IN REPLY REFER TO:

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

May 23, 1955

Re: DMEA-3587
Nugget Coal & Timber
Little Man Mine
Carbon Co., Wyoming
$32,700 - Uranium

Memorandum

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

From: R. D. Trace, U. S. Geological Survey

Subject: Review of Field Team report

The field examiners recommended a contract for the subject application, but according to the Field Team letter of transmittal, the application has been withdrawn.

This is the first record we have of DMEA-3587 and I, therefore, presume that the field referral was made by Denver.

I suggest that the applicant's request for withdrawal be affirmed.

RDTrace

R. D. Trace

5/24/55-gla

IN REPLY REFER TO:

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

May 23, 1955

Re: DMEA-3587
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R. D. Trace

RDTrace:hlm
G-5/23/55

Copy to: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
J. E. Crawford, 3641 Interior
J. O. Hosted, 3210 GSA

IN REPLY REFER TO:

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

Department of the Interior
Defense Minerals Administration
RECEIVED
MAY 13 1955

224 New Customhouse
Denver 2, Colorado

May 10, 1955

Memorandum

To: Chairman, Operating Committee

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3587 (Uranium), Nugget Coal and Timber Company, Little Man mine, Carbon County, Wyoming

Enclosed is a copy of a letter from the applicant requesting that the subject application be withdrawn.

W. M. Traver

Enclosure

W. M. Traver

NCCO

Nugget Coal & Timber Company

919 Midland Savings Bldg.
Denver 2, Colorado

REGIONAL DIRECTOR'S OFFICE
REGION III
MAY 9 1955
BUREAU OF MINES
DENVER, COLORADO

"NUGGET COAL MAKES WARM FRIENDS"

May 6th-1955

DMEA
Date Rec'd.
MAY 9 1955
BUREAU OF MINES
Denver, Colorado

Bureau of Mines
224 New Customhouse
Denver, Colorado

DMEA 3587

Gentlemen:

Complying with your telephone request we are listing below a copy of our previous letter dated April 26th, 1955:

"This will confirm our verbal statement in your office yesterday (April 25th) in which we advised we were withdrawing our application for a loan under the DMEP".

Trusting this is the desired information, we are,

Respectfully yours,

NUGGET COAL & TIMBER CO.

R. S. Harkins

R. S. Harkins
Executive Vice President

rsh/1

5/13/55 gla

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 13 1955

224 New Customhouse
Denver 2, Colorado

May 10, 1955

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To: Chairman, Operating Committee

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-3587 (Uranium), Nugget Coal and Timber Company, Little Man mine, Carbon County, Wyoming

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W. M. Traver

W. M. Traver

Enclosure

HMC:pw

cc: Subject
Chron
Harshman
Shaw

NCCO

& TIMBER

Nugget Coal Company

919 Midland Savings Bldg.
Denver 2, Colorado

REGIONAL DIRECTOR'S OFFICE
REGION III
MAY 9 1955
BUREAU OF MINES
DENVER, COLORADO

"NUGGET COAL MAKES WARM FRIENDS"

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DMEA
Date Rec'd.
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BUREAU OF MINES
Denver, Colorado

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224 New Customhouse
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DMEA 3587

RECEIVED

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R. S. Harkins
Executive Vice President

rsh/1

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

RECEIVED

224 New Customhouse
Denver 2, Colorado

May 10, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, Docket DMEA-3587 (Uranium), Nugget Coal and Timber Company, Little Man mine, Carbon County, Wyoming

Enclosed are the original and three copies of the report pertaining to the above application.

The applicant has requested that the subject application be withdrawn.

W. M. Traver

Enclosures

E. N. Harshman

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

224 New Customhouse
Denver 2, Colorado

May 10, 1955

Memorandum

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From: Field Team, Region III

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W. M. Traver

W. M. Traver

E. N. Harshman

E. N. Harshman

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Bureau Records Administration
RECEIVED
MAY 1 8 1955

Region III

TRANSMITTED

MAY 1 0 1955

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
January 27, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: John F. Shaw

Subject: DMEA 3587 (Uranium), Nugget Coal and Timber Company (Little Man claims), Carbon County, Wyoming.

Enclosed are the original and ten copies of the examination report on docket 3587 by C. M. Harrer. Also, enclosed are original and ten copies of joint "Summary, Conclusions and Recommendations" by C. M. Harrer and D. R. MacLaren.

It is recommended that the Government enter into an exploration contract with the applicant at an estimated cost of $32,700.00; the contract would be prepared in two stages. The first stage would consist of 750 feet of core drilling. The second stage would be dependent upon the results of the first stage and would consist of 5,250 feet of core drilling.

John F. Shaw

John F. Shaw

enclosures

JFS/cm

cc ✓10
DMEA 3587
Chron

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION XII

DMEA 3487

The Bennett Coal and Timber Company Lease

Carbon County, Wyoming

Premium

G. M. Harvey, Mining Engineer
Bureau of Mines

D. R. Mualaren, Geologist
Geological Survey

January 24, 1955

DMEA 3587

THE BUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

TRANSMITTED

MAY 1 0 1955

Summary, Conclusions, and Recommendations

By C. M. Hartzog
Mining Engineer
Bureau of Mines

D. R. Mauldrum
Geologist
Geological Survey

DMEA 3587

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By C. M. Barrer and D. R. MacLaren

The Nugget Coal and Timber Company, 919 Midland Savings Building, Denver 2, Colorado, has applied for exploration assistance estimated to cost $32,700.00 to explore for uranium on the Little Man group of unpatented mining claims on which they have a lease effective for over 10 years.

The property, consisting of the 12 standard mining claims, Little Man No's. 1 to 12, covers about 129 acres in sec. 14, T. 27 N., R. 84 W., Carbon County, Wyoming. It was investigated in the field by a Region III Defense Minerals Exploration Administration examining team on December 7, 1954, and has also been examined by various members of the Geological Survey and Atomic Energy Commission during 1954.

The rocks in the area are pre-Cambrian in age and comprise granites, gneisses, schists, and basic dikes. Uranium occurs in a black mineral which is finely disseminated in the granite and which is sufficiently concentrated within 4 to 6 feet of an overlying siliceous graphite schist to form ore bodies. Radioactivity in this zone is as much as 5.0 MR/hr. Although, no uranium mineral was identified, radioactivity up to 0.5 MR/hr is also found in a graphite schist zone, about 5 feet thick, between walls of altered granite.

A two stage exploration program is recommended at a cost of $32,700.00. Government participation of 75 percent would be $24,525.00.

Stage 1:

The first part of the program would consist of 750 feet of core drilling at $5.45 per foot, at four designated locations to cut two radioactive zones at a depth of 50 feet below outcrops or existing adit levels.

Stage 2:

The second part of the program would consist of 5,250 feet of core drilling at $5.45 per foot, or its equivalent, based on the results of a study of stage 1 and the approval of the Field Team. It should be noted that information developed by stage 1 and other work performed by the applicant may indicate exploration other than core drilling or amendment or termination of the contract. The applicant should submit an accurate topographic map and cross-sections through core drill holes as part of the project.

The Denver Exploration Branch of the Atomic Energy Commission was consulted on the results of their examination and on core drilling costs.

BMRA 3507

THE BUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

Engineering Report

By C. M. Harrar
Mining Engineer
Bureau of Mines

DMEA 3587

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

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Exploration and development	4
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Remaining team's proposal	6
Project costs	8
Conclusions	8
Recommendations	9

ILLUSTRATIONS

Figures	Follows Page
1. Location map, Nugget Coal and Timber Company lease, Carbon County, Wyo. (DMEA 3587)	1
2. Property map and proposed exploration, Nugget Coal and Timber Co., lease, sec. 14, T. 27 N., R. 84 W., Carbon County, Wyo. (DMEA 3587)	2
3. Plan showing approximate location of roads, trenches, tunnels, and recommended diamond drill holes, Claim No. 1, Little Man mine, Carbon County, Wyo.	*

* See figure with geologic report.

DMEA 3587

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

ENGINEERING REPORT

By C. M. Harper

INTRODUCTION

The Nugget Coal and Timber Company, 919 Midland Savings Building, Denver 2, Colorado, has applied for exploration assistance estimated to cost $32,700.00 to explore for uranium on the Little Man group of unpatented mining claims under lease (fig. 1).

The property has been visited by members of the Atomic Energy Commission and United States Geological Survey during 1954.

The property was examined for the Region III Defense Minerals Exploration Administration by the writer, accompanied by Don I. MacLaren and R. V. King of the Geological Survey, on December 7, 1954.

ACKNOWLEDGMENTS

Mr. Frank J. Reid, manager of coal operations for Nugget Coal and Timber Company at Hanna, was contacted and served as guide to the Little Man group of uranium claims. Mr. T. L. Johnston, supervising engineer in charge of exploration operations was met at the property and cooperated fully with the examining team. The Denver Exploration Branch of the Atomic Energy Commission made the results of their investigation of the property and comparable costs of core drilling available to the examining team.

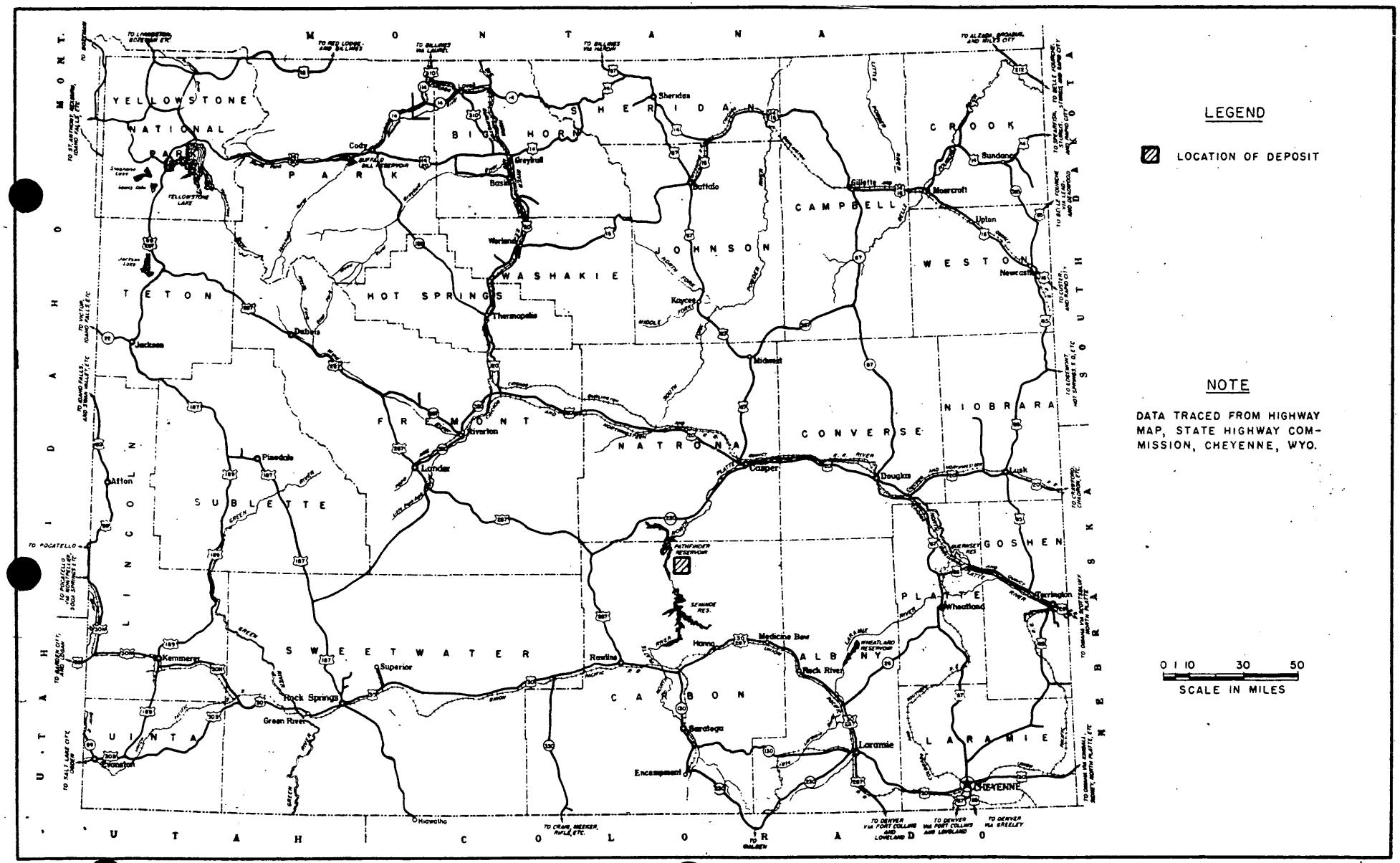

FIGURE 1.--LOCATION MAP, NUGGET COAL AND TIMBER COMPANY LEASE (URANIUM), CARBON COUNTY, WYOMING (DMEA 39[illegible])

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The Little Man group of mining claims under lease to the Nugget Coal and Timber Company are in sec. 14, T. 27 N., R. 84 W., sixth principal meridian, in Carbon County, Wyoming, (fig's. 1 and 2) at altitudes ranging between 6,900 and 8,000 feet above sea level. The property is in the rugged Pedro Mountain area; about 52 miles north of Hanna and is reached by travel over dirt roads. Hanna is the nearest residence point and is located on the Union Pacific railroad and U. S. Highway 30.

Water for domestic use is obtained from nearby springs and creeks. The North Platte river and Pathfinder dam are about 5 miles west of the property. Power lines from the Seminoe dam plant pass within 3 miles of the property and REA power is 6 miles distant.

HISTORY AND PRODUCTION

The Little Man group of mining claims was filed on as unpatented mining locations on August 13, 1954. There has been no appreciable production to date, although preparations are being made to send trial shipments to the Atomic Energy Commission at Rifle, Colorado, and Edgemont, South Dakota.

OWNERSHIP AND EXTENT

The Little Man group of unpatented mining claims (fig. 2) in sec. 14, T. 27 N., R. 84 W., Carbon County, Wyoming, are owned by John D. Bedford, Eric E. Lepponen, John Rimmer, Thomas Rimmer, Richard Lee, Mark Lee, Alex J. Rosece, James Kladianos, Dave Freeman, Sidney W. Freeman and Frank J. Reade, of Hanna, Wyoming. The Little Man group consists of

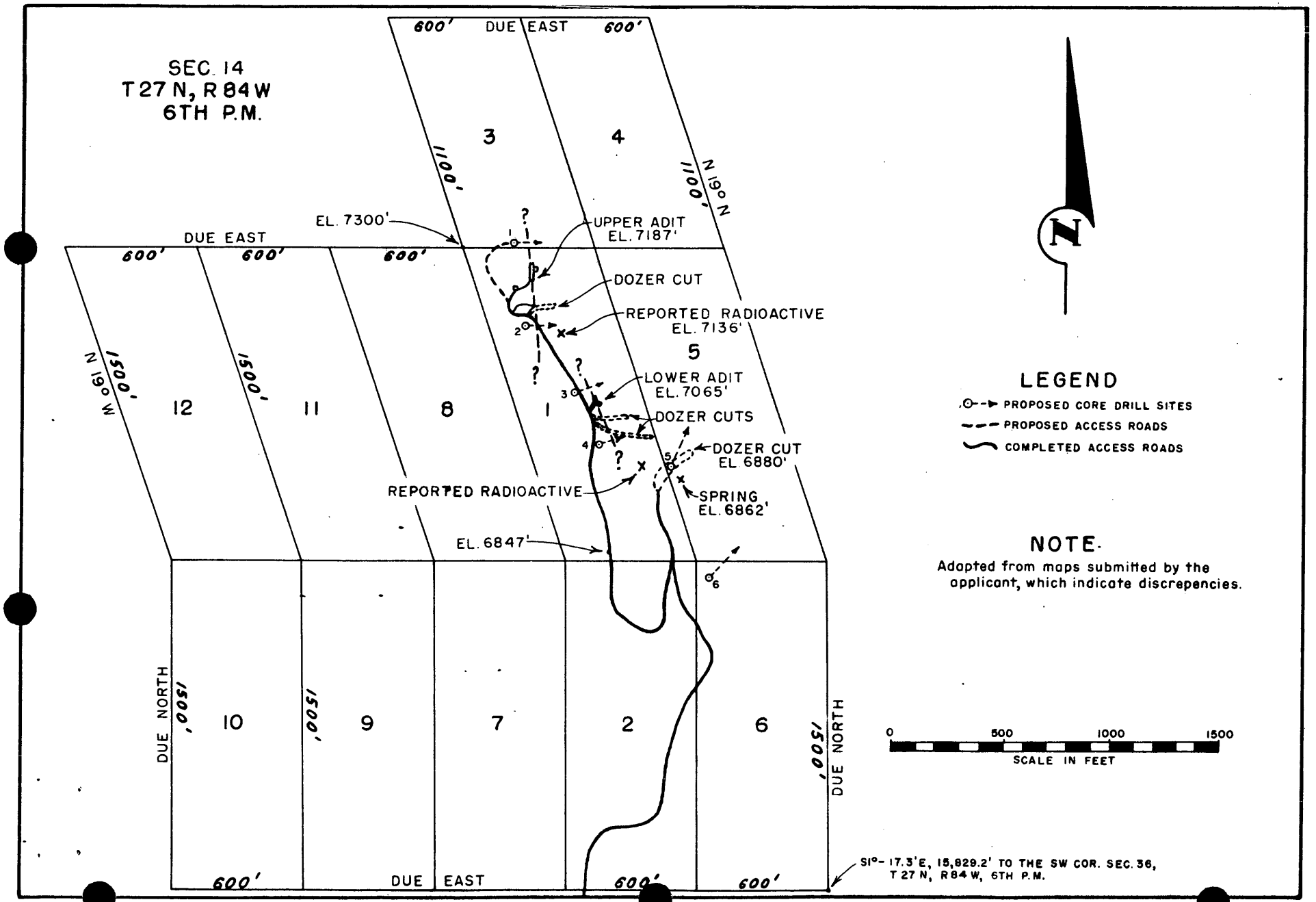

FIGURE 2-PROPERTY MAP SHOWING PROPOSED EXPLORATION, NUGGET COAL AND TIMBER CO., LEASE, CARBON COUNTY, WYO. (DMEA 3587)

12 unpatented mining locations covering about 329 acres, recorded on August 13, 1954. They are known as the Little Man claims, numbers 1 to 12. The claims are recorded on pages 286 to 297, volume 335 in the office of the Carbon County Clerk at Rawlins, Wyoming.

Nugget Coal and Timber Company, with offices at 919 Midland Savings Building, Denver 2, Colorado, has leased the property as of August 30, 1954. The lease is effective for 10 years and as long thereafter as mineral is produced in commercial quantities. Royalty payments will be 15 percent of the gross value of the ore; however, should a mill be constructed, the royalties would be reduced by 15 percent of the initial and operating costs of the mill.

DESCRIPTION OF DEPOSIT

Uranium minerals occur in a sheared zone or zones that includes graphitic schist, quartz-pyrite vein material and common pegmatitic granite in the Pedro Mountain area, Carbon County, Wyoming. Radioactivity is a prominent feature in two short adits on the Little Man claim No. 1 (Fig. 2). The lower adit was driven at an early date to explore a graphite zone. Values between 0.05 and 0.5 MR/hr were recorded in the adit. The upper adit has been driven about 60 feet along a strongly radioactive structure with readings in excess of 5.0 MR/hr.

Uranophane ($CaO.2UO_3.2SiO_2.7H_2O$) has been reported in the oxide zone by the applicant but was not identified by the examiners. Pitchblende $(UO_2)_2UO_4\ (MgO)_x$ is found in the upper adit in erratic concentrations.

Selected samples by J. D. Love of the Geological Survey during 1954 gave values of 0.33, 0.49 and 4.9 percent U_3O_8. Two 24-inch samples across the breast of the upper adit at 17 feet gave values of 1.20 and 1.26 percent U_3O_8. Five feet of sample taken 52 feet in from the portal of the upper adit averaged 0.165 percent U_3O_8 and 4.5 feet of sample at 58 feet averaged 0.307 percent U_3O_8[1]. A chip sample across a 4-foot width at 60 feet in the upper adit gave a value of 0.73 percent equivalent U_3O_8 and 0.80 percent chemical U_3O_8[2]. A truck load of 13.24 tons of uranium ore, shipped to Rifle, Colorado, assayed 0.28 percent U_3O_8. A 30-pound sample sent to Climax Uranium Corp., at Grand Junction, assayed 0.87 percent U_3O_8, 0.52 percent $CaCO_3$ and 1.03 percent V_2O_5.

MINABLE ORE RESERVES

No data is available on which to base an estimate of any type of ore reserves.

PRESENT STATUS

Exploration and Development

Since early in September 1954, four bulldozer trenches in the mineralized area and several miles of access road have been completed. In addition, a small maintenance shed and ore bin were constructed. Early exploration, for graphite, included an adit consisting of 34 feet of drift and 15 feet of crosscut, and several shallow shafts and pits. A new adit, which is 122 feet higher and 500 feet to the northwest of the above mentioned adit consists of 58 feet of drift and 9 feet of crosscut on a highly radioactive zone. Radioactive rock is being sorted with the aid of a geiger counter and shipped for amenability tests.

---

1. Denver Exploration Branch, Atomic Energy Commission.
2. U. S. Geological Survey.

Mining and Milling Equipment and Other Facilities

Drifting is accomplished with 55 and 90 pound Worthington jackhammers and a 256-cfm Joy air-compressor. Broken rock is removed by wheelbarrow. A TD-24 bulldozer is used for trenching, hauling equipment and snow removal. Miscellaneous trucks are used for hauling supplies and transporting ore. There are no milling facilities available and ore shipments would be trucked to Hanna, on the Union-Pacific Railroad, for shipment to the Atomic Energy Commission.

APPLICANT'S PROJECT PROPOSALS, WITH COSTS

The applicant, Nugget Coal and Timber Company, proposes to explore further the uranium indications on the Little Man claims 1, 5 and 6 (fig's 2 and 3) with 6,000 feet of core drilling, including access roads over rugged country to drill sites and the preparation of drill sites. They propose to core drill EX(7/8) or AX(1-1/8) sizes for $4.25 per foot and estimates 13,000 cubic yards of earth and rockwork in preparing drill access roads and drill sites at $0.40 per cubic yard.

Total estimated costs:

Core drilling 6,000 feet at $4.25 per foot	$25,500.00
Access roads and drill sites - 13,000 cubic yards at $0.40 per cubic yard	5,200.00
Contingencies	2,000.00
Total cost	$32,700.00
Total cost per foot of core drill hole	5.45

Six core drilling sites about 200 to 400 feet apart in very steep and rough terrain are proposed from which a radioactive zone would be explored by angle holes to a depth of 200 feet in vertical intervals of 50 feet. The proposed drilling program would be completed within 8 months of the date of an exploration contract.

The applicant's estimated over-all costs are believed to be conservative for the project.

EXAMINING TEAM'S PROPOSAL

Examination of the property disclosed radioactive shear zones in two short adits about 500 feet apart horizontally, with a difference in elevation of 122 feet. The two zones could not be traced outside the adits due to heavy snow and overburden. While the radioactive shear zones in the adits, and spots reported radioactive on the surface by the applicant (fig.2) appear to indicate a continuous structure, the possibility exists that they may be on separate structures as indicated by variances in dip and strike.

The property merits exploration, however, due to the lack of more positive data it is proposed that exploration be conducted in successive stages dependent upon geologic information to be developed.

As stage 1, it is proposed that the radioactive shear zone or zones on claim No. 1 be explored by core drilling to a vertical depth of 50 feet at the locations 1 to 4 on figure 2, which are in the approximate location of the applicant's proposed program. Holes 1 and 3 would be so placed as to intersect the radioactive structures at a depth of 50 feet below the adit floors. Holes 2 and 4 would be placed to intersect the radioactive shear structures 50 feet below their collar. Holes would be drilled at angles between 26° and 46° below the horizontal. Size AX or BX core is recommended as easier to split and examine. Total drilling is estimated at 750 feet.

Due to discrepancies and incompleteness of maps furnished by the applicant, an exploration program cannot be projected in detail. Therefore, core drilling as stage 1 is located from the two adit portals.

Hole No. 1 is tentatively located at a point 225 feet N. 46° W., of the portal of the upper adit and should be drilled for about 300 feet on a bearing of N. 70° E. with an inclination of 45° below the horizontal.

Hole No. 2 is tentatively located at a point 200 feet S. 8° W., of the portal of the upper adit and should be drilled for about 150 feet on a bearing of N. 70° E., with an inclination of 24° below the horizontal.

Hole No. 3 is tentatively located at a point 100 feet N. 29° W., of the portal of the lower adit and should be drilled for not more than 150 feet on a bearing of N. 70° E., with an inclination of 46° below the horizontal.

Hole No. 4 is tentatively located at a point 150 feet S. 15° W., of the portal of the lower adit and should be drilled for about 150 feet on a bearing of N. 70° E., with an inclination of 35° below the horizontal.

The applicant's holes 5 and 6 are not in a favorable area for exploration, on the basis of present knowledge.

Stage 2 of the program would be based upon the results of a study of information developed by stage 1 and would consist tentatively of the remaining 5,250 feet of core drilling requested by the applicant, subject to approval or revision of the program or cancellation by the Field Team on the basis of information developed in stage 1. It should be noted that information developed by stage 1 and other work performed by the applicant may indicate exploration other than core drilling.

PROJECT COSTS

Stage 1:

750 feet of core drilling (AX core) including access roads and site preparation in steep and rocky terrain, at $5.45 per feet - $ 4,087.50
The work would be completed in less than 2 months.

Stage 2:

5,250 feet of core drilling (AX core) including access roads and site preparation in steep and rocky terrain, at $5.45 per feet - 28,612.50
The work would be completed in less than 6 months.

The total project would be completed in 8 months at a cost of $32,700.00. Government participation at 75 percent would be $24,525.00.

The above costs are compiled from the applicant's proposal and are conservative. In substantiation, core drilling bids to the Atomic Energy Commission[3] under closely similar field conditions, not including construction and maintenance of access roads, the preparation of drill sites, hauling water, standby time and other incidentals varied between $4.53 and $6.63 per foot.

CONCLUSIONS

The identification of pitchblende in the very radioactive zone exposed in the upper adit, radioactivity in the lower adit and the favorable results of chemical and radiometric analyses indicate a favorable zone of uranium mineralization which should be explored further to determine its strike extent and potential in depth. The chances of making a significant discovery of uranium on the property are considered good.

---

3. Denver Exploration Branch, U. S. Atomic Energy Commission

The applicant's proposal to explore the uranium occurrence by core drilling in 50-foot stages to a depth of 200 feet below the surface is based on his hope that uranium is very extensive and will be found to a depth of over 200 feet.

Evidence available to the examining team does not justify this projection, however, core drilling of the structure or structures to determine their extent is recommended in stages; each stage depending upon evaluation of information developed and prior approval of the Field Team.

Maps submitted by the applicant exhibit discrepancies and are not in sufficient detail for use in projecting a detailed exploration program.

RECOMMENDATIONS

A unit short form contract in stages is recommended to include:

Stage 1:

> 750 feet of core drilling, the sites for which are tentatively located on figure 2, but which should be finally approved in the field, at the applicant's figure of $5.45 per foot; including preparation and maintenance of access roads and core drill sites and water supply. On completion of stage 1, the project should be reexamined for re-examination and the planning of an approved stage 2 on the basis of geologic information developed. Total cost of Stage 1 would be $4,087.50.

Stage 2:

> 5,250 feet of core drilling at a total cost of $5.45 per foot, or equivalent exploration as approved by the Defense Minerals Exploration Administration Field Team. Total cost of stage 2 would be $28,612.50.

Total cost of the project would be $32,700.00 and Government participation of 75 percent would be $24,525.00.

The applicant should submit a detailed topographic map and cross-sections along core drill holes as part of the project.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

January 31, 1955

TRANSMITTED

MAY 10 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 5587 (uranium), Nugget Coal and Timber Co., Little Man mine, Carbon County, Wyoming

Enclosed are the original and 10 copies of a geologic report by D. B. MacLaren, U. S. Geological Survey, on the above subject property.

At the Little Man mine, uranium occurs in granite near a contact with graphitic schist and in graphitic schist. Samples of the mineralized granite and schist, taken by the AEC and the examining team, indicate a content of 0.55 percent U_3O_8 over a width of 4 feet.

MacLaren recommends that a 2-stage exploration program be approved, consisting of four holes with a total length of 750 feet in the first stage and, if warranted, the remaining 5,250 feet requested by the applicant in the second stage.

It appears that significant amounts of uranium ore may be discovered by the proposed program. The ratio of first stage drilling (750 feet) to second stage drilling (5,250 feet) appears somewhat out of balance, and it may be advisable to reduce somewhat the footage allotted to Stage II.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (11)

ENHarshman:erh

MONARCH COAL AND TIMBER CO.

LITTLE MAN MINE

CARBON COUNTY, WYOMING

DMEA DOCKET 3507

Geologic Report

By D. R. Mauldin
U. S. Geological Survey

NUGGET COAL AND TIMBER COMPANY
LITTLE MAN MINE
CARBON COUNTY, WYOMING
DMEA Docket 5587

INTRODUCTION

The Nugget Coal and Timber Company, 919 Midland Savings Building, Denver, Colorado, has applied to the Defense Minerals Exploration Administration for assistance to explore for uranium in the Pedro Mountains, Carbon County, Wyoming. The applicant proposes to explore the downward and lateral extent of an indicated ore zone at the Little Man mine by building access roads for a diamond drill, and diamond drilling a total of 6,000 feet of holes from six stations, at an estimated cost of $32,700 (Government participation to be 75 per cent or $24,525).

The applicant has under lease 12 lode claims in sec. 14, T. 27 N., R. 84 W., 6th P. M. The claims may be reached by following a graveled county road for about 45 miles north from Rawlins, Wyoming, thence a fair "mine" road for 3 miles to the Little Man mine. The property is accessible throughout the year except following deep snow falls or heavy rains.

An examination was made December 7, 1954, in the company of R. W. King of the U. S. Geological Survey, C. M. Harrer of the U. S. Bureau of Mines, and T. L. Johnston, mine superintendent for the applicant. Although the ground was covered by about 2 feet of snow, two tunnels were open for examination. Based upon what was seen in

the tunnels and upon data furnished by J. D. Love of the U. S. Geological Survey and J. F. Whalen of the Atomic Energy Commission, both of whom have previously examined the property, it is concluded that the chance of making a significant discovery of uranium ore on this property is good. Because it is impossible to correlate or trace with certainty two indicated mineralized zones, it is recommended that a program somewhat modified from the one proposed by the applicant be approved. The estimated cost of the recommended program is given in the Engineer's Report. Representatives of the Atomic Energy Commission have been consulted and have made available to the examiners assays and other pertinent data.

GEOLOGY

The rocks of the Pedro Mountains, in the vicinity of the Little Man mine are granites, gneisses, schists, and basic dikes of pre-Cambrian age. Although no detailed study of the pre-Cambrian rocks has been made, there are, according to Love, three major types present. The oldest rocks are a sequence of granite gneisses, and schists, and probably include graphite schist and associated quartzite (?). This sequence is intruded and surrounded by pink and gray granite. Basic dikes, up to 100 feet wide and half a mile long cut the metamorphic series and the granite. Uranium apparently occurs in a black mineral which is finely disseminated in the granite, and which is sufficiently concentrated within four to six feet of an overlying siliceous graphitic schist to form ore bodies. A fluorescent

mineral found in iron-stained brecciated quartz vein material was later identified by the examiners to be a gelatinous coating of clear opal having barely detectable radioactivity. Love traced the graphitic layer for about 1,000 feet and throughout that distance found uranium minerals and spotty radioactivity in the granite along the underside of the graphitic schist. On claim No. 1 there are two tunnels and four trenches (fig. 3). Due to snow, the trenches could not be satisfactorily examined. One of the tunnels is an old crosscut from which an unsuccessful attempt was made to mine graphite many years ago, the other is a drift that is now being driven by the applicant in granite along and below a granite-schist contact.

The crosscut, the first 27 feet of which is in weathered granite, was driven about 50 feet into a steeply sloping hillside. At a point 27 feet from the portal the crosscut enters a zone of graphite schist about 5 feet wide that strikes N. 18° W. and dips 65° to 70° NE. In the first 24 feet from the portal of the crosscut there is no noticeable increase in radioactivity, but within 3 feet of the granite-schist contact radioactivity increases from .10 MR/hr. to .30 MR/hr. In the schist zone radioactivity is as high as .50 MR/hr. near the hangingwall side. Beyond the schist zone the wall rock is weathered granite in which the radioactivity decreases from .50 MR/hr. to .05 MR/hr. within a distance of 15 feet. Within the graphite schist zone radioactivity averages .10 MR/hr. Graphite is most abundant along the footwall of the schist zone while the highest radioactivity is along the hangingwall. In a road cut about 25 feet northwest of the crosscut portal the radioactivity of the exposed granite is .25 MR/hr.

Some 300 feet northeast of the portal of the crosscut the applicant is driving a drift about N. 8° W. along a granite-schist contact (fig. 3). At the time of the examination the drift was 38 feet long. At the breast there was a winze about 5 feet deep, and 30 feet from the portal there was a crosscut to the east 10 feet long.

The contact between the granite and the schist is close to the east side of the drift and dips 60° to 80° east. A few feet west of the contact the granite is coarse-grained to porphyritic. As the contact is approached, the granite becomes finer grained and contains increasing amounts of quartz, and along the contact the rock is very dense and highly siliceous. Brecciated quartz vein material (quartzite (?)) with some pyrite, ranging in thickness from less than an inch to about 2 feet lies between the granite on the west and schist on the east. East of the vein material is a 6-foot zone of graphite schist which contains small amounts of disseminated pyrite and molybdenite. According to Love, there is more granite and another graphite schist zone to the east, but this could not be checked as the crosscut did not expose it and the ground was covered by snow. Radioactivity in the granite, within 6 feet of the granite-schist contact was consistently high. The highest reading was 3.00 MR/hr. at the breast of the drift, within 4 feet of the granite-schist contact. A sample of this material, taken over a width of 4 feet, assayed 0.80 percent U_3O_8. In the crosscut, radioactivity was slight. The ore shipment of 13.24 tons averaging 0.27

percent U_3O_8, reported in the application, and another shipment of 10 tons averaging 0.44 percent U_3O_8, were sorted from material taken from the tunnel. A 30-pound sample sent by the applicant to the Climax mill at Grand Junction, Colorado, assayed 0.87 percent U_3O_8, 1.03 percent V_2O_5, and 0.52 percent $CaCO_3$. The location, width of cut, and assay value of eight samples taken from the drift by representatives of the Atomic Energy Commission are:

Location	Width	% U_3O_8	Calculated average
17.5 feet N. of portal, west to east	24 inches	1.62	4 feet at 1.04
	24 "	1.07	
52 feet N. of portal, west to east	36 inches	0.12	5 feet at 0.14
	24 "	0.17	
58 feet N. of portal, west to east	24 inches	0.07	4.5 feet at 0.26
	30 "	0.14	
	24 "	0.40	
	12 "	0.03	

The weighted averages of samples cut in the drift by the examiners and by representatives of the Atomic Energy Commission indicate a zone in the granite 4 feet thick containing 0.53 percent U_3O_8.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the chance of making a significant discovery of uranium ore on this property is good. Although it could not be proven by tracing on the ground, due to snow, or by projection on the maps, due to several discrepancies in the various maps submitted by the applicant, it is probable that the radioactive zone exposed in the opencut is not the same zone as the one exposed in

in the drift. In the drift high radioactivity is confined to a zone in the granite that underlies graphite-schist, while in the crosscut radioactivity is less intense and is more or less confined to a zone in the graphite schist between walls of altered granite.

It is recommended that each zone be explored separately, and that a program, set up in two stages, be approved.

Stage I should provide for the drilling of four holes totalling 750 feet in depth. Hole No. 1 is to be collared approximately 225 feet N. 46° W. of the portal of the drift, and is to be drilled to a depth of not more than 300 feet on a bearing of N. 82° E. and at an inclination of minus 45°. Hole No. 2 is to be collared approximately 200 feet S. 8° W. of the portal of the drift, and is to be drilled to a depth of not more than 150 feet on a bearing of N. 82° E. and at an inclination of minus 86°. Hole No. 3 is to be collared approximately 100 feet N. 29° W. of the portal of the crosscut, and is to be drilled to a depth of not more than 150 feet on a bearing of N. 68° E. and at an inclination of minus 46°. Hole No. 4 is to be collared approximately 150 feet S. 15° E. of the portal of the crosscut, and is to be drilled to a depth of not more than 150 feet at a bearing of N. 68° E. and at an inclination of minus 35°. Holes No. 1 and No. 2 will cut the radioactive zone indicated in the drift at two points about 375 feet apart; hole No. 1 at a depth of 50 feet below the floor of the drift, and hole No. 2 at a depth of 50 feet below the collar of the hole or about 100 feet below the floor of the drift. Holes No. 3 and No. 4 will cut the radioactive zone evident in the crosscut at two

points about 250 feet apart; hole No. 3 at a depth of 30 feet below the floor of the crosscut, and hole No. 4 at a depth of 30 feet below the collar of the hole or about 65 feet below the floor of the crosscut. Any unused portion of the footage allowed under Stage I should be allowed in Stage II if the results of Stage I are favorable.

Stage II should provide for additional drilling along either or both of the indicated ore shoots, as the results of Stage I may warrant. It is difficult at this time to estimate the amount of footage that may be required for drilling. Therefore, it is suggested that the balance of the footage applied for, 3,250 feet, be allowed in Stage II. The contract should stipulate that no drilling is to be started under Stage II without the written approval of the Defense Minerals Exploration Administration, at which time the number of holes to be drilled, their location, bearing, inclination, and depth will be defined.

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

224 New Customhouse
Denver 2, Colorado

May 10, 1955

Memorandum

To: Chairman of the Operating Committee, DMEA

From: Field Team, Region III

Subject: Report of Examination, Docket DMEA-3587 (Uranium), Nugget Coal and Timber Company, Little Man mine, Carbon County, Wyoming

Enclosed are the original and three copies of the report pertaining to the above application.

The applicant has requested that the subject application be withdrawn.

W. M. Traver

W. M. Traver

Enclosures

E. N. Harshman

E. N. Harshman

Reviewed by
DMEA OPERATING COMMITTEE
5-20-55
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

RECEIVED
MAY 1 3 1955

Region III

Building 20, Room 137
Denver Federal Center
Denver 2, Colorado
January 27, 1955

Memorandum

TRANSMITTED
MAY 1 0 1955

To: Executive Officer, DMEA Field Team, Region IV

From: John F. Shaw

Subject: DMEA 3587 (Uranium), Nugget Coal and Timber Company (Little Man claims), Carbon County, Wyoming.

Enclosed are the original and ten copies of the examination report on docket 3587 by C. M. Harrer. Also, enclosed are original and ten copies of joint "Summary, Conclusions and Recommendations" by C. M. Harrer and D. R. MacLaren.

It is recommended that the Government enter into an exploration contract with the applicant at an estimated cost of $32,700.00; the contract would be prepared in two stages. The first stage would consist of 750 feet of core drilling. The second stage would be dependent upon the results of the first stage and would consist of 5,250 feet of core drilling.

John F. Shaw

John F. Shaw

enclosures

JFS/cm

cc ✓10
DMEA 3587
Chron

Reviewed by
DMEA OPERATING COMMITTEE
5-20-55
(Date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 16 1955

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DMEA 3587

The Nugget Coal and Timber Company Lease

Carbon County, Wyoming

Uranium

C. M. Harrer, Mining Engineer
Bureau of Mines

D. R. MacLaren, Geologist
Geological Survey

January 24, 1955

Reviewed by
DMEA OPERATING COMMITTEE
5-20-55
(date)

DMEA 3587

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 1 6 1955

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

TRANSMITTED

MAY 1 0 1955

Summary, Conclusions, and Recommendations

By C. M. Harrer
Mining Engineer
Bureau of Mines

D. R. MacLaren
Geologist
Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE

5-20-55
(date)

DMEA 3587

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By C. M. Harrer and D. R. MacLaren

The Nugget Coal and Timber Company, 919 Midland Savings Building, Denver 2, Colorado, has applied for exploration assistance estimated to cost $32,700.00 to explore for uranium on the Little Man group of unpatented mining claims on which they have a lease effective for over 10 years.

The property, consisting of the 12 standard mining claims, Little Man No's. 1 to 12, covers about 329 acres in sec. 14, T. 27 N., R. 84 W., Carbon County, Wyoming. It was investigated in the field by a Region III Defense Minerals Exploration Administration examining team on December 7, 1954, and has also been examined by various members of the Geological Survey and Atomic Energy Commission during 1954.

The rocks in the area are pre-Cambrian in age and comprise granites, gneisses, schists, and basic dikes. Uranium occurs in a black mineral which is finely disseminated in the granite and which is sufficiently concentrated within 4 to 6 feet of an overlying siliceous graphite schist to form ore bodies. Radioactivity in this zone is as much as 5.0 MR/hr. Although, no uranium mineral was identified, radioactivity up to 0.5 MR/hr is also found in a graphite schist zone, about 5 feet thick, between walls of altered granite.

A two stage exploration program is recommended at a cost of $32,700.00. Government participation of 75 percent would be $24,525.00.

Stage 1:

The first part of the program would consist of 750 feet of core drilling at $5.45 per foot, at four designated locations to cut two radioactive zones at a depth of 50 feet below outcrops or existing adit levels.

Stage 2:

The second part of the program would consist of 5,250 feet of core drilling at $5.45 per foot, or its equivalent, based on the results of a study of stage 1 and the approval of the Field Team. It should be noted that information developed by stage 1 and other work performed by the applicant may indicate exploration other than core drilling or amendment or termination of the contract. The applicant should submit an accurate topographic map and cross-sections through core drill holes as part of the project.

The Denver Exploration Branch of the Atomic Energy Commission was consulted on the results of their examination and on core drilling costs.

DMEA 3587

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

Engineering Report

By C. M. Harrer
Mining Engineer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

5-20-55
(date)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 16 1955

DMEA 3587

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

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ILLUSTRATIONS

Figure — Follows page

1. Location map, Nugget Coal and Timber Company lease, Carbon County, Wyo. (DMEA 3587). 1
2. Property map and proposed exploration, Nugget Coal and Timber Co., lease, sec. 14, T. 27 N., R. 84 W., Carbon County, Wyo. (DMEA 3587). 2
3. Plan showing approximate location of roads, trenches, tunnels, and recommended diamond drill holes, Claim No. 1, Little Man mine, Carbon County, Wyo. . . . . *

* See figure with geologic report.

DMEA 3587

THE NUGGET COAL AND TIMBER COMPANY LEASE
CARBON COUNTY, WYOMING

ENGINEERING REPORT

By C. M. Harrer

INTRODUCTION

The Nugget Coal and Timber Company, 919 Midland Savings Building, Denver 2, Colorado, has applied for exploration assistance estimated to cost $32,700.00 to explore for uranium on the Little Man group of unpatented mining claims under lease (fig. 1).

The property has been visited by members of the Atomic Energy Commission and United States Geological Survey during 1954.

The property was examined for the Region III Defense Minerals Exploration Administration by the writer, accompanied by Don R. MacLaren and R. V. King of the Geological Survey, on December 7, 1954.

ACKNOWLEDGMENTS

Mr. Frank J. Reid, manager of coal operations for Nugget Coal and Timber Company at Hanna, was contacted and served as guide to the Little Man group of uranium claims. Mr. T. L. Johnston, supervising engineer in charge of exploration operations was met at the property and cooperated fully with the examining team. The Denver Exploration Branch of the Atomic Energy Commission made the results of their investigation of the property and comparable costs of core drilling available to the examining team.

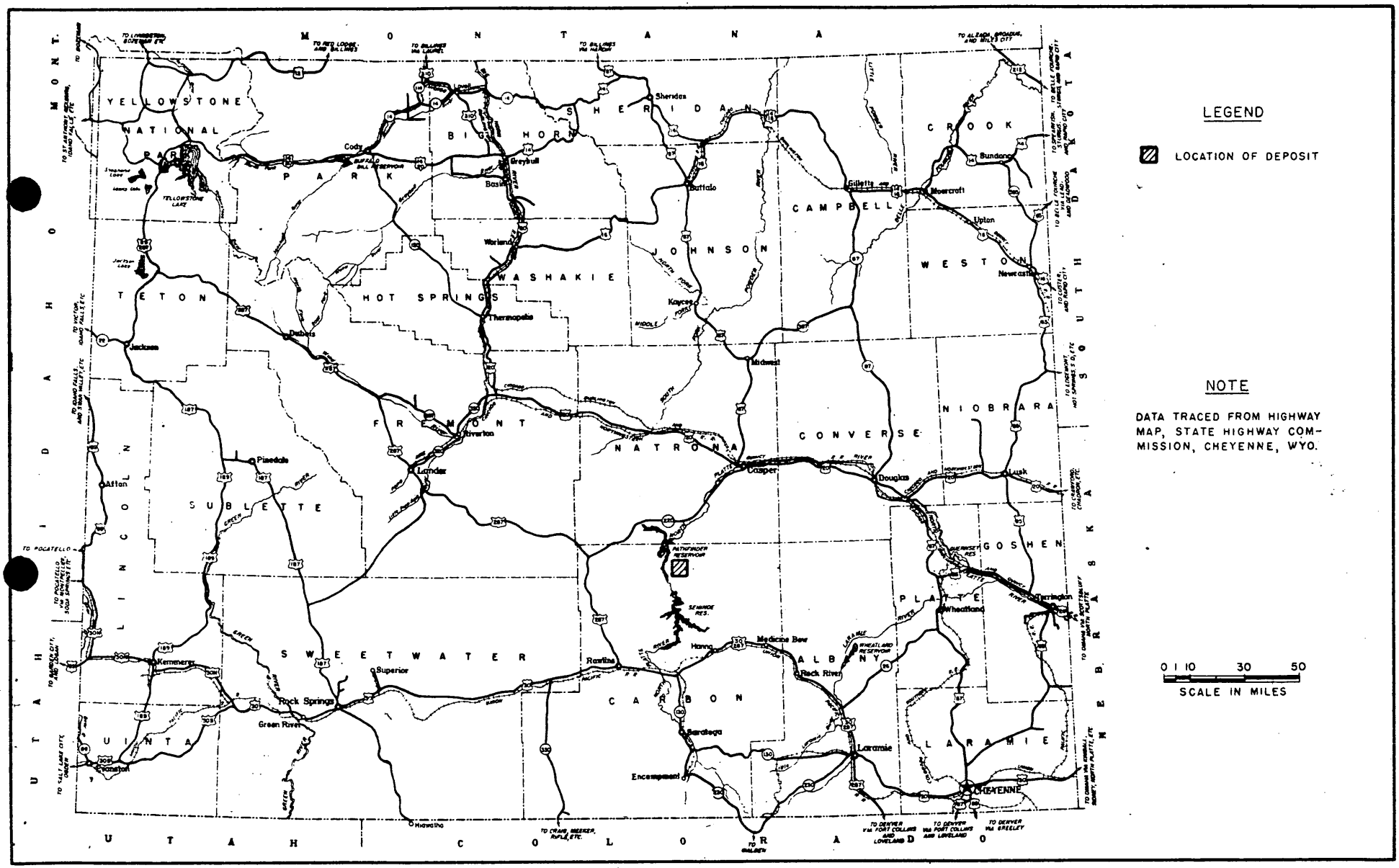


FIGURE 1.--LOCATION MAP, NUGGET COAL AND TIMBER COMPANY LEASE (URANIUM), CARBON COUNTY, WYOMING (DMEA 35

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The Little Man group of mining claims under lease to the Nugget Coal and Timber Company are in sec. 14, T. 27 N., R. 84 W., sixth principal meridian, in Carbon County, Wyoming, (fig's. 1 and 2) at altitudes ranging between 6,900 and 8,000 feet above sea level. The property is in the rugged Pedro Mountain area; about 52 miles north of Hanna and is reached by travel over dirt roads. Hanna is the nearest residence point and is located on the Union Pacific railroad and U. S. Highway 30.

Water for domestic use is obtained from nearby springs and creeks. The North Platte river and Pathfinder dam are about 5 miles west of the property. Power lines from the Seminoe dam plant pass within 3 miles of the property and REA power is 6 miles distant.

HISTORY AND PRODUCTION

The Little Man group of mining claims was filed on as unpatented mining locations on August 13, 1954. There has been no appreciable production to date, although preparations are being made to send trial shipments to the Atomic Energy Commission at Rifle, Colorado, and Edgemont, South Dakota.

OWNERSHIP AND EXTENT

The Little Man group of unpatented mining claims (fig. 2) in sec. 14, T. 27 N., R. 84 W., Carbon County, Wyoming, are owned by John D. Bedford, Eric E. Lepponen, John Rimmer, Thomas Rimmer, Richard Lee, Mark Lee, Alex J. Rascoe, James Kladianos, Dave Freeman, Sidney W. Freeman and Frank J. Reade, of Hanna, Wyoming. The Little Man group consists of

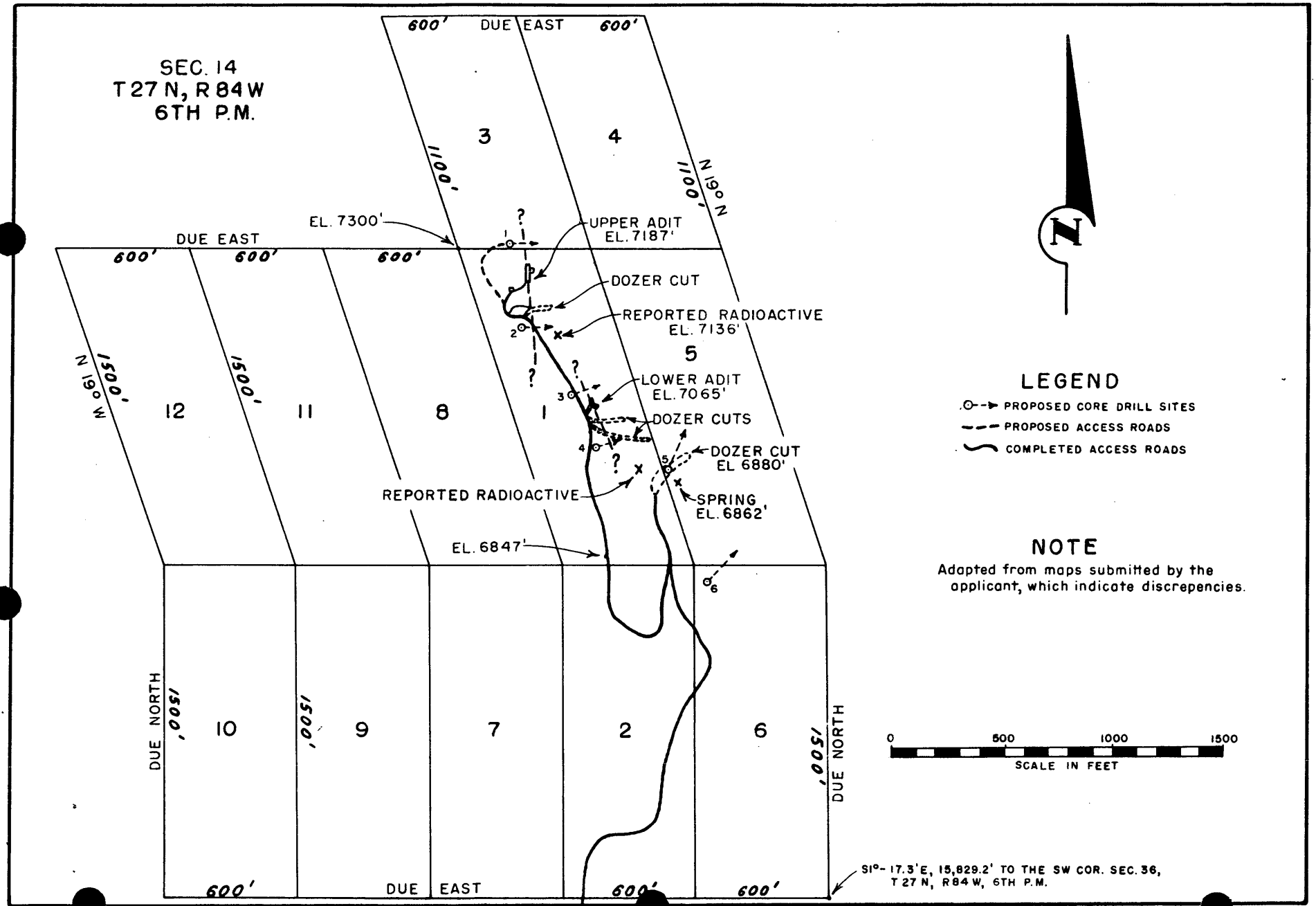


FIGURE 2-PROPERTY MAP SHOWING PROPOSED EXPLORATION, NUGGET COAL AND TIMBER CO., LEASE, CARBON COUNTY, WYO. (DMEA 3587)

12 unpatented mining locations covering about 329 acres, recorded on August 13, 1954. They are known as the Little Man claims, numbers 1 to 12. The claims are recorded on pages 286 to 297, volume 335 in the office of the Carbon County Clerk at Rawlins, Wyoming.

Nugget Coal and Timber Company, with offices at 919 Midland Savings Building, Denver 2, Colorado, has leased the property as of August 30, 1954. The lease is effective for 10 years and as long thereafter as mineral is produced in commercial quantities. Royalty payments will be 15 percent of the gross value of the ore; however, should a mill be constructed, the royalties would be reduced by 15 percent of the initial and operating costs of the mill.

DESCRIPTION OF DEPOSIT

Uranium minerals occur in a sheared zone or zones that includes graphitic schist, quartz-pyrite vein material and coarse pegmatitic granite in the Pedro Mountain area, Carbon County, Wyoming. Radioactivity is a prominent feature in two short adits on the Little Man claim No. 1 (Fig. 2). The lower adit was driven at an early date to explore a graphite zone. Values between 0.05 and 0.5 MR/hr were recorded in the adit. The upper adit has been driven about 60 feet along a strongly radioactive structure with readings in excess of 5.0 MR/hr.

Uranophane ($CaO.2UO_3.2SiO_2.7H_2O$) has been reported in the oxide zone by the applicant but was not identified by the examiners. Pitchblende $(UO_2)_2UO_4\ (H_2O)_x$ is found in the upper adit in erratic concentrations.

Selected samples by J. D. Love of the Geological Survey during 1954 gave values of 0.33, 0.49 and 4.9 percent U_3O_8. Two 24-inch samples across the breast of the upper adit at 17 feet gave values of 1.20 and 1.26 percent U_3O_8. Five feet of sample taken 52 feet in from the portal of the upper adit averaged 0.165 percent U_3O_8 and 4.5 feet of sample at 58 feet averaged 0.307 percent U_3O_8[1]. A chip sample across a 4-foot width at 60 feet in the upper adit gave a value of 0.73 percent equivalent U_3O_8 and 0.80 percent chemical U_3O_8[2]. A truck load of 13.24 tons of uranium ore, shipped to Rifle, Colorado, assayed 0.28 percent U_3O_8. A 30-pound sample sent to Climax Uranium Corp., at Grand Junction, assayed 0.87 percent U_3O_8, 0.52 percent $CaCO_3$ and 1.03 percent V_2O_5.

MINABLE ORE RESERVES

No data is available on which to base an estimate of any type of ore reserves.

PRESENT STATUS

Exploration and Development

Since early in September 1954, four bulldozer trenches in the mineralized area and several miles of access road have been completed. In addition, a small maintenance shed and ore bin were constructed. Early exploration, for graphite, included an adit consisting of 34 feet of drift and 15 feet of crosscut, and several shallow shafts and pits. A new adit, which is 122 feet higher and 500 feet to the northwest of the above mentioned adit consists of 58 feet of drift and 9 feet of crosscut on a highly radioactive zone. Radioactive rock is being sorted with the aid of a geiger counter and shipped for amenability tests.

---

1. Denver Exploration Branch, Atomic Energy Commission.
2. U. S. Geological Survey.

Mining and Milling Equipment and Other Facilities

Drifting is accomplished with 55 and 90 pound Worthington jackhammers and a 256-cfm Joy air-compressor. Broken rock is removed by wheelbarrow. A TD-24 bulldozer is used for trenching, hauling equipment and snow removal. Miscellaneous trucks are used for hauling supplies and transporting ore. There are no milling facilities available and ore shipments would be trucked to Hanna, on the Union-Pacific Railroad, for shipment to the Atomic Energy Commission.

APPLICANT'S PROJECT PROPOSALS, WITH COSTS

The applicant, Nugget Coal and Timber Company, proposes to explore further the uranium indications on the Little Man claims 1, 5 and 6 (fig's 2 and 3) with 6,000 feet of core drilling, including access roads over rugged country to drill sites and the preparation of drill sites. They propose to core drill EX(7/8) or AX(1-1/8) sizes for $4.25 per foot and estimates 13,000 cubic yards of earth and rockwork in preparing drill access roads and drill sites at $0.40 per cubic yard.

Total estimated costs:

Core drilling 6,000 feet at $4.25 per foot	$25,500.00
Access roads and drill sites - 13,000 cubic yards at $0.40 per cubic yard	5,200.00
Contingencies	2,000.00
Total cost	$32,700.00
Total cost per foot of core drill hole	5.45

Six core drilling sites about 200 to 400 feet apart in very steep and rough terrain are proposed from which a radioactive zone would be explored by angle holes to a depth of 200 feet in vertical intervals of 50 feet. The proposed drilling program would be completed within 8 months of the date of an exploration contract.

The applicant's estimated over-all costs are believed to be conservative for the project.

EXAMINING TEAM'S PROPOSAL

Examination of the property disclosed radioactive shear zones in two short adits about 500 feet apart horizontally, with a difference in elevation of 122 feet. The two zones could not be traced outside the adits due to heavy snow and overburden. While the radioactive shear zones in the adits, and spots reported radioactive on the surface by the applicant (fig.2) appear to indicate a continuous structure, the possibility exists that they may be on separate structures as indicated by variances in dip and strike.

The property merits exploration, however, due to the lack of more positive data it is proposed that exploration be conducted in successive stages dependent upon geologic information to be developed.

As stage 1, it is proposed that the radioactive shear zone or zones on claim No. 1 be explored by core drilling to a vertical depth of 50 feet at the locations 1 to 4 on figure 2, which are in the approximate location of the applicant's proposed program. Holes 1 and 3 would be so placed as to intersect the radioactive structures at a depth of 50 feet below the adit floors. Holes 2 and 4 would be placed to intersect the radioactive shear structures 50 feet below their collar. Holes would be drilled at angles between 26° and 46° below the horizontal. Size AX or BX core is recommended as easier to split and examine. Total drilling is estimated at 750 feet.

Due to discrepancies and incompleteness of maps furnished by the applicant, an exploration program cannot be projected in detail. Therefore, core drilling as stage 1 is located from the two adit portals.

Hole No. 1 is tentatively located at a point 225 feet N. 46° W., of the portal of the upper adit and should be drilled for about 300 feet on a bearing of N. 70° E. with an inclination of 45° below the horizontal.

Hole No. 2 is tentatively located at a point 200 feet S. 8° W., of the portal of the upper adit and should be drilled for about 150 feet on a bearing of N. 70° E., with an inclination of 26° below the horizontal.

Hole No. 3 is tentatively located at a point 100 feet N. 29° W., of the portal of the lower adit and should be drilled for not more than 150 feet on a bearing of N. 70° E., with an inclination of 46° below the horizontal.

Hole No. 4 is tentatively located at a point 150 feet S. 15° W., of the portal of the lower adit and should be drilled for about 150 feet on a bearing of N. 70° E., with an inclination of 35° below the horizontal.

The applicant's holes 5 and 6 are not in a favorable area for exploration, on the basis of present knowledge.

Stage 2 of the program would be based upon the results of a study of information developed by stage 1 and would consist tentatively of the remaining 5,250 feet of core drilling requested by the applicant, subject to approval or revision of the program or cancellation by the Field Team on the basis of information developed in stage 1. It should be noted that information developed by stage 1 and other work performed by the applicant may indicate exploration other than core drilling.

PROJECT COSTS

Stage 1:

750 feet of core drilling (AX core) including access roads and site preparation in steep and rocky terrain, at $5.45 per foot - The work would be completed in less than 2 months.	$ 4,087.50

Stage 2:

5,250 feet of core drilling (AX core) including access roads and site preparation in steep and rocky terrain, at $5.45 per foot - The work would be completed in less than 6 months.	28,612.50

The total project would be completed in 8 months at a cost of $32,700.00. Government participation at 75 percent would be $24,525.00.

The above costs are compiled from the applicant's proposal and are conservative. In substantiation, core drilling bids to the Atomic Energy Commission[3/] under closely similar field conditions, not including construction and maintenance of access roads, the preparation of drill sites, hauling water, standby time and other incidentals varied between $4.53 and $6.63 per foot.

CONCLUSIONS

The identification of pitchblende in the very radioactive zone exposed in the upper adit, radioactivity in the lower adit and the favorable results of chemical and radiometric analyses indicate a favorable zone of uranium mineralization which should be explored further to determine its strike extent and potential in depth. The chances of making a significant discovery of uranium on the property are considered good.

---

3. Denver Exploration Branch, U. S. Atomic Energy Commission

The applicant's proposal to explore the uranium occurrence by core drilling in 50-foot stages to a depth of 200 feet below the surface is based on his hope that uranium is very extensive and will be found to a depth of over 200 feet.

Evidence available to the examining team does not justify this projection, however, core drilling of the structure or structures to determine their extent is recommended in stages; each stage depending upon evaluation of information developed and prior approval of the Field Team.

Maps submitted by the applicant exhibit discrepancies and are not in sufficient detail for use in projecting a detailed exploration program.

RECOMMENDATIONS

A unit short form contract in stages is recommended to include:

Stage 1:

> 750 feet of core drilling, the sites for which are tentatively located on figure 2, but which should be finally approved in the field, at the applicant's figure of $5.45 per foot; including preparation and maintenance of access roads and core drill sites and water supply. On completion of stage 1, the project should be recessed for re-examination and the planning of an approved stage 2 on the basis of geologic information developed. Total cost of Stage 1 would be $4,087.50.

Stage 2:

> 5,250 feet of core drilling at a total cost of $5.45 per foot, or equivalent exploration as approved by the Defense Minerals Exploration Administration Field Team. Total cost of stage 2 would be $28,612.50.

Total cost of the project would be $32,700.00 and Government participation of 75 percent would be $24,525.00.

The applicant should submit a detailed topographic map and cross-sections along core drill holes as part of the project.

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Defense Minerals Exploration Administration
Denver Federal Center
Denver 2, Colorado

Defense Minerals Administration
RECEIVED
MAY 16 1955

January 31, 1955

TRANSMITTED
MAY 10 1955

Memorandum

To: Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 3587 (uranium), Nugget Coal and Timber Co., Little Man mine, Carbon County, Wyoming

Enclosed are the original and 10 copies of a geologic report by D. R. MacLaren, U. S. Geological Survey, on the above subject property.

At the Little Man mine, uranium occurs in granite near a contact with graphitic schist and in graphitic schist. Samples of the mineralized granite and schist, taken by the AEC and the examining team, indicate a content of 0.53 percent U_3O_8 over a width of 4 feet.

MacLaren recommends that a 2-stage exploration program be approved, consisting of four holes with a total length of 750 feet in the first stage and, if warranted, the remaining 5,250 feet requested by the applicant in the second stage.

It appears that significant amounts of uranium ore may be discovered by the proposed program. The ratio of first stage drilling (750 feet) to second stage drilling (5,250 feet) appears somewhat out of balance, and it may be advisable to reduce somewhat the footage allotted to Stage II.

E. N. Harshman

E. N. Harshman
Member, Field Team

Enclosures (11)

ENHarshman:arh

Restored by
DMEA OPERATING COMPANY
5-20-55
(Date)

NUGGET COAL AND TIMBER CO.

LITTLE MAN MINE

CARBON COUNTY, WYOMING

DMEA DOCKET 3587

Geologic Report

By D. R. MacLaren
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE
5-20-55
(date)

Administration
RECEIVED
MAY 1 3 1955

NUGGET COAL AND TIMBER COMPANY
LITTLE MAN MINE
CARBON COUNTY, WHOMING
DMEA Docket 3587

INTRODUCTION

The Nugget Coal and Timber Company, 919 Midland Savings Building, Denver, Colorado, has applied to the Defense Minerals Exploration Administration for assistance to explore for uranium in the Pedro Mountains, Carbon County, Wyoming. The applicant proposes to explore the downward and lateral extent of an indicated ore zone at the Little Man mine by building access roads for a diamond drill, and diamond drilling a total of 6,000 feet of holes from six stations, at an estimated cost of $32,700 (Government participation to be 75 per cent or $24,525).

The applicant has under lease 12 lode claims in sec. 14, T. 27 N., R. 84 W., 6th P. M. The claims may be reached by following a graveled county road for about 45 miles north from Hanna, Wyoming, thence a fair "mine" road for 3 miles to the Little Man mine. The property is accessible throughout the year except following deep snow falls or heavy rains.

An examination was made December 7, 1954, in the company of R. U. King of the U. S. Geological Survey, C. M. Harrer of the U. S. Bureau of Mines, and T. L. Johnston, mine superintendent for the applicant. Although the ground was covered by about 2 feet of snow, two tunnels were open for examination. Based upon what was seen in

the tunnels and upon data furnished by J. D. Love of the U. S. Geological Survey and J. F. Whalen of the Atomic Energy Commission, both of whom have previously examined the property, it is concluded that the chance of making a significant discovery of uranium ore on this property is good. Because it is impossible to correlate or trace with certainty two indicated mineralized zones, it is recommended that a program somewhat modified from the one proposed by the applicant be approved. The estimated cost of the recommended program is given in the Engineer's Report. Representatives of the Atomic Energy Commission have been consulted and have made available to the examiners assays and other pertinent data.

GEOLOGY

The rocks of the Pedro Mountains, in the vicinity of the Little Man mine are granites, gneisses, schists, and basic dikes of pre-Cambrian age. Although no detailed study of the pre-Cambrian rocks has been made, there are, according to Love, three major types present. The oldest rocks are a sequence of granite gneisses, and schists, and probably include graphite schist and associated quartzite (?). This sequence is intruded and surrounded by pink and grey granite. Basic dikes, up to 100 feet wide and half a mile long cut the metamorphic series and the granite. Uranium apparently occurs in a black mineral which is finely disseminated in the granite, and which is sufficiently concentrated within four to six feet of an overlying siliceous graphitic schist to form ore bodies. A fluorescent

mineral found in iron-stained brecciated quartz vein material was later identified by the examiners to be a gelatinous coating of clear opal having barely detectable radioactivity. Love traced the graphitic layer for about 1,000 feet and throughout that distance found uranium minerals and spotty radioactivity in the granite along the underside of the graphitic schist. On claim No. 1 there are two tunnels and four trenches (fig. 3). Due to snow, the trenches could not be satisfactorily examined. One of the tunnels is an old crosscut from which an unsuccessful attempt was made to mine graphite many years ago, the other is a drift that is now being driven by the applicant in granite along and below a granite-schist contact.

The crosscut, the first 27 feet of which is in weathered granite, was driven about 50 feet into a steeply sloping hillside. At a point 27 feet from the portal the crosscut enters a zone of graphite schist about 5 feet wide that strikes N. 18° W. and dips 65° to 70° NE. In the first 24 feet from the portal of the crosscut there is no noticeable increase in radioactivity, but within 3 feet of the granite-schist contact radioactivity increases from .10 MR/hr. to .30 MR/hr. In the schist zone radioactivity is as high as .50 MR/hr. near the hangingwall side. Beyond the schist zone the wall rock is weathered granite in which the radioactivity decreases from .50 MR/hr. to .05 MR/hr. within a distance of 15 feet. Within the graphite schist zone radioactivity averages .10 MR/hr. Graphite is most abundant along the footwall of the schist zone while the highest radioactivity is along the hangingwall. In a road cut about 25 feet northwest of the crosscut portal the radioactivity of the exposed granite is .25 MR/hr.

Some 500 feet northeast of the portal of the crosscut the applicant is driving a drift about N. 8° W. along a granite-schist contact (fig. 3). At the time of the examination the drift was 58 feet long. At the breast there was a winze about 5 feet deep, and 38 feet from the portal there was a crosscut to the east 10 feet long.

The contact between the granite and the schist is close to the east side of the drift and dips 60° to 80° east. A few feet west of the contact the granite is coarse-grained to porphyritic. As the contact is approached, the granite becomes finer grained and contains increasing amounts of quartz, and along the contact the rock is very dense and highly siliceous. Brecciated quartz vein material (quartzite (?)) with some pyrite, ranging in thickness from less than an inch to about 2 feet lies between the granite on the west and schist on the east. East of the vein material is a 6-foot zone of graphite schist which contains small amounts of disseminated pyrite and molybdenite. According to Love, there is more granite and another graphite schist zone to the east, but this could not be checked as the crosscut did not expose it and the ground was covered by snow. Radioactivity in the granite, within 6 feet of the granite-schist contact was consistently high. The highest reading was 5.00 MR/hr. at the breast of the drift, within 4 feet of the granite-schist contact. A sample of this material, taken over a width of 4 feet, assayed 0.80 percent U_3O_8. In the crosscut, radioactivity was slight. The ore shipment of 13.24 tons averaging 0.27

percent U_3O_8, reported in the application, and another shipment of 10 tons averaging 0.44 percent U_3O_8, were sorted from material taken from the tunnel. A 30-pound sample sent by the applicant to the Climax mill at Grand Junction, Colorado, assayed 0.87 percent U_3O_8, 1.03 percent V_2O_5, and 0.52 percent $CaCO_3$. The location, width of cut, and assay value of eight samples taken from the drift by representatives of the Atomic Energy Commission are:

Location	Width	% U_3O_8	Calculated average
17.5 feet N. of portal, west to east	24 inches	1.62)	4 feet at 1.04
	24 "	1.07)	
52 feet N. of portal, west to east	36 inches	0.12)	5 feet at 0.14
	24 "	0.17)	
58 feet N. of portal, west to east	24 inches	0.07	
	30 "	0.14)	4.5 feet at 0.26
	24 "	0.40)	
	12 "	0.08	

The weighted averages of samples cut in the drift by the examiners and by representatives of the Atomic Energy Commission indicate a zone in the granite 4 feet thick containing 0.53 percent U_3O_8.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the chance of making a significant discovery of uranium ore on this property is good. Although it could not be proven by tracing on the ground, due to snow, or by projection on the maps, due to several discrepancies in the various maps submitted by the applicant, it is probable that the radioactive zone exposed in the crosscut is not the same zone as the one exposed in

in the drift. In the drift high radioactivity is confined to a zone in the granite that underlies graphite-schist, while in the crosscut radioactivity is less intense and is more or less confined to a zone in the graphite schist between walls of altered granite.

It is recommended that each zone be explored separately, and that a program, set up in two stages, be approved.

Stage I should provide for the drilling of four holes totalling 750 feet in depth. Hole No. 1 is to be collared approximately 225 feet N. 46° W. of the portal of the drift, and is to be drilled to a depth of not more than 300 feet on a bearing of N. 82° E. and at an inclination of minus 45°. Hole No. 2 is to be collared approximately 200 feet S. 8° W. of the portal of the drift, and is to be drilled to a depth of not more than 150 feet on a bearing of N. 82° E. and at an inclination of minus 26°. Hole No. 3 is to be collared approximately 100 feet N. 29° W. of the portal of the crosscut, and is to be drilled to a depth of not more than 150 feet on a bearing of N. 68° E. and at an inclination of minus 46°. Hole No. 4 is to be collared approximately 150 feet S. 15° E. of the portal of the crosscut, and is to be drilled to a depth of not more than 150 feet at a bearing of N. 68° E. and at an inclination of minus 35°. Holes No. 1 and No. 2 will cut the radioactive zone indicated in the drift at two points about 375 feet apart; hole No. 1 at a depth of 50 feet below the floor of the drift, and hole No. 2 at a depth of 50 feet below the collar of the hole or about 100 feet below the floor of the drift. Holes No. 3 and No. 4 will cut the radioactive zone evident in the crosscut at two

points about 250 feet apart; hole No. 3 at a depth of 50 feet below the floor of the crosscut, and hole No. 4 at a depth of 50 feet below the collar of the hole or about 65 feet below the floor of the crosscut. Any unused portion of the footage allowed under Stage I should be allowed in Stage II if the results of Stage I are favorable.

Stage II should provide for additional drilling along either or both of the indicated ore shoots, as the results of Stage I may warrant. It is difficult at this time to estimate the amount of footage that may be required for drilling. Therefore, it is suggested that the balance of the footage applied for, 5,250 feet, be allowed in Stage II. The contract should stipulate that no drilling is to be started under Stage II without the written approval of the Defense Minerals Exploration Administration, at which time the number of holes to be drilled, their location, bearing, inclination, and depth will be defined.

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

224 New Customhouse
Denver 2, Colorado

February 3, 1955

Memorandum

To: Administrator, DMEA

From: Field Team, Region III

Subject: Report of Examination, DMEA Docket-3587, (Uranium) Nugget Coal and Timber Company, Littleman mine, Carbon County, Wyoming

The application for Government assistance in exploration work estimated to cost $32,700.00 has been approved by us and a contract is being prepared.

Government participation will be 75 percent, or $24,525.00.

Four copies of the Report of Examination and two copies of Form 3b will be forwarded with your copy of the contract.

W. M. Traver

W. M. Traver

HMC:pw

E. N. Harshman

E. N. Harshman

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 29 1954

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

224 New Customhouse
Denver 2, Colorado

November 26, 1954

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: Code 200

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docketing for Exploration Assistance

Enclosed herewith in duplicate is DMEA Form 3a and MF-103 and supporting data pertaining to the following applications for Government assistance in exploration work:

Maricopa Minerals Company (Columbium)

Nugget Coal & Timber Company (Uranium)

North West Development Company (Uranium)

for John F. Shaw
W. H. King

Enclosures

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

Not to be filled in by applicant

Docket No. 3587
Metal or Mineral Uranium
Date Received
Estimated Cost $32,700
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: NUGGET COAL & TIMBER COMPANY
919 MIDLAND SAVINGS BUILDING
DENVER 2, COLORADO

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

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

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

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

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

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

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

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

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

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

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

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

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

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

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

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

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

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

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

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

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

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

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

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

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

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

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

(*b*) How do you propose to furnish your share of the costs?

☑ Money ☑ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated Nov 17, 1954

NUGGET COAL & TIMBER CO.
(Applicant)

By N. A. Swenson, PRES.

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

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

MF-103

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 29 1954

1. (a) Nugget Coal & Timber Company
919 Midland Savings Building
Denver 2, Colorado

(b) Corporation, incorporated in Wyoming, permit in Colorado

(c) Nils A. Swenson, President
Roy S. Harkins, Executive Vice-President and Treasurer
Blanche A. Harkins, Secretary

(d) Stock company

2.

3. (a) Twelve (12) unpatented mining claims named "Little Man Mine" (1) to (12) inclusive, located in Section 14, Township 27 North, Range 84 West of 6.P.M., Carbon County, Wyoming.

(b) Little Man Mine

(c) Lessee

(d) Copy of lease attached.

(e) See (C)

(f) Book 335, pages 286 to 297, Carbon County Clerks Office, Rawlins, Wyoming.

4. (a) Since early in September, 1954, four surface exploration cuts have been made and one tunnel driven 45 feet into the ore body. A bulldozer, compressor and jackhammer are being used. Advancing of the tunnel is in progress. All of this work was done and is being done by the Nugget Coal & Timber Company. Over two miles of road have been built from the end of the old road to the mine tunnel. A passenger car can reach the mine workings in dry weather.

(b) One truckload, 13.24 tons of uranium ore, was shipped to Rifle, Colorado recently and another trial truckload shipment is being prepared. These shipments are from exploration and have not developed any measureable ore reserves. The first truckload shipment contained 0.27% U_3O_8, the shipment being prepared is expected to assay higher.

(c) The property is located in the rugged granite Pedro mountains. The ore zone is not a well defined vein but is found in metamorphosed granite and quartzite adjacent to and parralleling a graphite vein. Mineralization is irregular but is confined to an area about 8 feet wide which so far averages about .20% U_3O_8. Pockets containing as high as 3.0% U_3O_8 are found in the zone. At a depth of 20 feet pyrite dispersed through quartzite was encountered and has been explored 12 feet below the tunnel floor.

The graphite vein has a dip of 80 degrees and varies from 3 to 16 feet in width. An 8 foot probe hole into the hanging wall on the other side of the graphite vein shows some radioactivity. (see sketch attached)
Our reason for wanting to explore this deposit further is that we believe that a sizable ore body of marketable ore can be found and explited at a profit. Surface showings along 1000 feet of the strike of the ore zone indicate uranium ore along with graphite. We want to explore to a depth of 300 feet along the 1000 feet and along extensions of the area. The occurrence of a well defined graphite vein and of sulfides leads us to believe that an appreciable amount of uranium ore can be found by exploring deeper than our present workings.
No geology or engineering reports are available because very few geologists and engineers have seen the property or know of it. The few that have seen it say that it is the best looking prospect they have seen in Wyoming.

(d) The property lies 48 miles north of Hanna, Wyoming and is reached by county (dirt) road in about 1½ hours by car from Hanna. Alcova on oiled highway is 26 miles north and Casper 65 miles. The nearest shipping supply and residence point is Hanna on the U.P. railroad and highway 30.

(e) There is some reasonable manpower available from neighboring ranches. At present the most likely supply of manpower appears to be among ex-coal miners at Hanna and vicinity. Materials, supplies and equipment have been obtained from Hanna, Rock River and Laramie, Wyoming and from Denver, Colorado.
Water for domestic use is obtained from nearby springs. The Pathfinder Dam on the North Platte River is 5 miles west of the property.
The high tension power line from the Seminol Dam passes within 3 miles of the property.REA power is 6 miles distant.

5. (a) The uranium mineral in the oxidized zone has been identified as uranofane but the mineral in the sulfide zone has not yet been identified. It is being studied by the U.SG.S., The A.E.C. and the U. S. Vanadium Company.

(b) The proposed work will include some road building and tunneling but will consist mostly of core drilling to explore the ore zone at depth. (see sketch of proposed work attached) The immediate object will be to explore downhill from the present workings to determine if it is feasable to undertake tunneling at a point 1000 feet from the present workings at a point about 300 feet lower and directed along the ore zone. Six points along the ore zone have been selected as sites for core drilling. Of these six points 4 were selected along an area in which outcrops and surface cuts have shown radioactivity along the graphite vein. By drilling four holes at each of these four points, as shown on the proposed exploration sketch, the ore zone will be cut at 4 points approximately 50 feet apart to a depth of 200 feet. Total drilling footage mfor the 4 holes amounts to about 1800 feet. From the information obtained from drilling the first 4 points, drilling to be done at (5) and (6) will be layed out to explore the possible extension of the ore zone

at a level of 200 to 300 feet below the area of the first four. Also, the information from the first four may disclose several as yet unselected points for drilling exploration. It is estimated that an additional 4200 feet of drilling will cover the area not included in the first 4 points making a total of 6000 feet of core drilling. The sketch of proposed drilling shows a depth of about 200 feet as the bottom of the deepest hole. Drilling deeper may be feasable but will be determined by the results of the upper holes. By extending the present tunnel another 150 feet the ore zone and its relationship with the graphite vein will supplement exploration by core drilling. By extending the tunnel 50 feet in the old workings the ore zone between drilling points 3 and 4 will be more completely explored. Other points for tunneling may be developed as the work proceeds. The total amount of drilling, tunneling and surface cutting may be more or less than the amount estimated but we want to do enough of it to obtain sufficient information of the deposit to determine the mining and development program that we expect to carry out as soon as possible. We estimate 13,000cu. yds. of dirt and rock unclassified @ $ .40 per cu. yd. The cu. yds. for rebuilding present roads, new roads and drill settings, the roads will have to be good enough to haul water to the drill and move the drill in and out to the settings.

(c) The work will start within 10 days and be completed within 8 months from the date of an exploration project contract.

(d) The Nugget Coal & Timber Company has operated coal mines in Wyoming for 19 years. Considerable drilling and earth moving and similar work has been done by the company.
Mr. Swenson, President of the company has had many years of successfull mining operation, road and bridge building contracting and earth moving. Mr. T. L. Johnston, supervising engineer of the project has had 29 years mining and metallurgical experience including 10 years with the U. S. Bureau of Mines and 10 years in foreign countries. He is supervising the work now in progress.

6. <u>Estimated Cost:</u>

Drilling 6000 feet.	@ $ 4.25 per ft.	$ 25,500.00
Roads: 13,000 cu. yds.	@ $ .40 per cu. yd.	5,200.00
Contingencies:		2,000.00
	Total	$ 32,700.00

ESTIMATED COSTS

Cubic Yards	Per Hour
Tractor Operator	$ 2.70
Tractor - Fuel	1.28
Tractor - Oil	.75
Tractor - Repairs	.75
Tractor and Bulldozer Rental	10.00

Drilling and Shooting	
Driller (Drill and Shoot)	2.10
Jackhammer Rental	.25
Air Compressor Rental	4.95
* Pickup Truck Rental (¼) (includes: Fuel, Oil and repairs)	.38
Powder and Caps	.51
Bits and Steel	1.00
**Superintendent (¼)	1.07
	$25.74

$5,200 ÷ $25.74 per hr. = 202 hours
13,000 yds. ÷ 202 hours = 64.35 yds per hr.
64.35 yds X .40 per yd. =$25.74
202 hrs. X $25.74 per hr. = $5,199.48
202 hrs ÷ 8 hr. day = 25.2 work days

* Rental Rate $1.50 per hr.
(¼ x 1.50 = .38)
(3/4 x 1.50 = 1.12 charged to core drilling)

**Hourly wage $4.27
(¼ x 4.27 = $1.07)
(3/4 x 4.27 = 3.20 charged to core drilling)

Core Drilling	
Longyear Core Drill Rental (includes: Fuel, Oil & Repairs)	2.00
Bits	3.00
Water Tank Truck & Pump - Rental (includes: Fuel, Oil & Repairs)	3.00
Pickup Truck Rental (3/4) (includes: Fuel, Oil and repairs)	1.12
Tank Truck Driver	1.75
Core Drill Operator	2.60
Core Drill Helper	2.10
Superintendent (3/4)	3.20
	$18.77

$25,500 ÷ $18.77 = 1358.5 Hrs.
6,000 ft. ÷ 1358.5 hrs. = 4.416 ft. per hr.

Estimated Costs (continued)-

4,416 ft. per hr. X $4.25 per ft. = $18.77 per hr.
1,358.5 Hrs. X $18.77 per hr. = $25,499.05
1,358.5 hrs. ÷ 8 hr. day = 169.8 work days

Fairbanks Recorder's Office
RECEIVED
AUG 29 1954

August 28,1954.

TO WHOM IT MAY CONCERN

WE THE UNDERSIGNED DO HERBY GRANT (3) THREE WHOM SHALL BE KNOWN AS - JOHN RIMMER- JOHN BEDFORD- AND ERIC LEPPONEN THE POWER OF ATTORNEY., TO NEGOTIATE A CONTRACT WITH NUGGET COAL AND TIMBER CO. FOR THE PURPOSE OF MINING ALL ORE ON(12) TWELVE CLAIMS KNOWN AS-THE LITTLE MAN MINING CLAIMS.

SIGNED

Alex J. Pence
Dave Freeman
Thomas Rimmer
James Bedford
Mark R. Lee
Richard Lee
Frank Reade
Sidney H. Freeman

Leo, Wyoming, July 17, 1954.

Messrs. Rimmer, Lee, et al,

Hanna, Wyoming.

Gentlemen:-

In accordance with your request, permission is hereby given for you to to enter, cross, recross and construct a simple road across those portions of land owned by me in Sections 23 and 24, Township 27 North, Range 84 West, and to use such road freely in connection with your exploration and mining operations in the search for uranium and other metals in that neighborhood.

Yours very truly,

SIGNED Eugene K. Tong

WITNESS *

_L_E_A_S_E_

THIS AGREEMENT made this 30th day of August, A. D. 1954, by and between John D. Bedford, Eric E. Lepponen, John Rimmer, Thomas Rimmer, Richard Lee, Mark Lee, Alex J. Pascoe, James Kladianos, Dave Freeman, Sidney W. Freeman, and Frank J. Reade, by and through their committee and representatives and to whom all the above parties have given Power of Attorney, John Bedford, Eric E. Lepponen, and John Rimmer; all residents of the State of Wyoming, and hereinafter referred to as the lessors; and Nugget Coal and Timber Company, a corporation, organized and existing under and by virtue of the laws of the State of Wyoming, hereinafter referred to as the lessee.

I

That the party of the first part for and in consideration of the covenants and agreements hereinafter mentioned to be kept and performed by the said party of the second part, its successors and assigns, has demised and leased to the party of the second part all those premises situate, lying and being in Carbon County in the State of Wyoming, known and described as follows to wit:

Twelve (12) mining claims named Littleman Claims one (1) to twelve (12) both inclusive, located in Sections Fourteen (14), Township 27, North, Range 84, West of 6 P.M.

Little Man No. 1, description as follows to wit: The SW corner of claim #1 is located 17340.0' north and 1555.6' west of the SW corner of Section 36, Twp. 27N, R84W, 6pm. (A brass cap is located at this point.) the nce on a bearing of N19°-0'W for a distance of 1500.0' to the NW corner of claim #1, thence on a bearing of N90°-o'E for a distance of 600.0' to the NE corner, thence on a bearing of S19°-0'E for a distance of 1500.0' to the SE corner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner of claim #1, and the point of beginning. The NW corners of claim #1 are located in the NE¼ of Sec. 14, T27N, R84W,6PM. The SW and SE corners of claim #1 are located in the SE¼ of Sec. 14, T27N, R84W, 6PM.

Little Man No. 2, description as follows to wit: The SW corner of claim #2 is located 15840.0' north and 1555.6' west of the brass cap at the SW corner of Sec. 36, T27N, R84W, 6PM, thence on a bearing of N0°-0' for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S0°-0' for a distance of 1500.0' to the SE corner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The entire claim is located in the SE¼ of Sec. 14, T27N, R84W,6PM.

Little Man No. 3, description as follows to wit: The Sw corner of claim #3 is located 18758.2' north and 2044.0' west of the brass cap at the SW corner of Sec 36, T27N, R84W, 6PM, thence on a bearing of N19°-0'W for a distance of 1100.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S19°-0'E for a distance of 1100.0' to the SE corner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The entire claim is located in the NE¼ of Sec. 14, T27N, R84W, 6PM.

Little Man No. 4, description as follows to wit: The SW corner of claim #4 is located 18758.2' north and 1444.0' west of the brass cap at the SW corner of Sec. 36, T27N, R84W, 6PM., thence on a bearing of N19°-0'W for a distance of 1100.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S19°-0'E for a distance of 1100.0' to the SE corner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The entire claim is located in the NE¼ of Sec. 14 T27N, R84W, 6PM.

Little Man No. 5, description as follows to wit: The SW corner of Claim #5 is located 17340.0' north and 955.6' west of the brass cap at the SW corner of Sec.36, T27N, R84W, 6PM, thence on a bearing of N19°-0'W for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S19°-0'E for a distance of 1500.0' to the SE corner thence on a bearing of N90°-0'W for a distance of 600.0' to the SW Corner and the point of beginning. The NE and NW corners of the claim are located in the NE¼ of Sec. 14,T27N, R84W, 6PM. The SE and SW corners of the claim are located in the SE¼ of Sec. 14, T27N, R84W, 6PM.

Little Man No. 6, description as follows to wit: The SW corner of claim #6 is located 15840.0' north and 955.6' west of the brass cap at the SW corner of Sec. 36, T27N, R84W, 6PM, thence on a bearing of N0°-0' for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S0°-0' for a distance of 1500.0' to the SE corner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The entire claim is located in the SE¼ of Sec. 14, T27N, R84W, 6PM.

Little Man No. 7, description as follows to wit: The SW corner of claim #7 is located 15840.0' north and 2155.6' west of the brass cap at the SW corner of Sec. 36, T27, R84W, 6PM., thence on a bearing of N0°-0' for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S0°-0' for a distance of 1500.0' to the SE corner thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The entire claim is located in the SE¼ of Sec. 14, T27N, R84W, 6PM.

Little Man No. 8, description as follows to wit: The SW corner of claim #8 is located 17340.0' north and 2155.6' west of the brass cap at the SW corner of Sec. 36, T27N, R84W, 6PM, thence on a bearing of N19°-0'W for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S19°-0'E for a distance of 1500.0' to the SE corner thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The SW and SE corners of the claim are located in the SE¼ of Sec. 14, T27N, R84W, 6PM., The NW corner is located in the NW¼ Sec.14,T27N, R84W, 6PM., The NE corner is located in the NE¼ Sec.14,T27N, R84W, 6PM.

Little Man No. 9, description as follows to wit: The SW corner of claim #9 is located 15840.0' north and 2755.6' west of the brass cap at the SW corner of Sec.36,T27N,R84W,6PM., thence on a bearing of N0°-0' for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S0°-0' for a distance of 1500.0' to the SE corner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The NE &SE corners of the claim are located in the SE¼ Sec.14,T27N,R84W,6PM, The NW&SW corners of the claim are located in the SW¼ Sec.14,T27N,R84W,6PM.

Little Man No. 10, description as follows to wit: The SW corner of claim #10 is located 15840.0' north and 3355.6' west of the brass cap at the SW corner of Sec. 36, T27N,R84W,6PM., thence on a bearing of N0°-0' for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S0°-0' for a distance of 1500.0' to the SEcorner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The entire claim is located in the SW¼ of Sec 14, T27N, R84W, 6PM.

Little Man No. 11, description as follows to wit: The SW corner of claim #11 is located 17340.0' north and 2755.6' West of the brass cap at the SW corner of Sec. 36, T27N, R84W, 6PM, thence on a bearing of N19°-0'W for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S19°-0'E for a distance of 1500.0' to the SE corner of the claim, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The NW and NE corners of claim #11 are located in the NW¼ of Sec14, T27N, R84W, 6PM. The SW corner is located in the SW¼ of Sec. 14, T27N, R84W, 6PM. The SE corner is located in the SE¼ of Sec. 14, T27N, R84W, 6PM.

Little Man No. 12, description as follows to wit: The SW corner of Claim #12 is located 17340.0' north and 3355.6' west of the brass cap located at the SW corner of Sec. 36, T27N, R84W, 6PM., thence on a bearing of N19°-0'W for a distance of 1500.0' to the NW corner, thence on a bearing of N90°-0'E for a distance of 600.0' to the NE corner, thence on a bearing of S19°-0'E for a distance of 1500.0' to the SE corner, thence on a bearing of N90°-0'W for a distance of 600.0' to the SW corner and the point of beginning. The NE and NW corners of the claim are located in the NW¼ of Sec. 14, T27N, R84W, 6PM. The SE and SW corners of the claim are located in the SW¼ of Sec. 14, T27N, R84W, 6PM.

(All the above claims, 1 through 12, were filed in the office of the County Clerk of Carbon County, on the 13th day of August, 1954, in Book 335, and pages 286 to 297 both inclusive.)

And, the lessors shall obtain all easements and rights of ways for roads and assign the same to the lessee and the lessee shall construct and maintain said roads at its own expence.

To have and to hold said above described premises, with the appurtenances, unto the said lessee, Nugget Coal and Timber Company, aforesaid, from the date hereof, for and during a period of ten (10) years, and so long thereafteras mineral is produced in commercial quantities, subject to the conditions hereinafter stated. And, the said lessee in consideration of the leasing of the premises aforesaid by the lessors, does covenant and agree with the lessors, their heirs, executors, administrators and assigns, to pay to the lessors, as rent for said demised premises, a royalty of fifteen per cent (15%) of proceeds as received on gross shipments, provided however, that if the lessee in its discretion shall deem it advisable and feasible and it can obtain the authority, it may construct a mill at Hanna, Wyoming to process said minerals and ship a consentrated commercial product, that then the royalty shall be 15% of the gross shipments of the proceeds derived therefore, and the lessors shall bear their 15% of all costs of the construction and maintenance of said mill and equipment and labor, and their 15% of the depreciation and obseletion and their 15% replacement of all machinery and equipment from time to time as may be necessary to properly process said mineral; to be paid monthly by the lessee to the lessor on or before the 10th day of the following month in which said shipments are made to the credit of the lessors in the Hanna State and Savings Bank of Hanna, Wyoming, or its successors; which bank shall be the depository regardless as to change of ownership.

That in addition to the royalties above stated the lessors shall be entitled to receive from the government all discovery bonuses, and the lessee shall be entitled

to all other bonuses, and premiums.

II

IT IS, ESPECIALLY UNDERSTOOD AND AGREED between the parties hereto that said claims are located by the lessors primarily for uranium and other minerals, and that this lease is subject to all of the laws of the United States of America, the rules and regulations of the Atomic Energy Commission, so far as uranium and other atomic or fissionable minerals are concerned, and subject to the laws of the United States of America and the State of Wyoming, and on all other minerals, and

III

That the lessors covenant and agree that they have properly located said claims and given the proper notice and made the proper applications, as by law required, and that if said notices and applications have not been made the lessors will execute said instruments and deliver them to the proper government officials, and execute any and all other instruments as may be required by law affecting the location and development of said minerals; and the lessee agrees that it will cooperate with the lessors in filing the necessary notices, applications and other steps that may be required from time to time, by the United States Government or any department thereof.

IV

That the lessee will within thirty (30) days from the date of the signing of this lease commence exploration work to determine whether there is sufficient quantity and quality of said minerals in any of said claims of commercial value to justify the development and production of said minerals.

That the exploration work shall be carried on by the lessee, its agent and servants as they see fit, and that while said exploration work is in process all mineral of

commercial value shall be shipped to the proper government receiving center and such mineral as is developed, not purchased by the government, shall be shipped to the open market.

That after a sufficient amount of exploration work has been done to block out a sufficient quantity of uranium or other valuable mineral to justify the lessee in the development and extraction and sale of the same that then the lessee shall commence the actual production and sale of mineral, and the exploration work shall continue ahead of the development consistent with good business and according to good mining practice; provided, however, that should the exploration work not disclose commercial quantities and qualities of minerals that then the lessee upon 30 days written notice to the lessors, cancel this lease and be releived from any and all further obligations created hereby.

V

That should the exploration work convince the lessee that said lands contain minerals in commercial quantities and qualities, that then the lessee shall within a reasonable time commence the actual operation of mining of minerals and shipping the same to market, and that said operations of mining shall be carried on in a workman like manner, and in an economical manner so as to take out the greatest amount of ore possible with due regard to the development and preservation of the same as a workable mine.

VI

The lessee shall keep full, true and accurate records of all work performed, and shipments of all minerals made and receipts therefore, and to supply the lessors, or their agent, monthly a copy of the shipments and money received therefore, and to allow the lessors or their lawful attorney, access to said records for inspection, and to permit the lessors and their lawful agent to inspect the operations and works.

VII

The lessee, upon thirty (30) days notice, to the lawful attorney of the lessors, terminate and deliver said permises to the lessors; and within thirty days thereafter the lessee shall remove all improvements placed upon the surface of said property, all equipment, machinery and other personal property used in connection with development of said mine on said premises.

VIII

All expressed and implied covenants of this lease shall be subject to all federal and state laws, executive orders, rules and regulations, and this lease shall not be terminated, in whole or in part, nor lessee held liable in damage for failure to comply therewith if compliance is prevented by or if such failure is the result of any such law, order, rule or regulation or if such compliance is prevented by or failure is the result of inability of lessee through no fault of its own, to obtain sufficient and satisfactory material and equipment to justify the commencement of operations or to continue production of minerals from the leased premises.

IX

This lease and all its terms, conditions, and stipulations shall extend to and be binding on all successors of said lessors or lessee.

IN WITNESS WHEREOF, John D. Bedford, Eric E. Lepponen, John Rimmer, Thomas Rimmer, Richard Lee, Mark Lee, Alex J. Pascoe, James Kladianos, Dave Freeman, Sidney W. Freeman and Frank J. Reade, by and through their attorneys in fact John Bedford, Eric E. Lepponen, and John Rimmer, and The Nugget Coal & Timber Company as party of the second part, has caused these presents to be signed by its duly authorized officer this 30th day of August, A. D., 1954.

NUGGET COAL & TIMBER COMPANY

BY: [illegible]
President & Gen. Manager
Lessee.

John D. Bedford
Eric E. Lepponen
John Rimmer
Lessors.

State of Wyoming, County of Albany, ss:

On this 30th day of August A.D., 1954, before me personally appeared John D. Bedford, Eric E. Lepponen, and John Rimmer, to me known to be the persons who executed the foregoing instrument in behalf of themselves and Thomas Rimmer, Richard Lee, Mark Lee, Alex J. Pascoe, James Kladianos, Dave Freeman, Sidney W. Freeman, and Frank J. Reade, and acknowledged that they executed the same as their free act and deed, and the free act and deed of all the persons above named.

Given under my hand and notarial seal this 30th day of August, A. D., 1954, at Laramie, Wyoming.

My commission expires February 15, 1956.

R. R. McConnell
Notary Public

State of Wyoming, County of Albany, ss:

On this 30th day of August, A. D., 1954, before me appeared, N. A. Swenson, to me personally known, who being by me duly sworn, did say that he is the President and General Manager of Nugget Coal & Timber Company, a Wyoming Corporation, and that the seal affixed to said instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said N. A. Swenson acknowledged said instrument to be the free act and deed of said corporation.

Given under my hand and notarial seal at Laramie, Wyoming, this 30th day of August, A. D., 1954.

My commission expires February 15, 1956.

R. R. McConnell
Notary Public.

OFFICIAL BUSINESS

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO

AIR MAIL

Defense Minerals Exploration Administration
Interior Building
Washington 25, D. C.

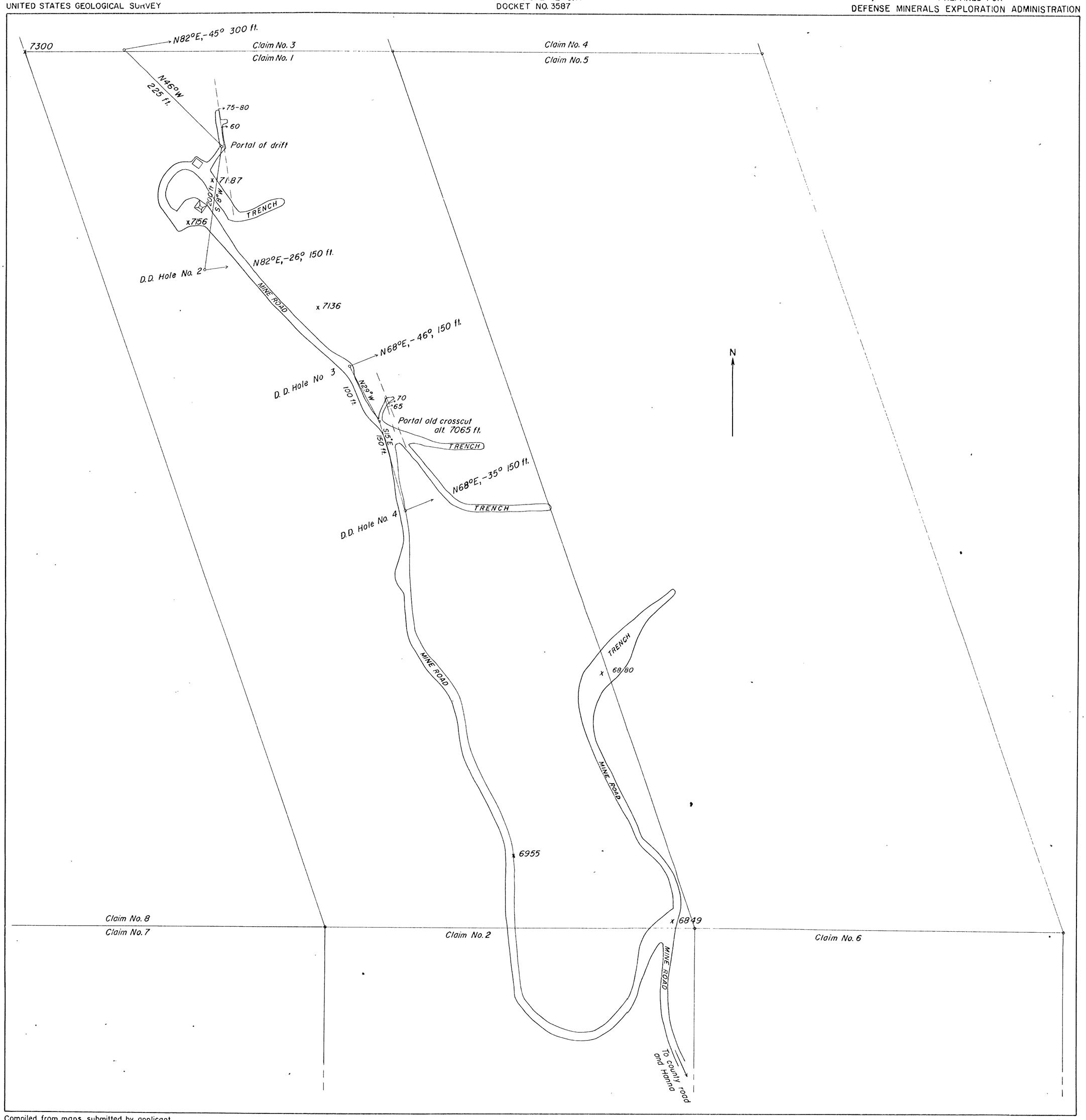
JUL 30 1954 DEN COLO.

(RMGC) 54 COLO.

All Claim Corners are Located From the Brass Cap at the S.W Corner of Sec. 36, T27N, R84W, 6th P.M.

Little Man Mineral Claims
Sec. 14, T27N, R84W, 6PM.

JK



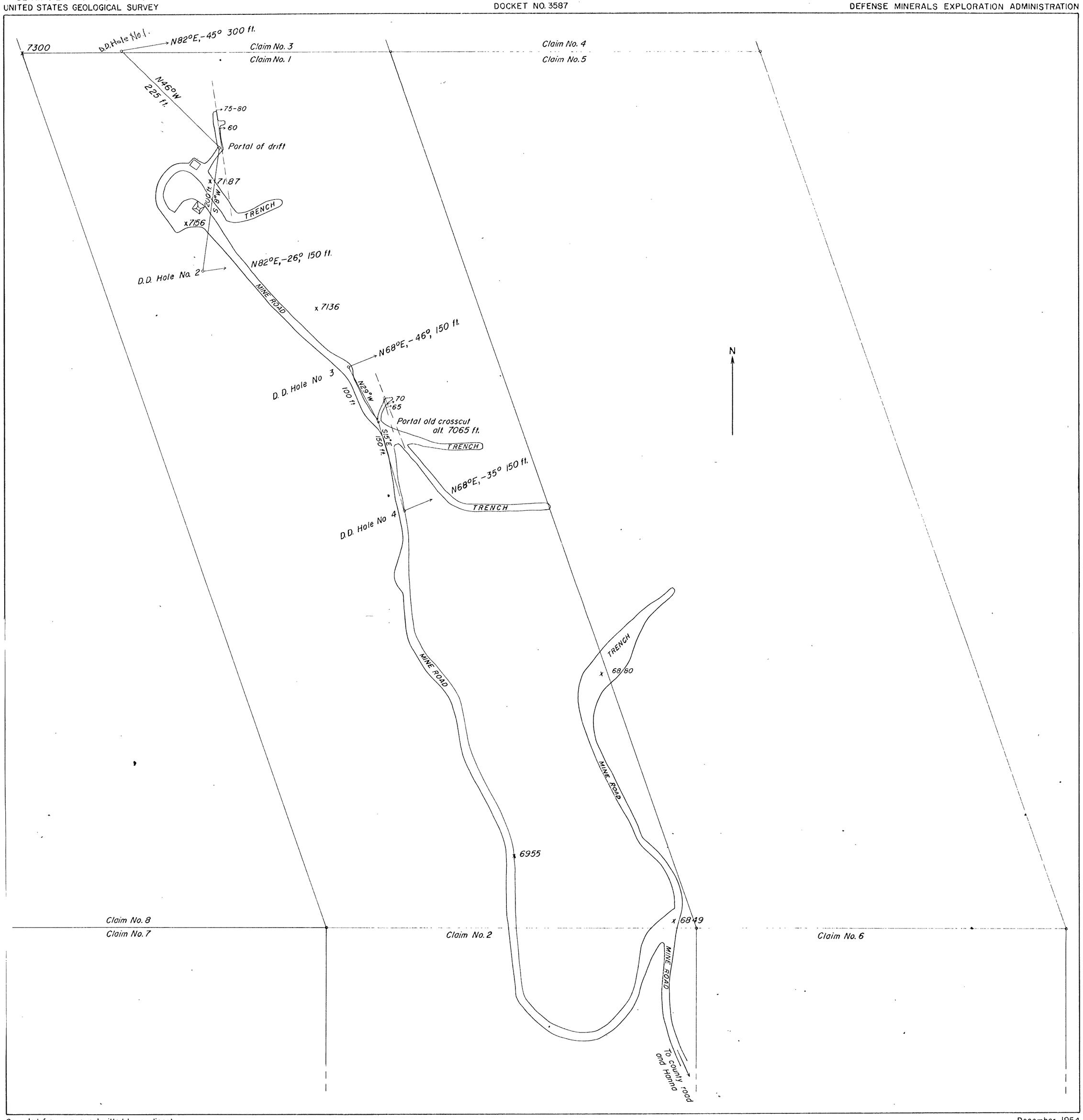
Compiled from maps submitted by applicant

December, 1954

FIGURE 3.—PLAN SHOWING APPROXIMATE LOCATION OF ROADS, TRENCHES, TUNNELS AND RECOMMENDED DIAMOND DRILL HOLES, CLAIM NO. 1, LITTLE MAN MINE, CARBON COUNTY, WYOMING

100 50 0 100 Feet

C-A



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December, 1954

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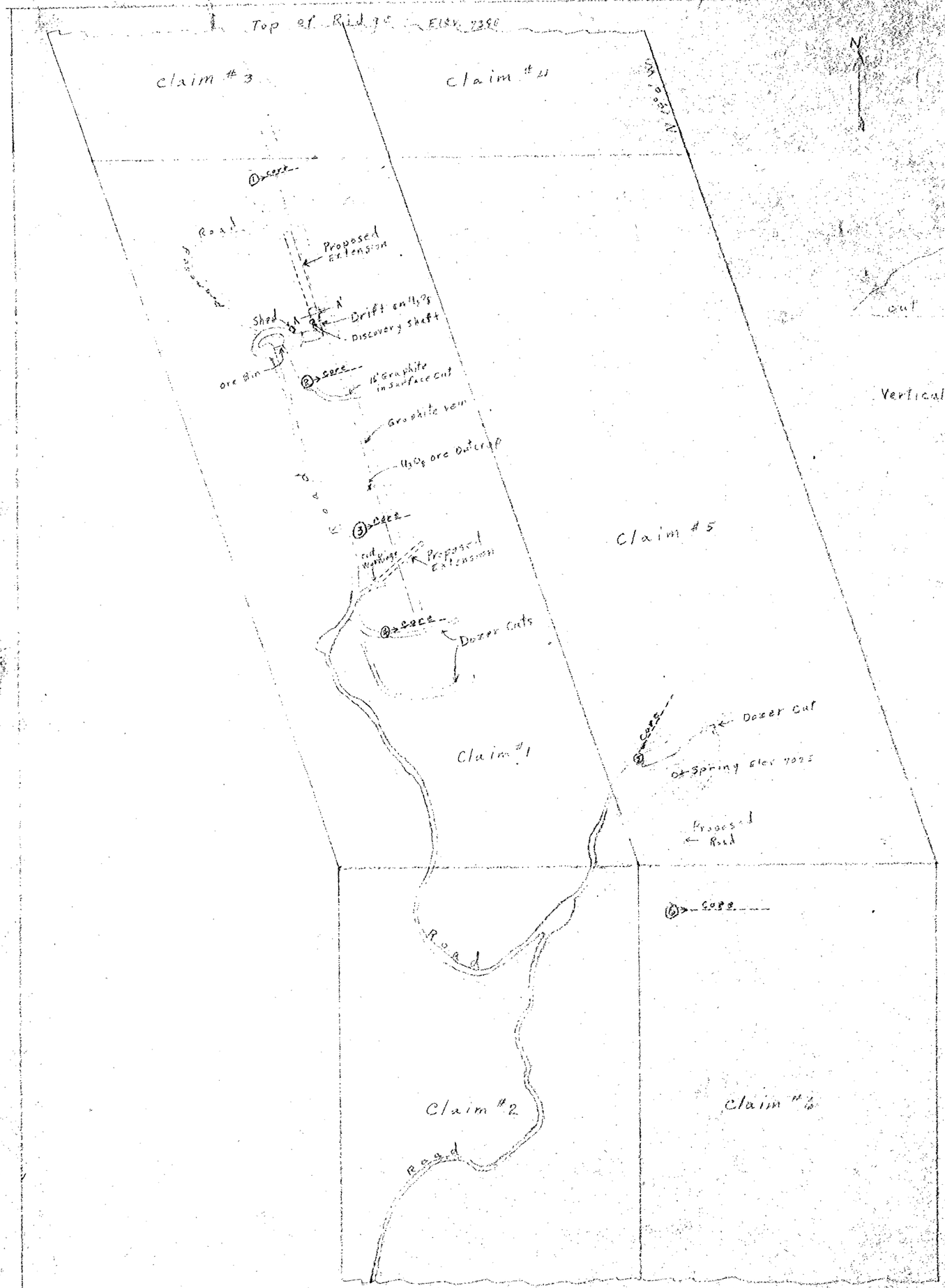
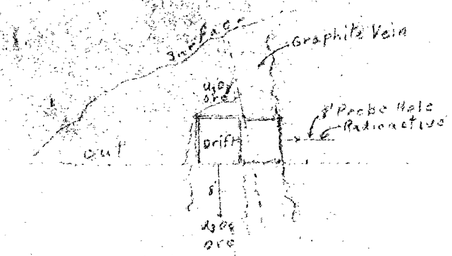
100 50 0 100 Feet

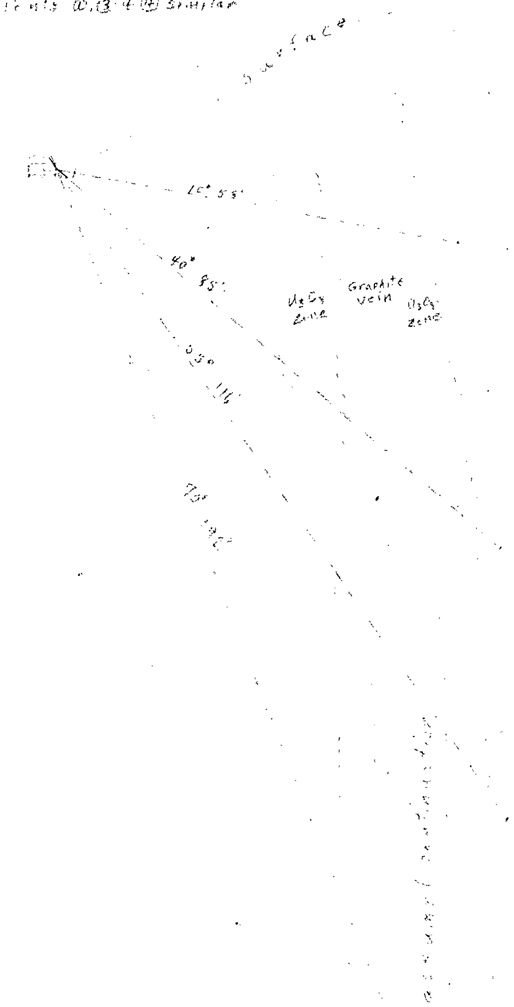
CAT





Vertical Section A-A

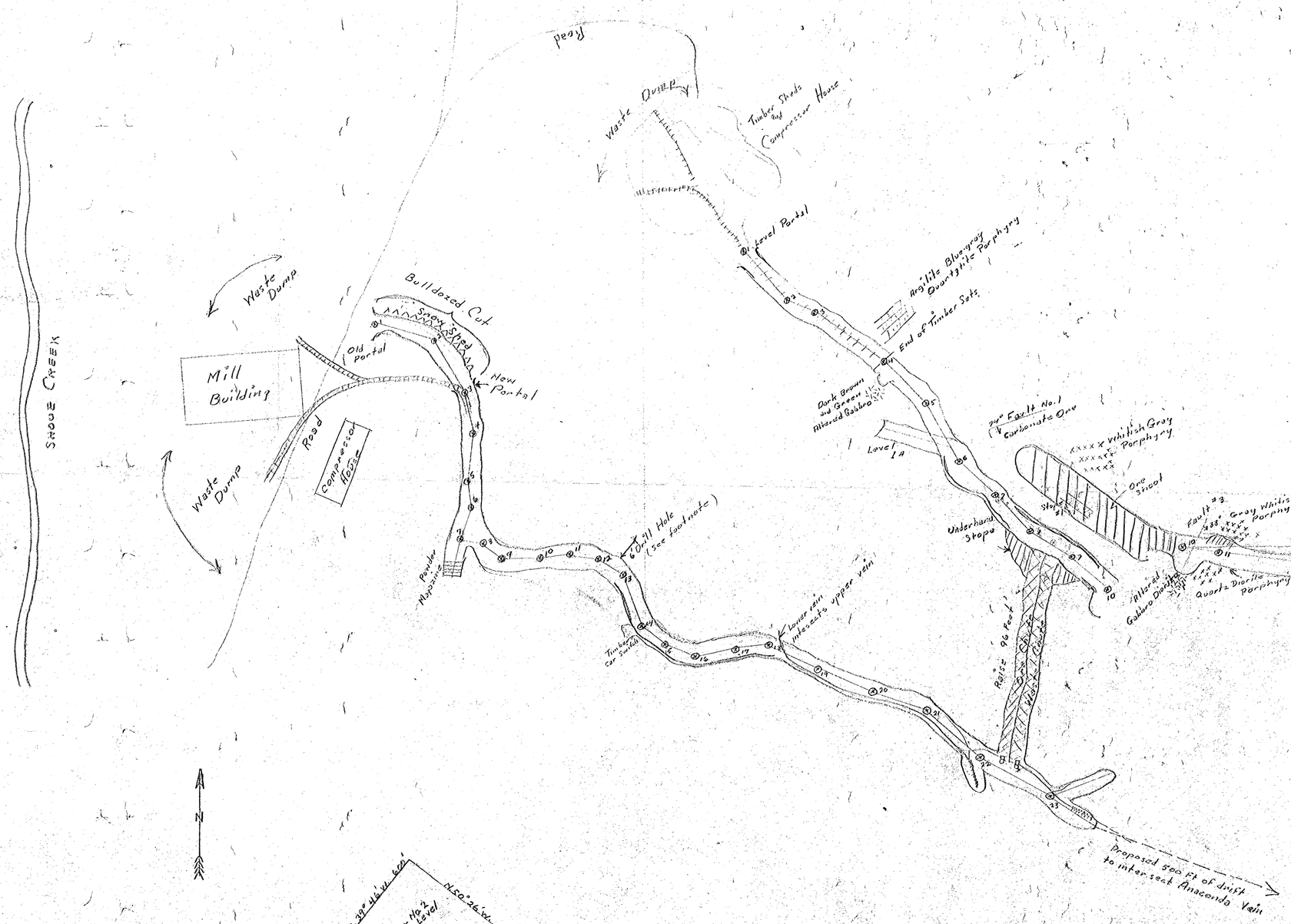
Proposed Core Drilling
Setup at Point ② on plan.
Holes ①, ③ & ④ similar

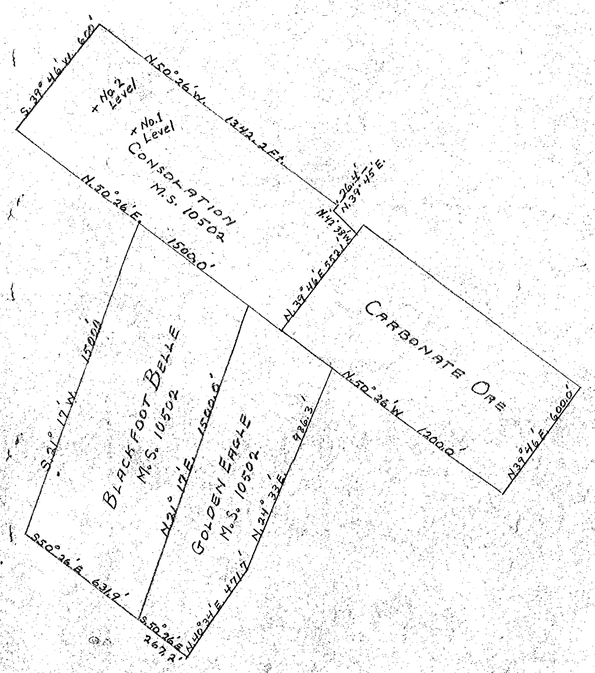


Proposed Exploration
Little Man Mine
Carbon County, Wyo.
Scale: Plan 1" = 150', Vertical 1/16" = 1'
Nov. 15, 1974 TEJ

200' Below surface

Virgil S. Ferguson
Lincoln, Montana





MAP OF CONSOLATION GROUP, LOCATED IN LEWIS & CLARK COUNTY, STATE OF MONTANA, IN THE HEDDLESTON UNORGANIZED MINING DISTRICT.

FOOTNOTES

Red markings indicate Ore bodies.
Blue markings indicate copper stains.
Upper drift measures 450 ft. from face to portal
300 ft. from face to raise.
Lower drift measures 424 ft. from face to new portal
Between survey sets 12 & 13 - 6 ft. drill hole shows last 2 ft. to contain shipping ore.
All 4 claims heavily timbered with lodge pole pine & fir.
Upper drift makes 30 Gals. water per hour.
Lower drift approx. the same.
At low stage, Shoue creek produces approx. 200 gals. per minute