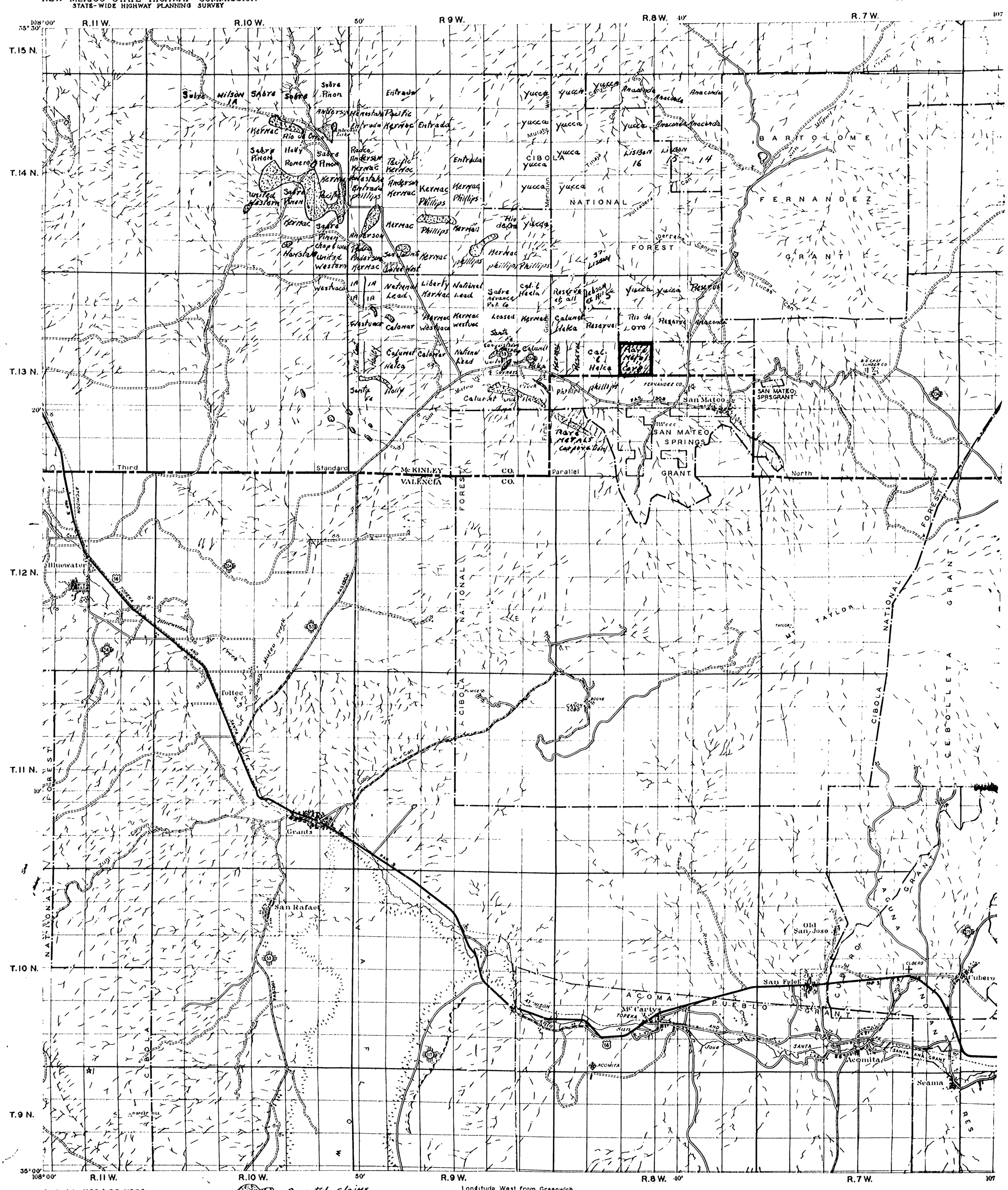
NATURAL GAMMA RAY
COUNTS PER SECOND

16-3-3

CALIPER INCHES

4	5	6	7	8	9
4	6	8	10	12	14
4	8	12	16	20	24

RESISTANCE
OHMS


R.11 W.
R.10 W.
R.9 W.
R.8 W.
R.7 W.
T.15 N.
T.14 N.
T.13 N.
T.12 N.
T.11 N.
T.10 N.
T.9 N.
108° 00'
35° 30'
35° 00'
107
Third
Standard
Parallel
North
McKINLEY CO.
VALENCIA CO.
SAN MATEO SPRINGS GRANT
SAN MATEO SPRS GRANT
Bluewater
Toltec
Grants
San Rafael
Old San Jose
San Fidel
Cubero
Acomita
Seama
McCartys
ACOMITA
ACOMA PUEBLO GRANT
CIBOLA NATIONAL FOREST
BARTOLOME FERNANDEZ GRANT
TAYLOR MT
CEBOLLETA GRANT
ATCHISON TOPEKA AND SANTA FE
Control by U.S.C. & G.S., U.S.G.S.; U.S.F.S., U.S.G.L.O., and Planning Survey Compiled 1938.
Reported claims
Longitude West from Greenwich
STATUTE MILES
Note: Location and Type of State Highways corrected to Aug., 1951
Highway Numbering correct to Aug., 1951
Modified Conic Projection
Standard Parallel 34½°
N.A. Datum
N