DMEA Form 9
(Rev. 5/57)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE

Idm-E No. 1100
13 JUN 1957

DMEA NO. 4746

Application (Denied
(Withdrawn
(After disposition, delete items not applicable)

Contract
(Terminated - not Certified
(Cancelled
(Terminated - Certified
(Royalty Agreement

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

Folder No. 1:

Left Side

Royalty Audits 1/
Certification of Discovery
✓ Cost Audits 2/
Termination Notice or Agreement
Recision Notice
Assignment of Contract
✓ Contract Amendments
X Contract with all exhibits and annexes
Owner's Consent to Lien
Subordination Agreement
✓ Application and attachments
✓ Envelope for maps

Right Side

✓ Project summary
✓ Work completed analysis
All other material filed in chronological order including the following reports if checked:

Field Team Semi-Annual Report for Certified Project
X Final Field Team Report (Tab)
X Operator's Final Report (Tab)
Interim Field Team Reports
Operator's monthly reports and all attachments
X On-site Exam Report (Tab)
Settlement Sheets
Drill Logs

Additional Folders:

Left Side

Folder No.____:
Analysis of Semi-Annual Inspection Reports
Interim Summary Reports by DMEA Engineers

Right Side

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

Folder No.____: Maps (Use pocket folder or envelope.)

Folder No.____: Settlement Sheets

Folder No.____: Drill Logs

Folder No.____: Royalty material

1/ Or reports of royalty review
2/ Or cost reports of review

16592

Original

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REVISED REPORT OF REVIEW

I have reviewed the Monthly Reports of:

Appalachian Sulphides, Inc.

South Strafford, Vermont

pertaining to Exploration Project Contract No. Idm-E1100, DMEA No. 4746, including Amendment No. 1, for June 1957 to September 1957, inclusive, covering a copper project in the Elizabeth Mine Area, Orange County, Vermont.

My review included an examination of the Monthly Reports (Forms MF-104) and supporting documents, comparison of the claimed costs with the contract and pertinent schedules, verification of work performed by reference to Field Team reports and correspondence, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the reasons given in the attached schedule.

The findings of this review are stated in the following summary and the attached schedule:

Total cost billed by Operator		$45,716.97
Exceptions:		
Prior to this review	$ -0-	
Herewith	-0-	-0-
Accepted cost claimed by Operator		45,716.97
Acceptable costs not claimed		427.00
Total acceptable cost, if claimed		$46,143.97

The contract calls for a 50 percent contribution of the allowable costs by the Government. Therefore, if the project is otherwise accepted as having met the terms of the contract, payments as follows are valid and proper:

On cost claimed	$22,858.48
On additional cost, if claimed	213.50
Total payable, if claimed	$23,071.98
Payable on audited claim	$22,858.48
Paid to date	18,473.24
Balance due Operator	$ 4,385.24
Additional payable, if claimed	$ 213.50

E. D. Talbert

E. D. Talbert, Auditor

February 13, 1958

Reasons for Report of Review in lieu of a final audit:

(a) the Monthly Reports were supported by documentary proof of that portion ($37,377.10) of the costs which covered work performed at unit rates under independent contract;

(b) the balance ($8,766.87) of the costs was under a contract provision for payment by the Government at fixed unit costs for work performed; and

(c) the administrative cost to the Government of an audit would be excessive in relation to the estimated amount of possible disallowances.

Additional acceptable costs, if claimed by Operator:

(a)	Drilling delays invoiced by drilling contractor and accepted by Field Team as reasonable	135 hrs. @ $6.00	$810.00	
	Claimed by Operator	64 hrs. @ 6.00	384.00	$426.00
(b)	Samples assayed per drill logs and confirmed by Field Team	145 ea. @ $1.00	$145.00	
	Claimed by Operator	144 ea. @ 1.00	144.00	1.00
	Total			$427.00

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF REVIEW

I have reviewed the Monthly Reports of:

Appalachian Sulphides, Inc.

South Strafford, Vermont

pertaining to Exploration Project Contract No. Idm-5110C, DMEA No. 4746, including Amendment No. 1, for the months of June 1957 to September 1957, inclusive, covering a project for the exploration of copper on property, known as the Elizabeth Mine Area located in Orange County, Vermont.

My review included an examination of the Monthly Reports (Forms MF-104) and supporting documents attached thereto, comparison of the costs claimed with the contract and pertinent schedules, verification of work performed by reference to Field Team reports and correspondence, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the reasons given in the attachment to this report.

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

Total cost as billed by Operator		$45,537.43
Exceptions:		
Prior to this review	$ -0-	
Herewith	-0-	-0-
Total accepted cost claimed		45,537.43
Additional acceptable cost, if claimed, per schedule attached		427.02
Total acceptable cost, if claimed		$45,964.45

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payments to the Operator by the Government as follows are valid and proper:

On cost claimed	$22,768.72
On additional cost, if claimed	213.50
Total amount payable, if claimed	$22,982.22
Amount payable on audited claim	$22,768.72
Amount reimbursed	18,473.21
Balance due Operator	$ 4,295.51
Additional payable, if claimed	$ 213.50

E. D. Talbert, Auditor

January 20, 1958

Reasons for Report of Review in lieu of a final audit:

(a) the Monthly Reports were supported by documentary proof of that portion ($37,216.45) of the costs which covered work performed at unit rates under independent contract;

(b) the balance ($8,748.00) of the accepted costs was under a contract provision for payment by the Government on the basis of fixed unit costs of work actually performed; and

(c) the administrative cost to the Government of an audit would be excessive in relation to the estimated amount of possible further exceptions thereunder.

Additional acceptable costs, if claimed by Operator:

(a) Drilling delays invoiced by drilling contractor and accepted by Field Team as reasonable	135 hrs. @ $6.00	$810.00		
Claimed by Operator	64 hrs. @ 6.00	384.00	$426.00	
(b) Samples assayed per drill logs and confirmed by Field Team	145 ea. @ $1.00	$145.00		
Claimed by Operator	144 ea. @ 1.00	144.00	1.00	
Total			$427.00	

Government's Copy

Rubin
Kenyon
Chamberlin
Selfridge
Johnson

TERMINATION AGREEMENT

It is agreed this 18th day of December, 1957, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and Appalachian Sulphides, Inc., hereinafter called the "Operator," parties to that certain Exploration Project Contract Idm-E1100, (Docket No. DMEA-4746), dated June 13, 1957, hereinafter called the "Contract," that:

1. Effective November 1, 1957, the Contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated.

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

3. The Operator shall promptly perform all winding-up and settlement actions provided for in the Contract, including the rendering of the final report and final account.

4. All rights of the Government respecting certification of discovery or development, percentage royalty and liens to secure the payment thereof, reports (including preservation of Operator's records), audits, accounts, and the right to recover any overpayment are hereby preserved.

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

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

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DMEA
RECEIVED JAN 2 1958
DATE | INITIALS | CODE

THE UNITED STATES OF AMERICA

By [signature]
Administrator, Defense Minerals
Exploration Administration

APPALACHIAN SULPHIDES, INC.

By John Dowley
Title General Manager

Government's copy

Butler
Thompson
Stewart
Chapman
Selfridge
Johnson

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DMEA
RECEIVED JAN 2 1958

DATE	INITIALS	CODE

EXPLORATION PROJECT CONTRACT
APPALACHIAN SULPHIDES, INC.
DOCKET NO. DMEA 4746

AMENDMENT NO. 1

It is agreed this 18th day of December, 1957, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and Appalachian Sulphides, Inc., that Exploration Project Contract No. Idm-E1100 (Docket No. DMEA-4746), dated June 13, 1957, is amended as follows:

In Exhibit "A," under "Estimated Costs of the Contract," the last item on page 3 is revised to read as follows:

"Depths in excess of 1,000 feet, 1,000 feet @ $3.15/ft. $3,150.00"

This Amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be required to contribute, the amount of any item designated as "maximum," nor the fixed unit cost of any item of work.

Executed in quintuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By [signature]
Administrator, Defense Minerals Exploration Administration

APPALACHIAN SULPHIDES, INC.

By John F Cowley
Title General Manager

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DATE	INITIALS	CODE
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Government's copy

MF-200
(Revised June 1954)

Docket No. DMEA -4746

Commodity Copper

Contract No. Idm-E 1100

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

EXPLORATION PROJECT CONTRACT[1]

It is agreed this 13 JUN 1957 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] APPALACHIAN SULPHIDES, INC., a Delaware Corporation, whose mailing address is South Strafford, Vermont, 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 two 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 Vermont, County of Orange, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] owner of [5] 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] ....., [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: none

(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: None

(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 copper. The work to be performed is described in Exhibit "A." The Operator on or before July 15, 1957 shall commence the work, and on or before July 15, 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 8) in a sum not less than the estimated total allowable cost set forth in Exhibit "A."~~ See Article 13.

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 $62,860.00 The Government shall contribute 50 percent of the allowable costs as they are incurred in a total sum not in excess of $31,430.00: *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

voucher or vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work or not in excess of the amount of the Government's contribution to the cost of property which is or may become subject to disposal as provided in Article 9(c), whichever is greater. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 7(b), but all payments by the Government are provisional only, subject to audit, until the account between the Operator and the Government is finally audited and settled. "Costs incurred" mean costs that have been paid or have become due and payable, or that in the opinion of the Government have become an obligation. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Estimated costs.*—(a) *Categories of costs.*—The allowable costs of the work to which the Government shall contribute are limited to those that are direct, reasonable, necessary, and that are estimated in Exhibit "A" by categories as specified in this article. If any category or subcategory is omitted from the estimate of costs, or if the word "none" is annexed to the listing thereof, costs under such category or subcategory are not allowable. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost, and any excess over the estimated total allowable cost of the work, shall not be allowable. Any excess over the estimate of any category, subcategory, or item, either as to requirement or related cost, not indicated as a maximum shall be allowable within the limit of the estimated total allowable cost of the work. To the extent that excesses over maximums other than the estimated total allowable cost of the work may be necessary for the performance of the work, the Operator shall incur such excesses for his own account without contribution by the Government; ~~but except for any such necessary excesses in categories, subcategories, or items the under the Operator is not obligated to incur more than his agreed percentage of the estimated total allowable cost of the work.~~ See Article 13.

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. See Article 13.

CATEGORY (2)—PERSONAL SERVICES.

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

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

Subcategory (c)—Labor.

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

CATEGORY (4)—OPERATING EQUIPMENT.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(c) *Reductions in costs.*—The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original estimated total cost. This provision does not apply to receipts from production which are subject to the Government's percentage royalty under the provisions of Article ~~8~~. See 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 years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

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

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

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

One and one-half (1½) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half (½)

percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 10. *Termination of the Government's obligations.*—(a) If in the opinion of the Government operations at any time have failed to achieve anticipated results that indicate the probability of making a worthwhile discovery, and in the opinion of the Government further operations are not justified, the Government may give the Operator written notice thereof, and thereupon: (1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting.

(b) If in the opinion of the Government the Operator is in any manner in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon: (1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to winding up, reporting, and accounting; and (2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting. The remedy provided for the Government in this paragraph "(b)" is in addition to any other remedy provided in this contract, and in addition to any other remedy the law may provide for breach of contract.

(c) The giving of any notice by the Government under the provisions of this Article 10 shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights shall be fully preserved.

ARTICLE 11. *Notices to be given by the Government* may be delivered to the Operator, or may be sent by registered mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 12. *Officials not to benefit.*—No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 13. *Changes and added provisions.*—

(a) In Article 3, the words following the reference to Article 10 are deleted, and the following words are substituted: "shall have completed the work."

(b) In Article 6(a), that part of the last sentence in the first paragraph beginning after the semicolon is deleted.

(c) Categories (2) through (7) of Article 6(a) are deleted.

(d) In Article 6(c), the words "Article 9" are changed to "Article 8."

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

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

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C O Mitterdorf

Administrator, Defense Minerals Exploration Administration

APPALACHIAN SULPHIDES, INCORPORATED

(Operator)

By J. M. Cunningham-Dunlop

Title President

I, FRANK C. SULLIVAN, certify that I am the Assistant secretary of the corporation named as Operator herein; that J. M. CUNNINGHAM-DUNLOP who signed this contract on behalf of the Operator, was then President of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

F C Sullivan

Assistant Secretary

[CORPORATE SEAL]

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

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"Appd. Sol. Off."

EXPLORATION PROJECT CONTRACT
APPALACHIAN SULFIDES, INCORPORATED
DOCKET NO. DMEA-4746

ANNEX I

The land referred to in Article 2 of the contract is shown outlined on the attached map entitled "Plan of Elizabeth Mine Area, South Strafford, Vermont," and is described as follows:

That area of land lying in the Township of Strafford, Orange County, Vermont, and bounded as follows:

Starting at the center of the highway leading from Strafford to Norwich at a point opposite an iron pipe set in a stone wall on the South side of the highway. Thence south 66° west 306 feet to an iron pipe set in a pile of stones. Thence south 8° 15' west 2700 feet to an iron pipe in the line of J. W. Tyson. Thence south 63° 30' east 1154 feet to an iron pipe set in a stone wall on the east side of the highway leading from Strafford to Norwich. Thence south 64° east 1625 feet to an iron pipe set in a stone wall. Thence south 31° west 3561 feet to an iron pipe. Thence south 84° 45' east 2850 feet along coordinate 7000 north. Thence north 5° 15' east 8500 feet along coordinate 9200 west. Thence north 84° 45' west 2990 feet along coordinate 15,500 north to a point on the highway leading from Route 132 to the mine. Thence along the line of said highway 460 feet to an iron pipe set at the end of a stone wall on the south side of the highway. Thence south 24° 45' west 1602 feet to an iron pipe at the intersection of two fences on the east side of a brook. Thence north 60° 45' west 1038 feet to an iron pipe set in the fence corner on the north side of the highway. Thence 23 feet to a point in the highway opposite the last-mentioned iron pipe. Thence 400 feet along the line of the highway to the starting point.

EXCLUDED LAND

Ore bodies known to exist as of the date of this contract are excepted from the land described above and are shown in color (red, blue, and green) on the attached map entitled "Longitudinal Section, The Elizabeth Mine, Appalachian Sulphides, Inc., South Strafford, Vt."

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EXPLORATION PROJECT CONTRACT
APPALACHIAN SULPHIDES, INCORPORATED
DOCKET NO. DMEA-4746

EXHIBIT A

Description of the Work

The purpose of the project is to explore for ores of copper by diamond core drilling, from both surface and underground locations, with such overburden drilling as may be necessary.

It is estimated that twenty-eight drill holes will be drilled, ranging in depths from 300 to 1500 feet, the total combined footage not to exceed 19,200 feet of hole. Drilling shall be done with EX size, or larger, coring bits.

The drilling shall be done along certain cross-sectional east-west planes related to the mine coordinate system, as follows:

North	latitude	7442
"	"	8800
"	"	10084
"	"	10900
"	"	12100
"	"	12500
"	"	13100
"	"	14000
"	"	15100

Drill holes shall be reamed and cased or cemented and redrilled as necessary.

The tentative locations of the holes are shown on the attached map entitled "Plan of Elizabeth Mine Area, South Strafford, Vermont", and the holes are tentatively delineated as follows:

Number	Location	Length	Angle
Plane N. 7442			
1002	Surface 9155 W	1,200 ft.	-65°
1001	" 9390 W	900 ft.	-65°
1000	" 9630 W	600 ft.	-65°

Number	Location	Length	Angle
Plane N. 8800			
1004	Surface 9275 W	1,100 ft.	-65°
1003	" 9600 W	700 ft.	-65°
Plane N. 10084			
796	Deepen existing hole	300 ft.	
Plane N. 10900			
1006	Surface 9250 W	1,500 ft.	-65°
1005	Underground 9855 W	600 ft.	-65°
Plane N. 12100			
1008	Underground 9695 W	650 ft.	-40°
1007	" " 9695 W	450 ft.	-13°
Plane N. 12500			
1013	Underground 9730 W	500 ft.	-17°
1012	" " 9840 W	450 ft.	-34°
1011	" " 9840 W	350 ft.	0°
1010	" " 9840 W	400 ft.	-30°
1009	" " 9840 W	300 ft.	0°
Plane N. 13100			
1017	Underground 9695 W	500 ft.	-68°
1016	" " 9695 W	750 ft.	-36°
1015	" " 9895 W	700 ft.	-53°
1014	" " 9895 W	600 ft.	-40°
Plane N. 14000			
1018	Underground 9845 W	550 ft.	-15°
1020	Surface 9980 W	600 ft.	-62°
1019	" 10160 W	800 ft.	-63°
1021	" 10480 W	800 ft.	-63°
1022	" 10740 W	600 ft.	-63°
Plane N. 15100			
1023	Underground 9985 W	700 ft.	-20°
1026	Surface 10540 W	1,200 ft.	-45°
1025	" 10950 W	800 ft.	-45°
1024	" 11305 W	600 ft.	-45°

All locations, lengths and angles of inclination are approximate. All hole directions are westerly, with respect to the mine grid north. The actual locations, directions, inclinations, and depths of all holes are subject to prior Government approval.

All drill holes shall be logged and all drill core shall be properly stored and made available to the Government for examination. All significantly mineralized core shall be split and one half thereof shall be properly sampled and assayed for copper. The remaining half of all significantly mineralized core samples shall be furnished to the Government upon request.

As required by Article 7(b) of the contract, assay reports shall be submitted monthly to the Government, together with drill logs and adequate engineering-geological plan maps and sections, showing the progress of the work and sample locations.

All work of drilling and sample preparation shall be properly supervised by competent engineers or geologists.

Bulldozing shall be performed with a D-6 or equivalent unit.

Estimated Costs of the Project

Actual Costs

Category (1) Independent Contracts

Drilling from surface

Overburden drilling, 280 feet @ $4.00/ft.	$ 1,120.00	
Diamond drilling		
0- to 500-foot depth 6,220 feet @ $2.40/ft.	14,928.00	
500- to 1000-foot depth 3,900 feet @ $2.65/ft.	10,335.00	
1000- to 1500-foot depth 1,000 feet @ $3.15/ft.	3,150.00	$29,533.00

Underground diamond core drilling		
0- to 750-foot depth 7,500 feet @ $2.40/ft.	$18,000.00	
750- to 1000-foot depth 300 feet @ $2.60/ft.	780.00	$18,780.00
Tro-pari and/or acid surveys 192 hours @ $6.00/hr.	1,152.00	
Drilling delays 64 hours @ $6.00/hr.	384.00	1,536.00
		$49,849.00
Categories (2) through (7)	None	
Fixed Unit Costs (See Article 13 of the contract)		
Incidental allowance 1/ for each foot of surface drilling completed 11,400 feet @ $0.37/ft.	4,218.00	
Incidental allowance 1/ for each foot of underground drilling completed 7,800 feet @ $0.69/ft.	5,382.00	
720 core boxes @ $2.00/each	1,440.00	
208 hours bulldozing @ $8.50/hr., including operator and all bulldozing costs whatsoever	1,768.00	
203 samples assayed @ $1.00/sample	203.00	13,011.00

S U M M A R Y

Total Independent Contracts	$49,849.00	
Total Fixed Unit Costs	13,011.00	
Estimated Total Cost of Project		$62,860.00
Government Participation @ 50%		$31,430.00

1/ Includes all costs of the work that might have been estimated and allowed under Categories (1) through (7), except those costs for which estimates are made in Exhibit "A".

APPALACHIAN SULPHIDES, INC
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

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RECEIVED MAY 13 1957

DATE	INITIALS	CODE

May 7, 1957

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

Attention: Mr. C. C. Mittendorf, Administrator

Gentlemen:

We submitted to you herewith Form Number MF-103, 4 copies complete with maps, Application for Aid in an Exploration Project, Pursuant to DMEA Order 1, Under the Defense Production Act of 1950, as Amended.

Your early consideration of and action on this application will be greatly appreciated, since it has been necessary to make our immediate commitment with the contract drilling firm, E. J. Longyear Company, before all of their equipment became committed elsewhere. Furthermore, time is of utmost importance on this project, in view of our present critical ore reserve position.

Very truly yours,

APPALACHIAN SULPHIDES, INC.
John F. Cowley, General Manager

By Clarence B. Benson
Clarence B. Benson, Asst. Gen. Manager

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED MAY 13 1957 D.M.E.A.

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

Not to be filled in by applicant

Docket No. 4746
Metal or Mineral Copper
Date Received 5-13-57
Estimated Cost $ 81,414.95
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: APPALACHIAN SULPHIDES, INCORPORATED
SOUTH STRAFFORD, VERMONT (ORANGE COUNTY)

Incorporated under the laws of Delaware

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

(*c*) If a corporation, add to above statement, titles, names and addresses of officers. See Attachment No. 1

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

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

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

See Attachment No. 2

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

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

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

(*e*) If you own the land, describe any liens or encumbrances on it No liens or encumbrances

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. No unpatented claims.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See Attachment No. 3 - Page 1

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades Attachment #3 - Page 1

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. See Attachment No. 3 - Page 2

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. See Attachment No. 3 - Page 3

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

See Attachment No. 3-Page 3

16—66551-1

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

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. See Attachment No. 4 - Page 1

(*c*) The work will start within 30 days and be completed within 6 months from the date of an exploration project contract.

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

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

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.). See Attachment No. 5 - Page 1

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants. See Attachment No. 5 - Page 1

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See Attachment No. 5 - Page 2

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be. See Attachment No. 5 - Page 2

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project. See Attachment No. 5 - Page 2

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. Att. 5 - Pg.2

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes. See Attachment No. 5 - Page 2

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above. See Attachment No. 5 - Page 3

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

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

(*b*) How do you propose to furnish your share of the costs? See Attachment No. 6

☐ Money ☐ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated May 7, 1957

APPALACHIAN SULPHIDES, INCORPORATED
(Applicant)

By John F Cowley

General Manager

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

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

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENTS TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM DF 103

Attachment No. 1

DATED:
May 7, 1957

1. (a) Appalachian Sulphides, Incorporated, South Strafford, Vermont

(b) Incorporated under the laws of Delaware

(c) Mr. J. M. Cunningham-Dunlop, President and Director
360 Bay Street - 6th Floor
Toronto 1, Ontario, CANADA

Mr. W. H. Woods, Vice President and Director
360 Bay Street - 6th Floor
Toronto 1, Ontario, CANADA

Mr. Philip Bastedo, Secretary and Director
60 Broadway, New York 5, New York

Mr. F. C. Sullivan, Assistant Secretary
360 Bay Street - 6th Floor
Toronto 1, Ontario, CANADA

Mr. H. E. Nauss, Treasurer
360 Bay Street - 6th Floor
Toronto 1, Ontario, CANADA

Mr. C. B. Benson, Assistant General Manager and Assistant Treasurer
South Strafford, Vermont

Mr. John F. Cowley, General Manager
South Strafford, Vermont

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DATE	INITIALS	CODE

2. Application filed with Defense Minerals Administration, Department of the Interior, Washington 25, D. C.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENTS TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 2 - Page 1

DATED May 7, 1957

3. (a) The legal description of the land upon which we wish to explore, all of which is owned by Appalachian Sulphides, Incorporated, is listed below. It will be noted that we have used an inclined plane and two separate elevations to differentiate between areas in the mine already developed and now being mined and the areas included in the proposed exploration project.

The property that will be involved in the exploration project is shown on the attached sketch entitled "Plan of the Elizabeth Mine Area", and is described as follows:

That area of land lying in the township of Strafford, Orange County, Vermont, and bounded as follows:

Starting at the center of the highway leading from Strafford to Norwich at a point opposite an iron pipe set in a stone wall on the South side of the highway.

Thence south 66° west 306 feet to an iron pipe set in a pile of stones.

Thence south 8°15' west 2700 feet to an iron pipe in the line of J. W. Tyson.

Thence south 63°30' east 1154 feet to an iron pipe set in a stone wall on the east side of the highway leading from Strafford to Norwich.

Thence south 64° east 1625 feet to an iron pipe set in a stone wall.

Thence south 31° west 3561 feet to an iron pipe.

Thence south 84°45' east 2850 feet along coordinate 7000North.

Thence North 5°15' east ~~3100~~ 8500 feet along coordinate 9200 West.

~~Thence north 84°45' west 400 feet along coordinate 10,100 North.~~

~~Thence north 5°15' east 5400 feet along coordinate 9600 West.~~

Thence north 84°45' west ~~2500~~ 2990 feet along coordinate 15,500 North to a point on the highway leading from Route 132 to the mine.

Thence along the line of said highway 460 feet to an iron pipe set at the end of a stone wall on the south side of the highway.

Thence south 24°45' west 1602 feet to an iron pipe at the intersection of two fences on the east side of a brook.

Thence north 60°45' west 1030 feet to an iron pipe set in the fence corner on the north side of the highway.

Thence 23 feet to a point in the highway opposite the last-mentioned iron pipe.

Thence 400 feet along the line of the highway to the starting point.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENTS TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 2 - Page 2

DATED May 7, 1957

This area has been sub-divided into two parts: Area 1 being all of that south of coordinate 10,100 North, and area 2 lying entirely north of coordinate 10,100 North.

From the above areas No. 1 and No. 2 we have excluded the ground now being mined, and certain ground adjacent to the current operations which contain previously developed ore as follows:

From Area No. 1: All of the ground above 1200 feet elevation.

From Area No. 2: All of the ground above 400 feet elevation in that part of Area No. 2 which is east of an inclined plane located as follows: The plane dipping easterly 68°15' and located between coordinates 10,100 North and 15,500 North. The bottom of such inclined plane is located at 400 feet elevation and extends from 9800 West at 10,100 North to 10,000 West at 15,500 North. The trace of the plane at 1400 feet elevation extends from 10,200 West at 10,100 North to 10,400 West at 15,500 North, and the plane extends up dip to the surface.

(b) Elizabeth Mine

(c) Owner

(d) Owner

(e) There are no liens or encumbrances on the land.

(f) There are no unpatented claims.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 3 - Page 1

DATED:
May 7, 1957

4. (a) The Elizabeth Mine has been operating continuously since 1943. The property consists of an underground mine with two adit openings; one vertical shaft of 835 feet; three haulage levels, the 300' level of approximately 2100 feet in length plus 1300 feet of X-Cut adit, the 575 level of approximately 3000 feet in length plus 1000 feet of X-Cut to the shaft, and the 975 level of approximately 5800 feet in length plus 970 feet of X-Cut to the shaft.

The surface plant consists of a concentrating plant, of 900 t.p.d. capacity, together with complete surface buildings including office, warehouse, hoist house, compressor house with compressors of 3250 c.f.m. capacity, boarding house, machine, carpenter and electric shops, garages and miscellaneous storage buildings. The operations are 100% owned by Appalachian Sulphides, Inc. All of the above mine workings are accessible for examination purposes.

(b) Production from 1943 through December 31, 1956, totalled 2,720,648 tons of ore containing 1.70% copper, from which were shipped 175,115 tons of copper concentrates at 23.90% copper (83,690,337 Lbs.) and 444,410 ounces of silver.

Present production is at the rate of 19,600 tons per month at 1.45% Copper.

Ore reserves as of Jan. 1, 1957, based upon our present G.S.A. Contract price for copper of 31.06¢ per pound, were estimated to be 144,000 tons at 1.66% Copper.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF103

Attachment No. 3 - Page 2

DATED:
May 7, 1957

4. (c) Mineralization at the Elizabeth Mine consists of disseminated and massive pyrrhotite with minor chalcopyrite and sphalerite in a quartz sericite schist. The emplacement of sulphides is by replacement of a favorable horizon and open space filling. Structurally, the ore zone occupies the east limb and syncline of a right hand drag fold plunging north; this fold position having thickened the favorable horizon and crumpled it to a point beyond its elasticity allowing open space filling as well as replacement.

We wish to explore possible ore horizons immediately below and to the west of the Elizabeth Mine syncline in indicated drag fold positions. Two amphibolite horizons and the ore horizon have been used in determining structure.

Cross-sections at 7442N, 8800N, 10100N, 10900N, 12100N, 12500N, 13100N, 14000N and 15100N are submitted and attached hereto to illustrate the indicated structure and possible ore bodies, together with the proposed drill holes.

The accompanying long section and plans will show the present ore body, previous diamond drilling and location of sections in our grid system.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 3 - Page 3

DATED:
May 7, 1957

4. (d) The mine is situated 11 miles from the Boston and Maine Railroad station of Kendall, Vermont, and is connected by a "black top" road.

The town of South Strafford and adjoining towns provide ample residence for employees.

(e) There is a sufficient supply of experienced manpower.

Our warehouse averages approximately $90,000 worth of materials and supplies on hand with good delivery service from suppliers.

Ample equipment for present operations is on had.

Water supply is excellent from the Company's pumping station on the Pompanoosuc River.

Power is furnished by the Central Vermont Public Service Corporation at 44,000 volts to our 2,500 KW autotransformer, from which 2,300 volts are distributed to the various plant transformer stations.

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APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 4 - Page 1

DATED:
May 7, 1957

5. (a) Copper.

(b) The proposed exploration program consists of underground and surface diamond drilling of favorable structural positions through which the known ore horizon is thought to pass.

The holes to be drilled are as follows:

Note: All coordinates and elevations are approximate, pending transit surveys of the cross-sections. The bearing of all holes to be drilled will be due West (mine coordinate system). All diamond drill holes, stations, coordinates, etc., are shown on the plans and cross-sections which accompany attachment 4 (c).

Some of the holes may necessarily be changed in length and exact position, as may be dictated by structural information gained in drilling.

Proposed DDH Number	Station Number	Coordinates		Elevation	Dip	Length of Hole
1000	S-1	7442N	9630W	1385'	-65°	600'
1001	S-2	7442N	9390W	1360'	-65°	900'
1002	S-3	7442N	9160W	1330'	-65°	1200'
1003	S-4	8800N	9600W	1395'	-65°	700'
1004	S-5	8800N	9262W	1330'	-65°	1100'
Extension of 796	U-1	10084N	9779W	868'	-75°	300'
1005	U-2	10900N	9855W	860'	-65°	600'
1006	S-6	10900N	9250W	1135'	-65°	1500'
1007	U-3	12100N	9695W	505'	-13°	450'
1008	U-3	12100N	9695W	505'	-43°	650'
1009	U-4	12500N	9839W	750'	0°	300'
1010	U-4	12500N	9839W	750'	-30°	400'
1011	U-5	12500N	9838W	690'	0°	350'
1012	U-5	12500N	9838W	690'	-34°	450'
1013	U-6	12500N	9734W	505'	-17°	500'
1014	U-7	13100N	9895W	830'	-40°	600'
1015	U-7	13100N	9895W	830'	-53°	700'
1016	U-8	13100N	9695W	500'	-48°	750'
1017	U-8	13100N	9695W	500'	-68°	500'
1018	U-9	14000N	9895W	510'	-15°	550'
1019	S-7	14000N	10160W	1125'	-63°	800'
1020	S-8	14000N	9980W	1120'	-62°	600'
1021	S-9	14000N	10480W	1155'	-63°	800'
1022	S-10	14000N	10740W	1170'	-63°	600'
1023	U-10	15100N	9980W	512'	-20°	700'
1024	S-11	15100N	11310W	1090'	-45°	400-600'
1025	S-12	15100N	10950W	1020'	-45°	400-800'
1026	S-13	15100N	10540W	1010'	-45°	600-1200'
	Total Surface Footage ('S' Holes)					11,400'
	Total Underground Footage ('U' Holes)					7,800'
	Total Proposed Diamond Drilling					19,200'

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5. (d) Appalachian Sulphides, Incorporated, a wholly-owned subsidiary of The Nipissing Mines Company Limited of Toronto, Ontario, Canada, has owned and operated the Elizabeth Mine since June 1954, when Appalachian acquired the mining properties of Vermont Copper Company, Incorporated.

Vermont Copper Company, Incorporated received aid for an exploration project under Defense Minerals Administration Exploration Project Contract No. Idm-E94-Copper, Docket No. DMEA 1526, dated August 1, 1951. This project was completed, and full repayment of the Exploration Project Aid was made to the Government in May 1954. Attached hereto is a copy of Defense Minerals Exploration Administration letter dated September 1, 1954, acknowledging the repayment of the Government's advance by Vermont Copper Company, Inc.

The operating management and staff of the Elizabeth Mine of Appalachian Sulphides, Inc., is headed by Mr. John F. Cowley, General Manager, and Clarence B. Benson, Assistant General Manager, and is the same as the management and operating staff of Appalachian's predecessor company, Vermont Copper Company, Inc. Mr. Cowley served as President of Vermont Copper Company, Inc. from March 1951 until Appalachian acquired its mining properties in June 1954. Mr. Benson was Treasurer and Manager of Vermont Copper for several years prior to June 1954.

See Attachment No. 3 - Page 1 of this application for a description of the Elizabeth Mine of Appalachian Sulphides, Incorporated.

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

SEP 1 1954

Mr. John F. Cowley, President
Vermont Copper Company, Inc.
South Strafford, Vermont

Re: Docket DMEA-1526 (Copper)
Contract Idm-E94
Elizabeth Mine
Orange County, Vermont

Dear Mr. Cowley:

Under the contract cited above the Government allotted a total of $51,382.00 for the exploration project and agreed to share 50 percent of the actual cost of the approved work. Your company claimed on the "Operator's Monthly Report and Voucher" a total cost of $34,832.51. The Contract Administration and Audit Division of this Administration in its final audit report of December 14, 1953, determined the total allowable cost of the project to be $34,832.51, and the Government's share at 50 percent participation to be $17,416.28.

The amount of $17,416.28 was, therefore, established on our books as an account receivable to be liquidated during a period of ten years from date of contract provided that sufficient ore would be marketed to make such payment at the rate of royalty established in the contract.

Your company, however, elected to repay the entire amount of the Government's advance immediately instead of waiting for the slower royalty earnings to retire the obligation. The amount of $17,416.28 was received from your company and deposited with the Treasurer of the United States on May 17, 1954, and our records have been adjusted accordingly. This is an unusual act on the part of our contractors. It has saved the Government money, time, and energy in bookkeeping, engineering, inspection, and other general overhead expenses.

I wish to express the sincere appreciation of this Administration for the patriotic and commendable manner in which the Vermont Copper Company performed its operations and obligations under DMEA contract No. Idm-E94.

With warmest personal regards,

Sincerely yours,

O Mittenzwey

Administrator

APPALACHIAN SULPHIDES, INC.
SOUTH STRATFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
FORM MF 103

 DATED May 7, 1957

6. Estimate of Costs

(a) Independent Contracts

Contract proposal by the E. J. Longyear Company, the lowest of three (3) bidders on the diamond drilling project, and to whom Appalachian expects to award the contract, provides for diamond drilling 11,400 feet of holes from 13 surface locations and 7,800 feet of holes from 10 underground locations, as shown on maps accompanying attachment 4 (c).

Surface Diamond Drilling:		
6,220 feet EX Core @ $2.40 Ft.	$14,928.00	
3,900 feet EX Core @ $2.65 Ft.	10,335.00	
1,000 feet EX Core @ $3.15 Ft.	3,150.00	
280 feet in Overburden @ $4.00 Ft.	1,120.00	
11,400 feet	$29,533.00	
Tro-pari and/or Acid Surveys - Estimated 114 Hours @ $6.00 per Hr. Delay Time Rate	$ 684.00	
Drilling Delays - Estimated 32 Hours @ $6.00 per Hr.	$ 192.00	
Total Surface	$30,409.00	
Underground Diamond Drilling:		
7,500 feet EX Core @ $2.40 Ft.	$18,000.00	
300 feet EX Core @ $2.60 Ft.	780.00	
7,800 feet	$18,780.00	
Tro-pari and/or Acid Surveys - Estimated 73 Hours @ $6.00 per Hr. Delay Time Rate	$ 468.00	
Drilling Delays including extra moving time over contract allowance - Estimated 32 Hours @ $6.00 per Hr.	$ 192.00	
Total Underground	$19,440.00	
19,200 Feet Total Contract Drilling		$49,849.00

(b) Labor, Supervision, Consultants, Other Geological & Drilling Costs

Geology and Engineering - Surveys for diamond drill stations & diamond drill holes, making necessary maps, logs of holes, reports, etc.			
Chief Geologist	150 days @ $27.00	$ 4,050.00	
Geologist	300 days @ $21.00	6,300.00	
Engineer	36 days @ $21.00	756.00	
Engineer	36 days @ $17.85	642.60	
	Total		$11,748.60
Automobile Mileage 1,500 miles @ 10¢			$ 150.00
Electromagnetic Surveys of 13 Surface D D. Holes @ $300.00 Each			$ 3,900.00
Access roads and preparing 13 surface diamond drill stations:			
208 Hours Caterpillar D-6 Tractor @ $8.50 per Hr. (Operator included)		$ 1,768.00	
208 Hours Laborers @ $1.60 per Hr.		332.80	
	Total		$ 2,100.80
Cutting underground diamond drill stations, moving drills to locations, extending air & water lines:			
360 Hours Miners @ $1.65			$ 594.00
Total Carried Forward			$68,342.40

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 5 - Page 2

DATED May 7, 1957

Total Brought Forward $68,342.40

(c) Operating Materials and Supplies:

Compressed Air for 2,960 Drill Hours underground @ 84¢ per hour (70 KWH 1.2¢)	$ 2,486.40	
720 Core Boxes @ $2.00	1,440.00	
2,000 feet of 2" Water Pipe @ 42¢ per foot	840.00	
Total		$ 4,766.40

(d) Operating Equipment:

1 - D-6 Caterpillar tractor with bulldozer blade, owned and will be furnished by Appalachian, @ $8.50 per hour charged to the project. Cost included in 6 (b) above. None

(e) Rehabilitation and repairs to existing building for diamond drill core storage will be done at our expense. None

(f) New Buildings, improvements, installations:

There are no new buildings, improvements or installations contemplated in the project. None

(g) Miscellaneous:

No cost of repairs to and maintenance of operating equipment, as such, are included in the Estimate of Costs. Equipment used and not furnished under the drilling contract will be charged to the project at specific rental rates, (6(b) above) None

Analytical work will be done in the Company's assay laboratory, with charges against the project on a per sample cost basis, Core splitting and sample preparation will be done by the engineering and geological staff, the labor estimate for which is included elsewhere. 200 Samples @ $1.00 each $ 200.00

Accounting will be done by the Company's present office staff, and no charge will be made against the project. None

Workmen's Compensation Insurance will be carried under the Appalachian present policy, for which the 1957 rate is $3.248 per $100.00 of payroll for the classifications involved in this project.

Estimated $12,600.00 Salaries and Wages @ $3.248/$100 $ 409.25

Employer's Liability Insurance is carried by Appalachian as Comprehensive General Public Liability Inaurance, with limits of $100/$500,000 for Bodily Injury and $200,000.00 for Property Damage. Insured with the Yorkshire Insurance Company, Policy No. CGL 614607. Coverage includes Independent Contractors clause. No charge will be made against the project for this coverage. None

Payroll Tax Rates are:

Social Security (Employer's Contribution)	2.25%	
Vermont Unemployment Compensation (Experience rated)	0.60%	
Federal Unemployment	0.30%	
Estimated $12,600.00 Salaries & Wages @	3.15%	$ 396.90

Totals Carried Forward $74,114.95

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 5 - Page 3

DATED May 7, 1957

	Total Brought Forward	$74,114.95
(h)	Contingencies:	
	Provision for possible 2,000 feet of additional diamond drilling within the proposed project area, which may be deemed advisable based on structural information obtained in the course of the proposed drilling program.	
	2,000 Ft. @ $2.40 - $3.15 per Foot $ 4,800.00	
	Provision for casing left in holes, necessity of some drilling with "AX" instead of "EX" equipment (Drilling contract specifies 25¢ per foot extra for "AX" core), explosives cutting underground stations, and miscellaneous materials and other valid project cost items not included above. $ 2,500.00 ?	
	Total	$ 7,300.00
	TOTAL ESTIMATED COST OF PROJECT	$81,414.95

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
FORM MF 103

Attachment No. 6

DATED May 7, 1957

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

(b) We propose to pay from our own funds, upon receipt of invoice, the cost of contract diamond drilling and any rental charges, including Company-owned equipment.

Salaries and wages, covering labor, supervision, etc., which are not included in the drilling contract, will be included in the Company's regular payrolls.

Materials and supplies not furnished under the drilling contract will either be issued to the project from our warehouse stock at cost, or will be purchased for the project by the Company.

Equipment owned and furnished by the Company will be charged at specified rental rates, or on an equitable cost basis, as in the case of compressed air, assaying, etc.

The Company is prepared to pay all costs of the project as they arise, subject to subsequent reimbursement by the Government for its share of the project costs.

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Project Summary Report

By: J. W. Alt September 4, 1958

1. Docket No. DMEA-4746 (Copper)
   Contract No. Idm-E1100

   Property: Elizabeth Mine
   Orange County, Vermont

   Operator: Appalachian Sulphides, Inc.
   South Stafford, Vermont

   Operator's Property Rights: Owner

2. Contract dated June 13, 1957. To complete - July 15, 1958.

Work Authorized

The purpose of the project is to explore for ores of copper by diamond core drilling, from both surface and underground locations, with such overburden drilling as may be necessary.

It is estimated that 28 drill holes will be drilled, the total combined footage not to exceed 19,200 feet of hole.

Estimated Costs of the Project

Actual Costs

Category (1) Independent Contracts

Drilling from Surface

Overburden drilling, 280 feet @ $4.00/ft.	$1,120.00	
Diamond drilling		
0- to 500-foot depth, 6,220 feet @ $2.40/ft.	14,928.00	
500- to 1000-foot depth, 3,900 feet @ $2.65/ft.	10,335.00	
1000- to 1500-foot depth, 1,000 feet @ $3.15/ft.	3,150.00	$29,533.00

Underground diamond core drilling

0- to 700-foot depth, 7,500 feet @ $2.40/ft.	$18,000.00	
750- to 1000-foot depth, 300 feet @ $2.60/ft.	780.00	$18,780.00

Tro-pari and/or acid surveys 192 hours @ $6.00/hr.	$1,152.00	
Drilling delays, 64 hours @ $6.00/hr.	384.00	$1,536.00
		$49,849.00

Fixed Unit Costs

Incidental allowance for each foot of surface drilling completed 11,400 feet @ $0.37/ft.	$4,218.00	
Incidental allowance for each foot of underground drilling completed 7,800 feet @ $0.69/ft.	5,382.00	
720 core boxes @ $2.00/each	1,440.00	
208 hours bulldozing @ $8.50/hr., including operator and all bulldozing costs whatsoever	1,768.00	
203 samples assayed @ $1.00/sample	203.00	$13,011.00

S U M M A R Y

Total Independent Contracts	$49,849.00
Total Fixed Unit Costs	13,011.00
Estimated Total Cost of Project	$62,860.00
Government Participation @ 50%	$31,430.00

Amendments

No. 1, agreed December 18, 1957.

In Exhibit "A," under :Estimated Costs of the Contract," the last item on page 3 is revised to read as follows:

"Depths in excess of 1,000 feet, 1,000 feet @ $3.15/ft. $3,150.00"

Work Completed

8 surface holes drilled - total footage	7,818 feet
16 underground holes drilled - total footage	6,084 feet
Total amount of drilling	13,902 feet
Total Cost of the Project	$46,143.97

This cost includes all costs, such as diamond drilling, bulldozing, overburden drilling, hole surveys, assays, and incidental allowances.

Three surface holes were uncompleted and abandoned after drilling, a total of 1,043 feet. The Government did not share in the cost of drilling the uncompleted holes.

Exploration under this contract started June 13, 1957, and was stopped on September 25, 1957.

The contract was terminated by the agreement, dated December 18, 1957, which became effective November 1, 1957.

3. Report of Review, dated February 13, 1958.

Total cost billed by Operator	$45,716.97
Exceptions	-0-
Accepted cost claimed by Operator	$45,716.97
Accepted costs not claimed	427.00
Total acceptable cost, if claimed	$46,143.97
Total payable, if claimed	$23,071.98

Operator's final report, dated November 1, 1957
Field Team final report, dated August 1958

4. Certification date: No certification was made as there was no discovery of ore.

5. Comments:

The Operator has an efficient and competent staff, who conducted this exploration in a highly satisfactory manner. This result is also partially due to previous experience in DMEA exploration and to the fact that further operation of the mine depended on results of this exploration.

About a month before completion of the last hole drilled, the Operator started to explore completed holes with Sharpe electro-magnetic drill hole equipment.

A total of ten DMEA drilled surface holes were explored with this equipment at the Operator's expense, in the hope of finding mineralized zones adjacent to completed drill holes. This survey was completed without success.

Copper mineralization in excess of one percent was intercepted in only four drill holes, all underground.

Shortly after completion of DMEA exploration, the mine was permanently closed. The mine was allowed to flood and all equipment has been removed.

Further exploration on this property with Government assistance is not warranted.

J. W. Alt

DMEA Form 17
Feb. 58

DEFENSE MINERALS EXPLORATION ADMINISTRATION

WORK COMPLETED ANALYSIS

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

Operator: APPALACHIAN SULPHIDES, INC.		Actual Cost	X
State: ORANGE COUNTY, VERMONT.		Agreed Unit Cost *	X
Final Report of Audit		Commodity: COPPER	Docket No. DMEA-4746
Final Report of Review	X		Contract No. Idm-E1100

Operation	Authorized by Contract and Amendments		Completed		Net cost after sale of Government Property
	Units	Cost	Units	Cost	
Drilling Delays--	144 hrs. @ $6.0/hr.	$ 864.00	135 hrs	$ 810.0	$ 810.00
Surface Diamond Drilling Overburden Drilling	160' @ $4.0/ft.	640.00	23'	92.0	
Surface Diamond Drilling (EX) 0'-500'	4,876' @ $2.4/ft.	11,702.40	2,977'	7,144.80	
Surface Diamond Drilling (EX) 500'-1,000'	3,900' @ $2.65/ft	10,335.00	2,800'	7,420.0	21,013.50
Surface Diamond Drilling Drilling (EX) 1,000'-1,500' (Specify)	2,024' @ $3.15/ft	6,375.60	2,018'	6,356.70	
Bulldozing-208 hours @ $8.50/hour. Surface Excavation *		1,768.00	54.5Hr	463.25	463.25
Underground Diamond Drilling-- 0'-750' 7,500' @ $2.4/ft		18,000.00	5,884'	14,121.60	
Underground D-Drilling-750'-1,000' 300' @ $2.60/ft.		780.00	200'	520.00	14,641.60
Tro-Pari and/or Acid Surveys * 192 Hours @ $6.00/hr.		1,152.00	152 hrs.	912.00	912.00
Incidental Allowance/ft. drilled * Surface Drill.-11,400' @ $0.37/ft.		4,218.00	7,818'	2,892.66	2,892.66
Incidental Allow./ft. drilled * Und.Gr.Drill.-7,800' @ $0.69/ft.		5,382.00	6,084'	4,197.96	4,197.96
Core Boxes--720 @ $2.00 each *		1,440.00	534	1,068.00	1,068.00
Assaying-203 samples @ $1.0 each * Other (Specify)		203.00	145	145.00	145.00
Totals		$62,860.00		$46,143.96 *	$46,143.97

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

Prepared by W. P. Klugescheid Date 2/10/59.

31398

☒ Audited C&PR 2/13/58. WORK ANALYSIS SHEET - DMEA PROJECT ☒ Actual Cost

☐ Certified No, Analysis as of Audit, Incl. Voucher for September 1957 * ☒ Agreed Unit Costs

Name APPALACHIAN SULPHIDES, INC. Docket No. DMEA-4746

State Orange County, Vermont. Commodity Copper Idm-E No. 1100

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units	COMPLETED Cost	NET COST
Drilling Delays--~~64 hours~~ @ $6.00/hr.	144 hrs.	864.00 ~~384.00~~	135 hrs	810.00	
Overburden Drilling 280' @ $4.00	160' ~~280'~~ @ $4.00/ft.	640.00 $ ~~1,120.00~~	23'	92.00	
Surface Diamond drilling EX 0'-500'	4876' ~~6,220'~~ @ $2.40/ft.	11,702.40 ~~14,928.00~~	2,977'	7,144.80	
Surface Diamond drilling (EX)500'-1,000'	3,900' @ $2.65/ft.	10,335.00	2,800'	7,420.00	
Drilling Diamond(Surface) (Specify)(EX)1,000'-1,500'	2,024' ~~1,000'~~ @ $3.15/ft.	6,375.60 ~~3,150.00~~	2,018'	6,356.70	
Bulldozing--208 hours @ $8.50/hour.			54.5	463.25	
Surface Excavation *		1,768.00			
Underground Diamond drilling--0'-750' 7,500' @ $2.40		18,000.00	5,884'	14,121.60	
Underground Diamond drilling--750'-1,000' 300' @ $2.60/ft.		780.00	200'	520.00	
Tro-pari and/or acid surveys--192 hours @ $6/hr.		1,152.00	152 hrs	912.00	
Incidental allowance/ft.drilled(surface) * 11,400' @ $0.37/ft.		4,218.00	7,818'	2,892.66	
Core Boxes--720 @ $2.00		1,440.00	534	1,068.00	
Incidental allowance/ft. drilled(Undgr) 7,800' @ $0.69/ft.		5,382.00	6,084'	4,197.96	
Other (Specify) 203 samples @ $1.00 ea.		203.00	145	145.00	
Totals		$62,860.00		$46,143.97	

Date of Contract--June 13, 1957.
Completion date July 15, 1958.
Expiration date of Royalty Payments June 13, 1967.
Amendment No. 1.--Changes allowance for one item.
Termination Agreement--dated December 18, 1957.
Operator's Final Report received November 25, 1957.

Prepared by [signature]

71626

Actual Costs

Surface Drilling -

Overburden Drilling 280' @ 4.00/ft.	1,120.00
Diamond Drilling (EX) 0-500' depth 6,220' @ $2.40/ft.	14,928.00
500'-1000' depth - 3,900' @ $2.65/ft.	10,335.00
1000'-1500' depth - 1,000' @ $3.15/ft.	3,150.00
Underground Drilling	
0'-750' depth 7,500' @ $2.40/ft.	18,000.00
750'-1000' depth 300' @ $2.60/ft.	780.00
Gro-pari and/or acid surveys 192 hrs @ $6.00/hr.	1,152.00
Drilling delays - 64 hrs. @ $6.00/hr.	384.00
	49,849.00

Fixed Unit costs

Incidentals allowance per foot drilled (Surface) 11,400' @ $0.37/ft.	4,218.00
Incidentals allowance per foot drilled (Underground) 7,800' @ $0.69/ft.	5,382.00
720 Core boxes @ $2.00 ea (wood)	1,440.00
208 hours bulldozing @ $8.50/hr	1,768.00
203 Samples assayed @ $1.00/sample.	203.00
	$ 62,860.00

Spent 1957 June, July, Aug, Sept.

Bulldozing	~~27.5~~ ~~52.50~~ 54.5 hrs @ 8.50	###	463.25 ~~233.75~~ ~~446.25~~ ~~42.50~~
Drilling delays @ $6.00/hr	~~54~~ ~~64~~ 135	###	810.00 ~~264.00~~ ~~384.00~~ ~~78.00~~
Survey stakes	~~44~~ ~~181~~ ~~33~~ 152 hrs @ $6.00/hr	###	912.00 ~~792.00~~ ~~216.00~~ ~~198.00~~
Core Boxes @ 2.00	~~283~~ ~~432~~ ~~102~~ 534	###	1068.00 ~~566.00~~ ~~876.00~~ ~~204.00~~
Surface D.D. 1000'-1500' @ $3.15	~~2018'~~ ~~1967'~~ ~~1833'~~ ~~1132'~~ ~~477'~~	###	6,356.70 ~~6,196.05~~ ~~3,565.80~~ ~~5,770.80~~ ~~1502.55~~
Lined Surface @ $0.57	~~6,582'~~ ~~7,467'~~ ~~7,818'~~ ~~13,271'~~ ~~4082'~~	###	3,892.66 ~~4,374.79~~ ~~1519.34~~ ~~2,000.47~~ ~~1410.17~~ ~~2,135.34~~
Surface D.D. 500'-1000' @ 2.65	~~2,800'~~ ~~2,350'~~ ~~7,041'~~ ~~25~~	###	7,420.00 ~~5,962.50~~ ~~2,458.65~~ ~~2,116.25~~
Lined Undgr. @ $0.64	~~4591'~~ ~~2474'~~ ~~7,019'~~ 6,084'	###	4,197.96 ~~1,914.06~~ ~~3,167.79~~ ~~1603.11~~
Undgr. D.D. 0'-750' @ $2.40	~~5,889'~~ ~~4,391'~~ ~~2,474'~~ ~~7,019'~~	###	14,121.60 ~~6,657.60~~ ~~10,538.40~~ ~~5,945.60~~
" " " 750'-1000' @ 2.60	200'	###	520.00
Overburden Drilling @ 4.00	~~74~~ ~~23'~~	###	92.00 ~~56.00~~
Surface D.D. 0-500 @ $2.40	~~1895'~~ ~~2,977'~~ ~~811'~~ ~~2,486'~~	###	7,144.80 ~~4,548.00~~ ~~5,466.40~~ ~~1,946.40~~
Sampling	~~47~~ ~~95~~ ~~144~~ @ 1.00 145	###	145.00 ~~95.00~~ ~~47.00~~ ~~144.00~~
	46,143.97 ~~45,716.97~~		~~45,537.45~~ ~~22,565.20~~ ~~36,946.48~~ ~~7,673.20~~

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION V

ELECTROTECHNICAL
EXPERIMENT STATION

P. O. BOX 217
NORRIS, TENNESSEE

OFFICIAL FILE COPY
O. M. E.
RECEIVED FEB 16 1959

DATE	INITIALS	CODE
2/16	C	110
		500
2/18		500

February 13, 1959

Memorandum

To: Jay L. Chambers, Office of Minerals Exploration Administration, Interior Building, Washington 25, D.C.

From: Administrative Assistant, Norris, Tennessee

Subject: Monthly reports and vouchers

We are enclosing two copies each of the following monthly reports and vouchers:

Idm-E1100 — Appalachian Sulphides, Inc.
Docket No. DMEA4746
6th and final payment
Amount $213.50

Idm-E1224 — Roland F. Beers, Inc.
Docket No. DMEA-4947
No payment - deficit

Helen Miller
Helen R. Miller

Attachments
/hbm
Copies to R. A. Laurence
V. J. Lynch
Norris files
Day files

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
ROOM 2-B POST OFFICE BLDG.
KNOXVILLE 2, TENN.

February 3, 1959

OFFICIAL FILE COPY
PAID ON VOUCHER & SCHEDULE
OF PAYMENTS O. M. E.
RECEIVED FEB 16 1959

DATE	INITIALS	CODE

Memorandum

To: Finance Officer, Region V - OME - Norris, Tennessee

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

Subject: DMEA-4746, Idm-E1100 (copper) Appalachian Sulphides, Inc. Elizabeth Mine Area, Orange County, Vermont

Enclosed is a letter from the Operator, forwarded from the Washington office with a request to process it for payment, claiming $213.50 as certified by a Report of Review dated January 20, 1958. The Field Team approves payment of this claim.

Robert A. Laurence

Robert A. Laurence

Amount: $ 213.50

Signature: Helen R. Miller

Date: FEB 13 1959 Vou.No.: 87

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

OFFICIAL FILE COPY
O. M. E.
RECEIVED FEB 16 1959

DATE	INITIALS	CODE

JAN 30 1959

Mr. Robert A. Laurence
Executive Officer
OME Field Team, Region V
Room 2-B, Post Office Building
Knoxville 2, Tennessee

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine Area
Orange County, Vermont
Contract No. Idm-E1100

Dear Mr. Laurence:

Enclosed is the original of a letter dated January 27, 1959, from the referenced Operator claiming the amount $213.50, which was certified by a Report of Review dated January 20, 1958, as payable if claimed.

It is requested that a voucher, using this letter as supporting documentation, be processed for payment.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

Enclosures

APPROVED:

C. T. Barrel
Member, Bureau of Mines

L. E. Lehrer
Member, Geological Survey

RECEIVED
FEB - 2 1959
U. S. Geological Survey
Geology Division
Knoxville, Tenn.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - Ex. Strafford 5-2411

OFFICIAL FILE COPY
O. M. E.
RECEIVED FEB 16 1959

DATE	INITIALS	CODE

OFFICIAL FILE COPY
1959 O. M. E.
RECEIVED JAN 30 1959

DATE	INITIALS	CODE
1/30	C	220

January 27, 1959

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

Dear Sirs:

According to our records there is an unpaid balance of $213.50 due from D. M. E. A. representing the Government's 50% share of certain additional accepted costs under DMEA #4746, Contract No. IdmE-11. We enclose a photocopy of the report or review by E. B. Talbot, auditor, dated January 20, 1958 in which this item was approved for payment if claimed by us. The amount was included in our amended final report which we filed after receipt of auditor's report or review.

In connection with our annual audit we shall appreciate your informing our accountants, Smith, Batchelder, Smith, Rugg and Darling, Norwich, Vermont, whether your records are in agreement and that the amount ultimately will be paid.

Very truly yours,

Clarence B. Benson

Clarence B. Benson
Asst. Treasurer & Vt. Manager

CBe/bm

Encl.

cc: William C. Rugg, Norwich, Vermont

RECEIVED
FEB - 2 1959
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

OFFICIAL FILE COPY
O. M. E.
RECEIVED JAN 30 1958

DATE	INITIALS	COPY

OFFICIAL FILE COPY
O. M. E.
RECEIVED FEB 16 1959

DATE	INITIALS	COPY

DEPARTMENT MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF REVIEW

I have reviewed the Monthly Reports of:

Appalachian Sulphides, Inc.

South Strafford, Vermont

pertaining to Exploration Project Contract No. IAr-21100, DMEA No. 4746, including Amendment No. 1, for the months of June 1957 to September 1957, inclusive, covering a project for the exploration of copper on property, known as the Elizabeth Mine Area located in Orange County, Vermont.

My review included an examination of the Monthly Reports (Form MT-104) and supporting documents attached thereto, comparison of the costs claimed with the contract and pertinent schedules, verification of work performed by reference to field team reports and correspondence, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the reasons given in the attachment to this report.

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

Total cost as billed by Operator		$45,537.65
Exceptions:		
Prior to this review	-0-	
Herewith	-0-	-0-
Total Accepted cost claimed		$45,537.65
Additional acceptable cost, if claimed, per schedule attached		427.00
Total acceptable cost, if claimed		$45,964.65

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payments to the Operator by the Government as follows are valid and proper:

On cost claimed	$22,768.72
On additional cost, if claimed	213.50
Total amount payable, if claimed	$22,982.22
Amount payable on audited claim	$22,768.72
Amount reimbursed	18,473.24
Balance Due Operator	$ 4,295.48
Additional payable, if claimed	$ 213.50

/s/ E. B. Talbert, Auditor

January 20, 1958

Reasons for Report of Review in lieu of a final audit:

(a) the Monthly Reports were supported by documentary proof of that portion ($37,216.45) of the costs which covered work performed at unit rates under independent contract;

(b) the balance ($8,748.00) of the accepted costs was under a contract provision for payment by the Government on the basis of fixed unit costs of work actually performed; and

(c) the administrative cost to the Government of an audit would be excessive in relation to the estimated amount of possible further exceptions thereunder.

Additional acceptable costs, if claimed by Operator:

(a)	Drilling delays invoiced by drilling contractor and accepted by Field Team as reasonable	135 hrs. @ $6.00	$810.00	$
	Claimed by Operator	64 hrs. @ 6.00	384.00	$426.00
(b)	Samples assayed per drill logs and confirmed by Field Team	145 ea. @ $1.00	$145.00	
	Claimed by Operator	144 ea. @ 1.00	144.00	$ 1.00
		Total		$427.00

FEB - 5 1969
RECEIVED

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
2/2	Talbert	800
2/2	Chambers	800
	Grunwald	500
		500
2/3	Selfridge	120
		100
		220

FEB 3 1959

Smith, Batchelder, Smith, Burg and Darling
Norwich, Vermont

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Contract No. Idm-F1100

Gentlemen:

As requested by letter of January 27, 1959, from the Appalachian Sulphides, Inc., you are advised that the records of this office confirm that a balance of $213.50 is due that company under the referenced contract.

The letter has been forwarded to the Executive Officer, OME Field Team, Region V, Room 2-B, Post Office Building, Knoxville 2, Tennessee, with a request that the amount be paid.

Sincerely yours,

(signed) FRANK E. JOHNSON (RR)
Acting Director

EDTalbert/GMcC
February 2, 1959

cc: Docket
Director's Reading File
Mr. Chambers
Mr. Robert A. Laurence
Appalachian Sulphides, Inc.
Mr. Frank Johnson

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
1/30	Talbert	800
1-30	Chandler	800
	Assured	~~900~~
		500
1/30	GCS	130
"	Johnson	100
		216
2/2	C	220

JAN 30 1959

Mr. Robert A. Laurence
Executive Officer
OSF Field Team, Region V
Room 2-E, Post Office Building
Knoxville 2, Tennessee

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine Area
Orange County, Vermont
Contract No. 14-[illegible]

Dear Mr. Laurence:

Enclosed is the original of a letter dated January 27, 1959, from the referenced Operator claiming the amount $213.50, which was certified by a Report of Review dated January 27, 1958, as payable if claimed.

It is requested that a voucher, using this letter as supporting documentation, be processed for payment.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (216)

Enclosures

cc: Docket
Director's Reading File
Operating Committee
THKiilsgaard
ADMcMahon
Mr. Chambers
Mrs. Helen Miller
~~Appalachian Sulphides, Inc.~~
~~Smith, Batchelder, Smith, Rugg & Darling~~

APPROVED:

C. J. Barosh (216)
Member, Bureau of Mines

N. E. Nelson (216)
Member, Geological Survey

EDTalbert/GMcC
January 30, 1959

8623

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - So. Strafford 5-2411

January 27, 1959

OFFICIAL FILE COPY
D M E.
JAN 29 1959

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

Dear Sirs:

According to our records there is an unpaid balance of $213.50 due from D. M. E. A. representing the Government's 50% share of certain additional accepted costs under DMEA #4746, Contract No. IdmE-11. We enclose a photocopy of the report or review by E. B. Talbot, auditor, dated January 20, 1958 in which this item was approved for payment if claimed by us. The amount was included in our amended final report which we filed after receipt of auditor's report or review.

In connection with our annual audit we shall appreciate your informing our accountants, Smith, Batchelder, Smith, Rugg and Darling, Norwich, Vermont, whether your records are in agreement and that the amount ultimately will be paid.

Very truly yours,

Clarence B. Benson
Asst. Treasurer & Vt. Manager

CBB/hm

Encl.

cc: William C. Rugg, Norwich, Vermont

OFFICE COPY
DMEA
RECEIVED AUG 25 1958

DATE	INITIALS	CODE
8/25	C	220
1	Gro	500
		225

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

August 22, 1958

~~Memorandum~~

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

From: Commodity Specialist, Branch of Base Metals

Subject: Field Team's Final Report, Docket No. DMEA 4746 (Copper), Appalachian Sulphides, Inc., Elizabeth Mine, Orange County, Vermont

The contract provided for core drilling 11,400 feet in 13 holes from surface and 7,800 feet in 15 underground holes. Work completed amounted to 7,818 feet in 8 holes drilled from surface and 16 underground holes totaling 6,084 feet. The mineralization penetrated by this drilling did not constitute an economic orebody and the contract was terminated by mutual agreement.

The Examiners conclude that the work completed under the contract did not discover ore and do not recommend that a Certificate of Discovery be issued. I concur in their conclusion.

A. D. McMahon

A. D. McMahon

Copy to: Division of Minerals
Branch of Base Metals (2)
Files
Thor Kiilsgaard, U.S.G.S.
F. D. Lamb

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

OFFICIAL FILE COPY
DMEA
RECEIVED AUG 18 1958

DATE	INITIALS	CODE
8-18	J.J.g.	325
8/18	JB	130
"		110
8/22	JB	130
8/25	C	220
9/2		500

August 15, 1958

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: Final Report, DMEA-4746, Idm-E1100 (copper)
Appalachian Sulphides, Inc. Elizabeth Mine,
Orange County, Vermont

Enclosed are the original and two copies of the Field Team Final report on the subject exploration project.

Unfortunately no ore was discovered, and we agree with the Field Examiners' recommendation that certification of discovery should not be issued. Notice of no certification was sent to the Operator on July 14, 1958.

Ft. Final Report

Robert A. Laurence
Robert A. Laurence
Executive Officer, DMEA, Reg.V

Wm. A. Beck
Wm. A. Beck, for V. J. Lynch
Member, Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE
8-22-58
(date)

DMEA
RECEIVED AUG 18 1958

DATE	INITIALS	CODE
8/22	2/12	130
		220

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

FIELD TEAM FINAL REPORT
REGION V

On

DMEA-4746, Idm-E1100 (copper) ELIZABETH MINE
Orange County, Vermont

By

H. L. Burmeister, Mining Engineer
U. S. Bureau of Mines (DMEA)

and

W. P. Williams, Geologist
U. S. Geological Survey
(DMEA)

Reviewed by
DMEA OPERATING COMMITTEE
8-22-58
(date)

August, 1958

FIELD TEAM'S FINAL REPORT ON COMPLETED CONTRACT

DMEA 4746 (Copper)
Contract Idm-E 1100
Appalachian Sulphides, Inc.
South Strafford, Vermont
Elizabeth Mine, Orange County, Vt.

Summary

The purpose of the exploration was to discover by both surface and underground core drilling, if copper ore bodies existed in the footwall of the Elizabeth vein.

The contract provided for core drilling a total of 11,400 feet from the surface, in an estimated 13 holes. These holes were to be drilled in 5 vertical east-west planes spaced at north-south intervals of 1,358 feet, 2,100 feet, 3,100 feet and 1,100 feet. The contract also provided for underground core drilling a total of 7,800 feet in an estimated 15 holes. The underground holes were to be located in 7 east-west vertical planes spaced on north-south intervals of 816 feet, 1,200 feet, 400 feet, 600 feet, 900 feet and 1,100 feet.

During the course of the contract, the proposed locations and lengths of a number of holes were changed in the light of data obtained in drilling preceding holes.

The contract was terminated by mutual agreement effective November 1, 1957, after completion of 8 holes drilled from the surface for a total of 7,818 feet and 16 underground holes for a total of 6,084 feet. One old underground hole was deepened. Three surface holes totaling 1,043 feet were uncompleted and abandoned at no cost to the Government.

Copper mineralization in excess of 1 percent was intercepted in only four drill holes, all underground. Three of these intercepts, all of narrow width, were on drilling plane or section 12,400 N. Mutual agreement to terminate the contract was based on the fact that ore which could be considered economic in the foreseeable future had not been discovered. It was agreed that further expenditure of funds was not justified.

Shortly after completion of DMEA exploration, the mine was permanently closed. The mine was allowed to flood and all equipment has been removed.

The total acceptable cost of this contract is $46,143.97 of which the Government's share is 50 percent or $23,071.99.

Geology And Ore Deposits

The Elizabeth mine is the southernmost mine of the Vermont Copper Belt, an area 20 miles from north to south and about 2 miles wide. The Belt contains three mines that have produced copper ore as well as six known, non productive sulfide deposits.

The ore deposits of the Vermont Copper Belt are found in two rock formations, the Waits River and the overlying Gile Mountain. Both formations are of Paleozoic age. The Elizabeth mine is in the Gile Mountain formation. The Gile Mountain formation is composed mostly of garnet-bearing biotite schist. The rock is relatively coarse grained with well developed cleavage. Accessory

minerals are epidote, apatite, sphene, hornblende, and cordierite. The schist contains local discontinuous beds of quartzite and lenses of pegmatite. Where the rocks are rich in hornblende they are commonly known as "amphibolite".

In the open cut and in the south workings of the Elizabeth mine there is a gneissic rock that is well banded in layers of coarse and fine crystals. The gneiss may be a metamorphosed volcanic rock.

All the rocks in the vicinity have been much deformed. The well developed schistosity strikes about N.7°E. and dips about 63° southeast. Major and minor folds plunge gently northward at most places. Locally, horizontal crests and southerly plunges may be found.

The latest stage of deformation is represented by a fault along which the Elizabeth vein extends. The amount and direction of movement on the fault is unknown. Local minor faults cut the rocks at wide intervals. Faults of both pre-ore and post-ore age are known.

The main ore shoot follows the folding in the rock and plunges northerly. The plunge flattens, however, and becomes gently southerly in the northern end of the mine. The main ore shoot measured over 6,000 feet in pitch length, and averaged about 20 feet in width. At some places the ore reached thicknesses of fifty feet or more.

The ore at the Elizabeth mine consisted of a massive aggregate of pyrrhotite and chalcopyrite with a gangue of silicate and carbonate. The approximate composition of the ore was as follows: quartz 15 percent, feldspar 15 percent, mica 10 percent, pyrrhotite 53 percent, and chalcopyrite 7 percent. The ore contained about 0.5 percent of zinc, as sphalerite. All gradations of ore were found, frommassive sulfide without gangue to schist with scattered grains of pyrrhotite or chalcopyrite.

The footwall in most parts of the mine is well defined. Immediately above the footwall there often was massive sulfide, or as much as 6 feet of strongly altered schist containing tourmaline, carbonate, actinolite, and disseminated sulfide. The hanging wall boundary of most places was gradational and was marked by interfingering of schist and sulfide stringers.

Recommendations

This exploration program did not discover ore; and the examining team does not recommend that a certification of the project be made. Further exploration is considered unjustified.

Description Of Work Completed

Exploration under this contract started June 13, 1957, and was stopped on September 25, 1957.

During the course of this contract there were completed with Government participation, 8 surface drill holes for a total of 7,818 feet and 16 underground drill holes for a total of 6,084 feet. Three surface holes were uncompleted and abandoned after drilling a total of 1,043 feet. The Government did not share in the cost of drilling the uncompleted holes.

All holes both surface and underground, were drilled EX size and on one of eight east-west planes which were at North-south intervals of 3,450 feet, 700 feet, 500 feet, 300 feet, 700 feet, 900 feet, and 1,000 feet.

All surface holes were drilled with truck mounted wireline equipment and underground holes were drilled with air powered machines. Abandonment of the three surface holes was necessary because of excessive decrease in vertical angle, probably caused by the drill runner's attempt to make footage. The longest completed surface hole was S-1008 which bottomed at 1551 feet and had a total vertical deflection from collar to bottom of 49 degrees. The second longest surface hole completed was S-1002 which bottomed at 1450 feet and had a total vertical deflection from collar to bottom of 52 degrees. Vertical deflection of underground holes was very small.

About a month before completion of the last hole drilled, the Operator started to explore completed holes with Sharpe electro-magnetic drill hole equipment. A total of ten DMEA drilled surface holes were explored with this equipment at the Operator's

expense, in the hope of finding mineralized zones adjacent to completed drill holes. This survey was completed without success. Many of the 144 core assays made indicated only traces of copper.

Expenditures

Total approved	$62,860.00
Total Gov't. acceptable cost	46,143.97
Government's share of acceptable cost at 50%	23,071.99
Government's share unexpended	8,358.02
Value of production during exploration	None
Royalty due the Government	None

Efficiency and Competency of Operator

The Operator has an efficient and competent staff, who conducted this exploration in a highly satisfactory manner. This result is also partially due to previous experience in DMEA exploration and to the fact that further operation of the mine depended on results of this exploration.

Equipment Purchased For Project

No equipment was purchased under the terms of the contract.

Selected References

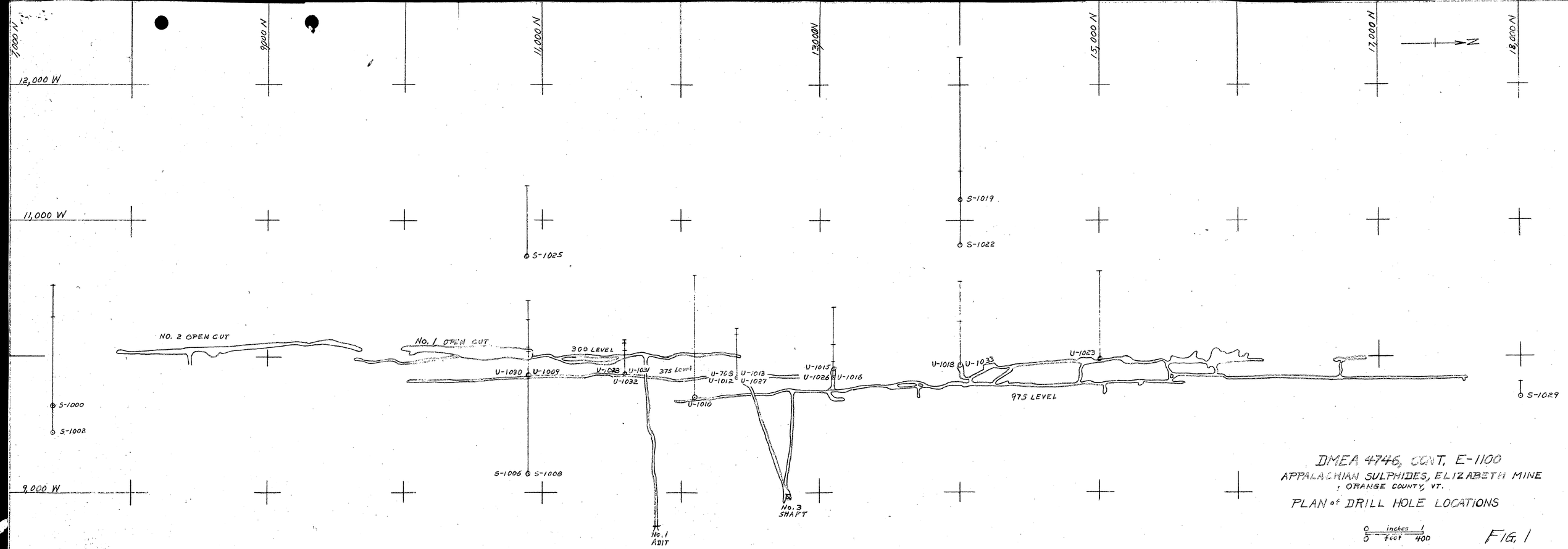
1. McKinstry, H. E. and Mikkola, A. K., The Elizabeth Copper Mine, Bull., Economic Geology, Vol. 49, No. 1, pp. 1-30, 1954.

2. White, W. S., Eric, J., et al, unpublished, Open File geologic reports, Mineral Deposits Branch, U. S. Geological Survey, 1942.

H. L. Burmeister
U. S. Bureau of Mines

W. P. Williams
U. S. Geological Survey

August, 1958



DMEA 4746, CONT. E-1100

APPALACHIAN SULPHIDES, ELIZABETH MINE

ORANGE COUNTY, VT.

PLAN of DRILL HOLE LOCATIONS

0 inches 1
0 feet 400

FIG. 1

Feb. 1958 HB

OFFICIAL FILE COPY
D M E A
RECEIVED AUG 18 1958

DATE	INITIALS	CODE

OFFICIAL FILE COPY
D M E A
RECEIVED AUG 18 1958

DATE	INITIALS	CODE

FIG-1

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
7/11	Griswold	500
7-11	Chambers	800
	Martin	120
7/14	Johnson	110
7/14	Mittendorf	100
7/15	C	220
		500

JUL 14 1958

Mr. Clarence B. Benson
Assistant Treasurer
Appalachian Sulphides, Inc.
South Strafford, Vermont

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine Area
Orange County, Vermont
Contract No. Idm-E1100

Dear Mr. Benson:

Reference is made to your terminated exploration contract with the Government.

We sincerely regret that the work performed did not result in a certification of discovery or development under the provisions of the contract. In the absence of such certification, the Government retains no claim or lien against the property subject to the contract or any future production therefrom. We, therefore, are closing our books and records on this project. Your attention, however, is called to the provisions of the contract which require the Operator to keep and preserve records for the period indicated.

Your interest in the Defense Minerals Exploration Administration exploration program and participation therein are fully appreciated.

Sincerely yours,

C. O. Mittendorf (for)

Administrator
WRGriswold/er 7/11/58
Copy to: Docket
Admr R File
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Mr. Chambers, DMEA
Region V (2)
Chron

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
2/13	Talbert	800
2/18	C	220
2/19	[illegible]	500

FEB 14 1958

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

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine Area
Orange County, Vermont
Contract No. Idm-[illegible]100

Dear Mr. Laurence:

As requested by your memoranda of February 11, 1958, a Revised Report of Review has been prepared. The original and three copies for normal distribution are enclosed.

The revised August 1957 and the final forms MF-104 submitted with your memoranda are enclosed.

Sincerely yours,

(Signed) E.L.D. Talbert

for Jay L. Chambers, Director
Contract Administration
and Audit Division

Enclosure

EDTalbert/wb
February 13, 1958

Copy to: Docket
Admr. Reading File
Helen R. Miller
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 FEB 12 1958

DATE	INITIALS	CODE
7/13	[illegible]	500

February 11, 1958

Memorandum

To: Jay L. Chambers, Contract Administration - DMEA

From: Acting Executive Officer, DMEA - Region V - Knoxville

Subject: Completion of DMEA-4746, Idm-E1100(copper)
Appalachian Sulphides, Inc. South Strafford, Vt.
Elizabeth Mine, Orange County, Vermont.

Work on the subject contract has been terminated as of December 18, 1957. An amendment has been received which allows for drilling beyond 1500 feet. This is Amendment No. 1 dated December 18, 1957.

The following units of work have been acceptably performed:

1. A total of 54.5 hrs. of dozer work has been completed.

2. Diamond drilling has been completed as follows:
   (a) Overburden drilling..... 23 feet
   (b) Surface drilling 7795 "
   (c) Underground drilling 6084 "
   Total... 13902 "

3. A total of 145 assays were made (determined by counting sample numbers).

4. Delays amounting to 135 hrs, appears to be reasonable.

An acceptable final geological and engineering report has been received. A report of review is requested.

R. A. Laurence
Executive Officer, DMEA, Reg.5

VJL/sm
cc
Lynch

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

EXTRA COPY
DMEA
RECEIVED FEB 13 1958

DATE	INITIALS	CODE
2/13	[illegible]	500

February 11, 1958

Memorandum

To: Jay L. Chambers, Director Contract Administration and Audit Division - DMEA

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

Subject: Completion of DMEA-4746, Idm-E1100-copper. Appalachian Sulphides, Inc. Elizabeth Mine, Orange County, Vermont.

On December 26, 1957 we requested a Report of Review on the subject contract. In tabulating the number of feet of diamond drilling we did not include 51 feet which had been disallowed, but subsequently authorized by Amendment No. 1. The surface drilling would therefore amount to 7795 feet and total feet of diamond drilling would be 13,902 feet. We are enclosing a new request for a report of review.

There is also enclosed the Operator's Monthly Report and Voucher in which claim is made for payment for the 51 feet of drilling. He has not as yet requested payment for delays and sampling which amount to $426.00.

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

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

VJL/zm
cc
Opr. Com.-2
Finance Office
Lynch
Files

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
1/23	Tolbert	800
"	Chandler	800
1/24	Dmea-4674	500
1/24	George C. Selfridge	130
"	Johnson	110
"	Gillendorf	100
1/27		220
		500

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

JAN 24 1958

Re: Docket No. DMEA-4674 (Zinc-Lead-Copper)
The New Jersey Zinc Company
Bonburnt Area
Buckingham County, Virginia
Contract No. Idm-E1103
and
Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont
Contract No. Idm-E1100

Dear Mr. Laurence:

Your memorandum of January 20, 1958, requests clarification of the meaning of the second paragraph of Article 6 (a) of contract form MF-200 (Revised June 1954). Your request is occasioned by the two, apparently to you, conflicting decisions on the referenced contracts as rendered by this Committee and the Contract Administration and Audit Division, respectively.

Actually there is no conflict. This Committee's letter of November 14, 1957, in reference to Docket DMEA-4674, pertains to the specifications of the work, as set forth in the "Description of the Work" portion of Exhibit "A", to be performed in accordance with Article 3 of the contract. The Division's letter of January 8, 1958, in reference to Docket DMEA-4746, deals with the "Estimated Costs of the Project" portion of Exhibit "A", which costs are defined and limited by Article 6 of the contract.

The work description under Contract Idm-E1103, Docket DMEA-4674, provided that "A fence of 6 holes shall be drilled ****." This was a definite specification. There was no authority, without amendment of the contract, for the Government to contribute to the costs of a seventh hole even though no maximum cost under Article 6 was exceeded.

On the other hand, the work description under Contract Idm-E1100, Docket DMEA-4746, contained no specifications as to the number of hours of drilling delays, because such were not items of work but

8623

costs incurred in connection with the performance of the drilling work. The 64 hours of delays, as estimated in the costs portion of Exhibit "A", were specified in neither Article 6 nor Exhibit "A" as a maximum, but the unit costs of the delays were maximums under Article 6.

Reference to Section III, pages 8-21 and the appendix following page 21, of the manual "Audit Procedure for Exploration Work under DMEA Exploration Contracts" may be of further assistance in clarification of this matter. Also, it is understood that a DMEA auditor will be visiting your office in the near future. He undoubtedly can help in resolving any additional questions you may have.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (HB)

APPROVED:

Frank D. Lamb (HB)

Member, Bureau of Mines

Thor H. Kiilsgaard (HB)

Member, Geological Survey

EDTalbert/wb
January 23, 1958

Copy to: Docket (2)
Admr. Reading File
Operating Committee
Mr. Bishop, USBM
Mr. McMahom, USBM
Mr. Kiilsgaard, USGS
Mr. Chambers
Helen R. Miller

OFFICIAL FILE COPY

Date	Surname	Code
1/21	Talbert	800
1/21	C	220
21	WRS.	500

JAN 21 1958

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

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine Area
Orange County, Vermont
Contract No. Idm-E1100

Dear Mr. Laurence:

There are enclosed an original and three copies of a Report of Review in lieu of a final audit of the referenced project.

If you concur with the facts stated in this Report of Review, the original and one copy should be released to the regional finance officer, one copy should be forwarded to the Operator, and one copy should be retained in your files. If for any reason you do not concur, please return the original and three copies to this Division with your comments.

Sincerely yours,

(Signed) J. L. Chambers

Jay L. Chambers, Director
Contract Administration
and Audit Division

Enclosure

EDTalbert/wb
January 21, 1958

Copy to: Docket
Admr. Reading File
Helen R. Miller
Mr. Chambers

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UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
XXXXXXXXXXXXXXXXXXXX
Room 13, Post Office Bldg.
Knoxville 2, Tenn.

January 20, 1958

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: Designation of "Maximums" in Contracts.

We need some clarification of the meaning of the second paragraph of Article 6 (a) of the long form contract, MF-200 (Revised June 1954). We are not sure what is meant by "to the extent specified" because of two apparently conflicting decisions.

In your letter of November 14, 1957 relative to DMEA-4674, Idm-E1103, you pointed out that "a fence of six holes" designates a maximum because it was not "a fence of approximately six holes." However, in a letter dated January 6, 1958, Mr. Talbert, referring to DMEA-4746, Idm-E1100, states that "neither Article 6 of the contract nor Exhibit 'A' provide that the estimate of 64 hours for drilling delays is a maximum." However, the wording in Exhibit 'A' is simply "Drilling delays, 64 hours @ $6.00/hr.", therefore we considered this to be a maximum and disallowed the excess over 64 even though the excess is considered reasonable and necessary. We do not find the word "approximately" used in connection with this item.

Please advise just what is necessary to interpret an item under actual costs as a maximum, and what wording implies that an item is not a maximum.

Robert A. Laurence
Executive Officer, DMEA
Region V

V. J. Lynch, Member
Bureau of Mines

RAL/zm
Lynch
Files

Operating Com. - 2

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

WASHINGTON 25, D.C.

RECEIVED JAN 20 1958
DATE 1/17 COPY 500

January 17, 1958

Memorandum

TO: E. D. Talbert, Acting Director, Contract Admin. and Audit Division - DMEA

From: Field Team, Region V - Knoxville, Tennessee

Subject: DMEA-4746, Idm-E1100 (copper) Elizabeth Mine, Orange County, Vermont. Appalachian Sulphides, Inc.

This is with reference to your letter of January 8. The Field Team believes that drilling delays amounting to 135 hours on a project the size of the subject contract is reasonable.

Robert A. Laurence
Executive Officer

V. J. Lynch, Member
Bureau of Mines

VJL/sm
cc: Lynch
Finance
Files

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5)

OFFICIAL FILE COPY

Date	Surname	Code
1/8	Talbert	800
1/9	gb	220
1/9		~~500~~

JAN 8 1958

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

Re: Docket No. DMFA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont
Contract No. Idm-E1100

Dear Mr. Laurence:

By memorandum dated January 6, 1958, you have confirmed the units of work acceptably performed under the referenced contract and requested the issuance of a Report of Review in lieu of a final audit. However, before preparing the Report of Review clarification of one item is necessary.

Your memorandum states, in part, that the "Hours of delay amounts to 64, the maximum allowed by the contract", whereas neither Article 6 of the contract nor Exhibit "A" provide that the estimate of 64 hours for drilling delays is a maximum. It is to be noted that Article 6 (a) provides that any excess over any estimate, either as to requirement or related cost, not specified as a maximum shall be allowable within the estimated total allowable cost of the project provided that such excess is a direct, reasonable, and necessary cost of the work.

Although the Operator claimed only 64 hours of delays, apparently under the mistaken impression that such was the maximum allowed by the contract, the audit review disclosed that the drilling contractor incurred and charged the Operator for 135 hours. Accordingly, it appears that the Government possibly should contribute to the costs of delays in excess of 64 hours to the extent that the Field Team accepts such delays as being reasonable and necessary in connection with the acceptable drilling.

Your comments and recommendations would be appreciated.

Sincerely yours,

(Signed) E. D. Talbert

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

EDTalbert/wb
January 8, 1958

Copy to: Docket
Admr. Reading File
Helen R. Miller
Mr. Chambers
Mr. Talbert

8623

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 1250 FEDERAL BLDG.
KNOXVILLE 2, TENN.

January 6, 1958

RECEIVED JAN 8 1958
DATE | INITIALS | CODE
1/8 | WRB | 500

Memorandum

To: Jay L. Chambers, Director Contract Administration and Audit Division - DMEA - Washington

From: Acting Executive Officer, DMEA - Region V - Knoxville

Subject: Completion of DMEA-4746, Idm-K1100(copper) Appalachian Sulphides, Inc. South Strafford, Vt. Elizabeth Mine, Orange County, Vermont.

Work on the subject contract has been terminated as of December 18, 1957. An amendment has been received which allows for drilling beyond 1500 feet. This is amendment No. 1, dated December 18, 1957.

The following units of work have been acceptably performed:

1. A total of 54.5 hours of dozer work completed.

2. Diamond drilling has been completed as follows:
   (a) Overburden drilling.....23 feet
   (b) Surface drilling..... 7795* "
   (c) Underground drilling ..... 6084 "
   Total 13902 "

3. A total of 145 assays were made (determined by counting sample numbers).

4. Hours of delay amounts to 64, the maximum allowed by the contract.

An acceptable final geological and engineering report has been received. A report of review is requested.

* Surface drilling as shown here includes the 51 feet deducted previous to Amendment No. 1.

V. J. Lynch

VJL/mm
cc
Lynch -Burmeister-Files Operating Committee 2

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

OFFICIAL FILE COPY
DMEA
RECEIVED JAN 2 1958

DATE	INITIALS	CODE
1/2/58	C	220
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December 30, 1957

Memorandum

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

From: Acting Executive Officer, DMEA - Region V

Subject: Signed Amendment No.1. Idm-E1100, DMEA-4746 (copper) Appalachian Sulphides, Inc. South Strafford, Vt. Elizabeth Mine, Orange County, Vermont.

Attached are two copies of the subject signed amendment no.1 to the subject contract.

The usual distribution of the other copies has been made by this office.

V. J. Lynch

V. J. Lynch

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

OFFICIAL FILE COPY
DMEA
RECEIVED JAN 2 1958

DATE	INITIALS	CODE
1/2/58	C	220
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December 30, 1957

Memorandum

To: Operating Committee, DMEA - Washington

From: Acting Executive Officer, DMEA - Region V

Subject: Termination Agreement - Idm-E1100, DMEA-4746(copper)
Appalachian Sulphides, Inc. South Strafford, Vt.
Elizabeth Mine, Orange County, Vermont.

Attached are two signed copies of the subject termination agreement.

The usual distribution of the other copies has been made.

DMEA
DATE | INITIALS | CODE

V. J. Lynch

V. J. Lynch

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

GENERAL FILE COPY
DMEA
RECEIVED DEC 30 1957
DATE | TELEPHONE | FILE
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December 27, 1957

United States Department of the Interior
Defense Minerals Exploration Administration
Room 13 Post Office Building
Knoxville 2, Tenn.

Att: Mr. V. J. Lynch, Acting Executive Officer, DMEA-Region V

Re: DMEA-4746, Idm-E1100(copper)
Appalachian Sulphides, Inc.
Elizabeth Mine, Orange County,
Vermont.

Dear Mr. Lynch:

We return to you herewith 4 signed copies each of Amendment No.1 to the subject contract and Agreement terminating the contract, having retained the "Operators" copy of each, in accordance with your letter dated December 23, 1957.

Very truly yours,

John F. Cowley

John F. Cowley
General Manager

JFC:th

Encl.

COPY

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
12/17	[illegible]	500
12-17	Chambers	800
12/18	[illegible]	130
"	Johnson	110
"	[illegible]	100
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DEC 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-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont
Contract No. Idm-E1100

Dear Mr. Laurence:

With reference to your December 2 memorandum, we are enclosing the original and four copies of a Termination Agreement to the cited contract. Likewise, with reference to your memorandum of the same date regarding payment for certain diamond drilling elements, we are enclosing the original and four copies of a proposed Amendment No. 1 to the contract.

Both instruments have been signed by the Administrator, for the Government. If they meet with your approval, please present them to the Operator for approval and signature and, when completed, distribute all the copies in the usual manner. If they do not meet with your approval and if any proposed change should lie beyond your delegated authority, all copies should be returned to us with your recommendations.

Two extra copies each of the agreement and amendment are enclosed for the use of the Field Team.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JLB)

Enclosures
APPROVED:

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

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

WRGriswold/er 12/17/57
Copy to: Docket
Admr R File
Mr. McMahom, USBM
Op. Committee
Mr. Kiilsgaard, USGS
Chron.

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OFFICIAL FILE COPY

Date	Surname	Code

December 17, 1957

Memorandum for the Files

From: Director, Division of Base Metals

Subject: Justification for Termination Agreement for Docket No. 4746, Appalachian Sulphides, Inc., Elizabeth Mine, Orange County, Vermont, Contract No. Idm-E1100 (copper).

Results of the program were completely negative. Actually, practically all drilling provided for in the contract was completed. However, since some of such drilling was done on the Operator's account, rather than under the contract, we are making a Termination Agreement for technical reasons.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Chron.

8623

OFFICIAL FILE COPY

Date	Surname	Code

500

December 9, 1957

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Director, Division of Base Metals

Subject: Preparation of Amendment No. 1 for Docket No. 4746, Appalachian Sulphides, Inc., South Strafford, Vermont, Elizabeth Mine, Orange County, Vermont, Contract No. Idm-E1100, Copper.

Will you kindly prepare an Amendment No. 1 to the cited contract, to be effective as of the contract date, which will make the following change:

At the bottom of page three of Exhibit A of the contract appears the following item:

1000 to 1500 foot depth
1000 feet @ $3.15/ft. $3,150.00

this should be changed to read

depths in excess of 1000 feet
1000 feet @ $3.15/ft. $3,150.00

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Chron.

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DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
12/9	Talbert	800
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Mrs. Helen R. Miller
Personal Assistant
Bureau of Mines, Region V
P. O. Box 217
Norris, Tennessee

DEC 9 1957

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont
Contract No. Idm-E1100

Dear Mrs. Miller:

By memorandum dated December 5, 1957, you submitted the enclosed final MF-104 (September 1957), together with copies of nine invoices applicable to prior vouchers of the referenced Operator, and requested a Report of Review in lieu of a final audit.

The review has been performed but preparation of the report is being held in abeyance pending:

(1) Possible amendment of the contract to permit payment of the 51 foot overage on hole No. 1008;

(2) Execution of a termination agreement now in preparation; and

(3) Receipt from the Executive Officer of the usual memorandum specifically confirming the number of units of the several items of contract work satisfactorily performed.

During the review it was noted that the drill records indicate assays of 145 samples applicable to contract footage, whereas the Operator has claimed costs for only 144 samples. The sample numbers applicable to contract footage appear to be:

Nos.	32501	through	32504
	32901	"	32920
	34001	"	34028
	34030	"	34100
	34578	"	34593
	34595	"	34600

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The review also disclosed that the drilling contractor's invoices charged the Operator for 135 hours of delays applicable to the contract footage, whereas the Operator has claimed costs for only 64 hours. The difference of 71 hours pertains to drilling as follows:

Hole No.	708	July	8 hrs.
	(various)	August	21 "
	1025	September	23 "
	1033	"	19 "

A copy of this letter is being sent to Mr. Laurence to advise him of these findings in order that he may incorporate in his confirmation memorandum his recommendations relative to these indicated additional costs.

Sincerely yours,

(Signed) J. L. Chambers

Jay L. Chambers, Director
Contract Administration
and Audit Division

Enclosure

EDTalbert/wb
December 9, 1957

Copy to: Docket
Admr. Reading File
R. A. Laurence, Reg. V
Mr. Chambers
Mr. Talbert

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

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RECEIVED DEC 3 1957

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December 2, 1957

Air Mail

Memorandum

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

From: Executive Officer, DMEA Field Team, Region V

Subject: DMEA-4746, Idm-E1100 (Copper)
Appalachian Sulphides, Inc., South Strafford, Vermont
Elizabeth Mine, Orange County, Vermont

Reference is made to my letter of September 5, 1957 to the Operator, two copies of which were sent to you on December 2. By some oversight, copies were not sent to you at the time.

At the time, I studied the contract carefully and decided that the "1000 feet" referred to was not specified as a maximum, and therefore I authorized drilling in excess of the 1000 feet in that particular depth group. In the light of other recent contracts, I now realize this may have been a wrong interpretation and I may have exceeded my authority. The excess over 1000 feet has not yet been paid for, but it has been drilled, and is claimed on the Operator's final voucher, which we forwarded this week to Mr. Chambers for final audit.

It is the Field Team's opinion that this drilling was justified and we recommend approval of it, and preparation of an amendment if you consider one to be required.

Robert A. Laurence

Robert A. Laurence

OFFICIAL FILE COPY
DMEA
RECEIVED DEC 4 1957

DATE	INITIALS	CODE
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[illegible] by [illegible]

Mr. [illegible] Cowley, [illegible] Mgr.
Appalachian Sulphides, Inc.
South Stratford, [illegible]

Re: Docket No. [illegible], [illegible]
Appalachian Sulphides, Inc.
Elizabeth Mine, Orange County, Vt.

Dear Mr. Cowley:

Your Operator's Monthly Report and Voucher and Operator's Unit Cost and Progress Report for July 1957, has been reviewed in this office and is being sent to the Finance Officer today for processing.

Deductions amounting to $1,610.10 have been made on account of charges made on Hole S-1003. This hole was abandoned before reaching the target area.

The deductions are as follows:

Diamond Drilling -	3 ft overburden at $4.00/ft	$12.00
	497 EX drilling at $2.40/ft	$1,192.80
	65 EX drilling at 2.65/ft	172.25
Surveying -	4 hours at $6.00/hr.	24.00
Incidentals -	565 ft at $0.37/ft	209.05
	Total deductions	$1,610.10

The above deductions and those previously made may be reclaimed if and when the abandoned holes are completed.

The breakdown of the various items in the contract as they should be as of August 1, is shown on the enclosed forms MF-104 and 104A.

The terms of the contract do not make the total footage under each item of "Diamond Drilling" in Category (1) maximums. The only maximums in this category are the estimated total amount ($49,849.00) and the estimated cost of each unit of work (see Article 6 of the contract form). It is, therefore, permissible to exceed the footage of 1000 feet at the $3.15/ft rate and the 1132 feet is allowable.

We hope this reaches you before you have made out your August report, and that the enclosed forms will be helpful in making it out.

Very truly yours,

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 8 POST OFFICE BLDG.
KNOXVILLE 2, TENN.

December 2, 1957

DMEA RECEIVED DEC 4 1957		
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Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: DMEA-4746, Idm-E1100, Appalachian Sulphides Co.
Elizabeth Mine, Orange County, Vermont
Final Report(Operator's)

Transmitted are three copies of the Operator's final report on the subject contract. The report contains a request, signed by John F. Cowley, General Manager, to terminate the contract by mutual consent.

No significant discovery was made. The Field Team concurs with the Field Examiners in recommending termination of this contract, effective date October 1, 1957.

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

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

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

November 21, 1957

United States Department of the Interior
Executive Officer
Defense Minerals Exploration Administration
College Park, Maryland

Re: DMEA Contract No. Idm-E 1100
Docket No. DMEA - 4746

Gentlemen:

We enclose herewith five (5) complete sets of the following reports and maps relative to our Diamond Drilling Program under the captioned contract for the MONTH OF OCTOBER 1957:

FINAL (Narrative) Report on Diamond Drilling Program of May - October 1957.

FINAL Summary of Diamond Drilling Program of May - October 1957.

100 Scale Diamond Drill Cross Sections (11 Sections each) as of November 1, 1957.

There are also enclosed with each of the five (5) sets a copy of our letter dated November 20, 1957, requesting that the captioned contract be terminated by mutual consent, together with a copy of Dr. Hugh McKinstry's letter dated November 8, 1957.

The Final Operator's Monthly Reports will be forwarded later, as soon as our September Report and Voucher have been finalized by DMEA.

Sincerely yours,

C.B. Benson

Clarence B. Benson
Assistant General Manager

CBB:hw
Encl.

OP'S FINAL REPORT

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

November 20, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED NOV 25 1957

DATE	INITIALS	CODE
11/25	gb	220
11/25	[illegible]	130
		500

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

Re: Docket No. DMEA 4746 (Copper), Idm-E1100
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont

Gentlemen:

In view of the disappointing results in the diamond drilling to date under the captioned contract, the management of Appalachian Sulphides, Inc., its geologists and our geological cunsultant, Dr. Hugh McKinstry, believe that further work in this connection is not warranted. A copy of Dr. McKinstry's letter dated November 8, 1957, is enclosed herewith.

Since the project was initiated a total of 3722 feet has been drilled for Appalachian's account prior to the signing of the contract, 13,902 feet have been drilled and approved by DMEA under the contract, and 1043 feet have been drilled but disallowed by DMEA under the Contract, making a total of 18,667 feet of drilling.

A total of ten (10) of the holes drilled from surface have been explored with the Sharpe electro-magnetic drill hole equipment at Appalachian's cost, in the hope of finding mineralized zones in the adjacent areas of the various D. D. holes, but without sucess.

Monthly reports have been submitted showing the detail of the above work, together with diamond drill logs and sections and reasons for not drilling some of the originally planned holes.

We therefore respectfully request that the Contract be terminated by mutual consent, which we believe to be in the best interests of both the Defense Minerals Exploration Administration and Appalachian Sulphides, Inc.

A copy of this letter is included with each of the 5 copies of our "Final Report on Diamond Drilling Program of May - October 1957", dated November 1, 1957.

Very truly yours,

John F. Cowley

John F. Cowley
General Manager

JFC/th
Encl.

HUGH McKINSTRY
R.O.T.C. BLDG. - 14 DIVINITY PLACE
CAMBRIDGE 38, MASSACHUSETTS

OFFICIAL FILE COPY
DMEA
RECEIVED NOV 25 1957
DATE | INITIALS | CODE

November 18, 1957

Mr. John F. [illegible]ley
Appalachian Sulphides
South Strafford, Vermont

Dear Sir:

After studying the results of the drilling recently completed in and around the Elizabeth Mine, I am convinced that this area has now been tested as thoroughly as can be warranted by the chance of finding new copper orebodies of such grade as would be profitable under present economic conditions. I am, therefore, unable to recommend any further exploratory work in or around this mine.

Very truly yours,

Hugh McKinstry

dm

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

EXTRA COPY
DMEA
RECEIVED NOV 25 1957
DATE | INITIALS | CODE

To: Defense Minerals Exploration Administration
From: Appalachian Sulphides, Incorporated
Subject: Final Report on Diamond Drilling Program of May - October 1957
DMEA Contract No. Idm-E 1100
Docket No. 4746

November 1, 1957

Brief

28 diamond drill holes totalling 18,667 ft. were drilled during the period May 15 through October 30th, 1957 (120 ft. drilled prior to May 15) for the purpose of exploring areas North, South and West of the Elizabeth Mine for mineralization.

Drill holes were laid out on the basis of known or inferred structure, known mineralization, geophysical and geological information, and anomalies located by electromagnetic surveys.

Significant mineralization was found only in the area just west of the present mine workings, and this did not reach mineable grade or proportions.

Drilling was conducted on nine cross sectional planes, and is reported in detail below accordingly. A tabular summary of the holes, footages, etc. is included with this report and the reader is referred to the attached cross sections showing holes, mineralized zones, amphibolite intersections and inferred structure.

7442 N

Drilling in this section totalled 3510 ft. in 4 holes, two of which (860 ft.) had to be abandoned because of undue flattening. No significant mineralization was found.

A detailed survey with the Sharpe drill hole E. M. equipment was run in holes 1000 S and 1002 S, and to the best of our knowledge in interpreting the complex results obtained, eliminated any chance of major mineralization being nearby. Possible weak conductors were indicated as follows:

1) In both holes weak anomalies indicate a minor conductor probably between the amphibolites and below hole 1000 S, roughly located at 9900 W and 900 to 1000 ft. elevation. This conductor is subject to question as it is so near the anomalies caused by known ore at 9850 - 10000 W and 1200 - 1400 ft. elevation as to be masked or distorted.

2) In both holes, a very weak conductor is indicated roughly along an inclined line from 10000 W and 500 ft. elev. to 10400 W 800 ft. elev. Probably this conductor is the scattered mineralization lying along the west limb of the inferred syncline and intersected at 978 ft. in hole 1000 S.

3) In hole 1002 S erratic anomalous readings indicate a possible weak conductor roughly located between 9900 W and 10000 W, above and south of hole 1002 S.

None of the above anomalies seem to justify any further work as they are too small and too erratic in ocurrence.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

To: Defense Mineral Exploration Administration
From; Appalachian Sulphides, Incorporated
Subject: Final Report on Diamond Drilling Program of May - October 1957
DMEA Contract No. Idm-E 1100
Docket No. 4746

November 1, 1957

8800 N

Two holes totalling 3000 ft. were tentatively proposed for the 8800 N section, but were not drilled. Holes at 7442 N and 10900 N; 1) showed no significant mineralization at the elevations to be checked at 8800 N., 2) showed inferred structure to be much the same north and south of 8800 N. For these reasons, it was felt that drilling proposed for 8800 N was unwarranted.

10100 N

The tentative proposal of July 1, 1957 included 301 ft. of deepening in hole 796 U. However, the reasons given for not drilling at 8800 N held equally for 10100 N, and the hole was not deepened.

10900

In this section two surface holes and two underground holes, totalling 3652 ft. were drilled in the immediate mine area. A third surface hole, 1007 S, had to be abandoned at 183 ft. because of undue flattening. 3.4 ft. of massive pyrrhotite was encountered at 741 ft. in hole 1006 U, but assayed only 0.40% Cu. Other scattered bits of mineralization found in these holes were inconsequential.

Holes 1006 S and 1008 S were surveyed with the electromagnetic equipment, and possible mineralization was indicated as follows:

1) In hole 1006 S, a fair anomaly indicates a conductor above the hole and roughly at 9900 W. This conductor is probably the remains of the mineralization west of the mine workings. Further drilling on the basis of this anomaly seems unwarranted, especially since no mineralization was found in hole 1030 U, which passed through the area 100 to 150 ft. above 1006 S.

2) Small anomalies were found as the probes passed through the amphibolites intersected in both holes; these are interpreted to be minor mineralization associated with these amphibolites.

DDH 1025 S (1135 ft.) was drilled farther west from the mine to try to delineate structure and check for possible mineralization in an inferred syncline there.

Structure to the west had been outlined prior to this drilling program at 15000 N, and during this program at 14000 N. In hole 1025 S, no amphibolites were intersected, and it is assumed that the anticline, which is so prominent in the other sections, either plunges south to pass under 1025 S or "squeezes" in towards the mine workings, or both. The possibility that the rising east limb of this anticline comes out of the ground east of hole 1025 S has been considered, but surface mapping has found no evidence in support of this theory.

Little can be deduced as to the width or depth of the syncline west of

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

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Subject: Final Report on Diamond Drilling Program of May-October 1957
DMEA Contract No. Idm-E 1100
Docket No. 4746

November 1, 1957

10900 - Continued

11000 W, as neither hole 1025 S or hole 1019 S (at 14000 N) found the rising west limb.

Hole 1025 S was checked with the E. M. unit; no anomalies were found.

11600 N

Three underground holes (total of 850 ft.) were drilled to check mineralization west of the mine workings. Sturctural interpretation is difficult in so confused an area, but apparently the best of the mineralization in this section (11.8 ft. of 0.96% Cu; hole 1028 U, 129.2 ft. to 141.0 ft.) lies above and west of an anticline in the amphibolite forming the footwall for the main ore zone in the mine. Other mineralization encountered was spotty and of very low grade.

12100 N

To supplement work done prior to this program one hole, DDH 1010 U (950 ft.) was drilled to check favorable areas west of the mine at elevation 500 ft. and lower. Mineralization encountered was insignificant and the structure inferred from the amphibolite intersections is shown on the cross section.

12400 N

A total of 1613 ft. of drilling was done in section 12400 N, during this program. Three new holes were drilled, and one old hole deepened by 310 ft. Drilling prior to this program had been in two holes comprising 370 ft.

As at 11600, the best mineralization was found above and to the west of an anticline in the footwall amphibolite, and was intersected in holes 708 U (12.1 ft. of 1.74% Cu) and 1013 U (20.4 ft. of 1.59% Cu). These were the best intersections found in the drilling west of the mine workings.

13100 N

At 13100 N, four holes were drilled totalling 1737 ft. Additional drilling was tentatively proposed in the July 1 revision, but disappointing results in the same target areas in adjacent sections discouraged further work here.

Mineralization, as at 11600 N, 12100 N and 12400 N is mostly above the anticline in the footwall amphibolite. Grade is very low in the 13100 N intersections.

14000 N

Drilling in the section 14000 N totalled 3415 ft. of which 1010 ft. were drilled in two underground holes to check immediately west of the mine, and 2405 ft. were drilled in two surface holes to check possible mineralization to the far west.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

To: Defense Minerals Exploration Administration
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Subject: Final Report on Diamond Drilling Program of May - October 1957
DMEA Contract No. Idm-E 1100
Docket No. 4746

November 1, 1957

14000 N - Continued

Near the mine two holes intersected amphibolites as shown in the inferred structure on the cross section. Mineralization was spotty and copper values were very low.

The two surface holes successfully outlined the east limb of the prominent anticline, but hole 1019 S did not reach the rising west limb of the syncline to the west despite being extended 200 ft. beyond the length tentatively proposed for it. The width and depth of this syncline is not known, as mentioned in the report on drilling at 10900 N, and further work which would outline it does not seem warranted because mineralization found in drilling west of 10100 W has been very poor.

Holes 1019 S and 1022 S were surveyed with the electromagnetic unit, and no anomalies were found in either hole.

15000 N

Hole 1023 U was drilled to 702 ft. for the purpose of checking the inferred synclines west of the mine syncline; these same synclines were also checked at 14000 N by hole 1018 U, and at 12100 N by hole 1010 U. Hole 1023 U passed just beneath both structures, indicating that they plunge south between 15000 N and 14000 N. No mineralization was found in hole 1023 U.

18000 N

DDH 1029 S (800 ft.) was drilled to check an anomaly found by the E.M. gear in previously drilled holes at 17700 N (see cross section; holes and mine workings at 17700 N are dashed on). The anomaly found in a detailed survey of two holes indicated a conductor north of the holes and located roughly at 9800 W and 700 ft. elevation. Hole 1029 S intersected no significant mineralization, and when checked with the E. M. unit, the only anomalies found were two minor ones indicating very weak conductors below the amphibolite.

Respectfully submitted,

Calvert Smith

Calvert Smith
Geologist

APPALACHIAN SULPHIDES, INC.

Summary of Diamond Drilling Program of May - October 1957 DMEA Contract No. Idm-E 1100
Docket No. 4746

Dated: November 1, 1957

Footage authorized for drilling in this program under DMEA Contract as signed June 13, 1957				19,200
Footage drilled after June 13, 1957 and approved under DMEA Contract		13,902	13,902	13,902
Footage authorized under DMEA Contract but not drilled				5,298
Footage drilled by Appalachian Sulphides, Inc. prior to June 13, 1957	3,722		3,722	
Footage drilled after June 13, 1957 but disallowed under DMEA Contract		1,043	1,043	
Total footage drilled in this program			18,667	
Tentative footage proposed for this program in revision of July 1, 1957				26,942
Total footage drilled				18,667
Footage tentatively proposed for this program but not drilled				8,275

SUMMARY OF HOLES

Hole No.	Section	Bearing	Dip at Collar	Remarks		Footage Breakdown: Prior to June 13	Footage Breakdown: After June 13	Footage Breakdown: After June 13 Dis-allowed	Total Length	Hole No.
708 U	12400 N	N 90° W	-30°	Core Assays		120	310		430	708 U
1000 S	7442 N	N 90° W	-65°	Core Assays	DDH E.M. Survey	1,000	200		1,200	1000 S
1001 S	7442 N	N 90° W	-80°	Hole Abandoned	DDH E.M. Survey			295	295	1001 S
1002 S	7442 N	N 90° W	-90°		DDH E.M. Survey		1,450		1,450	1002 S
1003 S	7442 N	N 90° W	-86°	Hole Abandoned	DDH E.M. Survey			565	565	1003 S
1006 S	10900 N	N 90° W	-60°	Core Assays	DDH E.M. Survey	1,225	277		1,502	1006 S
1007 S	10900 N	N 90o W	-70°	Hole Abandoned				183	183	1007 S
1008 S	10900 N	N 90° W	-80°		DDH E.M. Survey		1,551		1,551	1008 S
1009 U	10900 N	N 90° W	-30°				250		250	1009 U
1010 U	12100 N	N 90° W	-15°	Core Assays			950		950	1010 U
1012 U	12400 N	N 90° W	-15°	Core Assays			350		350	1012 U
1013 U	12400 N	N 90° W	-40°	Core Assays			401		401	1013 U
1014 U	13100 N	N 90° W	-40°	Core Assays		552			552	1014 U
1015 U	13100 N	N 90° W	-60°	Core Assays		265	420		685	1015 U
1016 U	13100 N	N 90° W	-30°	Core Assays			300		300	1016 U
1018 U	14000 N	N 90° W	-15°	Core Assays		560	102		662	1018 U

APPALACHIAN SULPHIDES, INC.

Summary of Diamond Drilling Program of May - October 1957

DMEA Contract No. Idm-E 1100
Docket No. 4746

Dated: November 1, 1957

SUMMARY OF HOLES (Continued)

Hole No.	Section	Bearing	Dip at Collar	Remarks		Footage Breakdown			Total Length	Hole No.
						Prior to June 13	After June 13	After June 13 Dis-allowed		
1019 S	14000 N	N 90° W	-40°	Core Assays	DDH E.M. Survey		1,200		1,200	1019 S
1022 S	14000 N	N 90° W	-80°		DDH E.M. Survey		1,205		1,205	1022 S
1023 U	15000 N	N 90° W	-20°				702		702	1023 U
1025 S	10900 N	N 90° W	-65°		DDH E.M. Survey		1,135		1,135	1025 S
1026 U	13100 N	N 90° W	-50°	Core Assays			200		200	1026 U
1027 U	12400 N	N 90° W	-55°	Core Assays			552		552	1027 U
1028 U	11600 N	N 90° W	-35°	Core Assays			302		302	1028 U
1029 S	18000 N	N 90° W	-90°		DDH E.M. Survey		800		800	1029 S
1030 U	10900 N	N 90° W	-65°				349		349	1030 U
1031 U	11600 N	N 90° W	-10°	Core Assays			250		250	1031 U
1032 U	11600 N	N 90° W	-60°	Core Assays			298		298	1032 U
1033 U	14000 N	N 90° W	+30°	Core Assay			348		348	1033 U
					Totals	3,722	13,902	1,043	18,667	

MEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

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November 29, 1957

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Director, Division of Base Metals

Subject: Preparation of Termination Agreement for Docket No. DMEA-4746, Appalachian Sulphides, Inc. Elizabeth Mine, Orange County, Vermont, Contract No. Idm-E1100 (Copper)

Will you kindly prepare a Termination Agreement, effective November 1, 1957, for the cited contract. No pseudo certification should be included, since results were negative and all targets were disproven.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Chron.

8623

DMEA-4746
agfal.

Excerpt from Mr. Mittendorf's diary, 11/19/57:

Jack Cowley phoned from South Strafford, Vt., for information he needed in the preparation of his report to DMEA. He said 13,900 ft. of drilling had been approved by the field team against the 19,000 ft. authorized by the contract; further, that he had accomplished 5000 ft. of drilling on his own while the application was in process, so that the 19,000 ft. envisioned at the time the application was made has, in fact, been accomplished. He sees no justification for requesting additional drilling under our contract. He said his consulting geologist, McKinstry, had just given him a letter setting forth his conclusions, which coincide with Jack's.

I suggested to Cowley that he give us all these facts, together with a copy of McKinstry's letter, and request that the contract be terminated by mutual consent.

He volunteered the information that the mine would probably close down during the month of December, but that they were doing pretty well right now by pulling the higher-grade pillars. He said their costs are very low because they are doing no development or stope preparation work.

Base Metals

5/28-Khg - 500

4746

DWCA - ~~1516~~

Excerpt from Mr. Mittendorf's diary, 8/22/57:

Thor Kiilsgaard is back from his trip to Vermont Copper, and he dropped in the office to give me a brief report.

He said Jack Cowley is doing an excellent job, so far as geologic and engineering planning is concerned. He is also doing some more geophysical work, which is contracted for by a Canadian outfit.

His luck, however, has been very discouraging. Only one hole encountered a "smell" of ore, and it is low-grade. They are going to continue on with the program as laid out, but Thor made it clear that everybody's hopes were pretty much down.

Docket Memo - 4746.
500

Excerpt from Mr. Mittendorf's diary, 7/22/57:

Jack Cowley phoned from Vermont to inquire whether his 104s should be sent to College Park or Knoxville. I suggested College Park. (Appalachian Sulphide Co.)

He said Millar had been on the property recently and made an interim inspection. As a result of the work done thus far, both Jack and Millar feel that the locations of the future drill holes should be changed. This, of course, can be handled by Millar (through Bob Laurence).

Jack also said the Longyear Co. had added $1 per foot to its bid for all holes drilled at 25° or under. He said he accepted the original bid and when the contract was received in the mail he noticed they had put in this added provision. He griped about the matter, but nothing could be done. He had to either accept or reject the contract. He wondered if we could amend the contract so as to pick up our share of this extra dollar.

I told him to write us about the case and we would take it up with the lawyers.

I haven't referred to the docket, but if this contract is not on the long form and does not have maxima inserted there should be no difficulty in making an amendment to handle the situation. ?

Jack said they were getting some good structural information from the drilling done thus far and that they have proved that another sincline occurs to the west of the main orebody. They have not found any ore; however, electromagnetic probing of some of the holes has given them good "kicks."

He called back a second time to check on the usability of his stock of 104s. He noted they were dated April 1952 and that they contained the Budget Bureau expiration date of June 30, 1953. I told him it would be o.k. to use them.

A Form 7
(2-56)

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7/9	Trained	500
7/10	GCS	130
"	Johnson	110
"	Pattenden	100
7/11	P.K	225
		500

JUL 11 1957

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

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont
Contract No. Idm-E1100

Dear Mr. Laurence:

With reference to the cited project, we are enclosing the signed "Field Team" and "Finance Office" copies of a contract covering the work program. An extra copy (unsigned) is also enclosed for Field Team use.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (SHB)

WRGriswold/er 7/9/57
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

Enclosures

APPROVED:

O. M. Bishop (SHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (SHB)
Member, Geological Survey

8623

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

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RECEIVED JUL 1 1957

DATE		CODE
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7/1	B	215
7/2	WRb	500

June 26, 1957

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

Re: ~~Docket No. DMEA-4746 (Copper)~~
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont

Contract No. Idm-E 1100

Attn: Mr. C.O. Mittendorf, Administrator

Gentlemen:

We return to you herewith the original (Government's copy) and the other four copies of the above-captioned contract, complete with Annex 1, Exhibit A and two maps, all copies signed by Mr. J. M. Cunningham-Dunlop, President of Appalachian Sulphides, Inc., in accordance with your letter of June 13, 1957.

We have retained the "Operator's Copy" for our files.

We understand that the effective date of the contract is June 13, 1957.

Mr. Cowley will no doubt communicate with you further regarding the contract upon his return from our mine in North Carolina.

Sincerely yours,

C.B. Benson

Clarence B. Benson
Assistant General Manager

CBB:hw
Encl.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 19 POST OFFICE BLDG.
KNOXVILLE 2, TENN.

WASHINGTON 25, D.C.

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 19 1957

DATE	INITIALS	CODE
6/19	C	220
		130
6/24	C	220
6/24	~~[illegible]~~	500

June 17, 1957

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: DMEA-4746, copper. Appalachian Sulphides, Inc.
South Strafford, Vermont

Submitted are the original and 2 copies of the engineer's report on the subject application.

The Field Team agrees with the conclusions and recommendations cited in this report.

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
6-21-57
(date)

ENGINEER'S REPORT

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 19 1957

DATE	INITIALS	CODE
		130
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by

W. T. Millar, Supervising Mining Engineer

Docket No. DMEA 4746 (copper)

Operator: Appalachian Sulphides, Inc.

Location: South Strafford, Vermont

Estimated Cost: $81,414.95

Government Participation: 50% or $40,707.47

SUMMARY

This report is prepared from a review of the application by H. L. Burmeister and W. T. Millar, without a field examination.

Comparisons between costs presented in the subject application and operating costs of exploratory work under Docket No. DMEA 1526X, Contract Idm-E 94, Vermont Copper Company, now Appalachain Sulphides, Inc. were made. Since the work proposed in this application is on the same property and in mine working adjacent to the previous exploration, the data available from our own records are considered authenic.

Comments on the application are shown under discussion.

CONCLUSION

The application is well presented and in general, the cost estimates appear to be reasonable, but some adjustments as shown in the comments on the cost estimate should be made.

Reviewed by
DMEA OPERATING COMMITTEE

6-21-57
(date)

Interpretations of the complex structural features of the mineralized area, presented in cross-sections with the application are favorable. Knowledge of the area gained from previous exploratory work suggests possible parallel ore bodies.

The proposed drilling program is adequate for indicating parallel ore bodies of mineable size but subject to changes in the plan, based on new data obtained as drilling progresses.

Considering the structural features, history of, and production from the area, additional exploration as proposed in the application is necessary for indicating ore reserves.

The efficiency and competency of the applicant was well demonstrated in previous exploratory work under Docket No. DMEA 1526X.

RECOMMENDATION

From the foregoing conclusions, it is recommended that the application be approved with the revisions as mentioned in the comments.

DISCUSSION

This application has been reviewed in the College Park Office without a field examination.

In general, it is well prepared, but considering the previous drilling by the operator it appears that part of the additional drilling proposed in the application needs further justification.

Beginning with Attachment No. 5 - Page 1 of the application:

6. Estimate of Cost

(a) Independent Contracts.

The costs presented are reasonable, but a copy of the subcontract is not attached, and specifications for drilling are not given.

On page 1 of Attachment No. 4 of the application, the list of 28 holes proposed for drilling shows depths or lengths varying from 300 to 1200 feet. The cost estimate for drilling specifies EX, the smallest standard size tool. Considering the intense folding and fracturing of the sturcture to be drilled, it is doubtful if EX size drill tools can do a satisfactory job. Furthermore, the ore will be the softest part of the core and using a small diameter tool, recovery will be poor, therefore loosing the information desired and purpose of exploring. Since the formation is badly broken frequent cementing or casing of the holes will be necessary. For casing a drill hole, reaming will be required but the cost of reaming is not quoted in the estimate. Time and expense might be reduced if the holes were started with larger diameter tools to allow for casing and reduction in size of drill bits when necessary. For these reasons it seems advisable that the subcontract should state that payment will be made, only on holes completed to the satisfaction of the Government engineers.

The cost estimate for drilling shows an average of $2.59 per foot for drilling from the surface and $2.41 per foot for drilling from underground stations. Under section (c) of the estimate is a cost of $2486.40 for compressed air for underground drilling which is equivalent to 31.87¢ per foot or an average cost of $2.73 per foot for underground drilling.

Reference is made to Docket No. DMEA 1526X, Contract Idm-E 94, Vermont Copper Company, now Appalachian Sulphides, Inc. The overall cost for drilling under the previous contract was $3.618 per foot, including engineering, geology, jeep rental, company labor for moving equipment and preparing drill

sites, cementing drill holes and pipe for delivering water to the drill when the distance to the source of water was more than 3,000 feet.

The estimated cost of drilling shown in this application, when taking into consideration the separate items for technical service, pipe, transportation, assays, etc. is very close to the cost of drilling from the surface during the previous exploration contract.

The Tro-pari or acid surveys are necessary and the cost estimate is reasonable.

(b) Labor, Supervision, Consultants, Other Geological and Drilling Costs

The rates per day stated under this section are reasonable but the time or duration of technical service appears excessive.

It is stated in the application that the exploration would be completed within 6 months from the date of the contract, yet the geologist is estimated for 300 days.

Assuming that $5\frac{1}{2}$ months or 143 work days will be required to complete the exploration, the following estimate is submitted for consideration: The applicant proposes 19,200 feet of drilling. Assuming that drilling will average 20 feet per shift, the proposed drilling would require 960 shifts of 8 hours each

$\frac{960}{143}$ = 6.75 shifts required each working day

40.6% of total footage is underground
59.4% " " " " surface

40.6% x 6.75 = 2.75 or use (3 shifts per day underground)
59.4% x 6.75 = 4.0 shifts per day on surface.

The total of 7800 feet underground will require 1 drill working 3 shifts per day.

The total of 11,400 feet surface drilling will require 2 drills, each on a 2 shift basis.

In producing approximately 140 feet of core per day, much of it in known barren ground, 100 days for Chief Geologist @ $27 is ample.

A geologist full time for 150 days @ $21 is sufficient for conducting hole surveys and logging core.

Only work for engineers is to spot holes as locations are selected. Since all work is in the immediate vicinity of mine, engineering should not require more than 15 days, and should not be combined with assaying.

Mileage.

1500 miles @ $.10 is reasonable.

Electromagnetic Survey of Holes.

This office does not believe that this survey is justified OK or would further the purpose of Government interest.

Drill holes appear to be spaced closely enough to spot or locate any mineable ore body.

Access Roads.

Seven of the 13 surface holes are within 400 feet of a good road, requiring a maximum of 2800 feet of access road to the drill sites. The other 6 holes would require 1800 feet or a total of 4600 feet of access road. This work should be completed easily within 48 bulldozer hours. An additional 24 hours for clearing 13 drill sites seems liberal. A grand total of 72 bulldozer hours @ $8.50 per hour.

One laborer to accompany the bulldozer in addition to the operator is standard practice. Therefore, 1 laborer at $1.60 per hour is

permissible.

It is considered that $800 is ample for access roads.

The cost listed for cutting underground drill stations and extending air and water lines is reasonable.

(c) Operating Materials and Supplies

Air for Underground Drills.

Allowing $0.84 per hour for air is equivalent to 32¢ per foot in addition to contractor's per foot rate. This brings the average per foot to $2.73 which seems to allow a fair percentage for the drilling contractor.

Under this section $840 for 2,000 feet of 2-inch water pipe @ 42¢ is listed. Water pipe is usually supplied by the contractor. This item should be provided for in the subcontract.

Core Boxes.

A 60 day supply of core boxes is sufficient. This would be 311 boxes containing 27 feet of core each. The price of $2.00 is satisfactory. Unmineralized core can be discarded after Government logging.

(g) Analytical Work

This cost should be calculated separately from the engineering and geological staff's work. A maximum allowable of $400 for assays should be sufficient.

Compensation and Payroll Taxes would have to be recalculated.

(h) Contingencies

2,000 feet of additional drilling is not necessary if holes are to be spotted on data obtained from previous holes.

Casing left in Holes.

Casing left in hole is for the account of the drilling contractor unless requested by the Operator who would then become liable. Such conditions should be covered in the subcontract.

Explosives for cutting underground stations are included in section (b), cutting underground stations, moving, and extending air and water lines. Actually, underground drilling will be from old stations, previously cut.

June 13, 1957

W. T. Millar

W. T. Millar, Supervising Mining Engineer

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/6	[illegible]	570
6/12	[illegible]	130
"	[illegible]	110
13	[illegible]	100
6/13	[illegible]	225
		500
6-6	Chamber	800

JUN 13 1957

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

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont

Dear Mr. Laurence:

In conformance with the phone request of the Applicant, we are forwarding the original and five copies of a proposed long-form contract to its South Strafford, Vermont, office.

We are enclosing two extra copies (minus the form), for Field Team use. Such material consists of Annex I (one page), Exhibit A (four pages), and two maps.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (NB)

Enclosures

WRGriswold/er 6/6/57
Copy to: Docket
Admr R File
Op. Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

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

Thor H. Kiilsgaard (NB)
Member, Geological Survey

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/6	[illegible]	500
[illegible]	[illegible]	800
6/12	Selfridge	130
6/12	Lamb	130
6/12	Kilsgaard	130
6/12	Johnson	110
13	Mittendorf	104
		225
		500

JUN 13 1957

Mr. John F. Cowley, General Manager
Appalachian Sulphides, Inc.
South Strafford, Vermont

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont

Dear Mr. Cowley:

With reference to your application, dated May 7, 1957, for Government assistance in the cited exploration project, we are enclosing the original and five copies of a proposed long-form contract covering the proposed work which has been signed by the Administrator, Defense Minerals Exploration Administration.

The complete contract consists of the form, Annex I (one page), Exhibit A (four pages), and two maps.

If the contract meets with your approval, please sign all copies, retain the "Operator's Copy" for your files, and return the balance to us. If you do not approve any of the contract provisions, all copies (unsigned) should be returned to us, with your comments.

You will note that Annex I and the property map delineate a somewhat different outline of the property included under the contract than you had proposed, as pertaining to the easterly boundary. Had we used the boundary proposed by you, we would have had to delete some of the proposed drilling.

Sincerely yours,

C. O. Mittendorf

Administrator
WRGriswold/er 6/6/57
Copy to: Docket
Admr R File
Op. Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Region V (2)
Chron.

Enclosures

8623

EXPLORATION PROJECT CONTRACT
APPALACHIAN SULFIDES, INCORPORATED
DOCKET NO. DMEA-4746

EXHIBIT A

Description of the Work

The purpose of the project is to explore for ores of copper by diamond core drilling, from both surface and underground locations, with such overburden drilling as may be necessary.

It is estimated that twenty-eight drill holes will be drilled, ranging in depths from 300 to 1500 feet, the total combined footage not to exceed 19,200 feet of hole. Drilling shall be done with EX size, or larger, coring bits.

The drilling shall be done along certain cross-sectional east-west planes related to the mine coordinate system, as follows:

North	latitude	7442
"	"	8800
"	"	10084
"	"	10900
"	"	12100
"	"	12500
"	"	13100
"	"	14000
"	"	15100

Drill holes shall be reamed and cased or cemented and redrilled as necessary.

The tentative locations of the holes are shown on the attached map entitled "Plan of Elizabeth Mine Area, South Strafford, Vermont," ~~but the actual locations, directions, inclinations, and depths of all holes are subject to prior Government approval.~~

Insert #1

All drill holes shall be logged and all drill core shall be properly stored and made available to the Government for examination.

All significantly mineralized core shall be split and one half thereof shall be properly sampled and assayed for copper. The remaining half of all significantly mineralized core samples shall be furnished to the Government upon request.

As required by Article 7(b) of the contract, assay reports shall be submitted monthly to the Government, together with drill logs and adequate engineering-geological plan maps and sections, showing the progress of the work and sample locations.

All work of drilling and sample preparation shall be properly supervised by competent engineers or gelogists.

Bulldozing shall be performed with a D-6 or equivalent unit.

Estimated Costs of the Project

Actual Costs

Category (1) Independent Contracts

Drilling from surface		
Overburden drilling, 280 feet @ $4.00/ft.	$ 1,120.00	
Diamond drilling		
0- to 500-foot depth 6,220 feet @ $2.40/ft.	14,928.00	
500- to 1000-foot depth 3,900 feet @ $2.65/ft.	10,335.00	
1000- to 1500-foot depth 1,000 feet @ $3.15/ft.	3,150.00	$29,533.00
Underground diamond core drilling		
0- to 750-foot depth 7,500 feet @ $2.40/ft.	18,000.00	
750- to 1000-foot depth 300 feet @ $2.60/ft.	780.00	18,780.00

Tro-pari and/or acid surveys 192 hours @ $6.00/hr.	$ 1,152.00	
Drilling delays 64 hours @ $6.00/hr.	384.00	$ 1,536.00
		$49,849.00
Categories (2) through (7)	None	

Fixed Unit Costs (See Article 13 of the contract)

~~Incidental allowance[1] for each foot of drilling completed 19,200 feet @ $0.60/ft.~~	~~11,520.00~~	
720 core boxes @ $2.00/each	1,440.00	
208 hours bulldozing @ $8.50/hr., including operator and all bulldozing costs whatsoever	1,768.00	
		13,011.00
203 samples assayed @ $1.00/sample	203.00	~~14,931.00~~

Insert 31 2

S U M M A R Y

Total Independent Contracts	$49,849.00	
Total Fixed Unit Costs	13,011. ~~14,931.00~~	
		62,860.
Estimated Total Cost of Project		~~$64,780.00~~
Government Participation @ 50%		~~$32,390.00~~
		31,430.

1/ Includes all costs of the work that might have been estimated and allowed under Categories (1) through (7), except those costs for which estimates are made in Exhibit "A".

IN REPLY REFER TO:

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

June 6, 1957
Re: DMEA 4746
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont
$81,414.95 - Copper

Memorandum

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

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

Subject: Review of Field Team Report

The applicant requested assistance in extending the exploration, by surface and underground diamond drilling, of the downward extension of the long Elizabeth ore structure and inferred parallel ore structures.

The applicant has explored 9 east and west sections and has partially outlined a series of inferred folds within which ore bodies similar to the Elizabeth may occur. The proposed work would be done on the same sections and thus would supplement the applicant's work.

The examiner recommends that the proposed work program be approved more or less as outlined in the application, but suggests changes in the boundaries of the area to be subordinated.

I concur with the recommendations of the examiner and the Field Team.

N. E. Nelson

N. E. Nelson

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

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 6 1957

DATE	INITIALS	CODE
6/6	C	
6/6	W.R.G.	200.
	June 6, 1957	500

Memorandum

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

From: Commodity Specialist, Branch of Base Metals

Subject: Review of Memorandum Examination Report, Docket No. DMEA 4746 (copper), Appalachian Sulfides, Inc., Elizabeth Mine Orange County, Vermont. $81,414.95

According to the subject geologic report the applicant's exploration program is well conceived and it will test targets in the same stratigraphic unit which proved favorable in the workings of the Elizabeth mine. The examiner, therefore, recommends that the exploration work substantially as proposed by the applicant be approved.

I concur in that recommendation.

A. D. McMahon

A. D. McMahon

Copy to: Division of Minerals
Branch of Base Metals(2)
Thor Kiilsgaard, U.S.G.S.
F. D. Lamb
F i l e s

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

JUN - 4 1957

Memorandum

To: Administrator, DMEA
Attention: Chief, Base Metals Division

From: Associate Solicitor, Division of Mineral Resources

Subject: Docket No. DMEA-4746, Appalachian Sulphides, Inc. (Copper)

As requested in Mr. Griswold's memorandum dated May 31, 1957, we have [redacted] the attached contract in satisfactory legal form for execution. We did not have the maps before us when drafting the contract. Therefore, the plan map should be carefully reviewed to determine that no legend thereon conflicts with the land description and excluded areas described in the contract.

Robert P. Dwyer

Attachments

HCRubin/emd
Copy to: Solicitors Docket (2)
DMEA Docket
W. R. Griswold
H. C. Rubin
R. P. Dwyer
chron.

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

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 4 1957

DATE	INITIALS	CODE
6/4	C	220
		130
6/6	C	220
6/6	~~WRB~~	500

June 3, 1957

Air Mail

Memorandum

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

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

Subject: DMEA-4746 (Copper)
Appalachian Sulfides, Inc., South Strafford, Vermont
Elizabeth Mine, Orange County, Vermont

Enclosed are the original and one copy of the field examination report on the subject application. It is our understanding that Mr. Griswold already has a copy of the report.

We agree with the examiner's conclusions, and endorse his recommendation for approval of a contract. Cost data should be reviewed with Mr. Millar of the Bureau of Mines, College Park, or his designated representative, to whom we delegate authority to give Field Team approval.

Robert A. Laurence
Robert A. Laurence
Executive Officer

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

Enclosures 2

Reviewed by
DMEA OPERATING COMMITTEE
6-5-57
(date)

IN REPLY REFER TO:

ON-SITE Report

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 4 1957

DATE	INITIALS	CODE
		130
		220

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

May 27, 1957
Re: DMEA 4746
Appalachian Sulfides, Inc.
Elizabeth Mine
Orange County, Vermont
$81,414.95 - Copper

Memorandum

To: ~~DMEA Field Team,~~ Region V

From: Walter S. White, Geologist, U. S. Geological Survey

Subject: Proposed diamond-drill exploration at Elizabeth Mine, Vermont

I visited the Elizabeth Mine on May 23-24, 1957, for the purpose of reviewing the exploration proposed in the application of Appalachian Sulfides, Inc., dated May 7 (DMEA docket No. 4746). My review included discussion of the geology and exploration with John F. Cowley, General Manager, Richard Dwelley, Resident Geologist, and Hugh McKinstry, Consulting Geologist, and examination of such surface and underground openings as I thought would be most critical for the geologic interpretation on which the exploration is based.

The geology of the mine, including a discussion of ore controls, is described in McKinstry, H. E., and Mikkola, A. K., The Elizabeth Copper Mine, Vermont, Economic Geology, Vol. 49, p. 1-29, 1954. The regional geologic setting of the deposit is described in White, W. S., and Jahns, R. H., Structure of central and east-central Vermont, Jour. Geol., Vol. 58, p. 179-220, 1950. The application referred to above contains a number of cross-sections illustrating the structural and stratigraphic position of the known ore shoot, as well as some tentative locations for exploratory drill holes.

The ore at the Elizabeth Mine appears to be confined to a layer, several tens of feet thick, of preponderant quartz-mica schist between two amphibolite beds designated the Westwall and Hanging-wall amphibolites, respectively. This zone contains traces of sulfide far beyond the confines of the mine and in a variety of structural settings. There are at least three possible explanations for this stratigraphic localization of sulfide mineralization, but regardless of which one is correct, the empirically observed association of ore with this particular stratigraphic zone may be taken as a prime guide in the search for new ore bodies.

Structure can also be used as a guide to ore. The greater part of the ore shoot at the Elizabeth Mine lies on the overturned

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

east limb of a structural syncline. (The term "structural syncline" is used because of the strong possibility that the rocks in the center of this "syncline" are older than the rocks on the limbs at any given level.) The ore shoot seems to be best developed where the fold is tight and the overturned limb is long and straight. The structural syncline becomes more open to the north, and the ore shoot becomes too small and low-grade to mine--the company has done considerable drilling in a vain attempt to prove a continuation or extension of the present ore shoot beyond the present north end of the mine. Several drill holes indicate that the ore does not persist on the east limb of the fold down the dip below the point where the Hanging-wall amphibolite curves around in the trough of the syncline. Except to the south (see below), the potentialities for further ore at the same stratigraphic horizon and in the same limb of the same fold as the present ore shoot would therefore seem to be very largely exhausted. Search for further ore should logically be directed toward finding places where the same stratigraphic unit occurs somewhere else in a similar structural environment, and this is the principal aim of the proposed exploration.

Though outcrops are not abundant enough to present an unequivocal picture, local and regional surface mapping by the company and by the U.S.G.S. (1943 and 1946) suggests the likelihood that west of the mine the favorable bed may be involved in one or more folds like the structural syncline at the Elizabeth Mine. If similar folds occur east of the mine, these would probably involve only beds structurally beneath the favorable bed, except far to the north along the strike.

The company proposes to drill a number of holes, both from surface and underground stations, primarily (1) to determine the structure west of the mine, and (2) to explore the overturned east limbs of any structural synclines that can be delineated. Such structural synclines, containing the favorable bed at reasonable depth, would be expected within 1000 - 1500' west of the present ore shoot on the basis of present knowledge. Additional targets of the drilling are (3) down-dip extensions of the present ore shoot in the southern part of the mine area, where the position of the trough of the structural syncline has not been established, and (4) possible ore shoots on the west limbs of the structural syncline, just above the trough, like the small shoots that have been mined between coordinates 14,000 and 16,000 N. Many holes can combine two or more of these objectives.

The company proposes to drill a number of east-west (mine coordinates) cross-sections of the critical area. These sections are along the following mine coordinate lines, all north latitude:

7442' and 8800', primarily for objectives 3 and 4, and also to locate where the Hanging-wall amphibolite curves in under the ore-zone--the lower limit of any possible ore in the favorable bed in this structural syncline; 10,900, all objectives; 12,100, 12,500, 13,100, 14,000, and 15,000, objectives 1, 2, and 4 (The bottom of the structural syncline is reasonably well established by previous exploration throughout this area, so none of the drilling would be looking for possible down-dip extensions of the present ore shoot--objective 3.).

The application specifies that the eastern boundary of the area covered by the contract should follow mine coordinate 9200 W between latitudes 7000 N and 10,100 N and that it should follow mine coordinate 9600 W between latitudes 10,100 N and 15,500 N, the latter being the northern boundary of the area of the exploration. It is very likely that this might preclude the drilling of certain desirable holes north of latitude 10,100 N, since collars might have to be located east of coordinate 9600 W in order to reach the area beneath the present ore shoot. (Holes tend to turn normal to the dip of the schistosity (65°E), and the collars must be placed to take this turning into account.) The applicant's section at latitude 10,900 N does, in fact, suggest that such a hole might well be drilled. On this basis, I recommend that the eastern boundary of the area covered by the contract be made the 9200 W coordinate for the entire distance from latitude 7000 N to 15,500 N.

The proposed exploration seems well conceived, and it is most prudent that it be carried out now in view of the limited future of the present ore shoot. I recommend that the application be approved. I further suggest that because the best location for any individual hole will depend very largely on what is found in preceding holes, no attempt be made to specify the exact location of each hole in the contract except for the provision that they be drilled on the east-west sections specified in the application and within the area covered by the contract.

Walter S. White

Walter S. White
Geologist

DMEA Form 7
(12-56)

500

OFFICIAL FILE COPY

Date	Surname	Code
5/31		500
		140

May 31, 1957

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Director, Division of Base Metals

Subject: Preparation of contract for Docket No. DMEA-4746, Orange, County, Vermont, Elizabeth Mine (Copper)

Kindly prepare a contract along the lines of the attached rough draft. The maps will be sent to you shortly.

W. R. Griswold

W. R. Griswold

Attachment

WRGriswold/bjl

Copy to: Docket
Chron.

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

May 21, 1957

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

Attn: Mr. C. O. Mittendorf, Administrator

Re: Appalachian Sulphides, Inc.
DMEA Form MF 103
Dated May 7, 1957

Gentlemen:

In order to more clearly identify the description of the land we wish to explore and that which is not to be included in the exploration Contract, we have revised Instruction No. 3 as submitted in our Attachment No. 2 Page 2 of the subject DMEA Application for Aid in an Exploration Contract.

The revision as now submitted is intended to exclude only the orebody and extensions of the orebody ~~which have been explored~~ and developed during previous years.

Will you kindly substitute the enclosed Attachment No. 2 Page 2 (Revised - May 21, 1957) together with longitudinal section marked "Attachment No. 2 Longitudinal Section", for Attachment No. 2 Page 2 as submitted under date of May 7, 1957.

Very truly yours,

John F. Cowley

John F. Cowley
General Manager

JFC:hw

Encl.

EXTRA COPY

~~OFFICIAL FILE COPY~~

DMEA
RECEIVED MAY 23 1957

DATE	INITIALS	CODE

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
FORM MF 103

Attachment No. 2 - Page 2
(Revised - May 21, 1957)

DATED: May 7, 1957

From this area we propose to exclude only the presently developed orebody, which includes ore now being mined, probable and possible ore in place as shown on the attached longitudinal section marked "Attachment No. 2, Longitudinal Section".

You will note that such section shows the orebody presently developed to be in one continuous ore shoot with the exception of the area between coordinates N-14000 and N-15500, where the No. 3 vein extends approximately 150 feet to the west or footwall of the No. 1 vein, together with the area approximately 100 feet below the 975 level, where the two zones are connected in a synclinal structure.

Substantial amounts of ore have been mined from the No. 3 zone and mineralization has been developed from the 400 foot elevation to the surface on that structure.

(b) Elizabeth Mine

(c) Owner

(d) Owner

(e) There are no liens or encrumbrances on the land.

(f) There are no unpatented claims.

EXTRA COPY
D M E A
RECEIVED MAY 23 1957

DATE	INITIALS	CODE

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 22 1957

DATE	INITIALS	CODE
5/22	WRY	500

May 20, 1957

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

Attention: Mr. C. O. Mittendorf, Administrator

Gentlemen:

In connection with our DMEA Application Form MF-103, dated May 7, 1957, we enclose herewith as supplementary information, four (4) copies each diamond drilling proposals from the three (3) companies who made bids for the work - - E. J. Longyear Company, proposal dated May 10, 1957; Joy Manufacturing Company, proposal dated April 24, 1957; and Sprague and Henwood, Inc., proposal dated April 24, 1957.

As indicated in our MF-103 Application, we have accepted the proposal from the Longyear Company, the lowest bidder, and enclose also four (4) copies of our letter dated May 16, 1957, to the Longyear Company enumerating certain points of understanding and stipulation in qualification of our acceptance of their proposal. Longyear has not yet returned a copy of this letter with their acceptance, but we do not anticipate that they will take exception to any of the stipulations set forth in our letter.

Very truly yours,

APPALACHIAN SULPHIDES, INC.
John F. Cowley, General Manager

By Clarence B. Benson
Clarence B. Benson, Asst. Gen. Manager

Longyear

E. J. LONGYEAR COMPANY
General Offices, Foshay Tower
Minneapolis 2, Minnesota, U.S.A.
TELEPHONE: FEDERAL 2-2447 • CABLE LONGCO

May 10, 1957

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DMEA
RECEIVED 1957

DATE	INITIALS	CODE

Appalachian Sulphides Company
South Strafford, Vermont

Attention: Mr. Clarence B. Benson

EXPLORATORY DRILLING PROGRAM - SOUTH STRAFFORD, VERMONT

Gentlemen:

1. Pursuant to our Mr. J. C. C. Blair's visit to your property at South Strafford, Vermont, and his talks with your Messrs. Benson, Cowley, and Dwelly, we are pleased to submit below our proposal for your proposed exploratory drilling at both surface and underground locations.

2. SURFACE DRILLING:

We understand that the surface work as now planned will consist of the drilling of a series of holes varying in inclination from a minus 45 degrees to vertical; that the formation will consist of schist; that EX and AX cores are required; that you will level all drill locations and make them accessible to truck transportation; and that water for the drilling will be made available within 2,000 feet of each drill location. We further understand that you will furnish for our personnel, trailer sites for three to four trailers, and that water, electric current, and sewage disposal facilities will be available at these sites.

UNDERGROUND DRILLING:

We understand that the underground drilling as now planned will consist of the drilling of a series of holes varying in inclination from horizontal to vertical (minus 90 degrees); that EX and AX cores are required; that the formation will consist of schist; that you will prepare drill locations in advance, providing 15 ft. of headroom and sufficient working space around the rig to permit efficient and safe operation of the drill; that you will provide four drill helpers at a cost to the Longyear Company not to exceed $1.60 per man hour for straight time and $2.40 per man hour for overtime. It is further understood that we will furnish a Tro-Pari instrument and Clinometer case but that you will be responsible for the instrument and for setting and reading of the instrument. It is also understood that you will assist us in moving our equipment into the Mine, from one location to another, and back to surface on completion of the drilling; that you will provide at each location compressed air in sufficient volume and at 85 p.s.i., so as to permit efficient operation of the drills; and also supply water as required at each location. In order to conserve compressed air, we understand that you will provide electric power as required for operation of our pumps, at no cost to the Longyear Company.

3. For this project we propose to furnish two truck-mounted rigs for the surface drilling, and two air-powered drills (one of which will be column-mounted) for the underground work, together with accessory equipment required to complete the work as now planned. We propose to operate the drills on a two shift basis, six days per week, providing the requisite number of experienced operators are available.

4. We will carry public liability insurance covering personal injury and property damage, and Workmen's Compensation insurance, and also, all-risk insurance on the drilling equipment protecting against loss by theft, fire, flood, land-slides and other similar hazards.

We will also assume and pay any and all Old Age Benefit, Unemployment and Social Security taxes and contributions imposed by federal or state authoritities.

Certificates showing the coverage referred to will be furnished upon request.

5. Based upon the conditions outlined above, we are pleased to quote as follows:

a) Surface drilling in holes ranging in inclination from 45 to 90 degrees -

1) Overburden Drilling
0 to 100 feet in depth.....$4.00 per foot

2) Diamond Core Drilling -

	EX-Size	AX-Size
Top of Ledge to 500'.....	$2.40 per ft.	$2.65 per ft.
500 to 1000 feet in depth.....	$2.65 per ft.	$2.90 per ft.
1000 to 1500 feet in depth....	$3.15 per ft.	$3.40 per ft.

3) Delays for your convenience or for which you are responsible.....$6.00 per hour, per two man crew

4) Angle and directional testing using Tro-Pari instrument.....$6.00 per hour, with two man crew, plus cost of repairs and full payment for instrument in the event that it is destroyed or lost in hole through no fault of the Longyear Company.

5) Casing lost or left in holes will be invoiced for at listed retail prices.

b) Underground drilling in holes varying in inclination from horizontal to vertical down -

1) Diamond Core Drilling -

	Angle Holes Varying in Inclination from 0° to _ 25°		Angle Holes Varying in Inclination from _25° to -90°	
	EX-Size	AX-Size	EX-Size	AX-Size
0 to 750 feet	$3.40	$3.65	$2.40	$2.65
750 to 1000 feet.....	$3.60	—	$2.60	—

2) Delays for your convenience or for which you are responsible.....$6.00 per hour, with two man crew

3) For time in excess of eight hours for two man crew, required to rig down, move, and rig up.....$6.00 per hour, with two man crew

4) Surveys using Tro-Pari instrument.....$6.00 per hour, with two man crew, plus cost of repairs and full payment for instrument in the event that it is destroyed or lost in hole through no fault of the Longyear Company.

5) Casing lost or left in holes will be invoiced for at listed retail prices.

c) Mobilization and demobilization

1. Should the total footage drilled under this agreement be less than 7,000 feet, it is agreed that the Longyear Company will be paid the sum of $1,500.00 to help defray the cost of mobilization and demobilization of personnel and equipment.

2. Should the total footage drilled under this agreement exceed 7,000 feet, it is agreed that the Longyear Company would be paid the sum of $1,000.00 to help defray the cost of mobilization and demobilization of personnel and equipment.

3. Should the total footage drilled under this agreement exceed 10,000 feet, it is agreed that there will be no charge for mobilization or demobilization of personnel and equipment.

6. The above-quoted drilling rates are based on wages currently being paid in the State of Vermont. If during the life of this project it becomes necessary for us to adjust the wages being paid our workmen because of demands of labor union or otherwise, it is understood and agreed that the Longyear Company reserves the right to increase drilling rates to cover resultant additional operating expenses.

7. Drill cores will be placed in receptacles furnished by you at each drill hole location.

8. Invoices covering work performed will be prepared in accordance with your instructions.

9. Thank you for the opportunity to be of service to you.

Sincerely,

E. J. LONGYEAR COMPANY

M. J. Gleason

Manager
Contract Drilling Division

ACCEPTED:

APPALACHIAN SULPHIDES COMPANY

By: John F Cowley
General Manager

Date: May 17, 1957

M.J.Gleason:bal

COPY

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

May 16, 1957

OFFICIAL FILE COPY
D M E A
RECEIVED
1957
DATE | CODE

E.J. Longyear Company
Foshay Tower
Minneapolis 2, Minnesota

Attention: Mr. M. J. Gleason, Manager, Contract Drilling Division

Re: Exploratory Drilling Program - South Strafford, Vermont

Gentlemen:

We return to you herewith the carbon copy of your exploratory drilling proposal dated May 10, 1957, which we accept subject to the following understanding and stipulations, which were discussed with and agreed to by your Mr. J.C.C.Blair yesterday in a telephone conversation with the writer. Acceptance of your proposal is by signature of Mr. John F. Cowley, General Manager of Appalachian, on both the original of your proposal letter, which we are retaining, and the carbon enclosed herewith.

1. Referring to the hourly rate for the four drill helpers underground, which we have agreed to provide, we understand that the drilling is subject to your regular bonus arrangement for such work, in addition to the $1.60/Hour straight time rate, which will be explained to the men involved by your foreman.

2. We believe, and Mr. Blair agrees, that it will be best all around, and for all concerned, for Appalachian to continue to carry on its payroll the four underground drill helpers, paying them the $1.60 hourly rate, and charging Longyear for the same plus Appalachian's cost for Workmen's Compensation insurance, Vermont Unemployment tax, Federal Social Security and Employer's Excise(Unemployment) tax - - provided that the charge for these fringe costs will not exceed what Longyear's cost would be for the same if carried on its payroll. At Appalachian's current rates, these fringe items aggregate approximately 8.5% of payroll.

Appalachian will continue the Group Insurance and Vacation benefits for these men under its regular plans and at Appalachian's expense.

3. Regarding the provision for labor rate escalation stipulated in Item 6 on Page 3 of your letter, we understand that this provision applies only in case of wage adjustments due to demands of Appalachian's employees, unionization of Appalachian's employees (which is not expected at this time), etc., and will not apply in case of adjustments made by Longyear of wage rates of its own employees.

4. We understand that the cost to Appalachian of casing lost or left in holes at its request will be no greater than Appalachian's cost would be if it purchased the casings as such.

COPY

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD
VERMONT

Telephone - South Strafford 5-2411

May 16, 1957

5. We understand that the rate of $4.00 per foot for overburden drilling will be subject to review after drilling conditions can be determined from a reasonable amount of drilling in overburden.

6. We understand that the value of the Tro-Pari instrument is approximately $1,300.00, as a basis for settlement in case the instrument is destroyed or lost in hole through no fault of the Longyear Company.

Sincerely yours,

Clarence B. Benson

Clarence B. Benson
Assistant General Manager

CBB:hw
cc: Mr. J.C.C. Blair, Max Meadows, Va.

ACCEPTED:

E. J. LONGYEAR COMPANY

By:_____

Date:_____

JOY MANUFACTURING COMPANY
900 WOODLAND AVENUE
MICHIGAN CITY, INDIANA

April 24, 1957

EXECUTIVE OFFICES
HENRY W. OLIVER BUILDING
PITTSBURGH 22, PA.

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 22 1957

DATE	INITIALS	CODE

AIR MAIL

Appalachian Sulphides, Inc.
South Strafford, Vt.

Attention: Mr. C. B. Benson
Asst. General Manager

Gentlemen:

This will confirm our phone conversation of this date with regard to proposed surface and underground drilling at South Strafford, Vermont.

We understand that you contemplate approximately 7,500 feet of underground drilling in holes 350 to 750 feet deep and approximately 11,000 feet of surface drilling in holes 400 to 1500 feet deep.

The prices we quote below are tentative and subject to revision upon inspection of the local conditions.

Underground Drilling

	EX Core
From 0. to 500. ft.	@$3.45 ft.
From 500. to 800. ft.	@$3.95 ft.

You to furnish compressed air at the drill at not less than 85 lbs. pressure.

You to furnish adequate water at the drill, we to furnish pump at the drill.

You to move equipment in and out of the mine and furnish facilities for movement of the drilling equipment between holes.

You to furnish sufficient headroom in line of drill holes so that the drill rods can be handled in at least 10 foot sections.

You to furnish core boxes.

Delays, if any on your part @$50.00 per 8-hour shift.

Surface Drilling

	EX Core
From 0. to 500. ft.	@$3.75 ft.
From 500. to 1000. ft.	@$4.25 ft.
From 1000. to 1500. ft.	@$4.75 ft.

You to furnish suitable access roads to the drill hole locations.

You to furnish core boxes.

We to pump water for drilling purposes provided that holes are spotted not more than 1200 feet from an adequate source of supply.

Delays, if any on your part @$50.00 per 8-hour shift.

The above prices are based on starting the holes with AX fittings in the ledge rock for a short distance, and then reducing to EX fittings.

Due to the large amount of contract drill work booked to date, and the definite scarcity of skilled personnel, we could only furnish one drill for the underground drilling and one drill for the surface drilling, operating two 8-hour shifts per day per drill and six days per week.

The prices as quoted above are higher than the prices under which similar drilling was performed for you in 1955 and 1956, and the reason for this is higher labor and materials costs since the last drilling.

We can ship the necessary drilling equipment for the proposed drilling in 3 to 4 weeks after acceptance and notice to proceed.

Thanking you for giving us an opportunity of quoting on your requirements, we are,

Yours very truly,

JOY MANUFACTURING COMPANY

W. J. Pilarski, Mgr.
Contract Drill Division

WJP/et

SPRAGUE & HENWOOD, Inc.
Contractors for DIAMOND DRILLING
MINERAL EXPLORATION • SOIL SAMPLING • PRESSURE GROUTING

EXECUTIVE OFFICES & PLANT
221 WEST OLIVE STREET
SCRANTON, PENNSYLVANIA
Telephone Diamond 4-8507

April 24, 1957

Appalachian Sulphides, Inc.
South Strafford, Vermont

Re: Proposed Diamond Drilling Project
South Strafford, Vermont

Attn: Mr. J. F. Cowley
General Manager

Gentlemen:

As per your telephone request and the information given to us on our call at your office, we are pleased to quote you on diamond drilling both underground and above ground. We are quoting you on a minimum of 10,000 feet of drilling on the surface and 6,000 linear feet underground and our price for this work will be as follows:-

OFFICIAL FILE COPY
RECEIVED MAY 22 1957

DATE	INITIALS	CODE

SURFACE DRILLING:-

For drilling EX holes to maximum depth of 1500 feet, as follows:

ITEM NO. 1 -

(a) Depth 0 ft. to 500 ft. -- $3.30 per lin. ft.
(b) Depth 500 ft. to 750 ft. -- $3.55 per lin. ft.
(c) Depth 750 ft. to 1000 ft. -- $3.80 per lin. ft.
(d) Depth 1000 ft. to 1250 ft. -- $4.15 per lin. ft.
(e) Depth 1250 ft. to 1500 ft. -- $4.45 per lin. ft.

ITEM NO. 2 -

For making inclination test by the acid method - EIGHT DOLLARS ($8.00) per hour.

ITEM NO. 3 -

For any casing left in hole at your request, - COST PLUS TRANSPORTATION.

ITEM NO. 4 -

For any delays caused by you - SIX DOLLARS ($6.00) per hour.

ITEM NO. 5 -

For re-entering any holes that have been previously drilled for the purpose of drilling them deeper - EIGHT DOLLARS ($8.00) per hr. (Hourly rate to include time of moving the outfit to the hole location, setting up, and cleaning the hole to its original depth).

ITEM NO. 6 -

For any drilling in excess of the minimum of 10,000 lin. ft. - A DEDUCTION OF TEN CENTS ($.10) per linear foot from the above prices will be made.

For the above prices we will furnish two (2) complete drilling rigs, including waterline and pumps, also experienced operating personnel.

You are to stake out holes, furnish a fore and aft site for aligning the machine, clear roads and drill sites suitable for truck travel, furnish us if required your tractor and driver at the rate of EIGHT DOLLARS ($8.00) per hour for moving our equipment and allow us to use water from your mine water system or suitable sumps within a distance of 1,500 feet of any hole.

You are to furnish core boxes for any cores which you wish to preserve. We will deliver the cores after they are boxed to your core shack.

Our foreman will have available to him degree rules for setting the desired angle of the swivel head on the machine.

Measurements to be taken from the top of the ground to the bottom of the hole.

UNDERGROUND DIAMOND DRILLING:-
Size EX, we are pleased to quote you as follows:-

ITEM NO. 1 -
(a) Depth 0 ft. to 500 ft. -- $3.20 per lin. ft.
(b) Depth 500 ft. to 750 ft. -- $3.45 per lin. ft.

ITEM NO. 2 -
For making inclination test by the acid method - EIGHT DOLLARS ($8.00) per hour.

ITEM NO. 3 -
For any casing left in hole at your request - COST PLUS TRANSPORTATION.

ITEM NO. 4 -
For any delays caused by you - SIX DOLLARS ($6.00) per hour.

ITEM NO. 5 -
For re-entering any holes that have been previously drilled for the purpose of drilling them deeper - EIGHT DOLLARS ($8.00) per hr. (Hourly rate to include time of moving the outfit to the hole location, setting up, and cleaning the hole to its original depth.)

ITEM NO. 6 -
For any drilling in excess of the minimum of 6,000 lin. ft. - A DEDUCTION OF TEN CENTS ($.10) per linear foot from the above prices will be made.

For the above prices we will furnish two (2) complete air operated diamond core drilling outfits. Each of the outfits will be equipped with an air driven pressure pump.

You are to furnish compressed air at the site of the drill machines, 350 cu. ft. per min. at 95 lbs. per sq. in. per drill, furnish a sufficient supply of water at the site of the drill machines, furnish locations for setting up the drilling equipment for a height to allow for use of 10 ft. drill rods.

To:
Appalachian Sulphides, Inc.
South Strafford, Vermont

April 24, 1957

You are to move our equipment into the mines from hole to hole and at the completion of the work to the surface. Our drill crew will assist in the moving of the equipment.

For any cores which you wish to preserve you are to furnish core boxes and the cores in the boxes will be turned over to you at the drill locations.

We are prepared to operate on a two-shift basis working six (6) eight hour days per week.

It is understood that you will furnish to us helpers to work with our diamond drillers inside of the mines. These men will be carried on our payroll or, if carried on your payroll, we will reimburse you for their wages plus insurance, etc.

Payments for the above work will be made monthly. Our invoice will be issued on the first of each month covering the footage drilled the previous month and payments to be made within fifteen (15) days after date of invoice.

If awarded the contract, we are prepared to move our equipment to the job within one week after receipt of your order.

We wish to thank you for the opportunity of quoting and we would be pleased to receive your order for this work.

Very truly yours,

SPRAGUE & HENWOOD, INC.

L. E. Mark
Contract Representative

LEM/lap

APPALACHIAN SULPHIDES, INC.
SOUTH STRAFFORD, VERMONT

ATTACHMENT TO
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
FORM MF 103

Attachment No. 2 - Page 2
(Revised - May 21, 1957)

DATED: May 7, 1957

From this area we propose to exclude only the presently developed orebody, which includes ore now being mined, probable and possible ore in place as shown on the attached longitudinal section marked "Attachment No. 2, Longitudinal Section".

You will note that such section shows the orebody presently developed to be in one continuous ore shoot with the exception of the area between coordinates N-14000 and N-15500, where the No. 3 vein extends approximately 150 feet to the west or footwall of the No. 1 vein, together with the area approximately 100 feet below the 975 level, where the two zones are connected in a synclinal structure.

Substantial amounts of ore have been mined from the No. 3 zone and mineralization has been developed from the 400 foot elevation to the surface on that structure.

(b) Elizabeth Mine

(c) Owner

(d) Owner

(e) There are no liens or encrumbrances on the land.

(f) There are no unpatented claims.

EXTRA COPY
D M E A
RECEIVED MAY 23 1957

DATE	INITIALS	CODE

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
5/20	[illegible]	500
5/20	[illegible]	130
	[illegible]	110
	[illegible]	107
5/21	[illegible]	220
		500

MAY 20 1957

Mr. John F. Cowley, General Manager
Appalachian Sulphides, Inc.
South Strafford, Vermont

5/20 Kiilsgaard 130
5/24 [illegible] 130

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont

Dear Mr. Cowley:

Your application for Government assistance to explore the cited property has been reviewed by the Division of Base Metals of the Defense Minerals Exploration Administration and is being referred to:

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

If additional information concerning your application is needed, the Field Team will get in touch with you at an early date.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

WRGriswold/er 5/20/57
Copy to: Docket
Admr R File
Op/ Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Region V (2)
Chron.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
5/20	Griswold	500
5/20	GCS	120
	Closed	110
	Mitchell	100
		225
		500

500

MAY 20 1957

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

Re: Docket No. DMEA-4746 (Copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont

Dear Mr. Laurence:

The cited application is being referred to your office for consideration, a field examination of the property if warranted, and recommendations.

We are enclosing copies of memoranda dated May 14 and 16, 1957, by A. D. McMahon, Bureau of Mines, and N. B. Nelson, Geological Survey, respectively, relating to the project.

We are also enclosing an extra copy of the application for the Field Team use.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (WRG)

WRGriswold/er 5/20/57

Copy to: Docket
Admr R File
Op. Committee
Mr. McMahon, USBM
Mr. Kiilsgaard, USGS
Chron.

Enclosures

APPROVED:

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

Thor H. Kiilsgaard (WRG)
Member, Geological Survey

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

May 17, 1957

Memorandum for the Files

From: Director, Division of Base Metals

Subject: Phone conversation of Application, Docket No. DMEA-4746, Appalachian Sulphides, Inc., Elizabeth Mine, Orange County, Vermont, (Copper)

The undersigned, on May 17, 1957, phoned Mr. John F. Cowley, Manager, of the Applicant company, at South Strafford, Vermont.

We advised him that Mr. Walter White of the Geological Survey would be at the mine on the morning of May 23rd to meet with the Applicant's representatives and Hugh McKinstry, their consulting geologist.

We also advised Mr. Cowley that their request for exclusion of certain "blocks" from any proposed contract could present various complications. We explained that from our viewpoint, it was simpler and more satisfactory if we were provided with longitudinal sections showing the existing ore reserves, and that such sections serve as an exclusion base in any contract which might be prepared.

Mr. Cowley stated that no great inconvenience would be involved and that he would forward copies to us, showing ore reserves to be excluded, in longitudinal sections.

W. R. Griswold

W. R. Griswold

WRG/er
Copy to: Docket
Chron.

8623

IN REPLY REFER TO:

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 17 1957

DATE	INITIALS	CODE
5/17	C	220
5/17	wey.	500

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

May 16, 1957

Re: DMEA 4746 (copper)
Appalachian Sulphides, Inc.
Elizabeth Mine
Orange County, Vermont
$81,414.95 - Copper

Memorandum

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

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

Subject: Review of application

The applicant requests assistance in extending the exploration, by surface and underground diamond drilling, of the downward extension of the long Elezabeth ore structure and inferred parallel ore structures. The applicant has explored 9 east and west sections with 68 surface and underground holes and has partially outlined a series of inferred folds within which ore bodies similar to the Elizabeth may occur. The proposed work would be done on the same sections and thus would supplement the applicant's work.

The South and North synclinal ore structures have a known length of 11,000 feet. The North mineralized zone is 9,300 feet long and the Elizabeth sulfide orebody in it has a length of about 8,000 feet. Maximum height of the steeply dipping orebody is about 600 feet and as the average angle of plunge is low (and in part lacking), the deepest one is only about 975 feet below the outcrop. The orebody has a maximum thickness of 50 - 70 feet, but the average width is much less, probably about 20 feet. The tenuous northerly 4,200 feet of the orebody has a maximum height of 200 feet and much of it is less than 100 feet high.

The main country rock of the region is garnet-mica schist with which are interleaved other metamorphased rocks of which two are important, a band of amphibolite, possibly derived from tuff and, of special significance, a band of tremolite-phlogopite schist, the gangue rock of the pyrrhotite-pyrite-chalcopyrite ore.

The long, narrow orebody occurs in the usually tight space between the amphibolite limbs of a synchine and...."the position of the oreshoot is determined by a favorable combination of stratigraphic horrizon and deformation. The stratigraphic member most amenable to replacement is the tremolite-phylogopite schist with its abundant

???

carbonate. Where it has been deformed the adjoining beds of schist have been sheared, strongly contorted and brecciated.....In the present interpretation this is a zone of slipping between competent and incompetent members on the long straight limb of a fold. Along this zone, intervals of thinning alternate with intervals of complex doubling and drag folding. In such places not only has the doubling-up caused a repetition of favorable members but the attendant crumbling has caused brecciation allowing still more opportunity for broad mineralization". /

The object of the proposed drilling is to find a repetition or repetitions of the above noted very special conditions. The drilling already done has located bands of amphibolite and, based on the repetitive intersections, numerous folds have been inferred. Apparently no ore making condition was found in the 68 holes in the 9 sections drilled.

The 68 holes are so placed and long enough to test a belt, including the Elizabeth zone, from 500 to 1,600 feet wide and 7,658 feet long - between 7,442 north and 15,100 north. As outlined, the proposed drilling would be done on the same 9 sections. The sections are widely spaced, from 400 to 1,368 feet and it would appear prudent, because a very special structural condition is being looked for, to drill between the sections. Also large parts of some of the proposed holes are in the non-subordinated blocks. Thus, a marked revision of the drilling scheme is indicated.

Referral of the application to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

/ H. E. McKinstry and Aimo K. Mikkola, 1954. The Elizabeth Copper Mine, Vermont, Economic Geology Vol. 49 No. 1.

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

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 14 1957

DATE	INITIALS	CC
5/14	C	220
5/15	WRS	500
	~~May 14, 1957~~	

Memorandum

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

From: Commodity Specialist, Branch of Base Metals

Subject: Review of application, Docket No. DMEA 4746 (Copper), Appalachian Sulphides, Incorporated, Elizabeth Mine, Orange County, Vermont. $81,414.95

The applicant proposes to explore possible ore horizons below and to the west of the Elizabeth Mine syncline with 19,200 feet of surface and underground diamond drilling at an estimated total cost of $81,414.95.

In view of the production record of the Elizabeth Mine it appears that further exploration for new ore bodies is warranted. The estimated costs of the project are reasonable and the applicants operation under a previous contract, Docket No. DMEA 1526, was worthy of commendation.

The area excluded from the exploration project should be thoroughly examined because of the amount of diamond drilling penetrating that ground. In this connection it appears that relocation of some holes would adequately test the target areas and allow the elimination of a few holes. For example, in reference to the following maps attached to the application:

1. Cross Section at 12,500 North - Slight changes in the directions of holes Nos. 1010, 1012, and 1013 would seem to allow the elimination of holes Nos. 1009 and 1011. Proposed hole No. 1009 explores only 70' of ground beyond the excluded area.

2. Cross Section at 14,000 North - Proposed D D Hole No. 1020, only 50' of this 600' hole penetrates the area included in the proposed exploration project. Possibly relocation of hole No. 1019 would adequately test both targets.

Not correct line drawn 200' too far west. WRW.

A field examination of the property is recommended.

A. D. McMahon

Attachment

Copy to: Division of Minerals A. D. McMahon
Branch of Base Metals (2)
Thor Kiilsgaard, U.S.G.S.
F. D. Lamb
Files

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

May 13, 1957

Appalachian Sulphides, Inc.
South Strafford, Vermont.

Subject: DMEA 4746

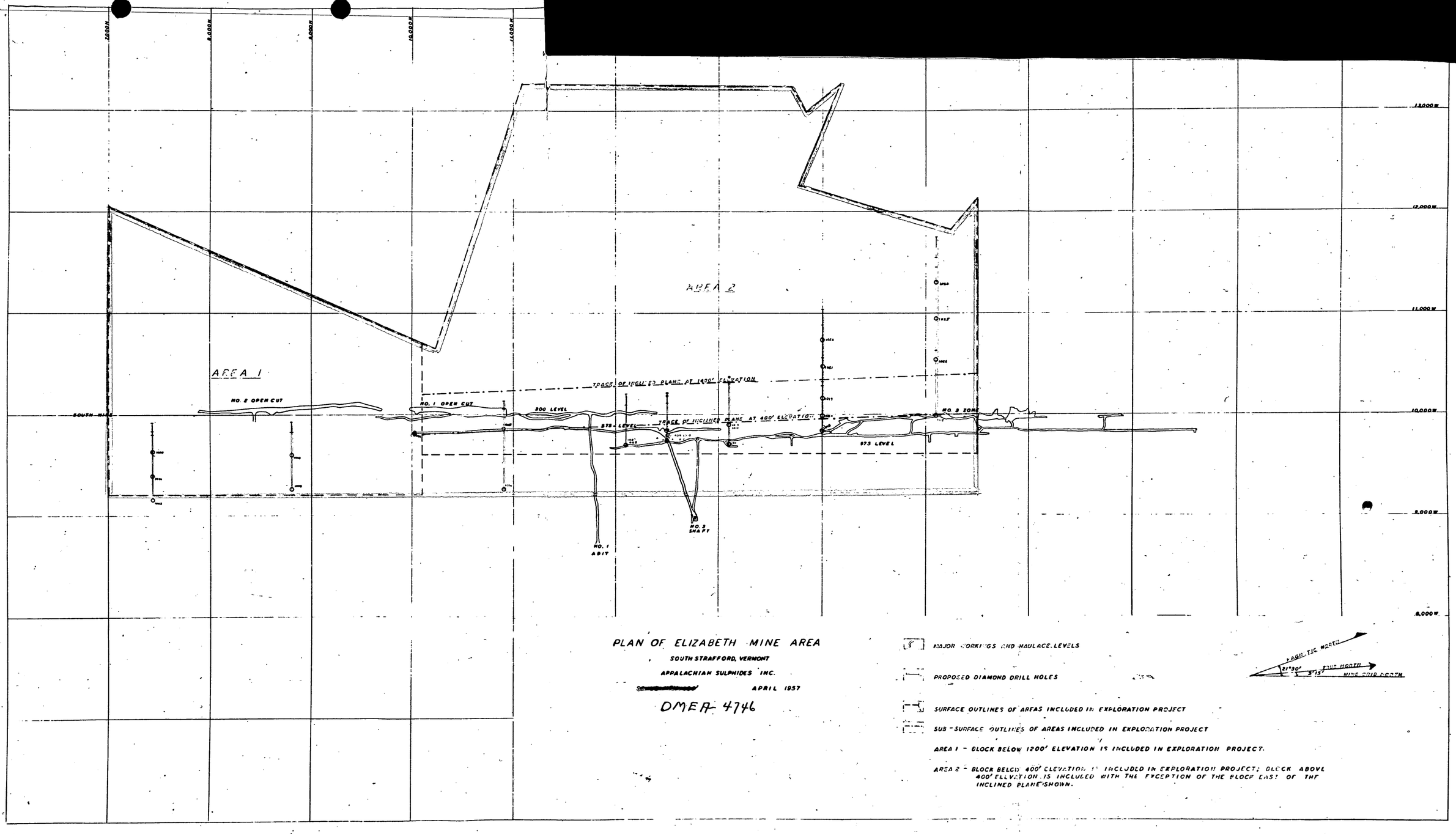
Gentlemen:

Your application for exploration assistance, dated May 7, 1957, submitted to our office at Washington, D.C., has been assigned Docket Number DMEA 4746 and referred to the Base Metals Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to: Region V.



PLAN OF ELIZABETH MINE AREA

SOUTH STRAFFORD, VERMONT

APPALACHIAN SULPHIDES INC.

[redacted] APRIL 1957

DMEA 4746

MAJOR WORKINGS AND HAULAGE LEVELS

PROPOSED DIAMOND DRILL HOLES

SURFACE OUTLINES OF AREAS INCLUDED IN EXPLORATION PROJECT

SUB-SURFACE OUTLINES OF AREAS INCLUDED IN EXPLORATION PROJECT

AREA 1 - BLOCK BELOW 1200' ELEVATION IS INCLUDED IN EXPLORATION PROJECT.

AREA 2 - BLOCK BELOW 400' ELEVATION IS INCLUDED IN EXPLORATION PROJECT; BLOCK ABOVE 400' ELEVATION IS INCLUDED WITH THE EXCEPTION OF THE BLOCK EAST OF THE INCLINED PLANE SHOWN.

OFFICIAL FILE COPY
D M E A
RECEIVED JUL 1 1957
DATE | INITIAL | CODE