DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE 27 JAN 1958 Idm-E NO._____ DMEA NO. 4799

1165

Application
- [ ] Denied
- [ ] Withdrawn

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

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

Folder No. 1:

Left Side

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

Right Side

- [ ] Project summary (final)
- [ ] Work Completed analysis (final)

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

- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] 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. 1 : Maps (Use pocket folder or envelope)

Folders No._____: Settlement Sheets

Folders No._____: Drill Logs

Folders No._____: Royalty material

17963

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 15 1957

DATE	INITIALS	CODE

CERTIFICATE OF OWNERSHIP

MERGING

MARINE MINERALS INC., A DELAWARE CORPORATION

INTO

HEAVY MINERALS CO., A DELAWARE CORPORATION

(Pursuant to section 253 of Title 8 of The Delaware Code of 1953)

Heavy Minerals Co., a corporation incorporated on the 12th day of June, 1953, pursuant to the provisions of the General Corporation Law of the State of Delaware DOES HEREBY CERTIFY that this company owns all the outstanding stock of Marine Minerals Inc., a corporation incorporated on the 28th day of April, 1954, pursuant to the provisions of the General Corporation Law of the State of Delaware, and that this company, by a resolution of its Board of Directors duly adopted at a meeting held on the 21st day of August, 1956, determined to and did merge into itself said Marine Minerals Inc., which resolution is in the following words to wit:

WHEREAS, Heavy Minerals Co. lawfully owns all the outstanding stock of Marine Minerals Inc., a corporation organized and existing under the laws of Delaware, and

WHEREAS, this company desires to merge into itself the said Marine Minerals Inc. and to be possessed of all the estate, property, rights, privileges and franchises of said company,

NOW, THEREFORE, BE IT RESOLVED That, this company merge into itself, and it does hereby merge into itself said Marine Minerals Inc. and assumes all of its liabilities and obligations, and

FURTHER RESOLVED That, the President or a Vice-President, and the Secretary or Treasurer of this company be and they hereby are directed to make and execute, under the corporate seal of this company, a certificate of ownership setting forth a copy of the resolution to merge said Marine Minerals Inc. and assume its liabilities and obligations, and the date of adoption thereof, and to file the same in the office of the Secretary of State of Delaware, and a certified copy thereof in the office of the Recorder of Deeds of Newcastle County.

With original letter 8-14-57

FURTHER RESOLVED That, the officers of this company be and they hereby are authorized and directed to do all acts and things whatsoever, whether within or without the State of Delaware, which may be in anywise necessary or proper to effect said merger.

For all accounting purposes the effective date of the merger shall be as of the close of business on December 31, 1956.

IN WITNESS WHEREOF, said Heavy Minerals Co. has caused its corporate seal to be affixed and this certificate to be signed by E. E. Wyatt, its Executive Vice-President, and K. L. Karr, its Secretary, this 24th day of December A. D. 1956.

Signed, Sealed and Delivered in the Presence of:

Gwendolyn Owens

Edward C. Cushman, Jr.

HEAVY MINERALS CO.

E. E. Wyatt
Executive Vice-President

K. L. Karr
Secretary

HEAVY MINERALS CO.
CORPORATE SEAL
1953
DELAWARE

STATE OF SOUTH CAROLINA,
COUNTY OF AIKEN,

Personally appeared before me Gwendolyn Owens, and made oath that she saw the within named E. E. Wyatt, Executive Vice-President, and K. L. Karr, Secretary, sign the name of HEAVY MINERALS CO., and affix the seal of the said corporation to the foregoing written instrument, and sign their names and affix their seals as Executive Vice-President and Secretary thereof, and as its act and deed deliver the within written instrument, and that she with Edward C. Cushman, Jr., witnessed the execution thereof.

SWORN TO and subscribed before me this 24th day of December, 1956.

Edward C. Cushman, Jr. L. S.
Notary Public for South Carolina.

Gwendolyn Owens

EDWARD C. CUSHMAN, JR.
NOTARY PUBLIC
SOUTH CAROLINA

STATE OF ILLINOIS)
COUNTY OF COOK) ss:

BE IT REMEMBERED that on this 24th day of December A. D. 1956, personally came before me, William R. Stead a Notary Public in and for the County and State aforesaid, E. E. Wyatt, a Vice-President of Heavy Minerals Co., a corporation of the State of Delaware, the company described in and which executed the foregoing certificate, known to me personally to be such, and he, the said E. E. Wyatt as such Vice-President, duly executed said certificate before me and acknowledged the said certificate to be his act and deed and the act and deed of said company; that the signatures of the said Vice-President and of the Secretary of said company to said foregoing certificate are in the handwriting of the said Vice-President and Secretary of said company respectively, and that the seal affixed to said certificate is the common or corporate seal of said company.

IN WITNESS WHEREOF, I have hereunto set my hand and seal of office the day and year aforesaid.

William R. Stead
Notary Public

Notary Public in and for the
County of Cook, State of Illinois
My Commission expires Feb. 7, 1958

WILLIAM R. STEAD
NOTARY PUBLIC
COOK COUNTY, ILL.

State of Delaware

Office of Secretary of State

I, **John N. McDowell**, *Secretary of State of the State of Delaware,* **do hereby certify** *that the above and foregoing is a true and correct copy of*

Certificate of Ownership of the "HEAVY MINERALS CO." merging "MARINE MINERALS INC.", pursuant to Section 253 of the General Corporation Law of the State of Delaware, as received and filed in this office the thirty-first day of December, A.D. 1956, at 3 o'clock P.M.

In Testimony Whereof, *I have hereunto set my hand and official seal at Dover this* thirty-first *day of* December *in the year of our Lord one thousand nine hundred and* fifty-six.

John N. McDowell

Secretary of State

Asst. Secretary of State

FORM 120

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 15 1957

DATE	INITIALS	CODE

THE STATE OF SOUTH CAROLINA,

COUNTY OF AIKEN.

ASSIGNMENT AND BILL OF SALE

WHEREAS, in pursuance of a plan of liquidation heretofore adopted, MARINE MINERALS INC., ~~a Delaware corporation~~ domesticated in the State of South Carolina, ASSIGNOR, desires to transfer and to distribute to HEAVY MINERALS CO., a Delaware corporation also domesticated in the State of South Carolina, ASSIGNEE, all of the assets and property of Assignor, of whatsoever kind or description, in complete liquidation of Assignor and in complete liquidation or cancellation or redemption of all of its shares; and

WHEREAS, Assignee proposes to assume, pay and discharge all the liabilities, obligations and indebtedness of Assignor to all persons, firms, corporations and associations, except Assignee;

NOW THEREFORE, KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the aforesaid plan of liquidation, Assignor does hereby bargain, sell, assign, transfer and set over unto Assignee, in complete liquidation of Assignor and in complete cancellation or redemption of all its shares, subject however, to the rights of third persons, all the real, personal, tangible, intangible and mixed property, assets, rights, business and good will of said MARINE MINERALS INC., including among other things, the following (PROVIDED, HOWEVER, that no specific enumeration or word of particular application herein contained shall in any way limit or impair the scope, effect or intent of any general description or word of general application herein contained), to wit:

All land, buildings, structures, tracks, sidings, fixtures, engines, machinery, appliances, tools, dies, jigs, apparatus, and equipment of every kind, class and description;

All patents, inventions, processes, formulae and all rights, interests and claims in, to, or under any thereof;

All trademarks, trade names and trade rights and trade secrets including the sole right to use the phrase "Marine Minerals" or any similar phrase;

All cash on hand or deposits in banks and all other cash assets;

with Applicants' letter 8-14-57

All shares of stock in other corporations or other securities and any and all beneficial interests which the Assignor may have in any property or properties;

All bills, notes and accounts receivable, and any and all sums of money due or to become due by reason thereof, customers' lists, prepaid taxes, deferred charges, leases, unexpired insurance, and all accounts and contracts, including existing contracts and orders and any and all choses in action, claims and demands of whatsoever nature;

All account books, manufacturing books, accounts and data of costs;

All materials, supplies, manufactured products and materials and goods in process of manufacture;

All rolling stock, wagons, automobiles and motor trucks;

All other rights, claims, demands, property, assets and effects of every kind and nature, tangible and intangible, and wheresoever situated, whether mentioned or referred to in this instrument or not, which is connected with the business hereby conveyed, together with the business as a going concern and all the good will thereof, and together with the tolls, rents, issues, profits, revenues, income, and profits of and from any and all of said assets, property and rights of aforesaid, and also all the estate, rights, title and interest and demand whatsoever, as well in law as in equity, of the Assignor in and to the said property and rights and any and every part thereof;

TO HAVE AND TO HOLD all and singular the aforementioned unto the said HEAVY MINERALS CO., its successors and assigns in fee simple forever.

The Assignor hereby covenants, represents and warrants to and with the Assignee that the Assignor is the lawful owner of the property hereby conveyed or hereby intended to be conveyed and that it has good and unencumbered title to the property and assets hereby sold, transferred, assigned and conveyed, and to each and every part thereof, and full right to sell, assign, transfer, and convey the same.

The Assignor further covenants and agrees to execute and deliver to the Assignee, its successors and assigns, all such further and separate assignments, agreements, conveyances, deeds, and other instruments as the Assignee or its successors and assigns may at any time reasonably request, for the better assuring to it or to them of the title to the said property and assets and all the right, title and interest of the Assignor therein and thereto.

The Assignee hereby assumes and agrees to perform all the outstanding agreements of the Assignor contained in its contracts hereinbefore assigned to the Assignee and the Assignee further covenants and agrees to pay, satisfy and discharge all the indebtedness and liabilities of the Assignor of any and every kind, direct or contingent, which may be unsatisfied at the date hereof, including the performance of all outstanding contracts.

This conveyance and agreement is executed by the Assignor pursuant to full and complete authority duly conferred by proper proceedings of its Board of Directors and stockholders, and it shall become effective immediately after the close of business on December 31, 1956.

IN WITNESS WHEREOF the parties hereto have respectively caused their corporate names to be signed hereto and their respective Seals to be affixed hereto, by their respective Presidents or Vice-Presidents, and by their respective Secretaries or Assistant Secretaries; and further have caused their said respective officers to sign their names and affix their Seals as such officers, this 31st day of December, Anno Domini 1956, and in the one hundred eighty-first year of the Sovereignty and Independence of the United States of America.

Marine Minerals Inc

Signed, sealed and delivered in the presence of

MARINE MINERALS INC.
Assignor

Ruth Baldwin

By P. E. Grant (SEAL)
(Vice) President

Helen Malamar
As to MARINE MINERALS INC.

By W. R. Steed (SEAL)
(Assistant) Secretary

Heavy Minerals Co

HEAVY MINERALS CO.
Assignee

Ruth Baldwin

By P. E. Grant (SEAL)
(Vice) President

Helen Malamar
As to HEAVY MINERALS CO.

By W. R. Steed (SEAL)
(Assistant) Secretary

THE STATE OF ILLINOIS

COUNTY OF COOK

PERSONALLY appeared before me, Ruth Baldwin, and made oath that she saw the within named E. E. Wyatt, (Vice) President, and W. R. Stead, (Assistant) Secretary, sign the name of MARINE MINERALS INC. and affix the Seal of said corporation to the foregoing written instrument, and sign their names and affix their Seals as (Vice) President and (Assistant) Secretary thereof, and as the act and deed of said corporation, deliver the foregoing written instrument for the uses and purposes therein expressed; and that she with Helen Malsnar, witnessed the execution thereof.

Ruth Baldwin

Sworn to and subscribed before me,
this the 31st day of December, 1956.

Lois B. Doll (SEAL)
NOTARY PUBLIC, STATE OF ILLINOIS
My Commission expires 9/26/60.

THE STATE OF ILLINOIS

COUNTY OF COOK

PERSONALLY APPEARED BEFORE ME, Ruth Baldwin, and made oath that she saw the within named E. E. Wyatt, (Vice) President, and W. R. Stead, (Assistant) Secretary, sign the name of HEAVY MINERALS CO. and affix the Seal of said corporation to the foregoing written instrument, and sign their names and affix their Seals as (Vice) President and (Assistant) Secretary thereof, and as the act and deed of said corporation deliver the foregoing written instrument for the uses and purposes therein expressed; and that she with Helen Malsnar, witnessed the execution thereof.

Ruth Baldwin

Sworn to and subscribed before me,
this the 31st day of December, 1956.

Lois B. Doll (SEAL)
NOTARY PUBLIC, STATE OF ILLINOIS
My Commission expires 9/26/60.

Form MF–103
Revised Feb. 1957

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Budget Bureau No. 42–R1035.3
Approval expires June 30, 1958

APPLICATION FOR AID IN AN EXPLORATION PROJECT

PURSUANT TO DMEA ORDER I, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

NAME OF APPLICANT (Full legal name and mailing address as it should appear on contract if one is executed)

HEAVY MINERALS COMPANY
MARINE MINERALS DIVISION
P.O. BOX 928
AIKEN, SOUTH CAROLINA

RECEIVED JUL 29 1957 DMEA

APPLICANT NOT TO USE THIS BLOCK

Docket Number: 4799
Date Received: 7/29/57
Government Participation %:
Region: V
Division Code: 600

BUSINESS ORGANIZATION (Check one)

- Individual [ ]
- Corporation [X]
- Partnership [ ]
- Other (Specify) [ ]

State in which firm is organized:

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

Name	Address	Title
On Attached Sheet		

APPROVED JUL 26 1957

Mineral(s) for which you wish to explore:

Estimated Cost of Project: $ 83326.88

LOCATION OF PROPERTY

Name	County	State
	Aiken and Orangeburg	S. C.

GENERAL INSTRUCTIONS

Before filling out this application, please read DMEA Order–I, Amended, "Government Aid in Defense Exploration Projects." To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit four copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 1, existing mine workings and geology in item 2, and the proposed exploration project in item 4. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 2(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals*, of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest DMEA Field Office.*

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.

7/23/57
Dated

G E Aiken
BY *(Signature)*

Project Engineer
Title

A wilfully false statement or certification to any Department or Agency of the United States Government is a criminal offense. U. S. Code, Title 18, Sec. 1001.

INFORMATION REQUIRED WITH THIS APPLICATION

1. *Applicant's Property Rights:*

(a) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore and all land adjacent to the proposed project area which you own or control. Describe any part of the project land or workings which should not be subject to Government lien for royalty payments. If the land consists of unpatented claims, state the book and page number for each recorded location notice, including amended locations, and the place where recorded (courthouse, recorder's office, county, and state).

(b) State all the names by which you know the property.

(c) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise. If you are not the owner, submit with this application one exact copy of the lease, contract, or other document (with address of owner) under which you control the property.

(d) Describe all liens, mortgages, or other encumbrances on the property.

2. *Physical Description:*

(a) Describe in detail and illustrate with maps or sketches all mining or exploration operations which you know have been or are being conducted upon the lands, including existing mine workings. Describe all production facilities.

(b) State your interest, if any, in operations stated in 2*(a)*.

(c) State, as far as you know, the past and current production, supporting your statement with copies of settlement sheets, mine records, or published data if available.

(d) Describe known ore reserves on the property giving quantities and grades and sampling methods used, supporting your statement with copies of assay certificates and assay maps if available.

(e) Describe by narrative and maps or sketches the geologic features of the property, including ore minerals, geologic formations, if known, and type of deposit (vein, bedded, etc.).

(f) State your reasons for expecting to find ore, and if you have sampled the area you propose to explore, show where the samples were taken, describe sampling methods used, and provide copies of assay certificates.

(g) Send with your application at least *two* copies of all geologic or engineering reports, assay maps, or technologic information which you may have, indicating on each whether you require its return to you.

3. *Accessibility of Project:*

(a) To aid DMEA representatives who may be required to examine the property, state the name and address of the person who will meet the DMEA representative; give directions for reaching the property; and describe accessibility of the property including the mine workings.

(b) Name the shipping and supply points and places where employees reside and state the distances between them and the property.

4. *The Exploration Project:*

(a) Describe fully the proposed exploration project giving individual footages and sizes of openings *for each item of work.* Use narrative, maps, plans, and longitudinal and cross sections as necessary. Show the location of the proposed work as related to geologic features such as veins, ore-bearing beds, contacts of rock formations, etc. Show also the relation of the proposed work to any existing mine workings and to *property boundaries* or to the closest identifiable corner.

(b) If an access road to the project must be built, show the location on the property map and state the length, type, and construction methods proposed.

(c) In the event that an exploration contract with DMEA is executed, how soon will the work start and how many months will be required to complete it? State your anticipated average daily or monthly rate of progress for each type of work.

5. *Experience:*

State your operating experience and background with relation to your ability to carry out this exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of Costs:*

Furnish detailed estimates of the costs *for each item of the work proposed in 4(a)* under the headings listed below with a total for each heading and the estimated total cost of the project. Costs for any work to be performed by an independent contractor should be shown separately under category *(a)* below. Costs for any work that is not to be performed by an independent contractor should be given in detail under categories *(b)* through *(g)*.

(a) Independent contracts. State the cost of any proposed independent contract for the performance of all or any part of the work, expressed in units of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved. Cost estimates should be supported by bids from three contractors if possible. *(Note* – If none of the work is to be contracted, write "none" after this item.)

(b) Personal services. For necessary supervision, engineering and geological services, and labor, include an itemized schedule of numbers, classes, rates of wages, salaries or fees, and periods of employment. State whether these technicians and employees are available.

(c) Operating materials and supplies. List items of material and supplies with their cost. Include under this heading power, water, and fuel, and units of equipment and tools costing less than $50 each.

(d) Operating equipment. List items of operating equipment to be used giving specifications and indicating how each item is to be acquired — i.e., rented, purchased, or provided by the applicant. If it is rented or purchased, state the estimated rental or purchase price. If it is to be furnished by the applicant, give its present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of necessary *initial* rehabilitation or repair of existing buildings, fixtures, installations (exclusive of mine workings), and movable operating equipment now owned by the applicant, which will be used on the exploration project.

(f) New buildings, fixtures, installations. Describe each building, fixed improvement, and installation to be purchased, constructed, or installed for the exploration project stating specifications and cost including labor, materials and supervision.

(g) Miscellaneous. For the operating equipment listed in 6*(d)*, describe the type and estimate the cost of repairs and maintenance expected during project operations. Do not repeat initial repairs listed in 6*(e)*. Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories.

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)* State whether you are prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation stated in Sec. 7 of DMEA Order–I, Amended.

(b) Explain to what extent you propose to furnish your share of the costs by providing money, by use of equipment owned by you, or otherwise.

* * * * *

INT.–DUP. SEC., WASH., D.C. 15539

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 13 POST OFFICE BLDG.
KNOXVILLE 2, TENN.

WASHINGTON 25, D. C.

July 26, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 29 1957

DATE	INITIALS	CODE

Memorandum

To: Operating Committee, DMEA - Washington

From: Executive Officer, DMEA - Region V - Knoxville, Tenn.

Subject: Application from Heavy Minerals Co., Aiken, S. C.
South Edisto River Area, Aiken & Orangeburg Counties, S. C
(rutile-monozite)

Enclosed are three copies of the subject application, received at this office. The fourth copy is being retained for our use.

It is noted that Marine Minerals, Inc., is the lessee of the Evergreen Plantation tract, whereas Heavy Minerals Co., Marine Minerals Division is the Applicant. These are known to be units of the same corporation, but a change in the corporation organization was made after the signing of the lease on August 2, 1955.

Robert A. Laurence

Robert A. Laurence

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APPLICATION FOR AID IN EXPLORATION

PROJECT BY

HEAVY MINERALS CO.

MARINE MINERALS DIV.

P. O. Box 928

Aiken, South Carolina

INTRODUCTION

In view of the evidence submitted with this application, further exploration on the described properties is warranted to determine preliminary tonnages and grade of mineable material. However, since all exploration is simply indicative, it is the applicant's intention to request funds for a one year program with said program to be divided into Phase I and Phase II. Phase I will be completed in six months from date of contract and if drilling data are favorable request will be made for immediate continuation with Phase II, the total program involves drilling approximately 360 holes having an average depth of 25.5 feet.

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DMEA
RECEIVED JUL 29 1957

DATE	INITIALS	CODE

CORPORATE OFFICERS

Name of Applicant:

(a) Heavy Minerals Co.
Marine Minerals Division
P. O. Box 928
Aiken, South Carolina

(b) A corporation, incorporated in the State of Delaware.

(c) President - J. Carlton Ward, Jr.
261 Madison Avenue
New York, N. Y.

Executive Vice President -
E. E. Wyatt
836 So. Michigan Ave.
Chicago 5, Illinois

Vice President, Research and Development -
John P. Magos
836 So. Michigan Ave.
Chicago 5, Illinois

Treasurer - Raymond T. Ruder
261 Madison Avenue
New York, N. Y.

Secretary - Kenneth L. Karr
836 So. Michigan Ave.
Chicago 5, Illinois

(1) A property map, Exhibit I, is attached indicating those lands covered in this application and the relationship of these lands to existing adjacent geographical features of the South Edisto River district, near Springfield, South Carolina. The following described two parcels of land are to be included for purposes of this application:

(a) Evergreen Plantation, a tract of land located in Orangeburg and Aiken Counties, State of South Carolina, and containing 1180 acres, more or less, and having the following metes and bounds: Delineated on the North and West by Davis Bridge - Springfield Public Road, Tracts Nos. 10, 11, 12, and 13 as shown on the Guingard Estate plat, made by H. Rudolph Schoenberg, Surveyor, dated November 12, 1918, and recorded in Miscellaneous Book 29, page 223, Aiken County, Court Clerk's Office, South Carolina, and by property now or formerly of Mrs. M. Salley, C. B. Stroman, John Stroman and George Stroman; on the East by property now or formerly of George Stroman, Mrs. M. Salley, Mrs. M. M. Drummond and "Salley" lands; and on the South by the South Edisto River. Heavy Minerals Co. holds a lease agreement with the owners of said described lands, Edisto River Holding Co. of Orangeburg County, South Carolina, for a ten (10) year period and as much longer as mining on a commercial scale is being pursued, but not to exceed twenty (20) years.

(b) A certain tract of land in Goodland Township, Orangeburg County, South Carolina, located about three and one-half (3-1/2) miles Southwest of Springfield, S. C., containing two hundred ten and five-tenths (210.5) acres, more or less, and bounded as follows: On the North by lands, now of formerly of the estate of C. J. Stroman; on the East by lands now or formerly of J. B. Stroman; on the South by lands now or formerly of Guingard, and on the West by lands now or formerly of D. H. Salley and M. A. Salley dated September 5, 1902, and recorded in the Orangeburg County Court Clerk's Office in Plat Book 3, page 175; and being the same tract of land conveyed to John W. Cook by Bert H. Hallman by deed, dated November 9, 1951, and recorded in the Orangeburg County Clerk's Office in Deed Book 171, at page 65. Also: A certain tract of land in Rocky Grove Township, Orangeburg County, South Carolina, on the Orangeburg - Aiken Road about four (4) miles Southwest of Springfield, South Carolina, known as the H. H. Salley Place, containing five hundred forty-six (546) acres, more or less, and bounded as follows: North by said road, East by lands now or formerly of C. B. Stroman; South by run of South Edisto River; West by lands now or formerly of the Estate of John G. Guingard, said tract having such form marks, buttings and boundaries as are shown upon plat thereof made by John J. Salley and copied by E. S. Croft, April 7, 1922, and recorded in the Orangeburg

County Court Clerk's Office in Plat Book 4, at page 30; and being the same tract of land conveyed to John W. Cook by Bert H. Hallman by deed, dated November 9, 1951, and recorded in the office of the Clerk of Court for Orangeburg County, in Deed Book 171, at page 65.

Titles to the above lands were conveyed, by sale, to Heavy Minerals Co. as recorded in the Orangeburg Court Clerk's Office, Deed Book "L", page 159, dated May 8, 1956.

Copy for Manager

(c) The above lands carry no "mine name".

(d) As stated in 1 (a) above.

(e) See copy of Edisto Holding Company lease submitted with this application.

(2) (a) Determination of the feasibility of expanding exploration operations on the parcels of land described in this application has been based on two (2) drill lines spaced approximately one (1) mile apart over the center portion of the properties. These lines trend in a general North-South direction normal to the run of the South Edisto River. All holes were made with a 4-1/2" churn drill on 200 ft. spacings along the lines. A total of 48 holes were completed in the reconnaissance drilling program to prove the existance of mineral content indicative of a planned and expanded exploration program.

(b) The existing drilling was done by Marine Minerals Inc., now known as Marine Minerals Division.

(c) No production has been recorded from the properties described in this application.

(d) The wide spacing between the reconnaissance drilling is insufficient information for the calculation of ore reserves. However, it does present evidence of the continuous nature of an alluvial deposit within the properties in this application. Exhibit II is a map of the area showing the two (2) parcels and the location of the reconnaissance drilling. Drill log information from the 48 exploration holes accompanies this application, as well as cross sections indicating probable deposit depth. Additional drilling required in Phase I of the proposed exploration program is also indicated on Exhibit II. These additional holes will be required to arrive at average grade and volume determinations to decide whether or not a commercially mineable deposit exists. Projected drilling under Phase II is indicated on Exhibit III.

(e) Alluvial mineral concentration is believe to be from the Tuscaloosa formation which is prevalent throughout the area. Tuscaloosa sediments were derived from the Piedmont region after the Appalachian uplift and subsequent periods of degradation of the Edisto drainage were favorable for concentration and the formation of placer deposits. Continuity of bench ground flanking both sides of the stream provide favorable

areas of exploration in these ancient beach sands. The mineral suite present in probable economically recoverable quantities includes ilmenite, monazite, rutile, and zircon.

(f) A commercial deposit is expected to be developed based on known geologic information and results of prior drilling herein presented.

(g) Four copies of all available engineering data are included with this application.

(3) (a) Arrangements for visiting the property by a DMEA representative can be made with Mr. G. E. Aiken, Project Engineer, Heavy Minerals Co., Aiken, South Carolina.

(b) Access to the southern end of this tract is by the Williston-Springfield road, State Highway No. 39 and the northern end is traversed by the Springfield-Aiken road, State Highway No. 4. Ingress and egress to the property is by a number of farm and logging operation roads which may be used except in periods of high water. Springfield, served by the Southern Railway, is more or less 5 miles from that area in the vicinity of Dean Swamp Creek. Minor supplies can be obtained from Aiken, about 25 miles distant, or most major items from Augusta, Georgia, some 45 miles away. An ample labor market exists within the Aiken area and electric power is readily available. The South Edisto, a class A stream, carries sufficient water year round for all normal mining operations by dredge and as water supply for concentrating equipment.

(4) (a) As proposed in the introduction, this exploration program will be conducted in two phases. Phase No. I will cover a 6 months period and involve drilling about 180 holes as in Exhibit II. Continuation with Phase II, another 6 months program, will be contingent upon the obtaining of satisfactory drill results in the first 6 months program. Exhibit II indicates the proposed exploration work to be carried out in Phase I with a 4-1/2" churn drill. Lines, as laid out, are to be spaced 800 feet apart and holes on the lines spaced at 200 feet, which will result in a pattern consistent with the grid system. This application proposes to drill out, as above, 6 lines as indicated on Exhibit II. A total of 180 holes will be required under this plan, and it is expected to complete this program in 6 months. Exhibit III indicates the proposed drilling to be carried out under Phase II. "On completion of the first 180 holes, notification will be made to the Regional DMEA office concerning the intention of Heavy Minerals Co. to proceed or reject the second six months program of another 180 holes." Not optional

Sampling procedure for both Phase I and II involves saving all the material, including slimes removed in each drive, and making total heavies calculation on a weight basis. This method has been successfully used by the U. S. Bureau of Mines. Each 2-1/2 feet drive will be sent to the laboratory for heavies determination. This procedure involves washing,

decanting slimes (to be saved), drying the total sample, screening and splitting the dried sample down to a convenient test size (plus or minus 100 grams) and recovering the contained heavies in a separatory funnel using acetylene tetrabromide (s.g. 2.95) to make a sink-float. Oversize material, coarse gravel and vegetation, from initial screening is weighed and a certain portion of this weight (based on the number of statistical splits) is added to the fraction being determined in the heavy media separation. After recovery of the heavies is made they are dried and weighed and their percentage computed.

Evaluation of the deposit will be made by standard cross section methods for yardage and grade.

Composite analysis of the separated heavies will be carried out as outlined in Exhibit IV.

(b) Primary access to the property can be gained by old logging roads and secondary County roads. However, a contingency for minor road repairs has been included in the overall cost. Road preparation, where required, will consist of simple plank tracks over mire areas and crude log and plank bridges over waterways.

(c) It is anticipated that the average drilling rate will run between 25 - 30 feet per day, including allowance for moving time. This is based on previous experience in this type of terrain. The work will start immediately on Phase I and be completed within six months from the date of the exploration

contract. Phase II starting date to be immediately following Phase I, but to be contingent upon obtaining favorable results from the first 6 months program.

(5) (a) Heavy Minerals Co. is operating a monazite-rare earth property near Clearwater, South Carolina, and conducting a continuous development drilling program similar in method to the exploration drilling proposed in this application. Besides their operating property at Clearwater the applicant has conducted exploration for heavy minerals by various drilling methods in Tennessee, Florida, and Georgia. By their demonstrated operating ability, available facilities, and considerable exploration drilling experience Heavy Minerals Co. is ably capable of carrying out the proposed work in this application.

Direct supervision of the work will be by Mr. G. E. Aiken, and Mr. M. C. Thompson. Mr. Aiken, Project Engineer, has the following background indicating his ability to carry out the program.

PROFESSIONAL BACKGROUND

Mr. G. E. Aiken
Project Engineer

Age: 35 years

Education: University of Alaska, B.S. Geological Engineering; University of Minnesota, M.S., Mining Engineering.

Employment:

Valuation Engineer: U.S. Corps of Engineers Mining Division in the Western States. Acting Chief Engineer: Pato Consolidated Gold Dredging Co., in charge of exploration and development placer drilling, surveying, evaluation of operating statistics for 7 dredges, and various related engineering projects normally under the supervision of the Engineering Department in any mining company. Mining Engineer: Nicaro Nickel Co., Cuba; Exploration and development drilling of lateritic nickel deposit. Assisted in drawing up mining plan and engineering details for proposed project and supervised mining field camp. Assistant Project Engineer: Heavy Minerals Co., Assisted in laying out development drilling program for a Florida heavy minerals deposit. Engaged in preliminary engineering design of a proposed mining operation and dry mill separation plant, and conducted mineral dressing test work to determine suitable equipment for beneficiation of the deposit.

PROFESSIONAL BACKGROUND

Mr. M. C. Thompson
Drilling Superintendent

Mr. Thompson has had considerable drilling experience with jet, rotary, and churn drills and is well qualified to carry out the proposed drilling program.

At present Mr. Thompson is Drilling Superintendent for the Heavy Minerals Company, and has been in this position for the past three years. Prior to this he was Drill Foreman for six and one-half years for Humphrey's Gold Corporation, in Jacksonville, Florida. Before working with Humphrey's Gold Corporation, Mr. Thompson worked as driller and Drill Foreman for National Lead Company for approximately three years, and all of his drilling experience, with the above, has been for heavy minerals and rare earths.

(6) Estimate of Costs:

Costing for the work involved in this contract has been divided between actual direct drilling costs and work to be performed not as a direct drilling charge. Under the latter will be included items such as consultant fees, drill alterations (initial), internal and external analytical work, travel, and communication.

(a) Not applicable

(b) Personal Services

Drilling	Drilling Per Wk.	Others Per Wk.
1 superintendent @ 600/mo.	$ 138.57	
3 Drillers, 1 @ 2.25/hr	90.00	
1 @ 450/mo.	103.93	
1 @ 1.85/hr.	74.00	
2 Laborers @ 1.25/hr.	100.00	
1 Surveyor, Part time @ 4.75 /mo.	21.61	
2 Rod men, Part time @ 1.75/hr.	24.02	
	553.10	

Drilling	Drilling Per Wk.	Others Per Wk.
1 Project Engineer @ 600/mo.		$ 138.57
1 Laboratory Technician @ 425/mo.		98.15
Consultant Fees, including geological, metallurgical, & engineering by Heavy Minerals Co., Service Division		150.00

(c) Operating Materials and Supplies

Drilling		
Pipe, 4-1/2"	10.00	
Rope	20.00	
Shoes	3.00	
Sand Pumps	12.00	
Fuel, drill and saws	35.00	
Drive Heads	12.00	
Tubs	1.00	
Small Tools	2.00	
Other		
Laboratory Glassware		4.00
Acetylene Tetrabromide		2.00
Alcohol		2.00
Filter Paper		4.00
Sample Bags, plastic		2.00
Sample Storage Facilities		10.00
Fuel, Drying Oven		6.00
Power		2.00

(d) Operating Equipment (use allowance)

Drilling		
1 "Swamp Buggy" Churn Drill Rig to be acquired by purchase at a cost of about $8000.	75.00	
1 Dodge "Power Wagon" owned by Heavy Minerals Co. Value $2800.	45.00	
1 1/2 ton Chevrolet Pick-up truck, Owned by Heavy Minerals Co. Value $700.	30.00	
Other		
1 Ford Sedan, 2-door, Owner by Heavy Minerals Co., Value $600.		30.00

With the exception of the "Swamp Buggy", to be purchased, all the above equipment is owned by Heavy Minerals Co. A use allowance based on a depreciation period of 4 years, as practiced

by this Company, plus fuel and oil demands have been the basis for calculating weekly costs allowance.

(e) Initial Repairs and Rehabilitation:

Drill Rig Alteration and Mounting on "Swamp Buggy". Total Cost not to exceed $520.00	20.00	

(f) Buildings, Improvements, Installations:

Laboratory Space Rental		10.00

(g) Miscellaneous

Drilling		
Vehicle Repair and Maintenance - tires, engine overhaul, and normal use maintenance	25.00	
Payroll Taxes and Workmen's Compensation	34.87	
Other		
Shafting to verify drilling ✓ Compare to Calle Loma		70.00 needed
Vehicle Repair and Maintenance tires, engine overhaul, etc.		5.00
Analytical Work, - See Exhibit IV		116.00
Reproductions		3.00
Accounting, Supplies		7.00
Payroll Taxes		5.72
Travel		50.00
Communications		10.00
Total Direct Drilling Cost	$ 877.00	
Total Other Costs		$ 725.44
		877.00
Total Drilling and Other Costs		$1,602.44

(7) (a) Heavy Minerals Co. is prepared to furnish their share of the proposed project cost in accordance with the regulations on Government participation stated in Sec. 7 of DMEA Order-1, Amended.

(b) The Applicant's share of the cost will be furnished by use of equipment owned by them, plus cash as required.

EXHIBIT IV

Cost of Analysis

Based on the proposal being submitted, 180 drill holes will be required to explore the area designated on Exhibit II. Calculating on the basis of six drives per hole, the total number of analyses required would be 1,080 each for TiO_2, ThO_2, REO, and ZrO_2. This method is not practical and the following scheme will be used:

180 drill holes

Composite statistical samples from each 6 holes:

$\frac{180}{6}$ equals 30 samples each for:

1. Total TiO_2 5
2. Rutile, TiO_2
3. ThO_2 10
4. REO 15
5. ZrO_2 (degree of contamination) 10

Total analysis required will be 5x30 equals 150.

It is expected that each analysis will average $20.00 or a total for six months at $3,000.00. Calculated on a weekly basis, $116.00 per week will be required to cover analytical work.

Analytical work for Phase II will be handled identically to the above procedure and will involve approximately the same number of samples.

EXPLORATION DRILLING

Drill results from lines 5cc-13, 14, 23, and 24 are shown below as determined from composite samples made on all holes in each line. The attached cross-sections of each of the lines carry the maximum depths to be expected and quantities of monazite and heavy mineral concentrate per cu.yd. of material by individual hole:

Line	Line Length	Depth	Conc.	Pounds/cu.yd. Mon.	Rutile	Zirc.	Ilmenite
				1.56	.26	4.02	6.63
5cc-23	3600'	31.7'	21.6	1.9	3.7	4.7	6.3
5cc-24	800'	20.0'	19.8	1.8	2.7	4.3	5.5
5cc-14	1850'	29.9'	16.2	1.4	2.1	2.8	5.3
5cc-13	3200'	17.6'	20.2	1.7	3.0	4.2	6.5

Based on the above lines the average depth of the deposit is 25.5'. Using this depth and the indicated surface area in Exhibit I it is expected that about 45,000,000 cu.yds. can be evaluated by this drilling program.

The direct cost for drilling on the basis of 180 holes in Phase I, at an average depth of 25.5', is calculated to be $4.97 per foot.

Indirect costs would add $4.11 to the above, or an overall drilling cost of $9.08 per foot.

No change in these costs is expected during Phase II of the program, since approximately the same number of holes will be drilled in the second six months' period.

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STATE OF SOUTH CAROLINA)
) LEASE AGREEMENT
COUNTY OF ORANGEBURG)

THIS AGREEMENT OF LEASE, made and entered into as of this 2nd day of August, 1955, by and between EDISTO RIVER HOLDING COMPANY, a partnership, of Orangeburg County, hereinafter called the Lessor, and MARINE MINERALS INC., a Delaware Corporation with principal place of business at Aiken, South Carolina, hereinafter called the Lessee,

WITNESSETH:

That the Lessor, for and in consideration of One Dollar ($1.00) in cash in hand paid by the Lessee to the Lessor, the receipt of which is hereby acknowledged, and of the covenants, agreements, payments and royalties hereinafter reserved and by the Lessee agreed to be paid, kept and/or performed, has granted, let and demised, and by these presents does grant, let and demise unto the Lessee, its legal representatives, successors and assigns, all of those certain real properties, situate, lying and being in the County of Aiken and Orangeburg, State of South Carolina, and more particularly described as follows, to wit:

All that certain tract or plantation of land, with improvements thereon, known as Evergreen Plantation, situate, lying and being in Orangeburg and Aiken Counties, State of South Carolina, containing eleven hundred and eighty (1180) acres, more or less, six hundred and eighty (680) acres, more or less, being in Aiken County, and five hundred (500) acres, more or less, being in Orangeburg County, respectively, and being bounded as follows: On the North and West by Davis Bridge-Springfield Public Road, Tracts Nos. 10, 11, 12, and 13 as shown on plat of Guignard Estate, made by H. Rudolph Schoonberg, Surveyor, dated November 12, 1918, and recorded in Miscellaneous Book 20, at page 23, in the Clerk of Court's office for Aiken County, South Carolina, and by the property now or formerly of Mrs. M. Salley, C. B. Stroman, John Stroman and George Stroman; and on the East by property now or formerly of George Stroman, Mrs. M. Salley, Mrs. M. M. Drummond, and "Salley" lands; and on the South by the South Edisto River.

Being the same lands conveyed to Edisto River Holding Company by Lexington Lumber Company by deed dated August 2, 1954.

TO HAVE AND TO HOLD said properties for the purpose of exploring for, mining, possessing and removing heavy minerals, ores, metals and other valuable mineral products, including gravel, stone, or other silica or sand materials, with the exclusive right to process and work the same for said purposes as hereinafter provided:

1. The terms of this lease shall be for ten (10) years from the 2nd day August, 1955, and as much longer (a) as the above mentioned mineral products in commercial quantities are being mined or removed from this land; or (b) as the Lessee shall pay monthly the minimum royalties provided for herein, but not exceeding twenty (20) years from the 2nd day of August, 1955, provided, however, that the lease may be sooner terminated as herein specified.

2. The Lessee shall pay to the Lessor as compensation herein referred to as "earned royalty", for material mined and removed from the leased land the following amounts:

(a) For ilmenite, rutile, zircon, monazite, or other heavy minerals, ores or metals, and other valuable mineral products (but not including gravel, stone or other silica or sand materials), two and one-half (2-1/2) per cent of the gross realization from sales F.O.B. point of shipment in South Carolina; this two and one-half (2-1/2) per cent royalty is based on the assumption that the total saleable amount of ilmenite, rutile, zircon, monazite, or other heavy minerals, ores or metals recovered will amount to one (1) per cent or less of the total earth processed. In the event that the total saleable amount of the heavy minerals or ores recovered should exceed one (1) per cent of the total earth processed, then the above royalty shall apply to the first one (1) per cent of said minerals or ores recovered, and the royalty to be paid to the Lessor on the excess above said one (1) per cent shall be as follows:

Over one (1) per cent and up to and including two (2) per cent.... five (5%) per cent of gross realization will be paid to Lessor.

All over two (2) per cent..... ten (10%) per cent of gross realization will be paid to Lessor.

(b) For gravel, stone, or other silica or sand materials, five ($.05) cents per ton for such gravel or sand produced, removed and sold from the leased land.

3. Payment of earned royalties shall be made for each calendar month by or before the 15th day of the following month and shall be accompanied by reports of production and sales for said period. Said royalty payments and reports shall be made either directly to the Lessors or to the _____ Bank of _____ for the account of the Lessors.

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4. The Lessee hereby pays unto the Lessor, on the signing of this Agreement, the first monthly payment, hereinafter referred to as the advance royalty, and agrees to pay to the Lessor on the same date of each succeeding month a monthly advance royalty payment. The monthly advance royalty payment shall be either fifty cents ($.50) per acre for the number of acres covered by this lease, or Two Hundred and Fifty Dollars ($250.00), whichever is the higher. However, when mining is being performed and earned royalty payments are due, the Lessee shall receive credit for any and all advanced royalty payments made as against earned royalty payments due, but in no event shall the Lessor receive a monthly payment less than the minimum specified, whether as advanced royalty, earned royalty, or both.

5. At the end of each calendar month, during the mining of this land, an accurate survey shall be made by the Lessee of the land mined and a computation made of the valuable minerals [illegible] and a report of such computations shall be submitted to the Lessor, along with the royalty payments provided above, by the fifteenth day of the following month. The Lessor shall examine such report and shall have the right and privilege of examining the books and records of the Lessee either in person or by his agent, at all reasonable times. The Lessor shall, within thirty (30) days after the submission of the above report and payment of royalty, submit in writing to the Lessee any corrections of, or disagreement with, such computation and royalty payment as he may wish, specifying the correct figures according to his computations. If no such notice of corrections or disagreement is submitted within the thirty (30) day period, then the computation, report and payment of the Lessee for said month shall be considered as accepted as correct and final.

6. In case the Lessor and Lessee cannot agree upon the monthly computations of production and royalty, then the matter of disagreement shall be settled by a board of arbitration made up of three (3) persons to be chosen in the following manner: Within one week from the notice of disagreement by the Lessor to the Lessee, they each shall appoint one (1) member of the arbitration board; within two (2) weeks from said date of notification of disagreement the two members of the board so appointed shall select a third member; if said members of the board are not selected or appointed within the time limit set, then either party may appeal to the resident judge of the First (1st) Judicial Circuit of South Carolina to appoint the remaining members or member of the board. The Board of Arbitration should return its findings within thirty (30) days of its appointment, and both parties to this lease shall accept such findings as correct and final. The findings of a majority of the board shall be considered the findings of the board. The costs of such arbitration board shall be born equally by both parties.

7. It is understood and agreed that the mining of the land covered by this lease will be a part of a larger project which will include the mining of other lands lying along the same creek or river. It is further understood that at certain times during the mining operations it may be necessary to mine land on both sides of a common boundary between this land and contiguous land during the same operating period. In this event it shall be assumed that the volume and value of heavy minerals or other mineral products recovered per cubic yard of earth mined from the land hereby leased, and the contiguous land, during any such operating period shall be the average of the total production for said

period from both sides of the boundary line. The determination of royalties for such period shall be made upon this basis. During any such period accurate surveys and records of the total cubic yards dug for the period from each side of the common boundary line shall be made by the Lessee. It is further understood that the Lessee is hereby authorized to construct and/or operate on the land hereby leased such stock piles, equipment, power lines, pipe lines, roadways, railroads, or other facilities, as he may find necessary or convenient to the mining operation thereon, and when mining operations on this land have been completed, the Lessor hereby agrees to grant to the Lessee the continuing use of such facilities for such period as is necessary to complete the mining of the nearby and other lands that are part of this project, provided, however, that the Lessee shall request such easements, in writing, during the term of the said lease and shall place on file in the office of the Clerk of Court for Orangeburg County a plat showing the requested easement.

8. Timber growing on the leased land shall remain the property of the Lessor to be harvested by him before necessary clearing operations are undertaken by the Lessee in preparation for dredging. Lessee shall give the Lessor at least six (6) months notice prior to the beginning of clearing operations. It is understood that such timber as may be standing or otherwise, upon the land hereby leased, after the expiration of the above mentioned six (6) months notice, may be cut, cleared and disposed of by the Lessee as he sees fit, and for his own benefit and without further compensation to the Lessor.

9. The Lessee agrees to permit the Lessor or its duly authorized agent to enter upon and visit all parts of the leased properties at any reasonable time during the Lessee's business hours for the purpose of observing whether the terms of this lease are being fully complied with by the Lessee.

10. It is agreed that the Lessee shall have the right of ingress and egress to the land hereby leased through other lands owned by the Lessor and described in that certain agreement whereby the Lessee was given the option to lease the herein described property.

11. The Lessee agrees to take all necessary actions to keep the leased properties free and clear of all mechanics', miners' and/or other labor liens and encumbrances of every other nature and description which might become a lien on said properties arising out of and from the Lessee's occupancy of said properties.

12. The Lessee agrees to save the Lessor free and harmless from any penalty, damage or other charges imposed for any violation of all ordinances and laws, municipal, state, or federal, affecting its use of said properties, whether occasioned by neglect of the Lessee or any agent in the employ of said Lessee, and the Lessee shall indemnify and keep harmless the Lessor against and from any loss caused by damage or expense occasioned out of construction and erection of any buildings or improvements by the Lessee on said properties, or out of any accident or other occurrence causing injury to any person whomsoever or property whatsoever and due to the use by the Lessee of the aforesaid properties, buildings thereon, or any part thereof.

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13. The Lessor represents, covenants and agrees with the Lessee that the lands covered by this lease are free from all liens and adverse claims of every kind and character, except as follows:

_____

_____

_____

The Lessor will warrant and defend the said properties to the Lessee against all claims and demands of all persons.

14. It is agreed, that at the expiration of the term of this lease or upon its cancellation, all structures, machinery, tools, fixtures, equipment and personal property which may have been installed on the properties by the Lessee shall remain the property of and may be removed by the Lessee at any time within one hundred and twenty (120) days following said expiration or cancellation date. Since this lease contemplates surface mining operations, Lessee shall be under no obligation to the Lessee to level or restore in any manner the leased properties after mining thereof is completed.

15. It is further understood and agreed that any time lost by reason of war, strikes, riots, or acts of God, is not to run against the time herein specified and during said time advance royalties shall not be paid to the Lessor, provided, however, that this lost time shall not exceed five (5) years.

16. All covenants, conditions and agreements in this lease contained shall extend to and be binding upon the respective legal representatives, successors, and assigns, or executors, administrators and assigns of the parties hereto.

17. During the term of this lease the Lessor shall pay all real estate taxes assessed and levied on the leased properties within the time prescribed by law, failing which, the Lessee shall have the right to pay such real estate taxes in the name of the Lessor and take credits for such sum so paid against any sums due hereunder to the Lessor from the Lessee.

18. Any notice, report, or payment required to be made or delivered pursuant to the provisions of this lease shall be either personally served upon the party to whom it is to be delivered, or mailed by first class mail, with postage fully prepair and if given to the Lessor shall be addressed to R. G. Hu[illegible] _____
(street)

_____, _____
(city) (state)

or to such other post office as Lessor may designate by notice given to the Lessee; and if given to the Lessee it shall be addressed in care of Henderson, Salley & Cushman, Aiken, South Carolina, or to such other Post Office as the Lessee may designate by notice given to the Lessor, and such notice shall be mailed as first class mail, postage fully paid, at a United States Post Office either in the State of South Carolina or the State of Illinois and shall be considered as given when so mailed.

19. The Lessee shall be the sole judge of the time, place, and method of mining and production hereunder.

20. If the Lessee shall fail to keep or perform any term or condition of this contract, and such condition shall continue for sixty (60) days after notice in writing from the Lessor to the Lessee, specifying such default in detail, then, at the election of the Lessor, this lease shall be terminated. Waiver by the Lessor of one or more failures of the Lessee to keep or perform any term of this agreement shall not be considered a waiver of such term.

21. Anything herein to the contrary, notwithstanding, the Lessee may abandon and terminate this lease and contract at any time upon written notice given to the Lessor, and upon giving such notice the Lessee shall have no further obligations and duties hereunder, save (a) to account for royalties theretofore accrued, and (b) to quitclaim and release this contract of record.

22. No transfer or assignment of any interest in this lease by either party hereto shall be effective or binding on the other party unless notice of such transfer or assignment be given in writing together with the assignees duly signed and acknowledged agreement to be bound by the terms of this instrument.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals this 2nd day of August, 1955.

EDISTO RIVER HOLDING COMPANY, Lessor

By R. A. Huffstetler, Sr.

R. A. Huffstetler, Sr.

R. A. Huffstetler, Jr.

R. A. Huffstetler, Jr.

Robert J. Gillespie

Robert J. Gillespie

Harriet H. Gillespie

Harriet H. Gillespie

IN THE PRESENCE OF:

Robert E. Pentland

Bessie E. Lacey

MARINE MINERALS INC., Lessee

By Owen H. Perry, Vice President

IN THE PRESENCE OF:

Robert E. Pentland

Elizabeth H. Lacey

STATE OF SOUTH CAROLINA)
)
COUNTY OF ORANGEBURG)

Personally appeared before me Robert E. Penland and made oath that he saw the within named EDISTO RIVER HOLDING COMPANY, Lessor, by R. A. Huffstetler, Sr., R. A. Huffstetler, Jr., Robert J. Gillespie, and Harriet H. Gillespie, sign, seal, and as its act and deed deliver the within written Lease Agreement and that he with Bessie E. Harvey witnessed the execution thereof.

Robert E. Penland

Sworn to before me this 2nd
day of August, 1955.

Bessie E. Harvey
Notary Public for South Carolina

STATE OF SOUTH CAROLINA)
)
COUNTY OF AIKEN)

Personally appeared before me Robert E. Penland and made oath that he saw the within named MARINE MINERALS, INC., Lessee, by Owen H. Perry, sign, seal and as its act and deed deliver the within written Lease Agreement and that he with Elizabeth G. Bancroft witnessed the execution thereof.

Robert E. Penland
Robert E. Penland

Sworn to before me this 2nd day
of August, 1955.

Elizabeth G. Bancroft
Notary Public for South Carblina

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DMEA-

MAP OF SOUTH FORK

SHOWING

Scale

0 1000 2000 3000 Feet

STAGE I

PROPOSED DRILL HOLES - STAGE II

PROPERTY LEASED

Fig. 2

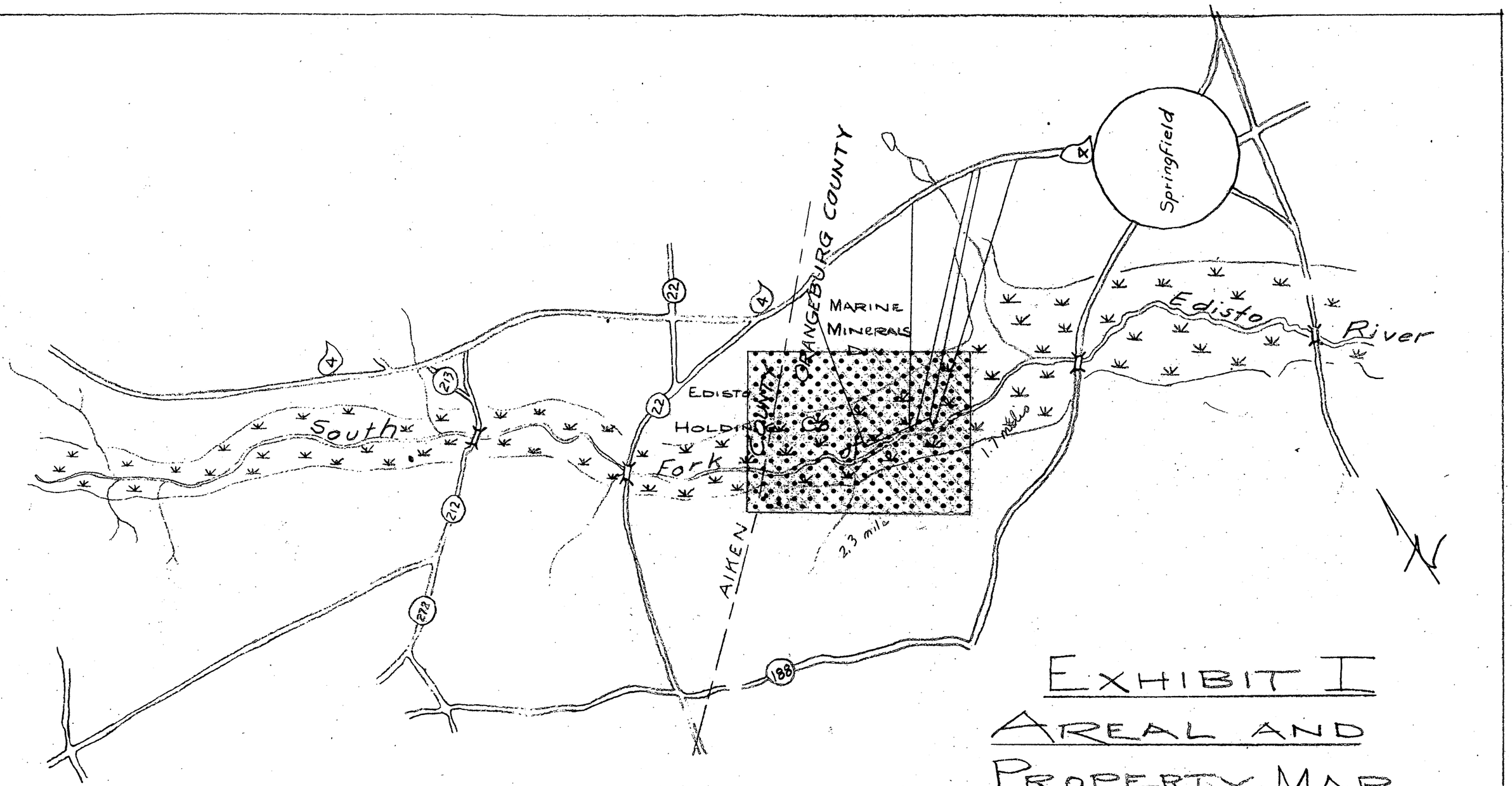

EXHIBIT I
AREAL AND PROPERTY MAP

AREA OF EXPLORATION

SCALE 1" = 1 mile

Rec. July 29, 1957

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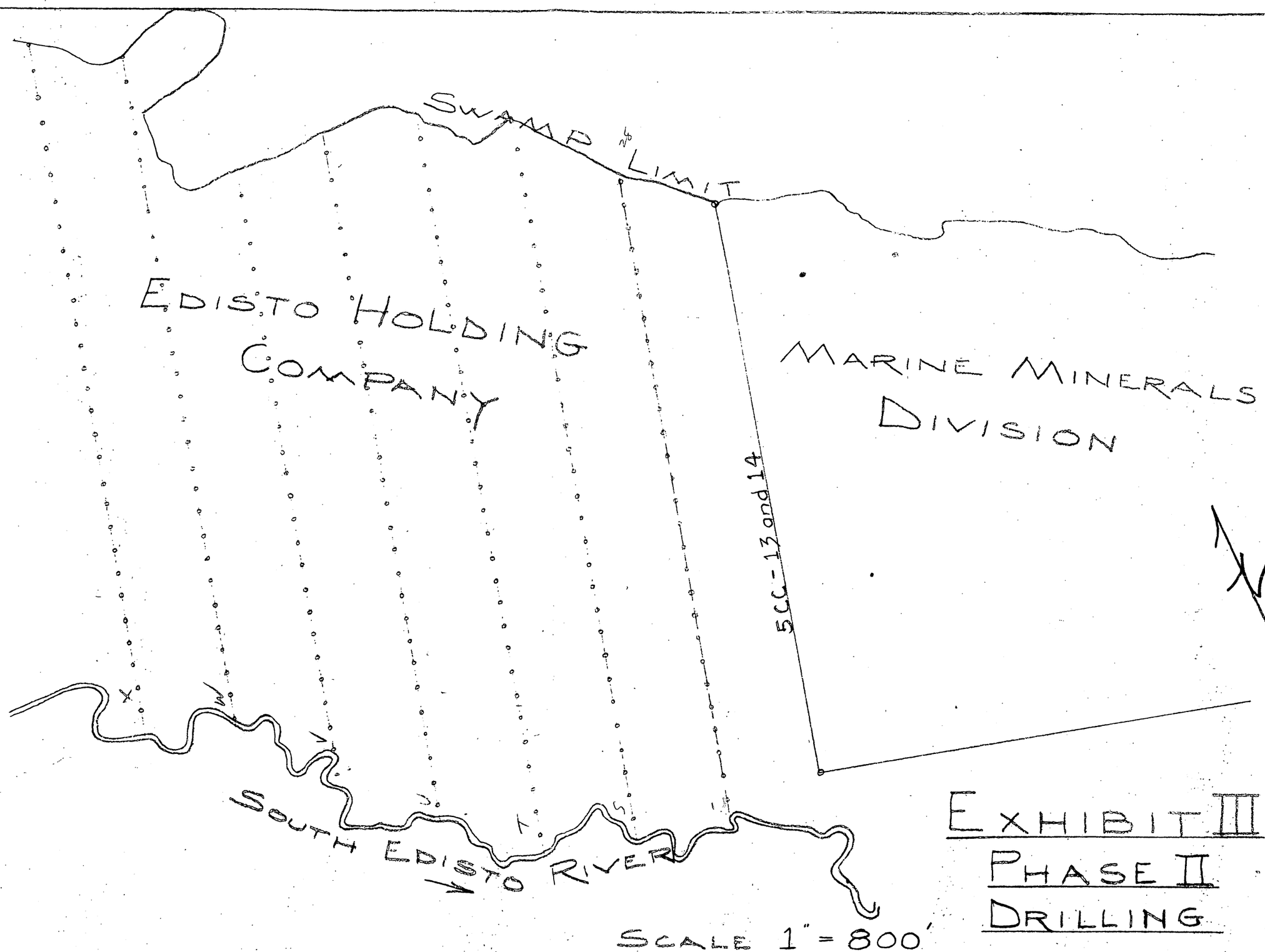

EXHIBIT III
PHASE II
DRILLING

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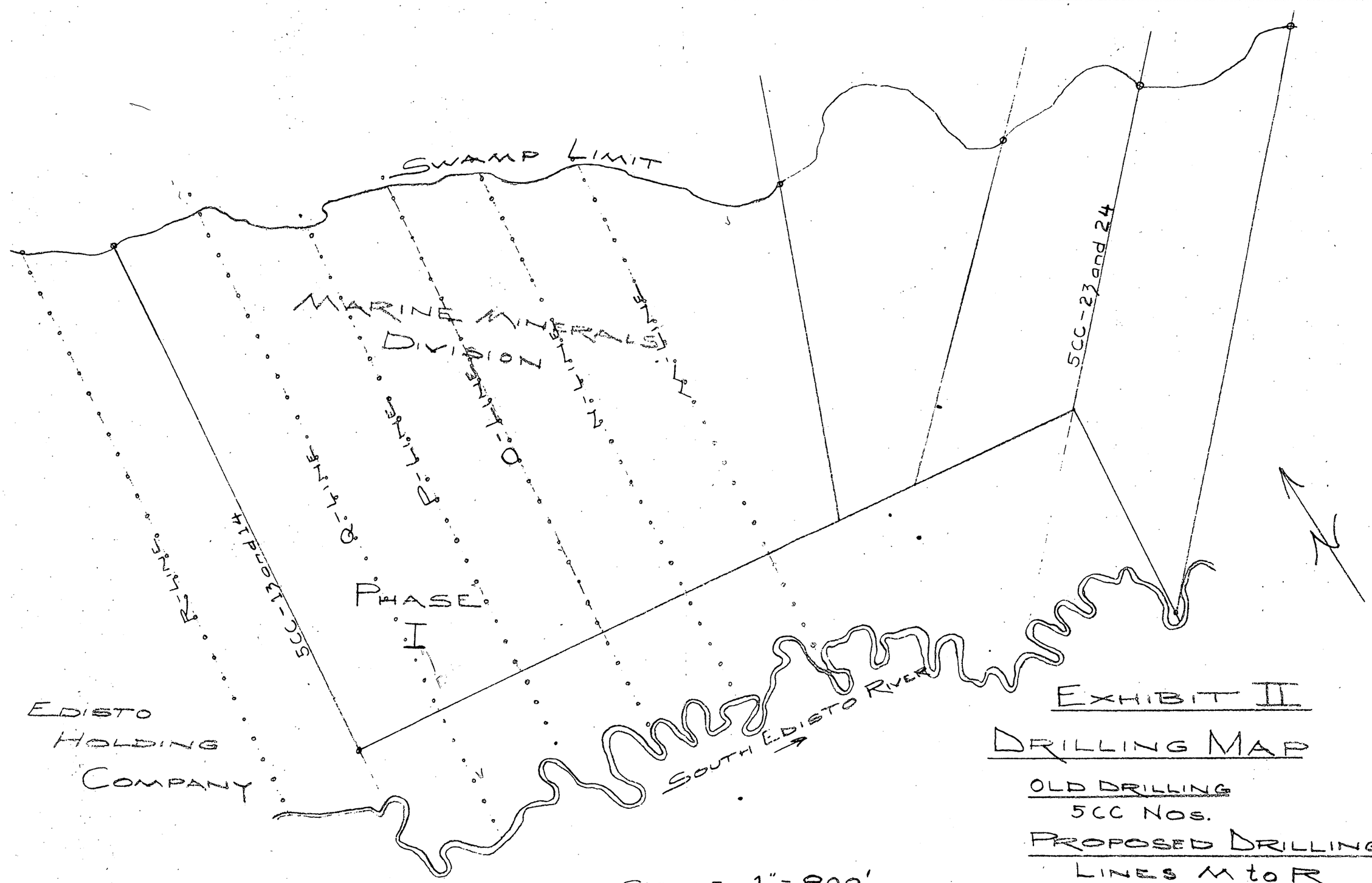

EXHIBIT II

DRILLING MAP

OLD DRILLING
5CC NOS.

PROPOSED DRILLING
LINES M to R

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MARINE MINERALS

DIVISION OF HEAVY MINERALS CO.

POST OFFICE BOX 206, CLEARWATER, SOUTH CAROLINA

RARE EARTH CHEMICALS · THORIUM · HEAVY MINERALS Phone Bath, S. C. 2593

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		225

July 30, 1958

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

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto ~~River Area~~
Aiken and Orangeburg Counties
South Carolina

Gentlemen:

As per your request we are returning herewith all copies of the unexecuted contract.

Very truly yours,

MARINE MINERALS
DIV. OF HEAVY MINERALS CO.

H. C. Laird

H. C. Laird
Manager - Mining Division

HCL:lw
Encl.

Government's copy

OFFICIAL FILE COPY
DMEA
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MF-200
(Revised June 1954)

Docket No. DMEA - 4799

Commodity Rutile, Thorium, and Rare Earths

Contract No. Idm–E 1165

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

EXPLORATION PROJECT CONTRACT[1]

It is agreed this 27 JAN 1958 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] Heavy Minerals Company, Marine Minerals Division, a Delaware Corporation,

whose mailing address is P. O. Box 928
Aiken, South Carolina,

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 2 maps.

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 South Carolina, Counties of Aiken and Orangeburg, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the[4] owner and lessee of[5] the entire interest 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: Royalty of 2-1/2 to 10 percent of gross sales price of all minerals mined and sold, payable to lessor.

(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 of Lessor (Edisto River Holding Company)**

(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 **Rutile, Thorium, and Rare Earths.** The work to be performed is described in Exhibit "A." The Operator on or before **APR 1 1958** shall commence the work, and on or before **September 1, 1958** (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 a sum not less than the estimated total allowable cost set forth in Exhibit "A."

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 $ **25,512.00**
The Government shall contribute **75** percent of the allowable costs as they are incurred in a total sum not in excess of $ **19,134.00** : *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

vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work not in excess of the amount of the Government's contribution to the cost of property which is or 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.

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 WORK). Estimates under this category include all requirements and related costs, such as labor, materials, supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be allocated 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~~ 8 **(See Article 13)**

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~~ 20 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. **(See Article 13)**

(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.*—

(a) Under Article 6(c), "Article 9" is changed to "Article 8."

(b) Under Article 8(b)(2), royalty repayment period is changed from "ten years" to "twenty years."

(c) Under Article 8(b): The word "minerals" includes sand and gravel products produced in processing ore.

16—70617-1

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C. A. Mittendorf
Administrator, Defense Minerals
Exploration Administration

HEAVY MINERALS COMPANY
(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

Long
Langer
Hawk
Selfridge
Gillett
Johnson

EXPLORATION PROJECT CONTRACT
HEAVY MINERALS COMPANY
DOCKET NO. DMEA-4799

ANNEX I

The land referred to in Article 2 of the Contract consists of 3 tracts known as the Evergreen Plantation, the John W. Cook Place, and the H. H. Salley Place, all located 3½ to 4 miles southwest of Springfield, South Carolina, as shown on the map, Fig. 1, entitled "Location Map of Proposed Project Area and Heavy Minerals Company Operations."

The Operator is in possession of the Evergreen Plantation, which consists of 1180 acres, more or less, in Orangeburg and Aiken Counties, South Carolina, by virtue of a lease, executed by the Edisto River Holding Co., on August 2, 1955, and recorded in Book 196, page 313, of the Official Records of Orangeburg County, South Carolina.

The John W. Cook Place, containing 210.5 acres in Goodland Township, Orangeburg County, and the H. H. Salley Place, containing 546 acres in Rocky Grove Township, Orangeburg County, were conveyed to the Operator by deeds recorded May 8, 1956, in the Clerk of the Courts Office, Orangeburg County, South Carolina, in Deed Book "L" at page 159.

A Consent to Lien and Subordination Agreement executed July 18, 1957, by the Edisto River Holding Company is attached and made a part hereof.

All of the descriptions in the above-mentioned instruments are incorporated herein by reference.

Any land within 2,000 feet of the boundaries of the above-described property, acquired during a period of 10 years from the date of this contract, shall be subject to the royalty repayment provisions of Article 8.

95
(Combines and supercedes MF-201 and MF-203)
June 1956

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator
Docket No. DMEA-
Contract No. Idm-E 1165
Contract Date 27 JAN 1958

RECEIVED JUL 29 1957 D.M.E.A.

CONSENT TO LIEN
and
SUBORDINATION AGREEMENT 1/

To the United States of America:

Referring to that certain land in the County of ORANGEBURG, State of SOUTH CAROLINA, described ~~as follows~~ 2/

IN A LEASE DATED AUGUST 2, 1955 AND RECORDED IN BOOK 196, PAGE 313, OFFICIAL RECORDS OF ORANGEBURG COUNTY. THE LESSOR BEING EDISTO RIVER HOLDING COMPANY, A PARTNERSHIP, AND SIGNED BY THE UNDERSIGNED PARTNERS.

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 August 2, 1955, and recorded in Book 196, Page 313, 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: NONE (State "None" or "See Annex No.____")

Dated this 18 day of JULY, 1957.

EDISTO RIVER HOLDING COMPANY [Seal] _____ [Address]

BY: R. A. Huffstetler [Seal] _____ [Address]

R. A. Huffstetler, Jr. [Seal] _____ [Address]

Robert J. Gillespie [Seal] _____ [Address]

Harriet H. Gillespie [Seal] _____ [Address]

WITNESS: Evelyn T. Copeland

Robert E. Penland [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]

STATE OF SOUTH CAROLINA)
COUNTY OF ORANGEBURG)

PERSONALLY APPEARED BEFORE ME EVELYN T. COPELAND AND MADE OATH THAT HE SAW THE WITHIN NAMED EDISTO RIVER HOLDING COMPANY, LESSOR, BY R. A. HUFFSTETLER, SR., R. A. HUFFSTETLER, JR., ROBERT J. GILLESPIE, AND HARRIET H. GILLESPIE, SIGN, SEAL AND AS ITS ACT AND DEED DELIVER THE WITHIN WRITTEN ~~LEASE~~ AGREEMENT AND THAT HE WITH ROBERT E. PENLAND WITNESSED THE EXECUTION THEREOF.

Evelyn T. Copeland

SWORN TO BEFORE ME THIS 18 DAY OF JULY, 1957.

Robert E Penland

NOTARY PUBLIC FOR SOUTH CAROLINA

EXPLORATION PROJECT CONTRACT
HEAVY MINERALS COMPANY
DOCKET NO. DMEA-4799

EXHIBIT "A"

Description of the Work

Exploration by churn drilling for concentrations of rutile, monazite, and rare-earth minerals shall be performed in the area indicated on attached map, Fig. 2, entitled "Map of South Edisto River Area, Aiken and Orangeburg Co., S. C., Showing Proposed Drilling Program."

General Provisions

The diameter of each hole shall be large enough to accommodate a 4-1/2 inch casing. The Government shall not contribute to the cost of an incompleted hole.

A sample shall be taken of each 2-1/2 foot interval of depth from each hole. Each sample shall be sacked, dried, and the weight and percentage of heavy minerals determined by heavy media methods and weighted hole composites shall be prepared. The weighted hole composites of heavy minerals shall be combined into weighted line composites which shall be analyzed for rutile, ilmenite, zircon, rare earths, and thorium. In lines having less than 8 holes, the weighted heavy mineral fraction shall be combined into a single line composite. In lines having more than 8 holes, 2 line composites shall be made of as nearly equal number of holes as possible.

The records for each hole shall show the weight and percentage of the heavy minerals recoverable from each 2-1/2 foot sample from each hole. The records for hole composites shall show the weight and percentage of heavy minerals recovered from the group and the analysis of the line composite samples for the above-mentioned elements. The monthly report shall include a map showing the location of all holes drilled during the reporting period, and the holes from which heavy minerals were combined into line composite samples. The location and extent of all drilling are subject to the approval of the Government.

The work shall be performed in two stages. The Operator shall perform all of the Stage I work and as much of the Stage II work as is approved in advance in writing by the Government.

Stage I

Drill 82 holes on lines across the deposit to an estimated average depth of 28 feet; provided, however, the aggregate drilling shall not exceed 2300 feet. The lines of drill holes shall be approximately 1600 feet apart, and the intervals between holes on each line will be approximately 400 feet. No hole shall be drilled within 200 feet of any property boundary line.

A small laboratory is to be installed in rented laboratory-office space for the recovery of the heavy minerals from the samples taken from each hole.

Stage II

Drill not in excess of 89 holes, on lines across the deposit, to an estimated average depth of 28 feet; provided, however, the aggregate drilling shall not exceed 2300 feet. The drill lines shall be approximately 1600 feet apart, located halfway between the lines of holes drilled under Stage I, and holes in each line shall be drilled approximately 400 feet apart in positions "staggered" between holes drilled in adjoining lines under Stage I.

Estimated Costs of the Project

Actual Costs

Stage I

Category (1) Independent Contracts

None

Category (2) Personal Services

(a) Supervision

1 project engineer, 1/2 time for 2 months @ $600/mo.	$ 600.00	
1 driller superintendent, 2 months @ $600/mo.	1,200.00	$ 1,800.00

(b) Technical Services			
1 laboratory technician 2 months @ $425/mo.	$ 850.00		
1 laboratory assistant 2 months @ $300/mo.	600.00		
2 rodmen - 4 days a month 2 months @ $1.75/hr.	224.00		
1 surveyor - 4 days a month for 2 months	170.00	$ 1,844.00	
(c) Labor	4,324.00	4,324.00	$7,968.00
Category (3) Operating Materials and Supplies			2,262.00
Category (4) Operating Equipment 1/			
(a) Rental			
None			
(b) Purchases			
None			
(c) Depreciation - Equipment			
1 "swamp buggy" - 2 months @ $166.67/mo.	333.33		
1 power wagon - 2 months @ $46.67/mo.	93.33		
1 jeep - 2 months @ $30/mo.	60.00		
1 pickup truck - 2 months @ $11.67/mo.	23.34		
1 sedan - 2 months @ $10/mo.	20.00	530.00	530.00

1/ Laboratory equipment to be furnished by the Operator at no charge to the project.

Category (5) Rehabilitation and Repairs

None

Category (6) New Buildings, Fixtures, and Installations

None

Category (7) Miscellaneous

Rental of laboratory and field office 2 months @ $85.00/mo.	$ 170.00*	
Repairs and maintenance of operating equipment	250.00	
Chemical analysis, 14 composite samples @ $52.50* each (for rutile, $3.75*; ilmenite, $3.75*; zircon, $15.00*; thorium, $15.00*; rare earths, $15.00*)	735.00	
Payroll taxes, liability insurance, etc.	597.00	
Bookkeeping, monthly reports, etc., 2 months @ $200.00/mo.	400.00*	$ 2,152.00
Total Estimated Cost - Stage I		12,912.00

Stage II

Category (1) Independent Contracts

None

Category (2) Personal Services

(a) Supervision

1 project engineer, 1/2 time 2.2 months @ $600/mo.	$ 660.00	
1 driller superintendent 2.2 months @ $600/mo.	1,320.00	1,980.00

(b) Technical Services

1 laboratory technician 2.2 months @ $425/mo.	$ 935.00		
1 laboratory assistant 2 months @ $300/mo.	600.00		
1 surveyor - 4-1/2 days month for 2 months	192.25		
2 rodmen - 4 days a month 2 months @ $1.75/hr.	252.00	$1,979.25	
(c) Labor	4,756.40	4,756.40	$ 8,715.65

Category (3) Operating Materials and Supplies 818.38

Category (4) Operating Equipment 1/

(a) Rental

None

(b) Purchases

None

(c) Depreciation - Equipment

1 "swamp buggy" - 2.2 months @ $166.67/mo.	366.67		
1 power wagon - 2.2 months @ $46.67/mo.	102.67		
1 jeep - 2.2 months @ $30/mo.	66.00		
1 pickup truck - 2.2 months @ $11.67/mo.	25.66		
1 sedan - 2.2 months @ $10/mo.	22.00	583.00	$ 583.00

1/ Laboratory equipment to be furnished by the Operator at no charge to the project.

Category (5) Rehabilitation and Repairs

None

Category (6) New Buildings, Fixtures, and Installations

None

Category (7) Miscellaneous

Rental of laboratory and field office 2.5 months @ $85/mo.	$ 212.50*	
Repairs and maintenance of operating equipment	275.00	
Chemical analysis, 16 composite samples @ $52.50* each (for rutile, $3.75*; ilmenite, $3.75*; zircon, $15.00*; rare earths, $15.00*; thorium, $15.00*)	840.00	
Payroll taxes and liability insurance	655.37	
Bookkeeping, monthly reports, etc. 2-1/2 months @ $200/mo.	500.00*	$ 2,482.87
Total Estimated Cost - Stage II (rounded)		$12,600.00

SUMMARY

Total Estimated Cost Stage I	$12,912.00	
Total Estimated Cost Stage II	$12,600.00	
Total Estimated Cost of Project		$25,512.00
Government Participation @ 75 percent		$19,134.00

* Represents a maximum in addition to those specified in Article 6 of the contract.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
7/23	Houk	600
"	Jensen	~~120~~
		110
"	Mittendorf	100
7/24	C	220
		225

600

JUL 24 1958

Heavy Minerals Company
Marine Minerals Division
P. O. Box 928
Aiken, South Carolina

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg Counties,
South Carolina

Gentlemen:

On June 4, 1958, the DMEA voided the unexecuted contract and requested you to return all copies to this office.

We are again requesting that all copies of the voided contract be returned to this office.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

LGHouk:gad 7/23/58
Copy to: Admr. R. File
Field Team, Region V
Mr. Kiilsgaard, 5222
Mr. Miller, 3415
Mr. Houk

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/4	Houk	600
6/4	Selfridge	120
		~~130~~
		~~130~~
6/4	Johnson	110
	Mittendorf	100
2/5		220
		215
6-4	Chambers	800

225

600

JUN 4 1958

Heavy Minerals Company
Marine Minerals Division
P. O. Box 928
Aiken, South Carolina

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg Counties
South Carolina

Gentlemen:

Reference is made to our letter of May 9, 1958, requesting that you execute the proposed contract or return it with the recommended changes before June 1, 1958.

Since you have failed to execute the contract or return it with your suggested changes, the offer of exploration assistance is withdrawn. The unexecuted contract is voided as of this date, and our records on this case are being closed.

Please return all copies of the unexecuted contract to this office.

Sincerely yours,

C. O. Mittendorf

Administrator

LGHouk:gad 6/4/58
Copy to: Admr. R. File
Operating Committee
Field Team, Region V
Mr. Kiilsgaard, 5222
Mr. Miller, 3415
Mr. Houk

8623

AEC Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/8	Knouse	600
4/8	Houk	600
4/9	Selfridge	120
4/11	Johnson	100
	Mittendorf	200
5/9	C	200
		600

600

MAY 9 1958

Mr. H. C. Laird,
Manager, Heavy Minerals Company
P. O. Box 978
Aiken, South Carolina

Re: Docket No. DREA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg
Counties, South Carolina

Dear Mr. Laird:

We are unable to grant your request of May 5, 1958, to hold open our offer of a contract to explore the subject property another 30 to 60 days.

We wish to cooperate and allow ample time for you to supply the proposed information but unless we receive either (1) the proposed contract with your recommended changes, or (2) the executed contract by June 1, 1958, the offer of a contract will be withdrawn.

Sincerely yours,

C. O. Mittendorf

Administrator

FLKnouse:rsi 5/8/58
Copy to: Admr. R. File
Mr. Kiilsgaard, 5222
Mr. Miller, 3415
Field Team, Region V
Mr. Houk
Mr. Knouse

8623

HEAVY MINERALS CO.

MINING DIVISION

POST OFFICE BOX 928, AIKEN, SOUTH CAROLINA

RARE EARTH CHEMICALS · THORIUM · HEAVY MINERALS

Phone 9-4141

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 7 1958

DATE	INITIALS	CODE
5/7	C	220
5/7	FJK	600

May 5, 1958

Mr. Lawrence G. Houk, Director
Division of Nonmetallic Minerals
U. S. Dept. of Interior
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg
Counties, South Carolina

Dear Mr. Houk:

We regret very much that we have not yet been able to reach a decision regarding the propsed contract for exploration of our property in the South Edisto River Area.

Due to the present heavy minerals market conditions we have shut down our Horse Creek mine and are reviewing our plans and positions. Economic conditions and uncertainties which prevail make it necessary that we re-evaluate our exploration program and mineral reserves. We expect to reach a decision regarding the South Edisto Area within 30 to 60 days and will appreciate your holding the proposed contract open for our further consideration.

Very truly yours,

HEAVY MINERALS CO.

H. C. Laird,
Manager - Mining Division

HCL:lw
CC: DMEA, Knoxville, Tenn.
J. M. Frame

Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/30	Knouse	600
5/1	Houk	600
"	Johnson	110
		~~[illegible]~~
5/1	C	220
		600

600

MAY 1 1958

Mr. H. C. Laird
Manager, Heavy Minerals Company
P. O. Box 928
Aiken, South Carolina

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg
Counties, South Carolina

Dear Mr. Laird:

Your letter of March 18, 1958, to our Knoxville, Tennessee, Office advised you would return the proposed contract to explore the subject property, with your recommended changes for consideration.

Please advise whether you are interested in proceeding with the exploration program and, if so, the approximate date we may expect to receive this information. A copy of your reply should be sent to our Knoxville, Tennessee, Office.

Sincerely yours,

SIGNED

Lawrence G. Houk, Director
Division of Nonmetallic Minerals

FLKnouse:rsi 5/1/58
Copy to: Admr. R. File
Mr. Kiilsgaard, 5222
Mr. Miller, 3415
Field Team, Region V
Mr. Houk
Mr. Knouse

8623

April 9, 1958

Resume of telephone conversation with Mr. Robert A. Laurence, Knoxville, Tennessee, April 9, 1958

By: Lawrence G. Houk

Mr. Laurence stated he had not heard from the Heavy Minerals Company, DMEA-4799 (contract forwarded January 27, 1958).

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

ROOM 13 POST OFFICE BLDG
KNOXVILLE 2, TENN.

RECEIVED MAR 24 1958

DATE	INITIALS	CODE
3/24	C	220
		130
3/25	Hook	600

March 20, 1958

Memorandum

To: Operating Committee, DMEA, Washington, D. C.

From: Field Team, DMEA, Region V, Knoxville, Tennessee

Subject: Docket No. DMEA-4799 (Rutile, thorium, rare earths)
Heavy Minerals Company, Aiken, South Carolina
Aiken and Orangeburg Counties, South Carolina

Enclosed are the original and two copies of a letter from the Applicant, indicating that changes in the proposed contract No. Idm-E1165, will be offered for our consideration.

These will be forwarded to you promptly when we receive them.

Robert A. Laurence
Robert A. Laurence
Executive Officer

V. J. Lynch
V. J. Lynch, Member
Bureau of Mines

Enclosures 3

HEAVY MINERALS CO.

MINING DIVISION

POST OFFICE BOX 928, AIKEN, SOUTH CAROLINA

RARE EARTH CHEMICALS · THORIUM · HEAVY MINERALS

Phone 9-4141

March 18, 1958

CONTROL COPY
DMEA
RECEIVED MAR 24 1958
DATE | MINERALS | CODE

Dept. of the Interior
Defense Minerals Exploration Administration
Room 13, Post Office Bldg.
Knoxville 2, Tenn.

Re: Proposed Contract
DMEA-4799 Rutile-Thorium and
Rare Earths
Aiken & Orangeburg Counties, S. C.

Gentlemen:

We are in receipt of proposed contract Idm-E 1165 and your letter of February 5, 1958. It appears advisable that the contract be changed in regard to location of drill holes, method of drilling and certain cost items. After further study we will return the contract with our proposed changes for your consideration.

Very truly yours,

HEAVY MINERALS CO.

H. C. Laird,
Manager - Mining Division

HCL:lw
CC: J. M. Frame

RECEIVED
MAR 20 1958
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
3/10	Houk	600
3/12	[illegible]	130
"	Johnson	110
"	Mittendorf	100
3/13	[illegible]	220
		600

600

MAR 13 1958

Mr. Robert A. Laurence
Executive Officer, DMEA
Field Team, Region V
Room 13, Post Office Bldg.
Knoxville 2, Tennessee

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg
Counties, South Carolina

Dear Mr. Laurence:

On January 27, 1958, we forwarded to you the original and four copies of a proposed long-form contract, and to date the copies of the executed contract have not been returned.

Please inquire if it is the intention of the Operator to sign the contract and advise us of its answer.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (b4B)

Approved:

Frank D. Lamb (b4B)
Member, Bureau of Mines

Thor H. Kiilsgaard (b4B)
Member, Geological Survey

LGHouk:gad 3/10/58
Copy to: Admr. R. File
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Miller, 3415
Mr. Houk

8623

February 10, 1958

Mr. L. G. Houk telephoned Mr. R. A. Laurence in Knoxville, Tenn.

Re: Docket No. DMEA-4799-Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg
Counties, South Carolina

Mr. Houk talked with Mr. Laurence who advised that Heavy Minerals Company's contract was sent to the Operator for execution and has not been received back by the Field Team.

DMEA Form 7
(12-56)

1/14 Bullum 600

OFFICIAL FILE COPY

Date	Surname	Code
1/14	Houk	600
1-14	Chambers	800
1/24	[illegible]	130
1/27	Johnson	110
"	[illegible]	100
1/28	[illegible]	220
		600

600

JAN 27 1958

Mr. Robert A. Laurence
Executive Officer, DMEA
Field Team, Region V
Room 13, Post Office Bldg.
Knoxville 2, Tennessee

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg
Counties, South Carolina

Dear Mr. Laurence:

Enclosed are the original and four copies of a proposed long-form contract signed by the Administrator for the Government. It consists of the form, Annex I (1 page), one Consent to Lien and Subordination Agreement, Exhibit "A" (5 pages), and two maps. Also enclosed are two extra copies of Annex I, Exhibit "A", and the maps for Field Team use.

If the proposed contract meets with your approval, present it to the applicant for execution. Copies of the executed contract are to be distributed in the usual manner. If any part of this proposed contract does not have either your approval or that of the applicant and cannot be amended within your delegated authority, then the original and all copies of the contract and the two extra copies of Annex I, Exhibit "A" and the maps are to be returned to this office, together with the proposed changes for consideration.

Copies of memoranda dated November 6 and 8, 1957, by Mr. James Paone, USBM, and Mr. W. P. Williams, USGS, respectively, relating to the project are enclosed.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (HB)

LGHouk:rsi 1/14/58
Copy to: Admr. R. File
Mr. Kiilsgaard, 5222
Operating Committee
Mr. J. A. Miller, 3415
Mr. Houk

Approved:

Frank D. Lamb

Member, Bureau of Mines (HB)

Ivor H. Kiilsgaard

Member, Geological Survey (HB)

Enclosures 11

P.S. Under Article 3 the starting date of the proposed contract has been left blank and is to be filled in when the contract is signed by the Operator.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
		130

January 16, 1958

Memorandum

To: Chairman, Operating Committee

From: Jay L. Chambers, Director
Contract Administration and Audit Division

Subject: Docket No. DMEA-4799 (Rutile-Monazite)
Heavy Minerals Company, South Edisto River Area
Aiken and Orangeburg Counties, South Carolina

I wish to call your attention to Items (a) and (b) under Category (2) of both Stage I and Stage II in the above-cited contract.

It is my interpretation of the contract that the Government will have to accept any bills paid by the Operator for Supervision and Technical Services which fall within the $900.00 and $922.00 amounts per month, respectively, in Stage I, and $990.00 and $989.625 in Stage II, notwithstanding the provision in the contract that the cost must be reasonable. I base this conclusion on the fact that we are aware of the provision in the contract to the effect that the cost must be reasonable, yet we have written the above amounts into the contract plan of work in Exhibit "A", without designating the number of persons involved in (a) or (b) and without specification for technical employees under (b).

Attachment

JLChambers/wb
January 16, 1958

Copy to: Docket
Admr. Reading File
Mr. Chambers

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 13 POST OFFICE BLDG.
KNOXVILLE 2, TENN.

EXTRA COPY
DMEA
RECEIVED DEC 9 1957
DATE | INITIALS | CODE

December 5, 1957

Memorandum

To: Operating Committee, DMEA - Washington

From: DMEA Field Team, Region V - Knoxville, Tennessee

Subject: Docket No. DMEA-4811 (rutile-monazite)
Strategic Minerals Corporation.
Kitching's Mill Area, Aiken County, Sou. Carolina.

Below are the comments of the Field Examiners on the items contained in your letter of November 25 on the subject docket.

1, 2 and 3 --comments not necessary.

4. Refer to item 3 of our memorandum dated Nov.26 on DMEA-4799, Heavy Minerals Company.

5. Comment not necessary.

6. Both types of drill rigs are described in the examination report under "Description of Drilling."

Heavy Minerals drill is securely mounted on a 4-wheel drive jeep and driving and pulling casing, drive pipe, sand bailer or sampler and accessory tools is accomplished by means of a drum attached to the "power take-off" on the jeep.

The Strategic Minerals drill is not machine mounted and is only a wooden tripod on which a sheave is attached for driving and pulling the drilling tools.

The ($2,000 plus $1,368 for parts) is for the steel frame work and necessary drill equipment for one rig. The parts are expendable items and are listed under operating material and supplies.

So far as we know, the swamp buggy is experimental in South Carolina. It has been successfully used in Louisana.

7. Breakdown of cost estimates for drilling the combined Stages I and II, as requested are listed below. The first breakdown is made using Sprague and Henwood's bid of $2.25 per foot for drilling only, and not including mobilization and de-mobilization of equipment, labor for clearing roads and building bridges.

The second breakdown includes these costs for $7.00 per foot, and is also a Sprague and Henwood bid submitted to Heavy Minerals Company DMEA-4799.

The figures in both breakdowns for magnetic and static separation and for chemical analyses, are those given by the Bureau of Mines, plus 25 percent which we believe are reasonable. The $10.50 for chemical analyses is an average of the cost of the 5 elements requested.

As these estimates cover only half the amount of drilling set up in the original examination report, the totals should be multiplied by two for a comparison.

EXAMPLE I. Cost estimates for Combined Stages I and II, for drilling 160 holes aggregating 4000 feet with 2 drills.

Independent Contracts

Sprague & Henwood bid 4,000 feet @ $2.25	$9,000.00

Labor and Supervision

Labor:	
4- Laborers @ $1.25/hr. 4 Mos.	3,200.00
2- Samplers @ $1.75/hr. 4 Mos.	2,240.00
Supervision:	
1 - Project Engr. @ $1000/Mo. 4 Mos.	4,000.00
Technical Services	
1 - Laboratory Technician @ $400/Mo. 4 Mos.	1,600.00
1 - Laboratory Assistant @ $300/Mo. 4 Mos.	1,200.00
1 - Surveyor, 4 days per Mo. @ $475/Mo. 4 Mos.	380.00
2 - Rodmen, 4 days per Mo. 4 mos. @ $1.75/hr.	448.00

Operating Material & Supplies

Gasoline, 10 Gal. per day, @ 30¢ gal.		$240.00
Oil 40 quarts @ 40¢ per qt.		16.00
Small hand tools including axes		~~100.00~~
Sledges, shovels, cant hooks and log carriers.		100.00
Drinking water kegs, tubs, gold pans, boots and galoshes.		100.00
Electric power, water, fuel for drying oven @ $50/Mo.		200.00
Laboratory Supplies, including separatory and glass funnels, beakers, drying pans, heat lamps, acetylene tetra-bromide and acetone.		555.00
Operating Equipment (Rental)		
1 - Monroe Calculator, 10 place fully automatic @ $40/Mo.		160.00
1 - Typewriter @ $30/Mo.		120.00
Field Office and Laboratory @ $75/Mo.		300.00
Purchase		
1 - Power saw		495.00
Depreciation		
1- 1947 Dodge power wagon present milage 43,017,	$700.00	
1 -1957 Ford passenger car, 8-cylinder, present milage 2,700	2300.00	
	$3000.00	
Depreciation, 1/60th/Mo. for 4 months		200.00

New Buildings, Improvements, etc.

Construct drying oven, benches, tables, electric wiring and plumbing in laboratory. $350.00

Miscellaneous

Repairs to Equip.

General Repairs and maintenance for all equipment. 500.00

Sampling and Analysis

Magnetic and static separation of heavy mineral concentrates- 27 samples @ $12.50 each 338.00

Outside chemical analysis for drill samples.(composite samples for 6 holes to be analyzed for ilmenite, rutile, thorium, rare earths and zirconium).

$\frac{160}{6}$ holes = 27 x 5 = 135 samples @ $10.50 each 1,418.00

Payroll taxes, 4.95%	647.00
Liability Ins. 0.95%	124.00
Accounting, office supplies, etc.	600.00
Total Estimated Cost of Project.....	$28,531.00

****

EXAMPLE 2 : Cost estimates for combined Stages I & II covering a 4 months period for completion of project.

Independent Contracts

4000 ft of drilling for combined Stages I & II @ $7.00/ ft. $28,000.00

(Unit cost includes mobilization, demobilization of equipment and labor, as well as all clearing, building roads, etc.).

Supervision

1 - Project Engineer, 4 mos. @ $1,000/Mo. $4,000.00

Technical Services

2- Samplers(1 Strategic Minerals man with each drill) @ $1.75/hr.	$2,240.00
1- Laboratory technician @ $400/Mo.	1,600.00
1- Laboratory assistant @ $300/Mo.	1,200.00
1 -Surveyor-4 da/Mo. @ $475/Mo.	380.00
2- Rodmen, 4 das/Mo. @ $1.75/hr.	448.00

Operating Equipment (rental)

1-Monroe Calculator-10 place, fully automatic @ $40/Mo.	160.00
1-Typewriter @ $30/Mo.	120.00
Rental of Field office and Laboratory @ $75/Mo.	300.00

Operating Materials & Supplies

Laboratory supplies including separatory and glass funnels, beakers, filter paper, drying pans, heat lamps, acetylene tetrabromide and acetone.	500.00
Electric power, water, fuel for drying oven @ $50/Mo.	200.00
Gas and oil(for power wagon and Ford passenger car - 800 gal. of gas and 40 qts oil estimated for 4 month period).	256.00

New Buildings, Improvements & Installations

[redacted] --

Construct drying oven, benches and tables for drying and sample preparation, and install necessary plumbing and electric wiring.	350.00

Depreciation

1 - 1947 Dodge power wagon-present milage 43,017- Value--$700.00

1 - 1957 Ford passenger car, 8 cyl. present milage 2,700. Value $2,300.00
Total $3,000.00

Depreciation 1/60th/Mo. for 4 months	200.00

Miscellaneous

Repairs and maintenance for all equipment,	$500.00
Magnetic and static separation of heavy mineral concentrates, 27 samples @ $12.50	338.00
Outside analyses for drill hole samples. (composite sample for 6 holes to be analyzed for rutile, Ilmenite, rare earths and thorium, zirconium).	
$\frac{160}{6}$ holes = 27 x 5 = 135 samples @ $10.50 each	1,418.00
Accounting, office supplies, reproductions, etc.	600.00
Payroll taxes, South Carolina unemployment compensation, Federal Workmans Compensation Ins. (5.9%)	582.00
Total Estimated cost of project.....	$43,380.00

Robert A. Laurence, Executive Officer
DMEA Field Team, Region V

V. J. Lynch, Member
Bureau of Mines

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11/29	wrh	600

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 25, POST OFFICE BLDG.
KNOXVILLE 2, TENN.

November 26, 1957

Memorandum

To: Operating Committee, DMEA - Washington

From: DMEA Field Team, Region V - Knoxville, Tennessee

Subject: Docket No. DMEA-4799(rutile-monazite)
Heavy Minerals Co., South Edisto River Area,
Aiken and Orangeburg Counties, S. C.

Below are the comments of the Field Examiners on the items contained in your letter of November 18 on the subject docket.

1. In the land description of the subject application, tracts 10, 11, 12, and 13 are bounding tracts as are 7, 8, 9, and 14. They are not part of the leased area, but the Applicant advises they could be obtained if needed. They do not feel, however, that this land contains mineable amounts of minerals and for that reason did not include them in the application. Recent drilling in this area confirms that opinion. ?

A property map showing these lots and their south boundary, which is marked all the way, is enclosed. A map showing the land to be included in this application is also enclosed.

Heavy Minerals Company's lawyer, Robert Penland, stated property lines adjoining a stream, run to the middle of the stream. In the event of natural shifting of the stream the property lines follow the new stream course.

Rules applicable to a Class A stream are attached. The Applicant is aware that to operate in the subject area they will have to confine and settle the slimes before allowing the water to return to the river.

2. We are in accord with the two-stage program as outlined in this paragraph, namely, having the lines in the first stage 1600 feet apart with a 400-foot hole spacing. And the

lines in Stage II, if drilled, midway between the 1600-foot lines with the 400-foot spacing between holes staggered with respect to the adjoining range line.

3. The costs suggested by the Field Examiners are high. They took the Applicant's figure of $20 a sample which were out of line with outside laboratories. The Applicant told the Examiners their analytical cost within the Company are largely a matter of paper transfer. That is, exact costs are not determinable. They are willing to meet competative costs shown in the outside analytical bids.

There is enclosed a schedule of charges for Technical Services, issued by the Southeastern Experiment Station of the Bureau of Mines on November 25, 1953. We would suggest their figures plus 25 percent be used for analytical work on this contract. Broken down into its components it would be as follows:

		B.&M.	Bryn Williams	Hanks
Titanium(rutile)	$3.75	3.00	4.00	5.00
Titanium(ilmenite)	3.75	3.00	4.00	(5.00)
Zirconium	15.00	12.00	10.00	10.00
Thorium	15.00	12.00	7.50	10.00
Rare earths	15.00	12.00	15.00	15.00
Total per composit.....	$52.50	42.00	40.50	45.00
	10.50	8.40	8.10	9.00

We are surprised to learn that in actual cost contracts there are no "Contingency" items allowable. It was our understandig that this applied only to unit cost contracts. In DMEA-2576, Idm-E392, Callahan Zinc-Lead Co., Inc. in Phase I of the contract, $3,000 was allowed for contingencies, "Unforeseen Expenses" and in Phase II, $1,200 was allowed for the same item.

4. The cost of supervision can be reduced by allowing the Project Engineer one-half time. It is estimated that he will put in one-half to two-thirds of his time on the project.

5. The Applicant's figure of $520 is for alteration and mounting of their present drill-rig to the swamp-buggy. It does not include the cost of a new drill. The Examiners figure of $2,000 for a drill-rig includes the cost of mounting it on the swamp-buggy. If two drills are used it will be necessary to purchase the drill to be mounted on it.

6. The percentage rates on taxes are as follows:

2.25% of first $4,200 per year for F.I.C.A.
2.70% of first $3,000 per year for South Carolina Workmens Compensation (unemployment).
0.95% of payroll for Workman's Compensation Insurance (Liability).
4.5¢ per hour employee for Company pension fund.

The above figures were given to this office November 22, 1957 by Charles C. Cook, Chief, Minerals Engineer for the Company. Mr. Cook will be in charge of the project.

V. J. Lynch

V. J. Lynch, Acting
Executive Officer, DMEA
Region V

Helmuth Wedow, Jr.

Helmuth Wedow, Jr.
Geologist, Geological Survey

Z

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 13 POST OFFICE BLDG.
WASHINGTON 25, D.C.
KNOXVILLE 2, TENN.

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November 26, 1957

Memorandum

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From: DMEA Field Team, Region V - Knoxville, Tennessee

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Rules applicable to a Class A stream are attached. The Applicant is aware that to operate in the subject area they will have to confine and settle the slimes before allowing the water to return to the river.

2. We are in accord with the two-stage program as outlined in this paragraph, namely, having the lines in the first stage 1600 feet apart with a 400-foot hole spacing. And the

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Titanium(ilmenite)	3.75
Zirconium	15.00
Thorium	15.00
Rare earths	15.00
Total per composit.....	$52.50

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V. J. Lynch, Acting
Executive Officer, DMEA
Region V

Helmuth Wedow, Jr.
Geologist, Geological Survey

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Lynch
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Files

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 13 POST OFFICE BLDG.
WASHINGTON 25, D.C.
KNOXVILLE 2, TENN.

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November 26, 1957

Memorandum

To: Operating Committee, DMEA - Washington

From: DMEA Field Team, Region V - Knoxville, Tennessee

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Rules applicable to a Class A stream are attached. The Applicant is aware that to operate in the subject area they will have to confine and settle the slimes before allowing the water to return to the river.

2. We are in accord with the two-stage program as outlined in this paragraph, namely, having the lines in the first stage 1600 feet apart with a 400-foot hole spacing. And the

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V. J. Lynch, Acting
Executive Officer, DMEA
Region V

Helmuth Wedow, Jr.
Geologist, Geological Survey

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[illegible]

2 to 9 [illegible]

$3.50 - (Number of samples x [illegible]) = [illegible]
10

(Example: 8 samples would cost):
$3.50 - (8/10 x $1.75) = $2.10/determination

Group II
Zinc, tin, silica, alumina, antimony, arsenic, calcium, magnesium, phosphorus, nickel, chromium, cadmium, bismuth, titanium, barium, sodium, and potassium:
1 Sample, per determination.......... [illegible]
10 Samples, per determination at $3.00.......... [illegible]
2 to 9 Samples, per determination prorated on basis of:

$6.00 - (No. of samples x $3.00) = Cost/determination
10

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JAN 7 1954
U. S. BUREAU OF MINES
DEF. MIN. ADM.
Knoxville, Tennessee

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CLASSIFICATION - STANDARDS
SYSTEM FOR THE STATE OF SOUTH CAROLINA

SECTION I

DEFINITIONS

The definition of any word or phrase employed in Sections II or III shall be the same as given in Section 20, South Carolina Water Pollution Control Law. The following words or phrases which are not defined in said Section, shall be defined or have meanings as follows:

Source of water supply for drinking, culinary or food processing purposes shall mean any source, either public or private, the waters from which are used for domestic consumption, or used in connection with the processing of milk, beverages, foods or for other purposes which require finished water meeting U. S. Public Health Service Drinking Water Standards.

Approved Treatment as applying to water supplies means treatment accepted as satisfactory by the authorities responsible for exercising supervision over the sanitary quality of water supplies.

Bathing shall include swimming but shall be regarded as a best usage only for waters in which bathing is or may be expected to be subject to effective sanitary supervision and control.

Fishing shall include the propagation of fish and other aquatic life.

Agricultural shall include use of waters for stock watering, irrigation and other farm purposes but not as source of water supply for drinking, culinary or food processing purposes.

Marine District waters shall mean all tidal waters which are so designated by the Water Pollution Control Authority and which generally shall have a chloride ion content in excess of 250 parts per million.

Underground Disposal shall mean the disposal of wastes by pumping or allowing to flow by gravity into the ground in such a manner as to enter the water-bearing strata of the earth. Such disposal is not to be permitted. This definition does not cover the use of tile fields in connection with septic tanks, or any other type of ground waste disposal subject to regulations of the State Board of Health.

Intermittent Discharge of Wastes shall refer to the practice of holding industrial wastes, domestic sewage, or mixtures of the two; or sludge resulting from the operation of plants, processes or systems for the treatment of the same, in lagoons, tanks or other suitable containers

for discharge at appropriate times. Such lagoons, tanks, or other containers shall be considered waste treatment plants to be operated on permit of the Authority as specified by the Water Pollution Control Act and shall be operated in the manner specified by the permit.

Controlled Discharge of Wastes and other phrases or words of the same general intent shall be construed the same as Intermittent Discharge of Wastes.

Swamp Waters shall refer to waters whose topographical location is such as to cause them to have very low flow velocities, and certain characteristics different from adjacent streams.

SECTION II

RULES APPLICABLE TO CLASSES AND STANDARDS

1. In any case where the waters into which sewage, industrial wastes or other waste effluents discharge are assigned a different classification than the waters into which such receiving waters flow, the standards applicable to the waters which receive such sewage or waste effluents shall be supplemented by the following stipulation: The quality of any waters receiving sewage, industrial wastes or other waste discharges shall be such that no impairment of the best usage of waters in any other class shall occur by reason of such sewage, industrial wastes or other wastes discharges.

2. Tests or analytical determinations to determine compliance or non-compliance with standards shall be made in accordance with methods and procedures approved by the Water Pollution Control Authority. (In approving methods, so far as practicable and applicable, the Authority will be guided by the latest edition of "Standard Methods for the Examination of Water and Sewage" published by the American Public Health Association and the American Water Works Association.)

3. In making any tests or analytical determinations of classified waters to determine compliance or non-compliance of sewage, industrial wastes or other wastes discharges with established standards, samples shall be collected in such manner and at such locations as are approved by the Water Pollution Control Authority as being representative of the receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.

4. Natural waters may on occasion have characteristics outside of the limits established by the standards. The standards adopted herein relate to the condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes.

5. Where tests for compliance with the fresh water standards for those classifications of B or above disclose that the minimum requirements thereof are being met with regularity at each domestic, industrial, or other water supply intake point, no violation of such classification shall be deemed to exist by virtue of any variation from the requirements

thereof which occurs other than at any such intake point, due to the discharge of wastes into any stream so classified, unless the quality of the water at such other point fails to meet the normal requirements of the next lower classification.

SECTION III

ESTABLISHED CLASSES FOR FRESH SURFACE WATERS AND THE STANDARDS OF QUALITY AND PURITY WHICH SHALL BE APPLIED THERETO

CLASS AA

Waters meeting State Board of Health regulations as suitable for use for domestic and food processing purposes with sterilization as only treatment required. Suitable also for uses requiring waters of lesser purity.

Quality Standards for Class AA Waters

Items	Specifications
1. Floating solids; settleable solids; oil; sludge deposits; tastes or odor producing substances.	None attributable to sewage, industrial wastes or other wastes.
2. Sewage or waste effluents.	None
3. Dissolved oxygen.	Not less than 5 ppm.
4. Toxic wastes, deleterious substances, colored or other wastes or heated liquids.	None in amounts to exceed limitations set by State Board of Health for waters for this use.

CLASS A

Waters meeting the State Board of Health regulations as suitable for use as swimming water. Suitable also for other uses requiring waters of lesser purity.

Quality Standards for Class A Waters

Items	Specifications
1. Floating solids; settleable solids; oil; sludge deposits.	None which are readily visible and attributable to sewage, industrial wastes or other wastes and which measurably increase the amounts of these constituents in receiving waters after opportuinity for reasonable dilution and mixture with the wastes discharged thereto.

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

Date November 14, 1957

DMEA Docket No. 4799
DMEA Contract No.
Commodity Rutile
Name of applicant Heavy Minerals Company
Name of property South Edisto River Area
Location of property Aiken & Orangeburg Co., S. C.
Estimated cost of project $56,414.00

To: L. G. Houk, Defense Minerals Exploration Administration

From: Jesse A. Miller, Commodity Specialist, Branch of Light Metals, Bureau of Mines

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

1. Date of subject document: 10/29/57. 2. Date received by reviewer: 11/5/57

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:

See memorandum of August 2, 1957.

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)

Jesse A. Miller

Jesse A. Miller

DMEA Form 7
(12-56)

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Date	Surname	Code
11/15	Houck	600
11/15	Martin	130
"	J. Jones	110
"	Pretendy	100
11/18	C	220
		600

600

NOV 18 1957

Mr. Robert A. Laurence
Executive Officer, DMEA
Field Team, Region V
Room 13, Post Office Bldg.
Knoxville 2, Tennessee

Subject: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg
Counties, South Carolina

Dear Mr. Laurence:

Review of the Field Examination Report of October 29, 1957, by L. E. Shirley and William A. Beck, and revised cost data on the subject application brings out the following points:

1. From our study of the land description it appears that Tracts 10, 11, 12 and 13 are bounding tracts, not part of the leased area. Does the Applicant control this property and Lot No. 14 which is not mentioned in the lease? A lease and Consent to Lien and Subordination Agreement will be required if work is to be done on this area. The 210.5 acre tract in Orangeburg County, shown on Page 3 of the application, cannot be located with respect to the project work. A clarification of the property included is needed. If, as seems apparent from the lease agreements, the center of the river is a property boundary, how is that boundary determined? It must be kept in mind that no DMEA work should be planned so that any hole is closer than 200 feet to a property boundary. In the State of South Carolina what is a "Class A Stream," and what restrictions are placed on a dredging operation?

2. We are considering a two-staged program in which the range lines in the first stage would be 1,600 feet apart with a 400 foot hole spacing along each range line. The second stage, contingent upon Stage I results, would have the range lines midway between ranges in Stage I on 1,600 foot centers, and the hole spacing 400 foot staggered with respect to the adjoining range line.

3. The costs suggested by the Field Team for sampling and assaying appear high to this office, i.e., 300 samples @ $20.00 each — $6,000.00. The Applicant requested 60 composite samples each to be analyzed for five constituents at $20.00 average per determination. According to our previous experience

8623

in work of this type and bids from Assayers, Bruce Williams, Hanks, and others, the $20.00 average is high. This figure represents $5.00 above the Ledoux bid with other laboratories showing greater differences. (See Applicant's letter of August 14, 1957 to Houk.) Please break this figure down into its components. If the Applicant desires to do this work it may be allowed the amount that a private assayer will charge, less any profit. Please note that in actual cost contracts there are no "contingency" items allowable.

4. In Stage I, cost of supervision, $10,500.00 appears to be out of line for labor cost of $18,918.00. Is it necessary to have a driller superintendent and also a project engineer to supervise two drill crews, and a laboratory technician and a part time survey crew when the expected rate of work completed is only two holes per day?

5. The Government may participate in the cost of the swamp-buggy and drill mounted on it, at an allowance of 1/60 of total cost for each month used on the project. The Applicant requested $520.00 for attaching drill-rig to swamp-buggy but does not mention purchase of a new drill. The Field Team Examiners set up $2,000.00 for a drill rig, to be mounted on buggy. Does the Applicant's price include the cost of drill rig, and does the Examiners' figure of $2,000.00 for a drill rig include the cost of mounting?

6. What are the percentage rates for payroll taxes, for workmen's compensation insurance, and for public liability insurance, in the State of South Carolina?

7. Because of the ore reserve at Horse Creek and the present mining rate, the royalty pay back period should be increased to 20 years.

We will continue processing the application when we receive the comments on the above.

Approved:

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

W. P. Williams (JWB)
Member, Geological Survey

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee (JWB)

Copy to: Admr. R. File
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Cservenyak, 3411
Mr. Houk

LGHouk:gad 11/14/57

PRICES FOR ANALYSES ---- TiO2, Th, etc.

	TiO2	Th	Rare Earth Oxides & Th Ox.	Zr
Craven, Shufflebarger, etc. - Docket No. DMEA-4652				
(a) Bruce Williams	$2.50			
(b) Bell-White Lab.	5.00			
Heavy Minerals Company -- Docket No. DMEA-4799 Marine Minerals Divn.				
(a) Smith Emery	$7.50	$15.00	$15.00	$10.00
(b) Abbot A. Hanks	5.00	10.00	15.00	10.00
(c) Ledoux & Co.	9.00	--	24.00	12.00
" " (2nd bid)		21.00 alone. 15.00 when grouped with total rare earths.		
Strategic Minerals Corp. -- Docket No. DMEA-4811				
(a) Carpeo Research & Eng.	$6.50	$17.50		
(b) Bruce Williams	4.00	7.50		
(c) Law & Co.	5.00	12.50		

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 18 POST OFFICE BLDG.
WASHINGTON 25, D. C.
KNOXVILLE 2, TENN.

November 8, 1957

11/12	C	220
11/12	2B	130
11/12	Hook	600

Memorandum

To: Operating Committee, DMEA - Washington

From: DMEA Field Team, Region V - Knoxville, Tenn.

Subject: DMEA-4799,(rutile, monazite) Heavy Minerals Co., Marine Minerals Division, Aiken, South Carolina South Edisto River Area, Aiken and Orangeburg, S. C.

Reference is made to the Field Examination Report, dated October 29, 1957.

Several errors in arithmetic were present in this report, and should be corrected if a contract is approved. The attached list of estimated costs should be substituted for those in the report.

Copies sent to: Bu. Mines Geo. Survey gpd

V. J. Lynch

V. J. Lynch, Acting Executive Officer
DMEA Field TEam, Region V

Helmuth Wedow, Jr.

Helmuth Wedow, Jr., Geologist
Geological Survey

z

STAGE I

Corrected Estimated Costs.(Two drill operation) 8 3/4 Months.

Independent Contracts. None

Labor and Supervision

Labor:

2 - Driller foremen @ $425/Mo.	$7,438.00
2 - Drillers @ $2.25/hr.	6,300.00
2 - Driller helpers @ $1.85/hr.	5,180.00

Supervision

1 - Project Engr. @ $600/Mo.	5,250.00
1 - Driller Supt. @ $600/Mo.	5,250.00

Technical Services

1 - Laboratory Technician @ $425/Mo.	3,719.00
1 - Surveyor, 4 da. per Mo. @ $475/Mo.	831.00
2 - Rodmen- 4 da. per Mo. @ $1.75/hr.	980.00

Operating Material and Supplies

Drive pipe - 4 1/2" O.D. 75 ft @ $10/ft.	750.00
Drive shoes - 2 @ $35/each	70.00
Rope, 2400 ft @ 52¢/lb.	208.00
Sand samplers (bailers) 3 @ $68/ea.	204.00
Chain wrenches, 2 with replaceable chains @ $38/each	76.00
Gasoline, 3500 gals. @ 30¢/gal.	1,050.00
Acetylene tetrabromide- 2 gal./Mo. @ $27/gal.	473.00
Acetone-60 gal. @ $1.50/gal.	90.00
Filter paper, sample bags	278.00
Fuel for drying oven @ $13.90/Mo.	122.00
Electric power and water @ $20/Mo.	175.00
Small hand tools, buckets, etc.	750.00
Drive heads - 2 @ $35/each	70.00

Operating Equipment (rental)

Laboratory & Field Office @ $85/Mo.	745.00

Purchase

1 - "swamp Buggy"(vehicle alone)	8,000.00
1 - Drill rig to be mounted on swamp buggy	2.000.00

Depreciation

1 - Dodge Power Wagon, 1 yr. old, good condition, low milage	$2,800.00	
1 - One-half ton Chev. pick-up truck	700.00	
1 - 1954 Ford Tudor, mileage 68,000	600.00	
	$4,100.00	
Depreciation allowence on above 1/60th/Mo. for 8 3/4 Mos.		$600.00

Miscellaneous

Repairs to Equipment	900.00
Sampling and Analysis $1.00 60 [illegible] @ $1.00 300 samples @ $20/each 300 [illegible] @ $20	$6,000.00
Payroll Taxes	684.00
Liability Insurance	2,280.00
Bookkeeping, Monthly Reports, etc.	1,500.00

Contingencies

Unforeseen Expenses	5,000.00
Estimated Total Cost of Stage I.....	$66,973.00

350 holes, 25' hole = 8,750 ft. of hole = 7.65 per foot

STAGE II

Sink 2 test shafts, 4' x 4' x 25' to obtain sufficient volume of samples for concentrating and assaying as a check against drilling results. (28 shifts).

Labor and Supervision

Labor:

4- laborers @ $1.00/hr.	896.00

Supervision		
1 - Project Engr. 1 1/2 Mos.@ $600/Mo.	$900.00	
Technical Services		
1 - Technician-required by Griffin Well Point Co. @$2.75/hr. plus travel exps.	410.00	
Operating Materials and Supplies		
Gasoline and oil	170.00	
Timber - 4000 b.f. @$75/M	300.00	
Miscellaneous	200.00	
Operating Equipment (rental)		
Wellpoint equip. as a unit including 40 wellpoints, header pipe, riser pipe, hose, gasoline engine, jetting pump and misc. fittings plus freight	1,000.00	
Miscellaneous		
Sampling and Analyses		
Analysis of bulk samples from 2-test pits @ $100/ea.	200.00	
Outside analyses for rutile, monazite, zircon, thorium and rare earths. 2 shafts x 5 samples ea. 10 @ $20/ea	200.00	
Payroll taxes	50.00	
Liability Ins.	150.00	
Contingencies		
Unforeseen expenses	400.00	
Estimated total cost of Stage II		$4,876.00
Total Estimated Cost (Stages I & II)		$71,849.00

Z

IN REPLY REFER TO:

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

DMEA
RECEIVED NOV 12 1957
DATE | INITIALS | CODE
11/12 | C | 220
11/12 | gad | 600

November 8, 1957

Memorandum

To: L. G. Houk, Defense Minerals Exploration Administration

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

Subject: Review of field examination report, DMEA 4799 (rutile, monazite), Heavy Minerals Co., Aiken and Orangeburg Counties, South Carolina

The examining team report that the applicant's property may contain economic reserves of heavy minerals. The deposit appears to have many resenblances to the deposits at nearby Horse Creek. The Horse Creek sands have been mined by the applicant since 1953; and the deposits were found by successful DMEA contract Idm-E392.

The examiners recommend approval of a DMEA contract that would provide for 350 drill holes and two 25-foot shafts.

I agree with the findings and recommendations of the examining team for the main reason that a discovery of minable heavy sands seems likely to result from the proposed work.

W. P. Williams

W. P. Williams

DMEA RECEIVED NOV 7 1957		
DATE	INITIALS	CODE
11/7	gb	220
11/8	gbd	600

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

Date November 6, 1957

DMEA Docket No. 4799
DMEA Contract No.
Commodity Monazite
Name of applicant Heavy Minerals Co.
Name of property
Location of property Aiken and Orangeburg Counties, S.C.
Estimated cost of project $56,414.00

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

Field Team Report
(Application, Field Team Report, etc.)

1. Date of original document: 10/31/57 2. Date received by reviewer: 11/6/57

3. Does [illegible] this property known to someone? Yes [ ] No [ ]

4. Other [illegible] or nearby properties known to someone? 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:

8. Problems requiring special considerations:
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. Reject [ ]
d. Agree with Field Team [x]
e. Discuss with Field Team [ ]
f. Request [illegible] [ ]
g. Request [illegible] [ ]
h. Approve [x]
i. Consult with Mr. [illegible] at [illegible]

10. Remarks (Use back of sheet if necessary)

DMEA FORM 6 REFERENCE SLIP

REV. 12-56 DEFENSE MINERALS EXPLORATION ADMINISTRATION

TO:	INITIALS	DATE
1. 220 ✓		
2. 600		
3.		
4.		
5.		
FROM: George C. Selfridge	245	11/4

FOR: Check items for action desired

____ Action ____ Reply for signature of ____

____ Approval ____ Investigate ____ Surname

____ Comment ____ Recommendations ____ Signature

____ Conference ____ Rewrite ____ File

____ Instructions ____ Your information

REMARKS:

GERTIE: As you will note transmittal memo states 8 extra cys of maps enclosed. Actually, 8 cys of property map & 5 cys of location map recd. These are attached to this report.

Hazel Berry

T.-DUP. SEC., WASH., D.C. M8278

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 13 POST OFFICE BLDG.
KNOXVILLE 2, TENN.

WASHINGTON 25, D.C.

DMEA
RECEIVED NOV 4 1957

		COPIES
11/4	C	220
11/6	HB	130
11-6	C	220
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October 31, 1957

Memorandum

To: Operating Committee, DMEA - Washington

From: DMEA Field Team, Region V - Knoxville, Tenn.

Subject: Field Examination Report - DMEA-4799(rutile,monazite). Heavy Minerals Co., Aiken, South Carolina South Edisto River Area, Aiken and Orangeburg Counties, South Carolina.

Enclosed are the original and two copies of the subject examination report, with 8 extra copies of the maps. Proposed Decl. 5 copies

We believe this area shows sufficient promise of containing economic reserves of heavy sands comparable to those now mined at nearby Horse Creek and therefore recommend approval of a long-form, actual cost contract providing for the work as outlined in the report.

11/4

On-Site Exam Rpt.

Robert A. Laurence

Robert A. Laurence,
Executive Officer, DMEA-Region V

V. J. Lynch

V. J. Lynch, Member
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

11-6-57
(date)

2. Sewage or waste effluents.	None in such quantity or quality as to raise the Coliform bacteria count of these waters above 1000 per 100 ml.
3. Odor producing substances contained in sewage, industrial wastes or other wastes.	The waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto shall not have an increased threshold odor number greater than 8, due to such added wastes.
4. Phenolic compounds.	Not greater than 5 parts per billion (Phenol)
5. pH	Range between 6.0 and 8.0, except that swamp waters may range from pH 5.0 to pH 8.0.
6. Dissolved Oxygen.	Not less than 4.5 ppm, except that swamp waters may have a low of 2.5 ppm.
7. Toxic wastes, deleterious substances, colored or other wastes, or heated liquids.	None alone or in combination with other substances or wastes in sufficient amounts or at such temperatures as to be injurious to fish life or make the waters unsafe or unsuitable for bathing.

CLASS B

Suitable for domestic supply after complete treatment in accordance with regulations of the State Board of Health. Suitable also for uses requiring water of lesser purity.

Quality Standards for Class B Waters

Items	Specifications
1. Floating solids; settleable solids; oil; sludge deposits.	None which are readily visible and attributable to sewage, industrial wastes or other wastes and which measurably increase the amounts of these constituents in receiving waters after opportunity for reasonable dilution and mixture with the wastes discharged thereto.
2. Sewage or waste effluents.	None in such quantities or qualities as to make the Coliform bacteria count of the waters exceed 5000 per 100 ml.

OFFICE SECRETARY
DMEA
RECEIVED NOV 4 1957

DATE	INITIALS	CODE
11-4	JHB	130
		220

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

FIELD EXAMINATION REPORT
REGION V

ON

DMEA-4799, SOUTH EDISTO RIVER AREA
Aiken and Orangeburg Counties
South Carolina
(Monazite and Rutile)

L. E. Shirley and Wm. A. Beck,
Mining Engineers, U.S. Bureau of Mines

October 29, 1957

Reviewed by
DMEA OPERATING COMMITTEE
11-6-57
(date)

FIELD EXAMINATION REPORT
On

DMEA-4799(monazite-rutile) SOUTH EDISTO
RIVER AREA, Aiken and Orangeburg
Counties, South Carolina

Applicant: Heavy Minerals Company, Marine Minerals Division,
P.O. Box 928, Aiken South Carolina

Heavy Minerals Company is a corporation, incorporated in the State of Delaware and lists its offices on page 1 of the application.

SUMMARY

Preliminary drilling by the Applicant has shown the presence of heavy minerals in an alluvial deposit. The results of the drilling shows an average heavy mineral concentration of 19.45 pounds per cubic yard of material. Of this concentration monazite averages 1.7 pounds per cubic yard and rutile 2.88 pounds per cubic yard. The presence of these minerals, and others, in economic quantities, places this deposit among those that should be further explored from the surface. Other factors favorable for an exploration program include good accessibility during dry seasons, mild climate, topography, the excellent availability of power, water, manpower and materials, and the broad experience of the Applicant in this type of exploration. If the completed exploration work outlines sufficient reserves, the deposit would also be amenable to either dredging or dragline operation.

It is recommended that a program similar to the one requested by the Applicant be conducted. This exploration program would consist of drilling and sampling, necessary analysis work, and test shafts to check the accuracy of the drilling.

Examination

The examination was made September 12, 1957 and required ten hours.

Charles C. Cook, Chief Minerals Engineer and M. C. (Buck) Thompson, Driller Superintendent for the Company, accompanied the Field Examiners on the property. After the property examination, a discussion of the proposed cost estimates submitted in the application, were reviewed. Those present included Mr. Cook, Hugh C. Laird, Manager of Mining, John Munzenrider, Mining Engineer, and various office personnel.

The property examination consisted of a visit to all the area under consideration, and observation of drilling procedures, and equipment in use. The cost discussion consisted of reviewing and revising estimates made by the Applicant.

Location and Accessibility

The property is located along the South Fork of the Edisto River where the Aiken County-Orangeburg County line crosses the river. The center of the property is located 5.0 airline miles N78°W of Springfield and 21.5 airline miles S16°E of Aiken, South Carolina. The Company maintains a field exploration office and laboratory near the City limits of Aiken, S. C.

The property for exploration purposes is accessible from surfaced State and County roads, graveled county roads and numerous farm roads extending to the limits of cultivated fields. Old logging roads and trails lead from the cultivated areas into the dense swamps and to the river. The logging roads are generally in poor condition and normal use requires spanning low, miry places with rough bridges in order to move vehicles past these points. At the time of this examination an area 700 feet laterally from the river was inundated by water from recent heavy rains. Only the higher elevated benches of the area would be easily accessible during all seasons of the year. The use of an amphibious-type vehicle would provide good access to the lower areas during extremely wet seasons which occur normally in late fall and early spring. Access during these periods could be gained by men-on-foot and equipment could be brought in by this method.

The area is served by the Southern Railroad which passes about 5 miles east of the property as shown on the location map accompanying this report.

Competency of the Applicant

The Applicant appears to be fully competent of carrying out an exploration program of this type successfully. The Heavy Minerals Company, although formerly retaining a larger exploration staff than it now maintains, has conducted numerous exploration programs on the West Coast of Florida, on properties in at least 3 West Tennessee counties, in Georgia and else where. In addition the Company has continued exploration in South Carolina, particularly along the South Edisto River, both northwest and southeast from the subject area and along other drainage in the general area. Although varied drilling methods have been employed in the areas mentioned, considerable experience has been gained by the Company in the prospecting for and exploration of heavy minerals in alluvial deposits of the type under consideration.

Mr. Hugh C. Laird, Manager of Mining, will be in direct charge of the exploration program. Mr. Charles C. Cook, under the existing organization, will direct the exploration drilling, sampling, and laboratory procedure. Mr. M. C. Thompson, with broad experience in placer-type drilling will supervise the drilling program if a contract is prepared. All of these individuals appear competent to conduct a program of this type intelligently. The Company has other experienced personnel in the plants at Clearwater, S. C. , and Chattanooga, Tennessee who would assist with laboratory work, bookkeeping, etc.

The Heavy Minerals Company has been operating in the Clearwater, S. C., area since 1953 and claims to be the first American Company to be engaged in domestic mining, domestic processing and domestic distribution of rare earths.

The Company has been producing heavy minerals since 1953 from the Horse Creek-Hollow Creek areas near the Clearwater, S. C., as a result of a successful exploration contract with DMEA (DMEA-2576, Idm-E392).

Development, production and sales data has been submitted to DMEA at regular six month intervals by the DMEA representative and the Company.

The financial responsibility of the Applicant is apparently satisfactory. The Field Examiners have no reason to believe that the Company is not on a sound financial basis, although no detailed investigation was made by the Examiners. The Company has promptly met its obligation to the Government, as a result of certification of DMEA-2576, Idm-E392 and the loan has been repaid in full.

Applicants Property Rights

Three adjoining parcels of land, consisting of a total of 1936.5 acres constitute the area to be explored. The largest parcel, referred to as the Evergreen Plantation, contains 1180-acres and is leased from the Edisto River Holding Company. An Owners Consent to Lien covering this leased area is included in the application along with a copy of the original lease. The other two parcels comprising 576.5 acres, are owned by the Applicant, but status of ownership, whether owned in fee simple or merely minerals rights owned, is not indicated in the description of owned property, submitted with the application.

The total acreage as shown on the Companys' property map

appears adequate for the proposed exploration program. In addition to the property under consideration, the Company controls, either by lease or ownership, much of the area along the South Edisto River, northwest and southeast from the proposed project and along Shaw Creek, a distance of 9 miles to the northwest.

The survey, submitted recently, of the property under consideration appears satisfactory, although no check can be made for accuracy. The base from this survey has been used to outline the proposed program of exploration.

Description of Property

No surface facilities exist on the property since this is a new Prospect. No known previous operations have been conducted on the property, with the possible exception of sand and gravel pits, located where good access permitted entry during dry seasons.

The Applicant has conducted a prospect drilling program, as indicated in the application. This work consisted of putting down a total of 48 holes along two lines 5 CC-13 and 14, and 58C-23 and 24, which are 7900 to 10,000 feet apart. Each line consisted of 24 holes each, and holes were spaced approximately 200 feet apart, ±10-20 feet. The applicant's exploration proposal is based on the results of this drilling.

In addition to the above drilling, Line "Q", adjacent to line 5CC-13 and 14, as indicated on the attached map of proposed drilling, has been drilled out during the lapse between the date that the application was submitted and the date of this examination. Thirty-one holes were completed but results are not known. It is recommended if a contract is prepared, that this line of holes be deleted from the exploration program. The Company, however, should supply DMEA with the results of this drilling to complete known information in event of a discovery and possible certification at a later date. No other known exploration work has been conducted on the property.

The relief of the area of exploration is low, varying from 210 to 240 feet. Elevations of the ridges do not exceed 350 feet in the surrounding areas northeast and southwest of the river.

The average annual precipitation is 44 inches and the extreme wet seasons are late fall and early spring.

GEOLOGY

The area to be explored lies in the coastal plain of

South Carolina and in the geographic division of the Aiken Plateau. This plateau lies between the valleys of the Savannah and Congaree Rivers. The headwaters of the South Edisto River, along which the deposits are located, rise in the Plateau in Aiken county and flow to the southeast.

The principal outcropping formations in the general area are of Cretaceous and Eocene ages. The Tuscaloosa formation of Cretaceous age, is 250 to 300 feet thick and consists of light grey, buff or white sand, generally crossbedded, containing inter-fingering lenses of variegated clays. The McBean formation, of Eocene age, unconformably overlaps the Tuscaloosa, and consists normally of loose yellow sand containing ledges of sandstone and patches of carbonaceous and calcareous matter. The estimated thickness is 100 feet. The Barnwell formation of Eocene age, unconformably overlaps both the McBean and the Tuscaloosa formation. It consists of sand characterized by its deep red color and scattering of rounded pebbles. Estimated thickness of this formation is 100 feet.

No attempt is made to answer the question of origin of the heavy minerals in regard to the formations mentioned. The occurence of the minerals in the alluvial material has given rise to a number of origins, mainly concerning the Piedmont Plateau and the prevalent formations in the general area. The occurrence of heavy minerals in the alluvial sand and gravels in the area has been known for sometime and limited reconnaisance has been conducted in the recent past by the Bureau of Mines and the Geological Survey, primarily as a result of AEC interest. The studies have shown heavy mineral concentration in varying amounts in many of the smaller streams flowing normal to the master streams. Prospect drilling by the Applicant has shown a parallel relationship in the occurence of a considerable concentration of heavy minerals along the South Edisto River in Aiken and Orangeburg counties South Carolina.

MINERALOGY

The principle minerals found in the deposit, as a result of preliminary or prospect drilling, are ilmenite, rutile, zircon and monazite. Associated minerals expected to be found in addition to those mentioned, are staurolite, quartz, kyanite, tourmaline and trace amounts of other minerals. No petrographic analyses were submitted by the Applicant for consideration.

According to Mr. Charles C. Cook, Chief Minerals Engineer, the minerals in the South Edisto River approximate those found in

the Hollow Creek-Horse Creek area. Physical characteristics, such as grain size, are also similar and the material can be handled satisfactorily by the Company's plant at Clearwater, S. C.

A petrographic analysis of a field composite prepared from the black sand concentrates as a result of drilling a similar deposit (Hollow Creek) by the Bureau of Mines in 1953 is as follows:

Mineral	Weight, percent
Staurolite	30.0
Illmenite	22.0
Quartz	20.0
Zircon	9.0
Rutile	8.0
Monazite	5.8
Kyanite	3.5
Tourmaline	1.5
Total	99.8%

Sand and gravel, not normally construed as minerals would constitute a large percentage of material moved in event of a mining operation. Recovery of the marketable materials could contribute to the economics of the deposit in a minor sense.

Description of drilling methods, sampling, and analysis employed by the Applicant

The Applicant uses a modified combination churn Empire drill, presently mounted on a Universal jeep, to conduct drilling in alluvial materials. The drill consists of a steel frame, hoist for pulling casing, 4 1/2" O.D. flush-jointed casing, drive-head, and saw-tooth drive shoe. The drill hole is usually started by hand auger, and the first joint of casing is placed in the auger hole and driven vertically by use of a drive-head operating from a power take-off on the jeep. The casing is rotated from time to time by hand held chain wrenches to keep the casing loose and free. Casing is added in 5 feet lengths as drilling proceeds. When firm ground is encountered a solid steel rod with bladed cutting tool is used to break the material. The tool is raised to the height of the frame and allowed to fall to bottom of hole and this action is accomplished by use of a rope attached to the tool and power take-off on the jeep. This tool has proven effective in cutting roots, hard ground, and small cobbles normally encountered in this area.

Samples are taken at 2 1/2 feet intervals by use of a sand

pump or bailer from top to bottom of the hole. These samples are sent to the laboratory where they are dried, separated by heavy media method and percentage of heavy minerals present computed. The Applicant proposes to group six holes into a composite sample and have an analyses made for total (1) TiO_2, (2) Rutile TiO_2, (3) ThO_2, (4) Rare Earth Oxides and (5) ZrO_2. On this basis approximately 300 analyses will be required for the proposed program. Bids submitted by companies making analyses indicates a higher rate for determinations mentioned above than the Applicant, who estimates $20 for each analyses.

Proposed Exploration Program

The Field Examiners recommend a drilling program as shown on the map accompanying this report, which outlines the proposed exploration. This program is essentially the same for number of holes to be drilled as the one recommended by the Applicant, with the exception of the staged drilling as shown in the application. The Applicant's proposal is based on previous and current drilling results, in the general area, of deposits of a similar nature.

STAGE I

The Applicant has requested that the drilling be set up in two stages. Stage I would have consisted of drilling that property southeast of drill line 5CC-23 and 24. A study of the property survey recently submitted, indicates a lesser amount of drilling is necessary in the area southeast of drill line 5CC-23 and 24. The reasons for this is a reduction in original area and the completion of drilling line "Q", parallel to line 5CC-23 and 24, after the application was prepared. To properly explore the area northwest of drill line 5CC-23 and 24, additional drilling other than that requested would be necessary. As proposed by the Field Examiners approximately 350 drill holes would be drilled along 13 lines. The number of holes in each line would vary with the distance from the river to the swamp limit. The swamp limit is not necessarily the economic limit of mineralization, but observed drilling results indicates lower mineralization along this first bench level. The holes should be spaced not more than 200 feet apart along the lines to properly explore each line. Hole depths, based on preliminary drilling of lines 5CC-23 and 24 and 5CC-13 and 14, average approximately 28 feet. Near the river mineralized depths of 30 to 35 feet are not uncommon, but it is anticipated that an average depth of 25 feet for each hole would be sufficient. note

As previously mentioned the line of holes designated on the map as line "Q", has been drilled and should be deleted if a contract is prepared. The results of this drilling are not known but should be submitted by the Company to DMEA if additional drilling is performed to the southwest of line "Q".

It is anticipated that the drilling phase, if approved, will require at least 350 shifts to complete, if only one drill is used as proposed by the Applicant. This is based on drilling approximately 25 feet per shift. The Applicant estimates that one shift is required to drill one hole and clear brush to the next hole. The drilling phase would be expedited considerably if a second drill was placed in use. The estimate of costs, therefore, is based on the use of two drills.

The Applicant is of the opinion that the drilling can be conducted more advantageously by themselves, since they are equipped and have experience in this type of drilling. Bids submitted by regular drilling companies indicates a higher drilling rate than that experienced by the Applicant. The Applicant estimates that direct drilling costs incurred by drilling line "Q" amounted to $4.34 per linear foot. This unit cost does not include depreciation, amortization, supervisory salaries or payroll taxes. The above figure is also based on an average drilling rate of 24.2 feet per shift.

Stage II

Upon successful completion of Stage I, two vertical check shafts 4' x 4' x 25' deep should be sunk as a check against the drilling results. In sinking a shaft in this type of material the unconsolidated nature of the material and the presence of considerable water are the two major problems to be considered. The use of a wellpoint system to handle the water and heavy timbering will be necessary. The Applicant, upon request, has submitted a cost breakdown based on figures obtained from a wellpoint company and includes estimated timber and labor costs.

The following cost estimates have been submitted to the Heavy Minerals Company, in the form of bids for drilling:

Company	Bid	
Mobile Drilling Co. 960 N. Pennsylvania St. Indianapolis, Ind.	Min. 4590 linear ft Max. 9180 linear ft	$7.10/ft.
Sprauge & Henwood Box 446 Scranton 2, Penna.	Min. 4590 linear ft In excess of 4590 lin ft	$7.00/ft. $6.50/ft.

Bids were sent by the Applicant to Hoffman Bros. Drilling Company, Box 426, Punxsutawney, Penna., and Mott Core Drilling Company, Box 2076, Huntington, West Virginia, and were either declined or no answer was received. Pennsylvania Drilling Co., 1205 Chartiers Ave., Pittsburgh, Penna., has notified the Company that their bid would be sent in the near future.

Bids for analytical work have been received from the following: Ledoux & Co., Abbot A. Hanks Inc. and the Smith-Emery Company.

The Applicant at the time of examination indicated that exploration work would begin as soon as a contract is signed and that the contract would be completed in 12 months (360 holes). The Examiners are of the opinion, based on the Applicant's estimate of one hole per shift, that it would require 8 3/4-months to drill 350 holes if two drill rigs are used or 17 1/2-months if only one rig is used.

The Applicant also stated the Company prefers an actual cost contract, and ~~xxxxx~~ although no statement was made that a unit cost contract would not be accepted, there were strong indications the actual cost contract was more favorable.

ESTIMATED COSTS

Stage I. (For two drill operation)

Supervision

1 - Project Engineer @ $600/Mo.	$5,250.00
1 - Driller Supt. @ $600/Mo.	5,250.00
1 - Laboratory Technician @ $425/Mo.	3,719.00

Labor:

2- Driller Foreman @ $425/Mo.	7,438.00
2- Drillers @ $2.25/hr.	5,850.00
2- Driller Helpers @ $1.85/hr.	4,810.00

Other: (Part-time).

1 - Surveyor - 4-da/Mo. @ $475/Mo.	831.00
2 - Rodmen @ $1.74/hr. 4 da./Mo.	980.00

(See - Revised costs memo of J. J. Fogach Nov. 8, 1957)

Operating Material and Supplies:

Drive Pipe - 4 1/2" O.D. 75 ft @ $10/ft.	$ 750.00
Drive shoes - 2 @ $35/each	70.00
Drive heads - 2 @ $35/each	70.00
Rope - 2400 ft @ 52¢/lb.	208.00
Sand samplers (bailers) 3 @ $68/each	204.00
Chain wrenches, 2 with replaceable chains @ $38/each	76.00
Gasoline 3500 gals. @ 30¢/gal.	1,050.00
Acetylene tetrabromide - 2 gal./Mo. @ $27/gal.	473.00
Acetone - 60 gal @ $1.50/gal.	90.00
Filter paper, sample bags	278.00
Fuel for drying owen @ $13.90/Mo.	122.00
Electric power & water @ $20/Mo.	175.00
Small hand tools, buckets, etc.	750.00
Tires, oil, maintenance (all vehicles)	900.00

Operating Equipment
To be purchased.

1 - "Swamp Buggy"(vehicle alone)	8,000.00
1 - Drill rig to be mounted on swamp buggy.	2,000.00

To be furnished by Operator:

1 - Dodge Power wagon, 1 yr. old, good condition, low milage	$2,800.00	
1 - One-half ton Chev. pick-up truck	700.00	
1 - 1954 Ford tudor, milkage, 68,000	600.00	
	$4,100.00	
Depreciation allowence on above 1/60 per month for 8 3/4 Mo.		600.00

To be rented:

Laboratory and Field Office @ $85/Mo.	745.00

Miscellaneous:

Analytical Work- 300 samples @ $20/each	6,000.00
Payroll taxes (Soc. Sec)	684.00
workman comp, liability Ins.	2,280.00
Booking keeping, monthly Reports, etc.	1,500.00

See revised costs, Pyrah memo of Nov. 8, 1957

Contingencies

Unforeseen Expenses $5,000.00

Estimated Total Cost of Stage I..... $52,138.00

(6,053

Stage II

Sink 2 test shafts, 4' x 4' x 25' to obtain sufficient volume of samples for concentrating and assaying as a check against drilling results (28 shifts)

Supervision

Project Engineer @ $600/Mo. 1½ Mos.	$900.00
Technician-required by Griffin Well Point Co., @ $2.75/hr. plus travel expenses	410.00

Labor

4 Laborers @ $1.00/hr	896.00

Equipment (rental)

Well Point equipment as a unit including 40 wellpoints, header pipe, riser pipe, hose, gasoline engine, jetting pump and misc. fittings plus freight charges.	1,000.00

Supplies:

Gasoline and oil	170.00
Timber - 4,000 b.f.	300.00
Miscellaneous	200.00

Contingencies

Unforeseen expenses	400.00

Estimated total cost of Stage II..... $4,276.00

Estimated total cost of project (stages I & II) $56,414.00

See revised costs
V. J. Lynch memo of Nov. 8, 1957

L. E. SHirley and Wm. A. Beck,
Mining Engineers, Bureau of Mines

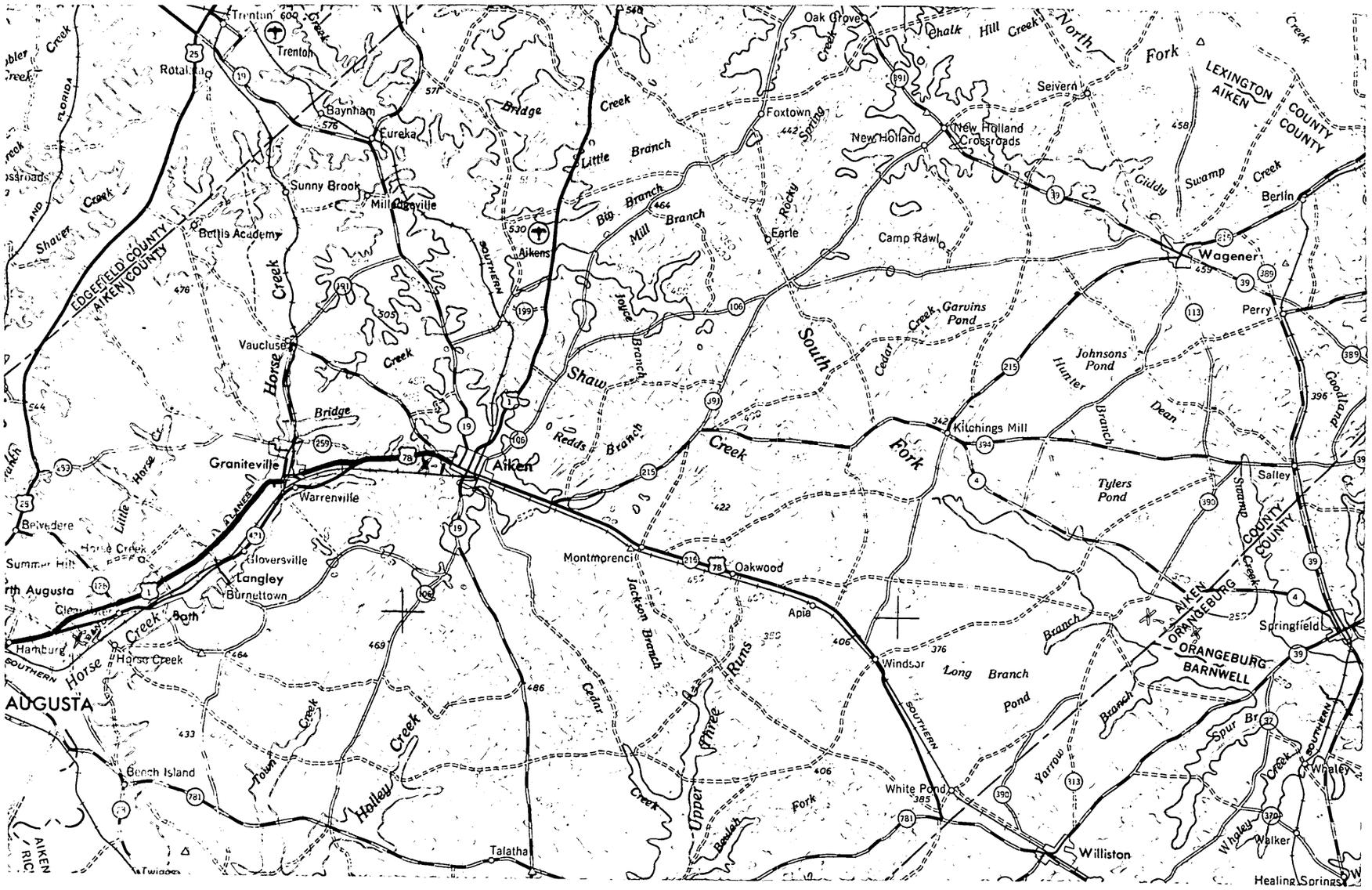
z

References:

Cook, C. Wythe - Geology of the Coastal Plain of South Carolina, Geological Survey Bull. 867, 1936.

Lang, Walter B - The Sedimentory Clays of South Carolina, 1934-1935; Geological Survey Bull.901,1940.

Kline, M. H. and others. Hollow Creek Monazite Placer, Aiken County, S. C. Bureau of Mines RME-3127 (U.S.A.E.C.)



DMEA-4799

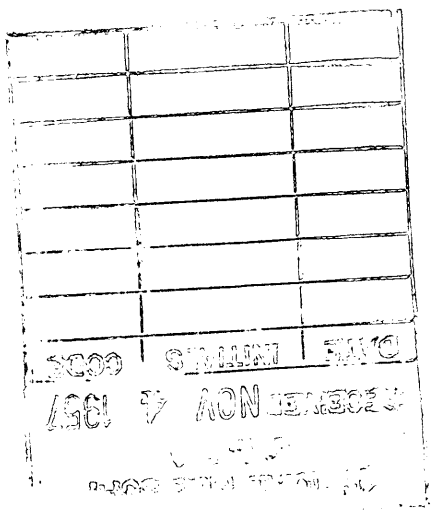
LOCATION MAP OF PROPOSED PROJECT AREA AND HEAVY MINERALS COMPANY OPERATIONS

SCALE 1" = 4 MILES
From Augusta, Georgia, South Carolina Sheet N1 17-8
AMS-Series V-501

X-1 SEPARATION PLANT AND DREDGE OPERATION

X-2 FIELD OFFICE AND LABORATORY

X-3 PROPOSED PROJECT



A Form 7
12-56)

OFFICIAL FILE COPY

Date	Surname	Code
9/23	Houk	600
9/23	GCS	130
"	Johnson	110
"	Mattendorf	100
9/24	B	220
		600

600

SEP 23 1957

Mr. Robert A. Laurence
Executive Officer, DMEA
Field Team, Region V
Room 13, Post Office Bldg.
Knoxville 2, Tennessee

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg Counties,
South Carolina

Dear Mr. Laurence:

Enclosed are two copies of a letter from the subject Applicant, dated September 17, 1957, together with two copies each of bids on drilling from Mobile Drilling & Engineering, Inc., and Sprague & Henwood, Inc., which were forwarded to this office. Bids from Abbot A. Hanks, Inc., and Smith-Emery Company for analytical work are also enclosed for your information.

Sincerely yours,

George C. Selfridge
(esy)
Chairman, Operating Committee

Approved:
Frank D. Lamb
(esy)
Member, Bureau of Mines
W. E. Nelson
(esy)
Member, Geological Survey

Enclosures 10

LGHouk:gad 9/23/57
Copy to: Admr. R. File
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Cservenyak, 3411
Mr. Houk

8623

hm

HEAVY MINERALS CO.

MINING DIVISION

POST OFFICE BOX 928, AIKEN, SOUTH CAROLINA

RARE EARTH CHEMICALS · THORIUM · HEAVY MINERALS

Phone 9-4141

September 17, 1957

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

Re: Docket No. DMEA 4799
Rutile - Monazite
Heavy Minerals Co.
South Edisto River Area
Aiken & Orangeburg Counties, S. C.

Attention: Mr. C. O. Mittendorf:

Dear Sir:

To complete our loan application the following material is enclosed: Bids on outside analytical work from two additional firms. Bids on drilling the footage specified in our DMEA application.

The Pennsylvania Drilling Co. still is considering submitting a bid. The remainder of the companies from the list you submitted either failed to submit a bid or did not answer our inquiry.

Mr. William Beck and Mr. Lawrence E. Shirley of the Regional office visted us September 12, 1957. During their visit they observed our drill team in the field. Additional detail on certain phases of the application was requested and has been supplied.

Very truly yours,

HEAVY MINERALS CO.

Charles C. Cook

Charles C. Cook,
Chief Minerals Engineer

OFFICIAL FILE COPY
DMEA
RECEIVED SEP 20 1957

DATE	INITIALS	CODE
9/20	C	220
		600

CCC;lw
Encl.

Answer: MOBILE DRILLING & EN[illegible]NEERING, INC. 2701 ROOSEVELT AVE. INDIANAPOLIS, IND.
ME. 8-[illegible] — 4-6323

Page 1 of 1

PROPOSAL

Reference:	Exploratory boring in the area near Aiken, South Carolina.
Date:	August 30, 1957
Number:	CD 1827
Terms:	Every thirty (30) days and/or upon completion of project.

TO: Heavy Minerals Company, Mining Division
Post Office Box 928
Aiken, South Carolina

Attention: Mr. G. E. Aiken,
Project Engineer

ITEM	ESTIMATED QUANTITY	DESCRIPTION	UNIT PRICE		PER	ESTIMATED TOTAL	
1.	4590 lin.ft. (minimum)	We propose to use heavy duty 4" I.D. drive casing and will guarantee 3" split spoon samples taken every two and one-half (2½) feet. Samples will be taken as directed by the Heavy Minerals Company and each day's samples will be bottled, marked and delivered to the Heavy Minerals Company office in Aiken, South Carolina, at the conclusion of each day's work.	7	10	ft.	32,589	00
	9180 lin.ft. (maximum)					65,178	00
		We will furnish one (1) skid mounted Model BE-36 Mobile drill and one (1) service truck plus all additional necessary material, labor and supervision necessary to perform the above described drilling. Our unit price includes mobilization and demobilization of equipment and labor as well as all clearing, building of roads etc. necessary to the successful completion of the work as outlined in your letter of August 21, 1957.					
	Note:	The above equipment can be furnished within one week after notice is given to proceed.					

EXTRA COPY
RECEIVED
DATE [illegible] CODE

Respectfully submitted,

MOBILE DRILLING & ENGINEERING, INC.

By Robert E. Dickinson
Robert E. Dickinson
Vice President
Title

We appreciate your valued inquiry. Additional information regarding our services gladly furnished upon request.

This Proposal valid for 30 days from date of Proposal.

FORM C0000

SAMPLING - TESTING - SOILS ENGINEERING - ANALYSIS - DESIGN

MOBILE DRILLING & ENGINEERING, INC. 2701 ROOSEVELT AVE. INDIANAPOLIS, IND.
ME. 8-35[illegible] 4-6323

PROPOSAL

Reference:	Exploratory boring in the area near Aiken, South Carolina.
Date:	August 30, 1957
Number:	CD 1827
Terms:	Every thirty (30) days and/or upon completion of project.

TO: Heavy Minerals Company, Mining Division
Post Office Box 928
Aiken, South Carolina

Attention: Mr. G. E. Aiken,
Project Engineer

ITEM	ESTIMATED QUANTITY	DESCRIPTION	UNIT PRICE		PER	ESTIMATED TOTAL	
1.	4590 lin.ft. (minimum) 9180 lin.ft. (maximum)	We propose to use heavy duty 4" I.D. drive casing and will guarantee 3" split spoon samples taken every two and one-half (2½) feet. Samples will be taken as directed by the Heavy Minerals Company and each day's samples will be bottled, marked and delivered to the Heavy Minerals Company office in Aiken, South Carolina, at the conclusion of each day's work. We will furnish one (1) skid mounted Model BE-36 Mobile drill and one (1) service truck plus all additional necessary material, labor and supervision necessary to perform the above described drilling. Our unit price includes mobilization and demobilization of equipment and labor as well as all clearing, building of roads etc. necessary to the successful completion of the work as outlined in your letter of August 21, 1957.	7	10	ft.	32,589 65,178	00 00

Note: The above equipment can be furnished within one week after notice is given to proceed.

Respectfully submitted,

MOBILE DRILLING & ENGINEERING, INC.

By Robert E. Dickinson
Robert E. Dickinson
Vice President
Title

We appreciate your valued inquiry. Additional information regarding our services gladly furnished upon request.

This Proposal valid for 30 days from date of Proposal.

FORM CD000

SPRAGUE & HENWOOD, Inc.
Contractors for DIAMOND DRILLING
MINERAL EXPLORATION • SOIL SAMPLING • PRESSURE GROUTING
EXECUTIVE OFFICES & PLANT • SCRANTON, PENNSYLVANIA

PLEASE REPLY TO:
575 LINWOOD AVENUE, NORTHEAST
ATLANTA 6, GEORGIA
Telephone: TRinity 5-4901

September 12, 1957

Heavy Minerals Co,
Mining Division -
P.O. Box 928
Aiken, South Carolina

Attention:- Mr.G. E. Aiken,
Project Engineer

Gentlemen:-

We are pleased to quote you in accordance with your inquiry of August 21, 1957 the following price schedule for exploration drilling for Heavy Minerals near Aiken, South Carolina.

ITEM NO 1 - For drilling a minimum of 4,590 lin.Ft. through overburden using a jet type method of recovering continous samples of the overburden, using the same method which you are now using yourselves and completing the minimum footage in 6 months- SEVEN DOLLARS - ($7.00) per lin. ft.

ITEM NO. 2- For all drilling in excess of 4,590 lin. ft. SIX DOLLARS AND FIFTY CENTS - ($6.50) per lin ft.

It is the intention of Sprague & Henwood, Inc. to try other methods of sampling to try and get more accurate Samples of the overburden than you are now getting with the use of the sand pump and bailer.

Payements are to be made within thirty (30) days after date of our invoice.

We trust you will find the above quotation in order and we would be prepared to start this work within two weeks after the award of the contract.

Very trult yours,

Sprague & Henwood Inc.,

Kevin A. Fletcher

Kevin A, Fletcher
Assistant Vice President

SPRAGUE & HENWOOD, Inc.
Contractors for DIAMOND DRILLING
MINERAL EXPLORATION • SOIL SAMPLING • PRESSURE GROUTING
EXECUTIVE OFFICES & PLANT • SCRANTON, PENNSYLVANIA

PLEASE REPLY TO:
575 LINWOOD AVENUE, NORTHEAST
ATLANTA 6, GEORGIA
Telephone: TRinity 5-4901

September 12, 1957

Heavy Minerals Co,
Mining Division -
P.O. Box 928
Aiken, South Carolina

Attention:- Mr.G. E. Aiken,
Project Engineer

Gentlemen:-

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ITEM NO 1 - For drilling a minimum of 4,590 lin.Ft. through overburden using a jet type method of recovering continous samples of the overburden, using the same method which you are now using yourselves and completing the minimum footage in 6 months- SEVEN DOLLARS - ($7.00) per lin. ft.

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Payements are to be made within thirty (30) days after date of our invoice.

We trust you will find the above quotation in order and we would be prepared to start this work within two weeks after the award of the contract.

Very trult yours,

Sprague & Henwood Inc.,

Kevin A. Fletcher

Kevin A, Fletcher
Assistant Vice President

[illegible]

Aluminum	[illegible]	[illegible]
Antimony	[illegible]	[illegible]
Arsenic	[illegible]	[illegible]
Barium Oxide	[illegible]	[illegible]
Bismuth	[illegible]	7.50
Beryllium Oxide	[illegible]	2.50
Boron Oxide, Water Soluble	[illegible]	7.50
Boron Oxide, [illegible]	[illegible]	[illegible]
Bromine, Water Soluble	[illegible]	5.00
Calcium Oxide, Total	[illegible]	6.00
Calcium Oxide, Acid Soluble	[illegible]	7.50
Cadmium	(Cd)	2.50
Carbon Dioxide, Water Soluble	(CO_2)	3.50
Carbon Dioxide, Acid Soluble	(CO_2)	3.50
Chlorine, Water Soluble	(Cl)	5.00
Chromium	(Cr)	7.50
Cobalt	(Co)	32.50
Columbium	(Cb)	12.50
Columbium and Tantalum	(Cb & Ta)	7.50
Fluorine	(F)	
Calcium Fluoride, evaluation method	(CaF)	12.50
Germanium	(Ge)	15.00
Graphite	(C)	5.00
Insolubles, Acid or Water		3.00
Iodine, Water Soluble	(I)	5.00
Iron	(Fe)	5.00
Lithium Oxide	(LiO_2)	10.00
Loss on Ignition		3.00
Magnesium Oxide, Total	(MgO)	6.50
Magnesium Oxide, Acid Soluble	(MgO)	5.50
Manganese	(Mn)	5.00
Mercury	(Hg)	5.00
Moisture, Free at 105°F	(H_2O)	2.50
Molybdenum	(Mo)	7.50
Nickel	(Ni)	6.00
Phosphorus Pentoxide	(P_2O_5)	5.00
Potassium Oxide	(K_2O)	10.00
Rare Earth Oxides, Plus Thorium Oxide		15.00
Selenium	(Se)	7.50
Silicon Oxide	(SiO_2)	5.00
Sodium Oxide	(Na_2O)	10.00
Specific Gravity, True		5.00
Specific Gravity, Apparent		3.00
Strontium Oxide	(SrO)	7.50
Sulphur, Native	(S)	5.00
Sulphate, Acid Soluble	(SO_4)	4.50
Tantalum	(Ta)	32.50
Tellurium	(Te)	7.50
Thorium	(Th)	15.00
Tin	(Sn)	6.00
Titanium	(Ti)	7.50
Tungsten	(W)	5.00
Uranium Oxide	(U_3O_8)	10.00
Geiger Counter, Equivalent U_3O_8		5.00
Vanadium	(V)	7.50
Zirconium	(Zr)	10.00

Certain combinations of elements at lower prices.

(OVER)

Smith-Emery Company

ESTABLISHED 1910

Quantitative Determinations for:		*Price per Sample*
Aluminum Oxide	(Al_2O_3)	$6.00
Aluminum and Iron Oxides	(R_2O_3)	5.00
Antimony	(Sb)	5.00
Arsenic	(As)	5.00
Barium Oxide	(BaO)	6.50
Bismuth	(Bi)	6.00
Beryllium Oxide	(BeO)	7.50
Boron Oxide, Water Soluble	(B_2O_3)	4.50
Boron Oxide, Total	(B_2O_3)	7.50
Bromine, Water Soluble	(Br)	5.00
Calcium Oxide, Total	(CaO)	5.00
Calcium Oxide, Acid Soluble	(CaO)	4.00
Cadmium	(Cd)	7.50
Carbon Dioxide, Water Soluble	(CO_2)	2.50
Carbon Dioxide, Acid Soluble	(CO_2)	3.50
Chlorine	(Cl)	3.50
Chlorine, Water Soluble	(Cl)	5.00
Chromium	(Cr)	7.50
Cobalt	(Co)	32.50
Columbium	(Cb & Ta)	12.50
Columbium and Tantalum		7.50
Fluorine	(F)	12.50
Calcium Fluoride, evaluation method	(CaF)	15.00
Germanium	(Ge)	5.00
Graphite	(C)	3.00
Insolubles, Acid or Water		5.00
Iodine, Water Soluble	(I)	5.00
Iron	(Fe)	10.00
Lithium Oxide	(Li_2O)	3.00
Loss on Ignition		6.50
Magnesium Oxide, Total	(MgO)	5.50
Magnesium Oxide, Acid Soluble	(MgO)	5.00
Manganese	(Mn)	5.00
Mercury	(Hg)	2.50
Moisture, Free at 105° F.	(H_2O)	7.50
Molybdenum	(Mo)	6.00
Nickel	(Ni)	5.00
Phosphorus Pentoxide	(P_2O_5)	10.00
Potassium Oxide	(K_2O)	15.00
Rare Earth Oxides, Plus Thorium Oxide		7.50
Selenium	(Se)	5.00
Silicon Oxide	(SiO_2)	10.00
Sodium Oxide	(Na_2O)	5.00
Specific Gravity, True		3.00
Specific Gravity, Apparent		7.50
Strontium Oxide	(SrO)	5.00
Sulphur, Native	(S)	4.50
Sulphate, Acid Soluble	(SO_4)	32.50
Tantalum	(Ta)	7.50
Tellurium	(Te)	15.00
Thorium	(Th)	6.00
Tin	(Sn)	7.50
Titanium	(Ti)	5.00
Tungsten	(W)	10.00
Uranium Oxide	(U_3O_8)	5.00
Geiger Counter, Equivalent U_3O_8		7.50
Vanadium	(V)	10.00
Zirconium	(Zr)	

Certain combinations of elements at lower prices.

(OVER)

ABBOT A. HANKS, INC.

PRICE LIST

Prices for Analyses of Ore Samples:

Aluminum	$ 5.00
Antimony	5.00
Arsenic	5.00
Barium	7.00
Beryllium	10.00
Bismuth	7.00
Boron	10.00
Cadmium	10.00
Calcium	5.00
Chlorine	5.00 (and up)
Chromium	5.00
Cobalt	5.00
Columbium Oxide plus Tantalum Oxide (Ta_2O_3)	25.00
Separation	10.00 (Additional)
Copper	3.00
Fluorine	10.00
Gallium	15.00
Germanium	15.00
Gold	3.00
Graphite	5.00
Gypsum	10.00
Indium	15.00
Iron	4.00
Lead	3.00
Lithium	10.00
Magnesium	5.00
Manganese	5.00
Moisture	3.00

The Platinum Metals:

Platinum Group (No Separation)	10.00
Platinum	7.00
Palladium	7.00

When a complete separation of all Platinum Group Metals is required, the fee shall be-----400.00

Miscellaneous Determinations on Ore

Insoluble	3.00
Ignition Loss	3.00
Carbon Dioxide	5.00
Available Oxygen	7.00
Calcium Fluoride	10.00

Mercury	$ 4.00
Molybdenum	5.00
Nickel	5.00
Phosphorus	5.00
Potassium	7.00
Selenium	10.00
Silica	5.00
Silver	2.00
Sodium	7.00
Strontium	10.00
Sulphur	5.00
Tantalum	25.00
Tellurium	10.00
Thorium	15.00
Tin	5.00
Thallium	15.00
Titanium	5.00
Tungsten	5.00
Tungsten (Concentrates)	7.50
Uranium	10.00
Vanadium	5.00
Zinc	4.00
Zirconium	10.00
Total Rare Earth Oxides plus Thorium	15.00
Separation of Thorium Oxide (Additional)	10.00

Concentrates (Control)

Total Rare Earth Oxides plus Thorium Oxide	30.00
Separation of Thorium Oxide (Additional)	10.00
Total Rare Earth Oxides	30.00

Analysis on Carbon Steels:-
$4.00 per element

Analysis on Alloy Steels:-
$6.00 per element

Radiometric Assay---------- 3.00 (Single Sample)
2.00 (2 or more)

Silica, Ferric Oxide, Alumina, Lime & Magnesia (Same Sample)	$20.00
Chromium & Iron (Same Sample)	8.00
Chromium, Iron & Silica (Same Sample)	12.00
QUALITATIVE SPECTROGRAPHIC ANALYSIS	6.00

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
8/19	[illegible]	600
8/19	Selfridge	130
8/19	Yopes	130
8/19	Williams	130
"	Johnson	110
"	Mettenday	100
8/20	[illegible]	220
		600

600

AUG 19 1957

Heavy Minerals Company
Marine Minerals Division
P. O. Box 928
Aiken, South Carolina

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg Counties,
South Carolina

Gentlemen:

Reference is made to your letter of August 14, 1957, supplying in quadruplicate ten chain scale property maps, Certificate of Ownership merging Marine Minerals Inc., into Heavy Minerals Company, and Assignment and Bill of Sale. Your application is now being referred to Mr. Robert A. Laurence, Executive Officer, DMEA Field Team, Region V, Room 13, Post Office Building, Knoxville 2, Tennessee, for further consideration and possibly a field examination.

Please obtain at least three tentative bids for the churn drilling. The following companies operating in eastern United States are listed for your convenience without comments as to their qualifications:

E. J. Longyear Co.
1700 Foshay Tower
Minneapolis 2, Minnesota

Cunningham Core Drilling and Grouting Co.
Salem, Virginia

Pennsylvania Drilling Co.
1205 Chartiers Avenue
Pittsburgh 20, Pennsylvania

Spang & Co.
Etna Street, P.O.Box 751
Butler, Pennsylvania

Sprague & Henwood, Inc.
Box 446
Scranton 2, Pennsylvania

Mobile Drilling, Inc.
960 North Pennsylvania St.
Indianapolis 4, Indiana

Mott Core Drilling Co.
Mott Bldg., Box 2076
Huntington, West Virginia

Hoffman Brothers Drilling Co.
Box 426, Tiona Street
Punxsutawney, Pennsylvania

8623

Your specifications to bidders should show in detail your requirements. The bids should cover the sampling interval, number of drills, mobilization and demobilization, stand-by time, and other pertinent data. The minimum footage can be the first stage of your proposal with the maximum being the total drilling proposed by your company. Please obtain bids on the outside analytical work from two additional firms.

Your offer to come to Washington to discuss your application is noted. At the present time it is not felt that this is necessary.

The Regional Office will contact you at an early date if an examination is to be made. Any assistance you may give the members of the Field Team during the examination will be appreciated.

Sincerely yours,

C. O. Mittendorf

Administrator

LGHouk:gad 8/19/57
Copy to: Admr. R. File
Operating Committee
Field Team, Region V
Mr. Kiilsgaard, 5222
Mr. Cservenyak, 3411
Mr. Houk

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
8/19	Houk	600
8/19	GCS	130
"	Johnson	110
"	Rutledge	100
		220

600

AUG 19 1957

Mr. Robert A. Laurence
Executive Officer, DMEA
Field Team, Region V
Room 13, Post Office Bldg.
Knoxville 2, Tennessee

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg Counties,
South Carolina

Dear Mr. Laurence:

Please review the subject application and arrange for a field examination if you deem it necessary.

Copies of memoranda dated July 30 and August 2, 1957, by Mr. W. E. Nelson, USGS, and Mr. Jesse A. Miller, USBM, respectively, relating to the project are enclosed. There are also enclosed a copy of the application for the use of the Field Team, two copies of a letter from the Applicant, dated August 14, 1957, and two copies of property map.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JB)

Approved:

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

W. P. Williams (JB)
Member, Geological Survey

Enclosures 9

LGHouk:gad 8/19/57
Copy to: Admr. R. File
Operating Committee
Mr. Kiilsgaard, 5222
Mr. Cservenyak, 3411
Mr. Houk

8623

HEAVY MINERALS CO.

MINING DIVISION

POST OFFICE BOX 928, AIKEN, SOUTH CAROLINA

RARE EARTH CHEMICALS · THORIUM · HEAVY MINERALS

Phone 9-4141

August 14, 1957

OFFICE FILE COPY
DMEA
RECEIVED AUG 15 1957

DATE	INITIALS	CODE
8/15	Q	220
8/16	Hmh	600

Mr. L. G. Houk, Director
Division of Nonmetallic Metals
Defense Minerals Exploration Administration
U. S. Department of the Interior
Washington 25, D. C.

Dear Mr. Houk:

This will acknowledge your letter of August 2, 1957 and, it is believed, answer to your request for more specific data to the best of our present information.

We are supplying you, in quadruplicate, with the only available metes and bounds description of the properties covered by our application. The enclosed map includes the Schoenberg plat and specifically it is the subdivided land lying to the North of land belonging to the Edisto River Holding Company. In this area, most of the early land surveys are next to impossible to rerun on the ground because the natural and man made monuments (trees, stumps, and stakes) no longer exist. The absence of the normal Township and Range subdivisions in South Carolina makes land descriptions doubly difficult. In reality, very few of the land owners along the S. Edisto, in this area, can point out all the survey corners on their property. Eventually, Heavy Minerals Co. will reestablish property lines as they affect their own and leased lands.

Drill lines, 5cc-13 and 14 and 5cc-23 and 24, mentioned in our application have been indicated on the enclosed map. None of the land in our application is in Barnwell County, as the map indicates.

Also enclosed, in quadruplicate, are copies of the Certificate of Merger and Assignment and Bill of Sale by which instruments Marine Minerals Inc. merged with and assigned to Heavy Minerals Co. all real estate and properties. This should clarify the question of the lessee, Marine Minerals Inc. and the applicant being Heavy Minerals Co.

Outside drilling bids were not obtained for two reasons:
1. Mr. Lawrence, D.M.E.A., Knoxville, indicated in preliminary conversations that this was usually not required if the applicant was to perform his own drilling and 2.) Heavy Minerals Co. believes that there is no commercial drilling company, in South East United States, qualified to attempt our type of drilling. Several mining companies are exploring in the South East, but to the best of our knowledge they all maintain their own drill crews, as does Heavy Minerals Co.

In the event outside drilling bids are mandatory, any information you may be able to supply as to companies qualified to do this type of drilling would be greatly appreciated.

hm

HEAVY MINERALS CO.

MINING DIVISION

POST OFFICE BOX 928, AIKEN, SOUTH CAROLINA

RARE EARTH CHEMICALS • THORIUM • HEAVY MINERALS

Phone 9-4141

The swamp vehicle we are most interested in is one manufactured by Wofford Folse Inc. of New Iberia, La. Their vehicle is 12 feet long by 7 feet wide and powered by a 4 cylinder Jeep motor. It is chain driven using four sets of dual wheels on each side of the buggy with tracks having wooden cleats running over the tires. A watertight body is used for flotation.

We realize it is not optional for us to proceed with the second six months phase, however, Knoxville officials agreed that the Government, like ourselves, would not care to proceed if drilling results did not warrant the second phase. This appears to be a sound engineering approach to any type of divided program where the second half depends on the favorable results in the earlier work.

Ledoux and Company, Teaneck, N. J. has given us a schedule of their analytical charges that is enclosed for your information. Calculations based on these charges (Ledoux) indicates our analytical cost for six months to be $2250. This is an average cost of $15.00 per determination and our application reported $20.00. It would be preferable to allow for the higher figure to cover reruns and special determinations for other than known elements. This is related to the answer to your question on the presence of other phosphate minerals. At this time none are known other than the monazite.

If necessary, it would be agreeable to us to come to Washington to discuss any of the data covered in our application that is not fully evaluated.

Yours very truly,

HEAVY MINERALS CO.

G. E. Aiken

G. E. Aiken
Project Engineer

Enclosures 14

[illegible]DOUX & COMPANY

[illegible]

[illegible]

July 20, [illegible]

[illegible]

[illegible] letter of July 21st [illegible]
[illegible] quote is follows:

Single	Multiple
[illegible]	[illegible]
10.00	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
7.00	11.00
[illegible]	[illegible]

[illegible] service to you on

Very truly yours,

[illegible] & COMPANY

[illegible] M. Atkins
[illegible]ment Service Director

LEDOUX & COMPANY
(Inc.)

359 ALFRED AVENUE
TEANECK, NEW JERSEY

TELEPHONE
Teaneck 7-7500

CABLE ADDRESS
"LEDOUX TEANECK"

CHEMISTS, CONTROL & RESEARCH CHEMISTS, SPECTROSCOPISTS – SAMPLING, WEIGHING & SHIPPERS' REPRESENTATION

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 15 1957

DATE	INITIALS	CODE

August 8, 1957

Heavy Minerals Co.
Mining Division
P. O. Box 928
Aiken, South Carolina

Attention: Mr. G. E. Aiken, Project Engineer

Gentlemen:

In response to your letter of August 6th, relative to our charges for ThO2 determinations, we wish to quote as follows:

	Single Determination	Duplicate Determination
ThO2	$21.00	$36.00
ThO2 (when determined in combination with Total Rare Earths)	15.00	25.00

Thank you for the opportunity to submit these prices.

Very truly yours,

LEDOUX & COMPANY

R. C. Atkins
Client Service Director

August 9, 1957

Memorandum to the file

By: Lawrence G. Houk, Director, Division of Nonmetallic Minerals

Subject: Resume of telephone conversation with Mr. R. A. Laurence, Executive Officer, DMEA Field Team, Region V, Knoxville, Tenn.

Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg Counties,
South Carolina

Discussed the Heavy Minerals Company's application. Mr. Beck is in the area now in connection with the semi-annual report of the Marine Minerals. He is expected to bring back valuable information on their operating costs. Mr. Laurence pointed out that the Heavy Minerals Company's representative had asked about the exclusion of the petroleum rights in the lease and whether the company would be liable for royalty on oil production. I told him I would talk with Mr. Rubin and advise him. Mr. Rubin tells me that if petroleum is excluded from the lease there is no responsibility on the part of the operator to pay royalty to DMEA. The Heavy Minerals Company's representative asked Mr. Laurence if the dower rights in the South Carolina law had any adverse effect on the leases or the Consent to Lien and Subordination Agreement. Mr. Rubin stated that it did not.

OFFICIAL FILE COPY DMEA RECEIVED AUG 5 1957		
DATE	INITIALS	CODE
8/6	P.K.	220
		600
Memorandum		

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

Date August 2, 1957

DMEA Docket No. 4799
DMEA Contract No.
Commodity Rutile and Monazite
Name of applicant Heavy Minerals Company
Name of property South Edisto River Area
Location of property Aiken & Orangeburg Co., S.C.
Estimated cost of project $83,326.88

To: L. G. Houk, Defense Minerals Exploration Administration

From: Jesse A. Miller, Commodity Specialist, Branch of Light Metals, Bureau of Mines

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

1. Date of subject document: 7/29/57. 2. Date received by reviewer: 7/30/57

3. Prior reports on this property known to reviewer: Yes [ ], No [X].

4. Prior reports on nearby properties known to reviewer: Yes [X], No [ ].

5. Information available on past production of nearby property: Yes [X], No [ ].

6. Other pertinent factors known to reviewer: Yes [X], No [ ].

7. Explain items marked yes above: Our past association with this company indicates that it is reliable; it has experience at working similar deposits nearby. The company should, therefore, be in a good position to evaluate the commercial possibilities of an ore body that might be outlined in the proposed drilling program.

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. Drill hole spacing [X]

9. Action advised:
   a. Obtain information from applicant [ ]
   b. Refer to Field Team [X]
   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) The proposed program will block out ore and will include development as well as exploration. The borderline between exploration and development, however, is probably very thin inasmuch

as a company would need a very accurate knowledge of the depth, lateral extent, and grade of a deposit of this nature, containing only about 1 percent heavy minerals, before it would consider working it.

Jesse A. Miller

Jesse A. Miller

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
8/2	Hood	600
		110
2	Matthews	100
8/2	P.K.	220
		600

600

AUG - 2 1957

Heavy Minerals Company
Marine Minerals Division
P. O. Box 928
Aiken, South Carolina

Re: Docket No. DMEA-4799
Rutile-Monazite
Heavy Minerals Company
South Edisto River Area
Aiken and Orangeburg Counties,
South Carolina

Gentlemen:

Reference is made to your application for exploration assistance for rutile-monazite in Aiken and Orangeburg Counties, South Carolina.

It will be necessary that your Company provide the DMEA with a metes and bounds description of the entire tract; possibly the plat made by H. Rudolph Schoenberg, dated November 12, 1918, and recorded in Miscellaneous Book 29, Page 23 in the Clerk of the Court's Office for Aiken County, South Carolina may suffice for the Evergreen Plantation tract. Please show the location of the lines 5cc-13 and 14, and 4cc-23 and 24 on this plat. Is any portion of the leased area in Barnwell County?

It is noted that the lessee is the Marine Minerals Inc., whereas the Applicant is the Heavy Minerals Company. Please obtain an assignment of the lease from the Marine Minerals Inc., to the Heavy Minerals Company. Please obtain three bids from reputable firms for jet and/or churn drilling indicating to the bidders the minimum of 180 holes averaging 25.5' with a maximum of 360 holes, also indicating the number of drills to be used, the number of shifts per day, and the length of the work week. The bids should be forwarded to this office. Please indicate the nature of the swamp buggy, manufacture, horse power and seller.

On Page 7 of your application you state: "On completion of the first 180 holes, notification will be made to the Regional DMEA office concerning the intention of Heavy Minerals Co. to proceed or reject the second six months program of another 180 holes." Please be advised that it is not optional for your

8623

Company to make the decision to proceed or stop the work at that point. Please obtain bids on the outside analytical work. Please indicate if there are any phosphate minerals other than monazite present in the deposit.

Sincerely yours,

Lawrence G. Houk, Director
Division of Nonmetallic Minerals

LGHouk:gad 8/2/57
Copy to: Admr. R. File
Field Team, Region V
Mr. Kiilsgaard, 5222
Mr. Cservenyak, 3411
Mr. Houk

IN REPLY REFER TO:

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

July 30, 1957
Re: DMEA 4799
Heavy Metals Company
South Edisto River Area
Aiken & Orangeburg Counties, S.C.
$83,326.88 - Rutile-Monazite

Memorandum

To: L. G. Houk, Defense Minerals Exploration Administration

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

Subject: Review of application

The applicant requests assistance in exploring, by churn drilling in 2 stages, a tract of swamp land, containing 1390.5 acres more or less, believed, by reason of preliminary drilling, to contain, as placer material, recoverable quantities of ilmenite, monazite, rutile, and zircon.

Forty-eight drill holes in 2 lines, a mile apart, have been drilled and the results, in the opinion of the applicant, warrant the drilling of approximately 360 additional holes, 180 holes in each of 2 stages. The depth of the proposed holes is estimated as 25.5 feet each or a total of about 9,180 feet.

The drilling indicates in the tract deposit 45,000,00 cu. yds. of material that contains:-

Line	Length	Depth	Conc.	Mon.	Rutile	Zirc.	Ilmenite
5cc-23	3600'	31.7'	21.6	1.9	3.7	4.7	6.3
5cc-24	800'	20.0'	19.8	1.8	2.7	4.3	5.5
5cc-14	1850'	29.9'	16.2	1.4	2.1	2.8	5.3
5cc-13	3200'	17.6'	20.2	1.7	3.0	4.2	6.5

Referral of the application to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

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DATE | CODE
7/31 C 220
600

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 13 POST OFFICE BLDG.
KNOXVILLE 2, TENN.

OFFICIAL FILE COPY
DMEA
RECEIVED JUL 31 1957

DATE	INITIALS	CODE
7/31	P.K.	220
7/31	Hank	600

July 29, 1957

Mr. G. E. Aiken, Project Engr.
Heavy Minerals Co.
P.O. Box 928
Aiken, S. C.

Dear Mr. Aiken:

Your application for aid in exploring for heavy sands in Aiken and Orangeburg Counties, South Carolina, has been forwarded to our Washington office, in accordance with established procedure. We will notify you if a field examination is to be made.

The Washington office will acknowledge receipt and will tell you the docket number assigned to the application.

Sincerely yours,

Robert A. Laurence
Executive Officer, DMEA
Region V

RAL/zm
Opr. Com-2
Lynch
Files

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

July 29, 1957

Heavy Minerals Company
Marine Minerals Division
P. O. Box 928
Aiken, South Carolina

Subject: DMEA 4799

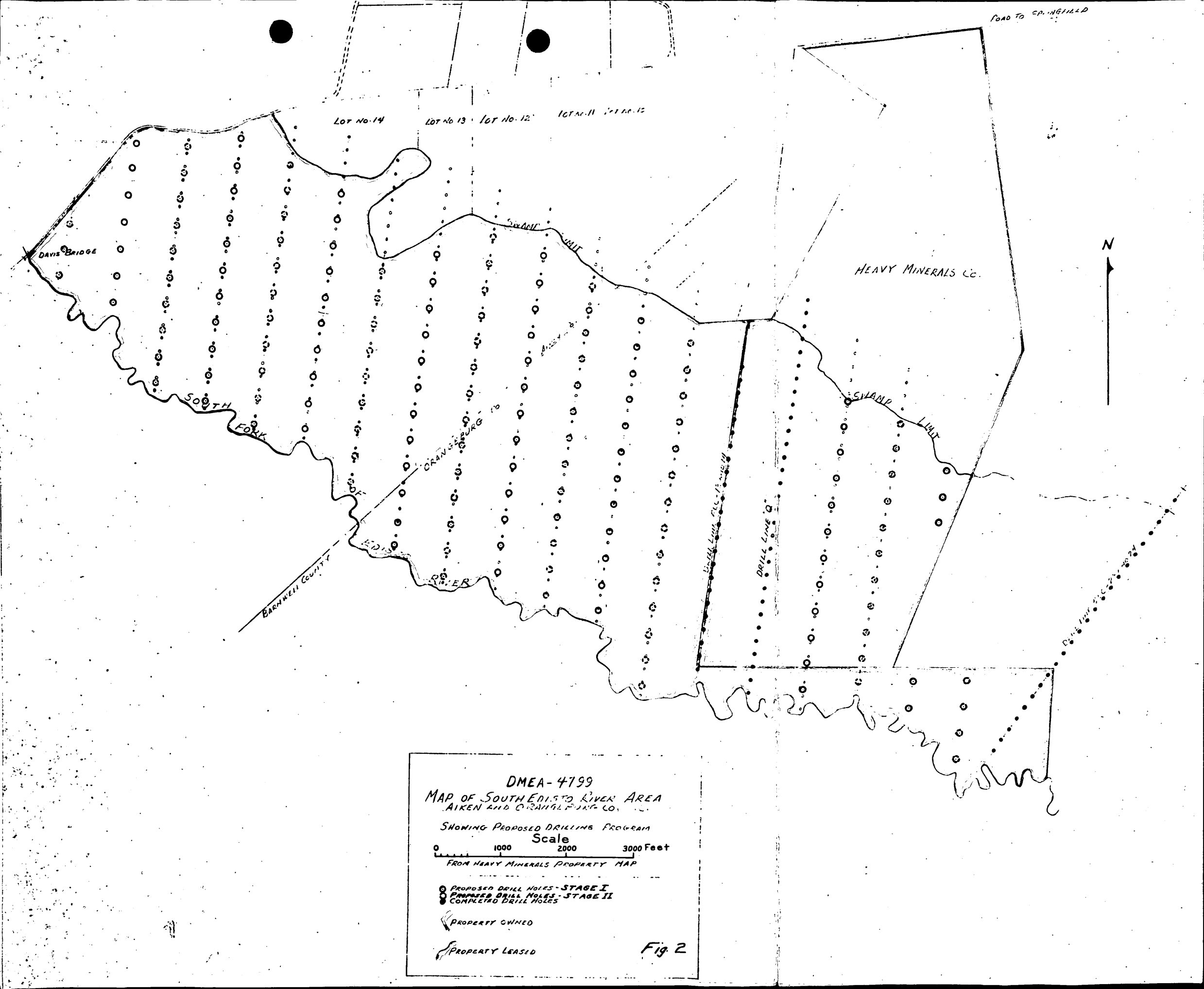
Gentlemen:

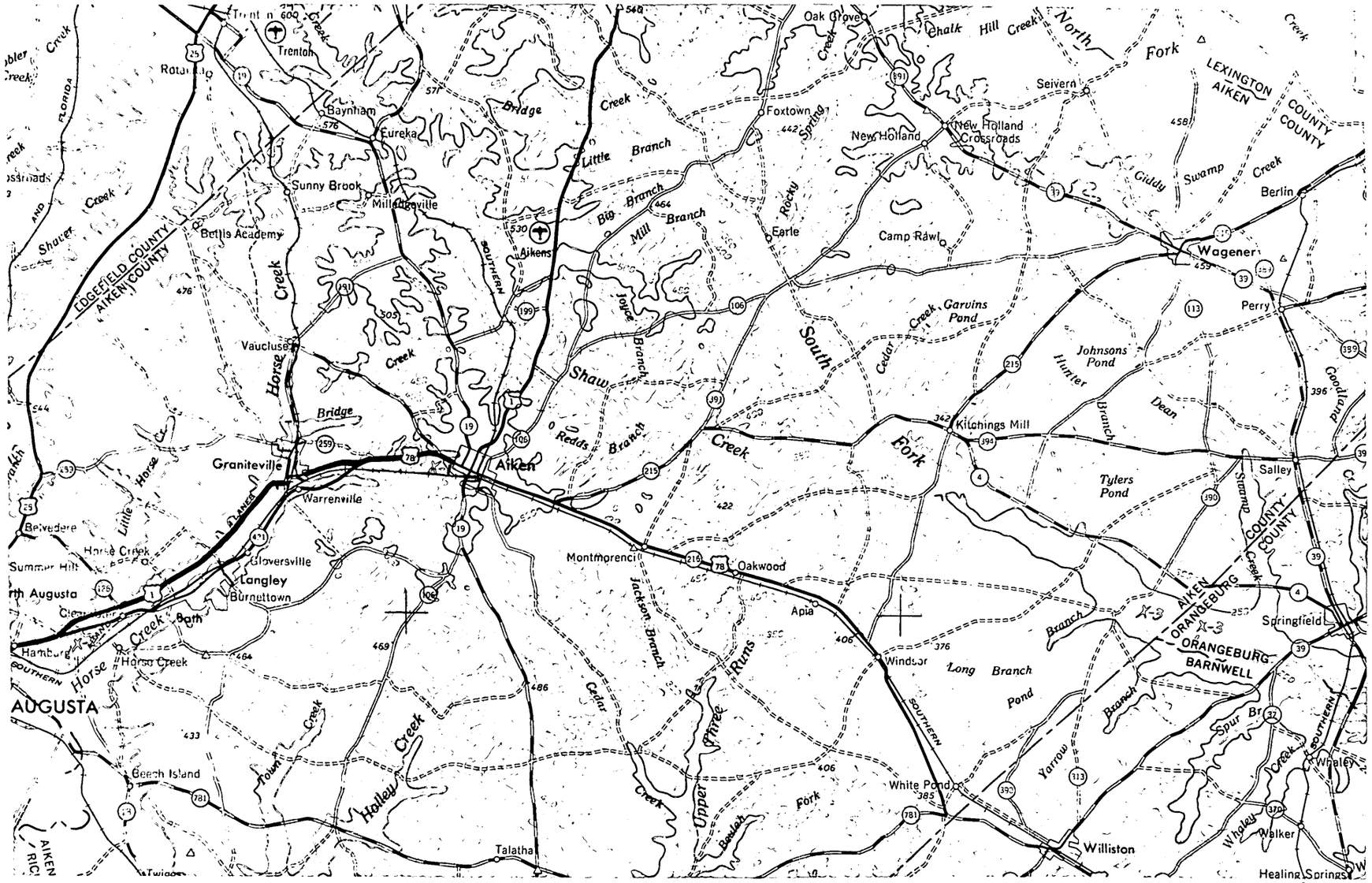
Your application for exploration assistance, dated July 23, 1957 submitted to our office at Knoxville, Tenn. has been assigned Docket Number 4799 and referred to the Division of Nonmetallic Minerals in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to:
Region V


ROAD TO SPRINGFIELD
LOT NO. 14
LOT NO. 13
LOT NO. 12
LOT NO. 11
DAVIS BRIDGE
SWAMP LIMIT
HEAVY MINERALS CO.
N
SOUTH FORK
EDISTO RIVER
ORANGEBURG CO.
BARNWELL COUNTY
SWAMP LIMIT
DRILL LINE
DRILL LINE
DMEA-4799
MAP OF SOUTH EDISTO RIVER AREA
AIKEN AND ORANGEBURG CO.
SHOWING PROPOSED DRILLING PROGRAM
Scale
0
1000
2000
3000 Feet
FROM HEAVY MINERALS PROPERTY MAP
PROPOSED DRILL HOLES - STAGE I
PROPOSED DRILL HOLES - STAGE II
COMPLETED DRILL HOLES
PROPERTY OWNED
PROPERTY LEASED
Fig. 2



DMEA-4799

LOCATION MAP OF PROPOSED PROJECT AREA AND HEAVY MINERALS COMPANY OPERATIONS

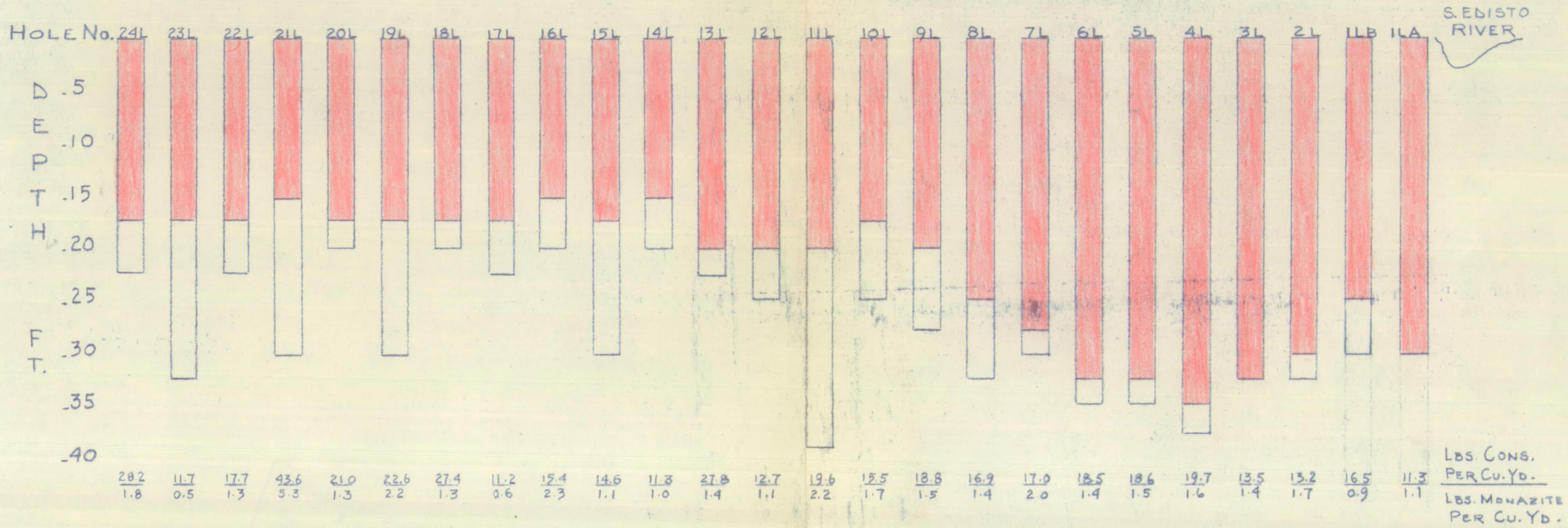
SCALE 1" = 4 MILES
From Augusta, Georgia, South Carolina Sheet N1 17-8
AMS-Series V-501

X-1 SEPARATION PLANT AND DREDGE OPERATION

X-2 FIELD OFFICE AND LABORATORY

X-3 PROPOSED PROJECT

Fig. 1



CROSS SECTION ON SOUTH EDISTO

LINE 5CC-13,14

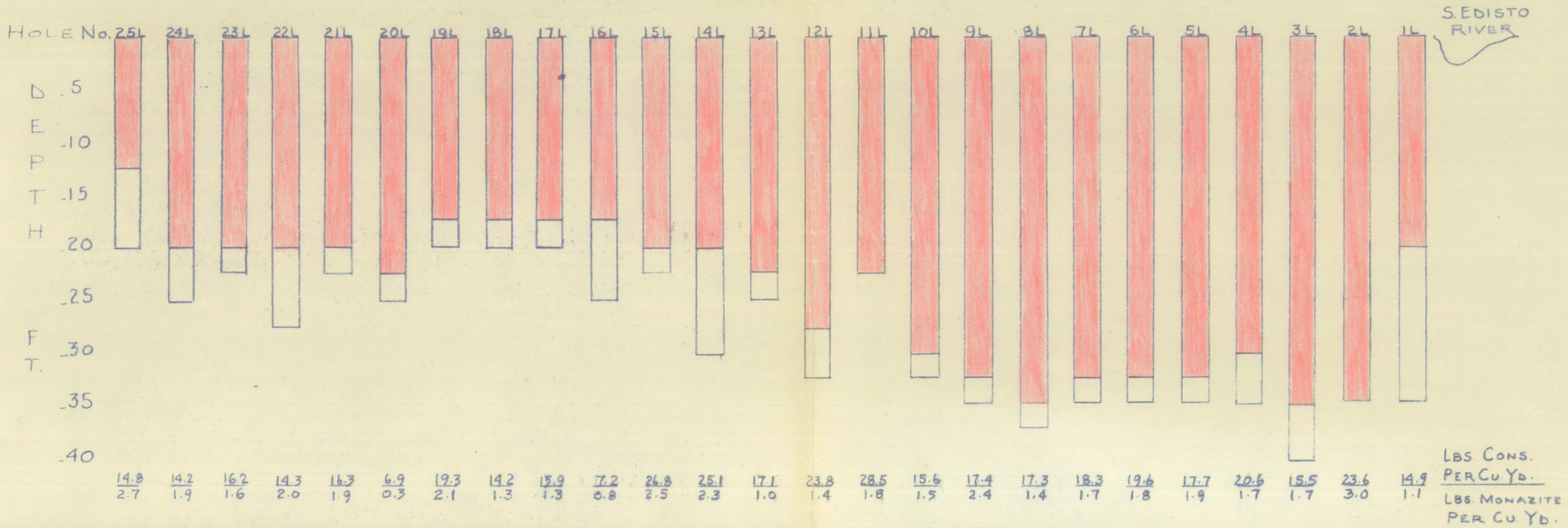
ORE CUT-OFF LIMIT

OFFICIAL FILE COPY
D M E A
RECEIVED JUL 29 1957

DATE	INITIALS	CODE

OFFICIAL FILE COPY
D M E A
RECEIVED JUL 29 1957

DATE		CODE



CROSS SECTION ON SOUTH EDISTO
LINE 5CC-23,24

ORE CUT-OFF LIMIT

OFFICIAL FILE COPY
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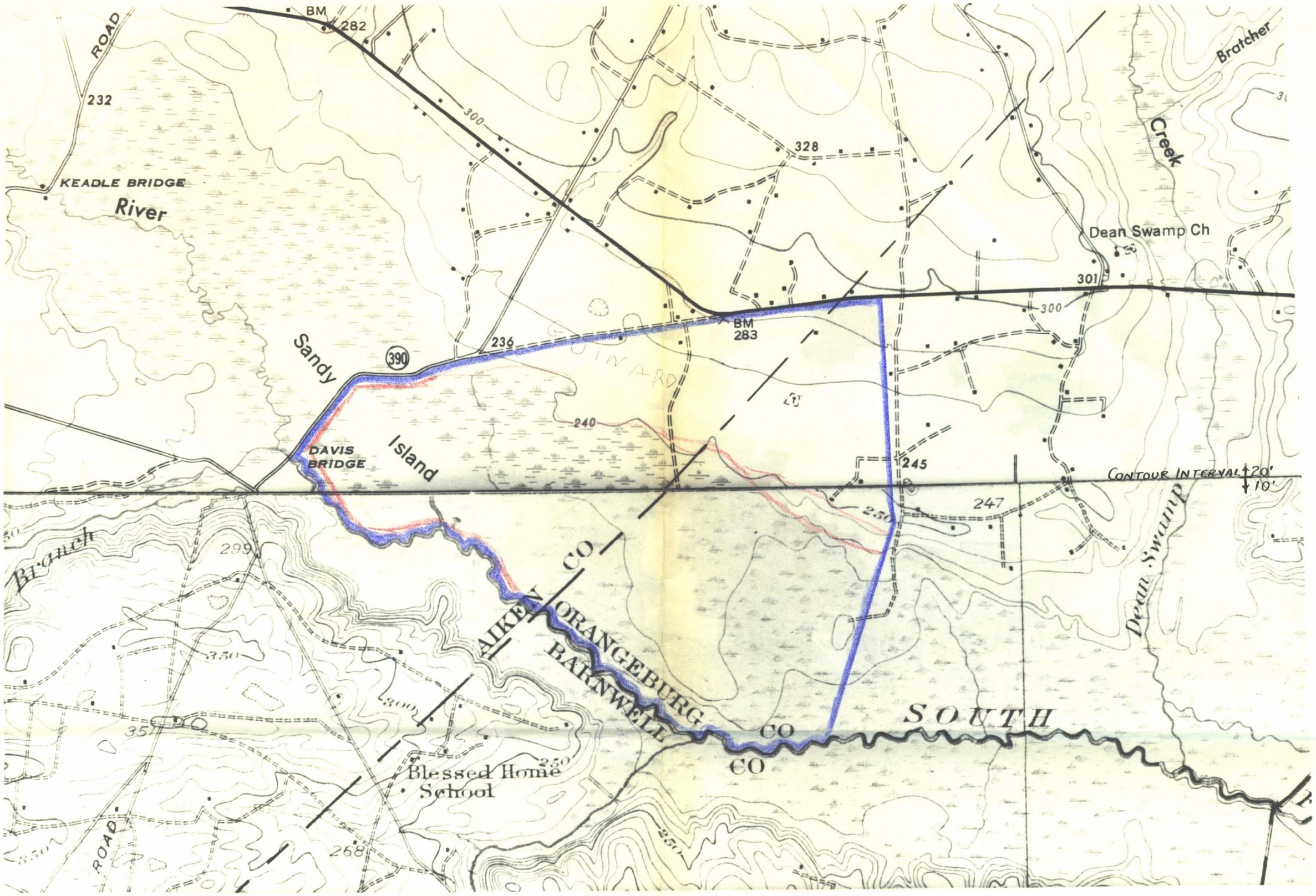
RECEIVED JUL 29 1957

DATE	INITIALS	CODE



DMEA-4799

SOUTH EDISTO RIVER AREA

AIKEN AND ORANGEBURG COUNTIES, S.C.

SCALE 1" = 2000'

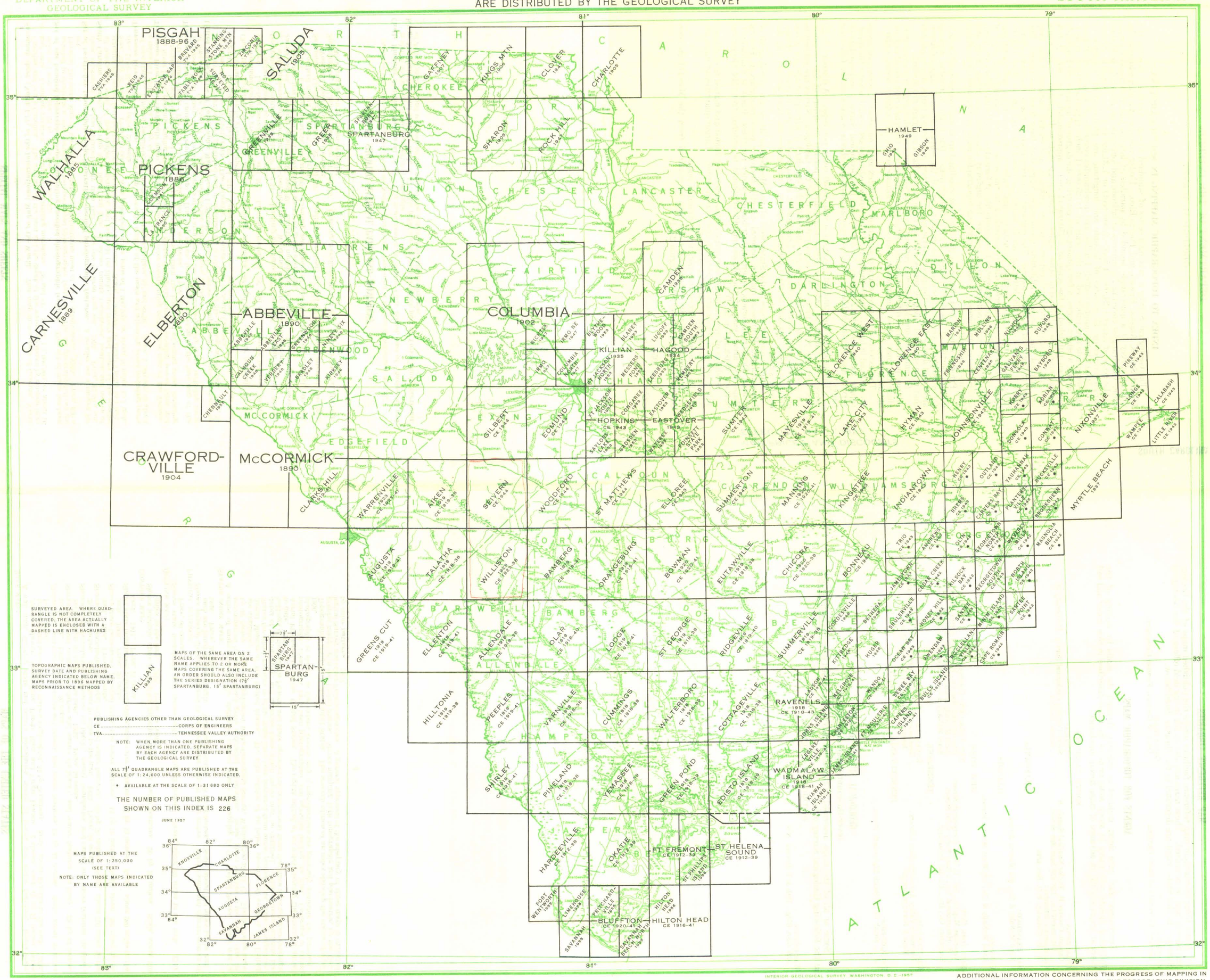
FROM SEIVERN AND WILLISTON 15 MIN. QUADRANGLES BY ARMY MAP SERVICE

TOPOGRAPHIC MAP SHOWING AREA INCLUDED FOR EXPLORATION PURPOSES IN BLUE.

INDEX TO MAPS OF SOUTH CAROLINA
ORDER MAPS BY NAMES PRINTED IN BLACK AND BY SERIES DESIGNATION
ALL MAPS SHOWN ON THIS INDEX
ARE DISTRIBUTED BY THE GEOLOGICAL SURVEY

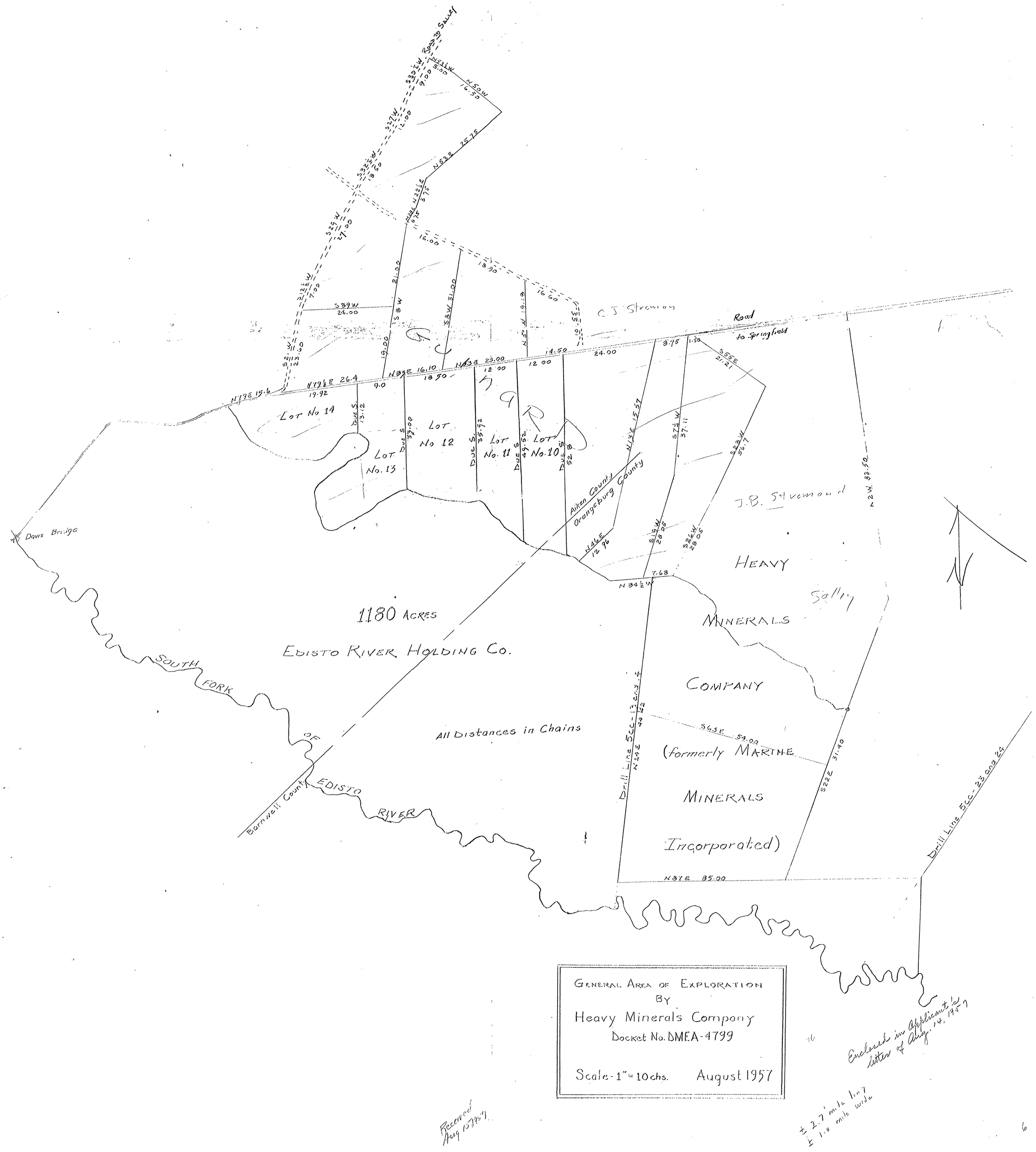
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOUTH CAROLINA



INTERIOR GEOLOGICAL SURVEY WASHINGTON D.C.—1957

ADDITIONAL INFORMATION CONCERNING THE PROGRESS OF MAPPING IN SOUTH CAROLINA MAY BE OBTAINED FROM THE TOPOGRAPHIC DIVISION, U. S. GEOLOGICAL SURVEY, 1109 NORTH HIGHLAND ST., ARLINGTON, VIRGINIA, OR THE MAP INFORMATION OFFICE, U. S. GEOLOGICAL SURVEY, WASHINGTON 25, D.C.



GENERAL AREA OF EXPLORATION
BY
Heavy Minerals Company
Docket No. DMEA-4799

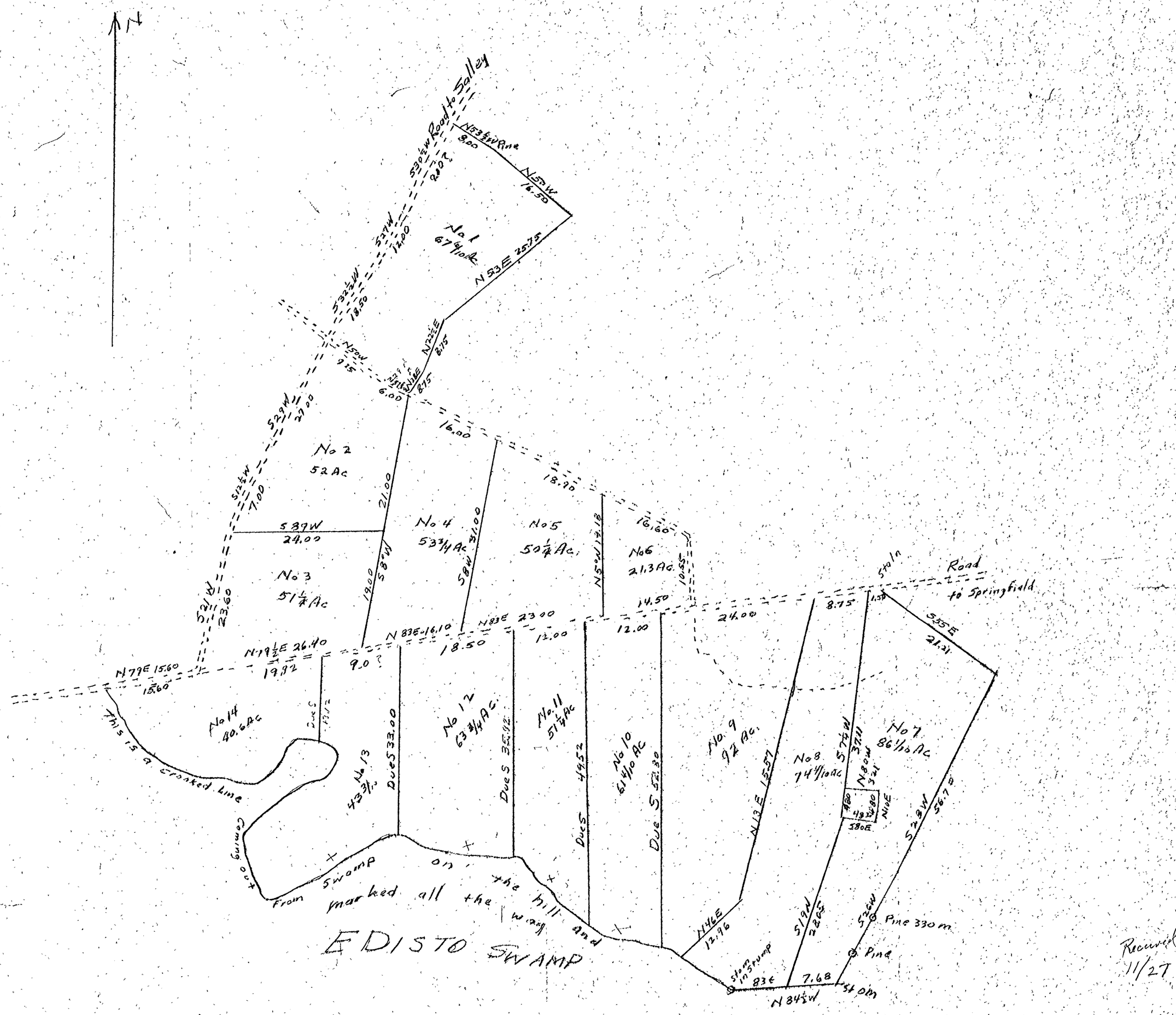
Scale-1"=10chs. August 1957

Enclosed in Applicant's letter of Aug. 14, 1957

Received Aug 15 1957

± 2.7 mile long
± 1.0 mile wide

6



Received 11/27/57
11/27

South Carolina
Aiken + Orangeburg Counties

The Above Plat

Represents Lands of the J.G. Guinyard Estate Surveyed for Wagener Real Estate + Guaranty Co
Roadways Reserved on all Lines from River to Publick Road
10 ch to inch

Nov 12, 1918

H. Rudolph Schoenberg
Surveyor

from Aiken County
Book 1 - Plats
Page 1

J.M.M.
7/15/85

Field Town Map

DMEA-4799.

MAP OF SOUTH EDISTO RIVER AREA
AIKEN AND ORANGEBURG Co, S.C.

SHOWING PROPOSED DRILLING PROGRAM

SCALE 1 INCH = 660'

FROM HEAVY MINERALS PROPERTY MAP

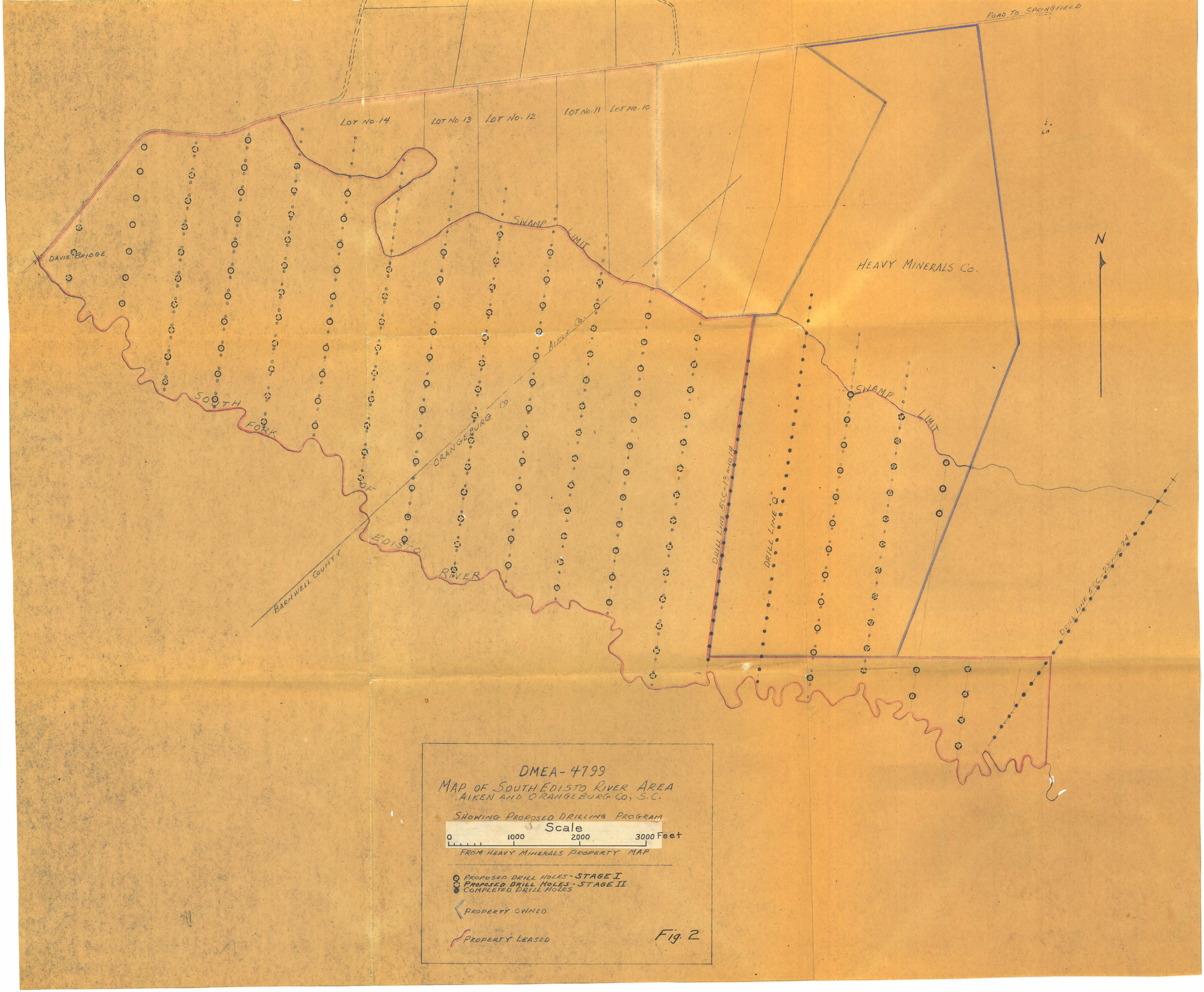
PROPOSED DRILL HOLES - First Stage
" " " " 2nd "
COMPLETED DRILL HOLES

PROPERTY OWNED

PROPERTY LEASED

Received Nov 4, 1959

Road to Salley
Road to Springfield
Lot No 14
Lot No 13
Lot No 12
Lot No 11
Lot No 10
Aiken County
Orangeburg County
1180 Acres
Edisto River Holding Co.
South Fork of Edisto River
Barnwell County
All Distances in Chains
Heavy Minerals Company
(formerly Marine Minerals Incorporated)
Drill Line 5CC
Drill Line 5CC
Leased Property
Company Owned
company owned (Color added by S.P.H.)
General Area of Exploration
By
Heavy Minerals Company
Docket No. DMEA-4799
Scale-1" = 10 chs.
August 1957


ROAD TO SPRINGFIELD
LOT No. 14
LOT No. 13
LOT No. 12
LOT No. 11
LOT No. 10
SWAMP LIMIT
HEAVY MINERALS CO.
N
DAVIS BRIDGE
SOUTH FORK OF EDISTO RIVER
AIKEN CO.
ORANGEBURG CO.
BARNWELL COUNTY
DRILL LINE SOC-13 AND 14
DRILL LINE "Q"
SWAMP LIMIT
DRILL LINE SOC-23 AND 24
DMEA-4799
MAP OF SOUTH EDISTO RIVER AREA
AIKEN AND ORANGEBURG CO, S.C.
SHOWING PROPOSED DRILLING PROGRAM
Scale
0 1000 2000 3000 Feet
FROM HEAVY MINERALS PROPERTY MAP
PROPOSED DRILL HOLES - STAGE I
PROPOSED DRILL HOLES - STAGE II
COMPLETED DRILL HOLES
PROPERTY OWNED
PROPERTY LEASED
Fig. 2