June 18, 1959

Memorandum

To: W. R. Griswold, Office of Minerals Exploration

From: H. Kirkemo, U. S. Geological Survey

Subject: Review of Field Team Report, OME 6045, (Copper-Lead-Zinc), Baltimore Syndicate, Ltd., Baltimore Mine, Jefferson County, Montana

This application is a renewal of a request (DMEA 3581) made in 1955 for exploration assistance totalling $19,522 on this property. The DMEA application was denied because the target did not seem to justify the proposed expenditure.

The Field Team Report on the OME application proposes a 2-stage program consisting of 1,200 feet of diamond drilling and 400 feet of drifting and crosscutting at a cost of about $26,000. Geologic reasons for the proposed OME program can be seen on the maps and cross sections that accompanied the DMEA application.

A block of untested ground 150 feet long and 275 feet high (level of No. 1 tunnel to surface) is shown between the two groups of workings on the Baltimore claim (see claim map). The drill holes proposed from drill station No. 1 in the Hope Tunnel will test this block.

Drill holes proposed from drill station No. 2 in the Hope Tunnel will explore the complexly faulted area between the Middle Fault and the East Fault where segments of the Baltimore vein may exist among strands of the faults. Also, there is a possibility that the vein developed from the surface to the 90-foot level (see Section F-F', DMEA 3581) may extend into the target area.

The map of Tunnel No. 5 (DMEA 3581) shows mine workings north of the North Fault. Apparently a vein was mined from the surface to its cut-off by the North Fault, a vertical distance of about 80 feet. No exploration for the vein in the footwall of the North Fault is evident from the maps. The proposed drill hole from station No. 3 in the Hope Tunnel may provide evidence that further exploration in this direction is justified.

The proposed DMEA program was essentially one of exploring and developing a known ore body.

The diamond drilling program proposed with OME assistance is seeking ore bodies beyond those already exposed in the Hope Tunnel. Geologic conditions warrant the modest exploration proposed with the drilling program. Funds for additional exploration of any significant discovery should be included in a contract.

H. Kirkemo

cc: OME (3)
A. D. McMahon, 3623
Director's reading
Branch reading
Chron. file
Docket file
HKirkemo/mm
G-MD-6-18-59

6045

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DATE	INITIALS	CODE

So. 157 Howard Street
Spokane 4, Washington

June 10, 1959

Memorandum

To: Chairman, Operating Committee, OME

From: OME Field Team, Region I

Subject: Docket No. OME-5045 (Copper-Lead-Zinc)
Baltimore Syndicate, Ltd.
Baltimore Mine
Jefferson County, Montana

Enclosed are three copies each of memorandum reports on the referenced application by R. D. Sample, Geologist, U. S. Geological Survey and S. W. Zeldon, Mining Engineer, U. S. Bureau of Mines.

Sample presents a geological justification for a recommended two-stage project and Zeldon presents an estimate of costs. The Field Team concurs with the recommendations and cost estimate.

Wing G. Agnew, Acting Exec. Officer
U. S. Bureau of Mines

Donald H. Maclaren, Acting Member
U. S. Geological Survey

Enclosures

cc: USBM (2)
USGS(SRO)
Sample

P. S. We wrote the applicant June 3, 1959 for a financial statement as asked for in your memorandum of May 8. We will forward it as soon as it is received.

Reviewed by
OME OPERATING COMMITTEE

(date)

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UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
So. 157 Howard Street
Spokane 4, Washington

June 9, 1959

Memorandum

To: OME Field Team, Region I

From: R. D. Sample, Geologist, U. S. Geological Survey

Subject: Application Examination Report, Docket No. OME-6045 (Copper-Lead-Zinc), Baltimore Syndicate, Ltd., Baltimore Mine, Jefferson County, Montana

INTRODUCTION

In an application received April 27, 1959, Baltimore Syndicate, Ltd., Box 755, Heppner, Oregon, Dr. C. M. Wagner, general partner, applied for Government aid to explore the Baltimore mine, Jefferson County, Montana, for copper, lead, and zinc minerals. The proposed program of rehabilitation, diamond and long-hole drilling, crosscutting, drifting, and raising was estimated to cost $32,020.75, of which the Government would have 50 percent participation.

A former application for Government aid to explore on the same property by raising from the Hope tunnel on a known ore shoot and drifting from the raise at 40-foot intervals was submitted by Mr. Louis Peura on November 16, 1954 (Docket No. DMEA-3581). The proposed project was more in the nature of development then and the cost seemed high in relation to the possible value of the ore that might be found and the application was denied.

On March 27, 1958, all rights to the property by former lessors were assigned to the Baltimore Syndicate, Ltd., a Montana Limited Partnership. During 1958 a limited amount of rehabilitation was done in the mine. Most of the work consisted of cleaning out the Hope tunnel, retimbering where necessary, and laying inadequate track. None of the workings were extended.

The property was examined by R. D. Sample on May 27 and 28, 1959, accompanied by Louis Peura. Only the Hope tunnel and Adit No. 2 could be examined underground. The other adits and shafts were caved and inaccessible. A quick reconnaissance was made of the surface workings but everything was badly caved and snow-filled.

Reviewed by
OME OPERATING COMMITTEE

(date)

Apparently, stoping of the east ore body was completed from the No. 4 level to the surface, and that on the west ore body, from the No. 1 level to the surface. Production figures are tabulated in the application.

GEOLOGIC SUMMARY

The Baltimore ore zone consists of a series of quartz veins and stringers complexly faulted and offset trending northeasterly through the quartz-monzonite of the Boulder batholith. The zone is also cut by a rhyolite dike. Sulfide mineralization occurs in and along with the quartz veins and fractures.

Because of the extremely complex faulting there may very well be additional ore shoots or faulted segments of the known shoots in the unexplored block of ground between the Middle and East faults. Although probably small, if the grade of the ore is similar to that which has been mined, these ore shoots would be worth exploring provided the exploration could be done at moderate cost.

EXPLORATION

The applicant proposes two diamond drill holes to explore the ground between the Middle and East faults, and a drift and raise to explore a known ore shoot, all on the Hope tunnel level. The drift and raise proposed by the applicant is not recommended for the same reasons that were the basis for denial of the former application. A modified two-stage program is recommended to explore the favorable ground between the faults (pl. 1).

Stage I

1. Rehabilitation of Hope tunnel for diamond drilling by installation of proper air and water lines. Also, repair about 800 feet of track and about 50 feet of timbered ground, and install about 50 feet of water line from a stream to the tunnel portal.

2. At approximately 600 feet from portal, cut drill station No. 1 in the south wall.

3. Diamond drill 3 holes from station in a south and southeast direction. Holes drilled no more than a maximum of 200 feet each; 2 holes drilled flat and 1 at an angle of about -30°.

4. At approximately 200 feet beyond first station, cut station No. 2 in the south wall.

5. From Station No. 2, drill 2 holes not more than 200 feet each in a south and southeasterly direction; 1 hole flat and the other at about -30°.

6. At the face of the northeast drift, drill 1 hole at -30° no more than 200 feet to determine the nature of the area beyond the projected north fault.

Stage II

If the results of Stage I warrants, a Stage II should provide for a maximum of 400 feet of crosscutting and drifting.

Attachment 1

Distribution:
OME (3)
USBM (2)
USGS(SRO)
Docket
Sample

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1201 N. Division St.
Spokane 2, Washington

June 10, 1959

MEMORANDUM

To: OME Field Team, Region I

From: S. W. Zoldok, Mining Engineer, U. S. Bureau of Mines

Subject: Cost Analysis, Docket No. OME-6045 (Copper-Lead-Zinc), Baltimore Syndicate, Ltd., Baltimore Mine, Jefferson County, Montana

The field examiner recommends a two-stage program consisting essentially of 1,200 feet of diamond drilling and 400 feet of drifting and crosscutting. The examiner states that the Hope tunnel has track laid, though somewhat inadequate, but lacks air and water lines.

Should the Government decide to participate in the exploration, the following costs are recommended for consideration:

Stage I

Rehabilitation - 880 feet of tunnel

2. Labor and supervision

Labor - 2 men 6 days @ $17/per day		$ 204.00

3. Operating materials and supplies

880 feet 2" pipe @ $0.44/ft.	$387.20	
900 feet 1" pipe @ 0.21/ft.	189.00	
Pipe fittings (20% of $576.20)	115.24	
Less 50% salvage	345.72	
Misc. track supplies	50.00	
Misc. posts, caps, etc.	150.00	545.72

6. New buildings, etc.

Repair existing compressor house		150.00

Reviewed by
OME OPERATING COMMITTEE

(date)

7. Insurance, etc.

15% of $204.00		30.60
Total cost of Rehabilitation work		$780.32

Cost per foot - $0.89 - say $0.90/ft.

Diamond Drilling

1. Independent contracts

AX diamond drilling

Mobilization	$ 150.00	
1,200 feet @ $6.50/ft.	7,800.00	
Reaming, casing and/or cementing 300 feet @ $3.00/ft.	900.00	$ 8,850.00

2. Labor and supervision

Supervisor-sampler 1.5 mo. @ $500/mo.	$ 750.00	
Consultant - 3 days @ $75/day	225.00	975.00

3. Operating materials and supplies

Core boxes - 38 @ $4/ea.	$ 152.00	
Sample bags 50 @ $0.50/ea.	25.00	
Gas, oil, etc.	50.00	227.00

4. Operating equipment

Depreciation on pickup 2,000 x 1/60 x 1.5 months		50.00

5. Rehabilitation and repairs — none

6. New buildings, etc. — none

7. Miscellaneous

Assays for Pb-Zn-Cu-Ag 50 @ $3.50/ea.	$ 175.00	
Insurance, etc. -15% of $750	112.50	287.50
Estimated cost Stage I drilling		$10,389.50

Stage II - Drifting and Crosscutting

Operating equipment needed and monthly depreciation:

Item	Value	Monthly Depreciation
Air compressor - 125 c.f.m.	$4,000	$ 66.67
2 jack-leg drills	1,080	18.00
1 ventilating fan	300	5.00
4 mine cars	1,200	20.00
5 lamps, with charger	325	5.41
1 water supply pump	300	5.00
Pickup	2,000	33.33
		$153.41

Crosscut or drift - 400 feet

Estimated advance 3.5 ft. per day, 114 days, 4.4 months

1. Independent contracts — none

2. Labor and supervision

Engineer-supervision 5 mos. @ $500/mo.	$ 2,500.00	
1 miner - 114 days @ $18/day x $1.083 O.T.	2,222.32	
1 helper- 114 days @ 16/day x 1.083 O.T.	1,975.39	$ 6,697.71

3. Operating materials and supplies

Drill bits, 22 @ $15 each	330.00	
Drill rods, 18 @ $9.10/ea.	163.80	
Dynamite, 3600# @ $23/100#	828.00	
Caps 1500 @ $0.02/ea.	30.00	
Fuse 12,500 ft. @ $13.45/m	168.13	
Gas 1500 gal. @ $0.35/gal.	525.00	
Lube oil, grease, etc.	60.00	
Ties 270 @ $0.30/ea.	81.00	
Fish plates, spikes, etc.	96.00	
Air hose 1"	44.00	
Water hose ½"	25.00	
Small tools	50.00	
Repair parts	100.00	2,500.93

3. Operating materials and supplies

Salvagable Items

2 line oilers @ $21.00/ea.	$ 42.00	
2" air line - 380 ft. @ $0.44/ft.	167.20	
1" water line - 380 ft. @ $0.21/ft.	79.80	
Pipe fittings	49.40	
Rail 16# 4,272# @ $12/100#	512.64	
Switch	60.00	
Ventube 1,200 ft. @ $1.08/ft. (Total less 50% salvage)	1,296.00	$ 1,103.52

4. Operating equipment

Depreciation 4.4 months @ $153.41/mo.	675.00

5. Rehabilitation and repairs — none

6. New buildings, etc. — none

7. Miscellaneous

Insurance - 15% of $6,697.71	1,004.66
Total cost crosscutting and drifting	$11,981.82

Cost per foot - $29.95 - say $30.00

Timbering - 20 sets (100 feet)

Estimated advance - 4 sets per day or 5 days (1/5 month)

2. Labor and supervision

Engineer-supervision 1/5 mo. @ $500/mo.	$ 100.00	
1 miner 5 days @ $18/day	90.00	
1 helper 5 days @ $16/day	80.00	$ 270.00

3. Operating materials and supplies

Posts, caps, girths, lagging, etc. 5,000 bd.-ft. @ $75/m	375.00	
Blocks, wedges, etc.	30.00	
Gasoline	30.00	435.00

4. Operating equipment

Depreciation - 1/5 mo. @ $153.41/mo.	$ 30.68

7. Miscellaneous

Insurance, etc. 15% of $270.00	40.50
Total cost for 100 feet timber	$ 776.18

Cost per foot - $7.76 - say $7.75

SUMMARY ESTIMATED COST OF PROJECT

Stage I

Repair existing compressor house	$ 150.00
Rehabilitate 880 feet of tunnel @ $0.90/ft.	792.00
Mobilization of drill	150.00
AX diamond drilling - 1200' @ $6.50/ft.	7,800.00
Reaming, casing and/or cementing - 300' @ $3.00/ft.	900.00
Supplies	227.00
Depreciation on pickup	50.00
Assays (Pb-Zn-Cu-Ag) 50 @ $3.50/ea.	175.00
Drill stations - 2 @ $300/each (1 station equals 10' drift @ $30/ft.)	600.00
Labor and supervision	862.50
Engineer consultant 3 days @ $75/day	225.00
Cost of Stage I	$11,931.50

Stage II

Drifting and crosscutting - 400' @ $30/ft.	$12,000.00
Timbering - 100' @ $7.75/ft.	775.00
Consulting engineer 15 days @ $75/day	1,125.00
Assays (Pb-Zn-Cu-Ag) 50 @ $3.50/ea.	175.00
Cost of Stage II	$14,075.00
Total cost of project	$26,006.50
Government Participation - 50%	$13,003.25

Distribution:
- OME (3)
- USGS (3)
- Docket
- Engineer

INVESTIGATION
OF
The Baltimore Mine
FOR
Baltimore Syndicate Ltd.

C. M. WAGNER, M.D.
Box 755
Heppner, Oregon

David E. Loughran, E. M.
Mining Engineer
Geologist
February 1, 1958

INVESTIGATION

OF

THE BALTIMORE MINE

FOR

BALTIMORE SYNDICATE LTD.

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DATE	INITIALS	CODE

David E. Loughran, E.M.
Mining Engineer
Geologist

February 1, 1958

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U. S. G. S.
SPOKANE, WASH.

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Tunnel No. 5 Map 22

I. INTRODUCTION

A. PURPOSE AND SCOPE:

The writer was commissioned by Dr. C. M. Wagner of Heppner, Oregon to investigate the Boulder Mining District, Jefferson County, Montana, to select a property worthy of exploration.

The Baltimore Mine was selected as being the most likely prospect in the area. An on the ground examination of the property was made from August 28 to September 4, 1957. A study was made of the surface geology. Where ore had been mined from the old stopes, mined through to the surface, the workings were visible but for the most part the underground workings were inaccessible.

Historical data, maps, records of shipment and Government publications were consulted, studied and analyzed. The writer has long been familiar with the Boulder District and has in the past operated and examined many mines on the Boulder Batholith in the general area of the Baltimore Mine.

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I. INTRODUCTION (Continued)

B. LOCATION AND ACCESSIBILITY:

The Baltimore Mine is situate in the Boulder Mining District at an elevation of 5,000 feet, approximately four miles northwest of Boulder, Montana, in the County Seat of Jefferson County.

The mine is reached by way of a good mountain road which extends just west of Boulder from U. S. Highway 91, northerly past the Great Northern Railroad Station at Boulder, thence northwesterly to the property. The road can be traveled in high gear.

Smelters for both copper and lead ores are located in Butte and Helena, Montana. The copper smelter is at Butte, 25 miles distant and the lead smelter is at Helena, 20 miles distant from loading ramps on the Great Northern Railway. These ramps are approximately three miles from the mine, thus providing relatively low freight and hauling costs for the ore.

Power is available within one mile and ample water for all purposes, including milling, is present in Boomerang Creek where it crosses the property. Skilled mine labor is available locally and at Butte. Butte and Helena are excellent sources of mining equipment and supplies.

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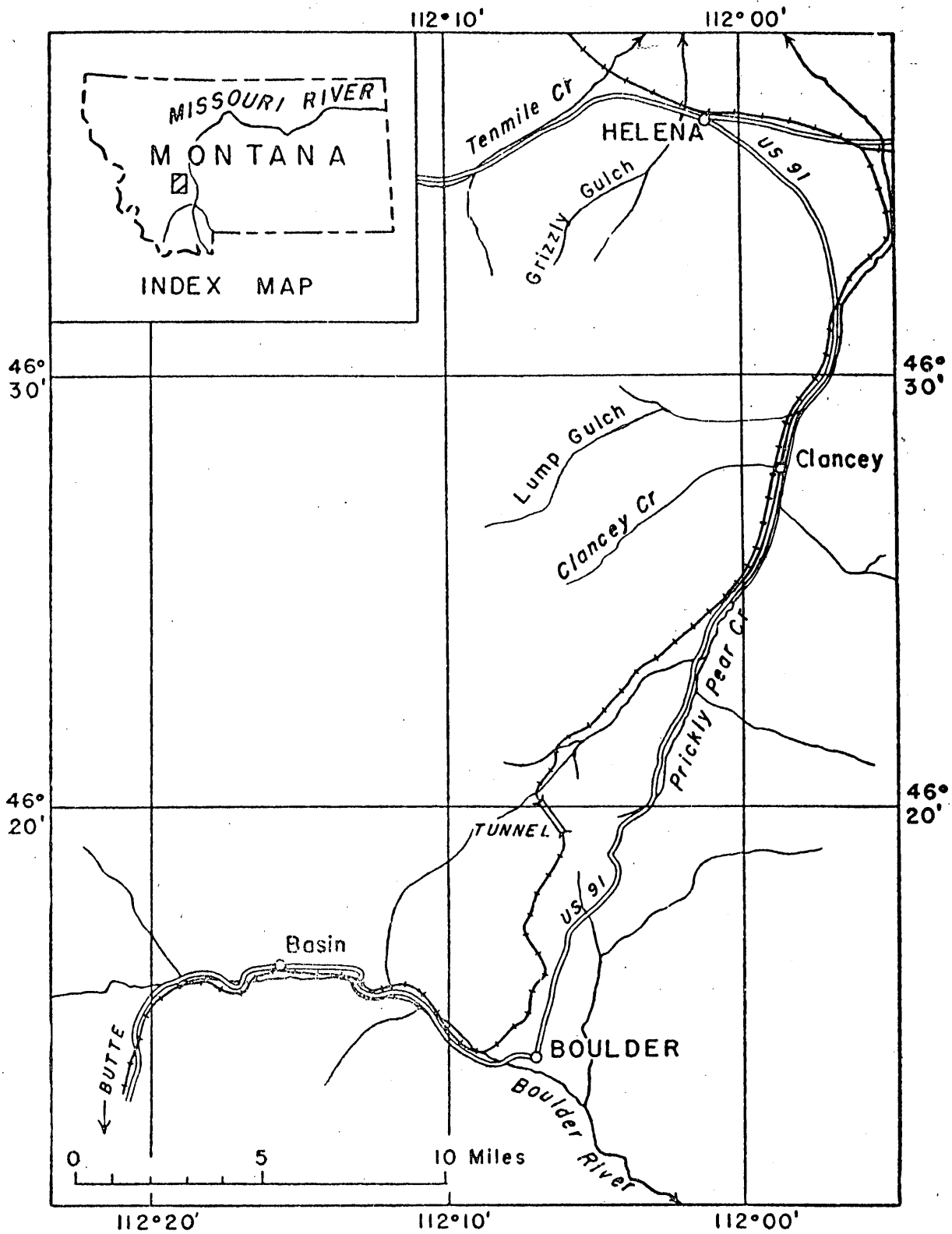

Index map showing area mapped near Clancey, Jefferson County, Mont.

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I. INTRODUCTION (Continued)

C. DESCRIPTION OF PROPERTY:

Quartz lode mining claims, situated in Jefferson County, Montana, described by name and survey number as follows:

Name	Survey No.
The BALTIMORE	1540
The SKIPPER	9690
The LAST HOPE	9689
The MINNIE	9689
The MONA	9689

All situated in Township 6 North, Range 4 West.

II. SUMMARY

The Baltimore mining property has the following favorable characteristics:

1. The past production was entirely in shipping grade ore. No concerted effort was made to recover the lower grade or mill ore and thus take advantage of the more modern low cost caving or open cut systems of mining. Only the so-called "cream" of the orebodies was removed.

2. The geological maps show a vein width in the No. 4 tunnel crosscut of approximately 100 feet. Samples taken on this level show a width of 17 feet averaging .9% lead, .7% copper, 4.8 oz. of silver, and 0.02 oz. gold, and side samples of probable ore remnants assaying 1.1% lead, 13% copper, 20.4 oz. silver and 0.03 oz. gold. This area should be tested by drilling for possible open pit mining. The 17 feet will gross at present metal prices $11.64 per ton.

3. The vein has not as yet been completely explored along its strike between the East and West ore shoots on and above the No. 4 tunnel where high grade ore has been mined previously.

4. The virgin ground between ore shoots on the upper levels and below the old workings may well be of mill grade with the high grade pockets and lenses of ore still intact.

5. The Hope tunnel has not as yet completely explored the possible downward extension of the east ore body.

6. No attempt has been made to explore the walls of the Baltimore vein with a view to mining wide widths of low grade material.

7. Among miners and old residents of the district familiar with the Baltimore the mine has the reputation of being a "Good Mine".

III. RECOMMENDATIONS

The sequence in which the apparent objectives in the rehabilitation of the Baltimore Mine should be undertaken is as follows:

1. Reclaim the lower or Hope tunnel and sample the exposed ore with a view to shipping by taking advantage of the low smelter rates for high silica ores. Development from this operation should be self-supporting.

2. The most recent large scale operation at the property was the driving of the Hope tunnel to explore the downward extension of the east orebody. It will be noted that approximately 130 feet of this extensive underground working explored only a part of the vein in the form of a partial crosscut. Quartz and vein matter are shown on both sides of this opening. Additional exploration normal to the vein both North and South is indicated. It is recommended that this be accomplished by long hole drilling. This should be followed by crosscuts indicated by the drilling.

3. The downward projection of the last orebody from the stopes above may follow the East fault and fall to the south of the present workings. A crosscut should be driven to the fault or to the rhyolite dike if a drill hole proves this contention.

4. The projection of the vein southwest has not as yet been explored. This development can best be accomplished by long hole drilling from the main crosscut tunnel, followed by drifting if indicated by the drilling. Several shipments of ore were made from this level of the mine. It is stated by miners of the area that this ore was approximately eight feet wide and assayed approximately .25 of an ounce in gold,

III. RECOMMENDATION (Continued)

9 oz. silver 1.5% copper and 2% lead to the ton.

5. A shallow winze will hole into the No. 1 tunnel from the proposed drift southwest. The west orebody in this tunnel can be explored by long hole drilling.

6. The 100' wide vein on the No. 4 tunnel should be tested by drilling for possible open pit mining.

7. Approximately 280 feet of the No. 4 tunnel should be reclaimed to the stoped area, then drill the walls of this area for possible wide bodies of low grade ore, drive a lateral from this area to the west face of the No. 4 tunnel, then drift westerly for 250 feet to explore the virgin ground between the east and west orebodies.

8. Bulldoze the surface across the strike of the vein both East and West of the present workings to explore extensions of the vein.

IV. HISTORY

A. PROPERTY UNDER EXAMINATION:

The Mona, Last Hope, Minnie and Maryland lodes were located during 1907 and 1914 by the Baltimore Copper Mining Company and were patented September 18, 1914. Mineral Survey Number 9690. The work reflected by the patent maps consisted of four discovery shafts, shaft and three cuts, four tunnels and one-half of the main working tunnel. The work was valued at $5,095.00. The claims comprised 77.894 acres.

The Skipper claim was located May 17, 1907, patented by Baltimore Copper Mining Company, September 4, 1914, Mineral Survey Number 9690, containing 20.526 acres. The value of the work was $2,432.50 for discovery cut, tunnel and one-fourth of a tunnel.

Mining of the veins of the Boulder Basin area, with one exception has been carried on to date, using the old square set and style systems to extract the ore. Only the richer, better grade material could be removed and shipped or treated at a profit. Mineralized wall rocks were left intact. Very little attempt was made to explore these vein walls for low grade material that could not be mined at a profit by the then standard systems of mining in vogue. In recent years new systems or methods of mining large tonnages have reduced the cost to a point whereby a much lower grade material can be mined at a profit. Wide widths of vein wall rocks formerly considered valueless can now be profitably extracted.

The Baltimore Mine with its "Wide stopes and veinlets and stringers spraying out into the adjoining country rock" as described in Geological Survey Bulletin 842 offers possibilities for such an operation.

V. GEOLOGY

A. REGIONAL GEOLOGY:

The Baltimore Mine occupies a small area in the Boulder Batholith. A huge mass of quartz monzonite intruded in early Tertiary time into the older rocks of the area. During its cooling stages the segregations and dikes of aplite and other minor rock phases conspicuous throughout the exposed parts of the Batholith were formed.

Fractures resulting from stress and strain set up in this colling igneous mass followed. These fractures became the channels for the escaping mineral bearing gases and solutions and deposition of the minerals in the fractures and their walls has formed the numerous early tertiary veins and lodes of this geological formation.

A period of quiet and erosion of the rocks followed. (Early Tertiary to middle Tertiary). In Miocene time a second period of igneous activity was initiated. Volcanos were in eruption and large areas of the surface were buried beneath thick flows of dacite and rhyolite. New fractures were formed and subsequently mineralized. Many of the older veins being weak phases of the rock mass were reopened and mineralized.

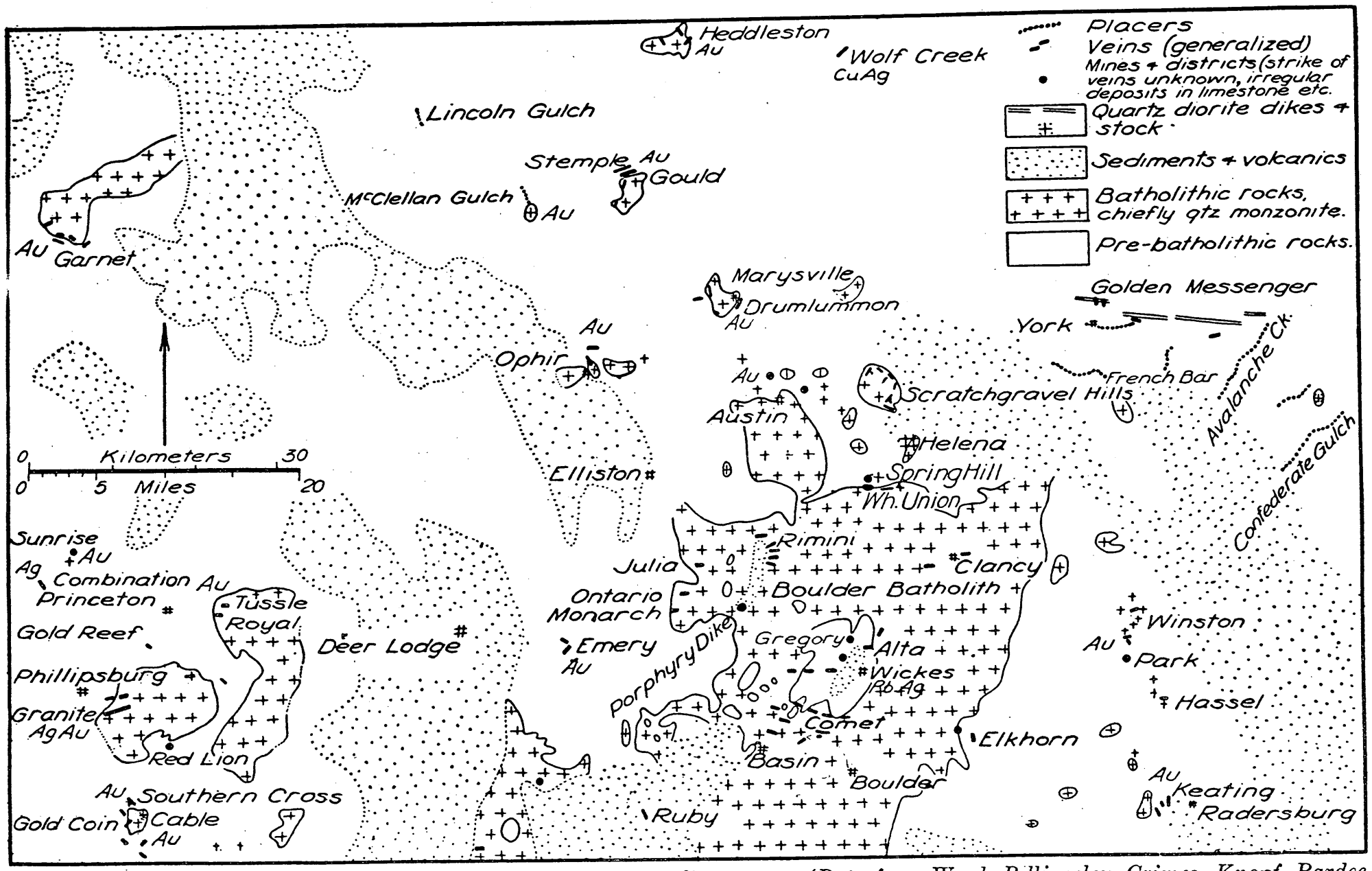

FIG. 92.—Map of north part of Boulder batholith and surrounding area. *(Data from Weed, Billingsley, Grimes, Knopf, Pardee, Schrader, Calkins, Stone, and others.)*

V. GEOLOGY (Continued)

B. LOCAL GEOLOGY:

Two periods of mineralization and probably the third, are present in the Baltimore lode. The second period with its lead, zinc, copper mineralization and the gold enrichment of the third. The barren coarsely crystalline quartz dumps at the property could represent the first or quartz pyrite period.

The Baltimore vein where exposed at the surface consists of bands of vuggy quartz with minor lead and fair silver values. The several bands or lenses of this material narrow to thin lenses at the surface. Directly below the surface the old workings become wider and at one place appeared to be in excess of fifty feet. The walls, where exposed, consist of altered and mineralized quartz monzonite of the Boulder Batholith. The extent of this alteration into the walls could not be determined. The vein appears to be made up in places of several parallel streaks or bands and in others a single band.

The vein is reported to be faulted on both ends. This statement refers to the east orebody only, as the west orebody beyond the west fault was subsequently discovered.

Only the shipping grade of ore was mined. Small stringers several inches wide, too narrow for economical mining, extend out into the walls from the old stopes.

The accompanying maps of the underground workings show two ore bodies. It will be noted that a section of vein approximately 200 feet long, between these two ore bodies has not as yet been explored. This section of the vein is in the upper high grade ore producing horizon

and could contain another ore shoot.

The east orebody is terminated by the North fault as is the rhyolite dike.

Geological Survey Bulletin 842, Metalliferous Deposits of the Greater Helena Mining Region, Montana, by J. T. Pardee and F. C. Schrader, pp. 292-293, is quoted on the Baltimore Mine as follows:

> "By far the most of a production of $325,000 from 1909 to 1928 reported in mineral resources for the Boulder District came from Baltimore Mine, of which the following description is condensed from the report by Knopf.
>
> At the Baltimore Mine 4-1/2 miles northwest of Boulder a small crew of men were employed during 1911. Two separate ore bodies have been exploited. The upper one is opened by tunnels 4, 5 and 6, the lower one by tunnels 1, 2 and 3. Tunnel 1 is the only one in which work was being done at the time of the visit. The general country rock is granite but the principal workings are in intrusive masses of aplite. Some porphyry dikes of andesitic character related to the dacites capping the granite have been encountered. The ore bodies that have been mined were short irregular veins with numerous branches but locally swelling to considerable dimensions. In Tunnel 5 there remains a large body of ore consisting mainly of black sphalerite in a white quartz gangue. Galena, pyrite and chalcopyrite are associated sulphides. This ore body was too zincy to work formerly and only the portions containing considerable lead were extracted. The ore body developed in the lower tunnels has been largely stoped out from above tunnel 2. In this tunnel the vein is about 130 feet long and is terminated at both ends by faults. The first 65 feet has been stoped out. The remainder of the vein consists of flinty gray and calcadonic quartz. In the winze between tunnels 2 and 1, 86 feet below, the vein stands vertical and ranges in width from 6 to 8 feet. The gangue is course white quartz, irregularly mingled with dark flinty quartz. Pyrite is the principal sulphide and sphalerite, galena and chalcopyrite occur in small amounts. The ore is said to contain $7.00 a ton in gold.

V. GEOLOGY (Continued)

B. LOCAL GEOLOGY (Continued)

According to Billingsley and Grimes, the Baltimore illustrates a structure called horsetail in the copper mines at Butte. Their map of the Baltimore Mine shows two groups of veins, one of which strikes about North 60 West and dips deeply north. The other strikes North 60 degrees to 80 degrees East and dips south. Each group includes one or more main veins from which many veinlets and stringlets spray out into the adjoining country rock. The northeastward trending load ends at a fault that lies along the footwall of the northwest lode. Both bodies are cut and slightly displaced by faults that strike North 40 to 60 degrees east."

V. GEOLOGY (Continued)

C. VEINS AND MINERALIZATION:

In general three periods or stages of mineralization are present in the veins of the area. A first and second stage in early Tertiary times associated with the batholith magma and the third stage in post Miocene time following the middle Tertiary volcanics. These three stages of mineralization are described by Dr. C. H. Clapp in his report on the Jib Mine at Basin, Montana as a quartz pyrtie stage, a galena, zinc, copper, silver stage and a gold silver stage. The quartz deposited in the first stage had a porcelain like texture, dry or bony in appearance resembling the quartz of pigmatites, probably the result of the high temperatures prevailing. Scattered pyrite in small bunches and grains occurred throughout this quartz.

As the magma cooled further the ore minerals of copper, zinc, lead and silvdr sulphides made their appearance. Gold was absent or minor in quantity. Copper sulphides in the Helena mining region consisted essentially of chalcopyrite, with minor amounts of borenite and tetrahedrite; galena and sphalerite account for most of the lead and zinc; silver is found with all three. Practically all the lead, silver, copper and zinc produced from the Boulder Batholith was deposited during this period of mineralization.

The greater part of the gold and much of the silver was deposited during the third period of mineralization. It is characterized by a secondary or crypto-crystaline quartz, some phases of which resemble opal or chalcedony. Lead, zinc and copper minerals are

practically absent. The ores of this period are very rich in gold and silver, at times bonanza in character. Early Tertiary veins where intersected by these middle to late Tertiary dikes are enriched in gold, usually only a few dollars per ton but occasionally to the extent of forming bonanza pockets of native gold.

The first period of deposition has characteristics of deposits of the deep vein zone; the second period those of deposits formed at shallow depths by hot ascending solutions.

The writer assisted Dr. Clapp in the field at the Jib Mine.

VI. EXPLORATION

All of the working on the Baltimore Claim, excepting the portal of the Hope tunnel is on the Last Hope claim.

The Baltimore claim has been developed in excess of 3,500' of drifts and crosscuts and in excess of 300 feet of raises and a 100' shaft from the surface.

VII. SAMPLES OF SHIPMENTS

BALTIMORE SMELTER SETTLEMENTS: (Every Tenth Lot for Period Shown)

Lot No.	Date	Shipper	AU Oz.	AG Oz.	PB %	Weight in lbs.	ZN %
1	3/27/89	Jessie Davidson	0.36	26.8	12.3	93218	
2	5/27/89	" "	0.32	25.1	11.0	56899	
3	8/ 2/89	" "	0.26	21.0	14.1	28157	
4	8/27/89	" "	0.30	13.9	13.2	41783	
5	9/26/89	" "	0.38	26.7	10.6	20736	
6	11/25/89	Archie McIntyre	0.48	38.3	6.7	5600	
7	6/12/00	Phil Unpher & Company	0.40	22.4	14.7	35398	
8	6/19/00	" " "	0.29	25.7	15.7	35721	
9	6/23/00	" " "	0.50	24.1	17.8	31100	
10	6/30/01	Austin & Pritchett	0.16	13.4	9.0	33986	
10	9/13/05	J. P. Walker	0.22	15.0	3.0	86406	
20	4/16/06	Moore & Gendle	0.11	27.1	7.1	38534	
25	6/21/07	Baltimore Mining & Dev. Co.	0.20	14.0	9.8	52226	
11	7/20/07	" " " "	0.11	10.9	5.1	65642	
17	9/25/07	" " " "	0.12	15.5	9.5	165549	21.0
18	10/ 5/07	" " " "	0.13	14.5	8.0	70737	18.9
10	3/ 7/12	C. Whitcomb	0.17	15.4	7.0	97593	1.0
14	3/26/12	" "	0.17	15.6	6.3	80649	1.6
13	3/26/12	" "	0.16	15.8	6.9	80974	2.0
15	3/11/18	" "	0.24	17.1	12.8	77993	2.3
16	7/10/13	Baltimore Copper Mines	0.16	21.6	7.7	51012	1.0
17	9/ 3/13	" " "	0.10	13.3	4.8	58543	3.9
18	9/10/13	" " "	0.11	13.6	5.6	46886	11.6
19	10/ 1/13	J. Matson	0.10	12.0	5.4	79687	11.0
29	5/ 2/14	Baltimore Copper Mines	0.10	25.1	9.3	125407	
39	7/ 7/14	" " "	0.14	24.0	7.0	74987	
49	9/29/14	" " "	0.08	22.2	4.0	98452	
59	5/ 4/14	" " "	0.09	19.7	5.4	107065	
69	5/13/16	Matson & Johnson	0.10	24.4	6.0	81973	
79	3/27/17	Matson Brothers	0.04	16.6	2.0	80045	1.6
89	3/29/19	Butte Copper Mng Company	0.09	24.3	3.8	83531	0.5
99	5/ 5/19	" " "	0.11	12.4	3.8	73992	

32

VIII. PHYSIOGRAPHY

A. TOPOGRAPHY AND DRAINAGE:

The general area is semi-mountainous.

Boomerang Creek with its V shape valley crosses the property in a north-south direction.

VIII. PHYSIOGRAPHY (Continued)

B. CLIMATE AND TIMBER:

Winters are severe respecting cold but snowfall is light. All winter operation is feasible. For instance, the Berkely open pit of the Anaconda Company is operated the year round at Butte under similar weather conditions.

Sufficient timber is on the claim to supply the mine with mine timbers.

February 1, 1958
David E. Loughman E.M.

IX. REPORT ON DAVID E. LOUGHRAN, E.M.

REPORT ON DAVID E. LOUGHRAN, E.M.

EDUCATION:

Degree of E.M. (Engineer of Mines), 1919, School of Mines, University of Montana, Butte, Montana

EXPERIENCE:

1914-1919

Student, School of Mines
Practical miner and sampler; summer and part time.
Anaconda Copper Mining Company, Butte, Montana.

1919-1920

Mine foreman
Goldsmith Mine, Butte, Montana

1920-1922

Mine Superintendent, Corbin Copper Co., and Alta Consolidated Mining Company, Wicks, Montana

1922-1923

Mine Superintendent, Timoblack Mining Co.
Butte, Montana
Mining Engineer, Champion Mine
Race Track, Montana

1923-1925

Mining Engineer and shift boss, mill man,
Jib Consolidated Mining Co., Basin, Montana

1925-1926

Superintendent of Mines, Anaconda Copper Mining Company, Rico, Colorado

1926-1931

Geologist, Anaconda Copper Mining Company,
Salt Lake City, Utah

1931-1933

President and General Manager, Sacramento Gold and Quicksilver Mining Company, Mercur, Utah

1933-1934

Superintendent and part owner, Midas Gold Mining Company, Atlantic City, Wyoming

1934-1936

Tunnel inspector and Labor Foreman, Fort Peck Dam, Montana, Corps of Engineers.

1936-1939

General Foreman, Snake Butte Quarry, Harlem, Montana, Corps of Engineers

1939-1942

Engineering Geologist, Chief Geologist, Tulsa District, Corps of Engineers, Tulsa, Oklahoma

1942-1946

Captain and Major, U. S. Army

1946-1956

Engineering Geologist, Chief Geologist, Tulsa District; Chief Foundation Section, Detroit Dam and The Dalles Dam, Oregon, Corps of Engineers

SUMMARY:

Experience includes mine examinations; mine supervision, and management; mill construction and operation; foundation studies for large structures; geology, mining methods; mine surveying and sampling; core boring; mining and excavation equipment.

REFERENCES:

Mr. Tom Lyon
International Smelting Company
Salt Lake City, Utah

Mr. Harold Stuart
Geologist, North Pacific Division
Corps of Engineers
Portland, Oregon

Mr. Lloyd Ruff
Chief Geologist, Portland District
Corps of Engineers
Portland, Oregon

Mr. John Templeman, C.E.
Chief, Construction Division
Portland District Corps of Engineers
Portland, Oregon

Mr. Roy Clark, C.E.
Special Assistant to the District Engineer
Portland District Corps of Engineers
Portland, Oregon

MME Form 40
Dec. 1958

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

Budget Bureau No. 42-R1368
Approval expires Dec. 31, 1963

MAY 4 1959 OME

APPLICATION FOR FINANCIAL ASSISTANCE IN MINERALS EXPLORATION

Pursuant to Public Law 85-701 (72 Stat. 700; 30 U.S.C. 641)

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

Baltimore Syndicate, Ltd.
c/o Clifford M. Wagner, M. D., General partner
Heppner, Oregon
Box 755

RECEIVED
APR 27 1959
U. S. G. S.
SPOKANE, WASH.

APPLICANT DO NOT USE THIS BLOCK

DOCKET NUMBER: 6045

DATE RECEIVED: 5-4-59

REGION: I

DIVISION CODE: 500

BUSINESS ORGANIZATION *(Check one)*

- INDIVIDUAL [ ]
- CORPORATION [ ]
- PARTNERSHIP [X]
- OTHER *(Specify)* [ ]

STATE IN WHICH FIRM IS ORGANIZED: Montana

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

NAME	ADDRESS	TITLE
C. M. Wagner, M. D.	box 755, Heppner, Oregon	general partner
Arthur Dalzell	Ione, Oregon	limited partner
Orval Cutsforth	Lexington, Oregon	" "
Clarence Warren	Heppner, Oregon	" "
Dr. Walter L. Stilson	4300 las Fores Blvd. Lynwood, California	" "

MINERAL(S) FOR WHICH YOU WISH TO EXPLORE: Copper, lead, and silver

ESTIMATED COST OF PROJECT: $ 32,020.75

PROPERTY NAME	LOCATION COUNTY	STATE
Baltimore Mine	Jefferson Co.,	Montana

GENERAL INSTRUCTIONS

Before filling out this application, please read the *OME Regulations for Obtaining Federal Assistance in Financing Explorations for Mineral Reserves* (30 CFR Chap. III). To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit four copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 2, existing mine workings and geology in item 3, and the proposed exploration work in item 5. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 3(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals*, of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Office of Minerals Exploration, Department of the Interior, Washington 25, D. C., or with the nearest OME Field Office.*

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief, and that he would not ordinarily undertake the proposed exploration under current conditions and circumstances at his sole expense.

April 20 1959
DATED

C. M. Wagner, M. D.
BY (Signature)

General Partner
TITLE

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

INFORMATION REQUIRED WITH THIS APPLICATION

1. Financial Eligibility:

(a) Submit evidence of efforts made within 90 days preceding the filing of this application to obtain credit from your bank of account and at least one other banking institution or other private source of credit. Such evidence shall include true copies of correspondence which show: (1) date of loan request, (2) amount and terms requested, (3) proposed use of loan funds, and (4) the replies from credit sources. If the loan was offered under terms which you consider unreasonable, state why you consider them so.

(b) List names and addresses of affiliated, parent, or controlling companies or organizations and state extent and nature of their interest.

(c) State how you propose to furnish your share of the exploration [redacted] cost.

2. Applicant's Rights in Land:

(a) State your interest in the land and mineral rights, whether owner, lessee, purchaser under contract, or other. If you are not the owner, submit one true copy of the lease, contract, or other document (with address of owner) under which you control the property. Describe all liens, mortgages, or other encumbrances on the land and state book and page number and official place where recorded.

(b) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore and all adjacent land which you own or control. Describe any part of the land or workings which should not be subject to Government royalty and liens. If the land consists of unpatented claims, state book and page number for each recorded location notice, including amended locations, and official place where recorded. State all the names by which you know the property.

(c) For all land or mineral rights encumbered or not owned, submit five copies of Lien and Subordination Agreements on MME Form 52. If the agreements cannot be obtained, state reasons and provide copies of letters of refusal.

3. Physical Description:

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

(b) State your interest, if any, in operations described in (a).

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

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

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

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

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

4. Accessibility of Property:

(a) To aid the OME representative who may examine the property, state name and address of person who will meet him; give directions for reaching the property; and describe accessibility of property and of any mine workings.

(b) Name the shipping and supply points and state the distances to the property.

5. Exploration Work:

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

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

(c) If an OME contract is executed, state how soon thereafter work would be started and finished. State your anticipated average daily or monthly rate of progress for each type of work.

6. Experience:

State your operating experience and background to conduct this exploration work and also that of the person who will supervise the work.

7. Estimate of Costs:

Furnish detailed estimates of the necessary costs *for each item of the work proposed in 5(a)* under the headings listed below with a total for each heading and the estimated total cost of the work. Costs for any work to be performed by an independent contractor should be listed separately under category (a) below. Costs for any work that is not to be performed by an independent contractor should be listed under categories (b) through (g).

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

(b) Personal services. The cost of supervision, engineering and geological services, outside consultants, and labor should be itemized by numbers and classes of employees; rates of wages, salaries or fees; and periods of employment. State whether these services are available.

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

(d) Operating equipment. List items of equipment and tools costing $50 or more per unit. Give specifications and indicate how each item is to be acquired—i.e., rented, purchased or provided by the applicant. If rented or purchased, state the estimated rental or purchase price. If furnished by the applicant, state condition and present fair market value.

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

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

(g) Miscellaneous. Describe the type and estimate the cost of repairs and maintenance of the operating equipment listed in 7(d). Do not repeat initial repairs listed in 7(e). Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories. [*Note*—The Government will not contribute to costs incurred before the date of the contract, or to costs of or incident to: (1) acquiring, using, or possessing land and any existing improvements, facilities, buildings, installations, and appurtenances, or the depreciation and depletion thereof; (2) general overhead, corporate management, interest and taxes (other than payroll and sales taxes); (3) insurance (other than employees' liability insurance); and (4) damages to persons or property (other than authorized repair to or replacement of equipment or other property used in the work).]

INT.-DUP. SEC., WASH., D.C. 48780

1. FINANCIAL ELIGIBILITY

(a) True copies of loan refusal are enclosed.

(b) Not applicable

(c) The Baltimore Syndicate will provide fifty percent of the required funds

2. APPLICANT'S RIGHTS IN LAND:

(a) Applicant's rights to land consists of a lease with option to purchase, (copy submitted herewith.)

There are no liens, mortgages or other encumberances.

(b) Claims on which exploration is planned are as follows:

Name	Survey Number
The Baltimore	1540
The Last Hope	9689

Adjacent land controlled:

The Skipper	9690
The Minnie	9689
The Mona	9689

The above claims are patented and all situated in Sec. 7, T. 6N. R. 4W., Jefferson County, Montana and are known locally as The Baltimore mine.

(c) Land and Mineral Rights encumbered or not owned:

Five MME Form 52's enclosed

3. PHYSICAL DESCRIPTION

(a) There are no operations being conducted at this time. Present Lease Holders reclaimed the Hope Tunnel in February and March 1958. The Baltimore claim has been developed in excess of 3500 feet of drifts and crosscuts, 300 feet of raises and winzes and a shaft approximately 100 feet in debth as shown on the mine maps. (See geological report). There are no production facilities.

(b) The Baltimore Syndicate contracted and financed the reopening of the Hope Tunnel and a short access road in 1958. The cost of these contracts was $2,250.00.

BALTIMORE SYNDICATE LTD.
c/o Dr. D. M. Wagner
Heppner, Oregon

3. Physical Description (cont'd)

(c) Past and Current production:

Geological Survey Bulletin 842, Metalliferous Deposits of the Greater Helena Mining Region, Montana by A. T. Pardee & F. C. Schrader, pp. 292-293 is quoted on the Baltimore Mine as follows:

"By far the most of a production of $325,000.00 from 1909 to 1928 reported in Mineral Resources for the Boulder District came from the Baltimore Mine."

Smelter returns for every tenth lot from March 1889 to May 1919 follow:

SAMPLES OF SHIPMENTS

BALTIMORE SMELTER SETTLEMENTS: (Every Tenth Lot for Period Shown)

Lot No.	Date	Shipper	AU Oz.	AG Oz.	PB %	Weight in lbs.	ZN %
1	3/27/89	Jessie Davidson	0.36	26.8	12.3	93218	
2	5/27/89	" "	0.32	25.1	11.0	56899	
3	8/2/89	" "	0.26	21.0	14.1	28157	
4	8/27/89	" "	0.30	13.9	13.2	41783	
5	9/26/89	" "	0.38	26.7	10.6	20736	
6	11/25/89	Archie McIntyre	0.48	38.3	6.7	5600	
7	6/12/00	Phil Unpher & Company	0.40	22.4	14.7	35398	
8	6/19/00	" " "	0.29	25.7	15.7	35721	
9	6/23/00	" " "	0.50	24.1	17.8	31100	
10	6/30/01	Austin & Pritchett	0.16	13.4	9.0	33986	
10	9/13/05	J. P. Walker	0.22	15.0	3.0	86406	
20	4/16/06	Moore & Gendle	0.11	27.1	7.1	38534	
25	6/21/07	Baltimore Mining & Dev. Co.	0.20	14.0	9.8	52226	
11	7/20/07	" " " "	0.11	10.9	5.1	65642	
17	9/25/07	" " " "	0.12	15.5	9.5	166549	21.0
18	10/5/07	" " " "	0.13	14.5	8.0	70737	18.9
10	3/7/12	C. Whitcomb	0.17	15.4	7.0	97593	1.0
14	3/26/12	" "	0.17	15.6	6.3	80649	1.6
13	3/26/12	" "	0.16	15.8	6.9	80974	2.0
15	3/11/18	" "	0.24	17.1	12.8	77993	2.3
16	7/10/13	Baltimore Copper Mines	0.16	21.6	7.7	51012	1.0
17	9/3/13	" " "	0.10	13.3	4.8	58543	3.9
18	9/10/13	" " "	0.11	13.6	5.6	46886	11.6
19	10/1/13	J. Matson	0.10	12.0	5.4	79687	11.0
29	5/2/14	Baltimore Copper Mines	0.10	25.1	9.3	125407	
39	7/7/14	" " "	0.14	24.0	7.0	74987	
49	9/29/14	" " "	0.08	22.2	4.0	98452	
59	5/4/14	" " "	0.09	19.7	5.4	107065	
69	5/13/16	Matson & Johnson	0.10	24.4	6.0	81973	
79	3/27/17	Matson Brothers	0.04	16.6	2.0	80045	1.6
89	3/29/19	Butte Copper Mng Company	0.09	24.3	3.8	83531	0.5
99	5/5/19	" " " "	0.11	12.4	3.8	73992	

3. Physical Description (cont'd)

(d) Ore Reserves.

There are no known ore reserves.

(e) The ore occurs in veins. The country rock consists of aplite and quarts-monzonite cut by rhyolite dikes. The ore minerals are galena, sphalerite and chalcopyrite with associated gold and silver.

Geological Survey Bulletin 842, Metalliferous Desposits of the Greater Helena Mining Region, Montana, by J. T. Pardee and F. C. Schrader, pp. 292-293, is quoted on the Baltimore Mine as follows:

"By far the most of a production of $325,000 from 1909 to 1928 reported in mineral resources for the Boulder District came from Baltimore Mine, of which the following description is condensed from the report by Knopf.

At the Baltimore Mine 4-1/2 miles northwest of Boulder a small crew of men were employed during 1911. Two separate ore bodies have been exploited. The upper one is opened by tunnels 4, 5 and 6, the lower one by tunnels 1, 2 and 3. Tunnel 1 is the only one in which work was being done at the time of the visit. The general country rock is granite but the principal workings are in intrusive masses of aplite. Some porphyry dikes of andesitic character related to the dacites capping the granite have been encountered. The ore bodies that have been mined were short irregular veins with numerous branches but locally swelling to considerable dimensions. In Tunnel 5 there remains a large body of ore consisting mainly of black sphalerite in a white quartz gangue. Galena, pyrite and chalcopyrite are associated sulphides. This ore body was too zincy to work formerly and only the portions containing considerable lead were extracted. The ore body developed in the lower tunnels has been largely stoped out from above tunnel 2. In this tunnel the vein is about 130 feet long and is terminated at both ends by faults. The first 65 feet has been stoped out. The remainder of the vein consists of flinty gray and calcadonic quartz. In the winze between tunnels 2 and 1, 86 feet below, the vein stands vertical and ranges in width from 6 to 8 feet. The gangue is course white quartz, irregularly mingled with dark flinty quartz. Pyrite is the principal sulphide and sphalerite, galena and chalcopyrite occur in small amounts. The ore is said to contain $7.00 a ton in gold.

According to Billingsley and Grimes, the Baltimore illustrates a structure called horsetail in the copper mines at Butte. Their map of the Baltimore Mine shows two groups of veins, one of which strikes about North 60 West and dips deeply north. The other strikes North 60 degrees to 80 degrees East and dips south. Each group includes one or more main veins from which many veinlets and stringlets spray out into the adjoining country rock. The northeastward trending load ends at a fault that lies along the footwall of the northwest lode. Both bodies are cut and slightly displaced by faults that strike North 40 to 60 degrees east."

BALTIMORE SYNDICATE LTD.
c/o Dr. C. M. Wagner
Heppner, Oregon

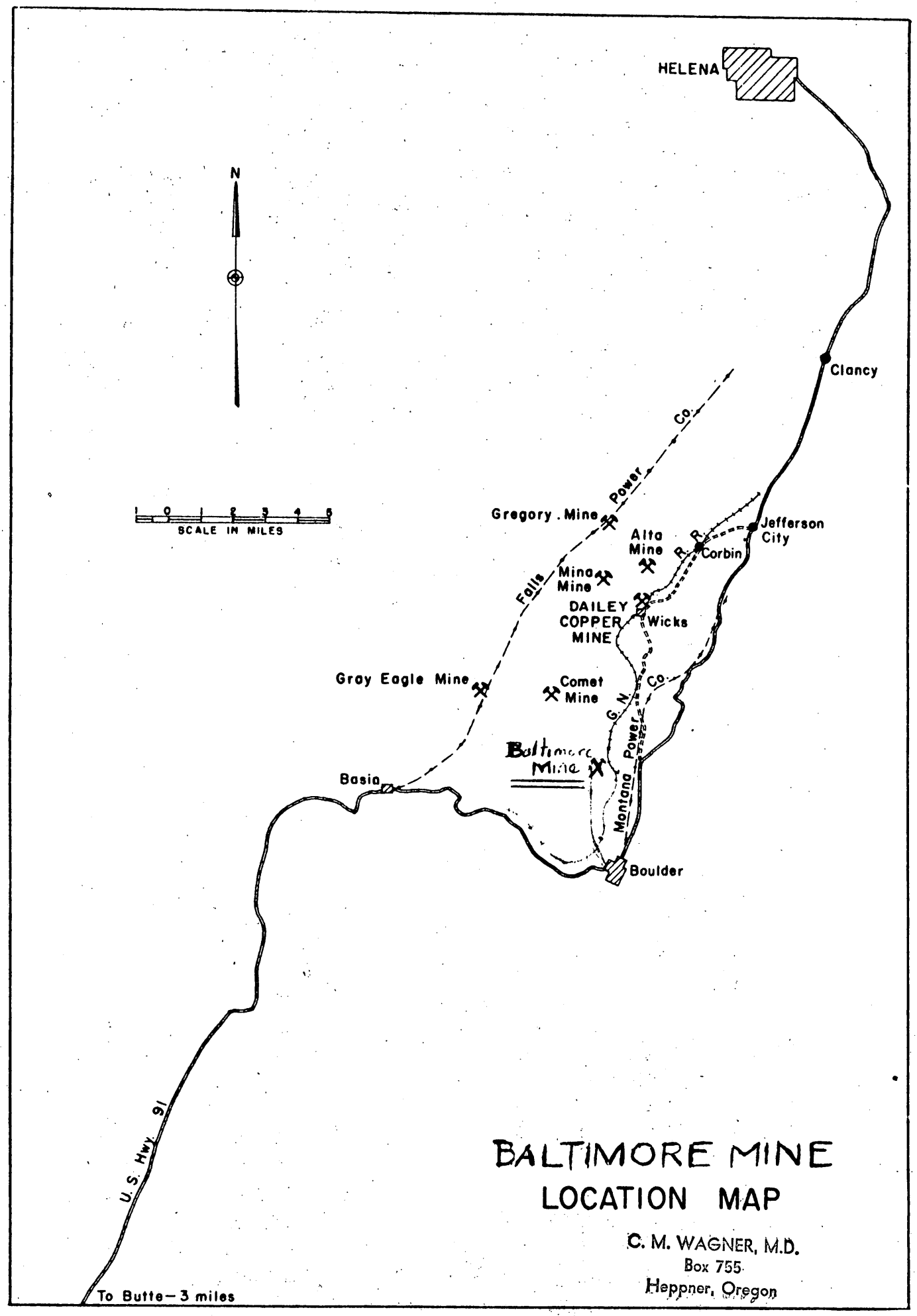
HELENA
N
Clancy
Falls Power Co.
Gregory Mine
Alta Mine
Jefferson City
Corbin
Mina Mine
DAILEY COPPER MINE
Wicks
Gray Eagle Mine
Comet Mine
G. N. Co.
Montana Power
Baltimore Mine
Basia
Boulder
U.S. Hwy. 91
To Butte—3 miles
1 0 1 2 3 4 5
SCALE IN MILES
BALTIMORE MINE
LOCATION MAP
C. M. WAGNER, M.D.
Box 755
Heppner, Oregon

PLATE I

EXTRA COPY
O. M. E.
RECEIVED MAY 4 1959

DATE	INITIALS	CODE

3. Physical Description (cont'd)

(f) Reasons for expecting to find ore.

Reasons for expecting to find ore are as follows:

There is no record of the mining of the zinc ore body referred to in Bulletin 842 U.S.G.S., pp. 292-293, either written or by "word of mouth". This ore should still be in place in tunnel No. 5.

The downward extension of the East ore body has not as yet been prospected in the Hope Tunnel.

The virgin ground between the East and West ore shoots has not been explored.

In opening the Hope Tunnel in 1958, it was learned that approximately 100 feet of the vein below the east orebody has been explored. Here it consists of approximately ten feet of quartz with patches and stringers of chalchopyrite and occasional spots of galena. The richer parts were stoped up for about twenty feet and inaccessible for sampling. Three samples, taken in June 1958 across the back where accessible, grossed $15.89 in copper, gold & Silver. (Dr. Wagner's letter)

(g) Two copies of a geological report with maps of the old workings are enclosed.

4. ACCESSIBILITY OF PROPERTY:

(a) Name and address of person to contact is:

Mr. Louis Peura
1124 Sixth Avenue
Helena, Montana

The property is reached as follows: Take road from Boulder, Montana to Great Northern Ry. Depot. After crossing railroad tracks, continue up the hill to the Free Enterprise Health Mine. Continue upgrade on right hand fork for approximately 2.5 miles. Cross Boomerang Gulch Creek and continue on West side of gulch, 5 miles to mine. Workings are on the East slope of Boomerang Gulch. The Hope Tunnel is open to the face. Old stopes can be viewed from the surface.

(b) Anaconda Smelter (Copper) is 52 miles and the East Helena Smelter (lead) 25 miles from the railway loading point. The loading point is approximately three miles from the mine.

Supplies can be obtained from Butte and Helena, 38 miles and 28 miles respectively from Boulder, Montana. Skilled miners are available locally.

BALTIMORE SYNDICATE LTD.
c/o Dr. O. M. Wagner
Heppner, Oregon

5. EXPLORATION WORK:

(a) The following work is contemplated.

(1) Hope Tunnel

a. Install rails and complete cleanup to face. Approximately 1100 feet.
b. Drive 5' x 7' drift southwest on vein exposed in east end of tunnel (See map of Hope Tunnel)
c. Raise on ore in above vein to No. 4 level. Raise 5' x 10' - 183 feet.
d. Complete long-hole drilling and diamond drilling as shown on map of Hope Tunnel Level and on the surface as follows:

LONG HOLE DRILLING

Hole No.	Depth in feet
1	75
2	40
3	80
4	50
5	50
6	50
7	50
8	50
9	50
Total	495

DIAMOND DRILLING

Hole No.	Depth in feet
1	225
2	140
3	140
Total	505

(2) Unexplored Section of vein between the East and West orebodies.

a. Reclaim the No. 3 tunnel level, elevation 5156, to east face of drift comprising 60 feet of crosscut and 80 feet of drift.

b. Drift easterly on vein to workings of the East orebody, approximately 225 feet. The waste from this operation can be dumped in old open stopes. This drift should be 5 x 7 feet. Mucking can be accomplished with a slusher.

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c/o Dr. O. M. Wagner
Heppner, Oregon

5. Exploration work (cont'd)

(b) No access road required.

(c) The work will be started within 30 days from date contract is executed and completed within 12 months.

The following table shows type of work and anticipated progress:

Type of Work	Anticipated Daily or Monthly Progress in feet
Drifts or crosscuts	100
Drift rehabilitation	150
Raises	75
Diamond drilling (Daily)	20
Longhole drilling (Daily)	50

6. EXPERIENCE:

Two members of the Baltimore group have had mining experience, Mr. Louis Peura of Helena Montana and Mr. D.E. Loughran of Portland, Oregon. Mr. Peura has been engaged in mining operations in the Boulder Basin area for 18 years part of which time was spent at the Baltimore Mine. Mr. Loughran's experience record is included herein.

Mr. Peura will supervise the work.

7. ESTIMATED COSTS

(a) Independent Contracts

Hope Tunnel Level

Install pipe and rail @ $1.50 per foot - 1100 feet	1650.00
Drifting - 100 feet @ 30.00 per foot	3000.00
Raising - 138 feet @ 40.00 per foot	5520.00
Longhole drilling 195 feet @ $1.25	233.75
Diamond drilling 225 feet @ $6.50 (Ex)	1462.00

Exploring Virgin section of vein between the East and West Orebodies:

Drift & Crosscut rehabilitation @ $24 per foot - 140 feet	3360.00
Drifting 225 feet @ $30 per foot	6750.00
Timbering drifts and crosscuts - 100 ft. @ $8.00 per foot	800.00
280 feet diamond drilling (Ex) 6.50	1820.00
Longhole drilling 300 feet @ $1.25 per foot	375.00
100 samples assayed @ 3.50 per sample	350.00

7. Estimated Costs (continued)

(a) Independent Contracts - cont'd

32 Core boxes @ $5.00 per box	160.00
Cementing & redrilling or reaming & coring 48 hours @ 9.00 per hour	432.00
Mobilization & demobilization	50.00

(b) Personal Services

Supervision - one @ $500.00 per month - 12 months	6000.00
Engineering & Geology 20 days @ 75.00 per day	1500.00

The above personnel are available.

(c) Operating Material & Supplies
Included in unit costs

(d) Operating Equipment
Included in unit costs

(e) Initial rehabilitation

One 16' x 24' building - roofing, siding, doors & Windows	500.00

(f) New buildings, fixtures, installations - none

(g) Miscellaneous

Workmens Compensation & Employees Liability Insurance	700.00

DESCRIPTION	Feet	Cost
Drifts & Crosscuts	325 @ $30.00	9750.00
Drift & Crosscut rehabilitation	140 @ $24.00	3360.00
Longhole drilling	495 @ $1.25	608.75
Diamond drilling (Ex)	225 @ $6.50	3282.00
Raises	138 @ $40.00	3360.00
Install Rail	1100 @ 1.50	1650.00
Timbering	100 @ $8.00	800.00
Samples	100 @ $3.50	350.00
Core boxes	16 @ $5.00	160.00
Personnel Services	2	7500.00
Buildings		500.00
Insurance, etc.		700.00
	Total	32,020.75

OME 6045

UNITED STATES

DEPARTMENT OF THE INTERIOR

OFFICE OF MINERALS EXPLORATION

REGION I

FINAL REPORT

Contract No. 2102

by

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

R. D. Sample
Geologist
U. S. Geological Survey

THE BALTIMORE SYNDICATE, LTD.
P.O. Box 755
Heppner, Oregon

Docket No.:	OME-6045
Commodity:	Lead-Zinc-Copper
Contract date:	July 27, 1959
Termination date:	March 24, 1960

BALTIMORE SYNDICATE, LTD.
Baltimore Mine
Jefferson County, Montana

Spokane, Washington

October 1960

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Summary	1
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THE PROJECT	3
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ILLUSTRATIONS

Plate 1.	Location map	In pocket
2.	Claim map showing sketch of underground workings and diamond drill holes	In pocket
3.	Geologic and assay map -- No. 1 and Hope Tunnel levels	In pocket

FINAL REPORT

THE BALTIMORE SYNDICATE, LTD.
Baltimore Mine
Boulder Mining District
Jefferson County, Montana

Contract No. 2102

* * * *

INTRODUCTION

This report describes an exploration project for lead-zinc-copper ore at the Baltimore mine in Jefferson County, Montana. The project was conducted jointly by the Office of Minerals Exploration and the Baltimore Syndicate, Ltd., a limited partnership.

Summary

The purpose of the project, which was set up in two stages, was to explore for new ore bodies or the downward extension of known ore bodies, believed to have been offset by faulting, by rehabilitating existing workings, diamond drilling, crosscutting, and drifting.

Work was started early in August 1959 and was completed by early March 1960. Work completed under the contract included rehabilitation of the Hope Tunnel, excavation of 2 diamond drill stations, 1,200 feet of diamond drilling, construction of 28 core boxes and making 22 assay determinations. The total cost of the project, subject to audit, was $8,994, of which the Government's share was 50 percent or $4,497.

Although zones of metallization were encountered in each of the diamond drill holes, the grade of the material was discouragingly low in each case. Continued exploration by crosscutting and drifting was not warranted, and upon the completion of Stage I, the Operator was advised that work under Stage II would not be authorized.

Recommendations

The project was not successful in discovering additional ore and it is recommended that no Certification of Discovery or Development be made.

PROPERTY

The property included in the project comprises the following five patented claims:

Name	Survey No.
Baltimore	1540
Last Hope	9689
Skipper	9690
Minnie	9689
Mona	9689

The claims are situated in sec. 7, T. 6 N., R. 4 W., Jefferson County, Montana, and may be reached by following for 3 miles a good dirt road which leaves U. S. Highway 91 northwesterly from the town of Boulder (pls. 1 and 2).

GEOLOGY

Regional Geology

One of the earliest geological studies made of the region was by J. T. Pardee and F. C. Schrader during the years 1926-1928, inclusive. The results of their work were published in "Metalliferous Deposits of the Greater Helena Mining Region Montana," U. S. Geological Survey Bulletin 842, 1933. They define the Basin and Boulder districts as that area drained by Boomerang, High Ore, Cataract, Basin Lowland, and other creeks tributary to the Boulder River (pl. 1). Both these districts are underlain chiefly by the quartz monzonite of the Boulder batholith of Late Cretaceous age and overlain unconformably by Tertiary volcanics. The monzonite is intrusive into the Elkhorn Mountain volcanics (upper Cretaceous). Both of these formations in turn are cut by dikes of dacite and rhyolite. The formations are all acidic and all have essentially the same composition. In places it is difficult to distinguish between the different rock formations.

The Boulder batholith has been the subject of a recent detailed study by U. S. Geological Survey geologists (Becraft, G. E., Pinckney, D. M., and Rosenblum, S., 1957, Geology and Mineral Deposits of the Jefferson City quadrangle, Montana: Unpublished preliminary manuscript, U. S. Geological Survey). In this report an attempt was made to subdivide the rocks of the Boulder batholith into various groups based mainly on textural and color differences. The Boulder batholith in the Basin and Boulder districts was mapped as (1) undivided quartz monzonite and granodiorite, and (2) medium-grained, light-gray quartz monzonite and granodiorite with a distinct reddish tint. Both of these rock types form part of the Main Stage of the batholith. In addition, they have mapped several small dikes or blebs of Alaskite from the Late Stage of the batholith, and several patches of Pleistocene glacial material.

Local Geology

The small area occupied by the Baltimore mine workings lies wholly in the undivided quartz monzonite and granodiorite which have been intruded by quartz aplite dikes, and by massive quartz veins and stringers (pl. 3). Much of the quartz monzonite is highly altered into soft claylike material. The quartz veins are irregular and pinch and swell within short distances. They usually are iron stained and contain flecks of iron and lead sulfides.

Mineralization appears to be in two separate ore bodies. The upper one is opened by Tunnels 4, 5, and 6 and the Hope Tunnel; the lower one by Tunnels 1, 2, and 3. All the openings are caved and closed except the No. 2 and Hope Tunnels (pl. 2). The Baltimore mine shows two groups of veins, one of which strikes about N. 60° W. and dips steeply north; the other strikes about N. 60°-80° E. and dips south. Each group includes one or more main veins from which many veinlets and stringers "horsetail" into the adjoining country rock.

THE PROJECT

According to Pardee and Schrader (1933), most of the production, valued at $325,000, reported from the Boulder district from 1909 to 1928 came from the Baltimore mine. Smelter settlements of every tenth lot of ore shipped, representing about 1,080 tons, indicate that the ore had an average grade of approximately 0.197 ounce gold and 19.01 ounces silver per ton, 8.3 percent lead, and 6.37 percent zinc. The project was based upon this impressive production from two known ore bodies and upon the belief that, because of complex faulting and shearing within these ore bodies, new ore bodies of similar grade or the downward extension of those already known, might be found.

An application for DMEA assistance was received April 27, 1959, in which it was proposed to explore the ground between the Middle and East faults by two diamond drill holes and to explore a known ore shoot by a drift and raise, all from the Hope Tunnel. The cost of this program was estimated by the applicant to be $32,020.75.

A modified two-stage program to explore the ground between the faults was agreed upon and a contract effective as of July 27, 1959, was executed. The total estimated cost provided for in the contract was $22,930, of which the Government's share was 50 percent.

Stage I provided for rehabilitation of the Hope Tunnel, repair of the existing compressor house, excavation of two diamond drill stations, and diamond drilling of 6 holes having a combined depth of 1,200 feet. Provision was also made for core boxes, assaying, engineering, etc. The estimated total cost of Stage I was $10,030.

Stage II, which was dependent upon the results of Stage I, provided for 400 feet of crosscutting and drifting, 100 feet of timbering, and assaying at a total estimated cost of $12,900. This stage was not started.

Rehabilitation of the Hope Tunnel was completed by September 10, 1959. By September 25, the drill station about 600 feet from the tunnel was completed. From an existing crosscut about 290 feet east of the station a flat drill hole had been started to the southeast (pl. 3). This hole, No. 1, was drilled to a depth of 205 feet at a bearing of S. 45° E. The hole started in quartz and at a depth of 42 feet entered quartz-monzonite. Two weakly mineralized zones were cut, one from about 11 to 15 feet from the hole collar, the other from about 35 to 40 feet from the collar. Assay of a sample from the first zone indicated a trace gold and 0.2 ounce silver per ton, no lead, and a trace copper; over a width of 4 feet 10 inches, one from the second zone indicated 0.005 ounce gold and 0.5 ounce silver per ton, 0.2 percent lead, and trace copper.

From the drill station about 600 feet from the tunnel portal Holes 2, 3, and 4, all in quartz-monzonite, were drilled as follows:

Hole No.	Inclination	Bearing	Depth (feet)
2	flat	S. 58° E.	207
3	-30°	S. 23° E.	200
4	flat	S. 8° W.	198

Hole 2 cut sparsely mineralized sections from about 27.5 to 28.9 feet, 156 to 161.5 feet, and 165.5 to 168.0 feet. Assays of samples from the two latter zones showed them to contain, respectively, 0.02 ounce gold and 0.4 ounce silver per ton, no lead, and a trace copper over a width of 6 feet 2 inches, and 0.02 ounce gold and 8.8 ounces silver per ton, 0.2 percent lead and 0.8 percent copper over a width of 3 feet 9 inches.

Hole 3 cut a sparsely mineralized section from 21.6 to 26.6 feet, and Hole 4 cut a similar zone from 17 to 20 feet. Assays of two samples taken in the latter zone indicated respectively 0.11 ounce gold and 4.1 ounces silver per ton, 0.2 percent lead and 1.0 copper over a width of 1 foot 5 inches and 0.09 ounce gold and 3.9 ounces silver per ton (not assayed for lead and copper) over a width of 1 foot 3 inches.

Hole 5 was drilled from a station cut about 151 feet east of Hole 2, at an inclination of -30° and a bearing of S. 35° E. It was drilled to a depth of 196 feet in quartz-monzonite and cut three weakly mineralized zones. Mineralization was so weak that no samples were taken.

Hole 6 was drilled from the northeasterly end of the tunnel at an inclination of -30° and a bearing of N. 64° E. It was drilled to a depth of 159 feet 10 inches in quartz-monzonite. No mineralization worth sampling was encountered.

Summary of Factual Data

Work completed under the contract on an actual and unit cost basis is as follows:

Item	Units authorized	Units completed	Unit cost	Total cost
Stage I				
Mobilization and demobilization	1 unit	1 unit	$150.00	$ 150.00
Diamond drilling	1,200 ft	1,200 ft	$5.10/ft	6,120.00
Reaming, casing, etc.	300 ft	80 ft	$3.00	240.00
Core boxes	40	28	$4.00 ea	112.00
Assaying	200 determinations	22	$1.00 ea	22.00
Rehabilitation of Hope Tunnel	1 unit	1 unit	$750.00	750.00
Repair of existing compressor house	1 unit	None	$150.00	--
Incidental allowance for each foot of drilling	1,200 ft	1,200 ft	$1.00	1,200.00
Diamond drill stations	2	2	$200.00 ea	400.00
				1/ $ 8,934.00

1/ Subject to audit

Total amount of contract	$22,930.00
Government participation at 50%	11,465.00
Total amount expended	$ 8,934.00
Government participation	4,467.00
Total amount unexpended	$13,996.00
Government's share unexpended	6,998.00

Enclosures
Distribution:
OME(3) Docket
USGS(SRO) MacLaren

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UNITED STATES
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FINAL REPORT

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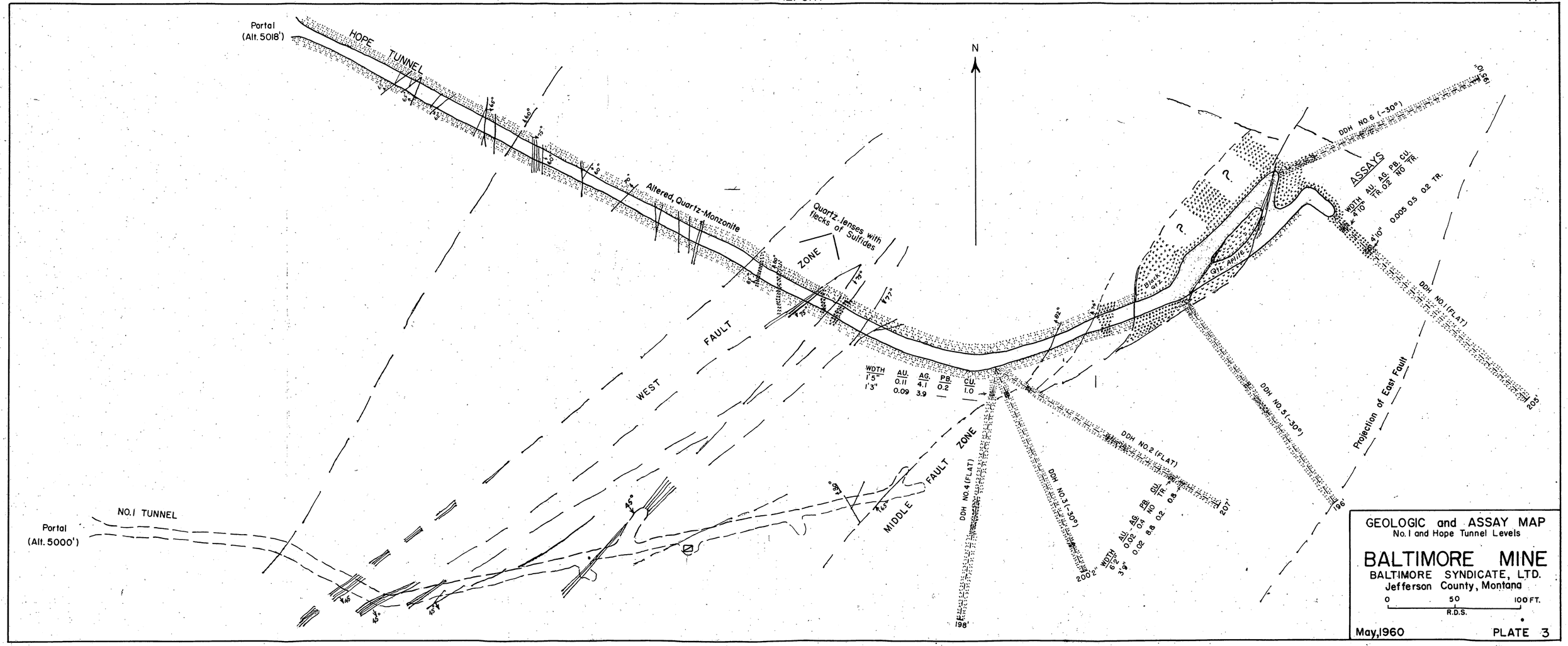

GEOLOGIC and ASSAY MAP
No. 1 and Hope Tunnel Levels

BALTIMORE MINE

BALTIMORE SYNDICATE, LTD.
Jefferson County, Montana

0 50 100 FT.
R.D.S.

May, 1960

PLATE 3

UNITED STATES
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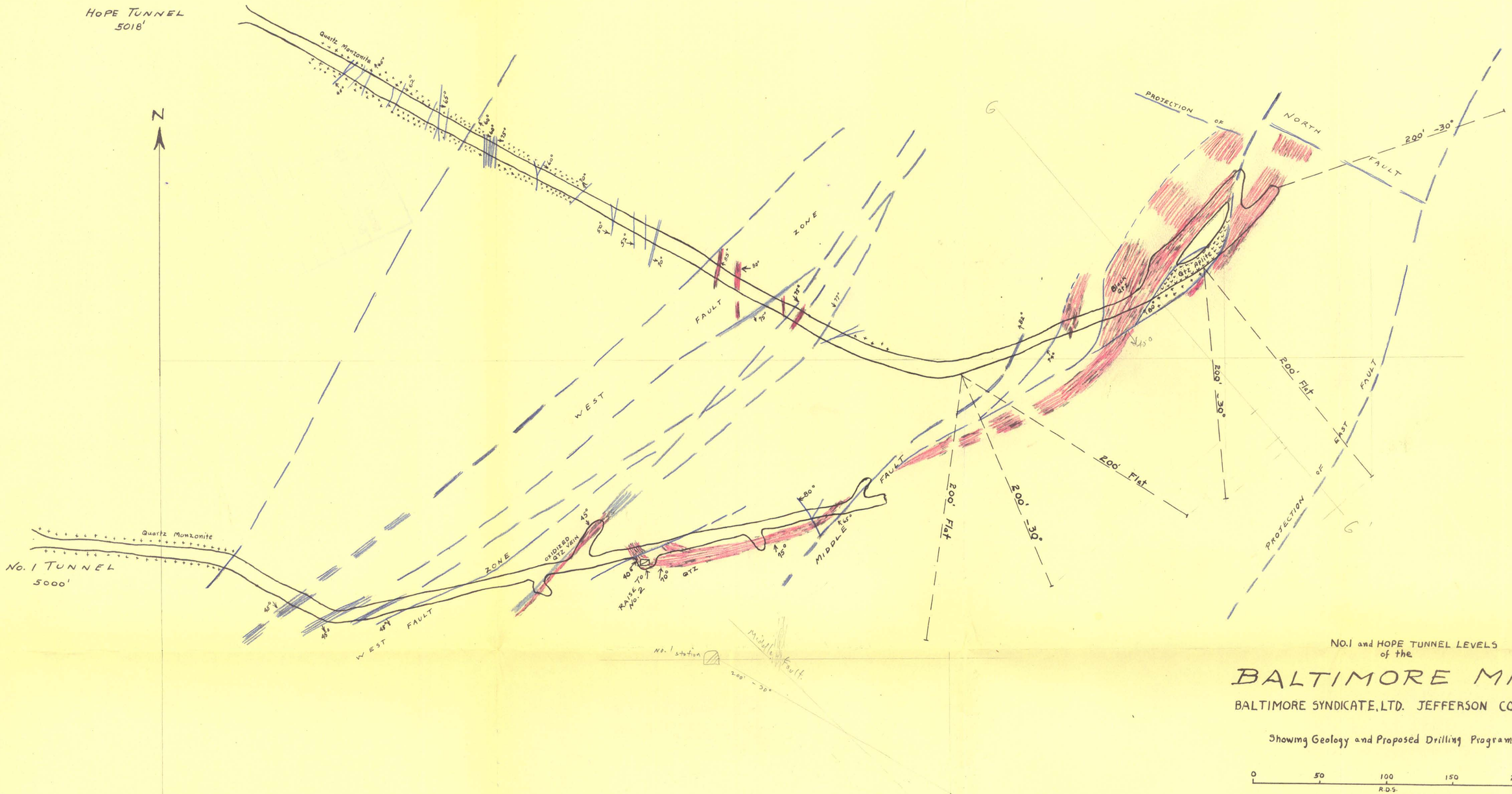
APPLICATION REPORT

OME 6045



NO. 1 and HOPE TUNNEL LEVELS
of the

BALTIMORE MINE

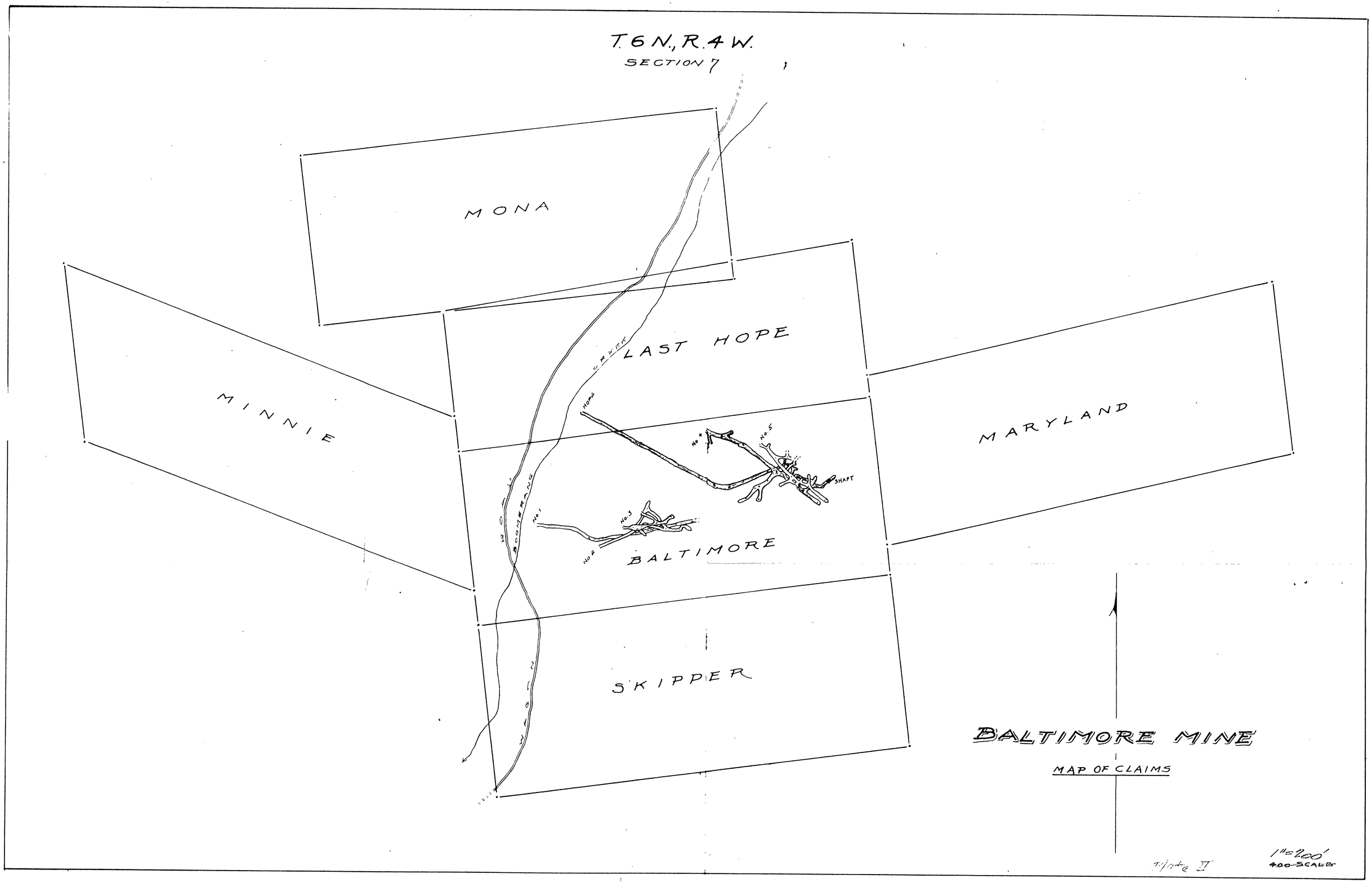
BALTIMORE SYNDICATE, LTD. JEFFERSON CO. MONT.

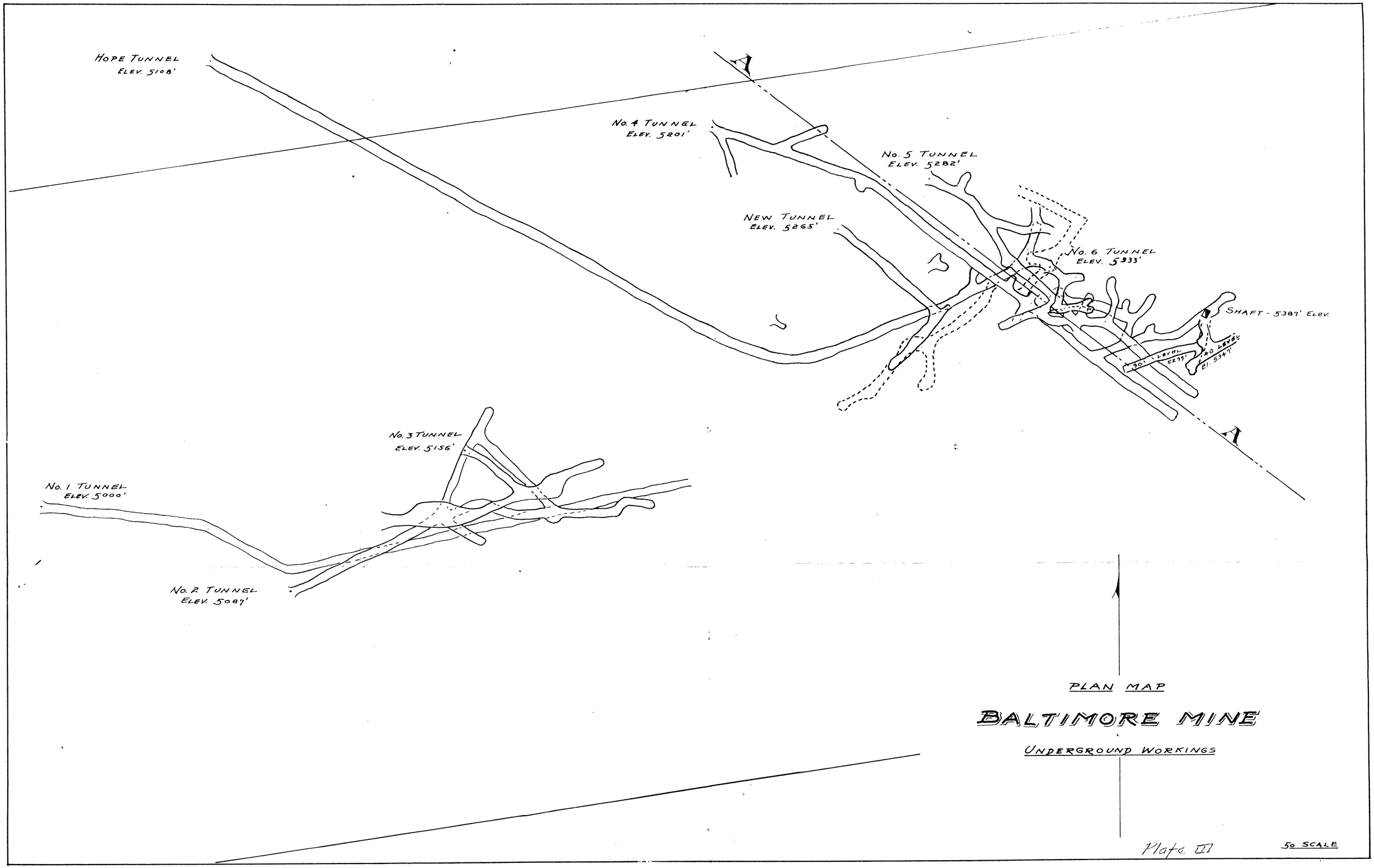
Showing Geology and Proposed Drilling Program

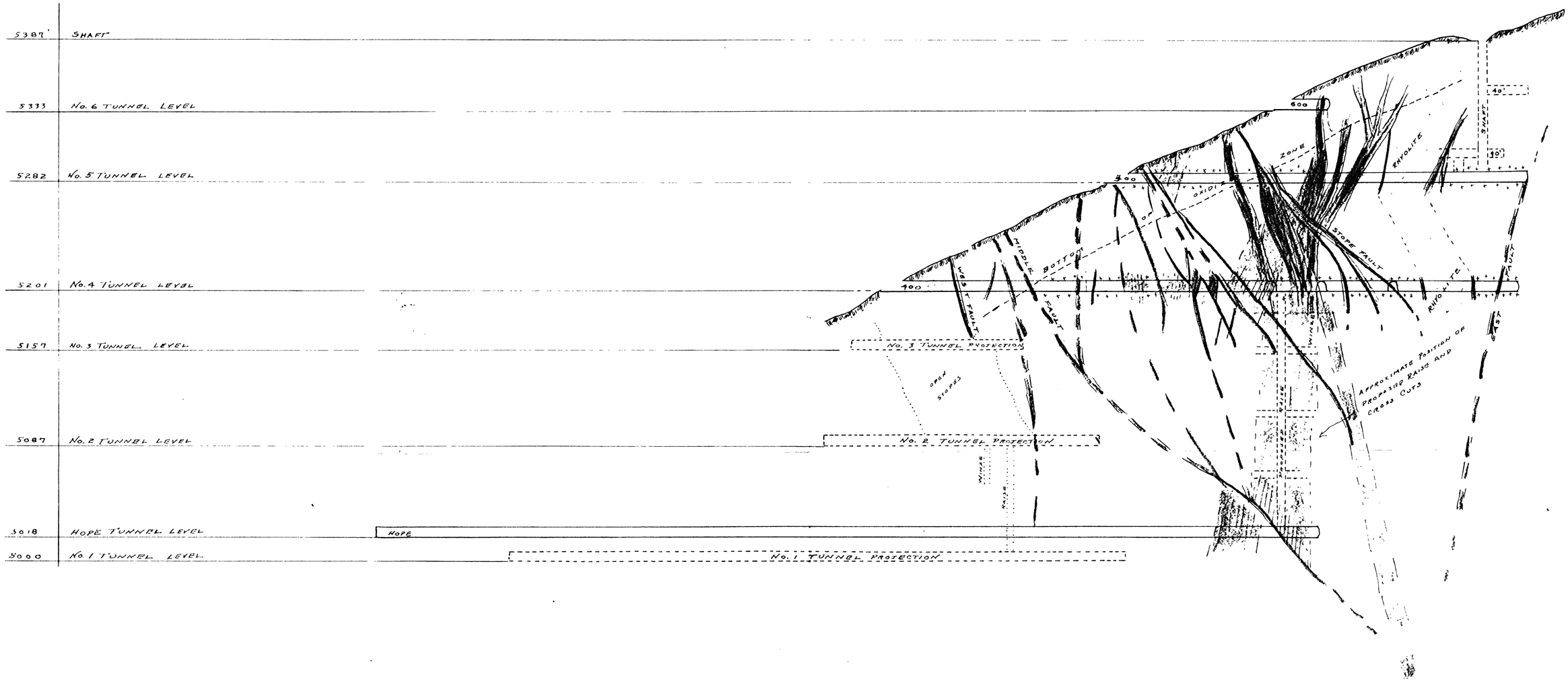
0 50 100 150 200 Ft.
R.D.S.

NOTE: Compiled from Applicant's Maps (June 1959)

PLATE 1


T.6N., R.4W.
SECTION 7
MONA
MINNIE
LAST HOPE
MARYLAND
BALTIMORE
SKIPPER
HOPE
No 4
No 5
SHAFT
No 1
No 3
No 2
BALTIMORE MINE
MAP OF CLAIMS
1"=200'
400 SCALE


HOPE TUNNEL
ELEV. 5108'
No. 4 TUNNEL
ELEV. 5201'
No. 5 TUNNEL
ELEV. 5282'
NEW TUNNEL
ELEV. 5265'
No. 6 TUNNEL
ELEV. 5333'
SHAFT - 5387' ELEV.
90' LEVEL
5239'
140' LEVEL
El. 5347'
A
A
No. 3 TUNNEL
ELEV. 5156'
No. 1 TUNNEL
ELEV. 5000'
No. 2 TUNNEL
ELEV. 5087'
PLAN MAP
BALTIMORE MINE
UNDERGROUND WORKINGS
Plate II
50 SCALE

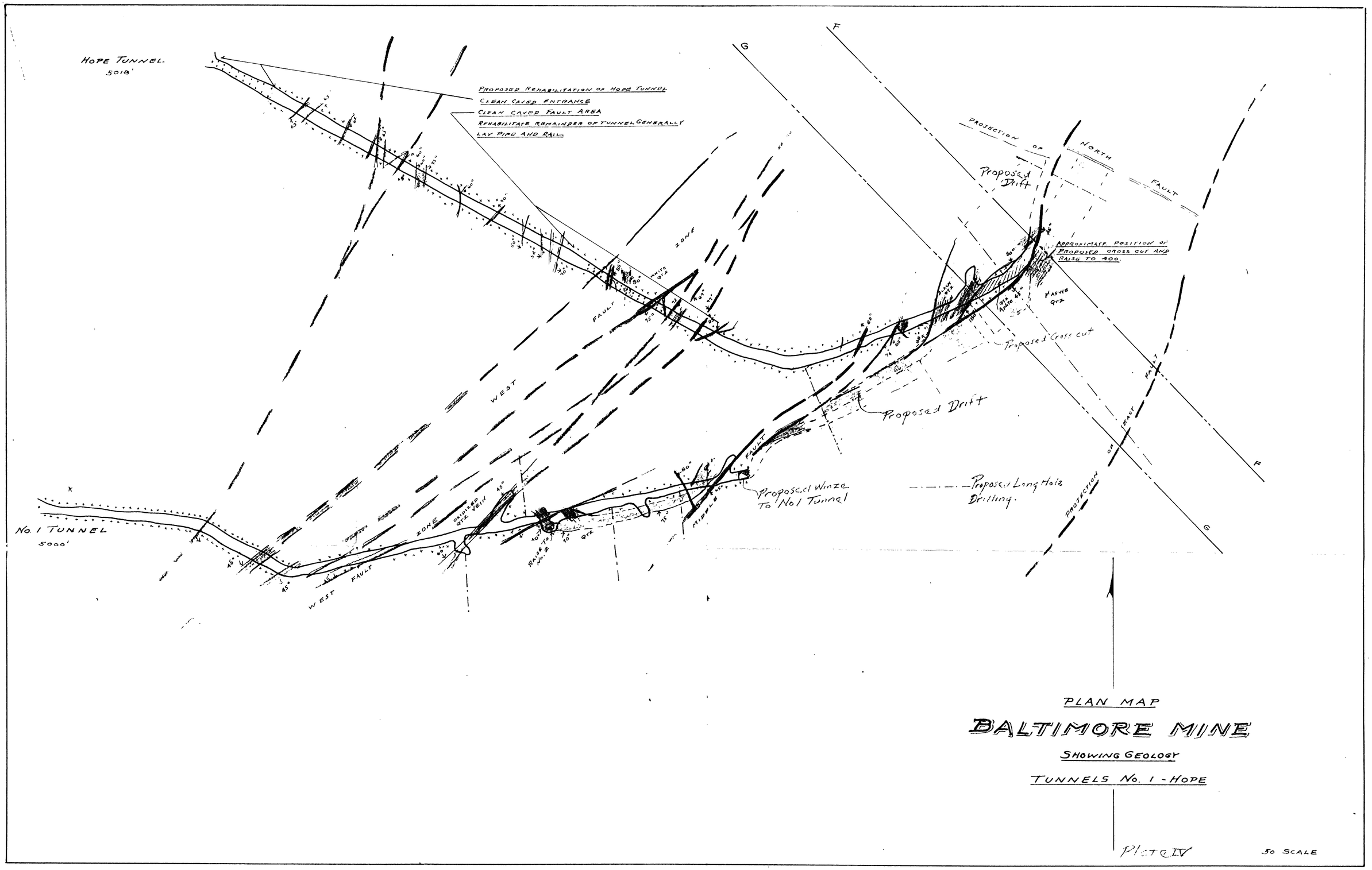


BALTIMORE MINE

SHOWING SECTION A-A

Plate VII

50 SCALE



PLAN MAP

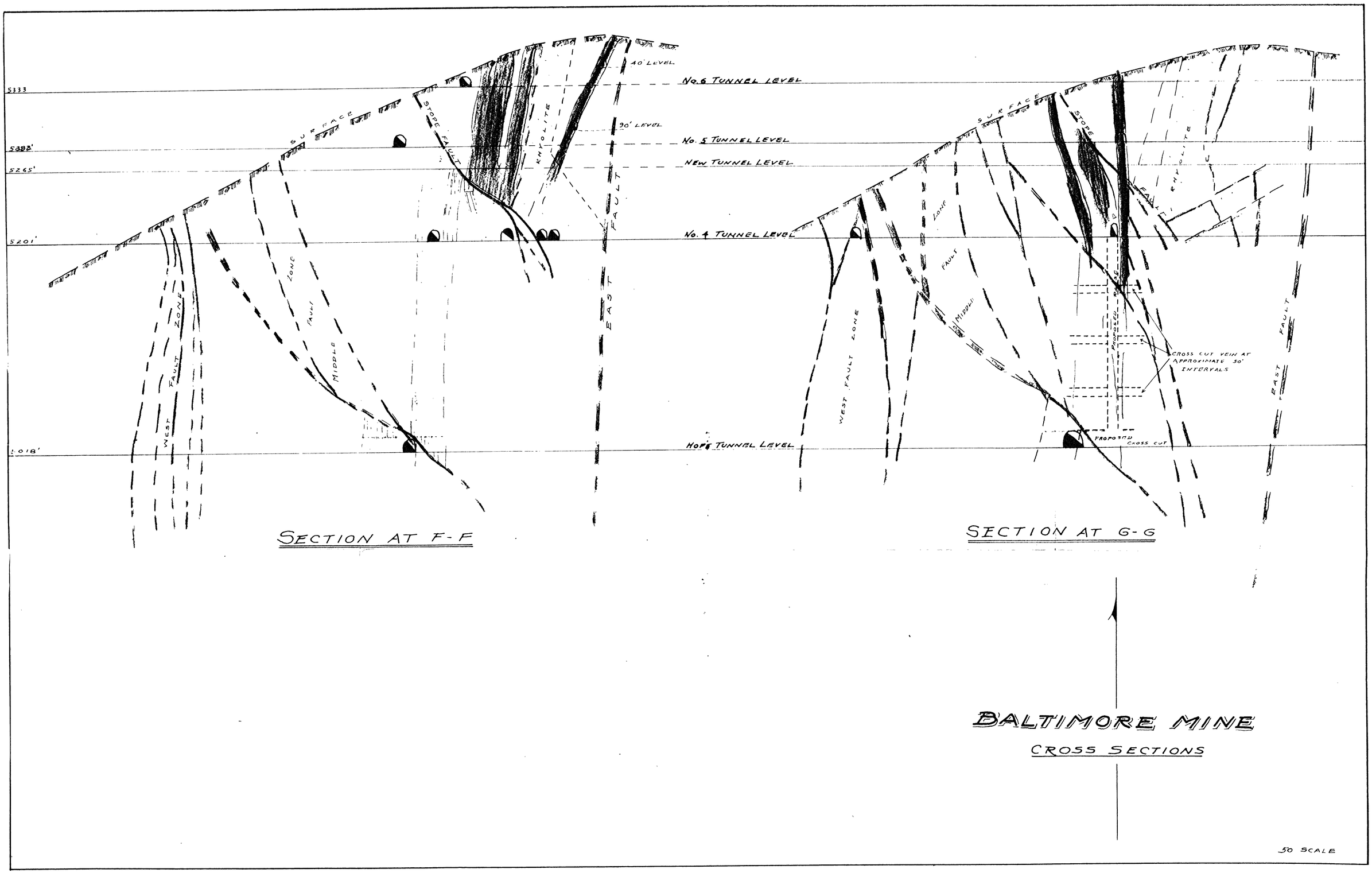
BALTIMORE MINE

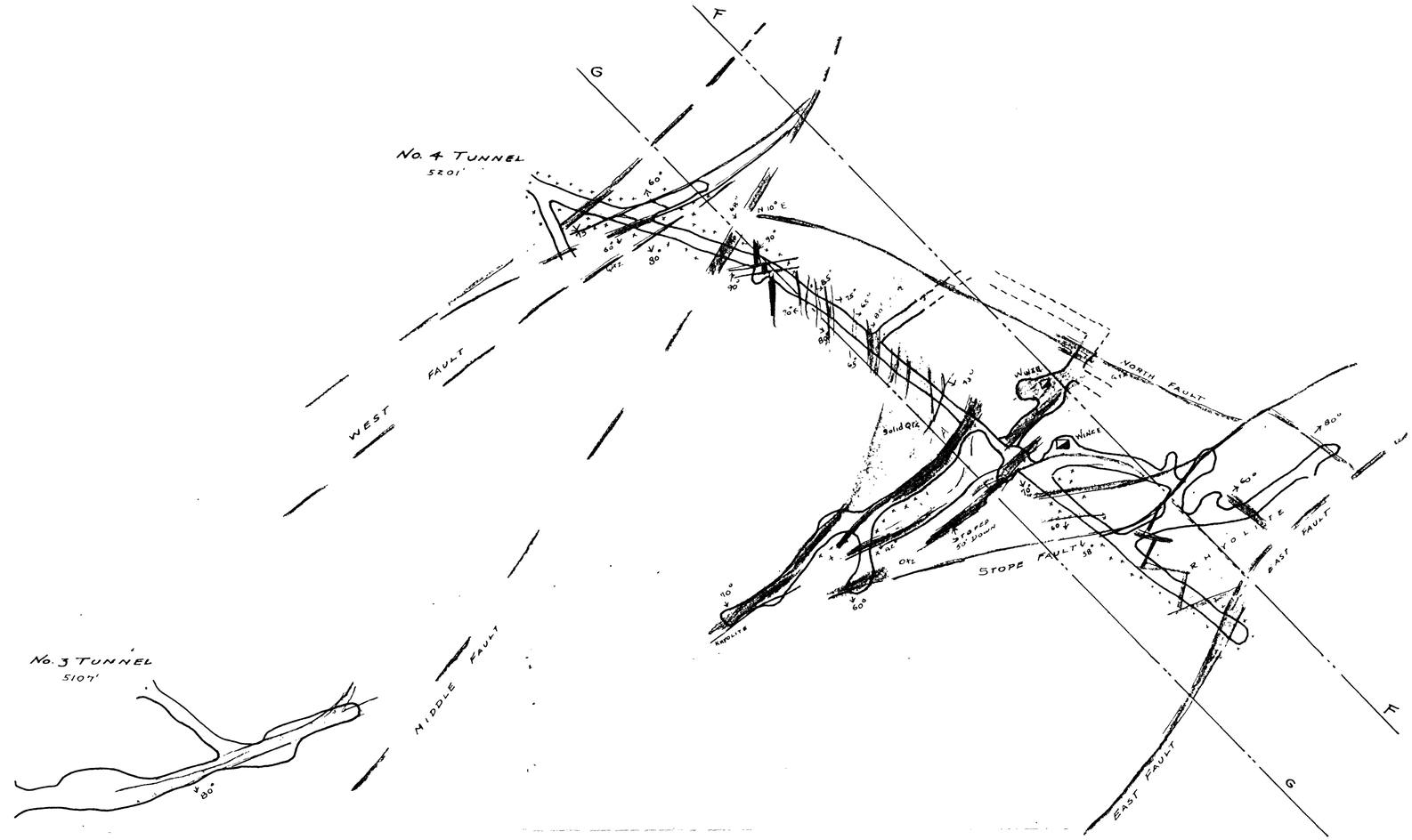
SHOWING GEOLOGY

TUNNELS No. 1 - HOPE

Plate IV

50 SCALE


5333
5282'
5265'
5201'
5018'
40' LEVEL
No. 6 TUNNEL LEVEL
90' LEVEL
No. 5 TUNNEL LEVEL
NEW TUNNEL LEVEL
No. 4 TUNNEL LEVEL
HOPE TUNNEL LEVEL
SURFACE
STOPE
FAULT
RHYOLITE
EAST FAULT
WEST FAULT ZONE
MIDDLE FAULT ZONE
SECTION AT F-F
SURFACE
STOPE
RHYOLITE
EAST FAULT
WEST FAULT ZONE
MIDDLE FAULT ZONE
PROPOSED RAISE
CROSS CUT VEIN AT APPROXIMATE 50' INTERVALS
PROPOSED CROSS CUT
EAST FAULT
SECTION AT G-G
BALTIMORE MINE
CROSS SECTIONS
50 SCALE



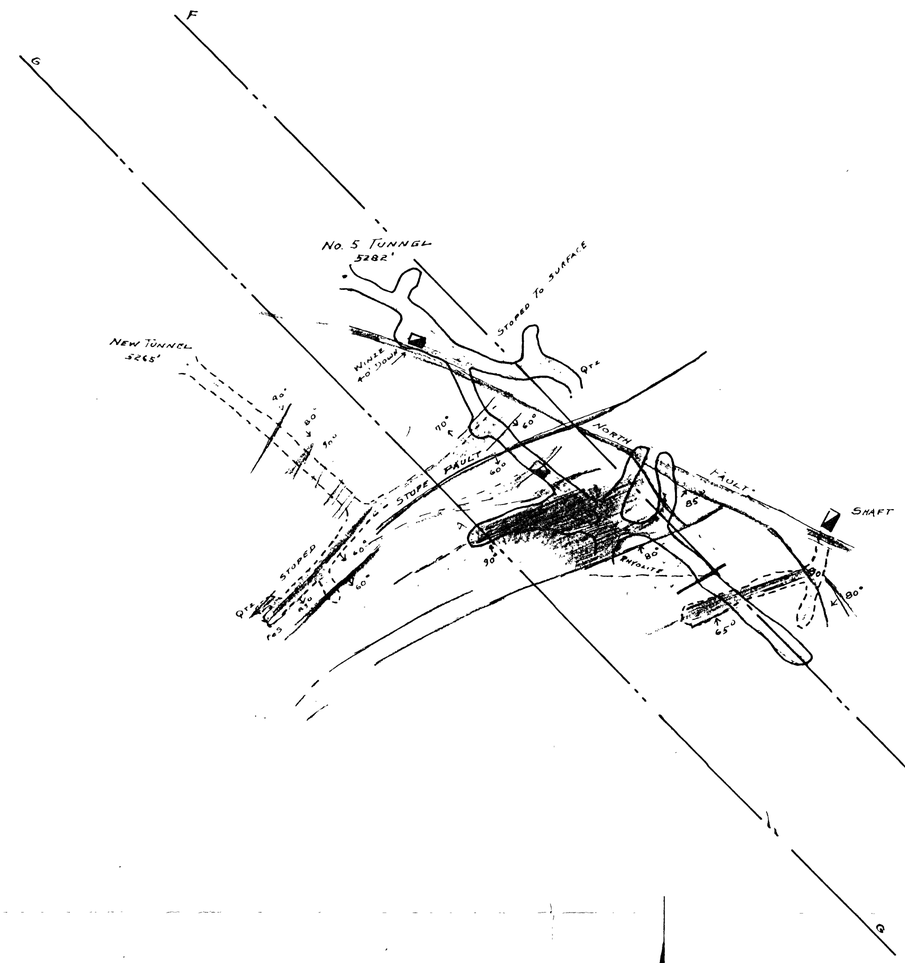
PLAN MAP

BALTIMORE MINE

SHOWING GEOLOGY

TUNNELS No. 3 AND No. 4

50 SCALE



PLAN MAP

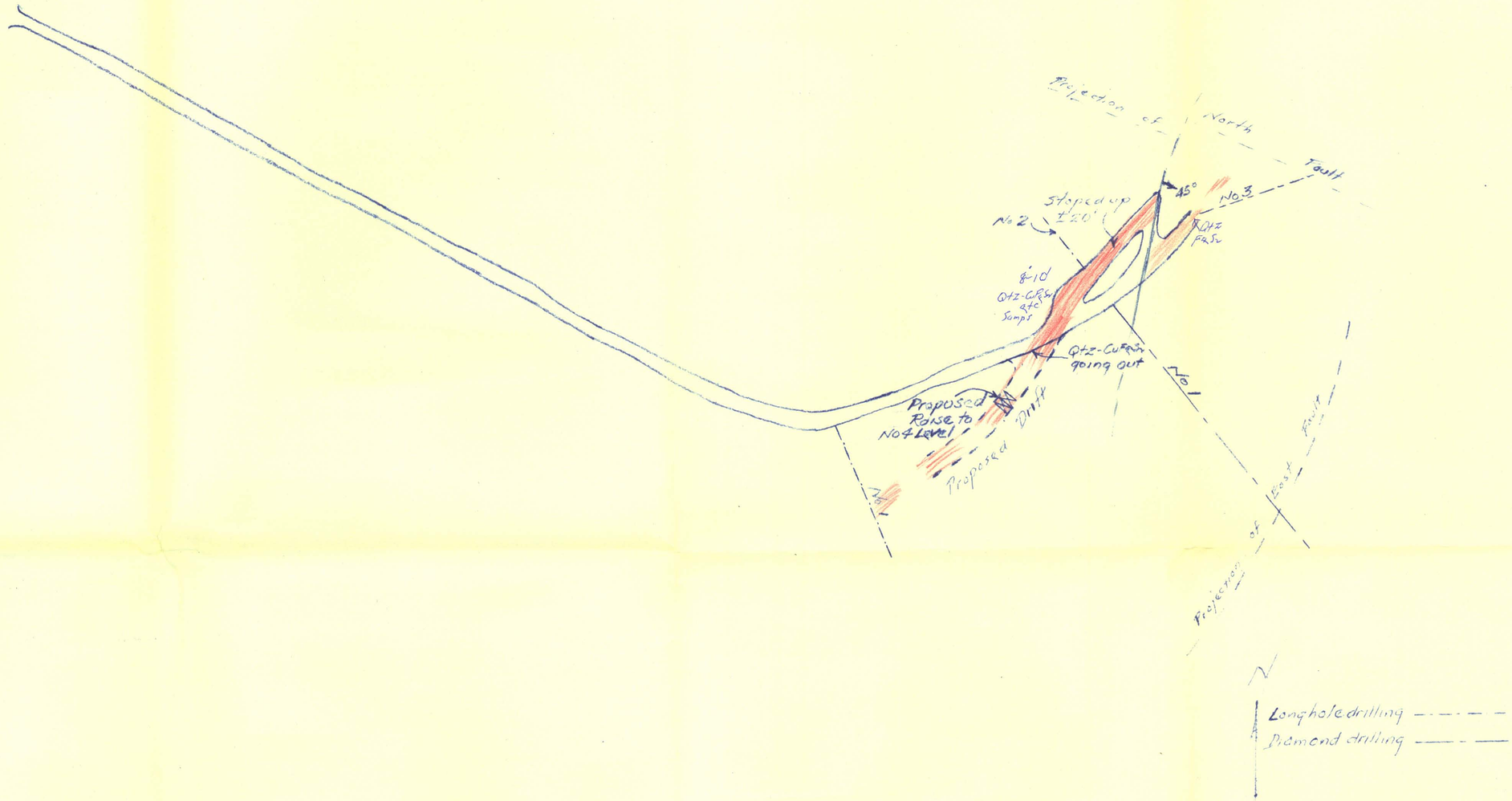
BALTIMORE MINE

TUNNEL No. 5

SHOWING GEOLOGY

Plate VI

50 SCALE



Longhole drilling - - - - - -
Diamond drilling ——— ———

BALTIMORE MINE

HOPE TUNNEL LEVEL

Showing

Proposed Exploration

Scale 1in = 50 Ft.

Dr. C. M. Wagner
Heppner, Oregon

©C. M. WAGNER, M.D.
Box 755
Heppner, Oregon

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OFFICE OF MINERALS EXPLORATION
FINAL REPORT

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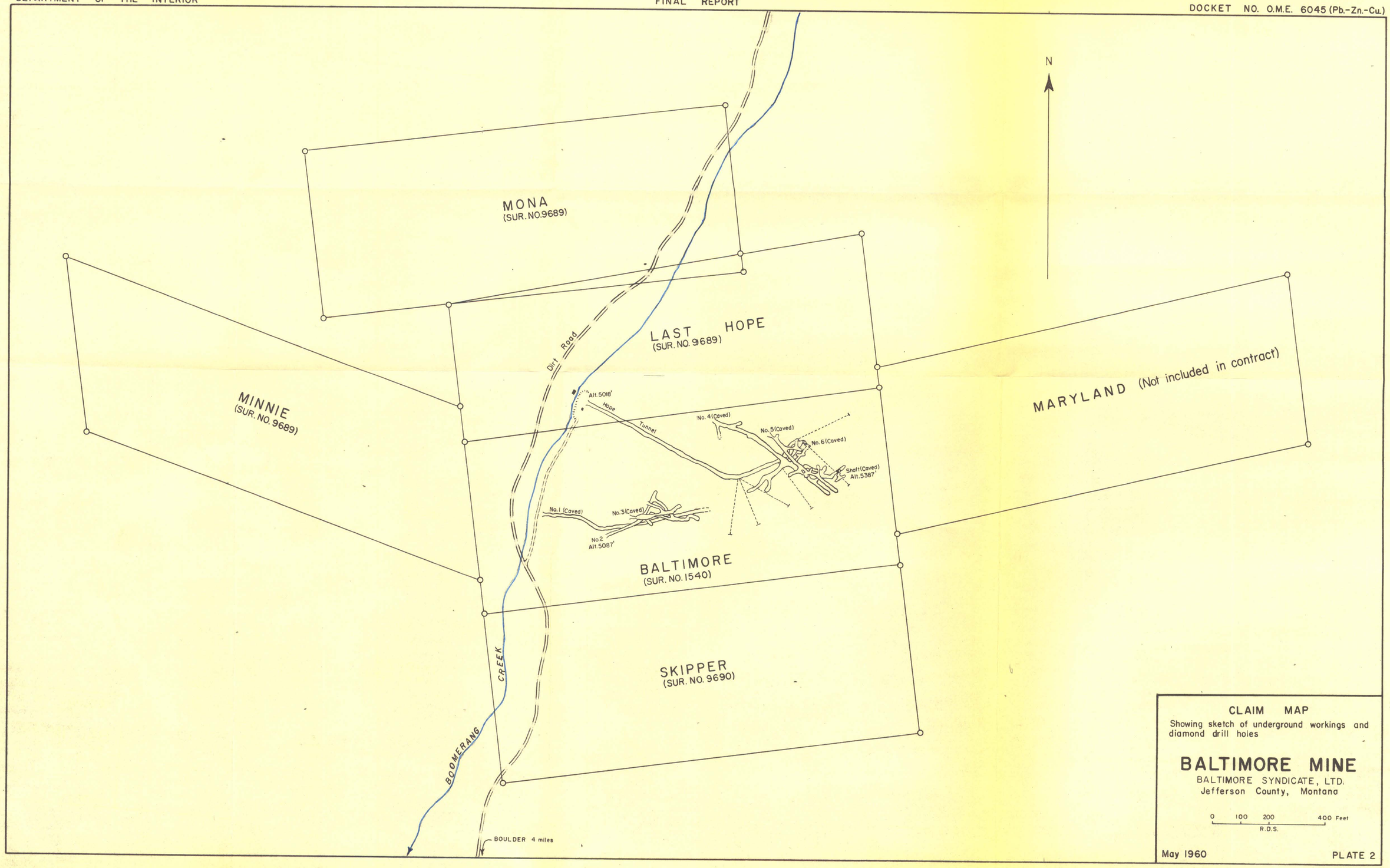


CLAIM MAP

Showing sketch of underground workings and diamond drill holes

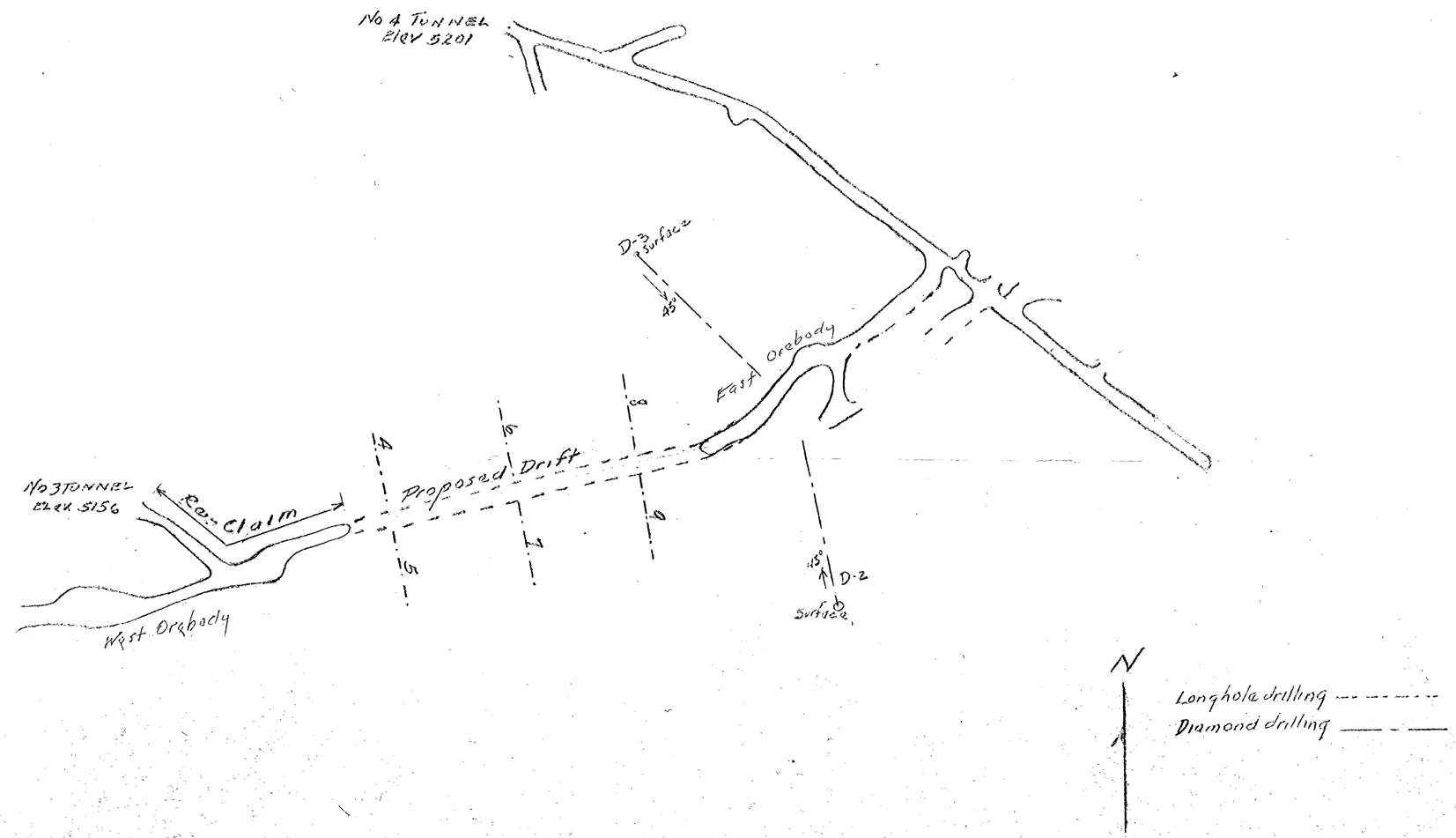
BALTIMORE MINE

BALTIMORE SYNDICATE, LTD.
Jefferson County, Montana

0 100 200 400 Feet
R.D.S.

May 1960

PLATE 2



BALTIMORE MINE

Showing
Proposed Drift Easterly
Scale 1 In. = 50 Ft.

Dr. C.M. Wagner
Heppner, Oregon

UNITED STATES
DEPARTMENT OF THE INTERIOR

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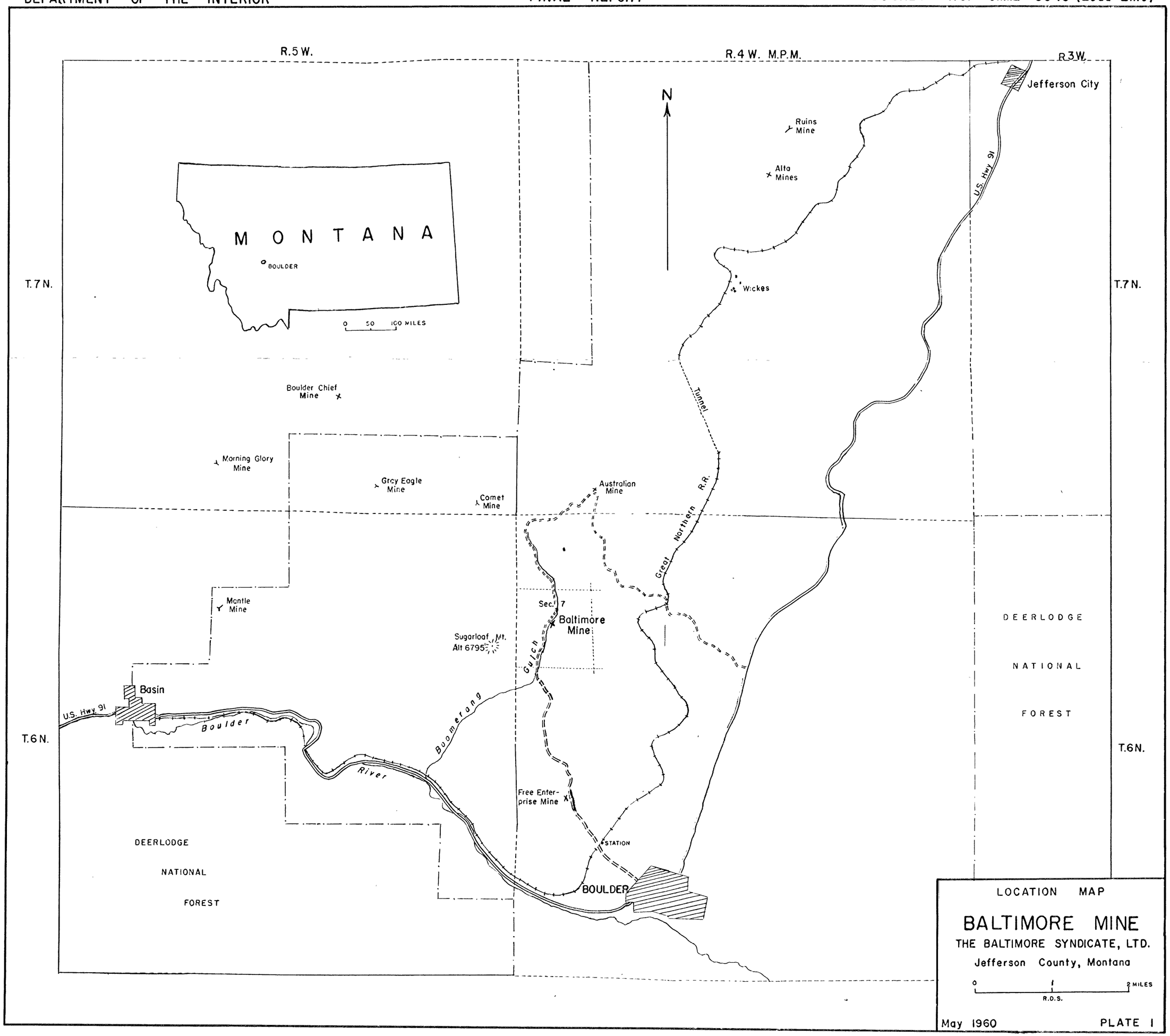
FINAL REPORT

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