DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE — Idm-E NO. 970 — DMEA NO. 4173

Application
- [ ] Denied
- [ ] Withdrawn

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

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

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [ ] Certification of Discovery
- [x] Closing Letter 1-22-59
- [x] Cost Audits 6-17-58
- [x] Termination ~~Notice~~ or Agreement 3-10-58
- [ ] Recision Notice
- [ ] Assignment of Contract
- [x] Contract Amendments
- [x] Contract with all exhibits and annexes
- [ ] Owner's Consent to Lien and Subordination Agreement
- [x] Application and attachments

Right Side

- [x] Project summary (final)
- [x] Work Completed analysis (final)
- All other material filed in chronological order including the following reports if checked:
- [ ] Field Team Semi-Annual Report for Certified Project
- [ ] Final Field Team Report (Tab)
- [x] Operator's Final Report (Tab) 6-12-58
- [ ] Interim Field Team Reports
- [ ] Operator's monthly reports and all attachments
- [x] On-site Exam Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. 1 : Reports
- [ ] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

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

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

Folders No. _____ : Settlement Sheets

Folders No. _____ : Drill Logs

Folders No. _____ : Royalty material

17963

DEPT. MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF REVIEW

I have reviewed the Monthly Reports of:

The New Jersey Zinc Company
Austinville, Virginia
and
160 Front Street
New York 38, New York

pertaining to Exploration Project Contract No. Idm-2970, DMEA No. 4173, including Amendment Nos. 1, 2, and 3, for December 1956 to March 1958, inclusive, covering a project for the exploration of zinc on property, known as the James-Woodruff Area located in Smyth and Wythe Counties, Virginia.

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 following reasons:

(a) the Monthly Reports were supported by documentary proof of that portion ($29,803.05) of the costs which covered work performed at unit rates under independent contract;
(b) the balance ($3,803.70) 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.

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

Total cost billed by Contractor		$33,606.75
Exceptions:		
Prior to this review	$ -0-	
Herewith	-0-	-0-
Total Accepted Cost		$33,606.75 ✓

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:

Payable on audited claim	$16,803.38
Paid to date	14,317.13
Balance due Operator	$ 2,486.25

E. D. Talbert

June 17, 1958

E. D. Talbert, Auditor

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
1/21	Klugescheid	500
	Kramer	500
1/21	Talbot	800
		~~130~~
		~~130~~
		~~130~~
		~~110~~
		~~100~~
		~~HB~~
1/23	C	220
		500

JAN 22 1959

Mr. S. S. Goodwin, Vice President
and Manager of Mines
The New Jersey Zinc Company
160 Front Street
New York 38, New York

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe & Smyth Counties, Virginia
Contract No. Idm-E970

Dear Mr. Goodwin:

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 certain records for the period indicated.

We appreciate your interest and participation in the DMEA exploration program which has now been succeeded by the Office of Minerals Exploration program.

Sincerely yours,

(signed) FRANK E. JOHNSON

Acting Director

WPKlugescheid/er 1/21/59
Copy to: Docket
Dir Read File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Mr. Chambers
Chron.
Region V (2)

43683

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DMEA
RECEIVED MAY 7 1958
DATE | INITIALS | CODE

Government's copy

App'd. Sol. Off.
Klugerschaid
Chambers
Selfridge
Johnson

TERMINATION AGREEMENT

It is agreed this 23rd day of April, 1958, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government", and The New Jersey Zinc Company, hereinafter called the "Operator", parties to that certain Exploration Project Contract No. Idm-E970, Docket No. DMEA-4173, dated July 23, 1956, as amended, hereinafter called the "Contract", that:

1. Effective March 10, 1958, 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 allowable 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 the Operator's records), accounts, audits, 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 in this termination agreement.

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

THE UNITED STATES OF AMERICA

By O O Mittendorf
Administrator, Defense Minerals Exploration Administration

THE NEW JERSEY ZINC COMPANY

By J Bodman

Title VICE PRESIDENT

Government's copy

OFFICIAL FILE COPY
DMEA
RECEIVED OCT 9 1957

DATE	INITIALS	CODE

EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

AMENDMENT NO. 4

It is agreed this 25th day of September, 1957, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and The New Jersey Zinc Company that Exploration Project Contract Idm-E970, Docket No. DMEA-4173, dated July 23, 1956, as amended, is further amended, effective July 23, 1956, as follows:

1. In Exhibit "A", under Description of the Work, the fifth paragraph is revised to read as follows:

"Diamond drilling shall be done with AX size, or larger, coring bits, except that when it is not feasible to complete a hole with AX size, with Government approval, the hole may be reduced with EX casing and completed with EX size bits. The Government will not contribute to the cost of drilling any hole which is not completed. All drill core shall be logged and shall be made available to the Government for examination. All significantly mineralized core shall be split and one half thereof shall be properly sampled and the samples assayed for zinc. All assay reports shall be submitted monthly to the Government together with the drill hole logs, proper engineering-geological plan maps and sections showing the progress of the work, and drill hole and sample locations. The remaining half of all significantly mineralized core shall be furnished to the Government upon request."

2. In Exhibit "A", under Estimated Cost of the Project, Category (1) Independent Contracts, is revised to read as follows:

"Overburden drilling and diamond drilling to 250-foot depth, 6,000 feet
AX size @ $2.20/ft. $13,200.00
EX size @ $2.00/ft.

Diamond drilling 250-foot to 500-foot depth, 4,650 feet
AX size @ $2.45/ft. $11,392.50
EX size @ $2.25/ft.

Diamond drilling 500-foot to 750-foot depth, 2,850 feet
AX size @ $2.70/ft.
EX size @ $2.50/ft. $7,695.00

Diamond drilling 750-foot to 1,000-foot depth, 1,200 feet
AX size @ $2.95/ft.
EX size @ $2.75/ft. 3,540.00

Diamond drilling 1,000-foot to 1,250-foot depth, 300 feet
AX size @ $3.20/ft.
EX size @ $3.00/ft. 960.00 $36,787.50

The above rates cover charges for reaming, cementing, water supply, casing, changing of location and all other charges which may be incurred by the Operator pursuant to the diamond drilling contracts. 1/"

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 "allowable 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 _____
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

By _____

Title _____

Government Copy

RECEIVED
SEP 27 1957
D.M.E.A.

EXPLORATION PROJECT CONTRACT

THE NEW JERSEY ZINC CO.

DOCKET NO. DMEA-4173- Zinc

AMENDMENT No.3

It is agreed this 12th day of September, 1957, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and The New Jersey Zinc Company, that Exploration Project Contract Idm-E970, (Docket No. DMEA-4173), dated July 23, 1956, and amended October 4, 1956 and April 16, 1957, be further amended as follows:

In Annex I of the contract there is hereby added the following parcels of land, designated " J. R. Horne" on the maps, Figures 2-B and 2-D which are attached to the contract. The tract is more specifically described in the records on file in the Clerk's Office of Smyth County, Virginia, and is further identified as follows:

Property Owner	Acreage (more or less)	Expiration of option	Deed Book	Page
J.R. & Nell Gray Horne, et al	130.5	1-31-62	115	51

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, nor the amount of any item designated as "maximum."

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Robert A. Lawrence
Executive Officer, DMEA
Field Team, Region V

THE NEW JERSEY ZINC COMPANY

By J Bordeman

Title: VICE PRESIDENT

EXHIBIT A

OFFICIAL FILE COPY
DMEA
RECEIVED SEP 16 1957
DATE | INITIALS | CODE

This AGREEMENT made and entered into this 31st day of January, 1957, by and between J. R. HORNE and NELL GRAY HORNE, his wife, HELEN ANN CORNS and HOWARD C. CORNS, her husband, ROBERT S. HORNE and BARBARA J. HORNE, his wife, WILLIAM G. HORNE and ELIZABETH B. HORNE, his wife, JAMES B. HORNE and JANEY L. HORNE, his wife, and BETTY SUE HORNE and BUD M. HORNE, infants, and the unborn children of J. R. Horne, D. J. Horne, Jr. and C. S. Horne, by A. A. Campbell, Special Commissioner, under Decree of the Circuit Court of Smyth County entered the 30th day of ~~January~~ April, 1957, parties of the first part, hereinafter called the "Owners", and THE NEW JERSEY ZINC COMPANY, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

--W I T N E S S E T H--

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part give, grant and convey unto the party of the second part for a period of five years expiring on the 31st day of January, 1962, the exclusive right and option to purchase

all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is all of that tract of land situated in the St. Clair Magisterial District of Smyth County, Virginia, and more particularly described as follows, towit:

BEGINNING at a walnut tree, a corner of the Newland tract, and with line of same, S 49 E 29-1/2 poles to a cherry stump, S 10-1/4 E 154 poles to a chestnut-oak on top of Chestnut Ridge; thence with the Ed Rhudy line S 71-1/2 W 49.9 poles to a stump, S 79 W 47-1/2 poles to a small maple (D.J.,Jr. corner); thence N 16 W 80 poles to a locust, N 25-1/2 W 17-1/2 poles to a fence post, S 77 W 18 poles and 8 links to a locust, N 37-1/2 W 10 poles to a stake on North bank of creek, S 87-3/4 W 16 poles to a stake, N 12 W 30 poles to a gate post, N 17-1/2 E 15 poles and 4 links to a stake, N 66-1/4 W 8 poles to a stake, N 20-1/2 W 6 poles to a stake, N 4-1/2 E 25-1/2 poles to a stake (corner in Bennington's line); thence N 77-3/4 E 107-1/2 poles to a stake, S 69-3/4 E 11 poles and 22 links to the beginning, and containing 130-1/2 acres, more or less, and being the same as was conveyed to Roy Horne, who is the same person as J. R. Horne, by deed dated January 18, 1936, by D. J. Horne and wife and reoorded in the Clerk's Office of Smyth County in Deed Book 115 at page 51, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

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

WITNESS the following signatures and seals:

/s/ J R Horne (SEAL)

/s/ Nelle Grey Horne (SEAL)

/s/ Helen Ann Corns (SEAL)

/s/ Howard C. Corns (SEAL)

/s/ William G. Horne (SEAL)

/s/ Elizabeth B. Horne (SEAL)

/s/ Robert S. Horne (SEAL)

/s/ Barbara J. Horne (SEAL)

/s/ James B. Horne (SEAL)

/s/ Janey L. Horne (SEAL)

/s/ A. A. Campbell, Special Commissioner (SEAL)

VIRGINIA,

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that J. R. Horne and Nell Gray Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires July 1, 1957.

Given under my hand this 30th day of ~~December,~~ November 1956.

/s/ D. Keith Lupton
Notary Public.

VIRGINIA,

CITY OF MARTINSVILLE, To-wit:

I, Nancy S. Lassiter, a Notary Public in and for the City of Martinsville in the Commonwealth of Virginia, do certify that Helen Ann Corns and Howard C. Corns, her husband, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires June 14, 1957.

Given under my hand this 17th day of December, 1956.

(Notary Seal)

/s/ Nancy S. Lassiter
Notary Public.

MARYLAND,

CITY OF BALTIMORE, To-wit:

I, Carroll L. Bryan, a Notary Public

in and for the City of Baltimore in the State of Maryland, do certify that Robert S. Horne and Barbara J. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the ~~4th~~ 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires May 7, 1957.
Given under my hand and notarial seal this 4th day of January, 1957.

/s/ Carroll L. Bryan
Notary Public.

(SEAL)

MARYLAND,
CITY OF BALTIMORE, TO-wit:

I, Harry A. Young, a Notary Public in and for the City of Baltimore in the State of Maryland, do certify that William G. Horne and Elizabeth B. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires May 6th 1957.
Given under my hand and notarial seal this 27th day of December, 1956.

(SEAL)

/s/ Harry A. Young
Notary Public.

STATE OF PENNSYLVANIA,
COUNTY OF Delaware, To-wit:

I, George B. Farris, a Notary Public in and for the County of Delaware in the State of

Pennsylvania, do certify that James D. Horne and Janey L. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires Jan. 1, 1959.

Given under my hand and notarial seal this 12 day of Jan., 1957.

(SEAL) /s/ George B. Farris
Notary Public.

VIRGINIA,
WYTHE COUNTY, to-wit:

I, Carol C. Morehead, a Notary Public in and for the County of Wythe in the Commonwealth of Virginia, do certify that A. A. Campbell, Special Commissioner for Betty Sue Horne and Bud M. Horne, infants, and the unborn children of J. R. Horne, D. J. Horne, Jr. and C. S. Horne, whose name is signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my County aforesaid and acknowledged the same.

My commission expires February 14, 1960.

Given under my hand this 24th day of June, 1957.

(SEAL) /s/ Carol C. Morehead
Notary Public.
(I was commissioned Carol Caudle.)

VIRGINIA: In the Clerk's Office of the Circuit Court of Smyth County, the 27th day of June, 1957, the foregoing writing was presented and with the certificates annexed, admitted to record at 1:00 o'clock P. M.

Teste: Ruth Allen - Deputy Clerk

800<u>00</u>

EXHIBIT A

46

EXTRA COPY
D M E A
RECEIVED SEP 16 1957

DATE	INITIALS	CODE

This AGREEMENT made and entered into this 31st day of January, 1957, by and between J. R. HORNE and NELL GRAY HORNE, his wife, HELEN ANN CORNS and HOWARD C. CORNS, her husband, ROBERT S. HORNE and BARBARA J. HORNE, his wife, WILLIAM G. HORNE and ELIZABETH B. HORNE, his wife, JAMES B. HORNE and JANEY L. HORNE, his wife, and BETTY SUE HORNE and BUD M. HORNE, infants, and the unborn children of J. R. Horne, D. J. Horne, Jr. and C. S. Horne, by A. A. Campbell, Special Commissioner, under Decree of the Circuit Court of Smyth County entered the 30th day of ~~January~~ April, 1957, parties of the first part, hereinafter called the "Owners", and THE NEW JERSEY ZINC COMPANY, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

--W I T N E S S E T H--

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part give, grant and convey unto the party of the second part for a period of five years expiring on the 31st day of January, 1962, the exclusive right and option to purchase

all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is all of that tract of land situated in the St. Clair Magisterial District of Smyth County, Virginia, and more particularly described as follows, towit:

BEGINNING at a walnut tree, a corner of the Newland tract, and with line of same, S 49 E 29-1/2 poles to a cherry stump, S 10-1/4 E 154 poles to a chestnut-oak on top of Chestnut Ridge; thence with the Ed Rhudy line S 71-1/2 W 49.9 poles to a stump, S 79 W 47-1/2 poles to a small maple (D.J.,Jr. corner); thence N 16 W 80 poles to a locust, N 25-1/2 W 17-1/2 poles to a fence post, S 77 W 18 poles and 8 links to a locust, N 37-1/2 W 10 poles to a stake on North bank of creek, S 87-3/4 W 16 poles to a stake, N 12 W 30 poles to a gate post, N 17-1/2 E 15 poles and 4 links to a stake, N 66-1/4 W 8 poles to a stake, N 20-1/2 W 6 poles to a stake, N 4-1/2 E 25-1/2 poles to a stake (corner in Bennington's line); thence N 77-3/4 E 107-1/2 poles to a stake, S 69-3/4 E 11 poles and 22 links to the beginning, and containing 130-1/2 acres, more or less, and being the same as was conveyed to Roy Horne, who is the same person as J. R. Horne, by deed dated January 18, 1936, by D. J. Horne and wife and recorded in the Clerk's Office of Smyth County in Deed Book 115 at page 51, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

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

WITNESS the following signatures and seals:

/s/ J R Horne (SEAL)

/s/ Nelle Grey Horne (SEAL)

/s/ Helen Ann Corns (SEAL)

/s/ Howard C. Corns (SEAL)

/s/ William G. Horne (SEAL)

/s/ Elizabeth B. Horne (SEAL)

/s/ Robert S. Horne (SEAL)

/s/ Barbara J. Horne (SEAL)

/s/ James B. Horne (SEAL)

/s/ Janey L. Horne (SEAL)

/s/ A. A. Campbell, Special Commissioner (SEAL)

VIRGINIA,

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that J. R. Horne and Nell Gray Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires July 1, 1957.

Given under my hand this 30th day of ~~December,~~ November 1956.

/s/ D. Keith Lupton
Notary Public.

VIRGINIA,

CITY OF MARTINSVILLE, To-wit:

I, Nancy S. Lassiter, a Notary Public in and for the City of Martinsville in the Commonwealth of Virginia, do certify that Helen Ann Corns and Howard C. Corns, her husband, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires June 14, 1957.

Given under my hand this 17th day of December, 1956.

(Notary Seal)

/s/ Nancy S. Lassiter
Notary Public.

MARYLAND,

CITY OF BALTIMORE, To-wit:

I, Carroll L. Bryan, a Notary Public

in and for the City of Baltimore in the State of Maryland, do certify that Robert S. Horne and Barbara J. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the ~~4th~~ 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires May 7, 1957.
Given under my hand and notarial seal this 4th day of January, 1957.

/s/ Carroll L. Bryan
Notary Public.

(SEAL)

MARYLAND,

CITY OF BALTIMORE, TO-wit:

I, Harry A. Young, a Notary Public in and for the City of Baltimore in the State of Maryland, do certify that William G. Horne and Elizabeth B. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires May 6th 1957.
Given under my hand and notarial seal this 27th day of December, 1956.

(SEAL)

/s/ Harry A. Young
Notary Public.

STATE OF PENNSYLVANIA,

COUNTY OF Delaware, To-wit:

I, George B. Farris, a Notary Public in and for the County of Delaware in the State of

Pennsylvania, do certify that James D. Horne and Janey L. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires Jan. 1, 1959.

Given under my hand and notarial seal this 12 day of Jan., 1957.

(SEAL) /s/ George B. Farris
Notary Public.

VIRGINIA,
WYTHE COUNTY, to-wit:

I, Carol C. Morehead, a Notary Public in and for the County of Wythe in the Commonwealth of Virginia, do certify that A. A. Campbell, Special Commissioner for Betty Sue Horne and Bud M. Horne, infants, and the unborn children of J. R. Horne, D. J. Horne, Jr. and C. S. Horne, whose name is signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my County aforesaid and acknowledged the same.

My commission expires February 14, 1960.

Given under my hand this 24th day of June, 1957.

(SEAL) /s/ Carol C. Morehead
Notary Public.
(I was commissioned Carol Caudle.)

VIRGINIA: In the Clerk's Office of the Circuit Court of Smyth County, the 27th day of June, 1957, the foregoing writing was presented and with the certificates annexed, admitted to record at 1:00 o'clock P. M.

Teste: Ruth Allen - Deputy Clerk

800<u>00</u>

EXHIBIT A

EXTRA COPY
DMEA
RECEIVED SEP 16 1957
DATE | INITIALS | CODE

46

This AGREEMENT made and entered into this 31st day of January, 1957, by and between J. R. HORNE and NELL GRAY HORNE, his wife, HELEN ANN CORNS and HOWARD C. CORNS, her husband, ROBERT S. HORNE and BARBARA J. HORNE, his wife, WILLIAM G. HORNE and ELIZABETH B. HORNE, his wife, JAMES B. HORNE and JANEY L. HORNE, his wife, and BETTY SUE HORNE and BUD M. HORNE, infants, and the unborn children of J. R. Horne, D. J. Horne, Jr. and C. S. Horne, by A. A. Campbell, Special Commissioner, under Decree of the Circuit Court of Smyth County entered the 30th day of ~~January~~ April, 1957, parties of the first part, hereinafter called the "Owners", and THE NEW JERSEY ZINC COMPANY, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

--W I T N E S S E T H--

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part give, grant and convey unto the party of the second part for a period of five years expiring on the 31st day of January, 1962, the exclusive right and option to purchase

all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is all of that tract of land situated in the St. Clair Magisterial District of Smyth County, Virginia, and more particularly described as follows, towit:

BEGINNING at a walnut tree, a corner of the Newland tract, and with line of same, S 49 E 29-1/2 poles to a cherry stump, S 10-1/4 E 154 poles to a chestnut-oak on top of Chestnut Ridge; thence with the Ed Rhudy line S 71-1/2 W 49.9 poles to a stump, S 79 W 47-1/2 poles to a small maple (D.J.,Jr. corner); thence N 16 W 80 poles to a locust, N 25-1/2 W 17-1/2 poles to a fence post, S 77 W 18 poles and 8 links to a locust, N 37-1/2 W 10 poles to a stake on North bank of creek, S 87-3/4 W 16 poles to a stake, N 12 W 30 poles to a gate post, N 17-1/2 E 15 poles and 4 links to a stake, N 66-1/4 W 8 poles to a stake, N 20-1/2 W 6 poles to a stake, N 4-1/2 E 25-1/2 poles to a stake (corner in Bennington's line); thence N 77-3/4 E 107-1/2 poles to a stake, S 69-3/4 E 11 poles and 22 links to the beginning, and containing 130-1/2 acres, more or less, and being the same as was conveyed to Roy Horne, who is the same person as J. R. Horne, by deed dated January 18, 1936, by D. J. Horne and wife and recorded in the Clerk's Office of Smyth County in Deed Book 115 at page 51, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

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

WITNESS the following signatures and seals:

/s/ J R Horne (SEAL)

/s/ Nelle Grey Horne (SEAL)

/s/ Helen Ann Corns (SEAL)

/s/ Howard C. Corns (SEAL)

/s/ William G. Horne (SEAL)

/s/ Elizabeth B. Horne (SEAL)

/s/ Robert S. Horne (SEAL)

/s/ Barbara J. Horne (SEAL)

/s/ James B. Horne (SEAL)

/s/ Janey L. Horne (SEAL)

/s/ A. A. Campbell, Special Commissioner (SEAL)

VIRGINIA,

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that J. R. Horne and Nell Gray Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires July 1, 1957.

Given under my hand this 30th day of ~~December,~~ November 1956.

/s/ D. Keith Lupton
Notary Public.

VIRGINIA,

CITY OF MARTINSVILLE, To-wit:

I, Nancy S. Lassiter, a Notary Public in and for the City of Martinsville in the Commonwealth of Virginia, do certify that Helen Ann Corns and Howard C. Corns, her husband, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires June 14, 1957.

Given under my hand this 17th day of December, 1956.

(Notary Seal)

/s/ Nancy S. Lassiter
Notary Public.

MARYLAND,

CITY OF BALTIMORE, To-wit:

I, Carroll L. Bryan, a Notary Public

in and for the City of Baltimore in the State of Maryland, do certify that Robert S. Horne and Barbara J. _____ Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the ~~4th~~ 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires May 7, 1957.
Given under my hand and notarial seal this 4th day of January, 1957.

/s/ Carroll L. Bryan
Notary Public.

(SEAL)

MARYLAND,

CITY OF BALTIMORE, TO-wit:

I, Harry A. Young, a Notary Public in and for the City of Baltimore in the State of Maryland, do certify that William G. Horne and Elizabeth B. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my City aforesaid and acknowledged the same.

My commission expires May 6th 1957.
Given under my hand and notarial seal this 27th day of December, 1956.

(SEAL)

/s/ Harry A. Young
Notary Public.

STATE OF PENNSYLVANIA,

COUNTY OF Delaware, To-wit:

I, George B. Farris, a Notary Public in and for the County of Delaware in the State of

Pennsylvania, do certify that James D. Horne and Janey L. Horne, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires Jan. 1, 1959.

Given under my hand and notarial seal this 12 day of Jan., 1957.

(SEAL) /s/ George B. Farris
Notary Public.

VIRGINIA,
WYTHE COUNTY, to-wit:

I, Carol C. Morehead, a Notary Public in and for the County of Wythe in the Commonwealth of Virginia, do certify that A. A. Campbell, Special Commissioner for Betty Sue Horne and Bud M. Horne, Infants, and the unborn children of J. R. Horne, D. J. Horne, Jr. and C. S. Horne, whose name is signed to the foregoing contract and agreement bearing date on the 31st day of January, 1957, personally appeared before me in my County aforesaid and acknowledged the same.

My commission expires February 14, 1960.

Given under my hand this 24th day of June, 1957.

(SEAL) /s/ Carol C. Morehead
Notary Public.
(I was commissioned Carol Caudle.)

VIRGINIA: In the Clerk's Office of the Circuit Court of Smyth County, the 27th day of June, 1957, the foregoing writing was presented and with the certificates annexed, admitted to record at 1:00 o'clock P. M.

Teste: Ruth Allen - Deputy Clerk

Division Copy

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EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

Amendment No. 2

It is agreed this 16th day of April, 1957, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and the New Jersey Zinc Company that Exploration Project Contract Idm-F970, Docket No. DMEA-4173, dated July 23, 1956, and amended October 4, 1956, is further amended as follows:

In Annex I of the contract, there are hereby added the following parcels of land.

Name of Property Owner	Acres	Expiration Date of Option	Deed Book	Will Book	Page
J. S. & Faye H. Eanes	65	3/18/60	(142		426
			(113		501
Glen D. & Blanche L. Fiedler	61	3/18/60	(133		132
			(142		419
M. O. & Helen Phipps Buchanan	250	3/18/60	(85		285
			(	27	45

These land areas are shown on the map entitled "Revised Property Map, James-Woodruff Area II" which is hereby made a part of the contract and designated Figure 2-D, and the particular tracts are specifically described in records on file in the Clerk's Office of Wythe County, Virginia, as indicated in the listing above.

- - - - - -

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, or the fixed unit cost of any item of work.

Executed in sextuplicate the day and year first above written and is effective as of July 23, 1956.

THE UNITED STATES OF AMERICA

By Robert A. Lawrence
Executive Officer, DMEA
Field Team, Region V

THE NEW JERSEY ZINC COMPANY

By N Boodwin

Title Vice Pres

EXTRA COPY
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DATE	INITIALS	CODE

Conformed copy
3/30/57

This CONTRACT AND AGREEMENT made and entered into this 18th day of March, 1957, by and between M. C. BUCHANAN and HELEN PHIPPS BUCHANAN, his wife, parties of the first part, hereinafter called the "Owners", and THE NEW JERSEY ZINC COMPANY, a corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company";

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00), cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of three years expiring on the 18th day of March, 1960, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is bounded and described in three tracts as follows:

TRACT NO. I. Several adjoining tracts of land aggregating 116.86 acres in the Speedwell Magisterial District of Wythe County, Virginia, and more particularly described as follows:

FIRST: A certain tract of land said to contain 54 acres, 3 roods and 4 perches and bounded as follows: BEGINNING at the joining of two fences, N 51½ W 29 poles to a stump; n 39½ W 64½ poles to a sycamore in creek at ford and with the road S 62½ W 11¼ poles; S 75¼ W 15 poles; N 88¼ W 22 poles, S 86½ W 15 poles and 15 links, leaving the road; S 13 E 111 poles to a chestnut oak stump; near top of a ridge; S 71½ E 28 poles; S 74 E 29 poles; N 66 E 7-3/4 poles; N 54½ E 50-3/4 poles to the beginning.

SECOND: A tract containing about 31.25 acres BEGINNING at a stake on the crest of the ridge and in the line of D. C. James N 71° 30' E 655' to a corner of D. C. James, thence N 12° 40' W 1,905' to a stake in center of the road leading to Cedar Springs, thence S 85° 15' W 745' to a stake in center of said road; S 15° 10' W E 2,057' to the beginning.

THIRD: A tract containing 30.83 acres BEGINNING at the same stake thence S 71° 30' W 412' to a stake; thence S 68° 30' W 254' to a stake; thence N 18° 25' W 1,287' crossing the creek to a stake in center of road, and following the center of the road N 12° W 475.5' to a stake; thence following said road N 25° 40' E 295' and with said road N 75° 50' E 281'; thence N 58° E 65' to a stake; N 16° E 149' to a stake; thence continuing in said road N 82° 30' E 87' to a stake, corner to tract No. 2; thence with said tract S 15° 10' W E 2,057' to the beginning; and being the same as was conveyed to M. O. Buchanan by S. B. Campbell, Special Commissioner, et al, by deed dated November 1, 1930, and recorded in the Clerk's Office of Wythe County in Deed Book 85,

at page 285, a reference to which is hereby made for a more complete description.

TRACT NO. II.

BEGINNING at a point in the middle of Cripple Creek SW from W. M. Buchanan's house, thence with his line S 33° E 181 poles to a stake in Poff's line with hickory pointers; thence in a SW course with Poff's line to a large white pine, thence S 62½° W 27 poles to a white oak above road; thence E 39° W 11¼ poles to a stake above road, thence S 74° W 9½ poles to a stake; thence N 52½ W 2 poles to a stake at road by a branch; thence N 21¼° E with D. C. James' line and the public road to a white oak stump a corner to the land of Eliza Keesling's heirs; thence with line of same to the middle of the creek; thence down said creek to James' corner, thence with his line to Wilson's corner, thence with line of same to a sycamore sapling by road on bank of creek, W. M. Buchanan's corner, and with line of same S 81° E 17-1/5 poles crossing creek to a stake with sycamore pointer at side of road; thence down road N 72-3/4° E 72 poles to a point in Cripple Creek; thence N 5-3/4° E 5-3/4 poles, thence N 68¼° E 18 poles, thence N 66° 35' E 15-1/3 poles to the beginning, containing about 98 acres, more or less; and being a part of the same which was devised to N. C. Buchanan, as Oscar Buchanan, by the will of W. M. Buchanan which was probated March 19, 1932, and recorded in the Clerk's Office of Wythe County in Will Book 27, at page 45, a reference to which is hereby made for a more complete description.

TRACT NO. III. a certain parcel of land containing by survey 36 acres, 2 roods, and 24 perches and bounded as follows: BEGINNING on a white oak on a ledge of rocks on the south side of a ridge, Wilson's corner, and with a line of the same S 72-3/4 E 149 poles to a stake in the center of the road, and with the same leaving Wilson's line S 12½ E 22-4/5 poles, crossing the creek and leaving the road to a stake in Wilson's line, and with a line

of the same S 40¼ E 14½ poles to a stake in same, sycamore pointers South of the road and on right bank of the creek, thence leaving said line S 81 E 17-1/5 poles crossing the creek to a stake and bunch of sycamore bushes pointers, by the road and with the same N 72-3/4 E 72 poles to the middle of the creek, and with the same N 5-3/4 E 5-3/4 poles, N 68¼ E 18 poles, N 66 35 E 15-3/4 poles, N 41-3/4 E 30½ poles, leaving the creek to a small topped sycamore on left bank of the creek, and with Buchanan and Wilson lines N 25-3/4 W 19-2/5 poles to the beginning; and being a part of the same which was devised to M. O. Buchanan, as Oscar Buchanan, by the will of W. M. Buchanan which was probated March 19, 1932, and recorded in the Clerk's Office of Wythe County in Will Book 27, at page 45, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

M. O. Buchanan (signed) (SEAL)

Helen Phipps Buchanan (signed) (SEAL)

VIRGINIA:

STATE AT LARGE, To-wit:

I, _____, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that M. C. Buchanan and Helen Phipps Buchanan, his wife, whose names are signed to the foregoing Contract and Agreement bearing date on the 18th day of March, 1957, personally appeared before me in my County aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 18th day of March, 1957.

_____
Notary Public.

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Conformed copy
3/20/57

This CONTRACT AND AGREEMENT made and entered into this 18th day of March, 1957, by and between GLEN D. FIELDER and BLANCHE L. FIELDER, his wife, parties of the first part, hereinafter called the "Owners", and THE NEW JERSEY ZINC COMPANY, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of three years expiring on the 18th day of March, 1960, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is bounded and described in two tracts as follows:

TRACT NO. 1: BEGINNING at a point in the old roadbed of Cedar Springs road, corner of land of Sumet E. Fielder; thence running

with the middle of said road S 9-1/3° E 9-3/4 P; S 15-1/2° E 25 P, corner to land of M. O. Buchanan; thence running with his line N 73-1/2° E 102 P to a stake; thence N 3-1/2° W 25 P to corner of fence, corner to land of Price Buchanan; thence N 39° W 20 P, corner to land of Sumet Fielder, S 85-1/2° W 35 P, S 55° W 10-3/4 P, S 53-1/2° W 19 P and 6 feet, S 71° W 11-3/4 P, S 70° W 24 P to beginning, containing 24-3/4 acres more or less.

This is the same property conveyed to Glen D. Fielder by Sumet E. Fielder, et al by deed dated August 9, 1946, and recorded in the Clerk's Office of Wythe County in Deed Book 133, page 132.

TRACT NO. 2: BEGINNING at a poplar on the North side and near the Creek, a corner to lands of W. H. Fisher and lands of James Otto James, and thence with James' line S 12-1/4° E 89-1/4 poles to a stake in the road leading from Bud Horn's by way of Phill Newland to State Road No. 115; thence with the road and Oscar Buchanan's line N 87-1/4° E 16 poles, S 85-1/4° E 18-1/2 poles, N 77-3/4° E 18 poles; thence leaving the road N 64-1/4° E 12 poles to a stake, on the bank of the Creek, N 36-3/4° W 16 poles to a stake on the west side of the Creek, N 11-1/4° W crossing the Creek and with State Road No. 115 22-1/2 poles to a stake in said road, a corner to the lands of Steve Fielder, and with the road and Fielder's line N 15-1/4° W 26-1/2 poles to a stake in said road, N 9° W 18-1/2 poles to a stake in said road, N 25° W 12 poles to a stake in the fork of the Grey Branch Road, and the State Road, and continuing with the State Road No. 115, N 64° W 16 poles to a stake in State Road; thence N 78° W 41 poles to a stake in said road and corner to W. H. Fisher's land; thence leaving the road, and with Fisher's line S 4-1/4° E 26 poles to the beginning, containing 37.32 acres, according to plat of survey by B. B. Roberts, Registered Surveyor, dated May 2, 1939.

This is the same property conveyed to Glen D. Fielder by Florence M. James, et al by deed dated June 18, 1953, and recorded in the Clerk's Office of Wythe County in Deed Book 142, page 419.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Glen D. Fielder (signed) (SEAL)

Blanche L. Fielder (signed) (SEAL)

VIRGINIA:

STATE AT LARGE, To-wit:

I, _____, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that GLEN D. FIELDER and BLANCHE L. FIELDER, his wife, whose names are signed to the foregoing Contract and Agreement bearing date on the 18th day of March, 1957, personally appeared before me in my County aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 19th day of March, 1957.

_____
Notary Public

EXTRA COPY
D M E A
RECEIVED MAY 3 1957

DATE	INITIALS	CODE

Conformed copy
3/20/57

This CONTRACT AND AGREEMENT made and entered into this 18th day of March, 1957, by and between J. S. EANES and FAYE H. EANES, his wife, parties of the first part, hereinafter called the "Owners", and THE NEW JERSEY ZINC COMPANY, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of three years expiring on the 18th day of March, 1960, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is bounded and described in two tracts as follows:

TRACT NO. 1: BEGINNING at a stake in the center of the State Road, leading to Speedwell, corner to Tract no. 2 of Otto James; thence N 12° W 1413' crossing Cripple Creek to a stake; thence N 78° W 8'; thence N 57° 30' W 113'; thence N 38° 40' W 215' to a walnut tree; thence S 67° 10' W 514' to a stake; thence along a fence on Fisher's line S 67° 10' W 517' to a stake; S 64° 15' W 301' to a stake; S 77° 40' W 303' to a stake; S 82° 30' W 491' to a stake, corner to Newland; thence S 10° 45' W 257' to a stake; corner to lands of Cal James; thence along said James' land N 87° 15' E 1607' along a fence line to a post; thence S 11° 40' E 1339' to a point in the center of the road leading to Speedwell; thence with the road N 25° 40' E 295', N 75° 50' E 281', N 58° E 65', N 16° E 149' N 82° 30' E 87' to the beginning, containing 41.64 acres, more or less, according to a plat of survey by B. B. Roberts, Registered Surveyor, dated May 4, 1939.

This is the same property conveyed to J. S. Banes by Florence M. James, et al by deed dated June 18, 1953, and recorded in the Clerk's Office of Wythe County in Deed Book 142, page 426.

TRACT NO. 2: BEGINNING at a stake on the bank of Cripple Creek, corner to land of J. A. James, thence S 12° 10' E 1469' to a stake in road leading to Cedar Springs; thence S 85' 15° W 745' to a stake in said road; thence N 12° W 1413' to a stake on the bank of creek, corner to W. H. Fisher; thence S 78° E 78'; thence N 83° 30' E 218'; thence S 88° 30' E 207'; thence N 68° E 218' to the beginning, containing 23.18 acres, more or less.

This is the same property conveyed to J. S. Banes by J. E. Fielder, Widower, by deed dated February 13, 1945, and recorded in the Clerk's Office of Wythe County in Deed Book 113, page 501.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances,

metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

J. S. Eanes (signed) _____ (SEAL)

Faye H. Eanes (signed) _____ (SEAL)

VIRGINIA:

STATE AT LARGE, To-wit:

I, _____, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that J. S. Eanes and Faye H. Eanes, his wife, whose names are signed to the foregoing Contract and Agreement bearing date on the 18th day of March, 1957, personally appeared before me in my County aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 19th day of March, 1957.

_____
Notary Public.

Docket Copy

EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

Amendment No. 1

It is agreed this 4th day of October, 1956, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and The New Jersey Zinc Company that Exploration Project Contract Idm-1970, Docket No. DMEA-4173, dated July 23, 1956, is amended as follows:

In Annex I of the contract, there is hereby added the following parcel of land, shown outlined in yellow on the eastern half of Figure 2B which is attached to the contract and listed as "Property Being Negotiated." This tract is more specifically described in the records on file in the Clerk's Office of Wythe County, Virginia, and is further identified as follows:

Name of Property Owner	Acreage (more or less)	Expiration date of Option	Deed Book	Page
N. S. King and his wife, Marylene C. King	80.37	9/24/58	133	535

* * * * *

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, or the fixed unit cost of any item of work.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Robert A. Lawrence
Executive Officer, DMEA
Field Team, Region V

THE NEW JERSEY ZINC COMPANY

By C. H. George

Title EXECUTIVE VICE PRESIDENT

E

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DATE	INITIALS	CODE

This CONTRACT AND AGREEMENT made and entered into this 24th day of September, 1956, by and between H. S. KING and DARYLENE C. KING, his wife, parties of the first part, hereinafter called the "Owners", and THE NEW JERSEY ZINC COMPANY, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company."

--W I T N E S S E T H--

That in consideration of One Dollar ($1.00), cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of two years expiring on the 24th day of September, 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia,

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and is bounded and described as follows:

BEGINNING at a point in the middle of Road No. 90 of the secondary highway system, being a corner of the W. N. Roberts property and running with the Roberts' line S 12° 40' W 175.7 feet to an iron stake in Montgomery's line; thence with Montgomery's line N 73° 1' W 115.76 feet; thence with Montgomery's line and Hurley's line N 72° 45' W 276 feet; thence continuing with Hurley's line N 78° 51' W 113 feet to a point formerly a cedar stump on a bluff on Cripple Creek; thence N 23° 30' W 48.76 feet to a point on the bank of Cripple Creek; thence N 5° 15' E 429 feet, N 19° 15' E 116.16 feet, N 7° 7' W 236.92 feet, N 30° W 206.56 feet, N 8° W 232.96 feet, N 15° W 304.02 feet, N 53° 52' E 354.38 feet; thence crossing Cripple Creek N 41° 45' E 105.60 feet to a point in the middle of said Road; and running thence with the middle of the road S 67° 10' E 217 feet, S 70° 15' E 1030 feet, S 70° 48' E 687 feet to the beginning containing 60.37 acres, more or less, and being the same property as was conveyed to the parties of the first part by deed dated October 26, 1950, by A. C. Woodruff, et ux, and recorded in the Clerk's Office of Wythe County in Deed Book 133, page 535, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals:

N. S. King (signed) (SEAL)

Darylene C. King (signed) (SEAL)

VIRGINIA:

STATE AT LARGE, To-wit:

I, D. KEITH LUPTON, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that N. S. King and Darylene C. King, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 24th day of September, 1956, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires July 1, 1957.

Given under my hand this 24th day of September, 1956.

D. KEITH LUPTON

Notary Public.

Docket Copy

MF-200
(Revised June 1954)

Docket No. DMEA 4173

Commodity Zinc

Contract No. Idm-E 970

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

EXPLORATION PROJECT CONTRACT[1]

It is agreed this JUL 23 1956 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] THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, whose mailing address is 160 Front Street, New York 38, New York, 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 five 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 Virginia, Counties of Smyth and Wythe, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] optionee (see Annex I) of [5] ..... 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."

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

(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 Zinc. The work to be performed is described in Exhibit "A." The Operator on or before January 1, 1957 shall commence the work, and on or before April 1, 1958 (unless the Operator's obligation to prosecute the work is terminated—see Article 10) shall ~~either~~ have completed the work ~~and shall have incurred allowable costs (exclusive of overhead) not less than the estimated total allowable costs 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 $41,388.00. The Government shall contribute 50 percent of the allowable costs as they are incurred in a total sum not in excess of $20,694.00: *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

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 9. **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.)

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

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

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.

(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~~ thirty years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first. **See Article 13.**

(c) *Basis for computation.*—The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent), at the point of delivery (the f. o. b. point); *except,* that charges of *the buyer* arising in the regular course of business, and shown as deductions on the buyer's settlement sheets, on account of the cost of treatment processes performed by *the buyer,* sampling and assaying to determine the value of the production sold, and freight paid by *the buyer* to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the crude ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing. **See Article 13.**

(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) Categories (2) through (7) of Article 6(a) are deleted. (b) To the extent that costs are set forth in Exhibit "A" as "Fixed Unit Costs" they are in lieu of the actual costs that otherwise would be allowable costs of the project as provided in Article 6 of the contract. The Government will contribute to the fixed unit costs as they accrue, on the basis of units of work actually performed. The fixed unit costs include all costs of the work necessary to complete the project. (c) In Article 3, everything after the reference to Article 10 is deleted and the following substituted: "shall have completed the work." (d) That part of the last sentence in the first paragraph of Article 6(a) commencing after the semicolon, is deleted. (e) In Article 6(c), the reference to Article 9 is changed to Article 8. (f) In Article 6(b): (1) the word "minerals" includes limestone and dolomite products produced in processing ore; and (2) the words "ten years" are changed to "thirty years." (g) The following clause is added to Article 8(c): "Provided, however, That so long as the Operator operates smelting facilities as an integrated part of its business, the settlement made by the Operator's smelter to its mine or mill on the ore or concentrates subject to the Government's royalty shall be, for the purpose of calculating the royalty payable to the Government under this contract, on the same settlement basis that the said smelter makes to its independent suppliers under the schedule most favorable to any independent supplier, or should gross income from mining operations for percentage depletion purpose in Federal income tax determination show a greater value for ore or concentrate sales than that value which would result from applying the smelter schedule most favorable to an independent supplier, the greater values will be used as the basis for calculating royalty payable to the Government.

Executed in sextuplicate the day and year first above written.

Indirty 6/26/56
Chungs
"Appr. Sol. Off."
Approved
Spiewak
Chambers

THE UNITED STATES OF AMERICA

By Frank E. Kramer
ACTING Administrator, Defense Minerals
Exploration Administration

Selfridge
H. Johnson

THE NEW JERSEY ZINC COMPANY
(Operator)

By S S Goodwin

VICE PRESIDENT
Title

I, Walter R. Anyan, certify that I am the secretary of the corporation named as Operator herein; that S. S. Goodwin who signed this contract on behalf of the Operator, was then Vice 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.

Walter R. Anyan

[CORPORATE SEAL]

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

EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMRA-4173

ANNEX I

The land referred to in Article 2 of the contract consists of various privately owned tracts of land in Wythe and Smyth Counties, Virginia, which are held by the Operator pursuant to option contracts, which permit it to engage in mineral exploration with option to purchase all mineral and mining rights upon such tracts. Such land areas are shown outlined in blue on the maps (Fig.-2A, 2B, and 2C) entitled "Camp Area, Smyth County, Va.," "Asbury Area, Wythe County, Va.," and "Speedwell Area, Wythe County, Va.," respectively. The location of the three areas outlined in Figs. 2A, 2B, and 2C are shown on another map (Fig. 1) entitled "The New Jersey Zinc Company, Austinville, Virginia, Index Geologic Map, Speedwell Syncline." These four maps are attached hereto and made a part of this contract. The particular tracts, more specifically described in the records on file in the Clerk's Office of Wythe County, Virginia, listed below, to which reference is here made, are as follows:

Name of Property Owner	Tract	Acreage (more or less)	Expiration date of Option	Deed Book	Will Book	Page
A. C. Woodruff and his wife, Mozelle H. Woodruff		160	8/29/58	95		124
Millard R. Newland and his wife, Katherine Umberger Newland		275	8/29/58		28	62
Dr. J. C. Moxley and his wife, Emma R. Moxley		211	9/8/58	110		534
(deducted therefrom for road)		2.33		105		419
Remaining acreage		209				
Fred E. Cline and his wife, Martha Wright Cline	I	64.86	9/11/58	111		331
	II	121.50		133		566
	III	1.50				
		187.86				
(deduction from Tract II)		27.01		65		149
Remaining acreage		161				
Sallie Ann Hale and others		98	9/16/58	134		36
					30	452
W. W. Roberts and his wife, Vella R. Roberts		123	10/7/58	133		584

Name of Property Owner	Tract	Acreage (more or less)	Expiration date of Option	Deed Book	Will Book	Page
A. L. Porter and others	I	366	10/15/58	94		196
	II	66		101		150
		432				
(deducted therefrom for road, Tract I)		3.04				
Remaining acreage		429				
Robert E. James and others		122	11/30/58	116		305
Raymond B. Smith and his wife, Betty Smith		85	1/29/59	140		173

SPECIAL AGREEMENT CONCERNING LAND

1. In the event the Operator or any subsidiary thereof at any time during the period expiring ten years from the date of this contract acquires any interest, title or equity, in any lands contiguous to the premises described in this contract, it is agreed that such contiguous lands shall thereupon become subject to the provisions of this contract and the parties hereto shall promptly execute amendments to this contract listing such contiguous lands as lands included in this contract.

2. It is further agreed that the Operator may, at any time before the expiration of sixty days following the conclusion or termination of exploration work performed pursuant to the terms of this contract, request the Government to delete from this contract such lands described in the Option contracts listed in this Annex I, or in any amendments thereto, as have no known value for mineral production. The Government will promptly prepare amendments removing the specified lands from the contract, which amendments shall provide that the Operator:

(a) certifies the lands have no known value for mineral production.

(b) has, prior to the execution of the respective amendment, surrendered or otherwise disposed of all of its interest, title, and equity in such lands, and any minerals produced therefrom, including any option, lease or permit thereto, without any consideration whatsoever, including future compensation, for such surrender or disposition, other than relief from the cost of maintaining such interest;

(c) agrees that no benefit from such lands or any production of minerals therefrom will accrue to the Operator or to any of its subsidiaries or affiliates, directly or indirectly, during the period expiring thirty years from the date of this contract;

(d) agrees that if the Operator or any of its subsidiaries or affiliates acquires any interest, title, or equity in such lands or any minerals produced therefrom, or derives any benefit therefrom, before the expiration of thirty years from the date of this contract, the lands with respect to which such interest, title or equity is acquired, and any minerals produced therefrom, shall be deemed subject to this contract and any certification from the date that the Operator or its subsidiaries or affiliates acquired such interest, title, or equity, or any benefit therefrom, until the expiration of thirty years from the date of this contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

EXHIBIT "A"

Description of the Work

The purpose of the project is to explore for ores of zinc by diamond drilling (plus necessary overburden drilling). The holes to be initially drilled pursuant to the contract are roughly indicated on the attached map (Fig.-3) referred to in Annex I. Fig. 3, attached hereto and made a part hereof, shows a generalized cross section and a proposed drilling pattern.

The objective of the work is to investigate the ore potential of the Patterson limestone and the Saccharoidal dolomite of the Shady formation. There is a suggestion from the shape and trend of the axes of the anomalies that they represent "pencil" ore bodies and it would appear likely that the pencils should pitch southeast at an acute angle to strike. Drill holes are expected to vary from 150 to 1,100 feet in depth locally, with an average of 600 feet more or less. Approximately 24 holes will be required. Not more than 15,000 feet of drilling shall be performed, provided, however, that the Operator may, upon the written approval of the Government, perform more than 15,000 feet of drilling so long as the total cost of all drilling work allowable under the contract is not exceeded.

The project is not intended to accomplish the outlining of individual ore bodies. The proposed work consists of fences of diamond drill holes, roughly at right angles to strike, designed to intercept ore shoots pitching into the bedding from the anomalies. The drill holes shall not be located on closer spacing than 200 feet in each fence nor shall the fences be closer together than 600 feet, except with prior approval of the Government.

All diamond drilling, including the location and depths of holes, is subject to prior Government approval.

All drill holes shall be logged geologically and all drill core will be made available to the Government for examination. All significantly mineralized core will be properly sampled and assayed for zinc. Such assays, together with proper geological logs of drill holes, will be reported to the Government, together with proper plan maps and sections showing the progress of the work. Diamond drilling will be done with AX size or larger coring bits.

The project work shall be supervised at all times by competent engineers or geologists.

Drilling will not be done at locations closer than 200 feet from property lines.

Estimated Cost of the Project

Actual Costs

Category (1) Independent Contracts

Overburden drilling and diamond drilling to 250-foot depth, 6,000 feet @ $2.20/ft.	$13,200.00	
Diamond drilling 250-foot to 500-foot depth, 4,650 feet @ $2.45/ft.	11,392.50	
Diamond drilling 500-foot to 750-foot depth, 2,850 feet @ $2.70/ft.	7,695.00	
Diamond drilling 750-foot to 1,000-foot depth, 1,200 feet @ $2.95/ft.	3,540.00	
Diamond drilling 1,000-foot to 1,250-foot depth, 300 feet @ $3.20/ft.	960.00	$36,787.50

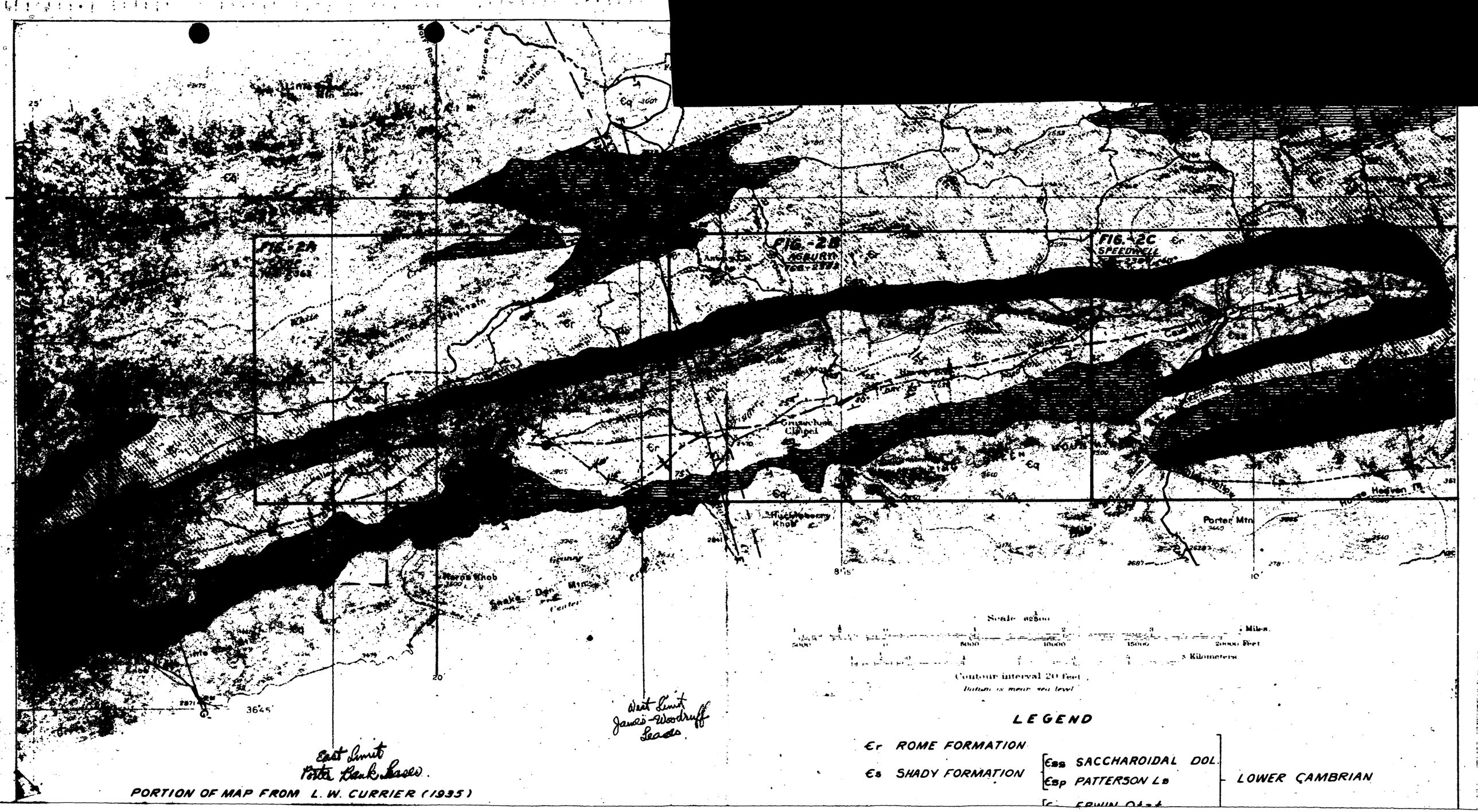
The above rates cover charges for reaming, cementing, water supply, casing, changing of location, and all other charges which may be incurred by the Operator pursuant to diamond drilling contracts. 1/

Categories (2) through (7) None

Fixed Unit Costs (See Article 13)

Incidental allowance for each foot of drilling completed, 15,000 feet @ $0.30/ft.	$ 4,500.00	
100 Samples of drill core to be assayed for zinc @ $1.00 per sample	100.00	$ 4,600.00
Estimated Total Cost of the Project (rounded)		$41,388.00
Government Participation @ 50%		$20,694.00

1/ Neither the cost nor value of casing left in drill holes at option of the Operator will be accepted as a charge under the contract.



PORTION OF MAP FROM L. W. CURRIER (1935)

RECEIVED
FEB 14 1956

THE NEW JERSEY ZINC COMPANY

(ESTABLISHED 1848)

HORSE HEAD PRODUCTS ®

100 FRONT STREET

NEW YORK 38, N.Y.

OFFICE OF THE
VICE PRESIDENT

February 10, 1956

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

JAMES-WOODRUFF AREA
WYTHE & SMYTH COUNTIES, VIRGINIA
D.M.E.A. EXPLORATION PROJECT
THE NEW JERSEY ZINC COMPANY

Gentlemen:

Enclosed herewith you will find a D.M.E.A. application in quadriplicate, pursuant to D.M.E.A. Order I, under the Defense Production Act of 1950, as amended, for an exploration project in Virginia. This is one of three projects for which we are applying. It is our desire to drill these three projects in the following sequence: (1) Beaver Creek Area, Smyth County, Virginia, (2) Porter Ore Bank, Smyth County, Virginia and (3) James-Woodruff Area, Wythe and Smyth Counties, Virginia.

Because of the desire to drill them in sequence we have refrained from filling in (5c) in the application. We believe we can start the first project within two weeks after the application is granted. It is believed that it will take six months to drill each property if a negative answer is obtained, but will take a year to drill each if ore is discovered.

Our attention has been attracted to these areas by the results of a soil sampling campaign.

If any further information is desired we would be glad to furnish it.

Very truly yours,

S. S. Goodwin
Vice President
and
Manager of Mines

SSG:ahg

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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FEB 14 1956

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. DMEA-4173
Metal or Mineral Zinc
Date Received 2-14-56
Estimated Cost $51,889.00
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: The New Jersey Zinc Company
160 Front Street
New York 38, New York

(*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. A New Jersey Corporation

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

(*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 sheet No. 2 attached

(*b*) State any mine name by which the property is known. None

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise
See sheet No. 2 attached

(*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. See Exhibit "A" and sheet No. 2

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

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

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

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. See sheet No. 3

(*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 sheet No. 3 attached

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

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

See sheet No. 3 attached

16—66551-1

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore This exploration seeks to discover zinc ore bodies

(*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 sheet No. 4 attached

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

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See sheet No. 4 attached

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

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

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

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

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

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

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

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

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

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs. See sheet No. 5 attached

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?

[X] 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 13 February, 1956

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.
(Applicant)

By [signature]

Vice President and
Manager of Mines

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

Sheet No. 1

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FEB 14 1950

1 (c) of instructions

Names, Titles, and addresses of Officers.

Mr. R. L. McCann, President	160 Front St., New York
Mr. C. Howard George, Executive Vice President	ditto
Mr. S. S. Goodwin, Vice President	ditto
Mr. Walter R. Anyan, Secretary	ditto
Mr. E. E. Schwegler, Comptroller	ditto
Mr. Samuel Riker, Treasurer	ditto
Mr. R. G. Kenly, Vice President	ditto
Mr. F. H. Baxter, Vice President	ditto
Mr. L. F. Johnson, Vice President	ditto
Mr. P. M. Ginder, Vice President	ditto
Mr. R. A. Oberfell, Assistant Secretary	ditto
Mr. W. L. Brookfield, Assistant Secretary	ditto
Mr. W. W. Gamwell, Assistant Treasurer	ditto

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

Sheet No. 2

No. 3 of Instructions.- Applicant's Property Rights

(a) The land under consideration consists of a group of properties as outlined on the accompanying maps, Figures 2A, B and C, the locations of which are shown on Index Map, Figure 1. The area outlined in blue is controlled by the option contracts summarized below. Three properties outlined in brown are being negotiated. The legal description of each tract is included in the contract and agreement under which the property is controlled by this Company. Copies of each of these contracts are attached to this application (Exhibit "A"). A summary listing of the properties and pertinent data follows:

Name of Property Owner	Acreage	Expiration date of Option	
A. C. Woodruff	160	8/29/58	(5 yrs)
M. R. Newland	275	8/29/58	(5 yrs)
J. C. Moxley	209	9/8/58	(5 yrs)
F. E. Cline	161	9/11/58	(5 yrs)
Sallie Hale, et al	98	9/16/58	(5 yrs)
W. W. Roberts	123	10/7/58	(5 yrs)
A. L. Porter	430	10/15/58	(5 yrs)
R. B. James	122	11/30/58	(5 yrs)
R. B. Smith	85	1/29/59	(5 yrs)

(c) The New Jersey Zinc Company holds options for the purchase of all mineral and mining rights on each of these properties, and has limited surface purchase privileges. This Company holds the exclusive right to prospect and explore for minerals on these properties.

F. E. Cline
Tract I - 64.86 A
" II - 94.40 A = 121.5 - 27.1
" III - 1.50 A
160.76 A say 161 A

J. C. Moxley
211.00 A
- 2.33 Road
209 A ±

A. L. Porter
Tract I - 366.00 A
Tract II - 66.00 A
432.00
3.04 [illegible]
428.96 A

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

Sheet No. 3

No. 4 of Instructions - Physical Description

(a) Zinc mineralization in the general area has been known since before 1929 and a small amount of iron ore was mined before 1900. In 1929 the American Smelting and Refining Company drilled one hole in the area between the two tracts now controlled. From 1929 to 1933 the area was studied and mapped by the geologic staff of The New Jersey Zinc Company. In the spring of 1953 the area was prospected by soil sampling for zinc. Zinc anomalies were found in the soil which are believed to be important.

(b) There has been no production of zinc from the area and there are no known reserves.

(c) The anomalies found in the soil prospecting campaign mentioned above occur in the Valley of Cripple Creek on the favorable Shady dolomite on the north limb of the Speedwell syncline about 18 miles southwest of Austinville.

The Speedwell syncline is an isolated overthrust block or klippe folded into a canoe shaped syncline. This structure is similar but less complicated than the overthrust block in which the Austinville district occurs.

The formations on the north limb are south dipping and consist of a small thickness of Erwin quartzite separated from the underlying Rome by the thrust and overlain in sequence by the ribbony Patterson member of the Shady, the Saccharoidal member and finally by the Rome formation which forms the center of the syncline and caps a high ridge south of the

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N.Y.

mineralized area. The formations dip south between 25 and 35 degrees.

A number of features make these properties appear worthy of drilling:

1. There are two areas of anomalous soil zinc which are fairly large, quite discreet and high grade carrying from 1000 to over 1500 PPM zinc equivalent as determined by the dithizone method.

2. One of these anomalies has some outcropping sphalerite associated with it.

3. In the area of both anomalies the broken, recrystallized and altered dolomite is distinctly "live looking".

4. Both anomalies are on the Shady dolomite which carries all the known ore in the Austinville district.

There is a suggestion from the shape and trend of the axes of the anomalies that they represent "pencil" orebodies in the Saccharoidal or Patterson dolomite or both. On the same basis it would appear likely that the pencils should pitch southwest at an acute angle to strike.

Any orebodies occurring in the area could be expected to be a combination of breccia and disseminated ore.

(d) The eastern end of the area has a paved highway, Va. 749, running down the center of it and the western end is accessible by a graveled farm road. The area is six to eight miles from the railroad station of Rural Retreat. We would expect to use Austinville, 18 miles northeast, as a supply and residence point.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK, N. Y.

Sheet #3 Cont'd. No. 4 of Instructions - Physical Description

(e) Manpower, materials, supplies, equipment, water and power are readily available in the area.

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THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK

No. 5 of Instructions - The Exploration Project

(b) The proposed work consists of a series of fences of diamond drill holes layed out with the intention of intersecting an ore shoot pitching in the bedding from the anomalies. Since we regard the best bet to be a southwest pitching pencil at an acute angle to strike, holes will first be drilled at right angles to strike on the southwest side of the anomalies. If this should fail we would test for a northeast pitch. The initial proposed holes can be seen on Figure 2B.

Both anomalies will be drilled but we would not propose to drill them simultaneously. In this way what is learned about the habit of the mineralization at one anomaly can be applied to the other, thereby saving footage. Holes would range from 150 to a maximum of 1100 feet, probably much less.

It would not be proposed to drill out any orebodies discovered in detail but only to determine whether ore is present in commercial quantities.

(d) The New Jersey Zinc Company has had wide experience in large-scale exploration programs in the Austinville district, as well as many other mining districts in the U.S. This project will be under the supervision of W. L. Albers, Superintendent, and W. Horatio Brown, Chief Geologist, both of who have been active in the Austinville district for 29 and 15 years respectively.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST NEW YORK N. Y.

Sheet No. 5

No. 6 of Instructions - Estimated Costs

Category 1 - Independent Contracts Diamond Drilling	15,000 @ $2.89		$43,350
See Exhibit "B"	$2.65	Av. Depth	
	.10	Water	
Contract with E. J. Longyear Co. for drilling in Wythe and Smyth Counties, Virginia	.10	Service	
	.04	Casing	
	$2.89		

Category 2

a. Supervision		
Geologist - half time 12 mos.		3,000
Asst. Geologist - Surveyor half time 12 mos.		2,500
b. Technical Services		
Draftsman - 1/3 time		1,300
c. Operating materials & supplies		
Core boxes, etc.		400
d. Operating equipment		
Cars 5,000 mi. @ 8¢		400
e. Rehabilitation and Repairs - None		
f. New buildings, improvements - None		
g. Miscellaneous		
Chemical Assays	100 @ 1.50	150
Accounting and Secretarial Charges	$30 x 12 mos.	360
Workmen's Comp. Insurance	1% x 7160	71
Insurance & Payroll Taxes	5% x 7160	358
Total extimated cost of project		$51,889

51,889
150
15000 | 51,739 | 3.44926

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y

X 1086 150M

COPY

RECEIVED
APR 27 1956

Austinville, Va.
April 25, 1956

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

Attention: Mr. W. R. Griswold

Gentlemen:

In accordance with your suggestions telephoned to our New York office, we are forwarding to you herewith bids from three diamond drilling contractors for our proposed DMEA projects:

James-Woodruff Area-Virginia-DMEA-4173
Porter Ore Bank-Virginia-DMEA-4174
Beaver Creek Area-Virginia-DMEA-4178

Bids are enclosed from E. J. Longyear Company, Joy Manufacturing Company, and Sprague & Henwood, Inc.

Although practically all of the holes are expected to be less than 1,000 feet, with an average near 500 feet, we have used 1,000 feet as a basis for comparison of the bids. You will note that Sprague & Henwood have bid the same on all three jobs. The other two concerns bid the same on the first two areas and much higher on Beaver Creek.

It seems on this basis that Joy is too high on all of its bids, and that Sprague & Henwood are much lower than Longyear on Beaver Creek and slightly lower than Longyear on the other two projects.

We therefore propose to award the contracts for the three projects to Sprague & Henwood and will so advise them if you concur.

X 1086 150M

COPY

We would appreciate it if you will advise us if there are any further steps we need to take to complete this application.

Very truly yours,

W. L. Albers/gm

W. L. Albers
Superintendent

WHoratioBrown:rjl
Encl.
In quadruplicate

cc: Mr. Robert A. Laurence, Knoxville, Tenn.
Mr. W. H. Callahan, N. Y.
Mr. S. E. Goodwin, N. Y.
Mr. A. E. Turner, N. Y.
Geol File

MANUFACTURERS OF
DIAMOND DRILLS
DRILLING EQUIPMENT
DIAMOND BITS

BRANCH OFFICES
NEW YORK PITTSBURGH
PHILADELPHIA
GRAND JUNCTION, COLO

EXECUTIVE OFFICES & PLANT
221 W. OLIVE STREET
SCRANTON, PA

SPRAGUE & HENWOOD, INC.

SINCE 1883

CONTRACTORS FOR
DIAMOND DRILLING
SHOT DRILLING · SOIL SAMPLING · PRESSURE GROUTING
WATER WELLS & CHURN DRILLING

MAIL ADDRESS · P. O. BOX 446
SCRANTON 2, PA.
DIAMOND 4-8507

RECEIVED
APR 27 1956

April 3, 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Attn: Mr. A. E. Turner
Assistant Manager of Purchasing

Re: Diamond Drilling -- Virginia
1-AX-524

Gentlemen:

On the basis of Mr. Turner's letters of March 23rd and March 29th, and on the basis of the site examination by our Mr. Fletcher, we are pleased to submit the following quotation for a minimum of 10,000 linear feet of AX drilling on the Porter Bank and James-Woodruff projects in Wythe and Smyth Counties, Virginia, and a minimum of 5,000 linear feet of AX drilling on the Beaver Creek project in Smyth County, Virginia. Our proposal is based on drilling vertical holes, with a maximum distance from water of 10,000 feet.

QUOTATION

ITEM #1 For drilling AX holes:

DEPTH	PRICE PER FT.
0' to 250'	$ 2.20 per ft.
250' to 500'	$ 2.45 per ft.
500' to 750'	$ 2.70 per ft.
750' to 1000'	$ 2.95 per ft.
1000' to 1250'	$ 3.20 per ft.
1250' to 1500'	$ 3.45 per ft.
1500' to 1750'	$ 3.70 per ft.
1750' to 2000'	$ 4.20 per ft.
2000' to 2250'	$ 5.00 per ft.
2250' to 2500'	$ 6.00 per ft.

ITEM #2 For acid testing the angle of the hole - EIGHT DOLLARS ($8.00) per hour.

Sprague & Henwood, Inc. will transport all cores free-of-charge to Marion, Virginia, in core boxes supplied by the New Jersey Zinc Company.

If awarded this work we are prepared to start within one week after receipt of written notice to proceed.

TO:
The New Jersey Zinc Company
160 Front Street
New York 38, New York

April 3, 1956

Several days will be required to assemble the necessary equipment and ship it to the job site. Therefore, any advance notice you could give us concerning the award of this contract will be very greatly appreciated.

Thank you for inviting us to submit our proposal and we hope our prices will meet with your approval.

Very truly yours,

SPRAGUE & HENWOOD, INC.

Robert M. Gorgas

Robert M. Gorgas
Contract Department

RMG/lap

MANUFACTURERS OF
DIAMOND DRILLS
DRILLING EQUIPMENT
DIAMOND BITS

BRANCH OFFICES
NEW YORK PITTSBURGH
PHILADELPHIA
GRAND JUNCTION, COLO.

EXECUTIVE OFFICES & PLANT
221 W. OLIVE STREET
SCRANTON, PA.

SPRAGUE & HENWOOD, INC.

SINCE 1883

CONTRACTORS FOR
DIAMOND DRILLING
SHOT DRILLING · SOIL SAMPLING · PRESSURE GROUTING
WATER WELLS & CHURN DRILLING

RECEIVED
APR 27 1956

MAIL ADDRESS · P. O. BOX 446
SCRANTON 2, PA.
DIAMOND 4-8507

April 19, 1956

The New Jersey Zinc Company
160 Front Street,
New York 38, New York

RE:- Diamond Drilling -
Virginia - 1-AX-524

Attention:- Mr. A. E. Turner,
Assistant Manager of Purchasing

Gentlemen:-

As per our telephone conversation, we are pleased to include in our quotation to you of April 3rd the following:-

ITEM NO. 3 - Casing left in holes by your request

AX casing - $ 1.54 per lin.ft.
BX casing - $ 1.96 per lin.ft.

ITEM NO. 4 - For use of 3-ton truck and driver - hauling cores, if requested - $ 4.00 per hour.

ITEM NO. 5 - Additional charge for furnishing and laying pipe line and pumping water, if necessary, to holes located over 10,000 feet from a suitable water supply.

From 10,000 feet to 12,500 feet - 15¢ per lin.ft. in addition to the above per foot prices quoted.

From 12,500 lin.ft. to 15,000 lin.ft. -15¢ per lin.ft. additional.

The prices quoted in our letter of April 3rd are for furnishing AX cores. Should any cementing be required in the hole due to cave formation, etc., we will cement the holes at our expense.

We trust you will find the above acceptable.

Thanking you, we are

Very truly yours,

SPRAGUE & HENWOOD, INC.,

Wm. J. Schank,
Vice President

WJS:GT
In Triplicate

JOY MANUFACTURING COMPANY
900 WOODLAND AVENUE
MICHIGAN CITY, INDIANA
TELEPHONE 7-7231

RECEIVED
APR 27 1956

EXECUTIVE OFFICES
HENRY W. OLIVER BUILDING
PITTSBURGH 22, PA.

April 2, 1956

The Jersey Zinc Company
160 Front St.
New York 38, N. Y.

Attention: Mr. A. E. Turner
Asst. Mgr. of Purchasing

Subject: Diamond Drilling
Virginia - 11524

Gentlemen:

In compliance with your request, we wish to set forth below prices and conditions covering a minimum of 10,000 feet of core drilling as follows:

Porter Ore Bank - Smyth County, Va.
James Woodruff - Wythe & Smyth Counties, Va.

		BX	AX	EX
From surface to 500. ft.	@	$3.10 ft.	$2.75 ft.	$2.50 ft.
From 500. to 1000. ft.	@	3.35 "	3.00 "	2.75 "
From 1000. to 1500. ft.	@	3.60 "	3.25 "	3.00 "
From 1500. to 2000. ft.	@	3.85 "	3.50 "	3.25 "

BX Casing left in holes at your request	@ $1.96 ft.
AX Casing left in holes at your request	@ $1.54 "
EX Casing left in holes at your request	@ $1.47 "
Surveying holes with your Tho-Pert Instrument	@ $7.50 per hr.
Capping Drill Holes, etc.	@ $4.50 per hr.

We will pump water for drilling purposes, which we understand from your local representative will be not over 6,000 feet from the drill holes.

If it is your desire to save cores of the drilling, then it will be necessary that you furnish the proper containers for same.

We will furnish for this proposed drilling one of our gasoline driven core drills complete with operating equipment, and will conduct the drilling operations on the basis of two 8-hour shifts per day and not less than six days per week.

We can start this work immediately upon receipt of instructions to proceed with the drilling.

Yours truly,

DIAMANT CORE DRILL CO.

W. J. Pilarski

W. J. Pilarski, Mgr.
Contract Drill Division

WJP/cc

JOY MANUFACTURING COMPANY
900 WOODLAND AVENUE
MICHIGAN CITY, INDIANA
TELEPHONE 7-7231

RECEIVED
APR 27 1956

EXECUTIVE OFFICES
HENRY W. OLIVER BUILDING
PITTSBURGH 22, PA.

April 2, 1956

AN/AM

New Jersey Zinc Company
160 Front Street
New York 38, N. Y.

Attention: Mr. A. E. Turner
Asst. Dir. of Purchasing

Subject: Standard Drilling
Virginia - NX-52h

Gentlemen:

In compliance with your request, we wish to set forth below prices and conditions covering a minimum of 10,000 feet of core drilling in connection with the Beaver Creek, South County, Virginia project.

	NX	AX	BX
From surface to 500. ft.	@ $3.35 ft.	$3.00 ft.	$2.75 ft.
From 500. to 1000. ft.	@ 3.50 "	3.25 "	3.00 "
From 1000. to 1500. ft.	@ 3.75 "	3.50 "	3.25 "

Surveying holes with your Tro-Pari Instrument	@ $7.50 per hr.
Capping Drill Holes, etc.	@ $4.50 per hr.
NX Casing left in drill holes at your request	@ $1.95 ft.
AX Casing left in drill holes at your request	@ $1.54 ft.
BX Casing left in drill holes at your request	@ $1.47 ft.

We will pump water for drilling purposes, which we understand from your local representative will be not over 2500 ft. from the drill holes.

If it is your desire to save cores of the drilling, then it will be necessary that you furnish the proper containers for same.

We will furnish for this proposed drilling one of our gasoline driven core drills complete with operating equipment, and will conduct the drilling operations on the basis of two 8-hour shifts per day and not less than six days per week.

We can start this work immediately upon receipt of instructions to proceed with the drilling.

Yours truly,

NEW JERSEY ZINC COMPANY

H. C. Pilawski, Mgr.
Contract Drill Division

HCP/ct

E. J. LONGYEAR COMPANY

DIAMOND DRILL MANUFACTURERS
CORE DRILLING CONTRACTORS
MINING ENGINEERING AND
GEOLOGICAL CONSULTANTS

GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA
TELEPHONE MAIN 2447
CABLE: LONGEAR

April 11, 1956

RECEIVED
APR 27 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Attention: Mr. A. E. Turner
Assistant Manager of Purchasing

Gentlemen:

Diamond Drilling - 1-X-524
Beaver Creek Area - Smyth County, Va.

1. In response to your letter of March 12th, we are pleased to submit below our proposal for your contemplated exploratory drilling program which is to be carried out in the Beaver Creek area, in Smyth County, Virginia.

2. We understand that the work as now planned will consist of a series of vertical holes to a maximum depth of 1500 feet, with a minimum aggregate footage of 5,000 feet; and that the rock to be drilled is Knox and the Maynardville dolomites. We also understand that the work is to be carried out in an area located between Chatham Hill and Saltville, Virginia.

3. For this work we propose to furnish one U.S. skid-mounted, diamond core drill, together with the necessary accessory tools required to accomplish the work as now planned. We also propose to supply all service equipment required for moving the rig from one location to another, and other services and facilities needed in connection with supplying water for drilling purposes. We further propose to operate the drill on a single or double shift basis, depending upon the availability of competent drill operators.

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 authorities.

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

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

a) Overburden Drilling

0 to 100 feet in depth, measured from
the collar of the hole .....$3.25 per foot

b) Diamond Core Drilling

Top of Ledge to 1,000 feet in depth, measured from the collar of the hole -

EX-size, recovering core approximately 7/8" in diameter.....$3.15 per foot

AX-size, recovering core approximately 1-3/16" in diameter..$3.25 per foot

BX-size, recovering core approximately 1-5/8" in diameter...$3.55 per foot

NX-size, recovering core approximately 2-1/8" in diameter...$4.00 per foot

1,000 to 1500 feet in depth, measured from the collar of the hole -

EX-size.....$3.40 per foot

AX-size.....$3.50 per foot

c) Drill hole surveying with Maas Compass..$5.00 per hour

d) Delays for your convenience or for which you are responsible.....$5.00 per hour

e) Hauling drill core from drill hole location to core storage sheds.....$3.25 per hour

f) Casing left in drill holes at your request -

EX-size.....$1.47 per foot
AX-size.....$1.54 per foot
BX-size.....$1.96 per foot
NX-size.....$2.66 per foot

g) Cleaning up of drill hole locations will be carried out at the sole expense of the Longyear Company.

h) Reaming and casing, when required, will be carried out at the sole expense of the Longyear Company.

6. In addition to the above-quoted footage rates, it is agreed that for drill hole locations in excess of 2500 feet from source of water supply, the following allowances will be made:

a) Water supply allowance for each drill hole which is in excess of 2500 feet, but not more than 5,000 feet from an adequate source of water supply - $0.05 per foot drilled.

b) Water supply allowance for drill holes which are in excess of 5,000 feet, but not more than 7500 feet from an adequate source of water supply - $0.10 per foot drilled.

c) Water supply allowance for drill holes which are in excess of 7500 feet, but not more than 10,000 feet from an adequate source of water supply - $0.20 per foot drilled.

7. It is further agreed and understood that the sources of the water supply to be considered for the purpose of computing the distance allowance are those which are presently available, or which are made available at the Company's expense, and do not include wells which may be drilled at the Contractor's expense.

8. Drill cores are to be placed in receptacles furnished by you at each drill hole location and transported to the point of permanent storage as provided for herein.

9. Invoices covering work performed will be prepared in accordance with your instructions.

10. We very much appreciate being afforded the opportunity to consider this work. Should our proposal be found acceptable, we are prepared to furnish the equipment from our Max Meadows warehouse and commence the drilling operations promptly after receipt of offial notice to proceed.

Very truly yours,

E. J. LONGYEAR COMPANY

M. J. Gleason, Manager
Contract Drilling Division

JCCB:bal

ACCEPTED:

THE NEW JERSEY ZINC COMPANY

By: _____

Date: _____

E. J. LONGYEAR COMPANY

DIAMOND DRILL MANUFACTURERS
CORE DRILLING CONTRACTORS
MINING ENGINEERING AND
GEOLOGICAL CONSULTANTS

GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA
TELEPHONE: MAIN 2447
CABLE: LONG

RECEIVED
APR 27 1956

April 11, 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Attention: Mr. A. E. Turner
Assistant Manager of Purchasing

Gentlemen:

Diamond Drilling - L-X-524
Wythe and Smyth Counties, Virginia

1. In response to your letter of March 12th, we are pleased to submit below our proposal for your contemplated exploratory drilling program which is to be carried out in the Porter Ore Bank and the James-Woodruff areas.

2. We understand that the work as now planned will consist of a series of vertical holes to a maximum depth of 1500 feet, with a minimum aggregate footage of 10,000 feet; and that the formation to be drilled is shady dolomite. We also understand that the work is to be carried out in two different areas, both of which are located within a radius of twenty miles of Sugar Grove. We further understand that the distance to water may range up to 8,000 feet at one or more of the drill locations.

3. For this work we propose to furnish one complete Longyear truck-mounted diamond core drill, together with the necessary accessory tools required to accomplish the work as now planned. We also propose to supply all service equipment required for moving the rig from one location to another, and other services and facilities needed in connection with supplying water for drilling purposes. We propose to operate the drill on a single or double shift basis, depending upon the availability of competent drill operators.

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 authorities.

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

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

a) Overburden Drilling
0 to 100 feet in depth, measured from
the collar of the hole.....$2.60 per foot

b) Diamond Core Drilling

Top of Ledge to 1,000 feet in depth, measured from the collar of the hole -

EX-size, recovering core approximately 7/8" in diameter.....$2.50 per foot

AX-size, recovering core approximately 1-3/16" in diameter.....$2.60 per foot

BX-size, recovering core approximately 1-5/8" in diameter.....$2.80 per foot

NX-size, recovering core approximately 2-1/8" in diameter.....$3.20 per foot

1,000 to 1500 feet in depth, measured from the collar of the hole -

EX-size.....$2.75 per foot

AX-size.....$2.85 per foot

c) Drill hole surveying with Maas Compass..$5.00 per hour

d) Delays for your convenience or for which you are responsible.....$5.00 per hour

e) Hauling drill core from drill hole location and to core storage sheds.....$3.25 per hour

f) Casing left in drill holes at your request -

EX-size.....$1.47 per foot
AX-size.....$1.54 per foot
BX-size.....$1.96 per foot
NX-size.....$2.66 per foot

g) Cleaning up of drill hole locations will be carried out at the sole expense of the Longyear Company.

h) Reaming and casing, when required, will be carried out at the sole expense of the Longyear Company.

6. In addition to the above-quoted footage rates, it is agreed that for drill hole locations in excess of 2500 feet from source of water supply, the following allowances will be made:

a) Water supply allowance for each drill hole which is in excess of 2500 feet, but not more than 5,000 feet from an adequate source of water supply - $0.05 per foot drilled.

b) Water supply allowance for drill holes which are in excess of 5,000 feet, but not more than 7500 feet from an adequate source of water supply - $0.10 per foot drilled.

c) Water supply allowance for drill holes which are in excess of 7500 feet but not more than 10,000 feet from an adequate source of water supply - $0.20 per foot drilled.

7. It is further agreed and understood that the sources of the water supply to be considered for the purpose of computing the distance allowance are those which are presently available, or which are made available at the Company's expense and do not include wells which may be drilled at the Contractor's expense.

8. Drill cores are to be placed in receptacles furnished by you at each drill hole location and transported to the point of permanent storage as provided for herein.

9. Invoices covering work performed will be prepared in accordance with your instructions.

10. We very much appreciate being afforded the opportunity to consider this work. Should our proposal be found acceptable, we are prepared to furnish the equipment from our Max Meadows warehouse and commence the drilling operations promptly after receipt of official notice to proceed.

Very truly yours,

E. J. LONGYEAR COMPANY

M. J. Gleason, Manager
Contract Drilling Division

MJG:bal

ACCEPTED:

THE NEW JERSEY ZINC COMPANY

By: _____

Date: _____

"EXHIBIT A"

Option Contracts

RECEIVED
FEB 14 1956

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

RECEIVED
FEB 14 1956

This CONTRACT AND AGREEMENT made and entered into this 29 day of August, 1953, by and between A. C. Woodruff and Rosella H. Woodruff, his wife, parties of the first part, hereinafter called the "Owners", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company."

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expiring on the 29 day of August, 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N.Y.

is all the property of the parties of the first part in said Magisterial District and is bounded and described as follows:

A.C.W.
D.H.L.

Bounded on the North by K.Y. Umberger and W.W. Roberts, on the East by State Highway No. 672, on the South by State Highway No. 90, and on the West by the land of J. G. Yoxley, and being a part of the property conveyed to A. C. Woodruff by the Federal Land Bank of Baltimore by deed dated January 5, 1937, and recorded in the Clerk's Office in Deed Book 95, page 186, a reference to which is hereby made for a more complete description.

In the same consideration, the Grantors give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals:

A. C. Woodruff (signed) (SEAL)

Myrell H. Woodruff (signed) (SEAL)

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK, N.Y.

VIRGINIA:
State-at-Large
~~WISE COUNTY~~, To-wit:

I, D. Keith Lopton, a Notary Public in and for the ~~County of Wise, in the~~ Commonwealth of Virginia State-at-Large do certify that A. C. Woodruff and Norella H. Woodruff, his wife, whose names are signed to the foregoing Contract and Agreement bearing date on the 29 day of August, 1953, personally appeared before me in my ~~County~~ State aforesaid and acknowledged the same.

My commission expires July 1, 1957.

Given under my hand this 29 day of August, 1953.

D. Keith Lopton (signed)
Notary Public

-3-

Conformed Copy
8/31/53

This CONTRACT AND AGREEMENT made and entered into this 29 day of August, 1953, by and between Millard R. Newland, and Katherine Umberger Newland, his wife, parties of the first part, hereinafter called the "Owners", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company."

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expiring on the 29 day of August, 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

160 FRONT ST., NEW

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is ~~all~~ part of the property of the parties of the first part in said Magisterial District and is bounded and described as follows:

BEGINNING at a corner with J. N. Horne on a ridge South of Cripple Creek leaving the Horne property and running in an eastern direction along the top of the ridge to a corner of the R. B. James property; thence with the line of the R. B. James property in a northern direction and a 300 foot extension thereof to a sharp right angle bend in the H. N. Newland line; thence approximately S 75° West across the Newland property to a sharp right angle bend in the western Newland line, approximately 1000 feet northwest of a corner of the J. N. Horne property; thence southeast approximately 1000 feet to a corner with J. N. Horne; thence South with the Horne property to the beginning containing approximately 275 acres. And being a part of the property devised to Millard F. Newland by his father Millard Fillmore Newland by will probated May 2, 1935, and recorded in Will Book 23, at page 62 in the Clerk's Office of Wythe County, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length,

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals:

Millard R. Newland (signed) (SEAL)

Katherine Umberger Newland (SEAL)
(signed)

VIRGINIA:

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that Millard R. Newland and Katherine Umberger Newland, his wife, whose names are signed to the foregoing Contract and Agreement bearing date on the 29 day of August, 1953, personally appeared before me in my County aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 29 day of August, 1953.

D Keith Lupton (signed)
Notary Public

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

This CONTRACT AND AGREEMENT made and entered into this 8th day of September, 1953, by and between Dr. J. C. Moxley and Emma R. Moxley, his wife, parties of the first part, hereinafter called the "Owners", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company."

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expiring on the 8th day of September, 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia and is bounded and described as follows:

160 FRONT ST., NEW YORK N. Y.

BEGINNING at a post, corner to the land of Miss Sallie Porter and George A. Lambert, thence with Porter's lines S 21-1/3° E 140 poles to a post; thence S 81-3/4° W 22-1/4 poles to a fence post; thence S 30-1/4° E 54 poles crossing Cripple Creek to a fence post; thence S 50-1/2° E 71 poles to a fence post; thence S 4-1/4° E 12-4/5 poles to a stake in a wire fence; thence running with the partition line between the land hereby conveyed and remaining land of Calvin S. James, S 77° 20' E 90-5/6 poles to a stake; thence running due East 36 poles to a fence post, corner to the lands of Cassell and Montgomery; thence running with the line of Montgomery's land N 23° W 61 poles to a fence post, corner to the land formerly owned by C. E. Kyle, now Woodruff, and thence running with his lines N 81-1/4° W 87 poles to a fence post; thence N 5° W 6 poles to a stake near Cripple Cree; thence N 9-1/2° W 73 poles crossing Cripple Creek to a fence post; thence N 47°E 30 poles to a fence post; thence N 1/4° E 74-1/2 poles to a fence post; thence N 3° W 22 poles to a fence post, corner to the lands of Greek R. James; and thence running with his lines and the line of George A. Lambert N 86-1/2° W 39-3/4 poles to a fence post; thence S 26-1/2° W 132 poles to the beginning containing 211 acres more or less.

There is excepted and reserved herefrom 2.33 acres conveyed to the Commonwealth of Virginia for a road by deed dated February 14, 1941, and recorded in Deed Book 105, page 419, in the Clerk's Office of Wythe County, and being the same property conveyed to Dr. J. C. Moxley by deed dated October 8, 1943, by W. H. Mundy, et ux, and recorded in the Clerk's Office in Deed Book 110, page 534, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals:

J. C. Moxley (signed) (SEAL)

Emma R. Moxley (signed) (SEAL)

VIRGINIA:

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, do certify that Dr. J. C. Moxley and Emma R. Moxley, his wife, whose names are signed to the foregoing Contract and Agreement bearing date on the 8th day of September, 1953, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 8th day of September, 1953.

D. Keith Lupton (signed)
Notary Public

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

This CONTRACT AND AGREEMENT made and entered into this 11 day of September, 1953, by and between Fred E. Cline and Martha Wright Cline, his wife, parties of the first part, hereinafter called the "Owners", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company."

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expiring on the 11 day of September, 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is bounded and described in three tracts as follows:

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

TRACT NO. 1: BEGINNING at a stake in the Cripple Creek Road, near a ford of said creek; thence N 3° W 2597 feet to a stake on top of the hill, in line of C. Ward Kyle; thence S 81° E 1217 feet to a stake in line of land formerly owned by T. F. Kidd; thence with Kidd's line, S 3° E 2270 to a stake in the Macadam Road on the South side of the creek; thence up said Macadam Road N 89° W 103 feet to a stake; thence S 77° 45' W 500 feet to a stake; thence S 79° 30' W 292 feet to a stake; thence N 68° W 132 feet to a stake; thence N 81° 15' W crossing the creek at the ford 116 feet to a stake; thence S 60° 15' W 98 feet to the beginning; containing 64.86 acres, more or less, and being the same property conveyed by J. W. Bartee and Laura Alice Bartee, his wife to Fred Cline and Martha Cline, his wife, by deed dated January 15, 1944, and recorded in the Clerk's Office of Wythe County in Deed Book 111, page 331, a reference to which is hereby made for a more complete description.

TRACT NO. 2: BEGINNING at a point on the North side of Macadam Road eastwardly from a conrete culvert and running with East side of old road S 12-3/4° E 3.83 chains crossing road and side of hill to a stake on bank of Dry Road; thence with road S 45° W 6.63 chains; thence S 54° W 6.08 chains to a post in fence above road; thence with William Miller's line N 11-7/8° W 1.79 chains; thence S 78-1/2° W 14.53 chains to a white oak by a roadway; thence with road N 74-3/4° W 6.00 chains, thence S 71-1/8° W 4.80 chains, thence N 74-5/8° W 2.25 chains to an iron stake at Creed Montgomery's gate; thence N 33.60 chains; crossing ridge and creek to a point about the intersection of Rural Retreat and Creek roads; thence with Creek road S 60-1/2° E 7.78

chains; thence S 59-4/5° E 2.50 chains, thence S 55-1/5° E 12.00 chains, passing Ward's and Shanahan's corners; thence S 68° E 4.00 chains; thence N 74-1/2° E 4.00 chains; thence N 57-7/8° E 6.00 chains to a point near edge of creek at ford; thence crossing Creek S 8° E 1.76 chains and with road S 66° E 2.00 chains, N 76-1/4° E 12.00 chains, S 85-7/8° E 4.00 chains, passing Shanahan's and Kidd's corner; thence S 68-7/8° E 3 chains to the beginning, said tract containing 121.5 acres more or less. There is excepted therefrom however, the tract conveyed by E. Lee Trinkle to C. Eugene Kyle, by deed dated May 8, 1918 and recorded in Deed Book 65, page 149. Description of this excepted area is as follows:

BEGINNING at a point in intersection of the Rural Retreat road with the Cripple Creek road near C. E. Kyle's residence (B. P. Ward's corner on C. E. Kyle's line) and running in the said Cripple Creek road with Ward's line, S 58° 15' E 528 feet to a point in North side of road; S 57° 30' E 171 feet to a point in North side of road; S 52° 30' E 505 feet to Ward's corner in road; thence S 25° W 103 feet, crossing Cripple Creek to a sycamore tree at side of Creek; thence S 9° 20' W 807 feet up North side of a steep ridge to a small black oak tree on top of ridge; thence along top of ridge N 86° 55' W 877 feet to a point in C. E. Kyle's line on South side of top of ridge; thence with Kyle's line N 2° 15' E 1525 feet down North side of ridge, ~~xxxx~~ crossing creek to the beginning and containing 27.01 acres, more or less, and being the same property conveyed by A. C. Woodruff and Nozelle H. Woodruff to Fred E. Cline and Martha Cline, his wife, by deed dated October 28, 1950 and recorded in the

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Clerk's Office in Deed Book 133, page 566, a reference to which is hereby made for a more complete description.

TRACT NO. 3: Being that parcel of 1-1/2 acres adjoining tract 1 and 2 above that was conveyed to Fred E. Cline and Martha Cline by Rose Umberger, et al, by deed dated _____, 19____, and intended to be recorded simultaneously herewith, a reference to which is hereby made for a more complete description.

no date
no stamps

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above-mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals:

Fred E. Cline (signed) (SEAL)

Martha Wright Cline (signed) (SEAL)

160 FRONT ST., NEW YORK N. Y.

VIRGINIA:

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, do certify that Fred E. Cline and Martha Wright Cline, his wife, whose names are signed to the foregoing Contract and Agreement bearing date on the 11 day of September, 1953, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 11 day of September, 1953.

D. Keith Lupton
Notary Public

THIS CONTRACT AND AGREEMENT made and entered into this 16th day of September, 1953 by and between Sallie Ann Hale, widow, and Lewis Crockett Hale, and Annie Belle Hale, parties of the first part, hereinafter called the "Owners", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

WITNESSETH:

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expiring on the 16th day of September, ~~19xx~~ 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is bounded and described as follows:

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BEGINNING at a stake at the intersection of the Ward road with the Rural Retreat road, and running with the Ward road and lines of Mrs. E. B. Ward, as follows: N. 62-1/8° E. 4.39 chains (17 poles 14 links) to a point in road; N 75-1/8° E. 5.10 chains to point in road; S. 4¼° E. 9.29 chains to stake between a large hickory tree and a post in corner of fence; S. 71½° E. 4.38 chains to a stake by fence, North from a small locust tree marked; thence with P. O. Shanahan's lines S. 9-1/5° W. 15.30 chains to stake on top of hill, and S. 3-3/4° West 38.50 chains to stake in creek road; thence with road N. 55-1/5°° W. 7.66 chains; N. ~~St~~ 59-4/5° W. 2.59 chains; N. 60½° W. 7.49 chains to a stake in road about where creek road and Rural Retreat road intersect; thence with Rural Retreat road N. 3½° W. 5.98 chains, N. 13° W. 6.82 chains, N 29-3/4° W. 2.65 chains, N. 19-3/4°, W. 4.77 chains, N. 9½° W. 5.38 chains, N. 2° E. 1.00 chain; N. 33-2/5° E. 4.14 chains, N. 31-1/3° E. 5.04 chains, N. 47-2/8° E. 2.68 chains, N 51° E. 3.00 chains, N. 33° E. 2.00 chains, N 13-5/8° E. 6.32 chains, N. 3/4° E. ~~xxxxxxxx~~ 2.00 chains, N. 2° E. 3.45 chains, and N 5-7/8° E. 1.63 chains to the beginning; containing 98 acres, more or less; and being the same property conveyed by A. C. Woodruff and Mozelle H. Woodruff to Robert M. Hale, by deed dated October 28, 1950, and recorded in the Clerk's Office in Deed Book 134, page 36, a reference to which is hereby made for a more complete description, and being a part of the property devised by said Robert M. Hale to Sallie Ann Hale for life, remainder to his son, Lewis Crockett Hale, and his daughter, Annie Belle Hale, by will probated September 26, 1951, and recorded in Will Book 30 at page 452.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time, the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals.

Sallie Ann Hale (signed) (SEAL)

Lewis Crockett Hale (signed) (SEAL)

Annie Belle Hale (signed) (SEAL)

THE NEW JERSEY ZINC COMPANY
160 [illegible] ST., NEW YORK N. Y.

VIRGINIA:

STATE AT LARGE, to-wit:

I, D Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, do certify that Sallie Ann Hale, widow, and Lewis Crockett Hale, and Annie Belle Hale, whose names are signed to the foregoing contract and agreement bearing date on the 16th day of September, 1953, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 16th day of September, 1953.

D Keith Lupton (signed)
Notary Public.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

A-1

Conformed copy
10/7/53 DLH

This CONTRACT AND AGREEMENT made and entered into this 7th day of ~~September~~ October, 1953, by and between W. W. Roberts and Valla R. Roberts, his wife, parties of the first part, hereinafter called the "Owners," and The New Jersey Zinc Company, a corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company,"

--W I T N E S S E T H--

That in consideration of One Dollar ($1.00), cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expiring on the 7th day of ~~September~~ October, 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore-bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is bounded and described as follows:

BEGINNING at a point in the middle of Road No. 90 of Virginia Secondary Highway System, and being a corner to Stanley King, and running thence with the middle of said Road S 71° 50' E 420 feet, S 76° 10' E 573 feet, S 87° 23' E 573 feet, S 89° 38' E 323 feet to a point at the intersection of State Highway No. 90 and State Highway No. 672; thence continuing with the middle line of Road No. 90, S 60° 30' E 513.48 feet, S 59° 48' E 170.94 feet, S 55° 20' E 506 feet to corner of Brown Ward land and also corner to Fred E. Cline; thence running with division line between the tract conveyed hereby and the Cline tract, S 25° W 103 feet to a sycamore on the South bank of Cripple Creek; S 9° 20' W 807 feet. S 86° 55' W 802 feet; thence due South 692.6 feet to an iron stake at Montgomery's gate, and being also corner to Cline tract; thence with lines of Montgomery's land N 73° W 251.46 feet, N 71° 6' W 198 feet, N 73° 52' W 422.4 feet, N 70° 36' W 316.8 feet, N 71° 52' W 192.72 feet, N 75° 36' W 948 feet, N 72° 01' W 33 feet to corner of Stanley King; thence with division line between tract of land conveyed hereby and the King tract N 12° 40' E 1757 feet to the beginning, containing 122.9 acres, more or less.

And being the same property as was conveyed by A. C. Woodruff, et ux, to W. W. Roberts and Vella Roberts by deed dated October 28, 1950, and recorded in the Clerk's Office of Wythe County in Deed Book 133, page 584, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral

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substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals.

W. W. Roberts (signed) (SEAL)

Vella R. Roberts (signed) (SEAL)

VIRGINIA:

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, do certify that W. W. Roberts and Vella R. Roberts, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 7th day of ~~September~~ October, 1953, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 7th day of ~~September~~ October, 1953.

D. Keith Lupton (signed)
Notary Public

THE NEW JERSEY ZINC COMPANY
160 FRONT ST. NEW YORK N.Y.

Conformed Copy
10/16/53 dth

RECEIVED
FEB 14 1956

This CONTRACT AND AGREEMENT made and entered into this 15th day of October, 1953, by and between A. L. Porter and Ruth J. Porter, his wife, and Robert Sterl Porter, single, parties of the first part, hereinafter called the "Owners", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expring on the 15th day of October, 1958, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and

and is bounded and described in two tracts as follows;

TRACT 1: BEGINNING at a forked white oak on the West side of said land, thence S 6 E 195½ poles to a fallen hickory; thence N 77 E123 poles to a gum sapling with black oak sapling pointer; thence N 4½ W 137 poles to a hickory on a North ridge; thence N 50½ W 71 poles to a white walnut at the foot of said ridge; thence N 30½ W 54 poles crossing Cripple Creek to an apple tree near said Creek; thence N 18-3/4 E 22½ poles to a fencing post by the wagon road; thence N 21-1/3 W 140 poles to a stake with hickory pointers on a North hill side; thence W 142 poles to a stake with two dogwoods and hickory pointers the Northwest corner of said land; thence S 11½ E 251 poles to a chestnut; thence N 74 E 95½ poles to the beginning, containing 366 acres more or less; there is excepted therefrom, however, 3.04 acres conveyed by A. L. Porter, et al, by deed dated December 9, 1939, to the Commonwealth of Virginia for a highway; and being the same property conveyed by a certain deed of partition dated May 14, 1936, recorded in the Clerk's Office of Wythe County in Deed Book 94 at page 196, a reference to which is hereby made for a more complete description.

TRACT 2: BEGINNING at a stake, corner to Robert E. James and running with two lines of said James S 77° 20' E 90.5 poles to a stake; thence running due East 36 poles to a fence post, corner to lands of Cassell and Montgomery; thence running West with Cassell's land S 20° W 94 poles to a stake, corner to S. T. Bennington; thence running West with his lines, S 74-3/4° N about 80 poles, corner to land of the heirs of Mrs. Sally Porter; thence running West with

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FRONT ST., NEW YORK N. Y.

line of Porter land N 4½° W 124-1/5 poles to beginning, containing 66 acres, more or less; and being the same property conveyed to Ruth J. Porter by deed dated January 14, 1939, by Calvin S. James, et ux, and recorded in the Clerk's Office in Deed Book 101, page 150, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals:

C. L. Porter (signed) (SEAL)

Ruth J. Porter (signed) (SEAL)

Robert Steve Porter (signed) (SEAL)

169 FRONT ST., NEW YORK N.Y.

VIRGINIA:

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that A. L. Porter and Ruth J. Porter, and Robert Steel Porter, whose names are signed to the foregoing contract and agreement bearing date on the 15th day of October, 1953, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 15th day of October, 1953.

D. Keith Lupton (signed)
Notary Public

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

Conformed copy
1/22/54

This AGREEMENT made and entered into this 30th day of November, 1938, by and between Robert E. Jones, widower, in his own right and as Guardian of Marion Virginia Jones and Robert E. Jones, Infants, in behalf of said Infants, party of the first part, hereinafter called the "Owner", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt thereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the party of the first part gives, grants and conveys unto the party of the second part for a period of five years expiring on the 30th day of November, 1943, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right to purchase a portion of the surface, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

ISO FRONT

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia, and is bounded and described as follows:

BEGINNING at a locust on a high ridge South of Blue Springs Creek, and running with top of said ridge N 81° E 264 feet; N 68½ E 733 feet to a stake; thence leaving top of said ridge and running with line of George J. Buchanan N 18° W 1287 feet to a stake in road, corner to land of Oscar Buchanan; thence running with his line and line of J. O. James, N 11° E 1800 feet to a stake; thence running with line of J. O. James, S 87¼° W 1582 feet to a stake, corner to land owned by the estate of N. F. Newland; thence running with his lines S 10½° E 2300 feet to a stake; S 88° E 23 feet to a stake; S 27° E 218 feet to a stake; S 5° E 142 feet; S 73° W 105½ feet; S 9¼° E 850 feet to a corner of George J. Buchanan on top of said ridge; thence running on top of said ridge, N 73° E 354 feet to a stake; N 72° E 485 feet to the beginning, containing 121.67 acres, more or less; and being the same property as was conveyed by C. R. James, et ux, to R. B. James and Elizabeth G. James, by deed dated January 12, 1946, and recorded in the Clerk's Office of Wythe County in Deed Book 116, page 305, a reference to which is hereby made for a more complete description.

In the same consideration, the Owner gives, grants and conveys unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water

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and to remove samples in accordance with the terms of the above mentioned agreement.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the party of the first part has executed this agreement the day and year first above written.

Witness the following signatures and seals:

Robert B. James (signed) (SEAL)
Robert B. James in his own right and as Guardian of Marion Virginia James and Robert C. James, infants, in behalf of said infants.

VIRGINIA:

STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia, at large, do certify that Robert B. James in his own right and as Guardian of Marion Virginia James and Robert C. James, infants in behalf of said infants, whose name is signed to the foregoing contract and agreement bearing date on the 30th day of November, 1953. personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires _____.

Given under my hand this 22 day of ~~November~~ January, 1954.

D. Keith Lupton (signed)
Notary Public

conformed copy
1/30/54

This CONTRACT AND AGREEMENT made and entered into this 29th day of ~~October~~ January, 1954, by and between Raymond B. Smith and Betty Smith, his wife, parties of the first part, hereinafter called the "Owners", and The New Jersey Zinc Company, a Corporation qualified to do business in Virginia, party of the second part, hereinafter called the "Company".

-W I T N E S S E T H-

That in consideration of One Dollar ($1.00) cash in hand paid, the receipt whereof is hereby acknowledged, and other good and valuable consideration not necessary to be herein set out at length, the parties of the first part do give, grant and convey unto the party of the second part for a period of five years expiring on the 29th day of ~~October~~ January, 1959, the exclusive right and option to purchase all the minerals and mineral interests, which shall be construed to mean all the minerals, mineral substances, metals, ores, ore bearing materials, and rock of every kind and description, which may be in, under or upon the following described premises, together with the right to mine, extract and remove the same, and the right to prospect for the same, and certain water rights, and the right of ingress and egress in accordance with an agreement of even date herewith entered into between the parties hereto.

The property herein mentioned is situated in the Speedwell Magisterial District of Wythe County, Virginia,

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

and is bounded and described as follows:

BEGINNING at a post in the North line of State Route 90, being corner to Robert M. Hale land, and running thence with the Hale line N 4° 45' E 2541 feet to a post, N 11° 5' E 1100 feet to a locust, S 70°30' E 825 feet to a white oak in Dewey Fisher's line; thence with the Fisher line, N 85° 30' E 683 feet to a black oak, S 47° 47' E 145 feet to a post, Dewey Williams' corner; thence with Dewey Williams' line, S 3° E 940 feet to a post, Fred Cline corner; thence with line of Fred Cline's land N 81° W 1217 feet to a post, S 3° E 2464 feet to a post in North line of Highway No. 90; thence with the North line of said Highway S 67° 10' W 442 feet to a point; S 78° 15' W 117 feet to a point; N 89° 33' W 121 feet to a point; N 71° 15' W 93 feet to a point; N 61° 45' W 267 feet to the beginning; containing 85.38 acres more or less; and being the same property conveyed to the parties of the first part by deed dated October 25, 1952, by Rose W. Umberger, et al, and recorded in the Clerk's Office of Wythe County in Deed Book 140 at page 173, a reference to which is hereby made for a more complete description.

In the same consideration, the Owners give, grant and convey unto the Company, for the same period of time the right to prospect for, explore and examine all minerals, mineral substances, metals, ores, ore bearing materials and rock of every kind, in, under or upon the described premises, including the right to enter thereon, to use available water and to remove samples in accordance with the terms of the above mentioned agreement.

THE NEW JERSEY ZINC COMPAN
160 FRONT ST., NEW YORK N.

The terms of this option and agreement are fully set out in the agreement of even date herewith and hereinbefore referred to, which is here referred to and made a part hereof as if fully herein set out at length.

In witness whereof the parties of the first part have executed this agreement the day and year first above written.

Witness the following signatures and seals:

Raymond B. Smith (signed) (SEAL)

Betty Smith (signed) (SEAL)

VIRGINIA:
STATE AT LARGE, To-wit:

I, D. Keith Lupton, a Notary Public in and for the Commonwealth of Virginia do certify that Raymond B. Smith and Betty Smith, his wife, whose names are signed to the foregoing contract and agreement bearing date on the 29th day of January, 1954, personally appeared before me in my State aforesaid and acknowledged the same.

My commission expires [illegible].

Given under my hand this 29th day of January, 1954.

D. Keith Lupton (signed)
Notary Public

THE [illegible] COMPANY
160 FRONT ST., NEW YORK [illegible]

RECEIVED
FEB 14 56

"EXHIBIT B"

The following contract with the E. J. Longyear Company has been negotiated for drilling in the Shady limestone belt of Wythe and Smyth Counties and is in effect for our current work.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

AGREEMENT

CORE DRILLING

RECEIVED
FEB 14 1956

THIS AGREEMENT made and entered into as of this 1 day of December, 1955, by and between THE NEW JERSEY ZINC COMPANY, a New Jersey corporation, hereinafter called the Company, and E. J. LONGYEAR COMPANY, a Delaware corporation, hereinafter called the Contractor,

W I T N E S S E T H :

WHEREAS the Company is about to undertake a surface drilling program in Wythe and Smyth Counties, Virginia, which program it is contemplated will involve a minimum of approximately 10,000 feet of drilling of a series of holes not more than a maximum depth of approximately 2,500 feet each, and

WHEREAS the Contractor represents that it is ready, able and willing to do such drilling,

NOW, THEREFORE, in consideration of the premises and of the mutual agreements hereinafter set forth, the parties hereto agree as follows:

1. The Contractor in consideration of payments to be made as hereinafter provided agrees to sink or drill with diamond drills in Wythe and Smyth Counties, Virginia, vertical and/or incline holes between 45° to 90°, at locations and to depths specified by the Company. The Contractor agrees to start said drilling on or about December 5, 1955. In the event drilling to depths greater than the depths for which rates are established in Paragraph 7 hereof is required, or in the event that rock of a harder or more abrasive type than shady dolomite is encountered, such drilling shall be performed only upon such conditions and at such rates as may be agreed upon between the parties hereto in a written instrument supplemental to this agreement.

2. The Contractor will initially furnish and use in performing the work herein, two gasoline-driven diamond core drill rigs

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of suitable capacity for the depth of holes contemplated. The Contractor will furnish the necessary skilled men to operate such drills on a two-shift basis. Contractor will also furnish and use all necessary accessory equipment required to perform the work.

3. The Contractor will also furnish water and all facilities and personnel required for water supply and moving the drill and accessory equipment.

4. The Company shall have the right to have a representative at the drill rigs at all times. The Company will furnish the necessary core and sludge containers and portable field core and sludge storage sheds and the Contractor will save and store therein such of the core and sludge samples as the Company desires, it being understood that Contractor will only be expected to save sludge samples when there is return water. If the Company elects to provide a permanent core and sludge storage shed in the area, the Contractor will, upon request of the Company, after the completion of each hole or when the field core and sludge storage shed is full, transfer such samples in Contractor's truck to, and store such samples in, said permanent core and sludge storage shed and the Company agrees to pay therefor at the rate of $3.25 per hour for the time consumed.

5. The Contractor will not itself, and will not permit any of its employees to, give any core or sludge samples or any information whatever regarding the records and results of this drilling to any person, firm or corporation other than to such person, firm or corporation as the Company may designate by written order, nor will the Contractor or its employees make any use of said information except in connection with the performance of the work hereunder. The Contractor acknowledges that a confidential relationship is hereby created by and between the parties hereto, and that such relationship as to the matter contained in this Paragraph 5 shall survive the termination of this Agreement.

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

6. The Contractor agrees to use every reasonable effort to complete each hole to the maximum depth desired by the Company. In the event any hole is not completed to the depth desired, the Company shall be the sole judge as to whether such hole is of value to it and whether the Contractor is entitled to all or any part of the quoted rates for drilling done in said hole. It is understood that the Company is under no obligation to pay for uncompleted holes.

7. It is contemplated that AX core will be recovered but if authorized by a Company representative, BX, NX or EX core may be accepted, and the Company agrees to pay the Contractor for the drilling of each such hole completed to the satisfaction of the Company's representative, in accordance with the following schedule:

a) Overburden Drilling

0 - 100 feet in depth measured from the collar of the hole.....	$2.65 per foot
100 -150 feet in depth measured from the collar of the hole.....	3.15 per foot

b) Diamond Core Drilling

0 - 1,000 feet in depth measured from the collar of the hole	
BX size recovering core approximately 7/8" in diameter.....	2.55 per foot
AX size recovering core approximately 1-1/8" in diameter.....	2.65 per foot
BX size recovering core approximately 1-5/8" in diameter.....	2.85 per foot
NX size recovering core approximately 2-1/8" in diameter.....	3.25 per foot
1,000 - 1,500 feet in depth measured from the collar of the hole	
BX size.....	2.80 per foot
AX size.....	2.90 per foot
1,500 - 2,000 feet in depth measured from the collar of the hole	
BX size.....	3.40 per foot
AX size.....	3.50 per foot

160 FRONT ST., NEW YORK N.

2,000 - 2,500 feet in depth measured from the collar of the hole

EX size.....	$4.10 per ft.
AX size.....	4.20 per ft.

c) Casing left in drill holes at Company's request -

EX size.....	1.47 per ft.
AX size.....	1.54 per ft.
BX size.....	1.96 per ft.
NX size.....	2.66 per ft.

8. In addition to the footage rates set forth in Paragraph 7 above it is agreed that for drill hole locations in excess of 2,500 feet from source of water supply, the following additional charges will be made:

a) Water supply charge for each drill hole which is in excess of 2,500 feet but not more than 5,000 feet from any adequate source of water supply.....	$0.05 per foot drilled
b) Water supply charge for drill holes which are in excess of 5,000 feet but not more than 7,500 feet from an adequate source of water supply	0.10 per foot drilled
c) Water supply charge for drill holes which are in excess of 7,500 feet but not more than 10,000 feet from an adequate source of water supply	0.20 per foot drilled

It is further agreed and understood that the sources of water supply to be considered for the purposes of computing the distance allowance are those which are presently available or which are made available at the Company's expense, and do not include wells which may be drilled at the contractor's expense.

9. If the Company shall request the Contractor to re-enter and/or deepen any existing drill holes, the Contractor shall re-enter and/or deepen such holes to the satisfaction of the Company's representative and the Company shall pay the Contractor for such operations in accordance with the following schedule:

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N.

(a) For moving, rigging up and rigging down, cleaning out existing drill holes, inserting or removing casing, laying and taking up water line, and any other operations which may be required until the drilling of new hole may be started -- $53.00 per two-man, eight hour shift, or proportionate part thereof for fractional shifts; plus the cost of any diamond loss incurred and the cost of any drill rods, core barrels, diamond bits or casing lost or left in the holes, or discarded on account of damages, due to causes other than ordinary wear and tear, up to the time of starting new drilling in the existing hole.

(b) New footage drilled in each existing drill hole shall be paid for by the Company in accordance with the schedule set forth in Paragraph 7 hereof.

(c) The Company shall receive a credit calculated at the rate of $0.50 for each foot of any new footage drilled in said existing holes which credit shall be applied against any sums due the Contractor pursuant to sub-paragraph (a) above, provided, however, that the total amount of such credit shall not exceed eighty (80%) per cent of the total amount due the Contractor pursuant to said sub-paragraph (a).

10. It is understood and agreed that the prices specified in Paragraphs 4, 7, 8, 9, 12 and 13 hereof include the cost of all equipment, materials, supplies, water, pipe installation, labor and all other items furnished by Contractor pursuant to the terms hereof, together with the cost of moving, storing, hauling, mobilizing and demobilizing all such items, and the cost of all necessary reaming, casing and cementing operations.

11. In the performance of the work covered by this agreement the Contractor will endeavor to recover the maximum amount of core when drilling in the mineralized zone and to that end will, when requested by the Company, use Castset bortz bits or other equivalent mechanically set bortz bits when drilling the mineralized zone.

12. The Contractor agrees to take Maas Compass readings at any point in any drill hole upon request of the Company, and the Company agrees to reimburse the Contractor for the time required

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to properly conduct such surveys at the rate of $5.00 per hour. The Contractor shall furnish the necessary Maas Compass.

13. Except as otherwise provided for herein, any delays in drilling for the Company's convenience or for which the Company is responsible, shall be paid by the Company to the Contractor at the rate of $5.00 per hour.

14. The Contractor will confer with the Company's representative before moving equipment to any drill hole location to the end that the Company's agreement with the owners or lessees of the premises upon which drilling is to be done or over which equipment is to be moved will be observed. The Contractor will exercise due care in moving equipment to and from and in operating at each such drill hole location so as not to cause any unnecessary damage to the surface of the said premises or to the crops, fences, buildings, livestock or other property thereon.

To the extent practicable, the Contractor will, at its own expense, restore each drill hole location to its original condition, cleaning up and removing all debris.

15. Payments shall be made to the Contractor by the Company for the work specified herein on completion of each hole and acceptance thereof by the Company's authorized representative.

16. The Company may at any time direct that the drilling contemplated hereunder be discontinued by Contractor. If the Company directs that the drilling be discontinued before the approximated footage of 10,000 feet has been drilled, a mutually satisfactory settlement shall be made with Contractor to reimburse it for those unrecovered costs which would have been recovered if the said approximated footage of 10,000 feet had been drilled.

17. At all times during the continuance of this contract the Contractor agrees to carry with a reliable insurance company or companies satisfactory to the Company, Workmen's Compensation and

Occupational Disease Insurance to protect its employees and comprehensive liability insurance (including automotive liability insurance) in an amount satisfactory to the Company, and shall furnish to the Company suitable evidence that such insurance has been procured and is being maintained during the time this contract is in effect. The Contractor also agrees to comply with all laws, rules and regulations, whether Federal, State or otherwise, which apply to or in any manner affect the operations or activities of the Contractor or its employees hereunder, or the work hereunder.

18. The Contractor will at all times indemnify, save and keep harmless the Company, its successors and assigns, of, from and against any and all loss, damages, costs, charges, expenses or claims for same which it, the Company, its successors or assigns, may suffer or sustain or be in anywise subjected to, either on account of injuries or loss occasioned to it, the said Company, its successors or assigns, its or their property or employees, or property in its or their possession or control, or on account of injuries to person or property sustained by other persons or corporations, including without limitation the Contractor and its employees, arising out of or resulting from or in any manner caused by or connected with the operations or activities of the Contractor or its employees hereunder. Anything herein to the contrary notwithstanding, however, the Contractor shall not be liable for, and the Company will indemnify and save it harmless from, any liability for damage to the surface of the premises upon which drilling is done or over which equipment is moved and any property thereon insofar as said damage could not be avoided by the exercise of due care by the Contractor.

19. The Company is not to be held nor is it responsible for loss or damage to the Contractor's equipment, it being understood that the Contractor during the time this Contract is in effect

THE HALL JAMES AND COMPANY
160 FRONT ST., NEW YORK N. Y.

will carry all-risk insurance on its drill rig or rigs and accessory equipment protecting against loss by theft, fire, explosion, flood, windstorm, landslides and other similar hazards.

20. The Contractor agrees that it will not, while this agreement is in force, do any drilling, either for itself or others, on properties adjoining those in which the Company has an interest in the aforesaid Wythe and Smyth Counties, Virginia, except by written permission of the Company.

21. It is expressly agreed that there are no promises, agreements, or undertakings outside of this contract. This contract may be altered only by the written consent of both of the parties hereto.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed as of the day herein first above written.

THE NEW JERSEY ZINC COMPANY

Witness:

_____ _____

Assistant Manager of Purchasing

E. J. LONGYEAR COMPANY

Witness:

_____ _____

160 FRONT ST., NEW YORK N. Y.

Operator's copy

MAIN COPY
DATE
RECEIVED
DATE | CODE

EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

AMENDMENT NO. 4

It is agreed this 25th day of September, 1957, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and The New Jersey Zinc Company that Exploration Project Contract Idm-E970, Docket No. DMEA-4173, dated July 23, 1956, as amended, is further amended, effective July 23, 1956, as follows:

1. In Exhibit "A", under Description of the Work, the fifth paragraph is revised to read as follows:

"Diamond drilling shall be done with AX size, or larger, coring bits, except that when it is not feasible to complete a hole with AX size, with Government approval, the hole may be reduced with EX casing and completed with EX size bits. The Government will not contribute to the cost of drilling any hole which is not completed. All drill core shall be logged and shall be made available to the Government for examination. All significantly mineralized core shall be split and one half thereof shall be properly sampled and the samples assayed for zinc. All assay reports shall be submitted monthly to the Government together with the drill hole logs, proper engineering-geological plan maps and sections showing the progress of the work, and drill hole and sample locations. The remaining half of all significantly mineralized core shall be furnished to the Government upon request."

2. In Exhibit "A", under Estimated Cost of the Project, Category (1) Independent Contracts, is revised to read as follows:

"Overburden drilling and diamond drilling to 250-foot depth, 6,000 feet AX size @ $2.20/ft. EX size @ $2.00/ft.	$13,200.00
Diamond drilling 250-foot to 500-foot depth, 4,650 feet AX size @ $2.45/ft. EX size @ $2.25/ft.	$11,392.50

Diamond drilling 500-foot to 750-foot depth, 2,850 feet		
AX size @ $2.70/ft.	$7,695.00	
EX size @ $2.50/ft.		
Diamond drilling 750-foot to 1,000-foot depth, 1,200 feet		
AX size @ $2.95/ft.	3,540.00	
EX size @ $2.75/ft.		
Diamond drilling 1,000-foot to 1,250-foot depth, 300 feet		
AX size @ $3.20/ft.	960.00	$36,787.50
EX size @ $3.00/ft.		

The above rates cover charges for reaming, cementing, water supply, casing, changing of location and all other charges which may be incurred by the Operator pursuant to the diamond drilling contracts. 1/"

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 "allowable 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 C O Mitteudorf
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

By_____

Title_____

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EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

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Executed in quintuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C O Mittendorf
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

By_____

Title_____

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EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

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Executed in quintuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By O. Mitterdorf
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

By_____

Title_____

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THE NEW JERSEY ZINC COMPANY
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THE UNITED STATES OF AMERICA

By C Wittendorf
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

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Title_____

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EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
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Executed in quintuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

C. O. Mittendorf

By_____
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

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Title_____

EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
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THE UNITED STATES OF AMERICA

C. O. Mittendorf

By_____

Administrator, Defense Minerals Exploration Administration

THE NEW JERSEY ZINC COMPANY

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EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
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AX size @ $3.20/ft.	960.00	$36,787.50
EX size @ $3.0/ft.		

The above rates cover charges for reaming, cementing, water supply, casing, changing of location and all other charges which may be incurred by the Operator pursuant to the diamond drilling contracts. 1/"

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 "allowable 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 C. Mittendorf
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

By_____

Title_____

DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

CONTROLLED DOCUMENT

DMA Docket No. 4173

DO NOT DETACH THIS SLIP

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Cys. BM, GS, Reg~~ion V~~

Routing Slip

To:	500	Date	2/14/56
To:	Opw Comm	Date	2-28-56
To:	Base Metals	Date	3/1/56
To:	Op Com	Date	5/31/56
To:	F.E. Johnson	Date	5-31-56
To:	Op Com	Date	5-31-56
To:	Base metals	Date	6/1/56
To:	Op Legal	Date	6/19/56
To:	Base Metals	Date	6/26/56
To:	Op. Comm	Date	6/27/56
To:	Base Metals	Date	6/29/56
To:	Op Comm	Date	7/20/56
To:	F.E. Johnson	Date	7-20-56
To:	130	Date	2-7-58
To:	110	Date	2-10-58
	130		4-22-58
	110		4-25-58

DO NOT DETACH

CONTROLLED DOCUMENT

PROJECT SUMMARY REPORT

By: J. W. Alt

February 10, 1959

1. Docket No. DMEA-4173 (Zinc)
Contract No. Idm-E970
Property: James-Woodruff Area
Wythe & Smyth Counties, Virginia

Operator: The New Jersey Zinc Company
160 Front Street
New York 38, New York

Operator's Property Rights: Optionee
Option Contracts by the following: A. C. Woodruff & wife; Millard R. Newland & wife; Dr. J. C. Moxley & wife; Fred E. Kline & Wife; Sallie Ann Hale & others; W. W. Roberts & wife; A.L. Porter & others; Robert B. James & others; Raymond B. Smith and wife.

2. Contract dated July 26, 1956. To complete April 1, 1958.
Royalty payment period - 30 years.

Work Authorized

The purpose of the project is to explore for ores of zinc by diamond drilling (plus necessary overburden drilling).

The objective of the work is to investigate the ore potential of the Patterson limestone and the Saccharoidal dolomite of the Shady formation.

Drill holes are expected to vary from 150 to 1,100 feet in depth locally, with an average of 600 feet more or less. Approximately 24 holes will be required. Not more than 15,000 feet of drilling shall be performed, provided, however, that the Operator may, upon the written approval of the Government, perform more than 15,000 feet of drilling so long as the total cost of all drilling work allowable under the contract is not exceeded. Diamond drilling will be done with AX size or larger coring bits.

Estimated Cost of the Project

Actual Costs

Category (1) Independent Contracts

Overburden drilling and diamond drilling to 250-foot depth, 6,000 feet, @ $2.20/ft.	$13,200.00	
Diamond drilling, 250-foot to 500-foot depth, 4,650 feet @ $2.45/ft.	11,392.50	
Diamond drilling, 500-foot to 750-foot depth, 2,850 feet @ $2.70/ft.	7,695.00	
Diamond drilling, 750-foot to 1,000-foot depth, 1,200 feet @ $2.95/ft.	3,540.00	
Diamond drilling 1,000-foot to 1,250-foot depth, 300 feet @ $3.20/ft.	960.00	$36,787.50

Fixed Unit Costs

Incidental allowance for each foot of drilling completed, 15,000 feet @ $0.30/ft.	$ 4,500.00	
100 samples of drill core to be assayed for zinc @ $1.00/sample	100.00	4,600.00
Estimated Total Cost of the Project (rounded)		$41,388.00
Government's participation, 50%		$20,694.00

AMENDMENTS

No. 1 Agreed October 4, 1956.

Adds one parcel of land to Annex I of the contract.

No. 2 Agreed April 16, 1957.

Adds three parcels of land to Annex I of the contract.

Amendments (continued)

No. 3 Agreed September 12, 1957.

Adds one parcel of land to Annex I of the contract.

Work Completed

27 Vertical diamond drill holes, 12,639 feet	$29,803.05
Incidental allowance per foot drilled	3,791.70
Assays, 12 @ $1.00/each	12.00
Total cost of project	$33,606.75

Drilling consisted of:

Overburden and diamond drilling to 250-foot depth, 6,495 feet @ $2.20/ft.	$14,289.00
Diamond drilling 250-foot to 500-foot depth, 4,455 feet @ $2.45/ft.	10,914.75
Diamond drilling 500-foot to 750-foot depth, 1,533 feet @ $2.70/ft.	4,139.10
Diamond drilling 750-foot to 1,000-foot depth, 156 feet @ $2.95/ft.	460.20

Work on the project was started on December 13, 1956 and the drilling was stopped on February 21, 1958. The project was terminated by mutual agreement, effective March 10, 1958.

3. Audit - Report of Review dated June 17, 1958.

Total cost billed by Contractor	$33,606.75
No exceptions	
Total Accepted Cost	$33,606.75
Government's participation, 50%	$16,803.38

Operator's final report dated May 26, 1958.
Field Team Final Report dated January 26, 1959.

4. Certification of Discovery or Development.

The project was terminated as unsuccessful and, therefore, no certification was issued.

5. Comments

The diamond drilling consisted of 27 holes ranging in depth from 134 to 906 feet, averaging 468 feet per hole. Core recovery was only moderate, averaging 78.3 per cent per hole. Essentially all of the drilling spanned a stratigraphic thickness of about 900 feet straddling the contact between the saccaharoidal and Patterson members of the Shady dolomite. Except for one trace occurrence of sphalerite in the saccaharoidal member, all oof the base-metal minerals noted were found as rare or scattered traces in the upper part of the Patterson in 16 of the 27 holes drilled. Only 12 core runs ranging from 1 foot to 9 feet in length were sufficiently mineralized to warrant assaying and the best of these was a 5-foot run containing 3.05 per cent zinc. As the amount of zinc discovered was so small and so scattered, calculation of "reserves" of mineralized rock is not warranted.

As there appeared to be little likehood that the completion of all of the 15,000 feet of drilling authorized would make a significant discovery, the project was terminated as unsuccessful.

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

J. W. Alt

J. W. Alt

JWAlt/er
CC: Docket
Dir. Read. File
Chron.

DMEA Form 17
Feb. 58

DEFENSE MINERALS EXPLORATION ADMINISTRATION

WORK COMPLETED ANALYSIS

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

Operator: THE NEW JERSEY ZINC COMPANY		Actual Cost	X
State: VIRGINIA		Agreed Unit Cost *	X
Final Report of Audit		Commodity: ZINC	Docket No. DMEA-4173
Final Report of Review	X		Contract No. Idm-E970

Operation	Authorized by Contract and Amendments		Completed		Net cost after sale of Government Property
	Units	Cost	Units	Cost	
Drifting & Crosscutting					
Raising					
Shafts					
Winzes					
Drilling (Specify) Diamond and Overburden.	15,000' @ ?	$36,787.0	12,639'	$29,803.05	$ 29,803.05
Surface Excavation					
Underground Excavation					
Incidental Allowance per foot dril. ~~XXXXXXXXXXXXXXX~~ 15,000' @ $0.30/ft.		4,500.00	12,639'	3,791.70	3,791.70
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify) 100 assays @ $1.00		100.0	12	12.00	12.00
Totals		$ 41,388.00		$ 33,606.75	* $ 33,606.75

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

Prepared by W. P. Klugescheid Date June 27.58/

31390

OK

☒ Audited Report & Review 6/11/58 WORK ANALYSIS SHEET - DMEA PROJECT ☒ Actual Cost

☐ Certified No. Analysis as of June 27, 1958. *☒ Agreed Unit Costs

Incl. Voucher for

Name THE NEW JERSEY ZINC COMPANY Docket No. 4,173

State VIRGINIA Commodity ZINC Idm-E No. 970

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units	COMPLETED Cost	NET COST
Drifting & Crosscutting					
Raising					
(AX) Overburden drilling ~~Shafts~~ and D.D. to 250' Depth	6,000' @ 2.20	$13,200.00	6,495'	$14,289.00	$29,803.05
D.D. 250' to 500' Depth ~~Winzes~~ 500' to 750' "	4,650' @ 2.45 2,850' @ 2.70	11,392.00 7,695.00	4,455' 1,533'	10,914.75 4,139.10	
DD. 750' to 1,000' Depth Drilling (Specify) 1,000' to 1,250' "	1,200' @ 2.95 300' @ 3.20	3,540.00 960.00	156'	460.20	
Incidental allowance per foot drilled ~~Surface Excavation~~ 15,000' @ 0.30 *		4,500.00	12,639	3,791.70	3,791.70
Underground Excavation					
Roads and Trails					
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify) 100 Assays @ 1.00 *		100.00	12	12.00	12.00
Totals		$41,388.00	Checks audit →	$33,606.75	$33,606.75

Amendment No. 1. takes in the N. S. King property of 80.37 Acres more oe less.
Amendment No. 2 takes in J. S. Eanes property, 65 acres, G. D. Fielder property, 61 acres, and the M. O. Buchanan property, 250 acres.
Amendment No. 3. takes in the J. R. Horne property of 130.5 acres.
Amendment No. 4. Not used.
Termination Agreement--Dated April 23, 1958.
Operator's Final Report received--June 12, 1958.
No basis for Certification. None will be recommended by the Field Team.

Prepared by W. K. Klugescheid

71626

Actual Costs,

Overburden drilling & D.D. to 250' depth.

(AX)	6,000' @ 2.20	13,200.00
D.D. 250' to 500' depth.		
	4,650' @ 2.45	11,392.50
D.D. 500' to 750' depth.		
	2,850' @ 2.70	7,695.00
D.D. 750' to 1000' depth.		
	1,200' @ 2.95	3,540.00
D.D. 1000' to 1250' depth.		
	300' @ 3.20	960.00

Fixed Unit Costs,

Incidentals allowance per foot drilled		
	15,000' @ 0.30	4,500.00
100 Samples assayed for Zinc @ 1.00		100.00
	Total (Rounded)	41,388.00

~~June July Aug Sept Oct Nov~~ 1956 ~~Jan Mar~~

1956 December 1957, ~~January Feb, Mar Apr, May~~

Spent

0-250 @ 2.20

250-500 @ 2.95

500-750 @ 2.90

750-1000 @ 2.95 156' 460.20

Samples 12 to 9 @ 1.00

Incidentals expenses @ $0.30

33,606.75

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

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O. M. B.
RECEIVED FEB 4 1959

DATE	INITIALS	CODE
2-4	C	220
~~2-5~~	~~WHB~~	~~500~~
	C	
Memorandum		
To:	~~W. R. Griswold~~, DMEA	

February 4, 1959

Re: DMEA 4173, Idm E-970
The New Jersey Zinc Co.
James-Woodruff Area
Wythe & Smyth Counties,
Virginia

From: O. M. Bishop, Commodity Specialist, Branch of Base Metals

Subject: Review of field team recommendation and field examiners final report on DMEA 4173, both dated January 26, 1959

On the basis of geochemical anomalies and other geological evidence, 27 diamond drill holes were driven vertically to depths of 134 to 906 feet to explore for zinc orebodies in a 2,249 acre tract in the James-Woodruff area.

Zinc mineralization was limited though wide spread and lead mineralization was almost entirely absent. Geologic review by the Operator and the field examiners resulted in the conclusion that no commercial or near commercial ore had been discovered or was likely to be discovered. On the basis of this conclusion, certification was not recommended.

I find the report amply documents the conclusion and concur in this recommendation.

O. M. Bishop

O. M. Bishop

Copy to: Division of Minerals
Branch of Base Metals
Mr. Kiilsgaard
Mr. Lamb
F I L E S

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
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DATE	INITIALS	CODE
1/28	C	220
1-28		120
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2-3		130
2-3	C	220
2-5		500

January 26, 1959

Memorandum

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

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

Subject: Docket No. DMEA-4173, Contract No. Idm-E970 (Zinc)
The New Jersey Zinc Company, New York, New York
James-Woodruff area, Wythe and Smyth Counties, Virginia

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

Certification is not recommended.

Robert A. Laurence
Robert A. Laurence
Executive Officer

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

Enclosures 3

Reviewed by
OME OPERATING COMMITTEE
2-3-59
((Minutes))

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O. M. E.
RECEIVED JAN 28 1959

DATE	INITIALS	CODE
2/3	2/3	130
		220

UNITED STATES

DEPARTMENT OF THE INTERIOR

OFFICE OF MINERALS EXPLORATION

Region V

FINAL REPORT

DMEA-4173, Idm-E970 (Zinc), JAMES-WOODRUFF AREA
Wythe and Smyth Counties, Virginia

Helmuth Wedow, Jr., Geologist
U. S. Geological Survey

L. E. Shirley, Mining Engineer
U. S. Bureau of Mines

January 26, 1959

Reviewed by
OME OPERATING COMMITTEE
2-3-59
(date)

FINAL REPORT

DMEA-4173, Idm-E970 (Zinc), JAMES-WOODRUFF AREA, Wythe and Smyth Counties, Virginia

Operator: The New Jersey Zinc Company, 160 Front Street, New York 38, N. Y.

SUMMARY AND RECOMMENDATIONS

Exploration for zinc-bearing ore bodies related to anomalous amounts of zinc in the soil overlying the Shady dolomite were conducted in the James-Woodruff area, Wythe and Smyth Counties, Virginia in the period December 1956 through February 1958. It was anticipated that these ore bodies would occur as mineralized pencil-like shoots plunging in the bedding at a low angle to the regional strike of bedrock, a habit similar to that of the zinc-lead ore bodies mined in the nearby Austinville district. The contract between the Operator and DMEA authorized a maximum of 15,000 feet of AX-size diamond core-drilling in vertical holes from the surface. The project was terminated by mutual agreement on the completion of 12,639 feet or 84 percent of the authorized drilling. The total project cost of items allowable under the contract amounted to $33,606.75 of which half ($16,803.38) was contributed by the Government.

The diamond drilling consisted of 27 holes ranging in depth from 134 to 906 feet, averaging 468 feet per hole. Core recovery was only moderate, averaging 78.3 percent per hole. Essentially all of the drilling spanned a stratigraphic thickness of about 900 feet straddling the contact between the saccaharoidal and Patterson members of the Shady dolomite. Except for one trace occurrence of sphalerite in the saccharoidal member, all of the base-metal minerals noted were found as rare or scattered traces in the upper part of the Patterson in 16 of the 27 holes drilled. Only twelve core runs ranging from 1 foot to 9 feet in length were sufficiently mineralized to warrant assaying, and the best of these was a 5-foot run containing 3.05 percent zinc. As the amount of zinc discovered was so small and so scattered, calculation of "reserves" of mineralized rock is not warranted.

As there appeared to be little likelihood that the completion of all of the 15,000 feet of drilling authorized would make a significant discovery, the project was terminated as unsuccessful. Consequently, certification was not recommended.

INTRODUCTION

On February 10, 1956, the New Jersey Zinc Company applied for DMEA asistance to explore for zinc ores in the James-Woodruff area, Wythe and Smyth Counties, Virginia (fig. 1). A contract to perform 15,000 feet of diamond drilling for the exploration was signed, effective July 23, 1956. Actual drilling was initiated on December 13, 1956. With the completion of 12,639 feet in 27 drill holes on February 21, 1958 drilling was recessed, and the Operator requested termination. The results of the drilling were reviewed with the Operator's field representatives on March 14, 1958, whereupon the field examiners recommended termination without certification. The termination agreement, effective March 10, 1958, was signed on April 23, 1958. The Operator was notified on January 22, 1959 that no certification would be made.

The contract between the Operator and the Government called for 15,000 feet of diamond drilling with AX-size or larger core. The holes were expected to vary from 150 to 1,100 feet in depth, averaging 600 feet, with approximately 24 holes required. The holes were to be arranged in a series of dip fences not less than 600 feet apart with the holes in each fence located no closer than 200 feet, except with prior Government approval. Estimated total cost for the project was $41,388.00 to which the Government would contribute 50 percent ($20,694.00). Actual costs (drilling) were not to exceed a total of $36,788.00 (rounded), and fixed unit costs were not to exceed a total of

$4,600.00. Fixed unit costs were broken down into assays and incidentals (professional and clerical services, and core boxes).

The area under lease by the Operator at the time the contract was signed amounted to approximately 1,662 acres (fig. 2). Approximately 587 acres were later amended into the contract (fig. 2), thus making a grand total of 2,249 acres for the contract area.

The purpose of the exploration was to evaluate the ore potential of areas in the vicinity of significant geochemical soil anomalies overlying the Shady dolomite (fig. 2). The drilling targets were possible pencil-like ore shoots lying at an acute angle to the regional strike, after the habit of the known ore bodies of the Austinville lead-zinc district (15-20 miles northeast) where the Operator has been mining for many years (fig. 1).

Access to the project area is by U. S. Highway 21 (from Wytheville) to Speedwell and thence by county roads westward to the drilling areas (figs. 1 and 2). The nearest railhead is at Rural Retreat (fig. 1), a station on the Norfolk and Western Railway.

Immediate geologic guidance for the project was maintained by Mr. R. C. Gilbert, under the supervision of Dr. W. H. Brown, Chief Geologist of the Operator's Bertha Mineral Division with headquarters at Austinville. Actual drilling was done by Sprague and Henwood under an independent contract with the Operator.

WORK ACCOMPLISHED

Actual drilling under the James-Woodruff contract (DMEA-4173, Idm-E970) was done from December 13, 1956 and completed on February 21, 1958, a period of approximately 62 weeks. A total of 27 vertical holes was drilled. These holes were arranged in a series of dip fences, as shown on figure 2, with Holes JW-26 and -27 each constituting single-hole dip fences. The total drilling amounted to 12,639 feet or about 84 percent of the 15,000 feet authorized under the contract. The total depths of the holes ranged from 134 feet (Hole JW-18) to 906 feet (Hole JW-16); the average depth was 468 feet. Core recovery per hole ranged from a low of 54.3 percent (Hole JW-22) to a high of 94.2 percent (Hole JW-12); the average was 78.3 percent. Review of the Operator's drill logs shows that the bulk of the core loss was in the first several hundred feet of rock below overburden and was due mainly to cavities and grinding of rotten rock in weathered zones. Some core loss occurred at greater depths and was caused mostly by grinding of highly fractured rock in blocky ground and fault zones, and related zones of deep weathering. Overburden consisted chiefly of clay residuum from the weathering of the carbonate bedrock. Depth of overburden in the holes was generally shallow, ranging from 1 to 50 feet, but averaging only about 18½ feet. Engineering data on the 27 holes are summarized in table 1.

Although the contract permitted 100 assays, the amount of mineralized rock encountered warranted at best only 12 assays. The data on these assays are given in table 2.

EXPENDITURES

The Report of Review of the James-Woodruff contract, issued by DMEA on June 17, 1958, summarized expenditures as follows:

Independent contracts (drilling)	$ 29,803.05
Fixed unit costs	3,803.70
Total costs billed by Operator	$ 33,606.75
Exceptions	0.00
Total accepted costs	$ 33,606.75

Thus, of a total of $41,388.00 allowed under the contract $33,606.75, or 81.2 percent was expended. At 50 percent participation the cost to the Government totalled $16,803.38. Average costs per hole are summarized below:

	Total costs	Average cost per foot	Average cost per hole
Drilling	$29,803.05	$ 2.358	$ 1,103.82*
Assays	12.00	0.00095	0.44*
Incidentals	3,791.70	0.30	140.43
Total	$33,606.75	$ 2.66*	$ 1,244.69*

* Rounded to nearest cent.

Thus, actual drilling costs, although varying from a low of $2.20 per foot to a high of $3.20 in various depth categories for an average of about $2.45 per foot for the authorized 15,000 feet, averaged only $2.358 per foot. The reason for this lower average is apparent when it is noted that the deepest hole drilled (JW-16) was only 906 feet as opposed

to a proposed maximum depth of 1,100 feet, and that the average depth of the holes was only 468 feet as opposed to an average expected depth of 600 feet.

GEOLOGY

Stratigraphic setting.--The general stratigraphic section of the James-Woodruff area is summarized in table 3. Most of the drilling was confined to a stratigraphic zone of about 890 feet straddling the contact between the saccharoidal and Patterson members of the Shady dolomite. Only one hole (JW-17) was outside of this stratigraphic range. This hole was collared in the lower part of the Patterson member and penetrated the Rome formation below the Sugar Grove overthrust fault. (See figs. 2, 3, and 4, and table 3.)

Structural setting.--The James-Woodruff area lies on the south-dipping north limb of the Speedwell-Sugar Grove syncline. The axis of this syncline in the project area has a trend of about N. 80°-85° E. The general attitude of the strata penetrated in the James anonaly area is approximately N. 80° E., 35° SE. Eastward, in the Woodruff anomaly area, the strike has swung around to about N. 85° E., and the dip has flattened to about 30° SE.

The only major fault in the area is the Sugar Grove overthrust (fig. 2). The dip of this fault has been interpreted variously by several authors. Currier (1934, pl. 1) shows the fault dipping relatively gently (30°) to the south beneath the Shady dolomite. Miller (1944, p. 33-34 and pl. 1) concludes that the fault is a high-angle reverse fault and shows it dipping at about 75°-80° S. in the vicinity of the James anomaly

area along the Smyth-Wythe county line. Finally, Stose and Stose (1957, p. 151-155 and pl. 1) believe that the Sugar Grove overthrust dips northward and, thus, they interpret the Speedwell syncline as a fenster. Hole JW-17, designed to test the possibilities for zinc in the lower part of the Patterson member of the Shady, is believed to have penetrated the Sugar Grove fault. It was collared in the Patterson about 850 feet south of the fault trace (fig. 2) and encountered a mylonite zone at a depth of 351 to 382 feet. Below the mylonite zone the hole showed 15 feet of red and gray shale typical of the Rome formation. If the mylonite zone is interpreted as the Sugar Grove fault, it then has a dip of about 20°-25° S. at the James anomaly. Consequently, the examiners believe that the interpretation of the fault as presented by Currier (see above) is probably more nearly correct than either of the others--that is, that the mass of Erwin, Shady, and Rome formations in the Speedwell syncline and lying south of the fault trace were thrust at a relatively low angle over the Rome north of the fault trace. The faulting occurred either prior to or during the initial stages of the folding of the Speedwell syncline.

Minor fault and fracture zones were noted in many of the cores examined. It is thought that these structures are chiefly high angle tear or cross faults similar to other such transverse shears found elsewhere in the Speedwell-Sugar Grove syncline. No correlation of such structures could be made between holes.

Mineralization.--It was believed at the outset of the James-Woodruff drillingthat possible zinc-bearing ore bodies were related to the intense geochemical anomalies (over 1,000 parts per million zinc equivalent) in the area (fig. 2). Further, that they would be pencil-like shoots similar to the ore bodies at Austinville and would plunge in the plane of the bedding at a highly acute angle to the regional strike of bedrock. Still further, that such ore bodies would be closely related to zones of coarse-grained white dolomite formed by the recrystallization of the finer-grained gray dolomites. Numerous zones of such white secondary dolomite were noted in the cores recovered. In some cases pyrite and traces of sphalerite actually accompanied the white dolomite; in other cases, however, the white dolomite was barren of sulfides or the sulfides were disseminated in the gray finer-grained dolomites.

The actual amount of zinc encountered in the drilling was disappointingly low, although it is believed to have been sufficient to have caused the anomalous amounts of zinc in the overlying soils. All occurrences of zinc observed in the core recovered are posted graphically on figures 3 and 4. The best run recovered was from Hole JW-5 in the Woodruff anomaly area where 5 feet from a depth of 305 to 310 feet (see table 2) contained 3.05 percent zinc. In the Woodruff anomaly area the occurrences of sphalerite appear to be confined to the strata between the Patterson "transition" zone above and the "faintly mottled" marker zone below (fig. 3). In the James anomaly area the zinc mineralization seems to be localized between the "faintly mottled" marker zone above and the "ellipsoidal" limestone below (fig. 4), with but two exceptions

as follows: (1) in Hole JW-13 a zone about 6 feet thick lying about 270 feet vertically above the base of the saccharoidal member contains rare traces of sphalerite, and (2) in Hole JW-23 a single "bleb" of sphalerite was found in dolomite below the "ellipsoidal" limestone.

The base metal mineralization in the James-Woodruff area, such as it is, appears to be solely zinc, in contract to the Austinville district where the zine-lead ratio is about 4 or 5 to 1. The only galena noted in the entire drilling of the project area was a single trace at a depth of 448 feet in Hole JW-24.

CONCLUSION

The drilling in the James-Woodruff area was unsuccessful in an attempt to discover ore bodies similar to those occurring in the relatively nearby Austinville district. Although only 84 percent of the total authorized drilling was completed, the Operator and the field examiners were in agreement that the expenditure of the remaining footage was not likely to result in any significant discovery. The project was terminated as unsuccessful and, therefore, was not recommended for certification.

REFERENCES CITED

Currier, L. W., 1934, Zinc and lead region of southwestern Virginia: Virginia Geol. Survey, Bull. 43.

Miller, R. L., 1944, Geology and manganese deposits of the Glade Mountain district, Virginia: Virginia Geol. Survey, Bull. 61.

Stose, A. J., and Stose, G. W., 1957, Geology and mineral resources of the Gossan Lead district and adjacent areas in Virginia: Virginia Geol. Survey, Bull. 72.

Helmuth Wedow, Geologist
U. S. Geological Survey

L. E. Shirley, Mining Engineer
U. S. Bureau of Mines

TABLE 1. -- SUMMARY OF ENGINEERING DATA ON DIAMOND-DRILL HOLES IN THE JAMES-WOODRUFF AREA, WYTHE AND SMYTH COUNTIES, VIRGINIA

NOTE: ALL MEASUREMENTS ARE IN FEET.

HOLE NO.	COLLAR COORDINATES*	COLLAR ELEVATION	TOTAL DEPTH	THICKNESS OF OVERBURDEN	PERCENT CORE RECOVERY
JW-27	15,440-S 84,590-W	2,351	627	13	74.3
JW-26	15,470-S 85,760-W	2,373	593	13	64.2
JW-1	14,490-S 87,070-W	2,388	161	5	73.1
JW-2	14,685-S 87,058-W	2,375	277	25	75.0
JW-3	14,884-S 87,045-W	2,359	332	21	85.5
JW-4	15,095-S 87,040-W	2,342	322	18	91.9
JW-5	15,280-S 87,030-W	2,331	443	19	88.2
JW-6	15,485-S 87,010-W	2,334	522	15	91.7
JW-7	15,690-S 86,998-W	2,435	730	8	89.5
JW-8	15,170-S 88,260-W	2,353	372	20	80.7
JW-9	15,340-S 88,290-W	2,370	471	26	92.4
JW-10	15,570-S 88,260-W	2,434	657	15	83.3
SUB-TOTAL	—	—	5,507	—	—
AVERAGE	—	—	459	16½	82.5
JW-11	16,650-S 102,525-W	2,434	200	1	83.9
JW-12	16,945-S 102,480-W	2,415	270	27	94.2
JW-13	17,185-S 102,425-W	2,398	417	2	85.8
JW-14	17,310-S 102,370-W	2,394	551	17	85.2
JW-15	17,570-S 102,305-W	2,435	717	40	74.7
JW-16	17,760-S 102,250-W	2,465	906	46	75.7
JW-17	16,725-S 105,115-W	2,519	397	11	69.9
JW-18	17,350-S 104,900-W	2,440	134	18	58.6
JW-20	17,705-S 104,775-W	2,415	322	4	90.3
JW-19	17,900-S 104,710-W	2,418	422	9	67.3
JW-21	18,090-S 104,645-W	2,436	550	19	75.5
JW-22	18,190-S 104,575-W	2,460	681	23	54.3
JW-23	18,000-S 105,310-W	2,461	410	15	67.3
JW-24	18,190-S 105,245-W	2,467	530	50	59.0
JW-25	18,375-S 105,180-W	2,490	625	25	82.3
SUB TOTAL	—	—	7,132	—	—
AVERAGE	—	—	475½	20½	74.9
GRAND TOTAL	—	—	12,639	—	—
GRAND AVERAGE	—	—	468	18½	78.3

* COLLAR COORDINATES ARE IN OPERATOR'S GRID SYSTEM BASED ON AUSTINVILLE ORIGIN.

NOTE: HOLES JW-1 THROUGH JW-10, AND JW-26 AND -27 ARE IN WOODRUFF ANOMALY AREA.

HOLES JW-11 THROUGH JW-25 ARE IN JAMES ANOMALY AREA.

HOLES ARE ARRANGED BY FENCES FROM EAST TO WEST AND FRO

TABLE 1

DMEA-4173, Idm.-E976 (zmc) NOV-1/53

TABLE 2.-- ASSAYS MADE ON MINERALIZED ROCK FROM DIAMOND-DRILL HOLES, JAMES-WOODRUFF AREA, WYTHE AND SMYTH COUNTIES, VIRGINIA

HOLE NO.	DEPTHS (FEET)	CORE LENGTH (FEET)	ZINC (PERCENT)
JW-5	173-175	2 (2)*	2.07
	175-180	5 (5)	1.03
	305-310	5 (5)	3.01
JW-6	237-239	2 (2)	0.10
	267-269	2 (2)	0.25
JW-7	414-417	3 (3)	0.51
	454-463	9 (9)	0.15
JW-15	705-706	1 (1)	1.46
JW-18	32-37	5 (5)	0.58
JW-19	373-376	3 (3)	1.56
JW-21	506-510	4 (4)	0.46
	520-522	2 (2)	0.35

* FIGURES IN ( ) SHOW ACTUAL AMOUNT OF CORE ASSAYED.

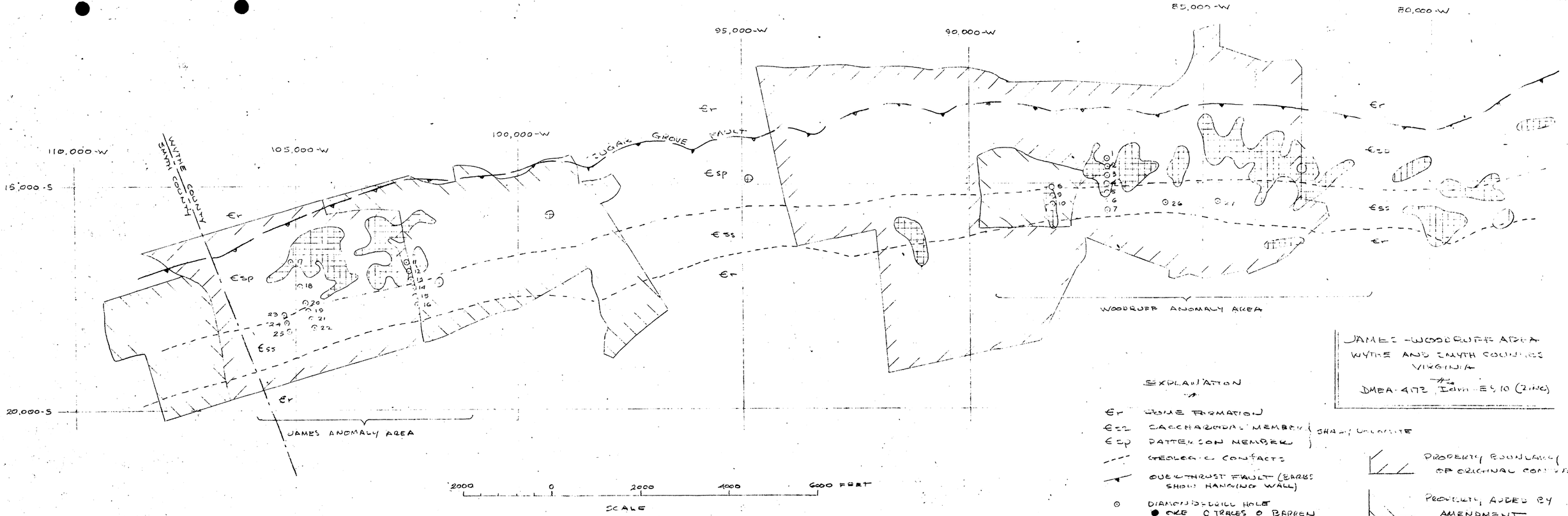
TABLE 3 – STRATIGRAPHIC [illegible] WHITE HAVEN-MOORBRUCE AREA

[illegible]	THICKNESS (FEET)	[illegible]
ROME FORMATION	1,000+	RED, [illegible] BANDED, BANDED DOLOMITE [illegible] AMOUNTS OF THIN LIMESTONE
CAMBRIAN (?)	SACCHAROIDAL (AUSTINVILLE) MEMBER	500±	GRAY AND WHITE DUN[illegible] SACCHAROIDAL DOL[illegible] MASSIVE AND LOCALLY THIN BE[illegible] DARTINGS
	BATTERSON (RIZ-BON) MEMBER	600±	DARK-GRAY DENSE DOLOMITE [illegible] CHARACTERIZED BY [illegible]
ERWIN QUARTZITE	0 – ?	LOCAL PATCHES OF GRAY AND [illegible] QUARTZITE ALONG THRUST FAULT
SUGAR GROVE – SPEEDWELL OVERTHRUST FAULT		
ROME FORMATION	?	AS DESCRIBED ABOVE

1/ NAMES IN [illegible] ARE THOSE USED LOCALLY BY THE NEW JERSEY ZINC CO.

[illegible] 1/23, Jan-Feb 196[illegible] (2 pk.)

HWI-1/59


110,000-W
105,000-W
100,000-W
95,000-W
90,000-W
85,000-W
80,000-W
15,000-S
20,000-S
WYTHE COUNTY
SMYTH COUNTY
SUGAR GROVE FAULT
Er
Esp
Ess
JAMES ANOMALY AREA
WOODRUFF ANOMALY AREA
2000 0 2000 4000 6000 FEET
SCALE
JAMES-WOODRUFF AREA
WYTHE AND SMYTH COUNTIES
VIRGINIA
DMEA-472 Idm-ES,10 (ZINC)
EXPLANATION
Er CONNE FORMATION
Ess CACCHAROUDAL MEMBER
Esp PATTERSON MEMBER
SHALY LIMESTONE
GEOLOGIC CONTACTS
QUEEN THRUST FAULT (BARBS SHOW HANGING WALL)
DIAMOND DRILL HOLE
ORE TRACE BARREN
SOIL AREAS CONTAINING MORE THAN 1000 PPM ZINC EQUIVALENT
PROPERTY BOUNDARY OF ORIGINAL CONTRACT
PROPERTY ADDED BY AMENDMENT

HW-1/59

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6/17	Talbert	800
6/17	C	220
6/18	[illegible]	500

JUN 17 1958

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

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe & Smyth Counties, Virginia
Contract No. Idm-E970

Dear Mr. Laurence:

The original and three copies of the Report of Review in lieu of a final audit, as requested by your memorandum of June 10, are enclosed.

If you concur with the facts as stated therein, the original and one copy should be submitted 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 all copies with your comments to this Division.

The final (March 1958) MF-104 and attachments, together with the drilling invoices supporting prior forms MF-104 are being returned to Mrs. Miller with a copy of this letter.

Sincerely yours,

(Signed) J. L. Chambers

Jay L. Chambers, Director
Contract Administration
and Audit Division

Enclosures

EDTalbert/ama
June 17, 1958

Copy to: Docket
Admr. Reading File
Helen R. Miller w/104 and invoices
Mr. Chambers

8623

Operating Committee

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 13 1958

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

6/13 C 220
6/13 Dez 4500

June 10, 1958

Memorandum

To: Mr. Jay L. Chambers, Chief Contract Admin. and Audit Division, DMEA

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

Subject: Completion of DMEA-4173, Idm-E970(zinc)
The New Jersey Zinc Company, Austinville, Virginia
James-Woodruff Area, Wythe & Smyth Counties, Va.

Work on the subject contract has been terminated as of March 10, 1958.

The following units of work have been successfully performed as verified by our Field Examiners:

1) A total of 12,639 feet of diamond drilling has been completed.

2) 12 sample analyses were made.

An adequate final engineering and geological report has been received from the Operator.

A report of review is requested. Final Monthly Report and Voucher attached.

Robert A. Laurence
Executive Officer, DMEA
Region V

VJL/zm
cc
Lynch
Finance Office
Files

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

June 10, 1958

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 12 1958
DATE
6/13 Sig. H.G. 225
6/13 GW 800
6/12 Sig 500

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: Operator's Final Report - DMEA-4173, Idm-E970-zinc
The New Jersey Zinc Company, Austinville, Va.
James-Woodruff Area, Wythe-Smyth Counties, Va.

Transmitted are three copies of the subject report.

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

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

zm

150M

COPY

EXTRA COPY
DMEA
RECEIVED JUN 12 1958
DATE | INITIALS | CODE

Austinville, Va.
June 4, 1958

Regional Executive Officer
Defense Minerals Exploration Administration
Room 13, Post Office Building
Knoxville 2, Tennessee

Subject: Final Report, James-Woodruff Property
Wythe and Smyth Counties, Virginia
DMEA-4173, Idm-E 970 (Zinc)

Dear Sir:

Enclosed is our final report on the James-Woodruff Project. It includes both an account of the results of the drilling and a summary of the costs, the latter on your standard forms.

We trust that this is satisfactory and completes the job.

Very truly yours,

W. L. Albers,
General Superintendent

WHoratioBrown/mjf
In quintuplicate

RECEIVED
JUN 10 1958
U. S. BUREAU OF MINES
DEF. MIN. ADM.
Knoxville, Tennessee

3e ✓

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RECEIVED JUN 12 1958

DATE	INITIALS	CODE

DIAMOND DRILLING RESULTS

JAMES-WOODRUFF AREA

WYTHE-SMYTH COUNTIES, VIRGINIA

DMEA 4173, IDM-E970 (Zinc)

by

R. C. Gilbert

May 26, 1958

THE NEW JERSEY ZINC COMPANY
Austinville, Virginia

161	11,769.1	73.1 %	
277	20,775.0	75.0	
332	28,386.0	85.5	
322	29,334.2	91.1	
443	39,072.6	88.2	
522	47,867.4	91.7	
730	65,335.0	89.5	
372	30,020.4	80.7	
471	43,520.4	92.4	12,633'
657	54,728.1	83.3	
200	16,780.0	83.9	
270	25,434.0	94.2	984,116.3
417	35,778.6	85.8	
~~515~~			77.9%
551	46,945.2	85.2	
712	53,186.4	74.7	Recovery
906	68,584.2	75.7	
397	27,750.3	69.9	
134	7,852.4	58.6	
422	28,400.6	67.3	
322	29,076.6	90.3	
550	41,525.0	75.5	
681	36,978.3	54.3	
410	27,593.0	67.3	
530	31,270.0	59.0	
625	51,437.5	82.3	
593	38,129.9	64.3	
627	46,586.1	74.3	

C O N T E N T S

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Geologic Section I, Area I, 7GB-4272	1" = 100'	In Pocket
Geologic Section II, Area I, 7GB-4288	"	"
Geologic Section I, Area II, 7GB-4357	"	"
Geologic Section II, Area II, 7GB-4356	"	"
Geologic Section III, Area II, 7GB-4360	"	"
Longitudinal Section I, Area I, 7GB-4358	"	"
Longitudinal Section II, Area I, 7GB-4359	"	"
Area I Plan 7GB-4284	"	"
Area II Plan 7GB-4355	"	"

SUMMARY

The discovery of geochemical anomalies in a region of known zinc mineralization induced the Company, with DMEA assistance, to conduct an exploration program in the vicinity of the anomalies on the James and Woodruff properties. Options were obtained on 2250 acres preparatory to diamond drilling.

A total of 12,639 feet was drilled in a total of 27 holes. Mineralized ground was encountered at both anomalies, but the grade and thickness of the mineralization were not of ore proportions. The drilling was done according to a preconceived plan, with minor approved variations.

As a result of the drilling, the potential of the area is regarded as low, and it is recommended that the project be abandoned and classified as non-productive.

INTRODUCTION

Location, Topography and Drainage

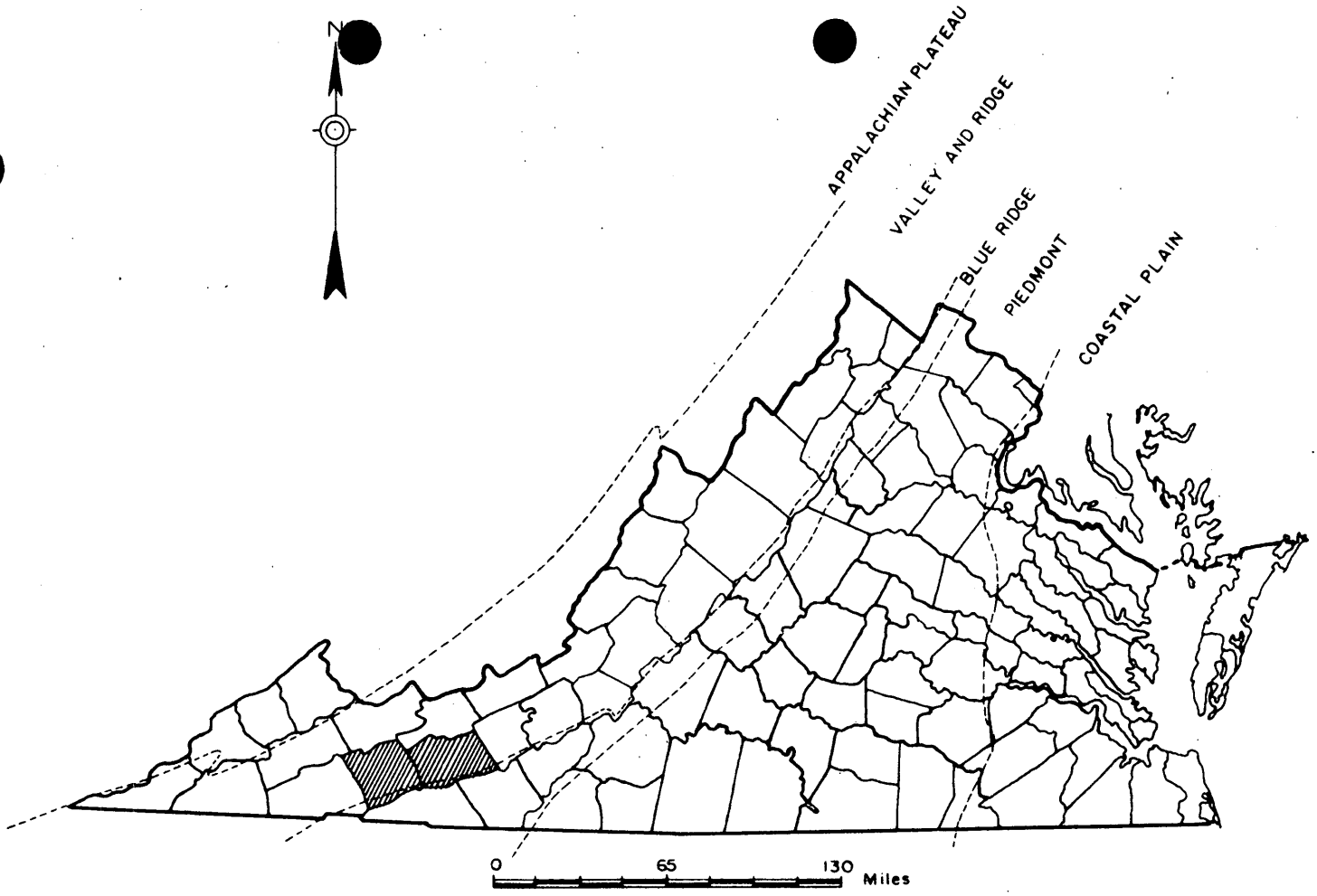
The James-Woodruff area is located 14 to 20 miles southwest of Austinville, and lies between Speedwell in Wythe County and the Smyth-Wythe County line to the west. This project is divisible into two parts (see Index Map, page 2), but since the geological settings are similar and the two areas of drilling are only four miles apart, they were treated as a single exploration project. (See Index Map, page 3).

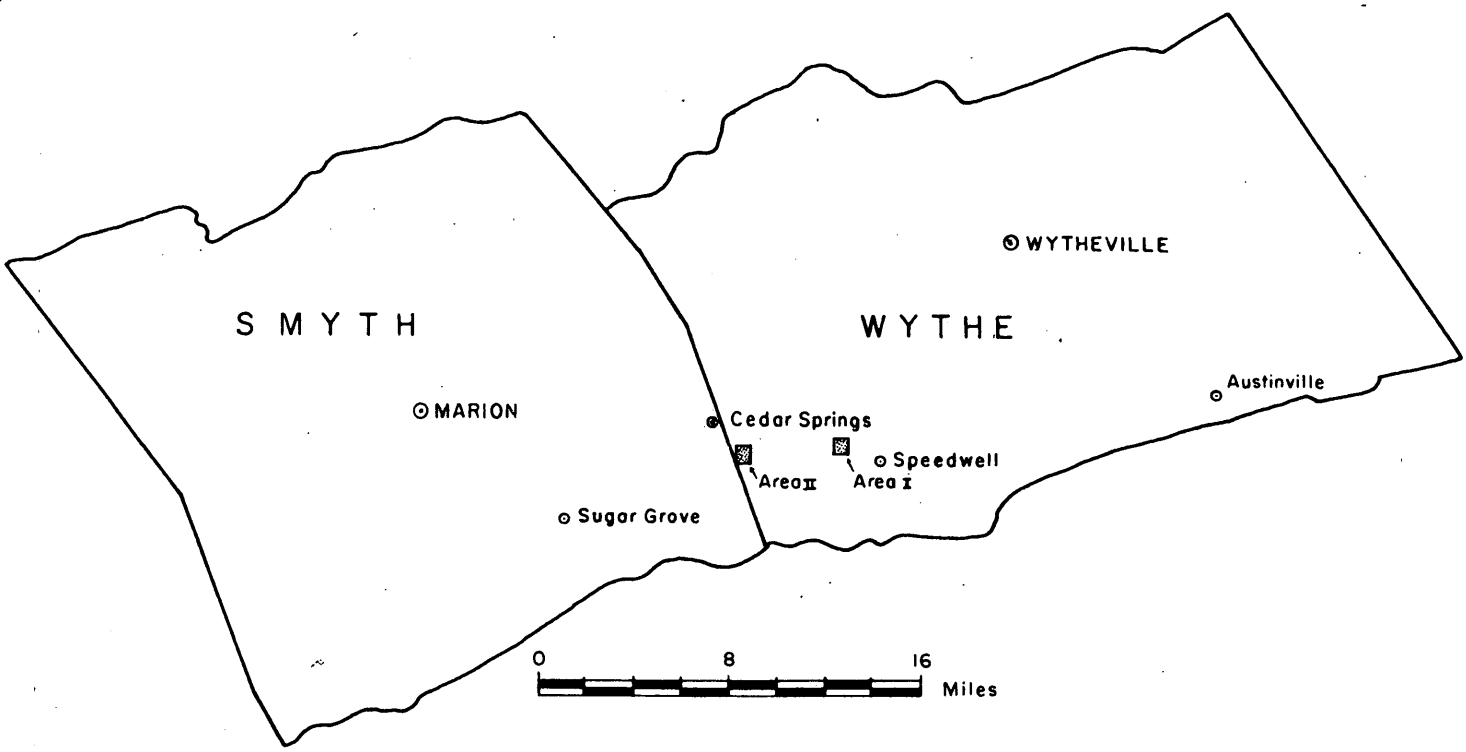
The topography is rolling to rugged. Elevations range from about 2320' at the level of Cripple Creek, which traverses both drilling sites, to about 2845', the crest of Bowling Green Mountain to the south.

The area west of Speedwell is drained by the east flowing Cripple Creek, which is a tributary of the New River System.

Scope of the Project

The diamond drilling project in the James-Woodruff area was designed to test for ore shoots associated with the geochemical anomalies. It was anticipated that any ore body associated with the anomalies would have a long axis sub-parallel to the regional strike of the beds, and would therefore conform in general to the shape of the ore bodies known in the Austinville area.

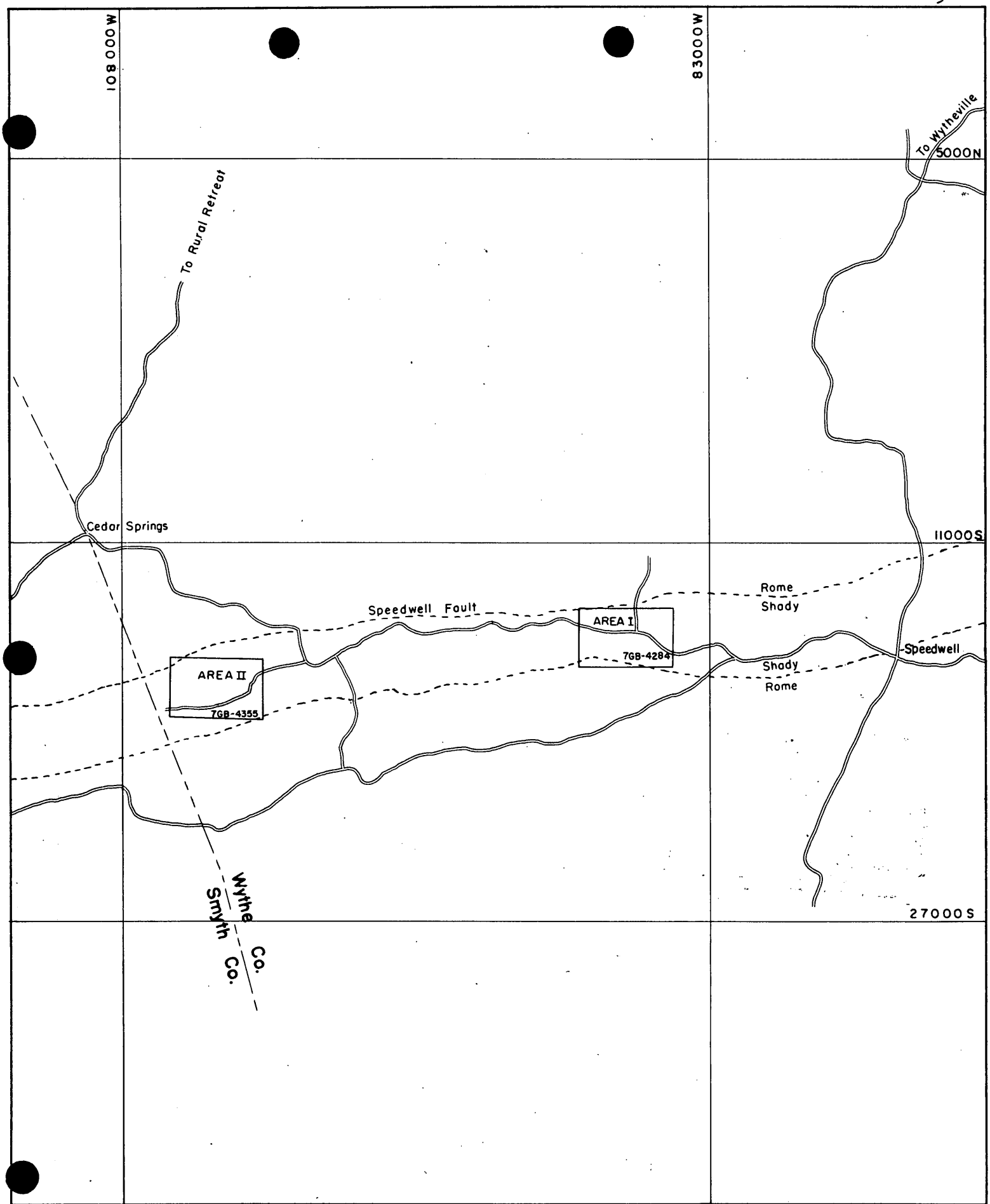




POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DISTRICT WYTHE-SMYTH COs, VA.
DRAWN R.C.G. DATE 4-10-58 TRACED E.E.F. SCALE	GEOGRAPHIC and PHYSIOGRAPHIC INDEX JAMES-WOODRUFF AREA	FILE NO. 7GB-4362

EXTRA COPY
DMEA
RECEIVED JUN 1 [illegible]

DATE	INITIALS	CODE



POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DISTRICT WYTHE-SMYTH COs., VA.
DRAWN RCG DATE 4-1-58 TRACED SCALE 1" = 1 Mile	INDEX MAP JAMES-WOODRUFF AREA	FILE NO. 7GB-4361

X 5407 C 1M 3-53

RECEIVED

DATE	INITIALS

The drilling was largely confined to fences of holes that were oriented approximately normal to the regional strike. In the James area (Area II, 7GB-4355 in pocket and page 6) a fence of holes was drilled east and west of the anomaly, as well as a fence 600 feet west of the western fence. In the Woodruff area (Area I, 7GB-4284 in pocket and page 5), one fence of seven holes was drilled to the west of the anomaly, with a second fence of three holes 1200 feet to the west of the first fence. A "fence" containing two holes was drilled on strike to the east of JW-6. This pattern of drilling should have penetrated any mineralized ground of ore proportions that was associated with the geochemical anomalies.

Personnel

Messrs. S. S. Goodwin and W. Horatio Brown mapped the area of this project in conjunction with regional studies[1]. The work of Mr. L. W. Currier[2] covered approximately the same ground that was mapped by Goodwin and Brown.

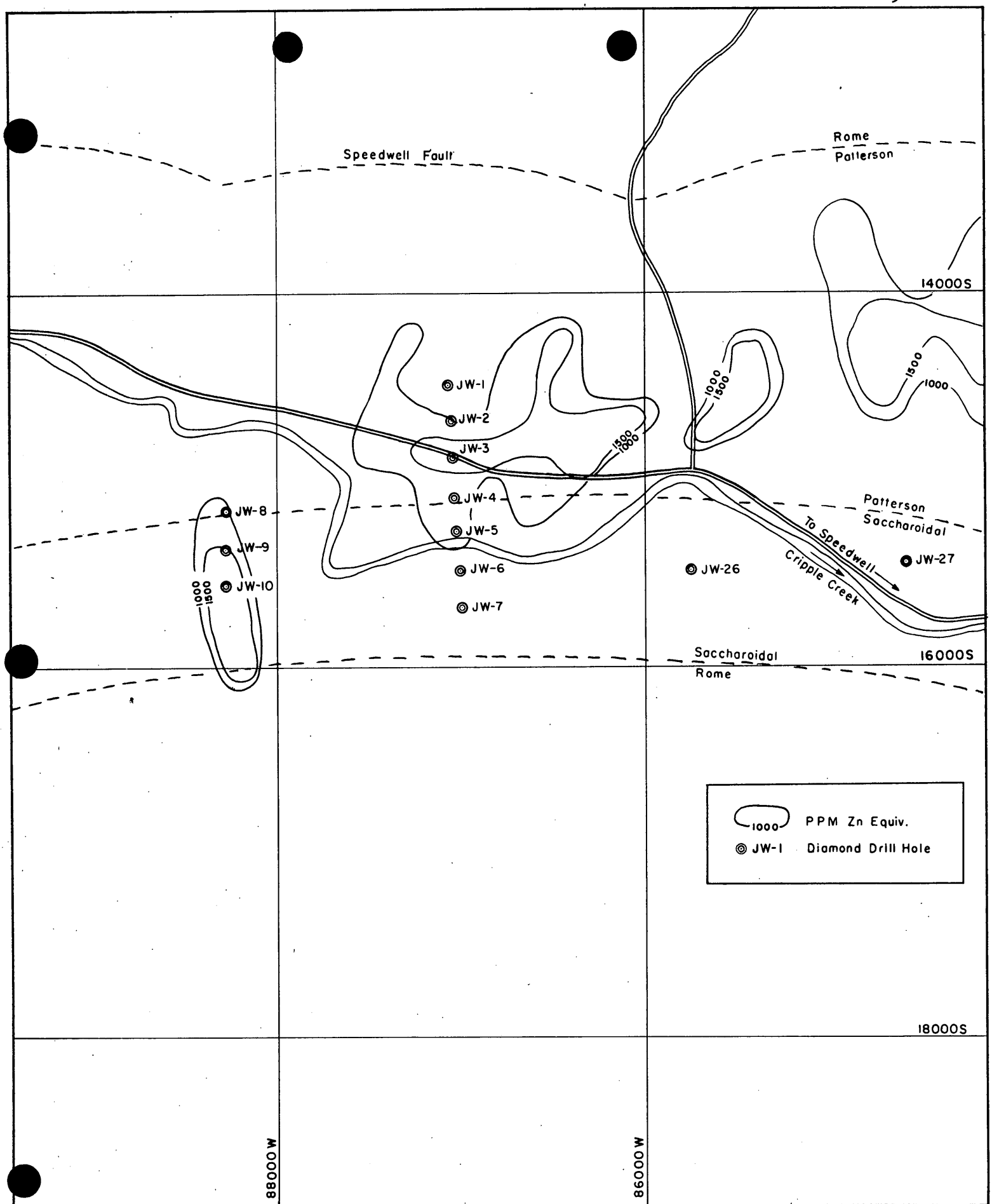
During 1952 and 1953, Mr. D. K. Lupton supervised a geochemical prospecting program in the area and conducted reconnaissance geological work. The recent drilling program was directed by the writer under the supervision of Brown.

Messrs. E. E. Fulford and H. M. Mabe assisted the writer with topographic control in the area.

The drilling was done by Sprague and Henwood.

DMEA Assistance

The Government of the United States, through the Defense Minerals Exploration Administration, contributed

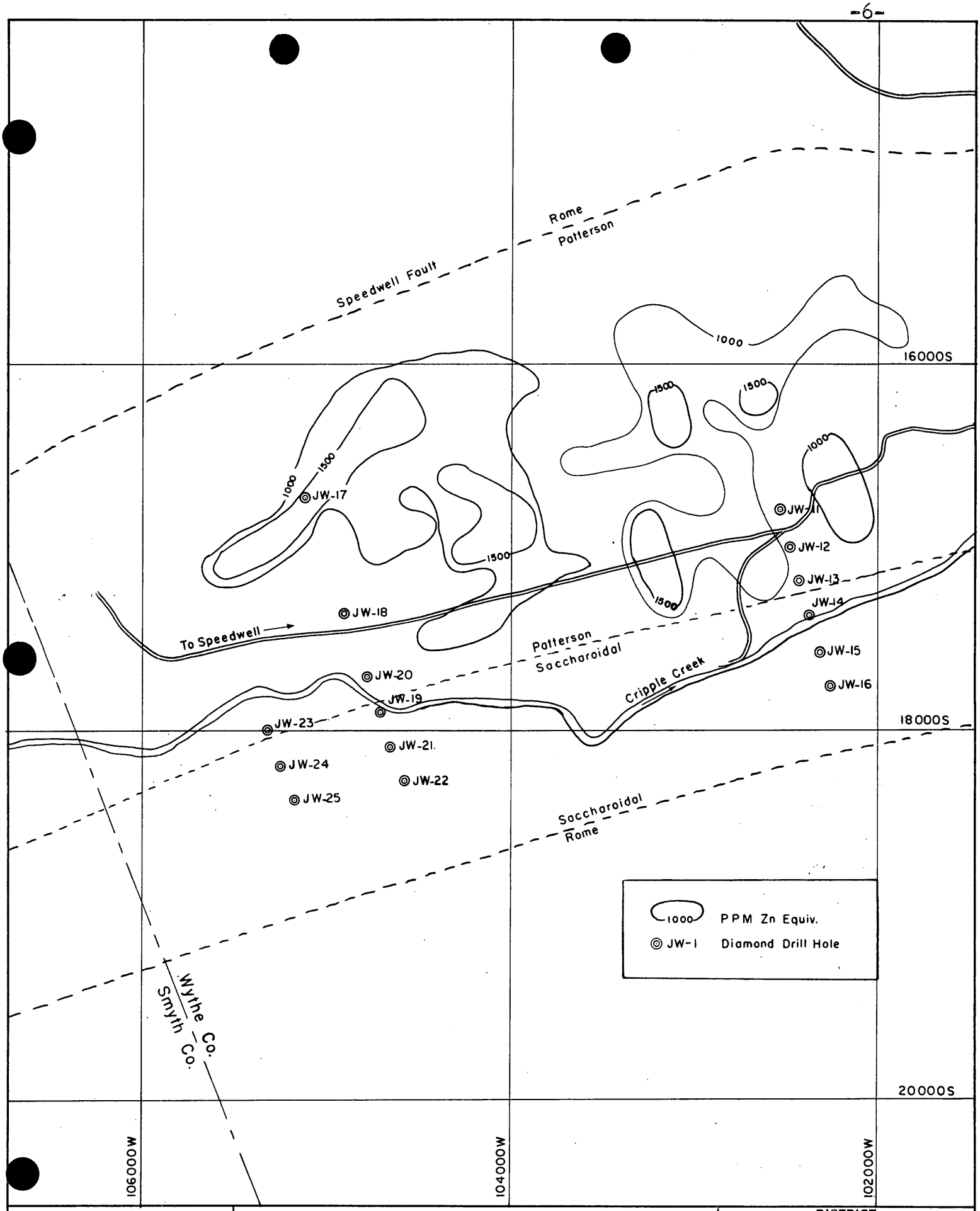


POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DISTRICT WYTHE-SMYTH COs, VA.
DRAWN R.C.G. DATE 4-10-58 TRACED E.E.F. SCALE 1"=660'	AREA I WOODRUFF ANOMALY JAMES-WOODRUFF AREA	FILE NO. 7GB-4363

X 5407 C 1M 3-53

RECEIVED

DATE	INITIALS



POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DISTRICT WYTHE-SMYTH COs, VA.
DRAWN R.C.G. DATE 4-15-58 TRACED E.E.F. SCALE 1"=660'	AREA II JAMES ANOMALY JAMES-WOODRUFF AREA	FILE NO. 7GB-4364

X 5407 C 1M 3-53

financial assistance to this exploration of the James-Woodruff project. This assistance, amounting to 50% of the costs involved, was applied for in February, 1956, and was granted by contract IDM E-970 dated July, 1956. This contract was the "fixed unit costs" contract with the costs divided into three major categories: drilling, sampling and analysis, and incidental allowances. no!

This contract was supervised by the Region V Field Team under the direction of Mr. R. A. Laurence. This project was inspected by Laurence and other members of the Field Team, including Messrs. V. J. Lynch, Helmuth Wedow, Jr., and Larry Shirley. The members of the Field Team were consistently aware of and helpful with the problems that arose during the exploration project.

The total costs incurred are shown on pages 8 and 9.

PREVIOUS WORK

Geology

The James-Woodruff area has been mapped by various geologists in conjunction with regional studies. This area was covered by W. Horatio Brown[1] and L. W. Currier[2]. Their results are essentially the same and are accepted as basic works in the area. Stose and Stose[3] recently published their geology of the area, but their version of the structure is not in agreement with the other reports. (See Structure, page 19).

The American Smelting and Refining Company drilled a hole about half way between the James and Woodruff properties.

Form MF-104A
(April 1952)

Budget Bureau No. 42-R1151.2

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

OPERATOR'S UNIT COST AND PROGRESS REPORT

RECEIVED
JUN 12 1958
D.M.E.A.

Month of _____ 195____ Docket No. DMEA 4173 Contract No. 970

Operator's Name The New Jersey Zinc Company Minerals Zinc

Address Austinville, Virginia

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT	
							Units	Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core				29,803.05	12,639	2.358	15000	2.45
Churn								
Auger								
Stripping								
Trenching								
~~Taken~~ Sample Assays Sample				12.00	12	1.00	100	1.00
Roads and Trails								
Incidental Allowances @ $0.30/ft				3,791.70	12,639	0.30	15000	0.30
TOTAL DISTRIBUTED COSTS				33,606.75				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS				33,606.75				$41,388.00

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this report is correct and complete to the best of their knowledge and belief.

Date _____ Operator Bertha Mineral Division THE NEW JERSEY ZINC CO.

Per _____ Title Gen'l Superintendent

W. L. Albers

REMARKS:

NOTE.—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.

(Instructions on reverse)

(For Government use only)

INSTRUCTIONS

Preparation of Form MF-104A—Operator's Unit Cost and Progress Report.—Applicable places on Form 104A should be filled in by the Operator. The purpose of this form is twofold as follows: (1) to furnish the supervising engineers and other administrators with statistical information necessary to better determine the progress of the project; and (2) to furnish more permanent information on mining costs for future use. The more important phases of operation on which permanent information is desired have been outlined in the form. There are blank lines, however, for those unusual phases which may need to be reported for a particular project. It will be necessary for the Operator to distribute his costs among the applicable phases reported with the exception of three items the costs of which are not to be distributed by the Operator. These three items are: "Operating Equipment Purchased", "Initial Rehabilitation and Repairs", and "New Buildings, Improvements, etc." The reason for not distributing these items on a monthly basis is doubtless clear to the Operator, since such distribution might well overstate the cost for any one month or period short of the entire contract period.

Form MF-104A has been designed to tie in with Form MF-104 for both monthly and cumulative costs. The "Total Costs" on Form MF-104A for each month should equal the monthly "Total Costs" as reported on Form MF-104. This is also true of the "Total Costs To Date".

In preparing Form MF-104A, it will be necessary frequently to distribute certain costs over a number of items. For instance, supervisory and engineering costs may have to be distributed over several phases, such as, drifting, crosscutting, raising, etc., provided that these items were reported active for the month. Such distributions should be made on the basis of time spent on the various phases, on man days of labor charged to such phases, or on some other equitable basis. "Operating Equipment", "Initial Rehabilitation and Repairs", and "New Buildings Improvements, etc.", will be distributed to the several phases of the project by the Washington Office of DMEA at the close of the project if determined necessary. The last two columns headed "Authorized by Contract" will be filled in by the Operator if such information is found in the contract. This information is usually a part of Exhibit "A" of the contract. A space for remarks has been provided for the use of the Operator to call attention to any unusual circumstances causing excessive or disproportionate unit costs.

GPO 872894

Form MF-104 (Rev.)
(April 1952)

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
OPERATOR'S MONTHLY REPORT AND VOUCHER

RECEIVED JUN 12 1958 DMEA

Month of ....., 195..... Docket No. DMEA 4173 Contract No. 970
Operator's Name The New Jersey Zinc Company Minerals Zinc
Address Austinville, Virginia
Contract Amount, $ 41,388.00 Government Participation: 50 % Amount, $ 20,694.00

ITEMS OF COSTS	FOR OPERATOR'S USE			FOR GOVERNMENT USE ONLY		
	Monthly Total	Totals Previously Reported	Totals To Date	Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent / Short Form } Contracts:						
Drilling			29,803.05			
Bulldozing						
Crosscutting						
Drifting						
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment			12.00			
Sampling and Analysis						
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incidental Allowances @ $0.30/ft			3,791.70			
TOTALS			33,606.75			

I certify that the above bill is correct and just and that payment therefor has not been received.

Date ..... *Payee .....

Per ..... Title .....

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

NOTE.—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.

(Instructions on reverse)

Pursuant to authority vested in me, I certify that this account is correct and proper for payment in the amount of:

$.....

Signature .....
(Authorized Certifying Officer)

Date ..... Vou. No. .....
(See other side)

(For Government use only)

CERTIFICATION BY GOVERNMENT REPRESENTATIVE:

I certify that to the best of my knowledge and belief the contractor submitting this voucher is operating a Defense Minerals Exploration Administration project under Contract No. ..... in accordance with the terms of the contract.

Signature ..... Title ..... Date .....

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature ..... Title ..... Date .....

MONTHLY REPORT OF OPERATOR

The Operator (Contractor) of an exploration project is required to make a monthly report to the Government through the Regional Executive Officer. This report consists of three parts as follows:

(a) *Form MF-104—Operator's Monthly Report and Voucher.*—This form details expenditures and constitutes a voucher for reimbursing the Operator for the Government's share of costs;

(b) *Form MF-104A—Operator's Unit Cost and Progress Report.*—This is a statistical report of expenditures which shows costs for the various types of operation; and

(c) *Narrative.*—A concise narrative description of progress made, results accomplished, and any unusual difficulties encountered must be furnished as an attachment to this Report and Voucher. Wherever possible, the narrative is to be illustrated with maps or sketches showing formations penetrated and location and assays of samples taken as well as advances in workings. In the case of diamond drilling or churn drilling, the location and inclination of holes is to be shown on a map; logs and assays also are to be submitted.

The Monthly Report of Operator should be prepared in an original and four copies all of which must be sent to the Executive Officer of the Region not later than the 15th of the month following.

Preparation of Form MF-104—Operator's Monthly Report and Voucher.—All the applicable spaces in Form MF-104 should be filled in by the Operator, and the Operator or his agent should sign the certification in the lower left corner of the form.

The items of costs are arranged in the order they appear in Article 6 (a) of Form MF-200 (Revised February 1952), however, this form is readily adaptable for use in reporting activities under other contract forms.

Under Item (1) delete words "Short Form" if the contract is a sub-contract under Form MF-200; and delete word "Independent" if the contract reported is on Form MF-200 (A). Also, report work paid for on a unit basis under contract Form MF-200 as though it were performed under an independent contract.

Under Item (2) include labor, supervision and technical services incurred for the exploratory operations. Do not include labor, supervision and technical services used for work performed under items (5) and (6).

Under Item (3) include the costs of material and supplies used in the project other than that used under items (5) and (6).

Under Item (4) appear the three types of operating equipment expenditures, that is, rental, purchase and depreciation. The expenditures made for renting equipment belonging to a third party will be reported under "Rental". The amount paid or duly obligated for payment for the purchase of equipment will be reported under "Purchase". The amount of expenditures due the Operator to reimburse him for depreciation of equipment owned will be reported under "Depreciation".

Item (5) comprises costs of labor, supervision, technical services, materials, etc., which are used in the initial rehabilitation and repair of existing buildings, installations, fixtures, and equipment. These costs, therefore, should not be reported under items (2) and (3).

Item (6) includes the labor, supervision, technical services, materials, etc., used in the installation or construction of new buildings, fixed improvements, etc., necessary for the project. These costs, therefore, should not be reported under items (2) and (3).

Item (7) covers miscellaneous types of expenditure such as payroll taxes, liability insurance, workmen's compensation insurance, repairs to equipment and sampling and analysis. Only that part of payroll taxes, liability insurance and workmen's compensation which are paid by the operator should be reported under item (7). The share paid by the employee as a payroll deduction is to be included under item (2) as labor costs.

Item (8) includes any unforeseen costs not included in the other seven categories.

The original of Form MF-104 when submitted for reimbursable expenses incurred under contract Form MF-200 must be supported by original documentation or by certified copies of purchase orders, payrolls or transcripts of payrolls, unless such documentation has been waived by the Regional Executive Officer. This certification may be stated thus, "Certified True Copy (or Transcript)", followed by appropriate signature. If the Executive Officer of the Region determines that a contract under Form MF-200 should have an "on-site" audit, that is, a Government auditor should make an audit of the Operator's books and records of account, the Operator need not support his monthly voucher with original or certified documents except in cases of equipment purchases whose individual costs exceed $50.00. In these cases the original or a certified copy of the purchase order or invoice should be attached to the Monthly Voucher. N. B.—Only the *original* of Form MF-104 is required to be documented. The four copies of Form MF-104 are not to be thus supported.

Form MF-104 submitted for reimbursement under fixed price contracts on Form MF-200 (A), however, are not required to be supported by documentation of any kind. The Operator will submit his claim under item (1) of Form MF-104 by deleting as stated above the word "Independent" and by showing the number of feet or other units immediately after the appropriate descriptive word, such as, drilling, bulldozing, crosscutting, drifting, etc., and giving the "Monthly Total" amount due. "Totals Previously Reported", and "Totals to Date" columns should also be filled in.

GPO 872893

This drilling was done about 1929, and the property owners report that mineralization was encountered.

The area has a history of iron mining.

Geochemistry

During 1953-54 D. K. Lupton directed a geochemical prospecting program in the area as well as conducting reconnaissance geological work. Among the anomalies delimited by this regional geochemical work were the Woodruff and the James anomalies.

The standard grid of 500 x 200 feet was used in the area. The samples, taken from a depth of about two feet, were analyzed by technicians using the colorimetric system.

The James and Woodruff anomalies were considered significant because of their size, intensity of soil zinc values, and their occurrence in a region that is known to contain mineralized outcrops. For these reasons, it was decided to test these anomalies by diamond drilling.

DIAMOND DRILL PROGRAM

The decision to test the James and Woodruff anomalies was based not only on the size and intensity of the anomalies but also on the known occurrence of mineralized localities in the region.

Subsequent to the discovery of the anomalies, a total of 14 properties containing 2,250 acres was optioned preparatory to drilling. Eight of the properties, totalling

1,347 acres, were in the area of the Woodruff anomaly; the remaining six properties, containing 903 acres, were in the area of the James anomaly.

The drilling pattern was based on the assumption that any ore body associated with either of the anomalies would pitch to the west at an acute angle to the strike of the beds. This was based on the regional structural pattern as well as some alignment in the high samples of the anomalies. Just two miles west of the James anomaly is a structural high that separates the Speedwell syncline from the Sugar Grove basin. This structural high was near enough to the James anomaly to influence the direction of pitch of an ore body associated with the anomaly. Consequently, a fence of holes was drilled both east and west of the anomaly. The only significant mineralization was encountered on the western fence as predicted by the alignment of high samples within the anomaly. In the area of the Woodruff anomaly, both structure and alignment of high samples indicated a western pitch to any ore body associated with the anomaly. Drilling encountered mineralization west of the anomaly.

Since most of the known mineralized outcrops in the region occur in the upper part of the Patterson member, it was anticipated that any ore body in the area would also be in the Patterson above the ellipsoidal zone, which occurs near the middle of this member of the Shady formation. Thus, the ellipsoidal zone was established as the bottoming horizon for the drilling project.

The diamond drill holes were so located that they should have penetrated any ore body, in the upper part of the Patterson member, that was associated with the geochemical anomalies.

To test for the assumed ore body, or ore bodies, a total of 12,639 feet was drilled in a total of 27 holes. Of the 12,639 feet drilled, 505 feet were in overburden which ranged in thickness from one foot (JW-11) to 50 feet (JW-24). Core recovery, excluding surface drilling, averaged 77.95% for the entire project, and ranged from 54.3% in JW-22 to 94.2% in JW-12. The holes ranged in depth from 134' in JW-18 to 906' in JW-16.

Hole JW-17 was collared below the ellipsoidal zone to test the ground in the hanging wall of the Speedwell fault. The results of this hole did not give any encouragement to drilling this ground.

Structural sections showing the results of the drilling are in the pocket at the end of the report.

GEOLOGY

General

The James-Woodruff area is underlain by the Lower Cambrian Shady formation. According to a composite of sections measured by Brown[1], the Shady is about 1,368 feet thick in the James-Woodruff area. This formation can easily be divided into two members: the lower ribbony Patterson and the upper Saccharoidal.

The Shady overlies, apparently conformably, the Erwin quartzite and is overlain, apparently without a break, by the Rome formation. Both contacts appear to be gradational but can be located within a few feet.

The James-Woodruff area is located on the north limb of the Speedwell syncline in the hanging wall of the Speedwell fault. The Speedwell fault thrusts the Shady, with an occasional thin sliver of Erwin, upon Rome. The entire thrust sheet was then folded into a syncline, with the Rome overlying the Shady in normal sequence in the center of the syncline. Thus the Rome borders the Shady to the east, west and north, and the lowermost Shady on the south limb of the syncline is covered by talus from the nearby quartzite ridges.

Stratigraphy

In the entire James-Woodruff project, drilling was done through a stratigraphic distance of 890 feet in the middle part of the Shady - with the exception of hole JW-17 - which was drilled in the lowermost part of the formation. Of this 890 feet penetrated in the middle part of the Shady, 388 feet were in the Saccharoidal member and 502 feet were in the Patterson (see Columnar Section, page 15). The youngest rock encountered was the Rome formation as seen below the Speedwell fault in hole JW-17, and the oldest rock was the Patterson as seen just above the Speedwell fault. The youngest Shady was from the Saccharoidal member at the collar of JW-16.

Patterson Member

The Patterson is the basal member of the Shady formation and normally overlies the Erwin quartzite. In the James-Woodruff area, the only hole to penetrate the lower part of the formation went from the Patterson through the Speedwell fault and into the Rome formation. The Patterson is overlain by the Saccharoidal member of the Shady without any apparent break in the sedimentation.

The Patterson is composed of medium to slightly darker fine to finely saccharoidal dolomite that contains more or less abundant shale partings. Near the middle of the Patterson is a series of limestones that contain thick shale partings that enclose small ovoid masses of limestone. This limy zone is known as the Ellipsoidal zone.

The upper 502 feet of the Patterson was penetrated by the drilling in the James-Woodruff area, as well as 300 feet near the base of this member. The rock encountered was a rather monotonous series of beds with a few persistent markers as well as a few lenticular (?) beds that were somewhat different from the normal ribbony rock.

Ellipsoidal Zone - The ellipsoidal zone that occurs near the middle of the Patterson is a medium gray fine grained limestone with abundant thick ribbony partings. The ellipsoidal masses within the ribbony partings give the rock the appearance of a conglomerate. The ellipsoidal zone is easily recognized in the outcrop as well as in drill core. Dolomitization of this zone does not destroy the characteristic ellipsoidal

ABBREVIATIONS

Abu — Abundant
Ble — Bleached
Brr — Breccia
D — Dark
Diag — Diagenetic
Ellip — Ellipsoidal
Fi — Fine
Fn — Faint
Gy — Gray
L — Light
M — Medium
Mass — Massive
Mot — Mottled
Pts — Partings
Rtr — Transition Zone
Ry — Ribbon
Sach — Saccharoidal
Sh — Shale
Tk — Thick
Tn — Thin
Zo — Zone

LEGEND

Dolomite
Limestone
Parting Shale
Diagenetic Breccia
Ellipsoidal Zone

SHADY FORMATION

SACCHAROIDAL MEMBER

PATTERSON MEMBER

MARKER	THICKNESS	COLOR	TEXTURE
	181'	M-DGy	Fi-Fi Sach
Pt Sh	14'		Fi Abu Tn Sh Pts
	123'	LGy	Mass Sach
	70'	L MGy	Fi Sach Few Sh Pts
RTr	70'	MGy	Fi Sach-Sach Diag Brr
	177'	MGy	Fi Sach Abu Ry Pts
Fn Mot	14'	L MGy	Fi Fn Mot Ble Diag Brr
	96'	MGy	Fi-Fi Sach Ry Pts
Ellip Zo	145'	MGy	Fi Tk Ry Pts, Ellip

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DRAWN R.C.G. DATE 4-9-58 TRACED E.E.F. SCALE 1"=100'	GENERALIZED SECTION JAMES-WOODRUFF AREA	FILE NO. 7GB-4366

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nature. About 145 feet of this limy zone was penetrated by diamond drilling, and it was generally used as the bottoming horizon.

Faintly mottled zone - About 96 feet above the top of the Ellipsoidal zone is a thin (14') zone of light medium gray fine grained dolomite that is faintly mottled. Although not recognized as such in the early drilling, this zone was later seen to be a bleached diagenetic breccia. This zone varied from a thickness of 8 feet in JW-22 to about 22 feet in JW-7. It was also noted that at the Woodruff anomaly (Area I) the faintly mottled zone was about 50 feet above the ellipsoidal zone and at the James anomaly (Area II) this zone was about 110 feet above the ellipsoidal zone. It is possible that there are two faintly mottled zones, and that only one occurs in each area. This is not believed to be the case. This marker was penetrated by all holes that cut through this zone with the possible exception of JW-14.

Patterson Transition - The uppermost 70 feet of the Patterson member is composed of medium to slightly darker gray finely saccharoidal dolomite that contains more or less abundant diagenetic breccia accompanied by some slight alteration. This zone was rather hard to define in some holes and sharp in other holes; consequently there is considerable variation in the thickness of this zone, but the average of 70 feet is a reasonable figure. The top of the transition zone marks the top of the Patterson member.

Fragmental beds - Within the upper part of the Patterson are several beds of dark gray fine to finely saccharoidal dolomite that contain abundant fragmental partings. These beds vary in thickness from a few inches to more than 30 feet, and are believed to be lenticular in shape. They may or may not be accompanied by alteration, and occur between the top of the faintly mottled zone and the middle of the transition zone. Zinc mineralization was noted in some of these beds. The nature and occurrence of these beds is not well understood.

Saccharoidal Member

The Saccharoidal member of the Shady formation is about 520 feet thick, according to measurements by Brown[1] in the James-Woodruff area. The Saccharoidal member is composed of light to dark gray fine to saccharoidal dolomite that is massive to thinly bedded. During the drilling of the James-Woodruff project only the lowermost 388 feet of this member was penetrated. Some of the well established markers and zones of this member were easily defined. About 70 feet of the rock that was originally included in the Transition zone of the Patterson is now classified as saccharoidal.

Light Gray Zone - About 70 feet above the top of the transition zone is a series of light gray massive saccharoidal dolomites that are about 123 feet thick. This zone is usually vuggy. Locally faint banding can be seen. There is some variation in thickness in this light gray zone, but the upper and lower limits are usually well defined.

Parting Shale - Just above the light gray zone is a thin bed of medium gray fine grained dolomite that contains abundant thin shale partings. Upon weathering, this zone appears to be more shale than dolomite, hence the designation "Parting Shale". This bed, about 14 feet thick, can be readily identified in outcrop and is probably one of the best markers of the lower part of the Saccharoidal member in the Speedwell area.

No attempt was made to identify markers above the parting shale zone, since only a few holes were collared above this zone.

Rome Formation

The Rome formation normally overlies the Shady conformably. The Rome is composed of vari-colored shales and gray carbonates, and this formation is about 2,000 feet thick.

The Rome encountered in Hole JW-17 in the area of the James anomaly was below the Speedwell thrust, and only a few feet of this formation was penetrated. Since the details of the stratigraphy of the Rome are incompletely known, and only a few feet of core were obtained, the stratigraphic position from which this core came is not known.

Structure

The James-Woodruff area is located on the south-dipping north limb of the Speedwell syncline. This syncline is bounded on the north, east, and west by the Speedwell thrust. The south edge of the syncline is covered by quartzite

talus, but the fault has been traced far enough to reliably infer its presence on the south. Brown[1] and Currier[2] agree that the Speedwell fault thrusts the Shady, and locally a thin sliver of quartzite, upon the Rome then the entire sequence was folded into a syncline. This interpretation does not agree with Stose and Stose[3], who regard the structure as a fenster instead of an overthrust infolded klippe. Since hole JW-17 encountered the fault and the underlying Rome as predicted by Brown and Currier, their interpretation of the structure is believed to be correct.

Other than the fault encountered in JW-17, the structure as defined by diamond drilling in the James-Woodruff area is simple. The beds dip rather uniformly to the south. Minor variations in dip from section to section are no more than is expected in the folded carbonates at the region.

A fault encountered in hole JW-27 caused some repitition of the beds in the lower part of the section. Since this fault was seen in only one hole, its relation to the bedding is not well known. The fault dips about 70 degrees on the core, and it is thought that the dip is to the southwest. Thus the fault encountered in JW-27 would be a cross fault similar to other cross faults known in the Speedwell syncline.

Locally, minor cracking and breaking were observed without detectable offset of the beds. In hole JW-19, the cracking and breaking were accompanied by mineralization.

Metamorphism

The term metamorphism is used to describe the coarse grained white dolomite that is the product of the recrystallization of the finer grained gray dolomite. This metamorphism results in a great change in the grain size as well as a marked lightening of the color.

In the vicinity of the Woodruff anomaly, the metamorphism occurs in relatively thin beds that range from about 10 feet to about 50. This alteration occurs just above and below the faintly mottled bed as well as in the zone between the faintly mottled bed and the transition zone. In the vicinity of the James anomaly the metamorphism occurs just above and below the faintly mottled, but in this vicinity the metamorphosed zones are slightly thicker than in the Woodruff anomaly. Between the faintly mottled zone and the top of the ellipsoidal zone at the James anomaly there is a relatively thick (up to 50 feet) zone of metamorphosed rock. A few thin beds of the coarse white dolomite were found just below the base of the Transition zone.

The metamorphosed dolomite is developed along or almost parallel to the bedding. This white dolomite can be correlated between holes on a given section, but correlation between sections is not assured.

The coarse grained recrystallized dolomite makes up about 40-50 per cent of the rock in the zones of alteration. This is moderate metamorphism according to the terminology

used at Austinville. There are many occurrences of less than 33 per cent white dolomite, but these are not noted on the sections.

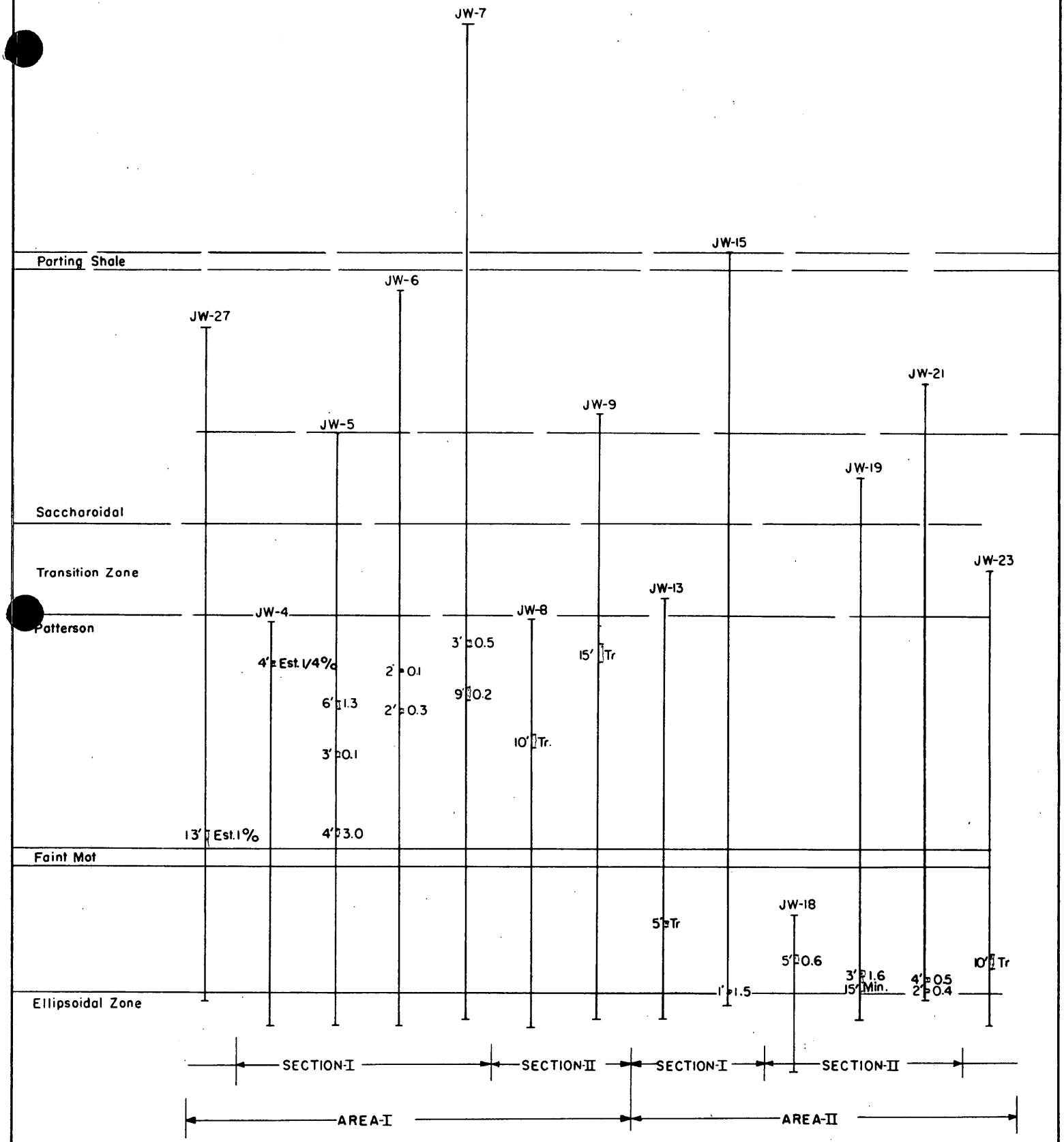
It was thought that a definite relationship would exist between the metamorphism and any mineralization in the area. In some cases, the metamorphism was accompanied by mineralization, but this was not always true.

Mineralization

It was assumed that any ore body in the James-Woodruff area associated with the geochemical anomalies would lie in the upper part of the Patterson member. This assumption was based on the location of the anomaly, the stratigraphic position of the known mineralized outcrops in the Speedwell syncline, and the position of the metamorphosed beds.

The mineralization penetrated by diamond drilling (see page 22) was in the upper part of the Patterson. None of the mineralized beds was thick enough, nor was the grade sufficient, to be classified as ore. The best of the mineralization was penetrated by hole JW-5. In this hole, three beds of mineralized ground were encountered - none of which assayed more than 3.0% Zn nor were they more than six feet thick.

The mineralization, as seen on the generalized drawing (page 22), is not confined to any bed or well defined zone. Generally, the mineralized ground in Area I (Woodruff anomaly) is between the faintly mottled marker and the base



NOTE: No horizontal scale intended Vertical scale 1" = 100'

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DRAWN R.C.G DATE 4-9-58 TRACED E.E.F. SCALE	MINERALIZATION ENCOUNTERED JAMES-WOODRUFF AREA	FILE NO. 7GB-4365

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of the Transition zone. In area II (James Anomaly) the mineralization is between the faintly mottled marker and the top of the Ellipsoidal zone.

The zinc mineralization is almost entirely sphalerite. The sphalerite is very finely disseminated ("corn meal" or pin head"). Occasionally fracture filling sphalerite is the predominate mineralization, as in hole JW-19. The sphalerite is accompanied by pyrite in various amounts.

Pyrite was commonly associated with the metamorphosed rock, especially in the thicker and more persistent units of alteration.

The anomalous soil zinc found in the James-Woodruff area can be traced to the mineralization encountered in the drill holes. Down pitch to the west of each anomaly a drill hole encountered zinc mineralization near the surface. At the Woodruff anomaly JW-4 penetrated four feet (true thickness) of mineralization, and in the James area JW-18 penetrated 5 feet of mineralized ground. In each case the mineralization was less than 50 feet (vertical measurement) below the surface.

Although nearly 50 per cent of the holes drilled encountered mineralized ground, none of the penetrations approach ore proportions. To be ore, the grade should be at least 5.0% Zn and the thickness not less than 10 feet, with sufficient tonnage available. Such grade and thickness was not encountered in the James-Woodruff project.

CONCLUSIONS AND RECOMMENDATIONS

The exploratory drilling in the vicinity of the geochemical anomalies on the Woodruff and the James properties near Speedwell, Virginia penetrated thin beds of low grade mineralization in the upper part of the Patterson member of the Shady formation. The drilling was done according to a preconceived plan with minor approved variations.

The mineralization encountered should account for the high soil zinc in the areas drilled, but is too low grade and too thin to be of commercial value. It is believed that if a commercial ore body existed in the area of the anomalies, the diamond drilling would have penetrated it.

Since the area has been tested according to plan, and the mineralization encountered is not of ore proportions, it is recommended that the project be terminated and classified as non-productive.

Ray G. Gilbertson

REFERENCES

1. Brown, W. Horatio; 1933, Regional Geology, NJZ Co. report.
2. Currier, L. W.; 1935, Zinc and Lead Region of Southwestern Virginia; Va. Geol. Sur. Bull. 43.
3. Stose, Anna J. and George W.; 1957, Geology and Mineral Resources of the Gossan Lead District and Adjacent Areas in Virginia; Va. Div. Min. Res., Bull. 72.

Diamond Drill Log - JW-1

Location: Based on Austinville Grid System

14490 S 87070 W

Inclination: Vertical Elevation: 2388

Object: To test for an assumed ore shoot down pitch from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	5	5	0	Overburden
5	161	156	114	Medium gray fine grained limestone, abundant ribbony partings ellipsoids, Patterson member of Shady.
		161		Bottom

Core Recovery: 73.1%

Diamond Drill Log - JW-2

Location: 214685 S 87058 W

Elevation: 2375 (?) Inclination: Vertical

Object: To test for an assumed ore shoot west of a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	25	25	0	Overburden
25	33	8	8	Medium gray fine saccharoidal dolomite, local diagenetic breccia, local oxidation, partings, Patterson Member of Shady.
33	36	3	3	Medium gray fine grained limestone, few partings.
36	49	13	11	Medium gray fine saccharoidal dolomite, moderate metamorphism, oxidized and leached, ribbony partings.
49	110	61	36	Medium gray fine to fine saccharoidal dolomite, local faint mottling, local abundant ribbony partings, local strong oxidation and leaching.
110	277	167	131	Medium gray fine grained limestone, abundant ribbony partings, ellipsoids.
	277			Bottom

Core Recovery: 75.0%

Diamond Drill Log - JW-3

Location: 14884 S 87045 W JW-1

Elevation: 2359 (?) Inclination: Vertical

Object: To test for an assumed ore shoot west of a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	21	21	0	Overburden
21	73	52	50	Medium gray fine saccharoidal dolomite, abundant partings, local oxidation. Patterson Member, Shady Formation.
73	121	48	36	Medium gray to buff fine Saccharoidal dolomite, abundant partings, strongly oxidized.
121	210	89	64	Medium gray fine to fine saccharoidal dolomite, local abundant partings, rare diagenetic (?) breccia.
210	332	122	116	Medium gray fine grained limestone, abundant ribbony partings, ellipsoids.
	332			Bottom

Core Recovery: 85.5%

Diamond Drill Log JW-4

Location: 15095 S 87040 W

Elevation: 2342 (?) Inclination: Vertical

Object: To test for an assumed ore shoot west of a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	18	18	0	Overburden
18	36	18	18	Medium gray fine saccharoidal dolomite, local partings, rare diagenetic (?) breccia. Patterson Member, Shady formation.
36	41	5	5	Weak disseminated zinc mineralization, estimated less than 1%.
41	46	5	5	Medium to dark gray fine to fine saccharoidal dolomite abundant partings, fragmental.
46	72	26	26	Medium gray fine to fine saccharoidal dolomite ribbony partings, local oxidation.
72	81	9	9	Medium gray to buff fine saccharoidal dolomite, ribbony partings, general strong oxidation.
81	118	37	28	Light to medium gray fine to fine saccharoidal dolomite, few partings, faint mottling.
118	169	51	51	Light to medium gray fine to fine saccharoidal dolomite, local partings, local oxidation, local vugs.
169	189	20	19	Medium gray fine saccharoidal dolomite, few partings, local moderate metamorphism few vugs.
189	194	5	5	Medium gray fine grained limestone, abundant ribbony partings, local sandgrains.
194	217	23	23	Medium gray fine saccharoidal dolomite, local moderate metamorphism, local diagenetic breccia, local oxidation, partings.

DDH - JW-4 (Cont.)

From	To	Dist	Recov	Description
217	297	80	76	Light medium gray fine saccharoidal dolomite, local partings, augen, local faint mottling, few vugs
297	322	25	25	Medium gray fine grained limestone, abundant ribbony partings, ellipsoids.
	322			Bottom

Core Recovery: 91.1%

Diamond Drill Log - JW-5

Location: 15280 S 87030 W-1

Elevation: 2331 (?) Inclination: Vertical

Object: To test for an assumed ore shoot pitching west from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	19	19	0	Overburden
19	25	6	4	Light gray massive saccharoidal dolomite, Saccharoidal Member of Shady Formation.
25	74	49	36	Medium gray finely saccharoidal dolomite, few partings, local diagenetic breccia.
74	98	24	21	Medium gray finely saccharoidal dolomite, abundant diagenetic breccia, few partings, Transition zone.
98	125	27	25	Medium gray finely saccharoidal dolomite, few partings, local diagenetic breccia, Patterson Member of Shady Formation.
125	128	3	3	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
128	145	17	15	Light medium gray finely saccharoidal dolomite, local strong oxidation, partings.
145	173	28	19	Medium gray finely saccharoidal dolomite, abundant thin wavy partings, scattered traces ZnS.
173	175	2	2	2.07% Zn
175	180	5	5	1.03% Zn
180	212	32	32	Medium gray finely saccharoidal dolomite, abundant thin wavy partings, local slight to moderate metamorphism local scattered traces of ZnS.
212	216	4	4	Estimated 1% Zn

DDL - JW-5 - Cont,

From	To	Dist	Recov	Description
216	299	83	83	Light medium to medium gray finely saccharoidal dolomite, partings, local oxidation, few vugs.
299	305	6	6	Medium gray finely saccharoidal dolomite, local diagenetic breccia, moderate to strong metamorphism.
305	310	5	5	3.01% Zn
310	318	8	8	Light medium gray finely saccharoidal dolomite, moderate to strong metamorphism, ribbony partings, local diagenetic breccia.
318	338	20	20	Light medium gray fine grained dolomite, few vugs, rare parting.
338	347	9	9	Medium gray finely saccharoidal dolomite, moderate metamorphism, local diagenetic breccia, rare parting.
347	414	67	47	Light medium gray fine to finely saccharoidal dolomite, abundant partings, local oxidation.
414	443	29	25	Medium gray fine grained limestone, abundant thick partings, local ellipsoids.
	443			Bottom

Core Recovery: 88.2%

Diamond Drill Log - JW-6

Location: 1548 feet S 870 feet W from JW-1

Elevation: 2324 (?) Inclination: Vertical

Object: To test for an assumed ore shoot pitching west from a geochemical anomaly

Results:

From	To	Dist	Recov	Description
0	15	15	0	Overburden
15	138	123	97	Light gray saccharoidal dolomite, local banding, few stylolites, vugs, Saccharoidal Member of Shady.
138	167	29	23	Medium gray finely saccharoidal dolomite, few vugs, local faint mottling.
167	190	23	23	Medium gray finely saccharoidal dolomite, diagenetic breccia, few vugs, local abundant fragmental partings, slight local moderate metamorphism, Transition Zone.
190	237	47	40	Light to medium local dark gray fine to finely saccharoidal dolomite, local fragmental partings, local strong oxidation, Patterson Member of Shady. Traces ZnS 233-237.
237	239	2	2	[illegible] 0.10 % Zn, [illegible] finely disseminated Zn in medium gray finely saccharoidal dolomite, abundant fragmental partings.
239	267	28	28	Medium gray finely saccharoidal dolomite, abundant ribbony partings local augen, rare trace ZnS.
267	269	2	2	[illegible] 0.25 % Zn. [illegible], finely disseminated, local fracture filling, in medium gray finely saccharoidal dolomite ribbony partings, local augen.
269	283	14	13	Medium gray finely saccharoidal dolomite, ribbony partings, few vugs, moderate metamorphism.
283	310	27	27	Medium gray finely saccharoidal dolomite, ribbony partings, augen.

DDL - JW-6 - Cont.

From	To	Dist	Recov	Description
310	317	7	7	Medium gray finely saccharoidal dolomite, ribbony partings, augen, moderate to strong metamorphism.
317	385	68	66	Medium gray finely saccharoidal dolomite, ribbony partings local augen, local limestone.
385	395	10	10	Medium gray fine grained limestone, local ellipsoids and sand grains.
395	404	9	9	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
404	416	12	12	Medium gray fine grained limestone, ellipsoids with sand grains.
416	420	4	4	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
420	443	23	23	Light mediun gray fine grained dolomite, rare parting, faint mottling.
443	492	49	49	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism 443-446.
492	522	30	30	Medium gray fine grained limestone, abundant ribbony partings, ellipsoids.
	522			Bottom

Core Recovery: 91.7%

Diamond Drill Log JW-7

Location: 15690 S 86998 W

Elevation: 2438 (?) Inclination: Vertical

Object: To test for an assumed ore shoot pitching west from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	8	8	0	Overburden
8	98	90	43	Light to medium gray finely saccharoidal dolomite, local banding, local oxidation, Saccharoidal Member of Shady.
98	118	20	20	Light to medium gray finely saccharoidal dolomite, abundant thin straight partings, local sand grains.
118	140	22	22	Light gray finely saccharoidal dolomite, faint mottling, local banding, rare partings.
140	195	55	55	Dark gray finely saccharoidal dolomite, local sand grains, local thick partings, local shattering.
195	206	11	11	Light gray to buff finely saccharoidal dolomite, local breccia, few thin partings, generally strong bleaching.
206	355	149	143	Light gray saccharoidal dolomite, local mud flakes, local vugs, rare stylolites, local banding.
355	379	24	24	Medium gray finely saccharoidal dolomite, local banding rare augen.
379	396	17	16	Medium gray finely saccharoidal dolomite, diagenetic breccia, local shattering, few vugs, Transition Zone.
396	414	18	18	Medium gray fine to finely saccharoidal dolomite, local shattering, local abundant fragmental partings, local oxidation. Patterson Member of Shady.

DDL JW-7

From	To	Dist	Recov	Description
414	417	3	3	3' 0.51 % Zn [illegible], disseminated in fine to finely saccharoidal dolomite, abundant fragmental partings.
417	431	14	14	Medium gray finely saccharoidal dolomite, local oxidation, local breccia, moderate metamorphism.
431	454	23	23	Light medium gray fine to finely saccharoidal dolomite, vugs, rare parting, local slight oxidation.
454	463	9	9	9' 0.15 %Zn [illegible] 1% disseminated finely divided Zn in medium gray finely saccharoidal dolomite, abundant fragmental partings.
463	536	73	61	Medium gray finely saccharoidal dolomite, abundant ribbony partings, local augen.
536	544	8	8	Medium gray finely saccharoidal dolomite, ribbony partings, vugs, moderate metamorphism.
544	624	80	77	Medium gray finely saccharoidal dolomite, abundant ribbony partings, few vugs, local slight oxidation.
624	632	8	7	Medium gray finely saccharoidal dolomite, ribbony partings local shattering, moderate metamorphism.
632	658	26	21	Light medium gray fine grained dolomite, rare parting, faintly mottled.
658	668	10	10	Medium gray finely saccharoidal dolomite, ribbony partings, local shattering.
668	713	45	44	Medium gray finely saccharoidal dolomite ribbony partings, local shattering.
713	730	17	17	Medium gray fine grained limestone, thick ribbony partings, ellipsoids.
	730			Bottom

Core Recovery: 89.5%

Diamond Drill Log - JW-8

Location: 15170' S 88260' W

Elevation: 2345 (?) Inclination: Vertical

Object: To test for an assumed ore shoot pitching west from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	20	20	0	Overburden
20	39	19	13	Medium gray finely saccharoidal dolomite, local diagenetic breccia, local shattering, Patterson Member of Shady Formation
39	48	9	8	Medium to dark gray fine to finely saccharoidal dolomite, shattered, pyrite mineralization.
48	63	15	15	Medium to dark gray fine to finely saccharoidal dolomite, local partings, few vugs, local diagenetic breccia, slight local moderate metamorphism.
63	74	11	11	Medium to dark gray fine grained dolomite, abundant fragmental partings.
74	100	26	26	Medium gray finely saccharoidal dolomite, ribbony partings, augen.
100	114	14	14	Medium to dark gray finely saccharoidal dolomite abundant fragments, rare trace ZnS.
114	154	40	33	Light medium gray fine to finely saccharoidal dolomite, ribbony partings, augen, local oxidation.
154	164	10	6	Medium gray finely saccharoidal dolomite, vugs, local oxidation, moderate metamorphism.
164	185	21	11	Light medium gray fine to finely saccharoidal dolomite, ribbony partings, bleached (?).
185	193	8	6	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.

DDL - JW-8 - Cont

From	To	Dist	Recov	Description
193	249	56	40	Light medium gray to buff fine to finely saccharoidal dolomite, Ribbony partings, local breccia (?) local strong oxidation.
249	262	13	12	Light medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
262	288	26	26	Light medium gray fine grained dolomite, rare parting faint mottling, shattered.
288	300	12	12	Medium gray finely saccharoidal dolomite, abundant partings, moderate metamorphism.
300	328	28	27	Medium gray fine to finely saccharoidal dolomite, ribbony partings, local oxidation.
328	336	8	8	Medium gray fine grained limestone, abundant partings, ellipsoids with sand grains.
336	343	7	6	Light medium gray finely saccharoidal dolomite, ribbony partings, vugs.
343	372	29	10	Medium gray fine grained dolomite, abundant thick ribbony partings, ellipsoids.
	372			Bottom

Core Recovery: 80.7 %

Diamond Drill Log - JW-9

Location: (Based on Austinville Grid System)

15,340 S 18,290 W

Inclination: Vertical Elevation: 2370 (?)

Object: To test for strike extension of JW-5 mineralization.

Results:

From	To	Dist	Recov	Description
0	26	26	0	Overburden
26	60	34	16	Light gray saccharoidal dolomite, Saccharoidal Member of Shady Formation.
60	98	38	32	Light medium gray fine grained dolomite local diagenetic breccia.
98	122	24	22	Light medium to medium gray finely saccharoidal dolomite, diagenetic breccia, vugs, Transition Zone.
122	146	24	23	Medium gray fine to finely saccharoidal dolomite, local oxidation, local partings.
146	164	18	17	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings, rare trace ZnS.
164	246	82	82	Light medium to medium gray fine grained dolomite, ribbony partings, local oxidation few augen, local shattering.
246	253	7	6	Medium to dark gray fine grained dolomite, abundant fragmental partings.
253	280	27	27	Medium gray finely saccharoidal dolomite, ribbony partings, augen.
280	300	20	20	Medium gray finely saccharoidal dolomite, local strong oxidation, ribbony partings, moderate metamorphism.
300	341	41	41	Medium gray local buff fine grained dolomite, ribbony partings, local strong oxidation.
341	361	20	20	Medium gray finely saccharoidal dolomite, ribbony partings, local brecciation, moderate metamorphism.

DDL - JW-9 (Cont.)

From	To	Dist	Recov	Description
361	386	25	25	Medium gray finely saccharoidal dolomite, ribbony partings, local oxidation.
386	410	24	24	Light medium gray fine grained dolomite, faintly mottled, vugs.
410	447	37	32	Medium gray fine grained dolomite, ribbony partings, local augen.
447	471	24	24	Medium gray fine grained limestone, ribbony partings, ellipsoids.
	471			Bottom

Core Recovery: 92.4%

Diamond Drill Log - JW-10

Location: (Based on Austinville Grid System)

15,570 S 88,260 W

Inclination: Vertical Elevation: 2435 (?)

Object: Test for western strike extension of JW-5 mineralization.

Results:

From	To	Dist.	Recov	Description
0	15	15	0	Overburden
15	66	51	38	Medium to dark gray finely saccharoidal dolomite, local banding, local brecciation, local partings; Saccharoidal member of Shady Formation.
66	84	18	16	Light to medium gray finely saccharoidal dolomite, few thin partings, local vugs.
84	142	58	58	Dark gray fine to finely saccharoidal dolomite, few thin partings, local shattering.
142	275	133	122	Light local medium gray saccharoidal dolomite, local banding.
275	294	19	17	Light medium gray finely saccharoidal dolomite, abundant bleached diagenetic breccia, Transition Zone.
294	353	59	42	Medium gray fine grained dolomite, few ribbony partings, vugs. Patterson Member of Shady Formation.
353	362	9	8	Medium to dark gray fine graimed dolomite, abundant fragmental partings.
362	405	43	39	Light medium to medium gray finely saccharoidal dolomite abundant ribbony partings.
405	420	15	9	Light medium gray finely saccharoidal dolomite, few vugs, ribbony partings, moderate metamorphism.
420	452	32	24	Medium gray fine to finely saccharoidal dolomite, ribbony partings, local vugs, local breccia.

DDL - JW-10 -(Cont)

From	To	Dist.	Recov	Description
452	467	15	14	Medium to dark gray fine to finely saccharoidal dolomite, local abundant fragmental partings, moderate metamorphism.
467	503	36	35	Medium gray finely saccharoidal dolomite, abundant ribbony partings, local oxidation.
503	558	55	42	Medium gray finely saccharoidal dolomite, ribbony partings, local abundant breccia, moderate metamorphism.
558	581	23	7	Light medium gray finely saccharoidal dolomite, bleached diagenetic breccia, faintly mottled.
581	594	13	13	Medium gray finely saccharoidal dolomite, ribbony partings, local diagenetic breccia, moderate metamorphism.
594	634	40	38	Medium gray finely saccharoidal dolomite, ribbony partings.
634	657	23	23	Medium gray fine grained limestone, ribbony partings, ellipsoids.
	657			Bottom

Core Recovery: 83.3%

Diamond Drill Log - JW-11

Location: (Based on Austinville Grid System)

16,650 S 102,525 W

Inclination: Vertical Elevation: 2440 (?)

Object: To test for an assumed ore shoot pitching east from a geochemical anomaly.

Results:

From	To	Dist.	Recov.	Description
0	1	1	0	Overburden
1	33	32	20	Light medium gray finely saccharoidal dolomite, ribbony partings, local augen, local shattering, Patterson Member of Shady Formation.
33	46	13	12	Medium gray fine grained dolomite, abundant fragmental partings.
46	79	33	23	Buff finely saccharoidal dolomite, ribbony partings, strongly oxidized.
79	92	13	12	Light gray to buff finely saccharoidal dolomite, ribbony partings, moderately oxidized.
92	114	22	20	Light gray finely saccharoidal dolomite, ribbony partings, local suggestion of ellipsoids.
114	200	86	80	Medium gray fine grained limestone, ellipsoids.
	200			Bottom

Core Recovery: 83.9%

Diamond Drill Log - JW-12

Location: (Based on Austinville Grid System)

16,945 S 102,480 W

Inclination: Vertical Elevation: 2405 (?)

Object: Test for an assumed ore shoot pitching east from a geochemical anomaly.

Results:

From	To	Dist.	Recov.	Description
0	27	27	0	Overburden
27	46	19	19	Medium to dark gray fine grained dolomite, abundant fragmental partings, Patterson Member of Shady Formation.
46	121	75	67	Light to medium gray fine to finely saccharoidal dolomite, local abundant diagenetic breccia (62-80), ribbony partings, local bleaching.
121	130	9	7	Light medium gray fine grained dolomite, generally shattered, local mylonite.
130	137	7	7	Medium gray finely saccharoidal dolomite, abundant ribbony partings.
137	185	48	46	Medium to dark gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism, pyrite mineralization.
185	196	11	11	Medium gray fine grained dolomite, ribbony partings, local shattering.
196	204	8	8	Medium to dark gray fine grained dolomite, abundant fragmental partings.
204	234	30	30	Medium gray fine grained dolomite, abundant ribbony partings.
234	270	36	34	Medium gray fine grained limestone, ribbony partings, ellipsoids.
	270			Bottom

Core Recovery: 94.2%

Diamond Drill Log - JW-13

Location: (Based on Austinville Grid System)

17,185 S 102,425 W

Inclination: Vertical Elevation: 2398 (?)

Object: To test for an assumed ore shoot pitching east from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	2	2	0	Overburden
2	20	18	18	Medium gray fine to finely saccharoidal dolomite, abundant diagenetic breccia, local shattering, Transition Zone.
20	180	160	130	Light medium to medium gray fine to finely saccharoidal dolomite, local partings, local oxidation, few vugs, local shattering, Patterson Member of Shady Formation.
180	203	23	23	Medium to dark gray fine grained dolomite, abundant fragmental partings.
203	259	56	50	Light medium to medium gray fine grained dolomite, local abundant bleached diagenetic breccia, local ribbony partings.
259	265	6	5	Medium gray fine grained dolomite, few ribbony partings, locally fractured. ZnS in fractures, estimated less than 0.1% Zn
265	308	43	43	Medium gray fine grained dolomite, abundant fragmental partings.
308	337	29	25	Medium gray fine grained dolomite, ribbony partings, local diagenetic breccia, moderate metamorphism.
337	350	13	8	Medium gray fine grained dolomite, ribbony partings, suggestion of ellipsoids.

DDL - JW-13 (Cont.)

From	To	Dist	Recov	Description
350	360	10	5	Fault zone, abundant brecciation and local shattering, local strong mylonite.
360	395	35	27	Medium gray fine grained dolomite, ribbony partings, local oxidation, local suggestion of ellipsoids.
395	417	22	22	Medium gray fine grained limestone, thick ribbony partings, ellipsoids.
	417			Bottom

Core Recovery: 85.8%

Diamond Drill Log - JW-14

Location: (Based on Austinville Grid System)

17,370 S 102,370 W

Inclination: Vertical Elevation: 2394 (?)

Object: To test for an assumed ore shoot pitching east from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	17	17	0	Overburden
17	22	5	2	Fault Zone
22	49	27	18	Medium gray finely saccharoidal dolomite, local weak shattering, Saccharoidal Member of Shady.
49	101	52	48	Light medium gray finely saccharoidal dolomite, abundant diagenetic breccia, local oxidation, Transition Zone.
101	197	96	94	Medium gray fine to finely saccharoidal dolomite, local diagenetic breccia, few partings, local augen, Patterson Member of Shady.
197	217	20	8	Light medium gray fine grained dolomite, very rare partings.
217	307	90	53	Light medium to medium gray finely saccharoidal dolomite, local diagenetic breccia, ribbony partings.
307	335	28	22	Medium gray fine grained dolomite, abundant fragmental partings.
335	423	88	83	Medium gray fine to finely saccharoidal dolomite, ribbony partings, augen, local oxidation.
423	465	42	42	Medium gray fine to finely saccharoidal dolomite, ribbony partings, local vugs, moderate metamorphism.
465	521	56	55	Medium gray finely saccharoidal dolomite ribbony partings, local vugs.
521	551	30	30	Medium gray fine grained limestone, abundant ribbony partings, ellipsoids.
	551			Bottom

Core Recovery: 85.2%

Diamond Drill Log JW-15

Location: (Based on Austinville grid system)

17,570 S 102,305 W

Inclination: Vertical Elevation: 2435

Object: To test for an assumed ore shoot pitching east from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	40	40	0	Overburden
40	182	142	75	Light gray saccharoidal dolomite, massive Saccharoidal Member of Shady Formation.
182	238	56	36	Light medium to medium gray finely saccharoidal dolomite, local abundant diagenetic breccia, few partings. Transition Zone.
238	315	77	70	Light medium to medium gray finely saccharoidal dolomite, few partings, local diagenetic breccia, local oxidation, Patterson Member of Shady.
315	318	3	3	Medium to dark gray fine grained dolomite, abundant fragmental partings.
318	400	82	72	Light medium to medium gray fine to finely saccharoidal dolomite, local diagenetic breccia, few ribbony partings.
400	407	7	7	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
407	506	99	63	Light medium to medium gray finely saccharoidal dolomite, ribbony partings, few vugs, local oxidation.
506	523	17	17	Medium to dark gray fine to finely saccharoidal dolomite, local breccia, abundant fragmental partings, pyrite mineralization.
523	590	67	65	Medium gray finely saccharoidal dolomite, abundant ribbony partings, local oxidation.

DDL - JW-15 - Cont.

590	636	46	36	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
636	705	69	51	Medium gray fine grained dolomite, ribbony partings, local shattering, local suggestion of ellipsoids.
705	706	1	1	Medium gray fine grained dolomite, generally shattered, zinc mineralization (1.46% Zn, Nil Pb, 2.36% Fe)
706	717	11	11	Medium gray fine grained limestone, thick ribbony partings, ellipsoids.
	712			Bottom

Core Recovery: 74.7%

Diamond Drill Log - JW-16

Location: (Based on Austinville Grid System)

17,760 S 102,250 E

Inclination: Vertical Elevation: 2465

Object: To test for an assumed ore body pitching east from a geochemical anomaly.

Results:

From	To	Dist.	Recov.	Description
0	46	46	0	Overburden
46	66	20	16	Light medium gray finely saccharoidal dolomite, few partings, few vugs, Saccharoidal Member of Shady.
66	87	21	15	Medium to dark gray fine grained dolomite, local weak diagenetic breccia, local banding.
87	119	32	31	Light to medium gray fine grained dolomite, local parting, local sand grains and mud flakes.
119	125	6	6	Medium to dark gray fine grained dolomite, shattered, local spherulites, rare bleb ZnS.
125	200	75	31	Medium gray fine to finely saccharoidal dolomite, local thin partings, locally bleached.
200	223	23	13	Light to medium gray, locally buff, fine grained dolomite, abundant contorted shale partings, locally bleached.
223	373	150	142	Light gray saccharoidal dolomite, generally massive.
373	390	17	12	Light medium gray finely saccharoidal to saccharoidal dolomite, local diagenetic breccia.
390	465	75	35	Medium gray fine to finely saccharoidal dolomite, local abundant diagenetic breccia, locally weakly oxidized, Transition Zone of Patterson Member.
465	504	39	15	Medium gray finely saccharoidal dolomite, local diagenetic breccia, few partings, locally oxidized, Patterson Member.

DDL - JW-16 - Cont.

From	To	Dist.	Recov.	Description
504	509	5	4	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
509	667	158	102	Medium gray finely saccharoidal dolomite, local diagenetic breccia, abundant ribbony partings, locally oxidized.
667	703	36	31	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
703	712	9	8	Light medium gray fine grained dolomite, abundant bleached diagenetic breccia, faintly mottled.
712	727	15	15	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
727	765	38	38	Medium gray finely saccharoidal dolomite, ribbony partings.
765	820	55	54	Medium gray finely saccharoidal dolomite, ribbony partings, locally oxidized, moderate metamorphism.
820	867	47	46	Medium gray finely saccharoidal dolomite, abundant ribbony partings, local suggestion ellipsoids.
867	906	39	36	Medium gray fine grained limestone, abundant thick ribbony partings, ellipsoidal zone.
	906			Bottom

Core Recovery: 75.7%

Diamond Drill Log - JW-17

Location: (Based on Austinville Grid System)

16,725 S 105,115 W

Inclination: Vertical Elevation: 2519

Object: To test for an assumed ore shoot pitching west from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	11	11	0	Overburden
11	115	104	82	Medium gray fine to finely saccharoidal dolomite, local abundant ribbony partings, Patterson Member of Shady.
115	133	18	16	Medium gray to buff fine to finely saccharoidal dolomite, ribbony partings, generally oxidized.
133	172	39	37	Medium gray, locally buff, fine to finely saccharoidal dolomite, ribbony partings, locally oxidized.
172	181	9	9	Medium gray fine grained dolomite, few thin irregular partings.
181	222	41	35	Light gray to pink saccharoidal dolomite, massive.
222	351	129	74	Medium gray to buff fine to finely saccharoidal dolomite, ribbony partings, local sand grains, locally oxidized.
351	382	31	11	Sugar Grove Fault zone.
382	397	15	6	Gray to red shale, Rome Formation
	397			Bottom

Core Recovery: 69.9%

Diamond Drill Log - JW-18

Location: (Based on Austinville Grid System)

17,350 S 104,900 W

Inclination: Vertical Elevation: 2440

Object: To test for an assumed ore shoot pitching west from a geochemical anomaly.

Results:

From	To	Dist	Recov	Description
0	18	18	0	Overburden
18	32	14	10	Medium gray finely saccharoidal dolomite, Ribbony partings, locally oxidized, moderate metamorphism, Patterson Member of Shady.
32	37	5	5	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism, 0.58% Zn, Nil Pb, 2.84% Fe.
37	65	28	8	Medium gray fine to finely saccharoidal dolomite, abundant ribbony partings, local strong oxidation, abundant openings.
65	134	69	45	Medium gray fine grained limestone, abundant ribbony partings, ellipsoids.
	134			Bottom

Core Recovery: 58.6%

Diamond Drill Log - JW-19

Location: (Based on Austinville Grid System)

17,900 S 104,710 W

Inclination: Vertical Elevation: 2418

Object: To test for an assumed ore body pitching west from a geochemical anomaly.

Results:

From	To	Dist.	Recov.	Description
0	9	9	0	Overburden
9	40	31	21	Light medium gray finely saccharoidal dolomite, rare parting, few vugs, Saccharoidal Member of Shady Formation.
40	150	110	43	Medium gray finely saccharoidal dolomite, local abundant diagenetic breccia, Transition zone of Patterson Member.
150	202	52	48	Light medium gray finely saccharoidal dolomite, abundant ribbony partings, local augen, Patterson Member.
202	248	46	24	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
248	266	18	12	Light medium gray fine grained dolomite, faintly mottled, bleached diagenetic breccia.
266	282	16	16	Medium gray finely saccharoidal dolomite, abundant ribbony partings, local slight brecciation.
282	283	1	1	Fault zone.
283	325	42	35	Medium gray finely saccharoidal dolomite abundant ribbony partings, local augen.
325	364	39	31	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings, slight to moderate metamorphism.
364	373	9	0	Cave

DDL - JW-19 - Cont.

From	To	Dist.	Recov	Description
373	376	3	3	Medium to dark gray finely saccharoidal dolomite, moderate metamorphism, generally brecciated, 1.56% Zn.
376	393	17	16	Medium gray finely saccharoidal dolomite local abundant fragmental partings, Traces ZnS.
393	396	3	3	Medium gray finely saccharoidal dolomite, ribbony partings, local brecciation.
396	422	26	26	Medium gray fine grained limestone, thick ribbony partings, ellipsoidal zone.
	422	Bottom		

Core Recovery: 67.3%

Diamond Drill Log - JW-20

Location: (Based on Austinville Grid System)

17,705 S 104,775 W

Inclination: Vertical Elevation: 2415

Object: To test for up dip extent of JW-19 mineralization.

Results:

From	To	Dist.	Recov.	Description
0	4	4	0	Overburden
4	88	84	75	Medium gray finely saccharoidal dolomite, ribbony partings, Patterson Member of Shady Formation.
88	120	32	30	Medium gray finely saccharoidal dolomite, locally shattered, moderate metamorphism.
120	138	18	15	Light medium gray fine grained dolomite, faintly mottled, bleached diagenetic breccia.
138	147	9	9	Medium to dark gray finely saccharoidal dolomite, ribbony partings, locally shattered, moderate metamorphism.
147	217	70	68	Medium gray finely saccharoidal dolomite, ribbony partings, locally shattered, local sand grains.
217	238	21	10	Medium gray finely saccharoidal dolomite, ribbony partings, local slight oxidation, moderate metamorphism.
238	243	5	5	Medium gray to buff finely saccharoidal dolomite, ribbony partings, general slight oxidation, local vugs.
243	260	17	15	Medium to dark gray finely saccharoidal dolomite, ribbony partings few vugs, moderate metamorphism.
260	285	25	25	Medium gray finely saccharoidal dolomite, ribbony partings, local vugs.
285	322	37	35	Medium gray fine grained limestone, thick ribbony parting, ellipsoidal zone.
	322	Bottom		

Core Recovery: 90.3%

Diamond Drill Log - JW-21

Location: (Based on Austinville Grid System)

18,090 S 104,645 W

Inclination: Vertical Elevation: 2436

Object: To test for down dip extent of JW-19 mineralization.

Results:

From	To	Dist.	Recov	Description
0	19	19	0	Overburden
19	44	25	10	Light gray massive saccharoidal dolomite, Saccharoidal Member of Shady Formation.
44	171	127	89	Medium, local dark gray, finely saccharoidal dolomite, rare thin parting, local slight bleaching, locally oxidized.
171	241	70	68	Medium to dark gray finely saccharoidal dolomite, abundant diagenetic breccia, Transition Zone of Patterson Member.
241	336	95	58	Medium gray finely saccharoidal dolomite, local abundant ribbony partings, locally oxidized.
336	376	40	5	Medium gray fine grained dolomite, abundant fragmental partings, generally oxidized.
376	386	10	10	Medium gray finely saccharoidal dolomite, abundant fragmental partings, moderate metamorphism.
386	398	12	12	Light medium gray fine grained dolomite, faintly mottled, bleached diagenetic breccia.
398	410	12	12	Medium gray finely saccharoidal dolomite, abundant ribbony partings, locally oxidized, moderate metamorphism.

From	To	Dist.	Recov.	Description
410	464	54	51	Medium gray finely saccharoidal dolomite, abundant ribbony partings.
464	468	4	4	Medium to dark gray fine grained dolomite, abundant fragmental partings.
468	497	29	29	Medium to dark gray finely saccharoidal dolomite, thick ribbony partings, well broken ground, moderate metamorphism.
497	522	25	25	Medium to dark gray finely saccharoidal dolomite, thick ribbony partings, well broken ground, heavy pyrite mineralization. 506-510, 0.46% Zn; 520-522, 0.35% Zn.
522	545	23	23	Light medium gray fine grained dolomite, few thin ribbony partings, rare thick parting, local vugs.
545	550	5	5	Medium gray fine grained limestone, abundant thick ribbony partings, ellipsoidal zone.
	550			Bottom

Core Recovery: 75.5%

Diamond Drill Log - JW-22

Location: (Based on Austinville Grid System)

18190 S 104,575 W

Inclination: Vertical Elevation: 2460 (Approx)

Object: Test for down dip extent of JW-21 mineralization.

Results:

From	To	Dist	Recov	Description
0	23	23	0	Overburden
23	175	152	85	Light gray saccharoidal dolomite, Massive, few vugs, Saccharoidal Member.
175	197	22	7	Light medium gray fine to finely saccharoidal dolomite, few thin partings.
197	268	71	32	Medium to dark gray finely saccharoidal dolomite, rare thin parting.
268	359	91	64	Medium gray finely saccharoidal dolomite, local abundant diagenetic breccia, locally oxidized, Transition Zone.
359	400	41	22	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings, Patterson Member.
400	417	17	10	Medium gray finely saccharoidal dolomite, moderate metamorphism, abundant ribbony partings.
417	473	56	9	Light medium gray finely saccharoidal dolomite, abundant ribbony partings.
473	500	27	27	Medium to dark gray finely saccharoidal dolomite, moderate metamorphism, abundant fragmental partings.
500	509	9	6	Light medium gray fine to finely saccharoidal dolomite, faintly mottled, bleached diagenetic breccia.
509	524	15	7	Medium gray finely saccharoidal dolomite, moderate metamorphism, abundant ribbony partings.

DDL - JW-22 (Cont.)

From	To	Dist	Recov	Description
524	572	48	32	Medium gray finely saccharoidal dolomite, ribbony partings, local vugs.
572	633	61	21	Medium gray finely saccharoidal dolomite, moderate metamorphism, ribbony partings.
633	660	27	14	Light medium gray fine to finely saccharoidal dolomite, ribbony partings, local vugs, suggestion of ellipsoids.
660	681	21	21	Medium gray fine grained dolomite, thick ribbony partings, ellipsoids.
	681			Bottom

Core Recovery: 54.3%

Diamond Drill Log - JW-23

Location: (Based on Austinville Grid System)

18,000 S 105,310 W

Inclination: Vertical Elevation: 2461

Object: To test for JW-21 mineralization on strike to the west.

Results:

From	To	Dist	Recov	Description
0	15	15	0	Overburden
15	76	61	53	Medium gray finely saccharoidal dolomite, few partings, local abundant diagenetic breccia, Transition Zone.
76	150	74	23	Light medium gray finely saccharoidal dolomite, rare partings local shattering, Patterson Member.
150	172	22	14	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
172	202	30	20	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism, local suggestion of ellipsoids.
202	215	13	4	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
215	232	17	10	Light medium gray fine to finely saccharoidal dolomite, faintly mottled, bleached diagenetic breccia.
232	267	35	21	Medium gray finely saccharoidal dolomite, abundant ribbony partings.
267	273	6	5	Medium gray finely saccharoidal dolomite, abundant fragmental partings, slightly bleached.
273	287	14	13	Medium gray finely saccharoidal dolomite, abundant ribbony partings, local slight bleaching.
287	315	28	27	Medium gray finely saccharoidal dolomite, abundant fragmental partings, moderate metamorphism.

DDL - JW-23 (Cont.)

From	To	Dist	Recov	Description
315	320	5	5	Medium gray finely saccharoidal dolomite, abundant ribbony partings.
320	331	11	11	Dark gray finely saccharoidal dolomite, broken, shattered ground, pyrite mineralization, Traces ZnS 330-331.
331	358	27	27	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism 331-342, few vugs.
358	364	6	6	Steep fault zone, strong crushing, local mylonite.
364	400	36	26	Medium gray fine grained limestone, thick ribbiny partings, ellipsoids.
400	410	10	1	Medium gray finely saccharoidal dolomite, diagenetic breccia, single bleb ZnS.
	410			Bottom

Core Recovery: 67.3%

Diamond Drill Log - JW-24

Location: (Based on Austinville Grid System)

18,190 S 105,245 W

Inclination: Vertical Elevation: 2467

Objective: To test for strike extension of JW-19 to the west.

Results:

From	To	Dist.	Recov.	Description
0	50	50	0	Overburden
50	96	46	24	Light medium to dark gray finely saccharoidal dolomite, local diagenetic breccia, Saccharoidal Member.
96	202	106	48	Light medium to medium gray finely saccharoidal dolomite, local abundant diagenetic breccia, Transition Zone.
202	303	101	34	Medium gray fine to finely saccharoidal dolomite, local diagenetic breccia, ribbony partings, local slight bleaching and oxidation, Patterson Member.
303	326	23	21	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings.
326	336	10	4	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
336	348	12	5	Light medium gray fine grained dolomite, bleached diagenetic breccia, faintly mottled.
348	356	8	3	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
356	406	50	36	Medium gray finely saccharoidal dolomite, abundant ribbony partings.
406	448	42	40	Medium to dark gray finely saccharoidal dolomite, abundant ribbony partings, locally broken ground, moderate metamorphism. Trace ZnS, bleb PbS 447-448.

DDL - JW-24 (Cont.)

From	To	Dist.	Recov.	Description
448	485	37	28	Medium gray finely saccharoidal dolomite, ribbony partings.
485	530	45	40	Medium gray fine grained limestone, thick ribbony partings, ellipsoids.
	530			Bottom

Core Recovery: 59.0%

Diamond Drill Log - JW-25

Location: (Based on Austinville Grid System)

18375 S 105,180 W

Inclination: Vertical Elevation: 2490

Object: To test for western strike extension of JW-19 mineralization.

Results:

From	To	Dist	Recov	Description
0	25	25	0	Overburden
25	143	118	91	Light gray saccharoidal dolomite, few vugs, massive, Saccharoidal Member of Shady.
143	163	20	18	Medium gray saccharoidal dolomite, vuggy, slight metamorphism.
163	226	63	37	Medium gray finely saccharoidal to saccharoidal dolomite, local banding, local "salt and pepper".
226	350	124	111	Medium gray finely saccharoidal dolomite, local abundant diagenetic breccia, local ribbony partings, Transition Zone.
350	460	110	77	Light medium to dark gray dolomite, fine to finely saccharoidal, local abundant ribbony partings, local abundant fragmental partings, Patterson Member.
460	469	9	8	Medium gray finely saccharoidal dolomite, few fragmental partings, moderate metamorphism.
469	476	7	6	Light medium gray fine grained dolomite, bleached diagenetic breccia, faintly mottled.
476	486	10	10	Medium gray finely saccharoidal dolomite, abundant ribbony partings, locally oxidized, moderate metamorphism.
486	535	49	49	Medium gray finely saccharoidal dolomite, abundant ribbony partings, augen.

From	To	Dist	Recov	Description
535	561	26	26	Medium gray finely saccharoidal dolomite, abundant ribbony partings, moderate metamorphism.
561	575	14	14	Medium to dark gray fine to finely saccharoidal dolomite, well shattered. Py mineralization.
575	588	13	13	Medium gray finely saccharoidal dolomite, ribbony partings, few vugs, locally well broken ground, moderate metamorphism. Trace ZnS 580-581.
588	610	22	21	Medium gray finely saccharoidal dolomite, locally limy, ribbony partings, suggestion of ellipsoids.
610	611	1	1	Fault zone, breccia, local mylonite.
611	625	14	12	Medium gray fine grained limestone, thick ribbony partings, ellipsoids.
	625	Bottom		

Core Recovery: 82.3%

Diamond Drill Log - JW-26

Location: (Based on Austinville Grid System)

15,470 S 85,760 W

Inclination: Vertical Elevation: 2373

Object: Test for strike extension of JW-5 mineralization to the east.

Results:

From	To	Dist	Recov	Description
0	13	13	0	Overburden
13	21	8	8	Medium gray fine to finely saccharoidal dolomite, few thin partings, Saccharoidal member of Shady.
21	130	109	75	Light gray saccharoidal dolomite, massive few vugs.
130	195	65	45	Light medium gray finely saccharoidal dolomite, few partings, local banding.
195	240	45	11	Medium gray finely saccharoidal dolomite, abundant diagenetic breccia, locally oxidized, rare vug, Transition Zone.
240	260	20	5	Medium gray finely saccharoidal dolomite, few ribbony partings, vuggy, Patterson Member of Shady.
260	275	15	5	Medium gray finely saccharoidal dolomite, abundant fragmental partings.
275	297	22	6	Medium gray fine to finely saccharoidal dolomite, ribbony partings local slight oxidation.
297	305	8	8	Light medium gray finely saccharoidal dolomite, abundant fragmental partings, moderately oxidized, moderate metamorphism.
305	350	45	25	Light medium gray finely saccharoidal dolomite, abundant ribbony partings, local oxidation.

DDL - JW-26 (Cont.)

From	To	Dist	Recov	Description
350	365	15	14	Light medium gray finely saccharoidal dolomite, abundant fragmental partings, local ribbony partings.
365	388	7	3	Light medium gray to buff finely saccharoidal dolomite, abundant fragmental partings, generally strongly oxidized.
388	401	13	13	Medium gray finely saccharoidal dolomite, abundant fragmental partings, locally strongly oxidized, moderate metamorphism.
401	436	35	15	Light medium gray finely saccharoidal dolomite, ribbony partings, generally oxidized.
436	479	43	33	Medium to dark gray finely saccharoidal dolomite, abundant fragmental partings, moderate metamorphism.
479	492	13	12	Light medium gray fine grained dolomite, faintly mottled, bleached diagenetic breccia.
492	506	14	9	Light medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
506	525	19	19	Medium gray finely saccharoidal dolomite, ribbony partings.
525	540	15	13	Medium gray finely saccharoidal dolomite, abundant ribbony partings, moderate metamorphism.
540	573	33	28	Medium gray finely saccharoidal dolomite, ribbony partings, local suggestion ellipsoids.
573	593	20	20	Medium gray fine grained limestone, thick ribbony partings, ellipsoids.
	593			Bottom

Core Recovery: 64.3%

Diamond Drill Log - JW-27

Location: (Based on Austinville Grid System)

15440 S 84590 W

Inclination: Vertical Elevation: 2351

Object: Test for strike extension of JW-5 mineralization to the east.

Results:

From	To	Dist	Recov	Description
0	13	13	0	Overbruden
13	95	82	68	Light gray saccharoidal massive dolomite, few vugs, saccharoidal member of Shady.
95	161	66	51	Light medium gray finely saccharoidal dolomite, local banding, rare thin partings.
161	230	69	57	Medium gray finely saccharoidal dolomite, abundant diagenetic breccia, local moderate metamorphism, Transition zone.
230	270	40	24	Light medium gray finely saccharoidal dolomite, abundant ribbony partings, local slight oxidation. Patterson Member.
270	280	10	8	Light medium gray finely saccharoidal dolomite, abundant ribbony partings, slight oxidation, moderate metamorphism.
280	317	37	34	Light medium gray finely saccharoidal dolomite, abundant ribbony partings, slight oxidation.
317	331	14	14	Medium gray finely saccharoidal dolomite, abundant fragmental partings, moderate metamorphism.
331	403	72	41	Light medium to medium gray finely saccharoidal dolomite, abundant ribbony partings, local bleached diagenetic breccia, local oxidation.
403	410	7	6	Fault zone, abundant breccia, local mylonite.
410	428	18	18	Medium gray finely saccharoidal dolomite, abundant ribbony partings, locally shattered.

JW-27 (Cont.)

From	To	Dist	Recov	Description
428	466	38	30	Light medium to medium gray finely saccharoidal dolomite, abundant ribbony partings, local sand grains.
466	470	4	4	Medium gray finely saccharoidal dolomite, few partings, moderate metamorphism.
470	489	19	18	Medium gray finely saccharoidal dolomite, abundant ribbony partings, local shattering.
489	502	13	7	Dark gray finely saccharoidal dolomite, few partings, local brecciation, rare trace ZnS.
502	516	14	5	Light medium gray finely saccharoidal dolomite, bleached diagenetic breccia, faintly mottled.
516	529	13	10	Medium gray finely saccharoidal dolomite, ribbony partings, local strong shattering.
529	543	14	7	Medium gray finely saccharoidal dolomite, ribbony partings, moderate metamorphism.
543	558	15	1	Fault Zone? strongly oxidized.
558	587	29	16	Alternating beds light medium gray dolomite and limestone, generally slightly oxidized.
587	591	4	4	Strongly oxidized ribbony limestone.
591	606	15	9	Medium gray finely saccharoidal dolomite, ribbony partings, local moderate metamorphism.
606	611	5	4	Light medium gray fine grained limestone, thin partings.
611	622	11	5	Light medium gray finely saccharoidal dolomite, abundant very small ellipsoids.
622	627	5	5	Medium gray fine grained limestone, thick ribbony partings, ellipsoids.
	627			Bottom

Core Recovery: 74.3%

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

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 7 1958

DATE	INITIALS	CODE
5/7	C	220
5/7	Klz	500

May 5, 1958

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: Termination Agreement - DMEA-4173, Idm-E970-zinc
The New Jersey Zinc Company
James Woodruff Area, Wythe & Smyth Counties, Va.

Transmitted is the original and Audit copy of the subject signed termination agreement.

The usual distribution of the other copies has been made.

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

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

z

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/21	Kugescheid	500
	Hansel	500
4-22	Chambers	800
4/23	[illegible]	130
"	Johnson	110
"	Rautendorf	100 HB
4/24	[illegible]	220
		500

500

APR 24 1958

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

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe & Smyth Counties, Virginia
Contract No. Idm-E970

Dear Mr. Laurence:

In accordance with your memorandum, dated March 19, 1958, and the request of the Operator, dated March 11, 1958, we are enclosing the original and four copies of a proposed Termination Agreement (one page) to the cited contract, signed by the Administrator for the Government. We are also enclosing two extra copies for the use of the Field Team.

If the agreement meets with your approval, kindly present it to the Operator for approval and signature and, when completed, distribute the copies in the usual manner. In the event that the agreement is not satisfactory and cannot be amended within your delegated authority, return all copies with your recommendations concerning any modifications.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (HB)

Enclosures

WPKugescheid/er 4/21/58
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

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

Thor H. Kiilsgaard (HB)
Member, Geological Survey

Government's copy

App'd. Sol. Off.

TERMINATION AGREEMENT

It is agreed this _____ day of _____, 1958, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and The New Jersey Zinc Company, hereinafter called the "Operator," parties to that certain Exploration Project Contract No. Idm-E970, Docket No. DMEA-4173, dated July 23, 1956, as amended, hereinafter called the "Contract," that:

1. Effective March 10, 1958, 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 allowable 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 reports (including preservation of the Operator's records), accounts, audits, 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 in this termination agreement.

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

THE UNITED STATES OF AMERICA

By_____
Administrator, Defense Minerals
Exploration Administration

THE NEW JERSEY ZINC COMPANY

By_____

Title_____

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/14	Klugescheid	500

500

April 14, 1958

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Director, Division of Base Metals

Subject: Rewrite of the Proposed Termination Agreement for Docket No. DMEA-4173, The New Jersey Zinc Company, James-Woodruff Area, Wythe and Smythe Counties, Virginia, Contract No. Idm-E970, Zinc.

We are returning the Termination Agreement recently prepared for this project. In clause 4, the Administrator's Office wishes to have the rights to certify preserved in all cases unless it is especially specified that it should be omitted. Whether certification is proposed or not at the time of the termination is of little importance, as, subsequent to the termination agreement, some condition may arise which makes certification advisable. The clause mentioned should be the standard as follows:

4. All of the rights of the Government provided for in the Contract with respect to a certification of discovery or development, percentage royalty and liens for its payment, records, and audits, and all rights to recover any overpayment, are preserved.

W. R. Griswold

WPKlugescheid/er
Docket
Chron.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/8	Klugescheid	570

500

April 8, 1958

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Director, Division of Base Metals

Subject: Preparation of Termination Agreement for Docket No. DMEA-4173, The New Jersey Zinc Company, James-Woodruff Area, Wythe and Smythe Counties, Virginia, Contract No. Idm-E970, Zinc.

Will you kindly prepare a Termination Agreement for the cited project. The effective date will be March 10, 1958. No discovery or development certification will be issued.

W. R. Griswold

WPKlugescheid/er
Copy to: Docket
Chron.

8623

Memorandum for the Files
From: W. P. Klugescheid, Division of Base Metals.
Subject: Docket No. DMEA-4173, The New Jersey Zinc Company, James-Woodruff Area, Smythe and Wythe Count, Virginia, Contract No. Idm-E970, Zinc.

SUMMARY OF DRILLING--DMEA-4173.

Hole.	Total Depth.	Remarks.
JW-1	161'	Barren Hole
JW-2	277'	Barren Hole
JW-3	332'	Barren Hole
JW-4	322'	36'-41' Estimated 1% Zn.
JW-5	443'	145'-173' Traces Zn. 173'-180' 3% Zn Est. 212'-216' 1% Zn Estimated. 305'-310' 2% Est.
JW-6	522'	239'-267' Tr. ZnS. 267'-269' Est. 1% Zn. 233'-237' Tr. ZnS. 237'-239' Est. 1% Zn.
JW-7	730'	414'-417' Est. 1% Zn. 454'-463' Less than 1% Zn
JW-8	379'	100'-114' Traces ZnS.
JW-9	471'	160' & 250' Traces Zn.
JW-10	657'	Barren Hole
JW-11	200'	Barren Hole
JW-12	270'	Barren Hole
JW-13	417'	256'-265' Traces of Sphalerite.
JW-14	551'	Scattered traces of Sphalerite.
JW-15	717'	705'-706' Estimated 2-3% Zn.
JW-16	906'	Barren Hole
JW-17	397'	Barren Hole
JW-18	134'	Barren Hole
JW-19	422'	373'-376'--1.56% Zn. 376'-393' Tr. ZnS.
JW-20	322'	Barren Hole
JW-21	550'	506'-510'--0.46% Zn. 520'-522'--0.35% Zn.
JW-22	681'	No Mineralization
JW-23	410'	Traces of Zn only.
JW-24	540'	No Mineralization

Hole.	Total Depth.	Remarks.
JW-25	625'	No Mineralization
JW-26	593'	No Mineralization
JW-27	627'	489'-502' Rare Traces of Zn.

The Field Team states that certification will not be recommended. None of the holes carry enough values to make commercial ore.

W. P. Klugescheid

W. P. Klugescheid

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

March 19, 1958

DMEA
RECEIVED MAR 21 1958
DATE | INITIALS | CODE
3/21 | C | 220
3/24 | Day | 130
| | 500

Memorandum

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

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

Subject: Docket No. DMEA-4173, Contract No. Idm-E970 (Zinc)
The New Jersey Zinc Company, New York, New York
James-Woodruff area, Wythe and Smyth Counties, Virginia

Enclosed are the original and two copies of a letter from the Operator requesting termination of the subject contract.

Drilling to date has shown no significant mineralization and our field examiners recommend termination, as the main target has been satisfactorily explored.

Therefore, we request termination by mutual agreement, effective March 10, 1958. Certification will not be recommended.

Robert A. Laurence
Robert A. Laurence
Executive Officer

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

Enclosures 3

BERTHA MINERAL DIVISION

THE NEW JERSEY ZINC COMPANY

AUSTINVILLE, VA.

HORSE HEAD PRODUCTS ®

March 11, 1958

OFFICIAL FILE COPY
DMEA
RECEIVED MAR 21 1958
DATE | INITIAL | CODE

Regional Executive Officer
Defense Minerals Exploration Administration
Room 13, Post Office Building
Knoxville 2, Tennessee

Subject: James-Woodruff Project
DMEA #4173, Contract 970

Dear Sir:

We have completed the last of the proposed holes in the James-Woodruff area; the last hole encountering no more than a trace of mineralization.

We would like your concurrence to a recess of this project pending consideration of termination.

Very truly yours,

W. L. Albers,
General Superintendent

P.C.G. RMK
RCGilbert/mjf
In quintuplicate

RECEIVED
MAR 17 1958
U. S. Geological Survey
Chemical Laboratory
Knoxville, Tenn.

Mr. Selfridge -

Add P.S. In any event total drilling footage of 15,000' is a maximum unless contract is amended by the Administration.

Letter should be routed through Mr. Chambers.

FEJohnson

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
2/7	Klugescheid	500
	Freund	500
2/10	[illegible]	130
"	Johnson	110
"	Butterworth	100
		~~HB~~
2/11	[illegible]	220
		500
2-	Chambers	800

500

FEB 10 1958

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

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe & Smythe Counties, Virginia
Contract No. Idm-E970

Dear Mr. Laurence:

We refer to your memorandum, dated January 28, 1958, concerning the above-cited project.

In Exhibit "A" of the contract, the total footage of drilling is limited to 15,000 except under special conditions. The number of holes to be drilled were given as "approximately 24", so this number of holes may be moderately exceeded if advisable.

Under "Estimated Cost of the Project", the estimated total cost of the drilling and the estimated cost of each unit of work for performance under an independent contract are maximums. This is according to Article 6(a) of the contract-Category (1). The number of feet allowable for the various depths may vary as necessary.

The Executive Officer is authorized to make the requested change by Article 6(a) of the contract, as mentioned above. 1/

P.S. 1/ The changes are within your delegated authority but the 15,000 feet cannot be exceeded except by an amendment executed by the Administrator.

Sincerely yours,

WPKlugescheid/er 2/7/58
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

George C. Selfridge (GCS)
Chairman, Operating Committee

APPROVED:

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

Thor H. Kiilsgaard (THK)
Member, Geological Survey

8623

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

January 28, 1958

COPY
DMEA
RECEIVED JAN 30 1958
DATE | INITIALS | CODE
1/30 | C | 220
| | 1304
| | 500

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: DMEA-4173, Idm-E970. The New Jersey Zinc Co. James-Woodruff Area, Wythe & Smyth Counties, Va.

The Field Examiners are of the opinion that two more diamond drill holes will be necessary to complete exploration work under the subject contract.

Todate drilling completed in each category is as follows:

Catergory	No. of holes	Contract footage	Footage used	Footage unused
0 - 250	25	6000.0	5995.0	5.0
250 - 500	25	4650.0	3712.0	938.0
500 - 750	25	2850.0	1323.0	1527.0
750 - 1000	25	1200.0	156.0	1044.0
1000 - 1200	25	300.0	0.0	300.0

The Field Team agrees with the Field Examiners that the 2 additional holes, making a total of 27, should be drilled. To do this it will be necessary to add 500 feet of drilling to the 0 - 250 foot category with an equal reduction in one of the other categories.

Please advise if the Executive Officer is authorized to make this change, possibly under the last sentence, second paragraph of Exhibit "A" of the contract. If not, please prepare an amendment to allow an additional 500 feet of drilling in the 0 - 250 category. It is understood that there would be no increase in the total cost of the project.

Robert A. Lawrence
EXECUTIVE OFFICER
DMEA, REGION V

V. J. Lynch
V. J. LYNCH
MEMBER, BUREAU OF MINES

BERTHA MINERAL DIVISION

THE NEW JERSEY ZINC COMPANY

AUSTINVILLE, VA.

HORSE HEAD PRODUCTS ®

Austinville, Va.
October 4, 1957

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DMEA
RECEIVED OCT 9 1957

DATE	INITIALS	CODE
10/7	B	220
~~10/9~~	~~Klug~~	~~600~~

Mr. Robert A. Laurence
Executive Officer
Defense Minerals Exploration Administration
Room 13, Post Office Building
Knoxville 2, Tennessee

Re: Docket No. DMEA-4173 (Zinc)
James-Woodruff Area
Wythe & Smyth Counties, Va.
Contract No. IDM-E970

Dear Mr. Laurence:

We are in receipt of yours of October 1 containing a proposed amendment to our contract.

We appreciate your intent in offering us this amendment, but ours is a single core size contract with Sprague and Henwood, and we have no rate for EX size core. Also, we do not believe it will be necessary to drill many more holes to complete this project.

Therefore, we are inclined to take a chance on not needing EX and are returning the amendment to you herewith.

If in case we have a hole in which the use of EX is absolutely necessary, we may get in touch with you and reopen this matter. In that case, we assume the AX rate would apply.

We appreciate your thoughtfulness in offering us this amendment but trust it will not be needed.

Cordially yours,

W. L. Albers
Superintendent

WHoratioBrown:rjl
In Quintuplicate

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OCT 7 - 1957
U. S. Geological Survey
Geologic Division
Knoxville, Tenn.

DMEA Form 7
(12-56)

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Date	Surname	Code
9/25	Klugescheid	500
9/		500
9/25	Talbut	800
9/25	ECL	130
"	Johnson	110
"	Stebudorf	100
9/26	B	220
		500

500

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

SEP 26 1957

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe & Smyth Counties, Virginia
Contract No. Idm-E970

Dear Mr. Laurence:

As recommended in your August 13 letter, we are enclosing the original and four copies of proposed Amendment No. 4 (two pages) to the cited contract, signed by the Administrator, for the Government. We are also enclosing two extra copies for the use of the Field Team.

If the amendment meets with your approval, kindly present it to the Operator for approval and signature and, when completed, distribute the copies in the usual manner. In the event that the amendment is not satisfactory and cannot be amended within your delegated authority, return all copies with your recommendations concerning any modifications.

Sincerely yours,

George C. Selfridge (est)
Chairman, Operating Committee

WPKlugescheid/er 9/25/57
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

Enclosures

APPROVED:
Frank D. Lamb (est)
Member, Bureau of Mines
N. E. Nelson (est)
Member, Geological Survey

8623

Government's copy

EXPLORATION PROJECT CONTRACT
THE NEW JERSEY ZINC COMPANY
DOCKET NO. DMEA-4173

AMENDMENT NO. 4

It is agreed this _____ day of _____, 1957, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and The New Jersey Zinc Company that Exploration Project Contract Idm-E970, Docket No. DMEA-4173, dated July 23, 1956, as amended, is further amended, effective July 23, 1956, as follows:

1. In Exhibit "A", under Description of the Work, the fifth paragraph is revised to read as follows:

"Diamond drilling shall be done with AX size, or larger, coring bits, except that when it is not feasible to complete a hole with AX size, with Government approval, the hole may be reduced with EX casing and completed with EX size bits. The Government will not contribute to the cost of drilling any hole which is not completed. All drill holes shall be logged and ~~all drill core~~ core shall be made available to the Government for examination. All significantly mineralized core shall be split and one half thereof shall be properly sampled and the samples assayed for zinc; ~~but no sample shall be taken representing more than five feet of core length.~~ All assay reports shall be submitted monthly to the Government together with the drill hole logs ~~and locations~~, proper engineering-geological plan maps and sections showing the progress of the work, and drill holes the sample locations. The remaining half of all significantly mineralized core shall be furnished to the Government upon request."

2. In Exhibit "A", under Estimated Cost of the Project, Category (1) Independent Contracts, is revised to read as follows:

"Overburden drilling and diamond drilling to 250-foot depth, 6,000 feet	
AX size @ $2.20/ft.	$13,200.00
EX size @ $2.00/ft.	
Diamond drilling 250-foot to 500-foot depth, 4,650 feet	
AX size @ $2.45/ft.	$11,392.50
EX size @ $2.25/ft.	

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
ROOM 313 POST OFFICE BLDG.
KNOXVILLE 2, TENN.

WASHINGTON OFFICE

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DMEA
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9/27	B	220
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9/30	Klug	500

September 25, 1957

Approved

Memorandum

To: Operating Committee, DMEA - Washington

From: Executive Officer, DMEA - Region V - Knoxville

Subject: Amendment No.3 - The New Jersey Zinc Co. Virginia. DMEA-4173, Idm-E970-zinc. James-Woodruff area.

Attached are two copies of the subject amendment signed by Mr. Goodwin, Vice President of the Company.

The usual distribution of the other copies have been made.

Robert A. Laurence

Robert A. Laurence

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

500

September 17, 1957

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Director, Division of Base Metals

Subject: Preparation of Amendment No. ~~3~~ 4 for Docket No. DMEA-4173, The New Jersey Zinc Company, James-Woodruff Area, Wythe and Smyth Counties, Virginia, Contract No. Idm-E970, Zinc.

Will you kindly prepare an Amendment No. ~~3~~ 4 for the cited project as follows:

In Exhibit "A":

1. Under Description of the Work, the fifth paragraph is revised to read as follows:

"Diamond drilling shall be done with AX size, or larger, coring bits, except when it is not feasible to complete a hole with AX size. With Government approval, the hole may be reduced with EX casing and completed with EX size bits. The Government will not contribute to the cost of drilling any hole which is not completed. All drill holes shall be logged and all drill core shall be made available to the Government for examination. All significantly mineralized core shall be split and one half thereof shall be properly sampled and the samples assayed for zinc; no sample shall be taken representing more than five feet of core length. All assays shall be submitted monthly to the Government, together with the logs of the drill holes and proper plan maps and sections showing the progress of the work and the sample

locations. The remaining half of all significantly mineralized core shall be furnished to the Government upon request."

2. Under Estimated Costs of the Project, Category (1) Independent Contracts, is revised to read as follows:

"Overburden drilling and diamond drilling to 250-foot depth, 6,000 feet AX size @ $2.20/ft. EX size @ $2.00/ft.	$13,200.00	
Diamond drilling 250-foot to 500-foot depth 4,650 feet AX size @ $2.45/ft. EX size @ $2.25/ft.	11,392.50	
Diamond drilling 500-foot to 750-foot depth, 2,850 feet AX size @ $2.70/ft. EX size @ $2.50/ft.	7,695.00	
Diamond drilling 750-foot to 1,000-foot depth, 1,200 feet AX size @ $2.95/ft. EX size @ $2.75/ft.	3,540.00	
Diamond drilling 1,000-foot to 1,250-foot depth, 300 feet AX size @ $3.20/ft. EX size @ $3.00/ft.	960.00	$36,787.50

The above rates cover charges for reaming, cementing, water supply, casing, changing of location and all other charges which may be incurred by the Operator pursuant to the diamond drilling contracts. 1/"

WPK/er
Copy to: Docket
Chron.

W. P. Klugescheid
for W. R. Griswold

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

September 18, 1957.

Memorandum for the Files

From: Director, Division of Base Metals

Subject: Justification for Amendment No. 3 for Docket No. DMEA-4173, The New Jersey Zinc Company, James-Woodruff Area, Wythe and Smyth Counties, Virginia Contract No. Idm-E970, Zinc.

Mr. Laurence, Executive Officer, DMEA Field Team, Region V, has noted that occasionally it becomes necessary to complete a hole using EX drilling. Hence, the amendment provides for payment in such instances.

for W. P. Klugescheid
W. R. Griswold

WRG/ER
Copy to:
Docket
Admr. File
Chron.

8623

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DMEA
RECEIVED SEP 16 1957

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

September 12, 1957

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: The New Jersey Zinc Co., DMEA-4173-Zinc.
James-Woodruff Area, Wythe & Smyth Counties, Va.

Enclosed are the original and 2 copies of a letter from the Operator, and 3 copies of an option covering the J. R. Horne tract, which adjoins the project area at the west end.

In accordance with the "Special Agreement Concerning Land", we have sent Amendment No.3 to the Operator for signature. As soon as we receive the executed copies, we will make the usual distribution.

Robert A. Laurence

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

SAFeitler

S. A. Feitler for V. J. Lynch
Member, Bureau of Mines

BERTHA MINERAL DIVISION

THE NEW JERSEY ZINC COMPANY

AUSTINVILLE, VA.

HORSE HEAD PRODUCTS ®

September 10, 1957

OFFICIAL FILE COPY
DMEA
RECEIVED SEP 16 1957

DATE	INITIALS	CODE

Mr. Robert A. Laurence, Executive Officer
Defense Minerals Exploration Administration
Room 13, Post Office Building
Knoxville 2, Tennessee

Subject: DMEA 4173, IDM-E970 (Zinc)
James-Woodruff Area
Wythe and Smyth Counties, Va.

Dear Sir:

We have recently completed negotiations for the J. R. Horne property. This property, containing 130 acres, lies to the west of the M. R. Newland property and is shown on maps 7GB-2353 and 2363. At the time of the original application this property was listed as "Property Being Negotiated."

We request that this property be added to our James-Woodruff contract. Copies of the option agreement are enclosed.

Yours very truly,

W. L. Albers,
Superintendent

R.C.G.
RCGilbert/mjf
In quintuplicate

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SEP 11 1957
U. S. Geological Survey
Geology Division
Knoxville, Tenn.

Only rarely in [illegible] these jobs, to reduce a hole to EX size, but when it [illegible] payment for the EX core should be authorized. [illegible] correspond to those given in bids accompanying the various applications.

[illegible]

[illegible]

[illegible]

[illegible]

Robert A. Lawrence
Over[illegible] Officer

[illegible]

[illegible] Chief
Engineer, Bureau of Mines

Enclosures 3

[illegible]

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

MAY 1 1957

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 3 1957

DATE	INITIALS	CODE
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		130
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		500

Approved work

Memorandum

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

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

Subject: DMEA-4173, Idm-E970 (Zinc), The New Jersey Zinc Company, New York, N. Y., James-Woodruff Area, Smyth and Wythe Counties, Virginia.

Enclosed are the original and two copies of the subject amendment. Also enclosed are four copies of the Operator's letter requesting the amendment and four copies of the option for each property. The usual distribution of other copies of the amendment has been made.

It is in the Government's interest to add these properties (as provided in the Special Agreement Concerning Land) as they increase the probability of making a discovery.

Please note that the James Heirs' Tract as shown on Fig. 2-B of the contract is now a part of the Eanes Tract, having been sold to Eanes on June 18, 1953, and therefore the Eanes Tract adjoins the original project area.

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

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

RAL —
VJL —
HWJ

BERTHA MINERAL DIVISION

THE NEW JERSEY ZINC COMPANY

AUSTINVILLE, VA.

HORSE HEAD PRODUCTS ®

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DMEA
RECEIVED MAY 3 1957

DATE	INITIALS	CODE

March 29, 1957

Mr. R. A. Laurence, Executive Officer
Defense Minerals Exploration Administration
Room 13, Post Office Building
Knoxville 2, Tennessee

Re: James-Woodruff Area, Virginia
DMEA #4173, Contract 970

Dear Sir:

At a recent conference at Austinville the question of the direction of pitch of a hypothetical ore shoot on the James end of the James-Woodruff area was discussed. As a result of this discussion it was decided that it was most probable that an ore shoot related to the James anomaly would pitch east instead of west as formerly postulated. This was based largely on the proximity of the area to the Dry Creek high in the Speedwell syncline which had been formerly ignored.

However, in order to drill an east pitching ore shoot it would be necessary to option more property to the east. This has been done. On the enclosed map you will see the additional properties which have been optioned.

Buchanan	250 Acres
Fielder	61 Acres
Eanes	65 Acres

We request that you add these properties to our James-Woodruff contract. Copies of options are enclosed.

To test for this postulated east pitching ore shoot we propose to drill a fence of holes along the east end of the R. B. James property as shown on the attached map (taken from 7GB-2353). If this fence is successful we will continue drilling to the east, if not, we will drill at the west side of

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APR 4 - 1957
Geologic Division
Knoxville, Tenn.

the anomaly on the Newland property as originally proposed.

Please advise us at your earliest convenience whether you concur in this change in the plan of drilling.

Very truly yours,

W. L. Albers,
Superintendent

WHoratioBrown/mjf
In quintuplicate

X 1086 150M

COPY

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5/6 | Klug. | 500

Austinville, Va.
October 1, 1956

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

Dear Mr. Laurence:

We have recently completed negotiations for the N. S. King property, which should be added to our James-Woodruff application in the Smyth-Wythe County area of Virginia.

This property is shown on the eastern half of figure 2-B of Docket Number 4173, contract Number 9[illegible]0, and was listed as "Property Being Negotiated" at the time of application.

A copy of the option agreement is enclosed.

Very truly yours,

W. L. Albers, Jr.
W. L. Albers,
Superintendent

R.C.G. WMB
RCGilbert/mjf
In quintuplicate

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

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OCT 15 1956

October 12, 1956

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: Amendment No. 1. The New Jersey Zinc Co. Idm-E970, DMEA-4173 (zinc) James-Woodruff Area, Virginia

Transmitted are three signed copies of the Amendment to the subject contract which adds the N. S. King property to the subject contract.

Robert A. Laurence

Robert A. Laurence

File Copy
Surname
Klugescheid
Selfridge
Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION 500
WASHINGTON 25, D. C.

JUL 23 1956

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

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe and Smyth Counties, Virginia

Dear Mr. Laurence:

Enclosed are the Field Team and the Finance Office copies of the cited contract signed by the Operator and the Government.

We are also enclosing two extra copies of Annex I, Exhibit "A", and the maps for the use of the Field Team.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (SHB)

Enclosures

WPKlugescheid/er 7/20/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

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

Thor H. Kiilsgaard (SHB)
Member, Geological Survey

R.C.S.

File Copy
Surname
Klugescheid
Grimsel
Selfridge
Yoes
Kilsgaard

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

JUL 23 1956

Mr. S. S. Goodwin, Vice-President
and Manager of Mines
The New Jersey Zinc Company
160 Front Street
New York 38, New York

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe and Smyth Counties, Virginia

Dear Mr. Goodwin:

Referring to your letter of July 10, 1956, we are enclosing the "Operator's Copy" of the cited contract signed by the Government.

Sincerely yours,

SIGNED
ACTING Administrator

Enclosure

WPKlugescheid/er 7/20/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region V (2)
Chron.

K.C.S.

THE NEW JERSEY ZINC COMPANY
(ESTABLISHED 1848)

OFFICE OF THE
VICE PRESIDENT

100 FRONT STREET

NEW YORK 38, N.Y.

RECEIVED
JUL 12 1956

July 10, 1956

Mr. C. O. Mittendorf, Administrator
Defense Minerals Exploration Administration
United States Department of The Interior
Washington 25, D. C.

Re: Docket #DMEA - 4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe and Smyth Counties, Va.

Dear Sir:

Returned herewith are the original and five copies of a contract covering proposed exploration work on the subject area, in accordance with your letter dated June 29, 1956.

The contract meets with our approval and we have no recommended changes. Accordingly, we have signed all copies and are returning them to you for dating and signature by the Government.

Very truly yours,

S. S. Goodwin
Vice President

SSG:ei

File Copy
Surname

Klugescheid
Irwin
Chambers
Yopp
Kiilsgaard
Selfridge
[illegible]

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

JUN 29 1956

Mr. S. S. Goodwin, Vice President
and Manager of Mines
The New Jersey Zinc Company
160 Front Street
New York 38, New York

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe and Smyth Counties, Virginia

Dear Mr. Goodwin:

With reference to your letter of February 10, with which you submitted an application for Government assistance in the cited exploration project, we are enclosing the original and five copies of a contract covering the proposed work.

Please note that the contract has not been signed by the Administrator nor has it been dated. If it meets with your approval, please sign and return all copies to us for dating and signature by the Government. In case there should be any specifications in the contract which do not meet with your approval, please return all copies to us, unsigned, with your comments.

Sincerely yours,

C. O. Mittendorf

Administrator

WPKlugescheid/er 6/26/56

Enclosures

Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region V (2)
Chron.

A.G.S.

File Copy
Surname
Klugescheid.

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

500

June 19, 1956

Memorandum

To: Associate Solicitor, Division of Mineral Resources

From: Chief, Base Metals Division

Subject: Preparation of Contract for The New Jersey Zinc Company, James-Woodruff Area, Wythe and Smyth Counties, Virginia, Docket No. DMEA-4173 (Zinc)

Will you please prepare a contract for the cited application. The draft of the contract, Exhibit "A", and Annex I and one copy of each of the maps are attached to this memorandum. Consents to Lien have been waived.

The missing copies of the maps to accompany the copies of the contract will be delivered to your office in a few days.

W. R. Griswold

W. R. Griswold

WPKlugescheid/er

Copy to: Docket
Base Metals
Chron.

MEMORANDUM

By: W, P, Klugescheid

Subject: Determination of drilling and incidental costs.

Docket No.: DMEA-4173 (James-Woodruff Area)

For drilling footage: Assume 3 fences with holes spaced at 200 feet centre to centre. See Fig. 3. The depths of holes as follows:

250 x 3	::	750'
350 x 3	::	1,050'
450 x 3	::	1,350'
550 x 3	::	1,650'
650 x 3	::	1,950'
750 x 3	::	2,250'
900 x 3	::	2,700'
1,100 x 3	::	3,300'
Total		15,000' as requested

0- 250'	approximately	6,000' @ $2.20/ft.....	$ 13,200.00
250- 500'	"	4,650' @ $2.45/ft.....	11,392.50
500- 750'	"	2,850' @ $2.70/ft.....	7,695.00
750-1,000'	"	1,200' @ $2.95/ft.....	3,540.00
1,000-1,250'	"	300' @ $3.20/ft.....	960.00
Totals		15,000'	$ 36,787.50

For Incidental cost per foot.

	From DMEA-4173	From DMEA-4174	Recapit. for both.
Geologist ½ time, 12 months	$ 3,000	$ 3,000	$ 3,000
Engineer ½ time,12 months	2,500	2,500	2,500
Draftsman 1/3 time, 12 months	1,300	1,300	1,300
Accounting & Secretarial	360	360	360
Compensation Insurance	71	71	71
Insurance & Payroll Taxes	358	358	358
Car-5,000 miles @ $0.08/mi.	400		
Car-6,870 miles @ $0.08/mi.		550	
Car-8,000 miles @ $0.08/mi.			640
Core Boxes	400	400	800
Total			$ 9,029

9,029/30,000 :: $0.30097 say $0.30/ft.

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

RECEIVED
JUN 12 1956

June 12, 1956

Re: DMEA-4173, Zinc-Lead
$51,889
The New Jersey Zinc Co.
James-Woodruff Area
Wythe & Smyth Counties,
Virginia

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop, USBM

Subject: Review of Field Team report dated June 6, 1956

The Field Team agrees that the applicants' proposal for 15,000 feet of diamond drilling, sampling and mapping is sound exploration.

They agree that Sprague and Henwood bid is a fair price, but as in the exploration at the Porter Ore Bank Area consider geologic services excessive. The Field Team recommends that such costs should be comparable to those developed in the Beaver Creek Contract (DMEA-4178). They also recommend that mileage costs be reduced because of nearness to Austinville and that the contract be worded to provide payment from lead as well as zinc. I should think the royalty would provide repayment from all mineral receipts whether zinc, lead, pyrite, or agricultural limestone.

I concur with the Field Team and recommend that a contract be prepared covering the requested exploration with modifications in costs as indicated by the Field Team.

O. M. Bishop

O. M. Bishop

Copy to - Mr. Kiilsgaard, Room 5224
Mr. Geehan
Div. of Minerals
O. M. Bishop
Files

IN REPLY REFER TO:

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

RECEIVED
JUN 13 1956

June 12, 1956

Re: DMEA 4173
New Jersey Zinc Co.
James-Woodruff Area
Wythe and Smyth Counties, Virginia
$51,889.00 - Zinc

Memorandum

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

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

Subject: Review of Field Team memorandum

The memorandum was prepared and the recommendation of approval of the application made without benefit of a formal field examination, because the Executive Officer is well acquainted with the geology of the area and little more would be learned by an on the ground examination.

I concur with the recommendation of approval of the application of the Field Team.

N. E. Nelson

N. E. Nelson

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

RECEIVED
JUN - 8 1956

Klugscheid

June 6, 1956

Memorandum

To: Operating Committee, DMEA, Washington 25, D. C.

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

Subject: Field Examination Report, DMEA-4173 (Zinc)
The New Jersey Zinc Company, New York, N. Y.
James-Woodruff Area, Wythe & Smyth Counties, Virginia

ON-SITE EXAM. RPT.

This memorandum is submitted in lieu of the usual examination report, as a full field examination was not considered necessary in this case. Mr. Griswold and Mr. Lynch visited the project area on May 10, 1956, and Mr. Laurence spent considerable time in geologic work for both the U. S. and Virginia Geological Surveys in this area some years ago. We recommend approval of a contract, to be essentially similar to that for DMEA-4178, recently submitted to the applicant for execution. Dates for beginning and completion should be withheld, as it is the applicant's intent to complete DMEA-4178 before beginning work on either DMEA-4173 or DMEA-4174.

We are in agreement with the applicant's proposal to drill sections of "fences" of holes to explore areas down an inferred plunge based on analogy to the Austinville ore bodies.

Drilling costs should be based on the bid of Sprague and Henwood, copies of which were submitted by the applicant along with two higher bids from other contractors.

Estimated costs for geologic, engineering and other services (excluding assays) given in the application seem high. They average 55.9 cents per foot, as contrasted with 27 cents on DMEA-4153 and 32 cents on DMEA-4119 and 4126, all of which are contracts with the same Company. The subject application includes estimates of 36.7 cents per foot for geology and 8.7 cents per foot for engineering and drafting, as contrasted to 17.1 cents and 10.0 cents estimated for the same services on DMEA-4177. Half-time services of both a

Reviewed by
DMEA OPERATING COMMITTEE
6-11-56
(date)

geologist and an assistant geologist for 12 months to service an average drill footage of 1250 feet per month seems to be more than needed. We recommend that the unit cost for services on this contract be the same as that used on the Beaver Creek contract, DMEA-4178, except as noted below.

Except for two minor differences, the contract for the James-Woodruff area could be the same as the one prepared for the Beaver Creek area, DMEA-4178. These are:

(1) Difference in cost of mileage to the job. This job is much closer to Austinville, and the estimated cost for this item per foot of drilling is 2.6 cents instead of 8 cents as at Beaver Creek.

(2) James-Woodruff is a Shady dolomite area, whereas Beaver Creek is a Kingsport dolomite area. Shady ores usually contain both sphalerite and galena in contrast to Kingsport ores which usually contain only sphalerite. Therefore, provision for both zinc and lead assays should be made in this contract. Because pyrite is also common in Shady ores, iron assays should be provided for, if the Company wants them.

Robert A. Laurence

Robert A. Laurence
Executive Officer

V. J. Lynch

V. J. Lynch
Member, Bureau of Mines

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

RECEIVED
JUN - 4 1956

June 1, 1956

Memorandum

To: Operating Committee, DMEA - Washington

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

Subject: DMEA-4173, New Jersey Zinc Company (zinc)
and
DMEA-4174, New Jersey Zinc Company (zinc)

Reference is made to your telegram of June 1 concerning these two applications.

It is our intention to recommend approval of both these applications, but preparation of reports has been delayed because of the Company's plan to do the three Virginia jobs consecutively. We will try to get the reports and recommendations to you within the first week of June.

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

A. L. Peyton
A. L. Peyton for V. J. Lynch
Member, Bureau of Mines

File Copy
Surname
Klugescheid
Shawell
Martin
Jefferson
Mittendorf

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

JUN - 1 1956 WPKlugescheid/er Rm 4442, Ext. 2690

TELETYPE
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Base Metals Division, DMEA

14X4401(01) Revolving Fund, Defense Production Act, Interior (allocated Working Fund to Office of Secy.)

Date :

To: Mr. Robert A. Laurence, Executive Officer, DMEA Field Team, Region V, Knoxville, Tennessee

When may we expect recommendations on Docket DMEA-4173, The New Jersey Zinc Company, James-Woodruff Area and Docket DMEA-4174, The New Jersey Zinc Company, Porter Ore Bank Area.

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

WPKlugescheid/er 5/31/56

Copy to: Docket (2)
Admr R File
Op. Committee
Base Metals (2)
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.
Confirmation Copy

R.C.L.

N1086 50M

COPY

RECEIVED
APR 26 1956

Austinville, Va.
April 25, 1956

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

Attention: Mr. W. R. Griswold

Gentlemen:

In accordance with your suggestions telephoned to our New York office, we are forwarding to you herewith bids from three diamond drilling contractors for our proposed DMEA projects:

James-Woodruff Area-Virginia-DMEA-4173
Porter Ore Bank-Virginia-DMEA-4174
Beaver Creek Area-Virginia-DMEA-4178

Bids are enclosed from E. J. Longyear Company, Joy Manufacturing Company, and Sprague & Henwood, Inc.

Although practically all of the holes are expected to be less than 1,000 feet, with an average near 500 feet, we have used 1,000 feet as a basis for comparison of the bids. You will note that Sprague & Henwood have bid the same on all three jobs. The other two concerns bid the same on the first two areas and much higher on Beaver Creek.

It seems on this basis that Joy is too high on all of its bids, and that Sprague & Henwood are much lower than Longyear on Beaver Creek and slightly lower than Longyear on the other two projects.

We therefore propose to award the contracts for the three projects to Sprague & Henwood and will so advise them if you concur.

X 1086 150M

COPY

We would appreciate it if you will advise us if there are any further steps we need to take to complete this application.

Very truly yours,

W. L. Albers/gm

W. L. Albers
Superintendent

WHoratioBrown:rjl
Encl.
In Quadruplicate

cc: Mr. Robert A. Laurence, Knoxville, Tenn.
Mr. W. H. Callahan, N. Y.
Mr. S. S. Goodwin, N. Y.
Mr. A. E. Turner, N. Y.
Geol File

MANUFACTURERS OF
DIAMOND DRILLS
DRILLING EQUIPMENT
DIAMOND BITS

BRANCH OFFICES
NEW YORK PITTSBURGH
PHILADELPHIA
GRAND JUNCTION, COLO

EXECUTIVE OFFICES & PLANT
221 W. OLIVE STREET
SCRANTON, PA.

SPRAGUE & HENWOOD, INC.

SINCE 1883

CONTRACTORS FOR
DIAMOND DRILLING
SHOT DRILLING · SOIL SAMPLING · PRESSURE GROUTING
WATER WELLS & CHURN DRILLING

MAIL ADDRESS · P. O BOX 446
SCRANTON 2, PA.
DIAMOND 4-8507

RECEIVED
APR 27 1956

April 3, 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Attn: Mr. A. E. Turner
Assistant Manager of Purchasing

Re: Diamond Drilling -- Virginia
1-AX-524

Gentlemen:

On the basis of Mr. Turner's letters of March 23rd and March 29th, and on the basis of the site examination by our Mr. Fletcher, we are pleased to submit the following quotation for a minimum of 10,000 linear feet of AX drilling on the Porter Bank and James-Woodruff projects in Wythe and Smyth Counties, Virginia, and a minimum of 5,000 linear feet of AX drilling on the Beaver Creek project in Smyth County, Virginia. Our proposal is based on drilling vertical holes, with a maximum distance from water of 10,000 feet.

QUOTATION

ITEM #1 For drilling AX holes:

DEPTH	PRICE PER FT.
0' to 250'	$ 2.20 per ft.
250' to 500'	$ 2.45 per ft.
500' to 750'	$ 2.70 per ft.
750' to 1000'	$ 2.95 per ft.
1000' to 1250'	$ 3.20 per ft.
1250' to 1500'	$ 3.45 per ft.
1500' to 1750'	$ 3.70 per ft.
1750' to 2000'	$ 4.20 per ft.
2000' to 2250'	$ 5.00 per ft.
2250' to 2500'	$ 6.00 per ft.

ITEM #2 For acid testing the angle of the hole - EIGHT DOLLARS ($8.00) per hour

Sprague & Henwood, Inc. will transport all cores free-of-charge to Marion, Virginia, in core boxes supplied by the New Jersey Zinc Company.

If awarded this work we are prepared to start within one week after receipt of written notice to proceed.

RAGUE & HENWOOD, INC.

TO:
The New Jersey Zinc Company
160 Front Street
New York 38, New York

April 3, 1956

Several days will be required to assemble the necessary equipment and ship it to the job site. Therefore, any advance notice you could give us concerning the award of this contract will be very greatly appreciated.

Thank you for inviting us to submit our proposal and we hope our prices will meet with your approval.

Very truly yours,

SPRAGUE & HENWOOD, INC.

Robert M. Gorges

Robert M. Gorges
Contract Department

RMG/lap

MANUFACTURERS OF
DIAMOND DRILLS
DRILLING EQUIPMENT
DIAMOND BITS

BRANCH OFFICES
NEW YORK · PITTSBURGH
PHILADELPHIA
GRAND JUNCTION, COLO.

EXECUTIVE OFFICES & PLANT
221 W OLIVE STREET
SCRANTON, PA.

SINCE 1883

SPRAGUE & HENWOOD, INC.

CONTRACTORS FOR
DIAMOND DRILLING
SHOT DRILLING · SOIL SAMPLING · PRESSURE GROUTING
WATER WELLS & CHURN DRILLING

RECEIVED
APR 27 1956

MAIL ADDRESS · P. O. BOX 446
SCRANTON 2, PA.
DIAMOND 4-8507

April 19, 1956

The New Jersey Zinc Company
160 Front Street,
New York 38, New York

RE:- Diamond Drilling -
Virginia - 1-AX-524

Attention:- Mr. A. E. Turner,
Assistant Manager of Purchasing

Gentlemen:-

As per our telephone conversation, we are pleased to include in our quotation to you of April 3rd the following:-

ITEM NO. 3 - Casing left in holes by your request

AX casing - $ 1.54 per lin.ft.
BX casing - $ 1.96 per lin.ft.

ITEM NO. 4 - For use of 3-ton truck and driver - hauling cores, if requested - $ 4.00 per hour.

ITEM NO. 5 - Additional charge for furnishing and laying pipe line and pumping water, if necessary, to holes located over 10,000 feet from a suitable water supply.

From 10,000 feet to 12,500 feet - 15¢ per lin.ft. in addition to the above per foot prices quoted.

From 12,500 lin.ft. to 15,000 lin.ft. -15¢ per lin.ft. additional.

The prices quoted in our letter of April 3rd are for furnishing AX cores. Should any cementing be required in the hole due to cave formation, etc., we will cement the holes at our expense.

We trust you will find the above acceptable.

Thanking you, we are

Very truly yours,

SPRAGUE & HENWOOD, INC.,

Wm. J. Schank,
Vice President

WJS:GF
In Triplicate

JOY MANUFACTURING COMPANY
900 WOODLAND AVENUE
MICHIGAN CITY, INDIANA
TELEPHONE 7-7231

RECEIVED
APR 27 1956

EXECUTIVE OFFICES
HENRY W. OLIVER BUILDING
PITTSBURGH 22, PA.

April 2, 1956

The Jersey Zinc Company
160 Front St.
New York 38, N. Y.

Attention: Mr. A. E. Turner
Asst. Mgr. of Purchasing

Subject: Diamond Drilling
Virginia - 1956

Gentlemen:

In compliance with your request, we wish to set forth below prices and conditions covering a minimum of 10,000 feet of core drilling as follows:

Porter Ore Bank - Smyth County, Va.
James Woodruff - Wythe & Smyth Counties, Va.

		BX	AX	EX
From Surface to 500. ft.	@	$3.10 ft.	$2.75 ft.	$2.50 ft.
From 500. to 1000. ft.	@	3.35 "	3.00 "	2.75 "
From 1000. to 1500. ft.	@	3.60 "	3.25 "	3.00 "
From 1500. to 2000. ft.	@	3.85 "	3.50 "	3.25 "

BX Casing left in holes at your request	@ $1.26 ft.
AX Casing left in holes at your request	@ $1.[illegible] "
EX Casing left in holes at your request	@ $1.47 "
Surveying holes with your Tro-Pari Instrument	@ $7.50 per hr.
Capping Drill Holes, etc.	@ $1.50 per hr.

We will pump water for drilling purposes, which we understand from your local representative will be not over 6,000 feet from the drill holes.

If it is your desire to save cores of the drilling, then it will be necessary that you furnish the proper containers for same.

We will furnish for this proposed drilling one of our gasoline driven core drills complete with operating equipment, and will conduct the drilling operations on the basis of two 8-hour shifts per day and not less than six days per week.

We can start this work immediately upon receipt of instructions to proceed with the drilling.

Yours truly,

J. J. [illegible] Co. AM

N. J. Pilarski

N. J. Pilarski, Mgr.
Contract Drill Division

NJP/ac

JOY MANUFACTURING COMPANY
900 WOODLAND AVENUE
MICHIGAN CITY, INDIANA
TELEPHONE 7-7231

RECEIVED
APR 27 1956

EXECUTIVE OFFICES
HENRY W. OLIVER BUILDING
PITTSBURGH 22, PA.

April 2, 1956

AM:KLP

The Jersey Zinc Company
160 Front Street
New York 38, N. Y.

Attention: Mr. A. E. Turner
Asst. Mgr. of Purchasing

Subject: Diamond Drilling
Virginia - HX-594

Gentlemen:

In compliance with your request, we wish to set forth below prices and conditions covering a minimum of 10,000 feet of core drilling in connection with the Beaver Creek, Smyth County, Virginia project.

	BX	AX	NX
From surface to 500. ft.	@ $3.35 ft.	$3.00 ft.	$2.75 ft.
From 500. to 1000. ft.	@ 3.60 "	3.25 "	3.00 "
From 1000. to 1500. ft.	@ 3.85 "	3.50 "	3.25 "

Surveying holes with your Tro-Pari Instrument	@ $7.50 per hr.
Capping Drill Holes, etc.	@ $6.50 per hr.
BX Casing left in drill holes at your request	@ $1.96 ft.
AX Casing left in drill holes at your request	@ $1.54 ft.
NX Casing left in drill holes at your request	@ $1.47 ft.

We will pump water for drilling purposes, which we understand from your local representative will be not over 2500 ft. from the drill holes.

If it is your desire to save cores of the drilling, then it will be necessary that you furnish the proper containers for same.

We will furnish for this proposed drilling one of our gasoline driven core drills complete with operating equipment, and will conduct the drilling operations on the basis of two 8-hour shifts per day and not less than six days per week.

We can start this work immediately upon receipt of instructions to proceed with the drilling.

Yours truly,

JOY MANUFACTURING COMPANY

W. J. Pilarski, Mgr.
Contract Drill Division

WJP/ct

E. J. LONGYEAR COMPANY

DIAMOND DRILL MANUFACTURERS
CORE DRILLING CONTRACTORS
MINING ENGINEERING AND
GEOLOGICAL CONSULTANTS

GENERAL OFFICE
1006 HAY TOWER
MINNEAPOLIS 2, MINNESOTA
TELEPHONE: MAIN 2447
CABLE: LONGRIP

RECEIVED
APR 27 1956

April 11, 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Attention: Mr. A. E. Turner
Assistant Manager of Purchasing

Gentlemen:

Diamond Drilling - 1-X-524
Beaver Creek Area - Smyth County, Va.

1. In response to your letter of March 12th, we are pleased to submit below our proposal for your contemplated exploratory drilling program which is to be carried out in the Beaver Creek area, in Smyth County, Virginia.

2. We understand that the work as now planned will consist of a series of vertical holes to a maximum depth of 1500 feet, with a minimum aggregate footage of 5,000 feet; and that the rock to be drilled is Knox and the Maynardville dolomites. We also understand that the work is to be carried out in an area located between Chatham Hill and Saltville, Virginia.

3. For this work we propose to furnish one U.S. skid-mounted, diamond core drill, together with the necessary accessory tools required to accomplish the work as now planned. We also propose to supply all service equipment required for moving the rig from one location to another, and other services and facilities needed in connection with supplying water for drilling purposes. We further propose to operate the drill on a single or double shift basis, depending upon the availability of competent drill operators.

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 authorities.

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

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

a) Overburden Drilling

0 to 100 feet in depth, measured from the collar of the hole .....$3.25 per foot

b) Diamond Core Drilling

Top of Ledge to 1,000 feet in depth, measured from the collar of the hole -

EX-size, recovering core approximately 7/8" in diameter.....$3.15 per foot

AX-size, recovering core approximately 1-3/16" in diameter..$3.25 per foot

BX-size, recovering core approximately 1-5/8" in diameter...$3.55 per foot

NX-size, recovering core approximately 2-1/8" in diameter...$4.00 per foot

1,000 to 1500 feet in depth, measured from the collar of the hole -

EX-size..... .....$3.40 per foot

AX-size.....$3.50 per foot

c) Drill hole surveying with Maas Compass..$5.00 per hour

d) Delays for your convenience or for which you are responsible.....$5.00 per hour

e) Hauling drill core from drill hole location to core storage sheds.....$3.25 per hour

f) Casing left in drill holes at your request -

EX-size.....$1.47 per foot
AX-size.....$1.54 per foot
BX-size.....$1.96 per foot
NX-size.....$2.66 per foot

g) Cleaning up of drill hole locations will be carried out at the sole expense of the Longyear Company.

h) Reaming and casing, when required, will be carried out at the sole expense of the Longyear Company.

6. In addition to the above-quoted footage rates, it is agreed that for drill hole locations in excess of 2500 feet from source of water supply, the following allowances will be made:

a) Water supply allowance for each drill hole which is in excess of 2500 feet, but not more than 5,000 feet from an adequate source of water supply - $0.05 per foot drilled.

b) Water supply allowance for drill holes which are in excess of 5,000 feet, but not more than 7500 feet from an adequate source of water supply - $0.10 per foot drilled.

e) Water supply allowance for drill holes which are in excess of 7500 feet, but not more than 10,000 feet from an adequate source of water supply - $0.20 per foot drilled.

7. It is further agreed and understood that the sources of the water supply to be considered for the purpose of computing the distance allowance are those which are presently available, or which are made available at the Company's expense, and do not include wells which may be drilled at the Contractor's expense.

8. Drill cores are to be placed in receptacles furnished by you at each drill hole location and transported to the point of permanent storage as provided for herein.

9. Invoices covering work performed will be prepared in accordance with your instructions.

10. We very much appreciate being afforded the opportunity to consider this work. Should our proposal be found acceptable, we are prepared to furnish the equipment from our Max Meadows warehouse and commence the drilling operations promptly after receipt of offial notice to proceed.

Very truly yours,

E. J. LONGYEAR COMPANY

M. J. Gleason, Manager
Contract Drilling Division

JCCB:bal

ACCEPTED:

THE NEW JERSEY ZINC COMPANY

By: _____

Date: _____

E. J. LONGYEAR COMPANY

DIAMOND DRILL MANUFACTURERS
CORE DRILLING CONTRACTORS
MINING ENGINEERING AND
GEOLOGICAL CONSULTANTS

GENERAL OFFICE
FOSHAY TOWER
MINNEAPOLIS 2, MINNESOTA
TELEPHONE: MAIN 2447
CABLE: LONG

RECEIVED
APR 27 1956

April 11, 1956

The New Jersey Zinc Company
160 Front Street
New York 38, New York

Attention: Mr. A. E. Turner
Assistant Manager of Purchasing

Gentlemen:

Diamond Drilling - L-X-524
Wythe and Smyth Counties, Virginia

1. In response to your letter of March 12th, we are pleased to submit below our proposal for your contemplated exploratory drilling program which is to be carried out in the Porter Ore Bank and the James-Woodruff areas.

2. We understand that the work as now planned will consist of a series of vertical holes to a maximum depth of 1500 feet, with a minimum aggregate footage of 10,000 feet; and that the formation to be drilled is shady dolomite. We also understand that the work is to be carried out in two different areas, both of which are located within a radius of twenty miles of Sugar Grove. We further understand that the distance to water may range up to 8,000 feet at one or more of the drill locations.

3. For this work we propose to furnish one complete Longyear truck-mounted diamond core drill, together with the necessary accessory tools required to accomplish the work as now planned. We also propose to supply all service equipment required for moving the rig from one location to another, and other services and facilities needed in connection with supplying water for drilling purposes. We propose to operate the drill on a single or double shift basis, depending upon the availability of competent drill operators.

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 authorities.

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

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

a) Overburden Drilling
0 to 100 feet in depth, measured from
the collar of the hole.....$2.60 per foot

b) Diamond Core Drilling

Top of Ledge to 1,000 feet in depth, measured from the collar of the hole -

EX-size, recovering core approximately 7/8" in diameter.....$2.50 per foot

AX-size, recovering core approximately 1-3/16" in diameter.....$2.60 per foot

BX-size, recovering core approximately 1-5/8" in diameter.....$2.80 per foot

NX-size, recovering core approximately 2-1/8" in diameter.....$3.20 per foot

1,000 to 1500 feet in depth, measured from the collar of the hole -

EX-size.....$2.75 per foot

AX-size.....$2.85 per foot

c) Drill hole surveying with Maas Compass..$5.00 per hour

d) Delays for your convenience or for which you are responsible.....$5.00 per hour

e) Hauling drill core from drill hole location and to core storage sheds.....$3.25 per hour

f) Casing left in drill holes at your request -

EX-size.....$1.47 per foot
AX-size.....$1.54 per foot
BX-size.....$1.96 per foot
NX-size.....$2.66 per foot

g) Cleaning up of drill hole locations will be carried out at the sole expense of the Longyear Company.

h) Reaming and casing, when required, will be carried out at the sole expense of the Longyear Company.

6. In addition to the above-quoted footage rates, it is agreed that for drill hole locations in excess of 2500 feet from source of water supply, the following allowances will be made:

a) Water supply allowance for each drill hole which is in excess of 2500 feet, but not more than 5,000 feet from an adequate source of water supply - $0.05 per foot drilled.

b) Water supply allowance for drill holes which are in excess of 5,000 feet, but not more than 7500 feet from an adequate source of water supply - $0.10 per foot drilled.

c) Water supply allowance for drill holes which are in excess of 7500 feet but not more than 10,000 feet from an adequate source of water supply - $0.20 per foot drilled.

7. It is further agreed and understood that the sources of the water supply to be considered for the purpose of computing the distance allowance are those which are presently available, or which are made available at the Company's expense and do not include wells which may be drilled at the Contractor's expense.

8. Drill cores are to be placed in receptacles furnished by you at each drill hole location and transported to the point of permanent storage as provided for herein.

9. Invoices covering work performed will be prepared in accordance with your instructions.

10. We very much appreciate being afforded the opportunity to consider this work. Should our proposal be found acceptable, we are prepared to furnish the equipment from our Max Meadows warehouse and commence the drilling operations promptly after receipt of official notice to proceed.

Very truly yours,

E. J. LONGYEAR COMPANY

E. J. Gleason, Manager
Contract Drilling Division

MJG:bal

ACCEPTED:

THE NEW JERSEY ZINC COMPANY

By: _____

Date: _____

C
O
P
Y

THE NEW JERSEY ZINC COMPANY
160 Front Street
New York 38, N. Y.

April 17, 1954

Mr. W. R. Griswold
United States Dept. of the Interior
Defense Minerals Exploration Administration
Washington 25, D. C.

DMEA APPLICATIONS
THE NEW JERSEY ZINC COMPANY

Re: Docket DMEA - 4153 Tenn.
" " - 4177 Tenn.
" " - 4178 Virginia
" " - 4171 "
" " - 4174 "

Dear Sir:

In our DMEA contracts, No. 4119, Talbott Area, Tenn., and No. 4186, Strawberry Plains Area, Tenn. paragraph 4 states "All mineralized core will be properly sampled and assayed for zinc and iron".

We do not normally make a practice of assaying for iron, and suggest, therefore, that the requirements for iron assays be deleted from the above listed Docket Applications pending. This matter was discussed with Mr. Robt. A. Lawrence, and he indicated that the Government does not care whether iron is determined or not. Also we do not want to be obligated to assay all core, but only that core which is significantly mineralized.

Wednesday, 11 April, we mailed in to Mr. Mittenderf the completed DMEA 4119 and 4186 contracts.

Very truly yours,

signed/ John B. Canada
for Manager of Exploration

JBC/alb

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

March 28, 1956

Docket

Memorandum

To: Operating Committee, DMEA, Washington 25, D. C.

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

Subject: DMEA-4173 (Zinc)
The New Jersey Zinc Company, New York, N. Y.
James-Woodruff area, Wythe and Smyth Counties, Virginia

Reference is made to your letter of February 29:

Although we expect to recommend approval of both this application and DMEA-4174 which is nearby, we prefer to wait until a definite decision is reached on DMEA-4178 before submitting recommendations on this proposal. This will not inconvenience the Applicant, as they have stated in their applications that they do not want to start on DMEA-4173 and DMEA-4174 until completion of the work on DMEA-4178.

Robert A. Laurence
Robert A. Laurence
Executive Officer

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

RECEIVED
MAR 30 1956

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
Room 13, Post Office Bldg.
Knoxville 2, Tenn.

C O P Y

March 16, 1956

Docket

Memorandum

To: Mr. C. O. Mittendorf, Administrator, DMEA - Washington

From: D.M.E.A. Field Team, Region V - Knoxville, Tennessee

Subject: Time for Repayment on Tennessee and Virginia Zinc Contracts.

As you know, we now have, in various stages of processing, 8 applications, from two different companies for drilling in Tennessee and Virginia for replacement-type zinc sulfide ore bodies. Total cost of these proposals is $1,411,477.00. In addition, we anticipate receipt of two more applications, for areas in Tennessee. A map being mailed under separate cover shows the locations of all these proposals, as well as mines now in operation and mills in operation or under construction, and of the current project, DMEA-2546.

Although we haven't any ore reserve figures to prove it, it is our opinion that none of the ore in any of these exploration areas is likely to be mined within the next ten years. The contract now in force with American Zinc Company of Tennessee (Idn-2676) contains a clause providing 30 years for repayment. It is our understanding that this term was based on the Operator's statement that they have now at least 30 years' reserves at their present milling capacity.

We recommended 30 years for the first two New Jersey Zinc projects because they are in the same general area as the West New Market project of American Zinc and one almost adjoins it. We do not know what New Jersey Zinc's reserves at Jefferson City are, but they are obviously quite substantial. American Zinc's new application is in this same area and should be treated the same as the others.

The second pair of New Jersey Zinc applications (DMEA-4153 and 4177) are in an outlying district. Although that Company is now developing a mine and building a mill at Flat Gap, in Hancock County, Tennessee the distance of these new applications from Flat Gap and the absence of railroads makes it seem quite probable that no ore discovered at Independence

or Edison is likely to be developed until enough is discovered to justify a separate mill in that area.

In Virginia, New Jersey Zinc's Denver Creek application (NMA-4176) is in an entirely new area. It is only four miles from a railroad, but is 100 miles by rail from the Company's Ambrosia mill. The other two Virginia areas (NMA-4177 and 4174) proposed by this Company are 6 and 10 miles respectively from the railroad, and 18 and 25 miles from Ambrosia by road and 45 and 80 miles by rail.

It is our opinion that all these Tennessee applications, and probably the Virginia ones (if approved) as well, should be subject to a longer period of repayment than 10 years. We have no way of knowing what a correct period should be, in order to be consistent with contracts in other regions. Sales of crushed and ground limestone as by-products of zinc ore milling should also be subject to royalty repayment.

Robert A. Lorraine
Executive Officer, NMA
Field Team, Region V

V. J. Lynch, Member
Bureau of Mines

RAL/ms
cc:
Gov. Con.-2
Grimsald
Hillegaard,
Lynch
Files

File Copy
Surname
Klugescheid
Selfridge
Yopes
Kiilsgaard

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION 500
WASHINGTON 25, D. C.

FEB 29 1956

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

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe and Smyth Counties, Virginia

Dear Mr. Laurence:

The cited application for exploration assistance is being referred to your office for consideration, a field examination of the property if warranted, and recommendations.

The Applicant has submitted only one bid from diamond drill contractors, and it is necessary to have three bids in these cases.

Copies of memoranda dated February 17 and 21, 1956, by N. E. Nelson, Geological Survey and J. W. Pennington, Bureau of Mines, respectively, relating to the project, are enclosed for your information.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (26B)

Enclosures

WPKlugescheid/er 2/27/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

P. F. Yopes (26B)
Member, Bureau of Mines

Thor H. Kiilsgaard (26B)
Member, Geological Survey

RCS.

File Copy
Surname
Klugescheid
Transmitted
yours
Kiilsgaard
Selfridge
Fejolmer

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

FEB 29 1956

Mr. S. S. Goodwin, Vice President
The New Jersey Zinc Company
160 Front Street
New York 38, New York

Re: Docket No. DMEA-4173 (Zinc)
The New Jersey Zinc Company
James-Woodruff Area
Wythe and Smyth Counties, Virginia

Dear Mr. Goodwin:

Your application for Government assistance to explore the cited property has been reviewed by the Base Metals Division of the Defense Minerals Exploration Administration and has been referred to:

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

If the Field Team requires additional information concerning your application, they will contact your Virginia Field Office at an early date.

Sincerely yours,

C. O. Mittendorf

Administrator

WPKlugescheid/er 2/28/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region V (2)
Chron

P.C.S.

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

RECEIVED

February 21, 1956

Memorandum

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

From: J. W. Pennington, Branch of Base Metals

Subject: Review of application, Docket No. DMEA 4173 (zinc), The New Jersey Zinc Company, James-Woodruff area, Wythe and Smyth Counties, Virginia, $51,889.00

Soil sampling of the area has revealed the presence of zinc anomalies. One of the outcrops contains sphalerite.

It is proposed to explore the area further by 15,000 feet of drilling. Holes will range from 150 to possibly 1,100 feet in depth. The pitch of the ore bodies is unknown and first drilling will be done on the southwest side of the anomalies. If this is unsuccessful, the northeast sides will be explored. Estimated cost of the project is $51,889.00.

Additional exploration of the area appears warranted. However, it is recommended that the application be referred to the Field Team for examination and evaluation.

J. W. Pennington

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

C
O
P
Y

February 20, 1956

Mr. John B. Canada
The New Jersey Zinc Company
160 Front Street
New York 38, New York

Re: Docket Numbers 4177, 4178, 4174 and 4173

Dear Mr. Canada:

This will acknowledge your letter dated February 16, 1956, in which you request that we identify the DMEA docket numbers of the four applications recently filed with this agency.

There are listed below the DMEA docket numbers for the four applications:

4177 - Eidson Area - Sector I, Copper Ridge Belt, Tennessee for $125,000.
4178 - Beaver Creek Area, Virginia for $55,689.
4174 - Porter Ore Bank Area, Virginia for $52,039.
4173 - James-Woodruff Area, Virginia for $51,889.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

REAdams:mm - 2/20/56
Copy to: Mr. Griswold
Mail & Files
Adm. R. File
Chron.

C
O
P
Y

THE NEW JERSEY ZINC COMPANY
160 Front Street
New York 38, N.Y.

February 16, 1956

Mr. Robert E. Adams, Chief
Operations Control and Statistics Division
United States Department of the Interior
Defense Minerals Exploration Administration
Washington 25, D. C.

D.M.E.A. APPLICATIONS
THE NEW JERSEY ZINC COMPANY

Dear Sir:

We received two notifications from your department dated February 15 for D.M.E.A. projects Mos. 7177 and 4178. These refer to two of our applications dated February 13.

On February 13, we sent you four DMEA applications as follows:

1. Eidson Area- Sector I, Copper Ridge Belt, Tennessee for $125,000.
2. Beaver Creek Area, Virginia for $55,680.
3. Porter Ore Bank Area, Virginia for $52,039.
4. James-Woodruff Area, Virginia for $51,889.

Undoubtedly your D.M.E.A. Docket Nos. 4177 and 4178 refer to two of the four foregoing applications, but inasmuch as there is no further identification than the docket numbers, we are unable to determine to which of our applications your D.M.E.A. docket numbers refer.

Will you please further identify as to which of our applications these two docket numbers refer.

Very truly yours,

signed/ John B. Canada

JBC:ahg

John B. Canada
For Manager of Exploration

IN REPLY REFER TO:

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

RECEIVED
FEB 17 1956

February 17, 1956

Re: DMEA 4173
New Jersey Zinc Co.
James-Woodruff area
Wythe & Smythe Cos., Va.
$51,889.00 - Zinc

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 exploring by diamond drilling generally soil-covered areas underlain by beds believed to be zinc-bearing. Extensive geochemical prospecting has shown anomalous conditions in the soil above the projected rock outcrop lines of members of the Shady dolomite formation on the north limb of the Speedwell syncline.

As worked out, the Shady dolomite is a unit of an overthrust block which has a relatively thin slice of Erwin quartzite at its base, resting on the Rome member of the Shady formation. The thrust fault separates the quartzite and the rocks of the Rome member. As inferred the fault dips at about the same angle as the faulted beds, 20-35° southerly.

Two areas of anomalous zinc values as determined by soil analysis are included in the James-Woodruff area and others are in two other 'areas' that are the subject of other applications by New Jersey Zinc Company. Similar structural conditions exist in two areas, but in the third area other formations are met with.

Until otherwise determined, it is assumed the ore bodies will be of the "pencil" type, with a southwest pitch, in the Saccharoidal or Patterson dolomite members of the Shady formation. The drilling plan is based on that assumption as for the initial holes.

The proposed work program consists of:--

Diamond drilling, 15,000 feet at $2.89/ft.	$43,350.00
Supervision and technical services	6,800.00
Miscellaneous, supplies, etc.	1,739.00
Total	$51,889.00

Except for the inferred ore bodies, believed to be down dip of the areas showing anomalous soil zinc values, no targets are offered. To that extent the work is prospecting rather than exploration.

Referral to the Field Team for appropriate action is recommended.

N. E. Nelson

N. E. Nelson

February 14, 1956
Subject: DMEA-4173
Re: Exploration Assistance

New Jersey Zinc Company
160 Front Street
New York 38, New York

Gentlemen:

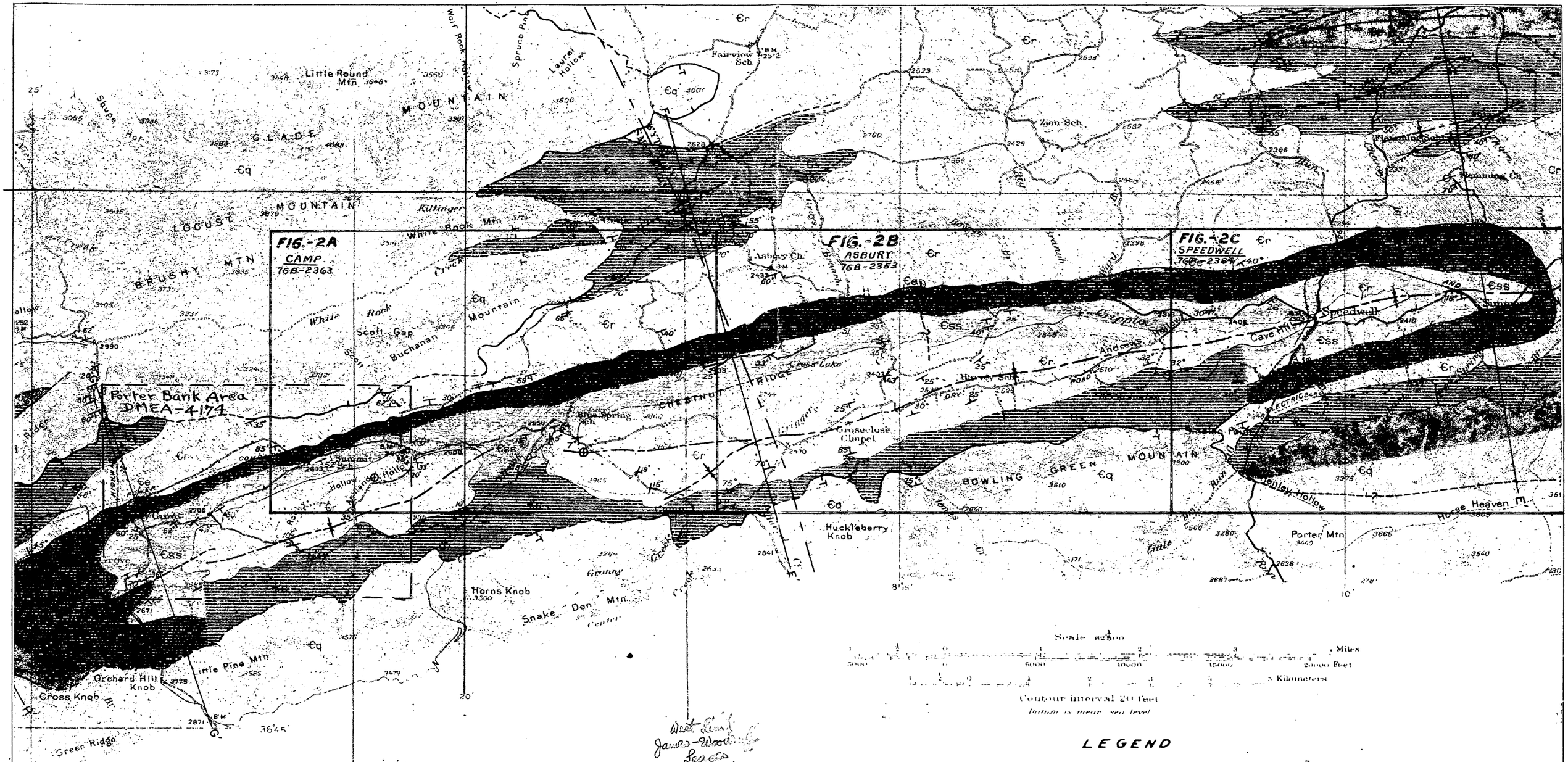
The receipt of your application dated February 13, 1956, for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-4173 and referred to the Base Metals Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division



PORTION OF MAP FROM L. W. CURRIER (1935)
GEOLOGIC MAP AND INTERPRETIVE CROSS SECTIONS
FROM REPORT "ZINC AND LEAD REGION OF SOUTHWESTERN
VIRGINIA", BULL. 43, VIRGINIA GEOL. SURVEY

LEGEND

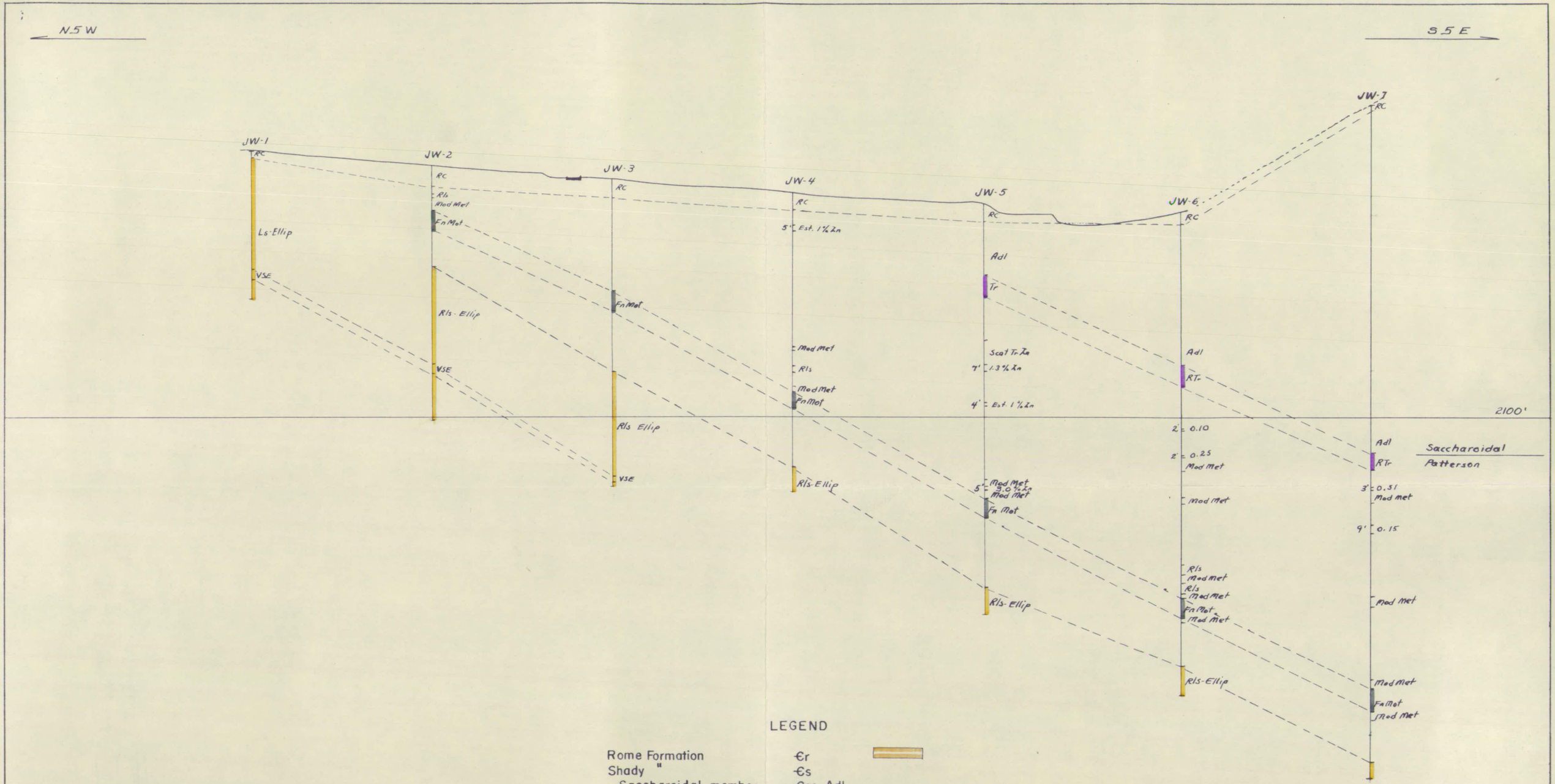
Єr	ROME FORMATION		LOWER CAMBRIAN
Єs	SHADY FORMATION	Єss SACCHAROIDAL DOL.	
		Єsp PATTERSON Ls	
Єq	CAMBRIAN QUARTZITE	Єc ERWIN Qtzt	
		Єh HAMPTON Sh	

Fig-2A AREA OF COVERAGE AND FIGURE NUMBER OF QUADRANGLE SHEET

DMEA-4173. FIG.-1

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN TRACED	DATE 1/30/56 SCALE 1/62500	INDEX GEOLOGIC MAP SPEEDWELL SYNCLINE

DISTRICT JAMES-WOODRUFF
FILE NO. 7GB-2961
THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK, N.Y.



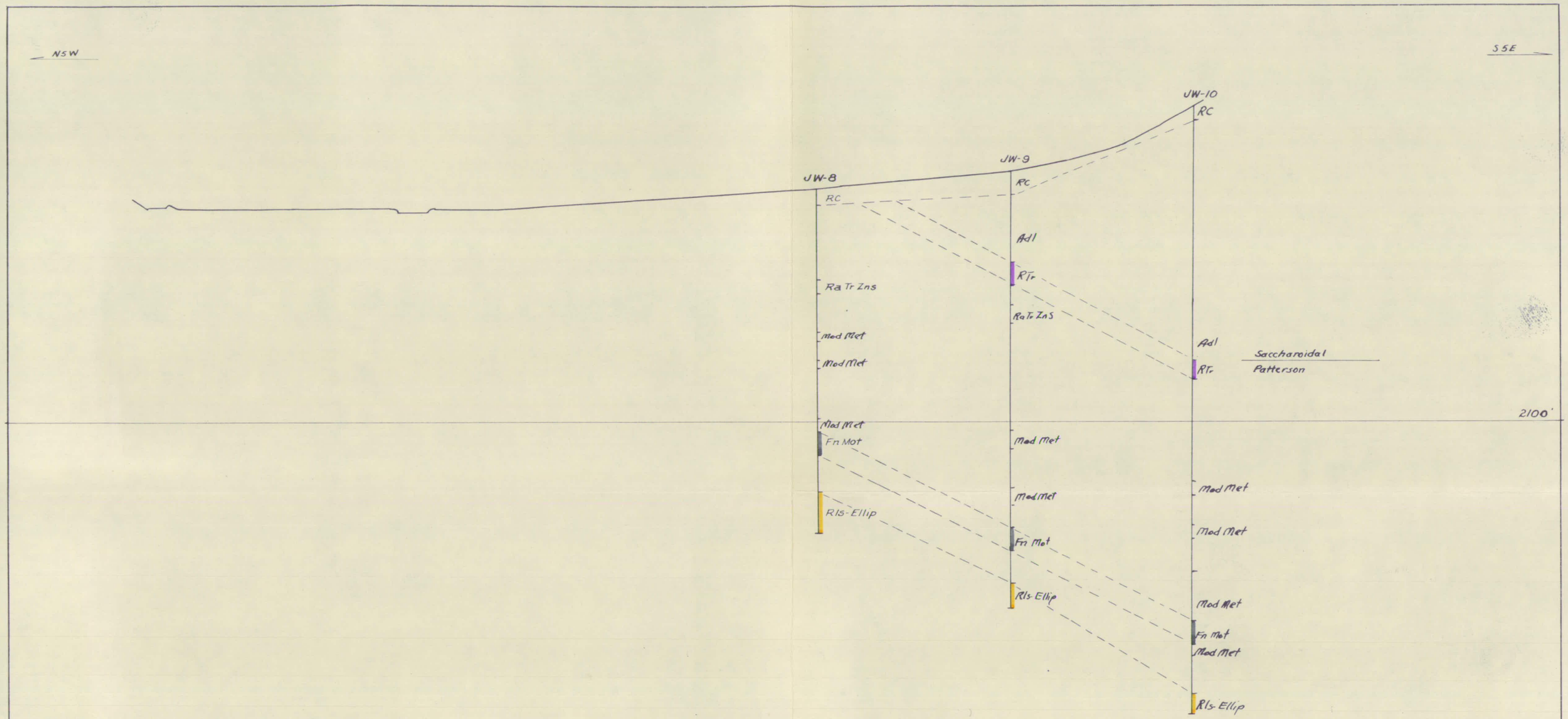
LEGEND

Rome Formation	€r	
Shady "	€s	
Saccharoidal member	€ss, Adl	
Parting Shale	Pt Sh	
Light Gray	LGy	
Patterson member	€sp, Rdl	
Transition zone	RTr	
Faintly Mottled zone	Fn Mot	
Ellipsoidal zone	Ellip	
Fault Zone	FaZo	

Note– Rock is dolomite except as noted

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY	DRAWN R.C.G. DATE 1/9/57 TRACED SCALE 1"=100'	GEOLOGIC SECTION # I JAMES-WOODRUFF AREA # I	DISTRICT WYTHE COUNTY, VA. FILE NO. 7GB-4272

X 5407 B 1M 3-53



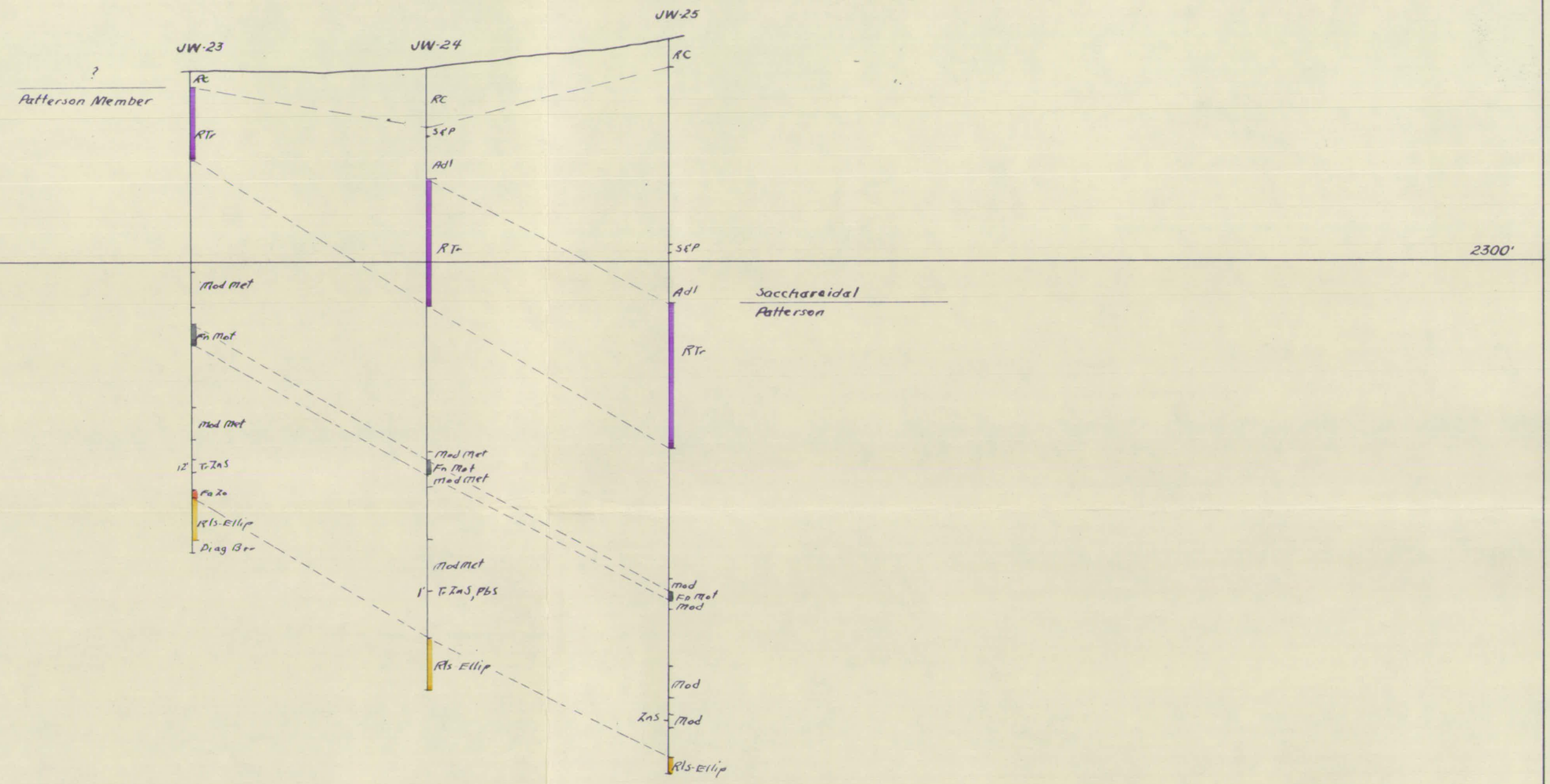
LEGEND

Rome Formation	Ꞓr	
Shady "	Ꞓs	
Saccharoidal member	Ꞓss, Adl	
Parting Shale	Pt Sh	
Light Gray	LGy	
Patterson member	Ꞓsp, Rdl	
Transition zone	RTr	
Faintly Mottled zone	Fn Mot	
Ellipsoidal zone	Ellip	
Fault Zone	Fa Zo	

Note- Rock is dolomite except as noted.

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY	DRAWN R.C.G. DATE 4-10-57 TRACED SCALE 1" = 100'	GEOLOGIC SECTION II JAMES-WOODRUFF AREA I	DISTRICT WYTHE CO., VA FILE NO. 7GB-4288

X 5407 B 1M 3-53



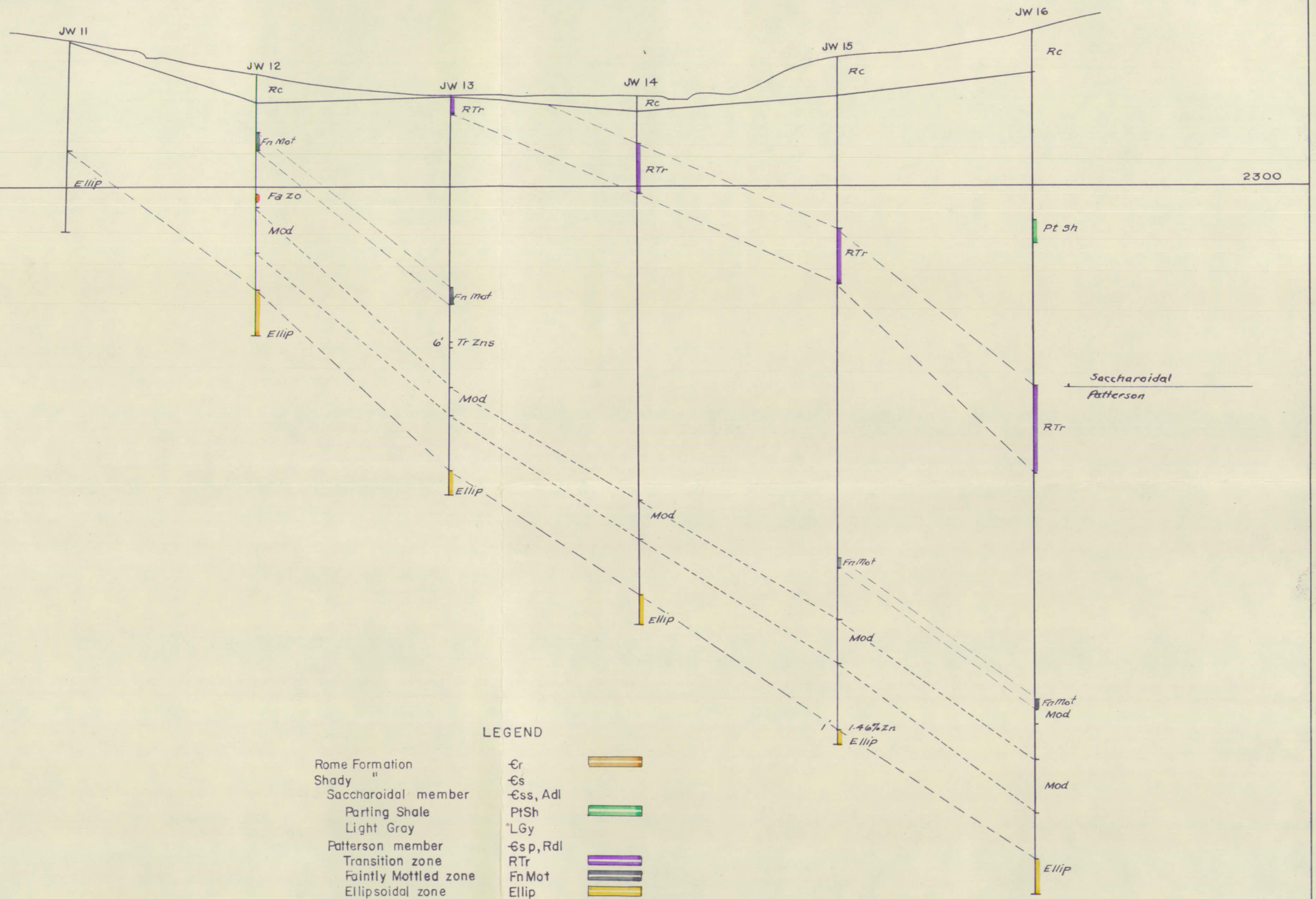
LEGEND

Rome Formation	Ꞓr	
Shady "	Ꞓs	
Saccharoidal member	Ꞓss, Adl	
Parting Shale	PtSh	
Light Gray	LGy	
Patterson member	Ꞓsp, Rdl	
Transition zone	RTr	
Faintly Mottled zone	FnMot	
Ellipsoidal zone	Ellip	
Fault Zone	FaZo	

Note- Rock is dolomite except as noted

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN R.C.G. DATE 12-16-57 TRACED SCALE 1"=100'	GEOLOGIC SECTION III JAMES-WOODRUFF AREA II
			DISTRICT SMYTH-WYTHE COS., VA. FILE NO. 7GB-4360

X 5407 B 1M 3-53



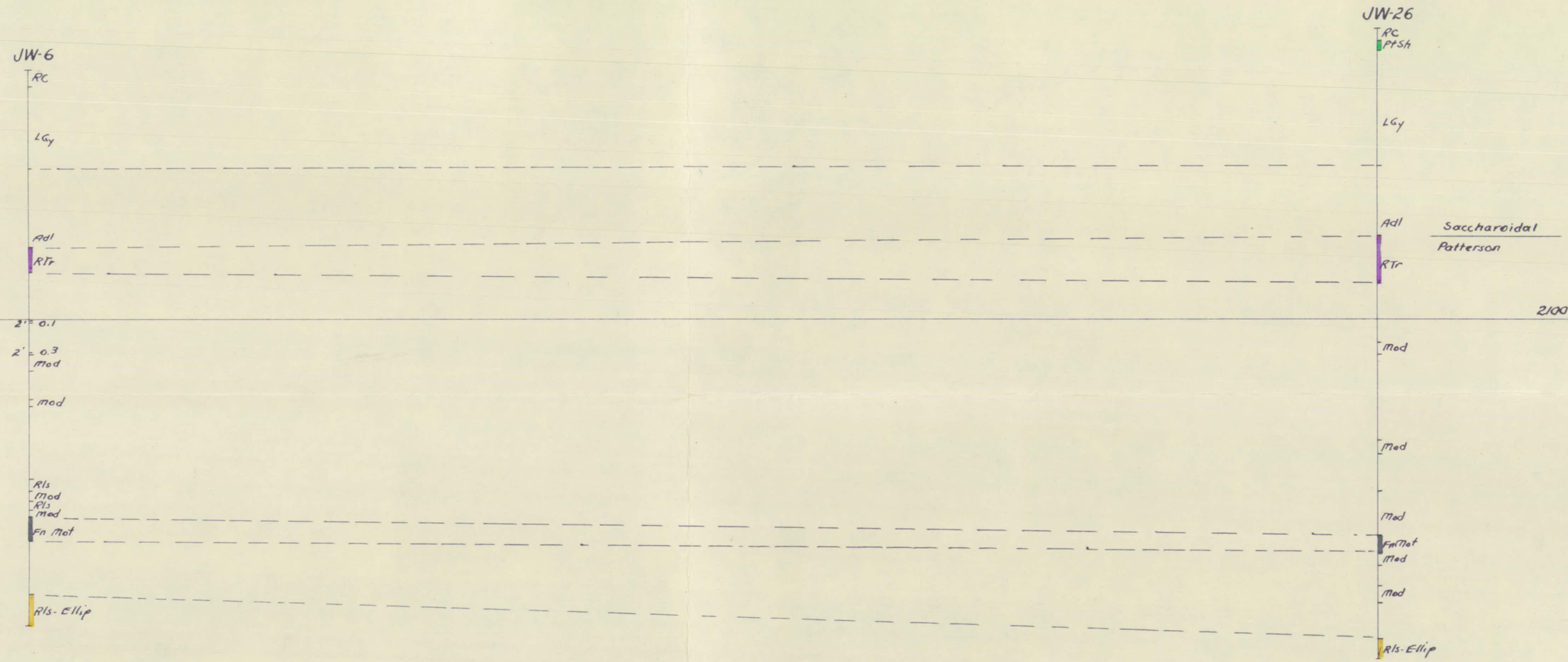
LEGEND

Rome Formation	Ꞓr	
Shady "	Ꞓs	
Saccharoidal member	Ꞓss, Adl	
Parting Shale	PtSh	
Light Gray	LGy	
Patterson member	Ꞓsp, Rdl	
Transition zone	RTr	
Faintly Mottled zone	Fn Mot	
Ellipsoidal zone	Ellip	
Fault Zone	Fa Zo	

Note - Rock is dolomite except as noted

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN R.C.G. DATE 8-23-57 TRACED E.E.F. SCALE 1"=100'	GEOLOGIC SECTION I JAMES—WOODRUFF AREA II	DISTRICT WYTHE COUNTY, VA. FILE NO. 7GB-4357

X 5407 B 1M 3-53



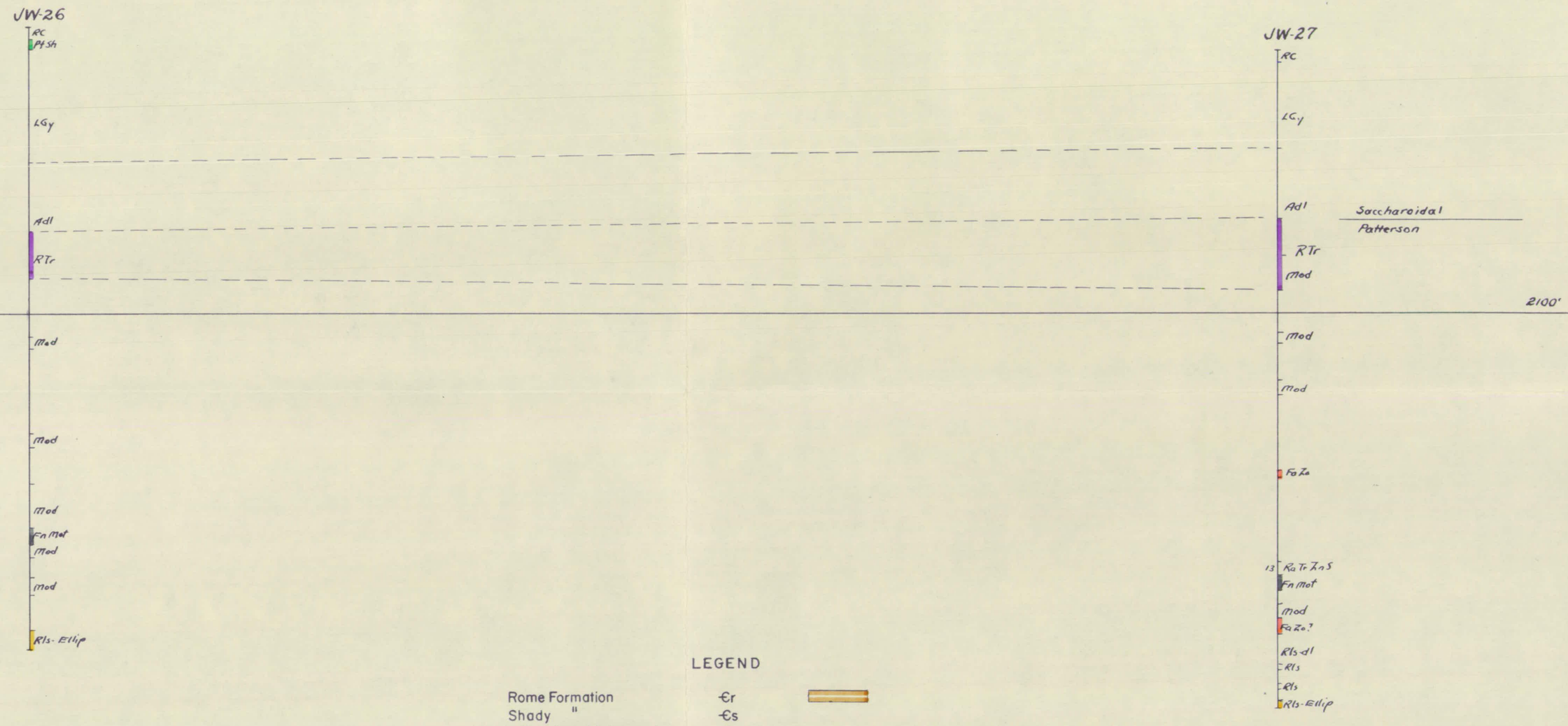
LEGEND

Rome Formation	Ꞓr	
Shady "	Ꞓs	
Saccharoidal member	Ꞓss, Adl	
Parting Shale	PtSh	
Light Gray	LGy	
Patterson member	Ꞓsp, Rdl	
Transition zone	RTr	
Faintly Mottled zone	Fn Mot	
Ellipsoidal zone	Ellip	
Fault Zone	FaZo	

Note-Rock is dolomite except as noted.

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN R.C.G. DATE 2-28-58 TRACED SCALE 1"=100'	LONGITUDINAL SECTION II JAMES-WOODRUFF AREA I	DISTRICT WYTHE-SMYTH COs., VA. FILE NO. 7GB-4358

X 5407 B 1M 3-53



LEGEND

Rome Formation	Ꞓr	
Shady "	Ꞓs	
Saccharoidal member	Ꞓss, Adl	
Parting Shale	PtSh	
Light Gray	LGy	
Patterson member	Ꞓsp, Rdl	
Transition zone	RTr	
Faintly Mottled	FnMot	
Ellipsoidal zone	Ellip	
Fault Zone	FaZo	

Note: Rock is dolomite except as noted.

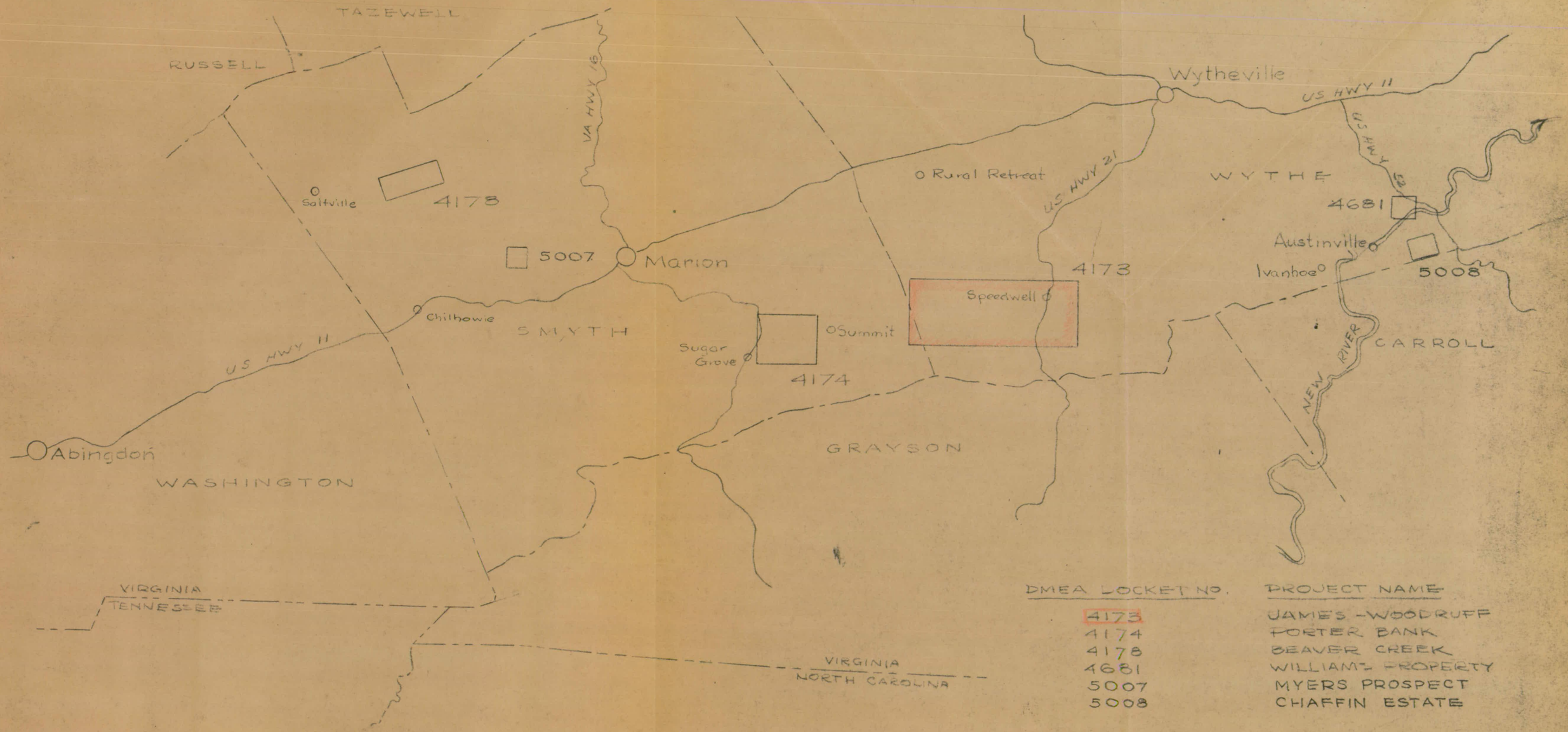
POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN R.C.G. DATE 3-3-58 TRACED SCALE 1"=100'	LONGITUDINAL SECTION I JAMES-WOODRUFF AREA I	DISTRICT WYTHE-SMYTH COs., VA. FILE NO. 7GB-4359

X 8407 B 1M 3-53

FIGURE 1

DMEA ZINC PROJECTS IN SOUTHWEST VIRGINIA

SCALE 1/250,000



DMEA DOCKET NO.	PROJECT NAME
4173	JAMES-WOODRUFF
4174	PORTER BANK
4178	BEAVER CREEK
4681	WILLIAMS PROPERTY
5007	MYERS PROSPECT
5008	CHAFFIN ESTATE

HW-4/57

FIGURE 3

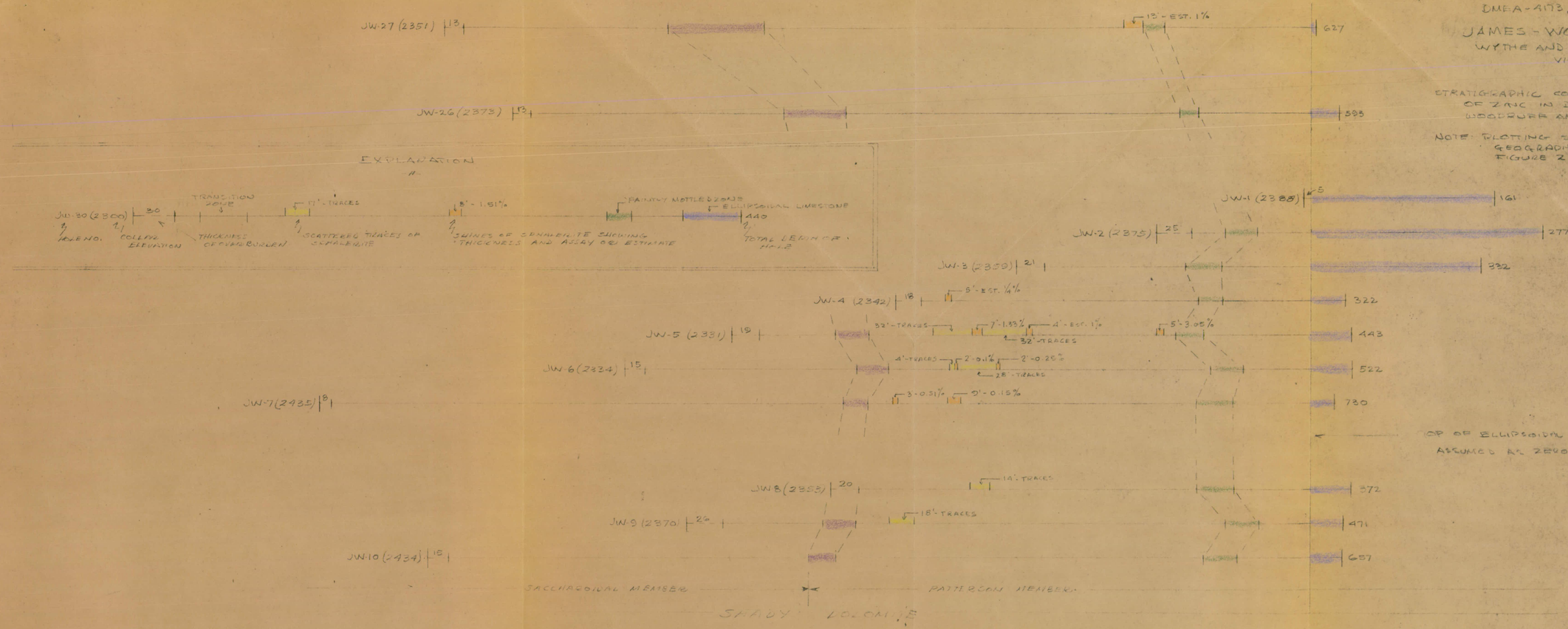
DMEA-4173, Idm-E970 (ZINC)

JAMES - WOODRUFF AREA

WYTHE AND SMYTH COUNTIES
VIRGINIA

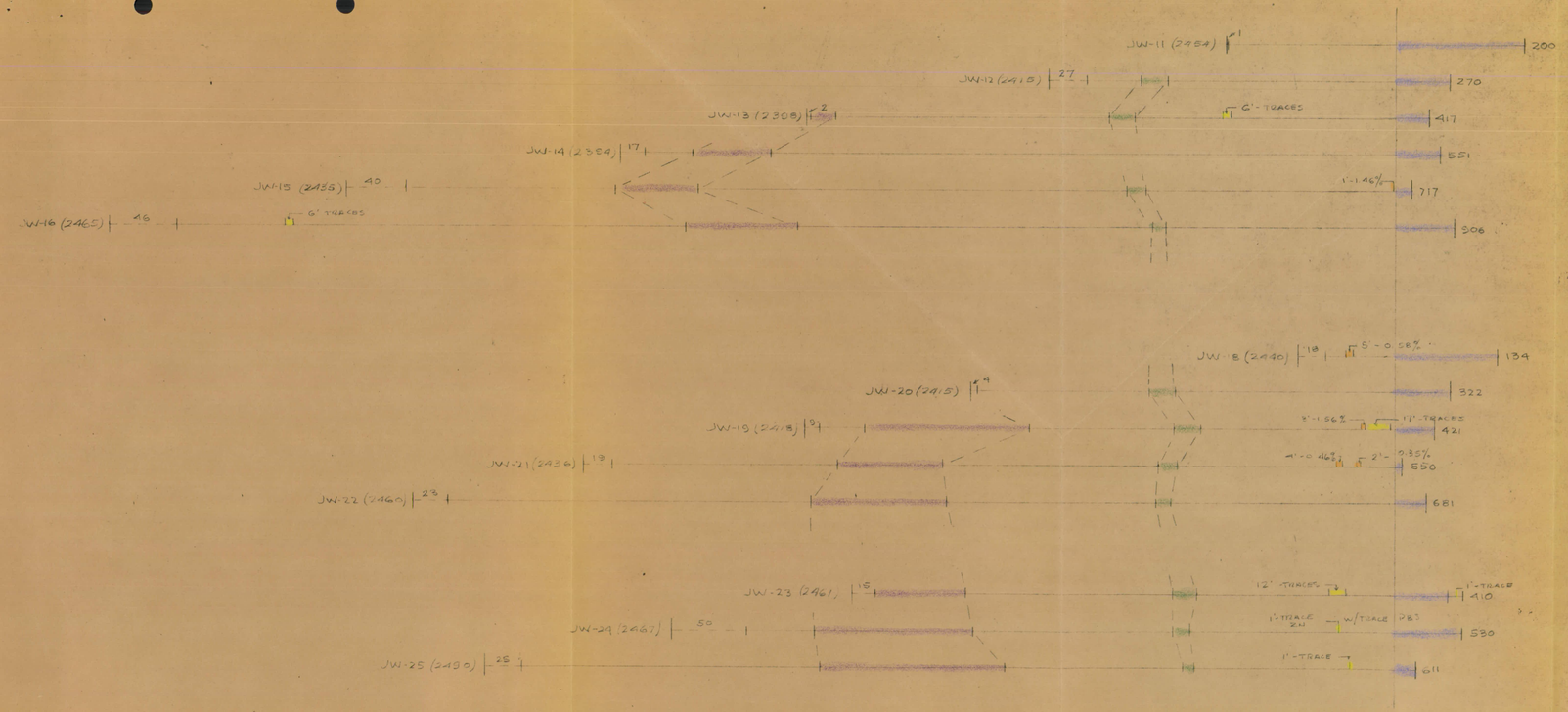
STRATIGRAPHIC CORRELATION AND OCCURRENCES OF ZINC IN DIAMOND-DRILL HOLES OF THE WOODRUFF ANOMALY AREA.

NOTE: PLOTTING SCALE IS 1" = 50'; FOR GEOGRAPHIC LOCATION SEE FIGURE 2



NW-1/59

FIGURE 4



EXPLANATION

FOR EXPLANATION OF SYMBOLS AND COLORS SEE FIGURE 2

PLOTTING SCALE 1" = 50'

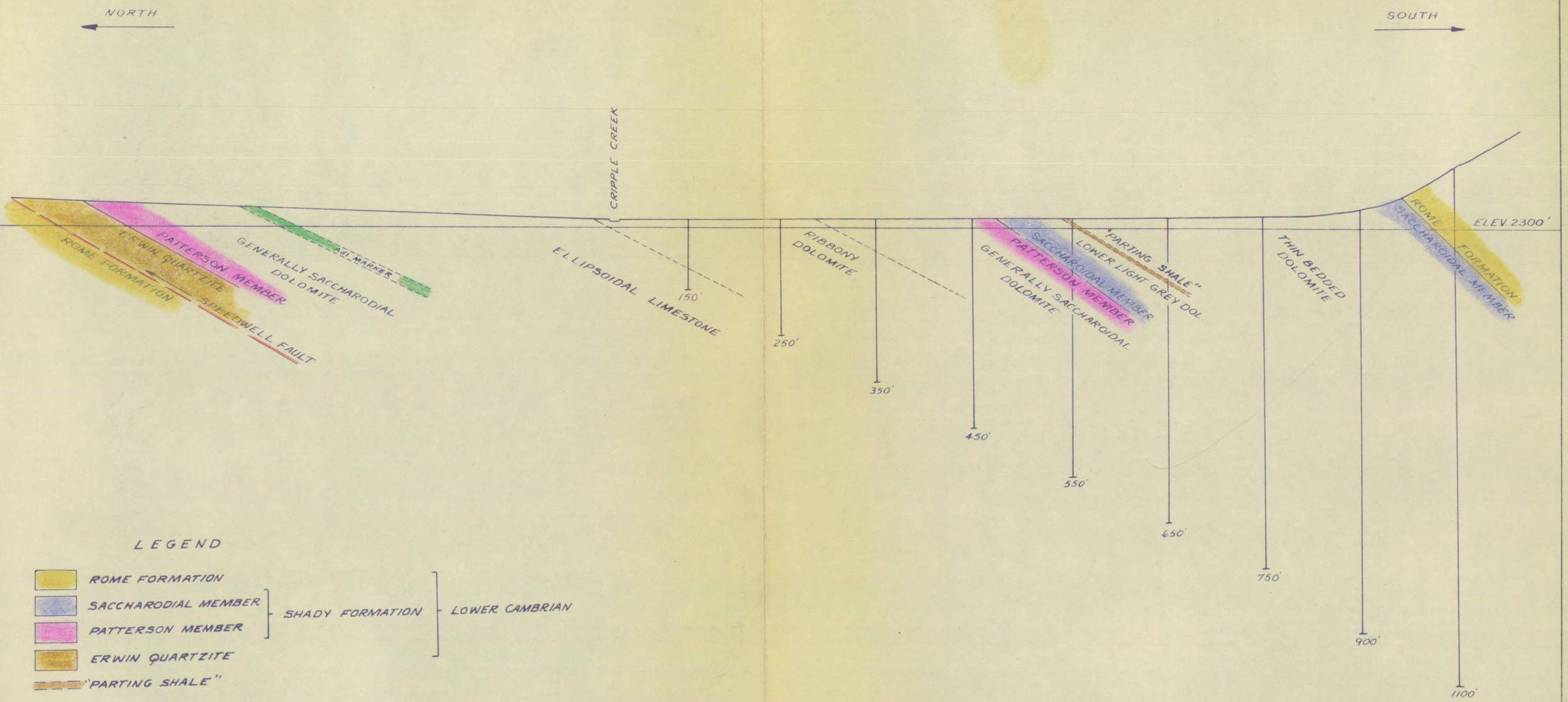
TOP OF ELLIPSOIDAL ASSUMED AS ZERO DATUM

DMEA-417?, Idaho 570 (ZINC)

JAMES-WOODRUFF AREA
WYTHE AND SMYTH COUNTIES
VIRGINIA

STRATIGRAPHIC CORRELATION AND OCCURRENCES OF ZINC IN DIAMOND-DRILL HOLES OF THE JAMES ANOMALY AREA

H-3221/59



LEGEND

- ROME FORMATION
- SACCHARODIAL MEMBER
- PATTERSON MEMBER
- ERWIN QUARTZITE
- "PARTING SHALE"
- "adl" MARKER
- SPEEDWELL FAULT

(SACCHARODIAL MEMBER, PATTERSON MEMBER, ERWIN QUARTZITE: SHADY FORMATION — LOWER CAMBRIAN)

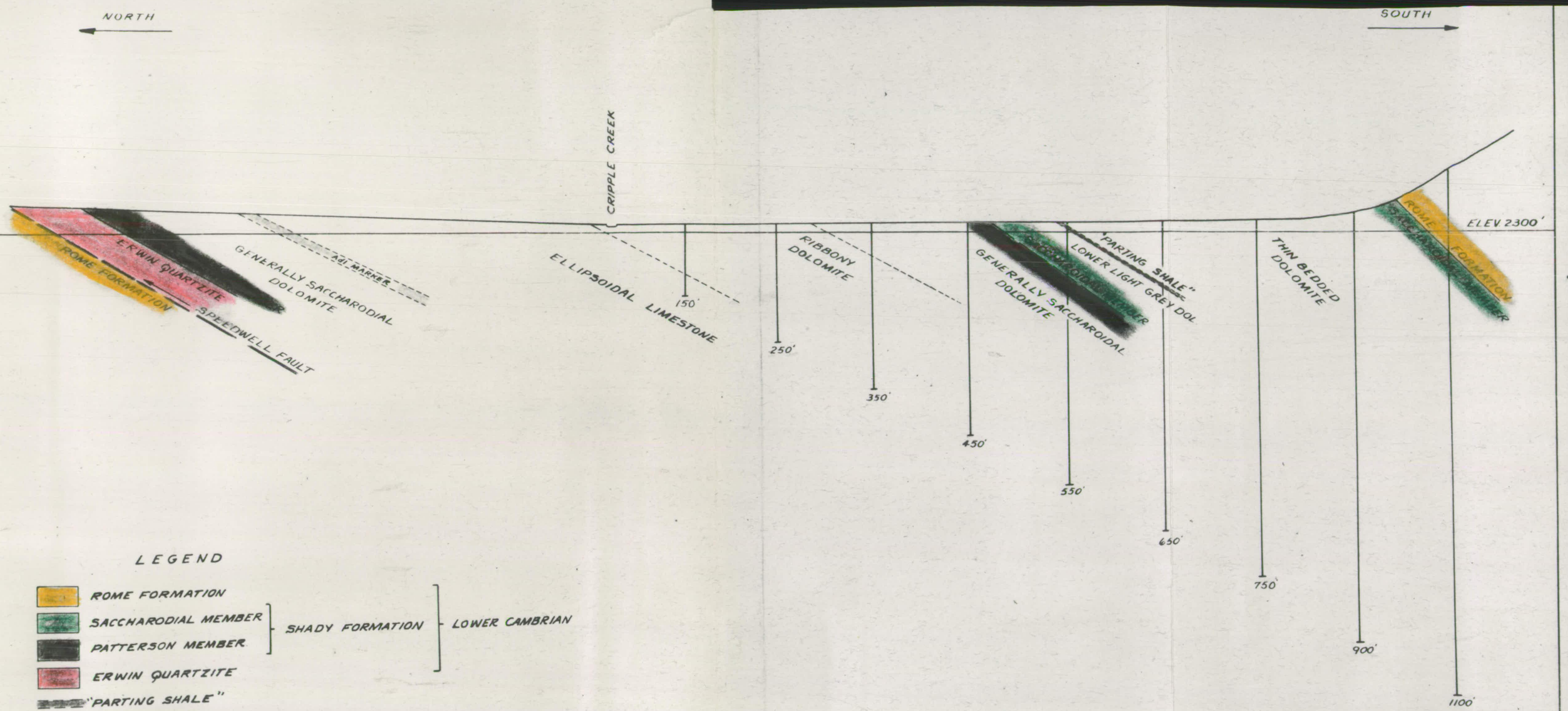
DMEA-4173. FIG. 3

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN D.K.L. DATE 1/30/56 TRACED E.E.F. SCALE 1"=200'	GENERALIZED CROSS SECTION AND PROPOSED DRILLING PATTERN	DISTRICT JAMES-WOODRUFF AREA FILE NO. 7GB-2962

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

Full Size

5407 B 1M 3-53



LEGEND

- ROME FORMATION
- SACCHARODIAL MEMBER } SHADY FORMATION } LOWER CAMBRIAN
- PATTERSON MEMBER
- ERWIN QUARTZITE
- "PARTING SHALE"
- "Adl" MARKER
- SPEEDWELL FAULT

DMEA-4173. FIG. 3

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN D.K.L. DATE 1/30/56 TRACED E.E.F. SCALE 1" = 200'	GENERALIZED CROSS SECTION AND PROPOSED DRILLING PATTERN	DISTRICT JAMES-WOODRUFF AREA THE NEW JERSEY ZINC COMPANY 76B 2962 160 FRONT ST., NEW YORK N. Y. 5407 B 1M 3-53

Full Size

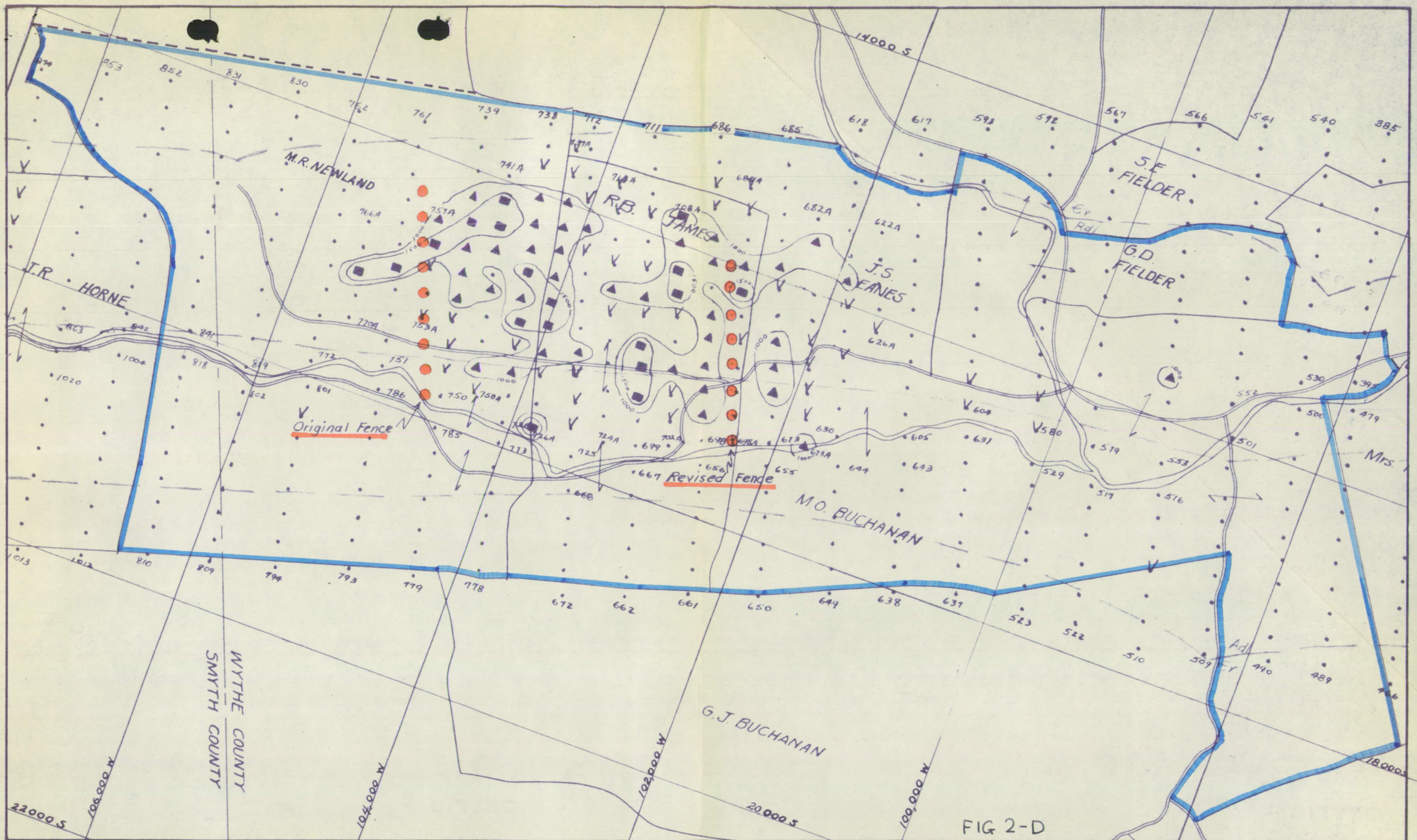
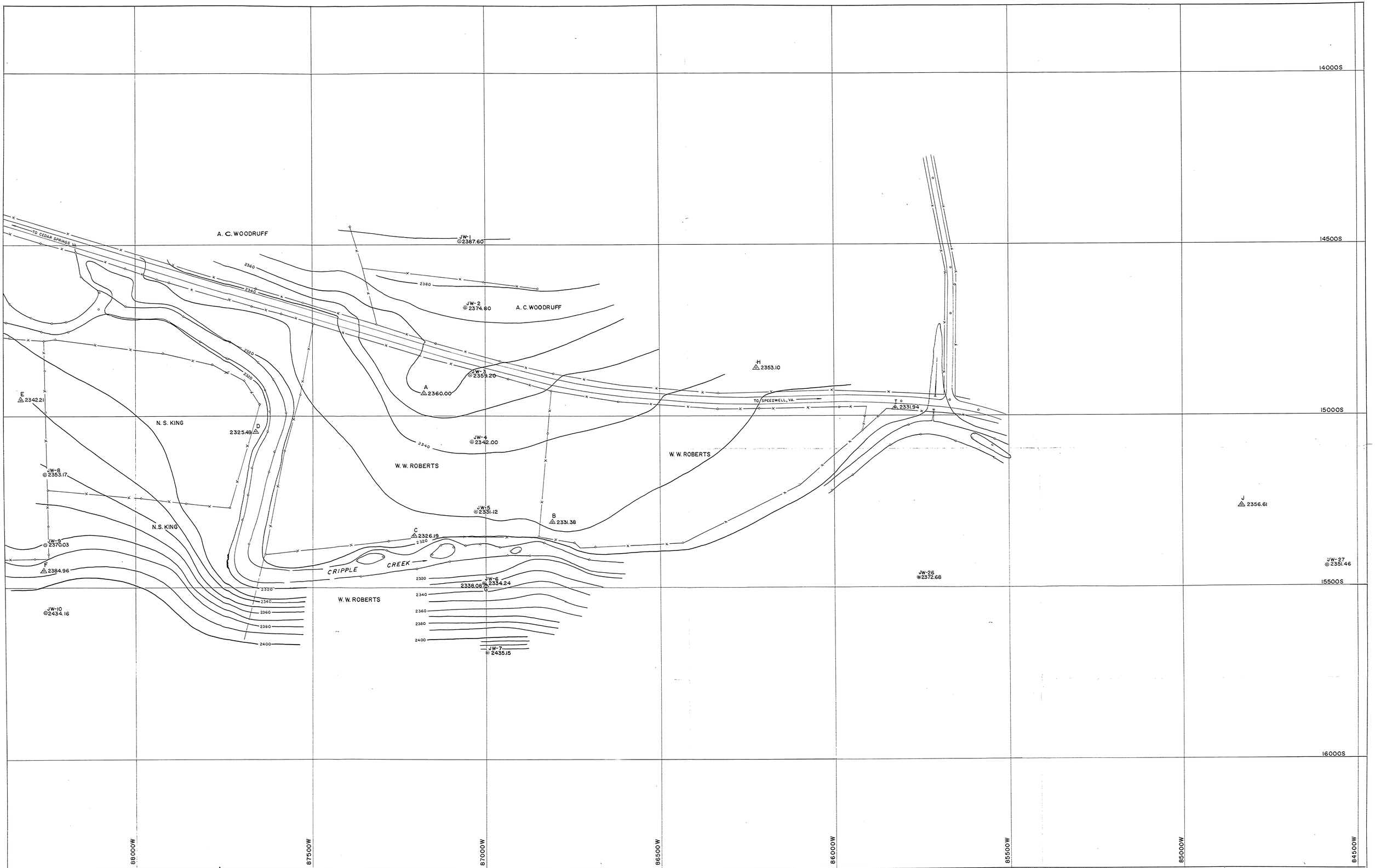
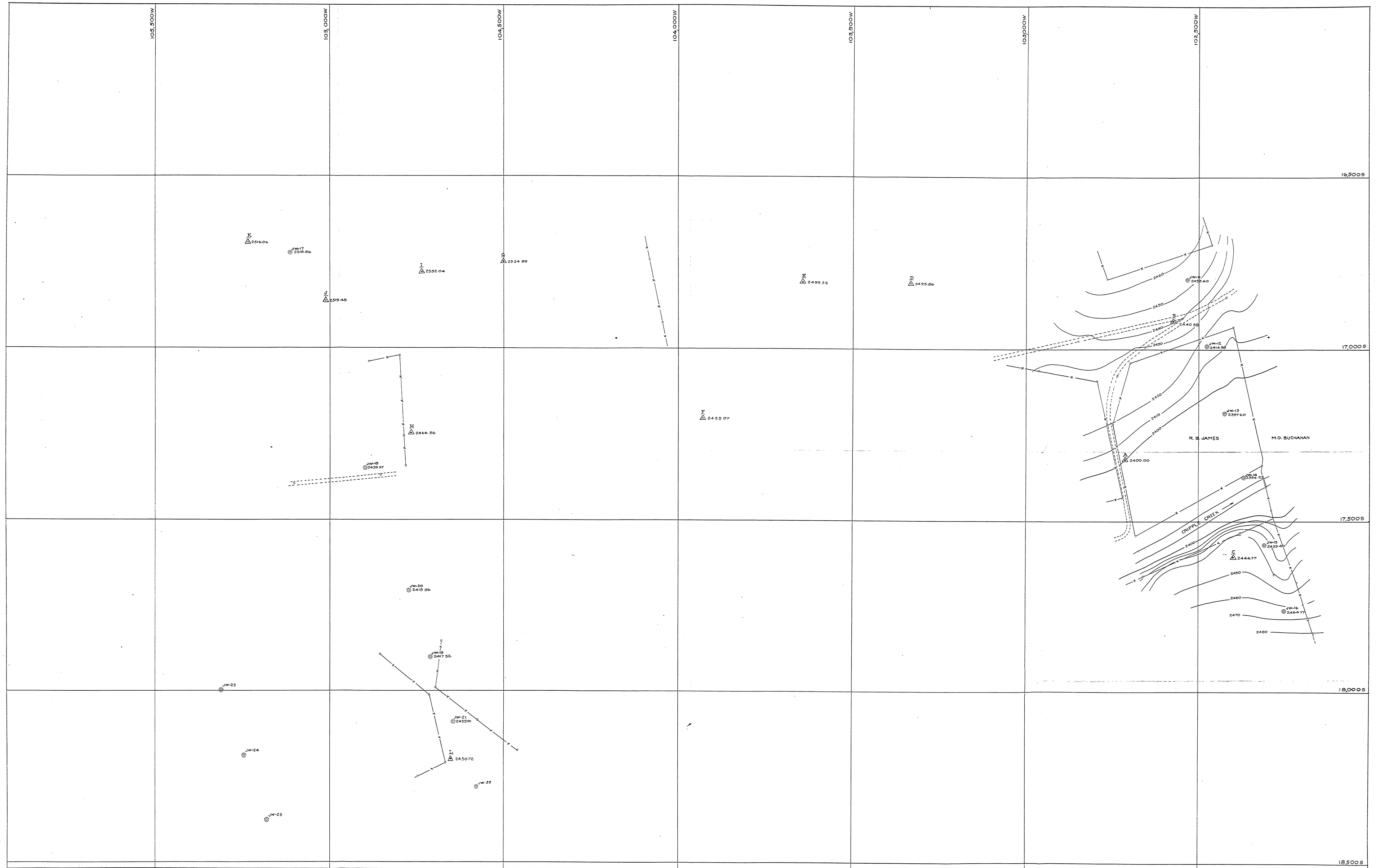


FIG 2-D

	3-25-57	REVISED PROPERTY MAP	SMYTH-WYTHE Cos., VA.
R.C.G.	1"=660'	JAMES-WOODRUFF AREA II	From TGB 2353



POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN E.E.F. TRACED E.E.F.	DATE 5-8-57 SCALE 1" = 100'	JAMES—WOODRUFF AREA I	DISTRICT WYTHE COUNTY, VA. FILE NO. 7GB-4284



POSTED TO DATE	THE NEW JERSEY ZINC COMPANY *AUSTINVILLE, VA*	DRAWN TRACED E.E.F	DATE 6-19-57 SCALE 1" = 100'	JAMES — WOODRUFF AREA II	DISTRICT WYTHE COUNTY, VA. FILE NO. 7GB-4355

FIG-2B

POSTED TO DATE
6/9/53 DKL
9/22/53 DKL

Ref. Photos TVA 223-6-1 A+B
223-7-1 A,B,C+D
223-7-3 C+D

THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK. ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED. THIS DRAWING MUST BE RETURNED TO BERTHA MINERAL DIVISION, THE NEW JERSEY ZINC COMPANY, AUSTINVILLE, VA.

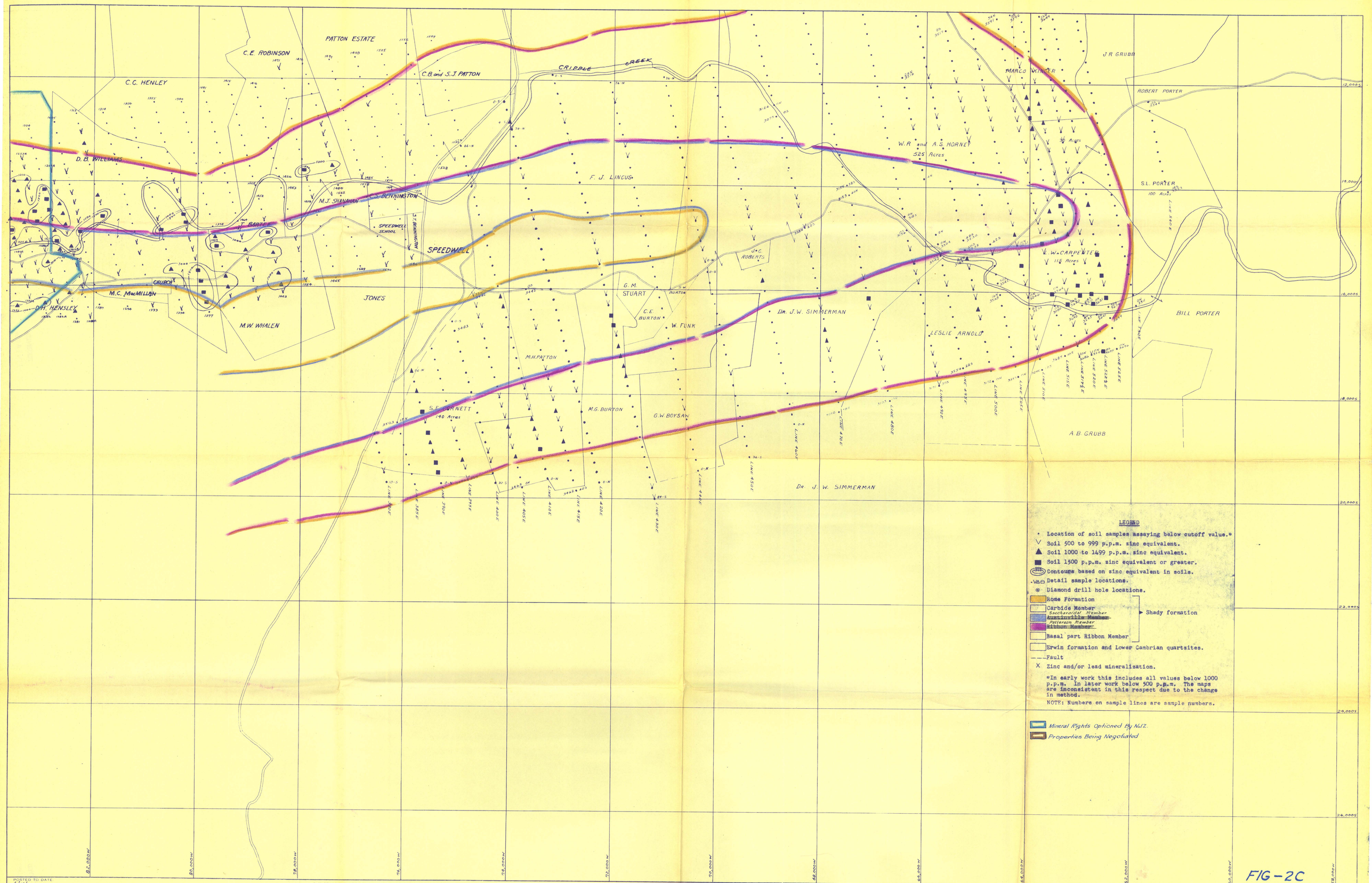
BERTHA MINERAL DIVISION
THE NEW JERSEY ZINC CO.
AUSTINVILLE, VA.

DRAWN DKL
TRACED
DATE 3/12/53
SCALE 1" = 660'

ASBURY AREA, WYTHE COUNTY, VA.
GEOCHEMISTRY

DMEA-4173.
FILE NO. 7GB-2353 1/2

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N.Y.



PORTED TO DATE 6/19/53 O.K.L.

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BERTHA MINERAL DIVISION
THE NEW JERSEY ZINC CO.
AUSTINVILLE, VA.

DRAWN [illegible] DATE 5/20/53
TRACED SCALE 1" = 660'

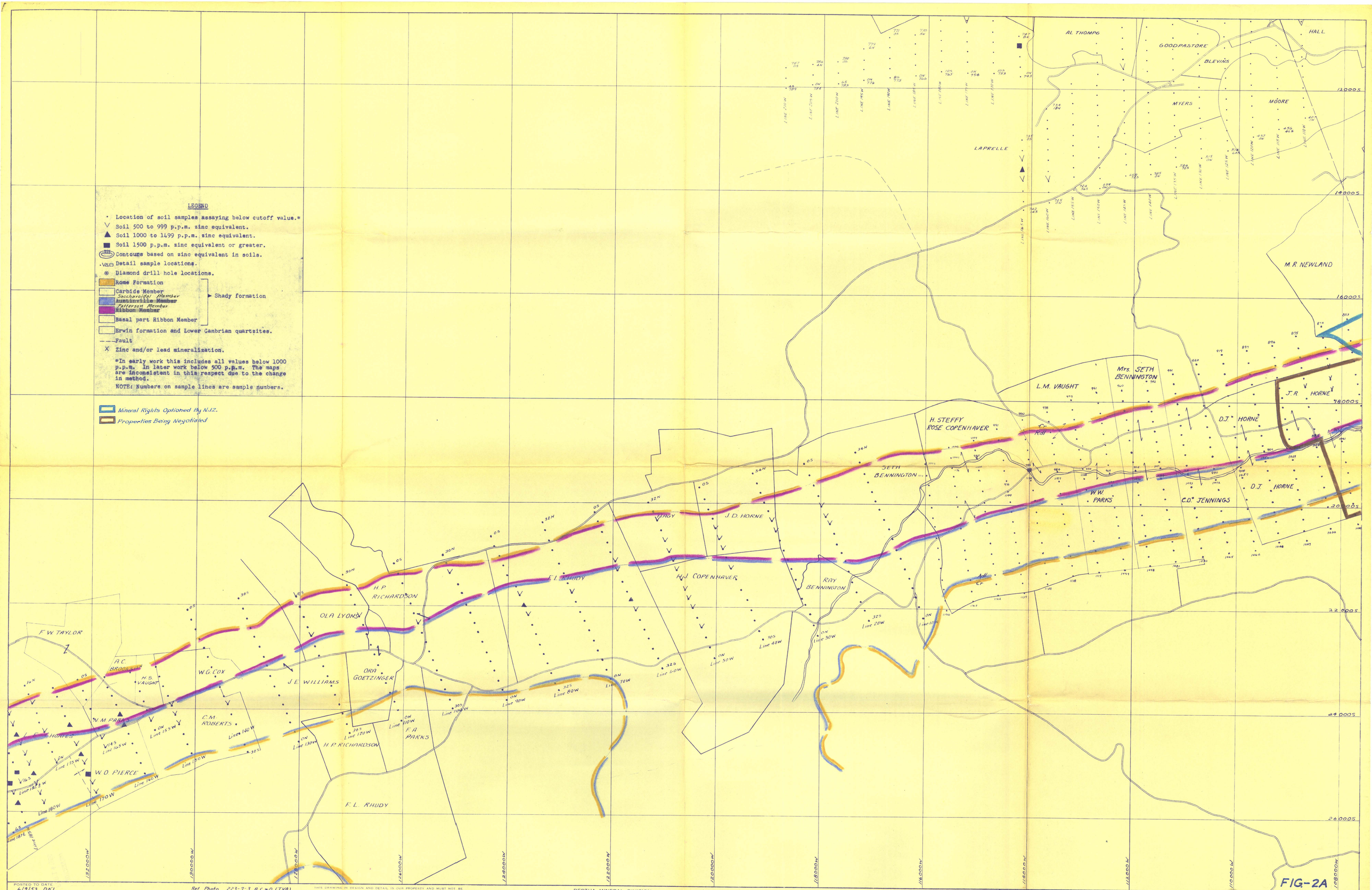
SPEEDWELL AREA, WYTHE COUNTY, VA.

FIG-2C

DMEA-4173.

FILE NO. 7GB-2384 1/2

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N.Y.



POSTED TO DATE 6/9/53 DKL

Ref. Photo 223-7-3 B,C,+D (TVA)
223-7-4 ABCEFIG

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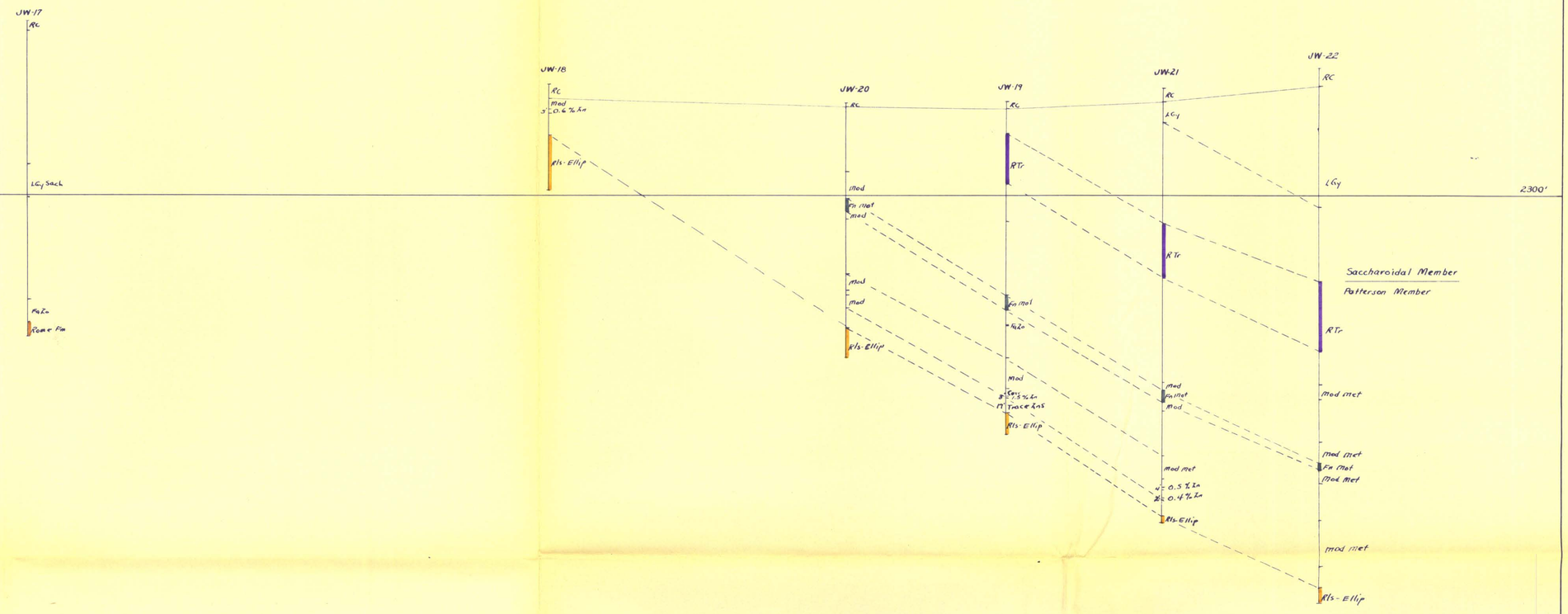
BERTHA MINERAL DIVISION
THE NEW JERSEY ZINC CO.
AUSTINVILLE, VA.

DRAWN DKL
TRACED
DATE 3/12/53
SCALE 1" = 660'

CAMP AREA, SMYTH COUNTY, VA.
GEOCHEMISTRY

FIG-2A
DMEA-4173.
FILE NO. 76B-2363 1/2

HOWARD SUTTON CO., INC., N. Y.
THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.



LEGEND

Rome Formation	Ꞓr	
Shady "	Ꞓs	
Saccharoidal member	Ꞓss, Adl	
Parting Shale	PtSh	
Light Gray	LGy	
Patterson member	**Ꞓsp, Rdl**	
Transition zone	RTr	
Faintly Mottled zone	Fn Mot	
Ellipsoidal zone	Ellip	
Fault Zone	FaZo	

Note—Rock is dolomite except as noted.

POSTED TO DATE	THE NEW JERSEY ZINC COMPANY AUSTINVILLE, VA.	DRAWN RCG. DATE 10-2-57 TRACED SCALE 1"=100'	GEOLOGIC SECTION II JAMES-WOODRUFF AREA II

DISTRICT SMYTH-WYTHE COUNTIES, VIRGINIA

FILE NO. 7GB-4356

X8407A 1M 3-53

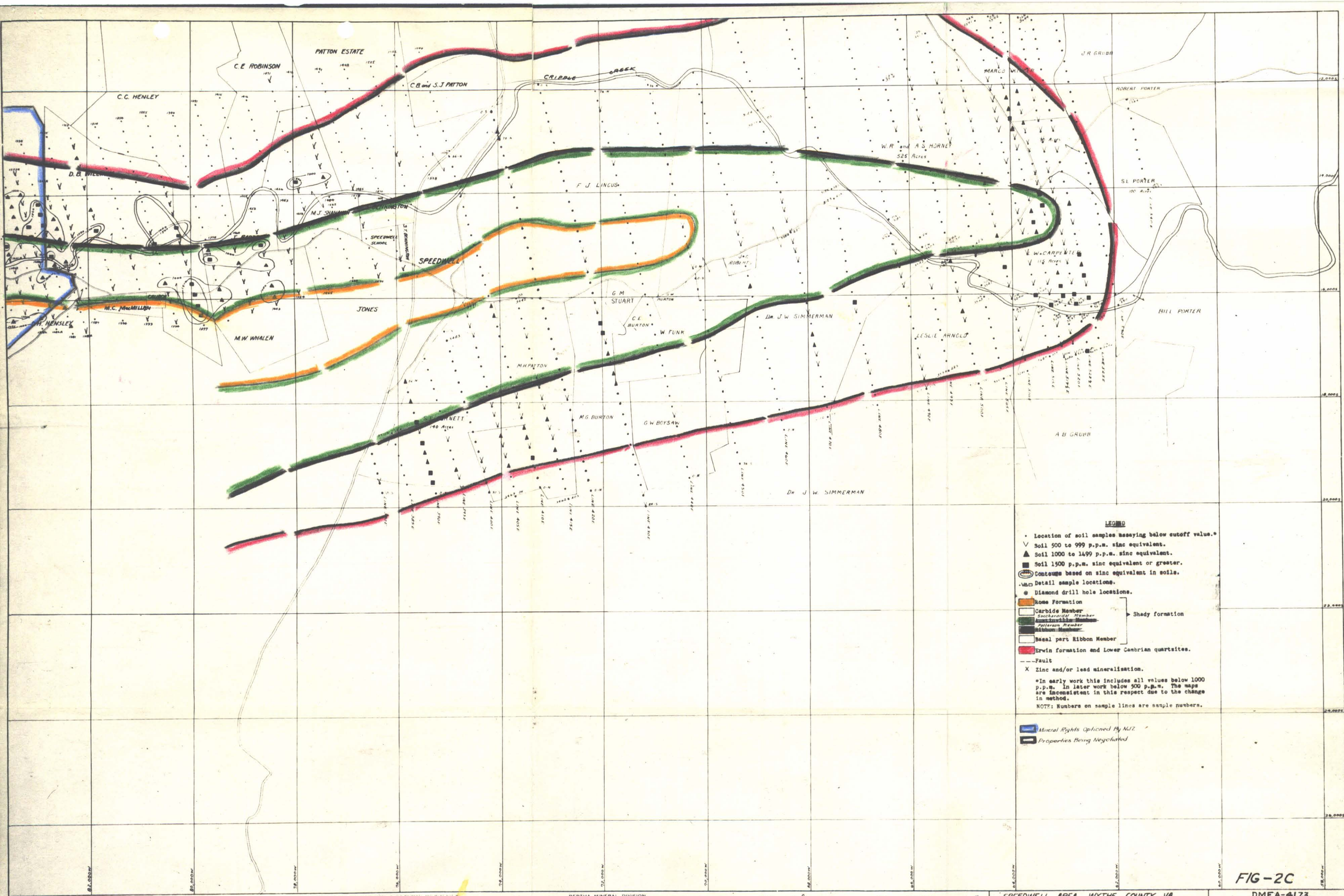


FIG-2C

POSTED TO DATE 6/19/53 D.K.L.

BERTHA MINERAL DIVISION
THE NEW JERSEY ZINC CO.
AUSTINVILLE, VA.

DRAWN
TRACED
DATE 5/20/53
SCALE 1" = 660'

SPEEDWELL AREA, WYTHE COUNTY, VA.

DMEA-4173.
FILE NO. 76B-2384 1/4

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N. Y.

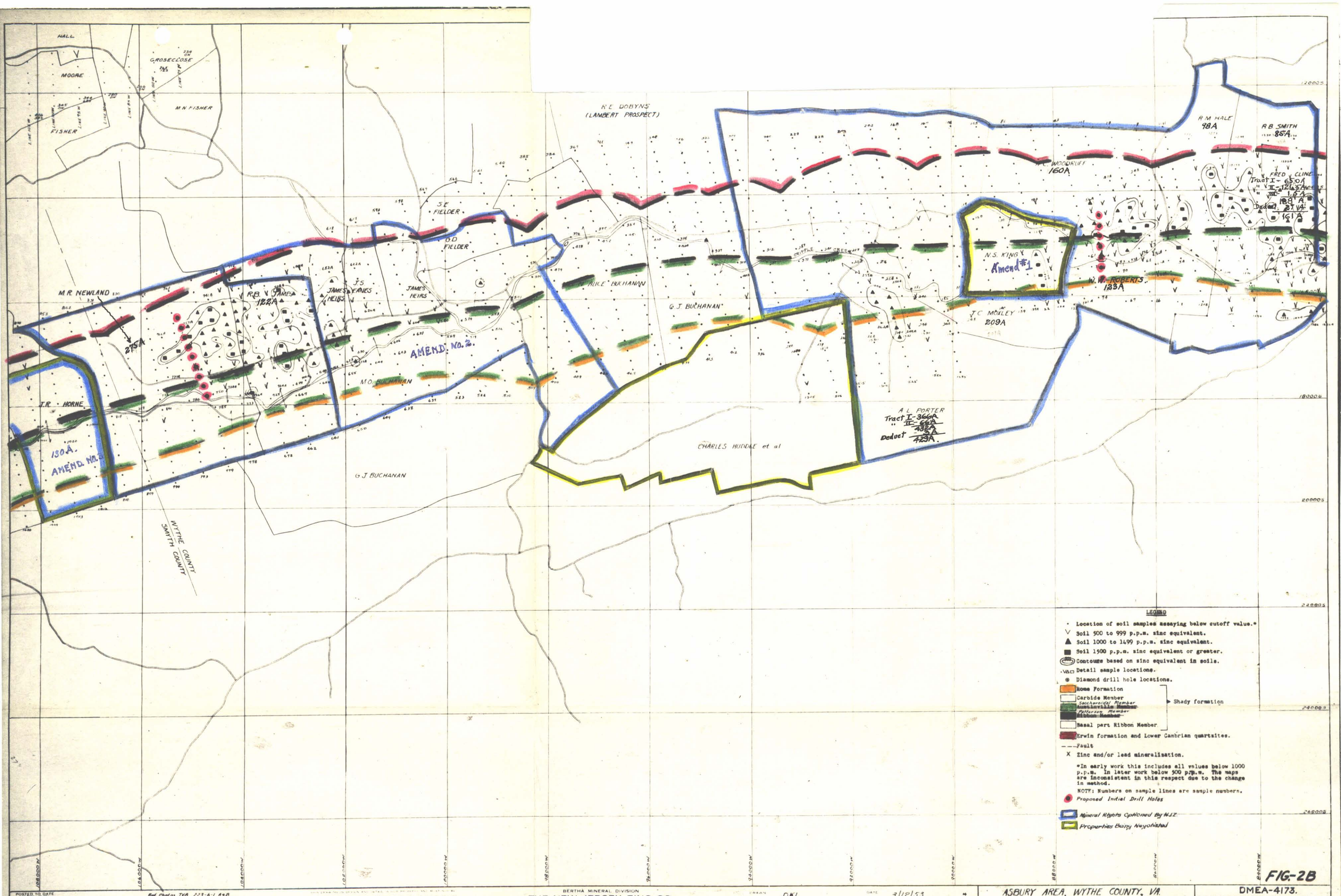
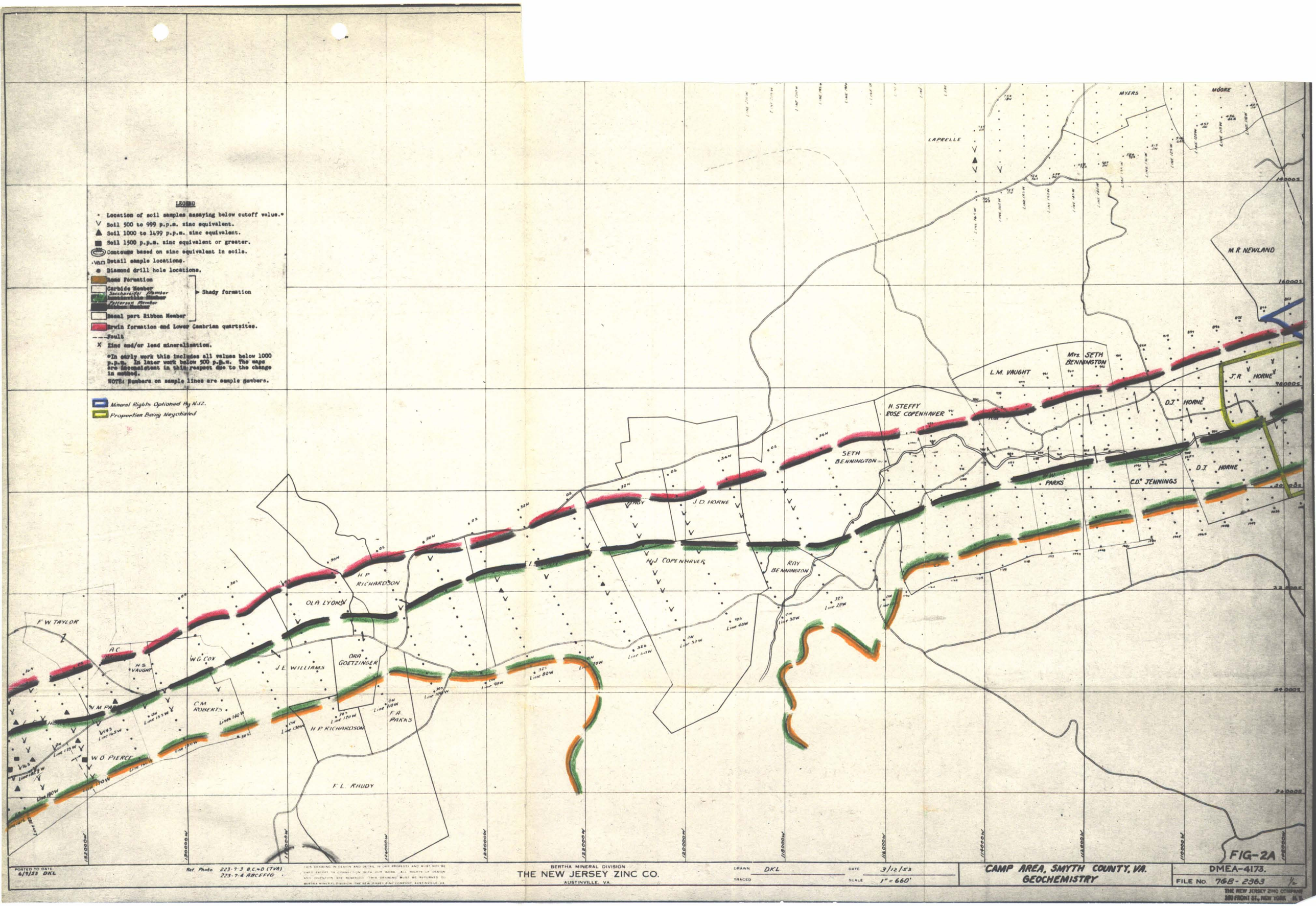


FIG-2B

POSTED TO DATE 6/9/55 DKL 9/22/55 DKL	Ref. Photos TVA 223-6-1 A+B 223-7-1 A,B,C+D 223-7-3 C+D	BERTHA MINERAL DIVISION THE NEW JERSEY ZINC CO. AUSTINVILLE, VA.	DRAWN DKL DATE 3/12/53 TRACED SCALE 1" = 660'	ASBURY AREA, WYTHE COUNTY, VA. GEOCHEMISTRY
				DMEA-4173. FILE NO. 76B-2353 1/2

THE NEW JERSEY ZINC COMPANY
160 FRONT ST., NEW YORK N.Y.


LEGEND
Location of soil samples assaying below cutoff value.*
Soil 500 to 999 p.p.m. zinc equivalent.
Soil 1000 to 1499 p.p.m. zinc equivalent.
Soil 1500 p.p.m. zinc equivalent or greater.
Contours based on zinc equivalent in soils.
Detail sample locations.
Diamond drill hole locations.
Rome Formation
Carbide Member
Saccharoidal Member
Patterson Member
Basal part Ribbon Member
Shady formation
Erwin formation and Lower Cambrian quartzites.
Fault
Zinc and/or lead mineralization.
*In early work this includes all values below 1000 p.p.m. In later work below 500 p.p.m. The maps are inconsistent in this respect due to the change in method.
NOTE: Numbers on sample lines are sample numbers.
Mineral Rights Optioned By N.J.Z.
Properties Being Negotiated
LAPRELLE
MYERS
MOORE
M R NEWLAND
L.M. VAUGHT
Mrs. SETH BENNINGTON
J.R HORNE
D.J. HORNE
H. STEFFY
ROSE COPENHAVER
SETH BENNINGTON
PARKS
C.D. JENNINGS
D.J. HORNE
J.D. HORNE
K.J. COPENHAVER
RAY BENNINGTON
H.P. RICHARDSON
OLA LYONS
F.W. TAYLOR
A.C.
H.S. VAUGHN
W.G. COX
J.E. WILLIAMS
ORA GOETZINGER
C.M. ROBERTS
H.P. RICHARDSON
F.A. PARKS
W.O. PIERCE
F.L. KHUDY
FIG-2A
POSTED TO DATE 6/9/53 DKL
Ref. Photo 223-7-3 B,C,&D (TVA) 223-7-4 ABCEFIG
BERTHA MINERAL DIVISION
THE NEW JERSEY ZINC CO.
AUSTINVILLE, VA.
DRAWN DKL
TRACED
DATE 3/12/53
SCALE 1" = 660'
CAMP AREA, SMYTH COUNTY, VA.
GEOCHEMISTRY
DMEA-4173.
FILE No. 76B-2363 1/2
THE NEW JERSEY ZINC COMPANY
250 FRONT ST., NEW YORK, N.Y.