C. M. E.
RECEIVED DEC 1 1958

DATE	INITIALS	CODE
12/1	C	220
		110
12/1		800
12/1		500

[illegible]

[illegible]

[illegible]

Operator: [illegible], Operator, P.O. Box [illegible]

Location: Luncheon Camp Creek Area, Grainger County, Tennessee

Summary of drilling completed

	Since last inspection	To date
Number of holes	1	42
Footage	595	23,[illegible]

Holes showing:

a) Commercial zinc ore----------	1
b) Non-commercial zinc mineralization--	23
c) No zinc mineralization----------	14

Additional data on the one hole completed during the interim follows:

Hole No. GD-17. Located 200 feet southeast of GD-16 on Greene-Dalton property. Coordinates 349326.98, 446130.60; elevation at collar 1395.23 "G". Drilling began 10/21/58 and was completed 11/7/58. Brief log of hole: 0-68 ft overburden, collared in Lascon fm; top of Kingsport (chert matrix) at 260 ft; top of "H" bed at 471 ft; top of "G" bed at 531½ ft; top of Longview fm at 565½ ft; top of "D" bed at 580½ ft; hole bottomed at 595 ft.

Mineralization: None, completely blank hole.

Present drilling is confined to Hole No.GD-18, located 300 feet north and updip from GD-16. The hole is near bottom and contains ore of commercial grade. Upon completion of this hole the drill will be moved to a site 400 feet updip from GD-18 on Greene-Dalton property.

Inspected: November 18, 1958

L. A. Shirley, Mining Engineer
Bureau of Mines, C.M.E

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

OFFICIAL FILE COPY
O. M.
RECEIVED DEC 4 1958

DATE	INITIALS	CODE
12/4	H. G.	225
		110
		500

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION V

ELECTROTECHNICAL
EXPERIMENT STATION

P. O. BOX 217
NORRIS, TENNESSEE

December 2, 1958

~~Memorandum~~

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

From: Administrative Assistant, Norris, Tennessee

Subject: Monthly report and voucher

We are enclosing two copies of the following monthly report and voucher:

Idm-E1088

B. H. Putnam
Docket No. DMEA-4580
12th payment - month of November
Amount $2025.81

Helen Miller
Helen R. Miller

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

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

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K-32

RECEIVED DEC 4 1958 O.M.E.

Month of November, 1958 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name D. H. Putnam Minerals Zinc
Address 512 Third Street, Marietta, Ohio
Contract Amount, $ 170,125.00 Government Participation: 50% Amount, $ 85,062.00

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	3777.00	59,235.00	63,012.00	12/16/58		
Bulldozing						
Crosscutting						
Drifting						
Reaming	48.00	1192.00	1240.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	---	290.25	290.25			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	---	87.50	87.50			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incid. Allow. @ .18/ft.	226.62	3,554.10	3780.72			
TOTALS	4051.62	64,358.85	68,410.47	4051.62	64,358.85	68,410.47

I certify that the above bill is correct and just and that payment therefor has not been received.
Date 11-29-58 *Payee D. H. Putnam
Per William T. Kline Title Superintendent

*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:
$2,025.81
Signature Helen R. Miller
(Authorized Certifying Officer)
Date DEC 2 1958 Vou. No. 64
(See other side)

$2025.81

(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. Tm E1088 in accordance with the terms of the contract.

Signature W. M. Beck Title MINING ENGINEER U. S. BUREAU OF MINES Date DEC 1 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Lawrence Title EXECUTIVE OFFICER OME FIELD TEAM REGION V Date DEC 1 1958

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.

Form MF-104A
(April 1952)

Budget Bureau No. 42-R1151.2

RECEIVED DEC 4 1958 O.M.E.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of November 1958 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name B. H. Putnam Minerals Zinc
Address 512 Third Street, Marietta, Ohio

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	3777.00	1259	63,012.00	21,004	3.00	50,000	3.00
~~Churn~~ Reaming	Foot	48.00	24	1240.00	620	2.00	5,000	2.00
~~Auger~~ Sampling	Each	—	—	87.50	70	1.25	550	1.50
Stripping ~~xxx~~ Core Boxes	Each	—	—	290.25	150	1.935	150	2.00
Trenching								
Test Pits								
Roads and Trails Inc. Allow. @ .18/ft.	Foot	226.62	1259	3780.72	21,004	.18	50,000	.18
TOTAL DISTRIBUTED COSTS		4051.62		68,410.47				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		4051.62		68,410.47				

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 Nov. 29, 1958 Operator B. H. Putnam

Per William T. Price Title Superintendent

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)

Hoover
GEOLOGIST, U. S. G. S.

1958

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

Invoice
Marietta, Ohio

B. H. Putnam, Appre.
512 Third Street
Marietta, Ohio

November 30, 1958

In account with
PUTNAM DRILLING COMPANY
P. O. Box 647

512 Third Street

Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - Nov. 1958

Core Hole No. OD-17

Footage drilled	595' @ $3.00/ft.	$1785.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just in accordance with the bid submitted by Putnam Drilling Co.

B. H. Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B. H. Putnam, Appro.
512 Third Street
Marietta, Ohio

November 30, 1958

In account with
PUTNAM DRILLING COMPANY
P. O. Box 647

512 Third Street

Phone FR 4-6761

Statement for drilling Pumcheon Camp Creek Project DMEA Contract No. 4580 - Nov. 1958

Core hole No. CD-18

Footage drilled	400' @ 3.00/ft.	$1200.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just in accordance with the bid submitted by Putnam Drilling Co.

B. H. Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B. H. Putnam, Appro.
512 Third Street
Marietta, Ohio

November 30, 1958

In account with
PUTNAM DRILLING COMPANY
P. O. Box 647

512 Third Street

Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - Nov. 1958

Core hole No. GD-19

Footage drilled	264' @ 3.00/ft.	$792.00
Reaming	24' @ 2.00/ft.	48.00
	Total	$840.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just in accordance with the bid submitted by Putnam Drilling Company.

B. H. Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT
GRAINGER COUNTY, TENNESSEE, FOR:

November, 1958

By: W. T. Hill

Docket No. 4580
Contract No. Idm-S 1088

During the month of November, three holes were drilled on the Puncheon Camp Creek Project. Hole GD-17 was drilled 200 feet southwest of GD-16. The hole collared in the Mascot formation and was drilled to a depth of 595 feet.

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-68	Overburden	---	---	--
68-280	Mascot	CMas @ 280	---	Dolomite; some faulting
280-568½	Kingsport	"R" @ 475, "S" @ 531½, "T" @ 568½	---	Dolomite; brecciated from 310-480; hvy faulting 425-480; dol. and re-xl in R-S bed zones
568½-595	Longview	"U" @ 580½	---	Dolomite & re-xl

Hole GD-18 was drilled on a dip fence 300 feet north of GD-16. The hole collared in the Mascot formation and was drilled to a depth of 400 feet.

0-91	Overburden (Mascot)	CMas in overburden	---	--
91-351	Kingsport	"R" @ 223, "S" @ 308½, "T" @ 351	199-200, shines; 203-04, 5.36% Zn; shines 205½, 207; 210-213½ 1.90% Zn, 214-215 4.26% Zn, 219½-232½ 13'-2.19% Zn, shines 238, 239, 241; 243-245, 2'-3.08% Zn., 248½-251, 2½'-0.78% Zn. 257-262½, 5½'-2.44% Zn. 268-68½, ½'-2.32% Zn. 270-281½, 11½'-3.75% Zn. or 281½-293, 23½'-3.05% Zn, 289½-306, 16½'-3.25% Zn, Total 270-306, 36'-2.93% Zn., shines 317, 323; 328½-329½-1'-0.92% Zn.; 340-340½-½'-0.40% Zn. 342½-344, 1½'-2.12% Zn.	Dolomite; well brecciated from 200-348
351-400	Longview	"U" @ 359	Shine @ 384½'	Dolomite & re-xl

Hole GD-19 was drilled 174' west of GD-18 on a northeast-southwest strike fence. The hole collared in the Kingsport formation and was drilled to a depth of 264 feet.

0-60	Overburden	---	---	---
60-230	Kingsport	"R" @ 105, "S" @ 179, "T" @ 230	ZnS shines @ 115, 116, 117; 118-130, 12'-2% Est.; ZnS shines @ 173, 179; 183-184, 1'-1% Est.; shines @ 185½, 188, 189, 191½	Dolomite, re-xl, some limestone; crackle & rubble breccia; some FeS shines
230-264	Longview	"U" @ 244'	---	Dolomite & re-xl

B. H. Putnam DD-GD-17

Copper Ridge Project-Luncheon Camp Creek

DMEA Idm-E 1088

Hole No:	GD-17	Collared:	10-21-58
Farm:	Green-Dalton	Bottomed:	11- 7-58
Loc: N	49,328.92	Depth:	595'
E	46,130.91	Casing:	BX 68, AX 120
Elev:	1396.12	Reaming:	None
Drilled By:	Putnam Drlg. Co.	Cement:	None
Logged By:	J. W. Spears		

Top Kingsport	280
Top R Bed	475
Top S Bed	531½
Base Kingsport	568½
Top U Bed	580½
Base U Bed	589½

0-68	Overburden
-88	Med dk gr dol; mott & some white eyelets (12' core loss 68-88)
-94	Lt med gr dol; mott 89-94; scatt ss grains 89-½ w/2" v hvy sand @ 89½; scatt ss grains 89½-91½ w/hvy ss @ 91½; sli darker 91½-94; shears 92-94; sand @ 94
-102	Med gr dol; TGS 97; bott foot mott & scatt ss grains
-103½	Lt med gr dol; brecc chert nod @ top; then mott w/scatt sand grains
-105	Chert, brecc; some re-xl, silica & shale
-109	Med gr semi re-xl to sug dol; mott
-109½	Dk gr dol; v mott (core from 109-120 was spilled, possibly some beds might have been reversed) (1' core loss 109-120)
-111	Lt gr dol; v sandy & some mottling
-114	Lt med gr dol; mott
-133	Dk gr dol; occ mott & eyelets; shears scattered thruout; fault (bedding plane?) @ 132
-134	Med dk (med) gr dol
-136	Dk gr dol; v mott (2' core loss 134-138)
-141½	Lt med gr dol (to med gr) well mott; sandy bott 6"
-143½	Med (lt) gr dol; mott & some eyelets; oxidized bott 6"
-149½	Med dk gr dol; well mott to 147
-152	Med gr dol; few hite eyelets @ top & bott 6"
-153	Lt med gr dol; some lt bands
-155½	Lt med semi re-xl to sug dol; v cherty top 6", then TGS & chert nod
-157	Med dk gr dol; v mott; few ss grains @ base
-158	Chert; bott 6" white chert
-162	Lt med (lt) gr dol; lt shears thruout; few ss grains @ 61; chert bott 3"
-163	White chert
-165	Lt med gr dol; shears to crackle
-168½	Lt med (med) gr dol; mott & sug; shaly @ 66½ w/tr FeS; v cherty bott foot & few scatt sand grains
-171	Lt gr dol; few lt bands; chert nod @ base
-175	Med gr dol; 1" fault @ 74½; 74½-75 mott & cherty & sug
-179½	Lt med gr dol; v mott top foot; then occ white eyelet to 78; v cherty 79-½
-185½	Lt gr dol; lt mott to 81½; then banded (41° dip) to 85 w/few scatt ss grains 84-85
-183½	Lt med gr dol; mott; grades to med gr
-192	Med gr dol; mott to well mott; scatt sand bott 6"
-196	Lt med (or med) gr dol; mott to well mott
-197	Med dk gr dol; well mott
-199	Med gr dol; scatt ss grains bott foot w/some sed. brecc @ base sealed w/grn shale
-212	Lt med gr dol; v mott top foot; chert nod 01½; lt bands 01½-07½; mott 07½-12
-213½	Med gr dol; mott & some silic eyelets; thin fault @ 13½
-215½	Med dk gr dol; banded; small chert nod @ 15 (Base M-8)
-218	Lt med gr dol (some med @ top) bands top foot; lt shears thruout; o xid. fault @ base w/chert nod below fault
-219½	Lt gr dol; lt mott; few white eyelets; grades to lt med gr
-222	Lt med gr dol; v mott & sugary
-223	Med gr dol; mott & sug; bott 6" v sandy edgewise congl. w/lite pebbles (base Bed M-7)
-224½	Lt med (to med) gr dol; mott; few lt shears
-227½	Med gr dol; mott; occ silic & white eyelets; faulted bott 6"
-229	Med dk gr dol; lt mott; few eyelets as above
-231½	Med gr dol; occ white eyelet
-233	Dk gr dol; shaly mott & white eyelets; v mott bott 3"
-234	Med gr dol; v mott
-235	Lt med gr dol; bott 6" hvy sand, then oolitic chert (Base M-6)
-236½	Lt gr dol; some scatt ss grains top 4"
-237½	Lt med gr dol; v mott
-241½	Med gr dol; v mott; some shears @ base
-242½	Med dk gr dol; shaly mott
-243½	Lt med gr dol
-245½	Dk gr dol; shaly bands and few eyelets
-248	Med gr dol; lt bands (to tr mott) few thin sands 46½-47, hvy sands 47 & 48

-250 Lt med gr dol; well mott; sli sug & tr's of silica; few scatt sand grains bott 6"
-253½ Lt gr dol; banded (@ 35° dip) scatt sand grains @ 51; grades to lt med gr dol about 52; TBS @ base
-258 Lt med to med gr dol; few white eyelets 57-58
-261 Lt med to med gr dol; v mott; sli sug & tr FeS @ top; chert nod @ base
-261½ Lt semi re-xl; shaly @ base & many sand grains
-263½ Med gr dol; lt shears
-268 Lt med gr dol; lt bands (35° dip) to 65; then lt mott
-275 Med gr dol; mott & occ white eyelets
-276 Med dk gr dol; v mott; chert nod @ base
-280 Lt med gr dol; lt bands (@ 38° dip) CM sands 79½ & 80 (TOP KINGSPORT FM 280')
-283 Lt med (med) gr dol
-288 Med gr dol; mott; chert nod 85
-297 Lt med gr dol; scatt sands (some hvy sands) 89½-90, also some grn shale from about 93 becomes darker w/lt mott (3' core loss 95-301)
-301½ Lt med gr dol; occ white eyelet to 300; lt crackle 300-01½; TGS @ base
-301½ Lt med sug dol (or semi re-xl) specks of FeS thruout
-303 Lt med gr dol
-310½ Lt med to med gr dol; scatt sed. breec
-317 Med dk gr dol; mott; fault 10½-11 w/shears to 12 (2' core loss 13-17)
-320½ Lt med (& med) gr dol; sed. breec; chert nod @ base (1' core loss 17-27)
-323 Lt med gr dol; thick bands @ 40° dip
-326 Med gr dol; some crackle
-327 Med dk gr dol; mott & silic eyelets
-344 Med to lt med gr dol; sed. breec to 32½ w/bands 28½-30; sed. breec 35-38; mott 40-41½
-344½ Med dk gr dol; mott
-346½ Lt med gr dol; sed. breec; bott 6" v sandy then oolitic cherts (base K-2)
-348 Lt med gr dol; shears & lt crackle; v hvy ss @ 48
-355 Med gr dol; occ sed. breec zone; (2' core loss 48-60)
-357½ Lt med gr dol; some sed breec top foot
-359½ Med gr dol; few eyelets top 6"; then sed breec
-368 Lt med gr dol; sed breec; some crackle w/gangue to 64; @ base grades to med gr dol
-371 Med dk gr dol
-373½ Med gr dol; sed. breec
-375½ Lt med gr dol; occ white eyelet
-376 Med gr dol; sed breec
-383½ Lt med gr (med) dol; 1" TGS @ 77; chert nods (some brecciated) 80½, 81, 81½, 82; banded 82-83½; chert nod 83½ (1½' core loss 76-80)
-392 Med (& lt med) gr dol; sed breec; also some breec to crackle w/gangue
-396 Lt med gr dol; sandy 93-½ & 94½; breec 94-96
-399 Med gr dol; some crackle to 97; sed breec 97½-99
-400 Lt med gr dol; bands & crackle; few ss grains & TGS @ base
-404 Med (& lt med) gr dol; sed breec
-405 Lt med gr dol; breec oolitic chert @ top
-415 Med (& lt med) gr dol; sed breec; ss grains 410½-11 (3' core loss 405-11)
-432 Lt med gr dol; sed breec; v sug 17-18; (1' core loss 11-15) shears 27-29, shaly @ 30, banded 30-31 w/few eyelets (5½' core loss 15-25, 1½' core loss 25-30; 1½' loss 30-38)
-434½ Lt gr dol; bott foot sed breec
-438 Lt med gr dol; sed breec; occ chert fragment
-439 Lt gr dol; shears (1½' core loss 38-43)
-443 Lt med gr dol; top foot sed breec, then 6" hvy breec w/white gangue; then shears to base
-448 Lt gr dol; some crackle & some sed breec; banded; sandy @ 45-½ (2' core loss 47-50)
-450 Med gr dol
-455 Lt gr dol; lt bands; occ white eyelet (3½' core loss 50-60)
-460 Med gr dol; shears
-466 Lt med (lt) gr dol; shears (4' core loss 60-67)
-468 Med gr dol; mott & sug; shears (2½' core loss 67-75)
-475 Lt med gr dol; mott; faulted to 73, then many shears (TOP K BED @ ABOUT 475'
-480 Med gr dol; mott & sug; occ shears & some oxidized

-483 Lt gr dol; some brecc w/grn shale top few inches; then occ zone dk re-xl; 82-½ pt chert pt re-xl; some eyelets and bands 81-82½
-484½ Br re-xl w/chert fragments
-486 Lt gr dol; lt bands; some sed crackle
-489½ Br re-xl; band of shale 86½-87; then scatt chert fragments
-495½ Lt br re-xl to semi re-xl, becomes mott (2' core loss 90-97)
-497 Lt med gr dol
-501½ Br to lt br re-xl; mott; occ zone darker brown
-502½ Lt med gr dol; some bands; chert nod @ 502
-504 Dk br shaly re-xl; some red oxidation
-509 Br re-xl
-514 Lt med gr dol; sug @ top; occ lt crackle to eyelets of re-xl; bott 6" becomes mott semi re-xl w/chert @ base
-514½ Dk br re-xl; silic; mott
-517½ Med dk gr dol; crackle to brecc; some silica & re-xl; few eyelets (base bed K-7)
-520 Lt br re-xl; v shaly & some silica
-524 Med dk to med gr semi re-xl; crackle to brecc top 1½'; mott
-524½ Lt semi re-xl
-525½ Med dk gr mott sug dol
-531½ Lt med gr dol; scatt dry brecc to 30 w/chert nod @ 30; v banded 30-31½ w/grn shale @ base
TOP S BED 531½
-537 Br re-xl; coarse; v silic to 36; chert nod 37
-543½ Lt med gr dol; sug; chert nod 39; semi & shaly 39-40; occ crackle w/gangue; cherty @ 542½
-548 Br re-xl; v cherty top few inches; v mott to poss old brecc
-549 Blocks of lt med gr dol in br re-xl
-553 Lt br re-xl; v shaly w/some sec chert 49½-53 (5' core loss 51-60)
-568½ Br re-xl; mott & silic top foot; then occ crackle; some shaly; becomes lighter br towards base
BASE KINGSPORT FM 568½'
-571 Lt med gr dol; sug @ top; mott; several cherts bott 6"
-580½ Lt med to med gr dol; chert nod 71½; occ lt crackle
TOP U BED 580½
-581 4" oolitic chert; then br re-xl
-587 Lt med semi re-xl; well mott; some red oxidation bott foot, then shaly @ base
-589½ Dk gr cherty re-xl
BASE U BED 589½
-593 Lt med gr dol; lt mott
-595 TD Med (med dk) gr dol; eyelets, crackle

B. H. Putnam DD-GD-18

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No:	GD-18	Collared:	11-8-58
Farm:	Green-Dalton	Bottomed:	11-18-58
Loc: N	49,769.76	Depth:	400'
E	46,091.28	Casing:	BX 70, AX 110
Elev:	1473.75	Reaming:	None
Drilled By:	Putnam Drlg. Co.	Cement:	2 Sacks
Logged By:	J. W. Spears		

Top Kingsport	in overburden
Top R Bed	223'
Top S Bed	308½'
Base Kingsport	351'
Top U Bed	359'
Base U Bed	371'

-91 Overburden
-94 Dk gr dol; v mott (9' core loss 91-104)
-102 Lt med gr dol; some banding; few white eyelets
-103 Dk gr dol
-108 Lt med gr dol; mott; shears 106-07 (1' core loss 104-10)
-114½ Lt gr dol; cherty top few inches; sandy @ 08½; fault @ 11; v sandy & some oolitic chert 13½-14½ (base bed K-2) (1' core loss 110-15)
-117 Lt med gr dol; v hvy ss @ 15½; lt mott; TBS @ base
-125 Med gr dol; lt shaly mott & occ white eyelet; to 20½ w/TBS 20½; well mott & occ TBS 120½-25
-127½ Med gr dol; ox to lt med gr dol; well mott; shears @ base, then TBS
-135 Lt gr dol; mott to 31½ w/¼" TGS @ 31½; then lt bands to 35 w/chert nods 33½, 34-½ & 35.
-142 Lt med gr dol; banded (43° dip) chert nod 36; then becomes well banded to wavy to 41; scatt ss grains 39-40½; v sandy 40½-41 (base K-3)
-145½ Med gr dol; mott & sug; tr congl bott few inches; ½" TGS @ base
-156½ Lt gr dol; few lt bands (40° dip) to 49 & few shales; chert nod 49; lt mott 49-55 w/sev cherts 54-55; banded to well banded 55-56½ w/a bleached chert @ 55½
-158 Lt med gr dol; v banded to wavy; scatt ss grains & chert fragments bott 6" w/TBS @ base
-162½ Lt med gr dol; lt bands; chert nod @ top; sev large cherts 60-62; bott 6" lt gr
-165 Lt gr semi re-xl or sug dol; mott; v cherty top 6" (base K-4)
-171½ Lt gr dol; lt bands to 71½; sev TBS's 67½-68; chert nod 69½, then grades to lt med gr
-178 Lt gr dol; mott top foot; then bands to well banded (49° dip) to 75½; chert nods 76½, 77½, & 178
-184½ Lt med (med) gr dol; banded (41° dip) to 81½, then mott
-189 Lt gr dol; lt bands, slightly wavy
-189 Lt gr dol; lt bands, slightly wavy
-194 Lt med gr dol; crackle 90-91; oxid shears 91½-92; scatt ss grains 92½-3½; grn shale & some re-xl 93½-94
-196 Med gr dol; crackle, mott; chert nod 195; (base bed K-5)
-200 Lt gr dol; lt bands; few eyelets @ top; <u>crackle w/ZnS shines 99-200</u>
-201 Lt med gr dol; mott & sug; sli oxid
-203½ Lt gr dol; lt mott & occ eyelet; brecc bott 9"; <u>est 2½% ZnS 203-04</u>
-205½ Med gr dol; top 3-4" brecc w/Zn; thin shaly mott w/occ eyelet & lt crackle; <u>ZnS & FeS shine @ 205½</u>
-210 Med gr dol; lt bands; crackle; <u>ZnS sh 07½</u>; dk chert nod @ 208
-217 Lt med (med) gr dol; crackle to brecc; <u>est 1% ZnS 10-13½</u>; <u>est 2½% ZnS 14-15</u>; some lt bands; ox @ base & few ss grains
-223 Lt med to lt gr dol; mott; ox @ top; brecc 19-23 <u>w/est 2½% ZnS & ½% FeS 19-23</u>; 1' core loss 20-23) <u>(TOP R BED 223)</u>
-224 Grn shale & re-xl; <u>tr ZnS top & bott</u>
-227 Med gr dol; mott & sug; shears to vuggy crackle to 26; v oxid 26-27
-229½ Lt med gr dol; sug & mott; crackle; <u>oxid & ZnS sh 28-29</u> (1' core loss 26-31)
-232½ Lt gr dol; brecc; est 3% ZnS 31½-32½ (much carbonate)
-234 Med dk gr dol; sug; lt mott to bands
-239 Dk gr dol; sug & mott; <u>strong ZnS sh @ 38</u> (½' core loss 31-39)
-241½ Br re-xl; brecc; cherty & shaly top part; occ tr ZnS
-243 Lt med gr dol; bands; lt crackle
-246 Br re-xl; brecc & silic to 45 <u>w/est 2% ZnS 43-45</u>
-247 Lt gr dol; some bleached; some crackle w/re-xl gangue & tr of FeS
-248½ Gr re-xl; v hvy FeS top 6"
-251½ Gr v banded semi re-xl
-253 Lt br re-xl; ZnS shine @ 52
-255 Br re-xl
-257 Lt gr re-xl (to semi re-xl) mott
-258 Re-xl; brecc; <u>est 2% ZnS</u>
-259½ Lt re-xl; some brecc w/shaly re-xl
-263½ Brecc. shaly re-xl; occ block dol; <u>est 4% ZnS 59½-62½</u>; chert nod @ 63½
-264½ Lt gr dol; lt bands
-266½ Gr mott to shaly re-xl; lt crackle

-268 Lt re-xl; crackle to 67½; then brecc; hvy ZnS sh @ 68
-272 Lt med mott sug dol to semi re-xl; brecc 70-71 w/est 3% ZnS
-272½ Br re-xl; brecc w/est 4% ZnS
-277½ Lt gr dol; brecc; est 4% ZnS 72½-77; some ss 73½ & 74½
-278 Br re-xl; brecc; est 4% ZnS
-284 Lt med gr dol; brecc; est 2½% ZnS 78-81½; few shears @ base
-285 Med dk & some lt gr dol; brecc; est 3% ZnS 84-85
-286 As above plus re-xl; brecc; est 1% ZnS 85-86
-287½ Gr re-xl; sli silic; est 1% ZnS 86-½
-289½ Lt gr dol; brecc; est 1½% ZnS
-295 Gr re-xl; w/scatt blocks lt & dk dol; est 3½% ZnS 89½-93½
-297 Dk gr dol; few eyelets; tr crackle
-302 Lt gr dol; brecc w/few dk gr blocks; sealed w/gangue and re-xl; est 2% ZnS & scatt FeS
-304 Dk gr dol; bott 6" to semi re-xl or re-xl
-306 Lt med semi re-xl; brecc w/gangue & re-xl; est 3½% ZnS
-307 Dk gr dol; eyelets; tr crackle
-308½ 6" lt re-xl; chert nod, then 6" lt med gr dol
TOP S BED 308½
-316 Coarse blk & white re-xl; silic; some brecc w/gangue; block dk gr dol @ 11, block lt dol @ 13; cherty 14-16
-317½ Lt br re-xl; silic; tr ZnS 17
-319½ Gr to dk re-xl; silic & scatt cherts
-322½ Lt br & white re-xl; chert @ base
-323½ Dk br re-xl; tr ZnS 23; chert @ base
-328½ Lt to med dk dol blocks sealed w/much cherty gr re-xl
-330½ Br re-xl; brecc; est 1% ZnS 28½-29½
-348 Blocks of med & med dk gr dol & semi re-xl sealed w/gr jasporoid re-xl & some white gangue; scatt FeS thruout; ZnS sh 40-½, 41½; block br re-xl 41½-42½; est 2% ZnS 42½-44; cherty @ base
-349 Lt med gr dol
-351 Lt br re-xl; tr vugs
BASE KINGSPORT @ 51
-359 Lt med gr dol; sli sug top 6"; chert nod 52; brecc w/re-xl 53-54½ & 58-59; some re-xl oxidation @ base
TOP U BED 359
-359½ Br re-xl; oolitic chert @ top
-365 Lt med gr dol; mott; sug (tr some poss semi re-xl) darker bott 6"
-367 Lt br re-xl
-368 Med gr dol blocks sealed w/re-xl (w/FeS) & some white gangue
-371 Lt br re-xl; lt mott (1' core loss 70-73)
Base U Bed 371
-372½ Med gr dol; brecc w/hvy FeS
-374 Med dk gr dol; eyelets; crackle w/FeS
-376 Med gr dol; @ top tr of re-xl & some chert; crackle to brecc w/FeS
-377 Lt br re-xl; v cherty @ top
-380 Lt med gr dol; brecc w/occ chert fragment & v hvy FeS
-383 Br mott re-xl
-384 Blocks of lt med gr dol & chert sealed w/jasporoid & re-xl
-386 Br re-xl & much jasper; some cherts; ZnS sh @ 84½; sandy 85½
-388½ Br re-xl; mott w/white; scatt FeS; grades to lt br
-389½ Lt gr dol; several cherts top 6"
-390 Lt re-xl
-392 Br banded re-xl
-393½ Lt mott re-xl
-398½ Lt gr dol; conc cherts 95 & 96; few ss grains @ base
-400 Lt med gr dol; lt mott (TD)

B. H. Putnam - D.D. GD-19

Copper Ridge Project - Pumcheon Camp Creek

DMEA Idm-E 1088

Hole No:	GD-19	Collared:	11-20-58
Farm:	Green-Dalton	Bottomed:	11-26-58
Loc: N	49,851.88	Depth:	264'
E	45,938.63	Casing:	BX 60; AX 110
Elev:	1467.21	Reaming:	86'-110'
Drilled By:	Putnam Drlg. Co.	Cement:	None
Logged By:	W. T. Hill		

Top R Bed	105
Top S Bed	179
Base Kingsport	230
Top U Bed	244

0-60	Overburden
-61½	Lt gr dol; banded; blue ch nods @ 61, 61½
-63½	Lt med gr dol; mott; some oxid.
-64½	Lt gr dol; banded
-68½	Lt med gr dol; banded
-70	Med dk gr dol; banded
-70½	Med gr dol; lt ss @ 70½
-71	Re-xl; coarse; brn; siliceous
-73½	Dol; med gr; banded; thin ch @ 71
-74½	Dol; lt gr; mott; oxid @ base
-85½	Dol; dk gr; banded (90% core loss)
-88½	Dol; lt-med gr; wh ch nod @ base
-90	Dol; dk gr; mott; lt gangue fracts.
-105	Dol; med-dk gr; mott; crackle & lt FeS shines (3' core)
-115	Re-xl; coarse grn'd; v siliceous; oxid. (1½' core)
-117	Dol; med-dk; mott; brecc; some traces ZnS and FeS; oxidized
-118	Re-xl; dk brn; ZnS shines; hvy ch 116 w/strong ZnS
-130	Re-xl; black & white; hvy ZnS shines; some FeS (5' core 120-130)
-131	Dol; lt gr
-135	Re-xl; brn; mott; crackle; 2" fault gangue 32'; vuggy
-141	Dol; lt-med; crackle; mott; ch nod 139½, 140
-148½	Re-xl; coarse; greenish 41-43; grades into semi; some crackle; rubble 47½-48½
-154	Dol; lt gr; banded 48½-49½; mott 49½-52; crackle; some lt FeS shines
-155	Dol; dk gr; crackle
-157	Cavity
-166½	Dol; dk gr; crackle; lower part mott
-167	Re-xl; silic; oxid
-168	Chert
-179	Dol; lt gr; rubble breccia; ZnS shines @ 73½, 78½; scatt FeS thruout
-182½	Re-xl; brn; coarse; silic
-183	Dol; brecc
-184½	Re-xl; brn; 183-84½ Est 1 % Zn; 5% FeS
-188	Dol breccia, sealed with re-xl and wh gangue; some chert; ZnS shines 85, ½; strong ZnS @ 88 in jasperoid
-191½	Ls; shaly; re-xl @ 89 & ZnS shine; 91-½, 20% re-xl & ZnS shine
-192½	Chert; brecc black jasperoid
-201½	Re-xl; brn; coarse black chert @ 94; 98 (6"); FeS @ 97; crackle thruout
-203	Dol; brecciated and sealed with re-xl & gangue
-211	Re-xl; brn; crackle 209-11; oxid @ 208½
-230	Re-xl; coarse to 25½; lt ss @ 18; bands jasperoid 11-13; FeS @ 19, 20-21, 22-23, 24 25 (hvy)
-244	Dol; lt med; v lt crackle
-253	Dol; mott; oolite @ 44; crackle 45-49
-256	Re-xl; coarse
-264	Dol; med gr; wh nods thruout; TD @ 264'

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DATE | INITIALS | CODE
11-7 | C | 220
" | | 110
11/10 | | 800
| | 500

DMEA EXPLORATION PROJECT

INTERIM REPORT

DMEA-4580, Idm-E1088 - Zinc

Operator: B. H. Putnam, Operator, P. O. Box 65, Thorn Hill, Tennessee

Location: Puncheon Camp Area, Grainger County, Tennessee

Summary of Drilling Completed

	Since last inspection	To Date
Number of holes	1	41
Footage	553	23,096

Holes showing:

a)	Commercial zinc ore	5
b)	Non-commercial zinc mineralization	23
c)	No zinc mineralization	13

Additional data on the one hole completed during the interim follows:

Hole No. GD-16.--Located 200 feet southeast of GD-15. Coordinates N49,503.81, E46,237.38; elevation of Derrick floor 1407.02. Drilling began October 4, 1958 and was completed October 18, 1958. Brief log of hole: 0-80 feet overburden, collared in Mascot formation; 12' of core recovery from 80 to 140 feet; top of Kingsport (chert matrix) at 220, top of "R" bed at 418½; top of "S" bed at 499; top of "U" bed at 532½; hole bottomed at 553 feet.

Mineralization.--Shines of sphalerite from 230½ to 231, at 233 and 243½; 5' (234½-239½) 1.59 % zinc; 9' (245-254) 2.47% zinc; 6' (261-267) 0.78% zinc; 8½' (269-277½) 2.40% zinc; 1' (281-282) 3.3% zinc; shines at 285, 291, 292, 305½, and 306; 2' (308-310) 1.06% zinc; shines at 311½, 314, 315½, from 316½ to 317 and at 318 feet; 2' (319-321) 1.22% zinc; shines from 325½ to 326, at 331½, 332½ to 333, 337½ to 338, 369½ to 370 and at 532½ in "U" bed.

Current drilling is in progress on GD-17, located 200 feet southeast of GD-16 on Greene-Dalton property. Core was observed to a depth of 284 feet. The total estimated depth of this hole is 600 feet.

Inspected: October 28, 1958

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

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION V

ELECTROTECHNICAL
EXPERIMENT STATION

P. O. BOX 217
NORRIS, TENNESSEE

November 4, 1958

Memorandum

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

From: Administrative Assistant, Norris, Tennessee

Subject: Monthly report and voucher

We are enclosing two copies of the following monthly report and voucher:

Idm-E1088 B. H. Putnam
Docket No. DMEA-4580
11th payment - month of October
Amount $1815.56

Helen R. Miller

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

OFFICIAL FILE COPY
O. M. E.
RECEIVED NOV 6 1958

DATE	INITIALS	CODE
11-6	C	220
11		110
11-7		500

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

RECEIVED NOV 6 1958 O.M.E.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Budget Bureau No. 42-R1036.5

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K-37

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of October, 1958 Docket No. DMEA 4950 Contract No. 10-S 2000
Operator's Name D. M. Putnam Minerals Zinc
Address 61 2 Third Street, Marietta, Ohio
Contract Amount, $ 170,125.00 Government Participation: 50 % Amount, $ 85,062.00

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Short Form Contracts:						
Drilling	3190.00	56,037.00	59,235.00			
Bulldozing						
Crosscutting						
Drifting						
Repairs	70.00	1,122.00	1,192.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	150.00	140.25	290.25			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	21.25	66.25	87.50			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify):						
Insol. Allow @ .15/ft.	191.58	3,362.22	3,554.10			
TOTALS	3631.13	60,727.72	64,358.85	3631.13	60,727.72	64,358.85

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

Date 10-27-58 *Payee D. M. Putnam

Per John W. Spears Title Superintendent

*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:

$ 1815.56

Signature Helen R. Miller
(Authorized Certifying Officer)

Date NOV 4 1958 Vou. No. 54

(See other side)

1815.57

(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. E-1088 in accordance with the terms of the contract.

Signature [illegible] Title MINING ENGINEER U.S. BUREAU OF MINES Date OCT 31 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A Lawrence Title EXECUTIVE OFFICER CME FIELD TEAM REGION V Date OCT 31 1958

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.

Form MF-104A
(April 1962)

Budget Bureau No. 42-R1151.2

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of October 195 8 Docket No. DMEA 4580 Contract No. Icm-E 1088

Operator's Name D. E. Putnam, Operator Minerals Zinc

Address 512 Third Street, Marietta, Ohio

OPERATION	Unit	Costs This Month	Units This Month	Costs to Date	Units to Date	Unit Costs to Date	Authorized by Contract: Units	Authorized by Contract: Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	3198.00	1066	59,235.00	19745	3.00	50,000	3.00
Churn Reaming	Foot	70.00	35	1,192.00	596	2.00	5,000	2.00
Auger Sampling	Each	21.25	17	87.50	70	1.25	550	1.50
Stripping Core Boxes	Each	150.00	75	290.25	150	1.935	150	2.00
Trenching								
Test Pits								
Roads and Trails Incld. Allow. @ .18/ft.	Foot	191.88	1066	3,554.10	19745	.18	50,000	.18
Total Distributed Costs		3631.13		64,358.85				Total Costs Authorized by Contract
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
Total Costs								

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 October 27 Operator D. E. Putnam

Per John W. Spears Title Superintendent

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.

Remarks:

(Instructions on reverse)

(For Government use only)

MINING ENGINEER
U. S. BUREAU OF MINES

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

Invoice
Marietta, Ohio

B. H. Putnam, Appro.
512 Third Street
Marietta, Ohio

October 31, 1958

In account with
PUTNAM DRILLING COMPANY
P. O. Box 647

512 Third Street

Phone: FR 4-6761

Statement for drilling Pursheon Camp Creek Project DMEA Contract No. 4580 - Oct. 1958

Core Hole No. GD-15

Footage drilled	513' @ 3.00/ft.	$1539.00
Reaming	35' @ 2.00/ft.	70.00
		$1609.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just in accordance with the bid submitted by Putnam Drilling Company.

B. H. Putnam, Operator

By: A R Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B. H. Putnam, Appre.
512 Third Street
Marietta, Ohio

October 31, 1958

In account with
PUTNAM DRILLING COMPANY
P. O. Box 647

512 Third Street

Phone: FR 4-6761

Statement for drilling Pumcheon Camp Creek Project DMEA Contract No. 4580 - Oct. 1958

Core Hole No. CD-16

Footage drilled	553' @ 3.00/ft.	$1659.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just in accordance with the bid submitted by Putnam Drilling Company.

B. H. Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

Statement

Jefferson City, Tenn. 9/15/58 195

M H. H. PUTNAM DRILLING CO

THORN HILL, TENN

MOYERS CABINET SHOP

103 Carson Street

Telephone 3113

1/11/58	25 -AX core Boxes 5' long 500 Grade Stakes	@ 200 3	50.00 15.00
			65.00
		Tax	1.95
			66.95

This ONE IS NATIONAL LEADS

6/21/58	50 - AX CORE BOXES 5' LONG	@ "200	100.00
		TAX	3.00
			103.00

9/21/58	50- AX CORE BOXES 5' LONG 500 -GRADE STAKES	@ 2.00 .3	100.00 15.00
			115.00
		TAX	3.45
			118.45

75 Boxes to P.O.W.C

Charge to Oil W. Hill

Putnam owes this

Total Due	66.95
	103.00
	118.45
Total Amount Due	288.40

ENGINEERS
INSPECTIONS and TESTS

The Bruce Williams Laboratories

ESTABLISHED 1898
MAIN OFFICE AND LABORATORIES 618-624 JOPLIN ST. TELEPHONE MAYFAIR 3-1556
JOPLIN, MISSOURI

CHEMISTS
INDUSTRIAL and ANALYTICAL

BATESVILLE, ARKANSAS
ST. LOUIS, MISSOURI
PICHER, OKLAHOMA

Mr. B. H. Putnam
P. O. Box 65
Thorn Hill, Tennessee

10-13-58

			ZINC	
798053	GD-12-1	441-443 (2')	6.22	= 8' @ 1.93%
054	GD-12-2	445½-447½ (2')	1.30	
055	GD-12-3	447½-449 (1½')	0.26	
056	GD-15-1	408½-411 (2½')	1.46	= 11' @ 1.02%
057	GD-15-2	412½-413½ (1')	0.80	
058	GD-15-3	416-417 (1')	1.30	
059	GD-15-4	418½-419½ (1')	5.52	
060	GD-15-5	425½-427½ (2')	0.72	

cf/nls 67-788

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES
ADDRESS ALL COMMUNICATIONS TO JOPLIN, MISSOURI

Bruce Williams

ENGINEERS
INSPECTIONS and TESTS

The Bruce Williams Laboratories

CHEMISTS
INDUSTRIAL and ANALYTICAL

ESTABLISHED 1896

MAIN OFFICE AND LABORATORIES 618-624 JOPLIN ST. TELEPHONE MAYFAIR 3-1556

JOPLIN, MISSOURI

BATESVILLE, ARKANSAS ST. LOUIS, MISSOURI PICHER, OKLAHOMA

Mr. B. H. Putnam
P. O. Box 65
Thorn Hill, Tennessee

9-25-58

				ZINC
797311	GD-14-1	292½-293½	(1')	2.12
312	2	301½-303½	(2')	2.44
313	3	305½-307½	(2')	1.40
314	4	307½-308½	(1')	1.52
315	5	346½-348½	(2')	1.16
316	6	348½-350	(1½')	11.12
317	7	351½-352	(½')	0.54
318	8	365-367	(2')	4.14
319	9	367-369	(2')	6.14
320	10	369-371	(2')	0.72
321	11	371-373	(2')	3.10
322	12	378½-379½	(1')	0.78
323	13	379½-382	(2½')	0.12
324	14	382-384	(2')	3.96
325	15	395-396½	(1½')	0.80
326	16	398½-400½	(2')	1.24
327	17	409-410	(1')	1.44

67-609 cf/nls

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES
ADDRESS ALL COMMUNICATIONS TO JOPLIN, MISSOURI

Bruce Williams

INDUSTRIAL AND ANALYTICAL CHEMISTS

The Bruce Williams Laboratories

ESTABLISHED 1898

MAIN OFFICE: 618-622 JOPLIN STREET
TELEPHONE MAYFAIR 3-1888

Joplin, Missouri

ENGINEERING INSPECTIONS AND TESTS

BRANCH OFFICES:

306 VALLEY DRIVE
ST. LOUIS, MISSOURI
TELEPHONE HOBART 7-3226

219 TERMINAL WAREHOUSE BLDG.
LITTLE ROCK, ARKANSAS
TELEPHONE FRANKLIN 2-0693

CONNELL HOTEL BLDG.
PICHER, OKLAHOMA
TELEPHONE 71P

STATEMENT OF YOUR ACCOUNT

Mr. B. H. Putnam
P. O. Box 65
Thorn Hill, Tennessee

TERMS CASH
NO DISCOUNT

DATE	ASSAY NO.	DESCRIPTION		
1958 Sept.		Statement rendered for work from 8-26 to 9-25-58 incl.		
		TOTAL AMOUNT DUE		$21.25

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT
GRAINGER COUNTY, TENNESSEE, FOR OCT. 1958
BY: T. W. SPEARS

Docket No. 4580
Contract No. Idm-E 1088

During the month of October, two holes were drilled on the Puncheon Camp Creek Project. Hole GD-15 was drilled on a strike fence 100 feet southwest of GD-14. The hole collared in the Mascot formation and was drilled to a depth of 513 feet.

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-67	Overburden	—	—	—
67-174	Mascot	CM ho rizon @ 174'	tr @ 172½	Dolomite; @ 10% core loss
174-456	Kingsport	Top of "R" @ 348 Top of "S" @ 417½ Top of "T" @ 456	tr 226, 270; shines 314-17, 324-24½, 327-28, 330-30½, 369-69½; 1.02% 408½-19½; tr 421-22; 0.72% 425½-27½	Dolomite; & re-xl; in part brecciated; some limestone
456-513	Longview	Top of "U" @ 467½ Top of L-4 @ 494½	tr. @ 501½	Dolomite & re-xl w/some brecciated; some limestone

Hole GD-16 was drilled on the same strike fence, 200 feet southwest of GD-15. The hole collared in the Mascot formation and was drilled to a depth of 553 feet.

0-80	Overburden	—	—	—
80-220	Mascot	CMas @ 220	—	Dolomite; 80-140 80% core loss
220-524½	Kingsport	Top of "R" 418½ Top of "S" 499 Top of "T" 524½	Shines 230½-31, 33; 1' @ 6.40% 234½-35½; 1' @ 1.56% 238½-39½; sh 243½; 9' @ 2.47%, 245-254; 3' @ 0.40% 261-64; 2' @ 1.76%, 265-67; 8½' @ 2.40%, 269-77½; 1' @ 3.30%, 281-82; sh 285, 291-92, 305½, 306; 2' @ 1.06%, 308-10; shines 314, 315½, 316½-17, 318; 2' @ 1.22%, 319-21; shines 325½-26, 331½, 332½-33, 337½-38 & 369½-70	Dolomite & re-xl & chert; much brecciation

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
524½-553	Longview	Top of "B" @ 532½	Shine @ 532½	Dolomite & re-xl with some brecciation.

Drilling is now underway at GD-17, 200 feet southwest of GD-16.

B. H. PUTNAM D.D. GD-15
Copper Ridge Project-Puncheon Camp Creek
DMEA Idn-E 1088

Hole No: GD-15

Farm: Green-Dalton

Loc: N 49,676.69

E 46,337.53

Elev: 1431.3

Drilled By: Putnam Drilling Co.

Logged By: J. W. Spears

Collared: 9-23-58

Bottomed: 10-2-58

Depth: 513

Casing: BX 67; AX 135

Reaming: 35' (100-135)

Cement: None

Top Kingsport	176'
Top R Bed	348
Top S Bed	417½
Base Kingsport	456
Top U Bed	467½
Base U Bed	480

0-67'	Overburden
-68	Lt med gr dol; mott (5' core loss 67-84)
-73	Lt gr dol; well banded (46° dip) scatt ss grains thruout; TGS @ base.
-79	Med to lt med gr dol; v sug top 2'; hvy ss @ base
-82	Cavity
-86	Lt med to med gr dol (2' core loss 84-92)
-89	Med gr dol; v mott
-89½	Lt med gr dol; bands; few ss grains
-95	Lt med to lt gr dol; lt mott; v silic 91½-92 w/large chert nod @ 92; fault 93-½
-98	Lt med gr dol; occ chert nod; large chert @ base
-100	Lt gr dol
-113	Lost core
-120	Cavity
-127	Dk gr dol; shaly mott; poss small cavity @ 24; (3' core loss 20-31)
-132	Med to lt med gr dol; hvy ss @ 30½; then oolitic cherts to 32
-134	Lt to lt med gr dol (1' core loss 31-40)
-135½	Med gr dol; well mott
-144½	Med dk gr dol; occ shales to 41; then mott (2' core loss 40-45)
-150	Lt gr dol; bands (45° dip) scatt ss grains 49-50
-152	Lt med gr dol; well banded to mott (dip 36°)
-155½	Med gr dol; lt bands (41° dip)
-157	Med dk gr dol; shaly mott
-158½	Med gr dol; mott
-159	Lt med gr dol; breco chert nod (pt oolitic) @ 59
-162	Lt gr dol; lt bands (40° dip) (3' core loss 59-69)
-165	Lt med gr dol
-166	Med gr dol; well mott
-169	Dk gr dol; shaly mott
-171½	Med gr dol; occ vug (2' core loss 69-78)
-172½	Med dk gr dol; mott
-173	Dk gr dol; v shaly; <u>tr of ZnS in fractions</u>
-178	Med dk to med gr dol; lt bands
	TOP KINGSPORT FM @176' (prob ground core containing sand)
-183½	Med dk gr dol; shaly mott
-187	Lt med to lt gr dol; lt bands; hvy ss @ 85
-190½	Lt med to med to med dk gr dol; shaly mott; few TBS's bott 6"
-193½	Lt med gr dol; mott & occ eyelet
-195½	Med dk gr dol; banded (dip 41°)
-200	Lt med gr dol; towards base grades to med gr.
-207	Med dk gr dol; shaly mott; lighted bott 1½'
-209	Med gr dol; well banded (40° dip) few white eyelets
-213	Med dk (to dk) gr dol; broad bands large eyelets 10½; bott 4" sandy
-218	Med gr dol; some lt mott; several TGS's bott 6"
-221½	Lt med gr dol; mott; sandy oolitic chert @ base
-225	Lt gr dol; scatt ss grains to 22; w/1" hvy ss & TGS @ 22; 24½-26 mott; 25 3/4-26 sandy oolitic chert w/<u>tr ZnS</u>
-228	Lt med gr dol; banded w/scatt sands top 9"
-239½	Med to med dk gr dol; shaly mott; sug 31-32 w/large eyelets @ 31;TBS 32 & 39½
-243½	Lt med to lt gr dol; shaly mott; ½" dk TGS @ base
-249	Lt gr dol; lt bands (40-35° dip) chert nods 45, 46, 46½, 47, 47½ & 49
-251	Lt med gr (med) dol; banded (dip 40°)
-254	Lt med to lt gr dol; wavy bands; scatt sands 52½-54, v hvy sands; ½" TGS base (base bed K3)
*257½	Med gr dol; sug & v mott; cherty (pt oolitic) near base w/TGS @ base
-260½	Lt gr dol; lt bands; chert near base; 1" TGS @ base
-264½	Lt med gr dol; lt mott
-270	Med gr dol; lt mott & lt bands; occ chert nod; @ base a thin sand, then TBS & chert nod w/<u>tr of ZnS</u>
-276	Lt med gr dol; conc chert nods 71, 72½, 73, 74, 75 & 75½; 1" TGS 276
-281½	Lt gr dol; lt bands (42° dip) chert nod 81½; bott 6" well banded & sug; TGS @ base
-284	Lt med gr dol; lt bands to mott; TGS @ base

-288 Lt gr dol; lt band becoming wavy bands (40° dip) [illegible] small chert nod; @ base v thin shale & chert
-297 Lt med gr dol; v cherty 90-½ w/much oolitic chert; chert nod 91½; bands 91½-96 (42° dip) large eyelets 93½-94½; ½" TGS @ 97
-298 Med to lt med gr dol; chert nod @ base
-302½ Lt med gr dol; few eyelets 98-99½ banded to well banded (dip 40°); ½" TGS @ base
-307 Lt med gr dol (top 9" med & mott) lt bands (43° dip) occ lt crackle; scatt ss grains 306-07
-310½ Med gr dol; some ss grains; top 9" brecc w/grn shale; brecc chert nod 08½; then crackle; large eyelet near base
-311½ Lt med to lt gr dol; eyelet @ 11; lt bands; crackle w/ZnS shines 14-17
-319½ Lt med gr mott semi re-xl (or sug dol)
-322 Lt gr dol; lt mott; few eyelets near base then TGS
-325 Lt med gr dol; banded (35° dip) occ crackle; ZnS shines 24-½
-331½ Lt gr dol; lt bands & occ crackle; ZnS shines 27-28 & 30-½; bott 6" is med gr dol
-338 Med dk to dk gr dol; crackle to brecc; est 1% FeS to 35; then 2% 35-38
-340 Med dk to med gr dol; banded; 1" sandy @ base then v hvy FeS shine
-345 Med gr dol; shaly mott to mott; large eyelet @ top; 42-45 crackle to brecc w/est 2% FeS
-348 Med gr dol; banded (55° dip) crackle to brecc w/est ½% FeS
TOP R BED 348'
-349 Grn shale w/some re-xl
-349½ Br mott re-xl
-352 Lt med gr dol; mott & sug; bott 6" brecc
-353½ Med gr semi re-xl; shaly
-356 Med dk gr dol; crackle to brecc w/est 2% FeS
-359 Med & med dk gr dol; est 2% FeS
-367 Br re-xl; brecc 64-66 w/est 2% FeS (3½' core loss 359-66) @ base becomes semi re-xl
-368½ Lt med gr dol; v sug @ top
-370½ Brecc; lt med gr dol; sealed w/re-xl & some gangue; 69-½ ZnS shines; 69½-70½ est 1% FeS
-373 Brecc chert & re-xl; occ block dol; bott 6" v hvy FeS; bott 2" re-xl
-374 Lt med gr dol; v sug @ top
-375 Br vuggy re-xl
-376 Lt br re-xl; top 2" gr sandy dol
-377 Brecc chert sealed w/shale & re-xl
-380 br to lt br re-xl
-382 Lt gr re-xl to semi re-xl, mott; brecc 380-81
-384 Lt med semi to dol
-386 Br re-xl; shaly top & bott 6"
-390½ Lt med gr semi re-xl to sug dol; lt mott
-391 Dk br re-xl
-396 Lt med gr dol; few ss grains & 1" TGS @ 92½, TGS 96
-396½ Gr re-xl
-397 Br mott re-xl
-399½ Med dk gr dol; some eyelets & crackle
-404 Med gr dol; some brecc w/grn shale & re-xl 400½-01; block dk dol 01-½; then brecc block of med gr dol to 03; 03-04 mostly grn shale
-404½ Dk re-xl
-408½ Med dk gr dol; sug; some shears & crackle, occ tr of re-xl
-412½ Gr semi re-xl & occ dk sug dol (or semi) crackle to bre ec; est 1% ZnS 08½-11
-413½ Brecc chert & some re-xl; est 1% ZnS 12½-13½
-417½ Lt med gr dol; banded; crackle to brecc; est 2% ZnS 16-16½
TOP S BED 417½
-418½ Br re-xl; crackld
-420 Brecc chert; dol & re-xl; est 4½% ZnS 18½-19½
-421 LS
-422 Brecc chert & some re-xl & occ dol; tr of ZnS thruout.
-425½ Lt br re-xl; occ fragment of chert; occ crackle
-426 V shaly jasperoid re-xl; est 2½% ZnS 25½-26
-428½ Med gr dol; brecc sealed w/br re-xl; tr's of ZnS & FeS to 27½
-431 Gr to br re-xl; mott; some scatt silica

-414 Lt br mott re-xl; silic top 6-8"
-415 Gr re-xl
-416 Lt med gr dol
-418 LS, ptly re-xlized top 3", then banded (40° dip)
-441 Br re-xl; v limy; v sandy 38½-39½
-456 Lt br re-xl; ox & silic; (8' core loss 39½-51; 5' core loss 51-57)
BASE KINGSPORT FM 456'
-461½ Lt med gr dol; lt bands to 58 (dip 37°) w/chert nod @ 57; v silic & some chert 58½-59; lt mott 59-61½ w/TGS @ 61½
-467½ Med gr dol; few silic eyelets & lt mott; some crackle near base w/a chert nod just above the base
TOP U BED (L-2) 467½'
-469 Dk br re-xl; top 6" oolitic chert
-470½ Lt med gr dol; v sug to semi re-xl; well mott; some crackle near base
-480 Lt br v coarse grained re-xl; silic to jasporeid; occ tr FeS thruout
TOP V BED (L-3) 480'
-482½ Lt med gr dol; lt crackle
-487 Med gr dol to med dk gr; eyelets & crackle & some mott; scatt ss grains bott 4?
-489 Br re-xl; grn shale & FeS @ 88; few vugs 88-89
-489 3/4 Lt med gr dol; crackle; scatt ss grains bott 1"
-491 Br mott re-xl
-494½ Dry breec; mix of silica & CMss to 92, then breec che rt & lt re-xl
BASE V BED 494½'
-496 Med gr dol; sug; v cherty top 6"; scatt ss grains bott 2"
-498 Br re-xl; grn shaly top 1"
-500 LS, top 6" some breec sealed w/re-xl
-501 Breec; re-xl sealed w/re-xl & jasper; occ block LS
-503 Lt gr re-xl; tr ZnS @ top
-504½ Lt gr dol; chert nod 504
-507 Br re-xl
-507½ Lt med gr sug dol; banded (35° dip) few ss grains @ base, then 1" TGS
-508½ Br re-xl
-513 Lt med gr dol; crackle to 11, chert nods 11-½; few bands 11½-13 (33° dip) TD

OFFICIAL FILE COPY
O. M. E.
RECEIVED OCT 20 1958
DATE | INITIALS | CC
10/20 | C | 220
10/21 | | 110
10/24 | | 800
500

DMEA EXPLORATION PROJECT

INTERIM REPORT

DMEA-4580, Idm-E1088 - zinc

Operator: B. H. Putnam, Operator. P.O. Box 65, Thorn Hill, Tenn.

Location: Puncheon Camp Area, Grainger County, Tennessee

Summary of Drilling Completed

	Since last inspection	To date
Number of holes	2	40
Footage	1018	22,543

Holes showing:

a) Commercial zinc ore---------- 4
b) Non commercial zinc mineralization----- 23
c) No zinc mineralization---------- 13

Additional data on the two holes completed during the interim follows:

Hole No. GD-14 - Located 200 feet southeast of GD-3 on Greene-Dalton property. Depth 505 feet. Coordinates N49,767.51, E46,388.73; elevation at collar 1425.89 feet. Drilling began Sept. 9, 1958 and was completed Sept. 18, 1958. Brief log of hole: 0-82 ft. overburden; collared in Mascot fm; top of Kingsport (CM) at 122½; top of "R" bed at 279½ ft; top of "S" bed (?) 360 ft; top of Longview dolomite at 412½ ft; "U" bed from 426 to 437 ft; hole bottomed at 505 feet.

Mineralization: Shines of sphalerite at 284½, 288½, 293-293½ and 298½. 7 ft (301½-308½) of 1.26% zinc; shines @ 343½; 5½ ft (346½-352) 3.50% zinc; 8 ft (365-373) 3.52% zinc; 5½ ft (378½-384) 1.64% Zn; 6½ ft (395-401½) 0.67% Zn; 1 ft (409-410) 1.44% Zn.

Hole No. GD-15 - Located 100 feet southeast of GD-14 on Greene-Dalton property. Depth 513 feet. Coordinates N49,676.97, E46,338.01; elevation at collar 1436.7 feet (est). Drilling began September 23, 1958 and was completed October 2, 1958.

Brief log of hole: 0-67 ft overburden, collared in Mascot fm; cavity from 113 to 120 ft, reamed from 100 to 135 ft; top of Kingsport (CM)(?) at 176; top of "R" bed at 348 ft; top of "S" bed at 417½; top of Longview dolomite at 456 ft; "U" bed from 467½ to 480; hole bottomed at 513 ft.

Mineralization: Traces of sphalerite at 173, 226, and 270 feet; shines of sphalerite from 314- to 317 feet, 324 to 324½, 327 to 328, 330 to 330½ and 368½ to 369 ft.

Runs: 2½ ft (408½-411) est. 1% zinc; 1 ft. (412½-413½) est. 1% Zn; 1 ft (416-417) est. 1% Zn; 1 ft (418½-419½) est. 4.5% Zn; 2 ft (425½-427½) est. 1% Zn; Trace of sphalerite at 501 ft. Heavy pyrite was observed from 333 to 473, est. 1% FeS_2.

Present drilling is confined to Hole GD-16, located 200 ft southeast of GD-15 on Greene-Dalton property. Core was observed to a depth of 155 feet.

Inspected: Oct. 7, 1958

V. J. Lynch, Mining Engineer
Bureau of Mines (OME)

z

L. E. Shirley, Mining Engineer
Bureau of Mines (OME)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION V

ELECTROTECHNICAL
EXPERIMENT STATION

P. O. BOX 217
NORRIS, TENNESSEE

OFFICIAL FILE COPY
O. M. R.
RECEIVED OCT 3 1958

DATE	INITIALS	CODE
10/3	C	220
		110
~~10/7~~	~~KEL~~	~~500~~

October 1, 1958

Memorandum

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

From: Personal Assistant, Norris, Tennessee

Subject: Monthly reports and vouchers

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

Idm-E1088 B. H. Putnam
Docket No. DMEA-4580
10th payment - month of September
Amount $1475.52

Idm-E1150 H. Lee Medford
Docket No. DMEA-4828
5th and final - month of August
Terminated: 8/18/58
Amount $408.00

Idm-E1195 H. Lee Medford
Docket No. DMEA-4936
3rd payment - month of August
Amount $990.00

Idm-E1184 Sam L. Phillips
Docket No. DMEA-4803
4th and final - month of August
Terminated: 8/18/58
Amount $280.50

Idm-E1205 McMahan, Young & Pitman
Docket No. DMEA-4937
2nd and final - month of August
Completion Date: 8/30/58
Amount $787.50

Helen R. Miller

Helen R. Miller

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

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

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K-

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of Sept., 1958 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name B. H. Putnam Minerals Zinc
Address 512 Third Street, Marietta, Ohio
Contract Amount, $170,125.00 Government Participation: 50 % Amount, $85,062.00

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	2784.00	53,253.00	56,037.00	10/14/58		
Bulldozing						
Crosscutting						
Drifting						
Reaming	—	1122.00	1122.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	—	140.25	66.25			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	—	66.25	140.25			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incid. Allow @ .18/ft.	167.04	3,195.18	3,362.22	X		
TOTALS	2951.04	57,776.68	60,727.72	2951.04	57,776.68	60,727.72

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

Date 9/30/58 *Payee B. H. Putnam

Per [signature] Title Superintendent

*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:

$ 1475.52

Signature [signature]
(Authorized Certifying Officer)

Date OCT 1 1958 Vou. No. 39
(See other side)

1475.52

(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. E-1088 in accordance with the terms of the contract.

Signature [illegible] Title MINING ENGINEER U. S. BUREAU OF MINES Date SEP 29 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Lawrence Title EXECUTIVE OFFICER DME FIELD TEAM REGION V Date SEP 29 1958

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.

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 OCT 8 1953 O.M.E.

Month of Sept. 8 1953 Docket No. DMEA 4580 Contract No. Idm- E 1088

Operator's Name B. H. Putnam, Operator Minerals Zinc

Address 512 Third Street, Marietta, Ohio

OPERATION	Unit	Costs This Month	Units This Month	Costs to Date	Units to Date	Unit Costs to Date	Authorized by Contract: Units	Authorized by Contract: Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	2784.00	928	56,037.00	18,679	3.00	50,000	3.00
XXX Reaming / Churn	Foot	-	-	1122.00	561	2.00	5,000	2.00
XXXX Sampling / Auger	Each	-	-	66.25	53	1.25	550	1.50
XXXXX Core Boxes	Each	-	-	140.25	75	1.87	150	2.00
Stripping								
Trenching								
Test Pits								
Roads and Trails Incid. Allow. @ .18/ft.	Foot	167.04	928	3,362.22	18,679	.18	50,000	.18
Total Distributed Costs		2951.04		60,727.72				Total Costs Authorized by Contract
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
Total Costs		2951.04		60,727.72				

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 Sept. 30 Operator B. H. Putnam

Per [signature] Title Superintendent

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)

Remarks:

(For Government use only)

[signature]
MINING ENGINEER
U. S. BUREAU OF MINES

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

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT, GRAINGER COUNTY, TENN. FOR SEPT. 1958

BY: W. T. HILL

Docket No. 4580
Contract No. Idm-E 1068

During the month of September, two holes were drilled on the Puncheon Camp Creek Project. Hole GD-13 was drilled on a strike fence 200 feet northeast of GD-12. The hole collared in the Mascot formation and was drilled to a depth of 423 feet.

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-29	Overburden	—	—	—
29-111	Mascot	CMas @ 111	—	Dolomite; 60% Core loss
111-359	Kingsport	Top of "R" @ 240 Top of "S" @ 295½ Top of "T" @ 359	—	Dolomite, limestone, & re-xl; no brecciation.
359-423	Longview	Top of L-4 @ 400	—	Dolomite, re-xl; some limestone.

Hole GD-14 was drilled on a strike fence 100 feet southwest of GD-8. The hole collared in the Mascot formation and was drilled to a depth of 505 feet.

0-82	Overburden	—	—	—
82-122½	Mascot	CMas @ 122½	—	Dolomite
122½-412½	Kingsport	Top of R @ 279½ Top of S @ 360 Top of T @ 412½	Shines @ 284½; 288; 293-293½, est. 2%; 298; 301½-308½, 7' @ 1.26% Zn; 343½; 346½-352, 5½' @ 3.5%; 365-373, 8' @ 3.52, 378½-384, 5½' @ 1.64%; 395-400½, 5½' @ 0.67%, 409-410, 1' @ 1.44%	Dolomite & re-xl; in part brecciated
412½-505	Longview	Top of L-4 @ 452		Dolomite and re-xl.

Drilling is now underway at location GD-15 100 feet southwest of GD-14.

Invoice
Marietta, Ohio

B. H. Putnam, Appre.
512 Third Street
Marietta, Ohio

September 30, 1958

In account with
PUTNAM DRILLING COMPANY
P. O. BOX 647

512 Third Street

Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580-Sept. 1958

Core Hole No. GD-13

Footage drilled	423' @ 3.00/ft.	$1269.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just in accordance with the bid submitted by Putnam Drilling Company.

B. H. Putnam, Operator

By: A. R. Eddy

A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B. H. Putnam, Appre.
512 Third Street
Marietta, Ohio

September 30, 1958

In account with
PUTNAM DRILLING COMPANY
P. O. Box 647

512 Third Street

Phone: FR 4-6761

Statement for drilling Luncheon Camp Creek Project DMEA Contract No. 4520 - Sept. 1958

Core Hole No. CD-14

Footage drilled	505' @ 3.00/ft.	$1515.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just in accordance with the bid submitted by Putnam Drilling Company.

B. H. Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

E. H. Putnam D.D. GD-13

Copper Ridge Project-Pumcheen Camp Creek

DMEA Idm-E 1088

Hole No:	GD-13	Collared:	8-29-58
Farm:	Green-Dalton	Bottomed:	9-6-58
Loc: N	50,010.11	Depth:	423
E	46,743.77	Casing:	EX 29; AX 123'
Elev:	1415	Reaming:	None
Drilled By:	Putnam Drlg. Co.	Cement:	None
Logged By:	E. W. Spears		

Top Kingsport	82' est (much core loss)
Top R Bed	240'
Top S Bed	298
Base Kingsport	359
Top U Bed	365
Base U Bed	383½

0-29	Overburden
-32	Lt med gr dol; top 3" sandy edgewise congl (Base M-7) then lt mott w/chert nods 30½, 31, & 32 (18' core loss 33-61)
-37	Lt gr dol; lt bands (dip @ 30°) to 34 w/TBS @ 34; then lt mott & grades to lt med gr; thin fault 36-½; TGS 37
-45	Lt med to med gr dol; mott w/silic eyelets; @ 40 v oxid prob much core loss below 40
-59	Med gr dol; mott w/gangue & silic eyelets
-60	Lt gr dol; thin ss @ base
-61	Lt br shaly re-xl
-66	Lt med gr dol; lt mott; sugary @ top; grades to med gr
-69½	Med gr dol; mott w/gangue & silic eyelets; bott 2' much darker
-72	Lt med gr dol; some sand & tr congl top 6"; sandy 71-72 (12' core loss 70-85)
-87	Only recov med gr mott to shaly dol (10' core loss 85-98)
	TOP KINGSPORT LST. @ 87'
-92	Med gr dol; v mott
-97	Lt gr dol
-100	Med gr dol; lt mott to shaly mott (5' core loss 98-110)
-103	Lt med gr dol; mott & oxid
-104	Med gr dol; to lt med gr; banded
-110	Lt med gr dol; v sandy (3") @ about 105
-116	Med dk gr dol; shaly mott & eyelets (2' core loss 110-120)
-118	Lt med gr dol; bands
-124	Med gr dol; shaly bands (35° dip) sands 122½-24 w/hvy ss 24
-125½	Lt med gr dol; shaly & sugary bott 2"
-126½	Med gr dol; well mott
-128½	Lt med gr dol; lt mott; lt shears; chert nod & TGS @ base
-137	Lt gr dol; 2" colitic sandy chert nod @ 34; sed. breco 34-36 w/hvy ss & colite @ 36 (Base K-2 thin zone)
-141	Lt med gr dol; lt mott; TBS @ 37½
-148½	Med gr dol; v mott top 6"; then shaly mott
-157	V lt gr dol; lt shaly mott to 53 w/TGS 53; then lt bands (dip 36°) chert nods 56 & 57
-159	Lt gr dol; well banded (35° dip) chert nods 58½ & 59
-165½	Lt med gr dol; v banded to wavy (dip 35-36°) v sandy 64-65½ w/bott 3" mostly grn shale (base bed K-3)
-168½	Lt gr dol; top 6" darker & some crackle
-172	Lt med to lt gr dol; lt mott to 70 w/thin fault @ 70; lt bands 70-72 w/chert nod @ 72 (tr colite)
-172½	Lt med gr sugary dol; mott (to cong.) w/scatt ss grn ins
-178	Lt to lt med gr dol; chert nod 75; v banded to wavy 75-78 w/chert nods 76, & 78 & few ss grains 78 (this zone partly sed. breco)
-183½	Lt gr dol; cong. banded chert nods 79½, 80½, 81½, & 82½
-184	Lt gr sugary dol; many specks white silica & some scatt ss grains; TGS @ base
-185	Lt med gr dol; mott; TGS @ base (base bed K-4)
-191½	Lt gr dol; lt bands (few gangue eyelets top6") chert nods 89 & 90
-193	Lt med gr dol; banded to mott; TBS @ base.
-202	Lt gr dol; lt mott top foot; then banded (dips 28-37°) chert nods 96½, 98½, & 99-½
-205	Lt to lt med gr dol; lt mott; TGS @ 204½
-213	Lt gr dol; banded to wavy to 10 w/some large eyelets 05-06; few scatt ss grains @ 10, then TGS; lt bands 10-12; well banded 12-13 (37° dip)
-215	Lt med gr dol; scatt ss grains for 4" @ 14; then 4" grn shale & 4" chert re-xl & shale (base bed K-5)
-219½	Lt gr dol; lt bands & trace lt crackle
-220½	Med to lt med gr sugary dol; shaly mott to mott
-234	Lt gr dol; mott to 23; then bands (dips 32-37°) scatt ss grains @ 33½; TGS @ 234
-238½	Lt med gr dol; lt bands & mott @ top to mott @ base; some eyelets bott 6"
-240	Lt (lt med) gr dol; banded (36° dip) few ss grains bott inch
	TOP ROGERSVILLE 240'

-241 Grn. shale; some chert in lower part.
-243½ Med gr sugary dol; mott
-245 Lt med gr dol; mott; chert nod 44
-249½ Med gr dol; mott & sug; some lt crackle; 1" TGS @ 45½; bott 2" lt med gr; few ss grains & TGS @ base
-253 Lt br re-xl; mott & shaly
-254½ Br. vuggy re-xl w/eyelets (grades to semi re-xl)
-255 Med gr dol; sugary; vuggy
-255½ Lt med gr dol; some bands of brecc chert sealed w/gangue & re-xl
-258½ Lt re-xl; chert nod then grn shaly @ 57
-260 Lt med gr dol; sug & mott (some semi re-xl)
-261 Dk br mott re-xl
-262 Lt gr dol; TGS 4" above base, then bott 4" sug
-267½ Br. re-xl; 65-67 white eyelets w/Fluorite centers
-271 Lt med semi re-xl to sug dol; chert nods 71 & ½
-277 Br. & grn mott re-xl; tr crackle @ 76
-279 Lt gr to grn re-xl (poss semi re-xl)
-280 Dk br re-xl; some vugs & eyelets
-286 Lt med gr dol; some crackle 80½-81 w/tr FeS; few ss grains 81, then sli darker & sug 81-½
-286½ Br mott re-xl
-289 Med dk (or dk) gr dol; vugs & eyelets; cherts 87½ & 88 (base bed K-7)
-291 LS; top 4" grn shale; TBS @ base
-293½ Med dk to med gr sug dol; few eyelets
-295½ Lt med gr dol; brecc top 6" w/FeS shines; crackle 94-95½
TOP S BED 295½
-298 Br re-xl; many dol blocks to 97; chert nod @ base
-298½ Med gr dol
-302½ LS; 1" re-xl & shale @ top; shaly & some zones congl; chert nod 302
-303 Med gr sug dol
-314 LS; cherty @ 07½; chert nod 09; shaly 09½ w/poss ZnS traces 09½-3/4; bott foot sli re-xl
-316 Br. re-xl
-321 3/4 LS; top 2" ptly re-xl
-323 Med gr dol; few ss grains @ base
-336 LS; chert nod & tr ss @ 32½; bott foot v re-xl
-337½ Br. re-xl; some white eyelets
-338 Gr banded re-xl; occ ss grains
-344 LS; v banded 40-41; partly re-xl & banded 41-44 w/some red oxidation
-347½ Lt br limy re-xl; some bands 46-3/4 w/thin ss 46 3/4; v tiny 46 3/4-47; TGS 47½
-349½ LS; partly re-xlized
-351½ Br. re-xl
-354½ SS
-359 Dk br re-xl
BASE KINGSPORT FM. 359'
-360 Gr re-xl to semi re-xl
-363 Lt med gr dol; sug; large chert nod 61; cherts 62½ & 63
-365 Med gr dol
TOP U BED 365'
-3666 Br. re-xl; oolitic chert nod @ top
-371 Med (lt) gr dol; v sugary & well mott
-376 Med to med dk gr dol; chert nod 74
-383½ Br re-xl; some lt crackle; darker bott foot; grn shale @ base
-388½ Lt med gr dol; semi @ top; then to sug to dol
-389½ Med gr dol; eyelets
-390½ Med semi re-xl; bott 6" chert
-392 Med gr dol; sug; some eyelets
-392½ Lt med gr dol; chert nod @ top; few sand grains @ base
-395½ Br re-xl; mott & silic & small vugs
-396 3/4 Lt med semi re-xl; v hvy ss @ base

-397½ Dk br re-xl; bott 3" much LS & chert (2' core loss 97-409)
-398½ Lt br re-xl; chert mod @ base
-400 Br re-xl; v cherty (base bed L-3)
-403 Lt med gr dol; bleached chert 400½; few ss grains 402
-406 Lt br re-xl
-410 LS; chert mod & some re-xl @ base
-412 Lt med gr dol; some crackle; sestt ss grains bott 3"
-417 Br. re-xl; silic, cyclets & vuggy
-418½ Or to br re-xl
-419½ Lt med gr semi re-xl
-422½ Lt br to br re-xl; lt crackle
-423 Lt re-xl; lt bands & chert mod in middle (TD).

B. H. Putnam D.D. GD-14
Copper Ridge Project - Puncheon Camp Creek
DMEA Idm-E 1088

Hole No: GD-14

Farm: Green-Dalton

Loc: N 49,767.51
E 46,388.73

Elev: 1425.89 D.F

Drilled By: Putnam Drlg. Co.

Logged By: J. W. Spears

Collared: 9-9-58

Bottomed: 9-18-58

Depth: 505'

Casing: BX 82'; AX 100'

Reaming: None

Cement: None

Top Kingsport	122½
Top R Bed	279½
Top S Bed	360 (? - core loss this zone)
Base Kingsport	412½
U Bed	426-437

0-82	Overburden
-88	Med to med dk gr dol; shaly bands
-90	Dk gr dol; shaly mott
-91	Med gr to lt med gr dol; scatt sands bott 3" w/hvy ss @ base
-92	Lt med gr dol
-94	Med gr dol; v mott & sugary
-97	Lt med to med gr dol; well banded (42° dip) scatt thin sands from 95-97
-100	Lt med to med gr dol; banded (dip 42°)
-101½	Lt med gr dol
-104	Med gr dol; oxidized; shaly mott; chert nod @ base
-108	Lt med gr dol; banded (38° dip)
-109	Med gr dol
-114	Med dk gr dol; shaly mott
-117	Med gr dol
-119½	Med dk gr dol; shaly mott & white eyelets; chert nod @ base
-122½	Lt med gr dol; banded (40° dip) hvy sands bott 3"
	TOP KINGSPORT FM 122½'
-124½	Lt med gr dol; lt bands; sandy 24-½
-127½	Med gr dol; lt mott; few eyelets
-129	Lt med gr dol; v sug; mott; top 4" v sandy & shaly
-135	Lt gr dol; banded to 30½ w/sand @ 30½; then lt mott & grades to lt med gr dol; TGS @ base
-137	Lt med gr dol; mott & oxid; poss 6" cavity near base
-141	Lt med to med gr dol; mott; v oxid top 1½'
-145	Lt gr dol; lt bands; poss cavity @ 42; sandy 42½; grades to med gr mott dol
-149	Med gr dol; shaly mott
-153	Med dk gr dol; shaly mott
-159	Med gr dol; few bands to 54, then broad bands (40° dip) w/occ chert nod to 59; v oxid. 57-59 w/poss cavity 58
-160½	Med to lt med gr dol; mott @ top; then lt bands w/few thin sands bott 6"
-168½	Lt med gr dol; lt mott & occ TGS; oxid w/poss cavity @ 65; v mott 65-68½ w/3" sandy congl @ 68½ & TGS @ 68½
-173½	Lt gr dol; 71½-72 sandy edgewise congl to oolitic chert; occ sand or oolitic chert to 73½ w/hvy ss & chert @ 73½
-174½	Lt med gr dol; some lt bands
-178	Med gr dol; mott
-178½	Med v mott sug dol w/chert nod @ top
-184	Med dk gr dol; shaly mott; some zones oxidized
-188	Lt gr dol; shaly mott; ½" TGS @ base
-192	Lt gr dol to lt med gr; lt bands; chert nods 90½, 91, 91½, & 92
-194	Lt med gr dol; well banded (41° dip) chert nods 93½ & 94
-202	Med to lt med gr dol; well banded to wavy; few sands 99-200½, v sandy 200½-02 w/1½" TGS @ 202 (base bed K-3)
-205	Med gr dol; well mott & sug; bott 2" is congl & chert w/<u>a trace of ZnS</u>
-207½	Lt gr dol; lt bands (42° dip) 1" TGS @ base
-210½	Med to lt med gr dol; shaly mott; chert nod @ base
-220	Lt med gr dol; mott to bands to 11½ w/large chert nod @ 11½; banded to wavy 11½-25 w/small chert nod 13 (dip 40°) lt mott 15-16 w/scatt ss grains @ 15; lt bands 16-20 w/chert nods 16½, 17, 18, 18½ & 19½
-221	Lt gr sug dol (to semi re-xl) large eyelets @ top; scatt specks of silica thruout
-221½	Med (med dk) gr dol; shaly mott; TBS @ base (base bed K-4)
-228	Lt gr dol; chert nod 26½ (dip 40°)
-229	Lt med gr dol; bands
-234	Lt gr dol; some mott top foot; then banded (40° dip) to wavy; large chert nod @ base
-235½	Med (lt med) gr dol; mott & sug; chert nods 35 & 35½
-240	Lt med gr dol; banded; chert nod 37½ & few ss grains few inches below the chert; TBS 39
-242	Lt med gr dol; mott
-243	Med gr dol; mott

-248 Lt gr dol; lt mott top 1½ feet & some white eyelets; then bands to wavy bands (dip 40°) & grades to lt med gr dol; TBS @ base
-253 Lt med gr to lt gr dol to 50 mott & crackle then banded sandy bott 6"
-254 Med gr dol; v cherty; top 4" grn shale (base bed K-5)
-258 Lt to lt med gr dol; few eyelets, top foot; lt crackle
-261½ Med gr dol; mott; crackle; FeS shines 58½-59 & 60½
-264 Med dk gr dol; shaly mott; lt crackle; occ tr FeS
-265½ Med gr dol; bands (41° dip)
-270 Lt med gr dol; crackle (some calcite filled) occ tr FeS; chert mod 69
-272½ Med gr dol; lt bands; some eyelets top foot & crackle w/FeS traces; few scatt ss grains bott 9"
-277½ Lt med gr dol; mott; lt crackle to 75, then strong crackle; darker towards base
-279½ Lt med gr dol; banded (41° dip) bott 4" breec sealed w/grn shale
TOP R BED 279½'
-280½ Grn brecciated shale
-282½ Lt med gr sug dol; about semi re-xl @ top; mott & crackle
-283 Med gr sug dol; well mott; crackle
-286 Lt med gr sug dol; well mott; crackle; ZnS shine 84½
-290 Med gr mott & sug dol; crackle; strong ZnS shine @ 88½; some FeS 89½
-291 Med dk gr dol; sug; & some lt g r dol
-291½ Lt med gr dol; crackle w/traces of FeS
-294 Lt br re-xl; crackle to breec; top 3" grn shale; est 2% ZnS 93-½
-295½ Gr shale mott re-xl
-296 Lt br mott re-xl
-298 Br mott re-xl; vugs & eyelets
-298 3/4 Lt med gr dol; tr ZnS @ base
-299 Gr shaly breec re-xl
-300 Br semi re-xl; vugs & eyelets
-301½ Lt med gr dol; banded; some crackle w/FeS; @ base 1" scatt ss grains then 3" re-xl & chert w/a ZnS tr @ top of re-xl
-303½ Med to lt med gr dol; banded breec; est 6% ZnS 02½-2 3/4; scatt ss grains bott 2"
-305 Mixture of re-xl, chert, silica & some gangue; v hvy ZnS shine @ 04; 2" grn shale (dk) @ base
-307 Dk br re-xl; FeS thruout; ZnS shine 05½; est 2% ZnS 06-06½
-308 Lt med gr dol; mott, sugary & breec; est 1½% ZnS 07-08
-310½ Br re-xl; strong ZnS shine @ 08½; v silic 09-½
-313½ Lt med gr dol; banded; scatt FeS thruout
-317 Lt br re-xl; @ base grades to semi re-xl
-320 Lt semi re-xl to sug dol
-322½ Lt gr dol
-325½ Br re-xl
-341 Lt med gr dol; zones of semi & sug; crackle to 32; breec 39-41
-343 Med dk gr dol; crackle; eyelets & vugs
-343½ Dk gr & lt gr dol; breec; ZnS shines
-346 Med gr sug dol; crackle
-350 Br jasperoid re-xl; breec; est 1% ZnS 46-48½; est 8% ZnS 48½-50
-353 Med dk gr dol; sug; crackle; eyelets; FeS shine 51; ZnS shines 51½-52; bott 3" becomes dk re-xl (5' core loss 52-62)
TOP S BED (?) 353'
-355½ Lt br re-xl; bott foot chert
-362 (Most of core less thin zone) become lt med gr dol; breec & sealed w/re-xl
-363 Br re-xl; bleached chert mod @ base (1' core loss 62-65)
-363½ Lt med gr dol
-381 Br re-xl; blocks of dol to 68; all silic 69-½; v cherty 72-½; v silic & oxid (vugs) 72½-75; thick band silica 77½; v silic 78½-81; ZnS 65-66½ est 1½%; 66½-69 est 8%; 69½-71½ est 2½%; 78½-79½ est 3%; shines 79½-80½

-382 Lt. med gr dol; crackle; ZnS shines throughout
-384 Br silic re-xl; est 3½% ZnS
-389 Lt br silic (v) & vuggy (oxid) re-xl
-391 Lt br mott re-xl
-391½ Lt med semi re-xl
-393½ Br re-xl; mott w/white; scatt ss grains 92-½; v sandy 91½-93
-398 Lt br v silic & vuggy re-xl; 94½-95 est 3% ZnS
-398½ Lt med semi re-xl; bands; crackle w/ZnS shines
-404 Lt br v silic vuggy re-xl; ZnS shines to 401
-412½ Lt re-xl; occ vug & eyelet to 07; then mott; 09½-10 est 2% ZnS; bott foot becomes dk gr.
BASE KINGSPORT FM 412½'
-426 Lt med gr dol; sug @ top; chert nod 15½; v silic to chert 15-16½; chert nod 18½ & below 18½ grades to med gr mott dol; crackle 21-22 w/chert nod 21½
TOP U BED 426
-427 Br re-xl; sandy oolitic chert @ top
-432 Lt med g v mott sugary dol to med gr sug dol
-437 Br re-xl; white mott to 33½; then v silic
-440 Lt med gr dol; to med gr; sug; lt mott
-442½ Med (med dk) gr dol; crackle & eyelets; scatt ss grains & FeS bott 3"
-443 Sec. chert
-446½ Lt med gr dol; few ss grains @ 43½; some breec w/re-xl gangue 43½-44½; lt crackle; chert nod near base; v heavy ss @ base
-452 Br re-xl; to 50 v silic & cherty; bott 6" most of bleached chert
-453½ Lt med gr dol; v cherty top 6"; scatt ss grains bott 6"
-455 Lt semi re-xl; mott
-459½ Lt br re-xl; few ss grains @ 56½; breec 57½-59½ w/chert & few blocks sandy lt gr dol
-464 Mostly silica, some lt br re-xl & chert
-464½ Br re-xl
-465½ Lt med gr dol; top 4" semi to sug; chert 65; few ss grains @ base
-467 Br re-xl; silic top 6" (1½' core loss 65-70)
-468 Lt med gr dol; chert nod in middle
-471 Gr mott re-xl (tc semi re-xl)
-475½ Lt (lt med) gr dol; lt crackle w/occ FeS trace; chert nod 73; banded 73-75½ w/few ss grains & chert nod @ 74½
-480½ Lt br to br re-xl; v silic top 6"; chert nod 77½; banded & silic w/traces of FeS from 77½-79½ (also oxid) sandy 79-½; shears (to fault) 79½-80½ w/chert nod @ 80½
-485½ V lt re-xl; breec 81½-82½ sealed w/shale & chert & sands; v silic 84½-85; chert nod 85-85 3/4 (oolitic??) crackle 85 3/4 to 86½
-485 Lt br re-xl; v mott w/white (reef?) bott foot becomes v silic
-490 Dk re-xl; band silic @ base
-491½ Lt med gr dol; lt crackle
-494 Lt br well mott re-xl (reef?)
-495 White re-xl; v silic
-496 Lt med gr dol (a breec block)
-498 Lt re-xl; to 97½ much grn material (shale?) sand @ base
-503 Lt br re-xl; mott; occ zones shaly (grn) & jasporoid; v sandy 02½-03
-504 Br & grn shaly re-xl; sandy
-505 Br re-xl (TD)

DMEA
RECEIVED SEP 22 1958
CODE
9-22 C 220
22 Com 100
" JEJ 110
9/23 Talbot 800
9/24 Murg 500

DMEA EXPLORATION PROJECT

INTERIM REPORT

DMEA-4580, Idm-E1088-Zinc

Operator: B. H. Putnam, P.O. Box 65, Thorn Hill, Tennessee

Location: Puncheon Camp Area, Grainger County, Tennessee

Summary of drilling completed

	Since last inspection	To date
Number of holes	2	38
Footage	883	21,525

Holes showing:

a) Commercial zinc ore---------- 3
b) Non-commercial zinc mineralization---------- 22
c) No zinc mineralization---------- 13

Additional data on the two holes completed during the interim follows:

Hole No. GD-12. Located 100 feet southwest of GD-9 and 100 feet northwest of GD-2 on Green Dalton property. Depth 460 feet. Coordinates N49,846.84, E 46,634.33; elevation at collar 1391 ft. Drilling began 8/20/58 and was completed 8/27/58. Brief log of hole: 0-44 feet overburden, collared in Mascot fm; top of Kingsport (CM) at 128 ft; top of "R" bed at 277½ ft; top of "S" bed(?) at 336; top of Longview dolomite at 390½; top of "U" bed at 402½; hole bottomed at 460 feet. Mineralization: Shine of sphalerite at 440½; 2 ft (441-443) est. 6% Zn; strong shines of sphalerite at 445½, 446 and 449 feet.

Hole No. GD-13- Located 200 feet northeast of GD-12 and 265 feet northeast of GD-3 on Green-Dalton property, depth 423 feet. Coordinates N50,010, E46,743; collar elevation 1414 feet. Drilling began 8/29/58 and was completed 9/6/58. Brief log of hole: 0-29 feet overburden; collared in Mascot fm; top of Kingsport fm (CM) estimated at 87 feet; top of "R" bed at 240 ft; top of "S" bed at 295½ ft; bottom of "S" at 359; "U" bed from 365 to 383½ feet; hole bottomed at 423 feet.

Mineralization: None.

The next hole to be drilled will be GD-14 located 180-feet southeast of GD-8 and 200 feet southeast of GD-7 on Green-Dalton property. The drill was moving to this location at the time of this visit.

Inspected: Sept. 8, 1958

L. E. Shirley, Mining Engineer
Bureau of Mines

Helmuth Wedow, Jr., Geologist
Geological Survey

z

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

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K-

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of August, 1958 Docket No. DMEA 4580 Contract No. Idm-E 1088

Operator's Name B. H. Putnam Minerals Zinc

Address 512 Third Street, Marietta, Ohio

Contract Amount, $ 170,125.00 Government Participation: 50 % Amount, $ 85,062.00

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	1380.00	51,873.00	53,253.00	9/18/58 OWRK		
Bulldozing						
Crosscutting						
Drifting						
Reaming	—	1,122.00	1,122.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	—	140.25	140.25			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	17.50	48.75	66.25			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify):						
Incid. Allow. @ .18/ft.	82.80	3,112.38	3,195.18			
TOTALS	1480.30	56,296.38	57,776.68	1480.30	56,296.38	57,776.68

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

Date August 30, 1958 Payee B. H. Putnam

Per William Thief Title Superintendent

*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:

$ 740.15

Signature Helen R. Miller
(Authorized Certifying Officer)

Date SEP 10 1958 Vou. No. 32

(See other side)

740.15

(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. Tam-E 1088 in accordance with the terms of the contract.

Signature [illegible] Title GEOLOGIST, U. S. G. S. Date SEP 4 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Lawrence Title EXECUTIVE OFFICER DMEA FIELD TEAM REGION V Date SEP 4 1958

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.

Form MF-104A
(April 1962)

Budget Bureau No. 42-R1151.2

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of August 195 8 Docket No. DMEA 4580 Contract No. Idm-E 1088

Operator's Name B. H. Putnam, Operator Minerals Zinc

Address 512 Third Street, Marietta, Ohio

OPERATION	Unit	Costs This Month	Units This Month	Costs to Date	Units to Date	Unit Costs to Date	Authorized by Contract: Units	Authorized by Contract: Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	1380.00	460	53,253.00	17,751	3.00	50,000	3.00
~~XXXXX~~ Reaming	Foot	—	-	1,122.00	561	2.00	5,000	2.00
~~XXX~~ Auger Sampling	Each	17.50	14	66.25	53	1.25	550	1.50
~~XXXXXX~~ Core Boxes	Each	—	-	140.25	75	1.87	150	2.00
Trenching								
Test Pits								
Roads and Trails Incid. Allow. @ .18/ft.	Foot	82.80	460	3195.18	460	.18	50,000	.18
Total Distributed Costs		1480.30		57,776.68				Total Costs Authorized by Contract
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
Total Costs		1480.30		57,776.68				

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 August 30, 1958 Operator B. H. Putnam

Per William T. Neff Title Superintendent

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)

Herman Weden Jr.
GEOLOGIST, U. S. G. S.
SEP 4 1958

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

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK
PROJECT, GRAINGER COUNTY, TENN.
FOR AUGUST - 1958

BY: W. T. HILL

Docket No. 4580
Contract No. Idm-X 1088

Drilling was resumed on the Puncheon Camp Creek project on August 20, 1958. Hole GD-12 was drilled 100 feet northeast of GD-2 and 100 feet SE of GD-4. The location is the first hole drilled on a strike fence between the Green-Dalton dip fence and the Stapleton dip fence. The hole collared in the Mascot formation and was drilled to a depth of 460 feet.

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-44	Overburden	---	---	---
44-128	Mascot	CMss @ 128	---	Dolomite.
128-391½	Kingsport	Top of R @ 277½ Top of S @ 336 Top of T @ 391½	---	Dolomite, re-xl, and ls, considerable core loss from 298-391½. Some breccia in "R" bed.
391½-460	Longview	Top of U @ 403 Top of L-4 @ 434	ZnS shine @ 40½; 441-443, est. 6% Zn; hvy shines 445½, 46, 49.	Dolomite and re-xl; very siliceous; breccia from 424-445.

Drilling is now underway 200 feet northeast of GD-12 at location GD-13.

Invoice
Marietta, Ohio

B. H. Putnam, Appro
512 Third Street
Marietta, Ohio

August 31, 1958

In account with
PUTNAM DRILLING COMPANY
512 Third Street P. O. BOX 647 Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - August, 1958

Core Hole No. GD-12

Footage drilled	460' @ 3.00/ft.	$1380.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B. H. Putnam, Operator

By: A R Eddy
A. R. Eddy
Drilling Superintendent

ENGINEERS
INSPECTIONS and TESTS

The Bruce Williams Laboratories

ESTABLISHED 1888

MAIN OFFICE AND LABORATORIES 618-624 JOPLIN ST. TELEPHONE MAYFAIR 3-1556

JOPLIN, MISSOURI

CHEMISTS
INDUSTRIAL and ANALYTICAL

BATESVILLE, ARKANSAS ST. LOUIS, MISSOURI PICHER, OKLAHOMA

National Lead Company
P. O. Box 61
Thorn Hill, Tennessee

5-15-58

			ZINC			
791788	GD-4-1	299"/o - 96"/o	0.48	.96		
789	GD-4-2	296"/o - 90"/o	0.86	1.72	6.0	13.8
790	GD-4-3	290"/o - 300"/o	3.20	6.40	1.70%	1.07%
791	GD-4-4	300"/o - 302"/o	1.30	2.60		
792	GD-4-5	302"/o - 305"/o	0.02	.06		
793	GD-4-6	305"/o - 309"/o	1.08	2.16		
794	GD-4-7	309"/o - 300	0.14	.45		
795	GD-4-8	419 - 421	6.56			

Charges $10.00

65-277

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES
ADDRESS ALL COMMUNICATIONS TO JOPLIN, MISSOURI

Bruce Williams

ENGINEERS
INSPECTIONS and TESTS

The Bruce Williams Laboratories

CHEMISTS
INDUSTRIAL and ANALYTICAL

ESTABLISHED 1888

MAIN OFFICE AND LABORATORIES 618-624 JOPLIN ST. TELEPHONE MAYFAIR 9-1550

JOPLIN, MISSOURI

BATESVILLE, ARKANSAS ST. LOUIS, MISSOURI PICHER, OKLAHOMA

National Lead Company
P. O. Box 65
Thorn Hill, Tenn.

5-23-58

			ZINC
79213	CD-5-1	497-99	10.76
147	CD-5-2	499-501	2.62
148	CD-5-3	501-503	1.28
149	CD-5-4	507½-509½	0.92
150	CD-5-5	512-513½	4.14
151	CD-5-6	495½-497.	0.78

16% to 2.26%

6' @ 4.88% ~ 8' @ 3.66%

Charge $7.50

10/38 66-377

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES
ADDRESS ALL COMMUNICATIONS TO JOPLIN, MISSOURI

Bruce Williams

B. H. Putnam - D.D. CD-12

Copper Ridge Project - Punchbowl Camp Creek

UMEA Idm-E 1088

Hole No:	CD-12	Collared:	8-20-56
Farm:	Green-Dalton	Bottomed:	8-27-56
Loc: N	49,846.54	Depth:	460'
E	46,634.31	Casing:	44' BX; 103' AX
Elev:	1390.85	Reaming:	None
Drilled By:	Putnam Drlg. Co.	Cement:	None
Logged By:	J. Spears & M. Hill	Water Table:	?

Top Kingsport Fm	128'
Top R Bed	277½'
Top S Bed	336'
Base Kingsport Fm	391½'
Top U Bed	403?
Base U Bed	421

-44 Overburden
-45 Med gr dol; v mott (10' core loss 44-60; cavities)(?)
-46 Lt med gr dol; bands; some sands & scatt ss grains bott 6" (dip 40°)
-46½ Lt re-xl; v sandy near base
-48 Lt to lt med gr dol; v mott
- Poss cavity
-69 Lt gr dol; occ chert nod to 60 (6' core loss 60-70)
-71 Med (to med dk) gr dol; sugary & mott; some eyelets; bott 2" sandy edgewise congl. (base bed M-7)
-73 Lt gr dol; lt mott; few eyelets top 6"; @ base grades to lt med gr dol
-75 Lt med gr dol; lt mott; TBS's 74 & 75
-77½ Med gr dol; mott & eyelets
-83 Med dk to dk gr dol; shaly mott (2' core loss 81-90)
-84½ Med gr dol; bott 6" hvy ss & oolitic chert
-86 Lt gr dol
-93½ Lt med gr dol; top 6" v cherty; vug (to oxid shear) @ 90½; from 90½-93 becomes darker & is mott w/silic eyelets
-94½ Med gr dol; mott w/silic eyelets
-96 Med dk gr dol; mott
-99 Lt med gr dol; bands (38° dip) scatt ss grains bott 3"
-101 Med gr dol; v cherty top 6"; then mott & sugary
-105½ Lt gr dol; well banded (36° dip) sands 102 & 03½; TBS @ base
-109 Lt med gr dol; bands
-111 Med gr dol; v shaly mott & oxidized
-115½ Lt med gr dol; bands; large chert nod 112 (39° dip)
-124½ Med dk gr dol; shaly mott & few eyelets; v oxidized 119-20
-125½ Dk gr dol; v shaly mott
-128 Med to lt med gr dol; banded (39o dip); sandy @ base
TOP KINGSPORT FM. 128'
-131 Lt gr dol; lt bands (2' core loss 128-37)
-132½ Lt med (med) gr dol; v mott & shaly
-134 Lt med gr dol; lt mott & few eyelets; TBS @ base
-135 Med gr dol; shaly mott
-137½ Lt med to lt gr dol
-138½ Lt med gr dol; mott; sand @ 138; TBS @ base
-140½ Med gr dol; lt bands; TBS 139; cherts 39½ & 40; TBS @ base
-143½ V lt gr dol; lt mott (to shaly)
-145½ Med gr dol; v shaly top 2"; mott; TBS @ base
-147 Lt med gr dol; lt mott
-150 Lt gr dol; TBS @ base
-151½ Lt med to med gr dol
-155 Med dk (dk) gr dol; shaly mott; chert nod @ base (base bed K-1)
-156½ Med gr dol; cherts 155½, 156, 156½; mott
-160½ Lt med gr dol; broad bands; many cherts 158-59
-161 Med gr; banded, blk sh seams 60½-60 3/4
-166 Med gr; faintly banded; 3" ss @ 63; blk sh @ 64½
-170½ Lt med, mott, lt shears @ 68-69½; 3" sh & lt ss @ 70½; smoky chert above sh.
-173 Lt med; sugary banded dol; 6" blue & white cone sh nods @ base; 5" hvy ss in and above chert; sed. congl.
-182½ Lt med; lt bands to 75; faint mott to 80; lt ss @ 73½; 1" hvy ss & sh @ 74½; blk sh @ 77; 79½-80½ hvy mott; bl ue & white chert mott @ 80; grn sh @ 80½, 81½.
-186½ Med gr mott dol; TBS @ base; bed darker toward bott; 82-84 gangue shears
-190½ V lt gr hvy mott dol; 1" ss @ base; blue chert nod above sh
-195½ V lt gr dol; banded; blue chert nods @ 92½, 93, 94
-211½ Med gr hvy banded dol; TBS @ 97, 97½, 98½, then smoky chert @ 96½, dip @ 98 = 36½°; chert @ 200 (congl) 201, 01½, 02½, 06½, 07½, 08½, 10 lt ss & TBS @ 205½ (overlain by 1" hvy band dol) 6" blk shaly dol @ base, overlain by 8" of semi-rexl

-215 V lt gr dol
-220 Lt dol; banded; blue ch @ 17½, 18; v lt ss @ 19½-20; TGS @ base
-230 Lt dol; 95% core loss (base of run ground)
-238 V lt dol; banded; blue ch @ 32, 33½, 35; TGS @ 33½ v lt ss; thin [illegible] @ 237
-241 Lt gr dol; mott 39-40½; upper 1' banded; TGS @ base
-242 Med gr dol; mott; shaly; dip @ 248 = 34½°
-250 Lt gr dol; banded (stronger toward base) few vugs; 4" v lt ss @ 247 & TGS; ch nod @ 47½; v lt ss @ base
-255 Lt dol; 6" blue ch nod @ 51; 3" shears @ 250½; lt crackle @ 52, 53½
-256½ Med dol; greenish, lt crackle
-270½ Lt med dol; mott to 58½; banded to 62½; banded 67-69; ch breec @ 58½; lt crackle 58½-59½; ch nod 62; lt sh @ 62½, 64; lt crackle @ 70; TGS & lt ss @ base; dip @ 69 = 35°
-277½ Lt med dol; mott 73-75; banded 75-76½; lt ss @ 77-½; TGS @ base; Top of R bed @ 277½
-278½ Cherty re-xl; mott
-279 Orn sh; part oxidized
-281½ Lt mott dol; wh ch nod @ 80; TGS @ base
-290 Med-dk dol; banded & shaly to 82½; hvy mott to 86; sugary near base
-291½ Orn shaly re-xl; 4" hvy shale @ top
-293 Brn re-xl; breec (fault); mott
-295 Lt gr dol; blue ch @ 94-95; hvy ss @ 94½; hvy grn sh @ base
-298 Brn re-xl; brecciated (fault?)
-321 Lt gr dol; mott; grn & sh sec ch @ 05; hvy core loss 300-21 (7' out of 21) most loss near base)
-322 Lt gr dol; faulted near base
-323½ Med gr mott semi re-xl; hvy fault gouge throughout
-327 Dk gr dol; some crackle; 1½' core loss 21-26
-330½ Ls; v shaly; 2' core loss 26-31; breec near top; part re-xl
-331 Re-xl; brn
-335 Dk gr dol; 2½' core loss 31-35, most in lower part; breccia; some faulting; oxid
-336 Lt gr dol; breec; oxid; Top of "S" bed @ 336'
-361 Re-xl; silic; coarse; weathered; vuggy; 16½' core loss from 35-36; fault @ 338
-362 Dol; lt gr; breec
-371 Re-xl, silic; coarse; weathered; vuggy; 1' core loss 62-70
-377 Ls; shaly; some crackle; 1' core loss 70-75
-379 Re-xl; 4½' loss from 78-84
-386½ Ls
-387 Re-xl
-388½ Re-xl & ls
-389 Ls
-391½ Re-xl; brn; crackle; silic; hvy silica (1') @ base; BASE KINGSPORT @ 391'
-407 Dol; ch nod @ 92; 401½, 02; core complete 84-91½; 6' loss 91½-01; complete 01-03; loss 3-7.
-412 Dol; lt gr; mott
-420½ Re-xl; dk; 6' core loss from 411-19
-425 Dol; lt gr; eyelets; crackle @ base
-427½ Dol; med-dk gr; vuggy; crackle
-429 Re-xl; brn; mott; grn sh @ top
-429½ Dol; lt gr; crackle; lt ss @ base
-430½ Re-xl; brn; silic; wh ch nod @ base
-433 Semi re-xl; gr, mott; 2" hvy ss @ base
-434 Re-xl & ch; short v hvy; part white; part blue
-438 Dol; med-dk gr; breec; hvy ch nods (white) from 34-36
-443 Re-xl; brn; brecciated; v silic 41½-43; ZnS sh @ 40½; 41-43 est. 6% ZnS; lt ss 40-41
-444 Dol; lt gr; sandy; TrS & FeS @ base
-450 Re-xl; brn; coarse; v siliceous; strong ZnS shines @ 45½, 46; 49
-450½ Dol; v lt gr
-454 Dol; part semi; mott; ch nod @ 53½; TGS & lt ss @ base
-455 Re-xl; black & white; coarse
-460 Dol; lt-med; wh cone ch @ 58; bl ch @ 60; TD @ 460

INTERIM REPORT

DMEA-4580, Idm-E1088 (Zinc)

Operator: B. H. Putnam, Assignee, P. O. Box 65, Thorn Hill, Tennessee

Location: Puncheon Camp Creek Area, Grainger County, Tennessee

Summary of drilling Completed

	Since last inspection	To Date
Number of holes	2	36
Footage	1,309	20,642

Holes showing:

a) Commercial zinc ore 3
b) Non-commercial zinc mineralization 21
c) No zinc mineralization 12

Additional data on the two holes completed during the interim follows:

Hole No.	Property	Depth	Remarks
GD-10	T. A. Green and A. B. Dalton	630 ft	Coordinates: N. 49673.93, E. 46737.08; Elevation 1379.22 Drilling began 6/16/58 Completed 6/21/58 Brief log of hole: 0-38 overburden, collared in Mascot formation, top of Kingsport (CM) @ 282, top of "R" bed @ 447, top of "S" bed @ 513½, top of Longview formation @ 559, "U" bed from 571½ to 583½, bottom @ 630. The hole was reamed from 72 to 120 ft. Mineralization: Strong zinc shines @ 580, 590½ and 600½ ft. 4½ ft (490½ - 495) est. 2% 1 ft (499 - 500) est. 5% 1 ft (501½ - 502½) est. 7% 1½ ft (506½ - 508) est. 4% 1 ft (587 - 588) est. 2% ½ ft (592½ - 593) est. 1%

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DATE	INITIALS	CODE
7/7	C	220
7	Com	100
"	[illegible]	110
7/8	[illegible]	800
~~7/16~~	~~[illegible]~~	~~500~~

Hole No.	Property	Depth	Remarks
GD-11	T. A. Green and A. B. Dalton	679 ft	Located 100 ft down dip from GD-10. Coordinates: N. 49586.73, E. 46785.85; elevation 1385.26. Drilling began: 6/23/58 Completed: 7/1/58 Brief log of hole: 0-24 overburden, collared in Mascot; top of Kingsport (CM) @ 353; top of "R" bed @ 509½; top of "S" bed @ 564½; top of Longview formation @ 611; top of "U" bed @ 621, bottom @ 679. Mineralization: Zinc shines @ 437½ - 438, 442, 465½ - 466, 490 - 492, 494½, 500 - 502, 546 - 549½. Runs: 1½ ft (516½ - 518) est. 3% Zn, 1% FeS_2 2½ ft (537 - 539½) est. 6 to 8% FeS_2 ½ ft (576 - 576½) est. 2% Zn.

This report brings up to date all drilling completed. The Operator has requested a brief recess to study results of all completed holes. The drill on this project has been moved to DMEA-5026, Luttrell prospect.

Inspected: July 2, 1958

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

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
Region V

ELECTROTECHNICAL LABORATORY — NORRIS, TENNESSEE

July 2, 1958

Memorandum

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

From: Personal Assistant, Norris Station

Subject: Monthly report and voucher

We are enclosing two copies each of the following monthly report and voucher:

Idm-E1088 — B. H. Putnam
Docket No. DMEA-4580
8th payment - month of May
Amount $3464.92

Helen R. Miller

Helen R. Miller

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

OFFICIAL FILE COPY
D M E A
RECEIVED JUL 7 1958

DATE	INITIALS	CODE
7/7	C	220
7/7	[illegible]	110
7/7	[illegible]	500

Form 4-104 (Rev.) April 1952

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Budget Bureau No. 42-R1036.5

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K- 1

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of May, 1958 Docket No. DMEA 4580 Contract No. Idm-E-1088

Operator's Name B.H.Putnam, Operator Minerals Zinc

Address 512 Third Street, Marietta, Ohio

Contract Amount, $ 170,125.00 Government Participation: 50 % Amount, $ 85,062.00

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Short Form Contracts:				7/8/58 a.w.p.k.		
Drilling	7,935.00	45,609.00	53,544.00	6264.00	45609.00	51873.00
Bulldozing						
Crosscutting						
Drifting						
Reaming	371.00	832.00	1,203.00	290.00	832.00	1122.00
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	———	140.25	140.25		140.25	140.25
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	———	48.75	48.75		48.75	48.75
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incidental allowance @ $.18/foot	476.10	2,736.54	3,212.64	375.24	2736.54	3112.38
TOTALS	8,782.10	49,366.54	58,148.64	6929.24	49344.54	56,296.38

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

Date May 31, 1958 *Payee B.H.Putnam, Operator

Per William Nell Title Superintendent

*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:

$ 3464.92

Signature Helen R. Kepler (Authorized Certifying Officer)

Date JUL 2 1958 Vou. No. (See other side)

3464.92

(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. E-1088 in accordance with the terms of the contract.

Signature J. Lynch Title MINING ENGINEER U. S. BUREAU OF MINES Date JUN 27 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Laurence Title EXECUTIVE OFFICER DMEA FIELD TEAM REGION V Date JUN 27 1958

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.

Form MF-104A
(April 1962)

Budget Bureau No. 42-R1151.2

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of May 1958 Docket No. DMEA 4580 Contract No. Idm-E-1088
Operator's Name B.H.Putnam, Operator Minerals Zinc
Address 512 Third Street, Marietta, Ohio

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes				51,875.00	17,291			
Drilling: Core	foot	7,935.00	2645	53,544.00	17,848	3.00	50,000	3.00
~~Churn~~ reaming	foot	371.00	185.5	1,203.00	601.5	2.00	5,000	2.00
~~Auger~~ sampling	ea.	———	———	48.75	39	1.25	550	1.50
~~Stripping~~ Core Boxes	ea.	———	———	140.25	75	1.87	150	2.00
Trenching								
Test Pits								
~~Roads and Trails~~ Incident. allowance @ $.18/ft.	foot	476.10	2645	3,212.64	17,848	.18	50,000	.18
TOTAL DISTRIBUTED COSTS		8,782.10		58,148.64				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		8,782.10		58,148.64				

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 May 31, 1958 Operator B.H.Putnam, Operator

Per William T. Weil Title Superintendent

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)

Payment for GD-7 has been disallowed.

W. J. Lynch

MINING ENGINEER
U. S. BUREAU OF MINES

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

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT

GRAINGER COUNTY, TENNESSEE

FOR MAY, 1958

By: W. T. Hill

Docket No. 4580
Contract No. Idm-E-1088

During the month of May, six (6) holes were drilled on the Puncheon Camp Creek Project.

On the Stapleton farm, hole ST-6 collared in the Kingsport formation and was drilled to a depth of 290 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-38	Overburden	-----	-----	-----
38-273½	Kingsport	"R" bed @ 172 "S" bed @ 241 "T" bed @ 273½	Traces 221-226 237½-238, 1% Est.	Dolomite, re-xl., and some ls., brecc. 140-260; FeS from 150-217
273½-290	Longview	"U" bed @ 285	-----	Dolomite & re-xl.

Hole ST-7 was drilled 100 feet north of ST-6. The hole collared in the Kingsport formation and was drilled to a depth of 226 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-23	Overburden	-----	-----	-----
23-205½	Kingsport	"R" bed @ 72½? "S" bed @ 142 "T" bed @ 205½	153½-155, shines; 157½-158½, 1% Est.	Dolomite & re-xl. in part brecc.; heavy core loss to 140.
205½-226	Longview	"U" bed @ 224	-----	Dolomite & re-xl.

Upon completion of ST-7, the drill was moved to the Green-Dalton farm. Hole GD-4 was drilled 100 feet north of GD-2. The hole collared in the Mascot formation and was drilled to a depth of 433 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-51	Overburden	------	------	------
51-100	Mascot	CM ss @ 100	------	Dolomite, heavy core loss.
100-368	Kingsport	"R" bed @ 254½ "S" bed @ 323 "T" bed @ 368	296½-302½, 6' @ .78% Zn., or 294½-307½, 13' @ 1.07% Zn., 307½-310, .18% Zn.	Dolomite & re-xl, lower part brecc., FeS shines 274-322.
368-433	Longview	"U" bed @ 380 L-3 bed @ 394	419-421, 2' @ 6.86%Zn	Dolomite & re-xl., in part brecc.

Hole GD-5 was drilled 100 feet south of GD-2. The hole collared in the Mascot formation and was drilled to a depth of 586 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-19	Overburden	------	------	------
19-258½	Mascot	CM ss @ 258½	------	Dolomite
258½-533	Kingsport	"R" bed @ 420 "S" bed @ 486 "T" bed @ 533	485½-487, .78% Zn 497-503, 6' @ 4.88%Zn or 8' @ 3.66% Zn 497-513½, 16½' @ 2.26% Zn.	Dolomite & re-xl; in part brecc.
533-586	Longview	"U" bed @ 542 L-3 bed @ 556	------	Dolomite, re-xl; and limestone.

In order to determine the rake of the ore body, the drill was moved west of the "fence" to a location (GD-6) 100 feet from GD-2 and 100 feet from GD-5. The hole collared in the Mascot formation and was drilled to a depth of 553 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-49	Overburden	------	------	------
49-226	Mascot	CM ss @ 226	------	Dolomite; heavy core loss to 160.
226-495	Kingsport	"R" bed @ 385½ "S" bed @ 455 "T" bed @ 495	shines @ 412; 427½; 440; 446-446½; ½% Est.; shines @ 448½, 449	Dolomite, re-xl, and ls.; some brecc. & FeS shines.
495-553	Longview	"U" bed @ 507½	526½-527½, 1' @ 3% Est Traces @ 535½, 537½.	Dolomite & re-xl; in part brecc.

Hole GD-7 was drilled 100 feet north of GD-6. The hole collared in the Madcot formation and was drilled to a depth of 557 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-70	Overburden	-----	-----	-----
70-162	Mascot	CM ss. @ 162	-----	Dolomite, heavy core loss 110'
162-446	Kingsport	"R" bed @ 323 "S" bed @ 403 "T" bed @ 446	336½-337½, 3% Est. Shines @ 343½,364½-365;374-3/4-375¼, 2% Est.; 399-400, 1½% Est.	Dolomite, re-xl., and some ls.; well-brecciated.
446-557	Longview	"U" bed @ 459 L-3 bed @ 471½	459-459½, 3% Est. Shines 470-471,478-479, & 481; 487½-488, 3% Est. Shines @ 493,494,502½-503;507-512½, 4% Est.; 516-516½, 3% Est.; Shines @ 521,523½;524½-527½, 1½% Est.	Dolomite & re-xl; in part brecc.

Invoice
Marietta, Ohio

B.H.Putnam, Appro
512 Third Street
Marietta, Ohio

May 29, 1958

In account with
PUTNAM DRILLING COMPANY

512 Third Street | P.O.Box 647 | Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - May, 1958

Core Hole No. GD-7

Footage drilled	557 @ $ 3.00	$ 1,671.00
Footage reamed	40½ @ $ 2.00	81.00
		$ 1,752.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam, Operator

By: A.R. Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B.H.Putnam, Appro
512 Third Street
Marietta, Ohio

May 28, 1958

In account with

PUTNAM DRILLING COMPANY

512 Third Street | P.O.Box 647 | Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - May, 1958

Core Hole No. GD-6

Footage drilled	553 @	$ 3.00	$ 1,659.00
Footage reamed	25 @	$ 2.00	50.00
			$ 1,709.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B.H.Putnam, Appro
512 Third Street
Marietta, Ohio

May 28, 1958

In account with

PUTNAM DRILLING COMPANY

512 Third Street P.O.Box 647 Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - May, 1958

Core Hole No. CD-5

Footage drilled	586 @	$ 3.00	$ 1,758.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam, Operator

By: A.R. Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B.H.Putnam, Appro
512 Third Street
Marietta, Ohio

May 28, 1958

In account with

PUTNAM DRILLING COMPANY

512 Third Street P.O.Box 647 Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4500 - May, 1958

Core Hole No. GD-4

Footage drilled	433 @ $ 3.00	$ 1,299.00
Footage reamed	38 @ $ 2.00	76.00
		$ 1,375.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B.H.Putnam, Appro
512 Third Street
Marietta, Ohio

May 28, 1958

In account with

PUTNAM DRILLING COMPANY

512 Third Street P.O.Box 647 Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - May, 1958

Core Hole No. ST-7

Footage drilled	226 @	$ 3.00	$ 678.00
Footage reamed	82 @	$ 2.00	164.00
			$ 842.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam, Operator

By: A. R. Eddy
A. R. Eddy
Drilling Superintendent

Invoice
Marietta, Ohio

B.H.Putnam, Appro
512 Third Street
Marietta, Ohio

May 28, 1958

In account with

PUTNAM DRILLING COMPANY

512 Third Street P.O.Box 647 Phone: FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 - May, 1958

Core Hole No. ST-6

Footage drilled	290 @ $ 3.00	$ 870.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam, Operator

By: A.R. Eddy
A. R. Eddy
Drilling Superintendent

B. H. PUTNAM DD - ST-6

Copper Ridge Project - Puncheon Camp Creek
DMEA - Idm-E 1088

Hole No:	ST-6	Collared:	4-30-58
Farm:	W.H. Stapleton	Bottomed:	5-2-58
Loc:	N 50,341.85	Depth:	290'
	S 46,952.02	Casing:	BX 38'; AX 47'
E Elev:	1446.54	Reaming:	none
Drilled by:	Putnam Drlg. Co.	Cement:	none
Logged by:	J.W. Spears	Water Table	?

Top Kingsport	-	collared in Kingsport
Top R bed	-	171½(est)
Top S bed	-	240
Base Kingsport	-	273½
Top U bed	-	284½

0 -38 Overburden
-39½ med gr dol; mott. (2'core loss 38-47)
-46 lt gr dol; sandy oolitic chert at 44½; banded 44½-46 w/ heavy sands 45½-46(base K-2)
-48 med gr dol (3' core loss 47-64)
-60 lt med gr dol; TBS 52; ox. and mott 52-54 w/ TBS 54; lt mott 54-60
-65 lt gr dol; lt mott to 64
-66½ lt(lt med) gr dol; lt mott to bands; chert nods 66 & 66½; ox. at 67(poss cavity)
-74½ lt med(med) gr dol; banded to mott(5' core loss 64-75); sandy 72-74½
-75½ med gr dol; TGS at 75 then large chert nod(1½' core loss 75-79) (base k-3)
-86 lt med(lt) gr dol; lt bands(dip at 79' 39°) to 80½; then mott to 83½ w/ bleached chert nod and few ss grains at 83½; bands 83½-86(dip 44°)
-88 lt med(med) gr dol; v. wavy bands; scatt ss grains 87½-88 & TGS at 88
-92½ lt med gr dol; chert nods 88½, 89½, 90½ & 92 ~~XXXX~~ (1' core loss 91-100)
-93½ lt gr sugary dol; silic and scatt ss grains to 93, then mott (base K-4)
-97 lt gr dol; bands(40°) & few eyelets
-100 lt med gr dol, grades to lt gr; banded (45° dip at 100') chert nods 98 & 100
-107½ lt gr dol; well banded, wavy bands at 106½ (40° dip at 105')
-111 lt gr dol; cherty 107½-08½; small bleached chert nod at 110; large chert at 111
-119 lt med gr dol; banded(40°); few large eyelets top 2 feet; then sugary & lt mott
-129 lt gr dol grading to lt med gr; well banded to 124(48°); then mott 124-25½; then bands to 128 (dip 47°); few ss grains 128½; Green shale 128½-29 (base K-5)
-129½ lt med gr dol(oxidized)
-131 med gr dol
-134½ lt med gr dol; TBS 132½, sli mott & sugary 132½-34½ W/ TBS 134½
-135½ lt gr dol, occ eyelet
1-50 lt med gr dol; lt mott to silic eyelets to 137½; brecc chert nod 137½; crackle 137½-38; bands 140-42 (dip 50°); crackle 142-43½; tr. crackle 145; occ lt crackle 147-50; TBS 150 (50° dip at 150)
-151½ med gr dol; bands; crackle w/ feS shines & scatt. specks of FeS thruout the Dol; grades to lt med gr dol (<u>start of brecc body</u>)
-153 lt med gr dol, as above; oxidized 152-52½; scatt ss grains 152½-53
-160½ med gr dol; mott; crackle w/ FeS shines to 153½; brecc 154½-57 w/ FeS shines; large eyelets 158-59; brecc w/ FeS shines 160-60½
-164 lt med gr dol; banded; brecc w/ few FeS shines (some dips to 80°)
-166 lt med(med) gr dol; mott & few eyelets
-168 lt med gr dol. banded (2½' core loss 166-70); some brecc w/ FeS shines; few ss grains and some dark inclusions bott 3"
-171½ lt med sime re-xl; banded to mott; 3" of dark shaly material at top

<u>Top R bed est at 171½'</u>
-172½ br re-xl; brecc w/ est 5% FeS
-174 lt med gr dol, some brecc w/ FeS shines; lt bands; bott 3" some ss grains & dk inclusions
-175 "dry brecc"; mixture of re-xl, chert, silica & shale
-179 med gr dol & med semi re-xl; mott; brecc W/ est 6% FeS
-181 med gr to med dk gr sugary dol; bott 6" partly dk re-xl
-183 br re-xl; brecc w/ tr of FeS
-185 lt br re-xl; crackle
-186 br re-xl; crackle and occ vug
-191 lt br re-xl; brecc w/ est 4% FeS; at 189 3" ~~bm~~ block of lt gr dol; 3" br vuggy re-xl at base
-193 lt med gr dol; banded; brecc w/ FeS traces
-197½ lt br mott re-xl(brecc?); heavy FeS 196½-97; few ss grains at 194 & 197½

-200 med gr dol; sugary to semi re-xl; brecc sealed w/ re-xl & white gangue &tr FeS
-201 lt gr dol; brecc w/ gangue at 3% FeS 197½-201
-204½ "dry brecc"; lt & lt med gr dol blocks sealed w/ much shely re-xl & silica & traces of FeS; heavy FeS shine bott 6"; thin ss near base
-208 lt br re-xl; 3" v. coarse & shaly at 207
-210 lt med semi re-xl, some brecc sealed w/ re-xl
-212 med to lt med gr dol; crackle w/ re-xl gangue
-217 lt br re-xl; shaly mott; crackle
-218 med semi-re-xl to sugary dol; brecc w/ FeS shines
-221 lt(lt med) gr dol; brecc to 220, 219½-20 w/ re-xl gangue
-221½ med semi re-xl to br re-xl; ZnS shine at 221½
-224 lt gr dol; brecc w/ few blocks dk gr dol; occ ZnS shine; chert nod at base
-226 med dk gr dol; some brecc w/ re-xl gangue & traces of ZnS; few eyelets (base K-7)
*227 dk shaly re-xl; large chert nod at base
-228 LS, shaly
-229½ lt br re-xl; sli shaly
-230½ dk semi re-xl; crackle
-233 med gr sugary dol; mott; some lt shears bott 6"
-240 lt med gr dol; sugary; brecc 236½-37 w/ ZnS shines; THen 3" of re-xl; cherty237-38; some bands 238-40

Top S bed est at 240'
-242 lt br re-xl, few blocks of dol at top, cherty; chert nod 241½-42
-243 lt med gr dol; bott 6" brecc sealed w/ re-xl; chert nod at base
-248½ br re-xl; brecc sealed w/ re-xl, silica, chert & shale; bott foot mostly all chert
-252 lt br re-xl; brecc; 251½-52 much jasperiod and chert
-252½ lt semi re-xl; crackle
-254½ lt med gr dol; crackle top foot; few ss grains at base
-255 green shaly silica w/ some re-xl & ss
-256½ br coarse grained mott re-xl(brecc?)
-261 lt re-xl, coarse grained, mott; lt crackle; chert nods bott 6" & grades to br re-xl
-264 br re-xl, mott, scatt traces of FeS
-265 lt med sugary dol to semi re-xl; mott
-267½ lt br re-xl; shaly; scatt ss grains 266-67
-271 lt re-xl; tr brecc 268½; shaly 270-70½
-273 gr re-xl; shaly; blue chert nod 273

Base Kingsport Fm 273½'

-278½ lt med gr dol
-284½ med gr dol; sugary bott 4"

Top U bed 284½'
-286 br re-xl; top 9 inches chert, part oolitic
-290 med gr sugary dol, mott TD

B. H. PUTNAM ST-7

Copper Ridge Project - Puncheon Camp Creek

DMEA Idm-E 1088

Hole:	ST-7	Collared:	5-2-58
Farm:	W.H. Stapleton	Bottomed:	5-5-58
Loc:	N 50,429.39	Depth:	226'
	S 46,903.17	Casing:	BX 23'; AX 130'
Elev:	1441.95	Reaming:	82' (48-130')
Drilled by Putnam Drlg. Co.		Cement:	none
Logged by J.W. Spears		Water table:	?

Top Kingsport Fm	-	collared in Kingsport
Top R Bed	-	72½' est
Top S Bed	-	142'
Base Kingsport	-	205½'
Top U Bed	-	217'

0 -23	Overburden
-26½	lt med gr dol; lt mott (1' core loss 23-27')
-34	lt med gr dol; lt bands (dip 7°); few eyelets; (1½' core loss 27-34')
-39	lt med gr dol; red mott; v. oxidized; TBS 39'; (2' core loss 34-40')
-42	med to lt med gr dol; banded (dip 35°)
-48	lt med gr dol; lt mott to 45', then sli darker & banded (dip 35°)
-53	med gr dol; mott; many eyelets & at 51
-54	lt med gr dol, lt bands; (4½' core loss 48-59, mostly from 54-59)
-59	med semi re-xl to sugary dol; mott
-62	lt med gr dol; lt mott; (1' core loss 59-63)
-65	lt gr dol; mott
-66½	cavity
-71	med(med dk) gr sugary dol; mott, tr. crackle; (10' core loss 67-95', prob. from 73-95)
-72½	lt med gr dol; crackle; lt bands; scatt ss grains at base

Top of R bed est. at 72½'

-76	lt br re-xl; shaly, crackle; v. oxidized in places
-95	br & gr re-xl; occ brecc or crackle; v. oxidized 92-94 & some lt gr dol at 94
-98	lt re-xl; oxidized (6½' core loss 95-110')
-102	lt gr dol
-110	lt re-xl
-112	br re-xl (3' core loss 110-32')
-120	cavity
-121	lt gr dol
-122	br mott re-xl
-126	med gr dol; 124-26 brecc w/ gangue & silica
-130	br re-xl; v. silic. & poss brecc; shaly
-136	lt med gr dol; mott top foot (3' core loss 137-140')
-137½	br re-xl & sec. chert
-142	lt gr dol, some brecc bott foot

Top S bed ~~mk~~ est at 142'

-147½	gr mott re-xl, silic & oxidized and occ crackle
-148	dk br re-xl & much sec chert
-148½	med gr semi re-xl
-159	lt gr re-xl, v. silic & oxidized; v. cherty 151-53 & shaly at 153; <u>ZnS shine 153½-55;</u> chert nods 155½ & 156½; <u>est 1% ZnS 157½-58½;</u>
-164½	gr re-xl, mott, lt crackle; some silica bott foot
-170½	lt to lt br re-xl, mott; chert nod 169½, then sli darker to base
-172	lt med gr dol
-174	lt re-xl
-175½	lt(bleached?) gr dol, banded (35° dip)
-183½	lt br re-xl; brecc 176-77, then v. silic. & vuggy to oxidized
-186½	v. lt re-xl, brecc 185-86½
-191½	lt re-xl; mott to 187 & shaly at 188; silic & oxidized
-192½	lt semi re-xl, brecc
-202½	lt re-xl; scatt ss grains top 3", then brecc w/ some silica gangue to 196, then very silic. to 201½
-204	gr re-xl
-205½	med gr semi re-xl, lt mott

Base Kingsport Fm 205½

-207½ lt med gr dol; chert not at base
-217 med gr dol, lt mott to bands

Top U bed 217'

-218 br re-xl, large chert nod at top
-223½ lt med gr sugary dol; mott & occ lt crackle
-224½ chert & oolitic chert
-226 med mott semi re-xl, few ss grains at top TD

E. H. Putnam DD GD - 4

Copper Ridge Project - Puncheon Camp Creek

DMEA Idm-E 1088

Hole No:	GD - 4	Collared:	5-8-58
Farm:	Green - Dalton	Bottomed	5-12-58
Loc:	N 49,852.24	Depth:	433'
	E 46,537.87	Casing:	BX 51'; AX 110
Elev:	1401.13	Reaming	38' (72-110')
Drilled by Putnam Drlg. Co.		Cement:	none
Logged by J. W. Spears		Water Table:	?

Top Kingsport Fm:	100' (est, much core loss)
Top R bed	254½'
Top S bed	323' (est, in breec zone)
Base Kingsport	368'
Top U bed	380'

0 -51 Overburden
-61 lt med(med) gr dol; mott & silic eyelets (6' core loss 51-64)
-63 med gr dol; mott; several oolitic cherts bott foot
-69 lt med gr dol; sandy & oolitic chert at 64, then well banded to mott(dip 37°); some shears at 68; (3' core loss 64-72')
-73 med gr dol; mott & silic eyelets; sandy bott 2"; (5' core loss 72-85')
-76 lt gr dol; well banded(dip 38°); scatt ss grains 73½-74 & a sand at 75
-83 lt med gr dol, lt bands
-85½ med gr dol; mott & oxidized
-90 lt gr dol; chert nod at 86½ (5' core loss 85-95')
-92 med(lt med) gr dol, some mottling
-106 med dk gr dol, shaly mott; (9½' core loss 95-106)

Top Kingsport Fm between 92 & 106, est at 98 -100'

-107½ lt med(med) gr dol; mott; TGS at base
-111 lt gr dol; lt bands (32° dip); thin ss at 108½; TBS at base
-114 lt med to med gr dol; mott to sli shaly; shaly & oxidized at base
-116½ lt gr dol; lt mott; TGS at base
-118 med gr dol; ½" TBS at base
-122 lt med gr dol; scatt ss grains 118½; grades to med gr dol & bott 2' mott
-124 med gr dol; shaly mott (2' core loss 120-129')
-128½ med dk gr dol; v. shaly mott; (base bed K-1)
-132½ lt med gr dol; v. cherty 129-29½ & chert nods 130½, 31½ & 32½
-133½ med gr dol; v. banded (40°) dip) (1' core loss 129-136)
-138½ lt med gr dol; shaly at 135; scatt ss grains 136-36½
-140½ lt med (med) gr dol; shaly mott
-144½ lt med gr dol; lt mott
-145 med gr dol; brecc; some ss grains,& green shale w/ TBS at base
-151 lt med gr dol; 148-48½ some oolitic chert & ss; occ chert frag & few ss grains 148½-50 w/ heavy ss & oolitic chert at 50 (base bed K-2)
-162 med gr dol; TBS 152½; lt mott 151-54½, then v mott 154½-55½, then lt mott to 162
-163 lt med gr dol, TBS at base
-172 lt gr dol; lt mott to 167½ w/ TGS at 167½; v. lt bands 167½-70(41° dip); chert nods 170½, 171, 171½ & 172
-180 lt(lt med) gr dol; well banded 172-73½(37° dip); chert nods 173½ & 174; very banded to mott 174½-80, & sandy 178½-80 w/ poss some sedimentary brecc; 1" TGS at 180 (base K-3 bed)
-181½ lt br mott semi re-xl grading to silica at base
-191½ lt bands to 185(40° dip); TGS 185; lt mott 185-87, then lt bands to 190 w/ chert nods 188½, 89½ & 90; well banded 190-91½
-198½ lt med(med) gr dol; well banded(40° dip) to 193½; scatt ss grains 194-94½ w/ TBS 194½; several cherts 195½-96½; large chert nods 197 & 198
-199 lt mott re-xl to semi re-xl
-200 med dk gr dol, shaly mott (base bed K-4)
-205½ lt gr dol;lt bands(dip 38°); chert nods 203 & 204½
-217 lt med gr dol; banded & thin shales to 206½, then lt mott to 207½; bands 207½-09 w/ chert nod at 209; v. mott to banded 209-10½ w/ chert nod 210½; bands 210½-12 (dip 42°); cherty 212-12½; lt bands 212½-17 w/ chert nods 213½, thin ss 214 and TBS 215(dip 38°)
-219 lt med gr sugary dol; mott
-228 lt gr dol; lt bands to 220, then well banded to mott to 223½ w/ TGS 223½; few ss grains 227-27½; TGS then large chert nod at 228 (base bed K-5)
-247 lt (lt med) gr dol; lt bands to 232(38° dip); then lt mott to 235 w/ TGS 233 & a few eyelets 233-35; lt bands 235-39 W/ chert nods 237 & 239; some lt mott or banding 239-47 w/ a sandy TGS at 247

-254½ lt med gr dol; crackle & lt mott to 252½, then lt bands & crackle

Top R bed 254¼ feet

-255½ br mott jasperiod re-xl, 1" TGS at top & 4" TGS at base
-264½ med & lt med gr dol; mott, sugary, crackle; tr FeS at top; shaly 258½-59; semi re-xl & shaly 260-61; TGS at base
-265½ lt shaly re-xl
-267 gr re-xl; occ vug
-268 lt gr dol, bottom 6" cherty & some sand grains
-269 br coarse grained re-xl
-269½ lt green shlay re-xl
-271½ gr re-xl to semi re-xl; some lt crackle
-272 lt gr dol; occ sand grain
-273 2" dk chert; 2" green sandy shale; 5" brecc chert sealed w/ re-xl & shale, then ½" TGS & 3" br re-xl
-275 mixture of lt med gr dol & re-xl, silica & green shale, lower foot almost all dol; chert nod at base
-278 br to lt br re-xl; some brecc; XX FeS shine at 277
-281 lt re-xl to semi re-xl; lt crackle
-285 lt med gr dol, some sugary; lt mott; occ crackle; chert nod 284½; TGS 285
-287½ lt br to gr fine grained re-xl
-293½ lt med gr dol; crackle 287½-88 w/ FeS shines; 288-90 sugary to semi re-xl; lt crackle 292-93½
-294 br re-xl
-307 Brecc W/ lt med gr dol & some blocks lt & med gr; 294½-301 est 1½% ZnS; (1' core loss 294-301); ZnS shines 301-05; est 2% ZnS & 2% FeS 305-07
-310 med dk gr dol, brecc; est 1/2% ZnS; (1' core loss 301-10)
-312½ med gr dol; crackle (1' core loss 310-15)
-314½ lt re-xl; brecc
-323 Brecc; lt & med gr dol w/ few dk gr blocks & some semi re-xl; sealed w/ white gangue and re-xl; scatt heavy FeS shines (1' core loss 319-24)

Top S bed est. at 323 feet

-326 Brecc: lt, med & dk gr dol sealed w/ much re-xl & silica (1' core loss 324-27)
-329 lt br re-xl; many chert fragments & occ dol block; vuggy (2½' core loss 327-33)
-333 lt re-xl, vuggy & occ bleached chert fragment
-337½ lt gr re-xl; brecc; vuggy (1' core loss 333-336)
-339½ lt br re-xl; v. silic & vuggy (1' core loss 336-343)
-341 lt gr dol; bleached chert nod at 340 (2' core loss 343-360)
-348½ lt br re-xl; silic; brecc w/ white gangue; bleached chert nod at 343
-349½ lt re-xl
-350½ lt gr dol
-355 br re-xl; v. much dk silica & bleached chert fragments
-358 br re-xl; silic & v. vuggy
-359 lt gr re-xl to semi re-xl
-366 lt br re-xl; silic & vuggy; feww ss grains at top; v. silic at base (1'core loss 360-67
-368 lt gr fine grained re-xl

Base Kingsport Fm at 368 feet

-373½ lt gr dol; brecc w/ silica gangue to 369; bleached chert nod 369; lt bands (dip 39°); bleached chert nod373½ (1' core loss 370-73)
-380 med gr dol; bleached chert nods 374 &374¼; (½' core loss 373-76; 1½' loss 376-79)

-380½ reddish br oxidized re-xl
-388½ lt med to med gr dol, sugary & lt mott
389½ lt re-xl
-390 br re-xl
-394 lt br re-xl; mott & some brecc; TGS at base
-396 lt med gr semi re-xl to sugary dol
-398 lt gr dol; crackle
-401 med gr dol; lt crackle; few eyelets; few ss grains & TGS at base
-402 br re-xl
-404 med gr semi re-xl to sugary dol; few ss grains bott inch
-405½ br mott silic re-xl
-407½ lt gr fine grained re-xl to semi re-xl; lt crackle; several chert nods; sandy bott 4 inches; TGS at base
-408½ brecc chert sealed w/ silica & re-xl
-410 br re-xl; lt crackle; bott 6" mostly chert
-412 med gr dol; chert nod 410½ & occ small chert nod to 411; scatt ss grains bott 3" and TGS at base
-414½ br re-xl; silic; top 6" shaly; few ss grains top & bott; TGS at base
4416½ lt br re-xl; brecc; few ss grains at top
-417½ lt med gr dol; lt crackle; scatt ss grains bott 6"
-419 lt br mott re-xl
-421 br silic re-xl; chert nod at top; <u>est 5% ZnS 419-421</u>
-423 gr re-xl
-424 lt gr sugary dol; chert nod 423½
-426 gr re-xl
-427 lt gr dol; sandy at base then TGS
-427½ br re-xl; shaly at top
433 TD lt gr dol; large chert nod 432

B.H. Putnam DD GD - 5

Copper Ridge Project - Puncheon Camp Creek

DMEA Idm-E 1088

Hole No:	GD - 5	Collared:	5-13-58
Farm:	Green-Dalton	Bottomed	5-17-58
Loc:	N 49,678.25	Depth:	586'
	E 46,633.44	Casing:	BX 19'; AX 39'
Elev:	1391.48	Reaming:	none
Drilled by Putnam Drlg. Co		Cement:	none
Logged by J.W. Spears		Water Table:	?

Top Kingsport Fm.	-	258½'
Top R bed	-	420
Top S bed	-	486
Base Kingsport Fm.	-	533
Top U bed	-	542½

0 -19 overburden
-20 med gr dol; mott & silic eyelets (3' core loss 19-32')
-23 med to lt med gr dol; lt bands; some sand 22½-23; oxidized at base
-25 med gr v. mott semi re-xl
-28 med(lt) gr dol; bands(41°); TGS at base
-32 lt med gr dol to med gr dol; lt mott
-34 dk gr dol; shaly mott w/ white eyelets
-36½ med dk gr dol; v mott; sandy 36-36½ w/ sand & TGS at 36½
-38 lt med gr dol; lt mott; some silic & white gangue eyelets
-51 med gr dol; mott & silic eyelets to 48½ w/ chert nod at 48½'
-53½ lt gr dol; bands (39°); sandy top 6"; (2' core loss 51-60)
-57½ lt med gr dol; v lt bands; oxidized bott foot
-59 lt med gr dol; mott & sandy & tr congl to 58½, then lt bands W/ ss & TGS & crackle at 59
-64½ lt gr dol; lt mott to bands; scatt ss grains 63½-64½ w/ 3" CM ss at 64½
-67 lt med gr dol; chert nod 66½; TGS 67; (1' core loss 67-76')
-72 med gr dol; large eyelet at 70
-73 lt med gr dol; mott; sandy
-76½ lt gr dol; sandy; becomes silica at 75, and from 75-76 is a mixture of silica, sand and oolitic chert
-78 gr re-xl; v mott
-81½ lt med gr dol; sugary; mott
-84½ med gr sugary dol; well mott
-85½ lt re-xl; v sandy
-87 lt gr dol; lt bands & sandy (dip 40°)
-90 lt med gr dol; mott
-106½ med dk gr dol; v mott to 91; then lt mott; fault 100-05 (1' core loss 95-98')
(1' core loss 98-101') (3½' core loss 101-05')
-107 med gr dol
-110 dk gr dol; v mott at top; tr brecc at base: (1' core loss 108-113')
-115 lt med gr dol; mott; scatt ssg-rains 114½-15 w/ a sand at 115: (1' core loss 113-17)
-124 med to med dk gr dol; mott & eyelets(silic. & gangue)
-125 lt med gr dol; lt bands (40° dip); few eyelets at top; few ss grains at base
-126 lt semi re-xl; silic; TGS at base
-129 med(med dk) gr sugary dol to semi re-xl; v mott; chert nod at base
-132½ lt med gr dol; bands (35°); scatt ss grains 132-32½ w/ large chert nod at base
-134½ lt re-xl; silic; cherty 133-33½; chert nod at base
-136 lt med gr dol
-139 lt med gr sugary dol; well mott; cherty & TGS at base
-144 lt gr dol; lt bands; chert nod at base (1' core loss 141-43')
-150 lt med gr gol grading to med gr (2' core loss 143-150')
-153 lt med gr dol; lt mott & many eyelets (½' core loss 150-59')
-157 lt gr dol; well banded (40° dip); occ a few ss grains
-158½ lt fine grained mott re-xl
-161½ lt med gr dol; mott; sli darker and shaly at base
-163 med gr sugary dol; mott; scatt ss grains & TGS at base
-170 lt med gr dol; v lt mott to 165, then well mott to 168½; bands 168½-70 & v sandy ;69½-70 (47° dip)
-173 lt gr dol; mott & few vugs (1' core loss 170-74')
-174 lt silic semi re-xl w/ scatt ss grains
-177½ lt gr dol; shears at 175; chert nods 176½ & 177½
-182 lt med gr dol; lt bands (40° dip)
-188 med gr dol; mott & silic eyelets; oxidized at base
-190 dk gr dol; shaly mott
-191½ med dk gr dol; banded (42° dip)
-193½ med gr dol; sandy 192½-93 w/ chert nod 93; some shears 193-93½

-195 lt gr dol; lt bands at top; then scatt ss grains and some silica
-199 med gr mott sugary dol to semi re-xl; band of silica at top;few vugs; sandy at base
-203 lt to lt med to med gr dol; lt mott & occ silic eyelet
-212 med(med dk) gr dol; mott & silic eyelets
-213 med dk gr dol; v. mott
-214 med gr dol; bott 6" oolitic cherts and sand
-215 lt med gr dol
-217 med gr dol; mott & shaly; 3" v shaly at base
-221 lt med gr dol; mott 219-21 (1½' core loss 220-27')
-223½ med gr dol; well mott
-226 lt gr dol; lt bands; sandy bott foo w/ heavy ss at base (41° dip)
-229 lt med to med to lt med gr dol; v mott & silic 227-28½; scatt ss grains bott 6"
-231 lt gr dol; banded & scatt sands (41° dip); TBS at base
-236 lt med gr dol; wavy bands & sandy to 232; then well banded; some crackle to lt shears
-238½ med gr dol(some Med dk gr at top); mott
-242½ lt gr dol; chert nod 240; then banded (39° dip); grades to med dk gr at base
-254½ med dk gr dol; shaly mott & occ eyelet
-255½ dk gr dol; v mott
-258½ med to lt med gr dol; lt bands (40° dip); scatt ss bott 6" w/ CM ss at base

Top Kingsport Fm at 258½'

-262 lt med gr dol
-265½ med dk gr dol; shaly mott
-271 lt med gr dol; lt bands top foot, then lt mott
-272½ med to med dk gr dol; shaly mott to v shaly
-276 lt gr dol; mott
-277½ med gr dol; shaly to banded (40° dip)
-278½ lt med gr dol; banded; sandy bott 4"
-281½ lt gr dol; TBS at base
-283 lt med gr dol; lt mott
-287½ med gr dol; mott & some silic eyelets, increasing towards base; chert nod at base
-303½ lt med gr dol; broad bands to 293; chert nods 288½ & 89½; banded 293-96½ (41° dip)
a and sandy 295-96½; TBS 299; few ss grains 300; TBS's 302½ & 303½
-306 lt gr dol
-309½ lt med gr dol; sandy at base
-310½ med gr dol; TBS 310
-317½ med(med dk) gr dol; shaly mott
-321½ lt med gr dol; mott & few silic eyelets; TBS at base
-326½ v lt gr dol; lt mott; ½" TGS at base
-330½ lt gr dol; lt bands (38° dip); chert nods 329½, 330 & 330½
-331 med gr cherty dol
-339 lt med gr dol; well banded(39° dip) to 333 w/ chert nods 332, 332½ & 333; banded to mott 333-339; sandy 337-39 w/ TGS 339 (bas bed K-3)
-342 br re-xl; mott; few ss grains at base then TGS
-353 lt gr dol; ½"TGS at 344; then lt mott; bleached chert nod 350; many eyelets & few ss grains 350-51 w/ TGS at 351; 351-51½ breec chert; chert nods 352 & 353
-355½ lt med gr dol; wavy bands; few ss grains bott 3" w/ TGS at base
-360 lt med gr dol; chert nods 357 & 358
-361 v silic lt semi re-xl; 2" TGS at base (bas bed K-4)
-361½ lt med gr dol; mott & eyelets
-393 lt gr dol; lt bands to 368 (39°dip); chert nods 364, 67, 68 & 68½; TGS 369; v banded to shaly 368-69; chert nod 370; v banded 371-73½ w/ chert nods 372 & 373½; few ss grains 373½; mott 373½-75 w/ small cherts 374 & 74½; v cherty 375-76; banded 376-80½(40°dip) w/ thin ss 377½; lt mott 380-82½ w/ large chert nod & TGS at 382½; banded to mott 382½-93(41°dip); w/ feww ss grains & TGS at 388; scatt ss grains 392-93 w/ 1" TGS 393

-394 lt med gr dol; lt crackle at top; chert nod 393½
-397½ lt gr dol; lt bands (40° dip)
-398 lt med semi re-xl
-400½ lt gr dol; lt crackle; TBS at base
-404½ lt med gr dol; chert nod 403; bands 403-04½ (40° dip)
-413 lt gr dol; some lt bands 411-13 (44° dip) 93½' core loss 395-413)
-420 lt med gr dol; thin ss near top; TGS 414, then lt mott

Top R bed 420 feet

-421 green shale w/ some blocks of dol
-424 med gr mott dol
-426 med gr to green mott sugary dol
-429 dk semi re-xl, mott; crackle
-434 lt gr to br re-xl; 3" shale at top; some vugs bott foot & tr crackle
-435 lt med gr dol; brecc; few ss grains at bas then a brecc chert nod
-436 lt re-xl; brecc w/ re-xl & many chert fragments; shaly at base
-439 dk br re-xl; brecc w/ gangue
-440 lt br v coarse grained re-xl; some blocks of dk re-xl & green shale
-441½ lt med gr dol; crackle
-444 br re-xl; some crackle (2' core loss 433-48')
-449 lt re-xl to semi re-xl; chert nod at base
-450 lt gr dol
-454 lt br shaly mott re-xl
-455 lt br to green mott semi re-xl
-458 lt br mott re-xl
-460 br re-xl; few vugs
-462½ lt med gr dol; lt crackle
-462 greenish gr semi re-xl
-468 lt med(lt) gr dol; lt crackle
-474 med dk gr dol; brecc w/ gangue to 471, then brecc sealed w/ re-xl & shale
-475½ lt br re-xl; several TGS's
-478 med gr dol; sugary; mott
-480 lt med gr dol
-481 med gr sugary dol to semi re-xl
-482 br re-xl
-486 med to lt med gr dol; lt crackle; few bands (37° dip); brecc bott 6" w/ ZnS shines

Top B bed 486 feet

-490½ lt br re-xl; brecc; few dol blocks in top foot; est 1% ZnS 485½-87'; tr FeS 487-87½
-496 lt med to med semi re-xl; mott; from 492½-96 brecc sealed w/ gangue & re-xl
-501 lt br re-xl; brecc; many chert fragments; occ FeS shine; est 10% ZnS 497-99; est 3% ZnS 499-501
-501½ lt med gr dol; few ss grains at base
-511½ br re-xl; feww ss grains at top; silic & occ FeS shine; crackle to some brecc; brecc 507½-09½; est 1% ZnS 501-03; est 1% ZnS 507½-09½
-512 lt gr re-xl; occ chert fragment
-533 lt br & lt gr re-xl; est 5% ZnS 512-13½; small bed dol about 520½; heavy FeS shine at 521½; sandy 520½; some brecc 522-24 & 526-28; v jasperiod 530-30½; v fine grained & mott bott 2 feet

Base Kingsport Fm 533 feet

-537 lt med gr dol; lt bands (30° dip at 536'); v cherty at base

-542½ med gr dol; crackle; cherty near base

Top U bed 542½ feet

-543 br re-xl; chert nod at top
-549½ lt med(med) gr sugary dol; mott
-553 lt gr re-xl; grades to br mott re-xl
-556 br re-xl; TGS then large chert nod at base
-558 med gr dol; cherty top foot; mott to few eyelets
-560 gr re-xl; chert nod at 559
-562½ med gr dol; 3" v heavy sand at 562½; chert nod 561½
-563½ dk re-xl; grades to LS
-564 LS; partly re-xlized; chert nod at base
-567 br re-xl; coarse grained; large chert nod at 565½; v cherty 566-67
-568½ gr semi re-xl to sugary dol; chert nod 567½; few ss grains at base
-572 br to green mott re-xl; crackle; few ss grains near base
-573 dk re-xl
-575 LS, sli re-xlized
-575½ dk re-xl
-576½ LS, sli re-xlized
-577 dk re-xl
-578½ med gr dol; sugary; several chert nods; scatt ss grains bott 6"
-580 br re-xl; lt crackle; chert nod at base
-582 lt br re-xl
-584 LS, sli re-xlized
-586 br re-xl; lt crackle TD

B. H. Putnam DD GD - 6

Copper Ridge Projedt - Puncheon Camp Creek

DMEA Idm-E 1088

Hole No:	GD - 6	Collared:	5-18-58
Farm:	Green-Dalton	Bottomed:	5-24-58
Loc:	N 49,674.52	Depth:	553'
	E 46,536.84	Casing:	HX 49'; AX 160'
Elev:	1403.15	Reaming:	83' (77-160')
Drilled by Putnam Drlg. Co		Cement:	none
Logged by J. W. Spears		Water Table	?

Top Kingsport Fm:	-	226
Top R bed	-	385½
Top S bed	-	455
Base Kingsport Fm.	-	495½
Top U bed	-	507½

0 -49 overburden
-50 med gr v mott semi re-xl (2' core loss 49-59)
-55½ med gr dol; mott; ligher at top and darker at base
-57 lt med gr dol; bands to mott & sandy
-59 med gr mott dol
-69 dk gr dol; v mott top 2'; v sugary & mott 76-79 (7' core loss 59-67; 6' core loss 69-77; 5' core loss 77-85')
-89 lt med to med gr dol; mott & some silic eyelets
-94 med gr dol; mott & silic eyelets
-97 cavity
-99 med gr dol; bands to mott; (1' core olss 97-99)
-100 cavity
-105 lt med gr dol; large chert nod at top; bands & eyelets to 103 w/ ss at 103; few eyelets 103-105; (1½' core loss 100-103; 1½' core loss 103-106)
-106½ med gr dol; mott
-109½ lt gr to med mott re-xl (poss semi re-xl)
-113 lt med gr dol; banded (43°dip) w/ few scatt ss grains to 111; sandy & oolitic cherts 111-111½; bands to lt mott 111½-113
-115 lt gr dol; v lt bands(43° dip); large chert nod at base (1½' core loss 113-119)
-117 lt med gr dol; lt bands (43° dip); grades to med gr dol
-119 med gr dol
-123 lt med gr dol (3' core loss 119-123)
-123½ chert & silica (1½' core loss 123-129)
-126 lt med gr dol; mott & some silic eyelets
-128½ lt gr dol; bands (43° dip)
-132 lt med gr dol; mott
-134 med gr dol; sha ly mott at top, then mott; scatt ss grains 133-34
-142½ lt med gr dol; mott to 140½, then bands (48° dip at 141); v sandy 142-42½
-145 med gr dol; mott & silic eyelets
-146 lt v silic re-xl to silica
-149 lt med gr dol (2' core loss 146-49)
-159 cavity
-159½ dk gr dol; shaly mott & eyelets
-160 med gr dol; bands (41° dip); grades to lt med gr dol
-161½ lt med gr dol; lt bands
-165 lt gr dol; scatt ss grains 161½-62, then lt mott & occ eyelet; some scatt ss at 164; silic 164½-65 w/ 2" of silica at 165: (2' core loss 162-72)
-170½ lt med gr dol; becomes lt mott; scatt ss grains at base
-171 sandy edgewise congl: (base bed M-7)
-171½ med gr sugary dol
-172 lt med gr sugary dol; mott; TGS at base
-173 lt gr dol; few ss grains at top
-181½ med gr dol; mott & silic eyelets; TGS's 175 & 178½
-182½ lt med gr dol; 182-82½ v sandy & oolitic cherts
-184 lt gr dol; ½" TGS at base
-190 lt med gr dol; mott & occ TGS
-192 med gr dol; mott & some eyelets
-194 lt gr dol; lt bands (40° dip); occ thin sand w/ a 1" CM ss at base
-195 lt med gr dol; sandy bott 2"
-197½ lt med to medgr sugary dol; mott & some scatt silica
-200 lt gr dol to lt med gr; few ss grains at top, then well banded (40° dip); sandy at 200
-206 lt med gr dol; few ss grains & a TBS at 200½, then banded & occ eyelet to 204
-207 med dk gr dol; shaly mott
-208 med gr dol; chert nod at base
-212 lt med gr dol; occ chert nod to 209, then banded(40° dip); TBS at base

-215 med gr dol; TBS 213; becomes mott at base & darker
-217½ med dk to dk gr dol; shaly mott
-218½ med gr dol
-221 med dk to dk gr dol; shaly mott & occ white eyelet
-223 dk gr dol; v shaly mott; chert nod at base
-226 med to lt med gr dol; banded (40° dip); sandy 225½-26 w/ CM ss at 226

Top Kingsport Fm at 226 feet

-228 lt med gr dol; some ss at top
-231 med(med dk) gr dol; shaly mott; chert nod at base
-232½ lt med(med) gr dol; well mott
-233 med dk gr dol; shaly mott
-237 lt med gr dol; lt bands top foot; some mott bott foot; TBS at base
-239½ med gr dol; shaly mott; TBS at base
-240½ med dk gr dol; shaly w/ TBS at base
-243½ lt med gr dol; mott
-245 med gr dol; banded (40° dip); TBS at base
-248½ lt med gr dol; scatt ss grains top 6"; becomes mott & med gr at base w/ TBS at base
-251½ med gr dol; shaly mott
-253½ med dk gr dol; shaly mott
-258½ lt med gr dol; banded (40° dip); grades to med gr dol
-260½ med dk gr dol; broad bands
-265½ lt med gr dol; some lt bands; scatt ss grains 261-61½ W/ TBS's 261½ & 265½
-266½ lt med gr dol; sugary, shaly & mott
-283½ lt med gr dol; mott to 271; v sandy & green shales 270½-71(poss. sed. congl); 271-74½ banded to mott & sli darker w/ heavy ss at 274½; sandy & oolitic cherts at 276; TBS 277½; lt mott 276-79; v mott 279-80; v lt bands 280-82 w/ TGS 282; lt mott 282-83½ W/ TBS 283½
-287½ med gr dol; shaly mott
-292½ lt gr dol; TGS 288; lt mott; bleached chert nod 291½; TGS 292½
-297 lt(lt med) gr dol; v lt bands; chert nods 295, 95½, 96 & 97
-305 lt med gr dol; banded to 299½(41° dip) w/ chert nod 298½; 299½-305 v banded to mottxx w/ scatt sands 301½-05 & 2"TGS at 305 (base bed K-3)
-307½ med gr sugary dol; mott; tr congl at 306½-07; TGS 307; v cherty 307-07½
-325½ lt gr dol; lt bands(40° dip) to 311 w/ chert nod & TGS at 311; lt mott 311-17 w/ bleached chert nods 315½, 16 & 17; banded 317½-19½(36° dip) w/ bleached cherts 318½ & 19; v mott to banded 319½-21 w/ thin ss at 321; lt bands 321-25½ w/ chert nods 322, 23, 23½, 24 & 25 (35° dip at 325)
-327 lt semi re-xl to sugary dol; scatt specks of silica & few ss grains; A 2" TGS and then a chert nod at base (base bed K-4)
-334 lt gr dol; some lt bands(38° dip at 332); chert nod 332½; TGS at base
-334½ lt med gr sugary dol; TGS at base
-337½ lt gr dol; lt mott top foot, then lt bands(39° dip at 337) to 337½ w/ chert nod at base
-339 lt med gr dol; mott to bands; few ss grains near base & TGS at base
-347 lt gr dol; chert nod near top & a 6" chert at 341½; lt bands(36° dip) from 341½-45 w/ small bleached chert nod 342½ & TGS 344; lt mott 345-47
-348½ lt med gr sugary dol; mott
-353½ lt med gr dol; banded(38° dip); few ss grains at base then a ½" TGS
-359 lt med gr dol; sli darker at top; some bands to mott & lt crackle; scatt ss grains bott 6" w/ 3" TGS at base (base bed K-5)
-359½ med gr dol; lt crackle
-363½ lt med gr dol; TGS at base
-364½ lt med gr sugary dol; lt mott
-367 lt med gr dol; lt mott; some lt crackle; few silic eyelets; TBS at base

-367½ med gr dol; cherty
-371 lt med gr dol; chert nod 369; lt bands 369-71(41°dip); shaly at base
-374½ lt gr dol; lt crackle (41° dip)
-378½ lt med gr dol; banded(39°dip); few ss grains at base then ½" TGS
-380½ med gr dol; sugary & mott
-385½ lt med gr dol; bands(37° dip at 382); lt mott at base

Top R bed at 385½ feet

-386½ green shale, brecc?; tr ss at top
-389 med gr sugary dol; well mott & lt crackle
-390 lt med gr sugary dol to semi re-xl; mott; 1 inch shaly at top
-395 med gr sugary dol; mott; crackle; FeS shine 394
-398½ lt br re-xl; 3" shaly(green) at top; mott; grades to br vuggy re-xl
-400 lt med gr dol; banded(47° dip); few ss grains at base & some brecc chert & re-xl
-402 brecc chert sealed w/ jasperiod re-xl & green shale
-403 LS, grades to re-xl
-405 br re-xl; lt mott 403-04; vuggy 404-04½
-406 lt med gr dol; brecc w/ re-xl & green shale
-406½ brecc chert & green shale
-408 lt med gr dol, few lt bands
-413 lt to br re-xl; v mott top 2'; lt crackle; ZnS shine 412; FeS shine 412½
-417 lt med gr sugary dol to semi re-xl
-419 lt gr dol; chert nods 417½ & 18; TGS 419
-421 br re-xl; shaly top foot; then well mott
-427 lt semi re-xl(greenish) to fine grained re-xl
-428 lt br re-xl; crackle; tr ZnS at 427½
-438 lt med gr dol; sugary; lt crackle; L"TGS at 429½; FeS shine 434½
-441½ med to med dk gr dol; crackle; some brecc w/ re-xl & green shale bott 4"; ZnS shine at 440; (2' core loss 438-41) (base bed K-8)
-444 LS; shaly top 6"
-444½ green shale, silica & re-xl
-445½ dk semi re-xl; FeS shines throughout; some brecc at top
-448½ med gr dol; brecc to 446½; est ZnS 446-46½; then crackle; FeS shine 447½; ZnS shine 448½
-455 lt med gr dol; sugary; mott; crackle; ZnS shines 449-49½; large chert nod 451½; lt bands 451-53(28° dip) (ground 4' core 455-461')

Top S bed est at 455 feet

-460 brecc re-xl, chert & some col blocks
-462½ brecc chert sealed w/ silica & re-xl
-465½ LS, partly re-xlized to 463½; chert nod 465
-467½ lt br re-xl; becomes limy at base
-468½ LS, ½" TGS at base
-469½ med gr dol; 1" TGS at base
-471 LS; shaly; large chert nod at base
-472 med dk gr shaly dol(brecc block?); tr re-xl & ss at top
-476 LS; XX sli re-xlized; bott 2" grades to re-xl
-492½ lt br re-xl; occ lt gr to br & zones shaly & mott; few bands & poss semi re-xl 481½-82(34°dip) w/ few ss grains at 482; silic 486-88 & shaly 488-89
-495½ lt gr re-xl(to semi re-xl?); large chert nod at base

Base Kingsport Fm at 495½ feet

-507½ med gr dol; crackle to brecc XX 495 -97; chert nods 496, 97 & 99; crackle 502½-06; brecc 506-07½ w/ some re-xl gangue & traces of FeS

Top U bed at 507½ feet

-508 br re-xl; brecc; oolitic chert nod at top
-516½ lt med gr dol; brecc 508-10 w/ some re-xl gangue; FeS shine at 508½; then sugary & some bands to mott; grades to med gr (1' core loss 505-14)
-520 lt br re-xl, v cherty 516½-18, then mott & lt crackle; FeS shines 519½-20
-526½ med mott semi re-xl to sugary dol; bott foot vuggy & some crackle
-530½ lt br re-xl; mott to brecc; est 3% ZnS 526½-27½; jasperiod 527½-30½
-532 lt med gr dol; mott & sugary (1½' core loss 514½-34)
-536 lt med to med gr dol; some eyelets; sugary 534-34½ w/ few as grains & TGS at 534½½; 534½-36 brecc sealed w/ chert & re-xl w/ ZnS shine at 535½
-536½ br re-xl; FeS shine at 536½
-538 lt med gr dol; crackle w/ FeS shines; ZnS shine at 537½
-539 br re-xl; brecc w/ some blocks chert & dol
-542 lt med gr dol; v sandy at top w/ tr brecc w/ re-xl; then occ brecc zone w/ gangue & traces of FeS; bott 6" brecc w/ many chert fragments & some re-xl
-543 br re-xl & chert fragments
-544½ brecc lt gr dol; v sandy; & br re-xl & occ FeS shine
-546 lt br re-xl, chert nod 545 & 545½
-553 brecc; br re-xl, chert & dol

EXPLORATION PROJECT

INTERIM REPORT

DMEA-4580, Idm-E1088- Zinc

6/30	C	220
30	COTM	100
"	JG	110
7/2	[illegible]	800
7/7	[illegible]	500

Operator: B. H. Putnam, Assignee, Thorn Hill, Tennessee

Location: Puncheon Camp Creek Area, Grainger County, Tennessee

Summary of Drilling Completed

	Since last inspection	To Date
Number of holes	5	34
Footage	2,595*	19,333*

Holes showing:

a) Commercial zinc ore 3
b) Non-commercial zinc mineralization 19
c) No zinc mineralization..... 12

* Includes Holes GD-7, -7a, -8, and -9 for which payment is not authorized. Yes! Not according to contract. ?

Additional data on the five holes completed during the interim follows:

Hole # GD-6. T. A. Green and A. B. Dalton Property- depth 553 ft. Coordinates N49674.72, E46536.84; Elevation 1403.15.

Drilling began 5/18/58 and was completed 5/24/58. Brief log of hole: 0-49 overburden,; Collared in Mascot fm; top of Kingsport fm (CM) at 226; top of "R" bed at 385½; top of "S" bed at 455; top of Longview fm @ 495½; top of "U" bed at 507½; bottomed at 553. The hole was reamed from 77 ft to 103 ft.

Mineralization: Shines of sphalerite at 412, 427½, 435½, 437½, 440, from 446 to 446½, 448 and 449.
1½ ft (526-527½) est. 3% Zn.

Hole # GD-7. T. A. Greene and A. B. Dalton Property. Depth 557 ft. Coordinates N49780.85, E46489.53; elevation 1416.23 ft.

Drilling began 5/24/58 and was completed 5/29/58. Brief log of hole follows: 0-7 ft overburden; collared in Mascot fm; top of Kingsport fm (CM) at 162 ft; top of "R" bed at 323 ft; top of "S" bed at 403 ft; top of Longview fm at 446 ft; "U" bed from 459 to 471½ ft; bottomed at 557 ft.

Mineralization: Shines of sphalterite from 336½ to 337½, at 343½; from 364½ to 365; from 470 to 471; at 478, 479, 481, 493, 494, from 502½ to 503, at 521 and 523½.

Runs:
- 1/2' (374½-375) est. 2% Zn.
- 1 ft (399-400) est. 1½% Zn, 5% FeS_2
- 1/2' (459-459½) est. 3% Zn.
- 2 ft (487-489) est. 3% Zn.
- 5½ ' (507-512½) est. 4% Zn (core loss 50%).
- 1 ft (516-517) est. 3% Zn.
- 3 ft (524½-527½) est. 1½% Zn.
- 22 ft (524-546) est. 4 to 5% , very heavy FeS_2.

Hole # GD-7(a) - T. A. Greene and A. B. Dalton Property, depth 541 ft. Coordinates not available to date. Hole is located 9 ft from GD-7; elevation 1415 ft.

Brief log of hole follows: 0-70 ft overburden; collared in Mascot fm; top of Kingsport fm (CM) at 157½; top of "R" bed at 309½; top of "S" bed at 377½; top of Longview fm at 416½; "U" bed from 428 to 440, bottomed at 541 ft.

Mineralization: Shines of sphalerite at 297, 299, 300 to 301, 303 to 303½, 305 to 306, 307, 366 to 367½, 376, 379 to 380½, 406, 422 to 428½ to 429, 431, 433, 448, 455½, 487, 489½ and 508. Assay runs as follows:

2	ft	(303-305)	0.70% Zn
2	"	(305-307)	1.18% "
1½	"	(310½-312)	0.50% "
2	"	(312-314)	0.88% "
2	"	(314-316)	3.52% "
2	"	(317-319)	1.58% "
1½	"	(319-320½)	0.46% "
5	"	(320½-325½)	0.26% "
2½	"	(325½-328)	4.26% "
2½	"	(330½-333)	0.94% "
1	"	(334-335)	2.74% "
2	"	(356-358)	1.52% "
2	"	(358-360)	2.36% "
3½	"	(360-363½)	0.14% "
1	"	(363½-364½)	2.90% "
2	"	(381½-383½)	1.14% "
2½	"	(383½-386)	1.36% "
4	"	(386-390)	0.24% "
3½	"	(390½-394)	2.74% "
1	ft	(402-403)	1.88 Zn
1½	"	(407½-409)	2.70 Zn
1	"	(437½-438½)	4.10% "
1	"	(440-441)	0.50% "
1/2		(452½-453)	1.00% "
1½	"	(466½-468)	4.20% "
2	"	(468-470)	0.38% "

Hole # GD-8, T. A. Greene and A. B. Dalton Property, depth 400 ft.

Coordinates N49842.70, E46429.67; elevation 1409.00.

Hole #GD-8 continued:

Drilling began 6/3/58 and was completed 6/6/58. Brief log of hole: 0-71 ft overburden; top of Kingsport fm (CM) estimated at 67 feet; top of "R" bed at 224; top of "S" bed at 283; top of Longview fm at 347; "U" bed from 360 to 376½ ft; bottomed at 400 ft.

Mineralization: Shines of sphalerite at 274½ and 280; Traces of sphalerite at 286, 288 (in limestone) and at 322 ft.

Hole # GD-9. T. A. Greene and A. B. Dalton Property, depth 544 ft. Coordinates N49759.35, E46686.13; elevation 1375.02 ft.

Drilling began 6/6/58 and was completed 6/11/58. Brief log of hole: 0-17 ft overburden, collared in Mascot fm; top of Kingsport fm (CM) at 200 ft; top of "R" bed at 363; top of "S" bed at 445; top of Longview fm at 489½; "U" bed from 500½ to 515; bottomed at 544. Hole was reamed from 39 ft to 151 ft.

Mineralization: Traces of sphalerite at 319, shines of sphalerite at 418, 425½ and 440.

Runs:	1	ft	(416 - 417)	est. 1½% Zn.
	3	ft	(429 - 432)	est. 3% Zn.
	½	"	(432 -432½)	est. 1% Zn.
	3	"	(435-438)	est. 1½% "
	2½	"	(441½-443)	est. 2½% "
	1	"	(510½-511½)	est. 0.75% Zn.
	19	"	(429-448)	est. 2 to 3% FeS_2.

Drilling in progress is confined to Hole #GD-10 with core examination to 351 ft as of 6/19/58.

Inspected: 6/17/58.

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

Helmuth Wedow, Jr., Geologist
U. S. Geological Survey (DMEA)

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DMEA EXPLORATION PROJECT

Interim Report

DMEA-4850, Idm-E1088-Zinc

Operator: B. H. Putnam, Assignee, Thorn Hill, Tennessee

Location: Puncheon Camp Creek Area, Grainger County, Tennessee

SUMMARY OF DRILLING COMPLETED

	Since last Inspection	To date
No. of holes	2	29
Footage	1,019	16,738

Holes Showing:

(a)	Commercial zinc ore.	1
(b)	Non-commercial zinc mineralization.	16
(c)	No zinc mineralization	12

Additional data on the two holes completed during the interim follows:

Hole GD-4, T. A. Greene and A. B. Dalton Property - depth 433 ft. Coordinates N49852.24, E46537.87; Elevation 1401.13.

Drilling began 5/8/58 and was completed 5/12/58. Drief log of hole: 0-51 overburden; collared in Mascot fm; Est. top of Kingsport fm @ 100 ft; top of "R" @ 254½ ft; top of "S" bed @ 323; top of Longview @ 368 ft; "U" bed from 380-394 ft; bottom @ 433 ft.

Mineralization:
2 ft (294-296½) of 0.48% Zn;
2 ft (296½-298½) of 0.86% Zn;
2 ft (298½-300½) of 3.20% Zn;
3 ft (302½-305½) of 0.02% Zn;
2 ft (305½-307½) of 1.08% Zn;
2½ ft (307½-310) of 0.18% Zn;
2 ft (419 - 421) of 6.86% Zn;

Average of entire mineralized section 0.914% Zn.

Hole GD-5, T. A. Greene and A. B. Dalton Property - Depth 586 ft; Coordinates: N49,678.25, E46,633.44; elevation 1391.48 (located 100 ft south of GD-2). Drilling began 5/13/58 and was completed 5/17/58. Brief log of hole: 0-19 overburden; Collared in Mascot fm; top of Kingsport @ 258½; top of "R" bed @ 420; top of "S" @ 486; top of Longview @ 533 ft; "U" bed from 542½ to 556; bottom @ 586.

Mineralization: 1½ ft (485½ -487) est. 2% Zn;
2 ft (497-499) est. 10% Zn;
2 ft (499 - 501) est. 3% Zn; 6' - 4.7% Zn (est)
2 ft (501 - 502) est. 1% Zn;
2 ft (507½-509½) est. 3% Zn;
1½ ft (512-513½) est. 6% Zn;

Drilling in progress is confined to Hole GD-6.

Inspected: May 21, 1958

L. E. Shirley, Mining Engineer
Bureau of Mines

R. A. Laurence and Helmuth Wedow, Jr.
Geologists, Geological Survey

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DEFENSE MINERAL EXPLORATION

INTERIM REPORT

DMEA-4580, Idm-E1088-Zinc

Operator: B. H. Putnam, Assignee, Thorn Hill, Tennessee

Location: Puncheon Camp Creek, Area, Grainger County, Tennessee

Drilling has resumed on this contract after a brief delay awaiting transfer of contract and leases from National Lead Company to B. H. Putnam.

Diamond drilling data on completed drilling and progress made since the last inspection of March 4, is summarized as follows:

Drilling Completed

Number of holes completed during Interim	7
Footage in holes completed during Interim	2,561
Total number of holes completed to date	27
Total footage in holes completed to date	15,719
Number of holes showing commercial zinc ore	1
Number of holes showing non-commercial zinc mineralization	14
Number of barren holes	12

Additional data on the seven holes completed during the Interim follows:

Hole No.	Property	Total depth	Remarks
GD-3	T.A. Green & A.B. Dalton	364	Location: 400' updip from GD-2; Coordinates: N49,935.51; E 46,490.16; Elevation-1403.48'; Brief log of hole: 0-49 overburden; collared in Kingsport; top of "R" bed @ 162; top of "S" bed @ 258; top of Longview fm @ 307½; top of "U" bed @ 308; bottom @ 364. Mineralization: 6.5' (245½-252) 1.76 Zn, shines of sphalerite from 262 to 263. This hole started 4/8/58 and completed 4/11/58.
ST-2	Viva and W.H. Stapleton	210	Location: 400' updip from GD-3; Coordinates- N50,12.61; E46,395.44; Elevation @ collar 1429.14. Drilling began 4/11/58 and was completed 4/14/58. Brief log of hole: 0-68 overburden, collared

Kingsport fm; top of "S" (?) 129; top of Longview @ 193; top of "U" bed @ 206½; bottom @ 210. No mineralization was encountered in this hole.

Hole No.	Property	Total Depth	Remarks:
ST-3	Viva & W.H. Stapleton	642	Location: 1200' SE of GD-1; Coordinates-N49,904.16, E47,193.58; Elevation - 1421.84. Drilling began 4/15/58 and was completed 4/22/58. Brief log of hole: 0-21 overburden; Collared in Mascot fm;(hole was reamed from 33 to 220) Chert matrix @ 350;; top of "R" bed 494; top of "S"(?) bed @ 568;base of "S" bed @ 632; bottomed @ 642. There was 9' of core loss out of a 11' run in "S" bed. No mineralization encountered in this hole.
	N.G.		
ST-4	Viva & W.H. Stapleton	479	Location: 400' updip from ST-3. Coordinates N50,086.78; E47,092.89; Elevation-1425.00'. Drilling began 4/22/58 and was completed 4/26/58. Brief log of hole: 0-97 overburden; Collared in Mascot fm; chert matrix @ 221; top of "R" bed @ 362; top of "S" bed @ 431½; base of "S" bed and Kingsport @ 465; top of "U" bed @ 477; bottom @ 479. No mineralization encountered in this hole.
	N.G.		
ST-5	Viva & W.H. Stapleton	350	Location: 400' updip from ST-4; Coordinates - N50254.21; E47,000.42. Elevation-1438.94. Drilling began 4/28/58 and was completed 4/30/58. Brief log: 0-93 overburden, cavity from 77 to 93; Chert matrix est. @ 69'; collared in Kingsport ; top of "R" bed @ 227; top of "S" bed @ 292; top of Longview @ 338; top of "U" bed @ 348½; bottom @ 350.
	N.G.		

Mineralization: Shines of sphalerite @ 171½, from 200½-202; 203½,204, 204½, 205,209,210,121½,303½; from 307 to 307; from 310½ to 312½, from 318 to 318½.

Hole No.	Property	Total depth	Remarks
ST-6	Viva & W.H. Stapleton N.G.	290	Location: 200' updip from ST-5; Collar elev. is est. 5½' higher than ST-5. Drilling began 4/30/58 and was completed 5/2/58. Drif log of hole: 0-38 overburden; collared in Kingsport fm; top of "R" bed @ 171½; top of "S" bed @ 241; bottom of "S" bed @ 273½; top of "U" bed @ 284½, bottom @ 290. Mineralization: Shines of sphalerite from 221½ to 226, and 237° to 238½. Dip of bedding in this hole is steeper than surrounding holes.
ST-7	Viva & W.H. Stapleton N.G.	226	Location: 200' updip from ST-6; collar elevation is approx. 2' lower than ST-6. No coordinates available. Drilling began 5/2/58 and was completed 5/5/58. Brief log of hole:0-23 overburden; collared in Kingsport; top of "R"(?) bed @ 72½; top of "S" bed @ 142; top of Longview @ 205½; top of "U" bed @ 217; bottom @ 226. Mineralization: Shines of sphalerite @ 153½, 155, and from 157½ to 158½.

Drilling In Progress

Hole GD-4 located 200' updip from GD-3 is now in progress. At the time of this visit the drill was down because of equipment breakdown. Upon completion of GD-4, present plans include moving the drill to GD-5 located 200' south and downdip from GD-3.

Since resumption of drilling, progress on this contract has been good. The Operator has indicated that negotiations for a second drill is underway and if procured will be placed on the DMEA project.

Inspected: May 6, 1958

V. J. Lynch and L. E. Shirley,
Mining Engineers, Bureau of Mines
DMEA

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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

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K-[illegible]

Month of April, 1958 Docket No. DMEA 4530 Contract No. DM-S 1068
Operator's Name D.H.Putnam, Operator Minerals Zinc
Address 512 Third Street, Durfett, Ohio
Contract Amount, $ 172,125.00 Government Participation: 50 % Amount, $ 85,062.00

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Short Form Contracts:						
Drilling				5/20/58 [illegible]		
Bulldozing	6135.00	39,474.00	45,609.00			
Crosscutting						
Drifting						
repairs	374.00	458.00	832.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
core boxes	0	140.25	140.25			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis						
Payroll Taxes	3.75	45.00	48.75			
Liability Insurance						
(8) Contingencies (specify):						
Incidental allow. .18/ft.	363.10	2363.44	2726.54			
TOTALS	6880.85	42,485.69	49,366.54	6880.85	42,485.69	49,366.54

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

Date April 30,58 *Payee D.H.Putnam, Operator

Per [signature] Title Superintendent

*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:

$ 3440.42

Signature Helen R. Miller
(Authorized Certifying Officer)

Date MAY 14 1958 Vou. No. 173

(See other side)

3440.43

(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. E-1088 in accordance with the terms of the contract.

Signature T. D. Lynch Title MINING ENGINEER U. S. BUREAU OF MINES Date MAY 12 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Lawrence Title EXECUTIVE OFFICER DMEA FIELD TEAM REGION V Date MAY 12 1958

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.

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

Month of April 1958 Docket No. DMEA 4580 Contract No. IDm-E 1088

Operator's Name B.H.Putnam Minerals Zinc

Address 512 Third Street, Marietta, Ohio

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	foot	6135.00	2045	45,609.00	15,203	3.00	50,000	3.00
Churn reaming	foot	374.00	187	832.00	416 436	2.00	5,000	2.00
Auger sampling	ea.	3.75	3	48.75	39	1.25	550	1.50
Stripping core boxes	ea.	-	-	140.25	75	1.87	150	2.00
Trenching								
Test Pits								
Roads and Trails Incid. allow.@ 18/ft	foot	368.10	2045	2736.54	15,203	.18	50,000	.18
TOTAL DISTRIBUTED COSTS		6880.85		49,366.54				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		6880.85		49,366.54				

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 April 30,1958 Operator B.H.Putnam

Per [signature] Title Superintendent

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.

REMARKS:

(Instructions on reverse)

(For Government use only)

[signature]
MINING ENGINEER
U. S. BUREAU OF MINES

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

[illegible]

[illegible], [illegible]

[illegible] - [illegible], 195[illegible]

[illegible]

[illegible]et No. 45[illegible]0
[illegible]ontr[illegible]et [illegible]o. [illegible]-[illegible]

[illegible]uring the month of [illegible]pril, five holes w[illegible]re [illegible]rilled on the Puncheon Camp Creek Project.

Hole GO-3 was drilled 200 feet north of G[illegible]-2 on the Greenbalton f[illegible]rm. The hole colla[illegible]ed in the Kingsport forma[illegible]tion and w[illegible] drilled to a depth of 364 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC	[illegible]	[illegible]
0-40	Overburden	---	---		---
40-30[illegible]	Kingsport	"R" bed 19[illegible] "[illegible]" bed 258 "[illegible]" bed 307½	245½-252, 6½ at 1.76% Zn. [illegible]-[illegible]3, shine		Dolomite [illegible] re-xl: lower part bresc; smome Fe[illegible] at 245-251
30[illegible]-364	Longview	"[illegible]" bed 31[illegible]	---		Dolomite, re-crystalline and ls.

Hole OT-2 was drilled on the Stapleton farm 200 feet north of G[illegible]-3. The hole collared in the Kingsport formation and was drilled to a depth of 210 feet.

DEPTH	FORMATION	KEY HORIZON	ZINC	[illegible]	[illegible]
0-6[illegible]	Overburden	---	---		---
6[illegible]-193	Kingsport	"S" bed 12[illegible] "T" bed 193'	---		Dolomite, re-xl, and ls: numerous cavitys and heavy core loss.
193-210	Longview	---	---		Dolomite & re-xl.

[illegible]
MAY 6 - 1950
[illegible]

Hole ST-[illegible] was drilled 600 feet east [illegible] -1. The hole collared in the Ascot formation and was drilled to a depth of 542 feet.

DEPTH	Formation	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-21	Ascot	Chert at 350'	---	Dolomite
21-632	Kingsport	"A" bed 494 "B" bed 368 "C" bed 632	---	Dolomite, re-xl, and ls.
632-542	Longview	---	---	Dolomite.

Hole ST-4 was drilled 200 feet north of ST-3. The hole collared in the Ascot formation and was drilled to a depth of 479 feet.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-97	Overburden	---	---	---
97-201	Ascot	Chert at 201	---	Dolomite
201-465	Kingsport	"A" bed 362 "B" bed 431½ "C" bed 465	---	Dolomite, re-xl, in part, breccia.
465-479	Longview	---	---	Dolomite & re-xl.

Hole ST-5 was drilled 200 feet north of ST-4. The hole collared at the base of the Ascot formation and was drilled to a depth of 350.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-93	Overburden	Chert at 68'	---	---
93-331	Kingsport	"A" bed 207 "B" bed 292 "C" bed 338	Shine at 171½, 200½-202, 1% est. shines from 203½-210½, shines from 303½-31[illegible].	Dolomite, re-xl, brecciated. some FeS.
331-350	Longview	---	---	Dolomite.

Drilling is now underway 100 feet north of ST-5.

B. H. PUTNAM DD GD - 3

Copper Ridge Project - Puncheon Camp Creek
DMRA Idm-R 1088

Hole:	GD-3	Collared:	4-8-58
Farm:	Green-Dalton	Bottomed:	4-10-58
Loc:	N 49,935.51	Depth:	364'
	E 46,490.16	Casing:	BX 49'; AX # 68'
Elev:	1403.48	Reaming:	none
Drill. by:	Putnam Drlg. Co.	Cement:	none
Logged By:	J.W. Spears	Water Table	?

Top Kingsport	30' est (in overburden)
Top R Bed	192
Top S Bed	257½
Base Kingsport	347½
Top U Bed	318
Base U Bed	336

0-49 Overburden
-50½ med gr dol; banded; several TBS's bott few inches
-54 lt med(med) gr dol; lt mott; v. sandy 51-51½
-56½ med gr dol; mott; grades to med dk gr dol
-60 med dk gr dol to dk gr dol; well mott
-61½ med gr dol; wavy bands; at base grades to lt med gr dol.
-63½ lt med gr dol; wavy bands at top to banded at base
-66 med(med dk) gr dol; darker at 65; well banded 65-66 (dip 40°)
-68 lt med(med) gr dol; lt wavy bands; scatt ss grains 67-68
-74 lt med(lt) gr dol; TGS 72; mott 72-74
-77½ med gr dol; some crackle at 75 & 76-76½; TGS & few ss grains at 76½; from 77-77½ sand & large oolitic cherts
-78½ lt gr dol; sandy & mott; some shears
-84 med(lt) gr dol; lt mott
-91½ med gr dol; v. mott; oxidized 84-87½
-109½ lt gr dol; lt mott to 97, then lt bands to 100½ w/ chert nods at 99, 100 & 100½ well banded 100½-03½ w/ chert nods 103 & 103½ (dip 101 - 39°); 103½-09½ well mott to banded & grades to lt med gr.(dip 105 - 46°); scatt ss grains 106½-09½ w/ heavy sands 108½-09½ & TGS 109½
-112 br semi re-xl; well mott & vuggy; v cherty bott 4", poss some oolite; TGS at base
-115 lt gr dol; v lt bands; ½" oxidized TGS at base (dip 114 - 43°)
-125 lt med(med) gr dol; well mott & oxidized to 120); banded 120-23½ w/ cherts 120½ & 121; wavy banding 123½-25 w/ some large ss grains bott 2" then TBS (dip 130 - 42°)
-130 lt med gr dol; chert nods 126½ & 126 3/4; many large dk cherts 127½-29½
-130½ lt med gr mott semi re-xl; TBS at base
-131½ med gr sugary dol; well mott; TBS at base
-150½ lt gr dol(& some lt med gr); lt bands 133-38½ w/ chert nods 136½ & 137 3/4; TBS 138; mott & shaly 138-40; banded 141-44½ (dip 41½°) w/ occ small chert nod; feww ss grains & TBS at 144½; crackle 145-46; v cherty 146-47; lt bands 147-50½ w/ cherts 148½ & 149; TBS 150½ (dip 150 - 42°)
-154 lt med gr dol; lt bands at top to mott at base; shaly at base
-155 med gr dol; mott, v. mott
-159½ lt gr dol; banded; few ss grains then TBS at base
-164 lt med gr dol; mott; tr crackle at 161 w/ FeS shine; 1½" TGS at 164
-164½ lt br re-xl; 1" dk & shaly at base
-166½ med to lt med gr dol; shaly at top; some lt crackle bott foot
-169 lt med gr dol; occ lt crackle
-170½ med gr dol; mott to v mott
-172 lt to lt med gr dol; lt mott; tr crackle at base then brecc chert nod
-175 med gr dol; mott; lt crackle; chert nod at base
-179½ lt med(med) gr dol; occ tr of crackle
-182 lt(lt med) gr dol; occ lt shear
-191 lt med gr dol; mott; occ crackle
-192 lt gr dol; lt bands; thin ss at base

TOP "R" BED AT 192'
-194 lt br re-xl; 2" green shale at top & 1" TGS at base
-198½ lt med gr sugary dol to semi re-xl; brecc 196-98½; 2" TGS at base
-200 lt gr sugary dol to semi re-xl
-202 dk to med dk gr dol
-203½ med gr dol; sugary, mott

-204½ lt med to lt gr dol; banded
-208 lt re-xl, v shaly 204½-05½; breec(fault?) 206½-08
-209 lt med gr dol; banded; few ss grains & chert nod at base
-210½ lt re-xl; shaly to 4"
-214 br re-xl; breec 211½-12½; breec(fault?) 212½-14
-215 chert, sec chert & some green shale
-215½ lt gr dol
-220½ lt br re-xl; mott & some crackle
-223 lt re-xl to semi re-xl
-225½ lt gr sugary dol; chert nod at base
-233 lt re-xl to semi re-xl; occ vugs and oxidized breec.
-241½ lt gr sugary dol, some semi re-xl; 239-40 some oxidized breec and vugs
-243 med gr dol; fault breec 241½-42½
-244½ med dk gr dol; crackle; chert nod at base
-245 med gr dol; shaly at base
-245½ lt re-xl w/ large chert nod at top; heavy ZnS shine at 245½
-246½ med(med dk) gr dol
-248 gr cherty re-xl; ZnS shine at top; much jasperiod and FeS; heavy ZnS shine at 248
*251 3/4 med & med dk gr dol; breec sealed w/ re-xl & gangue; heavy ZnS & FeS 248-51; ZnS shines 251-52; Est 2% ZnS 245½-252
-252 gr re-xl
257½ lt med gr dol; sugary; crackle; 254½-55 chert & re-xl; 255-57 crackle to breec w/ FeS shine at 257½

TOP "S" BED AT 257½'

-262½ "dry breec"; 257½-59 mostly lt gr dol sealed w/ re-xl, silica & green shale; 259-62½ mostly dk & med dk gr dol sealed w/ re-xl, silica & white gangue; 262-63 v. heavy FeS(est 10%) & some ZnS
-265 lt br re-xl & lt gr dol
-267 lt gr dol; breec w/ few dk blocks and some chert fragments; sealed w/ white gangue and some re-xl; few traces of FeS
-267½ chert, sec chert & green shale
-269 lt to lt med gr dol; 1" TGS 1" from top
-280 lt br re-xl; v silic, cherty & shaly; 277-79 almost all silica & chert
-281½ lt med gr dol; some crackle w/ re-xl; 3" TBS at base
-286 lt re-xl, breec
-287 gr re-xl
-288 lt med gr dol; oxidized crackle
-293 lt re-xl; breec to 289; oxidized & v shaly 289-89½; then vuggy(ground 5' Between 291 - 299)
-307½ gr mott re-xl; some vugs

BASE KINGSPORT FM AT 307½'

-312 lt med gr dol; large chert nod at 308; some sli banding; from 309½-10½ v silic and sugary to semi re-xl
-318 med gr dol, mott, several cherts 314½-15; sli darder bott 6"
-319 dk mott re-xl
-320½ lt(lt med) gr sugary dol
-325 lt med mott dol, sugary; some semi at top
-326 med gr semi re-xl to lt gr re-xl w/ scatt silica (1' core loss 325-29)
-327 sec silica
-332 br mott re-xl
-335 white re-xl
-336 gr re-xl to semi re-xl (1' core loss 329-39)
-340 lt med gr dol; crackle; chert nod 340
-342 med gr dol; mott & eyelets; sandy bott 4"
-343 lt gr dol; few ss grains at top
-343½ dk mott re-xl
-344 lt med gr dol

-348 lt semi re-xl(fine gr re-xl?); much silic. top 4"; very cherty 346½-48; v. sandy 347½-48
-35½ dk re-xl; almost all chert & silica
-354 lt med gr dol; sugary; few ss grains at base (1½' core loss 351-54)
-356 lt br re-xl
-362 LS, partly re-xlized; at 361 becomes lt re-xl; chert nods 361½ & 362
-364 lt med to lt gr dol; lt sands bott 6", then tr of re-xl at base TD

GD-3

Invoice
Marietta, Ohio

B.H.Putnam, Appro
512 Third Street
Marietta,Ohio

April 30,1958

In account with
PUTNAM DRILLING COMPANY

512 Third Street | PO Box 647 | Phone FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No 4580 for April,1958.

Core Hole No. CD-3

Footage Drilled	364' @	$3.00	$1092.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam,Operator

By Raymond Eddy
Raymond Eddy
Drilling Superintendent

B.H. PUTNAM DD ST-2

Copper Ridge Project - Puncheon Camp Creek

DMEA Idm-E 1088

Hole:	ST-2	Collared:	4-11-58
Farm:	Stapelton	Bottomed:	4-14-58
Loc:	N 50,112.61	Depth:	210'
	E 46,395.44	Casing:	BX 68'; AX 87'
Elev:	1429.19	Reaming:	none
Drill.by:	Putnam Drlg. Co.	Cement:	none
Logged:	J. W. Spears	Water Table	?

Top Kingsport	——
Top R Bed	?
Top S Bed	130' (core loss this zone)
Base Kingsport	193
Top U Bed	206½

0-68 overburden
-73 med(lt) gr dol; mott & sugary; 1" TGS at base (6' core loss 68-77')
-76 lt & dk re-xl w/ much chert & shale
-79 lt br re-xl
-85 cavity
-86 br re-xl; cherty at top
-87 lt med gr dol; sugary; breco
-88½ br re-xl; breco; some jasperiod (3' core loss 87-100')
-96 lt re-xl; some crackle
-97 lt med gr dol; chert nod near middle
-98 br re-xl
-109½ lt semi re-xl; lt mott; crackle (occ zone of re-xl or sugary dol)
-116 rotten rock, loss core, few pieces of med gr mott dol.
-123 LS, dk gr; sheared at base & tr re-xl (2' core loss 116-121')
-124 med gr dol; breco
-126 silica, chert & tr re-xl (6' core loss 124-135')
-128 lt semi re-xl; oxidized gangue filled fractures
-135 br coarse re-xl; some gangue filled fractures
-151½ LS; occ gangue filled fracture; some shale & silica at 139½-40
-152½ med gr dol; fractures w/ gangue filling; TGS at base
-165½ LS; bott few inches grades to re-xl (2' core loss 150-170')
-170 gr re-xl; some gangue filled fractures & occ chert fragment
-170½ LS; thin ss at base (2' core loss 170-179')
-171½ gr re-xl
-175 LS (dip 42°)
-177 gr re-xl
-179 LS
-180 gr semi re-xl(re-xl?); band of silica at base
-186 LS; some banding at top
-193 br mott re-xl

ST-2

D ASE KINGSPORT FM 193'

-199½ lt gr to lt med gr dol; chert nods 194½, 196, 198½ & 199½; tr re-xl at 196; tr silica at 197 (dip 41°)
-206½ lt med to med gr dol, lt mott; few lt shears
-208½ br re-xl; chert nod & few ss grains at top (2' core loss 196-210')
-210 lt gr sugary dol TD

Invoice
Marietta, Ohio

To B.H.Putnam,Appre
512 Third Street,
Marietta,Ohio

April 1,30,1958

In account with
PUTNAM DRILLING COMPANY

512 Third Street | PO Box 647 | Phone FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA contract No. 4580 for April,1958.

Core Hole No. ST-2

Footage Drilled	210' @ $3.00	$630.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam,Operator

By: Raymond Eddy
Raymond Eddy
Drilling Superintendent

B.H. PUTNAM DD ST -3

Copper Ridge Project Puncheon Camp Creek

EMEA Idm-E 1038

Hole:	ST-3	Collared:	4-15-53
Farm:	Stapleton	Bottomed:	4-22-53
Loc:	N 49,904.16	Depth:	642
	E 47,193.53	Casing:	BX21: AX220
Elev:	1421.34	Reaming:	33 220'
Drilled by:	Putnam Drilling Co.	Cement:	None
Logged by:	J.W. Spears	Water Table:	?

Top Kingsport Frm.	350
Top R Bed	493½
Top S Bed	568
Base Kingsport	632

Collar: 4-15-58
BX 21'
AX 33'

ST. 3

0-21 Overburden
-29 Lt. med. gr. dol; occ. shale; some lt. mott.
-32½ Med. to lt. med. gr. dol; mott. (3' loss 29-33)
-34 Chert & sec. chert.
-34½ Lt. med. gr. dol; TGS at base.
-38 Med. gr. dol.
-39 Dk. v. mott. semi re-xl to sug. dol.
-41½ Med. dk. gr. dol; few eyelets; TBS at base.
-43½ Med. gr. (to lt. med.) dol; scatt. ss grains 43-43½.
-50 Lt. med. gr. dol; lt. bands to 47½ (dip 33°); well mott. 47½-50.
-51 Med. gr. dol., mott.
-55 Med. dk. gr. dol; (to dk. gr.) mott & few silic eyelets.
-56 Silica
-57½ Lt. med. gr. dol; sugary, lt. bands.
-61½ Lt. med. gr. dol; (dip 33°)
-65 Lt. med. v. mott. semi re-xl.
-77 Med. gr. dol; v. lt. mott. sli. sugary; chert nods 75½,76,77(over 76-77)
-79 Lt. med. gr. dol.
-82 Chert & sec. chert (2' core loss 79-82)
-83½ Lt.(l. .) gr. dol; sand at 83 (36°)
-90 Lt. med. gr. dol; mott; eyelets; semi re-xl at top to sugary.
-91½ Lt. v. mott. re-xl.
-93 Lt. med. gr. dol; banded to 94½ (dip 33°) w/ scatt. sands 93½-94½; ox. & mott. to bands 94½-95½; sli. darker & mott 95½-93 & occ. white gangue eyelets & TGS 93.
-99½ Med. (m.l.) gr. dol; w/ large gangue eyelets; TGS about in middle.
-104½ Med. dk. gr. v. mott. semi re-xl to sug. dol; 2" of re-xl at base.
-110 Lt. med. gr. dol; lt. mott; eyelets & occ. vug; TGS & chert nod at base.
-113 Med. gr. dol; mott; bott. 2" sandy & some TGS.
-11 ½ Lt. med. gr. dol (to med. at base) mott.
-1 1½ Med. gr. dol (some se i sug.) mott; few ss grains bott. 6"; chert nod 3" from base; TGS at base.
-1 5½ Lt. med. gr. dol. grading to med. gr; well mott & silic eyelets.
-127 Lt. med. gr. dol; lt. bands to sli. mott; few ss grains at base (dip 37°)
-129 Med. gr. v. mott. semi re-xl (to sug. dol).
-133 Lt. med. gr. dol; some lt. mott. top 2 ft; TBS at base.
-135½ Med. gr. dol., lt. bands.
-139 Dk. gr. dol; shaly mott.
-143½ Med. gr. dol; mott; 3" sand & tr. re-xl at base.
-145 Lt. med. gr. dol; lt. mott; eyelets bott 6"; TBS at base.
-154½ Med. (med. dk.) gr. dol; v. mott. top 2 ft.; then mott; many silic & white gangue eyelets; chert nod at base.
-156½ Med.(l.m.) gr. dol; lt. bands; TBs at base. (33° dip).
-159 Lt. med. gr. dol; bands top 1 ft.; ss near top; large chert nod at base.
-163 Med. to lt. med. gr. dol; large chert nod at 160; fault (BF) bott. 6" with sandy & TGS at base.
-163½ Med. gr. dol; scatt. ss grains.

-164 Lt. med. gr. dol; scatt. sands.
-170 Lt. gr. dol (some l.m. at top); chert nod 166; then lt. mott. to bands; scatt. ss grains 169½-70.
-173 Lt. med. gr. dol; small chert nod 171½; TBS 173.
-17[illegible] Med. gr. dol; scatt. ss grains 177½-78 w/ TGS 177½. (dip 38°)
-179½ Lt. med. gr. dol; large oolitic chert nod at top; then scatt. ss zones & some eyelets & small cherts.
-181½ Re-xl, 179 3/4-180½ brecc. chert sealed w/ gangue; then 4" silica w/ oolitic chert nod; then silic cherty re-xl.
-183½ Lt. med. mott. semi re-xl; to sug. dol; TBS at base.
-187½ Med. gr. dol; some sugary; mott; bott. 6" much darker.
-190 Lt. med. gr. dol; mott. & vuggy.
-191½ Lt. med. gr. dol; banded; v. sandy top 4"; then scatt. sands to 191.
-193 Lt. med. to med. gr. sugary dol.
-204 Med. dk. gr. dol., v. mott. w/ silic eyelets to 196; then lt. mott & some silic eyelets to 201; then mott. & eyelets.
-208 Med. gr. dol., lt. mott; bedding plane fault 205-06.
-209 Med. dk. gr. dol.
-217 Cavity.
-219½ Lt. med. gr. dol; lt. mott & few eyelets; TBS at base.
-22[illegible]½ Med. to lt. med. gr. dol; mott w/ eyelets.
-225 Med. gr. dol., mott.
-226 Lt. med. gr. dol; banded (dip 38°)
-227 Lt. silic re-xl, some ss grains at top.
-229½ Lt. med. gr. dol., sugary, mott; much silica bott foot & 3" band of silica at base.
-235 Lt. gr. dol; lt. bands to 234 (dip 38°) v. cherty 234-34½.
-236 Med. & some lt. med. gr. dol; chert nod 236.
-236½ Lt. med. gr. dol., chert nod 236½.
-237½ Lt. gr. dol.
-240 Lt. med. gr. dol; v. mott. 237½-38; 239-39½; oolitic chert nod at 240.
-245 Lt. gr. dol; bands (40° dip) chert nod at base.
-249½ Med. gr. dol; lt. bands (40° dip) occ. small chert nod & a few ss grains & tr. silic at base.
-251 Chert to re-xl, tr. green shale about 250.
-252 Lt. med. gr. dol., lt. mott.
-255 Lt. gr. dol., v. banded (wavy) (38° dip)
-256½ Lt. med. gr. sug. dol. (to semi); mott.
-258 Lt. gr. dol., mott.
-261½ Lt. med. gr. dol., to med. gr; mott; TGS at base.
-267½ Lt. gr. dol; lt. mott & grades to lt. med. gr. dol; few eyelets 266-67.
-271 Lt. gr. dol; lt. mott; scatt. ss grains top foot; silic 270-71 w/ band of silica & chert at base.
-272 Lt. med. gr. dol., large chert nod at base.
-280 Lt. gr. dol.
-283½ Lt. med. (m) gr. dol; well mott w/ silic eyelets; TBS at base.
-285 Med. gr. dol; mott w/ silic eyelets.
-288 Lt. med. gr. dol; banded (dip 38°) grades to lt. gr. dol.
-292 Lt. med. gr. dol; mott, sugary; chert nod 291.
-293 Sec. chert to re-xl, some ss grains bott 6" & chert nod at base.
-297 Lt. med. (Med); lt. mott. & occ. eyelets.
-302½ Med. gr.dol; many gangue filled eyelets to 299; then few silic eyelts.
-306 Lt. to med. dk. gr. dol; top foot sbdly mott; then lt. mott & occ. eyelets.
-306½ Med. gr. dol; ss at 3" of oolicic chert.
-307½ Lt. gr. dol; sbdly chert 307-07½.
-311½ Lt. med. gr. dol; lt. mott and/or bands.
-315½ Med. gr. dol; mott & eyelets.

DST 3

-319 Lt. med. gr. dol; few ss grains 317-18 w/ 1" CNss at 318; few scatt. ss grains 318-19 w/ heavy ss & TGS at 319.
-320 Med. gr. dol., mott; sugary; TGS at base.
-325 Lt. gr. dol: well banded (dip 36°) scatt. ss grains 320-23½.
-329 Lt. med. (m) gr. dol., (3' core loss 323½-330)
-330 Med. gr. dol.
-332 Lt. med. gr. dol; chert nods 331½ & 332.
-339½ Lt. gr. dol; lt. bands; v. shaly at base.
-347 Med. dk. & dk. gr. dol; mott. & shaly; v. dk. gr. bott. foot.
-350 Lt. med. gr. dol; lt. bands (36°) ss at 350.
Top Kingsport Fm. 350 feet.
-353½ Lt. med. gr. dol., lt. mott. & occ. eyelets; shaly at base.
-356 Med. gr. dol., v. mott.
-361½ Lt. gr. dol., TGS at base.
-362½ Lt. med. gr. dol., TGS at base.
-365½ Lt. gr. dol., lt. mott; TBS at base.
-372½ Lt. med. gr. dol., lt. bands to 367½ (36°); few TBS's 367-67½; scatt. ss grains at 368; TBS's 370½,71,72½ (grades to med. gr. dol.)
-374½ Dk. (m.d.) gr. dol., mott & shaly.
-376½ Med. gr. dol., lt. mott.
-382 Lt. med. gr. dol; lt. bands; cherty 377,78, &380½ (grades to med. gr. dol.)
-383½ Med. dk. gr. dol., v. banded w/ TBS's (35°dip).
-386½ Lt. med. gr. dol; scatt. thin sands 383½-85; 2" chert nod then 2" TGS at base.
-389 Lt. med. gr. dol., well mott.
-398 Lt. gr. dol. chert nod 393; sandy & cherty (pt-oolitic) 395-95½; large oolitic chert (w/ tr. ss) at 397; TBS 398.
-401 Lt. med. gr. dol; dk. oolitic chert nod at base.
-402 Med. gr. dol: shaly mott.
-413 Lt. gr. dol; v. mott to 413 w/ small chert nod & TBS at 413; several chert nods 415½-16; banded 416-18 (35° dip).
-423½ Lt. med. gr. dol; v. banded to mott; scatt. ss grains 421½-23; dk. shale & chert 423-23½.
-439½ Lt. gr. dol. lt. bands to 426 (34°dip) small chert nod 424; mott 426-29 w/ chert nod at 429; some bands 429-30 w/ oolitic (or congl) chert at 430; banded 430-433(dip 35°) banded to mott. 433-34 w/ TBS 435; bleached chert nods 436-437.
-440 Lt. gr. sug. dol; v. silic (tiny white specks) few ss grains near top; 1" TGS at base.
-440½ Med. dk. gr. dol; sugary, mott. & shaly.
-457½ Lt. gr. dol., some lt. bands & occ. small bleached chert nod (2½' core loss 441-43) (dip 34°); at 449 a 4" dk. chert nod w/ TGS at base; lt bands 449-52 (dip 29°); cherty & mott 452-53; lt. bands 453-57½; chert nods 454½ & 456; (dip at 455 - 29°) few ss grains 456½; TBS 457½; (34° dip at 457).
-460 Lt. med. gr. dol; lt. bands top foot; then mott & becomes sugary; TGS at base.
-468 Lt. gr. dol; well banded & few eyelets (dip 30°); top foot lt. mott.
-469 Lt. med. gr. dol; TGS & chert nod at top; large chert nod at base.
-476½ Lt. gr. dol; lt. mott & some eyelets; TGS 472½; TBS 476; at about 477 becomes banded (dip 30°) to 479 w/ chert nod 479; some v. lt. bands 479-36½ w/ TGS at base.

St-3

-489 Lt. med. gr. dol; sugary, lt. mott; few ss grns at base then 1" of TGS and chert.
-493½ Lt. med. gr. dol; lt. mott to banded to 490; then banded 490-93; (34° dip) w/ ½" TGS at base.
Top R. Bed 493½
-496 Med. gr. sug. dol. (l. semi re-xl) well mott & sugary.
-496½ Lt. greenish gr. dol.
-500 Lt. med. gr. dol., well mott., sugary; some thin shears.
-501 Lt. greenish semi re-xl, TGS at base.
-504 Lt. med. gr. (green) mott. semi re-xl.
-506½ Lt. med. (to med.) gr. dol; mott to 506; 1" TGS at base.
-509½ Lt. re-xl to semi re-xl, mott; 0" v. coarse re-xl at top.
-511 Br. mott. re-xl.
-511½ Lt. med. gr. dol., chert nod at base.
-513½ Br. re-xl, sli. banded to 513½, then mott; some lighter re-xl 516-17½; darker & vuggy 517½-18½.
-519½ Lt. med. gr. dol; 0" repxl at base.
-521 LS, TGS 520,520½.
-521½ Med. gr. sugary dol.
-531½ Lt. br. coarse re-xl, to lt. re-xl; 0" chert nod at base.
-533½ Lt. med. gr. dol; ½" TGS at base.
-537½ Br. shaly re-xl, mott; becomes lt. re-xl; bott foot br. re-xl.
-549 Lt. med. gr. dol; sugary to poss. semi re-xl. (6' core loss 540-50) recovered 0' of continous dol; then a 1" bott. of LS)
-553½ LS, occ. chert nod, TGS at base.
-554½ Br. shaly reOxl.
-564 Med. (& l.v.) semi re-xl to sugary dol (0' core loss 550-60) large fractured chert nod at 561. (9' core loss 560-70).
-568 Lt. semi re-xl.
Top S Bed 568 est.
-570 Br. re-xl.
-589 LS (dip 534-35°) (1' loss 570-93; 1' loss 583-89) tr. lt. med. gr. dol at 589.
-590½ Lt. re-xl.
-594½ LS, at base grades to re-xl (0' core loss 591-99)
-595½ Lt. br. re-xl.
-598 Lt. med. gr. dol; mott. lt. fractures.
-603 Br. v. vuggy re-xl, mott. & brecc.
-610½ Lt. br. to lt. re-xl; silic, some vugs & brecc 609-10. (2½' core loss 605-610).
-614 Br. v. vuggy re-xl, mott. & silic (3' core loss 610-00).
-617 Lt. br. re-xl.
-617½ Lt. med. gr. dol; few ss gr ins at base.
-620½ Lt. br. re-xl; few ss grains at top; silic.
-625 LS, at base becomes re-xlized. (5' core loss 620-31).
-632 Lt. br. re-xl to gr. re-xl; mott top 3-4 feet. (0' core loss 631-37)
BASE IN FRONT FM. 630.
-636 Lt. med. gr. dol, lite fractures.
-637 Med. (L) gr. sugary dol. lt. fractures.
-640 T.D. med. gr. dol., lt. fractures (0' core loss 637-40).

Invoice
Marietta, Ohio

B.H.Putnam,Oppro
512 Third Street
Marietta,Ohio

April 30,1958

In account with
PUTNAM DRILLING COMPANY
PO Box 647

512 Third Street

Phone FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 for April,1958.

Core Hole No. ST-3

Footage Drilled	642 @	$3.00	$1926.00
Footage Reamed	187 @	$2.00	$ 374.00
			$2300.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam, Operator

By Raymond Eddy
Raymond Eddy
Drilling Superintendent

B.H. PUTNAM DD ST -4

Copper Ridge Project Puncheon Camp Creek

DMRA Idm-E 1033

Hole: ST-4
Farm: Stapleton
Loc: N. 50,086.78
E. 47,092.89
Elev: 1425.01
Drilled by: Putnam Drilling Co.
Logged by: J.W. Spears

Cored: 4-22-58
Bottomed; 4-26-58
Depth: 479'
Casing: BX 97'; AX 115'
Reaming: None
Cement: None
Water Table: ?

Top Kingsport fm	201'
Top R.Bed	362
Top S Bed	431½ (?)
Base Kingsport	465
Top U bed	477

0-97 Overburden
-101½ Lt. med. gr. dol.(bleached); from 99-101½ v. mott. w/ few eyelets; chert nod at top.
-103 Med. to med. dk. gr. dol; mott.
-114 Lt.(lt.med.) gr. dol; lt. mott; sandy green shale at base.
-116 Lt. med. gr. dol: mott; few ss grains top 3".
-117½ Lt. gr. sugary dol to some re-xl; v. silic; bott few inches re-xl; mott; chert nod at base.
-125½ Lt. gr. dol; bleached chert nod at 120; then grades to lt med. gr. w/ lt. bands (dip 36°).
-133 Med. gr. dol. (l.m. at top) mott w/ silic eyelets; bott. foot much darker w/ TBS at base.
-135½ Lt. gr. dol.
-140½ Lt. med. gr. sugary dol; silic to 140; mott; v. sandy 140-40½.
-153½ Med. gr. dol; white gangue eyelets to 143½; then lt. mott. w/ silic eyelets to 150; then few gangue eyelets 150-51½; shaly 153; sugary & v. mott 153-53½.
-154½ Med.(lt.) gr. dol; v. sandy & oolitic cherts bott. 6".
-162 Lt. med. gr. dol; bands (to mott) to 157 (dip 40°).
-165½ Med. gr. dol; mott w/ some silic eyelets; sli. darker towards base.
-167½ Lt. med. gr. dol; wavy bands (dip 40°) 1" CM type ss at base.
-168½ Lt. gr. dol; few ss grains bott 1" w/ TGS at base.
-170½ Med. gr. sugary dol; well mott & grades to l. med. gr. dol; silic bott. 6".
-171½ Lt. gr. sugary dol; some silica & occ. ss grains; ½" TGS at base.
-180 Lt. med. gr. dol: banded (dip 175-46°) few thin sands 173½-74½; TGS at 180.
-182 Med. gr. dol; shaly mott 180-80½, then mott w/ chert nod at base.
-190 Lt. med. gr. dol; bandes to 186(dip 39°) then from 186½ grades to almost med. gr. dol.
-191 Med. dk. gr. dol; shaly bott.
-194 Med. gr. dol; lt. mott; few eyelets.
-196 Lt. med. (m) gr. dol.
-197 Med. gr. dol.
-198 Dk. gr. dol; v. shaly mott.
-201 Lt. med. to lt. gr. dol; banded (dip 39°); bott 4-6" CMss.
Top Kingsport 201.
-206½ Lt. med. gr. dol., lt. mott; occ. silic eyelet; shaly bott 2" w/ chert nod at base.
-209 Med. gr. dol; v. mott.
-215 Lt. gr. dol, few lt. bands top foot.
-216 Lt. med. gr. dol; (39° dip).
-219 Lt. gr. dol; lt. mott to bands & occ. eyelet; TBS base.
-221 Med. gr. dol; lt. bands (dip 40°); shaly bott 4" & TBS at base.
-224½ Lt. med. gr. dol; sandy near top; grades to med.dk. gr; 1" TBS at base.
-229 Med. gr. dol; some mott at top; grades to med. dk. gr.: 1" TBS at base.
-231 Med. dk. gr. dol; mott; chert nod at base.
-234 Lt. med. gr. dol; mott to bands; chert nod 230½.
-242½ Lt. gr. dol; chert nod near top & at 235½,35 3/4, & 237 (dip 48°) well banded & grades to lt. med. gr. dol; scatt. ss grains 241-42½ w/ heavy ss to congl. at base.

-245 Lt. gr. dol; lt. mott; several cherts & some sec. chert 244-45.
-248 Lt. med. gr. dol; mott; sandy at base.
-250 Lt. re-xl to sec. chert; tr. brecc. at top.
-250½ Lt. gr. dol.
-252 Lt. & lt. med. gr. dol; congl; v. sandy, several cherts bott 6"; some oolitic chert.
-260 Lt. med. gr. dol; (occ. sli. color changes); lt. bands (40° dip) TGS 25
-260½ Med. dk. gr. dol; sandy mott.
-266½ Lt. med. (med.) gr. dol; well mott to silic eyelets (a TGS about 9" from top); TGS at base.
-277 Lt. gr. dol; lt. mott. to 271 w/ TGS 271; lt bands 271-77 increasing to 277 (36° dip) w/ chert nods 274,75,75½.
-283 Lt. med. gr. dol; v. banded (wavy); sandy 280½-82; brech. chert 282-83.
-304 Lt. gr. dol; lt. bands to 286½ (34° dip); lt. mott. 286½-92 w/ bleached chert nods 290 & 291; banded 292-95 w/ bleached chert nod 293 (dip 39°) v. banded (wavy) 295-98 w/ scatt. ss grains for 3" at 298, then TGS & chert nod; 6" chert nod at 302, nod at 303.
-304½ Lt. gr. sugary dol; many small specks of white silica & few ss grains; 1" chert & 1" TGS at base.
-305½ Lt. med. gr. dol; sugary.
-314 Lt. gr. dol; occ. eyelets to 306½; then lt. bands to 309, then well banded; (dip 35°); chert nod 310½, few ss grains at base, then ½" TGS & 3" chert nod.
-323 Lt. med. gr. dol; some bands to wavy bands; chert nod (lt. oolitic) at 317; 319-20 v. banded w/ several cherts & tr. silica & ss grains; chert nod 321½; some brecc. w/ jasperiod at 322 & also a heavy ss.
-323½ Med. gr. sugary dol.
-328½ Lt. med. gr. dol; TGS 325, bands 325-26 (33° dip); mott 326-28½ w/ occ. jasperoid zone 327½-28½.
-332 Lt. to lt. med. gr. dol; well banded (dip 35°); 1" TGS at base.
-337 Lt. med. gr. dol; banded; ss grains bott. few inches w/ 2" TGS & 4" chert nod at base.
-337½ Med. gr. dol.
-354 Lt. med. gr. dol, sugary 342-43; chert nod at 344, few eyelets 344-44½; lt. bands to 348 (36° dip at 345); fr m 346½-48 some brecc. w/ blk. jasperiod & some white gangue; black chert at 351; bands 351-53 (35° dip).
-362 Lt. med. gr. sugary dol; scatt. ss grains 354-55; 356-62 crackle w/ gangue & some jasperiod.

Top R Bed 362

-363½ Br. re-xl, 2" TGS at top.
-371 Lt. med. & med. gr.dol.; sugary to semi re-xl; 3" TGS at top; mott. & greenish.
-372½ Gr. mott. re-xl, eyelets, grades to semi re-xl.
-373 Lt. med. gr. dol; black chert nod & TGS at base.
-378 Lt. re-xl; greensish mott; becomes fine grained to semi re-xl.
-380 Br. mott. re-xl, few vugs; grades to semi re-xl.
-380½ Lt. med. gr. dol.
-382 Br. re-xl, tr. TGS & chert at top; sli. banded; tr. crackle w/ re-xl. & gangue; 2" of lt. gr. dol. at base w/ tr. ss & chert at base.
-386½ Br. mott to sli. sandy re-xl, occ. crackle.

-397½ Lt. med. gr. sugary dol; mott; tr. crackle w/ jasperiod & gangue & tr. FeS.
-399 Dk. br. vuggy & mott. re-xl.
-399 Lt. med. gr. dol; brecc. sealed w/ re-xl & green shale & occ. chert fragments.
-393 Lt. med. gr. dol., sugary; sli. banding (34° dip) (3' core loss 396-97)
-399½ Lt. br. re-xl, mott.
-400 Lt. gr. semi re-xl.
-404½ Lt. re-xl, 9" TGS at top (ptly re-xl); sli. shaly; 1" TGS 403½.
-409½ Lt. med. gr. sugary dol, some semi re-xl at top.
-410½ Dk. br. v. mott. re-xl.
-413½ Dk. gr. dol; brecc. w/ gangue to 412½, tr. w/ gangue & re-xl.
-415 Gr. to greenish dol & some dk. dol; brecc. w/ gangue & tr. re-xl.
-420 Med. gr. dol; "dry brecc."; v. shaly at 419.
-422 Brecc. chert sealed w/ re-xl & green shale.
-425 Med. gr. semi re-xl, some crackle tr. brecc. w/ white gangue.
-428 Lt. semi re-xl, bott. 6" chert nod.
-431½ Lt. med. gr., fine grained re-xl to semi re-xl, some crackle, gangue top part & re-xl bott. foot.
Top S BED 431½ (?)
-434½ Lt. br. coarse mott. re-xl, chert at base.
-437½ Lt. med. gr. dol; crackle.
-439½ Brecc. chert, some re-xl & green shale. (1" core loss 438-43)
-442 Lt. gr. fine grained re-xl, (to semi?) crackle.
-443 Brecc. chert, re-xl & green shale.
-446½ Med. gr. dol; weak dry brecc.
-455 Lt. br. re-xl; some oxidation at 451 & 452; crackle 450-452; shaly & sandy 453½-54; v. coarse re-xl 454-54½, v. shaly 454½-55.
-457½ LS, traces of TGS's bott. 2".
-464 Dr. to gray re-xl; tr. brecc. 458½-59.
-465 Lt. gr. fine grained re-xl.
BASE Kingsport 465.
-470 Lt. med. gr. dol; sugary 466½-67 w/ TGS 467; chert nod 470.
-477 Med. gr. dol; lighter at top; mott; large chert nod at base, some crackle bott. 2'.
Top U bed 477
-477½ Br. re-xl.
-479 T.D. Gr. semi re-xl., mott.

ST-4

Invoice
Marietta, Ohio

B.H.Putnam,Appro
512 Third Street
Marietta, Ohio

April 30,1958

In account with
Putnam Drilling Company
PO Box 647

512 Third Street

Phone FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580 April,1958.

Core Hole No. ST-4

Footage Drilled	479'	@ $3.00	$1437.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam,Operator

By Raymond Eddy
Raymond Eddy
Drilling Superintendent

B. .PUTNAM DI ST-5

Copper Ridge Project Puncheon Camp Creek

DMA Idm-E 1033

Hole:	St-5	Collared:	4-23-58
Farm:	Stapleton	Bottomed:	4-30-58
Loc:	N 50,254.21	Depth:	350'
	E 47,000.42	Casing:	AX 731, BX 93'
Elev:	1433.94	Reaming:	None
Drilled by:	Putnam Drilling Co.	Ceotn:	None
Logged by:	J.N. Spears	Water Table	?

Top Kingsport fm. - Inorverburden, est 69'
Top R.Bed - 227'
Top S. Bed - 292½
Base Kingsport fm.- 338
Top U bed. - 348½

0-73 Overburden.
Top Kingsport fm. in overburden, est 69'.
-77 Lt. (m.d.) gr. dol; shaly mott, occ. eyelet; bott. foot oxidized.
-93 CAVITY
-94½ Lt. gr. dol.
-100½ Med. dk. to dk. gr. dol; top foot bleached; well mott. to shaly; cherty 99-100.
-101 Med. gr. dol; sli. banding.
-103 Lt. med. gr. dol; bands to mottling; several cherts bott. 1' feet.
-106 Med. dk. gr. dol; well banded; chert nod 104 (dip 35°).
-109 Med. gr.dol. (to med. dk); lt. mott. to bands; sandy at 107, banded 107-09; sandy & tr. congl at 108 then ½" TGS.
-109½ Lt. gr. dol; 1" TGS at base.
-113 Lt. med. gr. dol; mott; grades to lt. gr. dol.
-119 Lt. gr. dol; ss & congl. at 113 & oolitic chert 113; tr. of ss 113-119 w/ ss at 119. (34° dip).
-124 Lt. med.gr. dol; lt. bands to sli. mott; TBS 121 (sli. darker 121-22) (36° dip).
-127 Med. gr. dol; shaly mott; some oxidized zones; TBS at base.
-131½ Lt. med. gr.dol; lt. mott. to mott. w/ silic eyelets.
-136 V. lt. gr. dol; lt. mott. to 136 w/ TGS 136.
-143 Lt. gr. dol; v. lt. bands; chert nod at top & at 139,39½,40,40½,41 w/ ½" TGS 141; banded 141-43 (dip 36°) w/ chert nods 142 & 143.
-149 Lt. med. gr. dol., well banded (wavy); sl.tt. ss grains 147-48½; bott 6" (148½-49)green shale, chert & re-xl; occ. sli crackle throut bed.
-153½ Lt. gr. dol; bands; some fracturing to crackle filled w/ re-xl (40° dip); heavy TGS at base.
-155 Lt. med. gr. dol., mott.
-160 Lt. gr. dol; bands (dip varies from 36°-45°).
-162½ Lt. gr. dol; v. mott. to banded; (dip 161 - 35°); few ss grains bott. 4" & TBS at base.
-168 Lt. med. gr. dol; lt. mott; chert nods 165,66,66½, 66 3/4, & 67½.
-619 Lt. gr.sugary dol; silic, crackle.
-186 Lt. gr. dol; brecc. 169-70 w/ green shale & gangue; crackle 171½ w/ strong ZnS shine; bands 172-76 (dip 173 - 34°) & tr. of crackle; chert nods 176-177; tr. FeS 177½; few bands at 179 (dip 32°); tr. FeS 180½; well banded 181-184; cherty 182½-83 w/ tr. ss; brecc. chert nods 184-85; brecc. 185½-86 w/ chert nod 186.
-186½ Med. dk. gr. dol; banded; sand & tr. FeS at 186½/.
-189 Lt. med. gr. dol (to med. gr) bands (dip 35°); tr. FeS at 189.
-192½ Med. gr. dol., mott; tr. FeS in crackle 189½-91½; grades to med. dk mott. dol.
-196 Lt. med. gr. dol; lt. bands (35° dip) & occ. eyelets; grades to lt. gr.
-202 Lt. gr. dol; bands to mott; thin ss 197; brecc. 197-99 w/ heavy FeS; brecc. 200-202 w/ ZnS shines (est. ½%) from 200½-02; shaly towards base w/ few ss grains then 1" TGS at base.
-203½ Lt. med. gr. dol; sli. darker top 2"; crackle 203-03½ w/ ZnS shine at 203½.
-207½ Med. gr. dol; mott; brecc. 203½-04½ w/ some re-xl & silic fragments in the gangue; ZnS shines 204-04½; brecc. w/ gangue 204½-06 w/ ZnS shine 205 & FeS shines 205-06; v. shaly & mott. 206-07½ w/ lt. crackle w/ FeS shines;

-209 Lt. gr. dol; lt. mott. to silic eyelets; heavy ZnS shine at 209 in crackle; brecc. chert nod.
-212½ Lt. med. gr. dol; banded; crackle w/ several chert fragments; ZnS shine 209 3/4 (dip 34°); brecc. chert nod at 212; ZnS shine 212½.
-220 Lt. gr. dol; lt. crackle; few ss grains at 220½ then a TGS.
-224 Lt. med. gr. dol; lt. mott & sugary & some lt. crackle.
-227 Lt. gr. dol, lt. bands; crackle w/ FeS shine at 225; (dip 35°); bott 6" brecc. & sealed w/ green shale & silica; few ss grains at 226½; TGS at base.
Top B BED 227 feet.
-228 Br. mott. r -xl, TGS at base.
-229½ Med. gr. mott. sugary dol; heavy FeS 228-29.
-231 Lt. med. gr. mott. sugary dol.
-232 Med. gr. mott. sugary dol; crackle; TGS at base.
-235 Med. semi re-xl, shaly to mott.
-237 Lt v. mott. to brecciated re-xl.
-238 Lt. med. gr. dol; lt. crackle w/ re-xl.
-240½ Lt. br. re-xl, v. shaly top 2".
-242½ Br. re-xl, vuggy.
-244 Lt. med. gr. dol; brecc. (1' core loss 240-47)
-246 Brecc. chert sealed w/ sandy br. re-xl.
-248 Lt. med. gr. re-xl to semi re-xl, some brecc.
-249 Dk. br. re-xl.
-252 Blocks of lt. & lt. med. gr. dol, in r -xl, silica, chert & gangue.
-253 Lt. med. gr. dol.
-259 Lt. re-xl, v. mott. top foot, from 256 grades to semi re-xl, chert nod at base.
-261 Lt. med. gr. dol; chert nod at 260.
-264 Lt. br. shaly re-xl, 2" TGS at top.
-265 Med. semi & re-xl, v. shaly.
-270 Lt. med. gr. dol; sli darker top 4-6"; then grades to lt. gr. dol w/ few eyelets.
-270 3/4 Br. r -xl.
-274½ Med. dk. (dk) gr. dol; brecc., mott; occ. eyelet & vug; v. shaly to jasperiod at base.
-275 LB
-276 Dk. re-xl, brecc.
-27 ½ Med. gr. sug. dol. to semi re-xl, some crackle w/ re-xl & white gangue.
-281 Lt. med. gr. sugary dol; some crackle w/ re-xl: v. cherty at 281.
-289 Lt. med. gr. dol; brecc. to crackle w/ gangue 281-83; brecc. w/ silica & shale 283-83½; tr. re-xl & a chert nod at 284½; b nded 284½-87 (dip 45°) & crackle; brecc. 287-89.
-292½ Lt. med. gr. dol., brecc; bott. foot has pieces of re-xl, shale & silica in the gangue.
Top B Bed 292½
-294 Br. re-xl, occ. lt. crackle; few chert nods bott. foot.
-300 Lt.(lt. med.) gr. dol; banded; 295-300 brecc w/ much re-xl, shale & silica & chert.
-302 Green shale & silica & some re-xl.
-306 Re-xl, silica & chert; ZnS shine 303½.
-303 Lt. br. re-xl, silic; crackle; heavy ZnS shine 307-07½; chert nod 303.
-310½ Lt. med. (med.) gr. dol; some brecc. w/ re-xl and gangue.

-313 Gr. v. silic re-xl; heavy ZnS shine at 310½; occ. ZnS shine to 31[illegible]½.
-315 Lt. br. re-xl, brecc. w/ band silica at base.
-31[illegible] Br. re-xl, occ. crackle & some small vugs; chert nod at 31[illegible].
-3[illegible]½ Lt. br. re-xl, ZnS shine 31[illegible]-13½; shaly 31[illegible]½-19, sand, 319-19½; then shaly w/ brecc w/ scatt FeS shine.
-3[illegible]½ Gr. re-xl; sandy 3[illegible]3-23½; FeS shines 3[illegible]5-25½.
-330½ Br. re-xl, some hands & crackle; FeS shine 3[illegible]9-30½.
-333 Lt. re-xl.
-33[illegible] Lt. gr. re-xl.
- BASE KINGSPORT from 33[illegible] feet.
-343½ Lt. med. (med.) gr. dol; brecc. w/ re-xl & gangue top foot; & FeS shine at top; chert nod 339½, then 3" sugary dol w/ TGS at base.
Top U bed 343½
-349½ Br. re-xl, large chert nod at top; pt. oolitic.
-350 TD Lt. med. gr. semi re-xl to sugary dol, scatt.

St-5

Invoice
Marietta Ohio

B.H.Putnam,Appro
512 Third Street
Marietta, Ohio

April 30,1958

In account with
PUTNAM DRILLING COMPANY
PO Box 647

512 Third Street

Phone FR 4-6761

Statement for drilling Puncheon Camp Creek Project DMEA Contract No. 4580
April,1958

Core Hole No. ST-5

Footage drilled	350'	@ 43.00	$1050.00

I hereby certify that to the best of my knowledge and belief the above invoice is correct and just and in accordance with the bid submitted by Putnam Drilling Company.

B.H.Putnam,Operator

By Raymond Eddy
Raymond Eddy
Drilling Superintendent

ENGINEERS
INSPECTIONS and TESTS

The Bruce Williams Laboratories

ESTABLISHED 1900

MAIN OFFICE AND LABORATORIES 610-624 JOPLIN ST. TELEPHONE MAYFAIR 9-1996

JOPLIN, MISSOURI

ST. LOUIS, MISSOURI

CHEMISTS
INDUSTRIAL and ANALYTICAL

PICHER, OKLAHOMA

FAYETTEVILLE, ARKANSAS

National Lead Company
P. O. Box 61
Thorn Hill, Tennessee

4-18-58

Samples from B. H. Putnam, P. O. Box 61, Thorn Hill, Tennessee

			ZINC
790419	GD-3-1	245½ - 247½ (2')	0.82
420	GD-3-2	247½ - 249½ (2')	1.96
421	GD-3-3	249½ - 252 (2½')	2.36

= 6½' @ 1.76 %

$3.75

CF-nls 65-979

THE ABOVE FIGURES ARE AS DETERMINED IN OUR LABORATORIES
ADDRESS ALL COMMUNICATIONS TO JOPLIN MISSOURI

Bruce Williams

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

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K-

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of FEBRUARY 195 8 Docket No. DMEA 4580 Contract No. IDM-E 1088
Operator's Name NATIONAL LEAD COMPANY Minerals ZINC
Address 111 BROADWAY, NEW YORK, N.Y.
Contract Amount, $ 170,125.00 Government Participation: 50% Amount, $ 85,062.50

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	3477.00	35,997.00	39,474.00	5/30/58 ASPK		
Bulldozing						
Crosscutting						
Drifting						
REAMING	40.00	418.00	458.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
CORE BOXES	0	140.25	140.25			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	37.50	7.50	45.00			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): INCIDENTAL ALLOW. @ .10/FT.	208.62	2,159.82	2,368.44			
TOTALS	3763.12	38,722.57	42,485.69	3763.12	38,722.57	42,485.69

I certify that the above bill is correct and just and that payment therefor has not been received.
Date FEBRUARY, 1958 Payee NATIONAL LEAD COMPANY
Per [signature] Title SUPERINTENDENT

*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:

$ 1881.56

Signature Helen R. Miller
(Authorized Certifying Officer)

Date MAY 14 1958 Vou. No. 72
(See other side)

1881.56

(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. E-1088 in accordance with the terms of the contract.

Signature V. J. Lynch Title U. S. BUREAU OF MINES Date MAY 12 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature [illegible] Title EXECUTIVE OFFICER DMEA FIELD TEAM REGION V Date MAY 12 1958

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.

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

Month of FEBRUARY 1958 Docket No. DMEA 4580 Contract No. IDM-E 1088
Operator's Name NATIONAL LEAD COMPANY Minerals ZINC
Address 111 BROADWAY, NEW YORK, N.Y.

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	FOOT	3477.00	1159	39,474.00	13,158	3.00	50,000	3.00
Churn REAMING	FOOT	40.00	20	458.00	249	2.00	5,000	2.00
Auger SAMPLING	EACH	37.50	30	45.00	36	1.25	550	1.50
Stripping CORE BOXES	EACH			140.25	75	1.87	150	2.00
Trenching								
Test Pits								
Roads and Trails INCID. ALLOW. @ .18/FT.	FOOT	208.62	1159	2,368.44	13,158	.18	50,000	.18
TOTAL DISTRIBUTED COSTS		3763.12		42,485.69				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		3763.12		42,485.69				

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 FEBRUARY, 1958 Operator NATIONAL LEAD CO.

Per [signature] Title SUPERINTENDENT

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.

REMARKS:

(Instructions on reverse)

(For Government use only)

[signature]
MINING ENGINEER
U. S. BUREAU OF MINES

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

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT

GRAINGER COUNTY, TENNESSEE

FOR FEBRUARY 1958

BY: W.T. HILL

DOCKET NO. 4580
CONTRACT NO. IDM-E 1088

DURING THE MONTH OF FEBRUARY, TWO HOLES WERE COMPLETED ON THE PUNCHEON CAMP CREEK PROJECT.

HOLE GD-1 (GREEN-DALTON FARM) WAS DRILLED 2115 FEET EAST OF DA-1 AND 600 FEET SOUTH OF GEOPHYSICAL STATION GP 11½. THE HOLE COLLARED IN THE MASCOT FORMATION AND WAS DRILLED TO A DEPTH OF 625 FEET. THE RESULTS ARE SUMMARIZED BELOW:

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-7	OVERBURDEN	---	-----	--
7-326	MASCOT	CMss @ 326	----	DOLOMITE WITH OCCASIONAL THIN BEDS OF RE-XL.
326-594½	KINGSPORT	"R" @ 497 "S" @ 560, T @ 594½	ZNS SHINES @ 487½, 491, 493, 498½, 512½, 523, 524, 525½, 538.	DOLOMITE AND RE-XL; IN PART BRECCIATED;
594½-625	LONGVIEW	"U" BED @ 607½.	----	DOLOMITE & RE-XL.

HOLE GD-2 WAS DRILLED 200 FEET NORTH OF GD-1. THE HOLE COLLARED IN THE MASCOT FORMATION AND WAS DRILLED TO A DEPTH OF 534 FEET. THE RESULTS ARE SUMMARIZED BELOW:

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-71	OVERBURDEN	----	----	--
71-190	MASCOT	CMss @ 190'	----	DOLOMITE.

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
190-475	KINGSPORT	"R" @ 356½; "S" @ 424½. "T" @ 475	408½-410½, 1% EST.; 419-419½, 2% EST.; 426-426½, 5%; SH @ 429, 432; 434-446, 12' @ 5.59%; OR 434-454, 20' @ 3.6%. 456-458, .36%; 458-464, 6' @ 4.23%; OR 456-470½, 12½' @ 2.71%. 495-496, 2.46%;	DOLOMITE & RE-XL; IN PART BRECCIATED.
475-534	LONGVIEW	"U" @ 487; L-3 @ 502.	SHINES @ 478½, 488; 491½-492, SHINES; 495-496, 2.46%; SHINES @ 502, 505½, 506, 507½, 508½, 510½; 515-520, 5' @ 2.95%.	DOLOMITE & RE-XL; IN PART BRECCIATED.

THE DRILLING HAS BEEN TEMPORARILY HALTED AS NATIONAL LEAD COMPANY IS WITHDRAWING FROM THE PROJECT. AS SOON AS THE ASSIGNMENTS TO B. H. PUTNAM, OPERATOR, HAVE BEEN MADE, THE DRILLING WILL BE RESUMED.

ENGINEERS
INSPECTIONS and TESTS

The Bruce Williams Laboratories

ESTABLISHED 1898

CHEMISTS
INDUSTRIAL and ANALYTICAL

MAIN OFFICE AND LABORATORIES 618-624 JOPLIN ST. TELEPHONE MAYFAIR 3-1556

JOPLIN, MISSOURI

BATESVILLE, ARKANSAS ST. LOUIS, MISSOURI PICHER, OKLAHOMA

National Lead Company
P. O. Box 61
Thorn Hill, Tenn.

2-27-58

OUR NO.	MARK	DESCRIPTION	[redacted]
			ZINC
758210	JA-2-1	631½ - 633	0.27
211	JA-2-2	593 - 595	0.60
~~212~~	~~VA-7-1~~		~~2.76~~
~~213~~	~~VA-7-2~~		~~4.31~~

$2.50
~~$2.75~~

ADDRESS ALL COMMUNICATIONS TO JOPLIN, MISSOURI

Bruce Williams

2/12/58

65-464

INDUSTRIAL
AND
ANALYTICAL
CHEMISTS

The Bruce Williams Laboratories
ESTABLISHED 1898
MAIN OFFICE: 618-622 JOPLIN STREET
TELEPHONE MAYFAIR 3-1556
Joplin, Missouri

ENGINEERING
INSPECTIONS
AND
TESTS

BRANCH OFFICES:

306 VALLEY DRIVE
ST. LOUIS, MISSOURI
TELEPHONE HOBART 7-3226

219 TERMINAL WAREHOUSE BLDG
LITTLE ROCK, ARKANSAS
TELEPHONE FRANKLIN 2-0693

CONNELL HOTEL BLDG
PICHER, OKLAHOMA
TELEPHONE 710

March 12, 1958

National Lead Company
P. O. Box 61
Thorn Hill, Tennessee

		ZINC	RERUN
788920	GD-2-1	6.32	
921	GD-2-2	0.48	
922	GD-2-3	7.76	
923	GD-2-4	15.08	
924	GD-2-5	2.56	
925	GD-2-6	1.38	
926	GD-2-7	none detected	
927	GD-2-8	none detected	
928	GD-2-9	1.98	1.98
929	GD-2-10	0.44	0.40
930	GD-2-11	none detected	
931	GD-2-12	0.36	
932	GD-2-13	1.92	1.86
933	GD-2-14	6.04	
934	GD-2-15	4.74	
935	GD-2-16	0.20	
936	GD-2-17	1.50	1.50
937	GD-2-18	2.06	2.04
938	GD-2-19	5.00	
939	GD-2-20	2.46	
940	GD-2-22	4.24	
941	GD-2-23	2.48	
942	GD-2-24	1.30	

THE BRUCE WILLIAMS LABORATORIES

Bruce Williams

28 @ 1.25
35.00

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	63	CODE		DATE	AT SHIP POINT	

SOLD TO
National Lead Company
Box 2047
Morristown, Tennessee

SHIPPED TO
Puncheon Camp, Tennessee

TERMS NET 30 DAYS
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 97042

INVOICE DATE 2-25-58

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 625.' Core Drilling at Puncheon Camp, Tennessee as per agreement.					
		Prospect #	From / To		Total Feet	Unit Cost		Total Cost
		C D 1	0. / 625.		625.	$3.00		$1,875.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	

SOLD TO

National Lead Company
Box 2047
Morristown, Tennessee

[redacted] DAYS
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 97087

INVOICE DATE 3-17-58

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tennessee

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 534.' Core Drilling at Puncheon Camp, Tennessee as per agreement.					
		Prospect#	From To		Total Feet	Unit Cost		Total Cost
		G. D. 2	0. 534.		534.	$3.00		$1,602.00
		Reaming						
		G. D. 2	75. 95.		20.	2.00		40.00
								$1,642.00
			WORK COMPLETED					

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

R. Lowe

DMCA 4580

Copper Ridge Exploration-Diamond Drill Hole CD-2 Ore Results

March 18, 1958

Mr. G. H. Wiles

Mr. G. B. Bryan

The table below shows assay results from the above hole just received by telephone from the Bruce Williams Laboratory in Joplin.

You will note that the upper part of the mineralized showing shows a 10' thickness averaging 6.44% zinc or 12' averaging 5.60%. After an intervening 14' of low grade material there is another 12' section that will average 2.74%. The overall average for 36' of nearly continuous mineralization is 2.93%. Other isolated horizons are mineralized as shown but are either too low grade or too narrow to be considered as ore.

Sample No.	Feet From	Feet To	Thickness	Assay % Zn	Ft. X %	Averages
CD-2-1	434	436	2 ft.	6.32	12.64	
" 2	36	38	2 "	.48	.96	
" 3	38	40	2 "	7.76	15.52	10'-6.44%
" 4	40	42	2 "	15.08	30.16	12'-5.60%
" 5	42	44	2 "	2.56	5.12	
" 6	44	46	2 "	1.38	2.76	
" 7	46	48	2 "	0	0	
" 8	48	50	2 "	0	0	
" 9	50	52	2 "	1.98	3.96	36"-2.93%
" 10	52	54	2 "	.44	.88	
" 11	54	56	2 "	0	0	
" 12	56	58	2 "	.36	.72	
" 13	58	60	2 "	1.92	3.84	
" 14	60	62	2 "	6.04	12.08	
" 15	62	64	2 "	4.74	9.48	12'-2.74%
" 16	64	66	2 "	.20	.40	
" 17	66	68	2 "	1.50	3.00	
" 18	68	70	2 "	2.06	4.12	
" 19	480	482	2 "	2.90	[illegible]	[illegible]
" 20	492	496	4 "	[illegible]	[illegible]	[illegible]
" 22	515	517	2 "	4.24	8.48	
" 23	17	19	2 "	2.45	4.90	5'-2.91%
" 24	19	20	1 "	1.30	1.30	

Samples 9, 10, 13, 17 and 18 had originally been estimated to contain 7%, 3+%, 3+%, 4% and 5% respectively, which is considerably higher than reported by Williams. These samples are being re-assayed and until sufficient results may change seriously the averages of the mineral part of the ore zone they will not affect the upper [illegible]

[illegible]

RECEIVED
MAR 20 1958
U. S. Geological Survey
Geologic Division
Denver, Colo.

OFFICE FILE COPY
DMEA
RECEIVED MAR 17 1958
DATE | INITIAL | CODE
3-17 | C | 220
17 | com | 100
" | | 110
3/18 | | 800
3/18 | | 500

DMEA EXPLORATION PROJECT

INTERIM REPORT

DMEA-4580, Idm-E1088-zinc

Operator: National Lead Company, New York, N.Y.

Location: Puncheon Camp Creek Area, Grainger County, Tennessee

Diamond drilling data on the above project to date and progress made since the last inspection of February 4 is summarized as follows:

Drilling completed

Number of holes completed since last inspection..	2
Footage in holes completed since last inspection.	1,159
Total number of holes completed to date.....	20
Total footage in holes completed to date.....	13,158*
Number of holes showing commercial zinc ore.....	1
Number of holes showing non-commercial zinc mineralization.....	10
Number of barren holes.....	9

* Hole No. JA-2 bottomed at 730 feet instead of the reported depth of 731 feet.

Additional information on the two holes completed during the interim is as follows:

Hole No.	Property	Total depth	Remarks
GD-1	T.A. Greene & A. B. Dalton	625	Coordinates: N 49588, E 46685. Collar elevation 1407; a brief log of the hole is as follows: 0-7 overburden; collared in Mascot fm; Chert matrix @ 326; top of "R" bed (?) @ 489; top of "S" bed 560; top of Longview @ 594½; top of "U" @ 607½; bottomed @ 625. Mineralization: Shines of sphalerite @ 487½, 491, from 493 to 493½, 498½, 512½, 523, 524, 525½ and 528. The hole was started 1/29/58 and completed 2/13/58.

Hole No.	Property	Total depth	Remarks
GD-2	T.A. Greene & A.B. Dalton	534	Location: 200 ft up dip from GD-1. A brief log of the hole follows: 0-65 overburden; chert matrix @ 190; top of "R" bed @ 357; top of "S" bed @ 424½; top of "T" @ 475; top of "U" bed @ 487; hole bottomed @ 534.

3.5 x 10 = 35.0
0.5 x 4 = 2.0
0.5 x 3 = 1.5
0.5 x 3 = 1.5
3.0 x 3 = 9.0
1.0 x 5 = 5.0
3.5 x 10 = 35.0
1.0 x 3 = 3.0
13.5 13.5 92.0 -6.8%

Mineralization: Limits of mineralization from 408½ to 520 ft. 2'(408½-410½) of est. 1% Zn; 1/2' (419-419½) of est. 2% Zn; 1½'(426-427½) of est. 1½% Zn; 1' (434-435) of est. 10% Zn; 1½'(437½-439) of est. 1% Zn; 3½' (439½-443) of est. 10% Zn; 1/2' (451-451½) of est. 4% Zn; 1/2' (453-453½) of est. 3% Zn; 1/2' (458-458½) of est. 3% Zn; 3' (459-462) of est. 3% Zn; 1' (463-464) of est. 5% Zn; 3½' (466½-470) of est. 10% Zn; 1'(495-496) of est. 3% Zn; 5' (515-520) of est. 3½% Zn; Shines of sphalerite @ 424½, 429, 432; scattered shines from 434 to 470½; from 491 to 492, from 505½ to 506, @ 507½, 508½ and 510½- traces of sphalerite @ 478 and 488.

No additional drilling is in progress at this time awaiting the decisions of the Companies involved concerning future operations.

Inspected: March 4, 1958

L. E. Shirley, Mining Engineer
Bureau of Mines (DMEA)

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OFFICE FILE COPY
DMEA
RECEIVED FEB 17 1958

DATE		CODE
2-18	C	220
19	Com	100
		110
		800
2/21		500

INTERIM REPORT

DMEA-4580, Idm-E1088 - Zinc

Operator: National Lead Company, New York, N.Y.

Location: Puncheon Camp Creek Area, Grainger County, Tennessee

Diamond drilling data on the above project todate and progress made since the last inspection of January 6, 1958 is summarized as follows:

Drilling Completed

Number of holes completed since last inspection	2
Footage in holes completed since " "	1,446
Total number of holes completed to date	18
Total footage in holes completed to date	12,000
Number of holes showing commercial zinc ore	0
Number of holes showing non-commercial zinc mineralization	9
Number of barren holes	9

Additional data on the two holes completed during the interim is as follows:

Hole No.	Property	Total depth	Remarks
DA-2	W.B.Dalton	715	Coordinates: 48645 North abd 44796 East. Elevation: at collar 1410 ft. A brief log of the hole is as follows: 0-44' overburden, cm sand @ 401, top of "R" bed @ 592; top of "S" bed @ 643½; top of "T" bed @ 679; top of "U" (?) bed @ 689;-Bottom @ 715. Hole was started 12-21-57 and completed 1-8-58. Mineralization: Zn shines @ 313 and 490½.
JA-2	E. Jackson	731	Coordinates: 47056 North and 42228 East. Elevation @ collar 1368. Hole was started 1-11-58 and completed 1-24-58. A brief log of the hole follows: 0-27 overburden; chert matrix @ 434; top of "TR" @ 597; top of "S" bed @ 648; top of "T" bed @ 693; top of "U" bed @ 703; bottom @ 731. Mineralization: Zn shines @ 557, 558½ to 559½, 579½ to 581½, 589 to 591. From 593 to595, 2 ft of est. 1% Zn and from 631½ to 633, est. 1/4% Zn.

Drilling in Progress

Number of holes in progress---------- 1

Total footage drilled in incompleted holes
at time of inspection---------- 140

Additional data on the one hole in progress at this time is as follows:

Hole No.	Property	Present depth	Est. Total depth	Remarks
GD-1	T.A. Greene & A.B. Dalton	140	650	Location: 2100 ' northeast and along strike from DA-1 Drilling began 1-29-58. Hole collared in Mascot fm and present depth is in Mascot.

Inspected: Feb. 4, 1958

L. E. Shirley, Mining Engineer
Bureau of Mines

Helmuth Wedow, Jr. Geologist
Geological Survey

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

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

PAID ON VOUCHER & SCHEDULE
DISBURSEMENTS K- 42
FEB 27 1958

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of January, 1958 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name National Lead Company Minerals Zinc
Address 111 Broadway, New York, N.Y.
Contract Amount, $170,125.00 Government Participation: 50% Amount, $85,062.50

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Short Form Contracts:						
Drilling	6843.00	29,154.00	35,997.00	3/10/58		
Bulldozing						
Crosscutting						
Drifting						
Reaming	210.00	208.00	418.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	51.50	88.75	140.25			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	2.50	5.00	7.50			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify):						
Incidental Allow. @ .18/ ft.	410.58	1749.24	2159.82			
TOTALS	7517.58	31,204.99	38,722.57	7517.58	31,204.99	38,722.57

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

Date January 1958 *Payee National Lead Company

Per [signature] Title Superintendent

*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:

$ 3758.79

Signature [signature]
(Authorized Certifying Officer)

Date FEB 25 1958 Vou. No. 133

(See other side)

3758.79

(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. E-1088 in accordance with the terms of the contract.

Signature [signature] Title MINING ENGINEER U. S. BUREAU OF MINES Date FEB 20 1958

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature [signature] Title EXECUTIVE OFFICER MINING ENGINEER DMEA FIELD TEAM U. S. BUREAU OF MINES REGION V Date FEB 20 1958

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.

Form MF-104A
(April 1952)

Budget Bureau No. 42-R1151.2

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

RECEIVED FEB 25 1958

OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of January 1958 Docket No. DMEA 4580 Contract No. Idm-E 1088

Operator's Name National Lead Company Minerals Zinc

Address 111 Broadway, New York, N.Y.

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	6843.00	2281	35,997.00	11,999	3.00	50,000	3.00
Churn Reaming	Foot	210.00	105	418.00	209	2.00	5,000	2.00
Auger Sampling	Each	2.50	2	7.50	6	1.25	550	1.50
Stripping Core Boxes	Each	51.50	25	140.25	75	1.87	150	2.00
Trenching								
Test Pits								
Roads and Trails Incid. Allow. @ .18/ ft.	Foot	410.58	2281	2159.82	11,999	.18	50,000	.18
TOTAL DISTRIBUTED COSTS		7517.58		38,722.57				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		7517.58		38,722.57				

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 January 1958 Operator National Lead Company

Per [signature] Title Superintendent

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)

[signature]
MINING ENGINEER
U. S. BUREAU OF MINES

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

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT

GRAINGER COUNTY, TENNESSEE

FOR JANUARY 1958

BY: W.T. HILL

Docket No. 4580
Contract No. Idm-E 1088

During the month of January, three holes were completed on the Puncheon Camp Creek Project.

On the Dalton farm, hole DA-2 was drilled 200 feet north of DA-1. The hole collared in the Mascot formation and was drilled to a depth of 715 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-44	Overburden	—	—	—
44-401	Mascot	CMss @ 401'	Shine @ 313'	Dolomite with occasional thin beds of re-xl. Several cavities in upper part.
401-679	Kingsport	"R" bed @ 580½; "S" bed @ 643½; "T" bed @ 679	Shine @ 491	Dolomite & re-xl; some LS; occasional crackle brecc. with trace of FeS.
679-715	Longview	"U" bed @ 689	—	Dolomite and re-xl; bott. 9' brecciated.

On the Elvin Jackson farm, two holes were drilled. Hole JA-1 was collared in the Mascot formation and was drilled to a depth of 836 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZONS	ZINC MINERALIZATION	REMARKS
0-27	Overburden	—	—	—
27-545	Mascot	CMss @ 545	—	Dolomite with occasional thin beds of re-xl.
545-815½	Kingsport	"R" bed @ 711½; "S" " " 760; "T" bed @ 815½	Traces of ZnS @ 674½, 684	Dolomite and re-xl w/one thin bed of LS; crackle & rubble breccia scattered throughout; FeS shines from 628-752.
815½-836	Longview	"U" bed @ 824½	—	Dolomite and re-xl.

Hole JA-2 was drilled 200 feet north of JA-1. The hole collared in the Mascot formation and was drilled to a depth of 731 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-27	Overburden	—	—	—
27-434½	Mascot	CMbs @ 434½	—	Dolomite w/occasional thin beds of re-xl; occasional breccia from 320-434½ with scattered FeS shines.
434½-693	Kingsport	"R" bed @ 597; "S" bed @ 648; "T" bed @ 693	Shines @ 557; 558½-559½; 579½-581½; 589-591; 593-595, Est. 1% Zn; 631½-633, Est. ½% Zn.	Dolomite and re-xl; in part brecciated, FeS shines from 563-690.
693-731	Longview	"U" bed @ 703	—	Dolomite and re-xl.

ENGINEERS
INSPECTIONS and TESTS

The Bruce Williams Laboratories

CHEMISTS
INDUSTRIAL and ANALYTICAL

ESTABLISHED 1898

MAIN OFFICE AND LABORATORIES 618-624 JOPLIN ST. TELEPHONE MAYFAIR 3-1556

JOPLIN, MISSOURI

BATESVILLE, ARKANSAS ST. LOUIS, MISSOURI PICHER, OKLAHOMA

National Lead Company
Thorn Hill, Tennessee

12-28-57

OUR NO.	MARK	DESCRIPTION	[redacted]	
			ZINC	IRON
764868	00-6-1		0.02	----
869	6-2		None Detected	----

ADDRESS ALL COMMUNICATIONS TO JOPLIN, MISSOURI

CF-nls

904

Bruce Williams

CHARGE $2.50

Statement

Jefferson City, Tenn. 1/11/58 195

M National Lead Co

Thorn Hill, Tenn

MOYERS CABINET SHOP

108 Carson Street

Telephone 3113

25- AX Core Boxes 5' Long	@ 2,00	50,00
500- Grade Stakes	.3	15,00
		65,00
	Tax	1,95
		66,95

THANKS

25 CORE BOXES $50.00

TAX 1.50

TOTAL $51.50

NATIONAL LEAD CO. D.D. DA-2

Copper Ridge Project-Punchbowl Camp Creek

DMEA Xdm-E 1088

Hole No: DA-2

Farm: W.B. Dalton

Loc: N 48,645.50
E 44,794.88

Elev: 1409.9

Drilled By: Jor Mfg. Co.

Logged By: J.W. Spears

Collared: 12/21/57

Bottomed: 1/8/58

Depth: 715

Casing: BX 44; AX 167

Reaming: 105' (62 to 167)

Cement: None

Water Table: ?

Top Kingsport	401
Top R Bed	592 (?)
Top S Bed	643½
Base Kingsport	679
U Bed	689

cc/ New York
Dr. Hulin
Dr. Scharon
B.H. Putnam
H.B. Purwell
DMEA (5)

0-44	Overburden
-48	Med. dk. gr. dol.
-50	Med. gr. dol; lt. banding; hvy. to CMas @ 50 (1½' core loss 44-50).
-52	Lt. gr. dol; (10' core loss 50-62) (poss. large cavity??)
-52½	Lt. med. gr. dol; v. oxid. vuggy, cherty.
-73	Lt. med. gr. dol; (5' core loss 62-69, eyelets 67-70, v. sandy 70-71, lt. banding 71-73).
-74	Lt. gr. dol; lt. banding; grades to med. gr.
-76	Med. gr. dol; mott.
-81	Dk. gr. dol.
-82	White chert.
-84	Lt. gr. dol. (2' core loss 82-86).
-85½	Lt, med. gr. dol; red mott; thin shears 86-86½ (N 30° E, 75° NW).
-103½	Med. gr. dol, large nod 90; mott. & sugary 90-93; sandy 103-03½ w/2" CM @ 103½.
-104½	Lt. gr. dol; TGS @ base.
-106	Breec. chert.
-110½	Lt. med. gr. dol; some crackle w/grn. & white gangue; chert nod 108, 109-10½ breec. w/grn. & white gangue & chert fragments; large nod 110½.
-113½	Lt. re-xl; mott; v. sandy 111½-12, v. cherty & shaly 112-13½.
-124	Lt. med. gr. dol; v. mott. to 116; hvy. sands 119-19½; 119½-24 lt. red mott. & few eyelets
-129½	Dk. gr. dol; mott. - banded.
-130	Lt. re-xl; mott; few ss grains.
-136	Lt. med. gr. dol; mott.
-138	Med. gr. dol; well mott.
-141	Lt. med. gr. dol; well mott.
-147	Med. to med. dk. gr. dol; lt. mott.
-149	Lt. med. gr. dol.
-153	Med. gr. dol.
-154½	Lt. med. gr. dol; thin sands bott. 6" then chert nod.
-155	Lt. re-xl; cherty.
-162	Cavity.
-172	Dk. gr. dol; v. mott. 162-63 & 70-72 w/some sandy edgewise congl. @ base.
-177	Med. gr. dol; mott; bleached top foot (oxid. @ top) scatt. eyelets.
-183½	Dk. gr. dol; v. lt. mott; occ. eyelet, vuggy 181-83½.
-185½	Med. gr. dol; lt. banding.
-186½	Lt. med. gr. dol; edgewise congl. to v. mott. 185½-86; 1" bedding plane fault 186; sand 186½.
-189	Lt. gr. dol; cherty @ 187½; lt. banding; fault 188½-89.
-190	Med. gr. dol.
-193	Lt. med. gr. dol; v. sandy 192½-93 w/chert nod 193.
-200	Lt. gr. dol; lt. crackle 193-94; scatt. sands 199-99½ w/breec. chert 199½-200.
-209	Lt. med. (to med.) gr. dol; sugary 200-01; v. sandy & mott. 208½-09.
-211	Br. re-xl; oolitic cherts 210½, 211.
-213½	Med. re-xl; mott.
-216	Lt. med. gr. dol; red mott.
-217	Med. gr. dol; mott.
-221	Dk. gr. dol; v. mott; (top 6" semi re-xl) scatt. ss grains bott. 4".
-223½	Lt. med. gr. semi re-xl; few ss grains top 4"; mott.
-225½	Med. gr. dol; v. mott. to 224½; v. sandy 225-25½.
-226	Lt. med. gr. dol; v. sandy; TGS @ base.
-229	Lt. med. to med. gr. dol; mott; occ. silic eyelet.
-252	Med. dk. - dk. gr. dol; mott; bedding plane fault 232-33 (3' core loss 230-37, 6' loss 237-47, 6' loss 247-56) occ. shear or bedding plane (?) fault bott. 2-3'.
-264	Med. gr. dol. (to med. dk.) mott. 258-64 (1' core loss 256-65) scatt. shears thruout.
-265	Lt. med. to med. gr. dol.
-266	Lt. v. silic semi re-xl (1½' core loss 265-68).
-268	Lt. med. gr. dol; mott; crackle.
-271	Med. gr. dol; v. mott. (1' core loss 268-70; 1' core loss 270-72) thin fault @ 269; chert nod 271.

-275½ Lt. gr. dol; bande[illegible] occ. bedding plane shear, scat[illegible] ss grains bott. 6" (1' core loss @ 272-76).
-277 Med. gr. dol.
-278½ Lt. gr. dol; thin fault 278.
-281 Lt. med. gr. dol; lt. mott.
-282½ Med. gr. dol; sugary; well mott.
-286½ Lt. med. gr. dol; banded; v. cherty top 6", chert nod 286½ (pt. oolitic).
-291 Med. gr. dol.
-292½ Sec. chert.
-294 Lt. gr. dol; oolitic chert nod 294.
-297 Lt. med. gr. semi re-xl to sugary dol.
-302 Lt. med. gr. to med. gr. dol; mott.
-311 Lt. med. gr. dol; lt. mott. 302-05; v. mott. 305-08; crackle 302-04 w/grn. & white gangue lt. bands 308-09½; v. mott. 309½-11.
-311½ Lt. gr. dol; v. sandy; TGS @ base then 2" of chert.
-314½ Lt. med. gr. dol; mott; few ss grains @ 313; brecc. 313-13½ w/FeS shine, chert nod @ 313½
-320 Lt. gr. dol.
-322 Lt. med. gr. dol; grades to med. gr.
-327 Med. gr. dol; mott; crackle @ 323 w/tr. FeS.
-328½ Med. dk. gr. dol.
-332 Med. gr. dol; lt. banding; few ss grains @ 331½-3/4 then TGS, 2" chert, TGS.
-336 Lt. med. gr. dol; mott; mostly chert bott. 6".
-338 Med. gr. dol; v. sandy edgewise congl.
-341 Lt. med. gr. dol; lt. mott; eyelets; grades to med. gr; TGS @ base.
-344½ Med. gr. dol; mott; eyelets.
-351½ Med. dk. gr. dol; few eyelets; lt. crackle, few ss grains then 3" oolitic chert @ base.
-354 Lt. gr. dol; few ss grains top 3", lt. mott. bott. foot.
-355½ Med. gr. dol; well mott.
-360 Lt. med. gr. dol; v. lt. crackle.
-364½ Dk. gr. dol; lt. crackle.
-366 Med. gr. dol; lt. crackle; scatt. ss grains 366½-67 w/TGS 367, sand 368.
-369 Dk. semi re-xl; w/4" shaly silic @ top.
-372 Lt. med. gr. dol; lt. banding & crackle (grades to med. gr. dol.)
-379 Med. gr. dol; lt. crackle; TGS @ base.
-381½ Lt. med. gr. dol; well mott; chert nods 381, 81½.
-385½ Med. to lt. med. gr. dol; lt. shears thruout w/thin fault 385½ (N 40° W, 35° NE) (dip of formation @ 385 is 38°).
-390½ Med. gr. dol. to med. gr.; mott.
-398½ Dk. gr. dol; mott; v. mott. bott. foot.
-401 Med. gr. dol; lt. banding; thin sands bott. 6".
TOP KINGSPORT 401
-408½ Med. gr. dol; hvy. ss @ top; lt. shears 406-06½; v. mott. & darker 407½-08½.
-418½ Lt. med. gr. dol; lt. crackle w/grn. & white gangue; thin fault 414½-415 (N 40° W, SW 70° (dip @ 410= 33°).
-422 Med. gr. dol; mott; mott. to 419½ w/chert nod 419½; 2 thin nods 422.
-426 Lt. med. gr. dol; grades to med. gr. @ about 424.
-428 Med. dk. gr. dol; lt. mott.
-432 Dk. gr. dol.
-451 Med. gr. dol; v. mott. 432-33, chert nods 433, 36; well banded 436-42 (dip 436= 42°, dip 442= 39°) 6" CMss 442-42½, v. mott. 445½-47 & 450-51.
-454½ Lt. med. gr. dol; scatt. sands 451-52 w/1" TGS 452, mott. 452-54 w/FeS shine 454; v. sandy edgewise congl. 454-54½ w/2" oolitic chert @ 454½.
-457 Med. gr. dol; chert nod & hvy. ss @ 456.
-461½ Med. dk. gr. dol; mott; thin chert nod @ base.
-470 Med. gr. dol; lt. mott; bedding plane fault & few ss grains @ base.
-489½ Lt. med. gr. dol; lt. mott. & lt. crackle to 481 w/chert nods 474, 75½, 78½, 79½ & 480; FeS shine 480-81; banded 481-82½ w/large chert nod 481½; v. banded (dip 40°) 83-89½ w/sands 87-89 (v. hvy. bott. 6") & chert 89-89½; vert. fault 85-87 (N-S, vert.) & fault 487 (N 20° E, 75 NW).

-494 Lt. gr. dol; chert nod near top; ZnS shine in shale seam @ 91; chert nod 94 (grades to med. gr.) (1' core loss 492-94).
-499 Lt. med. to med. gr. dol; sli. mott.
-506 Lt. med. gr. dol; large chert nod @ top; banded (dip 40°) w/chert nod 500½, 02, 02½; few ss grains 506.
-512½ Lt. med. to med. gr. dol; chert nods 508, 09, 10½, 12; few ss grains 512½.
-513½ Lt. sugary dol; v. silic (tiny white specks) scatt. ss grains & small vugs.
-514 Chert w/some med. semi re-xl.
-518½ Lt. med. gr. dol. w/lt. shears (N 50° E, 55° E) TGS @ 518½.
-531 Lt. gr. dol; lt. banding to 24 (dip 39°) shears 20 (N 10° W, dip 65° NE) chert nods 21,21½; 1" TGS @ 24; lt. mott. 24-27½; banded 27½-31½ w/FeS sh's. 28½, 29 & scatt. ss grn's. 31-31½.
-532½ Breco. chert.
-537½ Lt. gr. dol; sil. sugary & silic @ 533½ & FeS sh; chert nod 535, sand 35½; fault 36-38 w/ some breco. & tr. of FeS (N 20-40° E, dip 55° SE).
-541½ Lt. med. gr. dol.
-543½ Med. gr. dol; mott.
-547 Lt. gr. dol; banded, 41° dip.
-555 Lt. med. gr. dol; mott. 47-49 w/few ss grains then TGS @ 49, <u>banded 49-53 w/lt. crackle & FeS shines;</u> scatt. ss grains 554-54½; chert nod 555.
-555½ Med. gr. dol; chert nod.
-562 Lt. med. gr. dol; 558-60 v. mott. & sugary, chert nod 562.
-566½ Med. gr. dol; v. lt. crackle; <u>FeS shine near base</u> & chert nod @ base.
-570 Lt. med. gr. dol; crackle w/FeS shear 567-67½; lt. banding 568-70 (dip 41°).
-574 Med. gr. dol; crackle top foot.
-578½ Lt. med. gr. dol; mott. 575½-78½.
-580½ Med. gr. dol; (dip 35°).
-584 Br. re-xl; v. shaly 582-82½, 583½-84.
-586 Grn. - br. mott. semi re-xl.
-591 Dk. semi re-xl; v. mott; occ. block lt. med. gr. dol.
-592 Lt. med. gr. dol; banded; chert nod @ base.
TOP R BED 592 (?)
-593 Dk. re-xl; blocks of chert & lt. gr. dol.
-595 Br. re-xl.
-598 Lt. med. gr. dol; mott; crackle top 6" then breco. sealed w/br. shaly re-xl.
-600 Br. mott. re-xl w/small block lt. gr. dol. @ base.
-602 Med. dk. gr. sugary dol. to semi re-xl.
-603½ Lt. med. gr. dol.
-611 Lt. br. re-xl; mott. (fine grained) vuggy 610-11.
-612 Lt. gr. dol; chert nod then TGS @ base.
-621 Br. shaly re-xl; grn. mott.
-626½ Lt. med. gr. sugary dol. to semi re-xl.
-627½ Dk. re-xl.
-630½ Dk. gr. dol; lt. crackle; chert nod @ base.
-634 Ground core, no recovery.
-635 LS
-636 Dk. re-xl.
-638 Med. gr. dol; mott. & sugary; lt. crackle w/occ. FeS shine; 3" dk. re-xl @ base.
-643½ Lt. med. gr. dol; mott. to chert nod @ 40; 40-41½ semi re-xl; banded; (39°) 41½-43½ sugary.
TOP S BED 643½
-648 Lt. br. coarse re-xl; mott. to 646; 2" grn. shale & chert nod @ 648.
-650 LS, much grn. shale & re-xl in bands; chert nod @ base.
-651 Br. re-xl; (to semi re-xl) v. cherty.
-656 LS, cherty 653½-54.
-659 Br. re-xl; crackle top foot, then silic.
-661 Lt. med. gr. dol; breco. w/gangue top 6", then breco. sealed w/silic & some re-xl; sandy @ base.
-667 Br. re-xl; mott. to 663 w/chert nod 663; 663-67 silic w/chert fragments.

-661 Med. br. to gr. re-xl; sandy; chert nod @ base.
-671½ Lt. gr. re-xl; coarse; sandy @ 70; breco. 70-70½ w/re-xl gangue; some as @ base.
-675 Reddish br. re-xl; some black silic @ base.
-677½ Lt. br. re-xl; partly lt. silic @ top; banded; (30° dip).
-679 Lt. gr. re-xl.
BASE KINGSPORT FORMATION 679
-689 Lt. med. gr. dol. to med. gr. dol; v. lt. gangue filled fractures thruout.
-689½ 3" oolitic chert, then br. re-xl.
-690½ Lt. semi re-xl.
-694½ Lt. med. gr. dol; sugary, well mott.
-696 Med. gr. dol; sugary, mott; chert nod 696.
-699 Lt. br. silic, re-xl; 2" TGS @ 98, then breco. w/grn. shale gangue to 699.
-701 Lt. semi re-xl.
-703½ Med. gr. dol; few eyelets; sugary; grades to semi re-xl w/hvy. as @ base.
-706 Lt. br. mott. re-xl; chert nod @ base.
-714 Lt. med. gr. dol; occ. breco. some w/1-4" of br. silic re-xl; v. sandy @ 710, some white silic, grn. shale, & chert fragments 710-10½; hvy. as 713, lt. crackle w/gangue 713-14.
-715 TD Lt. br. re-xl; chert nods 714, 715.

NATIONAL LEAD CO. D.D. JA-1

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: JA-1

Farm: Elvin Jackson

Loc: N 46,885.89
E 42,333.46

Elev: 1340.71

Drilled By: Joy Mfg. Co.

Logged By: J.W. Spears

Collared: 12/10/57

Bottomed: 1/2/58

Depth: 836

Casing: BX 27'; AX 40'

Reaming: None

Cement: None

Water Table: ?

Top Kingsport		545
Top R Bed	(711½)	711½ (?)
Top S Bed	(759½)	759½ (?)
Base Kingsport		815½

CC: DMEA 5
New York
Malin
Scharon
Putnam
Burwell

0-27	Overburden
-35	Lt. med. gr. dol.
-37	Cavity
-42	Lt. gr. dol; 37-40 scatt. chert & shale frag's; chert nods 41, 41½.
-43	Med. semi re-xl; cherty top 6"; chert nod @ base.
-48	Lt. med. gr. dol; banded; v. cherty 44-45½; chert nods 47½, 48.
-51	Lt. re-xl; mott.
-58	Med. dk. re-xl; v. mott; vuggy (to semi re-xl).
-67	Med. gr. dol; mott.
-69	Lt. gr. dol; mott. top foot; then banded w/eyelets.
-70	Lt. med. gr. dol; banded; TBS 70.
-75	Lt. gr. dol; v. lt. mott.
-81	Lt. med. gr. dol; mott; brecc. chert nod 78-78½; few eyelets 79-81.
-90	Med. gr. dol; lt. banding to mott; chert nod 85; occ. TBS's 85-90.
-93	Lt. med. gr. dol; v. mott.
-94½	Lt. gr. dol; lt. mott; eyelets.
-97½	Lt. med. gr. dol.
-99	Med. gr. dol; v. mott.
-105	Lt. med. gr. dol; banded 99-104 w/ss grains 104; few eyelets 104-06 & chert nod 106.
-108	Med. gr. dol; few eyelets; chert nods 106½, 108.
-109	Lt. med. gr. dol; mott; ½" TGS @ 109.
-109½	Med. re-xl.
-113½	Lt. re-xl - semi re-xl; chert nod 110½.
-116½	Med. gr. dol; well banded.
-124½	Med. dk. gr. dol; v. mott. 119½-24½.
-125	Lt. re-xl; chert nod @ base.
-135	Lt. med. gr. dol; banded to 135 (some zones med. gr.) mott. 135-36.
-141½	Med. gr. dol; mott. w/silic eyelets, blk. chert nod 136.
-145	Dk. gr. dol; mott; 2" re-xl @ base.
-146	Med. gr. dol; mott.
-147½	Lt. gr. dol; v. banded; sandy bott. 3".
-150½	Lt. med. gr. dol.
-151	Lt. med. gr. dol; sugary; v. mott; TBS 151.
-152	Lt. med. gr. dol; v. mott.
-154½	Lt. gr. dol; banded.
-155½	Med. gr. dol; banded; v. shaly 155-55½.
-162½	Lt. med. gr. dol; v. sandy @ 158; mott. 160½-62½.
-164	Lt. gr. dol; v. banded.
-166	Med. gr. dol; banded.
-174	Lt. med. gr. dol; well mott. darker bott. 2'.
-176½	Lt. gr. dol; sand @ 175.
-183	Lt. med. gr. dol; mott. 179-83; sand 80½; fault 82-83.
-189½	Lt. gr. dol. (grades to lt. med. gr.) lt. banding; scatt. ss grains 189-89½ w/ss 189½ & A ½" TGS.
-190½	Med. gr. dol; mott.
-191½	Med. mott. semi re-xl (to re-xl).
-193½	Dk. gr. dol; mott.
-196	Lt. med. gr. dol. to med. gr. dol; few ss grains @ top; dk. chert nod 195.
-199½	Dk. gr. dol; lt. banding to mott; dk. chert nod near base.
-206½	Lt. gr. dol.
-208½	Lt. med. gr. dol; 206½-07½ well banded; v. sandy & silic 207½-08; v. sandy 208-08½ w/some edgewise congl.
-211	Dk. gr. dol; mott.
-213	Med. gr. dol; sugary; v. mott.
-216	Dk. gr. dol; mott.
-217½	Med. gr. dol; chert nod @ base.
-220	Lt. gr. dol; well banded.
-230	Med. gr. dol; well mott. to 227½; then banded; v. sandy 229½-30 w/TGS 230.

-233 Lt. gr. dol; ½" TGS @ base.
-235½ Lt. med. gr. dol; lt. mott; TBS @ base.
-238½ Lt. gr. dol; mott; few ss grains & TGS @ base.
-240 Lt. med. gr. dol.
-242½ Med. to med. dk. gr. dol; mott.
-243½ White & blue chert.
-249 Med. gr. dol; banded.
-253 Med. dk. to dk. gr. dol; mott; many silic eyelets.
-257 Lt. med. gr. dol; lt. mott-bands; scatt. ss grains bott. 6".
-259 Lt. gr. dol; banded.
-262½ Med. gr. dol; mott.
-267½ Med. dk. gr. dol; few ss grains @ base.
-268 White chert.
-272½ Lt. med. to med. gr. dol; banded.
-276½ Med. gr. dol; well mott; sugary; TBS @ base.
-286½ Lt. med. to med. gr. dol; lt. mott. to 279; cherty & sandy @ base.
-288½ Lt. gr. dol; lt. blue mott.
-290 Chert; white, sec.; FeS shine.
-293 Lt. med. gr. dol; brecc.
-296 Lt. med. mott. re-xl - semi re-xl; shaly, hvy. ss & TGS @ top 3"; chert nod 295½, dk. 295½-96.
-301½ Lt. med. gr. dol; lt. mott; 297-98½ sandy w/heaviest @ 298½; TGS @ base.
-308½ Med. gr. dol; mott; eyelets top foot, becomes med. dk. gr; 4" lt. re-xl. @ base.
-313 Lt. gr. dol; lt. mott. - banding; few eyelets; TBS @ base.
-314½ Med. gr. sugary dol; well mott.
-320 Lt. to lt. med. gr. dol; mott.
-323 Lt. med. gr. dol; mott. & silic eyelets; 1" sand @ base.
-326 Lt. med. grading to med. gr. dol. to med. dk. gr; well mott.
-327 Med. gr. dol; lt. banding; occ. eyelets.
-328½ Lt. gr. dol; scatt. ss grains bott. 4"; chert nod @ base.
-330 Med. gr. sugary dol; chert nod 329½.
-333½ Med. semi re-xl; to sugary dol.
-335½ Lt. med. gr. dol; banded; thin sands top foot; bott. 6" darker.
-344 Dk. gr. dol; from 338½-44 v. mott.
-345½ Lt. med. gr. dol; v. lt. mott; occ. eyelets; sandy top 3".
-354½ Med. gr. dol; well mott; silic eyelets; lighter towards base.
-356 Lt. med. gr. dol.
-363½ Lt. gr. dol; banded to 357½ w/sand @ 356½ & chert nods 359, 360½.
-365 Med. gr. dol; sandy chert nod @ base.
-365½ Lt. med. gr. dol; v. sandy to edgewise congl.
-366½ V. sandy, silic re-xl; chert nod @ base.
-367 Lt. med. gr. dol; mott; TGS @ base.
-368½ Lt. gr. dol; mott; bott. 5" v. sandy (to CM) & silic.
-379½ Lt. med. gr. - med. gr. dol; lt. mott. to 371½; mott. 74½-75; w/few ss grains; 2" CM @ 75; then sandy & cherty to 76; thin fault @ 376 & 77; 3" of silic sand @ 378½.
-380½ Med. mott. re-xl; fault (thin) 379½-80.
-385 Lt. med. gr. dol; mott; occ. gangue filled steep fracture; becomes darker towards base.
-387½ Dk. gr. dol; v. mott; TGS @ base.
-389 Lt. med. gr. semi re-xl to sugary dol; mott.

Lt. med. gr. dol; mott; v. sandy 391-91½ w/CMss @ 391½.
Med. gr. to lt. med. gr. dol; mott.
-398 Dk. gr. dol; slight banding; fault 396-97.
-405½ Med. dk. gr. dol. (to med. gr.) banded; shears @ 404½.
-407 Lt. med. gr. dol; banded; fault 406½-07½ (bedding plane?)
-410 Med. gr. dol; mott.
-411½ Dk. gr. dol; shears thruout; (NW dip steep)
-416 Lt. med. gr. dol; lt. mott; scatt. ss grains top 2"; thin shears thruout; v. sandy 414½-15, few eyelets 415-16/
-425½ Med. gr. dol; lt. mott; some silic eyelets; thin fault @ base.
-430 Lt. med. gr. dol; v. silic 426-27½; mott. & sugary, 427½-30.
-431 Dk. gr. dol; mott. & sheared.
-435½ Lt. gr. dol; sheared thruout; few ss grains bott. 6".
-437 Chert; primary w/some sec; tr. oolitic chert @ base.
-440½ Lt. med. gr. dol. (2" dk. mott. dol. @ 439).
-442 Lt. re-xl to semi re-xl; v. mott; bott. 6" chert w/tr. ss @ base.
-445½ Lt. med. gr. dol; banded 442-44; chert nods 444½ & 445½.
-451 Med. gr. dol; lt. shears; thin fault 450½; crackle 450½-51 w/TGS @ 451.
-452½ Sec. chert.
-453 Lt. re-xl; brecc. & sealed w/sec. chert.
-454½ Chert; 1" oolite @ top; bott. 6" sec. chert.
-455 Lt. med. gr. dol; mott; sugary.
-457½ Med. dk. gr. dol; mott; v. sheared.
-458½ Dk. gr. dol; scatt. sands 458-58½; TGS 458½.
-460½ Lt. med. gr. dol; lt. mott; few shears @ top.
-463 Med. gr. dol; mott; v. sugary to semi re-xl; thin fault @ base.
-464½ Lt. med. gr. dol; banded; sand @ base.
-466 Lt. med. to med. semi re-xl; mott.
-469 Lt. med. gr. dol; v. sandy 66-66½; 67-69 v. mott. & vuggy.
-473 Lt. gr. dol; fault 470½-71½ & 473½-74.
-479½ Lt. med. gr. dol; fault 476½-77; mott.
-481½ Med. gr. dol; mott. w/silic eyelets; TBS @ base.
-482½ Med. dk. gr. dol; TBS @ base.
-485½ Lt. med. gr. dol; well banded; 1" sand & TGS @ base.
-488½ Lt. gr. dol; v. mott. @ top to lt. mott. @ base.
-490 Lt. med. gr. dol; silic & thin ss @ 490.
-492 Med. gr. dol; mott; v. sugary to semi re-xl; bott. 6" sandy edgewise congl.
-495½ Lt. med. gr. dol; mott; many eyelets top 1½".
-500 Med. gr. dol; mott; TGS 497; fault 497½-98, oolitic chert nod @ 500.
-502 Dk. gr. dol; sheared; mott; large chert nod 501½-02.
-504 Lt. gr. dol; few ss grains @ 503.
-506 Med. gr. dol; v. mott.
-509½ Lt. med. gr. dol; lt. mott.
-512 Med. gr. dol; mott.
-515 Lt. gr. dol; mott; few ss grains 513½-14 w/shears @ 514½; sand @ 515.
-516 Lt. med. gr. dol; mostly oolitic cherts; TGS @ base.
-520½ Lt. gr. dol; mott. 516-18; v. banded 518-20½.
-525 Med. gr. dol; TGS 523; v. mott. 523-25 w/several shears.
-528 Lt. gr. dol; banded; fault @ 526½.
-529½ Lt. med. gr. dol.
-536½ Med. gr. dol; from 532½-36½ mott. w/shears @ 533½.
-542 Dk. gr. dol; chert nod @ base.
-545 Med. gr. dol; several ss grains 44½-46½ w/CMss 45; sli. banding; lt. crackle 545-45½.
TOP KINGSPORT FORMATION 545½
-551½ Med. dk. gr. dol; mott. 550-55½.
-553 Lt. med. gr. dol; v. mott.
-554½ Lt. gr. dol; scatt. ss grains & TGS @ 554½.
-571½ Lt. med. gr. dol; mott. 54½-63; grades to med. gr. dol; sand @ 66; shears @ 71; TBS 71½.
-574 Med. gr. dol; v. mott. w/silic eyelets & chert; shears 571½-72½.
-577 Lt. med. gr. dol; banded; chert nods 574, 74½, 75, 76, 77; tr. brecc. 76½-77.

-569½ Med. gr. dol; nods 574-77½, 578½; banded to 582; scatt. ss grains 582-83, 3" shaly semi re-xl @ 586½; mott. 586½-89½ w/2" TGS 589½.
-591½ Lt. med. gr. dol; chert nod @ top; then few inches sandy; banded 89½-91½ w/CMss 591½; lt. crackle 590½-91½.
-596½ Lt. med. to med. gr. dol; lt. crackle; oolitic chert 596-96½.
-605½ Lt. med. gr. dol; occ. lt. crackle; brecc. chert nod 602; crackle brecc. 602-04 w/some grn shale in gangue; TGS 605½.
-620½ Lt. gr. dol; TGS 610; chert nod & TGS 610½ & lt. mott. to 610½; lt. banding 610½-13½ w/nod 613½; lt. shears 613½-14½ w/nod 614½; v. banded to mott. 614½-20½ w/nods 614½-15 & 616; sandy 620-20½.
-621½ Lt. med. gr. dol; lt. mott.
-623½ Med. semi re-xl; mott; sandy w/some oolitic chert @ 623.
-625½ Lt. med. gr. dol. & med. sugary dol; brecc. w/gangue & tr. grn. shale.
-627½ Med. gr. sugary dol; thin fault 626.
-634 Med. gr. & lt. gr. dol. & chert fragments; lt. brecc; est. 1% FeS 627½-28½.
-638 Med. lt. gr. dol; chert nods 636½, 38.
-640½ Med. gr. dol; chert nods 638½, 39, 40.
-642 Lt. med. gr. dol; chert nod 641; v. silic (tiny white specks) 641-42 w/chert nod & TGS 642
-645½ Lt. med. gr. dol; lt. mott. to 644½; eyelets 644½-45½.
-649 Lt. gr. dol; banded; chert nod 646½; thin vertical fault 647-49.
-650½ Med. gr. dol; lt. banding; fault 650; TGS 650½; FeS shine 649.
-654 Lt. med. to med. gr. dol; lt. mott; brecc. 653½-54 w/FeS shines.
-656½ Lt. gr. dol; well banded to 655½; then mott. & banded 655½-56½ w/few ss grains bett. 3" & TGS @ 656½.
-658½ Lt. med. gr. dol; many small chert nods to 658 w/large nod 658; vert. shears 657-58½.
-659½ Med. gr. dol; banded; FeS shine @ base.
-664½ Lt. med. gr. dol; chert nod 660½; few ss grains 661 w/FeS shine.
-667 Med. gr. dol; v. mott. & sugary.
-670 Lt. med. gr. dol; banded; crackle to brecc. w/est. ½% FeS, some grn. gangue.
-673 Med. gr. dol; brecc. w/est. 1½% FeS & some grn. gangue.
-676 Lt. med. gr. dol; lt. crackle to 675; scatt. ss grains 674½-75 w/2" TGS 675, from 75-76 chert fragments & some brecc. w/shaly re-xl; gangue.
-684 Lt. med. to med. gr. dol; occ. lt. crackle; crackle 679½-81 w/ZnS shine @ top & FeS shine bott. foot; crackle 681½-82½ w/est. 1% FeS; chert nod 683; @ base shale seam w/tr. of ZnS & FeS.
-685½ Med. dk. gr. dol; crackle.
-688 Med. gr. dol.
-690 Med. dk. gr. dol; lt. crackle w/grn. & white gangue.
-693½ Lt. med. gr. dol; brecc. 690-93 w/est. 3% FeS; sand & TGS @ base.
-694½ Lt. gr. dol; mott; crackle w/occ. FeS shine & grn. & white gangue bott. 6".
-698 Lt. med. gr. dol; occ. large gangue eyelet; chert nod 696½; FeS shine 697.
-700 Br. re-xl; mott; top 9" grn. silica w/FeS shines.
-702 Dk. mott. sugary dol.
-702½ Med. gr. dol; mott.
-705½ Gr. to grn. mott. re-xl.
-709½ Med. gr. semi re-xl.
-710 Med. dk. gr. semi re-xl; mott; lt. crackle w/grn. & white gangue.
-711½ Med. gr. dol. to semi re-xl; crackle w/grn. & white gangue; TGS @ base.
TOP "R" BED 711½
-712½ Br. re-xl.
-714½ Lt. med. gr. dol; crackle; grn. & white gangue to 714; then shaly re-xl gangue.
-715 Brecc. chert nod.
-716½ Br. & grn. mott. re-xl; grn. shale & some ss grains @ top.
-720 Lt. med. gr. dol; crackle w/grn. & white gangue; tr. FeS 719.
-721 Br. mott. re-xl; lt. crackle.
-722 Blocks of dol. & chert in br. shaly re-xl; TGS @ 722.
-723½ Br. re-xl; banded 723-23½.
-724½ Lt. med. gr. dol; banded; crackle.
-726½ Br. re-xl.
-731½ Lt. re-xl; chert nods 731; 31½; lt. crackle 729-31.

-714 Lt. med. gr. dol; sugary; brecciated w/some chert fragments & grn. & white gangue.
-717 Re-xl; v. shaly; lt. to 735½, thin brown.
-742½ Lt. med. gr. dol; sugary to semi; lt. mott. (740½-41 sli. darker & crackle w/FeS shines)
TGS 741½, 741½-42½ brecc. sealed w/lt. shaly re-xl.
-743½ Lt. gr. dol.
-744 Dk. re-xl.
-745 Dk. gr. dol; mott; brecc. @ 45 some lt. med. gr. blocks sealed w/lt. re-xl.
-746½ Dk. re-xl to semi re-xl; fault @ 746½.
-748½ Lt. br. v. shaly, cherty re-xl.
-753½ Med. gr. semi re-xl; 750½-52 brecc. w/gangue and re-xl & FeS shine.
-755 Br. re-xl.
-758 Med. gr. semi re-xl; lt. crackle w/grn. & white gangue, chert nod @ base.
-759½ Lt. gr. sugary dol; banded.
TOP S BED 759½
-765 Br. re-xl; 761-62½ doloclastic chert & silica w/TGS 762½; dk. br. 762½-65.
-766½ Gr. to grn. mott. semi re-xl; chert nod 765½.
-767 Lt. med. gr. semi re-xl.
-768½ Med. gr. dol; sugary; eyelets; tr. silic & re-xl @ base.
-771½ Med. gr. semi re-xl; mott; occ. zone re-xl; chert nod @ base.
-775½ Lt. re-xl; mott; 772½-74½ v. cherty & silic.
-777½ Med. gr. dol; sugary; mott; to semi re-xl.
-781½ LS, partly re-xl.
-785½ Lt. br. re-xl; v. mott.
-790½ Br. re-xl.
-797½ Lt. re-xl.
-801 Lt. gr. dol.
-801½ Lt. re-xl.
-806½ Br. re-xl; crackle.
-808 Lt. re-xl; mostly chert; v. sandy 806½-07.
-811½ Lt. br. re-xl; mott.
-815½ Chert nod w/band jasperoid @ base.
BASE KINGSPORT FORMATION 815½
-819 Med. gr. dol; mott; sugary; fractured & oxid. shears.
-824½ Lt. med. semi re-xl; mott; fractured & oxid. shears; few ss grains @ base.
-825 V. silic. lt. br. re-xl.
-827½ Lt. med. to med. gr. dol; mott; sugary; some crackle w/silica top 6", banded sec. chert 27.
-828½ White chert.
-830 Br. re-xl; chert nod @ base.
-833½ Lt. re-xl; chert nod @ base.
-834 Br. re-xl; banded.
-835 Lt. br. re-xl.
-836 Mixture of re-xl, silica & some shale. TD.

NATIONAL LEAD CO. D.D. JA-2

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: JA-2

Farm: Elvin Jackson

Loc: N 47,055.75
E 42,328.41

Elev: 1367.85

Drilled By: Joy Mfg. Co.

Logged By: J.W. Spears

Collared: 1/11/58

Bottomed: 1/24/58

Depth: 731

Casing: BX 27'; AX 34'

Reaming: None

Cement: None

Water Table: ? (HFW @ 175)
lost water below 175

Top Kingsport	434
Top R Bed	597
Top S Bed	648
Base Kingsport	693
U Bed	703

cc/ New York
DMEA 5
Dr. Halin
Dr. Scharon
B.H. Putnam
H.B. Burwell

-27	Overburden
-21½	Lt. med. gr. dol; mott; chert nod near top.
-34	Dk. gr. dol; chert nod @ base (1½' core loss 29-34)
-35	Lt. med. gr. dol; well banded (dip 35°) lt. shears (N 30° E, 65° NW)
-36	Med. gr. dol; fault @ 36 (N 25° E, 65° NW)
-37	Lt. med. gr. dol; lt. shears; TGS @ base.
-38	Med. gr. dol; lt. mott.
-40	Med. dk. gr. dol; well mott; (1½' core loss 34-42)
-41	Lt. med. gr. dol.
-42	Dk. gr. dol; ss @ 42.
-45½	Med. gr. dol; mott; vug @ 43½, hvy. ss 43½-46, shears & oxid. 44-45½ (N 80° W, 20-50° NE) bedding plane fault 45½.
-49½	Med. dk. gr. dol; v. mott; shears @ base.
-50	Lt. med. gr. dol; banded.
-51½	Dk. gr. dol.
-59	Med. gr. dol; v. mott. to 54½, then lt. bands to 56 (oxid. @ 55½-56), well mott. 56-57½ w/fault 57½-58 (N 10° E, 75° NW) banded 57½-59 (dip 37°).
-62½	Med. dk. gr. dol; mott. to banded.
-70	Lt. med. gr. dol; fault 64-65 (no data); lt. mott. 67-69, few ss grains @ 70.
-72½	Med. gr. dol.
-75	Lt. med. gr. dol; banded (42° dip) scatt. ss grains 74-74½, chert nod 74½; TGS 75.
-75½	Med. gr. dol; bott. 2" TGS.
-77½	Med. dk. gr. dol; mott. to banded; oxid. top 6".
-82½	Med. gr. dol.
-84	Dk. gr. dol.
-84½	Med. gr. dol.
-86½	Med. dk. gr. dol; TBS @ base.
-88½	Med. gr. dol; banded (35°).
-91½	Lt. med. gr. dol; lt. bands (37°) shears @ 89½ (N 20° E, 65 NW) @ base grades to med. dk. gr. dol.
-92½	Dk. gr. dol; sheared.
-94½	Med. to med. dk. gr. dol; banded; v. sandy 93½-94½ (dip 39°) w/ZnS shine @ 94½.
-97	Dk. gr. dol; mott. top feet & bott. 6".
-98½	Lt. med. gr. dol; v. mott. & sugary.
-101	Dk. gr. dol; bott. 6" semi re-xl.
-103½	Med. dk. gr. dol; lt. mott; @ base sands, chert nod, TGS.
-105½	Lt. gr. dol; lt. mott. to bands.
-108	Lt. med. gr. dol; lt. mott. to 107½, bands 107½-08; lt. shears thruout.
-115½	Med. gr. dol; from 113-13½ lt. bands (dip 37°); v. sandy 114½-115½ w/TGS 115½.
-118	Lt. gr. dol; TGS @ base.
-125½	Lt. med. to med. gr. dol; mott.
-128½	Med. gr. dol; mott.
-129½	Med. semi re-xl; mott; chert nod 129½.
-132	Lt. med. gr. dol; banded to 131.
-134	Med. gr. dol.
-136	Med. gr. semi re-xl; v. mott; lt. shears @ 135½.
-137½	Dk. gr. sugary dol; v. mott; lt. shears.
-141	Lt. med. gr. dol; lt. mott. to 140, banded 140-41.
-143½	Lt. gr. dol; bands (35½°) scatt. ss grains 141-41½, grades to lt. med. gr. dol.
-145	Lt. med. gr. dol; banded.
-148	Med. gr. dol; mott.
-153½	Med. dk. gr. dol; few ss grains & TGS @ 153½.
-154 3/4	White chert.
-158½	Lt. med. gr. dol; banded to mott.
-162	Med. (lt. med.) gr. dol; well mott; fault @ 160.
-171½	Lt. med. (med.) gr. dol.
-173	Med. gr. dol; sugary.
-176	Lt. med. gr. dol. (to lt. gr.) chert nods 173½, vug 173½, thin chert 174.

-177½ White chert.
-179½ Lt. med. gr. dol; TBS @ base.
-180 Br. re-xl; 1" chert nod & 1" silica @ top.
-181½ Lt. med. gr. dol; mott; scatt. sand grains bott. 4" & TBS " base.
-185½ Lt. med. gr. sugary dol. to semi re-xl; mott; TBS @ base.
-187 Lt. gr. dol.
-191½ Lt. med. gr. dol; v. banded & sandy 187-88 (32° dip) lt. mott. 188-91½.
-194 Med. gr. dol; mott; eyelets.
-199 Dk. gr. dol; mott. to banding; bott. 6" v. mott. & sugary w/scatt. ss grains.
-203 Med. dol, gr.; well mott; 1" TBS @ base.
-204½ Dk. gr. dol; well mott.
-207½ Lt. med. gr. to med. gr. dol; mott. & banded.
-212 Med. gr. to med. dk. gr. dol; mott. & banded; hvy. ss @ base.
-218 Med. gr. to med. dk. gr. dol; well mott. 212-16; banded 216-18 & oxid. 217½-18; sand & TBS @ 218.
-220 Med. gr. dol; v. mott. to banded; chert nod 219½.
-222½ Med. dk. gr. dol; mott; vugs 220½-21½; 22-22½ sandy & tr. of edgewise congl.
-225½ Lt. med. to med. to med. dk. gr. dol; TBS @ base.
-234½ Dk. gr. dol; occ. mott. zone.
-236 Lt. med. gr. dol; mott; silic eyelets.
-240½ Med. gr. dol; mott. & silic eyelets.
-242 Lt. med. gr. dol.
-246 Dk. gr. dol.
-252 Lt. med. gr. dol; banded to 248½ (32° dip) sev. chert nods 248½, 49; TBS @ 252.
-253 Med. gr. dol; scatt. silic specks & few ss grains.
-264½ Lt. med. gr. dol; scatt. ss grains 253-53½; v. cherty 253½-54; sand @ 257; few vugs @ 58; chert 58½; grades to med. gr. dol. @ base.
-265 Med. gr. dol; v. sandy.
-266 Lt. med. gr. dol; sandy oolitic chert @ top; scatt. ss grains to 266 w/chert nod 266.
-273 Lt. med. (to med.) gr. dol; 2" CM sand @ 268 (1½' core loss 269-71) between 272 & 73 grades to med. gr.
-275 Med. gr. dol.
-277 Med. dk. v. mott. semi re-xl to sugary dol.
-282½ Lt. med. gr. dol; v. sandy 280½-81; few ss grains 281-81½.
-284½ Med. gr. dol.
-307 Dk. gr. dol; (1½' core loss 282-88½; 3' core loss 288½-93; 6' core loss 293-301; 1' core loss 301-03; ½' core loss 303-06, 1' core loss 306-09) chert nod @ 307.
-308 Med. gr. dol.
-312½ Lt. med. gr. dol; sheared (1' core loss 309-11½).
-313½ Med. gr. dol; few ss grains @ base, then 1" of silica.
-317 Lt. med. gr. dol; lt. mott; v. sandy 316-16½.
-319 Med. (lt. med.) gr. dol; mott.
-321 Lt. med. gr. dol; vugs 319-20.
-325½ Med. gr. dol; sugary 321-22 w/FeS shine 321½; lt. mott. w/tr. silic eyelets & lt. crackle from 323-25½ w/tr. FeS @ 325.
-326½ Lt. med. gr. dol; tr. crackle @ top.
-331½ Lt. semi re-xl; v. silic top 9"; then v. cherty to 328; mott. 328-31 w/a fault @ 331.
-333 Med. gr. dol; sugary; band of silica & tr. of FeS @ base.
-336½ Lt. gr. dol; crackle w/FeS shine top 9"; thin sands 335½-36, breco. & sheared chert 336-½.
-340 Lt. med. gr. dol; lt. mott. & sugary bott. foot.
-341 Br. v. silic re-xl; chert nod @ base.
-344½ Lt. gr. dol; lt. breco. w/re-xl & white gangue.
-348½ Lt. med. gr. dol; 346½-48½ crackle to breco. w/FeS shines.
-349 Lt. med. mott. semi re-xl.
-350½ Lt. med. gr. dol.
-353 Med. (lt. med.) gr. dol; mott; scatt. ss grains bott. 9" w/tr. of congl.
-355 Lt. gr. dol; @ base grades to lt. med. gr.

-356 Lt. med. gr. dol; mott; @ base grades to med. gr. dol; FeS shine 356.
-357½ Med. gr. dol; mott.
-360½ Lt. gr. dol; crackle w/FeS shine 357½-58; sandy 58½-59; lt. mott. 59-60½ w/tr. of ss 59
-369 Lt. med. gr. dol; well mott. to 362 w/v. silica & some ss grains 61½-62; large bleached chert nod @ 63; brecc. vuggy nod @ 64½; lt. bands 64½-69 (dip 26°).
-376 Med. (to lt. med.) gr. dol; mott; crackle 71-76 w/shears 75-76.
-383½ Lt. med. gr. dol; banded & shears 376-78½; dip 23° (N 70° E, 60° W), sandy 78½-79 w/TGS 79; lt. mott. 79-82½ w/ss @ 82½; v. sheared & cherty 82½-83½ w/FeS shines.
-384½ Med. gr. dol; sugary; mott; banded; (28° dip) sheared (EW, 65° N) @ 84½ 3" of sandy edgewise congl. (base bed M-7).
-386½ Lt. gr. dol; fault 384½-86 (NS, 60° W).
-391 Lt. med. gr. dol. to med. gr. dol; lt. mott; few silic eyelets; v. steep thin fault 90½
-392 Dk. gr. dol; mott; few eyelets.
-395 Lt. med. gr. dol; shears 92½-93; brecc. 93-93½ w/some ss grains (dip 28°) @ 94½ 2" of sandy white chert & some oolite steep fault 93½-95 (N 70° E, 80° NW).
-397½ Med. gr. dol; fault brecc. (?) 95-96; some ss & tr. oolite @ 97½.
-398 Lt. med. gr. dol; @ base 2" of oolitic chert & some sand.
-400 Lt. gr. dol; v. lt. crackle & lt. mott.
-401 Lt. med. gr. dol; sugary; mott.
-403 Lt. gr. dol; fault 401-02 (all small pieces).
-405 Med. (lt. med.) gr. dol; v. lt. bands.
-408½ Lt. gr. dol; bands (dip 23°) thin sands 407¼-3/4 w/½" CMss @ 407 3/4; ss @ 408½.
-409 Oolitic chert.
-414½ Lt. med. gr. dol; crackle 410-10½; lt. bands (dip 22°) steep fault 412-13 (NS; 70° W).
-419½ Med. gr. dol; mott; brecc. bott. 6".
-423 Lt. gr. dol; banded (dip 23½°) crackle 422-23 w/FeS shine 423.
-426½ Lt. med. gr. dol; steep to vertical shears 423-24 & 25½-26.
-428½ Dk. gr. dol; mott.
-431½ Med. gr. dol; lt. mott; bott. foot much fault brecc. w/tr. FeS.
-435 Lt. med. gr. dol; banded (dip 29°) v. sheared to 433 (N 80° W, 55° NE) FeS shine 33½; brecc. 34-35 w/est. 2% FeS; v. sandy 35-35½.
TOP KINGSPORT FORMATION 435
-444 Lt. med. gr. dol; sandy 38-40; 40½-42 v. mott. to banded w/sands @ 42; (dip 32°) crackl 442-44 w/FeS shines.
-452½ Lt. gr. dol; faults 50½-52½ (EW, 55-60° N) (dip 449 = 20°).
-454 Lt. med. gr. dol; fault 53½-54.
-455½ Med. gr. dol; mott.
-465 Lt. med. gr. dol; well mott. to banded to 459 w/chert nod @ 58½; well banded 59-65 (20° dip) w/lt. shears (NS, 55° W) chert nod 60½; tr. flourite in shear @ 64½; hvy. ss 465.
-468½ Lt. med. gr. dol; mott. 467-68½.
-470½ Med. (lt. med.) gr. dol; mott; ox. shears @ 470.
-471 Dk. gr. dol; chert nod @ base.
-474 Lt. gr. dol; lt. bands 473½-74 (dip 22°).
-475½ Lt. med. gr. dol; few ss grains & tr. chert @ 74½; 2" of v. sandy chert to sand @ 75½.
-480 Med. gr. dol; lt. mott; 1" fault @ 478 (tr. flourite (NS, 55° W) 3" oolitic chert @ 80.
-488 Lt. med. gr. dol. (to med.) lt. mott; crackle 86½-88.
-497 Lt. gr. dol; lt. mott. & eyelets to 93 & occ. small chert nod; 2" shaly zone @ 93; lt. bands 93-97 (dip @ 94 is 19°) large chert nods 95½, 96, 96¼, 96½, 96 3/4.
-503½ Lt. med. gr. dol; to 499 well banded (24° dip) & brecc. chert nod 98½; 99-503 well band ed to mott; sandy 503-03½ w/TGS 503½ (dip 24°).
-507½ Lt. to lt. med. gr. dol; well mott; sugary; 506½-07 scatt. silic specks; brecc. chert nod 507-07¼; re-xl; 507¼-07½ w/band of silica @ 507½.

-0½ Lt. gr. dol; lt. b[illegible]ing (dip 23½°) shears 08½-10 w[illegible]ult @ 510 (N 50° E, 40° NW), brecc. chert nod & TGS @ 510½.
-515 Lt. med. gr. dol; 2" TGS 511; shears 511-13 w/chert nod 513; sev. chert nods 14-15.
-516 Lt. gr. dol; banded (dip 23°); chert nod 515½.
-518 Lt. med. gr. dol; v. banded to mott. w/sand @ 578 & then a small chert nod.
-523 Lt. med. to med. gr. dol; chert nod 520, 21, 22; from 22-23 brecc. w/some chert frag's.
-524 Lt. med. gr. dol; sugary; tiny white specks of silica (base bed K-4).
-526 Lt. med. gr. dol; well mott.
-531 Lt. gr. dol; eyelets 26-27 & 28½; 1" bedding plane fault @ 27; lt. bands 28½-31 (32°).
-534 Lt. med. gr. dol; lt. bands (25° dip); thin fault 33½ (N 40° E, 60° NW).
-543½ Lt. gr. dol; lt. bands to 540; ox. shears @ 36 (N 40° E, 40° NW); v. banded 40-40½ w/few ss grains 40½; then chert nod; chert nod 42.
-547½ Lt. med. gr. dol; lt. bands to 546; then lt. mott. 46-47½ w/TGS 47½.
-548 Med. mott. semi re-xl.
-550 Lt. gr. dol; lt. bands.
-552 Lt. med. gr. dol; banded; (dip 29°).
-552½ Med. gr. dol.
-556 Lt. med. gr. dol; 2" TGS @ 556.
-557 Med. gr. dol; sugary.
-558½ Lt. med. gr. dol; ZnS shines top 4"; chert nod @ base.
-562 Med. gr. dol; crackle w/ZnS shine 58½-59½; then grades to lt. med. gr. dol.
-562½ Br. - green re-xl.
-565 Lt. med. gr. dol; lt. crackle w/FeS shines.
-567 Med. gr. dol; brecc. w/est. 1% FeS.
-568½ Lt. med. gr. dol; chert nod @ base.
-572 Med. gr. dol; crackle 69½-70 w/FeS shine; crackle w/grn. & white gangue 70-72.
-576 Lt. med. gr. dol; lt. bands (dip 25°).
-578 Med. gr. dol; thin ss @ 578.
-579½ Lt. gr. dol; lt. mott.
-582½ Lt. med. gr. dol; crackle w/ZnS shines 79½-81½; 3" silica @ 82½.
-587 Br. mott. semi re-xl; occ. lt. crackle.
-588 Lt. med. gr. dol; lt. bands.
-588½ Lt. med. mott. semi re-xl.
-590 Lt. med. gr. dol; sugary; 89-90 crackle w/ZnS shines & tr. FeS.
-597 Lt. med. gr. dol; lt. bands to mott; 90-91 lt. crackle w/ZnS shines, crackle 93-95 w/est. 1% ZnS & tr. FeS @ 94½; tr. re-xl @ 96; 3" grn. shale @ 97.
TOP R BED 597
-599 Br. re-xl.
-600 Lt. med. gr. dol; top 6" semi re-xl.
-601½ Chert; sec. & prim; some ss @ 600½; 2" TGS @ base.
-603 Re-xl; mott; gr. to br., darker @ top.
-606 Lt. med. to med. gr. sugary dol; 3" of br. re-xl @ 605.
-608 Dk. br. re-xl; cherty; mott; thin bands of grn. silica @ base.
-609 Gr. re-xl.
-611 Lt. med. gr. dol.
-613½ Lt. br. re-xl; lt. mott; FeS shine @ 613½.
-618 Lt. gr. re-xl (fine grained, poss. semi re-xl) occ. lt. FeS shine.
-619½ Lt. gr. dol; crackle w/FeS shines.
-624 Lt. br. re-xl; mott. & shaly; v. shaly toward top; crackle bott. 6".
-630 Lt. med. gr. dol; semi re-xl to sugary top 1½'; lt. crackle.
-630½ Dk. br. re-xl.
-633½ Med. dk. gr. dol; crackle 31½-33 w/est. 1% ZnS.
-634½ Med. gr. dol.
-637½ Br. re-xl; some white gangue (?) @ top; then 4" grn. shale; chert nod 35 3/4-36 3/4.
-640 Med. dk. gr. dol; v. sugary.
-642 Br. re-xl; chert nod @ base.
-646 Lt. med. gr. dol; lt. crackle w/silic gangue.
-648 Lt. med. gr. dol; w/50% eyelets of re-xl & silica.
TOP S BED 648

-650½ Lt. br. silic re-xl.
-653 Br. re-xl; silic bott. 6".
-655½ Lt. gr. re-xl (fine grained, poss. semi re-xl).
-656½ Re-xl, gr, cherty; FeS shine @ top.
-661 Lt. med. semi to sugary dol; lt. crackle w/occ. FeS shine.
-662 Sec. chert.
-663 Br. re-xl; sst. 2% FeS 661-63.
-664½ Lt. v. cherty re-xl.
-665½ Br. re-xl; chert @ base.
-667 Med. (lt. med.) gr. dol; crackle; chert nod near base; few ss grains @ base.
-670½ Br. re-xl; occ. chert fragment & FeS shin e.
-671 Lt. med. gr. dol; crackle.
-672 Br. re-xl.
-678 Lt. br. re-xl; crackle 672-75 & 77-78.
-679½ Lt. re-xl; v. shaly 79-79½ w/sand @ 79½.
-683 Br. re-xl; 1" TGS @ 81; large chert nod 82.
-685½ Lt. to lt. br. mott. re-xl.
-688 Br. re-xl.
-693 Lt. br. re-xl; lt. crackle 88-91 w/FeS shine 91; lt. gr. re-xl bott. 2'.
BASE KIN SPORT FM . 693
-695 Lt. gr. dol; crackle.
-696½ Lt. med. gr. semi re-xl.
-699 Lt. br. re-xl.
-702½ Med. gr. dol; lt. crakkle.
-703½ Br. re-xl; 6" chert @ top; silica @ base.
-709½ Lt. med. gr. fine grained re-xl to semi re-xl.
-715 Lt. br. re-xl; breec. 09½-10½; breec. 12-12½ w/FeS shines; v. cherty 13½-15.
-719 Br. re-xl.
-722 Lt. med. gr. dol; tr. breec. @ top & @ 720; then lt. crackle.
-725½ Med. gr. dol; lt. mott.
-726½ Br. re-xl; chert nod @ top; siliceous.
-729 Lt. med. gr. dol; lt. mott.
-730 Lt. v. cherty; silic; re-xl. (TD)

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tenn.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96963

INVOICE DATE 12-31-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 836.' agreement.	Core Drilling at Puncheon Camp, Tennessee as per					
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		J-1	0. / 836.		836.		$3.00	$2,508.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tennessee

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

INVOICE NO. 97011

INVOICE DATE 1-25-58

SHIPPED TO

Puncheon, Tennessee

PLEASE REMIT TO PITTSBURGH, PA.

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 730.' Core Drilling at Puncheon, Tennessee as per agreement.					
			Prospect # / From / To		Total Feet		Unit Cost	Total Cost
			JA 2 / 0. / 730.		730.		$3.00	$2,190.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE 63			DATE	AT SHIP POINT	

SOLD TO: National Lead Company
Box 2047
Morristown, Tennessee

~~TERMS NET 30 DAYS.~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 96971

INVOICE DATE 1-22-58

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 715.' Core Drilling at Puncheon Camp, Tennessee as per agreement.					
			Prospect # / From / To		Total Feet		Unit Cost	Total Cost
			DA-2 D2 / 0. / 715.		715.		$3.00	$2,145.00
			Reaming					
			DA-2 D2 / 62. / 167.		105.		2.00	210.00
								$2,355.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A

INTERIM REPORT

DMEA-4580, Idm-E1088 (Zinc)

1/16 gb 220
17 Chm 100
1/20 Kling 500.

Operator: National Lead Company, New York, New York

Location: Puncheon Camp Creek area, Grainger County, Tennessee

The Puncheon Camp Creek project of the National Lead Company was inspected on December 3, 1957 and January 6, 1958. The interim report for December 3 inadvertently was not submitted with those of other projects on Copper Ridge visisted in the same inspection period. The data for the two inspections are combined herein.

The diamond drilling on the Puncheon Camp Creek project completed through January 6, 1958 and since the last reported inspection on November 5, 1957 is summarized as follows:

Footage in holes completed since last reported inspection	4,439
Total footage in holes completed to date	10,554
Number of holes completed since last reported inspection	7
Total number of holes completed to date	16
Number of holes showing commercial zinc ore	0
Number of holes showing non-commercial zinc mineralization	7
Number of barren holes	9

Brief summaries of the seven holes completed since the last reported inspection follow:

Hole No.	Property	Total depth	Remarks
CO-4	Coffman	754	Location: About 200 feet downdip from Hole CO-3. Abbreviated log: 0-18 residual clay; 18-469 Mascot dolomite; 469-638 upper Kingsport dolomite member; 638-729 lower Kingsport limestone member; 729-754 Longview dolomite. Mineralization: Barren hole; no zinc but strong shines of FeS_2 @ 622-629, 650-652½; 686-691, and 741-748.
CO-5	Coffman	490	Location: About 200 feet updip from Hole CO-3. Abbreviated log: 0-62 residual clay; 62-197 Mascot dolomite; 197-367 upper Kingsport dolomite member; 367-468 lower Kingsport limestone member; 468-490 Longview dolomite. Mineralization: Barren hole; no zinc but scattered shines of FeS_2 @ 419½-445.

ACTION ON INTERIM
OR FINAL FIELD TEAM REPORT
Date 1/16/58

Referred to:

1. ~~Mr. Mittendorf~~
2. ~~Mr. Johnson~~
3. ~~Mr. Chambers~~
4. Docket Control Mails and Files
5. Division
6. Docket Control Mails and Files
7. 500

Note comments in report regarding:

1. Holes completed to date of inspection should be
2. 17 and footage of completed holes 11,394'
3.
4. Talbert 1/20/58

and take appropriate action.

- - - - - - - -

Action taken by Division:

Robert E. Adams

gb

Hole No.	Property	Total depth	Remarks
CO-6	Coffman	397	Location: About 200 feet updip from Hole CO-5. Abbreviated log: 0-87 residual clay; 87-97 Mascot dolomite; 97-272 upper Kingsport dolomite member; 272-385 lower Kingsport limestone member; 385-397 Longview dolomite. Mineralization: Shine hole; shine of ZnS @ 283-289; scattered strong shines of FeS_2 @ 300-366.
CO-7	Coffman	260	Location: About 200 feet updip from Hole CO-6. Abbreviated log: 0-80 residual clay; 80-131½ upper Kingsport dolomite member; 131½-238 lower Kingsport limestone member; 238-260 Longview dolomite. Mineralization: Barren hole.
MG-5	McGinnis	830	Location: About 200 feet downdip from Hole MG-4. Abbreviated log: 0-7 residual clay; 7-512 Mascot dolomite; 512-681(?) upper Kingsport dolomite member; 681(?)-791 lower Kingsport limestone member; 791-830 Longview dolomite. The top of the lower Kingsport is questionable because of the extreme brecciation noted throughout the Kingsport. Mineralization: Shine hole; zinc mineralization as follows: 0.44 % Zn @ 625½-627, shine @ 653½, ¼ % Zn (est) @ 672½-673, shines @ 688-691 and 695; FeS_2 shines scattered @ 350-405, 539-600, and 614-662.
DA-1	Dalton	872	Location: About 580 feet NE (on strike) from Hole MG-5. Abbreviated log: 0-47 residual clay; 47-544½ Mascot dolomite; 544½-745 upper Kingsport dolomite member; 745-825 lower Kingsport limestone member; 825-872 Longview dolomite. Mineralization: Shine hole; zinc mineralization as follows: shine ZnS @ 666½, ½ % Zn (est) @ 833-835½, ½ % Zn (est) @ 836½-838; FeS_2 shines--heavy @ 608-688½, and--light @ 688½-760.
JA-1	Jackson	836	Location: About 1200 feet SW (on strike) from Hole CO-2. Abbreviated log: 0-27 residual clay; 27-545 Mascot dolomite; 545-711½(?) upper Kingsport dolomite member; 711½-815 lower Kingsport limestone member; 815-836 Longview dolomite. Mineralization: Shine hole; ZnS shines @ 679½ and 684; FeS_2 shines @ 627-698 with scattered traces @ 698-751.

With the completion of Hole JA-1 the drill rig on this hole was removed from the project temporarily and shifted to the Operator's non-DMEA Copper Ridge project at Rockbridge. It is anticipated that the drill will be returned to the Puncheon Camp Creek project within the next several weeks. Meanwhile, one diamond-drill hole is in progress. The data on this hole are summarized as follows:

Hole No.	Property	Present depth	Estimated total depth	Remarks
DA-2	Dalton	556	720	Located about 200 feet updip from Hole DA-1; collared in Mascot dolomite (44 feet of overburden); currently drilling in upper Kingsport dolomite member (chert-matrix ss @ 401); shines of ZnS @ 313 and 490½.

Inspected: December 3, 1957 — Helmuth Wedow, Jr., and R. A. Laurence
Geologists, U. S. Geological Survey

January 6, 1958 — Helmuth Wedow, Jr., Geologist
U. S. Geological Survey

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

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

RECEIVED JAN 16 1958 D.M.E.A.

Klay

Budget Bureau No. 42-R1036.5

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K- 33

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

Month of December 195 Docket No. DMEA 4580 Contract No. Idm-E 1088

Operator's Name National Lead Company Minerals Zinc

Address 111 Broadway, New York, N.Y.

Contract Amount, $ 170,125.00 Government Participation: 50 % Amount, $ 85,062.50

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Short Form Contracts:						
Drilling	3396.00	25,758.00	29,154.00	3/10/58 WPK		
Bulldozing						
Crosscutting						
Drifting						
Reaming	—	208.00	208.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	—	88.75	88.75			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	—	5.00	5.00			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incidental Allow. @ .18/ ft.	203.76	1545.48	1749.24			
TOTALS	3599.76	27,605.23	31,204.99	3599.76	27605.23	31204.99

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

Date December 1957 *Payee National Lead Company

Per [signature] Title Superintendent

*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:

$ 1799.88

Signature Helen R. Miller (Authorized Certifying Officer)

Date JAN 14 1958 Vou. No. 108

(See other side)

1799.88

(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. E-1088 in accordance with the terms of the contract.

Signature W. J. Lynch Title MINING ENGINEER U. S. BUREAU OF MINES Date JAN 7 -

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Lawrence Title EXECUTIVE OFFICER REGION V Date JAN 7 -

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.

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

Month of December 1957 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name National Lead Company Minerals Zinc
Address 111 Broadway, New York, N.Y.

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	3396.00	1132	29,154.00	9718	3.00	50,000	3.00
Churn Reaming	Foot	---	---	208.00	104	2.00	5,000	2.00
Auger Sampling	Each	---	---	5.00	4	1.25	550	1.50
Stripping Core Boxes	Each	---	---	88.75	50	1.77½	150	2.00
Trenching								
Test Pits								
Roads and Trails Incidental Allow. @ .18/ ft.	Foot	203.76	1132	1749.24	9718	.18	50,000	.18
TOTAL DISTRIBUTED COSTS		3599.76		31,204.99				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		3599.76		31,204.99				

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 December 1957 Operator National Lead Company

Per [signature] Title Superintendent

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)

[signature]
MINING ENGINEER
U. S. BUREAU OF MINES

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

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	63 CODE			DATE	AT SHIP POINT	

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tenn.

SHIPPED TO

Puncheon Camp, Tenn.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96948

INVOICE DATE 12-24-57

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 872.'	Core Drilling at Puncheon Camp, Tennessee as per agreement.					
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		DA-1	0. / 872.		872.		$3.00	$2,616.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tenn.

SHIPPED TO

Puncheon Camp, Tenn.

~~TERMS 2% 10 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96913

INVOICE DATE 12-18-57

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 260.' Core Drilling at Puncheon Camp, Tennessee as per agreement.							
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		CO-7	0.	260.		260.		$3.00	$780.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

COLLEGE OF PHYSICIANS

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT

GRAINGER COUNTY, TENN. FOR DECEMBER 1957

BY: W.T. HILL

Docket No. 4580
Contract No. Idm-E 1088

During the month of December, two holes were completed on the Puncheon Camp Creek project.

On the Coffman farm, hole CO-7 was drilled 200 feet north of CO-6. The hole collared in the Kingsport formation and was drilled to a depth of 260 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-80	Overburden	—	—	—
80-238	Kingsport	Top of "R" @ 131½; "S" @ 188; "T" @ 238	—	Dolomite and re-xl; in part brecciated; numerous cavities.
238-260	Longview	—	—	Dolomite and re-xl.

On the Dalton farm, hole DA-1 was drilled 700 feet east of MG-1 and 580 ± feet NE of MG-5. The hole collared in the Mascot formation and was drilled to a depth of 872 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-47	Overburden	—	—	—
47-544½	Mascot	CMas @ 544½	—	Dolomite w/occasional thin beds of re-xl; some FeS mineralization.
544½-825	Kingsport	Top of "R" bed @ 745; "S" @ 795½; "T" @ 825.	Tr. ZnS @ 666	Dolomite, re-xl, and limestone; in part brecciated; heavy FeS mineralization from 595-688; lt. FeS from 688-758.
825-872	Longview	—	833-835½, 2½' @ ½% Est; 836-838, 2' @ ½% Est.	Dolomite, re-xl, and limestone.

Drilling is now underway at location DA-2, 200 feet north of DA-1 and at JA-1, 1200 feet west of the Coffman fence of holes.

NATIONAL LEAD CO. D.D. CO-7

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: CO-7

Farm: D.F. Coffman et ux.

Loc: N 48,372.80
E 42,824.59

Elev: 1571.92

Drilled By: Joy Mfg. Co.

Logged By: J.W. Spears

Collared: 12-2-57

Bottomed: 12-6-57

Depth: 260'

Casing: BX 80; AX 99

Reaming: None

Cement: None

Water Table: ?

TOP KINGSPORT	Collared in Kingsport
TOP R BED	131½
TOP S BED	188
BASE KINGSPORT	238

cc/ N.Y. Office
C.D. Hulin
Leroy Scharon
B.H. Putnam
H.B. Burwell
DMEA (5)

0-80	Overburden
-84	Lt. gr. dol; banded; chert nod 81.
-96	Cavity.
-99	Med. gr. dol; cherty (3' core loss 96-99)
-115½	Lt. med. gr. dol; (2½' core loss 99-102; 1' core loss 102-04; 2' core loss 104-07; ½' core loss 107-08½; 2' core loss 109½-12½) ex. @ 108; vert. ox. shears 110-11; banding 112-14.
-120	Lt. gr. dol; mott. to banded; oxl crackle to brecc. 118-19; fault 119-20.
-125½	Lt. med. gr. dol; sheared; chert nod 123½; hvy. grn. shale then chert nod 125½.
-128½	Med. gr. dol; mott.
-131½	Lt. gr. dol; mott.
	TOP R BED 131½
-132½	Lt. br. re-xl; mott; shaly; grn. shale 132-32½.
-136	Br. re-xl; mott; large chert nod 134; hvy. ss then chert nod @ 135.
-139	Lt. gr. dol.
-141	Lt. med. gr. dol. (sugary) to semi re-xl; mott.
-142	Br. re-xl; crackle.
-143	Lt. gr. dol; brecc. w/grn. shale & re-xl; hvy. TGS @ base.
-152	Lt. gr. re-xl; mott; lt. crackle.
-153½	Lt. med. gr. dol; sugary; chert nods 152½, 153½.
-161	Lt. gr. dol; sugary to semi re-xl; lt. mott. 155-61; oxl crackle 158-60.
-163½	Med. gr. dol; sugary; well mott; occ. vug.
-164	Br. re-xl.
-169	Lt. gr. to med. gr. dol; ox. shears 167-69 (1' core loss 167-71).
-170	Dk. br. re-xl; mott; crackle; several chert nods.
-173	Med. dk. gr. dol; crackle; chert nod 173.
-175	Lt. med. gr. dol; brecc; gouge & some grn. shale; oxid. (1' core loss 173-75)
-176	Cavity
-177	Dk. br. shaly, banded re-xl.
-181	Med. gr. dol; sugary; mott; brecc; (2' core loss 177½-181½).
-183	Br. re-xl; 182-82½ sec. chert & chert; v. brecc. to fault 182½-83 (½' core loss 81½-83).
-185½	Lt. gr. fine grained re-xl; crackle.
-188	Lt. med. gr. dol; sugary; lt. mott; brecc; chert nod 187; brecc. w/re-xl 187-88.
	TOP S BED 188
-189	Mixture of re-xl & sec. chert; oxid; chert nod 189.
-192	Lt. med. gr. dol; crackle 189-91½; brecc. (some re-xl) 191½-92½.
-196	Gr. re-xl; chert nod 193½; band. dol. 194-94½; jaspereid; chert nod 196.
-205½	Lt. br. re-xl; brecc; silic.
-208	Dk. br. re-xl; brecc. 205-08.
-209	Lt. med. gr. dol.
-210½	Coarse br. jaspereid re-xl & few blocks lt. med. gr. dol.
-215½	Cavity
-218	Lt. br. mott. re-xl; brecc.
-226	Br. re-xl; lt. crackle.
-231	Lt. grl re-xl; cavity 227-30.
-232½	LS, gr; bott. 6" partly re-xl.
-237	Gr. re-xl.
-238	Lt. gr. fine grained re-xl.
	BASE KINGSPORT FM. 238
-240½	Lt. med. gr. dol; top foot semi re-xl; chert nod 240½.
-246	Med. gr. dol; chert nod 242 (245)
-246½	Lt. gr. silic. re-xl.
-251	Med. gr. dol; chert nod @ base.
-256	Lt. gr. fine grained re-xl.
-258½	Lt. med. gr. dol; mott.
-260 TD	Lt. v. silic. re-xl.

NATIONAL LEAD CO. D.D. DA-1

Copper Ridge Project - Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: DA-1

Farm: W.B. Dalton

Loc: N 48,469.19
E 44,894.01

Elev: 1403.44

Drilled By: Joy Mfg. Co.

Logged By: J. Spears

Collared: 12/2/57

Bottomed: 12/20/57

Depth: 872

Casing: BX 47'; AX 60'

Reaming: None

Cement: None

Water Table: ?

Top Kingsport	544½
Top R bed	739½
Top S bed	795½
Base Kingsport	825
"G" bed	835½-45

cc/ New York
C.D. Hulin
Leroy Seharon
B.N. Butnam
H.B. Burwell
DMEA

0-47	Overburden
-49	Med. dk. gr. dol; v. mott; chert nod @ top; v. oxid. top 6".
-55	Med. gr. dol; banded.
-61½	Med. dk. gr. dol; v. mott; 3" shaly, sandy chert @ base.
-63½	Chert & sec. chert w/hvy. ss then chert nod @ base.
-66	Lt. gr. dol; lt. mott.
-70	Lt. med. gr. dol.
-71½	Med. gr. dol; sandy bott. foot; mott.
-75	Lt. med. gr. dol; lt. banding.
-76	Lt. med. semi re-xl; lt. mott.
-79	Dk. gr. dol; v. mott; dk. chert nod 76½.
-86½	Med. dk. gr. dol; mott. w/silic eyelets to 83'; v. mott. 83-86½ w/few ss grains bott. 4".
-88	Med. gr. dol; banded; 6" sec. chert 87-87½.
-89	Lt. gr. dol; well banded; thin ss & TGS @ base.
-95	Med. gr. dol; lt. mott. to 92½ w/1" TGS 92½; well mott. 92½-95.
-103	Lt. med. gr. dol; sands 97-98; thin ss 100½; grades to lt. gr.
-105	Med. gr. dol; well mott.
-106	Dk. gr. dol; well mott.
[illegible]	
-118½	Lt. med. gr. dol; lt. banding 106-11; lt. mott. 11-18½; oxid. 15-16 w/TBS 16.
-120	Med. gr. dol.
-129	Lt. med. gr. dol; TGS 126; oxid. 27-27½; thin ss 27½; mott. 26-29.
-130	Med. gr. dol.
-132	Lt. gr. dol.
-133	Lt. med. sugary dol; mott.
-135½	Lt. med. gr. dol.
-137	Lt. gr. dol; banded to mott.
-141½	Med. gr. dol; banded to mott.
-146	Lt. med. gr. dol; vert. ss ox. shear 141½-42½.
-147½	Med. dk. gr. dol; TBS 146½; large dk. chert nod @ 147½.
-158	Lt. med. gr. dol. to med. gr; lt. banding to mott. 47½-56½; v. sandy 56½-58.
-159½	Med. dk. gr. dol; shears @ base.
-161½	Med. gr. dol; sheared; v. mott.
-168	Med. dk. gr. dol; mott. 61½-63; 6" chert nod @ base.
-169	Lt. med. gr. dol; banded.
-179	Med. gr. dol; mott; TGS 177.
-180	Lt. med. gr. dol; v. sandy 79-80 w/TGS 180.
-190	Lt. gr. dol; red mott; few ss grains 88-88½; TGS 88½.
-192	Lt. med. gr. dol; red. mott.
-193	Med. gr. dol; mott.
-193½	Lt. med. gr. dol.
-197	Brecc. chert & sec. chert (2' core loss 194-99)
-199	Lt. gr. dol; hvy. ss top 3".
-200	Med. gr. sugary dol.
-202½	Med. semi re-xl; mott; (to sug. dol.)
-205	Dk. gr. v. mott. semi re-xl.
-213	Lt. gr. dol; shears @ top; lt. banding; scatt. ss grains 209-09½; chert nod 209½.
-215	Lt. med. gr. dol.
-221	Med. gr. dol; mott.
-222½	Brecc. chert w/semi re-xl; bott. 6" sec. chert.
-225	Lt. gr. dol.
-231½	Lt. med. gr. dol; lt. banding to 230; well mott. 230-31½.
-243½	Med. gr. dol; mott. 231½-33½; v. hvy. to CM sands 243-43½ w/chert nod 243½.
-244	Lt. gr. dol; v. sandy.
-245	Brecc. chert; some sand top 2".
-248	Lt. med. gr. dol; crackle; FeS shine 247½.

-248½ Lt. gr. dol; mott; crackle.
-249½ Brecc. chert.
-251 Lt. gr. dol; several chert nods bott. 6"; TGS @ base.
-253 Lt. re-xl; mott; hvy. ss 252½; then shaly, sandy, & cherty to base.
-256½ Lt. med. semi re-xl; mott.
-261 Lt. med. gr. dol; lt. mott. to 258½; scatt. sands 258½-260 w/heavier sands towards base; eyelets 261-64.
-265½ Med. gr. dol; eyelets; shaly, bands.
-271½ Med. dk. gr. dol; sugary; mott.
-272½ Lt. re-xl; v. cherty; scatt. ss grains.
-285 Lt. med. to med. gr. dol; mott; eyelets 275-76.
-290½ Med. gr. dol; few ss grains & TGS @ 290; mott. 290-93½.
-296½ Lt. re-xl; dk. chert nod 297½.
-299½ Med. gr. re-xl; v. mott.
-300½ Med. dk. gr. dol; mott; sugary.
-301 Lt. v. silic. re-xl.
-304 Med. gr. dol; TBS @ base.
-310½ Dk. gr. dol; 306-10½ mott.
-313 Med. dk. gr. dol; v. mott.
-314 3" re-xl; then lt. gr. dol.
-315 Lt. med. gr. dol; many eyelets; TGS @ base.
-320½ Med. dk. to med. gr. dol; mott; eyelets.
-325 Dk. gr. dol; shaly; mott.
-326½ Med. gr. dol; banded.
-330 Lt. gr. dol; well banded to mott. 326½-28; lt. mott. 328-30 w/chert nod 330.
-336 Lt. med. gr. dol; 335-36 v. mott; sandy 335½-36.
-341½ Lt. gr. dol; hvy. ss & large chert nod 336½-37; v. mott. to 337; then lt. mott; scatt. sands 340½-41½; heavier bott. 6".
-347 Med. gr. dol; sli. banded (some small zones lt. med. gr.).
-349 Lt. med. gr. dol. to semi re-xl; mott; v. silic. w/scatt. ss grains.
-358½ Med. gr. dol; oolitic chert nod 351½; v. mott. 352½-55; mott. 355-58½.
-361 Dk. gr. dol; v. mott.
-362 Med. gr. dol; banded; sandy top 3".
-367½ Lt. med. gr. dol; v. mott. 362-66 w/tiny vugs to 64 & v. sandy 364-66; mott. 66-67½.
-382 Dk. gr. dol; mott. to 372.
-383½ Med. dk. gr. dol.
-385 Med. gr. dol; fault 384-85.
-386 Dk. gr. dol; mott; sheared.
-387 Med. gr. dol.
-388½ Dk. gr. dol; v. mott.
-398 Lt. med. gr. dol; v. mott. to 396; v. sandy 395½-96; oxid. 396-97.
-400 Med. gr.dol; mott.
-406 Med. dk. gr. dol; mott.
-408 Lt. gr. dol; vl mott; silic & cherty; 1" silic TGS @ 407½; few ss grains 406.
-411 Med. gr. dol; v. mott & sugary; 410-11 few ss grains & poss. edgewise congl.
-411½ Lt. silic. re-xl.
-416 Med. gr. dol; thin fault then chert nod @ 413½; few ss grains 415-15½; shears @ 415½ & silic. TGS; v. cherty 415½-16.
-417 Lt. gr. dol; tr. brecc. @ top.
-419½ Lt. med. gr. dol.
-423 Med. gr. dol; blue mott; large chert nod @ base.
-426½ Lt. med. gr. dol; well banded 423-25; 2/3 chert 425-26½.
-430½ Med. gr. dol; fault 426½-27.
-433 Brecc . chert sealed w/chert; est. 1% FeS.
-437½ Lt. med. gr. dol; lt. crackle 33-35 w/est. ½% FeS; 35-35½ fossiliferous oolitic chert.
-445 Med. gr. dol; blue mott. to 440; v. mott. 440-43½ w/few ss grains 442½-43½.

-460 Lt. med. gr. dol; v. mott. 446-49; banded 449-50; v. mott. & sugary 450-52 w/sand @ 50; few sands 452-52½; mott. 452½-54 w/ a sand @ 454.
-470 Med. gr. dol; 465-68 mott.
-473 Med. dk. gr. dol.
-476 Med. gr. dol; banded; large chert nods @ base.
-478½ Lt. med. gr. dol.
-481 Med. gr. sugary; sandy; edgewise congl.
-485 Lt. med. gr. dol; thin steep fault @ top (apparent displacement 3") eyelets 481½-85.
-487 Med. gr. dol; eyelets; shears 486, 487.
-495 Med. dk. gr. dol; occ. mott. & occ. lt. crackle.
-496 Med. gr. dol; 495½-96 hvy. ss & oolitic chert.
-498 Lt. med. gr. dol; lt. mott; TBS @ base.
-503 Med. to lt. med. gr. dol; well mott. to 500; then lt. mott.
-506 Dk. gr. dol; chert nod @ 505.
-512 Med. gr. dol; lt. banding; thin sands 508½, 09, 10 w/TGS 510; well mott. 510-12; w/FeS shine 510½; occ. steep shear; few ss grains & TGS @ 512.
-517 Lt. med. to med. gr. dol; well banded to 516.
-521 Med. gr. to med. dk. gr. dol; TGS @ 521.
-528 Lt. med. gr. dol; mott. to 523 w/few ss grains & TGS @ 523; lt. banding 523-28 w/occ. lt. crackle; FeS shine 528, grades to med. gr.
-532 Med. gr. dol. to lt. med. gr; occ. lt. crackle; FeS shine 530½.
-541 Dk. gr. dol; well mott. to 535; mott. 539-40; v. mott. 40-41.
-550 Med. dk. gr. dol; sli. banded to 544 w/sand @ 544 & 1" CM @ 544½, fault (bedding plane, 50
TOP KINGSPORT 544½
-558½ Med. gr. dol; v. mott. 550-51 w/TBS 551; lt. mott. 551-53; then v. lt. banding 53-58½.
-562 Lt. med. gr. dol; mott; few eyelets.
-568 Med. gr. dol; fault 563½-64½. (N 20°W, 70 NE
-570 Med. dk. gr. dol.
-574 Dk. gr. dol; v. mott.
-579½ Med. dk. to med. gr. dol; lt. crackle; v. lt. banding; chert nod 579½.
-583½ Med. gr. dol; banded; sandy 583-83½.
-593 Lt. med. to med. gr. dol; 1" sandy zone 1" from top; 586½-88½ blue mott; 588½-93 mott. w/tr. of crackle.
-602½ Lt. gr. dol; 593-98½ crackle to brecc; FeS shines 596-98½; lt. crackle 598½-600; v. sandy & mott. (to congl.) 600-01 w/tr. oolitic chert @ 601; v. sandy & oolitic cherts 602-02½.
-616½ Med. gr. dol; occ. crackle; brecc. w/FeS 608-08½; v. mott. 609-11; FeS shines 612-13 & 614-16 (est. 1%)).
N 45°W, 45 NE
-626 Lt. med. gr. dol; brecc. 617-18 w/est. 2% FeS; shears 619-20; tr. brecc; brecc. chert & FeS @ 620; crackle 623-26 w/est. ½% FeS & some grn. gangue.
-629 Med. gr. dol; crackle w/est. ½% FeS; chert nods 627½, 28, 29.
-666½ Lt. med. gr. dol; v. banded to mott. 629-38; crackle w/FeS shines 632-38 (1½' core loss 628-38), few ss grains 636½-38 becoming stronger towards 638 & a chert nod @ 638; lt. banding 638-44½; 6" TGS 644½-45; mott. 646-47; brecc. 649-55 w/many chert frag's & est. 2% FeS (cherts 649½, 50, 52, 52½, 53, 54, 55, 55½) v. mott. 656-58; brecc. 658-63 w/est. 2% FeS & some grn. gangue & occ. chert fragments; chert nod 665½.
-667½ Lt. silic. dol. (many white specks) sheared; mott; few ss grains; ZnS shine @ top; then few FeS shines.
-673 Lt. gr. dol; brecc. 667½-72 w/est. 1½% FeS; some grn. gangue.
-695 Lt. med. to lt. gr. dol; lt. crackle & shears to 677½ w/few FeS shines; brecc. 677½-83 w/est. 3% FeS & large chert nod 681; banded & crackle 683-85 w/FeS shines; brecc. 685-88½ w/est. 2% FeS; 2" TGS 688½; banded 688½-89½ w/FeS shine @ 689½; TGS @ 689½; 692-93 v. mott. to banded & crackle w/FeS shines.
-697 Top 6" brecc. chert w/FeS shines; then 2" of re-xl w/ silic; then med. mott. semi re-xl.
-702 Lt. gr. to lt. med. gr. dol; crackle w/occ. FeS shine.
-703 Med. gr. dol; mott.
-710 Lt. gr. to lt. med. gr. dol; scatt. ss grains 709-10 w/3" TGS @ 710.
-712 Med. gr. dol.

-716 Lt. med. - med. gr. dol; well mott. & sugary; TGS @ base.
-718½ Lt. med. gr. dol; grades to med. gr. in bott. foot.
-725 Med. to med. dk. gr. dol; crackle w/est. 1% FeS; 718½-19½ & 723-25; sli. banded 721-25; 1" band of silica @ base.
-731 Lt. med. gr. dol; lt. banding; few v. thin shears.
-733 Med. gr. dol; occ. crackle w/FeS shine; scatt. ss grains & ½" TGS @ base.
-736 Lt. med. gr. dol; mott.
-739½ Med. gr. dol; brecc. to crackle w/FeS shines 736-38½; 38½-39½ sealed w/grn. shale.
-743½ Mixture of dol. & lt. re-xl.
-746½ Med. dk. v. mott. semi re-xl to re-xl; br. crackle w/FeS shines.
-747½ Dk. br. mott. re-xl.
-748½ Lt. med. gr. dol.
-751½ Br. re-xl; some dol. blocks; v. much grn. shale w/some chert fragments.
-756 Br. re-xl; mott; FeS shine w/gangue @ 755.
-758 Med. gr. dol; top 6" some brecc. w/shale & re-xl.
-763 Br. mott. re-xl; occ. lt. crackle w/FeS shine.
-765 Lt. re-xl; lt. mott; few eyelets & vugs.
-766 Lt. med. gr. dol; chert nod @ base.
-774 Med. re-xl; mott.
-781 Lt. med. gr. semi re-xl - sugary dol. - dol.
-781½ Dk. re-xl.
-784 Dk. gr. dol; lt. crackle; grn. shale @ base.
-790 LS; grn. & red shale @ 788½.
-790½ Dk. re-xl.
-791 Lt. med. gr. dol; sheared to brecc. w/some grn. shale.
-793 Br. re-xl; bott. 9" chert nod.
-795½ Lt. med. gr. dol; lt. banding.
-799½ Br. v. mott. re-xl; cherty & shaly; 1" TGS @ base.
-800 LS; 1" TGS @ base.
-801½ Med. dk. gr. dol.
-802½ Lt. gr. dol.
-805½ Dk. gr. dol. w/few lt. gr. blocks sealed w/re-xl & shale.
-806 Dk. re-xl; cherty @ 806.
-811 LS; 6" dk. re-xl & grn. shale @ 807-08½; TGS @ 809.
-812½ Br. re-xl; top 6" partly LS (1½' core loss 806-16)
-814 Gr. re-xl; crackle 812½-14.
-816 Br. re-xl; mott; lt. crackle; chert nod 815 (2½' core loss 816-21)
-821 Gr. re-xl; v. mott.
-824 Lt. re-xl.
-824½ Br. re-xl.
-825 Lt. semi re-xl or fine grained re-xl.
-827 Lt. med. gr. dol.
-832 Med. dk. gr. dol.
-835½ Med. gr. dol; crackle; ZnS est. ½%; 833-35½.
-836½ Chert & re-xl (doleclastic chert)
-841 Lt. med. gr. semi re-xl to sugary dol; mott; lt. crackle w/est. ½% ZnS 836½-38; 2" grn. shale @ base.
-842 Lt. re-xl; TGS @ base.
-843 LS
-844 Dk. shaly re-xl & grn. shale w/tr's of LS.
-845 LS & grn. shale.
-848 Dk. gr. dol; many eyelets; brecc. top 1½' sealed w/grn. shale.
-850 Med. gr. sugary dol; mott.
-853½ Lt. med. gr. dol; occ. thin zone of re-xl; chert nod 853; thin ss & TGS @ 583½.
-855½ Re-xl & chert; dk. chert nod @ top; 2" lt. re-xl; 4" chert, then alternating br. re-xl & chert about 6"/ unit; TGS @ base.

-862½ LS; 1" shaly re-xl @ 861.
-864 Lt. med. gr. dol; scatt. ss grains bett. 6".
-865 Lt. re-xl to LS.
-869½ LS; 3" dk. re-xl @ 866; TGS @ base.
-872 Mixture of dk. re-xl & lt. LS. (TD)

Note: Fault measurements are made by orienting the core with the bedding planes striking E-ward dipping to the south.

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT
GRAINGER COUNTY, TENNESSEE
FOR NOVEMBER - 1957

BY: W.T. HILL

Docket No. 4580
Contract No. Idm-E 1088

During the month of November, four holes were completed on the Puncheon Camp Creek project.

One of these holes, MG-5, was drilled on the McGinnis farm 200 feet south of MG-4. The hole collared in the Mascot formation and was drilled to a depth of 830 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-7	Overburden	--	---	--
7-512	Mascot	CMss @ 512	---	Dolomite; sporadically brecciated and mineralized with FeS.
512-791	Kingsport	Top of "R" @ 681; "S" @ 762½; "T" @ 791.	625½-627, 1½' @ .44%; 653½; 672½-673, ½' @ ¼%; 688-689½, 1½' @ .14% ZN; 695.	Dolomite and recrystalline; brecciated; FeS mineralization scatte throughout upper part
791-830	Longview	Top of "U" @ 804½	---	Dolomite and re-xl.

On the Coffman farm, three holes were drilled. Co-4 was drilled 200 feet north of CO-2 and 200 feet south of CO-3. The hole collared in the Mascot formation and was drilled to a depth of 754 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-18	Overburden	---	------	--
18-469	Mascot	CMss @ 469	------	Dolomite; faulted in lower part.
469-729½	Kingsport	Top of "R" @ 627; "S" @ 677; "T" @ 729½.	---	Dolomite and re-xl; in part brecciated and mineralized with FeS.
729½-754	Longview	---	---	Dolomite and re-xl; crackle breccia with FeS.

Hole CO-5 was drilled 200 feet north of CO-3. The hole collared in the Mascot formation and was drilled to a depth of 490 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-62	Overburden	--	--	--
62-197	Mascot	CMas @ 197	--	Dolomite.
197-468	Kingsport	Top of "R" @ 367· "S" @ 419; "T" @ 468.	--	Dolomite, re-xl, and limestone. Some FeS mineralization in the lower part.
468-490	Longview	--	--	Dolomite and re-xl.

Hole CO-6 was drilled 200 feet north of CO-5. The hole collared in the Mascot formation and was drilled to a depth of 397 feet. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-87	Overburden	--	--	--
87-97	Mascot	--	--	Dolomite.
97-385	Kingsport	Top of "R" @ 271½; "S" @ 328; "T" 385	283-289, 6' of shines.	Dolomite and re-xl, in part brecciated; FeS mineralization from 300-374.
385-397	Longview	--	--	Dolomite.

Drilling is now underway 200 feet north of CO-6 at location CO-7 and 600 feet east of MG-5 at location DA-1.

NATIONAL LEAD CO. D.D. MG-5

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: MG-5

Farm: J.C. McGinnis et ux

Loc: N 48,169.32
E 44,413.07

Elev: 1326.70

Drilled By: Joy Mfg. Co.

Logged By: J.McDonald, J.Spears

Collared: 10-31-57

Bottomed: 11-15-57

Depth: 830'

Casing: BX 7'; AX 10'

Reaming: None

Cement: None

Water Table: ?

Top Kingsport Fm. (CMss)	512'
Top R Bed	681'
Top S Bed	753½'
Base Kingsport Fm.	790½'

0-7	Overburden
-9	Lt. gr. dol; chert nod @ 9; lt. fract. thruout.
-17	Lt. gr. dol; 4" chert & mott. @ 9' ∠.
-25	Dk. gr. dol; lt. shearing @ 24-25.
-31½	Med. gr. dol; mott; 28-31 lt. vert. shearing.
-32½	Chert; lt. ss @ base.
-45	Lt. gr. dol; banded; lt. fracts. thruout; vugs 34½; chert nod & ss @ 34; TGS @ base.
-56	Dk. gr. silic. dol; white blotches.
-59½	Med. gr. hvy. mott; siliceous; lt. fract. thruout; TGS @ 59.
-67	Lt. gr. dol; banded; lt. fracts; TGS @ base.
-68½	Med. gr. dol; hvy. mott.
-72	Med. gr. dol; faintly banded.
-76½	Lt. gr. dol; banded; lt. ss 72-73; crackle & sheared.
-77½	Med. gr. dol; sheared 77-78.
-80½	Hvy. fault gangue; steep angled.
-82½	Dk. gr. dol.
-83½	Med. gr. dol.
-88	Lt. gr. dol; vuggy.
-89	Lt. med. dol; 88½-89 banded & vuggy.
-98	Lt. med. gr. dol; banded; WGF @ 91½; lt. fracts. thruout; redish banding.
-99	Lt. med. gr. dol; bluish mott; lt. ss & grn. shale @ base.
-105	Lt. gr. dol; TGS @ base; v. lt. ss @ base; lt. banding 104-05; lt. fracts. 101-02.
-107	Med. gr. dol; lt. shearing @ 105; lt. mott. thruout; 2" hvy. ss @ base.
-113½	Dk. gr. dol; 107½-08½ hvy. mott; lt. shears 112-115½.
-117½	Med. gr. dol; 113½-115 lt. scatt. fracts.
-120½	Dk. gr. dol; 118½-120½ lt. shears; spotted; base marked by 3" blue chert.
-122	Med. gr. dol; lt. shearing 120½-21½.
-125½	Dk. gr. dol; 1" CMss @ 124½; TBS above ss.
-126½	Med. gr. dol; brecc. chert @ base.
-127½	Med. gr. dol; hvy. mott; lt. fracts.
-133	Lt. med. gr. dol; banded 129½-33; scatt. ss 131-33; hvy. ss @ base; in pt. CM; TGS @ base. 128½-29 brecc.
-136	Dk. gr. dol; TGS @ base.
-138	Med. gr. dol; lt. mott.
-143½	Dk. gr. dol; 138-40 mott; lt. fracts; TGS @ 143; 143-43½ sh. & ss & chert.
-145½	Lt. med. dol; brn. chert @ 144; crackle @ 145.
-148	Med. gr. dol; hvy. mott.
-154½	Dk. gr. dol; v. lt. banded.
-157	Med. gr. dol; banded; 6" scatt. ss & grn. shale @ base.
-160	Lt. brownish dol; dip @ 157=.29°.
-171½	Med. gr. blue mott. dol; some lt. banding; lt. crackle 170½-71½.
-174	Brown brecc. chert w/white gangue dol; TGS @ base.
-176½	Lt. gr. dol; sli. banded; 175½-76 mott; shaly.
-178	Dk. gr. dol; mott; brecc; ½% FeS 176½-77½.
-180	Dk. gr. dol; lt. crackle; shears @ base.

-181½ Dk. dol; lt. banded; crackle @ 180½ & 81½.
-182½ Med. gr. dol; crackle thruout; med. ss 182-82½; 2" chert breccia @ base.
-185 Med. gr. dol; banded; lt. shear thruout; 184 weak breccia wgf; chert nod @ 186.
-193½ Med. gr. dol; mott; chert @ 186½; lt. fract. thruout; 189½ weak breccia.
-193½ Dk. gr. dol; lt. crackle thruout; 191 weak breccia wgf.
-195 Med. gr. dol; wgf breccia and small fault @ 194-94½; breccia @ base.
-196 Brecciated chert.
-202 Med. gr. dol; lt. band; scatt. ss @ base above 3" ch; str. crackle breccia 96-97; weak fault @ 200½; crackle 201½-02.
-203 Med. gr. dol; crackle thruout.
-204½ Mott. & dk. gr. dol.
-216 Dk. gr. dol; lt. spotted; lt. breccia 206½; fault gangue 3" wide @ 207; low angle 30° ∠; lt. crackle breccia @ 209½ & 12.
-218 Lt. gr. dol; 3" hvy. sands @ 216½; 2" chert @ 217; hvy. sands & chert @ base.
-221 Brecciated chert; ¼% FeS @ 219-20; 220-20½ lt. gr. dol; 220½-21 ¼% FeS.
-223 Lt. gr. dol; 2" chert breccia; TGS @ base.
-227 Lt. gr. dol; mott; chert filled fract. @ 225; scatt. ss & grn. shale @ 26; chert @ base.
-231 Med. gr. dol; banded; minor fault @ 230; 230-31 scatt. ss.
-236 Med. gr. dol; vuggy & spott; fault gangue @ 231 3/4; thin shearing @ 235-36.
-242½ Dk. gr. dol; mott.
-243 Strongly spott. dol; cherty @ 293; brecc. and silic; probable fault zone.
-243½ Breccia zone; silic.
-245½ Lt. med. gr. dol; lt. mott; 243½-44½ strong crackle.
-247 Lt. gr. dol; spott; 246-47 vuggy.
-249 Lt. med. gr. dol; spott. thruout; vuggy @ 148; 4" chert @ base.
-255 Med. gr. dol; str. blue mott; str. crackle breccia @ 245, 246 & 48; breccia is vuggy.
-260½ Med. gr. dol; lt. mott; str. crackle @ 256½-58; fault breccia @ 58; crackle 58-59; weak crackle 260-60½.
-263½ Lt. med. gr. dol; mott; str. crackle @ 260½-63½.
-265 Dk. med. gr. dol; crackle from 264-68.
-271 Dk. med. gr. dol; str. mott; wgf breccia @ 69; ch. breccia @ 70½; wgf & ch. nod @ base.
-271½ Lt. gr. dol; med; lt. fract.
-273 Dk. med. gr. dol; str. mott; chert nods; spott; 271½-72.
-281½ Med. gr. dol; fract. 277-81.
-282½ Lt. med. gr. dol; banded; thin chert bands 281½-82; TBS @ base.
-286 Dk. gr. dol; str. mott. 83½-84; fracts @ 85; str. crack. 85½-86; sand, pebbly @ base—(edgewise congl.)
-287½ Med. gr. dol; spotted.
-289 Med. gr. dol; mottled.
-291 Med. gr. dol; spott; vuggy; thin bedding plane fault @ 91; cherty @ base.
-299 Dk. gr. dol; spott. 291½96½; cherty 291-92; thin bedding plane fault @ 291.
-299½ Lt. gr. dol; banded; thin bedding plane fault @ 299½.
-300 Lt. med. gr. dol; 2" hvy. ss (some CM?) TBS @ base.
-300½ Lt. med. gr. dol; scatt. hvy. ss thruout.
-306½ Dk. med. dol; spott. 302; vug. 304; chert nod 306; lt. fract. 300½-01.
-309 Lt. med. gr. dol; str. fract. 308½-09; 1" fract. chert @ base.
-311 Med. gr. dol; scatt. ss thruout; hvy. ss @ 10; blue chert @ base; (ch.) spott. 10-11, vuggy; lt. fract. thruout.
-315 Lt. med. dol; scatt. ss 314-15; TBS; hvy. ss @ base (some CM?) hvy. fract. 11-12½.
-316 Chert bed; banded; scatt. ss thruout; sand dike @ top.
-324 Med. gr. dol; spott. 319½-20½; chert nod 317; scatt. ss 323-24; shearing thruout; small fault (brecciated) 316½-20; chert nods near & @ base.
-325½ Sheared chert bed; scatt. ss thruout; FeS shine lower contact; lt. fract.
-326½ Med. gr. dol; sugary; re-xl? silic; oolitic chert nod @ base.
-334 Lt. med. gr. dol; mott; chert nod & vuggy 27-28; bed plane fault @ 27; 3" bed. plane fault @ 32; steep angle fault (breccia) @ 329-30; fract. thruout.
-335½ Dk. gr. dol; silic; med. ss @ base; fract. thruout/

-336½ Med. gr. dol; banded; scatt. ss thruout; 2" hvy. ss & TBS @ base, steep angle fault extends length of bed.
-338 Lt. med. gr. dol; banded; fract. 336½-37; dol. breccia 337; lt. shear 37½-38.
-344 Dk. med. gr. dol; cherty 39-40; FeS shine 340; med. scatt. ss 39½-40½; lt. scatt. ss 40½-41; str. fract. thruout.
-359 Dk. gr. dol; spott; str. fract. thruout; small bed. plane faults; ½% FeS est. 350-50½ in wgf; 3/4% FeS est. 352-53 in wgf; ½% FeS est. 356½-58½.
-359½ Fault gangue; FeS shine.
-362 Lt. med. gr. dol; lt. fract. thruout; 3" fault breccia @ base, FeS shines in breccia.
-370½ Dk. med. gr. dol; ~~[illegible]~~ Mott; silic; lt. ss 370-70½; med. ss @ base; str. fract. @ 61-62; 69; ½% FeS est. in wgf. @ 366½-67; FeS sh. @ 368 in wgf.
-380 Dk. med. gr. dol; lt. mott; spott; TBS @ 373 & 76; rubble breccia @ 371½ & 72-73½; low angle fault (breccia) @ 377½; FeS sh. @ 73-73½ & 80, in wgf.
-381 Lt. gr. dol; fract. thruout.
-382 Med. gr. dol; str. mott; v. silic; (cherty) chert nod @ base.
-385½ Semi re-xl; med. gr; lt. mott.
-386 Bedded chert; highly fract.
-386½ Lt. med. gr. dol; fract; silic.
-387 White chert; brecciated -3% FeS Est.
-391½ Lt. med. gr. dol; lt. banding; str. fract. 387-88½, fault gangue 388½-89; fault steep dipping, extends to 390; wgf @ 390; crackle @ base.
-395 Lt. gr. dol; lt. mott; breccia 393½-95, wgf; FeS sh. 393½-94.
-395½ Blue and white breccia. chert; fract's wgf; FeS sh. near base, occurs along fract. planes
-398½ Med. gr. dol; banded; rubble breccia thruout; chert nod @ 397; FeS sh. @ 96½-98.
-399 Cherty fault gouge; FeS shine @ base.
-406½ Med. gr. dol; rubble breccia 399½-400; fract. 400-01; rubble breccia @ 401-03; wgf FeS sh. @ 399½; ½% FeS est. 403-04½ & 05-05½, FeS in wgf; 6" silic. grn. shale & 2" dol. chert @ base.
-407 Semi re-xl; gr. brn.
-409 Med. gr. dol; str. mott; silic; str. fract. 407½-08½, 4" cherty fault gouge @ 408.
-410½ Lt. gr. dol; banded.
-413 Dk. med. gr. dol; lt. band; fract. 409-10; TGS & 1" hvy. ss @ base.
-417 Lt. med. gr. dol; blue mott; sheared 416-17; 2" fault gouge @ base.
-419½ Dk. med. gr. dol; banded; shearing 418-18½; lt. scatt. ss 419-19½; silic 419-19½.
-422 Lt. med. gr. dol; mott; v. str. mott. 421-21½; lt. ss @ 421½-22.
-422½ Brecciated chert.
-430 Lt. med. gr. dol; vuggy 422½-23½; ch. nod @ 24; fract. @ 27½.
-435 Med. gr. dol; mott; TGS @ 431; rubble @ 432-33; FeS shine @ 432.
-438 Dk. gr. dol; mott; crackle 435-35½, 436½-37; spott. 435-35½; lt. shear 436-37½.
-441 Dk. med. gr. dol; lt. banding; med. scatt. ss 440½-41; TGS & 3" ch. @ base; wgf 440½-41; rubble 438½; crackle 438-39.
-445 Lt. gr. dol; crackle 442-43.
-447½ Lt. med. gr. dol; str. mott; 446-47½ med. hvy. ss; edgewise congl. 47-47½; lt. fract. thruout; some CM @ base.
-455 Med. gr. dol; str. crackle thruout; rubble 450-51; 452½-54½; rubble contains many diff. dolo; much sandy dol; more ch. spott. 451-51½; FeS sh. 450-50½.
-460 Dk. gr. dol; spott; rubble 457½-58; str. crackle 458-60.
-461½ Dk. med. gr. dol; hvy. ss 461-61½; crackle thruout.
-462 Brecciated oolitic chert; w/sand dike.
-468 Med. gr. dol; lt. banding; shaly 464-64½; lt. ss 62-62½; rubble 62-72½; crackle 62½-63 & 467-67½; fault breccia 463½, steep angle.
-474 Dk. gr. dol; mott; spott. 469-70; crackle 69½-70 & 72½-73; lt. fract. 70-72½.
-476 Med. gr. dol; 2" hvy. ss @ 475; 1" hvy. ss & 1" GS & 1" ch. @ base; lt. fract. thruout.
-478 Dk. med. gr. dol; sugary; str. mott; chert nod @ 477; 1" ch. @ base.
-479 Lt. med. gr. dol; banded.
-483½ Med. gr. dol; lt. band; lt. spott. thruout; bed. angle; lt. fract. thruout; str. crackle 480-81 & 81½-82.
-486½ Dk. med. gr. dol; TGS @ base; crackle 484½-86; rubble 486-86½.

-492 Med. gr. dol; banded; TGS 486 3/4; ch. nod 487½-89; thin fault breccia 487½-88; crackle 488-89½; rubble 489½-90; steep angled fault 491-91½; fault gouge.
-493½ Lt. med. gr. dol; lt. band; fract. thruout.
-497½ Med. gr. dol; TGS @ base; lt. fract. 493½-95; str. shear 495-96½.
-503½ Dk. gr. dol; sugary; lt. fract. thruout; rubble 503-03½; WG filled, some grn. silic.material.
-510 Dk. med. gr. dol; lt. mott; spott. @ 508; TBS @ 506 & @ base; str. fract. 506-07½.
-512 Med. gr. dol; hvy. ss @ base; some CM; sand dikes (?) length of bed; rubble 510-10½; crackle thruout.
-516 Med. gr. dol; banded; hvy. ss @ 513 & @ base & CM @ base(?) & 2" oolitic chert-dol; breccia 512½, 14½, steep angled fault.
-522 Dk. med. gr. dol; spott.517-19; steep angled fault (breccia) 516-17; WGF 520½-21, some grn. silica & FeS shine @ 521.
-523 Lt. med. gr. dol; str. crackle thruout.
-524 Fault gouge; fault plane steep angle (75°∠)
-525½ Lt. gr. dol.
-529 Med. gr. dol; 527½-28 dol. breccia; lt. fract. 527-27½ & 28.
-533 Lt. med. gr. dol; mott; TBS @ 529½; dol. breccia 529½-30½; spott. 530½-33; 6" rubble breccia @ base; WG filled & grn. silica.
-537 Lt. gr. dol; banded; 2" fault breccia WG & grn. silica; @ 535-36½; FeS sh. @ 535.
-541 Med. dk. gr. dol; brecc. 537-38, 539-41; some silica gangue; est. ¼% FeS 539-41.
-547½ Lt. gr. dol; mott; shears 541-41½.
-556½ Med. gr. dol; crackle to 550½; brecc. 554-56½ w/est. ¼% FeS; chert nod 554½.
-560 Lt. med. gr. dol; lt. crackle.
-565 Lt. gr. dol; 564-65 mott.
-580 Med. to lt. med. gr. dol; crackle 568-68½; brecc. 570-74 w/occ. FeS sh; crackle 74-80.
-581 Med. dk. gr. dol.
-582½ Med. gr. dol; hvy. sands.
-583 Med. dk. gr. dol.
-594 Med. gr. dol; chert nods 583, 84; band. 84-88 & brecc; est. 1% FeS 86-87; hvy. sands 87-88 w/chert nod 588; mott. 588-88½ w/hvy. ss 588½.
-595 Dk. gr. dol.
-600 Med. gr. dol; v. banded 595-97½; brecc. 596-97½ w/FeS sh; brecc. 99-600 w/est. 1%FeS; sand @ 600.
-602 Lt. med. gr. dol; crackle; 601½-02 hvy. sands.
-606 Med. gr. dol; brecc; sandy; FeS shine 605½.
-614 Lt. med. gr. dol; brecc. 609-11 w/some sands; 612-13½ sand congl; shears 613½-14.
-618½ Med. gr. dol; brecc. 614-17 w/some black sands; 1% est. FeS 614-15; crackle 617-18½.
-619 Silica & chert.
-621 Lt. med. gr. dol; brecc. to 621 w/est. 4% FeS 619½-20½; cherty & tr. ss @ 621.
-622½ Lt. gr. dol; banded.
-638 Lt. med. gr. dol; brecc. 622½-24 w/some re-xl gangue; several chert nods 624½-25½; crackle 624-27 w/TGS 25½ & FeS sh. 25½; est. 1% ZnS 25½-27 w/thin ss 27; brecc. sealed w/shale 27-27½; brecc. 28-29½ pt. sealed w/re-xl & occ. FeS sh; few ss grn's 39½; brecc. 30-32½ w/est 2% FeS; crackle 32½-36 w/FeS sh. 35; large chert nod 35½; brecc. 36-38 w/est. 2% FeS; ch. nod 637.
-639 Lt. med. dol; sugary; w/many specks of white silica.
-642 Lt. gr. dol.
-643 Lt. med. gr. dol; brecc.
-645½ Lt. gr. dol; banded; brecc. 645-45½ w/est. 1% FeS.
-656 Lt. med. gr. dol; mott; brecc. w/est. 2% FeS 648-49; crackle 646-48; brecc. 652-56 w/FeS sh. 652-52½; ZnS sh. 653½; chert nods 654½, 655, 655½.
-657 Lt. gr. dol; brecc. w/est. ¼% FeS.
-660 Lt. med. gr. dol; crackle.
-664 Lt. gr. dol; brecc. 661-62 w/est. 3% FeS; brecc. 662-64 pt. sealed w/re-xl.
-669½ Lt. med. gr. dol; mott; crackle to 666.

-672 Med. gr. dol; weak brecc. w/FeS shine 669½ & chert nod 670.
-673½ Lt. med. gr. dol; lt. mott; lt. crackle; est. ~~1% ZnS 672½-73~~.
-676½ Med. gr. dol; crackle brecc. w/some chert fragments.
-678½ Lt. med. gr. dol; lt. banding; chert nods 678, 78½.
-688 Med. gr. dol; 4" brecc. @ 679 w/many chert fragments; occ. thin brecc. zones to 681. 681-84 brecc. sealed w/re-xl & chert fragments; large chert nod 682; 684-88 brecc. w/ re-xl & white gangue; large chert nod 687.
-689 Lt. med. gr. dol; top 1" many specks of silica; crackle 688-88½ w/est. 1% ZnS.
-692 Med. gr. dol; crackle 689-89½ w/FeS shine @ top then ZnS shine; chert nod 689½; from 689½-90 brecc. sealed w/br. re-xl; crackle brecc. 690-92 w/ZnS shines 690½-91.
-711½ Lt. med. gr. dol; 3" brecc. @ 695 w/tr. ZnS; chert nod 695½; from 697-98 brecc. w/ gangue & br. re-xl; occ. crackle w/gangue 698-700 w/large chert nod @ 700 from 702-05 brecc. sealed w/dk. re-xl & chert fragments; sand grains 705-05½; from 706½-09 brecc. sealed w/re-xl & chert fragments; crackle brecc. 709-11½ & sand 09-10 & sev. chert nods 710-11½.
-714 Med. gr. dol; some brecc. sealed w/gangue, re-xl & chert fragments.
-718 Lt. gr. dol; lt. banding; tr. flourite @ 718.
-719 Lt. med. gr. dol; brecc; cherty.
-720 Med. gr. dol.
-721 Lt. med. gr. dol; chert nod @ base.
-724 Med. dk. to med. gr. dol.
-731½ Dry brecc; lt. & med. gr. dol; sealed w/dk. cherty re-xl; occ. gangue filled crackle.
-733 Dk. re-xl & semi re-xl.
-738 Lt. re-xl; fine grained to semi re-xl; lt. crackle.
-744½ Alternating blocks of med. gr. & lt. gr. dol; some bands of dk. re-xl.
-750½ Lt. gr. dol; chert nod 749; tr. re-xl 749½.
-751½ Dk. re-xl; chert nod 751 then 6" grn. shale.
-753½ Lt. med. gr. dol; thin as 752½; v. sugary & mott. w/crackle 752½-53½ w/TGS 753½.
-754½ Lt. re-xl.
-763 Blocks of dk. & lt. med. gr. dol; 6"-12" thick; TGS 761; dk. re-xl 762½-63.
-764 Med. dk. gr. dol; brecc. & sealed w/dk. re-xl.
-765 Dk. re-xl; chert nod 765.
-765½ Br. spotted re-xl; chert nod 765½.
-768 Lt. gr. dol; brecc.
-771 Lt. re-xl.
-776 Dk. cherty re-xl.
-777 Lt. re-xl; chert nod 777.
-778 Lt. med. gr. dol; w/many chert nods & crackle.
-781½ Br. re-xl; chert @ top; from 778-83 horizontal joints.
-782½ Dk. cherty re-xl.

-785½ Lt. re-xl; v. cherty 783-83½; crackle.
-790½ Dk. re-xl; chert nods 787, 88.
BASE KINGSPORT FM. 790½
-798½ Med. gr. dol; 790½-91½ brecc. sealed w/re-xl; grn. shale & gangue; 791½-98 crackle; 798-98½ brecc. w/some chert fragments.
-799 Lt. br. re-xl.
-800 Med. gr. dol; crackle.
-800½ Med. gr. & lt. med. gr. dol; mott; brecc. sealed w/chert, re-xl, shale & gangue.
-802 Lt. med. gr. dol; mott; crackle to brecce
-802½ Lt. re-xl.
-803½ Med. gr. dol; large chert nod 803-03½.
-804½ Lt. med. gr. dol.
-805 Dk. re-xl & chert.
-808 Med. gr. dol.
-810 Lt. br. re-xl; 6" chert nod @ 809.
-811 Lt. gr. dol; chert nods 810½, 11.
-812 Lt. med. gr. dol.
-813½ Br. cherty re-xl.
-817 Med. gr. dol. (814½-15 re-xl)
-818 Br. cherty re-xl; large chert nod @ base.
-824 Lt. med. gr. dol; large chert nods 819½, 23.
-830 TD Lt. br. re-xl; cherty; brecc. chert nod 825½; scatt. ss grains 828; large chert nod 829½.

NATIONAL LEAD CO. D.D. CC-4

Copper Ridge Project-Luncheon Camp Creek

DMEA Idm-E 1088

Hole No: CC-4

Farm: D.F. Coffman

Loc: N 47,711.17
E 43,287.61

Elev: 1440.57

Drilled By: Joy Mfg. Co.

Logged By: W.Hill, J. McDonald, J.Spears

Collared: 10-26-57

Bottomed: 11-12-57

Depth: 754'

Casing: BX 18'; AX 31½'

Reaming: None

Cement: None

Water Table: 40'

-18 Overburden
-23 Med. dk. gr. dol; mott. to well mott; cavity 19-20.
-25 Med. gr. dol; sec. chert 24-24½; cherty to 25.
-26 Lt. gr. dol; sand @ base; banded.
-29 Med. gr. dol; ½" TGS 28½; v. mott. 28½-29.
-33½ Lt. med. gr. dol; lt. mott.
-40 Lt. gr. dol; few large eyelets to 35; then banded to 36½ w/thin sands 36-36½; thin ss 38½; banded 38½-39; mott. 39-40.
-41 Cavity
-42 Med. dk. gr. dol; v. mott; chert nod @ base.
-44 Lt. gr. dol.
-46 Med. dk. gr. dol; banded.
-51½ Lt. gr. dol.
-53 Cavity
-64 Lt. med. gr. dol; banded to 56½; thin sands 56-56½; sli. ox. to 63, fault 63-64.
-66 Lt. gr. dol; thin ss 66.
-70½ Lt. med. gr. dol; tr. of crackle w/FeS shine @ 69; banded 69-70½; hvy. sands 70-70½ w/TGS @ base.
-75 Med. gr. dol; banded to mott.
-79 Lt. med. gr. dol; sand @ top; eyelets 78-79.
-81 Med. dk. gr. dol.
-82 Lt. med. gr. dol.
-82½ Med. gr. dol; mott.
-85 Lt. med. gr. dol; lt. mott; 1" CMss @ 85.
-93 Lt. to lt. med. gr. dol; v. sandy 91½-93.
-95 Dk. gr. dol.
-96 Med. dk. gr. dol; v. mott; chert nod @ base.
-97 Lt. med. gr. dol; v. mott.
-101 Med. dk. gr. dol; v. mott. & banded to 100.
-103 Med. gr. dol.
-106 Lt. gr. dol; some congl. top foot.
-107½ Med. gr. dol.
-112½ Dk. gr. dol; lt. banding.
-114 Med. gr. dol; well mott.
-115½ Lt. med. gr. dol; banded; v. sandy; TGS @ base.
-119 Lt. gr. dol.
-124 Lt. med. gr. dol; lt. mott.
-128 Med. gr. dol; mott.
-129 Lt. med. gr. dol.
-132 Med. gr. dol; vuggy to 130, chert 131-32.
-135½ Lt. med. gr. dol.
-136½ Med. gr. dol.
-139½ Med. gr. semi re-xl; v. mott.
-140½ Dk. gr. dol; mott.
-144 Lt. med. gr. dol; lt. banding.
-148½ Lt. gr. dol; mott. to 145 w/thin ss 145; well banded 145-48½.
-150½ Lt. med. gr. dol.
-154 Med. gr. dol.
-155½ Med. dk. gr. dol.
-156½ Lt. med. mott. semi re-xl.
-160½ Lt. gr. dol.
-165 Lt. med. gr. dol; well banded.
-171 Med. gr. dol; v. mott. to 167; then lt. mott. to 170.
-180 Lt. med. gr. dol; few eyelets 172-73; mott. 178-80; sandy 179-80 w/3" CMss @ 180.
-184 Brown. chert sealed w/chert.
-186½ Lt. re-xl; (2' core loss 182½-87½).
-187½ Lt. med. gr. dol; sandy; chert nod 187.

-188 Lt. med. gr; scatt. ss thruout; 2" hvy. ss & chert & grn. shale @ base; mott.
-193 Lt. gr. dol; banded; ss thruout; hvy. ss @ 191.
-197 Med. gr. dol; vuggy near top.
-202 Dk. gr. dol; mott. & banded; TGS @ bottom.
-208 Lt. gr. dol; mott; TBS @ base.
-209 Med. gr. dol; sli. mott; black chert nod @ 209.
-212 Dk. gr. dol; hvy. mott; shaly @ base.
-212 Lt. med. gr. dol; sli. mott; TGS @ base & 8" hvy. ss.
-215 Lt. med. gr. dol; sli. mott.
-216 Dk. gr. dol; TBS @ base.
-217 Lt. gr. dol; lt. ss thruout.
-232 Med. gr. dol; hvy. mott; TGS @ base.
-233½ Lt. gr. dol; TBS @ base.
-241½ Dk. gr. dol; black shale bands; TBS @ base.
-244½ Dk. gr. dol; hvy. mott; shaly; shale @ base.
-256 Med. gr. dol; hvy. mott. 245½-47½; shaly; sli. mott. thruout.
-261 Lt. gr. dol; banded; hvy. ss 257-57½; CM @ 257; sand dike @ 257½.
-263 Lt. gr. dol; banded; TBS @ base.
-265 Med. dol; mott. vug @ 264½; scatt. ss 264-65 & hvy. ss @ 265. 1" sh. @ base.
-269½ Lt. gr. dol; lt. mott; 268½-269½ scatt. ss; hvy. @ base.
-272½ Lt. gr. dol; holothurian texture.
-277½ Lt. med. dol; scatt. ss @ base; white chert nods @ 272-72½; small chert nods & frags. 270½-278; vuggy @ 275.
-279 Lt. gr. dol; silic; sandy thruout; sugary (xl).
-281½ Sac. chert & re-xl; chert is dolomitic.
-282 Med. gr. sand re-xl; mott; chert nod @ 282.
-284½ Med. gr. dol; mott; spotted.
-291½ Dk. mott. dol; spotted; siliceous 287½-290; lt. ss @ base; lt. shear @ base.
-292 Lt. gr. dol; sandy; hvy. ss @ base.
-294 Med. gr. dol; mott.
-297 Dk. gr. dol; mott. 294-95½; lt. ss 295½-97.
-298 Lt. dol.
-305 Dk. gr. dol; hvy. mott; silic; spotted.
-311 Med. gr. dol; mott.
-313½ Lt. gr. dol; banded; chert nod @ 311½; shear (hvy.) 313-13½, low angle; strong fault 13
-317 V. dk. gr. dol; lt. mott; lt. fract. thruout.
-319 Dk. gr. dol.
-322 Med. gr. dol; hvy. mott; TGS @ 319½; TGS @ 320, 21; 21½, lt shear; TBS @ base.
-329½ Lt. gr. dol; 323 3" hvy. sand; 323-24 vuggy; scatt. shears 24-24½.
-333 Med. to dk. dol; mott; spotted; 330-31 lt. scatt. shear.
-335 Re-xl; brecc. coarse.
-337 Med. gr. dol; lt. band.
-339½ Dk. gr. dol; strongly mott; fract. thruout; lt. sand & chert & GS @ base; low ∠ fault.
-345 Lt. gr. dol; faint blue mott; faint banding; lt. scatt. ss 344-45.
-347 Med. gr; strong mott; shears (lt.); TBS @ base.
-350 Lt. gr. dol; blue mott. & ba nd; scatt. steep angled fract. thruout.
-351 Med. gr. sand re-xl; blue-white chert bed @ base.

-354 Solid lt. chert; FeS shine 352; base in TBS and FeS shine (½% est.).
-357½ Med. gr. dol; weak breccia @ 355, weak fault zones @ 355½ & 366½; chert nod @ 355½-357; spotted @ base.
-358½ Fault breccia, chert & dol; filled also white gangue; Est. 1% FeS 357½-358½.
-363 Dk. gr. dol; fractured @ 358½-359 and lt. fractured @ 362½-363.
-364 Chert breccia @ 358-363; white chert band, & TGS @ base; 363½-64 mush grn. silica.
-371 Lt. gr. dol; banded; lt. shear @ 366 and 369½.
-373 Lt. gr. dol; mott; TBS @ base.
-377 Med. gr. dol; sugary; 376½-77 ss; hvy. ss & TGS @ base.
-383½ Lt. gr. dol; mott.
-389½ Lt. gr. dol; mott; 384-84½ med. ss; grn. shale @ 385½.
-395½ Lt. gr. dol; banded; 393½-95½ blue mott.
-403½ Med. gr. dol; mott; few spots; TGS @ base.
-407 Lt. gr. dol; banded; 406½-07 scatt. ss; 2" bed of chert @ base.
-410½ Lt. gr. dol; mott.
-411 Oxid, fault breccia, 2% FeS est.
-413 Re-xl; 412-13 weak fault breccia; steep angled 515; edgewise congl. @ base.
-416 Lt. med. gr. dol; spotted thruout; lt. fract. @ 413-14; 415-16.
-419 Med. dk. dol; mott; thin fault gangue @ 416½; fract. 416-17; 417½ TBS.
-429 Dk. gr. dol; spotted; lt. mott. thruout; TBS @ 419, 423½, 425, 426½; lt. ss, 1" white sandy chert @ base (OM?); chert nod @ 418, str. shear, fault breccia @ 423½.
-430 Lt. gr. dol; hvy. ss @ 429½, 429 3/4; sand dike @ 29½-29½; 2" gr. shale @ base.
-436 Lt. med. to med. gr. dol; mott; dol. breccia @ 431(?); spott. & vuggy 433½-44; lt. shears weak bed. plane; fault 432½-33½.
-439 Dk. dol; sugary; crackle thruout; faulted length of bed, vertical.
-442½ Lt. med. gr. dol; banded; lt. ss thruout; hvy. ss; BS @ 441; (OM?) 3" hvy. ss; TBS @ base
-443½ Dk. med. gr. dol; mott; silic.
-444½ Lt. med. gr. dol; mott; 1" gr. shale @ base.
-448 Lt. gr. dol; banded; shearing @ 445-46; shearing, fault breccia @ 447½.
-451½ Dk. med. gr. dol; shearing thruout; TBS @ 450; crackle @ 450-51½; 4" BS @ base.
-453½ Med. gr. dol; mott; lt. shears thruout; spott. 453-53½; 2" fault gouge @ base; fault plane @ 450.
-455 Lt. gr. dol; banded; lt. shearing thruout; fault breccia @ 454½; fault plane vert.
-457 Med. gr. dol; banded; TBS @ 456½-57; fault breccia 55-55½, fault plane vert.
-460 Dk. gr. dol; banded & mott; 3" BS @ base.
-466 Dk. gr. dol; lt. mott; BS @ base; shearing @ 461-65.
-468½ Dk. med. dol; banded; str. crackle breccia @ 466-67; vert. fault extends from top to base, weakly oxid; thin sand @ base.
-469 Lt. gr. dol; sandy; OM @ 468½-3/4.
KINGSPORT
-471½ Dk. gr. dol; lt. mott; sand dike @ 469; thin ss @ 470; crackle 469-70; dol. breccia @ 470; shearing 470½-71½; TBS @ base.
-480½ Lt. gr. dol; shear 477-79.
-482 Dk. gr. dol; mott; TBS @ base.
-484½ Lt. gr. dol; lt. mott; steep angle (minor) fault 482-82½; TBS @ base.
-486½ Dk. gr. dol; banded; TBS @ base.
-491 Lt. gr. dol; mott. & spott. 490-91; 2" med. ss @ 486½; then dol. breccia (½") @ 487½.
-495 Dk. med. gr. dol; mott; chert nod 493-96; crackle 93-94.
-500 Lt. med. dol; banded; blue chert (nod?) @ 496-96½-97, 98½-99; spott. 97-98.
-501 Dk. gr. dol; banded; shaly.
-504 Med. gr. dol; spott. thruout; TBS @ base.
-506 Med. gr. dol; 505½-06 shaly.
-509½ Med. gr. dol; mott; lt. shear 508-09½.
-510 Dk. gr. re-xl (?) fine grained.
-513 Med. gr. dol; lt. crackle 511-12; 512-13 fault; lt. sand, pebbles; & 2" blue chert @ base.
-516 Med. gr. dol; chert nod & hvy. ss @ 514½; str. crackle @ 513-13½ & 514-14½.

-419 Dk. gr. dol; lt. banding; last 4" brecciated chert, fault.
-520 Med. dk. gr. dol; str. mott; (holothurian structure).
-522½ Dk. gr. dol; banded; TBS @ 421½-22.
-524½ Lt. med. gr. dol; str. shear @ 423; TBS @ 423½.
-528½ Lt. med. gr. dol; lt. mott; TBS & TGS @ base; lt. shear @ 427.
-533½ V. lt. gr. dol; lt. mott; TBS @ base.
-537½ Lt. gr. dol; lt. banding; chert nod 435½ to base; lt. dol. breccia @ 434-34½.
-545 Lt. med. gr. dol; str. banding; chert nod 437½-39; lt. ss @ 440½, 444½-445; spott. 441½-base; TGS & chert @ base.
-546 Med. gr. dol; mott; silic; chert nod @ 445 3/4; scatt. ss & pebbles @ base; WBP @ 446.
-546½ Brecciated chert.
-549 Lt. med. gr. dol; 3" GS & 3" chert @ 448½-49; TGS @ base; lt. crackle @ 448.
-553½ Lt. med. gr. dol; crackle 550-51.
-563½ Lt. med. gr. dol; banded; chert nods 556-57½, 560 thru 563½; lt. ss @ 556½ & 560-60½; crackle 554-55, 557 & 63½; ½% FeS est. 554-54½.
-567 Lt. med. gr. dol; 2" chert @ 566; scatt. ss 566½-67; 1" congl. @ base; vuggy 564-64½.
-569½ Med. gr. dol; mott; sugary texture; silic. grn . shale 567½-568.
-576 Med. gr. dol; spott. 570-71½; scatt. ss, TGS @ 573; TBS @ base; lt. fract. 575½-76½.
-578½ Lt. gr. dol; banded.
-582 Lt. gr. dol; str. shear 579-80½.
-584½ Lt. med. gr. dol; banded; crackle @ 582½; rubble 83-83½; 2" fract. chert @ base.
-591 Med. gr. dol; TBS @ 589; crackle 584½-85; FeS sh; str. shear 590-90½.
-594 Med. gr. dol; mott.
-596½ Lt. med. gr. dol; fract. 594½-95½; crackle 596-96½.
-599½ Lt. med. gr. dol; banded; scatt. ss @ 599; mott. 599-99½.
-604½ Lt. gr. dol; banded; lt. scatt. ss 604-04½; ch. nod @ 02; 2" GS @ base; steep angle fault 602½-03, 3" fault gouge 603.
-607 Lt. med. gr. dol; chert nods 605-06; crackle 605½-06.
-610 Med. gr. dol; fract. thruout; low angle fault @ 609, 2" fault gouge; t. brecciated chert bed @ base.
-612½ Lt. gr. dol; lt. mott; fract. thruout; TBS; 1" chert @ base.
-616½ Med. gr. dol; crackle 613½-15; 2" fault breccia 614½ & 616½, FeS sh. 614½.
-622½ Med. gr. dol; banded; thin hvy. sand @ base; fract. 617½-18½; str. crackle 617½, FeS sh; 621-622½ rubble breccia; FeS sh. @ 622½.
-624 Lt. med. gr. dol; rubble 622½-23; crackle 623-24; ½% FeS 622½-24; 2" fault breccia @ base.
-626½ Med. gr. dol; TGS @ base; rubble breccia thruout; ½% FeS est. 624-25; ½% 626-26½.
-629 Brown-grey re-xl; fault breccia 626½-27; 628½-29; TBS @ base; FeS sh. @ 627-29.
-631½ Inter-bedded brown & gr. re-xl; & gr. dol; mott.
-632 Lt. med. gr. dol.

-63[illegible] Med. gr. dol; sugary to semi re-xl; mott; 3" TGS @ base.
TOP "R" BED 638½.
-64[illegible] Br. re-xl; silic; 639½-40 cherty & sandy; fault 641½-42½.
-65[illegible] Lt. gr. re-xl; brecc. chert nod @ base w/FeS shine.
-65[illegible] Lt. med. gr. dol; brecc. occ chert nod; FeS shine.
-65[illegible] Br. re-xl; grn. shale 653½-54; occ. brecc. w/FeS shines; 1% FeS sat. 656-57½.
-66[illegible] Lt. gr. dol.
-66[illegible] Dk. gr. dol.
-66[illegible] Med. gr. dol.
-66[illegible] Re-xl & darker gr. dol.
-671 Med. dk. gr. dol; crackle.
-674 Med. gr. dol; chert 673½-74; crackle.
-677 Lt. med. gr. dol; some crackle w/some re-xl gangue; banded.
TOP "S" BED 677.
-679½ Br. re-xl; v. silic.
-687 Br. to gr. re-xl; crackle to 686, then brecc. 686-87 w/sat. 3" FeS.
-689½ Lt. gr. fine grained re-xl to semi re-xl; chert 689-89½.
-691½ Lt. med. gr. dol; sugary; brecc. sealed w/re-xl; sat. ½% FeS 690½-91.
-693 Br. mott. re-xl; cherty @ 692½-93.
-697 Lt. br. re-xl.
-704½ Br. re-xl; brecc. 700-04½ w/FeS shines 701, 704.
-707 Lt. med. gr. dol; crackle brecc; FeS shine 707; thin ss 707.
-708 Chert, silica & re-xl.
-712 Lt. coarse re-xl; band of dk. silica @ base.
-713 Br. re-xl; mott.
-714 Lt. coarse re-xl; brecc; tr. of FeS.
-728 Lt. br. re-xl; crackle 714½-15½ w/FeS shine 715½; occ. crackle to 722 w/chert nod 722; crackle to brecc. 722-28½, shaly @ base.
-729½ Dk. br. re-xl; mott; crackle.
BASE KINGSPORT FM. 729½
-731 Lt. med. gr. dol; occ. crackle.
-741½ Med. gr. dol; crackle 731-34½; FeS shine 737; crackle w/sat. ½% FeS 741-41½.
-742½ Lt. gr. re-xl; crackle.
-748 Med. gr. dol; crackle w/sat. ½% FeS 742½-744; crackle 745-48½; sat. 1% FeS 746½-48½.
-752 Lt. med. re-xl to semi re-xl; mott.
-754 TD Med. gr. dol; mott; brecc. [illegible] w/sat. 1% FeS 752-53.

NATIONAL LEAD CO. D.D. CO-5

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: CO-5

Farm: (d.f.) Coffman

Loc: N 48,040.81
E 43,058.72

Elev: 1483.11

Drilled By: Joy Mfg. Co.

Logged By: J. Spears

Collared: 11/15/57

Bottomed: 11/27/57

Depth: 490

Casing: BX 62; AX 80

Reaming: None

Cement: None

Water Table: ?

Top Kingsport	197
Top R Bed	366½
Top S Bed	419
Base Kingsport	468

0-62 Overburden

-101½ Lt. med. gr. dol; (some lt. gr.) banded 62-63; chert nod 65½-66 (6½' core loss 65½-73) banded 74-75½ (1' core loss 73-75½) (3½' core loss 75½-80), chert nods 75½-82 w/large nod 81½-82½ (1' core loss 80-82) chert nod 85, 86, 89, 90; thin fault 86½; Cavity 90-96; mott. 96-100½ w/shears at 98½ & 100; FeS sh. in lt. crackle @ 100½; SCATT. SS GRAINS 100½-01½.

-103 Med. gr. dol; mott.

-106½ Lt. med. gr. dol; lt. mott; fault 104-05½.

-107½ Lt. silicl re-xl; mott.

-108½ Lt. med. gr. dol; mott; sheared; TGS @ 108½.

-109½ Lt. gr. dol; fault.

-111½ Lt. med. gr. dol; mott; crackle w/FeS sh. 110-110½; chert nod 110½; fault 111½.

-112 Semi re-xl; v. cherty.

-119½ Lt. gr. dol; shears to 114½.

-127½ Med. gr. dol; mott. to 122, then mott. & silic. eyelets to 127½.

-131½ Lt. med. gr. dol; lt. banding to 130; thin sands 130-31½ w/1" GM then TGS then 2" blue chert @ base

-135 Lt. gr. dol; mott. 133-34.

-136½ Chert w/2" sand [illegible] oolite @ base.

-140 Lt. gr. dol; mott. w/few eyelets; TGS @ base.

-146½ Med. gr. dol; mott; some eyelets pt. silic.

-149½ Lt. med. gr. dol; mott; ox. shear @ base.

-150½ Med. dk. gr. dol; mott; sugary.

-152 Med. gr. dol; lt. banding; str. sands 51½52 w/large oolitic chert nod 152.

-160 Lt. med. gr. dol. to lt. gr. dol; 3" grn. shale & re-xl @ 154; 57-60 sli. darker.

-163 Med. gr. dol; v. mott; sugary.

-167 Lt. gr. dol; sandy bott. 4 inches w/½" TGS @ base.

-170 Med. gr. dol; v. mott.

-171½ Lt. med. gr. dol; few ss grains 170½ & silica 170½-3/4.

-177 Med. gr. dol.

-182 Lt. med. gr. dol; to med. gr; mott; chert nod @ 181, 182.

-185½ Lt. gr. dol; lt. banding.

-195 Med. dk. gr. dol; mott; fault 192-93.

-197 Med. gr. dol; banded.

TOP KINGSPORT 197'

-200 Lt. med. gr. dol; thin ss @ top & @ 198; TGS 198; lt. mott. 198-202 w/2" shale @ 202.

-204 Med. gr. dol; mott; sugary to semi re-xl.

-208 Lt. gr. dol.

-210 Med. gr. dol; mott; shale bott. 4".

-215 Lt. med. gr. dol; mott. to 213 w/TBS's @ 213 & 15.

-219 Lt. gr. dol; sandy top 6"; TBS 219.

-222 Lt. med. to med. gr. dol; ½" TBS @ base.

-224½ Med. dk. gr. dol; v. mott; chert nod @ 223.

-236 Lt. med. gr. dol; banded; chert nods 228, 28½, 29½ & 30; sandy 32-32½; TGS 236.

-239 Med. gr. dol; mott. to 237; lt. crackle 237-39.

-243 Lt. gr. dol.

-245 Lt. med. gr. dol; lt. crackle.

-247½ Lt. gr. dol.

-249½ Med. gr. dol.

-251 Lt. med. gr. dol; mott; oolitic chert nod 250½.

-253 Med. gr. dol; mott.

-265½ Lt. gr. dol; from 255½-59 mott. w/few eyelets; shears 259; from 262-67 ox. [illegible] breec.

-267½ Lt. med. gr. dol; ox. breec.

-270½ Lt. gr. dol; well banded; chert nods 268½; 270½.

-272½ Lt. med. gr. dol; well banded.

-274 Lt. gr. dol; banded; sandy 73-74 w/1" TGS @ base.

-276 Lt. med. gr. dol; mott; @ base 2" w/white specks; small chert nod @ base.

-285½ Lt. gr. dol; vert. ox. shear 75-79; chert nod 79; 1" TGS 79½; mott. 79½-80½; crackle 280½-84½ w/2 chert nods 284½.

-288 Lt. med. gr. dol; chert nods 286-86½.
-289½ Lt. gr. dol; well mott. to banded.
-295½ Lt. med. gr. dol; chert nods 290, 91½, 93, 94½, 95½.
-296½ Lt. semi re-xl; silic; 1" TGS @ base.
-308½ Lt. gr. dol; lt. banding; chert nods 300, 301, 302½.
-314 Lt. med. gr. dol; to 310½ mott. to banded w/chert nods 309, 10, 10½; chert nod 11½, 12½-13; brecc. 12-12½.
-328 Lt. gr. dol; banded 14-15; large dk. chert nod 18½; TGS 19; mott. 19-20; well banded 320-24, lt. banding 24-28.
-337 Lt. med. gr. dol; scatt. ss grains 29½-30; then TGS & large chert nod. (3' core loss 335-340) fault @ 337.
-341 Med. gr. dol.
-348½ Lt. med. gr. dol; crackle 44-45; chert nod (pt. oolitic??) 346½.
-354 Lt. gr. dol; lt. banding; occ. lt. crackle; chert nod 354.
-358½ Med. gr. dol; thin fault 355½; brecc. 355½-56½; crackle 356½-58½.
-360½ Lt. med. gr. dol; thin fault 359½; 360-60½ brecc. w/silic. & re-xl.
-362½ Med. to med. dk. gr. dol; mott; crackle 361-61½.
-366½ Lt. med. semi re-xl; mott.
TOP R BED 366½
-368 Br. re-xl & dk. grn. shale; brecc.
-369 Med. gr. dol; sugary; hvy. ss 369.
-370 LS: bands of grn. shale & ss & re-xl.
-371½ Dk. re-xl; top 9" shaly.
-373½ Lt. med. gr. dol; crackle.
-374 Br. mott. re-xl; crackle.
-375 Lt. gr. dol; brecc. w/shale & re-xl; some crackle w/gangue.
-375½ Lt. br. coarse jasporiod re-xl; some lt. grn. shale.
-377½ Lt. med. gr. dol; banded; crackle.
-336½ Lt. re-xl; mott; shears bott. 6".
-339½ Lt. gr. dol; sugary; chert nods 388, 88½ (1' core loss 88½-90½).
-391 Br. & grn. mott. re-xl.
-393 Lt. gr. semi re-xl; mott; crackle.
-434½ Lt. med. gr. dol; mott; sugary; crackle; 3" shaly re-xl @ 398.
-405½ Dk. re-xl; mott.
-409 Dk. gr. dol; chert nods 407½-08.
-411 Blk. silic. shale & some re-xl.
-414 Med. dk. gr. dol.
-415 Lt. med. gr. dol; mott.
-416½ Br. re-xl; sheared; large chert nod @ base.
-419½ Lt. med. gr. dol; crackle 16½-18½; brecc. 18½-19½.
TOP S BED 419½
-423 Lt. br. re-xl; 419½-23 silic. & cherty w/est. 2% FeS; cherty 22-22½.
-426 Lt. gr. fine grained re-xl; crackle; fault 425½-26.
-433½ Lt. med. semi re-xl; lt. mott. & lt. crackle; grading to dol; brecc. 29-33½ w/est. 4% FeS 432-33½; chert 433½.
-443 Lt. br. re-xl; cherty & shaly top 6"; lt. crackle w/occ. FeS shine.
-444 Lt. med. gr. dol; chert nod 43½; scatt. ss grn's 43½-44; some brecc w/re-xl & wht. gangue
-445 White silica w/est. 2% FeS.
-446½ Br. jasporiod re-xl.
-457½ Lt. gr. re-xl; from 49-51 dk. silic. & lt. grn. shale mix. w/re-xl; sandy 456; fault 57½.
-458 Lt. med. gr. dol; sheared.
-461 Lt. gr. re-xl; ½" TGS @ 458½; brecc. 60-61.
-467½ Lt. br. re-xl; mott. 61-64; several thin faults bott. 6".
-468 Lt. gr. fine grained re-xl; crackle.
BASE KINGSPORT 468
-470 Lt. gr. dol; lt. banding; cherty @ base.
-479 Lt. med. gr. dol; ~~SEE~~ mott. 70-71; grades to med. gr. dol; lt. crackle; chert nods 77-½.
-479½ Chert nods & some re-xl.
-485 Lt. med. gr. dol; top few inches semi re-xl; mott. 81½-85.
-490 TD Lt. re-xl; vert. fault along half the core 87½-89.

NATIONAL LEAD CO. D.D. CO-6

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: CO-6

Farm: D.F. Coffman

Loc: N 48,202.00
E 42,941.25

Elev: 1534.55

Drilled By: Joy Mfg. Co.

Logged By: J. Spears

Collared: 11/21/57

Bottomed: 11/27/57

Depth: 397

Casing: BX 87; AX 98

Reaming: None

Cement: None

Water Table: ?

RESULTS

Top Kingsport	97
Top R bed	271½
Top S bed	328
Base Kingsport	385

0-87	Overburden
-97	Med. dk. gr. dol; mott. & eyelt. to 94; lt. banding 94-97 w/thin sands 96-97 & hvy ss 97.
-103	Med. gr. dol; lt. mott; few ss grains @ 98½; dk. chert nod 103.
-111	Lt. med. gr. dol; well mott to 106; hvy. sands 07-07½; oxid. 07½-08; lt. mott. 09-11.
-112	Med. gr. dol; mott; shale bott. 2".
-115½	Lt. med. gr. dol; mott.
-117½	Med. dk. gr. dol; banded to mott.
-124	Lt. med. gr. dol; TGS 121; mott. 121-24; few ss grains 117½.
-127	Med. dk. gr. dol; well mott.
-135	Lt. med. (some lighter) gr. dol; 127-33 lt. banding w/thin fault 133; shaly 139½; v. mott. 139½-143½ w/3" of sandy chert @ 143½ then TGS; lt. mott. & crackle, 144-46½; sand & chert @ 46½; 46½-47½ v. mott. & silic w/hvy. ss & some oolitic chert nod 153; v. mott. & cherty 153-54.
-161	Lt. med. grading to med. gr. dol; well mott.
-170	Lt. gr. dol; lt. mott. 161-65½; chert nods 167½, 68, 68½, 69; banded 67-70.
-175	Med. gr. dol. (to. lt. med. gr.) banded; chert nods 170½, 71; tr. crackle 74½-75.
-178	Lt. med. gr. dol; banded & mott; sandy 176½-78; lt. crackle 76½-77.
-179½	Lt. med. re-xl to semi re-xl; v. silic & mott; 3" chert nod @ top; sandy & TGS @ base.
-194	Lt. med. gr. dol; v. lt. banding to 183 w/chert nod 183; eyelets 83-84; mott. 84-85; chert nod 87½; several cherts & few ss grains 90-90½ w/TGS 190½; lt. mott. 90½-94, 93½-94 sandy & chert fragments w/mod (oolite??) @ 194.
-202	Med. gr. dol; shears 198 (2' core loss 191-200) (3½' core loss 200-210).large chert nod @ 202.
-204	Lt. med. gr. dol.
-206	Lt. med. gr. dol; sugary; many white specks of silic & some ss grains; TGS @ base.
-216	Lt. gr. dol. (2' core loss 210-215).
-218	Lt. med. gr. dol; mott; lt. crackle; chert nod @ base.
-220½	Lt. gr. dol; chert nod 220; thin ss 220½
-226	Lt. med. gr. dol; 224-26 well mott.
-230½	Lt. gr. dol; lt. banding; scatt. ss grains bott. 6".
-231	Med. gr. dol; mott.
-236	Lt. gr. dol; (to lt. med.) banded; lt. crackle.
-237½	Lt. med. gr. dol. (to med.) 2" TGS @ top; chert nods 236½, 237; some ox. crackle.
-243	Lt. gr. dol; occ. large eyelets; shears 242-43.
-245½	Lt. med. gr. dol; ox. crackle; chert nod 245½.
-249	Med. gr. dol; some ox. crackle; chert nod 249.
-253	Lt. gr. dol; lt. banding.
-263½	Lt. gr. to lt. med. gr. dol; lt. crackle 253-55; scatt. ss grains then TGS @ 257; mott. 257-60; lt. banding 260-63½.
-264½	Grn. shale & silica w/few ss grains.
-265	Dk. br. re-xl; crackle.
-271½	Med. gr. semi re-xl to sugary dol; well mott; shaly top foot; 270½-71½; lighter gr. & breoc. sealed w/shale; 1" TGS w/FeS shine @ base.
	TOP R BED 271½
-273½	Br. re-xl; 272½-73½ v. shaly.
-274½	Lt. gr. re-xl.
-276	Br. re-xl; v. cherty & shaly & sandy to 275½; bott. 6" grn. sandy shale.
-277½	Dk. re-xl; v. cherty.
-279	Lt. med. gr. dol; mott; sugary; some breoc. w/re-xl top 6".
-280	Dk. br. re-xl; mott.
-283	Med. gr. dol; breoc. sealed w/much silic & shaly sandy re-xl.
-289	Gr. re-xl; mott; crackle; ZnS shines thruout est. 1% (2' core loss 80-89)
-296½	Lt. gr. dol; sugary (semi re-xl to 292) mott. w/vugs to 92; chert nods 92, 92½; lt. banding 92½-93½; mott. 93½-96½.
-297	Grn. & br. v. mott. re-xl.
-303	Med. gr. (to med. greenish) semi re-xl; crackle; est. 4% FeS 300-01.
-303½	Br. shaly re-xl.
-309	Lt. med. to med. gr. dol; sugary; crackle 305-08 w/FeS shine 307.

-310½ Dk. mott. re-xl.
-313½ Dk. gr. dol; crackle 310½-12½; brecc. 312½-13½; est. 3% FeS 311-15.
-316 Dk. re-xl; shaly & silic; 15-16 all dk. silic. shale.
-316½ Br. re-xl; brecc. sealed w/dk. silica & white gangue.
-322 Med. gr. to med. dk. gr. dol; sugary; 316½-18 brecc. w/re-xl & gangue; crackle 318-FeS shines 320½; 321½-22.
-323 Lt. med. gr. dol; sugary.
-325 Med. semi re-xl; chert nods 324½-25.
-328 Lt. med. gr. dol; crackle 326-28 w/FeS shine 326.
TOP "S" BED 328'
-332½ Br. re-xl; FeS shine 330; much jasporiod 330-32½.
-334 Med. dk. gr. dol; chert nod 333½; some crackle w/re-xl & gangue; est. 1% FeS 32-33.
-338 Med. gr. dol.
-340 Br. re-xl; est. 4% FeS 38-39; chert nod 339½-40.
-350½ Lt. br. re-xl; from 342-42½ mixture of chert nods, jasporiod & re-xl w/FeS shines; crackle to brecc. thruout occ. FeS shine & est. 3% FeS 347-50; silic. 350-50½.
-352 Dk. br. re-xl; mott; chert & FeS shine 352½.
-357 Med. gr. dol; mott; brecc. sealed w/gangue & re-xl; est. 3% FeS 352-54½; 55-57 the re-xl predominates.
-364 Lt. re-xl; much jasporiod 58-59; crackle; chert nod @ 364.
-366 Br. re-xl; crackle to brecc; est. 3% FeS 364-66.
-373 Lt. br. re-xl; crackle.
-377 Br. re-xl; FeS shine 373½; crackle.
-381 Lt. br. re-xl; crackle.
-385 Lt. gr. fine grained re-xl; mott; shears 384-85.
BASE KIRKSPORT FM. 385
-386½ Lt. gr. dol; lt. banding; TOP @ base.
-387 Lt. med. semi re-xl; TOP @ base.
-396 Lt. med. gr. dol; lt. banding; lt. crackle; chert nod 395; oolite nod 395½; large nod 396.
-396½ Br. re-xl.
-397 TD Lt. med. gr. dol.

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National Lead Company
P. O. Box 61
Thorn Hill, Tennessee

11-20-57

OUR NO.	MARK	DESCRIPTION	ZINC	IRON	LEAD	LIME	MOISTURE
782086	~~K5~~ 6-5-1		0.44				
087	~~K5~~ 6-5-2		0.10				
088	~~K5~~ 6-5-3		0.14				
089	~~K5~~ 6-4-1		0.38				
090	KL-6-1		0.20				
091	KL-6-2		0.06				
092	KL-6-3		0.24				
093	KL-6-4		4.68 ✓				

ADDRESS ALL COMMUNICATIONS TO JOPLIN, MISSOURI

Bruce Williams

64-515

$10.00

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO: National Lead Company
P.O. Box 2047
Morristown, Tenn.

[redacted]
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 96864

INVOICE DATE 11-25-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 830.' agreement.	Core Drilling at Puncheon Camp, Tennessee as per						
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		MR-5	0.	830.		830.		$3.00	$2,490.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.

CONTRACT	CODE	DATE	AT SHIP POINT
	63		

SOLD TO: National Lead Company
P.O. Box 2047
Morristown, Tenn.

[redacted]AYS
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 96863

INVOICE DATE 11-25-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

F. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 754.' agreement.	Core Drilling at Puncheon Camp, Tennessee as per						
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		CO-4	0.	754.		754.		$3.00	$2,262.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.

CONTRACT	CODE	DATE	AT SHIP POINT
	63		

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tenn.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96912

INVOICE DATE 12-18-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 490.' Core Drilling at Puncheon Camp, Tennessee as per agreement.						
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		CO-5	0. / 490.		490.		$3.00	$1,470.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO: National Lead Company
P.O. Box 2047
Morristown, Tenn.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96911

INVOICE DATE 12-18-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 397.' Core Drilling at Puncheon Camp, Tennessee as per agreement.							
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		CO-6	0.	397.		397.		$3.00	$1,191.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

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

Klug -

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Budget Bureau No. 42-R1036.5

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K-

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of November 1957 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name National Lead Company Minerals Zinc
Address 111 Broadway, New York, N.Y.
Contract Amount, $ 170,125.00 Government Participation: 50 % Amount, $ 85,062.50

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	7413	18,345.00	25,758.00	3/10/58		
Bulldozing						
Crosscutting						
Drifting						
Leaming	—	208.00	208.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	—	88.75	88.75			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	5.00	—	5.00			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incidental Allow. @ .18 /ft.	444.78	1,100.70	1,545.48			
TOTALS	7,862.78	19,742.45	27,605.23	7862.78	19742.45	27605.23

I certify that the above bill is correct and just and that payment therefor has not been received.
Date November 1957 *Payee National Lead Company
Per [signature] Title Superintendent

*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:
$ 3931.39
Signature [signature] (Authorized Certifying Officer)
Date JAN 14 1958 Vou. No. 108
(See other side)

4

3931.39

8

(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. E-1088 in accordance with the terms of the contract.

Signature S. Fitler Title MINING ENGINEER U. S. BUREAU OF MINES Date DEC 27 195

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature W. J. Lynch Title ACTING EXECUTIVE OFFICER DMEA - REGION V Date DEC 27 195

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.

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

Month of November 1957 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name National Lead Company Minerals Zinc
Address 111 Broadway, New York, N.Y.

OPERATION	Unit	Costs This Month	Units This Month	Costs to Date	Units to Date	Unit Costs to Date	Authorized by Contract: Units	Authorized by Contract: Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	7413.00	2471	25,758.00	8586	3.00	50,000	3.00
Churn Reaming	Foot	—	—	208.00	104	2.00	5,000	2.00
Auger Sampling	Each	5.00	4	5.00	4	1.25	550	1.50
Stripping Core Boxes	Each	—	—	88.75	50	1.77½	150	2.00
Trenching								
Test Pits								
Roads and Trails Incidental Allow. @ .18 /ft.	Foot	444.78	2471	1,545.48	8586	.18	50,000	.18
Total Distributed Costs		7862.78		27,605.23				Total Costs Authorized by Contract
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
Total Costs		7862.78		27,605.23				

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 November, 1957 Operator National Lead Company

Per [signature] Title Superintendent

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.

Remarks:

(Instructions on reverse)

(For Government use only)

[signature]
MINING ENGINEER
U. S. BUREAU OF MINES

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

OFFICIAL FILE COPY
DMEA
RECEIVED NOV 15 1957

DATE	INITIALS	CODE
11/15	gb	220
15	[illegible]	100
11/21	[illegible]	—

INTERIM REPORT

DMEA-4580, Idm-E1088 (Zinc)

Operator: National Lead Company, New York, New York

Location: Puncheon Camp Creek area, Grainger County, Tennessee

Diamond drilling on the Puncheon Camp Creek project of National Lead Company in the Copper Ridge district to date and since the last inspection on October 15, 1957 is summarized as follows:

Drilling completed@

Footage in holes completed since last inspection . . .	1,682
Total footage in holes completed to date	6,115
Number of holes completed since last inspection . . .	3
Total number of holes completed to date	9
Number of holes showing commercial zinc ore	0
Number of holes showing non-commercial zinc mineralization	3
Number of barren holes	6

Drilling in progress:

Number of holes in progress	2
Total footage drilled in incompleted holes at time of inspection	755

Brief summaries of the three holes completed since the last inspection follow:

Hole no.	Property	Total depth	Remarks
CO-3	Coffman	617	Location: About 400 feet northwest (updip) from Hole CO-2. Abbreviated log: 0-26 residual clay; 26-323 Mascot dolomite; 323-507(?) upper Kingsport dolomite member; 507(?)-598 lower Kingsport limestone member; 598-617 Longview dolomite. Mineralization: Barren hole; scattered shines of pyrite 479-520 and 582-591.
MG-3	McGinnis	380	Location: About 200 feet northwest (updip) from Hole MG-2. Abbreviated log: 0-127 residual clay; 127-273 upper Kingsport dolomite member; 273-354 lower Kingsport limestone member; 354-380 Longview dolomite. Mineralization: Barren hole; scattered shines of pyrite @ 295-304 and 340-343.

Hole no.	Property	Total Depth	Remarks
MG-4	McGinnis	685	Location: About 200 feet southeast (downdip) from Hole MG-1. Abbreviated log: 0-24 residual clay; 24-389 Mascot dolomite; 389-559 upper Kingsport dolomite member; 559-660 lower Kingsport limestone member; 660-685 Longview dolomite. Mineralization: Shine hole: 493½-496 w/ 1% Zn(est); 503½-504½ w/ ¼% (est); 510½-512 w/ ¼% Zn (est); also shines @ 491, 526½, 527, 530, and 531½.

Two holes were in progress at the time of inspection. Pertinent available data on these holes are summarized below:

Hole no.	Property	Present Depth	Est. Total Depth	Remarks
CO-4	Coffman	462	730	Located 200 feet downdip from Hole CO-3; collared and drilling in Mascot dolomite.
MG-5	McGinnis	293	725	Located 200 feet downdip from Hole MG-4; collared and drilling in Mascot dolomite.

Inspected: November 5, 1957

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

V. J. Lynch and L. E. Shirley
Mining Engineers, U. S. Bureau of Mines

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

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

PAID ON VOUCHER & SCHEDULE OF PAYMENTS K- 27

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of October 1957 Docket No. DMEA 4580 Contract No. Idm-E 1088

Operator's Name National Lead Co. Minerals Zinc

Address 111 Broadway, New York, N.Y.

Contract Amount, $ 170,125.00 Government Participation: 50% Amount, $85,062.50

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Short Form Contracts:						
Drilling	9138.00	9207.00	18,345.00	12/20/57		
Bulldozing						
Crosscutting						
Drifting						
Reaming	208.00	—	208.00			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	—	88.75	88.75			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	—	—	—			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incid. Allow. @ .18/ft.	548.28	552.42	1,100.70			
	9894.28	9848.17				
TOTALS			19,742.45	9894.28	9848.17	19742.45

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

Date Oct. 1957 *Payee National Lead Co.

Per [signature] Title Superintendent

*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:

$ 4947.14

Signature Helen R. Meller
(Authorized Certifying Officer)

Date NOV 22 1957 Vou. No. 87

(See other side)

4947.14

(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. E 1088 in accordance with the terms of the contract.

Signature [illegible] Title GEOLOGIST, U. S. G. S. Date NOV 19 1957

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature V. J. Lynch Title ACTING EXECUTIVE OFFICER DMEA - REGION V Date NOV 19 1957

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

Form MF-104A
(April 1952)

Budget Bureau No. 42-R1151.2

RECEIVED NOV 25 1957 DMEA

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of October 1957 Docket No. DMEA 4580 Contract No. Idm-E 1088
Operator's Name National Lead Co. Minerals Zinc
Address 111 Broadway, New York, N.Y.

OPERATION	Unit	Costs This Month	Units This Month	Costs to Date	Units to Date	Unit Costs to Date	Authorized by Contract: Units	Authorized by Contract: Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	Foot	9138.00	3046	18,345.00	6115	3.00	50,000	3.00
Reaming	Foot	208.00	104	208.00	104	2.00	5,000	2.00
Churn Sampling	Ea.	—	—	—	—	—	550	1.50
Auger Core Boxes	Ea.	—	—	88.75	50	1.77½	150	2.00
Stripping								
Trenching								
Test Pits								
Roads and Trails Incidental Allowance @ 18/ft.	Foot	548.28	3046	1,100.70	6115	.18	50,000	.18
Total Distributed Costs		9934.28		19,742.45				Total Costs Authorized by Contract
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
Total Costs		9934.28		19,742.45				

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 October 1957 Operator National Lead Co.

Per [signature] Title Superintendent

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)

[signature]
GEOLOGIST, U. S. G. S.

NOV 19 1957

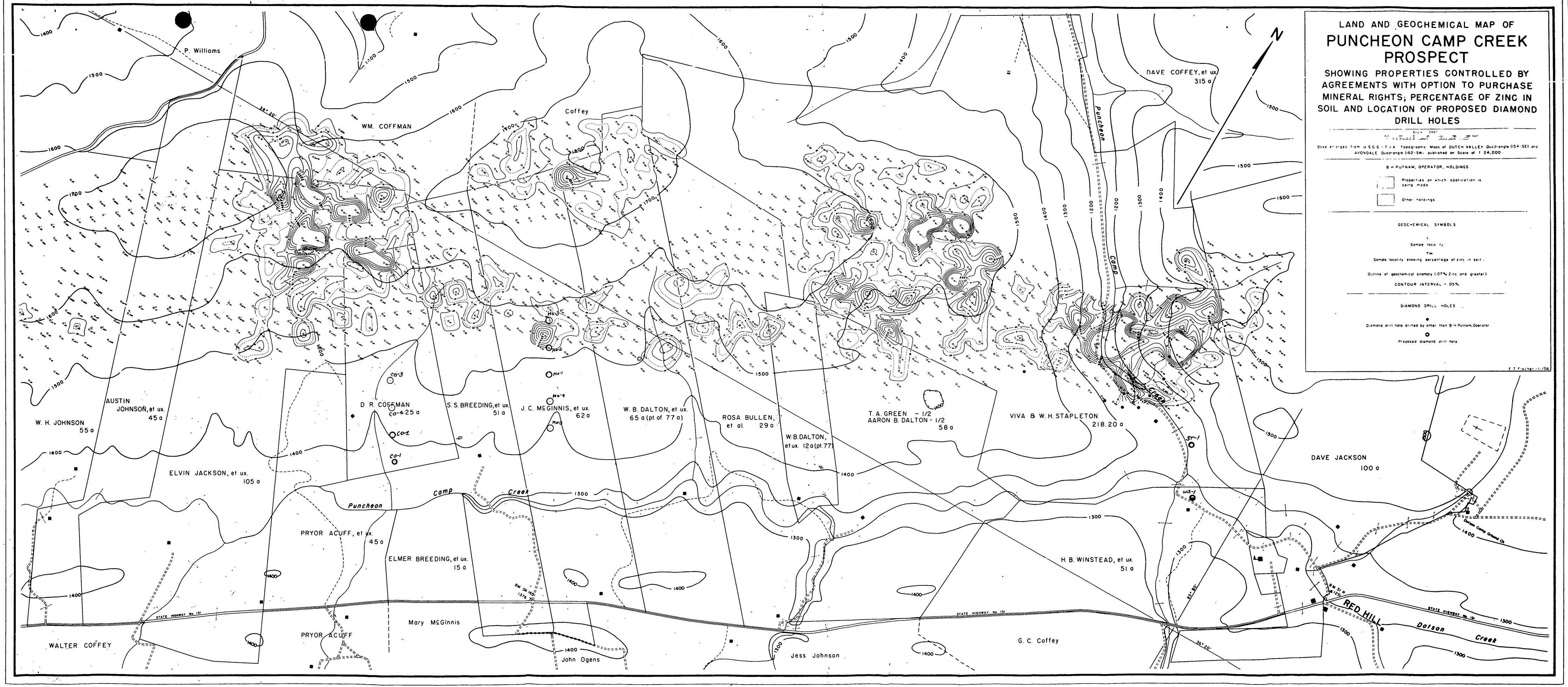
INSTRUCTIONS

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


LAND AND GEOCHEMICAL MAP OF
PUNCHEON CAMP CREEK PROSPECT
SHOWING PROPERTIES CONTROLLED BY AGREEMENTS WITH OPTION TO PURCHASE MINERAL RIGHTS; PERCENTAGE OF ZINC IN SOIL AND LOCATION OF PROPOSED DIAMOND DRILL HOLES
Base enlarged from U.S.G.S. T.V.A. Topographic Maps of DUTCH VALLEY Quadrangle (154-SE) and AVONDALE Quadrangle (162-SW), published on Scale of 1:24,000
B. H. PUTNAM, OPERATOR, HOLDINGS
Properties on which application is being made
Other holdings
GEOCHEMICAL SYMBOLS
Sample locality
Sample locality showing percentage of zinc in soil
Outline of geochemical anomaly (.07% Zinc and greater)
CONTOUR INTERVAL = 05%
DIAMOND DRILL HOLES
Diamond drill hole drilled by other than B. H. Putnam, Operator
Proposed diamond drill hole
F. T. Fischer - 1-1-56
N
P. Williams
WM. COFFMAN
Coffey
DAVE COFFEY, et ux. 315 a
Puncheon Camp Creek
W. H. JOHNSON 55 a
AUSTIN JOHNSON, et ux. 45 a
ELVIN JACKSON, et ux. 105 a
D. R. COFFMAN CO-4 25 a
S. S. BREEDING, et ux. 51 a
J. C. McGINNIS, et ux. 62 a
W. B. DALTON, et ux. 65 a (pt. of 77 a)
ROSA BULLEN, et al. 29 a
W. B. DALTON, et ux. 12 a (pt. 77)
T. A. GREEN - 1/2
AARON B. DALTON - 1/2 58 a
VIVA & W. H. STAPLETON 218.20 a
DAVE JACKSON 100 a
PRYOR ACUFF, et ux. 45 a
ELMER BREEDING, et ux. 15 a
H. B. WINSTEAD, et ux. 51 a
WALTER COFFEY
PRYOR ACUFF
Mary McGinnis
John Ogens
Jess Johnson
G. C. Coffey
STATE HIGHWAY No. 131
RED HILL
Dotson Creek
Dotson Camp Ground Ch.

EXTRA COPY
D M E A
RECEIVED NOV 25 1957

DATE	INITIALS	CODE

EXTRA COPY
D M E A
RECEIVED NOV 25 1957

DATE	INITIALS	CODE

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	

SOLD TO

National Lead Company
Box 2047
Morristown, Tenn.

SHIPPED TO

Puncheon Camp, Tenn.

[redacted]S
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96816

INVOICE DATE 10-25-57

DATE SHIPPED

SHIPPED VIA

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 59.' Reaming in connection with core drilling at Puncheon Camp, Tennessee as per agreement.						
		MG-2	Reaming From 50 to 109. 59.		@$2.00 per ft.			$118.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE 63			DATE	AT SHIP POINT	

SOLD TO

National Lead Company
Box 2047
Morristown, Tenn.

TERMS NET 30 DAYS
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96773

INVOICE DATE 10-21-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 510.' Core Drilling at Puncheon Camp, Tennessee as per agreement.						
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		MC-2	0. / 510.		510.		$3.00	$1,530.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE 63			DATE	AT SHIP POINT	

SOLD TO: National Lead Company
Box 2047
Morristown, Tenn.

~~TERMS [illegible] DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 96818

INVOICE DATE 10-25-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 380.' Core Drilling at Puncheon Camp, Tennessee as per agreement.						
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		MG-3	0. / 380.		380.		$3.00	$1,140.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tenn.

TERMS NET 30 DAYS
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96774

INVOICE DATE 10-21-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 854.' Core Drilling at Puncheon Camp, Tennessee as per agreement.						
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		Coffman 2	0. / 854.		854.		$3.00	$2,562.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

FORM P133A

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE 63			DATE	AT SHIP POINT	

SOLD TO: National Lead Company
Box 2047
Morristown, Tenn.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96817

INVOICE DATE 10-25-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 617.' Core Drilling at Puncheon Camp, Tennessee as per agreement.							
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		C.O. 3	0.	617.		617.		$3.00	$1,851.00
		Reaming							
		C.O. 3	55.	100.		45.		2.00	90.00
									$1,941.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tennessee

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96841

INVOICE DATE 11-13-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 685.' agreement.	Core Drilling at Puncheon Camp, Tennessee as per						
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		MG 4	0.	685.		685.		$3.00	$2,055.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK PROJECT
GRAINGER COUNTY, TENN.
FOR OCTOBER 1957

Docket No. 4580
Contract No. Idm-E 1088

During the month of October, five holes were drilled on the Puncheon Camp Creek project.

Three holes were drilled on the McGinnis farm. Hole MG-2 was drilled 200' north of MG-1. The hole collared in the Mascot formation and was drilled to a depth of 510'. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-42	Overburden	---	---	--
42-182	Mascot fm.	CMss @ 182	---	Dolomite; few cavities near top.
182-454	Kingsport fm.	Top of "R" bed @ 365; "S" @ 418; "T" @ 454	Sh. @ 297; 316-17, 1' @ ¼% Est.	Dol. and re-xl; in part brecc; some scatt. FeS shines.
454-510	Longview fm.	Top of "U" bed @ 465	---	Dol and re-xl; some crackle brecc; lt. FeS shines 492-499.

Hole MG-3 was drilled 200' north of MG-2. MG-3 collared in the Kingsport formation (the CMss would have been in the overburden) and the hole was drilled to a depth of 380'. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-127	Overburden	---	---	---
127-354	Kingsport fm.	Top of "R" bed @ 273; "S" @ 321; "T" @ 354	Sh's. 187½-91	Dol, re-xl; and limestone; both crackle & rubble brecc; FeS sh. 229-44, 295-304, 340-43
354-380	Longview fm.	Top of "U" bed @ 365	---	Dol. and re-xl.

MG-4 was drilled 200' south of MG-1. The hole collared in the Mascot formation and was drilled to a depth of 685'. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-24	Overburden	---	---	--
24-389	Mascot fm.	CMss @ 389	---	Dol; some FeS shines near base.

389-660	Kingsport fm.	Top of "R" @ 559, "S" @ 615, "T" @ 660	Sh. @ 491; 493½-96, 2½' @ 1% Est; 503½-04½, 1' @ ¼% Est; 510½-12, 1½' @ ¼% EST; Sh. @ 527, 30, 31½	Dol. re-xl, and chert, in part brecc; rubble brecc. near base; scatt. FeS shines.
660-685	Longview fm.	Top of "U" @ 672	———	Dol. and re-xl.

On the Coffman farm, hole CO-2 was drilled 200' to the north of CO-1. The hole collared in the Mascot formation and was drilled to a depth of 854'.

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-16	Overburden	—	—	—
16-566	Mascot fm.	CMss @ 566'	—	Dolomite.
566-832	Kingsport fm.	Top of "R" @ 715; "S" @ 785; "T" @ 832.	—	Dol. & re-xl; in part brecc; Tr's FeS 768-820
832-854	Longview fm.	Top of "U" @ 844'	—	Dol. & re-xl.

Hole CO-3 was drilled 400' north of CO-2. The hole collared in the Mascot formation and was drilled to a depth of 617'. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-26	Overburden	—	—	—
26-323	Mascot fm.	CMss @ 323'	———	Dolomite.
323-598½	Kingsport fm.	Top of "R" @ 507; "S" @ 552½; "T" @ 598½.	———	Dol. & re-xl; in part brecciated.
598½-617	Longview fm.	Top of "U" @ 611'	—	Dol. & re-xl.

NATIONAL LEAD CO. D.D. MG-3

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: MG-3

Farm: J.C. McGinnis et. ux

Loc: N 48,843.77
E 43,978.44

Elev: 1521

Drilled By: Joy Mfg. Co.

Logged By: J.W. Spears

Collared: 10-8-57

Bottomed: 10-15-57

Depth: 380

Casing: BX 127; AX 135

Reaming: None

Cement: None

Water Table: None

0-127	Overburden
-134	Med. gr. dol; crackle @ 128; oxidized 129½-30.
-135	Lt. gr. dol; v. silic. & mott. & some ss grains.
-140½	Lt. med. gr. dol; well mott. to banded; chert nod @ base.
-148	Med. gr. dol.
-152½	Lt. med. gr. dol; oxidized crackle.
-156	Med. gr. dol; oxidized shears @ base.
-168	Lt. med. gr. dol; fault 161, chert nods 163½, 64½, 65½, 67; banded 167-68 (1½' core loss 164-68).
-173	Med. gr. dol; well banded to 172, v. sandy 172-73 w/some congl., 2" silic. green shale @ 173.
-187½	Lt. med. gr. dol; v. mott. to 176; v. sandy 175½-76 w/2" silic. green shale @ 176; chert nod 179½, 1" TGS 180; chert nod 184, 185½, 186½, 187½.
-191½	Med. dk. gr. dol; crackle w/ZnS shines, chert nod @ base.
-196	Med. gr. dol, chert nod 195.
-201	Lt. med. gr. dol; shears 196, 197, v. silic. 196½-98; chert nods 197; 3" silic. cherty shale @ 198; shears 199½ (201)
-207	Med. gr. fault 202-02½.
-216½	Lt. med. gr. dol; tr. crackle; brecc. chert nods 213, 214; nod 216½.
-218	Med. gr. dol.
-224	Lt. med. gr. dol; lt. banding to 220; crackle 221-21½; large chert nod 221½; then v. mott. 221½-24.
-228½	Lt. gr. dol; lt. banding; lt. crackle; ox. brecc. chert nod @ base.
-233	Med. gr. dol; crackle; occ. FeS shine.
-234	Lt. gr. dol; scatt. ss grains 233½-34 w/1" silic. green shale @ 234.
-240½	Lt. med. gr. dol; occ. lt. crackle.
-241½	Lt. mott. oxidized re-xl. (2' core loss 242-46).
-246	Lt. med. gr. dol; occ. oxidized crackle w/few FeS shines.
-254½	Lt. gr. dol; occ. oxidized crackle to 251; thin sand, 254½.
-258	Lt. med. gr. dol; lt. mott.
-260½	Med. gr. dol; green shale 260-60½.
-265½	Dk. gr. dol; well mott; semi re-xl to sugary dol; 1" TGS 264, then re-xl w/red. stain to 265½.
-267½	Lt. gr. dol; lt. mott.
-272	Med. gr. dol; mott. semi re-xl to re-xl bott. 9".
-273	Lt. med. gr. dol; 2" TGS w/few ss grains @ base.
	TOP "R" BED 273
-275	Lt. br. coarse re-xl.
-276	Dk. gr. dol; silic. & shaly bott. 2".
-278½	LS, v. shaly; sandy 276½-77; 1" TGS @ base.
-280½	Gr. re-xl.
-281	Lt. med. gr. dol.
-282	Jasporiod re-xl; brecc.
-283½	Lt. med. gr. dol; crackle.
-290½	Lt. gr. re-xl; mott; tr. crackle.
-292	Lt. med. gr. dol; chert fragments, brecc.
-297	Br. to green mott. re-xl; brecc. 295-97 w/est. 1% FeS.
-306	Lt. med. gr. dol; brecc. sealed w/gangue & re-xl; est. 2% FeS 297-98½; crackle w/est. 1% FeS 301-02 & 303-04½; chert & TGS @ 306.
-308	Dk. gr. dol; crackle w/gangue re-xl & shale.
-312	Med. dk. gr. dol; mott.
-314½	Med. gr. dol; mott.
-321½	Lt. med. gr. dol; crackle 318-19; few ss grains 20½; chert nod 321½.
	TOP "S" BED 321½
-323½	Med. dk. semi re-xl.
-324½	Mix of semi re-xl & med. dol; sealed w/re-xl.
-331	Lt. med. gr. dol; crackle; occ. thin band of dry brecc; v. cherty 328½-29; silica 330-31.

-333½ Mixture of lt. & med. gr. dol; sealed w/silic; v. cherty 332-33½.
-336 Lt. med. gr. dol; med. sealed w/re-xl; & silicia.
-339½ Br. jasporiod re-xl.
-352½ Lt. br. re-xl, brecc. to 343 w/est. 1½% FeS; crackle 343-47; silic. 351½-52½.
-354 Lt. gr. mott. re-xl.
BASE "S" BED 354
-357 Lt. med. gr. dol; lt. crackle.
-366 Med. gr. dol; chert nods 365-66 w/tr. oolite.
-366½ Silic. re-xl.
-367½ Lt. semi re-xl; mott.
-373 Med. gr. dol; sugary to some semi re-xl; v. mott; vuggy 372-73 w/TGS 373.
-379 Br. re-xl, sli. silicl. v. shaly 377-78.
-380 Med. gr. dol; v. sugary & mott. TD.

NATIONAL LEAD CO. D.D. MG-4

Copper Ridge Project-Punchson Camp Creek

DMEA Idm-E 1068

Hole No: MG-4

Farm: J.C. McGinnis et. ux.

Loc: N 48, 341.89
E 44, 303.30

Elev: 1369

Drilled By: Joy Mfg. Co.

Logged By: J.W. Spears

Collared: 10-16-57

Bottomed: 10-29-57

Depth: 685'

Casing: BX 24'; AX 30'

Reaming: None

Cement: None

Water Table: 45'

0-24	Overburden
-28	Med. gr. dol; mott.
-42½	Lt. med. gr. dol; mott; few ss grains @ 39.
-43½	Med. shaly re-xl.
-47½	Med. dk. semi re-xl, v. mott.
-49	Lt. med. gr. dol; eyelets.
-52	Med. gr. dol.
-53	Lt. med. gr. dol.
-63	Med. to med. dk. gr. dol.
-70	Lt. gr. dol; large chert nod 64.
-75	Lt. med. gr. dol; to 74 v. mott. w/crackle.
-77	Med. gr. dol.
-88	Lt. med. to med. gr. dol; v. sandy 86-86½; brecc. 86½-88.
-90	Lt. gr. dol; brecc. 88-89; chert nod 89; crackle 89-90.
-94½	Brecc. chert sealed w/sec. chert.
-100	Lt. gr. dol; scatt. ss grains 96-98½; heaviest towards base.
-104	Lt. med. gr. dol.
-110	Med. gr. dol; mott.
-111	Lt. semi re-xl; silic.
-115	Lt. gr. dol; vugs 14-15.
-120	Lt. med. gr. dol; v. mott. 117-20.
-124	Lt. gr. dol.
-128	Lt. med. gr. dol.
-129	Med. gr. dol; mott.
-131	Lt. med. gr. dol.
-134	Med. gr. dol; mott; fault 133.
-135½	Lt. med. gr. dol; sheared; sandy @ base.
-139½	Med. gr. v. mott. semi re-xl.
-140	Lt. gr. dol; TGS.
-142½	Lt. med. gr. dol.
-147	Med. gr. dol.
-157	Lt. med. gr. dol; mott; crackle; vugs 156-57.
-167½	Med. dk. gr. dol; mott; few eyelets; chert nods 166.
-178	Med. gr. dol; banded to 169 w/6" CMss 168½-69; thin vert. fault 172-73; chert nod 176; well mott. 176-78 w/sands 177½-78.
-183½	Lt. gr. dol; chert nod near top; crackle 178-81; scatt. ss grains 182-83½ w/2" CMss @ 83½.
-194	Lt. med. gr. dol; v. sheared top 2', v. sandy, 193½-94.
-197	Lt. gr. dol; sandy & cherty; sheared to fault thruout. (1' core loss 196-200; 1½' core loss 200-03).
-202	Lt. br. re-xl; mott; fault @ base.
-205	Lt. med. gr. dol; mott; shears thruout.
-207	Dk. gr. dol; v. mott; sugary.
-207½	Cavity.
-209	Lt. med. gr. dol; mott.
-211½	Med. dk. gr. dol; well mott. to 210½, then congl. & sandy to 211½.
-212½	Lt. med. gr. dol; mott; sheared.
-214	Med. semi re-xl.
-228	Med. dk. gr. dol; sugary, well mott. to 218.
-233½	Med. gr. dol; mott; fault 229-30½.
-236½	Med. dk. gr. dol; v. mott; sheared; few ss grains @ base.
-241½	Lt. med. gr. dol; mott.
-250	Med. gr. dol; well mott; faults 244, 249. (2' core loss 243-250).
-261	Lt. med. gr. dol; lt. mott. to 250; shears 250-52; large chert nod 256½-57; lt. banding to 261.
-263	Med. gr. dol; semi re-xl top foot.

-273½ Lt. med. gr. dol; lt. mott; crackle to 268; fault (cherty) 268-69, lt. banding & crackle 269-71½, FeS shine 271½; brecc. oolitic chert 271½-72.
-276 Med. gr. dol; (2' core loss 274-78).
-281½ Lt. med. gr. dol; cherty @ 278, sheared 279-81½ (2½' core loss 278-85).
-287 Med. gr. dol; (to med. gr. dk.) well mott; thin ss 285 & 286½-87.
-288½ Lt. med. gr. dol; mott.
-290½ Lt. gr. dol.
-296 Lt. med. gr. dol; mott. to 295; crackle 292-96 w/FeS shines 292-93, sand 296.
-297½ Lt. gr. dol; v. sandy.
-299 Lt. med. gr. dol; well mott.
-303 Lt. gr. dol; v. cherty & sandy & mott. to 299 3/4; then crackle to 301; vert. ox. shears 301-03, chert nod 303.
-310 Lt. med. gr. dol; mott. 307½-10; tr. crackle 307½-08½ w/FeS shine.
-314 Med. gr. dol; mott; some crackle.
-316 Med. dk. gr. dol; mott; tr. crackle w/FeS shine @ 315.
-319 Med. gr. dol; lt. banding, thin sand @ base.
-323 Lt. gr. dol; lt. mott; sheared.
-325 Lt. med. gr. dol; congl. & sand to 324, then sandy to 325.
-330½ Med. gr. dol; many eyelets.
-340 Med. dk. gr. dol; many eyelets to 338; shears 333-34; fault 334-35.
-341 Med. gr. dol; scatt. ss grains; oolitic chert @ base.
-342½ Lt. gr. dol.
-344 Lt. med. gr. dol; mott.
-349½ Med. gr. dol; mott. to 345½.
-353 Med. dk. gr. dol.
-363 Lt. med. gr. dol; crackle to 355 w/FeS shine 355; thin ss 356½ then 1" TGS; v. mott. 356½-58½ w/oolitic chert nod 358½ & silica to 359 w/1" TGS; grades to med. gr. dol.
-367 Med. gr. dol; FeS shine 365, 366; TGS 367.
-374 Lt. med. gr. dol; mott. to 369½ w/chert nod 369½; then lt. banding.
-386 Med. dk. gr. dol; mott. 377-85; 385-86 lighten & cherty w/chert nod 386.
-394½ Med. gr. dol; banded to 389 w/hvy. ss 389.
TOP KINGSPORT 389.
-395½ Chert, lt.
-414 Lt. med. gr. dol.
-419½ Med. gr. dol; v. mott. 416-19½.
-422½ Lt. med. gr. dol; chert nods 420½, 421, 422½.
-438½ Med. gr. dol; sli. banded to 428½, crackle 428½-33; lt. mott. 433-35, thin ss @ 38½.
-440 Lt. med. gr. dol; thin ss 439, TGS 439½; hvy. ss & TGS @ 440.
-441 Med. gr. dol; chert nod 441.
-442½ Lt. med. gr. dol; crackle; hvy. ss bott. 3".
-444 Med. gr. dol.
-450 Med. dk. gr. dol.
-454 Med. gr. dol.
-458½ Med. dk. gr. dol; mott; TGS & ss @ base.
-472½ Lt. med. gr. dol; chert nod 469½; crackle 469½-71; chert nod 472½.

-480½ Med. gr. dol; well banded; 478-79 w. sandy & much green shale; bott. 6" brecc. chert.
-483½ Lt. med. gr. dol; tr. crackle bott. 3". TGS @ base.
-497 Med. gr. dol; crackle 483½-84½ w/FeS shine 484; chert nods 488½, 90, 91, 91½, 95, 95½, 96 & 97; 3" of ZnS shine @ 491; est. 1% ZnS tr. crackle 493½-96.
-503 Lt. med. gr. dol; v. sheared (vertical) 498-501; chert nod 499½, 500, 02, 03.
-507 Med. gr. dol; crackle w/ZnS shines (est. ½%) 503½-04½ w/large chert nod 504½; 505-06 silic w/oolitic chert 505½; chert 506-07.
-513½ Lt. med. gr. dol; lt. banding; crackle w/est. ½% ZnS 510½-12 w/chert nod 512; fault 513-13½.
-524 Lt. med. gr. sugary dol; sli. mott.
-526 Med. gr. dol; well mott.
-530½ Lt. med. gr. dol; crackle 527-28 w/ZnS shine 527-27½; ZnS shine 530; TGS 530½.
-531½ Med. gr. dol; mott; crackle; ZnS & FeS shine 531.
-540 Lt. med. gr. dol; banded to 535 w/sand then green shale to 536; chert nod 538.
-543 Lt. med. gr. sugary dol; chert nod 543.
-546½ Med. gr. dol; chert nods 543½-545; banded 545-46½.
-555½ Lt. med. gr. dol; vert. shears to 551; crackle 552½-52½ w/est. 1% FeS; a thin ss & TGS @ 555½.
-557½ Lt. gr. dol; fault 555½-58.
-559 Med. gr. dol; mott; top pt. sugary w/chert nod 558½.
-561½ Br. mott. re-xl.
-563 Lt. med. gr. dol; sugary to semi re-xl.
-564 Blocks of dol. in re-xl & sandy green shale.
-565 Lt. med. gr. dol.
-566 Dk. re-xl; shale, sand.
-569 Br. re-xl.
-572½ Lt. gr. dol; some bands of green shale & re-xl; some crackle w/gangue, tr. ss 569½.
-575 Lt. med. semi re-xl, crackle; chert nod @ base.
-577 Lt. med. gr. dol; TGS @ base.
-579 Br. re-xl, mott; crackle w/gangue.
-584 Lt. re-xl & lt. med. gr. dol; sealed w/much dk. shaly re-xl.
-587 Lt. med. gr. dol; cherty; crackle; 1% FeS 586-87.
-590½ Lt. gr. mott. re-xl.
-591½ Br. re-xl; large nod @ base.
-592 Lt. med. gr. dol.
-594½ Dk. shaly re-xl; mott; occ. crackle w/gangue; bott. 6" some dol. blocks.
-597½ Lt. med. gr. dol; tr. re-xl @ 596½; 1% FeS 597-97½.
-601 Med. gr. dol; some semi re-xl; brecc. sealed w/re-xl; some crackle w/gangue.
-605 Dk. gr. dol; 601-03 brecc. & sealed w/re-xl.
-608 Lt. med. gr. dol; brecc. to 607 w/some chert; FeS shine 607.
-610 Dk. gr. & med. gr. dol. & chert; brecc. & sealed w/re-xl, sand & shale.
-611 Med. mott. re-xl.
-614 Dk. & med. gr. dol; & much chert; sealed w/green shale & some silica.
-619½ Chert (lt. med. gr. dol. 614-14½; 615½-16) some green shale 619-19½.
-624 Br. grading to lt. re-xl; silic. to 621; shears @ base.
-627 Lt. med. gr. dol.
-627½ Dk. semi re-xl & green shale.
-628½ Lt. med. gr. dol.
-630½ Green shale, chert & re-xl.
-631½ Lt. med. gr. dol; brecc. w/green shale & re-xl.
-632½ Chert
-635 Br. re-xl; crackle.
-637½ Mixture of re-xl, chert & green shale.
-639 Lt. med. gr. dol; brecc. w/gangue; thin sand @ base.
-641 Med. dk. gr. sugary dol; some dry brecc. 639-40.
-658½ Gr. re-xl to br. re-xl; occ. crackle.
-660 Lt. gr. re-xl.
BASE KINGSPORT FORMATION 660'
-661½ Lt. med. gr. dol; TGS @ base.

-672 Med. gr. dol; ox. shear 665; crackle 665-69; mott. & med. dk. 669-72.
-673 Cherty re-xl.
-679½ Med. gr. dol; grading to lt. med. gr. dol; sugary; well mott; few ss grains & TGS @ base.
-683½ Lt. br. re-xl; few chert fragments at top; TGS then chert nod at base.
-685 Med. gr. dol; crackle; TD

NATIONAL LEAD CO. D.D. CO-3

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E-1088

Hole No: CO-3

Farm: D.F. Coffman

Loc: N 47,876.47
E 43,176.46

Elev: 1454.16

Drilled By: Joy Mfg. Co.

Logged By: J.W. Spears

Collared: 10-10-57

Bottomed: 10-25-57

Depth: 617

Casing: BX 26; AX 100

Reaming: 44', 56 to 100

Cement: None

Water Table ?

0-26	Overburden
-50	Lt. gr. dol; sand at top; (18' core loss or/rotten rock27-50) 1' dk. mott, shaly dol; rest lt. gr. dol. w/lt. mott.
-52	Lt. med. gr. dol; v. mott.
-57	Lt. gr. dol.
-62	Cavity
-66	Lt. med. gr. dol; grade to med. gr. mott & silic. eyelets.
-70	Lt. med. gr. dol; 69-69½ sandy, congl; chert nod 69½.
-71½	Med. gr. dol; v. mott.
-72	Dk. gr. dol.
-75½	Lt. med. g. dol; fault 75-75½.
-77½	Cavity.
-78½	Med. gr. dol; oxidized.
-86	Dk. gr. dol; well mott.
-86½	Med. gr. dol; oxidized, sandy & cherty.
-87	Cavity
-89	Lt. gr. dol; vuggy, mott.
-91	Med. gr. dol; mott; occ. vug.
-92	Med. dk. gr. dol; crackle.
-97	Med. gr. dol; sugary, oxid; sli. mott. (grades to med. dk. gr.)
-100	Cavity
-102	Lt. gr. dol; lt. banding; few ss grains @ base.
-108	Lt. med. gr. dol; fault 103-04½; hvy. sands 100½-07; cherty & sandy @ 108.
-112	Lt. gr. dol; lt. banding; faulted; sandy bott. 6".
-120	Med. to lt. med. gr. dol; fault top 6", thin ss 119; mott. 119-20; w/scatt. sands 119½-20 & oolite @ 120.
-121	Lt. gr. dol; v. sandy.
-124	Chert layer.
-127½	Lt. med. gr. dol; mott, sugary.
-128½	Med. gr. dol; mott.
-132	Dk. gr. dol; v. mott. (2' core loss 131½-136)
-136	Med. gr. dol; v. mott.
-137	Med. dk. gr. dol; v. sandy.
-139	Lt. med. gr. dol.
-141	Med. gr. dol; mott.
-148	Med. dk. gr. dol; well mott; sheared; eyelets, (1' core loss 146½-48½).
-150	Med. gr. dol; v. sheared.
-156	Med. dk. gr. dol; to dk. gr; sheared.
-163½	Med. gr. dol; oxidized.
-167½	Lt. med. gr. dol; sandy 166½.
-175	Med. gr. dol; mott; occ. eyelets.
-181	Lt. med. gr. dol; mott; occ. eyelet, TGS @ base.
-182½	Lt. silic; re-xl.
-186½	Med. dk. gr. dol; mott; sand grains bott. 6", then chert nod.

-191 Lt. gr. dol; banded; bott. 6" cherty & sugary.
-192½ Med. gr. dol; banded.
-194½ Lt. med. gr. dol; banded.
-195½ Lt. semi re-xl, v. mott.
-201 Med. to lt. med. gr. dol; mott; few eyelets 199; chert nod 201.
-205 Lt. med. gr. dol; few ss grains at top, then chert nod; shears 203-04½; chert nod @ base.
-210 Med. gr. dol.
-212 Lt. med. gr. dol; mott; chert nod 210½-12.
-221 Lt. gr. dol; FeS shine in crackle 213½; large nods 214½, 15½, 18; mott. 218-21 w/TGS 221.
-225½ Med. gr. dol; mott. 223-25½; sandy & congl. 225-25½ w/TGS @ base.
-228 Lt. gr. dol.
-233½ Med. gr. dol; mott. to 231; scatt. ss grains 232-33½ w/chert nod 233½.
-235 Lt. gr. dol; v. sandy at top 4".
-239½ Lt. med. gr. dol; well mott. to 237; ex. chert nod 237.
-244 Lt. gr. dol.
-250½ Lt. med. gr. dol; well mott. to silic; grades to med. gr. dol.
-254 Med. dk. gr. dol; banded.
-256 Med. gr. dol; hvy. sands 255½-56 w/chert nod 256.
-260 Lt. gr. dol; mott.
-263½ Med. gr. dol; v. mott.
-267½ Lt. med. gr. dol; v. sandy top 6" then lt. mott.
-277 Dk. gr. dol; mott; v. mott. bott. foot.
-279 Lt. med. gr. dol; v. sandy 278-79 w/oolite 279.
-281½ Lt. gr. dol.
-285 Med. gr. dol; v. mott. to 283.
-286½ Med. dk. gr. dol.
-290½ Dk. gr. dol.
-294 Lt. med. gr. dol; few ss grains 293, hvy. ss 294.
-297 Med. gr. dol; v. mott; grades to le. med. gr; TGS @ base.
-300 Lt. med. gr. dol; well banded.
-301½ Med. gr. dol; well banded.
-303 Med. dk. gr. dol; banded; sheared; thin fault @ base.
-305 Med. gr. dol; mott; chert nod near base.
-308½ Lt. gr. dol; oolite chert nods @ 305½; banded.
-312½ Med. gr. dol; TBS @ base.
-320½ Med. dk. gr. dol; mott. to shaly; few eyelets 318-20; v. shaly 320-20½.
-323 Med. gr. dol; banded.
TOP KINGSPORT FM. 323'
-328½ Lt. med. gr. dol; hvy. sands top 2", then sand dike to 324; mott.
-330½ Med. gr. dol; v. shaly top 6", then well mott.
-335 Lt. gr. dol; thin ss 331½.
-336½ Med. gr. dol; well mott, v. shaly bott 2".
-340 Lt. med. gr. dol; well mott.
-341½ Med. gr. dol; banded, TBS @ base.
-345 Lt. med. gr. dol.
-346 Med. gr. dol; well mott.
-350 Med. dk. gr. dol; well mott.
-354 Lt. gr. dol; lt. banding.
-359 Lt. med. gr. dol; chert nods 355, banded; thin sands bott. foot.
-361½ Lt. gr. dol.
-369½ Med. gr. dol; fault 363-64; 2" sandy green shale @ 366; then 2" oolitic chert; then v. sandy to 367.
-377 Lt. med. gr. dol; mott. to 374; oolitic chert nod 372, fault 372½; sheared oolitic chert @ 372½.

-394 Lt. gr. dol; lt. mott. to 387, chert nods 387,89½,90,90½,91,91½; well banded 391½-94 w/nod @ 393.
-400 Lt. med. gr. dol; v. mott. to banded; sandy 399-400 w/3 silica & green shale @ base.
-400½ Med. gr. dol; mott. thin ss & chert nod @ base.
-401½ Lt. med. gr. dol; large chert nod 401½.
-413 Lt. gr. dol; lt. banding to 405½; chert nod 405½, 410½, TGS @ base.
-414 Chert & sec. chert.
-417 Lt. med. gr. dol; v. mott; thin fault 414½,415½; few ss grains bott. few inches & TGS @ base.
-420½ Lt. med. gr. dol; chert nods 418, 18½, 20-20½.
-425½ Med. gr. dol; some brecc. 420½-21½ w/chert nods 421½, 422½; v. silic. 423-24½ w/ oolitic nod 423 3/4; mott. 424½-25½.
-432 Lt. gr. dol; banded; TGS @ base.
-433 Lt. med. gr. dol; mott.
-435 Lt. gr. dol; lt. mott.
-439 Lt. med. gr. dol; v. banded to mott; fault 437½; chert nods 438, 38½, 39 w/few ss grains 439 above chert & TGS below chert.
-441 Med. gr. dol; chert nod 440.
-444 Lt. med. gr. dol; chert nod 441½, silic. 442½ then chert nod; nod 443½; sand 444, banded 442½-44.

-446 Lt. gr. dol; well banded.
-462 Lt. & lt. med. gr. dol; lt. mott. to 448½ w/chert nod 448½; v. mott. 448½-50, banded 450-59 w/occ. vert. shears; fault 456-57; scatt. ss grains 461-62 w/3" TGS @ 462.
-466½ Med. gr. dol; lt. crackle.
-471 Lt. med. gr. dol; mott, crackle; sheared & vugs 470-71 w/chert nod 471.
-473 Med. gr. dol; lt. crackle.
-486½ Lt. med. gr. dol; lt. banding & crackle to 475 w/FeS shine 475; ox. fault 477-78; brecc. 478-82 w/2% FeS est. 479-82; thin faults 484-85; brecc. w/est. 1% FeS 485-86½; scatt. ss grains 486-86½.
-489 Lt. gr. dol; brecc. w/est. 1% FeS; fault 488-89½.
-492 Med. gr. dol; silica seam @ base; lt. crackle w/FeS shines.
-494½ Med. dk. gr. dol; mott; sugary.
-505½ Med. gr. dol; some semi re-xl; v. mott; brecc. 494½-98 w/est. 1% FeS; crackle w/FeS shines 501-03.
-507 Med. gr. dol; tr. crackle w/re-xl; chert nod @ base.
TOP "R" BED 507.
-509 Dk. br. re-xl; cherty.
-514½ Br. re-xl; cherty; some crackle w/FeS shines.
-519 Lt. br. re-xl; est. 3" FeS 515-16; v. cherty; mott.
-520 Lt. med. gr. dol.
-527½ Gr. re-xl; FeS shine @ top; mott.
-513½ Med. gr. dol; mott. to banded.
-534½ Dk. re-xl.
-538 Med. dk. gr. dol; few eyelets, lt. crackle.
-540 Lt. coarse re-xl.
-540½ Med. dk. gr. dol.
-541 Lt. coarse re-xl.
-545 Med. dk. gr. dol; sugary top foot; mott; tr. crackle.
-547 Med. gr. dol; mott.
-548 Br. silic re-xl.
-552½ Lt. med. gr. dol; crackle to 550, brecc. 550-51 w/re-xl & siliceous; crackle 551-52½, FeS shines 550-52½.
TOP "S" BED 552½.
-555 Lt. br. coarse re-xl.
-558 Br. re-xl; crackle; chert nod @ base.
-559 Lt. mott. semi re-xl.
-561½ Lt. fine grained re-xl.
-564½ Gr. mott. re-xl.
-566 Lt. med. gr. dol.

-568½		Med. gr. dol; mott; chert nods 567, 568-68½.
-575		Br. re-xl; some crackle.
-578		Lt. med. gr. dol; crackle, thin ss @ base.
-582		Lt. br. re-xl; brecc.
-587		Lt. re-xl w/dk. silica; est. 2% FeS 582-84.
-590		Lt. br. re-xl.
-592		Lt. & dk. re-xl; est. 3% FeS 590-91.
-597		Br. re-xl; brecc.
-598½		Lt. re-xl.
		BASE KINGSPORT FORMATION 598½'.
-600		Lt. med. gr. dol; lt. crackle.
-611		Med. gr. dol; lt. mott; some crackle.
-612		Chert & re-xl; oolitic chert @ top.
-617	TD	Lt. med. gr. dol; mott.

NATIONAL LEAD CO. D.D. MG-2

Copper Ridge Project-Puncheon Camp Creek

DMEA Idn-E 1088

Hole No: MG-2

Farm: J.C. McGinnis et ux

Loc: N 48,675.46
E 44,084.02

Elev: 1469

Drilled By: Joy Mfg. Co.

Logged By: J.E. Spears

Collared: 9-26-57

Bottomed: 10-8-57

Depth: 510'

Casing: BX 42; AX 109

Reaming: 59'

Cement: None

Water Table: Dry

0-42	Overburden
-43½	Lt. med. gr. dol; mott.
-49	Med. gr. dol; well mott, few eyelets 46; chert nods 47, 48, 49 (4' core loss 44-50)
-52	Lt. med. gr. dol; few ox. shears 49, banding 51-53; chert nod 54½; fault 54½-55, ox. shears 56½-59, (2' core loss 50-56) (5' core loss 56-66).
-70	Med. gr. dol; some banding, chert nod (pt. oolitic) & CMss about 66; sheared & oxidized w/some brecc. 66-70 w/chert nod @ 70.
-71	Lt. med. gr. dol, chert nod 70; (1' core loss 70-77)
-74½	Med. gr. dol; well mott; scatt. ss grains bott. 6", then TGS.
-78	Lt. gr. dol.
-84	Lt. med. gr. dol; v. mott. to 81½; scatt. thin sands 83-84 w/hvy. ss & TGS @ 84.
-94	Lt. gr. dol, 84-84½ thin shaly-sandy dikes; v. mott. 84½-86½ w/scatt. sand grains & some silica; several chert nods at 88, nod at 90; shear 91-93 (core loss 93-94)
-99	Cavity
-105	Lt. med. gr. dol; vert. fault 99-100 (4' core loss 100-105)
-108	Cavity.
-109½	Med. gr. dol; eyelets, ox. at 109½.
-111	Med. gr. dk. dol; chert nod @ base.
-113	Lt. med. gr. dol; some reddish mott. v. sheared 112½-13.
-113½	White chert bed.
-121	Lt. med. gr. dol; v. sandy & congl. to 115½ w/chert seam 115½; grades to med. gr. about 116; sli. mott. 118-120 w/TGS 120-121.
-129½	Med. dk. gr. dol; mott. w/few eyelets; bott. 1½ foot v. mott. & darker, few ss grains @ base.
-131	Lt. med. gr. dol; hvy. sands 130-30½, large chert ol. 130½31 w/some oolitic chert.
-137	Lt. gr. dol, few ss grains near top; 133-34 darker ' mott.
-139½	Med. gr. dol; occ. vug in top foot.
-142½	Med. dk. gr. dol.
-146	Med. dk. gr. dol, few ss grains 143½; scatt. v. thin sand 144½-45 TGS 145; scatt. sand 145-46 w/TGS 146.
-149½	Med. dk. gr. dol; v. mott. 3" shaly silica at top; some vugs & eyelets; v. few ss grains at 149; chert nod & blue silica 149-49½
-154½	Lt. gr. dol, crackle 153-54½ w/est. ½% FeS.
-159	Med. gr. dol; occ. lt. [illegible] crackle.
-162	Lt. med. gr. dol; sli. mott; chert nod 162.
-164	Lt. gr. dol; tr. crackle, ox. [illegible] shines 163-64; oolitic, chert nod 164.
-167	Lt. med. gr. dol.
-170	Med. gr. dol.
-172	Lt. gr. dol.
-174	Lt. med. gr. dol.
-179	Med. gr. dol; occ. crackle w/some green gangue; occ. eyelet; chert nod @ base.
-180½	Lt. med. gr. dol; crackle.
-182	Lt. gr. dol; some banding; hvy. ss 182.
	TOP KINGSPORT FORMATION 182
-184½	Lt. gr. dol.
-187	Lt. med. gr. dol, oolitic chert nod 187.
-188	Chert bed.
-189	Med. gr. dol; mott, sugary, shaly.
-191½	Lt. gr. dol; sand 190; crackle 190-91.
-200	Lt. med. gr. dol; eyelets to 193; crackle 193-94.
-203	Med. gr. dol, crackle top 6".
-206	Lt. med. gr. dol; scatt. ss grains 203-03½; ox. 203½-04.
-213½	Med. gr. dol; TGS 210, v. mott. 210-13½.

-217 Lt. gr. dol, chert nods 214, 14½, 15, 16; banded 216-17.
-228 Lt. med. gr. dol; lt. banded 217-18½; chert nod @ 218½; well banded to 222; thin ss 222-222½; fault @ 224; ox. zone & grn. sh. @ 228.
-232½ Med. gr. dol; mott; crackle @ 231.
-235 Lt. gr; lt. ss @ 232½; ox. zone & ss @ 233; hvy. ss @ 233½; 1' sec. ch. 233½-234½.
-241½ Lt. med. gr. dol; scatt. ss 235-236; hvy. ss @ 236; mott. 236-241½; thin ss @ 241.
-264 Lt. gr. dol; thin ss @ TD @ 250'; ch. nod @ 257; 259½; 260, 261, 262; 262-264 banded & mott.
-268 Lt. med. gr. dol; well banded; v. semi 267-268.
-274½ Lt. gr. dol; 270½-271 blue ch. nods; mott. 268-271, chert nod 274, few ss grains thru 1" TD @ 274½.
-285 Lt. med. gr. dol; gr. crackle w/FeS shine @ 279½; chert nod 280; banded 282-84½ w/ thin ss 284½; TGS 285.
-290 Med. gr. dol; chert nods 286, 86½, 87½, 88½ & 89½.
-291 Lt. med. semi re-xl; many specks of white silica; few ss grains; TGS @ base.
-299½ Lt. med. gr. dol; v. mott. top 6"; ZnS shine in crackle @ 297, chert nods 297½, 99; TGS 299½.
-306 Lt. gr. dol; lt. banding, few eyelets.
-309½ Lt. med. gr. dol; crackle 306-06½ w/FeS shines; chert nods 306½-07, 308, 309, 309½.
-311½ Med. gr. dol, grades to lt. med. gr.
-316 Lt. med. gr. dol; 315-16 mott. & sugary.
-320 Lt. gr. dol; 316-17 crackle w/cut. & ZnS.
-321 Med. gr. dol. mott.
-330½ Lt. med. gr. dol; scatt. ss grains 324½-25, green shale 325-25½; chert nods 325½, 26½; from 326 grades to med. gr. dol.
-331½ Med. semi re-xl; mott.
-338 Med. gr. dol, some grades to med. dk. gr, chert nods 334, 338.
-344 Lt. med. gr. dol; shears 338-39; crackle breec. 339-42 w/green & white gangue & cut. & FeS; few ss grains @ base.
-346½ Med. gr. dol; occ. crackle w/green & white gangue; few ss grains @ base.
-349½ Lt. med. gr. dol; occ. crackle w/green & white gangue; few ss grains @ base. Occ. FeS shine.
-358½ Med. gr. dol, green shale 351½-52; v. mott. 353-55; dk. dol 355-55½; 355½-57½ crackle w/green shale & white gangue (1' core loss 355-58).
-358½ Lt. gr. dol.
-362½ Med. gr. dol; v. mott. top 2'; some semi re-xl top foot; crackle breec w/gangue bott. 3'.
-365 Lt. med. gr. dol; 362½-64 "dry breec"; crackle w/gangue 364-65 w/chert nod 365.
-368 Lt. re-xl, v. silic. to all silica.
-371 Br. re-xl, shaly (2' core loss 362-371; 1' loss 371-74).
-373 Lt. & br. re-xl; mott, coarse; @ 372 v. dk. & silic; green shale 373.
-375 Lt. med. gr. dol.
-378 Lt. br. re-xl; silic, crackle; FeS shine 377.
-381 Lt. gr. re-xl; mott.
-385½ Lt. semi re-xl; (4' core loss 379-86).
-388½ Lt. med. gr. dol; sugary; breec. 386-87.
-392½ Green & br. re-xl; mott; some blocks med. & dk. dol.
-394 Lt. mott. re-xl.
-395 Br. re-xl.
-397½ Lt. re-xl; shaly; bott. 6" none lt. gr. dol.
-398 Br. re-xl.
-400 Med. gr. dol.
-402½ "Dry breec.", re-xl w/blocks of dol. & chert.
-405½ Lt. med. gr. dol; mott. to 403½, re-xl 403½-04.
-407 Lt. med. gr. dol; "dry breec".
-412 Dk. gr. dol, dry breec. to 410, crackle 410-411.
-418½ Med. gr. dol, mott; some crackle w/FeS shine @ 414-15; chert frag. & dry breec. 415-16 & 417½-18½.

-422 Br. re-xl; v. cherty 420-21.
-423½ Med. gr. dol; mott; brecc. sealed w/re-xl.
-424 Gr. re-xl.
-426 Lt. gr. dol.

Top "S" bed 418'
-427 Br. re-xl.
-428½ Lt. semi re-xl; 1" TGS @ base.
-433 Lt. med. semi re-xl (or fine grained re-xl) chert nods 431, 433.
-435 Br. re-xl; cherty, some dol. blocks.
-436½ Med. gr. dol; sandy & TGS @ base.
-454 Br. re-xl; v. shaly & cherty & silic to 441½, chert nod 446½-47.
Base Kingsport 454'.
-456 Lt. gr. dol; some semi re-xl @ top.
-465 Lt. med. gr. to med. gr. dol; sand, oolite @ 465 & some red oxidation.
-466½ Br. re-xl; top 6" chert.
-473 Lt. med. gr. dol; mott.
-475½ Lt. re-xl; v. silic; jasporiod 475-75½.
-479 Med. gr. dol; v. cherty top 6"; some brecc. w/re-xl.
-485 Lt. semi re-xl to sugary dol; crackle.
-487 V. silic, re-xl.
-489 Lt. gr. dol; crackle.
-490½ Br. re-xl; v. cherty.
-496 Lt. br. re-xl, sli. mott. tr. of crackle, FeS shines 492-94; few ss grains 495½.
-500 Br. mott. v. silic. re-xl; tr. of FeS thruout.
-502 Lt. med. gr. dol; scatt. ss grains 501½-02.
-505 Lt. gr. re-xl (fine grained) some crackle w/silic. & white gangue.
-510 TD Lt. gr. dol.

NATIONAL LEAD CO. D.D. CO-2

Copper Ridge Project-Puncheon Camp Creek

DMEA Idm-E 1088

Hole No: CO-2

Farm: D.F. Coffman

Loc: N 47,546.18
E 43,400.85

Elev: 1403

Drilled By: Joy Mfg. Co.

Logged By: J.W. Spears

Collared: 9-23-57

Bottomed: 10-8-57

Depth: 854

Casing: BX 16'; AX 21'

Reaming: None

Cement: None

Water Table: _____

0-16	Overburden
-21	Med. gr. dol.
-27½	Lt. med. gr. dol; cavity 23-26; sli. banded.
-32	Lt. gr. dol; chert nod 31½.
-34	Med. gr. dol; FeS shine 33.
-36	Lt. gr. dol; chert nod @ 36.
-42	Lt. med. gr. dol; w/chert nod @ 37½.
-45	Med. gr. dol; mott. top foot; banded 44-45.
-47	Semi re-xl.
-58	Lt. med. gr. dol; grades to med. gr.
-67	Lt. gr. dol; mott. top foot; then banded to 62; sli. mott. from 62-67; occ. eyelets.
-76	Lt. med. gr. dol; large chert nod (oolitic) @ 71½-72; ox. @ base.
-78½	Med. gr. dol; banded.
-84	Lt. med. gr. dol.
-87	Med. gr. dol; mott.
-91½	Lt. gr. dol; eyelets; some lt. mott; chert nod @ base.
-93½	Med. gr. dol; well mott.
-98	Lt. med. gr. dol; banded; TBS & ox. zone @ 96; chert nod @ 98.
-99	Lt. gr. dol; chert nod @ base.
-104	Lt. med. gr. dol; 102½-04 well mott; v. mott; v. shaly bott. 6".
-106	Lt. semi re-xl.
-110½	Lt. med. gr. dol; sugary; vuggy; v. mott; dk'er towards base.
-117	Lt. med. gr. dol; sli. banded; grades to med gr.
-120½	Med. dk. gr. dol; v. mott; ½' breccia near top.
-123½	Med. gr. dol; mott; silic. bott. 6".
-130	Lt. med. gr. dol; banded to 127 w/TBS 127.
-135½	Med. gr. dol; well banded to 133½; few ss grains 130½; chert nod (lk.) 135½.
-142	Lt. med. gr. dol; mott; silic; chert nod 136½; grades to med. gr.
-148	Med. gr. dol; mott; fault 146 & 144½-48.
-166	Lt. med. gr. dol; fault 152; TBS 152½; v. mott. 152½-55½; shear; 155½ & 156½; banded & sands 158½-159, fault 160; sands 161½-62; lt. banding 161½-64; v. mott. 164-66.
-167	Lt. gr. dol.
-170½	Dk. gr. dol; lt. banding; v. mott. & sandy bott. 6" w/TBS @ base.
-177	Lt. med. gr. dol; mott; fault 175.
-184½	Med. gr. dol; banded to 179½ w/sand @ 179½; lt. mott. 179½-84½ w/ 1" chale @ 183½ & thin sand & TBS @ 184½.
-186	Lt. gr. dol; thin fault 186.
-187	Lt. med. gr. dol.
-189½	Lt. gr. dol.
-192	Lt. med. gr. dol.
-193½	Lt. gr. dol; banded; v. hvy. (to CM) sand; 193-94½ w/TBS 193½.
-195½	Lt. med. gr. dol.
-197½	Med. dk. gr. dol; v. mott.
-201½	Med. gr. dol.
-203½	Med. dk. gr. dol; dk. oolitic chert nod @ base.
-207½	Med. gr. dol; hvy. ss 206; TBS @ 207½.

-211½ Lt. med. gr. dol; grades to med; some banding/
-213½ Lt. gr. dol; many scatt. sands becoming hvy. towards base; some edgewise congl.
-216 Dk. gr. dol; bott. few inches mott.
-217½ Lt. med. gr. dol; v. mott.
-220 Dk. gr. dol; v. mott.
-222½ Med. dk. gr. dol; some mott; TGS @ base.
-224½ Lt. gr. dol; some blue mott.
-226½ Lt. med. gr. dol; some mott.
-230 Dk. gr. dol.
-233½ Med. gr. dol; FeS shine @ 233; edge. congl. @ 33½.
-235 Lt. med. gr. dol; sli. banded; v. hvy. sands 34-35; chert nod @ base.
-238 Lt. gr. dol.
-249 Lt. med. gr. dol; mott; thin sand & TGS @ 45.
-251½ Re-xl; extremely silic. 50-51½; band sec. chert @ 50.
-252 Lt. gr. dol; TGS @ base.
-254 Lt. med. gr. dol; banded; chert nod @ 53; thin fault @ 54.
-255½ Med. gr. dol.
-256 Med. semi re-xl; chert nod @ base.
-260 Lt. med. gr. dol; grading to med, gr.; v. mott. sugary (semi re-xl).
-267½ Lt. gr. dol; banded; scatt. sand grains 63½-64.
-273 Med. gr. dol; mott. top foot; thin fault @ 72.
-274½ Lt. re-xl; mostly silica 74-74½.
-281 Lt. med. g. dol; v. banded 77½-81.
-283½ Med. gr. dol; well mott.
-295½ Lt. med. gr. dol; grading to med; v. hvy. sands @ 93½-94, chert nod @ 94: chert layer 94-95½.
-297½ Lt. med. gr. dol; bott. 3" breccia w/shale; chert layer 97½-98.
-298½ Chert layer.
-300 Lt. med. gr. dol; chert nod at 300; part (?) oolitic.
-301 Lt. re-xl; v. silic.
-303½ Lt. med. gr. dol; v. sandy to 301½, then 4" green shale; v. mott. 301-03; w/scatt. ss grains at 303 & 303½.
-304 Lt. semi re-xl; chert nod @ base.
-304½ Lt. med. gr. dol; mott.
-307½ Lt. gr. dol; well banded to 306 w/chert nod 306; then lt. banding w/hvy. scatt. sands 306-07½.
-311½ Lt. med. gr. dol; FeS shine 308; eyelets; TGS @ base.
-314 Med. gr. dol; fault @ 312; mott.
-318 Med. dk. gr. dol; well mott; occ. thin gangue filled shears.
-318½ Lt. semi re-xl; silic, sandy.
-320½ Lt. med. gr. dol; eyelets, vugs.
-323½ Lt. gr. dol, mott; oolitic chert nod @ base.
-337 Lt. med. gr. dol; v. mott to 325, then lt. mott. to 333½; v. sandy 333-33½; well mott. 333½-337.
-340½ Med. gr. dol; few ss grains 339½.
-343½ Med. dk. gr. dol; v. mott.
-344 Lt. gr. dol; TGS ? base.
-346 Lt. med. gr. dol; TGS @ base.
-348½ Med. gr. dol.
-355 Dk. gr. dol; mott; v. hvy. ss @ 356.
-365 Med. gr. dol; grading to med. dk. gr.; v. mott w/silic eyelets.
-368½ Med. gr. dol; banded; v. hvy. sands bott. 6".
-371 Lt. gr. dol; banded; hvy. sands top 4" then sand dikes; chert nod @ base.
-375 Lt. med. gr. dol.

-176½ Med. gr. dol; scatt. sands & more congl; bott. 4" sec. chert.
-180 Lt. gr. dol; thin steep fault 378; scatt. sands 379-80 w/chert nod @ 380.
-186 Lt. med. gr. dol; few ss grains @ top; v. hvy. to CM ss @ 381; v. sheared 384-86 w/fault 385½-86.
-187 Med. gr. dol; ss grains @ base.
-188½ Lt. med. gr. dol; v. sandy; oolitic chert nod @ 188.
-192½ Breec. chert & sec. chert w/FeS shines; 3" TGS @ base.
-194½ Med. gr. dol; mott; shears @ top.
-198½ Dk. gr. dol; mott; thin ss @ base.
-200½ Lt. med. gr. dol; banded & thin sands to 199½, then well mott.
-204 Med. gr. dol; v. mott; thin faults 201½, 204; chert nod & few ss grains @ 204.
-205½ Lt. med. gr. dol.
-207½ Med. gr. dol; thin shears.
-411½ Med. dk. gr. dol; v. sheared.
-421½ Med. gr. dol; sheared; fault 416-21½, from 417-19 ½ core dk. dol.
-424 Lt. med. gr. dol.
-426 Med. gr. dol; v. mott; thin ss @ base.
-438 Lt. med. gr. dol; v. mott to 427½, then lt. mott. to 430; hvy. sands 430-30½, fault @ 435.
-441½ Med. gr. dol; silic. eyelets; vert. ox. shears TGS 2 feet.
-443½ Lt. semi silic, mott.
-448½ Lt. med. to med. gr. dol; v. mott, vert. shears; thin fault 448, then few ss grains; chert nod 448½.
-452 Lt. gr. banded dol; sheared 451-52.
-453½ Med. gr. banded dol.
-455 Lt. gr. dol; thin fault 454½-455.
-455½ Lt. med. gr. silic. semi re-xl.
-459½ Sec. chert; oolite @ 458.
-463½ Lt. gr. dol; 1" breec. & white tongue; 462½-63 oolitic chert nods.
-469 Lt. med. gr. dol; silic. 467-68; blue chert nods 468½-69; FeS shine 468½.
-474 Lt. gr. dol; lt. banding, small chert nod 473.
-478½ Lt. med. gr. dol; v. mott; small chert nod 475.
-480½ Med. gr. dol; v. mott; scatt. ss grains bott. 6", TGS @ base.
-485½ Lt. gr. dol; well mott; vert. shears 484-85½; thin ss 485½.
-492 Lt. med. gr. dol; lt. banding to 486½; v. banded 486½-87, scatt. ss grains 486½-88½ w/TGS 487½ & hvy. ss 487½-88; v. mott. 488½-92 w/bott. 8" v. cherty w/some ss grains.
-498 Lt. gr. dol; fault 493 w/some chert & FeS shine; lt. banding 493-96; lt. mott. 496-98.
-503 Lt. med. gr. dol; v. mott. silic eyelets; TGS @ base.
-504½ Med. gr. dol; v. mott, silic eyelets; TGS @ base.
-507½ Lt. med. gr. dol; banded; few ss grains & TGS @ base; tr. ZnS in the shale.
-512½ Lt. gr. dol; lt. mott. to 511½; chert nod 512½.
-513½ Lt. med. gr. semi re-xl; bott. 3" congl. w/few ss grains.
-520 Lt. med. gr. dol; banded to 514½ & v. sandy; mott. 514½-20 TGS 518, 18 3/4, 19½; vugs 518-20; thin fault @ 520.
-525 Med. dk. gr. dol, well mott.
-526½ Med. dk. gr. dol; lt. banding; oolitic chert nods @ 526½.
-528 Lt. gr. dol.
-529½ Lt. med. gr. dol, v. mott.

-536 Med. dk. gr. dol; mott.
-538½ Med. gr. dol; banded; sand then TBS @ 537½; thin sand, 538-38½ w/TGS 538½.
-548 Lt. med. gr. dol. grades to med. gr. dol; 538½-41 v. mott. & vuggy w/TBS 541; banded 541-48 w/2" TBS 548.
-549½ Lt. med. gr. dol; mott.
-553 Lt. gr. dol; lt. banding; chert nod 551½.
-554½ Med. gr. dol; lt. banding.
-563½ Med. dk. gr. dol; mott; dk. chert nod @ base.
-566 Med. gr. dol; scatt. ss grains bott. 6" w/hvy. ss 566.
TOP *KINGSPORT* FM. 566
-570½ Dk. gr. dol; chert nod @ base.
-572½ Med. gr. dol; well mott; TBS @ base.
-576 Lt. gr. dol.
-578 Med. dk. gr. dol; well mott, TBS @ base.
-531 Lt. med. gr. dol; well mott, TBS @ base.
-532½ Med. dk. gr. dol; well mott, TBS @ base.
-539 Med. gr. dol, occ. TBS.
-592 Med. dk. gr. dol; v. mott; TBS 590.
-604 Lt. med. gr. dol; mott 592-93 w/chert nod 592½ & 593; banded 593-601½ w/chert nods 593½, 94½, 95½; sand, 600½-01; mott. 601-03.
-607 Med. gr. dol; mott; 2" shale @ 604.
-612½ Lt. gr. dol; mott. to 611, chert nod 611-11½, banded 611½-12½ w/hvy. sands @ 612½.
-615½ Med. dk. gr. dol; mott.
-624 Med. gr. dol; chert nod 616½, mott. 616½-17, TBS 618-18½.
-627 Lt. gr. dol; mott.
-647½ Lt. med; gr. dol; chert nods 629, 29½, 30, 31, 31½, 32, 33, 33½; banded 631½-37½, sandy 637-37½ w/TGS; v. mott. 637½-40; v. cherty w/chert nods 642½ & 2" TGS 643; chert nod 647½.
-649 Med. gr. dol; crackle bott. 6".
-657 Lt. med. gr. dol to med. gr; lt. mott. 649-51 w/sand grains 650½-51 & TGS 651; chert nod 652,53½, 54, 54½, 56 & oolit. ~~vert~~ mod 657.
-660 Lt. sugary dol; scatt. ss grains & silic. specks to 58 w/1" silic green shale @ 58 mott. 658-60.
-665½ Lt. gr. dol; lt. mott. to 663, lt. banding 663-65½.
-666½ Lt. med. gr. mott. to banded.
-675½ Lt. gr. dol; banded to 671½ w/chert nods 669½, 670 & few ss grains then large chert nod @ 671½.
-680 Lt. med. gr. dol; mott. 677½-80.
-690 Lt. gr. dol; lt. banding; shaly 685; mott. 685-86½.
-691½ Lt. med. gr. dol; chert nod 691.
-695½ Lt. gr. dol; fault 695½.
-700 Lt. med. gr. dol; mott. 695½-96½.
-706 Lt. gr. dol; banded to 702; chert nod 706.
-710 Lt. med. gr. dol; chert nod 708; sand & 1" TGS @ 710.
-715 Lt. gr. dol. grades to lt. med. gr; v. lt. crackle bott. 2', 1" TGS @ base.
-718½ Br. re-xl; shaly & coarse top foot; TGS @ base.
-720½ Lt. shaly semi re-xl to fine grained re-xl, v. shaly 720-20½.
-722½ Lt. med. gr. dol; mott. 2" TGS @ base.
Top "A" bed 728'.
-728 Lt. med. gr. dol, sugary to semi; mott; bott.2' sheared; 1" TGS @ base.
-729½ Br. re-xl; cherty at top; crackle.
-731 Med. gr. dol; banded; bott. foot chert, TGS @ base.
-732½ Br. shaly re-xl; crackle.
-737½ Lt. med. gr. dol; sugary; 734-37½ mott. & brecc. sealed w/re-xl; TGS 737½.
-747½ Re-xl, top foot br; then lt. mott. fine grained.
-749 Lt. med. gr. dol; sugary; chert nod @ base.
-751 Br. re-xl; TGS @ base.

-755		Lt. med, med. gr. dol; fault 752-52½; mott.
-765		Med. gr. dol; mott; vert. fault 760-61.
-768½		Med. dk. gr. dol; v. mott. top foot.
-774½		Med. & med. dk. gr. dol; brecc, sealed w/re-xl & much black jasporiod; by 73-74½ almost all jasporiod (occ. FeS shine).
-778½		Med. dk. gr. dol; crackle; some mott. @ top.
-785		Lt. med. gr. dol; sugary, mott; 781-81½ chert nod & some re-xl; v. sheared to faulted 781½-85; banded 783-85,
		Top "S" bed 785'.
-791½		Br. re-xl; mott. to 786½ w/band of jasporiod @ 786½; v. cherty @ 789; some jasporiod 790-90½; chert nod 790½-91.
-797		Lt. gr. semi re-xl to fine grained re-xl; crackle to brecc; v. cherty 795½-97.
-809		Br. re-xl; cherty & v. silic. to 798; brecc. 801½-04 w/est. 2% FeS 801½-02½; shears 805-05½; brecc. 807-09; vert. fault 807-09.
-812		Lt. med. gr. dol; mott, fault 809-12; bott. foot some re-xl.
-815		Br. re-xl, mott, FeS shine 812½, fault 813½-15.
-816		Lt. med. gr. dol; vert. fault.
-817½		Br. re-xl, v. silic top 9" w/occ. block dol.
-820		Lt. gr. re-xl & br. re-xl; FeS shine @ top.
-832		Lt. br. re-xl; occ. zone of jasporiod, fault 826½-28.
-840½		Lt. med. gr. dol; scatt. faults 832-37 & 840-41.
-844		Med. gr. dol.
-845		OOlite, 4" chert w/FeS shines; re-xl
-852		Lt. gr. dol; v. sugary to semi re-xl; thin shears thruout; chert nod @ base.
-854	TD	Lt. v. silic. re-xl; few ss grains bott. 3".

DMEA
RECEIVED OCT 25 1957
DATE | CODE
10/25 gb 220
10/30 Clay 500

INTERIM REPORT

DMEA-4580, Idm-E1088 (Zinc)

Operator: National Lead Company, New York, New York

Location: Puncheon Camp Creek Area, Grainger County, Tennessee

Diamond drilling on the Puncheon Camp Creek project of National Lead Company in the Copper Ridge district to date and since the last inspection on September 17, 1957 is summarized as follows:

Drilling completed:

Footage in holes completed since last inspection . . .	2,916
Total footage in holes completed to date	4,433
Number of holes completed since last inspection . . .	4
Total number of holes completed to date	6
Number of holes showing commercial zinc ore	0
Number of holes showing non-commercial zinc mineralization	2
Number of barren holes	4

Drilling in progress:

Number of holes in progress	2
Total footage drilled in incompleted holes at time of inspection	471

Brief summaries of the four holes completed since the last inspection follow:

Hole No.	Property	Total Depth	Remarks
CO-1	Coffman	961	Location: On downdip extension of Fence 6 (see contract map) approximately 200 feet northwest of contact between Mascot dolomite and Chickamauga limestone. Abbreviated log: 0-9 overburden; 9-653 Mascot dolomite; 653-853 upper Kingsport dolomite member; 853-939 lower Kingsport limestone member; 939-961 Longview dolomite. Mineralization: Shine of ZnS @ 290 (in Mascot); shines of FeS_2 @ 928-929, 933, and 951-952; classed as barren hole.
CO-2	Coffman	854	Location: 200 feet northwest of Hole CO-1. Abbreviated log: 0-16 overburden; 16-566 Mascot dolomite; 566-728 upper Kingsport dolomite member; 728-832 lower Kingsport limestone member; 832-854 Longview dolomite. Mineralization: Scattered traces of FeS_2 @ 769-771, 801-802, 812, 820, and 844; barren hole.

Hole No.	Property	Total Depth	Remarks
MG-1	McGinnis	591	Location: Approximately at position of third hole updip from southeast end of Fence 5 (see contract map). Abbreviated log: 0-95 overburden; 95-276 Mascot dolomite; 276-480 upper Kingsport dolomite member; 480-557 lower Kingsport limestone member; 557-591 Longview dolomite. Mineralization: Shines of ZnS @ 380, 388, 390, 426-427 ($\frac{1}{4}$% Zn. est), and 428; scattered traces and shines of FeS_2 @ 353-511; shine hole.
MG-2	McGinnis	510	Location: 200 feet updip from Hole MG-1. Abbreviated log: 0-42 overburden; 42-182 Mascot dolomite; 182-365 upper Kingsport dolomite member; 365-454 lower Kingsport limestone member; 454-510 Longview dolomite. Mineralization: Traces of FeS_2 @ 377, 414, and 491-495; barren hole.

Pertinent data on the two holes in progress are as follows:

Hole No.	Property	Depth	Est. Total Depth	Remarks
CO-3	Coffman	131	600	Located 400 feet NW of Hole CO-2; collared and drilling in Mascot dolomite (overburden 26 feet).
MG-3	McGinnis	340	420	Located 200 feet NW of Hole MG-2; collared in upper Kingsport dolomite member (127 feetof overburden); currently drilling in lower Kingsport limestone member (top @ 273); shine of ZnS @ 187$\frac{1}{2}$-191; scattered traces of FeS_2 @ 229-244.

Approval has also been given to drill holes as follows: CO-4 (200 feet down dip from CO-3), CO-5 (200 feet updip from CO-3), CO-6 (200 feet up dip from CO-5), CO-7 (200 feet up dip from CO-6); MG-4 (400 feet down dip from MG-1), MG-5 (200 feet down dip from MG-1), and MG-6 (600 feet down dip from MG-1).

Inspected: October 15, 1957

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

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

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

Budget Bureau No. 42-R1036.5

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

PAID CHECKER & SCHEDULE
OCT 23 1957
D.M.E.A.

OPERATOR'S MONTHLY REPORT AND VOUCHER

Month of September, 1957 Docket No. DMEA 4580 Contract No. Idm-3 1088
Operator's Name National Lead Co. Minerals Zinc
Address 111 Broadway, New York, N.Y.
Contract Amount, $ 170,125.00 Government Participation: 50 % Amount, $ 85,062.50

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	4656.00	4551.00	9207.00	12/13/57		
Bulldozing						
Crosscutting						
Drifting						
Reaming	—	—	—			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
Core Boxes	88.75	—	88.75			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment	—	—	—			
Sampling and Analysis						
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): Incidental Allowance at .16/ft.	279.36	273.06	552.42			
TOTALS	5024.11	5370.18	9848.17	5024.11	4824.06	9848.17

I certify that the above bill is correct and just and that payment therefor has not been received.
Date Sept. 1957 *Payee National Lead Co.
Per G. G. Brown Title Superintendent

*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:
$ 2512.06
Signature Victor R. Miller
(Authorized Certifying Officer)
Date OCT 23 1957 Vou. No. 77
(See other side)

2512.05

(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. E-1088 in accordance with the terms of the contract.

Signature N. J. Lynch Title MINING ENGINEER U. S. BUREAU OF MINES Date OCT 18 1957

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Lawrence Title EXECUTIVE OFFICER DMEA FIELD TEAM REGION V Date OCT 23 1957

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.

Form MF-104A
(April 1952)

Budget Bureau No. 42-R1151.2

RECEIVED OCT 25 1957 D.M.E.A.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of September 195 7 Docket No. DMEA 4580 Contract No. Idn-E 1088
Operator's Name National Lead Co. Minerals Zinc
Address 111 Broadway, New York, N.Y.

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		4656.00	1552	9207.00	3069	3.00	50,000	3.00
Churn Reaming	Foot	—	—	—	—	—	5,000	2.00
Auger Sampling	Foot	—	—	—	—	—	550	1.50
Stripping Core Boxes	Ea.	88.75	50	88.75	50	1.77½	150	2.00
Trenching								
Test Pits								
Roads and Trails Incid.								
Allowance @ .18¢/ft.	Foot	279.36	1552	552.42	3069	.18	50,000	.18
TOTAL DISTRIBUTED COSTS		5024.11		9848.17				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		5024.11		9848.17				

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 Sept. 1957 Operator National Lead Co.

Per [signature] Title Superintendent

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.

REMARKS:

(Instructions on reverse)

(For Government use only)

[signature]
GEOLOGIST, U. S. G. S.
OCT 18 1957

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

A PROGRESS REPORT ON THE PUNCHEON CAMP CREEK
PROJECT, GRAINGER COUNTY, TENNESSEE
FOR SEPTEMBER 1957

Docket No. 4580
Contract No. Idm-E 1088

During the month of September, two holes were drilled on the Puncheon Camp Creek project.

One hole was drilled on the McGinnis farm (MG-1). The hole collared in the Mascot formation and was drilled to a depth of 591'. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0'-95'	Overburden	----	--------	----
95'-276'	Mascot fm.	CMss @ 276'	---	Light, medium, and dk. gray dol.
276-557'	Kingsport fm.	Top of "R" @ 480; top of "S" @ 519½; top of "T" @ 557.	Shines @ 388, 390; 426½-427, ½' @ ¼% Est; 428.	Light, medium, and dk. gray dol. w/re-xl and limestone in lower part; in part brecc.
557-591'	Longview fm.	-------	-----	Dol. and re-xl.

One hole was drilled on the Coffman farm (CO-1). The hole was collared in the Mascot formation and was drilled to a depth of 961'. The results are summarized below:

DEPTH	FORMATION	KEY HORIZON	ZINC MINERALIZATION	REMARKS
0-9'	Overburden	----	-----	---
9-661'	Mascot fm.	CMss @ 661'	Trace @ 290½	Dol; light, med. dk. gray.
661-939'	Kingsport fm.	Top of "R" bed @ 853; top of "S" bed @ 905; top of "T" 939.	---	Light, med. and dark gray dol. w/recrystalline and limestone in lower parts.
939-961'	Longview fm.	-------	--------	Dol. w/some re-xl.

On the McGinnis farm, drilling is now underway 200' north of MG-1 at location MG-2.
On the Coffman farm, drilling is underway at location CO-2 200' north of CO-1.

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.		DATE	AT REC. POINT	B.O. NO.
			OUR ORDER NO.			
CONTRACT	CODE 63			DATE	AT SHIP POINT	

SOLD TO: National Lead Company
Box 2047
Morristown, Tenn.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 96747

INVOICE DATE 9-25-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
			To 591.' Core Drilling at Puncheon Camp, Tennessee as per agreement.					
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		MG-1	0. / 591.		591.		$3.00	$1,773.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO

National Land Company
Box 2047
Morristown, Tenn.

~~[illegible] 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96746

INVOICE DATE 9-25-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 961.' Core Drilling at Puncheon Camp, Tennessee as per agreement.							
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		Coffman 1	0.	961.		961.		$3.00	$2,883.00
		CO-1							

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

Statement

Jefferson City, Tenn. 10/7/57 195

M National Lead Co

Thorn Hill, Tenn

MOYERS CABINET SHOP

108 Carson Street

Telephone 3113

25- AX Core Boxes	5' Long	@ 2.00	50.00
25- AX Core Boxes	4' "	1.55	38.75
500- Survey Stakes		.03	15.00
200- " Hubs	2x2x12	.03	6.00
			109.75

THANH YOU

Gevaert

NATIONAL LEAD CO. D.D. MG-1

Copper Ridge Project-Puncheon Camp Creek

DMRA Idn-F-1038

Hole No: MG-1

Farm: J.C. McGinnis et ux

Loc: N 48,510.70
E 44,196.20

Elev: 1412

Drilled By: Joy Mfg. Co.

Logged By: J.M. Spears

Collared: 9-14-57

Bottomed: 9-23-57

Depth: 591'

Casing: Bx 25'; AX 103'

Reamings: None

Cement: None

Water Table: 300#

0-95	Overburden
-103	Lt. med. gr. dol.; v. sandy 101 (6' core loss 95-103.
-115	Med. dk. gr. dol.; grades to med. gr.; few eyelets 106-08; shears 114.
-117½	Lt. gr. dol.; sheared.
-120	Lt. med. gr. dol.
-123	Med. dk. gr. dol.; v. mott.; chert nod at base.
-129	Lt. med gr. dol.; well mott.; v. sandy 128-129.
-139	Med. gr. dol.; mott. to 135; tr's of breco. 135-38.
-141	Lt. med. gr. dol. to silic. re-xl; some sand grains; bott. 8" chert.
-144	Lt. med. mott. silic. re-xl.
-145	Lt. med. gr. dol.; mott.; chert nod at base.
-149	Lt. gr. dol.; chert nod at base.
-151	Med. gr. dol.; ox. zone 150, chert nod 151.
-158½	Lt. med. gr. dol.; Lt banding to 153; mott. 153-58½.
-168	Lt. gr. dol.; lt. crackle to 160 w/chert nod 159½; brecc. w/ FeS shines 160-168 w/chert nod 168 (9' core loss 160-171.)
-169½	Med. dk. gr. dol.
-173	Med. gr. dol.; large eyelet at 171½.
-175½	Med. dk. gr. dol.; mott; some thin shears; at base 2" scatt. ss grains then TGS.
-178	Lt. med. gr. dol.; lt. mott.; some lt shears thruout.
-180½	Med. gr. dol.; mott; from 179-80 some crackle filled w/chert.
-183	Lt. med. gr. dol.; banded 181-82; scatt. sands 181½-82½; v. mott. 182½-83 w/thin shear.
-184½	Lt. gr. dol.; scatt. sands 183-84.
-187	Lt. med. gr. dol.; mott; poss. openings 186-87 w/chert nods & few ss grains.
-195½	Lt. gr. dol.; chert nod 189½.
-200	Lt. med. gr. dol.; well mott; ox. zone 198 & TGS; wtr.(?) zones 199½-200.
-202	Med. gr. dol.; thin shears near top; wtr.(?) zone & TGS at 202.
-203½	Med. dk. gr. dol.; mott.
-205½	Med. gr. dol.; banded; wtr.(?) sone 204; thin sands 205-05½ w/TGS @ base.
-211	Lt. gr. dol.; mott.; some reddish color; small vugs 207-08; bott. 3" v. silic.
-214½	Lt. med. gr. dol.; v. sandy & congl. to 213; red mott. & eyelets 213-14½.
-217	Med. gr. dol.; eyelets; TGS at base.
-220½	Lt. med. gr. dol.; sli. red color; TGS 218 w/ 1" fault below; few eyelets 218-20.
-227½	Med. gr. dol.; grades to med. dk. gr.; sli. mott.; eyelets; few vugs at 222.
-228½	Dk. gr. dol.; mott.
-230½	Med. gr. dol.; v. heavy sand 229½ & 230; chert nod (sandy(at 230, then 6" green silic. seam.
-236½	Lt. med. gr. dol.; mott; occ. eyelet.
-240½	Med. dk. gr. dol.; chert nod at base.
-242½	Lt. med gr. dol.; scatt. ss grains 241-42 w/sand & TGS at 242; bott. 6" silic.
-243½	Med. gr. dol.; v. mott.; chert nod 243½.
-249	Lt med. gr. dol.; shears 248-49.
-255	Med. gr. dol.; thin shears to 252; mott. 252-55.
-270	Lt. med. gr. dol.; chert nod 256; banded; fault 259-60, 262-62½; v. mott. 265-66.
-273	Med. gr. dol.; v. mott.; 272-73 w/chert nod 273.
-280	Lt. med. gr. dol.; lt. banding; at 276 v. heavy ss w/some oolite; TBS 277½; scatt. ss grains 277½-78; TBS 280.
-282	Med. gr. dol.

282-284	Lt. semi re-xl, v. silic. TGS @ base.
-292	Lt. gr. dol.; thin heavy ss at 285½; TBS 292.
-293½	Lt. med. gr. dol.; eyelets.
-295	Lt. gr. dol.; lt. mott.
-299	Lt. med. gr. dol.; lt. banding, occ. chert nod.
-303	Lt. gr. dol.
-309	Med. gr. dol.; 306-09 v. mott. & silic.
-325	Lt. med. gr. dol.; sli. mott. to 309½ & cherty 309½; banded 309½-318½ w/chert nods 310½, 311½ & sandy 318-318½; shale & sugar at 325.
-329	Lt. gr. dol.; mott; grades to lt. med. gr.
-329½	Lt. med. semi re-xl; band. sec. chert at top & bott.
-333	Lt. med. gr. dol.; CMss at 331; grades to med. gr.
-346½	Med. gr. dol.; cherty at 336.
-350	Lt. med. gr. dol.; crackle 34 -50.
-360	Lt. gr. dol.; brecc. 353½-55 w/FeS shines; lt. banding 355-58 w/chert nod 358; crackle brecc. 358-60 w/FeS shines; brecc. chert nod at 360.
-364	Lt. med. gr. dol.; v. banded & grades to med. gr.
-370	Med. gr. dol.; v. banded; scatt. sands 368½-70 & 2" of silic. & green shale at 370.
-373	Lt. med. gr. dol.; v. mott.; large chert nod 373.
-384	Lt. gr. dol.; lt. banding to 377; chert nods 376½, 377; green shale 377-77½; chert nods 382½, 83, 84.
-392	Lt. med. gr. dol.; chert nods 385, 87, 87½, 88½; ZnS shines at 388 & 390; many specks of sec. chert 390-91 w/ TGS at 391; v. mott. 391 92 w/ chert nod 392.
- 407	Lt. gr. dol.; chert nod 399; TGS 400, banded 400-07 w/ 6" chert nod at 407.
-417	Lt. med. gr. dol.; chert nod 408, thin ss 411; crackle 413-15; v. mott. 415-17.
-419½	Lt. gr. dol.; crackle.
-436	Lt. med. gr. dol.; TGS 422½; mott. 422½-23; tr ZnS (est. ¼%), 426½-27 in fractures; chert nod 428; crackle 428-28½ w/ ZnS shines; crackle 431-32½ w/est. 1% FeS; v. mott. 432½-33½; crackle 435-35½ w/FeS shines.
-441½	Med. gr. dol.; chert nods 436½, 438.
-450	Lt. med. gr. dol.; crackle to rubble brecc. to 446½ w/est. ½% FeS.
-460	Med. gr. dol.; crackle 450-52; 454½-58; FeS shines; 454½-58 & at 459.
-463½	Lt. med. gr. dol.; FeS shine at top; mott.
-468½	Med. gr. dol.; scatt. crackle w/FeS shines; TGS at base.
-470½	Br. semi re-xl, mott; vuggy.
-474½	Med. gr. dol.; mott.
-477½	Lt. med. gr. dol.; mott.; 476-77½; some brecc. w/ re-xl, gangue, & green shale.
-478	Green shale w/2" dk. semi re-xl at base; Top "R" bed 478.
-479½	Lt. med. gr. dol.; banded.

		Top "R" Bed 479½.
-485		Br. re-xl; v. sandy, cherty & shaly, some crackle; block of med. dol. 483-83½; 1" TGS at 485.
-487		Dk. br. re-xl.
-489		Lt. med. gr. dol; crackle filled w/gr. shale 488-89.
-490½		Lt. br. re-xl.
-493		Med. gr. sugary, dol; 3" green shale @ base.
-497		Br. re-xl; shaly.
-499½		Lt. fine gr. re-xl; vuggy; chert nod @ base.
-500		Lt. med. gr. dol; has breccia filled green shale.
-504½		Br. re-xl.
-511		Lt. med. gr. dol; 509-511 breccia w/ ½% FeS.
-511½		Dk. re-xl.
-513½		Med. dk. gr. dol; w/crackle,occ. FeS shine.
-514½		Lt. med. gr. dol.
-516½		Brecciated chert selaed w/silica & green shale; bott. 3" lt re-xl.
-519½		Lt. gr. dol; some crackle @ 17½; 3" brecciated chert @ 17½, chert nod @ base.
-523½		Lt. br. re-xl; top few inches v. silic. bott. 6" mostly sec. chert.
-525		Dk. br. re-xl.
-530		Br. re-xl; shaly; 28½-30 v. cherty.
-530½		Lt. med. gr. dol.
-532		Gr. re-xl; fine grained.
-536½		Br. re-xl; top 2' mostly chert nod; scatt. chert nods.
-542½		Med. gr. dol; eyelets, mott; some brecc. w/re-xl at 540½-41 & @ 542-42½.
-548		Limestone; some re-xl 545½-46p; green shale 546½-47; 3" dk. shaly dol. 548.
-550½		Lt. br. re-xl; scatt. ss grains 549-50 & few @ 550½.
-557		Dk. br. shaly re-xl; bott. 6" lt. gr. re-xl.
-559		Lt. med. gr. dol.
-568½		Med. gr. dol; some lt. crackle.
-569½		6" oolitic chert & re-xl then 6" v. silic. re-xl.
-576½		Lt. gr. dol; mott. sugary; grades to lt. med. gr.
-581		Br. re-xl; 1" green shale then 4" chert nod @ base.
-583		Lt. med. gr. dol; crackle, chert nod @ base.
-584		Br. cherty re-xl; chert nod @ base.
-584½		Lt. med. gr. dol; sandy.
-585½		Lt. br. re-xl.
-588		Lt. med. gr. dol; v. sandy 587½-88 w/chert nod 588.
-591	TD	Br. silic. & cherty re-xl, some brecc. @ 589-90.

NATIONAL LEAD CO. D.D. CO-1

Copper Ridge Project-Luncheon Camp Creek

USEA Idn-E-1068

Hole No: CO-1

Farm: D.F. Coffman

Loc: N 47,375.05
E 43,520.01

Elev: 1360.0

Drilled By: Joy Mfg. Co.

Logged By: H. Hill & J. Spears

Collared: 8-30-57

Bottomed: 9-21-57

Depth: 961'

Casing: BX 10'; AX 40'

Reaming: None

Cement: None

Water Table: 35'

0-9	Overburden.
-11	Lt. gr. banded dol.
-18	Lt. gr. dol.; mott. thin ox. shears thruout.
-19	Lt. gr. mott. dol.
-21	Lt. gr. faintly banded dol., dip at 20'-27°.
-22	Cavity.
-25	Lt. gr. dol; crackle; some FeS mineralization. w/ gangue dol.
-26	Cavity.
-28	Lt. gr. mott. dol; few shears; thin fault gangue at 31.
-31	Cavity.
-31½	Lt. gr. dol; few gough fractures.
-32	Dk. gr. dol; crackle.
-36	Cavity.
-40½	Med. gr. dol.
-75	Dk. gr. mott. dol; silic; crackle; RGS 41½; sugary; asphaltic odor.
-83½	Med. gr. dol.; faintly banded (bluish); few gangue fracs. 75-77; TGS 81½, 83½.
-85	Med. gr. (brownish) dol.
-88½	Med. gr. banded dol; smoky ch. 87 & TGS; TBS 88.
-93	Med. gr. strongly banded dol.; blue ch. 91, 92½.
-95½	Med. gr. mott. dol.
-103	Med. gr. mott. dol.; blue ch. 101.
-113	Med. gr. faintly mott. dol; faint redish color; TBS 104, 04½, 06, 08, 13, TGS 111.
-115½	Med. dk. gr. dol; mott; red color.
-117	Med. gr. sugary dol; banded.
-119	Lt. gr. dol; TGS at base.
-120	Med. gr. dol; blue ch. 120.
-124	Lt. gr. dol; brn. ch. 123; white ch. band at base.
-125	Dk. gr. dol; brn. ch. 124½.
-136	Med. dk. gr. dol; lightly banded; TBS 129½, 131. Dip 134-32°. TGS at base.
-141	Med. gr. dol.
-145	Med. gr. dol; redish coloration; banded; TBS at 141½; TGS at base.
-148	Med. gr. strongly banded dol; lt. ss 146; shaly.
-154½	Lt. gr. (brn. or coffee colored); blue ch. nods at 148½, 149½, 151½, 152. white & blue ch. banded 152½, 153. FeS shine 153 (in chert).
-160½	Med. dk. gr. dol; blue ch. 158; TGS 159-60.
-169	Dk. gr. banded dol; sugary texture.
-177½	Med. dk. gr. dol; TGS 176½. lt. scatt. shears 173.
-182½	Lt. med. gr. banded dol; blue ch. 179; TGS 182½.
-192	Med. gr. mott. dol; thin shear 185½.
-197	Med. gr. dol; smal, scatt. blue ch. 192½-94 (vug fillings?) Wh. ch. nod @ 194.
-201	Med. dk. gr. dol; banded; 2" fault goug 199½; scatt. w. shears 199½-201.
-213½	Med. gr. dol; strong steep angle shear from 202-04; thin shears 204-212; eyelets 210-12; TGS @ base.
-215	Dk. gr. mott. dol; lt. shears thruout.
-217	Med. gr. dol; lightly banded; large quartz filled (re-xl) vug 216; dip @ 216-36°.

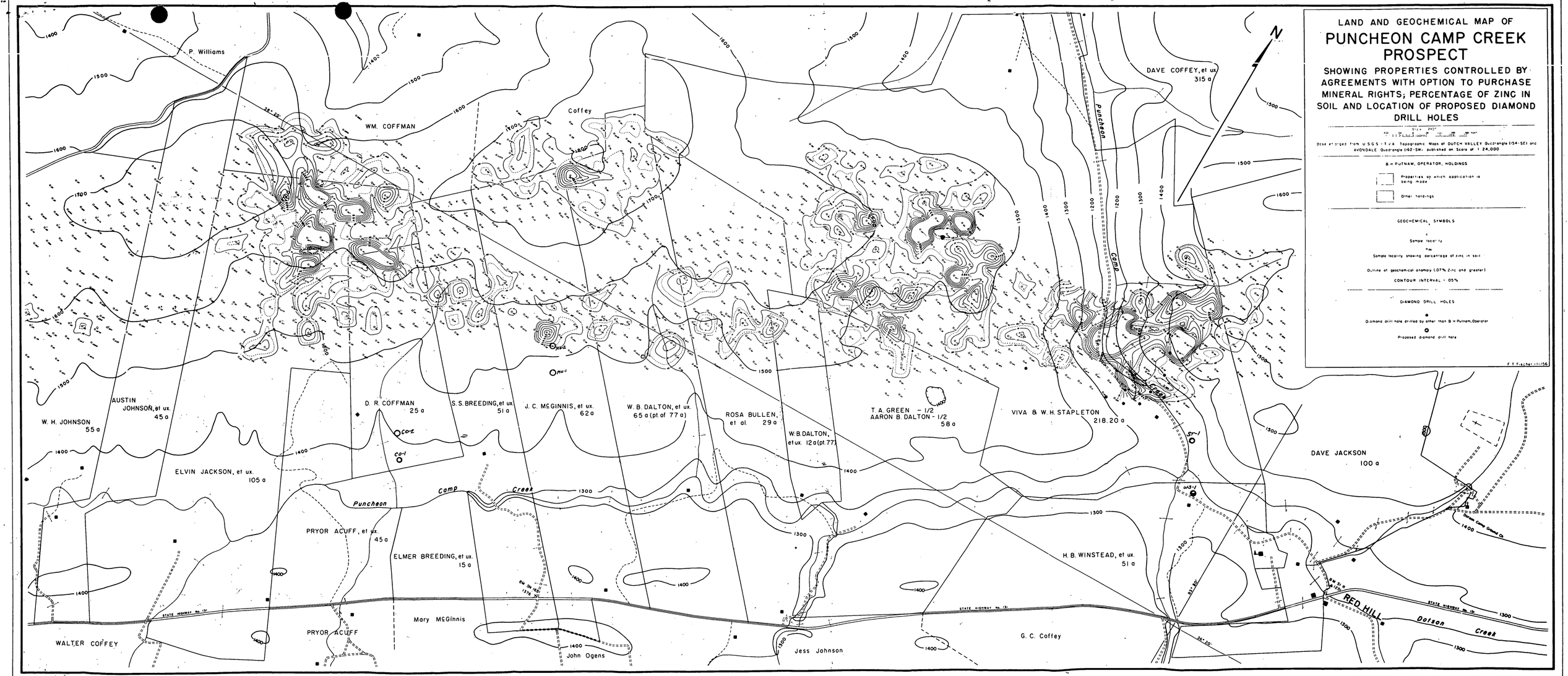
-222 Med. gr. dol; 4" grn. shale 217½ & lt. scatt. ss; ch. nods 219½, 220½, 222½; lt. scatt. steep shears 220-222½.
-229½ Re-xl, coarse grained, brn.; brecc. sealed w/ grn. shale 223½-224 & FeS re's; vuggy 229½-230 w/ hvy. FeS (2.00%).
-232 Lt. gr. dol; thin steep angle fault at 232.
-234½ Med. gr. dol; fault 232½, lt. shears thruout.
-240½ Dk. gr. dol; mott; lt. steep shears 235, base marked by 4" chert oolite & ss.
-247 Lt. gr. banded dol; vuggy w/eyelets; base marked by 6" fault gouge (60°).
-248½ Dk. gr. mott. dol.
-257 Med. gr. dol; mott. to 252; wh. sec. ch. 250-50½ & tr's of FeS.
-258 Lt. gr. well banded dol; lt. ss at 258.
-267 Med. gr. dol, blue ch. 260½, 261; hvy. mott. 264-65.
-272 Med. gr. well banded shaly dol; TGS 270, 70½, 71, 71½.
-274 Med. gr. strongly mott. dol; wh. ch. nod 273.
-275 Lt. gr. banded dol; TGS at base.
-277½ Dk. gr. bandedd dol; TGS at base; dip at 275-36°.
-280½ Med. gr. hvy. mott. dol; TGS at base.
-281 Dk. gr. dol.
-291 Med. gr. mott. dol; 6" grn. shale at 290-90½; ZnS shine 290½.
-294½ Med. gr. dol.
-297½ Very lt. gr. banded dol; thin open shear 295.
-303 Med. gr. dol; banded 299-300; 4" low angle shearing 298.
-305 Dk. gr. mott. dol; hvy blk. shale 304; lt. scatt. ss at base.
-312 Lt. med. gr. dol; TGS 209, 310½.
-315 Med. dk. gr. dol; faintly banded; TGS 313, 315; 1" CMss 313½.
-321 Lt. gr. dol; banded 319-321; scatt. ss 319-320; hvy. ss 320-321.
-324 V. dk. gr. dol.
-326 Med. gr. mott. sugary dol.
-329 Med. dk. gr. dol; 6" blue ch. at base.
-333 Lt. gr. banded dol.
-339½ Dk. gr. dol; hvy. mott. 333-34; shaly.
-342 Med. gr. dol.
-343 Lt. gr. banded dol; TGS at 342; FeS sh. 342; scatt. ss 42-42½.
-345 Lt. gr. dol.
-347 Med. gr. dol.
-355 Lt. med. gr. dol. TGS at 352.
-357 Sec. ch. & re-xl; FeS tr's thruout.
-359 Lt. gr. banded dol.
-362 Med. gr. dol.
-366½ Dk. gr. hvy. mott. dol; silic.
-374½ Lt. gr. banded dol; lt. scatt. ss 369-370.
-377½ Med. gr. mott. dol.
-381 Med. to med. dk. gr. dol; chert nod 378p v. mott. 379½-81; chert nod 381.
-382 Gr. re-xl, top 6" sec. chert.
-387 Lt. med. gr. dol; banded.
-400½ Med. dk. gr. dol, v. mott. 387-91; v. mott. bott. 6" & thin fault at base.
-405 Med. gr. dol; 400-01½ sandy & sugary; v. cherty 401½-04½; 404½-05 brecc. sealed w/sandy silic.
-406½ Re-xl, cherty at top then v. sandy.

-408 Lt. med. gr. dol, mott; thin fault just above base.
-409½ Br. re-xl.
-410½ Lt. med. gr. dol., mott; chert nod at base.
-414 Lt. gr. dol, dli. mott; 412-13½ scatt. sands.
-417 Lt. med. gr. dol, eyelets.
-423 Med. gr. dol, mott. banded 419-23.
-423½ Med. semi re-xl; v. mott.
-428 Lt. med. gr. dol, mott; occ. eyelets & vugs.
-432 Med. gr. dol, v. mott; bott. 4" sandy edgewise congl.
-433 Br. shaly re-xl.
-441½ Lt. med. gr. dol, mott; 438-39 sandy w/ pinpoint vugs; TGS 439.
-443½ Med. gr. dol.
-445 Lt. med. gr. dol., thin ss 444½.
-446 Br. silic. re-xl.
-449½ Br. semi re-xl; mott; silic; few ss grains bott. 2".
-462 Med. gr. dol, lt. banding; TBS 454; v. mott; 457-62; v. hvy. ss at base.
-464 Lt. med. gr. dol, mott; few eyelets.
-465½ Med. gr. dol, v. mott. at top.
-473½ Med. dk. gr. dol, mott; chert nod @ base.
-478½ Lt. gr. dol; thin CMss at 478.
-482 Med. gr. dol, TGS at base.
-484½ Med. dk. gr. dol, mott; v. sandy 483-83½ & 484; chert nod 484-84½.
-488 Lt. gr. dol; mott; thin ss's 487-87½; v. heavy ss at base.
-496 Lt. med. gr. dol.
-497½ Med. gr. dol; occ. thin ss then heavy ss at base.
-498½ Lt. med. gr. dol., v. sandy.
-500½ V. silic. cherty re-xl; grades to sec. chert; then 2" re-xl & TGS.
-503 Re-xl grading to semi re-xl, fault 501½-03.
-505 Med. gr. dol, mott; scatt. sand 505. (2½ core loss 502-05).
-506½ Lt. med. gr. dol; banded.
-508½ Med. gr. dol. v. sugary.
-512 Dk. gr. dol, mott.
-515 Med. gr. dol.
-520 Med. dk. gr. dol, mott; vert. ox. shears.
-522 Med. gr. dol; lt. mott.
-530 Dk. gr. dol, mott; steep shears to faults thruout.
-537 Lt. med. gr. dol, mott; shears thruout w/ thin faults 534½-35½; sandy 535½-36; fault 536½-37.
-546½ Med. gr. dol, fault shears thruout; mott.
-549 Lt. gr. dol, mott; sugary, cherty.
-550½ Med. gr. dol, fault 549-50; congl. (cherty) 550-50½; TBS 550½.
-554 Lt. med. gr. dol; banded; some shears; chert nod 2" from top; few sand grains then chert nod at base.
-555 Lt. gr. dol, v. mott; silic.
-556 Med. gr. semi re-xl.
-557½ Lt. med. gr. dol; brecc. but no gangue; TBS at base.
-559 Sec. chert w/ nods.

-559½	Chert.
-563	Lt. gr. dol; cheared, chert nod at base.
-568	Med. gr. dol.
-575	Lt. med. gr. dol; cherty top 6", some oolite; chert nod 569-69½ & 570; thin shear 572, chert nods 573, 575.
-577	Med. gr. dol; mott.
-583	Dk. gr. dol. mott. to banded.
-590½	Med. gr. dol, well mott. to 588½; heavy ss 589½; sandy & sheared 589½-590½.
-591	V. mott. dk. re-xl.
-605½	Lt. med. gr. dol; v. sheared to 594, chert nod 593-93½; mott. 600-05½.
-606½	Med. gr. dol.
-608½	Lt. med. gr. dol; banded; thin fault 607; sheared 607-08; v. thin ss 608½, then chert seam.
-611	Lt. gr. dol; well mott. to 609½, v. sheared 610-11.
-612½	Lt. med. gr. dol; bott. 6" silic. & few ss grains.
-613½	Silic. chert nods bott. 3" dk. sandy dol.
-627½	Med. gr. dol; top 6" v. sandy w/ oolitic chert nods; thin sli. mott. w/ eyelets; bott. foot darker & large chert nod at base (pt. oolitic).
-629	Lt. gr. dol; few scatt. ss grains top foot.
-631½	Med. gr. dol, v. mott.
-632	Lt. med. gr. dol; shears.
-638	Med. gr. dol; lt. mott. & eyelets to 635½; well mott. w/ occ. vugs to 638.
-641	Lt. med. gr. dol, scatt. ss grains w/ hvy. sands 640 & 641 w/ shear 639½-40 & TBS 641.
-642½	Med. gr. dol, v. mott.
-648	Lt. med. gr. dol; banded; mott. to 643 w/hvy. shale 643; then v. banded & vert. shears to 648.
-650½	Med. gr. dol; FeS sh. at 650.
-653½	Lt. med. gr. dol; v. mott.; hvy. sand at base then TGS.
	TOP OF KINGSPORT FORMATION 663½.
-657	Lt. gr. dol; well banded to 655½; lt. shears thruout.
-678	Med. gr. dol; v. mott. to 660; vert. faults 657-69, 660-61; v. hvy. ss 661; hvy. shears 671-77; chert nod 678.
-685	Lt. med. gr. dol; vert. fault 678½-79; shears thruout bed.
-688½	Lt. gr. dol; lt. mott. & banding.
-691	Lt. med. gr. dol; chert nod 689½; few ss grains & eyelets bott. 6".
-696	Lt. gr. dol; sheared; fault 693-94 & 695½-97.
-703	Med. gr. dol; mott; sheared thruout; fault 698½-701.
-709	Lt. med. gr. dol; well banded to 707 w/many vert. faults; fault 707-08.
-713	Med. gr. dol, vert. shears thruout.
-716½	Lt. med. gr. dol.
-724	Med. gr. dol; mott. 6" top; 1" sandy shale at 717; chert nod 717½; w/br's ss 717½; fault 719 & hvy. ss at base of fault; chert nod 724.
-731½	Lt. med. gr. dol; TGS 725½; occ. steep thin shear.
-733	Med. gr. dol; mott; sheared; TGS at base.
-736	Lt. gr. dol; chert nod 734, fault 735½-736.
-738	Lt. med. gr. dol; chert nod 737½; TGS 738.
-741½	Lt. gr. dol; TGS at base.
-744	Lt. med. gr. dol; chert nods 743, 744; tr. crackle 742.

-746½ Lt. gr. dol; well banded; chert nod 746½.
-755 Lt. med. gr. dol; well banded (dip at 750 @ 47°) to 751½; few ss grains at 753; banded 753-54 w/ few ss grains at 54; v. mott. shaly & silic 754-55 w/ chert nod 755.
-764½ Lt. gr. dol, lt. shears thruout; chert nod 758½, TG 759½ w/ 3" dk shaly dol below; chert nods 763,763½-64(w/ sand & shale).
-775½ Lt. med. gr. dol; band of sec. chert 765½; scatt. ss grains 767½-68; fault 769; chert nods 770-71 & 71½; thin fault 772; chert nod 773½; fault 774; from 774-75½ many small specks of silica & 3" shaly chert at base.
-800 Lt. gr. dol, v. mott. to 778; few vugs 777-79 (2½' core loss 782-87) banded 779-85 w/ chert nod 784; fault 786-87; mott 787-89; fault 788-89; v. banded 789-89½ & scatt. sand grains 789½-790; brecc. chert sealed w/ silica 790-90½; white chert nod 791; crackle 791-92; ox. shears 792-93; fault brecc. 794½-95 w/ heavy ss 795; brecc. sealed w/ silica(?) 795-96; fault 797-98½; v. mott. 798½-800.
-802 Lt. med. gr. dol; fault 801-02.
-807½ Lt. gr. dol, banded; fault 802-07½.
-811½ Lt. med. gr. dol; mott; sheared top foot; chert nod 809½; fault 811-11½.
-814 Lt. gr. dol; fault 811½-14.
-822 Med. gr. dol; mott. & fault to 817 w/ chert nod 817; shears 817-822; chert nod 819 w/ TGS 1" above; banded 819-22/
-832½ Lt. med. gr. dol; sheared to 826 w/ TLS 826.
-840 Med. gr. dol; some crackle filled w/ shale.
-- TOP OF "R" BED 840.
-842 Dk. br. semi re-xl, top 6" shaly chert.
-853 Med. gr. dol, well mott.
-853½ Br. re-xl.
-855 Med. gr. dol; banded, 3" green shale at base.
-858 Br. re-xl, shaly; some dol. blocks top foot.
-859 Br. re-xl.
-861 Med. dk. gr. dol; sugary.
-861½ Med. gr. dol; brecc. sealed w/ black shale.
-868½ Br. mott. re-xl; a little breccia sealed w/ gr. shale & sand @ 63, fault @ 66; v. silic. 67-68.
-874 Lt. med. gr. dol; mott; lt. shears thruout.
-875½ Lt. gr. re-xl.
-886½ Med. gr. dol; mott; many thin shears; thin fault @ 79.
-891 Dk. gr. dol; mott.
-896 Limestone; hvy. green shale at top, then shaly thruout.
-900½ Med. dk. gr. dol.
-905 Lt. med. gr. dol.
-908½ Lt. br. coarse grained re-xl.
-911 Br. re-xl; chert nod at base.
-912 Med. gr. dol; crackle; chert nod 911½.
-913 Br. re-xl; brecc. & sealed w/ re-xl.
-913½ Med. gr. dol; crackle & sealed w/ re-xl; chert nod 913½.
Top "S" bed ~~913½~~ 905.
-917 Br. re-xl; from 14½-17 almost all chert nod; fractured w/ some green shale.
-919 Lt. br. re-xl; 918½-19 dk silica.
-924 Lt. re-xl; shear 922; bott. 6" silic.
-925 Med. gr. dol; fault 925-26; from 926-28 mott; fault 26½-27 w/ tr. re-xl below fault.
-930½ Br. re-xl; est. 10% FeS from 928-929; crackle 930-30½.
-931 Limestone, v. shaly.
-931 Lt. re-xl; tr. jasperiod 931½, FeS shine 933, fault 933.
-935 Br. re-xl; jasperiod top 6" & bott. 3".
-937 Lt. silic. re-xl.
-939 Lt. br. mott. silic. re-xl; grades to 1 foot of silica.
BASE OF KINGSPORT FM. 939
-949 Med. gr. dol; crackle & shears; v. ~~shaly~~ sheared 948-49.
-950 Br. re-xl; top 6" chert nod.
-952½ Lt. med. gr. dol; mott; brecc. 951-51½ & crackle 951½-52½; est. 2% FeS 951½-

-952½ (cont.)	-52½; est. 2% FeS 951½-52½; bott. 3" crackle sealed w/ re-xl.
-953	Br. re-xl.
-953½	Med. gr. semi re-xl.
-954½	Lt. med. gr. dol; sheared; fault @ base.
-955½	Br. cherty, re-xl.
-960½	Med. gr. dol; v. mott; sheared.
-961	Lt. re-xl; TD.


LAND AND GEOCHEMICAL MAP OF
PUNCHEON CAMP CREEK PROSPECT
SHOWING PROPERTIES CONTROLLED BY AGREEMENTS WITH OPTION TO PURCHASE MINERAL RIGHTS; PERCENTAGE OF ZINC IN SOIL AND LOCATION OF PROPOSED DIAMOND DRILL HOLES
Scale
Base enlarged from U.S.G.S. - T.V.A. Topographic Maps of DUTCH VALLEY Quadrangle (154-SE) and AVONDALE Quadrangle (162-SW), published on Scale of 1:24,000
B. H. PUTNAM, OPERATOR, HOLDINGS
Properties on which application is being made
Other holdings
GEOCHEMICAL SYMBOLS
Sample location
Sample location showing percentage of zinc in soil
Outline of geochemical anomaly (.07% Zinc and greater)
CONTOUR INTERVAL = 05%
DIAMOND DRILL HOLES
Diamond drill hole drilled by other than B. H. Putnam, Operator
Proposed diamond drill hole
F. T. Fischer - 11/56
N
P. Williams
WM. COFFMAN
Coffey
DAVE COFFEY, et ux. 315 a
Puncheon Camp Creek
W. H. JOHNSON 55 a
AUSTIN JOHNSON, et ux. 45 a
ELVIN JACKSON, et ux. 105 a
D. R. COFFMAN 25 a
S. S. BREEDING, et ux. 51 a
J. C. McGINNIS, et ux. 62 a
W. B. DALTON, et ux. 65 a (pt. of 77 a)
ROSA BULLEN, et al. 29 a
W. B. DALTON, et ux. 12 a (pt. 77)
T. A. GREEN - 1/2
AARON B. DALTON - 1/2 58 a
VIVA & W. H. STAPLETON 218.20 a
DAVE JACKSON 100 a
PRYOR ACUFF, et ux. 45 a
ELMER BREEDING, et ux. 15 a
H. B. WINSTEAD, et ux. 51 a
WALTER COFFEY
PRYOR ACUFF
Mary McGinnis
John Ogens
Jess Johnson
G. C. Coffey
STATE HIGHWAY No. 131
RED HILL
Dotson Creek
Puncheon Camp Creek Co.
Co-1
Co-2
Ms-1
Ms-2
S-1
W3-1

BATCH COPY
DATE
OCT 23 1957
DATE | INITIALS | CODE

1957
DATE | INITIALS | CODE

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

Budget Bureau No. 42-R1036.5

PAID ON VOUCHER & SCHEDULE OF PAYMENTS No. 16

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

Month of [illegible], 195[illegible] Docket No. DMEA [illegible] Contract No. [illegible]
Operator's Name [illegible] Minerals [illegible]
Address [illegible]
Contract Araount, $[illegible] Government Participation: [illegible] % Amount, $[illegible]

ITEMS OF COSTS	FOR OPERATOR'S USE: Monthly Total	Totals Previously Reported	Totals To Date	FOR GOVERNMENT USE ONLY: Approved Monthly Total	Approved Totals Previously Reported	Approved Totals To Date
(1) Independent Short Form Contracts:				10/31/57 [illegible]		
Drilling	4551.00	---	4551.00	4551.00		4551.00
Bulldozing						
Crosscutting						
Drifting						
[illegible]	---	---	---			
(2) Labor and Supervision:						
Labor						
Supervision						
Technical Services						
(3) Operating Mat'ls. and Supplies:						
Timber						
Explosives						
Pipe						
Track						
[illegible]	---	---	---			
(4) Operating Equipment:						
Rental						
Purchase						
Depreciation						
(5) Initial Rehabilitation and Repairs						
(6) New Bldgs., Improvements, etc.						
(7) Miscellaneous:						
Repairs to Equipment						
Sampling and Analysis	---	---	---			
Payroll Taxes						
Liability Insurance						
(8) Contingencies (specify): [illegible]	[illegible]	---	[illegible]	273.06		273.06
[illegible]						
TOTALS	[illegible]		[illegible]	4824.06		4824.06

I certify that the above bill is correct and just and that payment therefor has not been received.
Date [illegible] *Payee [illegible]
Per [illegible] Title [illegible]

*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)

2412.03

Pursuant to authority vested in me, I certify that this account is correct and proper for payment in the amount of:
$ 2412.03
Signature [illegible]
(Authorized Certifying Officer)
Date SEP 27 1957 Vou. No. 58
(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. Tdm E1088 in accordance with the terms of the contract.

Signature C. A. Beck Title MINING ENGINEER U. S. BUREAU OF MINES Date SEP 20 1957

APPROVAL BY DMEA EXECUTIVE OFFICER OR ALTERNATE:

Signature Robert A. Lawrence Title EXECUTIVE OFFICER DMEA FIELD TEAM REGION V Date SEP 20 1957

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.

Form MF-104A
(April 1962)

Budget Bureau No. 42-R1151.2

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

OPERATOR'S UNIT COST AND PROGRESS REPORT

Month of August 1957 Docket No. DMEA 4090 Contract No. [illegible]
Operator's Name [illegible] Company Minerals Zinc
Address 111 [illegible], [illegible] 6, N.Y.

OPERATION	UNIT	COSTS THIS MONTH	UNITS THIS MONTH	COSTS TO DATE	UNITS TO DATE	UNIT COSTS TO DATE	AUTHORIZED BY CONTRACT Units	AUTHORIZED BY CONTRACT Unit Costs
Drifting								
Crosscutting								
Raising								
Shafts								
Winzes								
Drilling: Core	foot	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Churn	foot					[illegible]	[illegible]	[illegible]
Auger	[illegible]					[illegible]	[illegible]	[illegible]
Stripping	[illegible]					[illegible]	[illegible]	[illegible]
Trenching								
Test Pits								
Roads and Trails								
Incidental Allowance Sec. 2 (f)	foot	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TOTAL DISTRIBUTED COSTS		[illegible]		[illegible]				TOTAL COSTS AUTHORIZED BY CONTRACT
Operating Equipment Purchased								
Initial Rehabilitation and Repairs								
New Buildings, Improvements, etc.								
TOTAL COSTS		[illegible]		[illegible]				

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 [illegible] 1957 Operator [illegible] Company

Per [illegible] Title [illegible]

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)

Incidental Allowance should be $273.06 and totals $4,824.06

W. A. Beck
MINING ENGINEER
U. S. BUREAU OF MINES
SEP 20 1957

[illegible]
GEOLOGIST, U. S. G. S.
SEP 20 1957

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

A PROGRESS REPORT ON THE
PUNCHEON CAMP CREEK PROJECT, GRAINGER COUNTY,
TENNESSEE FOR AUGUST, 1957.

By: W.T. Hill

Docket No. 4580
Contract No. Idm-E 1088

During the month of August, two holes were drilled on the Puncheon Camp Creek project. The first hole was drilled on the V. Stapleton farm (ST-1). The hole collared in the Mascot formation, and was drilled to a depth of 607 feet. The results are summarized below:

Depth	Formation	Key Horizon	Zinc Mineralization	Remarks.
0-1½	Overburden	---	---	---
1½-360	Mascot fm.	CMss @ 360'	---	Lt. med., and dk gray dolomite.
360-563½	Kingsport fm.	Top of "R" bed 493'; Top of "S" bed @ 543'.	---	Light, med. and dark gray dol. with recrystalline and limestone in the lower part.
563½-607	Longview fm.	Top of "T" bed 563½; Top of "u" bed 575½.	---	Dolomite and recrystalline.

The second hole was drilled 400 feet south along the "fence" on the Winstead farm. Hole WS-1 collared in the Mascot formation and was drilled to a depth of 910'. The results are summarized below:

Depth	Formation	Key Horizon	Zinc Mineralization	Remarks.
0-1	Overburden	—	—	—
1-673½	Mascot fm.	CmSS @ 673½	ZnS sh. @ 538	Light, medium, and dark gray dol.
673½-905	Kingsport fm.	Top of "A" bed @ 723'; top of "H" bed @ 857	ZnS sh. @ 763½, est. ½% ZnS 766½-767.	Light, medium and dark gray dolomites; limestone and recrystalline in lower part; some crackle breccia.
905-910	Longview fm.	Top of "T" bed @ 905'	—	Medium gray dolomite.

Drilling is now underway on the E.R. Coffman farm.

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE 63			DATE	AT SHIP POINT	

SOLD TO: National Lead Company
P.O. Box 2047
Morristown, Tenn.

~~TERMS NET 30 DAYS~~
NO CASH DISCOUNT

PLEASE REMIT TO PITTSBURGH, PA.

INVOICE NO. 96620

INVOICE DATE 8-16-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO: Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION	CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 607.' Core Drilling at Puncheon Camp, Tennessee as per agreement.						
		Prospect #	From / To		Total Feet		Unit Cost	Total Cost
		~~Jackson~~ 1 ST-1	0. / 607.		607.		$3.00	$1,821.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

JOY MANUFACTURING COMPANY

HENRY W. OLIVER BUILDING

PITTSBURGH 22, PENNSYLVANIA

CUSTOMER'S ORDER NO.	DATE	REQ. NO.	OUR ORDER NO.	DATE	AT REC. POINT	B.O. NO.
CONTRACT	CODE			DATE	AT SHIP POINT	
	63					

SOLD TO

National Lead Company
P.O. Box 2047
Morristown, Tenn.

TERMS NET 30 DAYS
NO CASH DISCOUNT

PLEASE REMIT TO
PITTSBURGH, PA.

INVOICE NO. 96685

INVOICE DATE 8-31-57

DATE SHIPPED

SHIPPED VIA

SHIPPED TO

Puncheon Camp, Tenn.

P. O. ADDRESS

MARKS

REQUESTED ROUTING

SHIPPED FROM

ORIGINAL QUANTITY ORDERED	UNIT	PART NUMBER	DESCRIPTION		CODE	UNIT PRICE	QUANTITY BACK ORDERED	QUANTITY SHIPPED	AMOUNT
		To 910.' agreement.	Core Drilling at Puncheon Camp, Tennessee as per						
		Prospect #	From	To		Total Feet		Unit Cost	Total Cost
		Winston 1	0.	910.		910.		$3.00	$2,730.00

F. O. B. SHIPPING POINT UNLESS OTHERWISE SPECIFIED

NO RETURNS ALLOWED UNLESS AUTHORIZED BY THIS OFFICE

FORM P133A

GOODS COVERED BY THIS INVOICE WERE PRODUCED IN COMPLIANCE WITH THE REQUIREMENTS OF THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED, INCLUDING SECTION 12(A).

National Lead Co. Winstead No.1
Puncheon Camp Creek Project.
Grainger Co. Tenn.
Drilled by Joy Drilling Co.
Logged by John W. Spears.

Collar 8-9-57
BX 1'
AX 20'
Elev. 1233.

0-1	Overburden
-4½	Med. gr. dol.
-10½	Lt. med. gr. dol; some red mottling.
-19	Med. to med. dk. gr. dol.
-23½	Lt. med. gr. dol; sli. banding, chert nod at 23.
-49	Med. dk. gr. dol; v. banded 23½-29; fault 29-30; opening at 33,41,44; some steep shears 41-42.
-53	Med. gr. dol, banded; thin ss 50; v. shaly at 53.
-58	Lt. med. gr. dol; sli. mott, chert nods 54,54½,55½,56; v. mott & cherty 57½-58.
-67	Med. gr. dol, chert nods 60-62½.
-68	Lt. med. semi re-xl, vugs & eyelets.
-69	Lt. med. gr. dol.
-71½	Dk. gr. dol, v. mott; sugary.
-75½	Med. dk. gr. dol., mott.
-86	Med. dk. gr. dol.
-90½	Med. gr. dol, mott & banded; eyelets 87-89½; green shale at base.
-95	Lt. med. gr. dol, lt. mott to banding.
-102	Med. gr. dol, mott to 98, chert nod 98-99, then banded to 102.
-105½	Dk. gr. dol, mott.
-115	Med. gr. dol, sli. mott to 111, then v. mott w/ occ. FeS shine.
-116	Lt. med. gr. dol.
-119	Med. gr. dol., lt. banding, occ. eyelets.
-121½	Dk. gr. dol., mott.
-124½	Med. dk. gr. dol., lt. banding.
-127	Dk. gr. dol, mott.
-134½	Med. gr. dol, occ. crackle w/ green gangue.
-135	Med. dk. gr. dol., v. mott.
-144	Lt. med. gr. dol, sli. mott, v. sugary w/ tr. semi re-xl.
-145½	Med. gr. dol., mott.
-153	Med. dk. gr. dol, mott; many eyelets 151-53.
-157½	Dk. gr. dol., v. mott.
-159	Lt. med. gr. dol., congl w/ chert, sand, etc; v. mott.
-164½	Med. gr. dol, chert nod 163½.
-170½	Lt. med. gr. dol., banded to 169½; few thin sands 167-67½; tr. of edgewise congl. at 167½; large eyelet 167 3/4.
-172½	Med. gr. dol, mott; large chert nod at base.
-174	Dk. gr. dol, mott.
-179	Med. dk. gr. dol, mott; many eyelets.
-183	Dk. gr. dol, some mott., occ. eyelets; chert nod 181.
-188	Med. gr. dol, tr. ss at 185½; chert 185½-86.
-194½	Lt. med. gr. dol; sli. banded; occ. eyelets to 191; then mott to 194½ w/ many eyelets bott. 6".
-198	Lt. gr. dol; few thin sands 195½-96; v. banded to mott 196½-98 w/ many sands; TbS 198.
-206	Lt. med. gr. dol, banded 198-203; mott 203-06.
-217½	Lt. gr. dol, banded 206-09½; lt. mott to banding w/ eyelets 209-17½; TbS at base.
-220	Lt. med. gr. dol., banded.
-224	Lt. gr. dol, mott to banded; 1" shale at base.

-226 Med. gr. dol, mott; TGS at base.
-228½ Lt. med. gr. dol., mott.
-230½ Lt. gr. dol, sli. banded; TGS at base.
-233 Lt. med. gr. dol.
-233½ Med. gr. dol., TGS at base.
-235½ Lt. med. gr. dol., banded; thin sands bott. 6" then TGS.
-238½ Med. gr. dol., mott.
-240 Med. dk. gr. dol, mott to banded; few eyelets.
-247 Lt. med. gr. dol, sandy top 3"; few steep ox. shears at 243; 2" of blk. shale & chert at 246.
-248½ Dk. gr. dol, mott; TBS at base.
-249½ Med. gr. dol, banded; heavy sands 248½-49.
-250½ Lt. med. gr. dol; banded; TBS at base.
-256½ Lt. gr. dol, top 6" mott; 255-56½ v. banded w/ heavy sands.
-259 Med. gr. dol.
-263 Med. dk. semi re-xl, v. mott.
-266 Lt. med. gr. dol; TGS at base.
-269 Lt. gr. dol, lt. banding.
-270½ Med. gr. dol., lt. mott.
-275 Dk. gr. dol., banded.
-276½ Med. dk. gr. dol, mott to banded.
-278 Med. gr. dol; banded; TGS at base.
-278½ Lt. med. gr. dol, sandy.
-282½ Lt. gr. dol.
-285 Lt. med. gr. dol., lt. mott; TBS 284,285.
-292 Lt. gr. dol, lt. mott to 288; then mott.; heavy ss 290.
-297 Br. re-xl; extremely cherty & silic except for 293-94 which is sandy.
-300 Med. gr. dol, tr. crackle top 2½ feet w/ gangue & green (?)
-301 Silic re-xl.
-305 Dk. semi re-xl, v. mott; some vugs & silic.
-308 Lt. med. gr. dol., lt. banding, occ. eyelets.
-312½ Lt. gr. dol., mott to 309 w/ scatt sand grains; then banded.
-316 Lt. med. gr. dol., mott; chert nod 313½.
-321½ Med. dk. gr. dol., lt. mott.
-329 Lt. med. gr. dol; lt. banding; top 6" white chert; v. sugary 1' below chert; grades to med. gr.
-334 Med. gr. dol.
-340½ Lt. med. gr. dol, few vugs 337, some eyelets.
-342½ Med. gr. dol; FeS shi e 341; eyelets; thin sand & TGS at base.
-343 Lt. med. gr. dol, sandy & congl; FeS shine at top.
-344 Chert; tr. of bright green mineral; TGS(siliceous) at base.
-346 Med. gr. dol; occ. crackle w/ green & white gangue.
-346½ White chert.
-358½ Lt. med. gr. dol; TGS 349; v. mott 349-353; few eyelets & vugs 351-53; sandy 352½-53; FeS sh. 353; mott 353-56; breco. 354½-55½ sealed w/ green & white gangue; TGS 356; banded to mott 356-58½ w/ large eyelets & many thin sands.
-363½ Med. gr. dol, mott; eyelets; some green & white gangue.
-364 Lt. med. gr. dol., v. banded; chert nod at top.

-368½ Med. dk. gr. dol, mott.
-370 Lt. med. gr. dol, lt. mott.
-376 Lt. gr. dol; mott; eyelets; TBS at base.
-378½ Med. gr. dol, v. mott; thin sand & TGS at base.
-393½ Lt. med. gr. dol to med. gr.; mott; TBS's 381,387; thin sands 393-93½ w/ TGS at 393½.
-401 Lt. med. to lt. gr; dk. chert nod 394; sugary to 396½; TBS 401.
-404 Med. gr. dol; TBS 404.
-409 Dk. gr. dol, some mott; dk. chert nod 408.
-411 Med. dk. gr. dol.
-413 Med. lt. gr. dol., v. mott.
-424½ Med. gr. dol, mott; many eyelets; sli. banded bott. 3 feet w/ chert nod 423.
-425 Lt. gr. dol, banded.
-425½ Med. gr. dol, TBS at base.
-428 Lt. med. gr. dol; heavy ss near top; sli. banded, large chert nod at base.
-434½ Med. gr. dol, lt. banding to 432½ then v. mott.
-439 Lt. med. to med. gr. dol; few thin sands top 6" then few inches of breec. w/ white & green gangue; bott 6" sandy w/ TGS at base.
-439½ Mixed of silica(dk.) shale & sand.
-444 Lt. med. gr., chert seems 441½,442½; heavy sands 442½-43; then chert nods & scatt. sand grains to 444 w/ large nod at 444.
-446 Lt. med. semi re-xl.
-450½ Lt. med. gr. dol., sli. mott.
-453 Med. gr. dol; mott, some vugs; thin ss at base.
-459½ Lt. med. gr. dol; banded w/ thin sands to 454½ w/ TGS 454½; then mott; scatt. sand grains 456-58.
-462½ Med. gr. dol, mott.
-465½ Dk. gr. dol.
-480½ Med. gr. to med. dk. gr. dol, thin ~~mkk~~ fault 477-80; some crackle w/ white and green gangue at 478-78½.
-487 Lt. med. gr. dol, some semi re-xl at top; mott and banded; scatt. sands 485-85½.
-490 Med. gr. dol., mott.
-495 Med. dk. gr. dol., mott; some silic eyelets; v. cherty at 494; banded 494-95.
-496 Lt. silic semi re-xl.
-498½ Med. gr. dol., mott.
-501½ Med. dk. gr. dol., mott.
-505 Lt. med. gr. dol, breec. 504-05 filled w/ dk. silic shale; tr. ss 504½; 2" of chert then 3" shale)(green) at 505.
-507 Med. gr. dol., mott.
-508 Chert & re-xl.
-512 Lt. med. gr. dol., banded; large chert nod at base.
-517½ Med. dk. gr. dol, 516½-17 breec. w/ green gangue; many cherts 517-17½.
-518½ Chert layer.
-520½ Lt. med. gr. dol to 519 breec. w/ white & green gangue; 519-19½ breec. w/ chert; 519½-520½ chert layer.
-522 Lt. med. mott. re-xl, TGS at base.
-533 Lt. med. gr. dol, fault 527; occ. eyelets 522-530 & lt. mottling; from 530-32½ well mott; 532½-533 banded.
-534½ Med. gr. dol., mott; some scatt. sands vuggy.
-536 Lt. med. gr. dol; top 6" vuggy; scatt. sands & mott.
-536½ Re-xl, TGS at base.
-546 Lt. gr. dol; chert nod 538 w/ ZnS shine; lt. banding 541-43½; TGS 543½; from 543½-45 crackle w/ gangue.

-550	Lt. med. gr. dol., mott.
-554	Med. gr. dol; mott to banded; some eyelets.
-556½	Lt. med. gr. dol; well banded; scatt. sand at base & TD[b].
-561	Lt. gr. dol., mott; crackle.
-563	Med. gr. dol; v. mott; v. cherty; some vugs; bott 9" edgewise congl. & sand.
-565	Lt. med. gr. dol; scatt. eyelets; TBS at base.
-576	Med. gr. dol., eyelets; v. sheared 569-70 w/ TBS 569½.
-577	Lt. med. gr. dol; v. heavy sands; oolitic chert nodes 577.
-578½	Lt. gr. dol.
-584	Lt. med. gr. dol., mott.

Footage	Dip
375	37
400	38
425	37
450	35
475	?
500	32
525	36
550	37
575	37

WS #1

584-587½ dk. gr. dol.; mott. to 586; banded 586-87½

587½-590½ med. gr. dol.; few sd. grains 589-89½; 6" chert nod. 590 w/ sands in chert at top;

590½-592 oolitic chert to 591½, then 6" ls. w/ ½" TGS at base

592-598 med. gr. dol., well banded

598-599 dk. gr. dol.

600' = 36° dip

599-601 med dk. gr. dol., v. mott.

601-610 med. gr. dol.; mott. to banded to 605; banded 605-06

610-611½ med. dk. gr. dol., v. mott.

611½-616 med. gr. dol., occ. eyelets, lt. mott.

616-618½ med. dk. gr. dol.; occ. eyelets; lt. mott.; chert nod. at base

618½-625½ med. gr. dol.; lt. banding to 620; scattered sands 620-20½ w/ heavy sd. 620½; mott. 622-25½

625' = 38° dip

625½-628 dk. gr. dol., v. mott.

628-642 lt. med. gr. dol., some mott; banded 639-42 w/ thin sand 642

642-647½ med. gr. dol. slightly mott; shears (horizontal) at 647

647½-652½ med. dk. gr. dol. 650½-52½ v. mott. to banded; chert nod. at base

652½-655½ med. gr. dol.; well banded to 654½, chert nod. 656½

650' = 35° dip

656½-661½ lt. med gr. dol.; banded to 661; scattered thin sands 650-61 w/ TGS 661½

661½-664½ med gr. dol.; few eyelets. TGS at base

WS #1

664½-668 lt. med. gr. dol.; mott.

668-668½ re-xl. w/ 2" sec. chert at base; TBS at base

668½-672 lt. gr. dol.; chert nod. 669

672-673½ lt. med gr. dol.; 672-72½ sandy edgewise congl. w/ oolitic chert nod. at 672½; at 673½ 2" c.m. ~~com.~~ sand and oolite

Top Kingsport @ 673½ feet. 675' - 38° dip

673½-684 lt. med. to med. gr. dol.; very shaly for 2" at 679'; lt. mottled 679-84' w/ TBS's 680, 81 and 83'

to689½ lt. to lt. med. gr. dol.; very mottled.

689½-692 lt. gr. dol.; lt. mottled; ½" TGS at base

692-694 lt. med. gr. dol.; chert nod. 693'; banded 693-94'

694-695½ lt. med. gr. dol.; chert nods. 695-695½

695½-698 lt. gr. dol.; chert nods. 696, 696½, v. banded 695½-98 w/ 2 chert nods 698

698-703½ lt. med. to med. gr. dol.; v. banded to mottled; chert nod. 698½; scattered sands 702½-703½ w/ chert nods.(partly oolitic) at 703½; then 2" green siliceous shale.
700' - 36° dip.

703½-707 lt. gr. dol.; lt. banding, chert nod. at base

707-707½ med. gr. dol.; few ss. grains; TGS at base

707½-708½ lt. med. gr. dol.

708½-711 lt. gr. dol., mottled; oolitic chert nod.at base

711-712½ lt. med. gr. dol.; trace crackled; TGS at base

712½-714 med. gr. dol.; chert nod. near base

714-716 lt. med. gr. dol.; slightly ~~xxxxxxxx~~ banded to mottled; few scattered sand grains; TGS at base

716-725 med. gr. dol.; chert nods. 719,720,720½,721,722; crackle @ 719-722½; siliceous & mottled 722-724 w/ TGS @ 724; mottled

WS # 1

from 724-725

725' - 37° dip

725-735 lt. med. gr. dol.; many thin shears; chert nods 729,730, 731½,732½

735-739 lt. gr. dol.; 737-739 v.banded w/ chert nod 737½

739-741 lt. med. gr. dol.; chert nod @ 739½ .

WINSTEAD (WS-1)

740-744½ lite gry. dol.; slight crackle breccia.

744½-746 Sec. chert with grn. shaly material; 3-6" of xl @ top & bott. of chert; fluorite shines @ 746'.

746-751 lite med. gry. banded dol.; dip 32° @ 750; some crackle @ 748½-749'.

751-753 med. gry. dol. slightly banded; scatt. ss @ 753' & TGS.

753-761 lite. med. gry. dol.; ch. nods. @ 754, 757½, banded from 755-757; ss @ 757 & TGS; crackle @ 755' and 759-761.

761-764 med. gry sugary dol.; breccia @ 763½ & trace ZnS.

764-770 dark gry. dol., crackle from 766½-767 & ZnS shines throughout.

770-780 med. dk. gry. dol.; scatt. ss @ 778½; weak crackle throughout.

780-782 med. gry. mott. dol.

782-783 " " " "

783-784 limestone, in part xl; top 8" mostly green shale (insol. residue) TOP OF "R" @ 783'

784-785 xl, dark brown; med. grained.

785-789 med. brn. gry. mott. dol., sugary; heavy fault gouge @ 787 (6" @ 50° to core length); thin shears throughout.

789-793 shaly med. gry. dol.; in part xl.; very dk. near base.

793-795½ dark xl; shaly near base.

795½-796½ ls. & xl. with grn. & red shales.

796½-797 shaly xl.

WINGTEAD (WS-1)

797-799 ls. blocks surrounded by black xl, chert and grn. shale. ss @ 798.

799-804 brn. coarse grn'd. xl; hvy. grn. shale @ 800½; sug-gy 802½-804; brecc. 803-804.

804½-805 very coarse grn'd xl.

805-807½ Coarse grn'd brn. xl; crackle; TGS @ base.

807½-808 fine grn'd med. gry. dol.; shaly.

808-815 brn. xl; med. grn'd; crackle @ 814½-815; sec. ch. @ 814.

815-817 dol.; med. gry., crackle; TGS @ base.

817-818 re-xl; brn.

818-822½ dol.; med. gry; sugary (semi-xl).

822½-824½ re-xl; brn.

824½-827 dol., med. gry., mott.

827-829 dol., med. gry.

829-833 dark gry. mott. dol.; crackle breccia.

833-840 ls; shaly

840-842 dark gry. dol.

842-843 med. gry. dol.

843-845½ dark gry. sugary dol.; slightly crackle.

845½-846 chert

846-852 re-xl; brn. coarse grn'd.

852-853 limestone, shaly, brecc. near base with xl. & grn shale.

853-857½ dol., med. gry., crackle brecc., ½" doloclastic chert @ base.

857½-874 limestone, smoky ch. @ 859, 860½. Top of 5" @ 857'

874-875½ med. gry. dol., thin ss & TGS @ base.

WINSTEAD (WS-1)

875½-886	limestone; brn. ch. nods. @ 879'.
886-887½	limestone & xl.; 6" shaly zone @ base.
887½-894	limestone, heavy ss @ 890½-891½ & TGS.
894-896	xl, scatt. ss @ 896'.
896-899	limestone; TGS @ base.
899-905	coarse brn. xl., heavily mottled & whitish patchy coloring.
905-907½	med. gry. dol. with eyelets; blue ch. nods. 907.
907½-910	med. gry. silic. dol.; blue ch. nods. @ 909.

TD @ 910'

National Lead Co. Stapleton #1
Puncheon Camp Creek Project
Grainger Co., Tenn.
Drilled by Joy Drilling Co.
Logged by John W. Spears.

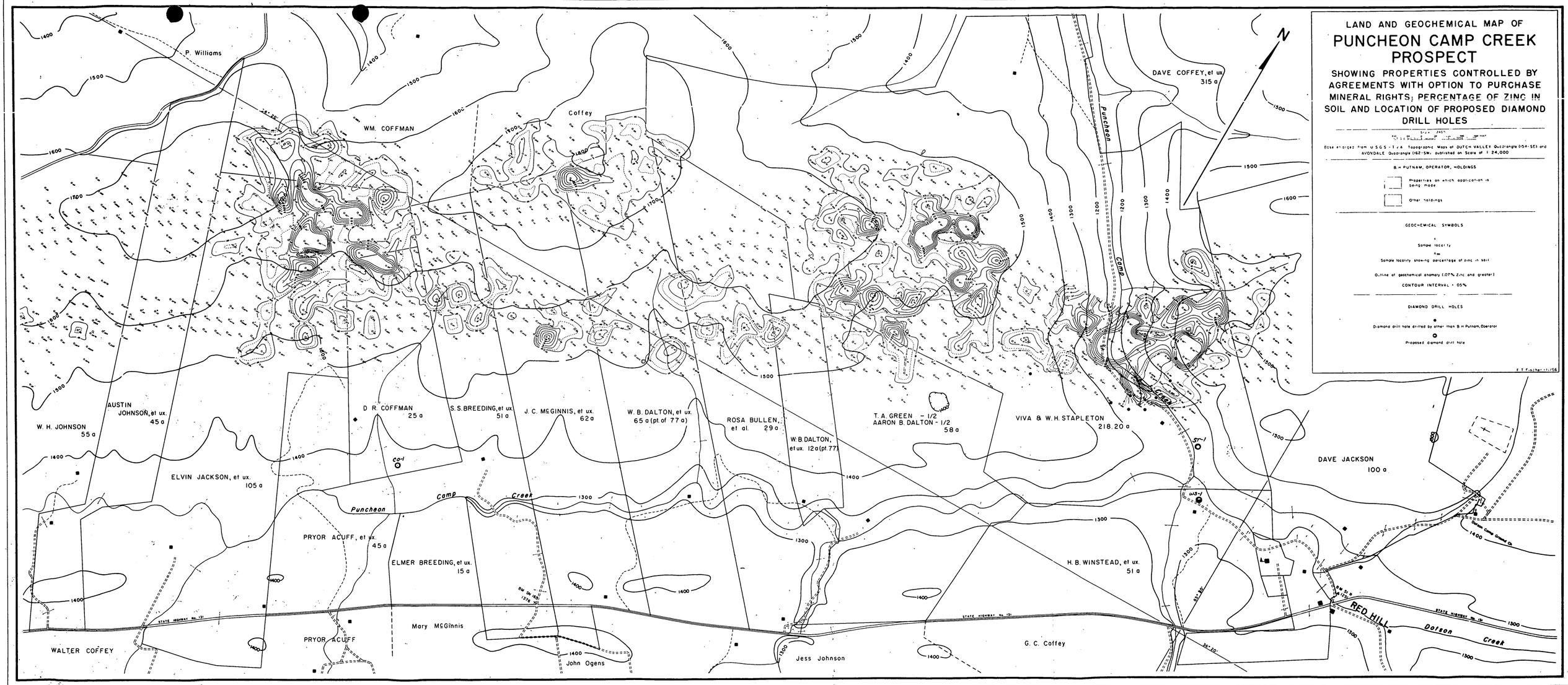
Collar 7-26-57
BX 1½'
AX 18½'
Elev. 1254.5

0-1½	Overburden
-8	Dk. gr. dol., v. mott.
-8½	Med. gr. dol, eyelets.
-15	Lt. med. gr. dol, lite banding.
-17	Med. gr. semi re-xl, silic, mott.
-29	Med. gr. dol, mott to 22; few eyelets 20-22; vert. ox. shears 23-27; few eyelets 28-29.
-31	Lt. Med. gr. dol., few eyelets 29-30; thin sand 30½, then chert(primary) to 31.
-32	Med. gr. dol, chert nod & TGS at base.
-36½	Lt. med. gr. dol., banded; chert 34-36½; tr. re-xl base of chert.
-37½	Med. gr. dol.
-38½	Lt. med. re-xl., mott.
-40½	Lt. med. semi re-xl, mott; scatt. sand grains.
-47½	Lt. med. gr. dol., mott; tr. re-xl at 44; banded 45-46 w/ large eyelets, scatt sands 46-47½ becoming heavier towards base.
-51	Med. gr. dol; mott; scatt small gangue filled eyelets.
-57	Med. dk. gr. dol; eyelets top 6"; mott; chert nod at base.
-57½	Lt. silic re-xl; TGS at base.
-63½	Lt. gr. dol; mott; very thin fault at base; TBS at base.
-67	Med. gr. dol; banded-mott; tr. ss at base.
-72	Lt. med. gr. dol, sli. banded to mott.
-74	Med. gr. dol, mott-sli. banding, TBS at base.
-81	Lt. med. gr. dol; mott-sli. banding to 78½, then banded to 81 w/ sand at 81.
-84½	Med. gr. dol; v. mott & sugary, vugs bott. foot.
-85½	Med. gr. dol, v. lite banding.
-87½	Lt-med. gr. dol., v. lite banding.
-93½	Dk. gr. dol; banded to 90, then mott to 93½; chert nod at base.
-96	Med. dk. gr. dol, mott; scatt. sand grains bott 2".
-107	Med. gr. dol; large gangue eyelets to 101, v. mott & some eyelets 101-04; few eyelets & lt. banding 104-07.
-109	Med. dk. gr. dol., sli. banding; 3" dk. & shaly at base.
-115	Lt. med. gr. dol, v. banded 109-110; then sli. banding.
-117½	Med. gr. dol, well mott; darker 115-16; scatt. sand thruout w/ heavy sands 116½, 17,17½.
-122½	Lt. med. gr. dol. , banded 117-119 w/ TBS 119; mott 119-22½; scatt. sand 122-¼ w/ v. heavy sand 122¼ then chert to 122½.
-132	Med. gr. dol, tr. crackle or shears 124, chert seam 128; crackle 129-30½; breec. 130½-32; thin ss 132 then che rt nod.
-133	Lt. med. gr. v. cherty re-xl.
-138	Med. gr. dol., mott.
-140	Dk. gr. dol, v. mott; sugary; few eyelets; thin fault at base.
-143½	Lt. med. gr. dol, mott to banded; few ss grains at top; v. heavy sands 141½-43 w/ some vugs 141½-142.
-144½	Med. gr. dol; blue mott.
-146½	Med. dk. gr. semi re-xl, v. mott.
-160	Med. dk. gr. dol, sli. mott to banding; vugs 151½,154-55; fault 157 3/4-160.
-163½	Med. gr. dol., mott.
-166	Med. dk. gr. dol, mott.
-172	Lt. med. gr. dol., mott; thin shear 167½; v. heavy sands 169½-70¼ thin fault 172.
-180	Med. gr. dol, mott. occ. eyelets.
-181	Lt. med. gr. dol.
-182½	Lt. v. silic semi re-xl.

-184 Med. mott. semi re-xl.
-185½ Med. gr. dol., mott; shears at 184½; chert nod 185½.
-189 Lt. gr. dol., banded; few ss grains bott. 6"; cherty base.
-191 Med. & lt. fine grained silic re-xl.
-192 Chert nod top 6", then med. gr. dol; chert nod at base.
-196 Lt. med. gr. dol, some darker & mott 193-94; eyelets 194-96.
-198 Med. gr. dol, v. mott; top 6" semi re-xl & silic.
-199½ Lt. med. gr. dol; banded, few thin sands; chert nod at base.
-204 Lt. gr. dol, banded; fault 201; chert nod 202; large nod at base.
-210 Med. gr. dol, few eyelets to 206; w/ chert nod 206.
-211½ Sec. chert.
-214 Lt. med. gr. dol, banded; oolitic chert nod 214.
-216 Med. gr. dol, mott.
-220½ Lt. med. gr. dol., sli. mott.
-221½ Med. gr. dol, v. mott; few eyelets bott. 6".
-227½ Lt. med. gr. dol; mott.
-228½ Silic re-xl; brecc. w/ gangue top 2".
-240 Lt. gr. dol; scatt. sand grains top 6"; sec. chert seam at 234½, many vugs 234-35; chert nod 237.
-247 Lt. med. gr. dol., sli. mott.
-248 Med. gr. dol; few eyelets.
-251 Lt. med. gr. dol; banded; thin ss 250½; fault 250½-51.
-253 Lt. gr. dol.
-257½ Med. gr. dol., v. mott., sugary.
-259 Lt. gr. dol, few eyelets.
-268½ Lt. med. gr. dol., many eyelets; shears 263.
-270 Med. gr. dol.
-271 Lt. med. gr. dol; v. heavy sands, colitic chert nod at base.
-272½ Lt. gr. dol.
-274 Lt. med. gr. dol.
-276½ Med. gr. dol; v. shaly to banded.
-279 Lt. med. gr. dol.
-281 Med. dk. gr. dol., v. mott bott 2".
-284 Lt. med. gr. dol, scatt. thin sands bott. foot; TGS at base.
-285½ Br. silic re-xl, sandy oolitic chert nod at base.
-286 Shaly silica w/ TGS at base.
-292 Lt. med. gr. dol.
-293 Dk. gr. shaly dol.
-294½ Med. gr. dol., mott; sugary; chert nod at base.
-297½ Lt. gr. dol, chert nod 296; banded from 296.
-300 Lt. med. gr. dol; banded.
-309½ Dk. gr. dol; v. banded to mott.
-312 Med. dk. gr. dol, banded; sandy 311½-12 w/ v. heavy sand at 312.
-317½ Med. gr. dol, sli. banded to shaly.
-318½ Lt. med. gr. dol; mott, sugary.
-319½ Dk. gr. dol, v. banded to mott.
-324 Lt. med. gr. dol., sli. banded.
-325½ Med. gr. dol; banded to mott; TBS at base.
-328½ Lt. gr. dol, mott to banded.

-330½ Med. dk. gr. dol; banded.
-331½ Med. gr. dol, thin ss 331; sli. banded.
-340 Lt. med. gr. dol, grades to med. gr.
-344½ Lt. gr. dol, chert nods 343,43½,344½; banded.
-354 Lt. med. gr. dol., v. banded to 348; scatt. sands 347-48; ½" TbS at 351.
-358½ Lt. gr. dol.
-360 Lt. med. gr. dol, sand & oolite at 359, chert nod 359½; heavy ss 360 (CM).
TOP KINGSPORT 360.
-362½ Lt. med. gr. dol; TbS 362½.
-374 Lt. med. gr. dol; sli. mott; TBS 369½; scatt. sand at 374, then TGS.
-389 Lt. gr. dol, white chert nod 377; sli. banded 379,384; chert nods 382½,83,84; v. banded 384-89 w/ thin ss 87 & scatt. heavier sands 388-89 w/ tr. congl. at base then 1" TGS.
-392 Lt. med. gr. dol., mott; chert nod 391½.
-396 Lt. gr. dol, v. lt. banding, chert nod 395½, TGS 396.
-397 Med. gr. dol., mott.
-400 Lt. gr. dol, chert nod 399-400.
-402 Lt. v. silic re-xl, many "floating" chert nods; v. sandy 400½-01½.
-409 Lt. gr. dol, sugary to 404 w/ few ss grains 404; chert nods (white & blue) at 404,07,07½,08½.
-411 Lt. med. gr. dol., mott; sugary, TBS at base.
-417 Lt. gr. dol, well banded, white chert nod 416½; TBS 417.
-418 Med. gr. dol, mott to banded.
-426½ Lt. gr. dol, sli. banded grading to well banded at 422 & banded to mott. from 423-24; sli. mott 424-26½.
-428 Med. gr. dol, silic; large chert nod at base.
-432½ Lt. med. gr. dol; banded to tr. ss at 428½; crackle 428½-29 w/ TBS 429; thin ss 430; banded 430-32½.
-435 Med. gr. dol; mott; crackle 434-34½.
-444½ Lt. med. gr. dol, well banded; occ. crackle w/ gangue; TGS and chert 440; brecc. 443½-44½; top 6" gangue, bott. 6" w/ green shale.
-450 Med. dk. gr. dol, crackle, brecc. 447-49.
-456 Med. gr. dol, mott 450-52; some crackle 452-56.
-459 Med. dk. gr. dol, chert & ss seam at 459.
-467 Med. gr. dol, crackle 459-63 w/ chert nod 463; banded 63-65 w/ chert nod 465; few ss grains 467.
-474 Lt. med. gr. dol; mott to 472½ w/ few eyelets & vugs bott. 6"; banded 472½-74.
TOP "R" BED 474.
-476 Dk. semi re-xl, 4" green shale at top, 1" TGS 475.
-477 Med. dk. gr. dol, mott.
-480 Lt. med. gr. dol; mott.
-489½ Med. gr. dol, mott to banded: some bands semi re-xl.
-491½ Med. gr. semi re-xl; v. mott; few vugs; chert nod at base.
-492½ Lt. gr. dol, banded; at base brecc. chert, shale & tr. ss.
-494 Dk. shaly re-xl.
-496½ Lt. med.- med. gr. dol, sugary, mott, few vugs 495-96.
-502 Lt. br. re-xl; few vugs top; TGS 498½; banded 498½-99½; v. shaly 499½-500.
-505 Lt. gr. semi re-xl, chert nod at base.
-506 Lt. med. gr. dol; tr. crackle; chert nod 506.
-514½ Lt. gr. re-xl, fine grained to semi; mott; green shale at base.

-520	Med. gr. dol.
-520½	Dk. re-xl.
-523	Dk. gr. dol, occ. brecc. w/ gangue.
-524	Med. gr. dol, sli. banded; occ. brecc. w/ gangue.
-525	Lt. gr. & dk. gr. dol, blocks sealed w/ green shale.
-527	LS, shaly; v. shaly at base.
-527½	Dk. re-xl, shaly.
-530	Med. dk. gr. to dk. gr. dol, brecc.
-531	Dk. br. re-xl.
-533½	Lt. med. gr. dol, chert nod 532 w/ tr. brecc. below it. Bott. 6" brecc. sealed w/ blk. re-xl.
-535½	Br. re-xl, top foot brecc. w/ gangue; then dol. blocks & chert in the re-xl.
-536½	Med. gr. dol; brecc. & sealed w/ green shale & re-xl.
-539½	Br. re-xl, cherty at 538; green shale at base.
-543	Dk. gr. semi re-xl, banded; 542-42½ brecc. w/ green shale; chert nod at base. TOP "S" BED 543.
-544	Brecc. chert sealed w/ dk. shaly re-xl.
-551	Lt. br. re-xl., tr. gangue filled brecc; shaly 548½-49½.
-552	Lt. med. gr. dol., brecc; sealed w/ re-xl & green shale, TGS at base.
-556½	Lt. br. re-xl, crackle 552-54; from 554-56½ brecc. sealed w/ dk. re-xl.
-558½	LS, partly to wholly re-xlized; v. shaly.
-559½	Lt. re-xl., shaly.
-563½	Lt. br. re-xl, tr. of white gangue.
	BASE OF KINGSPORT 563½.
-564½	Lt. med. gr. re-xl, grades to semi re-xl, mott.
-571	Lt. med. gr. dol; chert nods 565½,566½; eyelets 566½; sli. banded, TGS 571.
-575½	Med. gr. dol.
-	BASE OF "T" BED 575½.
-577	Dk. br. re-xl, oolitic chert nod at top.
-578½	Lt. gr. dol, grades to semi re-xl, mott.
-582½	Lt. med. gr. semi re-xl, large chert nod at base.
-584	Gr. mott. re-xl, green shale at base.
-585	Green shaly re-xl.
-586	Blk. & white re-xl.
-	BASE OF "U" BED 586.
-588½	Lt. med. gr. dol; crackle brecc. top foot.
-591	Dk. gr. dol; mott; TGS at base.
-592	Lt. gr. re-xl., mott.
-595	Med. to dk. mott. semi re-xl.
-597	Dk. br. re-xl, silic.
-599	Med. gr. semi re-xl, several chert nods 598-99.
-604	Br. re-xl, banded; chert nods 600½,01½,02½.03,03½,04.
-607	Lt. gr. dol; banded; chert nod 605. T.D.


LAND AND GEOCHEMICAL MAP OF
PUNCHEON CAMP CREEK PROSPECT
SHOWING PROPERTIES CONTROLLED BY AGREEMENTS WITH OPTION TO PURCHASE MINERAL RIGHTS; PERCENTAGE OF ZINC IN SOIL AND LOCATION OF PROPOSED DIAMOND DRILL HOLES
Scale 2465'
Base enlarged from U.S.G.S. - T.V.A. Topographic Maps of DUTCH VALLEY Quadrangle (154-SE) and AVONDALE Quadrangle (162-SW), published on Scale of 1:24,000
B. H. PUTNAM, OPERATOR, HOLDINGS
Properties on which application is being made
Other holdings
GEOCHEMICAL SYMBOLS
Sample locality
Sample locality showing percentage of zinc in soil
Outline of geochemical anomaly (.07% Zinc and greater)
CONTOUR INTERVAL = 05%
DIAMOND DRILL HOLES
Diamond drill hole drilled by other than B. H. Putnam, Operator
Proposed diamond drill hole
F. T. Fischer - 11/56
N
P. Williams
WM. COFFMAN
Coffey
DAVE COFFEY, et ux. 315 a
Puncheon Camp Creek
AUSTIN JOHNSON, et ux. 45 a
W. H. JOHNSON 55 a
ELVIN JACKSON, et ux. 105 a
D. R. COFFMAN 25 a
S. S. BREEDING, et ux. 51 a
J. C. McGINNIS, et ux. 62 a
W. B. DALTON, et ux. 65 a (pt. of 77 a)
ROSA BULLEN, et al. 29 a
W. B. DALTON, et ux. 12 a (pt. 77)
T. A. GREEN - 1/2
AARON B. DALTON - 1/2
58 a
VIVA & W. H. STAPLETON 218.20 a
DAVE JACKSON 100 a
PRYOR ACUFF, et ux. 45 a
ELMER BREEDING, et ux. 15 a
H. B. WINSTEAD, et ux. 51 a
Mary McGinnis
PRYOR ACUFF
WALTER COFFEY
John Ogens
Jess Johnson
G. C. Coffey
RED HILL
Dotson Creek
STATE HIGHWAY No. 131
Puncheon Camp Creek Co.
Co-1
WS-1

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DMEA
RECEIVED SEP 27 1957

DATE	INITIALS	CODE
9/27	B	220
30	Conn	100
10/1	Klag	500

INTERIM REPORT

DMEA-4580, Idm-E1088 (Zinc)

Operator: National Lead Company, New York, N.Y.

Location: Puncheon Camp Creek area, Grainter County, Tennessee

Since the last inspection on August 27, 1957, no diamond-drill holes have been completed on the Puncheon Camp Creek area project.

Two holes are in progress in the western half of the project area. Available data on these holes are summarized below:

Hole No.	Property	Depth Est.	Total Depth	Remarks
CO-1	Coffman	802	1000	Located approximately on Fence 6 (see contract map) at site about 500 ft down dip from last hole shown; collared in Mascot dolomite; chert-matrix ss @ 719(?); shines of Zns @ 290 ft.
MG-1	McGinnis	171	600	Located on Fence 5 (see contract map) approxi. at the site of the 3rd hole up-dip from the SE end; collared and drilling in Mascot dolomite.

The second hole on the Coffman fence will be drilled either 200 ft or 400 ft up-dip from Hole CO-1 depending on the condition of the ore zone of the Kingsport in Hole CO-1. The tentative location for the second hole on the McGinnis fence is 200 feet updip from Hole MG-1.

Inspected: September 17, 1957

Helmuth Wedow, Jr., Geologist
Geological Survey

z

L. E. Shirley, Mining Engineer
Bureau of Mines

A PROGRESS REPORT ON THE
PUNCHEON CAMP CREEK PROJECT, GRAINGER
COUNTY, TENNESSEE FOR JULY, 1957.

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DMEA
RECEIVED 1957

DATE	INITIALS	CODE
8/26	[illegible]	500

Docket No. 4580
Contract No. Idm-E 1088

Drilling is now underway on the Puncheon Camp Creek project. The first drilling location is on the V. Stapleton farm (ST-1). Due to the steep rocky slope at the drilling site, a great deal of time was spent preparing the location and moving in the drilling equipment, and as a result, drilling has been underway only a few days. The "Operators Unit Cost and Progress Report" is not being submitted with this report.

from National Lead

Repts

INTERIM REPORT

DMEA-4580, Idm-E1088 (Zinc)

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DMEA
RECEIVED SEP 5 1957
CODE
9/5 C 220
540

Operator: National Lead Company, New York, N. Y.

Location: Puncheon Camp Creek area, Grainger County, Tennessee

Diamond drilling on the Puncheon Camp Creek project completed to date and since the last inspection on August 8, 1957 is summarized as follows:

Footage in holes completed since last inspection . . .	910
Total footage in holes completed to date	1,517
Number of holes completed since last inspection . . .	1
Total number of holes completed to date	2
Number of holes showing commercial zinc ore	0
Number of holes showing non-commercial zinc mineralization	1
Number of barren holes	1

A summary of the one hole completed since the last inspection is given below:

Hole No.	Property	Total Depth	Remarks
WS-1	Winstead	910	Location: 400 feet SE of Hole ST-1 Abbreviated log: 0-1 Overburden; 1-674 Mascot dolomite; 674-783 upper Kingsport dolomite member; 783-910 lower Kingsport limestone member and Longview dolomite (contact not recognized) Mineralization: Shines of ZnS @ 538 and 763; ½ foot estimated @ ½% Zn @ 766½-767.

At the time of inspection Hole WS-1 had just been completed and the drill rig was preparing to move to a new site. The location of the next hole will be at the down dip end of a dip fence 1,200 feet southwest of Hole WS-1 at a site about 100 feet northwest of the property line between the Winstead and Stapleton tracts.

Drilling on the Puncheon Camp Creek project will continue for several more holes with only one rig until a better understanding of the stratigraphy is obtained.

Inspected: August 27, 1957

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

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DATE	INITIALS	CODE
8/19	Com	100
8/21	Ktug	500

INTERIM REPORT

DMEA-4580, Idm-E1088 - Zinc

Operator: National Lead Company, New York, New York

Location: Puncheon Camp Creek area, Grainger County, Tennessee

Diamond drilling on the Puncheon Camp Creek ~~project of National~~ Lead Company completed to date is summarized as follows:

Footage in holes completed to date	607
Number of holes completed to date	1
Number of holes showing commercial zinc ore	0
Number of holes showing non-commercial zinc mineralization	0
Number of barren holes	1

A summary of the one hole completed on this project to date follows:

Hole No.	Property	Total Depth	Remarks
ST-1	Stapleton	607	Abbreviated log: 0-360 Mascot dolomite; 360-474 upper Kingsport dolomite member; 474-564 lower Kingsport limestone member; 564-607 Longview dolomite. Mineralization: Barren

Study of the core from the ore zone (lower Kingsport limestone member) shows that most of the rock encountered is a coarse crystalline dolomite (so-called recrystalline of district) and is probably the feature responsible for the prominent low resistivity anomaly reported in the interim report of July 12, 1957.

At the time of inspection the drill rig was being moved to a site 400 feet southeast (down dip) from Hole ST-1. The new hole will be No. WS-1 on the Winstead property and will be bottomed at about 900 feet.

Inspected: August 8, 1957

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

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DATE		CODE
7/30	Conn	100
7/31	Klug	500

INTERIM REPORT

DMEA-4580, Idm-E1088 - Zinc

Operator: National Lead Company, New York, N. Y. - assignee

Location: Puncheon Camp Creek area, Grainger County, Tennessee

Diamond drilling on the Puncheon Camp Creek project in the Copper Ridge district is scheduled to begin on July 25, 1957. A drill was being moved on the property at the time of this inspection. The hole location was surveyed in about a week ago.

Inspected: July 24, 1957

V. J. Lynch, Mining Engineer
U. S. Bureau of Mines

Dewey H. Amos, Geologist
U. S. Geological Survey

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7/22 | 100
7/22 | 5.00

INTERIM REPORT

DMEA-4580, Idm-E1088 - Zinc

Operator: National Lead Company, New York, New York--assignee

Location: Puncheon Camp Creek area, Grainger County, Tennessee

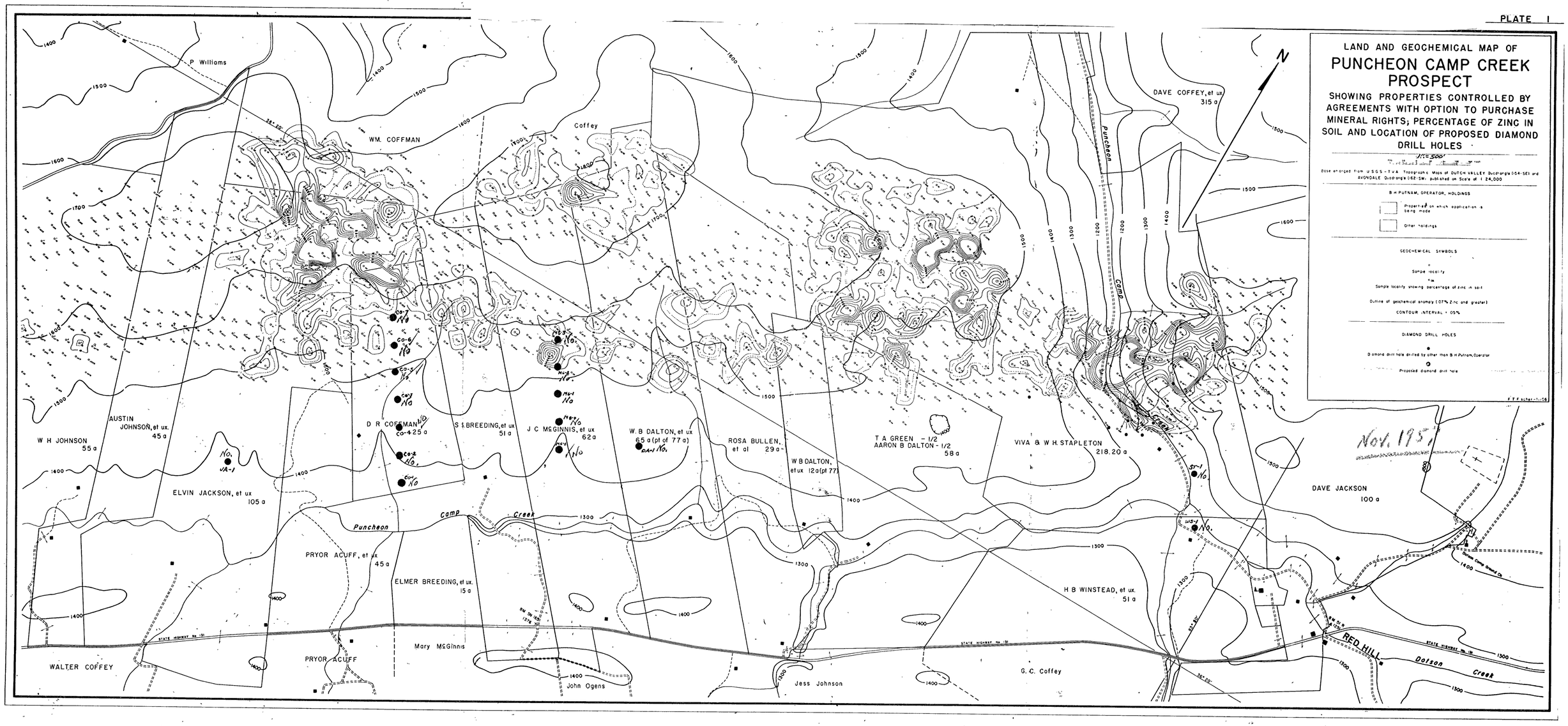
Diamond drilling on the Puncheon Camp Creek project in the Copper Ridge district is scheduled to start on July 18 or 19, 1957. Drilling equipment is being moved to the project area and the site for the first hole was selected at a meeting between the writers and the Company's representatives on the date of this report. The site will be on Fence No. 1, as shown on the map accompanying the contract, and will be approximately that of the second hole from the southeast end of the fence. The selection of this site for the initial drilling is based on recently available geophysical and additional geological data gained since the transfer of the Putnam interests in Copper Ridge to the National Lead Company. The geophysical data show a prominent resistivity low anomaly roughly paralleling the regional strike at depths ranging from about 600 to about 800 feet below the surface. The position of this anomaly along the strike coincides roughly with the prominent geochemical anomaly in the Kingsport formation at the surface on the Stapleton tract. The first hole will probably bottom at about 700-800 feet.

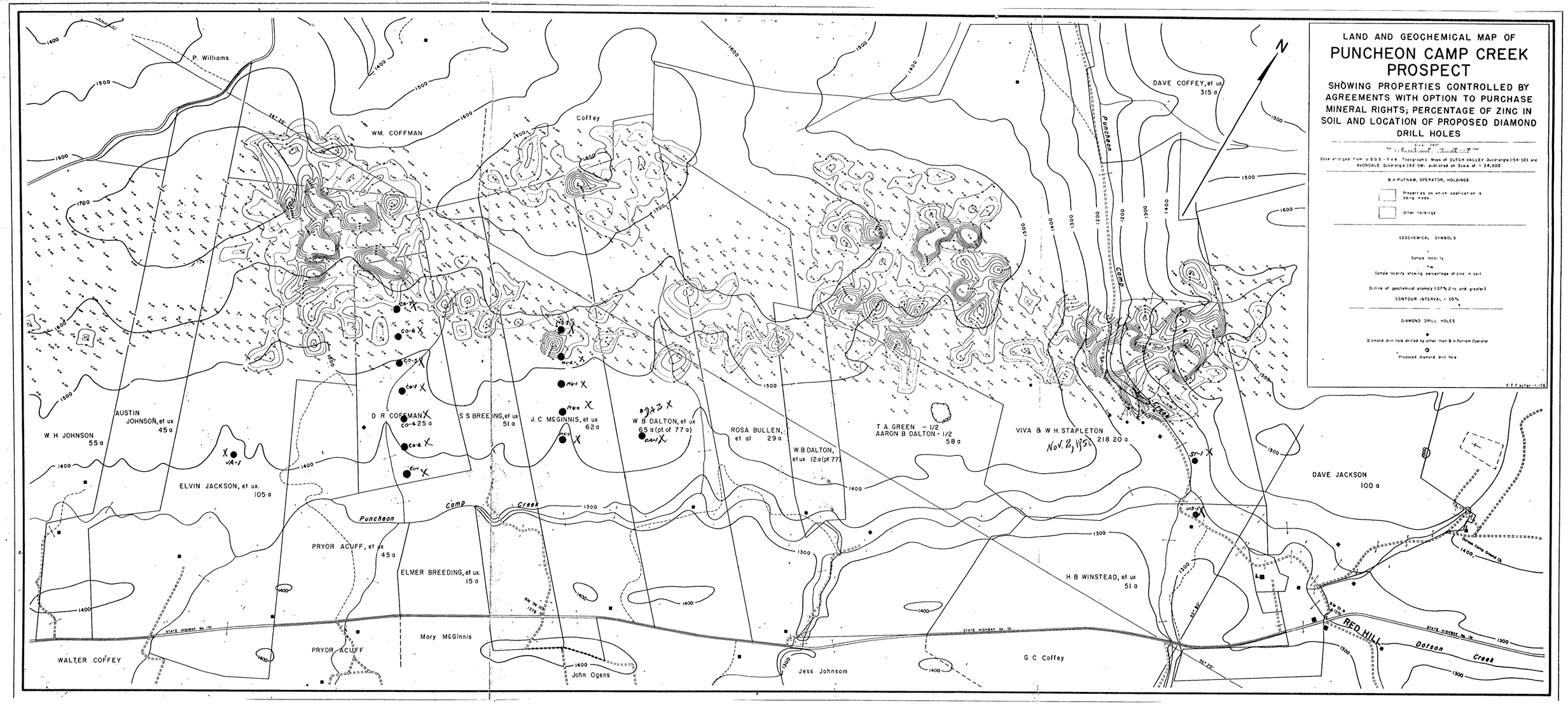
Inspected: July 12, 1957

V. J. Lynch, Mining Engineer
U. S. Bureau of Mines

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

PLATE I


LAND AND GEOCHEMICAL MAP OF
PUNCHEON CAMP CREEK PROSPECT
SHOWING PROPERTIES CONTROLLED BY AGREEMENTS WITH OPTION TO PURCHASE MINERAL RIGHTS; PERCENTAGE OF ZINC IN SOIL AND LOCATION OF PROPOSED DIAMOND DRILL HOLES
1/16 500'
Base enlarged from U.S.G.S.-T.V.A. Topographic Maps of DUTCH VALLEY Quadrangle (154-SE) and AVONDALE Quadrangle (162-SW) published on Scale of 1:24,000
B.H. PUTNAM, OPERATOR, HOLDINGS
Property on which application is being made
Other holdings
GEOCHEMICAL SYMBOLS
Sample locality
.5%
Sample locality showing percentage of zinc in soil
Outline of geochemical anomaly (.07% Zinc and greater)
CONTOUR INTERVAL = 05%
DIAMOND DRILL HOLES
Diamond drill hole drilled by other than B.H. Putnam, Operator
Proposed diamond drill hole
F.T.F. Asher-1-56
N
P. Williams
WM. COFFMAN
Coffey
DAVE COFFEY, et ux 315 a
Puncheon Camp Creek
AUSTIN JOHNSON, et ux. 45 a
W H JOHNSON 55 a
D R COFFMAN co-4 25 a
S S BREEDING, et ux 51 a
J C McGINNIS, et ux 62 a
W. B DALTON, et ux 65 a (pt of 77 a)
ROSA BULLEN, et al 29 a
W B DALTON, et ux 12 a (pt 77)
T A GREEN - 1/2
AARON B DALTON - 1/2 58 a
VIVA & W H. STAPLETON 218.20 a
DAVE JACKSON 100 a
ELVIN JACKSON, et ux 105 a
PRYOR ACUFF, et ux 45 a
ELMER BREEDING, et ux. 15 a
H B WINSTEAD, et ux. 51 a
Mary McGinnis
WALTER COFFEY
PRYOR ACUFF
John Ogens
Jess Johnson
G. C. Coffey
RED HILL
Dotson Creek
Dotson Camp Branch
STATE HIGHWAY No. 131
STATE HIGHWAY No. 191
Nov. 1957


LAND AND GEOCHEMICAL MAP OF
PUNCHEON CAMP CREEK PROSPECT
SHOWING PROPERTIES CONTROLLED BY AGREEMENTS WITH OPTION TO PURCHASE MINERAL RIGHTS; PERCENTAGE OF ZINC IN SOIL AND LOCATION OF PROPOSED DIAMOND DRILL HOLES
Base enlarged from U.S.G.S.-T.V.A. Topographic Maps of DUTCH VALLEY Quadrangle (54-SE) and AVONDALE Quadrangle (62-SW), published on Scale of 1:24,000
B H PUTNAM, OPERATOR, HOLDINGS
Properties on which application is being made
Other holdings
GEOCHEMICAL SYMBOLS
Sample locality
Sample locality showing percentage of zinc in soil
Outline of geochemical anomaly (.07% Zinc and greater)
CONTOUR INTERVAL = 05%
DIAMOND DRILL HOLES
Diamond drill hole drilled by other than B H Putnam Operator
Proposed diamond drill hole
F.T.F. Fischer-1-56
N
P. Williams
WM. COFFMAN
Coffey
DAVE COFFEY, et ux 315 a
Puncheon Camp Creek
W. H JOHNSON 55 a
AUSTIN JOHNSON, et ux 45 a
ELVIN JACKSON, et ux. 105 a
D R COFFMAN
S S BREEDING, et ux 51 a
J. C McGINNIS, et ux 62 a
W B DALTON, et ux 65 a (pt of 77 a)
ROSA BULLEN, et al 29 a
W.B DALTON, et ux 12 a (pt 77)
T A. GREEN - 1/2
AARON B DALTON - 1/2 58 a
VIVA & W H. STAPLETON 218 20 a
Nov. 8, 1951
DAVE JACKSON 100 a
PRYOR ACUFF, et ux 45 a
ELMER BREEDING, et ux. 15 a
Mary McGinnis
PRYOR ACUFF
WALTER COFFEY
John Ogens
Jess Johnsom
G C Coffey
H B WINSTEAD, et ux 51 a
RED HILL
Dotson Creek
STATE HIGHWAY No. 131
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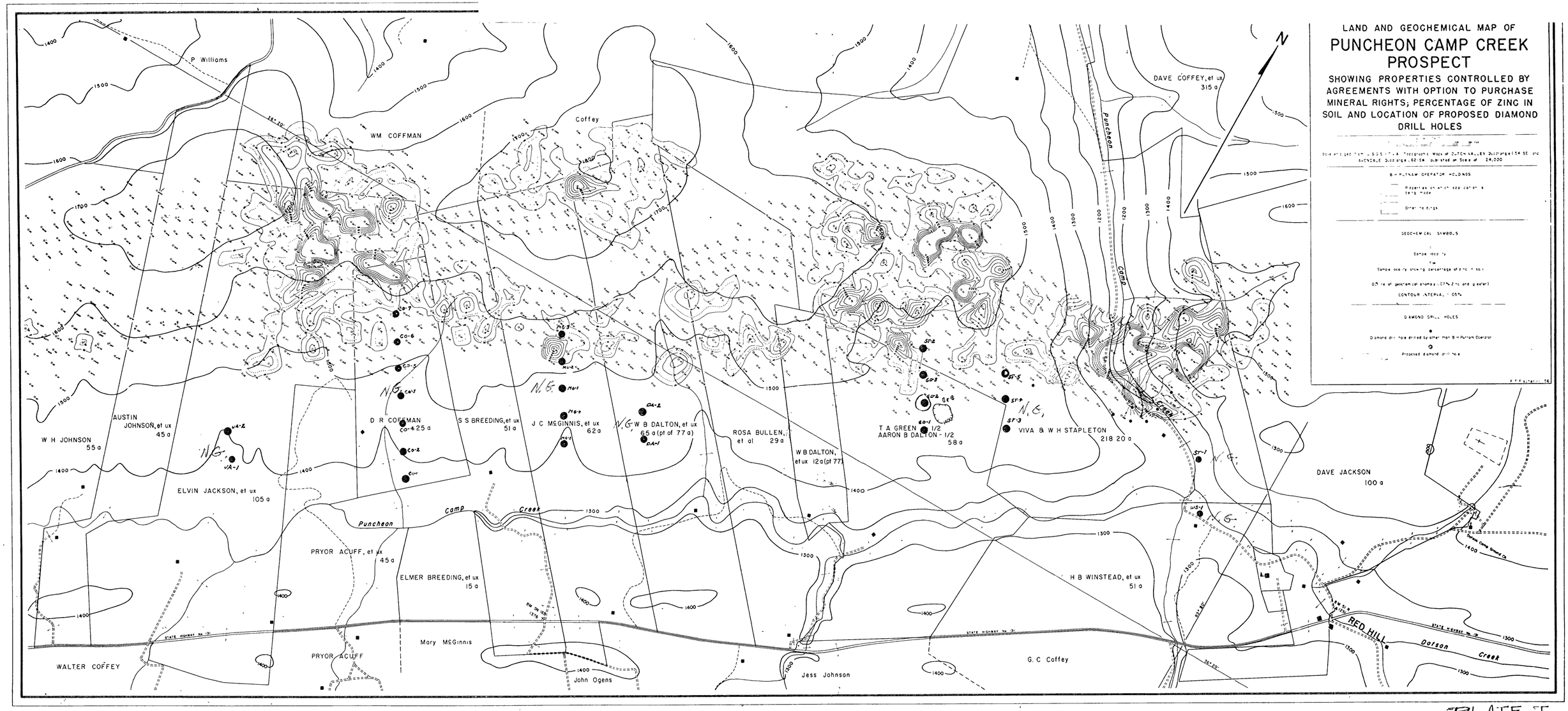
LAND AND GEOCHEMICAL MAP OF
PUNCHEON CAMP CREEK PROSPECT
SHOWING PROPERTIES CONTROLLED BY AGREEMENTS WITH OPTION TO PURCHASE MINERAL RIGHTS; PERCENTAGE OF ZINC IN SOIL AND LOCATION OF PROPOSED DIAMOND DRILL HOLES
B-PUTNAM OPERATOR HOLDINGS
Other holdings
GEOCHEMICAL SYMBOLS
CONTOUR INTERVAL - 05%
DIAMOND DRILL HOLES
Diamond drill hole drilled by other than B H Putnam Operator
Proposed diamond drill hole
N
P Williams
WM COFFMAN
Coffey
DAVE COFFEY, et ux 315 a
Puncheon Camp Creek
AUSTIN JOHNSON, et ux 45 a
W H JOHNSON 55 a
ELVIN JACKSON, et ux 105 a
D R COFFMAN 25 a
S S BREEDING, et ux 51 a
J C McGINNIS, et ux 62 a
W B DALTON, et ux 65 a (pt of 77 a)
ROSA BULLEN, et al 29 a
W B DALTON, et ux 12 a (pt 77)
T A GREEN 1/2
AARON B DALTON - 1/2 58 a
VIVA & W H STAPLETON 218 20 a
DAVE JACKSON 100 a
PRYOR ACUFF, et ux 45 a
ELMER BREEDING, et ux 15 a
H B WINSTEAD, et ux 51 a
Mary McGinnis
PRYOR ACUFF
WALTER COFFEY
John Ogens
Jess Johnson
G. C Coffey
RED HILL
Dotson Creek
STATE HIGHWAY No 31
N.G.

PLATE-I