DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

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DMA Docket No. 3007

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Exploration Assistance

Any action taken to change the type of request for assistance must be promptly reported to the Reports and Records Branch. Use DMA Form 2 for submitting these reports.

COPIES TO USGS, USBM. ONE COPY RETAINED IN REGION II.

Routing Slip

To: Code 500, Room 3538 Date 4/29/53

To: Oper Com Date 9-23-53

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FILE COPY
SURNAME:

500

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

Keating
Zimmel
~~Hedges~~
Kinkel
~~Selfridge~~

SEP 23 1953

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313-314 Mutual Life Building
Seattle 4, Washington

Re: Docket No. DMEA-3007 (Lead-Zinc)
Silver Coin Claims
Mt. Baker National Forest
Snohomish County, Washington

Dear Mr. Jones:

Your application for aid for an exploration project and other data available to us in Washington relating to the above project have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position of the National Defense Program.

Careful study of all our information indicates to us that the probability of disclosing minable ore reserves by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention.

Sincerely yours,

Frank E. Johnson
857
ACTING Administrator

AGKeating/bjl (9/21/53)

Copy to: Docket
Admr. R. File
Op. Committee
Base Metals
Mr. Bishop
Mr. Kinkel
Region II (2)
Chron.

DENIED

R.C.G.
9-23-53

UNITED STATES 500
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

September 21, 1953

Memorandum

To: Administrator

From: Chief, Base Metals Division

Subject: Denial of application Docket No. DMEA-3007 (Lead-Zinc), Silver Coin Mining Company, Silverton Mining District, Snohomish County, Washington

The applicant proposes the following work:

Drifting 1,000 feet : $40.00/ft.	$40,000.00
Vein stripping and road work	10,000.00
Buildings and improvements	5,000.00
Supervision, engineering, accounting, etc.	35,000.00
Contingencies	10,000.00
	$100,000.00

The purpose of the work is to explore for lead and zinc by extending the present recently started adit tunnel and by opening up a reported "Native Silver" tunnel covered by recent slide.

The Field Team reports that "the workings include a 60 foot trench which crosscuts the mineralized zone and a 20 foot adit, and that there are also a number of shallow prospect pits mostly sloughed and filled with debris. It is reported that there is a tunnel to the northeast, but its location has been obscured by landslide and talus material.

The alteration zone was thoroughly sampled with samples taken in the center and at each end of the adit tunnel. The assay results averaged: Trace Au., .35 oz. Ag. and .19 per cent Cu. Through inadvertance, the samples were not assayed for zinc. In view of the low grade of ore that is indicated by the assay results, the possibility seems remote that zinc assay results would be sufficiently high to change the opinion that this prospect is obviously not worthy of further consideration for exploration. There remains the remote possibility that the ore zone may persist in depth; however, the apparent grade of the target and incompetence of the Applicant make an exploration project unfeasible.

The Field office recommends that the application be denied because of an unfeasible geological target and no alternative program is suggested. The Washington commodity members concur with the recommendation of the Field office, to which the Base Metals Division also Concurs.

W. R. Griswold

W. R. Griswold

FILE COPY
SURNAME:

500

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

Keating

September 21, 1953

Copy to: Docket
Admr. R. File
Op. Committee
Base Metals
Chron.

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To: Administrator

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W. R. Griswold

AGKeating/bjl

W. R. Griswold

R.C. 9-23-53

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

September 18, 1953

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop, Base Metals Branch

Subject: Concurrence with field team denial of application of Silver Coin Mining Company (Docket No. DMEA-3007)

I concur with the field team in denying the subject application on the grounds that the exposed mineralization appears to be of minor importance, and the size and apparent grade of the target, combined with incompetence of the applicant makes success of exploration doubtful.

O. M. Bishop

O. M. Bishop

Copy to: Minerals Division
A. R. Kinkle, USGS
O. M. Bishop
Files

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

September 8, 1953

MEMORANDUM

To: DMEA Field Team, Region II

From: Willard P. Puffett, Geologist, U. S. Geological Survey

Subject: Docket No. DMEA-3007(Lead-Zinc), assay data of Silver Coin Mining Company, Snohomish County, Washington.

Following is listed the assay data for zinc which were not included in the original examination report due to failure of the Union Assay Office, Inc., to furnish these data at the same time as other assay data submitted with the original report. As the examination report recommended a denial to the application, these data will have no bearing on the recommendation but are being submitted only to complete the record. The locations of the samples are shown on the map submitted with the examination report of July 30, 1953.

Sample No.	Length (inches)	Zinc (Percent)
216	84	4.2
217	43	1.0
218	18	None
219	76	1.5

It is to be noted that the first listed sample shows some promise for zinc content, but the applicant did not emphasize in his application that zinc occurred at the property in any important quantity.

Distribution:
DMEA(Orig.&3)
USBM(2)
Docket
Puffett

913

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

WASHINGTON 25, D. C.

No. 717 Howard Street
Spokane 1, Washington

September 6, 1949

[illegible]

To: [illegible] Dep, Region [illegible]

From: Willard [illegible] McCabe, Geologist, U. S. Geological Survey

Subject: Project No. [illegible]-3[illegible] (Zinc-Lead), assay data of Silver Cup Mining Company, Okanogan County, Washington.

Following is listed the assay data for zinc which were not included in the original examination report due to failure of the Pacific Assay Office, Inc., to furnish these data at the same time as other assay data submitted with the original report. As the mineralization report mentioned a interest to the application, these data will have a bearing on the recommendation that is to be submitted by the examiner. The locations of the samples are shown on the map submitted with the examination report of July 31, 1949.

Sample No.	Length (Inches)	Zinc (Percent)
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	1.5

It is to be noted that the first listed sample shows not promise for zinc content, but the applicant did not emphasize in his application that zinc occurred at the property in any important quantity.

Distribution:
[illegible] (Original)
(2)
[illegible]cket
[illegible]ffett

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

IN REPLY REFER TO:

DEPARTMENT OF THE
Defense Minerals Administration
RECEIVED
SEP 9 - 1953

September 8, 1953

Memorandum

To: Mr. W. R. Griswold

From: A. R. Kinkel, Jr.

Subject: Concurrence with field team's denial

Re: DMEA-3007
Silver Coin Mining Co.
Snohomish County, Wash.
$100,000
Lead-zinc

I concur with the field team in denying the subject application for the reasons outlined in their report.

A R Kinkel Jr

A. R. Kinkel, Jr.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 31 1953

August 26, 1953

Hearing
Betty

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-3007 (lead-zinc)
Silver Coin Mining Company
Snohomish County, Washington

Dear Mr. Selfridge:

Enclosed are four copies of a report by E. A. Magill, U. S. Bureau of Mines, and Willard Puffett, U. S. Geological Survey, concerning a field examination on the subject property.

The examiners recommend denial of the application on the grounds of an unfeasible geologic target. No alternative program or further work is suggested.

The Field Team concurs with the examiners and recommends denial of the application.

By DMEA Field Team, Region II

M. E. Volin, Acting Exec. Officer
(U. S. Bureau of Mines)

Thor H. Kiilsgaard, Acting Member
(U. S. Geological Survey)

Enclosure
cc: USBM (2)
Puffett

Reviewed by
DMEA OPERATING COMMITTEE

9-9-53
(date)

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration
RECEIVED
AUG 31 1953

July 30, 1953

9/23/53

MEMORANDUM

To: DMEA Field Team, Region II

From: E. A. Magill, Mining Engineer, U. S. Bureau of Mines, and Willard Puffett, Geologist, U. S. Geological Survey

Subject: Docket No. DMEA 3007 (lead-zinc), application for exploration loan, Silver Coin Mining Company, Snohomish County, Washington

APPLICANT

The applicant is the Silver Coin Mining Company, 313 Mutual Life Building, Seattle 4, Washington.

RECOMMENDATIONS

It is recommended that an exploration loan for the Silver Coin Mining Company be denied. No alternative program or further work is suggested.

EXAMINATION

The Silver Coin prospect was examined on July 21, 1953, by E. A. Magill, U. S. Bureau of Mines, and Willard Puffett, U. S. Geological Survey. Seven hours were spent on the examination with about two hours actually at the prospect. Mr. Harry P. Mears accompanied the examining team.

LOCATION OF PROPERTY

The Silver Coin prospect is located in sec. 11, T. 30 N., R. 9 E. Willamette meridian, Silverton mining district, Snohomish County, Washington. The nearest town is Granite Falls which is 30 miles from the property. Seattle is 76 miles from the property. At the present time, it is necessary to hike in the last 3½ miles to the prospect over a jeep road which was completed in 1948.

Although the workings are only at an elevation of 2,850 feet, the working season is relatively short. Snow covers the ground from November 1 to June 1. The road to the property is so steep and with

Reviewed by
DMEA OPERATING COMMITTEE
9-9-53
(date)

such sharp curves that only small, four-wheel drive vehicles are able to traverse it. It would be necessary to relocate at least 1½ miles of road to make it practical to move equipment onto the property by truck. This relocation is necessary because of the sharp turns and steep grades of that portion of the present road.

The road is not passable at the present time because of windfalls and washed out sections.

COMPETENCE OF APPLICANT

It would be necessary for the applicant to hire competent personnel to supervise the project. Mr. Jones, the applicant's consulting engineer, is not capable of directly supervising a project because of his health.

PROPERTY

The property consists of 17 unpatented mining claims and a millsite located in secs. 11, 14, and 23, T. 30 N., R. 9 E. The applicant is the owner of the property. Claims are recorded in the County Recorder's office at Snohomish, Washington. The book and page numbers of these claims as recorded are listed in the application.

DESCRIPTION OF PROPERTY

The Silver Coin mining prospect is on the southwest side of a relatively steep-sided valley bordering Marten Creek and is about 1 mile southeast of Granite Pass. The prospect is at an altitude of approximately 2,850 feet. Beyond the prospect, there is marked increase in altitude to the southwest along the northeast slopes of an unnamed mountain whose summit is at an altitude of 4,986 feet. Timber and smaller types of vegetation cover the lower slopes of the valley, obscuring most of the bedrock.

Development workings on the prospect include a 60-foot trench which crosscuts the mineralized zone. A 20-foot adit explores the mineralized zone. To the southwest in line with the apparent strike of the alteration zone, for a distance of at least 150 feet, are a number of shallow prospect pits now for the most part sloughed and filled with surface debris. It is reported that there is a tunnel to the northeast, across Marten Creek, but its location has been obscured by landslide and talus material. The accompanying map shows all workings that were accessible for inspection in July 1953.

GEOLOGY

The rock underlying the Silver Coin prospect is a gray biotite, hornblende monzonite or diorite. It is presumed that this rock

is a northward extension of the Index granodiorite[1] and probably represents a quartz poor variant of the formation. At the Silver Coin prospect, the monzonite is very even grained, and though coarsely jointed, exhibits no other lineal or foliation characteristics.

In the short adit is exposed a strongly altered zone, apparently bounded by strong joints and localized at and near the intersection of two fractures steeply dipping in opposite directions. This alteration zone is very soft, contains much sericite, is considerably iron-stained with minor copper stain, and can be traced for nearly 20 feet, attaining a maximum width of 7 feet. In the central portion of the exposed alteration zone is much coarse-grained calcite around which is fair grade sphalerite and minor chalcopyrite. On the northeast end of the adit, coarse-grained quartz lines the westward-dipping of the two strong fractures. In the northeast end of the adit, the zone is nearly 4 feet wide. Near the southwest end of the adit, a very tight crosscutting fracture apparently limits the main part of the alteration zone, for beyond to the southwest of this crosscutting fracture the zone narrows to less than 2 feet in width and is confined to the margins of strong joints in the southeast walls of the adit.

The alteration zone crops out on the slope above and southwest of the adit portal. As represented on this slope, the alteration zone is 6-to 7-foot wide and consists of a band of soft brown to green-stained material, bordered on both sides by relatively unaltered monzonite. A narrow band of alteration can be seen following the northward dipping footwall structure to the northwest. Few sulphides could be seen in the alteration zone above the adit level.

All outcrops in the area surrounding the trench and adit were examined for possible ore-bearing minerals. No exposures exhibited any apparent alteration of the country rock and certainly no indications of sulphide mineralization were seen away from the area in and above the adit.

The alteration zone was thoroughly sampled. Three samples, one at each end and one in the central portion, were taken in the adit. A channel sample was cut across the alteration zone on the hillslope slightly above the adit level. The applicant reports that much bismuth-bearing material had been found to occur at the prospect. Consequently, all samples taken were assayed for gold, silver, zinc, copper, and bismuth. Locations of all samples are shown on the accompanying map. Below is a tabulation of the assay results. It is to be noted that no zinc assay results are listed. Apparently due to an oversight by the Union

---

1/ Weaver, Charles E., The Tertiary formations of western Washington, Washington Geological Survey, Bull. 13, 1916, pl. X, pp. 65-67.

Assay Office, Inc., the samples were not assayed for zinc. In view of the low grade of ore that is indicated by the assay results received, the possibility seems remote that zinc assay results will be sufficiently high to change the opinion that this prospect is obviously not worthy of further consideration as a site for exploration.

Sample No.	Width Inches	Gold oz/ton	Silver oz/ton	Zinc %	Copper %	Bismuth %
216	84	Tr.	0.7	N.R.	0.61	None
217	43	Tr.	0.1	N.R.	None	None
218	18	Tr.	0.2	N.R.	None	None
219	76	Tr.	0.4	N.R.	0.15	None

Note: N.R. means not reported.

PAST OPERATION

The prospect was originally discovered in the 1880's. Apparently, work from then until 1948 consisted of no more than the annual assessment work necessary to hold the claims. In 1948, the applicant constructed 3½ miles of jeep road up Marten Creek to the prospect at a reported cost of $16,000. In 1949, they dozed out the old crosscut, forming an open cut to the mineralized zone, at a reported cost of $3,000. The property has been inactive since 1949 except for annual assessment work.

There has been no production from the property.

MANPOWER AND SUPPLIES

Manpower and supplies are available for exploration work although the wage scale is affected by the logging operations in the area. Wage scales for miners would have to be at least $2 per hour to obtain competent men.

APPLICANT'S PROPOSAL

The applicant proposes to carry out the following work

1. 1,500 feet of drifting
2. Repair road and strip veins
3. Construct:
   - Tool and blacksmith house
   - Living quarters
   - Install water system

The total cost of this program is to be $100,000 broken down as follows:

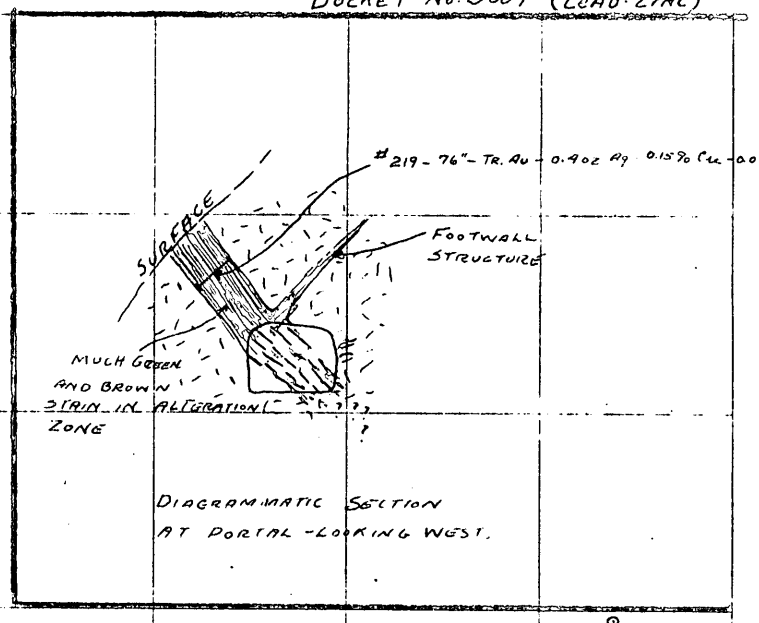
1,500 feet of drifting @ $40/ft.	$ 40,000
Repairs to road including stripping of veins - lump sum	10,000
Buildings and water system	5,000
Supervision, geology, engineering, analytical work and accounting	35,000
Contingency	10,000
Total	$100,000

The objective of this program is to explore for the extension of the mineralization exposed in the present workings.

From an examination of the present exposures, it does not appear that the mineralized zone can be projected horizontally over a few feet, the existing open cut apparently having exposed both ends of the zone. There remains the rather remote possibility that the zone persists in depth; however, the size and apparent grade of the target and the incompetence of the applicant make an exploration project unfeasible.

Enclosure - 1
Distribution:
DMEA (4) Docket
USBM (5) Puffett
USGS (SRO)

DOCKET No. 3007 (LEAD-ZINC)



NORTH

STRONG VERTICAL JOINTS. NO ALTERATION.
90°

ALTERATION ZONE MUCH BLEACHED AND SERICITIZED SCATTERED ZnS, OCCASIONAL CHALCOPYRITE

ALTERATION ZONE APPARENTLY PINCHES TO NORTHEAST

GOOD ORE AT INTERSECTION OF STRUCTURES

QUARTZ CRYSTALS ALONG WEST DIPPING STRUCTURE

GRAY, BIOTITE HORNBLENDE MONZONITE

55°

70°

#217 - 43" - Tr Au - 0.1 oz Ag - 0.0% Cu - 0.0% Bi

VERY NARROW FRACTURE APPARENTLY LIMITS ALTERATION ZONE

47°

SCATTERED COARSE-GRAINED CALCITE CRYSTALS

95°

65°

65°

FEW CHUNKS "ORE" ON DUMP. DARK ZnS, SOME CHALCOPYRITE, MANY QUARTZ CRYSTALS

ELEVATION 2840' (ANEROID)

#218 - 18" - Tr Au - 0.2 oz Ag - 0.0% Cu - 0.0% Bi

#216 - 84" - Tr Au - 0.7 oz Ag - 0.61% Cu - 0.0% Bi

STRONG JOINTS FORM MARGIN OF ALTERATION ZONE

SMALL PROSPECT PIT. ABOUT 30' ALONG SILL. NO ALTERATION IN MONZONITE

MONZONITE IS COARSELY JOINTED BUT VERY SPARSELY ALTERED OUTSIDE OF MAIN ALTERATION AREA.

Silver Coin Mining Company Prospect

Sec. 11, T. 30 N., R. 9 E., Silverton Mining District

Snohomish County, Washington

1" = 20'

Tape & Brunton Traverse & Geology - W. P. Puffett, USGS - 7/21/53

"ALBANENE" No. 103M K&E CO., N.Y. REG. U.S. PAT. OFF

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

[redacted]
Bo. 157 Howard Street
Spokane 4, Washington

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 31 1953

August 26, 1953

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-3007 (lead-zinc)
Silver Coin Mining Company
Snohomish County, Washington

Dear Mr. Selfridge:

Enclosed are four copies of a report by E. A. Magill, U. S. Bureau of Mines, and Willard Puffett, U. S. Geological Survey, concerning a field examination on the subject property.

The examiners recommend denial of the application on the grounds of an unfeasible geologic target. No alternative program or further work is suggested.

The Field Team concurs with the examiners and recommends denial of the application.

By DMEA Field Team, Region II

M. E. Volin, Acting Exec. Officer
(U. S. Bureau of Mines)

Thor H. Kiilsgaard, Acting Member
(U. S. Geological Survey)

Enclosure
cc: USBM (2)
Puffett

Reviewed by
DMEA OPERATING COMMITTEE
9-9-53
(date)

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 31 1953

July 30, 1953

MEMORANDUM

To: DMEA Field Team, Region II

From: E. A. Magill, Mining Engineer, U. S. Bureau of Mines, and Willard Puffett, Geologist, U. S. Geological Survey

Subject: Docket No. DMEA 3007 (lead-zinc), application for exploration loan, Silver Coin Mining Company, Snohomish County, Washington

APPLICANT

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RECOMMENDATIONS

It is recommended that an exploration loan for the Silver Coin Mining Company be denied. No alternative program or further work is suggested.

EXAMINATION

The Silver Coin prospect was examined on July 21, 1953, by E. A. Magill, U. S. Bureau of Mines, and Willard Puffett, U. S. Geological Survey. Seven hours were spent on the examination with about two hours actually at the prospect. Mr. Harry P. Mears accompanied the examining team.

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Although the workings are only at an elevation of 2,850 feet, the working season is relatively short. Snow covers the ground from November 1 to June 1. The road to the property is so steep and with

Reviewed by
DMEA OPERATING COMMITTEE
9-9-53
(date)

such sharp curves that only small, four-wheel drive vehicles are able to traverse it. It would be necessary to relocate at least 1½ miles of road to make it practical to move equipment onto the property by truck. This relocation is necessary because of the sharp turns and steep grades of that portion of the present road.

The road is not passable at the present time because of windfalls and washed out sections.

COMPETENCE OF APPLICANT

It would be necessary for the applicant to hire competent personnel to supervise the project. Mr. Jones, the applicant's consulting engineer, is not capable of directly supervising a project because of his health.

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Development workings on the prospect include a 60-foot trench which crosscuts the mineralized zone. A 20-foot adit explores the mineralized zone. To the southwest in line with the apparent strike of the alteration zone, for a distance of at least 150 feet, are a number of shallow prospect pits now for the most part sloughed and filled with surface debris. It is reported that there is a tunnel to the northeast, across Marten Creek, but its location has been obscured by landslide and talus material. The accompanying map shows all workings that were accessible for inspection in July 1953.

GEOLOGY

The rock underlying the Silver Coin prospect is a gray biotite, hornblende monzonite or diorite. It is presumed that this rock

is a northward extension of the Index Granodiorite[1] and probably represents a quartz poor variant of the formation. At the Silver Coin prospect, the monzonite is very even grained, and though coarsely jointed, exhibits no other lineal or foliation characteristics.

In the short adit is exposed a strongly altered zone, apparently bounded by strong joints and localized at and near the intersection of two fractures steeply dipping in opposite directions. This alteration zone is very soft, contains much sericite, is considerably iron-stained with minor copper stain, and can be traced for nearly 20 feet, attaining a maximum width of 7 feet. In the central portion of the exposed alteration zone is much coarse-grained calcite around which is fair grade sphalerite and minor chalcopyrite. On the northeast end of the adit, coarse-grained quartz lines the westward-dipping of the two strong fractures. In the northeast end of the adit, the zone is nearly 4 feet wide. Near the southwest end of the adit, a very tight crosscutting fracture apparently limits the main part of the alteration zone, for beyond to the southwest of this crosscutting fracture the zone narrows to less than 2 feet in width and is confined to the margins of strong joints in the southeast walls of the adit.

The alteration zone crops out on the slope above and southwest of the adit portal. As represented on this slope, the alteration zone is 6-to 7-foot wide and consists of a band of soft brown to green-stained material, bordered on both sides by relatively unaltered monzonite. A narrow band of alteration can be seen following the northward dipping footwall structure to the northwest. Few sulphides could be seen in the alteration zone above the adit level.

All outcrops in the area surrounding the trench and adit were examined for possible ore-bearing minerals. No exposures exhibited any apparent alteration of the country rock and certainly no indications of sulphide mineralization were seen away from the area in and above the adit.

The alteration zone was thoroughly sampled. Three samples, one at each end and one in the central portion, were taken in the adit. A channel sample was cut across the alteration zone on the hillslope slightly above the adit level. The applicant reports that much bismuth-bearing material had been found to occur at the prospect. Consequently, all samples taken were assayed for gold, silver, zinc, copper, and bismuth. Locations of all samples are shown on the accompanying map. Below is a tabulation of the assay results. It is to be noted that no zinc assay results are listed. Apparently due to an oversight by the Union

---

1/ Weaver, Charles E., The Tertiary formations of western Washington, Washington Geological Survey, Bull. 13, 1916, pl. X, pp. 65-67.

Assay Office, Inc., the samples were not assayed for zinc. In view of the low grade of ore that is indicated by the assay results received, the possibility seems remote that zinc assay results will be sufficiently high to change the opinion that this prospect is obviously not worthy of further consideration as a site for exploration.

Sample No.	Width Inches	Gold oz/ton	Silver oz/ton	Zinc %	Copper %	Bismuth %
216	84	Tr.	0.7	N.R.	0.61	None
217	43	Tr.	0.1	N.R.	None	None
218	18	Tr.	0.2	N.R.	None	None
219	76	Tr.	0.4	N.R.	0.15	None

Note: N.R. means not reported.

PAST OPERATION

The prospect was originally discovered in the 1880's. Apparently, work from then until 1948 consisted of no more than the annual assessment work necessary to hold the claims. In 1948, the applicant constructed 3½ miles of jeep road up Marten Creek to the prospect at a reported cost of $16,000. In 1949, they dozed out the old crosscut, forming an open cut to the mineralized zone, at a reported cost of $3,000. The property has been inactive since 1949 except for annual assessment work.

There has been no production from the property.

MANPOWER AND SUPPLIES

Manpower and supplies are available for exploration work although the wage scale is affected by the logging operations in the area. Wage scales for miners would have to be at least $2 per hour to obtain competent man.

APPLICANT'S PROPOSAL

The applicant proposes to carry out the following work

1. 1,500 feet of drifting
2. Repair road and strip veins
3. Construct:
   - Tool and blacksmith house
   - Living quarters
   - Install water system

The total cost of this program is to be $100,000 broken down as follows:

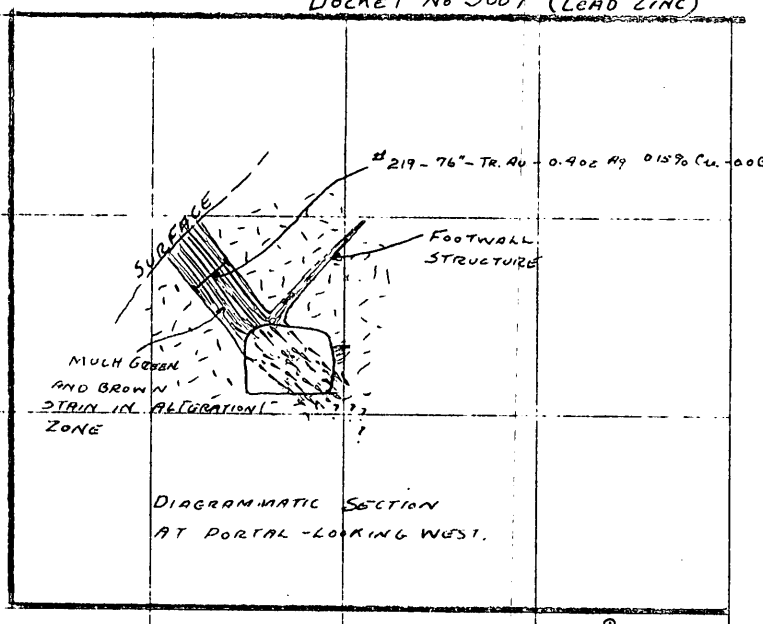
1,500 feet of drifting @ $40/ft.	$ 40,000
Repairs to road including stripping of veins - lump sum	10,000
Buildings and water system	5,000
Supervision, geology, engineering, analytical work and accounting	35,000
Contingency	10,000
Total	$100,000

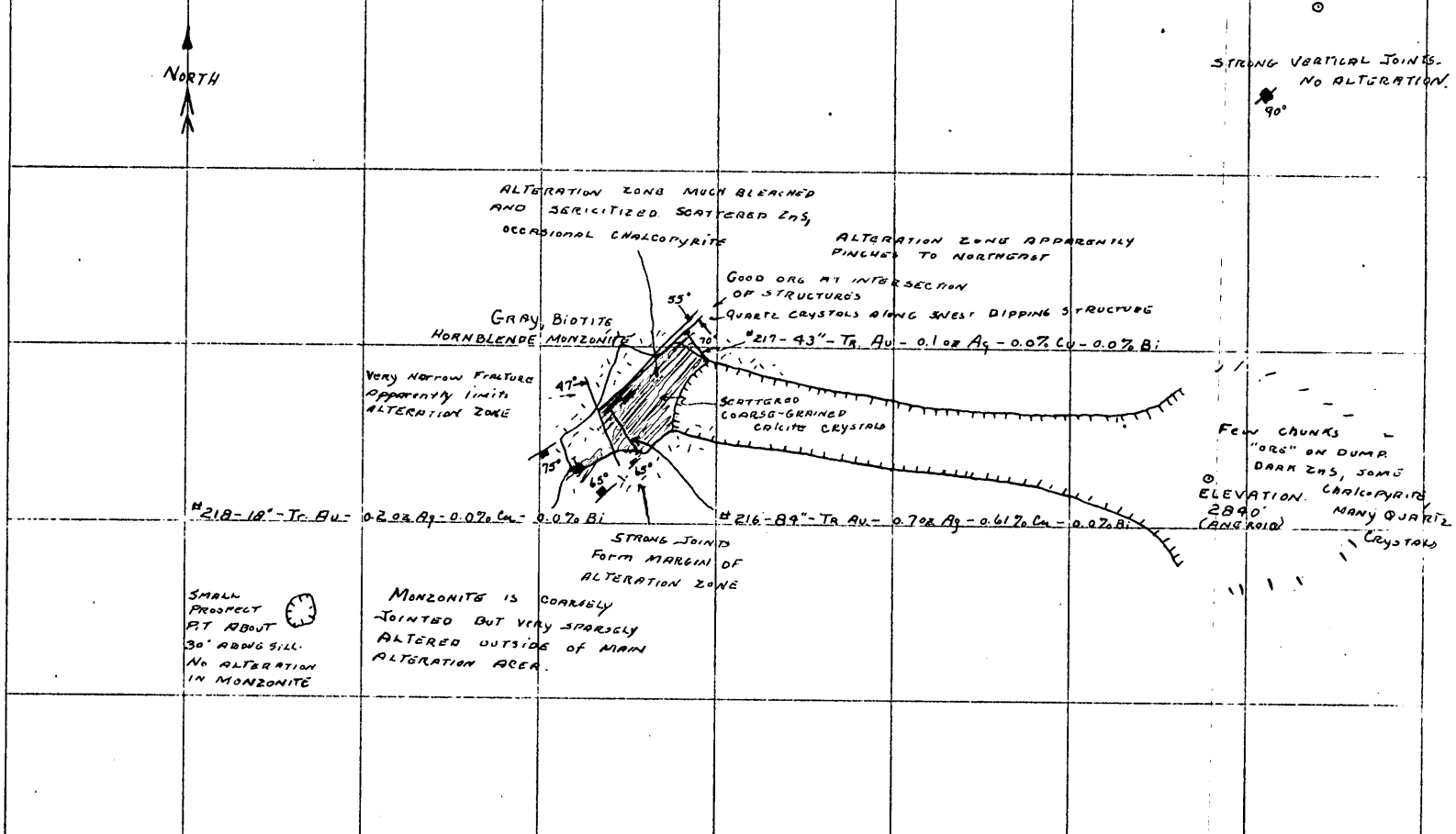
The objective of this program is to explore for the extension of the mineralization exposed in the present workings.

From an examination of the present exposures, it does not appear that the mineralized zone can be projected horizontally over a few feet, the existing open cut apparently having exposed both ends of the zone. There remains the rather remote possibility that the zone persists in depth; however, the size and apparent grade of the target and the incompetence of the applicant make an exploration project unfeasible.

Enclosure - 1
Distribution:
DMEA (4) Docket
USBM (5) Puffett
USGS (SRO)

DOCKET No 3007 (LEAD ZINC)





Silver Coin Mining Company Prospect

Sec. 11, T. 30 N., R. 9 E., Silverton Mining District

Snohomish County, Washington

1" = 20'

Tape & Brunton Traverse & Geology - W. P. Puffett, USGS - 7/21/53

"ALBANENE" NO. 105M K&E CO., N.Y. REG. U.S. PAT. OFF

FILE COPY
SURNAME:
Docket
Keating
Inserted

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

JUL 8 1953

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313-314 Mutual Life Bldg.
Seattle, Washington

Re: Docket DMEA 3007 (Copper-Bismuth-Lead-Zinc)
Silver Coin Claims
Mt. Baker National Forest
Snohomish County, Washington

Dear Mr. Jones:

This will acknowledge receipt of your letter of June 19, 1953, relative to the above-cited application, in which you advise us that you have consulted with the principals of the company and they desire to have the application reactivated.

As you no doubt understand, before this office can give further consideration to the application, it is necessary that the DMEA Field Team examine the property and submit a report.

Mr. A. M. Weissenborn, Executive Officer, DMEA Field Team, Region II, South 157 Howard St., Spokane, Washington, has advised us that he expects, in the near future, to have a field party in the area in which your project is located and that an examination can be made at that time. At the appropriate time, Mr. Weissenborn will communicate with you regarding the examination, if he has not already done so.

Sincerely yours,

C. O. Mittendorf

Administrator

AGKeating/jh
7/7/53
cc. to: Docket
Adm. Reading File
Oper. Comm.
Base Metals
Chron.
Messrs. Bishop
Kinkel
DMEA Field Team, Region II (2)

R.C.J. 7-8-53

EPHONE Main 6510

MINING
MILLING
ASSAYING
SURVEYING
ANALYTICS
APPRAISALS

CLARENCE H. JONES

ENGINEER
MINERALS, ORES, CONCENTRATES, METALS
IMPORTING AND EXPORTING
DOMESTIC DISTRIBUTION
SHIPPING
313-314 Mutual Life Building
SEATTLE
U. S. A.

CABLE ADDRESS:
"JOMO"
CODES:
PRIVATE
AND ALL
STANDARD

Hanewald
Keating
Betty

CLARENCE H. JONES
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

June 19, 1953

VIA
AIR MAIL

C. O. MITHENDORF, Administrator
U.S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25
DISTRICT OF COLUMBIA

Re: Docket No. DMEA 3007 Explor. Appli.
Silver Coin Claims
Mt. Baker Nat'l. Forest
Snohomish County, Washington

GENTLEMEN:

I have your letter of May 19, 1953, advising cause and effect of your inability to grant Silver Coin Mine their supplication for assistance under the Defense Production Act owing to lead and zinc.

Also your letter of June 8, 1953, stating that you were now in a position to continue consideration of this Application, and asking for reply as to whether or not the Silver Coin Mining Company desired to reactivate their case.

I have had a meeting with the Mine principals, and they advise me by all means to advise you that they wish the matter not only reactivated but pressed to a successful conclusion.

I wish to thank you for your letter, and trust that if you need any further information from this end will be only too glad and willing to supply you with it, if it is obtainable.

I do wish to stress, however, that the lead, zinc mineral consideration which you mentioned in your letter of May 19, has not been considered by the Mine as a very strong argument favorable to the Application. The copper and the bismuth, as shown by the assays sent you, have been the predominating minerals in the ore of this Mine.

A director of the Company, Mr. Harry P. Mears, a short time ago was in Washington, D.C. and consulted with the Bureau of Mines in regard to the property and this loan. The consultant took him to your office and through this source the Application was made.

The gentlemen informed him, when he saw the Bismuth content of the ore, that the government certainly wanted Bismuth as well as copper.

This trip to Washington by Mr. Mears was made especially for the purpose herein stated.

Thank you for your consideration, and trust to hear from you upon receipt of this letter.

Yours very truly,

CLARENCE H. JONES, Engineer

By Clarence H. Jones
For Silver Coin Mining Co.

CHJ:AT

500
FILE COPY
SURNAME:

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

JUN 8 1953

Mr. Clarence R. Jones, Engineer
Silver Coin Mining Company
312-314 Mutual Life Building
Seattle 4, Washington

Re: Docket No. MRA 3007 (Lead-Zinc)
Silver Coin Claims
Mt. Baker Nat'l. Forest
Snohomish County, Washington

Dear Mr. Jones:

On May 18, 1953, you were informed that a restricted program directive had obliged this Administration to deny your application for Government assistance in an exploration project.

However, a modifying directive dated June 1, 1953 has given us authority to continue processing your application. Therefore, we are reactivating your case. If you no longer desire to pursue your application, kindly advise accordingly.

Sincerely yours,

C. O. Mittendorf

Administrator

WRGriswold/hmj
(6-5-53)

CC to: Docket
Adm. R. File
Op. Committee
Base Metals Division
Region II (2)
Mr. Kinkel
Mr. Bishop
Chron.

6-8-53

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

xxxxxxxxxxxxxxxxxx

So. 157 Howard Street
Spokane 4, Washington

May 29, 1953

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Co.
313-314 Mutual Life Building
Seattle 4, Washington

Docket No. DMEA-3007 (Copper, Lead, Zinc)

Re: Application for Exploration Assistance
Silver Coin Mine
Snohomish Co., Washington

Dear Mr. Jones:

We are returning herewith as per your instructions the book submitted to this office in connection with your application for exploration assistance minus the exploration application itself which we are keeping for our files. Other than this, the book is intact.

We thank you for your interest in our Defense Minerals Exploration Administration program.

Very truly yours,

Mary L. Smelser
for A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosure
cc: DMEA(2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.
xxxxxxxxxxxxxxxxxx
So. 157 Howard Street
Spokane 4, Washington

May 29, 1953

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Co.
313-314 Mutual Life Building
Seattle 4, Washington

Docket No. DMEA-3007 (Copper, Lead, Zinc)

Re: Application for Exploration
Assistance
Silver Coin Mine
Snohomish Co., Washington

Dear Mr. Jones:

We are returning herewith as per your instructions the book submitted to this office in connection with your application for exploration assistance minus the exploration application itself which we are keeping for our files. Other than this, the book is intact.

We thank you for your interest in our Defense Minerals Exploration Administration program.

Very truly yours,

Mary L. Smelser
for A. H. Weissenborn
Executive Officer, [illegible]
Field Team, Region II

Enclosure
cc: [illegible]

FILE COPY
500 SURNAME:

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

MAY 1 9 1953

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313-314 Mutual Life Building
Seattle 4, Washington

Re: Docket No. DMA 3007 (Lead-Zinc)
Silver Coin Claims
Mt. Baker Nat'l. Forest
Snohomish County, Washington

Dear Mr. Jones:

This is to inform you that, effective April 15, 1953, the commitment of funds allocated to the DMA for exploration assistance under the Defense Production Act was restricted to certain specified metals and minerals still in short supply. Lead and zinc were not specified, and consequently were automatically removed from the list of metals or minerals eligible for exploration assistance.

I regret to advise you that, since your application relates to lead-zinc and was pending on the date of the restrictive order, we are without authority or funds to enter into a contract for exploration, and your application is accordingly denied. This action is taken without prejudice to the merits of your proposed project.

The staff of the DMA wishes to express its appreciation for your interest in the exploration program and for your cooperation during the period your application has been under consideration.

Sincerely yours,

C. C. Mittendorf

Administrator

MAY 1 9 1

WHGriswold/hmj
(5/18/53)
CC to: Docket
Adm. R. File
Op. Committee
Base Metals Division
Region II (2)
Mr. Kinkel
Mr. Bishop
Mhorn.

DMEA 3007

Docket

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.
xxxxxxxxxxxxxxxxx
So. 157 Howard Street
Spokane 4, Washington

May 1, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 4 1953

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313-314 Mutual Life Building
Seattle 4, Washington

Re: Application
Silver Coin Claims
(Mt. Baker Nat'l. Forest)
Snohomish County, Washington

Dear Mr. Jones:

The application for DMEA assistance on the Silver Coin Claims has been reviewed in this office and forwarded to Washington for further consideration. If additional information is desired, you will be contacted by our Washington office.

Yours very truly

Harold Kirkemo
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

cc: USBM (2)
DMEA (2)
Puffett

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
~~WASHINGTON, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

May 1, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 4 1953

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313-314 Mutual Life Building
Seattle 4, Washington

Re: Application
Silver Coin Claims
(Mt. Baker Nat'l. Forest)
Snohomish County, Washington

Dear Mr. Jones:

The application for DMEA assistance on the Silver Coin Claims has been reviewed in this office and forwarded to Washington for further consideration. If additional information is desired, you will be contacted by our Washington office.

Yours very truly

Harold Kirkeso
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

cc: USBM (2)
DMEA (2)
Puffett

April 29, 1953

Mr. Harry P. Mears, Manager
Silver Coin Mining Company
Seattle 4, Washington

Subject: DMEA-3007
Re: Exploration Assistance
Silver Coin Mineral Group

My dear Mr. Mears:

The receipt of your application dated April 14, 1953 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-3007 and referred to the Base Metals Division.

Kindly refer to DMEA-3007 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Chief, Operation's Control
and Statistics Division

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

April 29, 1953

Memorandum

To: Executive Officer, DMEA Field Team, Region II

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region II.

DMEA-3007 - Silver Coin Mining Company

ROBERT E. ADAMS

Robert E. Adams,
Chief, Operation's Control
and Statistics Division

38226

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

April 22, 1953

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 27 1953

Dear Mr. Selfridge:

Enclosed are three copies of an application for DMEA assistance submitted by the Silver Coin Mining Company. The application concerns a property in the Mt. Baker National Forest, Snohomish County, Washington. One copy of the application has been retained for the files of this office.

The application, although bulky, is largely superfluous and pertaining to various and sundry matters far removed from exploration. We have no information at this office on the Silver Coin property; however, after scanning the application we are inclined to wonder whether the property warrants exploration.

We plan on having a field party in that part of Washington during the second week in May and will attempt to interview the applicants at that time and also to examine the property, if it is accessible.

Sincerely yours,

Thor H. Kiilsgaard

Thor H. Kiilsgaard
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosure

cc: USBM (2)
Puffett

2

2 SILVER COIN MINING CO.

APPLICATION FOR AID

FOR SILVER COIN MINE

EXPLORATION PROJECT

PURSUANT TO DMEA ORDER NO. 1

TO

U.S. DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

CITY OF WASHINGTON 25

DISTRICT OF COLUMBIA

NOTE

If you have no purpose in retaining this Book and its contents, please return same, less the items you wish to retain, and address all communications in reference to this Application et caetera to

CLARENCE H. JONES
Engineer
313--314
Mutual Life Building
Telephone Main 6510
Seattle 4, USA.

ORE SAMPLES IN BAG ATTACHED.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration

APR 27 1953

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. .....
Metal or Mineral .....
Date Received .....
Estimated Cost .....
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: Silver Coin Mining Company
a limited mining co-partnership, duly documented and recorded.
313 Mutual Life Building, Seattle 4, Washington
Harry P. Mears, et al.

(*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 Silver Coin Mineral Lode, unpatented, Claims Nos. 1 to 17 inclusive, and millsite, situated in Sections 23, 14, and 11, T 30 N, R.9, WM., in the Mt. Baker National Forest, in the Silverton, formerly Stillaguamish, Mining District, Snohomish Co., Washington

(*b*) State any mine name by which the property is known. Silver Coin Mineral Group

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

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

(*e*) If you own the land, describe any liens or encumbrances on it None

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

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

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

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

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. Constructed 3½ miles road, but it is badly in need of repairs and partial reconstruction.

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

16—66551-1

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

(*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 soon as weather permits days and be completed within 24 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. Registered professional engineer

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

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

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

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

(*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. See attached list

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

(*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?

[X] Money [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated April 14, 1953

SILVER COIN MINING COMPANY
(Applicant)

By Harry P. Meers
Manager

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

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

SILVER COIN MINERAL CLAIMS

MINING RECORDS, VOLUME, PAGE, AND INSTRUMENT NUMBER

REFERS TO APPLICATION FORM MF-103, PAGE 1,

PARAGRAPH 3 (f).

Claim	N of L No.	Recorded Vol.	Recorded Page	Date Recorded	Amendment No.	Vol.	Page	Date Recorded
Silver Coin No. 1	709704	44	204	8-15-41	862458	47	62	11-20-47
" " " 2	709705	44	205	8-15-41	862459	47	67	11-20-47
" " " 3	789529	45	385	8-14-45	877608	47	125	4-23-48
" " " 4	789530	45	384	8-14-45	877609	47	131	4-23-48
" " " 5	852913	46	590	8-12-47	877610	47	137	4-23-48
" " " 6	853520	46	598	8-18-47				
" " " 7	853521	46	598	8-18-47				
" " " 8	853522	46	599	8-18-47				
" " " 9	853523	46	600	8-18-47				
" " " 10	853524	46	601	8-18-47				
" " " 11	853525	46	602	8-18-47				
" " " 12	853526	46	603	8-18-47				
" " " 13	853527	46	604	8-18-47				
" " " 14	853528	46	605	8-18-47				
" " " 15	877611	47	142	4-23-48				
" " " 16	877612	47	143	4-23-48				
" " " 17	877613	47	144	4-23-48				
" " MS" 3	877614	47	145	4-23-48				

2

SILVER COIN MINE

Replies To Interrogations In Application

For Exploration Project

Paragraphs And Subdivisions 4 to 7 inc.

DMEA Order 1, Form MF - 103

- Attached -

CLARENCE M. JONES
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

4. PHYSICAL DESCRIPTION

(a) 150 feet of cross cut to vein. 15 feet of tunnel on vein. No commercial operation has been made. Mine will be accessible as soon as road is repaired.

(b) No commercial production has been made. Good samples taken, see Application Book data pages. If vein struture continues as indicated from surface, prospects and tunnel showing the ore reserves as calculated will be extensive.

(c) See engineering, chemical and geological report data herewith pages 1 to 25 in Application Book data; also see Property Map in said Book page

(d) From Seattle via U.S. Highway 99 to city of Everett 28 miles.

Thence via State paved Highway 15 to city of Granite Falls 18 miles.

Thence via Mountain Loop State Highway to Martin Creek 26.5 miles.

Thence via Silver Coin Mine Road 3½ miles (to be repaired) to Silver Coin Mine.

Total mileage Seattle to Silver Coin Mine 68.5 miles.

(e) All that is necessary will be available.

5. THE EXPLORATION PROJECT

(a) Chalcopyrite, Bornite, Galena, Sphalerite, Bismuthinite, Cosalite, Gold and Silver, native and in sulphides.

(b) See Property Map in Application Data Book page 43 and photographs on pages 26,27,28,29,30,31.

Mine work to consist of general exploration work, drifting on vein already discovered, in

SILVER COIN MINE APPLICATION, Attached. Contd.

5' x 7' tunnel recently started.

Also opening up reported native silver tunnel covered by recent slide.

Field location shown by arrow and X mark in photograph on page 27 in Book.

(c) Work will start within 30 days or as soon as Mine Road can be sufficiently repaired, and finished within 24 months.

(d) All machinery and equipment, materials, tools, and supplies to be furnished and supplied by Contractor.

Registered Professional Engineer will be in charge.

6. ESTIMATE OF COSTS

(a) All work will be contracted. Costs will include everything necessary: pipe, ties, power, labor, fuel, machinery and equipment, powder, caps and fuses, tools and supplies, all transportation costs included. Total estimated costs $100,000.

Rock cost, first 500 feet of drift, $40 per linear foot. Timbering with sawed timber $4 per foot extra, with round or unsawed timber $7 per foot extra.

1000 linear feet 5' X 7' tunnel, with 50 to 100 feet of timbering will cost approximately.. $40,000

Average set up time after road is opened is about 2 weeks.

Road costs, including vein stripping, lump sum	$10,000.
Buildings, Tool and Blacksmith house, Living quarters	2,500.
Water system.....	500.
Compressor house.....	2,000.

(b) For supervision, Qualified Geologist, Engineering, Licensed Chemist, Analytical Work, Accounting.... 35,000.

Contingency.....	10,000
Total.....	$100,000

2.

SILVER COIN MINE APPLICATION, Attached. Contd.

(c) Included in ESTIMATE OF COSTS, Paragraph 6 (a) on attached typewritten sheet.

All machinery and equipment, bulldozers, scrapers, compressors, power saw, drifters, loader, trucks, drills, are now owned and in good condition and in possession of proposed Contractor.

(d) All operating equipment will be furnished by Contractor.

(e) There are no buildings on or near Mine Property.

(f) New buildings required, improvements, installations:

Living quarters.....	$2500.
Water system.....	500.
Compressor house, shop.....	2000.

(g) Miscellaneous
See Paragraph 6 (b), attached typewritten page.

(h) Contingencies
10% .....$10,000.

2

Retain Pages 1-24

ORE ELEMENTS

GEOLOGICAL EXCERPTS OF

S I L V E R C O I N M I N E

ENGINEERS REPORT

MINERALIZATION:

The following summary of the mineralization of the Silver Coin Mine ore, and all the materials contained therein, and the distinguishable characteristics of each, somewhat in detail, that those not of the expert knowledge of the technician may fully understand the character of this mineral deposit, the gangue as well as the minerals containing the valuable metals in the ore body as it exists in the mine fissures in the ground.

The mineralization consists of cosalite and/or bismuthinite, chalcopyrite, sphalerite in quartz, penninite, sereeite gangue, along irregular fractures in a northeast to southwest directional zone in a hornblende granite with minor biotite and muscovite and possibly other impurities, which are given herein, either in connection with these above given or by themselves, and are defined by way of explanation for the benefit of the non-expert, or those less informed in such matters.

Penninite is the predominate gangue mineral, or material,

A polished section of the cosalite ore revealed that inclusions of chalcopyrite and pyrrhotite were not uncommon in the cosalite.

There has not as yet been sufficient development work done on the exposed vein, or mineral fracture, so as to develop well defined walls.

Section samples across the mineralized fracture from the fresh granite to complete mineralization, showed hornblende granite with minor biotite and muscovite, and development of penninite as an alteration.

An alteration of the feldspar to kaolin and increased development of penninite and some pyrite.

Vein material proper, being cosalite, and/or bismuthinite, chalcopyrite and sphalerite in a quartz - penninite - sereeite gangue, and a small amount of late deposited calcite.

With the present knowledge of the ore now available, it is apparent that a separate, or selective, concentration should be made of the cosalite and/or bismuthinite, chalcopyrite, and sphalerite.

The first extraction probably should be silver, bismuth, lead concentrate, the second a copper concentrate, and the third a zinc concentrate. It is possible the gold may follow either one or all of them.

APPARENT GEOLOGY OF ORE SAMPLES

from

SILVER COIN MINE

SILVERTON MINING DISTRICT

SNOHOMISH COUNTY WASHINGTON

Sample No. 1: A high grade Bismuth-Lead ore containing high values in Silver. This ore is the result of downward leaching of the main ore body by waters of meteric origin. The ore from which this enrichment evolved has evidently been eroded away leaving no trace of leached ore for conformation of this theory.

At the present tunnel this zone of enrichment is a vein about four feet wide with stringers filling in all the cracks of the main ore shoot. This type ore is exposed for a vertical height on the surface of 2500 feet, about, and a distance of about 2½ miles. The thickness will vary in this type deposit so therefore the actual volume cannot be safely determined.

Samples No. 2 & 4: The ore in contact with the ore of sample No. 1. This ore is, apparently, a Mesothermaltype metasomatic replacement. This ore will probably hold true for depths well below the watertable whereas the ore of sample No. 1 will probably be limited to the water table depth which is as yet unknown. The width is about 2 ft.

Samples No. 3: These are sampes of the main ore body. This is a fracture zone where high temperature, hypothermal, rising solutions by metasomatic replacement altered the Grano-diorite country rock enriching it with concentrations of Chalcopyrite, Sphalerite, Bismuthenite, and Galena; these minerals also carry gold and silver.

Molding in conformity with other mines in the area this deposit should extend for at least 1500 feet below the surface giving it a total depth of about 4000 feet. It is the main fissure in this vein that carries the ore in Sample No. 1 A large portion of this ore is rich enough for shipping direct to the smelter as no method of selective flotation has as yet been worked out for the bismuth.

Sample No. 5: A thin wall between ores, represented by samples No 2 & 3, replacement minerals in this case, are Copper and Iron Sulphides carrying a small amount of Gold and some Silver. This Metosomatic replacement penetrated deep into the Granodiorite country rock giving a large supply of middle and low grade ore. As the temperature decreased this fissure apparently remained open and the ascending solutions continued to remain active longer than in many others in the area.

The result being that in conjunction with this high temperature deposit there are also minerals of a lower temperature or of a Mesothermal nature. These Mesothermal minerals are the Sulphides of Bismuth, Lead, Zinc and Silver.

During this process much of the Granodiorite became so completely altered as to render it unrecognizable of being of a Granitic origin. As a result the Mesothermal alteration and deposition brought about a large volume of massive Bismuth-Lead ore in a soft Kaolin Matrix.

This Mesothermal replacement also penetrated well into the country rock already enriched with Chalcopyrite replacement at a higher temperature resulting in an ore that is also rich in Bismuth and Lead. As a result this ore is quite rich allowing a low ratio of concentration for a rich concentrate.

The Silver Coin Vein apparently extends for a distance of over 3 miles and is exposed in a vertical depth of over 2500 feet with a near vertical dip and should persist for over 1000 feet more.

DEFINITION OF THE GANGUE MATERIALS

FELDSPAR

The Feldspar Group of Minerals have in common a prismatic angle of about 120 degrees, they consist of aluminum silicate with potassium, sodium, calcium or barium, cleavable in two directions, about right angles, angular to compact, vitreous to subtranslucent, often opalescent, may be either colorless, white, red, green, bluish or gray.

Feldspars are divided according to their crystallisation into monoclinic feldspars including orthoclase, or common feldspars, potassium - aluminum - silicate,-$KAlSi_3O_8$, and varieties in which the potassium is partially replaced by sodium then the equation, or symbol, becomes $(KNa)\ AlSi_2O_8$, or soda orthoclase and hyalophane, a potassium - barium - aluminum - silicate $(K_2Ba)\ Al_2Si_4O_{12}$.

Triclinic feldspars, or plagioclase, including 3 microcline, a potassium - aluminum - silicate, $KAlSi_3O_8$, with varieties wherein the potassium is partially released by sodium $(KNa)\ Si_3O_8$, called Soda Microcline. Albite, a sodium - aluminum - silicate $NaAl_2Si_2O_8$. Antherthite, a calcium - aluminum - silicate, $CaAl_2Si_2O_8$.

Oligoclase, andesine and labradorite, sodium - aluminum and calcium aluminum,silicates of varying compositions corresponding to compounds varying from $(NaAlSi_2O_8)$ to $(CaAl_2Si_2O_8)$. Feldspars alter to argillite ((clay).

The feldspar family form one of the most important of the constituents of rocks as its constituent members constitute by much the largest portion of the plutonic and volcanic rocks. Feldspar will weather to clay.

KAOLIN

Kaolinite

Most important of all clays. Is an argillaceous or feldspatic compact friable, or mealy, pearly to earthy, white, grayish or reddish, hydrous aluminum silicate $H_4\ Al_2\ O_9$ crystallizing in the monoclinic system largely used for making china clay articles etc. also called china clay, porcelain clay from which the finest china ware is made.

Kaolin

$H_4\ Al_2\ Si_2\ O_9$, When pure aluminum oxide, $Al_2\ O_3$ is 39.5%, its hardness is 2 to 2.5, its specific gravity is 2.6, its weight is 162.5 lbs. per cubic foot.

2

PENNINITE

Pen'nin-ite is a green chlorite apparently crystallizing in the rhombohedral system. Is gangue material. It is a series of carboniferous rocks comprising the red sandstone and the ordinary mountain limestone and millstone grit, in Geology called the Pennin System.

MUSCOVITE

Is a potassium mica, H_2, K Al_3 (Si O_4)$_3$. It has a variable and uncertain percentage of any one of its constituents, and has a scaly, plates foliated structure, and colorless, yellowish white color, it has a vitreous pearly luster, is transparent to translucent, streak is white, tenacity is tough, laminae elastic, hardness is 2.5, specific gravity is 2.9, weight per cubic foot is 180.96 pounds. It is prevalence and general diffusion is found in granitic rocks and schists.

SERICITE

Sericite is a fine scaly silky muscovite, resembling talc, occurring in membraneous aggregates, hydro-mica, a talc like mica occurring in small scales and forming sericitic schist.

Sericite is the most common alteration product in the walls, but is never found in the fissure fillings.

BIOTITE

Bi^a o-tite is a pearly vitreous submetalic, brown-green-black, magnesium-iron mica of monoclinic crystallization, though with an apparent hexagonal form, symbolized by the formula H_2K (Mg Fe)$_3$ Al (Al Si O_4)$_3$. It has no metal source, its streak is white, hardness 2.5 to 3, specific gravity 2.7 to 3.1, weight per cubic foot approximately 180.96 pounds. It is transparent to opaque and somewhat brittle.

PYRRHOTITE

Pyr'rho-tite is a magnetic iron sulphide, bronze - red - yellow to copper red, Fe_{11} S_{12} or Fe_n S_{n+1} or Fe_5 S_6 to Fe_{16} S_{17}, crystallizing in the hexagonal system, present when pure Fe 61 % S variable, approximately 38.5 %. Streak grayish black, hardness 3.5 to 4.5 specific gravity 4.6, weight per cubic foot 287.04 pounds, Since it is the only known magnetic sulphide, it is therefore distinctive and easily determined.

HORNBLENDE

Horn'blende" is a white to greenish-black and black varieties of ferrous magnesium-calcium-aluminum amphibole, partly a silicate, its formula and divisions of metallic substances are both variable its color is vitreous, hardness 5.0 to 6.0, specific gravity is 3.2

HORNBLENDE Contd.

and its weight in pounds per cubic foot is 199.68. There are many varieties. It is one of the amphiboles.

It is found in many crystalline limestones, in granite and schistose rocks , and sometimes in serpentine and in volcanic or igneous rocks. There are any number of closely related species, including the above, resembling each other in form but differing in system of crystallization, and having closely related optical properties and similar general chemical composition. Hornblende, tremolite, and asbestos are the most commonly occuring members of the group. A green or bluish-green aluminous amphibole as distinguished from the dark brown hornblendes is called par'gas-ite.

Hornblende rock is a metamorphic shistose rock containing either feldspar, quartz, or mica.

Hornblende Schist is a schistose rock consisting essentially of hornblende,

QUARTZ

Quartz, $Si\ O_2$, is a Silicondioxide, when pure is composed of silicon 46.9 percent and oxygen 53.1 percent, it has a specific gravity of 2.7, hardness 7, its weight is 168.75 pounds per cubic foot.

This native silicon dioxide is a non-metallic element called silica and next to oxygen is the chief elementary constituent of the earth's crust.

Silica occurs in deposits of importance in many different forms such as vein quartz, as a constituent of pegmatites; as sand, sandstone, quartzite, or flint; as tripoli and as diatomite.

In some forms such as rose, smokey, and amethystine quartz, it has value as gems. Other forms of silica are agate, chalcedony, cherg, opal and onyx.

Native silicon dioxide either massive or crystallising in the hexagonal system, and varying greatly in luster, transparency and color, is the hardest of the common minerals, is infusible in the blowpipe flame, and resists all acids except hydrofluoric. It abounds in rocks and is an essential element of granite.

Optically, it is remarkable as exhibiting rotary polarization, some specimens being dextrorotatory and some levorotatory.

Different colors and varieties are due to impurities, making a large variety of jewels such as cats-eyes, topaz, sapphires, onyx, flint, agate, opal, glass et caetera.

Quartz is either phenocrystalline, which is crystallized and has a vitreous luster, as rock-crystal, or cryptocrystalline, which is massive, like flint, and generally colored.

QUARTZ Contd.

silica, is a white or colorless, extremely hard, crystalline silicon dioxide, $Si\ O_2$, and combined with various bases in all the silicate minerals.

Silica is contained in certain animals, as sponges, and in some plants, as diatoms.

TALC

Talc, $H_2\ Mg_3\ (Si\ O_3)_4$, its color is white to green, it is unit 1 in the scale of hardness, when pure, luster is pearly, its percent when pure is Mg 19.2 percent, it has a specific gravity of 2.7, and weighs 168.75 pounds per cubic foot. It crystallizes in the orthorhombic or monoclinic system of crystallization.

Talc is almost impervious to heat, and is not at all affected by acids. Large quantities of ground talc are consumed each year.

The principal uses for talc are for filler in paper and rubber, cosmetics, face powder, medicinal purposes, pencils, electric insulators and paints. The fibrous form of talc is required for the paper industry and paints, and the finest grades for pencils and toilet purposes.

The increasing use of talc in fire resisrting paints provides a good market for it in the future.

Good talc should be free from silica, grit and other impurities.

The vein form of talc is not common, deposits that derive from altered sedimentary rock and altered igneous rock are of most importance.

Talc is always associated with highly disturbed and altered rocks and usually a secondary mineral resulting from the alteration of other magnesian silicates or occasional carbonates.

Talc - schist is a schistos rock chiefly composed of talc and quartz. No.1 deposits are related immediately with crystalline limestone and schist, as are found in some eastern states. The lenses of ore vary from a thin vein to those of 50 or more feet thick and several hundred feet long.

In No.2 basic rocks, such as basalt, are altered and talc is found therein with soapstone. Talc and soapstone are frequently found together.

Talc is also an altered product of serpentine, and in place is found as lenses and sheets of blue and white marble. Soapstone is also derived from the alteration of basic rocks, but is not so pure as talc and occurs in massive form. It is mined and sawed into blocks of various sizes for use as table tops, tubs,

TALC Contd.

switchboards, scientific laboratories, fireless cookers, and for low voltage electrical purposes.

Soapstone is not interchangeable with talc for uses mentioned above for soaps tone.

Quartz, fluorite, apatite, barite and tourmaline are likely to be changed by weathering.

SULPHUR

Sulphur is an element but not a metal. Its color is yellow, its luster is greasy, adamantine, its Degree of Transparency is translucent, it is brittle, its average hardness is 2, and Specific Gravity is 2, weight per cubic foot 125 pounds. Fusing or melting temperature is 240 degrees F. and ignition temperature 500 degrees F. Symbol is S.

Sulphur mat occurs native, that is in its natural form, or as a sulphide in combination with a metal or metals.

The sulphides used directly as a source from which sulphur is produced are the iron compounds pyrite and pyrrotite.

Sulphur given off from the converters in smelters as a sulphur dioxide gas from zinc and copper ores in the process of reduction and refining of metal ores, are collected from smoke stacks and other sources and converted or condensed into acid, $H_2 S O_4$, and commercial sulphur.

Sulphur may be found as crystals, crusts, powder, and masses. It may be found in limestone, and when it constitutes 30 to 50 percent of the rock it becomes workable. It also impregnates rhyolite and exists as incrustations in irregular open fractures in lava, and also cemented to surface debris derived from the lava.

The greatest deposits of native sulphur are found in Louisiana and Texas in the coast region in undulating ground, when drilled for oil was found to consist of dome shaped core of rock salt, containing limestone, gypsum and sulpher the latter thought to have been derived from solutions coming from masses of cooling igneous rocks. The oil saturations contained therewith came in the porous rock at a later period.

The three minerals are not mined together, the sulphur lies at a depth of about 1000 feet and is recovered by forcing hot water down to the beds of gypsum, from which the sulphur is melted and comes to the surface as a pure product.

Sulphur occurs widely and is abundantly distributed in nature in both the combined and the free state. Hundreds of minerals contain sulphur as one of their essential chemical constituents.

SULPHUR Contd.

In its native state sulphur occurs in a pure crystalline form more commonly intermixed with earthy matter, the latter being the most important source of all native sulpher.

The origin of native sulphur is of two types of occurence.

Large deposits occur in sedimentary rocks and are generally the results of the reduction of gypsum.

The occurence of the sulphides is wide and abundant; the sulphides of the metals, especially pyrite, which is the sulphide of iron, are scattered throughout a large part of the earths crust.

Industrially, the occurence of sulphides is of major economic importance, because of the metallic content of lead, copper, zinc, bismuth and many other sulphide ores, and in the instance of pyrite, from which sulpher its self is processed and recovered.

Sulphur in the form of sulphur dioxide, SO_2, is an important by-product in the smelting of ores of various metal minerals.

METALLIC MINERALS

COSALITE

Cosalite is a lead gray opaque brittle sulpho-bismuthite crystallizing in the orthorhombic system, also called "Bjelkite" its symbol is $Pb_2 Bi_2 S_5$, Hardness 2.8, specific gravity 6.5, weight per cubic foot 406.25 pounds, luster metallic, streak black, when pure contains Bismuth 42.1 per cent lead 41.8 per cent sulphur 16.1 per cent.

Cosalite occurs in quartz veins with pyrite and sphalerite sulphides, some telluride et caetera. Its principal metals are bismuth and lead.

BISMUTHINITE

Bismuthinite, $Bi_2 S_3$ ***, is a trisulphide, trivalent, triad***. Per cent metal when pure, bis muth 81.2, sulpher 18.2, fusing temperature F. 507 degrees, specific gravity 6.5, weight per cubic foot 406.25 pounds, cubic feet per 2000 pounds 4.821, structure fibrous, foliated, hardness Moh scale 2, luster metallic, intensity glimmering, tenacity sectile, transparency opaque, color yellow, lead gray, tin white.

Bismuthinite crystallizes in the orthorhombic system, its principal metals are bismuth, copper, lead, zinc, gold, silver, and sulphur.

Bismuthinite is found in the United States, Saxony, Bolivia, Australia. It is associated with molybdenite and apatite in quartz, and called Bismuth Glance, and found disseminated in veins through gneiss, clay-slate.

CHALCOPYRITE

Chalcopyrite, $Cu\ Fe\ S_2$, is a metallic brass-yellow copper sulfoferrite, sometimes called copper glance, it has a greenish black streak, percentage when pure is copper 34.6 per cent, iron 30.5 per cent, sulpher 34.9 per cent. Hardness Moh scale is 3.5 to 4, specific gravity 4.2, weight per cubic foot 262.5 pounds. It is softer than iron pyrite, and occurs associated with pyrite, iron sulphide, galena, lead sulphide, sphalerite, a zinc sulphide.

Chalcopyrite and pyrite bear resemblance to each other, the pyrite generally is lighter in color and does not respond to copper tests. Chalcopyrite can easily be scratched with a knife, pyrite can not.

In appearance both may somewhat resemble gold and may be mistaken for same, gold can be cut with a knife.

Chaalcopyrite may be found in igneous rocks, in veins, or in rocks near igneous rocks. It is the most common of all copper minerals and is the mineral from which nearly all the other copper minerals are usually formed either directly or indirectly. There are exceptions to this assumption, like the Michigan copper deposits.

Chalcopyrite is frequently found with pyrite and often has gold with it.

BORNITE

Bor nite, $Cu_3\ Fe\ S_3$, contains, when pure, copper 55.6 per cent, iron 16.3 per cent, sulpher 28.1 per cent, luster metallic, transparency opaque, streak grayish black, tenacity brittle, hardness Moh scale 3.3, specific gravity 5, color when newly fractured, bronze, copper red, when fresh broken its color is dark red brown, the color of horseflesh and is sometimes called horseflesh ore, peacock ore, purple ore and variegated ore. The weight of bornite is 312.085 pounds per cubic foot.

Bornite is a secondary enrichment, that is where surface waters have soaked into the ground and dissolved the copper on or at the surface and deposited it deeper down.

It is also found with other copper minerals, and weathers to cuprite, native copper, malachite, azurite, or limonite (iron).

Bornite resembles niccolite (nickel), and pyrrhotite (iron sulphide), but neither will give a green color to a flame.

2

SILVER COIN MINE ORE

DESCRIPTION, CHARACTERISTICS AND KNOWN PHYSICAL PROPERTIES OF BISMUTH METAL AND BISMUTHINITE MINERAL ORE

CLARENCE E. JONES
STATE OF ARIZONA
REGISTERED
PROFESSIONAL ENGINEER

BISMUTH METAL	DERIVATION.....	G. Origin unknown.
	DISCOVERED.....	Ancient times. In 1450 for commercial use by Basil Valentine.
	WHERE AND HOW FOUND.....	Native. As Sulfid. And in rare minerals.
	OCCURENCE FORM With other	Metals or Elements.
	DIVISION OF ELEMENTS Metallic or non-metallic.....	Metallic.
	DESCRIPTION.....	A soft, heavy, coarsely crystalline brittle metal.
	COLOR.....	White, reddish tinge.
	LUSTER: Metals have 5 degrees of Luster.....	Splendid
	Bismuth.....marked with.....X	Shining Glistening Glimmering Dull
	CRYSTALLIZATION SYSTEM.....	Structure highly crystalline.
	Brittleness.....	Very brittle when cold.
	MALLEABILITY.....	Malleable when heated.
	POWDERS.....	Readily when cold. Easily pulverized.
	RESEMBLANCE GROUP.....	Antimony.
	DUCTILITY.....	None
	TENACITY.....	Low

BISMUTH METAL AND BISMUTHINITE MINERAL ORE

BISMUTH METAL Contd.

Bismuth in nature is semi-rare.
Is useful and uncommon.
It constitutes much less part of the earths crust than.....One-millionth.

TARIFF DUTIES FOR IMPORTS

Held free of customs duties since 1857.
Was made dutiable by US. Tariff Act of 1922 assessable at the foreign market price at per cent thereof.. 7½

Same duty was continued by the US. Congressional Act of 1930, paragraph 377.

Chemical compounds and salts assessed at percent ad valorem, paragraph 22, ... 35

MENDELEJEFF CLASSIFICATION GROUP

Isomorphous with..... Antimony
Periodic Table Group..... 5
" " Series..... ... 11

SYMBOLIC ABBREVIATION FORMULA..... Bi'''

VALENCE,

Exchangeable Atom Name..... 3, Triad, Trivalent

ATOMIC NUMBER..... 83

Number of assigned position in series of numbers of elements arranged according to periodic law, equal to number of free negative electrons in atom in excess of positive over negative charges in the nucleus.

CRYSTAL SYSTEM, GEOMETRICAL FORM OF..Rhombohedral

A solid bound by 6 sides, planes or faces, all equal, possessing 3 common planes of symmetry, intersected at angles of 60 degrees. A subdivision of the Hexagonal System, 6 sides and 6 angles.

WEIGHT CHARACTERISTICS

Atomic Weight.....208.9

The weight of its atom in form of gas compared to weight of an atom of hydrogen, being 1.

BISMUTH METAL Contd.

WEIGHT CHARACTERISTICS Contd.

Specif ic Gravity..... 9.8
Water 0° c. 32° F. Distilled
62.417 pounds av. per cu. ft.
Distilled Bi..... 9.78
Molten 1355° C. 2439°F..... 10.04

WEIGHTS Avoirdupois

Comparative Physical of Bismuth
Metal solidified form.

Per cubic inch av. ounces.....5.6704
" " " av. pounds..... .3544
" " Foot " pounds. 612.4
Cubic Feet per 2000 pounds av... 3.2649

CHEMICAL EQUIVALENT.....71.5
The number of parts by weight which
will combine with, or displace, one
part by weight of hydrogen.

HARDNESS
Decreases rapidly as temperature
increases.

Moh Scale..... 2.
Brinell Scale..... 7.3

STRENGTH
Tensile
Power or weight required to tear
asunder one square inch, av.
pounds.....3248.

Over one square inch area, per
square inch of area, av. pounds,
up to.....6400.

COEFFICIENCY OF EXPANSION

Linear expansion per degree C.
0 degrees C. to 100 degrees C.... .0000157
-190 degrees C. to 0 degrees C... .000013

Cubical expansion per degree C...
0 degrees C. to 100 degrees C... .00471
-190 degrees C. to 0 degrees C... .0039

Denotes increase or decrease of
its volume per degree of stated
temperature.

BISMUTH METAL Contd.

HEAT

Dilation Linear Expansion
For 1 degree in a length of
100 feet, inches..... .00928

Superficial Heat expansion is times
linear heat expansion..... 2.

Cubical Heat expansion is times
linear heat expansion..... 3.

EXPANSION FROM MOLTEN TO SOLID
condition, is percent of solid..... 3.2

SPECIFIC HEAT

Water @ 32 degrees F. = 1
Bismuth, from 32 degrees F. to 212
degrees F. ..... .0308

Metals have least specific heat than
any of the substances ranging from
Bismuth, .0308 the lowest, to cast iron,
.1298 the highest.

Mineral substances have .2.
Water and Woods have about .5.

Liquids, except Bromine, are less than
Water, Olive oil being lowest, vinegar
being highest.

Specific Heat is the quantity requisite
to change the temperature of a
substance any stated number of degrees
compared with that which would produce
the same effect upon an equal body of
water at 32 degrees F.

Water having the greatest Specific
Heat of any known body. This meaning
the actual quantity of heat received
and retained.

LATENT HEAT OF FUSION

Is heat required to change its solid
body to that of a liquid.

Bismuth fusing temperat ure being.....
degrees F. ..... 507.
Specific Heat, when liquid, ...0363
" " " solid..... .0308
The Latent Heat of Fusion in Heat
Units of one pound..... 22.7

BISMUTH METAL Contd.

Latent Heat of Fusion at degrees F.....	518.
or " " C.....	270.
is calories per gram.....	10.3
One French Caloric equal B.T.U.....	3.96832
The B.T.U., British Thermal Unit is to a Caloric.....	.251996

The British Thermal Unit, B.T.U., is the heat required to raise the temperature of one pound of pure water one degree Fahrenheit, at or near 39.1 degrees F., water.

BOILING TEMPERATURE

Temperature at moment of ebullition from degrees F.	2300.
" C.	1260.
To " F.	2624.
" C.	1440.

The boiling temperature is that at which, generally speaking, the atoms of a metal element are commencing to become capable of converting their heat into motion sufficient to enable them to overcome entirely the attraction holding them to each other, and extend themselves in all directions through space, by conversion into vapor, or gas, and exceeding the pressure of the atmosphere.

VOLATILIZING TEMPERATURE

The temperature at which Bismuth most fluently volatilizes is from degrees F.	2012.
" C.	1100.
To " F.	2624.
" C.	1440.

HEAT CONDUCTIVITY

Silver being.....	100.
Bismuth as compared to silver.....	1.8

By Kent formula Bismuth is that of 1/56 the heat conductivity of fine Silver.

The thermal conductivity of Bismuth is less than any other metal except Mercury.

BISMUTH METAL Contd.

The thermoelectric properties of Bismuth are remarkable.

Pure Bismuth metal possesses a thermal electric motive force, E.M.F., of microvolts per degree Centigrade, against Silver .....60.

ELECTRICAL CONDUCTIVITY

Bismuth is the most diamagnetic material known.

A sphere of Bismuth metal is repelled by either pole of a magnet.

A bar of Bismuth, if suspended by a string and subjected to the influence of a magnet, will turn right angle to its axis.

The absorbtive powers of Bismuth for X-rays are similar to those of lead.

Molten Bismuth is nearly twice as good electric conductor as when solid, this being contrary to most metals, except Antimony being the only other metal with the same electrical characteristic but the difference being much less.

The electrical conductivity of Bismuth is extraordinary low and is further decreases when exposed to the influence of a magnetic field.

Bismuth, up to about 2 per cent, like silicon, increases the electric resistance of steel without diminution of the magnetic permeability or dissipation of energy through hysteresis.

Bismuth Steel has been suggested as a substitute for silicon steel for transformer sheet.

From a study of the iron-bismuth diagram it is difficult to understand how Bismuth Steel can be made.

BISMUTH METAL Contd.

ELECTRICAL CONDUCTIVITY contd.

Silver being.....	100.
Bismuth is as compared to Silver....	1.3

According to Kent formula Bismuth electrical conductivity is only about 1/80 that of Silver.

ELECTRO-CHEMICAL EQUIVALENTS

Bismuth, grams per ampere hour.....	2.5991

ELECTROCHEMICAL ORDER OF THE ELEMENTS

In the following series each metal is electronegative to all that follow it.

Two metals in contact in the presence of an electrolyte form a galvanic couple which causes the more electronegative to be decomposed by electrolyte:

Cs-, Rb, K, Na, Li, Ba, Sr, Ca, Mg, Al, Cr, Mn, Za, Ca, Fe, Co, Ni, Ti, In, Pb, Cd, Sn, Bi, Cu, H, Hg, Ag, Sb, Te, Pd, Au, Ir, Rh, Pt, Os, Si, C, B, N, As, Se, P, S, I, Br, Cl, O, F.

The order changes with the specific electrolyte.

Bismuth is preceded by 22 elements and succeeded by 25 other elements.

EXTRACTION OF BISMUTH

Bismuth ores should be carefully hand sorted, and may be further treated by either wet or dry methods. The wet method is usually based on the fact that Bismuth may be hydrolized from chloride solutions. Liquations have been used but are quite wasteful, and have been superseded by smelting.

Because of high volatility of Bismuth and its oxides, smelting has to be conducted at a low temperature.

Detailed outlined smelting and refining processes are obtainable.

Carbon or iron may be used as reducing agent and soda ash and sometimes fluorspar have to be added to produce

BISMUTH METAL Contd.

EXTRACTION OF BISMUTH contd.

slag that will be liquid at low temperature.

In cupelling bismuth bearing lead the bismuth is removed mostly in the litharge that forms toward the end of the operation.

Such litharge contains about 20 per cent bismuth is dissolved in hydrochloric acid, HCl, and the Bismuth recovered from the filtered solution by diluting and neutralizing most of the free acid with milk of lime or soda ash.

The bismuthoxychloride from this source is heated with lime or soda ash to fix the chlorine and is then smelted.

Slimes from the Betts electrolytic refining process, virtually the sole source of bismuth produced in the United States, are fused with caustic soda and soda ash, and sodium sulphate if copper is present, and the metal is then cast into slabs for electrolytic refining.

There is another meritorious method for treating slimes which is to subject them to an oxidizing fusion similar to cupelling, and treat the bismuth product from the first fusion in a second furnace, and reduce the slag from the second furnace with salt cake and carbon producing an impure bismuth metal which is cast into slabs for anodes and refined electrolytically.

Bismuth used for medicinal and pharmaceutical preparations must be of high purity, 99.9 per cent bismuth, and free from arsenic,

Refining of bismuth for this use is therefore difficult part of the operation and involves an intricate series of treatments for the complete removal of the contaminating elements.

BISMUTH METAL Contd.

SOLVENT

Nitric Acid..... HNO_3

Bismuth is readily attacked by both concentrated and diluted Nitric Acid.

When pure Bismuth metal is dissolved with concentrated nitric acid it becomes Bismuth Nitrate, $Bi(NO_3)_3$.

ELECTROLYTIC REFINING OF BISMUTH

Bismuth is refined electrolytically in Bi Cl_3 solution carrying an excess of free hydrochloric acid. Current density, 15 to 30 amperes per square foot.

Anodes, argentiferous and auriferous Bismuth; cathodes, pure bismuth; porcelain tanks.

Mixed copper and manganese, like Bismuth, is also diamagnetic, but when Bismuth is added the alloy is distinctly magnetic.

An alloy of 5 parts Bismuth, 2parts tin and 3 parts lead melts at 199 degrees F. and is used for sterotyping and making metallic pencils.

An alloy of 1 part Bismuth, 2 parts tin, and 1 part lead is used for a soft solder for pewter, and by soap makers for moulds.

FUSIBLE ALLOYS OF BISMUTH

Fusing temperatures of alloys in degrees Fahrenheit; parts of each

Bismuth 5, lead 3, tin 2 melts at..	212.
Bismuth 47.38, cadmium 13.29, lead 19.36, tin 19.97 " ".....	160.
Bismuth 4, cadmium 1, lead 2, tin 1..... " " ...	165.
Bismuth 2, lead 1, tin 1 .... " " ...	200.
Bismuth 4, lead 1, tin 1 ... " " ...	201.
Bismuth 6, lead 5, tin 3 ... " " ...	202.
Bismuth 5, tin 3 ..... " ".....	202.
Bismuth 8, lead 3, tin 5.... " " ...	208.
Bismuth 5, lead 1, tin 3 ... " " ...	212.

BISMUTH METAL Contd.

FUSIBLE ALLOYS OF BISMUTH contd.

Bismuth 5, lead 1, tin 4	melts at...	240.
Bismuth 1, lead 1, ...	" " ...	257.
Bismuth 1, tin 1	" " ...	286.
Lead 2, tin 3 ..	" " ...	334.
Lead 1, tin 3 ..	" " ...	334.
Bismuth 1, tin 2, ...	" " ...	336.
Lead 1, tin 2 ..	" " ...	360
Bismuth 1, tin 8 ..	" " ...	392.
Bismuth 1, tin 3 ..	" " ...	392.
Lead 1, tin 1 ..	" " ...	466.
Lead 2, tin 1 ..	" " ...	475.

Formula of well known alloys

Newton's
Bismuth 50 lead 31.25 tin 18.75 F°.. 202.

Rose's
Bismuth 50 lead 28.10 tin 24.10 F°.. 203.

D'Arcet's
Bismuth 50 lead 25.00 tin 25.00 F°.. 201.

D'Arcet's with mercury
Bismuth 50 lead 25.00 tin 25.00
Mercury 25.00 F°..... 113.

Wood's
Bismuth 50 lead 25.00 tin 12.50
cadmium 12.50 F°..... 149.

Lipowitz's
Bismuth 50 lead 26.90 tin 12.78
cadmium 10.40 F°..... 149.

Guthrie's Entectic
Bismuth 50 lead 20.55 tin 21.10
cadmium 14.03 F°..... Very low.

THE COMMON IMPURITIES IN BISMUTH

The common impurities in bismuth metal consists of Iron, Copper, Arsenic, Lead, Antimony, Cobalt, Molybdemum and Tellurium.

SMELTER FLUE DUST RECOVERY OF BISMUTH

At Murray, Utah, an analysis of the smelter flue dust of the lead blast furnaces showed Bismuth 0.50 per cent.

BISMUTH METAL Contd.

Arsenic 35 per cent, Lead 40 percent, Cadmium 15 per cent, Antimony 0.7 per cent, Selenium 0.5 per cent.

Mexican lead bullion also may contain considerable Bismuth.

COMMERCIAL USES FOR BISMUTH

Bismuth, is more crystalline than Antimony or Arsenic and too brittle to be used alone as a metal.

But it has remarkable characteristics when used as an alloy.

It is much used for sprinkler plugs and other fire protection devices, electric fuses, low melting solder, dental amalgams, and tempering baths for small tools.

In most of these alloys the function of the Bismuth is to lower the melting temperature, most all of them contain about 47 per cent or more of Bismuth, and melt when placed in hot water.

U.S. Patents have been issued for a Bismuth Antimony Lead Cadmium alloy for use in bonding glass.

Bismuth improves the casting properties of tin and lead by lowering the surface tension, thereby producing sharply defined castings even when the percentage of Bismuth is insufficient to cause the metal alloy being cast to expand and fill the mould at the moment of solidification.

Bismuth also acts as a hardening agent, and is used for the purpose of hardening the lead plates or grids used for electric storage batteries, stiffening and preventing buckling of the plates and consequently preventing the loosening of the active material in the grids, thereby making it possible to materially increase the charging and discharging electric current rate, like quick recharging and heavy

BISMUTH METAL Contd.

discharging rate used in starting internal combustion engines used in automobiles, trucks, boats etc.

An important use for Bismuth has been in the form of its compounds which are used extensively in medical and cosmetic preparations, indigestion remedies and toilet powders.

A number of the compounds are used in treating wounded soldiers in time of war.

Insoluable salts of Bismuth are given human patients preparatory to X-Ray examination of the digestive tract.

Bismuth compounds are used in porcelain painting, enameling, and in the manufacture of optical glass.

Bismuth alloys are used for making delicate castings, such as dental dies from plaster impressions, to hold delicate castings or pieces of irregular shape during machining or testing operations, to furnish gas tight liquid seals for apparatus such as nitriding ovens, and for toys, such as "magic teaspoons" which melt in hot water.

Bismuth amalgams, with or without lead and tin, are used for the production of mirrors ,the luster and brilliance of which is equal to that of silver.

Bismuth added to tin will impart hardness, sonorousness, luster, and fusibility.

Ten per cent addition of Bismuth improves the appearance of tinned joints on hot or cold rolled steel.

Bismuth is used for regulating and controlling the hardness of Bearing Metals which are mostly made of Bismuth, Antimony, Tin, and Copper.

BISMUTH METAL AND BISMUTH MINERAL ORE

BISMUTH

Metal

Contd.

Bismuth is required in the manufacture of Britannia Metal and Puter.

The addition of Bismuth, up to the limit of its solid solubility in either tin or lead improves the resistance to oxidation of these metals.

Bismuth alloyed with lead have good casting qualities and produce good impressions of the mould.

Bismuth in various amounts have been added to brass and bronze alloyed mixtures, and to anti-friction metals, but smaller amounts when present as an impurity, are usually regarded with extreme caution and suspicion, depending upon the purpose for which its use is intended, but is nevertheless used as a good medium for argument to break down or effect a lower price.

The electrical and thermal conductivities of Bismuth are extraordinarily low and the electrical conductivity further decreases when it is exposed to the influence of a magnetic field, consequently Bismuth is used in the construction of instruments for determining the strength of magnetic fields.

Miscellaneous uses for Bismuth include the following items:
Metallic Pencils, consisting of alloys of Bismuth, lead and mercury.

In the separation of metals in the Platinum group.

Fusion with Bismuth is used to dissolve Rhodium.

Plates of metallic Bismuth are used as a surface for friction and lubrication tests, as these plates are much more easily cleaned of grease than is glass.

ANTI-KNOCK PROPERTIES organo-metallic

BISMUTH Metal Contd.

compounds of Bismuth possess decided anti-knock properties and are about one third to one half as efficient as lead compounds when used as fuel for internal combustion gasoline engines.

Bismuth trichloride renders less inflammable some water proofing materials, such as tar, creosote, and non-drying oils.

Bismuth tri-oxide is used to some extent as a pigment in vitreous enamels, porcelain, and glass, to increase the fusibility of coloring oxides or compounds.

For this use it resembles lead oxide, but has the advantage of being non-poisonous.

A mixture of Bismuth composition $Bi_2O_3 : {}_3Zn$ has been patented as a Catalysis in the synthesis of methanol.

Catalysis for the oxidation of ammonia have been made by adding Bismuth oxide to iron oxide.

Bismuth trioxide has been used as a catalysis for the oxidation of hydrocyanic acid.

Owing to the volatility of Bi_2O_3, the life of some of these catalyses at high temperature is short.

An important use of Bismuth as an alloy for steel castings for domestic Stoves, Ranges, and Culinary Utensils has been proven.

The addition of Bismuth produces a smooth bright surface to the castings, preventing surface air holes and roughness, and lessens the shrinkage during the cooling period of the cast metal.

FOR PRINCIPAL BISMUTH MINERAL ORE see Folder following page.

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RETURN

11 - 47 SILVER COIN MINE. Bald Mountain El. 4773'

Looking West from Silver Coin Mine

101748 SILVER COIN MINE
X Marks vein exposure 100' wide.

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RETURN

6-7-52 SILVER COIN MINE.

No.1 Tunnel. Winter Stored Tools.

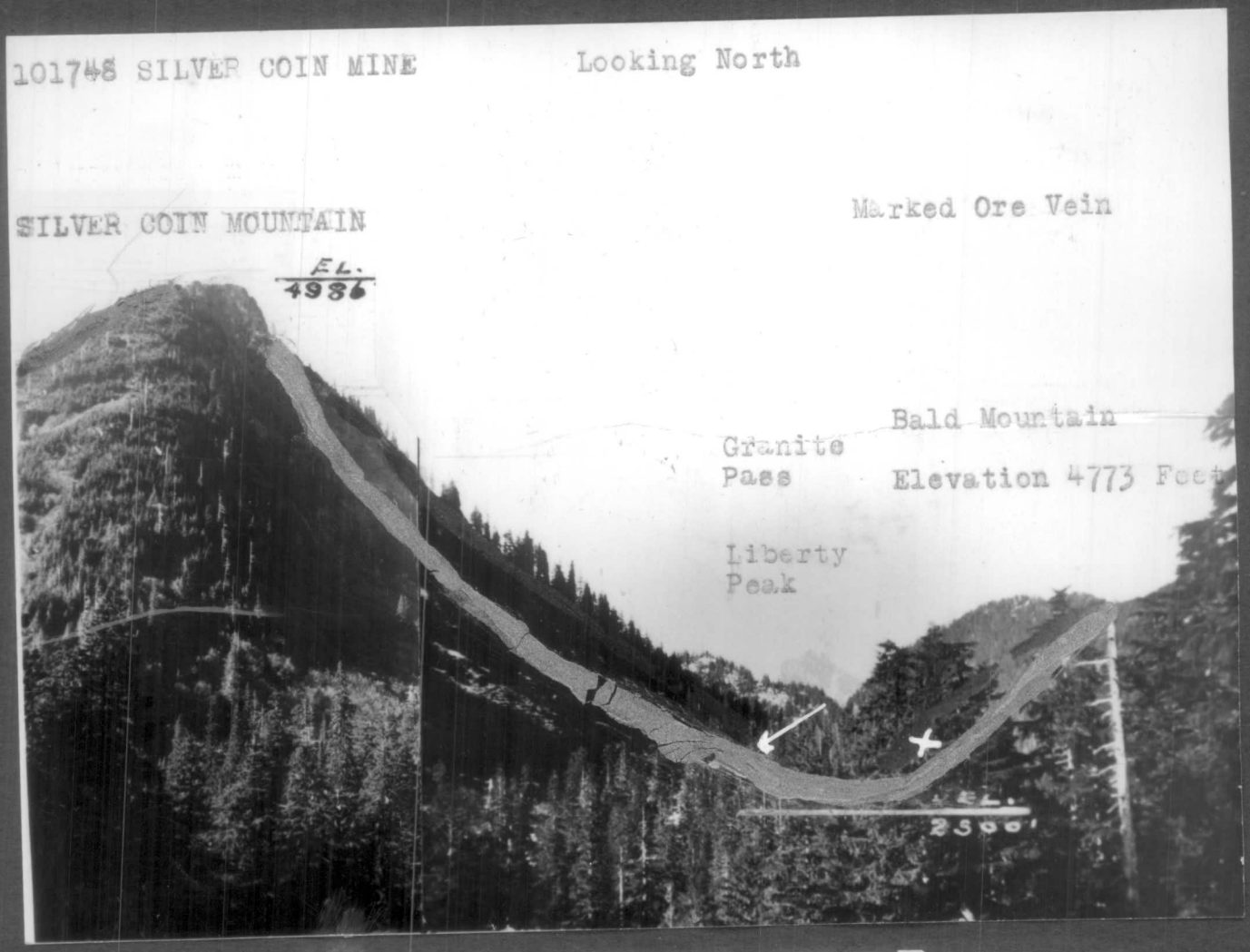
6-7-52. SILVER COIN MINE.

No.1 Tunnel. Winter Stored TOOLS.

RETURN

27

101748 SILVER COIN MINE Looking North



Arrow: Indicates location of prospect tunnel cross cut and portal.

X Indicates shallow prospect tunnel where native silver is said to have been located.

RETURN

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10548 SILVER COIN MINE Tunnel No. 1

Showing Exposed Ore Vein

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RETURN

6-8-52 SILVER COIN MINE.

Where Crosscut Tunnel No. 1 Penetrates Foot Wall to Main Vein Exposing Ore in side of Vein.

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Lambert-McKamey

LABORATORIES

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND COMMERCIAL CHEMISTS

ASSAYERS METALLURGISTS

April 26, 1948

CERTIFICATE No. 2013

CERTIFICATE OF ANALYSIS

COMPLETE ANALYTIC REPORT

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313 Mutual Life Bldg.
Seattle, Washington

Dear Sir:

We hereby certify that we have run assays & analyses on the sample marked "Bismuthinite Sulphide Sample # 5" from the silver coin claim No. 1, Silverton Mining District, Snohomish County, Washington.

This sample was submitted to us April 12, 1948 and we would report the results as follows:

RESULTS:

		@	Value/ton
Bismuth	24.71%	$ 2.00/lb.	$988.40
Lead	21.10%	0.173/lb.	73.00
Copper	6.22%	0.215/lb.	26.75
Zinc	5.80%	0.12/lb.	13.92
Sulphur	9.45%	- - - - -	- - - - -
Gold	1.40 tr.oz.	35.00/oz.	49.00
Silver	269.74 tr.oz.	0.75/oz.	202.31
Iron (Fe)	8.38%	- - - - -	- - - - -
Tellurium (Te)	0.50%	- - - - -	- - - - -
Alumina (Al_2O_3)	3.36%	- - - - -	- - - - -
Silica (SiO_2)	20.99%	- - - - -	- - - - -
Calcium (Ca)	Trace	- - - - -	- - - - -
Potassium (K)	Trace	- - - - -	- - - - -
Magnesium (Mg)	Trace	- - - - -	- - - - -
TOTALS - - -	100.51%	- - - - - - - - - - -	$1,353.38

Lambert-McKamey Laboratories

Metallurgical & Chemical Engineer

BY R. Lambert

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LABORATORIES

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND COMMERCIAL CHEMISTS

ASSAYERS METALLURGISTS

April 11, 1949

CERTIFICATE NO. 2393

CERTIFICATE OF ANALYSIS

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313 Mutual Life Building
Seattle, Washington

Dear Sir:

We hereby certify that we have made assays and analysis on ore "Sample #1" from the Silver Coin #1 Claim, Tunnel #1, and immediate vicinity situated in the Silverton Mining District, Snohomish County, Washington.

This sample was submitted to us April 5, 1949 and we report our results as follows:

SAMPLE #1

	Per Cent	Quant./Ton	Value/Unit	Total Val./Ton
Bismuth - - -	15.62	312.40 lbs.	$ 2.00/lb.	$ 624.80
Lead - - - -	23.54	470.80 lbs.	0.17/lb.	80.04
Zinc - - - -	8.10	162.00 lbs.	0.16/lb.	25.92
Copper - - -	4.78	95.60 lbs.	0.235/lb.	22.47
Gold - - -	- - - -	1.90 ozs.	35.00/oz.	66.50
Silver - - -	- - - -	174.04 ozs.	0.905/oz.	157.51
				$ 977.24

Chemical & Metallurgical Engineer

Lambert-McKamey Laboratories

BY R. B. Lambert

1 B

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LABORATORIES

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND COMMERCIAL CHEMISTS

ASSAYERS METALLURGISTS

CERTIFICATE NO. 1692

CERTIFICATE OF ANALYSIS

August 8, 1947

Silver Coin Mining Co.
Mr. Clarence H. Jones, Engineer
313 Mutual Life Bldg.
Seattle, Washington

Dear Sir:

We have made assays and analyses of the composite of samples numbered 1, 2, & 3, from the silver coin claim No. 1, Silverton Mining District, Snohomish County, Washington, submitted by you and we wish to report as follows:

TEST RESULTS:

	ASSAY	@	Value/Ton
Gold	0.30 Tr. oz./ton	$35.00/Tr.oz.	$ 10.50
Silver	96.96 Tr. oz./ton	.64/Tr.oz.	62.05
Zinc	10.60%	.10½/lb.	22.26
Lead	15.10%	.15/lb.	45.30
Copper	1.60%	.21/lb.	6.72
Antimony	None	- - - - -	None
Bismuth	5.42%	2.00/lb.	216.80

Total Value/Ton - - - $363.63

Lambert-McKamey Laboratories

BY R. Lambert

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LABORATORIES

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND COMMERCIAL CHEMISTS

ASSAYERS METALLURGISTS

April 11, 1949

CERTIFICATE NO. 2393

CERTIFICATE OF ANALYSIS

Mr. Clarence E. Jones, Engineer
Silver Coin Mining Company
313 Mutual Life Building
Seattle, Washington

Dear Sir:

We hereby certify that we have made assays and analysis on ore "Sample #3a" from the Silver Coin #1 Claim, Tunnel #1, and immediate vicinity situated in the Silverton Mining District, Snohomish County, Washington.

This sample was submitted to us April 5, 1949 and we report our results as follows:

SAMPLE #3a

	Per Cent	Quant./Ton	Value/Unit	Total Val./Ton
Bismuth	3.59	71.80 lbs.	$ 2.00/lb.	$ 143.60
Lead	2.70	54.00 lbs.	0.17/lb.	9.18
Zinc	0.40	8.00 lbs.	0.16/lb.	1.29
Copper	Trace	Trace	0.235/lb.	None
Gold	----	0.14 ozs.	35.00/oz.	4.90
Silver	----	33.84 ozs.	0.905/oz.	30.63
				$ 189.60

Chemical & Metallurgical Engineer

Lambert-McKamey Laboratories

BY R. B. Lambert

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2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND COMMERCIAL CHEMISTS

ASSAYERS METALLURGISTS

CERTIFICATE NO. 1692

CERTIFICATE OF ANALYSIS

August 8, 1947

Mr. Clarence H. Jones, Engineer
Mutual Life Bldg.
Seattle, Washington

Dear Sir

We have made assays and analyses of the composite of samples numbered 1, 2, 3 submitted by you, marked "Harry P. Mears-Skalabrin-Silver Coin Mineral Claims Ore Samples-Silverton Mining Snohomish Co. Wash.", and we would report as follows:

TEST RESULTS

		@	Value per Ton
Gold-----	0.30 oz.	$35.00	$10.50
Silver---	96.96 oz.	64¢	62.05
Zinc-----	10.60 %	10.5¢	22.26
Lead-----	15.10 %	15¢	45.30
Copper---	1.60 %	21¢	6.72
Antimony-	None	----	None
Bismuth	5.42%	----	----
		Total Value	146.83

Lambert-McKamey Laboratories

BY R. Lambert

1C

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LABORATORIES

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND COMMERCIAL CHEMISTS

ASSAYERS METALLURGISTS

May 18, 1948

CERTIFICATE NO. 2031

CERTIFICATE OF ANALYSIS

COMPLETE ANALYTICAL REPORT

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313 Mutual Life Building
Seattle, Washington

Dear Sir:

We hereby certify that we have run assays and analyses on ore sample # 6 from the Silver Coin # 1 claim, tunnel # 1, and immediate vicinity situated in the Silverton Mining District, Snohomish County, Washington.

This is the sample that was submitted to us May 7, 1948 and we report our results as follows:

RESULTS:

Substance	Per Cent	Quant./Ton	Value/Unit	Total Value/Ton
Bismuth	1.75 %	35 lbs.	$ 2.00/lb.	$ 70.00
Lead	0.75 %	15 lbs.	0.175/lb.	2.62
Zinc	3.30 %	66 lbs.	0.12/lb.	7.92
Copper	1.12 %	22.4 lbs.	0.215/lb.	4.82
Gold	- - - - -	0.2 tr. oz/ton	35.00/tr.oz.	7.00
Silver	- - - - -	18.98 tr.oz/ton	0.74 5/8 per tr.oz.	14.16
Silica (SiO_2)	49.62 %	- - - - - -	- - - - - - - - -	- - - -
Sulfur (S)	2.06 %	- - - - - -	- - - - - - - - -	- - - -
Moisture (H_2O)	1.31 %	- - - - - -	- - - - - - - - -	- - - -
Iron Oxide (Fe_2O_3)	15.96 %	- - - - - -	- - - - - - - - -	- - - -
Aluminum (Al_2O_3)	17.88 %	- - - - - -	- - - - - - - - -	- - - -
Lime (CaO)	2.63 %	- - - - - -	- - - - - - - - -	- - - -
Magnesium (MgO)	3.06 %	- - - - - -	- - - - - - - - -	- - - -
Tellurium (Te)	0.18 %	- - - - - -	- - - - - - - - -	- - - -
Potassium (K)	Trace	- - - - - -	- - - - - - - - -	- - - -
TOTALS - - - - -	99.62 %	- - - - - -	- - - - - - - - -	$106.74

Metallurgical & Chemical

Lambert-McKamey Laboratories

BY Robert B. Lambert

SENECA 2224

RETURN

Lambert-McKamey

LABORATORIES

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND COMMERCIAL CHEMISTS

ASSAYERS METALLURGISTS

April 11, 1949

CERTIFICATE NO. 2393

CERTIFICATE OF ANALYSIS

Mr. Clarence H. Jones, Engineer
Silver Coin Mining Company
313 Mutual Life Building
Seattle, Washington

Dear Sir:

We hereby certify that we have made assays and analysis on ore Sample #9 from the Silver Coin #1 Claim, Tunnel #1, and immediate vicinity situated in the Silverton Mining District, Snohomish County, Washington.

This is the sample that was submitted to us April 5, 1949 and we report our results as follows:

	Per Cent	Quant./Ton	Value/Unit	Total Val./Ton
Bismuth	- - - None	None	$ 2.00/Av.lb.	$ None
Lead	- - - 3.02	60.40 Av.lbs.	0.17/" "	10.27
Zinc	- - - 5.80	116.00 " "	0.16/" "	18.56
Copper	- - - None	None	0.235/" "	None
Gold	- - - - - -	0.04 Tr.ozs.	35.00/Tr. oz.	1.40
Silver	- - - - - -	12.18 " "	0.905/" "	11.02
				$ 41.25

Chemical & Metallurgical Engineer

Lambert-McKamey Laboratories

BY R. Lambert

RETURN

ORE, Middle Grade, Item No. 1
" Milling " " 3 & 4
CONCENTRATES, 6.05 Ratio, " " 5
SULPHIDES, " " 2

ANALYSIS AND ASSAY SUMMARY CHART

MINERAL:
BISMUTHINITE, Containing Copper, Lead, Zinc, Bismuth, Silver, Gold.

Item No.	Date	Mine Property	COPPER Per Cent	COPPER Lbs. Ton	COPPER $ Ton	LEAD Per Cent	LEAD Lbs. Ton	LEAD $ Ton	ZINC Per Cent	ZINC Lbs. Ton	ZINC $ Ton	BISMUTH Per Cent	BISMUTH Lbs. Ton	BISMUTH $ Ton	SILVER Ounces Ton	SILVER $ Ton	GOLD Ounces Ton	GOLD $ Ton	TOTAL $ Value Per Ton	Item No.
1	8- 8-47	Silver Coin Mine	1.60	30.	7.52	15.10	302	58.89	10.60	212	31.80	5.42	108.4	216.80	96.96	88.23	.30	10.50	413.74	1
2	4-26-48	" " "	6.22	124.4	29.23	21.10	422	82.29	5.80	116	17.40	24.70	494.2	988.40	269.74	245.46	1.40	49.00	1411.78	2
3	5-18-48	" " "	1.12	22.4	5.26	0.75	15	2.93	3.30	66	9.90	1.75	35.	70.00	18.98	17.27	.20	7.00	112.36	3
4	8-13-48	" " "	1.12	22.4	5.26	2.59	54.8	10.90	3.30	66	9.90	1.75	35.	70.00	18.98	17.27	.20	7.00	119.5[illegible]	4
5	8-16-48	" " "	5.99	120.8	27.97	16.52	330.4	64.65	33.36	267	40.08	13.65	273.	546.00	131.84	119.79	1.24	43.40	842.05	5
6																				6
7																				7
8																				8
9																				9
10																				10
11																				11
12																				12
13																				13
14																				14
15																				15
16																				16
17																				17
18		TOTALS	16.05	320.	75.24	56.06	1124.2	219.66	66.36	727	109.08	47.26	945.6	1891.20	536.50	488.20	3.34	116.90	2899.[illegible]	18
19		AVERAGES	3.21	64.	15.05	11.21	224.8	43.9	7.24	105	21.82	9.46	189.12	378.24	107.30	97.64	.668	23.38	579.89	19

AT CONVERTED CURRENT MARKET METAL PRICES, infra:

Copper	Per Pound	$ .235
Lead	" "	.195
Zinc	" "	.15
Bismuth	" "	2.00
Silver	" Fine Ounce, Troy	.91
Gold	" " " "	35.00

AUGUST 13, 1948.

CLARENCE H. JONES
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

CLARENCE H. JONES
Engineer
313 Mutual Life Building
Telephone Main 8173
SEATTLE 4, USA.

Item No.	SAMPLE NO.	Analysis Marked—— Character of	X	CHEMIST	CERTIFICATE NO.
		ORE			
1 & 2		Tunnel No. 1	X	Lambert	1692 2000
		Channel No.			
		Grab			
3 & 4		Dump	X	Lambert	2031
		Composit			
		Open Cut			
		Geomania			
		CONCENTRATES			
2		Sulphides	X	Lambert	2000 2013
		Metallics			
		Jig			
		Amalgam			
5		Flotation Cells	X	Lambert	2032
		" Table			
		" Pilot Table			

Mine SAMPLED By
STATE OF WASHINGTON
DIVISION OF MINES & GEOLOGY
Analyzed & Assayed By Them
Composit Results Reported
October 21, 1949
Have Been Summarized
And Set Forth Below:

ANALYSIS AND ASSAY SUMMARY CHART
Of Chemists Certificates
SILVER COIN MINES
SITUATED IN SILVERTON MINING DISTRICT
IN SNOHOMISH COUNTY, WASHINGTON.

MINERAL:

BISMUTHINITE, Containing Copper, Lead, Zinc, Bismuth, Silver, Gold.

			COPPER			LEAD			ZINC			BISMUTH			SILVER		GOLD		TOTAL	
No.	Date	Mine Property	Per Cent	Lbs. Ton	$ Ton	Per Cent	Lbs. Ton	$ Ton	Per Cent	Lbs. Ton	$ Ton	Per Cent	Lbs. Ton	$ Ton	Ounces Ton	$ Ton	Ounces Ton	$ Ton	$ Value Per TON	No.
1	10-21-49	Silver Coin	2.20	44.	10.34	7.5	150.	25.50	Unreported			8.82	176.40	352.80	98.78	92.96	.34	11.90	493.50	1
2																				2
3																				3
4																				4
5																				5
6																				6
7																				7
8																				8
9																				9
10																				10
11																				11
12																				12
13																				13
14																				14
15																				15
16																				16
17																				
18																				18
19																				19

AT CURRENT MARKET METAL PRICES, Including Premiums, as Quoted Below: April 5, 1949.

Copper	Per Pound	$ .235
Lead	" "	.17
Zinc	" "	.16
Bismuth	" "	2.00
Silver	" Fine Ounce	.905
Gold	" " "	35.00

CLARENCE H. JONES
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

CLARENCE H. JONES
Engineer
313 Mutual Life Building
Telephone Main 8173
SEATTLE 4, USA.

SAMPLE NO., Analyzed or Assayed is marked with ---------- X

ORE FROM TUNNEL No. Channel----------
Grab----------
Composit----------

" " OPEN CUT----------

" " OUT CROP----------

" " GEOMANIC----------

CONCENTRATES From Flotation Cells----------

Flotation Table----------
Pilot Table----------
Composit----------

CLARENCE H. JONES
Engineer
313 Mutual Life Building
Telephone Main 8173.
Seattle 4, USA.

CLARENCE H. JONES STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

SILVER COIN MINE
Bismuthinite Mineral Ore
6.05 To 1 Bulk Concentration Ratio
Labratory Flowsheet
Approximate Analytical Results

August 13, 1948

		MILL HEADS		CONCENTRATES								
						Tailings		Recovery		Assay Value		
	Symbol	Percent	Fine Troy Ounces Ton	Percent	Troy Ounces	Percent	Troy Ounces Ton	Percent	Troy Ounce Ton	$ Av. Pound	$ Fine Troy Ounces	$ 2000 Pound Ton
Copper	Cu	1.12		5.99		Trace		100.		.235		27.97
Lead	Pb	2.59		16.52		.10		96.1		.195		64.63
Zinc	Zn	3.30		13.36		.52		84.3		.15		40.08
Bismuth	Bi	1.75		13.63		.08		95.4		2.00		546.00
Silver	Ag		18.98		131.84		.55	99.5	131.84		.91	119.97
Gold	Au		.20		1.24		.005	97.5	1.24		35.00	43.40
Silica	SiO_2	49.62		12.81								
Sulphur	S	2.06		15.98								
Iron	Fe_2O_3	15.96		9.45								
Alumina	Al_2O_3	17.88		8.14								
Lime	CaO	2.63		1.13								
Magnesia	MgO	3.06		2.26								
Tellurium	Te	.04		.12								
Potassium	K	Trace		Trace								
Moisture	H_2O	1.31										
TOTALS		101.32		99.39								842.05
Average								95.49				
Tolerance		1.32										
Gangue		92.24		49.89		99.30						
Sulphides		10.82		65.48		4.22						
Metallics		8.76		49.50		.70						

SENECA 2224

Lambert-McKamey

LABORATORIES

INDUSTRIAL AND
COMMERCIAL CHEMISTS

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

ASSAYERS
METALLURGISTS

August 13, 1948

Clarence H. Jones, Engineer
Silver Coin Mining Company
313 Mutual Life Bldg.
Seattle, Washington

Dear Sir:

We are pleased to send you herewith four copies of our Ore-Dressing Laboratorie's report on the investigation of a sample of ore submitted to us, by you, May 7, 1948.

The object of our investigation was to determine the most feasable method of treating the ore from the standpoint of concentration.

As follows, we are submitting a report describing our findings including a proposed flow sheet as a guide for future operations.

Respectfully submitted,

LAMBERT-McKAMEY LABORATORIES

Robert B. Lambert

Robert B. Lambert

Metallurgical & Chemical Engineer

Sample Identifications

A sample of approximately 75 lbs. of uncrushed ore was received from Mr. Clarence H. Jones, Engineer, 313 Mutual Life Bldg., Seattle, Wn., which he reports to be from the SILVER COIN MINING COMPANY owners and operators, in the Silverton Mining District, on Martin Creek, Snohomish County, Washington.

Object of Tests

The object of the tests was to determine the concentratability of the ore, taking into consideration gravity concentration, bulk flotation, and selective flotation, so as to sketch a proposed flow sheet for future operations.

Preparation of Sample

The entire sample was crushed to minus 3/4 inch and the resulting product then crushed through a smaller crusher to minus 1/4 inch. This sample was then mixed thoroughly and cut into several 1200 gram samples by repeated passes through a Jones sampler. As work progressed these portions were ground to various mesh sizes so as to constitute samples for the numerous tests that were conducted.

Description of Ore

The ore represented by the sample tested is a highly siliceous material containing mostly sulphides of Bismuth, Copper, Zinc, Lead, and Iron intimately associated. In addition, appreciable amounts of iron oxide were present with smaller amounts of malachite apparent. However, the major mineral is Bismuthinite.

Test Procedure

After careful microscopic study it was decided that the ore first be tested by gravity concentration at various screen sizes so as to study the recovery and also the nature of the sulphides present. Results of these tests indicated that gravity concentration alone was not adequate for satisfactory recovery of the segregated sulphide as the tailing loss was too great in each case. Examination of the concentrates indicated that the minerals carrying commercial value were intimately associated and that it would take a minus 65 mesh grind to free them completely from the gangue.

Our next step was to attempt to float the various commercial minerals selectively by use of reagents commonly used for these purposes. These attempts were without any degree of success which further substantiated our theory of the intimate association of the minerals.

We then decided to try to produce a high grade bulk flotation concentrate, containing as much of the metals of commercial value as possible, with a tailing loss as low as possible. This we were able to do quite effectively.

The data on the following pages will indicate the analytical results of our best recovery and also the percentage of recovery.

Gravity Concentration

The charge was ground to pass minus 20 mesh screen and then carefully panned so that the concentration ratio was 10 to 1.

Concentrates	Troy Oz./Ton
Gold	0.72
Silver	101.24

Tailings	
Gold	0.16
Silver	15.20

Recovery	
Gold	20.0%
Silver	19.8%

The charge was ground to minus 65 mesh screen and then carefully panned so that the concentration was approximately 5 to 1.

Concentrates	Troy Oz./Ton
Gold	0.50
Silver	47.50

Tailings	
Gold	0.14
Silver	14.04

Recovery	
Gold	30.0%
Silver	24.2%

Flotation Tests

Fineness of grind	minus 65 mesh
Charge	1000 grams
Pulp dilution	3 to 1
Conditioning time	10 minutes
pH of circuit	7.8
Collector (total)	0.3 lbs./ton of ore
Frother (total)	0.3 lbs./ton of ore
Conditioner (total)	0.5 lbs./ton of ore
Collector	Amyl Xanthate Z-5
Frother used	Cresylic acid
Conditioner used	Sodium Metasilicate
Duration of Flotation	25 minutes
Ratio of concentration	6.05 to 1

The rougher concentrates produced were recleaned and a final cleaner concentrate obtained. The middling product was combined with the tailings to produce the final tailings.

Analytical Results

	Heads	Concentrates	Tailings	Recovery
Bismuth (Bi)	1.75%	13.63%	0.08 %	95.4 %
Lead (Pb)	8.59 %	16.52 %	0.10 %	96.1 %
Zinc (Zn)	3.30 %	13.36 %	0.52 %	84.3 %
Copper (Cu)	1.12 %	5.99 %	Trace	100.0 %
Gold (Au)	0.20 tr.oz/ton	1.24 tr.oz/ton	0.005oz/ton	97.5 %
Silver (Ag)	16.98 tr.oz/ton	131.84 tr.oz/ton	0.55 oz/ton	99.5 %
Silica (SiO_2)	49.62 %	12.81 %	- - - - - - - - - -	
Sulfur (S)	2.06 %	15.98 %	- - - - - - - - - -	
Iron (as Fe_2O_3)	15.96 %	9.45 %	- - - - - - - - - -	
Alumina (Al_2O_3)	17.88 % (as Fe)	0.14 %	- - - - - - - - - -	
Lime (CaO)	2.63 %	1.13 %	- - - - - - - - - -	
Magnesia (MgO)	3.06 %	2.26 %	- - - - - - - - - -	
Tellurium (Te)	0.04 %	0.12 %	- - - - - - - - - -	
Potassium (K)	Trace	Trace		
Moisture (H_2O)	1.31 %	- - - - - - - - - - - - - - - - - -		

Market Evaluation of Concentration (Based on current market quotations)

			Value/Ton
Bismuth (Bi)	13.63 %	at $2.00/lb.	$ 546.00
Lead (Pb)	16.52 %	at 0.195/lb.	64.63
Zinc (Zn)	13.36 %	at 0.15/lb.	40.08
Copper (Cu)	5.95 %	at 0.235/lb.	27.97
Gold (Au)	1.24tr.oz.	at $35.00/tr.oz.	43.40
Silver (Au)	131.84tr.oz.	at $0.91/tr.oz	119.97
		TOTAL	842.05

SENECA 2224

Lambert-McKamey

LABORATORIES

2232 THIRD AVENUE
SEATTLE 1, WASHINGTON

INDUSTRIAL AND
COMMERCIAL CHEMISTS

ASSAYERS
METALLURGISTS

August 16, 1948

CERTIFICATE NO. 2032

CERTIFICATE OF ANALYSIS

Clarence H. Jones, Engineer
Silver Coin Mining Company
313 Mutual Life Bldg.
Seattle, Washington

Gentlemen:

We hereby certify that we have analyzed a sample of flotation concentrates produced by us from a sample of ore submitted by Mr. Clarence H. Jones, Engineer of Silver Coin Mining Company.

The analytical results are as follows:

Bismuth (Bi)	13.63 %
Lead (Pb)	16.52 %
Zinc (Zn)	13.36 %
Copper (Cu)	5.99 %
Gold (Au)	1.24 tr.oz/ton
Silver (Ag)	131.84 tr.oz/ton
Silica (SiO_2)	12.81 %
Sulfur (S)	15.98 %
Iron (Fe_2O_3)	9.45 %
Alumina (Al_2O_3)	8.14 %
Lime (CaO)	1.13 %
Magnesia (MgO)	2.26 %
Tellurium (Te)	0.14 %
Potassium (K)	Trace

Lambert-McKamey Laboratories

BY R. Lambert

Market Evaluations of Heads

Bismuth (Bi)	1.75 % @ $2.00/lb.	$70.00
Lead (Pb)	2.59 % @ 19.5¢/lb	10.10
Zinc (Zn)	3.30 % @ 15¢/lb.	9.90
Copper (Cu)	1.12 % @ 23¼¢/lb.	5.26
Gold (Au)	0.20 tr.oz./ton @ $35.00/tr.oz.	7.00
Silver (Ag)	18.98 tr.oz./ton @ 91¢/tr.oz.	17.27
	TOTAL	$119.53

Market Valuation of Mill Heads

Copper	1.12 %	22.4 lbs.	@ $0.235/lb.	$ 5.26
Lead	2.59 %	51.8 lbs.	@ $0.195/lb.	10.10
Zinc	3.30 %	66.0 lbs.	@ $0.15/lb.	9.90
Bismuth	1.75 %	35.0 lbs.	@ $2.00/lb.	70.00
Silver	18.98 tr.oz.		@ $0.91/tr.oz.	17.27
Gold	1.20 tr.oz.		@$35.00/tr.oz.	7.00
			Total	119.53

Market Valuation of Concentrates

Copper	5.99 %	120.8 lbs.	@ $0.235/lb.	27.97
Lead	16.52 %	330.4 lbs.	@ $0.195/lb.	64.63
Zinc	13.36 %	267.2 lbs.	@ $0.15/lb.	40.08
Bismuth	13.65 %	273.3 lbs.	@ $2.00/lb.	546.00
Silver	131.84 % tr.oz.		@ $0.91/tr.oz.	119.97
Gold	1.24 % tr.oz.		@$35.00/tr.oz.	43.40
			Total	$ 842.05

Additional data

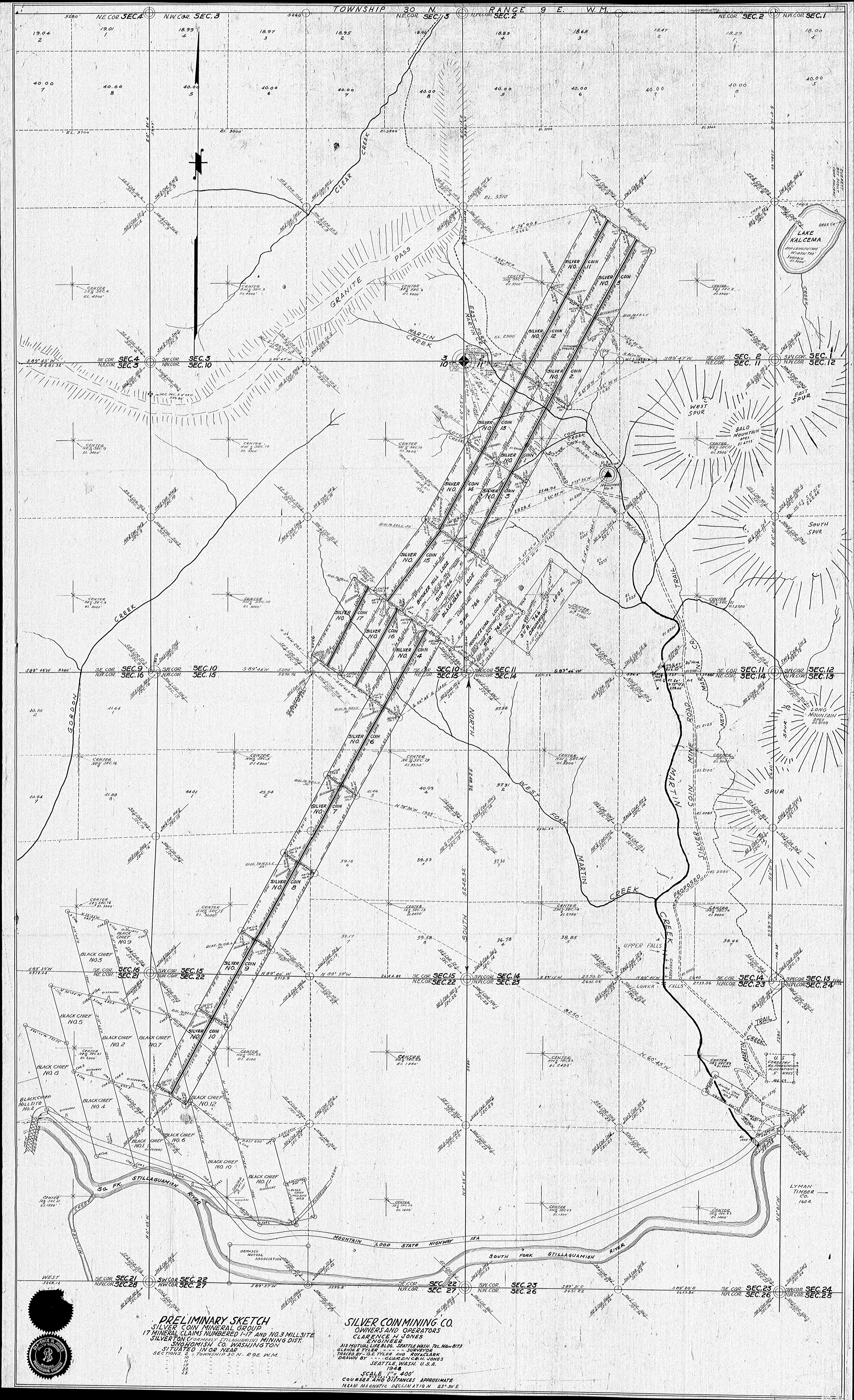
Weight of uncrushed ore - - - - - - - - - - 100.0 lbs./cubic ft.
Weight of ground ore - - - - - - - - - - 97.0 " " " "
Weight of dry concentrates- - - - - - - - 148.0 " " " "
Weight of filtered concentrates - - - - - 177.0 " " " "

Cost of Reagents:

	lbs./ton	Cost/lb.	Cost/ton of ore
Amyl Xanthate - - - - -	0.3	$0.30	$0.090
Cresylic acid - - - - -	0.3	0.15	0.045
Sodium Metasilicate- - -	0.5	0.05	0.025
	Total Reagent Cost - -		$ 0.16

Proposed Flow Sheet

The proposed flow sheet includes a grizzly, primary crusher, secondary crusher, rolls, ball mill in closed circuit with a spiral classifier, a series of rougher float cells, a series of series of cleaner float cells, a pilot (Wilfley type) table and a drum type filter. A conditioner would be optional in the circuit.


TOWNSHIP 30 N. RANGE 9 E. W.M.
CLEAR CREEK
GRANITE PASS
MARTIN CREEK
EAST FORK MARTIN CR.
LAKE KALCEMA
WEST SPUR
EAST SPUR
BALD MOUNTAIN
SOUTH SPUR
LONG MOUNTAIN
COIN CREEK
COIN MINE TRAIL
SILVER COIN NO. 1
SILVER COIN NO. 2
SILVER COIN NO. 3
SILVER COIN NO. 4
SILVER COIN NO. 5
SILVER COIN NO. 6
SILVER COIN NO. 7
SILVER COIN NO. 8
SILVER COIN NO. 9
SILVER COIN NO. 10
SILVER COIN NO. 11
SILVER COIN NO. 12
SILVER COIN NO. 13
SILVER COIN NO. 14
SILVER COIN NO. 15
SILVER COIN NO. 16
SILVER COIN NO. 17
BUNKER HILL LODE
BLACKHAWK LODE
MONTEZUMA LODE
DRUMMOND LODE
BLACK CHIEF NO. 1
BLACK CHIEF NO. 2
BLACK CHIEF NO. 3
BLACK CHIEF NO. 4
BLACK CHIEF NO. 5
BLACK CHIEF NO. 6
BLACK CHIEF NO. 7
BLACK CHIEF NO. 8
BLACK CHIEF NO. 9
BLACK CHIEF NO. 10
BLACK CHIEF NO. 11
BLACK CHIEF NO. 12
BLACK CHIEF MILLSITE NO. 2
MILLSITE NO. 3
U.S. LOCATION MONUMENT NO. 2
U.S. FORESTRY RE-FORESTATION PLANTATION 5 ACRES
LYMAN TIMBER CO. 160 A.
DEMASCO MUTUAL ASSOCIATION
SO. FK. STILLAGUAMISH RIVER
MOUNTAIN LOOP STATE HIGHWAY 15A
UPPER FALLS
LOWER FALLS
CASCADES
GORDON CREEK
MILLSITE CREEK
MARTIN CR.
SILVER COIN MINE ROAD
NORTH FORK MARTIN CREEK
WEST FORK MARTIN CREEK
PROPOSED
PRELIMINARY SKETCH
SILVER COIN MINERAL GROUP
17 MINERAL CLAIMS NUMBERED 1-17 AND NO. 3 MILLSITE
SILVERTON (FORMERLY STILAGUAMISH) MINING DIST.
SNOHOMISH CO. WASHINGTON
SITUATED IN OR NEAR
SECTIONS 2, 10, 11, 15, 22, 23 TOWNSHIP 30 N. - R 9 E W.M.
SILVER COIN MINING CO.
OWNERS AND OPERATORS
CLARENCE H JONES
ENGINEER
313 MUTUAL LIFE BLDG. SEATTLE WASH. TEL. MAIN 8173
GLENN E TYLER - - - - - SURVEYOR
TRACED BY - G.E. TYLER AND ROY A. CLARK
DRAWN BY - - - - CLARENCE H. JONES
SEATTLE, WASH. U.S.A.
1948
SCALE 1" = 400'
ELEVATIONS
COURSES AND DISTANCES APPROXIMATE
MEAN MAGNETIC DECLINATION 23° 30' E.
CLARENCE H. JONES
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

INDEX NO.	MINERAL ORES OF BISMUTH	CHARACTER	EXCHANGEABLE ATOM VALENCY	SYMBOL
1	BISMUTH	Native	Trivalent. Triad***	$3Bi_2O_3 \cdot CO_2 \cdot H_2O$
2	BISMUTHINITE	Trisulphide	Trivalent. Triad***	Bi_2S_3***
3	COSALITE, Bjelkite	Sulfobismuthite		$Pb_2Bi_2S_5$
4	TETRADYMITE	Bismuth Telluride	Tetrad 2v Quadrivalent	Bi_2Te_3****
5	BOLIVITE	Native Oxysulphide		$Bi_2(S,Te)3$*** $Bi_2S_2O_3$
6	BISMITE	Bismuth trioxide	Trivalent. Triad***	Bi_2O_3***
7	Bismutite	Carbonate		$3Bi_2O_3 \cdot CO_2 \cdot H_2O$
8	BISMUTOSPHAERITE	Carbonate, Fibrous		Bi_2O_3
9	BISMUTHIC SULPHIDE	Bismuth Sulphide, Glance		Bi_2S_2

INDEX NO.	ATOM NO.	BISMUTH PERCENT WEN PURE	FUSING TEMPERATURE	SPECIFIC GRAVITY AVERAGE	WEIGHT PER CU. IN. AV. OZS.	WEIGHT PER CU. FT. 4°C LBS.	CU. FT. 2000 LBS. AV.
1	83	100	520° F. 266° C.	9.8	5.6704	612.4	3.268
2		Bi 81.2 S 18.8	507° F. 264° C.	7.4	4.2766	462.5	5.
3		Bi 41.8 Pb 42.1		6.5	3.7457	406.25	4.821
4		Variable		7.2	4.2766	462.5	4.32
5							
6			1248° F. 820° C	8.5	4.9112	531.25	3.766
7		Variable		6.8	3.935	425	4.7
8							
9							

INDEX NO.	ATOMIC WEIGHT E = 4	MOLECULAR WEIGHT E = 2,0 = 16	STRUCTURE	HARDNESS MOH SCALE	LUSTER INTENSITY	TENACITY
1	208.9.		Platy Arborescent	2	Shining	Ductile
2		528.20	Fibrous Foliated	2	Glimmering	Ductile
3			Fibrous Massive	2.5	Soft	Brittle
4			Macc. Foli. Blad. Gran.	1.5	Splendent	Laminae Flexible
5						
6		466.				
7			Earthy Incrust. Pulverulent	4.3		
8						
9					Lustrous Prisms	

INDEX NO.	DEGREE OF TRANSPARENCY	COLOR	LUSTER KINDS OF	STREAK
1	Opaque	Light Copper Red	Metallic	Lead gray, Tin white
2	Opaque	Yellow lead gray, Tin white	Metallic	Tin white
3	Opaque	Lead gray to tin white	Metallic	Black
4		Steel gray	Metallic	
5		Dark gray		
6		Yellow		
7	Subtranslucent to Opaque	White to green	Vitreous, Dull	Colorless to green
8		Yellow		
9		Dark gray		

INDEX NO.	CRISTAL GEOMETRICAL Form	PRINCIPAL METALS	WHERE FOUND
1	Rhombohedral	Bismuth Copper, zinc, gold, silver	U.S.A. Saxony, Bolivia, Australia
2	Orthorhombic	Bismuth, lead, sulpher.	U.S.A. Saxony, Bolivia, Australia
3	Orthorhombic	Bismuth, lead, sulpher.	Guanajuato, Mexico.
4	Rhombohedral	Bismuth Tellurium, Sulpher.	
5			
6	Orthorhombic Amorphous, Coralloe	Bismuth-ocher. Rare	
7	Uncrystallized.		
8	Spherical		
9	Isomorphous with Sb		Sometimes with native Sb_2S_3

INDEX NO.	ASSOCIATED WITH: OCCURRENCES:
1	In igneous and sedimentary rocks. Also native and in rare minerals.
2	Molybdenite and Apatite in quartz, disseminated in veins through gneiss.
3	Molybdenite and Apatite in quartz, Bismuth Glance. Disseminated in veins through gneiss, clay-slate.
4	In quartz veins with pyrite, sphalerite, some telluride, etc. Bismuth-Tellurius, soils paper. Magnetite, Chalcopyrite, Limonite etc.
5	
6	Occurs with other bismuth minerals.
7	Exact composition doubtful. Occurs with Native Bismuth, basic bismuth carbonate.
8	Usually found as an altered product.
9	Sometimes found with native Sb_2S_3, more frequently found with Bi_2S_3.