DMEA Form 9

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE

DMEA NO. 4096

Application (~~Denied~~
(Withdrawn ✓
(After disposition, delete items not applicable)

Contract (Terminated - not Certified
(Cancelled
(Terminated - Certified
(Royalty Agreement

This is the official contract file containing all official records of the project. The records contained in the files are checked and are arranged in this order:

Left Side

Interim Royalty Audits
Reports of Royalty Review
Certification of Discovery
Certificate of Audit (Final)
Interim Audit(s)
Report of Review
Termination Notice or Agreement
Recision Notice
Assignment of Contract
Contract Amendments (latest on top)
Contract with all exhibits and annexes
Owner's Consent to Lien
Subordination Agreement
✓ Leases and assignments of leases
✓ Application and attachments
✓ Envelope for maps

Right Side

Project summary
Work completed analysis
All other material is filed in chronological order with correspondence including the following reports as checked:

Final Field Team Report (Tab)
Operator's Final Report
(2R) Interim Reports
(2R) Operator's monthly reports and all attachments (latest on top)
✓ On-site Exam Report(s) (Tab)
(4) Settlement Sheets

When the volume of records is expected to warrant additional folders, or when convenience of reference warrants separate folders for certain records, they should be set up in this order:

Left Side

Folder No. 2: (In chron. order)
Interim Summary Reports by W. O. Engineers

Right Side

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

Folder No. 3: Maps (Use pocket folder or envelope. Fold maps with title block out and show reference to related document or correspondence.)

Folder No. 4: Settlement Sheets

Folder No. 5: Drill Logs

9775

DMEA

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

1605 Evans Avenue
Reno, Nevada

December 12, 1955

Memorandum

To: Operating Committee, DMEA, Interior Building, Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Loan Application (Lead-zinc)
Combined Metals Reduction Co.
Pan American Mine
Pioche, Nevada

Attached are three sets of MF-103, Application for Aid forms and attachments relative to above subject. The fourth set has been retained in our files.

S. Ricker

Attach.

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BUREAU OF MINES
WASHINGTON, D. C.

DEC 13 1 14 PM '55

COMBINED METALS REDUCTION COMPANY

P. O. BOX 150

SALT LAKE CITY 10, UTAH

		DATE
S. Ricker	R	12/12/55
ANSWERED		

December 8, 1955

Mr. S. Ricker
Executive Officer
DMEA Field Team, Region II
Defense Minerals Exploration Administration
1605 Evans Avenue
Reno, Nevada

Re: Application for Aid
Pursuant to DMEA Order 1
Combined Metals Reduction Co.
Pan American Mine

Dear Mr. Ricker:

Attached herewith are four copies of an Application for Aid in an Exploration Project for Pb-Zn ores in our Pan American Mine, located in Pioche, Nevada.

Also enclosed are:

1. Supporting Data for the Application.
2. Lease Agreement and Extension thereto covering our rights in the property.
3. Consent to Lien properly executed, and
4. Supporting maps for the project.

Specific reference is made to the expiration date of the Extension of Lease Agreement and to our option for renewal. The lease expires on January 10, 1957 with full renewal rights for additional five year periods. It is our intention to renew the Lease and keep it active as long as a contract with DMEA shall exist. As long as a contract with DMEA is in effect, our obligations under renewal rights in the Lease Agreement will be fulfilled.

Your approval of our application will be highly appreciated.

Very truly yours,

M. J. Kennard
Vice-President

Encl.
MJK/bs

cc: E. H. Snyder
Paul Gemmill
W. H. Kelsey
O. F. Burton
Frank Anderson

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DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION II
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RENO, NEVADA

COMBINED METALS REDUCTION COMPANY

PAN AMERICAN D. M. E. A. PROJECT

November 14, 1955

Mr. W. H. Kelsey, Production Manager

Paul Gemmill

Dear Mr. Kelsey:

Herewith is our D. M. E. A. application for matching funds to sink the Pan American Shaft and explore the area east of the Shodde fault.

The U. S. Bureau of Mines, under Project 15-214 performed the drilling that located encouraging mineralization in two 1200 foot drill holes. This information, together with the well recognized fact that our regular sulphide ore bodies are fringed with the type of carbonate mineralization encountered in the drill holes, makes the proposed exploration look very attractive.

The project is submitted on the unit cost basis which we have found is the least complicated and most practical way to keep score.

Since the surface plant, including main hoist and other facilities must be installed before the actual shaft sinking can commence, the starting date should be set for about March 1, 1956.

COPY

Yours very truly,

Paul Gemmill

Paul Gemmill, Plant Manager

PG:dab

cc: 10 - Copies

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FORM 25

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

Not to be filled in by applicant

Docket No. DMEA-4096
Metal or Mineral Lead-Zinc
Date Received 12/13/55
Estimated Cost $312,220.00
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Combined Metals Reduction Company
P. O. Box 150
218 Felt Building
Salt Lake City, Utah

(*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
See attached data

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

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

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

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

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

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

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

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

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

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

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

(*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 60 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.

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

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

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

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

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

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

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

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

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

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

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

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

[X] Money [X] 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 January December 8, 1955

Combined Metals Reduction Company
(Applicant)

By Wm H. Kelley - Vice President

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

APPLICATION FOR AID IN AN EXPLORATION PROJECT
PURSUANT TO D.M.E.A. ORDER 1
UNDER THE DEFENSE PRODUCTION ACT OF 1950
AS AMENDED

TO ACCOMPANY FORM 103

1. (a) The name of the applicant is:

Combined Metals Reduction Company
218 Felt Building
Salt Lake City, Utah

(b) Combined Metals Reduction Company is a Utah corporation, duly qualified to do business in the State of Nevada.

(c)

E. H. Snyder	President	2109 Berkeley St.	Salt Lake City
Otto Herres	V. President	Hillcrest Apts.	Salt Lake City
Allan Hoover	Director	30 Rockefeller Plaza	New York City
Jeremiah Milbank, Jr.	Director	44 Wall Street	New York City
George W. Snyder	Director	1361 Butler Ave.	Salt Lake City
C. M. Christensen	Secretary	2377 Stringham Ave.	Salt Lake City
O. F. Burton	Treasurer	2170 Rossevelt Ave.	Salt Lake City

Mailing address for all officers is 218 Felt Building, Salt Lake City, Utah.

(d) Does not apply.

2. Read and noted.

APPLICANT'S PROPERTY RIGHTS

3. (a) The land we wish to explore includes the following patented and unpatented lode mining claims:

Name of Claims	Location Date	Recording Date	Book	Page
Mt. Comet No. 5	1- 9-19	4-15-19	F-1	389
Central	7- 1-26	9-21-26	H-1	107
Central No. 1	7- 1-26	9-21-26	H-1	107
Central No. 2	7- 1-26	9-21-26	H-1	107
Albert	7- 1-25	5- 9-27	H-1	185
Boardinghouse	7- 1-25	5- 9-27	H-1	185
Spearhead	3- 1-28	3-17-28	H-1	278
Jennie	8- 1-14	10-27-14	E-1	415
Curtis	3- 4-29	6- 3-29	H-1	484
Great Western No. 2	10-22-28	2-11-29	H-1	390
Lindberg	3- 4-29	6- 3-29	H-1	484
Mt. Comet No. 6	Patented			
Mt. Comet No. 1	Patented			

The above claims are recorded in the records of Lincoln County, Nevada, at the Book and Page indicated.

These claims are a contiguous group located in Township 1 South, Range 66 East, Mt. Diablo Meridian, in the Comet Mining District, Lincoln County, Nevada.

Attached claim map No. A-1684 shows location and area of above said claims.

(b) Pan American Mine.

(c) Lessee.

(d) Copies of "Agreement of Lease" are attached.

(e) Does not apply.

(f) Stated in 3(a) above.

PHYSICAL DESCRIPTION

4. (a) No mining operations have been performed on the property included in this application for exploration assistance, except for some prospect pits on various outcrops.

Three core drill holes were drilled by the U. S. Bureau of Mines to a maximum depth of 1260 feet for purpose of exploring the C.M. Beds.

This proposed exploration project is closely related to exploration work already completed in the Pan American Mine where a 2300 foot incline shaft, known as the Deeper Incline, extends down on the dip in the C.M. Beds for 2300 feet, the dip being about 12 degrees. Drifts have been extended out from the shaft on 800, 1200, 1500 and 2000 foot levels. At present, all mine openings on 1500 level and above are accessible for examination. The water is up to 1500 level, but can be pumped down to the bottom of the shaft in three weeks time. Water flow at bottom of the shaft is less than 50 gallons per minute.

Combined Metals Reduction Company (see Agreement of Lease attached hereto) holds under lease from Comet Coalition Mines Company 43 patented and 210 unpatented contiguous lode mining claims of which Pan American Mine is an integral part.

(b) There has been no production from the property included in this application for exploration aid, except possibly from surface prospects pits in the early days of the district.

No ore reserves can be calculated, but the U. S. Bureau of Mines core drill holes (U. S. Bureau of Mines Project 15-214 and Report R.I. 4541, Sept., 1949) showed encouraging mineralization in silver, lead, zinc and manganese that warrants further exploration in the C.M. Beds in that area.

(c) The general geology of the area is described in the U. S. Geological Survey's Professional Paper #171 "Geology and Ore Deposits of the Pioche District, Nevada".

The Pan American property covers a section of lower and middle Cambrian Sediments from the basal Prospect Mountain Quartzite through the lower section of Highland Peak formations, a thickness of more than 2000 feet.

The sediments outcrop on the property and dip east into the Highland Range at from 8 to 15 degrees.

The section in the lower Cambrian includes the Pioche Shale formation containing several limestone members of which the C.M. beds are the first limestone member above the Prospect Mountain Quartzite and the most important.

The C.M. limestone has an average thickness of 50 feet in this area. Overlying the C.M. beds is a fine grained impervious shale locally called the "C" Shale. Underlying the C.M. beds on the footwall side of the C.M. beds is a siliceous formation up to 20 feet thick that readily fractures under stress.

The sedimentary formations are cut by a series of north-east to east-west fissures and faults, and north-east striking porphyry dikes.

Several of these fissures have produced some high grade silver-lead ore in the upper formations and they are probably the source of extensive replacement mineralization in the lower limestone beds.

The ore deposit in the Pan American Mine is a replacement of the C.M. beds out from fissures. The mineralization is low grade but very extensive and has been explored down the dip for over 2000 feet. The thickness of mineralization varies from 50 feet to 8 feet along the edges of the replacement. Width of mineralization along the strike varies from 600 feet to 200 feet, the average being about 400 feet.

The complex replacement contains sphalerite, silver bearing galena, pyrite, manganese and iron carbonates. The Mineralization is uniform in grade, and will average 0.005 oz. gold, 1.74 oz. silver, 1.25% lead, 2.50% zinc and 9.3% manganese, which has been confirmed from exploration and development of 1,386,000 tons in the Deeper Incline of the Pan American Mine.

Our reason for further exploration work at the Pan American Mine is that the higher grade ore channels, that we are reasonably sure exist in this area, have not been found.

About 400 feet down dip from the present bottom of the Deeper Incline shaft is a north-south fault and fracture zone dipping steeply to the east that off-sets the sediments about 110 feet vertically, the east side being the down side. Replacement of high grade ore in the C.M. beds along and out from fracture zones is a fact that has been observed in mining of high grade ore bodies in the C.M. beds throughout the various mining districts in the Pioche area.

(d) A secondary state road extends to the proposed project, this road will be oil surfaced as soon as the Pan American Mine starts production.

Distance to nearest railroad point is Caselton Plant of Combined Metals Reduction Company, a distance of 16 miles.

Distance to the town of Pioche is about 23 miles by road, and to the town of Panaca about 26 miles. Ample housing is available at Pioche or Panaca.

(e) Ample man power is available in the Pioche district.

Material, supplies and equipment are available as needed from Combined Metals Reduction Company. Well equipped service shops for repair of equipment are available at Caselton Plant.

Water is available at and near the proposed project.

Power lines of the Lincoln County Power District No. 1 service the Pan American Mine from the main sub-station located near the Caselton Plant. Power is delivered at 22,000 volts and a sub-station near the mine reducing the voltage to 2300 and 440 volts. Cost of power is between 6 and 7 mills per kilowatt hour.

5. (a) This exploration project is for lead and zinc.

(b) The proposed exploration work consists of the following:

(1) Extend the Deeper Incline shaft 1,000 feet.
(2) Drift north 2550 feet from near bottom of extended Deeper Incline shaft.
(3) Drift south 500 feet from near bottom of extended Deeper Incline shaft.
(4) Raising and crosscutting to be determined from fissures and mineralized replacement exposed in drifting, but total raising and crosscutting is not to exceed 900 feet.
The proposed exploration work is shown on attached maps A-1684, C-1060 and section C-1082.

(c) The work will start within 60 days from effective date of exploration contract and be completed in 24 months.

(d) Combined Metals Reduction Company and its "Parent" company, Combined Metals, Inc., have explored, developed and operated extensive lead-zinc deposits in the Pioche District for over thirty years.

The project will be under direct supervision of a competent staff of engineers that are technical graduates with many years of experience in this type of work.

ESTIMATED COST OF PROJECT

6. (a) Independent contracts - None.

(b) It is here requested that the proposed exploration contract be on a unit cost basis as follows:

1000 feet of incline shaft, 10' x 7' in clear	@ $128.90/ft.	$128,900
3950 feet of drifting, cross-cutting and raising	@ $ 46.41/ft.	183,320
	Total Cost of Project	$312,220

The following are detail estimates of cost:

(Tabulation on pages 6 and 7)

ESTIMATED COST PER FOOT OF SHAFT

	Man-hours per foot of Shaft	*Sinking Labor and Supervision $	Explosives $	Timber $	Rails & Ties $	Air & Water Lines Power Cable $	Ventilation Tubing $	Equip. Rental $	Equip. Repair $	Drill Steel $	Electric Power $	Total Cost $
Drilling & Blasting	5.8	14.50	7.40					1.25	1.50	5.50	6.55	30.15
Mucking	6.8	17.00						1.50	1.50			20.00
Timbering	3.7	9.25		13.50								22.75
Hoisting	4.8	12.00						0.50	0.50		1.50	14.[illegible]0
Ventilation	0.4	1.00					1.75	0.15	0.20		0.60	3.70
Pumping & Drainage	2.4	6.00						0.60	3.40		2.25	12.25
Compressed Air	0.8	2.00						1.25	0.50		2.20	5.95
Power & Signal Cables	0.8	2.00				1.00						3.00
Air & Water Lines	0.8	2.00				3.30						5.30
Rails & Ties	1.4	3.50			5.40							8.90
Waste Disposal	0.7	1.75						0.25	0.25			2.25
Supervision	1.8	4.50										[illegible]0
Miscellaneous	1.5	3.75						0.50	0.50			4.75
Totals	31.7	$ 79.25	$ 7.40	$13.50	$5.40	$4.30	$1.75	$6.00	$8.35	$5.50	$6.55	$138.00

*Labor cost is figures at flat $20 per shift or $2.50 per hour.

Less Timbering	22.75
Cost less timbers	$115.25
Average Cost (60% of shaft timbered)	$128.90

ESTIMATED COST PER FOOT OF DRIFT OR CROSS-CUT

	Man-hours per foot of drift x-cut	*Labor & Supervision $	Explosives $	Timber $	Rails & Ties $	Air & Water Lines Power Cable $	Ventilation Tubing $	Equip. /Rental $	Equip. Repair $	Drill Steel $	Electric Power $	Total Cost $
Drilling & Blasting	2.2	5.21	3.25					0.50	0.60	2.60		12.16
Mucking & Tramming	2.8	6.64						0.75	0.75			8.14
Timbering	1.1	2.61		4.75								[illegible]6
Hoisting	1.4	3.32						0.20	0.20		0.80	4.52
Ventilation	0.2	0.47					0.90	0.15	0.20		0.60	2.32
Pumping & Draining	0.3	0.71						0.25	0.75		1.20	2.91
Compressed Air	0.3	0.71						0.30	0.15		1.00	2.16
Power Cable	0.2	0.47				0.40						0.87
Air & Water Lines	0.3	0.71				1.85						2.56
Rail & Ties	0.8	1.90			2.40							4.30
Waste Disposal	0.3	0.71						0.10	0.10			[illegible]1
Supervision	0.6	1.42										1.42
Miscellaneous	0.8	1.90						0.20	0.20			2.30
Total	11.3	$26.78	$3.25	$4.75	$2.40	$2.25	$0.90	$2.45	$2.95	$2.60	$3.60	$ 51.93

*Labor cost is figured flat @ $19.00 per shift or $2.37 per hour.

Less Timbering	7.36
Cost less timbering	$ 44.57
Average Cost (25% require timbering)	$ 46.41

Labor, Supervision and Consultants

The shaft sinking crew will consist of five men per shift. One hoistman, one topman, one special miner or working shift boss, two miners or shaftmen.

Our present pay schedule is as follows:

Job Title	Wage Rate/Shift 40 Hour Week	Add for Wet Shaft	*Misc. Payments	Cost/Shift 48 Hr. Week
Special Miner	15.88	1.00	4.65	21.53
Miner	15.34	1.00	4.51	20.85
Hoistman	14.80		3.78	18.58
Topman	13.45		3.54	16.99

* Shift differential, vacation and holiday pay, workman's compensation, insurance, fringe benefits, overtime, etc.

Average cost per man-shift will be very close to $20.00 on a six day work week.

Engineering, supervision and consultants will be chargeable at part time from staff of Combined Metals Reduction Company at $400.00 per month.

Progress in shaft sinking is estimated at 5 foot advance on three shifts in 24 hours. The present shaft to 2300 feet of depth was sunk in the C.M. beds in self supporting ground. However, the next 1000 feet of shaft will be in "D" shale for about 400 feet to the north-south fault intersection, then in "C" shale for about 400 feet to the C.M. beds on the east and down side of the fault.

From previous experience in driving through "C" and "D" shale near fault zones, timbering will be required. Therefore it is estimated that 60% of the 1000 feet of shaft sinking will require timbering.

(c) Operating material and supplies - are itemized in detail cost estimate above.

(d) Operating Equipment is available at the Pan American Mine, and additional equipment will be furnished by Combined Metals Reduction Company at reasonable rental cost as shown under detail cost estimate.

(e) Rehabilitation and Repair - This will be performed by the operator without any cost to the Government.

(f) New buildings, improvements, installations - This will be performed by the operator without any cost to the Government.

(g) Miscellaneous - Cost of repair and maintenance of equipment is estimated in detail cost estimate at $8.40 per foot of advance in shaft and $1.35 per foot of advance in drifting, cross-cutting and raising.

Assaying of 200 samples for silver lead- and zinc @ $3.50 per sample is included under Miscellaneous in detail cost estimate.

Accounting and warehouse cost is estimated at $150.00 per month and is included under Miscellaneous in detail cost estimate.

Workman's Compensation, employer's liability insurance and payroll taxes will approximate 8½% of payroll.

(h) Contingencies - It is estimated that the project can be completed for amount indicated.

7. (a) We are prepared to furnish our share of the cost of this project.

(b) Our share will be furnished in cash.

Respectfully submitted,

SUPPLEMENTAL AGREEMENT AND LEASE

THIS SUPPLEMENTAL AGREEMENT AND LEASE made and entered into, in triplicate, this 28 day of September, 1951, by and between COMET COALITION MINES COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Nevada, hereinafter called "Lessor", COMBINED METALS REDUCTION COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Utah and duly qualified to do business within the State of Nevada, hereinafter called "Lessee", and INTERNATIONAL SMELTING AND REFINING COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Montana and duly qualified to do business within the State of Nevada, hereinafter called "International",

WITNESSETH:

Whereas, Lessee has fully and faithfully complied with all of the covenants and agreements of Agreement and Lease dated January 10, 1947, and has served notice in writing upon Lessor more than ninety days prior to the end of the term of said Agreement and Lease, thereby demanding from Lessor a renewal and extension of said lease for an additional term of five years,

Now Therefore, in consideration of the premises and in conformity with the provisions of Paragraph 21 of said Agreement and Lease, the said Agreement and Lease dated January 10, 1947, is hereby extended and renewed for an additional term of five years, beginning January 10, 1952, and expiring at noon on the 10th day of January, 1957, unless renewed and extended or unless sooner terminated in accordance with the provisions of said Agreement and Lease.

In all respects other than as herein stated said Agreement and Lease dated January 10, 1947, is hereby ratified and confirmed.

IN WITNESS WHEREOF the parties hereto have caused these presents to be signed by their respective officers thereunto duly authorized and their corporate seal to be hereunto affixed, duly attested, all in trip-

licate, on the day and year first hereinbefore written.

LESSOR:

COMET COALITION MINES COMPANY

Attest:

Secretary-Treasurer

By:

Its President

LESSEE:

COMBINED METALS REDUCTION COMPANY

By:

Attest:

Its President

INTERNATIONAL SMELTING AND REFINING COMPANY

By:

Attest:

SECRETARY

Its Vice-President

STATE OF UTAH :
) ss
County of Salt Lake:

On this first day of October, 1951, before me H. Van Dam, a Notary Public in and for said County and State, personally appeared E. H. Snyder and C. M. Christensen, known to me to be the President and Secretary, respectively, of one of the corporations that executed the foregoing instrument, and upon oath did depose and say that they are the officers of the said corporation as above designated; that the signatures to the said instrument were made by officers of the said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily for the uses and purposes therein mentioned.

WITNESS MY HAND and official seal the day and year in this certificate first above written.

H. Van Dam
Notary Public in and for said
County and State

My Commission Expires:
September 7, 1952.

26092

No.

FILED AND RECORDED AT REQUEST OF

COMBINED METAL RED. CO.

AT 1 MIN. PAST 1 P M

THIS 4TH DAY OF OCT.

A. D. 1951 IN BOOK O

OF MISCELLANEOUS

ON PAGE 22 LINCOLN COUNTY

NEVADA RECORDS

[illegible]

COUNTY RECORDER, LINCOLN CO. NEV.

FEES $ 1.95

PROOF READ BY B.&F.

Return by Registered Mail to -

Box 150

S.L.C. 10, UTAH

10

AGREEMENT AND LEASE

THIS AGREEMENT AND LEASE, made and entered into, in triplicate, this [illegible] day of [illegible], 1947, by and between COMET COALITION MINES COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Nevada, hereinafter called "Lessor", COMBINED METALS REDUCTION COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Utah and duly qualified to do business within the State of Nevada, hereinafter called "Lessee", and INTERNATIONAL SMELTING AND REFINING COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Montana and duly qualified to do business within the State of Nevada, hereinafter called "International";

WITNESSETH:

WHEREAS, the authorized capital stock of Lessor is $500,000.00 divided into 2,000,000 shares of a par value of 25¢ each, of which 1,502,000 shares is issued and outstanding, and 498,000 shares is held in the treasury of Lessor; and

WHEREAS, International is owner and holds in its own name 760,246 shares of Lessor's capital stock; and

WHEREAS, Lessor has been unable to develop ores of commercial value sufficient to operate its said properties and is indebted to International upon demand promissory notes, bearing interest at the rate of 6%, in the total sum, including principal and interest as of December 1, 1946, of $57,186.67; said principal of said indebtedness to International having been expended by Lessor for ordinary expenses of carrying on its business and to pay for exploration, development work and to improve its properties; and

WHEREAS, Lessor is without funds or credit sufficient to enable it to pay its debts or develop its said properties or carry on the business of mining for which it was organized; and

WHEREAS, upon the terms and conditions and for the considerations hereinafter set forth, Lessor and Lessee are willing to enter into a lease and other agreements, hereinafter specified, and for the considerations to be received by International as herein provided, International is willing to waive interest on said indebtedness owing to it as aforesaid and to defer payment of said indebtedness, as and upon the conditions herein stated;

NOW, THEREFORE, in consideration of the obligations undertaken by Lessee hereunder and the covenants and agreements hereinafter set forth and by said Lessee to be kept and performed, the said Lessor does hereby grant, demise and let unto Lessee the following named and described mining claims and mining properties situate in the Comet Mining District, Lincoln County, State of Nevada, to-wit:

PATENTED CLAIMS:

Sur. No. 4731
Cedar No. 7
Hub
Hub No. 1
Hub No. 8
Hulla No. 1
Juniper No. 1
Juniper No. 2
Pine No. 5
Pine No. 6
Pup No. 1
Spoke No. 1
Spoke No. 2

Sur. No. 4732
Comet Chieaf
Juniper No. 3
Juniper No. 4
Log Cabin
Log Cabin No. 2
Murphy
Murphy No. 4
Murphy No. 5
Roxana
Stone Cabin
Tom Boy No. 1

Sur. No. 4734
Central No. 3
Central No. 4
Central No. 6
Central No. 7
Central No. 8
Dorthy
Mount Comet No. 1
Mount Comet No. 3
Mount Comet No. 4
Mt. Comet No. 6
Mt. Comet No. 7
Ramona
Rennow
Sheik No. 3
Stella No. 2

Sur. No. 4738
Fox
Southside

Sur. No. 4741
Iron Cap No. 3
Iron Cap Extension
Silver Star

UNPATENTED CLAIMS:

Hub No. 7
Flapper No. 1
Murphy No. 1
Murphy No. 3
Great Western
Bald Eagle
Iron Cap
North Star
Silver Star No. Three
Mount Comet No. 5
Sheik
Sheik No. 2
Sheik No. 4
Albert
Gilhooly
Cedar No. 1
Cedar No. 2
Cedar No. 3
Cedar No. 4
Cedar No. 8
Central
Central No. 1
Central No. 2

Argentum
Argentum No. 1
Argentum No. 2
Argentum No. 3
Argentum No. 4
Argentum No. 5
Argentum No. 6
Argentum No. 7
Blue Jay
Blue Jay No. 1
Blue Jay No. 2
Boarding House
Calico
Calico No. 1
Calico No. 2
Great Western No. 1
Great Western No. 2
Great Western No. 3
Great Western No. 4
Great Western No. 5
Hanna
Hard Luck
Harwood

UNPATENTED CLAIMS, continued:

Christianson
Comet Chieaf No. 1
Comet Chieaf No. 3
Comet Giant
Comet King
Comet Standard
Curtis
Deer Horn
Deer Horn No. 1
East Side No. 1
East Side No. 2
East Side No. 3
East Side No. 4
East Side No. 5
East Side No. 6
East Side No. 7
East Side No. 8
East Side No. 9
East Side No. 10
East Side No. 11
East Side No. 12
East Side No. 13
East Side No. 14
East Side No. 15
East Side No. 16
East Side No. 17
East Side No. 18
East Side No. 19
East Side No. 20
East Side No. 21
East Side No. 22
East Side No. 23
East Side No. 24
East Side No. 25
East Side No. 26
East Side Fraction
Elwood
Flapper No. 2
Flapper No. 3
Flapper No. 4
Flapper No. 5
Franklin
Galena
Galena No. 1
Galena No. 2
Galena No. 3
Galena No. 4
Galena No. 5
Galena No. 6
Galena No. 7
Hub No. 2
Hub No. 3
Hub No. 5
Hulla
Hulla No. 2
Iron Cap No. 1
Iron Cap No. 2
Iron Cap No. 4
Iron Queen
Jennie
Lindberg
Log Cabin No. 1
Lone Eagle
Lounge Lizard
Lucky Bill
Maracoba
Maracoba No. 1
Maracoba No. 2
Maracoba No. 3
Maracoba No. 4
Maracoba No. 5
Mount Comet
Mount Comet No. 2
Mt. Comet No. 8
Mt. Comet No. 9
Mt. Comet No. 10
Mt. Comet No. 11
Murphy No. 2
Non Pariel
Pine No. 1
Pine No. 2
Pine No. 3
Pine No. 4
Pine Fraction
Pocahontas
Pup
Pup No. 2
Ramona No. 1
Ramona No. 2
Rim No. 1
Rim No. 2
Rim No. 3
Rim No. 4
Rim No. 5
Rim No. 6
Rim No. 7
Rim No. 8
Roxana No. 1
Roxana No. 2
Roxana No. 3

UNPATENTED CLAIMS, continued:

Galena No. 8
Gigolo
Gigolo No. 2
September
Silver Star Extension
Silver Tip
Silver Tip No. 1
Silver Tip No. 4
Snow No. 6
Snow No. 7
Snow No. 8
Snow No. 9
Snow No. 10
Snow No. 11
Snow No. 12
Snow No. 13
Snow No. 14
Snow No. 15
Snow No. 16
Snow No. 17
Snow No. 18
Snow No. 19
Snow No. 20
Snow No. 21
Southside No. 1
South Star
Spearhead
Spoke
Spoke No. 3
Spoke No. 4
Spoke No. 5
Tom Boy
Roxana No. 4
Roxana No. 5
Roxana No. 6
Top No. 1
Top No. 2
Top No. 3
Top No. 4
Top No. 5
Top No. 6
Top No. 7
Top No. 8
Top No. 9
Top No. 10
Top No. 11
Top No. 12
Top No. 13
Top No. 14
Top No. 15
Top No. 16
Top No. 17
Top No. 18
Top No. 19
Wonder
Wonder No. 1
Wonder No. 2
Wonder No. 3
Wonder No. 4
Wonder No. 5
Wonder No. 6
Wonder No. 7
Wonder No. 8
Wonder No. 9

together with all buildings, equipment, tools and supplies now on the aforesaid claims belonging to Lessor.

TO HAVE AND TO HOLD, said demised premises unto Lessee for mining purposes only, including the prospecting for and the development, mining, extraction, removal and sale of ores and metals of all kinds, for a term of Five (5) years from the date hereof and expiring at noon on the 1st day of December, 1951, unless renewed and extended or unless sooner terminated as hereinafter provided.

1: Lessee agrees to enter into immediate possession of said mining claims and mining properties, and on or before Six (6) months from the date hereof and thereafter, to prosecute the exploration and development of said premises with reasonable diligence; and within Three (3) years from the date hereof Lessee shall spend not less than One Hundred Fifty Thousand (150,000.00) Dollars in the development, equipping and operating of said mining claims and mining properties and for surface improvements thereon and

in building roads thereto. As part of said development program Lessee agrees to dewater the Pan-American incline as soon as materials and labor are available for such purpose.

2: Lessee, in order to protect and preserve Lessor's titles to said mining claims and mining properties, shall do and perform each year upon or for the benefit of each of the aforesaid unpatented claims, the annual assessment work required by federal mineral land laws; provided, that as to any unpatented claims above described, where discovery is lacking or for any other reason the location is invalid, Lessee may at its option either endeavor to make a valid discovery or otherwise perfect said location for or in behalf of Lessor, or may after Thirty (30) days written notice to Lessor abandon said claim. However, Lessee shall not be responsible for the loss of any claim where the loss occurs by reason of the invalidity of location proceedings, or where the Lessee having done a sufficient amount of work to protect all claims in the group it may be held that such work does not apply to some of the claims; and, provided further that at Lessee's option proceedings to obtain in Lessor's behalf United States patent for any or all of said unpatented claims may be initiated and prosecuted, and Lessor and Lessee each agree to do whatever is necessary on its part to be done to obtain such patent or patents.

3: The time and manner of doing all the work required of Lessee under this Agreement, except as stated in paragraphs 1 and 2 above, shall be within Lessee's sole judgment and discretion; operations may be suspended whenever in Lessee's sole judgment economic conditions do not justify continuance, also for causes beyond Lessee's control, including, but not limited to, acts of God, fire, destruction of mine or mining facilities, strikes, riots, unavailability of labor, materials or supplies; but during any such period of suspension Lessee shall employ and keep on duty a watchman for the protection of said mining claims and mining properties.

4: All work on said properties shall be done in accordance with good mining practice, with a view to the development and preservation of said properties for permanent mining purposes.

5: Lessee agrees to keep all tunnels, drifts, shafts and other mine workings of a permanent nature which are used in mining operations free and clear of loose rock and rubbish, except when prevented from so doing by any casualty or other causes beyond its control; to make all working tunnels, drifts and raises, in the demised premises of such size as will meet all requirements of good mining practice. To timber and keep in repair all timbering necessary and proper to be done in the course of good mining.

6: Within the requirements of sound mining practice, to avoid leaving any substantial or valuable amount of ore in an inaccessible condition and so far as practicable to avoid any wasting of such ore.

7: Lessee agrees to furnish and pay for all labor, power, tools, equipment, powder, timber and other materials, services and supplies that may be used by it in the prosecution of work under this Lease and not to allow any claim or lien for any such thing to be effectually made or asserted against

said premises or against Lessor. Lessee covenants and agrees to hold Lessor harmless and fully indemnify it against all claims and demands of any kind or nature which may be made upon it or against the demised premises for or on account of any debt or expenses contracted or incurred by Lessee, as well as from and against any and all acts, transactions or omissions by Lessee, its agents or servants. And Lessee shall defend and save Lessor harmless and fully indemnify it as to any liability or asserted liability for or on account of injury to any person or damage to any property sustained during the continuance of this lease, resulting from the unsafe condition of the demised premises due to any act or omission of Lessee.

8: Upon entering into possession of the demised premises, Lessee agrees to forthwith post and to keep posted in conspicuous places on the demised premises written notices to the effect that the same are held by Lessee and that Lessee and not Lessor is liable for all labor performed, for supplies and/or materials used by it in or upon said demised premises, and that Lessee and not Lessor shall be responsible for all debts and expenses incurred by Lessee in Lessee's mining operations, and Lessee will have prepared and recorded an affidavit of posting such notices, all as provided in Section 3743 of the Nevada Compiled Laws 1929.

9: Lessee agrees to comply with the laws of the State of Nevada with respect to Workmen's Compensation and to comply with and abide by all federal laws and regulations, state laws and all other legislation now or subsequently applicable to the working and operation of said demised premises, and agrees to make all payments, returns and reports required by such laws.

10: Lessee agrees to permit a duly authorized agent or representative of Lessor, at all reasonable times, when accompanied by a representative of Lessee, but at Lessor's risk, to enter into and upon said demised premises and workings therein, for the purpose of examining, inspecting, surveying or taking such samples as said representative or agent may desire, and to permit Lessor and its agents or representatives, authorized in writing, at all reasonable times, to have access to all records of ore production from the demised premises, all cost data and such other records as will show compliance on the part of Lessee with the provisions of this Lease.

11: Lessee agrees to furnish Lessor with a copy of all Lessee's assay and geological maps and logs of drill holes pertaining to the demised premises, and to furnish to Lessor a monthly report of Lessee's operations in or upon said premises, with a statement of all direct mining costs and expenditures properly classified. Said monthly report shall be made by Lessee to Lessor within Forty Five (45) days after the close of each calendar month.

12: Lessee covenants and agrees to pay before delinquency all taxes levied upon the personal property, improvements and structures placed or installed upon the demised premises while this Lease shall remain in force and effect. Further, Lessee agrees to pay to Lessor an amount equal to the net proceeds taxes, occupation taxes or other taxes exacted from

Lessor because of and which are based upon production by Lessee from the demised premises, and to furnish such information and date concerning operations in the leased premises as shall be required to enable Lessor to make proper returns for tax purposes.

13: Lessee covenants and agrees that it will deliver to Lessor the demised premises, with the appurtenances and improvements thereon or therein, in good order and condition, reasonable wear and tear and damage by natural causes excepted, without demand, or further notice, on the last day of the term hereof, or at any time previous upon demand for forfeiture, or upon other termination hereof; it being understood and mutually agreed that all tracks, loading chutes, piping, ventilating tubing and other fixtures constructed or installed by Lessee within the demised premises, and all ore knocked down and not shipped prior to such expiration or earlier termination, shall remain in place at the termination of this Lease and be and become the property of Lessor; any equipment or property placed on the demised premises by Lessee, other than that above specifically mentioned in this paragraph, the purchase price of which is chargeable to said lease operation and which purchase price has not then been fully recovered by Lessee as hereinafter provided, may be removed from the premises by Lessee at any time within Sixty (60) days subsequent to the termination of said Lease and by said Lessee kept for its own use and purposes in the event that within Thirty (30) days next subsequent to such termination Lessor does not exercise its right hereby granted to acquire full title in and to such equipment or property by paying to Lessee such portion of said purchase price thereof chargeable to said lease operation which has not then been fully recovered by Lessee as herein provided.

14: It is mutually agreed by the parties hereto that Lessee may at any time on Sixty (60) days written notice, without liability or obligation on its part for so doing, beyond the obligations incurred hereunder to the date of surrender, terminate this lease and surrender the possession of the leased premises.

15: For breach of any covenant or agreement herein specified to be kept and performed by Lessee, Lessor may terminate this Lease by delivering to Lessee at its office, 218 Felt Building, Salt Lake City, Utah, a written notice of Lessor's intention to terminate the same, which written notice shall set forth the breach of covenant or agreement complained of; and if Lessee is thus in default as claimed by Lessor, it is agreed that Lessee may within Sixty (60) days following the receipt of such notice avoid said termination and cure such default by performing the covenant or agreement breached. If such default has not been thus cured within the said Sixty (60) day period, said termination shall thereupon become effective, and all of Lessee's rights hereunder shall be forfeited, except only those rights and obligations which have become fixed and unconditional. Failure by Lessor, through its agents or otherwise, to exercise for any length of time any right of forfeiture, shall in no event operate as a waiver of such right of forfeiture for any breach still continuing or for any reoccurrence thereof or for any different breach.

16: It is mutually agreed by the parties hereto that all ores mined and extracted under this Lease shall be marketed or disposed of by Lessee upon

the most favorable terms and conditions available to either Lessor or Lessee, but Lessee shall have first and prior right to purchase for treatment at its Caselton Mill all flotation mill ore on a schedule subject to change at six-month intervals and designed to provide Lessee a mill operating profit equivalent to Twelve and one half (12.5) per cent of the net smelter value of the concentrates, f.o.b. Caselton, Nevada, produced from said ore up to a maximum mill profit of $1.50 per ton of crude ore.

17: In consideration of Lessor's leasing the demised premises to Lessee, Lessee agrees to pay as rental for the demised premises a share of the profits derived from Lessee's operations hereunder determinable before depreciation, depletion and income taxes, all as hereinafter provided. For the purpose of computing and paying rental, Lessee's accounting period shall be the calendar year, and rental shall be payable, as hereinafter provided, within Sixty (60) days after the close of said accounting period. Rental shall be computed and paid as follows:

A. When in any one calendar year the total revenuesderived from operations hereunder are less than the costs of operations of said demised property for such year, no rental shall be paid by Lessee to Lessor.

B. When in any calendar year revenues received by Lessee from operations hereunder exceed Lessee's costs of operations of the demised premises for that year, the excess shall be divided and paid as follows

(1) The proportion of said excess which the then unpaid indebtedness owing from Lessor to International bears to the total of said last mentioned indebtedness plus the then unpaid accumulated cost of Lessee's operations hereunder, shall be paid to International.

(2) The proportion of said excess which the then unpaid accumulated cost of Lessee's operations hereunder bears to the total of said last mentioned cost plus the then unpaid indebtedness owing from Lessor to International, shall be retained by Lessee.

C. If and when said indebtedness to International has been fully paid and Lessee during any calendar year has received the full amount of its then accumulated costs of operations hereunder, one-third of any profit from Lessee's operations hereunder during such year shall be paid as rental to Lessor and the remaining two-thirds of such profit shall belong to and be retained by Lessee. No rental shall be due or payable during any subsequent year until and unless all of Lessee's then accumulated costs of operations hereunder have been paid.

It is the express intention of the parties hereto that the debt owed by Lessor to International and Lessee's entire accumulated costs of operations hereunder shall be repaid to International and Lessee from revenues derived from ores, provided, however, that if this Lease is terminated before International has received full payment of indebtedness owing from Lessor to it, the said Lessor agrees to pay any balance of said indebtedness then

remaining unpaid within Six (6) months next following said termination. However, it is agreed that Lessee shall not charge any interest on any accumulated costs of operations carried on its books, and in the event that the indebtedness of $57,186.67 owing from Lessor to International as of December 1, 1946, is paid while said Lease is in force and effect, no interest thereon from or after said December 1, 1946, shall be exacted or paid. Lessee's costs of operations or accumulated costs shall include a pro rata share of Lessee's overhead charges distributed on the basis of the operating costs of its respective operating units; the cost of planning and supervising the work; the cost of labor, supplies, power, equipment, services, fire insurance, transportation and material; the cost of assaying and sampling; all costs and expenses incident to acquiring patents to claims herein described; the amounts paid for Workmen's Compensation and Industrial Insurance premiums and Social Security contributions; the amounts paid for net proceeds taxes and other taxes (except Federal and State Income Taxes of the parties hereto), assessments, levies, imposts, duties and charges which are now or may hereafter be levied by competent authority upon or against the demised premises or the operations to be carried on under this Lease; and all expenditures for fixed and depreciable assets placed on the property.

18: Any mining claims hereafter located by Lessee adjoining the mining claims and mining properties hereinabove described shall be located in the name of Lessor and shall thereupon be included in and made a part of the leased premises hereunder.

19: It is mutually agreed by the parties hereto that Lessee shall have and is hereby granted the exclusive option to purchase at any time while this Agreement is in effect, all or any part of 375,000 shares of Lessor's treasury stock, at the price of 50¢ per share, and Lessee may apply upon said purchase at any time it elects to take said stock, or any part thereof, any amounts recoverable by Lessee as money paid out for costs of operations hereunder and not theretofore repaid to it out of revenues derived from mine earnings, following which application Lessee's recoverable costs of operations will be thereby reduced to the extent of such application. Lessor agrees that it will not sell, hypothecate or otherwise dispose of any of said 375,000 shares of treasury stock and does specifically consent to Lessor's granting to International an option to purchase all or any part of the remaining 123,000 shares of treasury stock at 50¢ per share all as provided in the next succeeding paragraph of this Agreement.

20: It is mutually agreed by the parties hereto that International shall have and is hereby granted the exclusive right and option to purchase at any time while this Agreement is in effect, all or any part of 123,000 shares of Lessor's treasury stock, at a price of 50¢ per share, and International may apply upon said purchase at any time it so elects to take said stock, or any part thereof, any portion of any indebtedness owed by Lessor to International; and Lessor agrees that it will not sell, hypothecate or otherwise dispose of any of its said treasury stock other than that herein optioned as aforesaid.

21: It is agreed that the Lessee may, provided it has fully and faithfully complied with all of the covenants and agreements of this Agreement and Lease contained, upon notice in writing to Lessor at least Ninety (90) days prior to the end of the term hereof demand and receive from Lessor a renewal and extension of this Lease for an additional term of Five (5) years; and may likewise demand and receive a renewal and extension hereof for a third and fourth five-year term respectively, provided that during the second, third and fourth five-year terms, if this Lease shall be so renewed and extended, Lessee shall

cause to be expended upon the demised premises not less than Twenty Thousand (20,000.00) Dollars annually in the further exploration and development, equipping and operating of said mining claims and mining property and for surface improvements thereon.

22: That any and all modifications or alterations of or additions to or changes in any of the terms, conditions or agreements of this Agreement and Lease contained, hereafter at any time claimed by any party hereto to have been made orally or otherwise than in writing, signed by the parties hereto, under due authority thereof, shall be void and not binding on any party hereto.

23: That Lessee may not assign this Agreement and Lease and its rights and obligations thereunder without the prior written consent of Lessor.

24: Each and every clause and covenant of this Agreement and Lease shall extend to, benefit and bind the successors and assigns of the parties hereto respectively.

25: This Agreement and Lease shall not be in force or effect or be binding upon any party hereto until execution and delivery thereof has been duly authorized and approved by Lessor's Board of Directors and thereafter fully ratified by Lessor's stockholders at a special meeting of said stockholders duly called and held.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be signed by their respective officers thereunto duly authorized, and their corporate seal to be hereunto affixed, duly attested, all in triplicate, on the day and year first hereinbefore written.

LESSOR:

COMET COALITION MINES COMPANY

By: Tom Lyon

Its President

Attest:

LESSEE:

COMBINED METALS REDUCTION COMPANY

By

Its President

Attest:

INTERNATIONAL SMELTING AND REFINING COMPANY

By:

Its Vice President

Attest:

STATE OF Utah)
: ss
COUNTY OF Salt Lake)

On this 10th day of January, 1948, personally appeared before me, a Notary Public, in and for Salt Lake County, E. H. Singleton, known to me to be the President of the corporation that executed the foregoing instrument, and upon oath, did depose that he is the officer of said corporation as above mentioned; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily and for the uses and purposes therein mentioned.

Notary Public in and for the
County of Salt Lake,
State of Utah.

My Commission Expires:

3/4/50

STATE OF Utah)
: ss
COUNTY OF Salt Lake)

On this 10th day of January, 1948, personally appeared before me, a Notary Public, in and for Salt Lake County, Tom Lyon, known to me to be the Secretary of the corporation that executed the foregoing instrument, and upon oath, did depose that he is the officer of said corporation as above mentioned; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily and for the uses and purposes therein mentioned.

Notary Public in and for the
County of Salt Lake,
State of Utah.

My Commission Expires:

3/4/50

STATE OF NEW YORK)
: ss
COUNTY OF NEW YORK)

On this 30th day of December, 1946, personally appeared before me, a Notary Public, in and for New York County, Frederick Laist, known to me to be the Vice President of the corporation that executed the foregoing instrument, and upon oath, did depose that he is the officer of said corporation as above mentioned; that he is acquainted with the seal of said corporation and that the seal affixed to said instrument is the corporate seal of said corporation; that the signatures to said instrument were made by officers of said corporation as indicated after said signatures; and that the said corporation executed the said instrument freely and voluntarily and for the uses and purposes therein mentioned.

Notary Public in and for the
County of New York,
State of New York.

My Commission Expires:

VERONICA T. BURKE
NOTARY PUBLIC, STATE OF NEW YORK
COUNTY
NO. 1[illegible]
REG. NO. 27[illegible]
EXPIRES MARCH 30, 19[illegible]

NO. A -16[illegible]

REFERENCES

COMBINED METALS REDUCTION CO.

[illegible]

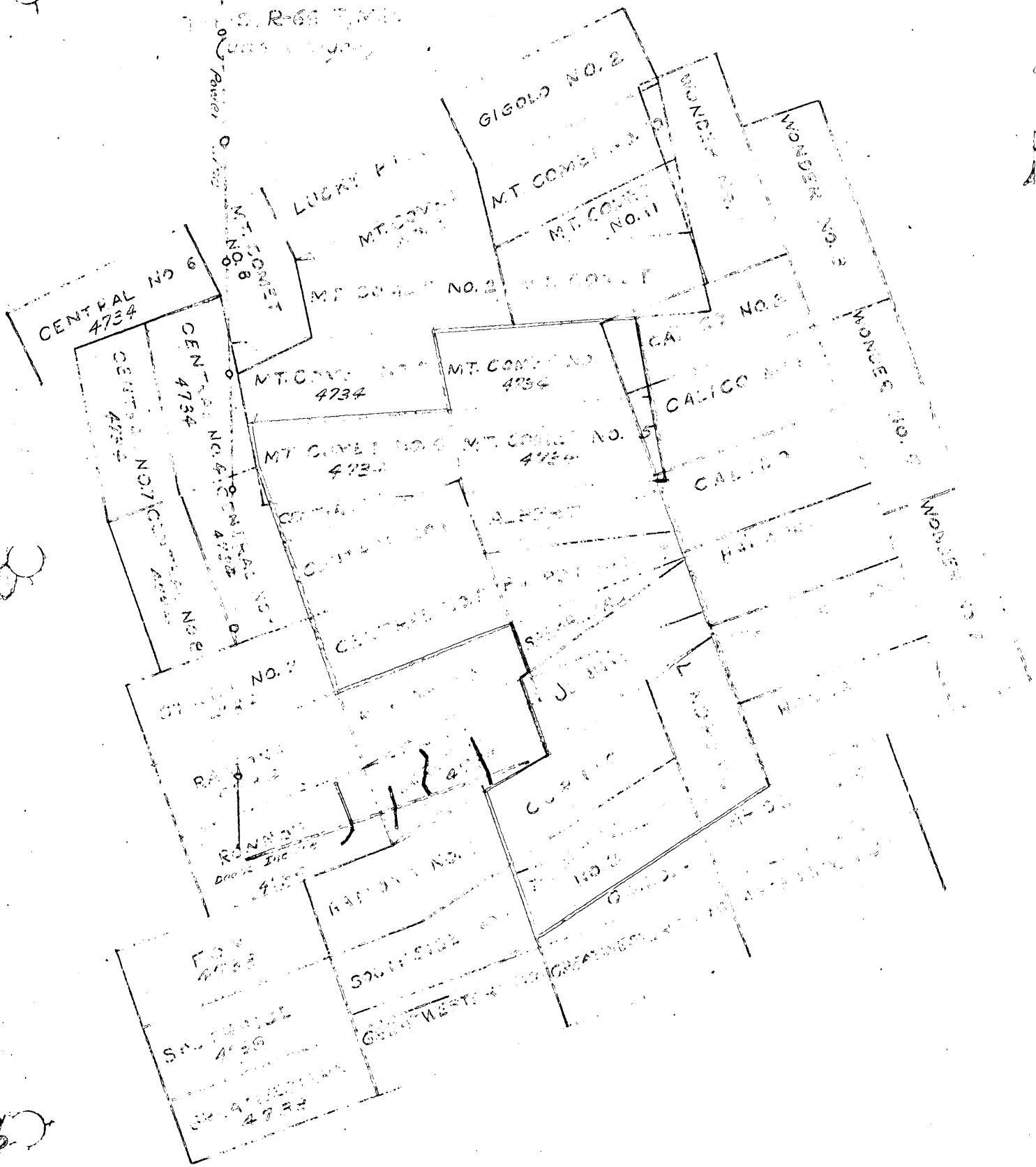
[illegible] 19

MADE BY [illegible]

TRACED BY

CHECKED BY [illegible]

SCALE



RECEIVED
DEC 13 1956

MF-203
Revised March 24, 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator_____
Docket No. DMEA-_____
Contract No. Idm-E_____
Contract Date_____

CONSENT TO LIEN

To the United States of America:

Referring to that certain land in the County of Lincoln, State of Nevada, described 1/

in an Agreement and Lease dated the 10th day of January, 1947 and recorded on the 13th day of January, 1947, No. 22326, in Book 4 of Miscellaneous, page 47, official records of said county.

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of a percentage royalty on production as may be provided for by the contract;2/ and represents and undertakes that there are no claims, liens, or encumbrances upon the undersigned's right, title, or interest in the land prior to that hereby granted to the Government other than the following:3/

3. Undertakes and agrees neither to commit any act nor assert any claim in conflict with the provisions of this Consent to Lien; and to give advance notice of the Government's rights under this Consent to Lien to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, or interest in the land; and

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

3/ Write "none" if that is the case. Do not leave lines blank.

4. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Consent to Lien shall extend and apply thereto.

5. Added provision: _____

Dated this 5th day of December, 1955.

COMET COALITION MINES COMPANY [Seal]

By J. J. Lillie [Seal]

J. J. Lillie

President [Seal]

I, ROM WARBURTON, certify that I am the Secretary (Secretary, etc.) of the corporation named herein; that J. J. Lillie, who signed this agreement was then President (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

Rom Warburton, Secretary [Corporate Seal]

MF-203
Revised March 24, 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator_____
Docket No. DMEA-_____
Contract No. Idm-E_____
Contract Date_____

CONSENT TO LIEN

To the United States of America:

Referring to that certain land in the County of Lincoln, State of Nevada, described ~~as follows~~ 1/

in an Agreement and Lease dated the 10th day of January, 1947 and recorded on the 13th day of January, 1947, No. 22326, in Book "N" of Miscellaneous, page 47, official records of said county.

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of a percentage royalty on production as may be provided for by the contract; 2/ and represents and undertakes that there are no claims, liens, or encumbrances upon the undersigned's right, title, or interest in the land prior to that hereby granted to the Government other than the following: 3/

None

3. Undertakes and agrees neither to commit any act nor assert any claim in conflict with the provisions of this Consent to Lien; and to give advance notice of the Government's rights under this Consent to Lien to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, or interest in the land; and

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

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3/ Write "none" if that is the case. Do not leave lines blank.

4. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Consent to Lien shall extend and apply thereto.

5. Added provision: _____

Dated this 5th day of December, 1955.

COMET COALITION MINES COMPANY [Seal]

By J. J. Lillie [Seal]

J. J. Lillie

President [Seal]

I, ROM WARBURTON, certify that I am the Secretary (Secretary, etc.) of the corporation named herein; that J. J. Lillie, who signed this agreement was then President (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

Rom Warburton

Rom Warburton, Secretary [Corporate Seal]

MF-203
Revised March 24, 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator_____
Docket No. DMEA-_____
Contract No. Idm-E_____
Contract Date_____

CONSENT TO LIEN

To the United States of America:

Referring to that certain land in the County of Lincoln, State of Nevada, described 1/

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1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

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1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

3/ Write "none" if that is the case. Do not leave lines blank.

4. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Consent to Lien shall extend and apply thereto.

5. Added provision: _____

Dated this 5th day of December, 1955.

COMET COALITION MINES COMPANY [Seal]

By J. J. Lillie [Seal]

President [Seal]

I, ROM WARBURTON, certify that I am the Secretary (Secretary, etc.) of the corporation named herein; that J. J. Lillie, who signed this agreement was then President (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

Rom Warburton, Secretary [Corporate Seal]

[illegible]

Mr. Lawrence G. Lautz, Chief
Nonmetallic Minerals Division
U. S. Dept. of the Interior, B.M.E.R.
Washington 25, D. C.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
4/3	Frank	500
"	Johnson	110
	A Mittendorf	100
		220

APR 4 - 1957

Mr. Paul Gemmill, General Manager
Combined Metals Reduction Company
218 Felt Building
Salt Lake City, Utah

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Gemmill:

Referring to the cited application, we have been advised by Mr. Spangler Ricker, Executive Officer, Region II, that you desire that it be held in abeyance for an additional six months.

It is very difficult for us to hold applications open for long periods and we must therefore consider it as having been withdrawn. This action is taken completely without prejudice to the property and you are fully entitled to reapply at any time. You may be very sure that any such later application would be given our full consideration.

Sincerely yours,

C. O. Mittendorf

Administrator

WRGriswold/er 4/2/57
Copy to: Docket
Admr R File
Op. Committee
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region IV (2)
Chron.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

500

April 2, 1957

Memorandum

To: Mr. Allen S. Dakan, Chief, Operations Control and Statistics Division, DMEA

From: Chief, Base Metals Division

Subject: Withdrawal of Application, Docket No. DMEA-4096, Combined Metals Reduction Company, Pan American Mine, Lincoln County, Nevada, Lead-Zinc.

We are advising the cited Applicant that this application is being considered as withdrawn.

W. R. Griswold

W. R. Griswold

WRG/er

Copy to: Docket
Chron.

8623

DMEA

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

3/21 C 220
3/21 WRG 500

March 18, 1957

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Company
Pan American Mine
Lincoln County, Nevada
(Your letter, March 4, 1957)

We have contacted Mr. Paul Gemmill relative to his future plans concerning subject docket.

Mr. Gemmill stated his Company was not financially ready to begin any exploration program immediately but expected to install a hoist at the collar of the shaft and to do some assessment work. The Company would agree to the withdrawal of the application, if it would not jeopardize their position in again submitting an application. However, Mr. Gemmill suggests that, if possible, the application be held in abeyance for an additional period of six months in order to allow them time in which to perfect their plans for financing the exploration work proposed on the property. They are desirous of going ahead with the exploration program as soon as they are financially able.

I would recommend that the application be withdrawn without prejudice to the property and that the Applicant be advised to submit a new proposal when his Company is financially prepared to conduct an exploration program.

S. Ricker

S. Ricker

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
500 3/1	Griswold	500
3/4	Selfridge	130
"	Johnson	110
"	Illegible	100
2/5	C	225
		500

MAR 4 1957

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Ricker:

Referring to the cited application, we have had nothing further on it since the copy of your letter to the Applicant dated October 24, 1956.

It is difficult for us to hold applications open beyond a reasonable period of time. Will you therefore advise us as to the Applicant's present intent. If no action is contemplated within the near future we should then classify the application as withdrawn.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)
WRGriswold/er 3/1/57
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

Frank D. Lamb (FDL)
Member, Bureau of Mines

Thor H. Kiilsgaard (THK)
Member, Geological Survey

8623

D M E A
Oper. Com
Wash. D.C.

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

Pending

1605 Evans Avenue
Reno, Nevada

October 24, 19

RECEIVED
OCT 26 1956

Mr. Paul Gemmill, Gen. Mgr.
Combined Metals Reduction Co.
218 Felt Bldg.
Salt Lake City, Utah

Re: Docket No. DMEA-4096 (lead-zinc)
Pan American Mine
Lincoln County, Nevada

Dear Mr. Gemmill:

Pursuant to our telphone conversation October 22, 1956 relative to your application for Government assistance, the following points will be discussed with Mr. Reginald Lee by Mr. Gentry during his visit in Pioche October 27, 1956:

1. The possibility of subjecting to royalty payments to the Government all ore presently exposed from the collar of the shaft to the bottom of the shaft.

   The above area would probably include the following additional mining claims: Ramona 4734, Ronnow 4734, Ramona No. 1, Dorothy 4734, Ramona No. 2.

2. This would require "Owner's Consent to Lien" be obtained on the additional claims; and an extension of royalty to a 15 year period instead of the customary 10 year period.

3. Additional diamond drilling depending upon results from the following proposed work:

Extension of shaft:	
400 feet @ $121.00/ft.	$48,400.00
Diamond drilling:	
2,000 feet @ $7.00/ft.	14,000.00
	$62,400.00

Very truly yours,

S. Ricker
Executive Officer
DMEA Field Team, Region II

SRicker:gh
cc: Opr. Com., DMEA, Wash., D.C.
R. M. Smith
File

Griswold
Selfridge
Yopes
Whitendorf

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

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

SEP 20 1956

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Ricker:

This is with reference to your memorandum of August 31, with enclosures, covering the cited application.

We cannot feel that the alternate proposal, submitted by the Applicant in its July 28 letter, would be apt to develop a significant amount of worthwhile data. We must reiterate that we probably could give serious consideration to a request by the Applicant for a few holes to be drilled from surface, but nothing beyond that. In view of the conditions cited by Roscoe Smith, it would seem that churn drilling would be advisable, as is presently being done in the Pioche area.

On the map entitled "Geologic and Topographic Map, Pan American Area - Comet District" we have drawn a line between U.S.B.M. holes No. 1 and No. 2. We note that an existing road is close to this line for most of the distance. It appears that this road could be utilized for drilling sites at little expense.

In essence, we believe that the application was well summarized by H. K. Stager, in the last paragraph of his August 15 memorandum. He stated:

> "If the tonnage and grade . . . do not, at this time, warrant the risk involved . . . I believe that exploration should be delayed . . ."

Actually, the grade of the ore with the metallurgical problems involved, presents little expectancy for a worthwhile target.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

APPROVED:

P. F. Yopes
Member, Bureau of Mines

Thor H. Kilsgaard
Member, Geological Survey

WRGriswold/er 9/19/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kilsgaard, USGS
Chron.

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

RECEIVED
SEP 13 1956

September 13, 1956

Re: DMEA-4096; Lead-Zinc; $185,750
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Memorandum

To: W. R. Griswold, DMEA

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

Subject: Review by field team dated August 31, 1956, received September 7, 1956, covering counter proposal of applicant

The Operating Committee suggested that drilling would be a more logical exploration method than the expensive shaft sinking, drifting, crosscutting, raising program requested by the applicant. To this suggestion, the applicant replied with a compromise request which includes:

1. 390 feet of incline shafting to cross the Schodde fault,

2. cutting of diamond drill station and boring 4 drill holes totaling 2,000 feet,

3. 500 feet of drifting on the 1,500-foot level and 400 feet of drifting on the 2,000-foot level.

The field examiner, Roscoe Smith (USGS), states that surface drilling is not feasible because the formations are costly to drill and the project area is difficult of access because of cliffs not shown on the project map. Mr. Stager (USGS) states that the operators alternate program of sinking and diamond drilling, explores about half of the inferred ore block covered by Stage I of the original application and that the drifting program is not exploration but would serve only to prove dimensions and grade of known ore. In conclusion, he writes that the original proposal is probably the cheapest type of exploration for the deposit. S. Ricker (USBM) concurs with this view and appears to recommend a contract covering work proposed in the original application.

It is my opinion that the $312,000 exploration program outlined in the original application or the sinking-drilling program phase of the alternate program, which would cost in the order of $65,000, are both good exploration programs. There is some doubt

however whether the ore target contains sufficient values to warrant the expenditure. The 1,386,000 tons of complex zinc-lead-silver-manganese ore now developed between the 600 and 2,300 level of the Deeper Incline will yield approximately $5.00 gross revenue per ton when mined and milled. It seems doubtful that such ore will pay exploration, development, mining and milling costs, in view of the fact that large tonnage relatively shallow operations on simple ores in southeast Missouri cost $3.94 per ton, and those in Washington cost about $5.00 per ton according to the Tariff Commission study of 1952.

I believe that over a period of time the ore will become commercial through improved methods and recoveries. I therefore conclude that the Government is warranted in participating in the limited alternate program of sinking the incline 390 feet and boring 2,000 feet of diamond drill hole. Such a contract should be on a unit-cost basis and should provide for repayment over a period of not less than 20 years.

O. M. Bishop

O. M. Bishop

Copy to: Mr. Kiilsgaard, Rm. 5222
Division of Minerals (2)
Branch of Base Metals
Files

IN REPLY REFER TO:

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

RECEIVED
SEP 13 1956

September 12, 1956

Re: DMEA 4096
Combined Metals Reduction Co.
Pan American Mine
Lincoln Co., Nevada
App. Est. $312,220.00
Rec'd 271,000.00
Lead-zinc

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of supplemental memorandum concerning alternate proposals.

The applicant originally requested assistance in exploring for a high grade ore channel in the down dip and across-a-fault extension of a mineralized bed, the C. M. bed. The above-the-fault section has been extensively explored by shaft (incline), drifting and diamond drilling. As a result of the work the applicant estimates 1,386,000 tons of ore has been developed. The estimated grade is:

Oz Au. Ton	Oz Ag. Ton	Percent Lead	Percent Zinc	Percent Manganese
0.005	1.74	1.25	2.50	9.3

The U. S. Bureau of Mines drilled 3 holes into the above and below fault sections with the following results:

Hole No.	Thickness feet	Au Oz	Oz Ag	Percent Lead	Percent Zn	Percent Mn
1 (Below) Fault	12.0	.005	2.8	1.3	2.9	8.1
2 (Below) Fault	12.0	.005	2.23	0.3	2.4	9.6
3 (Above) Fault	15.5	.007	2.3	2.4	4.5	8.4

At least 4 holes have been drilled north of the reserve area and above the fault, probably by the applicant, for which no data are given except that they showed no mineralization. Three of the holes are near the No. 3, Bureau of Mines hole.

The alternate proposal of the applicant sinking and drilling, involves less work and would seem to offer as good or better chances of locating a high grade channel below or east of the fault than does the original proposal, but will not provide openings through which mining might be done. The alternate program would also be a partial substitute for surface drilling at an over-all smaller cost. The drilling would explore the CM beds near the Shodde Fault and fracture zone, which according to the application is a good place to look for high grade replacement ore in the CM beds.

The alternate proposal includes drifting on the 1,500 and 2,000 levels off the incline shaft. If, as should be expected, such work would carry subordination of the Stella No. 2, Ramona, Ramona No. 1, Ronnow, Dorothy, Fox, Ramona No. 2, Southside, Southside No. 1, Greatwestern and Greatwestern No.1 claims, the proposal should be entertained. Within the named claims are the 1,386,000 tons of ore considered as reserves. The area within the claims was excluded from the subordinated area in the original application.

Inasmuch as the known reserves do not warrant a plant and the purpose of the original proposed project was to indicate a tonnage that would justify such an outlay, the known reserves would benefit materially and to require such subordination would not be entirely out of order.

No estimate of cost of the alternate proposal has been submitted.

I concurred (April 10, 1956) with the examiners' and the Field Team's recommendation of the large project and again concur on the understanding that knowing the location of the material called ore is desirable. On the same basis the alternate proposal is also acceptable. I will also concur with a denial of the application.

N. E. Nelson

N. E. Nelson

DMEA

Griswold

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

RECEIVED
SEP - 4 1956

1605 Evans Avenue
Reno, Nevada

August 31, 1956

Memorandum

To: Operating Committee, DMEA, Interior Building, Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4096 (Lead-zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Enclosed are three copies of a letter dated July 28, 1956 from Mr. Reginald Lee presenting a counter proposal for exploration than that we suggested to him in accordance with your letter of May 24, 1956.

Also enclosed are four copies of a memorandum from H. K. Stager and four copies of covering memorandum from Roscoe Smith.

Upon review of the original proposal by the applicant and the Field Teams application report, I am inclined to agree with the conclusions set forth in the memoranda by Smith and Stager. Diamond drilling would seem to be only temporizing with the real issue as to whether or not a significant ore body can be discovered.

I would appreciate having your further suggestions.

S. Ricker

Encl.

8/31 Field memo

BUREAU OF MINES
WASHINGTON, D. C.

SEP 4 1 07 PM '56

COMBINED METALS REDUCTION COMPANY

CASELTON PLANT PIOCHE, NEVADA

July 28, 1956.

7/28 letter

REFER TO		DATE
Ricker	SR	8/3/56
Gentry		
ANSWERED		

RECEIVED
SEP - 4 1956

Mr. S. Ricker, Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Ricker:

Reference is made to your letter of May 31, 1956 to Mr. M. J. Kennard, relative to application for aid in an exploration project at the Pan American Mine.

We note that you recommend surface diamond drilling as a preliminary stage of exploration.

We are agreeable to a diamond drilling program, but would like to submit an alternate proposal of underground diamond drilling, a small amount of drifting and shaft sinking as follows:

Stage I

1. Extend the Deeper Incline shaft across the Schodde Fault, approximate slope distance 390 feet. Shaft to follow footwall of C.M. Beds on present inclination.

Cut a diamond drill station on the hanging wall side of the Schodde Fault.

2. Drill 4 diamond drill holes, not to exceed a total of 2,000 feet, from above proposed drill station to cut the C.M. Beds at approximate location shown on attached map C-1076.

3. Extend the 1500 level north drift 150 feet.

Extend the 1500 level south from the shaft 350 feet.

Stage II

Extend 2000 level north 100 feet and south 300 feet. This work is dependent on results obtained in drifting on 1500 level.

COMBINED METALS REDUCTION COMPANY

SHEET 2 DATE July 28, 1956 TO Mr. S. Ricker

Unit cost of extending the Deeper Incline to the Schodde Fault will be greatly reduced from cost estimate in original application, as no large water flow or heavy ground is likely to be encountered.

Likewise, unit cost of drifting on 1500 level and 2000 level will be reduced. This will also be the case with the shorter underground diamond drill holes as compared with the longer surface holes.

As suggested in your letter, we will be happy to work out a program with your engineer, at his earliest convenience.

Very truly yours,

Reginald G. Lee

Reginald G. Lee

cc: E. H. Snyder
Paul Gemmill
M. J. Kennard
File

RECEIVED
SEP - 4 1956

Mineral Deposits Branch

August 23, 1956

Memorandum

To: S. Richer, Executive Officer, DMEA Field Team, Region II

From: Eugene M. Smith

Subject: DMEA-4096 (lead-zinc)
Combined Metals Reduction Co.
Pan American mine
Lincoln County, Nevada

Enclosed are six copies of a memorandum from Hal Stager in which he appraises and rejects alternate proposals for exploring the subject mine.

Of the several proposals the revised project recommended in the application report appears to be best suited to explore the deposit within the limitations imposed by the low grade of the ore. The project has a good geologic target which would be adequately tested by the proposed work.

In his letter of May 24, 1956 to Mr. Richer, Mr. Martin raised the questions of drilling costs and severe terrain. Drilling could be accomplished but at a high cost. Shale formations in the Cambrian section resemble and have the same drilling characteristics as layered quartzite. To move in a rig of the size required for drilling this rock, through the cliff-forming limestones of the Highland Peak formation, would be costly although not impossible. These cliffs are not shown on the generalized contour map in the report.

Drilling cannot be done for $3.00 in this region. Our lowest cost diamond drilling is at the Sonoma quicksilver mine where DMEA allows $3.00 for underground drilling and where actual costs are running $4.50. Even here in soft rock the lowest contract bid for surface drilling to depths of 1,000 feet is $9.60 per foot, not including water, core boxes, logging, reaming, casing, cementing, access roads, and preparation of drill sites.

Mineral Deposits Branch

RECEIVED
SEP - 4 1956

August 15, 1956

8/15 Memo - HK Stager

Memorandum

To: S. Ricker, Executive Officer, DMEA Field Team, Region II

From: H. K. Stager, geologist, U. S. Geological Survey, Menlo Park, California

Subject: DMEA-4096 (lead-zinc)
Combined Metals Reduction Company
Pan American mine
Lincoln County, Nevada

COMMENTS ON SUGGESTED ALTERNATE PROPOSALS FOR AN EXPLORATION PROJECT AT THE PAN AMERICAN MINE

The application report contained a recommendation for Stage I of an exploration program to consist of deepening the Pan American inclined shaft 1,000 feet, drifting 100 feet south and 1,000 feet north on the 3,300 level, and raising and crosscutting 300 feet, at an estimated cost of $185,750, of which the Government's share would be $92,875.

The Operating Committee did not feel justified in approving a contract of this size without additional preliminary exploration and suggested a surface diamond or churn drilling program of 5 test holes totaling about 7,000 feet. A program of this type would cost about $70,000, of which the Government's share would be $35,000.

The applicant is agreeable to a preliminary drilling program but made an alternate proposal for 390 feet of shaft sinking, 900 feet of drifting, and 2,000 feet of underground diamond drilling. No estimate of cost for this program was given but it would probably be about $90,000, of which the Government's share would be $45,000.

The drilling program proposed by the Operating Committee would yield useful information relative to the problem of the approximate width and trend of the ore body cut by U.S.B.M. hole No. 1 but would not be sufficient to determine the size and grade of the ore body. If all the proposed holes cut barren limestone at the ore horizon the program could be terminated and a saving in money and work would result. But if even one hole cut ore similar to that cut by the U.S.B.M. hole then the extent of the body would be known sufficient to require that underground work be undertaken to more accurately determine the size and grade of the body. To obtain the same amount of information by drilling alone would require a far greater number of test holes with an eventual cost in excess of the proposed underground work. Unless the drilling proved the deposit unminable the original underground work would still be required to provide an opening through which the body could be mined, resulting in a far greater over-all cost to the applicant.

The applicant's suggested alternate program, insofar as the shaft sinking and drilling is concerned, is a compromise and would provide him with a mine opening to a point about 400 feet closer to the inferred ore body but would limit the ground to be tested by preliminary drilling to about half of that proposed in Stage I of the original program and by the Operating Committee. The proposed drifting is not relevant to the problem. It is outside of the proposed project area and would serve only to further delimit the known ore body that has already been explored to a degree sufficient to determine its approximate size and grade.

Both alternate proposals have merit and would add further useful information upon which to base underground work. However either preliminary drilling program would add greatly to the over-all cost of the program without making a significant addition to the final amount of information necessary for an appraisal of the ore reserves or minability of the deposit.

The economics involved in the exploration, mining, and milling of the Pan American deposit are marginal to a high degree and any additional expense involving any of these factors must be considered in the light of the value of the end product. An exploration program must be designed to yield the greatest

WEDNESDAY

AUGUST						1956
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12

SEPT. 1956

OCTOBER						1956
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APPOINTMENTS

7 A. M. .....

8 A. M. .....

9 A. M. .....

10 A. M. .....

11 A. M. .....

12 Noon .....

1 P. M. .....

2 P. M. .....

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SEPTEMBER						1956
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TUESDAY

11

SEPTEMBER

amount of information at the lowest possible over-all cost, taking into consideration the amount of ground tested, the area of exposures to be made available for sampling, and the eventual utilization of exploratory openings for the removal of ore.

The original program when considered with the final end product in view is probably the cheapest type of exploration for this deposit. If the tonnage and grade of the inferred reserves at the Pan American mine do not, at this time, warrant the risk involved in an exploration program of the magnitude outlined in the original proposal, then I believe that exploration should be delayed until such time as a more favorable economic situation develops.

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

1605 Evans Ave., Reno, Nev.

RECEIVED
JUN - 4 1956

May 31, 1956

Mr. M. J. Kennard, Vice President
Combined Metals Reduction Company
P. O. Box 150
Salt Lake City 10, Utah

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Kennard:

Reference is made to your letter of December 8, 1955, relative to your application for aid in an exploration project on above cited mine.

While granting that the property warrants a certain amount of exploration, it is thought that until more preliminary exploration is done your proposed work is more elaborate and costly than can be justified at this time.

Would you be agreeable to a diamond drilling program along similar lines as shown on the attached cross-section? If so, will you please advise us so that our engineers may contact your representative and draw up a revised program suitable to you, as well as the Government.

Sincerely yours,

S. Ricker
Executive Officer
DMEA Field Team, Region II

Enclosure

SRicker:am

Copy to: Operating Committee, DMEA, Washington
Roscoe Smith
File

File Copy
Surname
Chambers
Martin
Johnson
Stedman

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

MAY 24 1956

Mr. Spangler Rieker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Rieker:

Referring to the cited application, we cannot accede to the request of the Applicant for the proposed program of shaft sinking, drifting and raising.

It is probable that the property in question does warrant a certain amount of exploratory work and a request for a logical program of diamond drilling or churn drilling would be given consideration. We do not agree with the Applicant's objections to diamond drilling; it states that holes would be in excess of 1500 feet. Yet we have various contracts where it is routine to drill to 1800 - 2000 foot depths. Costs per foot are under $3.00.

From our information the statement about 1500-foot depths is questionable. To illustrate, we have located the proposed north drifting on the company's topographic map and taken a cross section along the line of the proposed north drift, within the limits of the map. It will be noted that five additional drill holes on about 250 feet spacing (to supplement USBM hole No. 1) would adequately explore the same section of the CM bed as would be explored by the very expensive program of shaft sinking and drifting. It will also be noted that the deepest hole would only be about 1360 feet and that the section indicates no severe terrain conditions. Certainly if impossibly

R.C.

severe terrain conditions existed they should appear on a map with a 25-foot contour interval. In other projects truck mounted drills are used where terrain conditions are favorable, with less favorable terrain drills are skid-mounted.

We are enclosing prints showing a cross section along the line of the proposed north drifting, with possible drill hole locations. There appear to be many locations where drilling could be done and where results would be significant. Will you please advise the Applicant that if it chooses to submit a revised proposal, along the lines indicated, we shall be glad to give consideration to such a request. Otherwise, the application must be denied.

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee (WB)

Enclosures

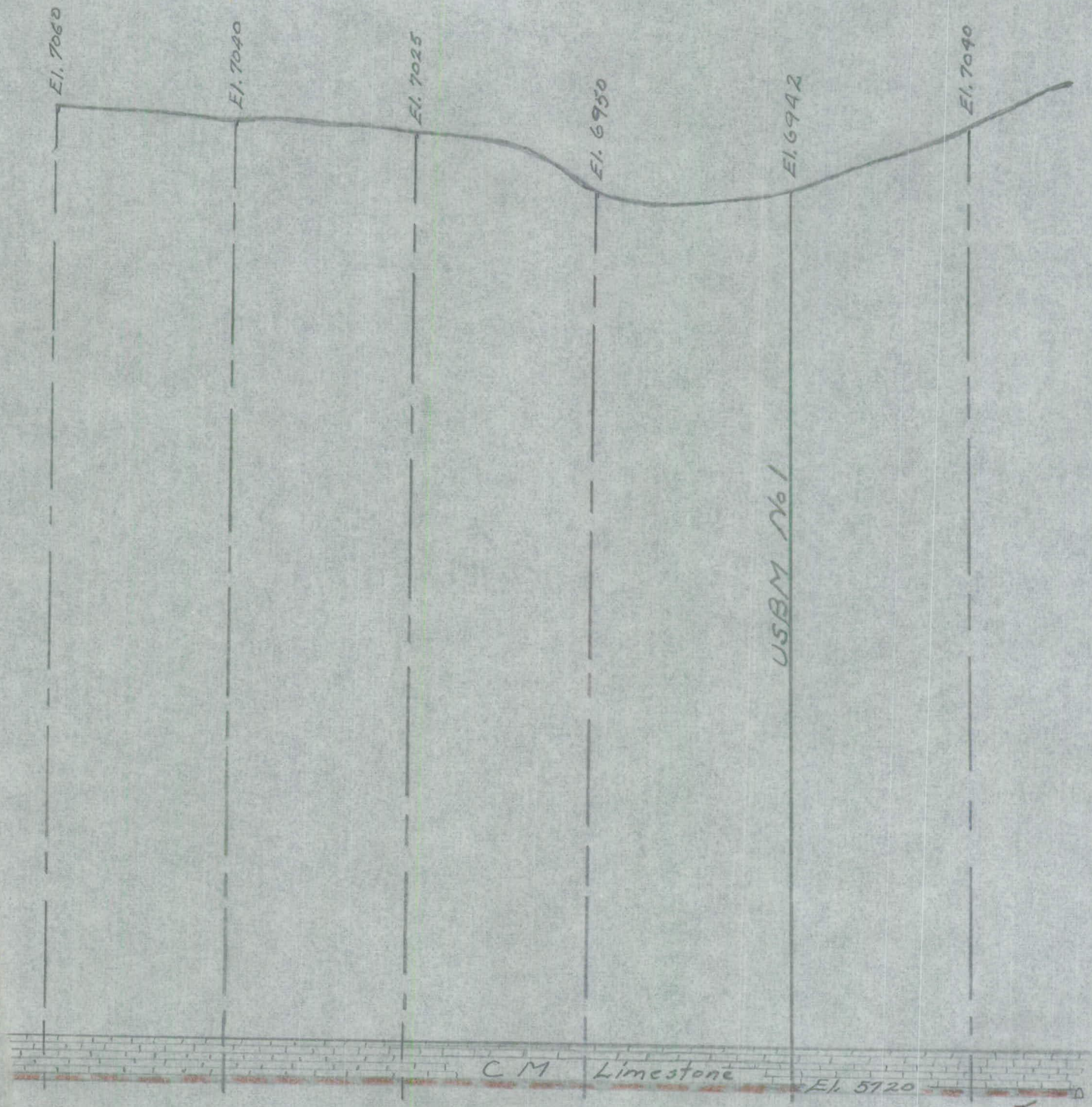
APPROVED:

/s/ Robert W. Geehan (WB)
Member, Bureau of Mines

Thor H. Kiilsgaard (WB)
Member, Geological Survey

WRGriswold/er (5/16/56 rewritten
5/21/56)

Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

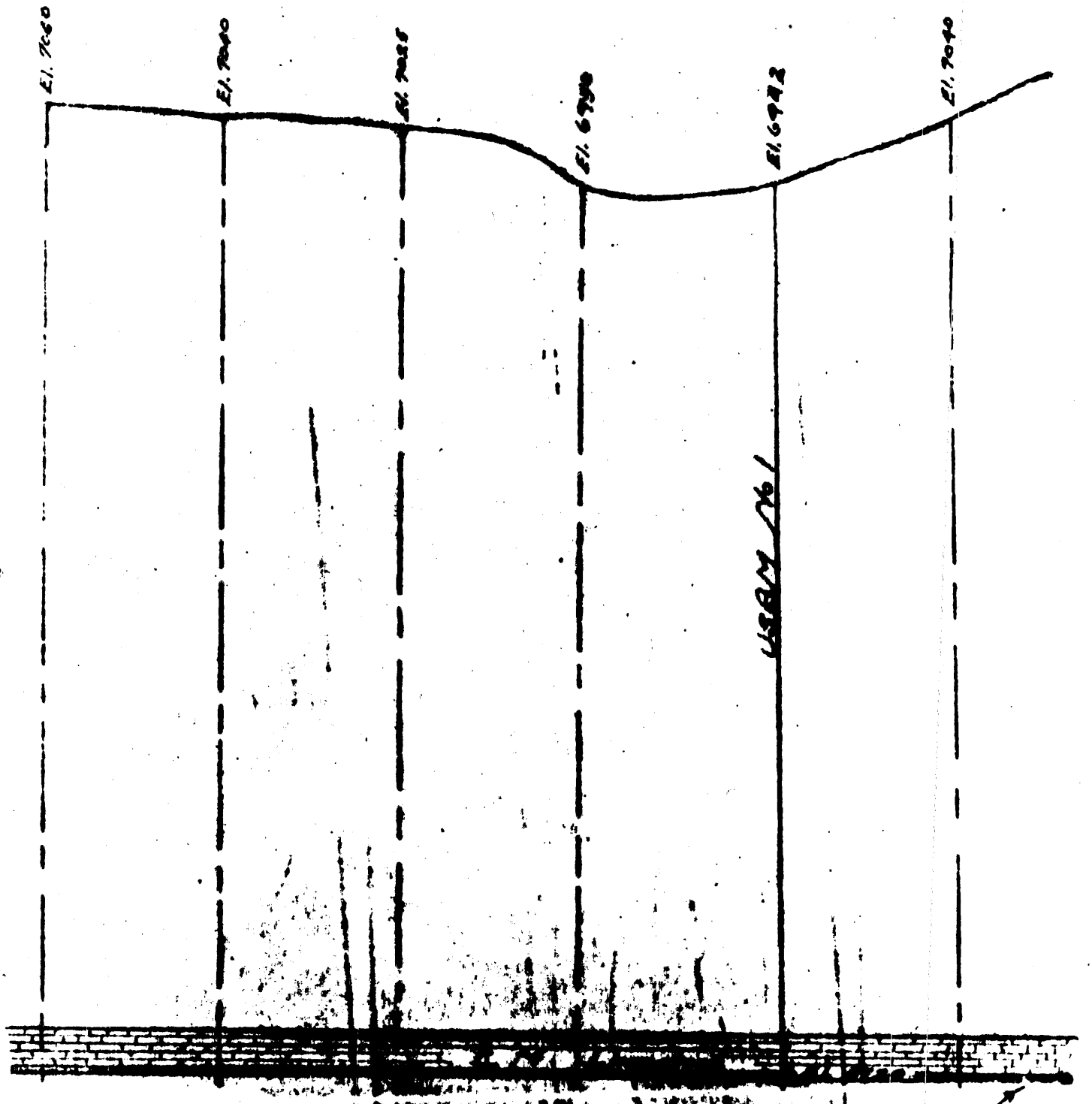


DMEA 4096

Combined Metals Reduction Co.

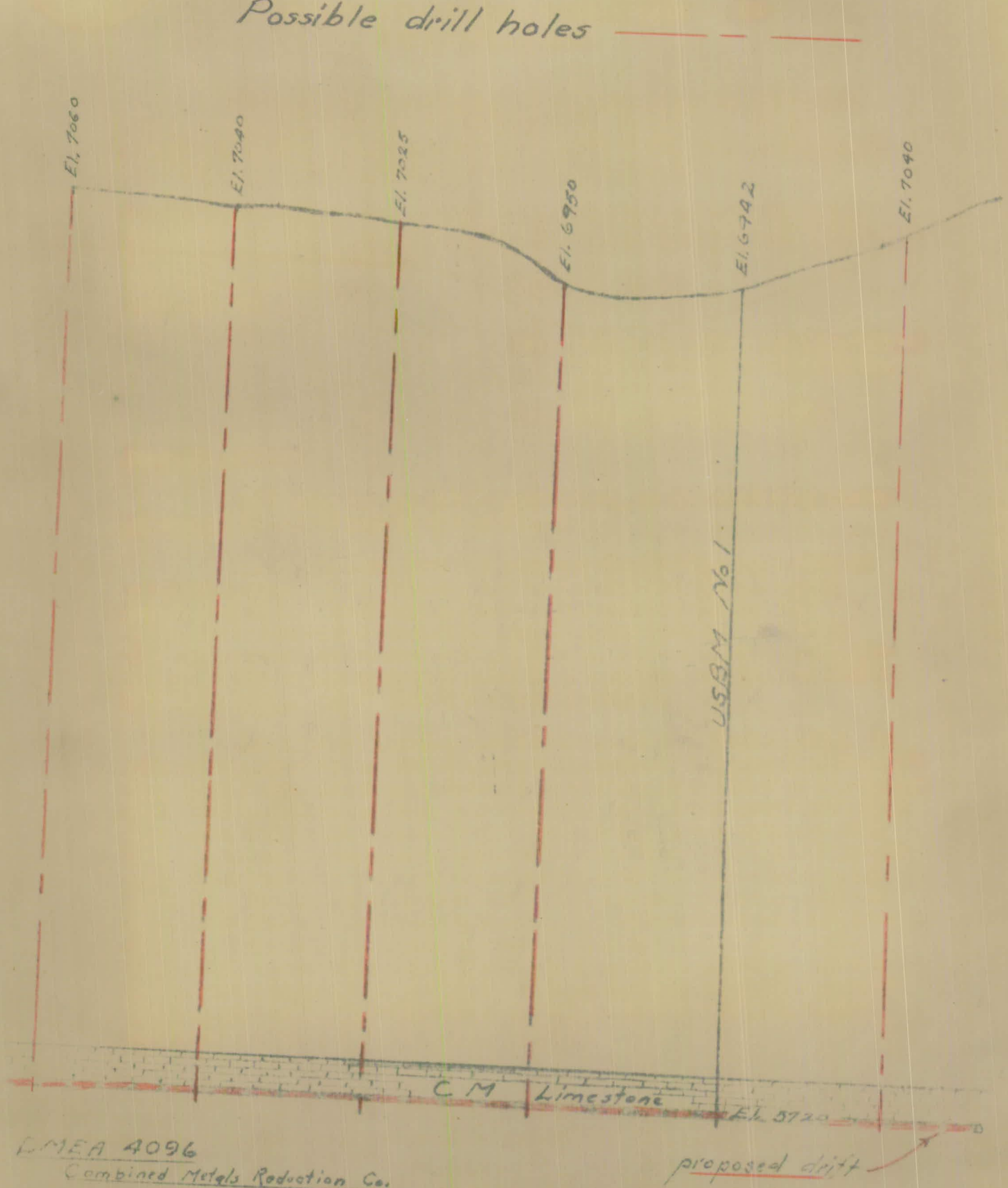
Section in plane of proposed North Drift

scale 1" = 200'



DMEA 4096
Combined Metals Reduction Co.
Section in plane of proposed North Drift

scale 1" = 200'



EMEA 4096
Combined Metals Reduction Co.

Section in plane of proposed North Drift

scale 1" = 200'

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

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Ricker:

Referring to the cited application, ~~we are enclosing copies of our letter of denial to the Applicant.~~

It is probable that the property in question does warrant a certain amount of exploratory work and a request for a logical program of diamond drilling would be given consideration. ~~The~~ We do not agree with applicant's objections to diamond drilling, ~~are trivial;~~ It states that holes would be in excess of 1500 feet. Yet we have various contracts ~~in the Appalachian area~~ where it is routine to drill to 1800 - 2000 foot depths. Costs per foot are under $3.00.

~~Actually~~ From our information we ~~question~~ the statement ~~of~~ about 1500-foot depths is questionable. To illustrate, we have located the proposed north drifting on the company's topographic map and taken a cross section along the line of the proposed north drift, within the limits of the map. It will be noted that five additional drill holes on about 250 feet spacing (to supplement USBM hole No. 1) would adequately explore the same section of the CM bed as would be explored by the very expensive program of shaft sinking and drifting. It will also be noted that the deepest hole would only be about 1360 feet and that the section indicates no severe terrain conditions. Certainly if impossibly severe terrain conditions existed they should appear on a map with a 25-foot contour interval. ~~In the Appalachian~~ In other projects truck mounted drills are used where terrain conditions are favorable, with less favorable terrain drills are skid-mounted.

The Applicant's contention that underground methods would still be required to explore the deposit is ridiculous. We are adequately exploring replacement deposits of vastly greater magnitude than this, by diamond drilling, in various districts.

We are enclosing prints showing a cross section along the line of the proposed north drifting, with possible drill hole locations.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

Enclosures

APPROVED:

Robert W. Gechen

Member, Bureau of Mines

Thor H. Kilsgaard

Member, Geological Survey

No paragraph There appear to be many locations where drilling could be done and where results would be significant. Will you please advise the Applicant that if it chooses to submit a revised proposal, along the lines indicated, we shall be glad to give consideration to such a request. Otherwise, the application must be denied.

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

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Reviewed by
DMEA OPERATING COMMITTEE

5-18-56
(date)

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Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

Enclosures

APPROVED:

/s/ Robert W. Geehan

Member, Bureau of Mines

Thor H. Kiilsgaard

Member, Geological Survey

WRGriswold/er 5/16/56

Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

File Copy
Surname
Linwood
Selfridge.

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

Mr. Spangler Rieker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Rieker:

Referring to the cited application, we are enclosing copies of our letter of denial to the Applicant.

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Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (SHB)

Enclosures

APPROVED:

/s/ Robert W. Geehan (SHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (SHB)
Member, Geological Survey

WRGriswold/er 5/16/56

Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

File Copy
Surname

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

May 16, 1956

Memorandum

To: The Administrator

From: Chief, Base Metals Division

Subject: Denial of Application, Docket No. DMEA-4096, Combined Metals Reduction Co., Pan American Mine, Lincoln County, Nevada, Lead-Zinc.

The cited application deals with the Pan American mine, located some 7 miles from Pioche. Obviously, with Pioche reserves a low ebb, this company would like to obtain another ore supply. They state that in the present mine levels they already have available 1,386,000 tons of sulfide ore with a grade of 1.74 oz. Ag, 1.25 % Pb., and 2.5% Zn. This ore would not be included in the proposed contract.

The lowest section of the 12 degree inclined shaft went out of ore but two Bureau of Mines drill holes (1800 feet apart) indicated another ore horizon, lower down. These two holes averaged; width 13½ feet, 2.47 oz. Ag., 1.15% Pb. and 2.3% Zn. A third Bureau of Mines hole also showed similar material but a cluster of three other holes drilled around it were barren, hence little value can be given to this No. 3 hole. The ore minerals are present in a finely crystalline, inter-grown ground mass and require very fine grinding. Recoveries are very poor, about the best that can be hoped for is 75% for lead, 73% for zinc and 60% for silver.

There is little hope than an economic operation could be based upon this material, however the Applicant presents a theoretical calculation as follows:

Mill head value per ton	$5.08

(This figure is okay, as checked both by Mr. Bishop and myself)

Mining Cost	$1.125
Milling	1.58½
Hauling	.60
Other	.20
	$3.51

As contrasted to the proposed combined mining and milling cost of $2.71, Mr. Bishop cites various district costs, as follows:

Year 1952

Southeast Missouri	$3.94 per ton
Washington (Metaline Falls)	5.19
Tri State	3.00
Northern Illinois and Wisconsin	3.56
Nevada	13.52

In view of the fine grind required in milling this ore, and the relatively adverse conditions involved, as contrasted to more favorable conditions in other districts, we see little expectancy that such material could be mined and treated at less than mill-head value. Actually it would probably require shrewd operation to achieve a break-even basis, at present markets.

However, all reviewers are in accord that we might logically participate in a reasonable amount of exploratory effort. In referring the project to the Field both commodity members, and this office, cited the apparent need for additional diamond drilling. But the Applicant, for certain reasons, is desirous of getting the mine into shape for production and the Field recommends a program of 1000 feet of shaft sinking, 2,300 feet of drifting, and 950 feet of raising, in two stages. Total cost $271,200.00

Actually the project is almost an ideal one for diamond drilling and the Applicants objections are trivial.

It states that holes would be over 1,500 feet in depth and the terrain is difficult. I have transposed the proposed deep level drift onto the company's topographic map and taken off a cross section along the line of the proposed drift, until it runs off the map. It will be noted that five drill holes, plus hole USBM No. 1 (on about 250 feet spacing) would thoroughly explore the identical area as the proposed drifting for a length of 1,300 feet at a fraction of the expense. The deepest drill hole would only be about 1,360 feet, whereas in Tennessee it is routine to go to 1,800 - 2,000 feet. Furthermore the cross section does not indicate severe conditions of terrain.

The Applicant requests a unit cost contract of $121.00 per foot for the incline and $46.00 per foot for drifting and raising. Probably at such figures the Government's contribution would go a long way toward defraying the entire cost of the work.

It is quite out of the question to endorse the project, in the present form. In the first place it is unsound from an engineering stand point; merely because 2 holes, 1,800 feet apart, showed mineralized material, is not sufficient reason to go off "half-cocked" and embark on a large and expensive program of shaft sinking and drifting. It would be far more prudent to first drill a few more holes. And as far as the company's objections of hole depth and difficult terrain, one is forced to wonder how the Bureau of Mines were able to drill their holes.

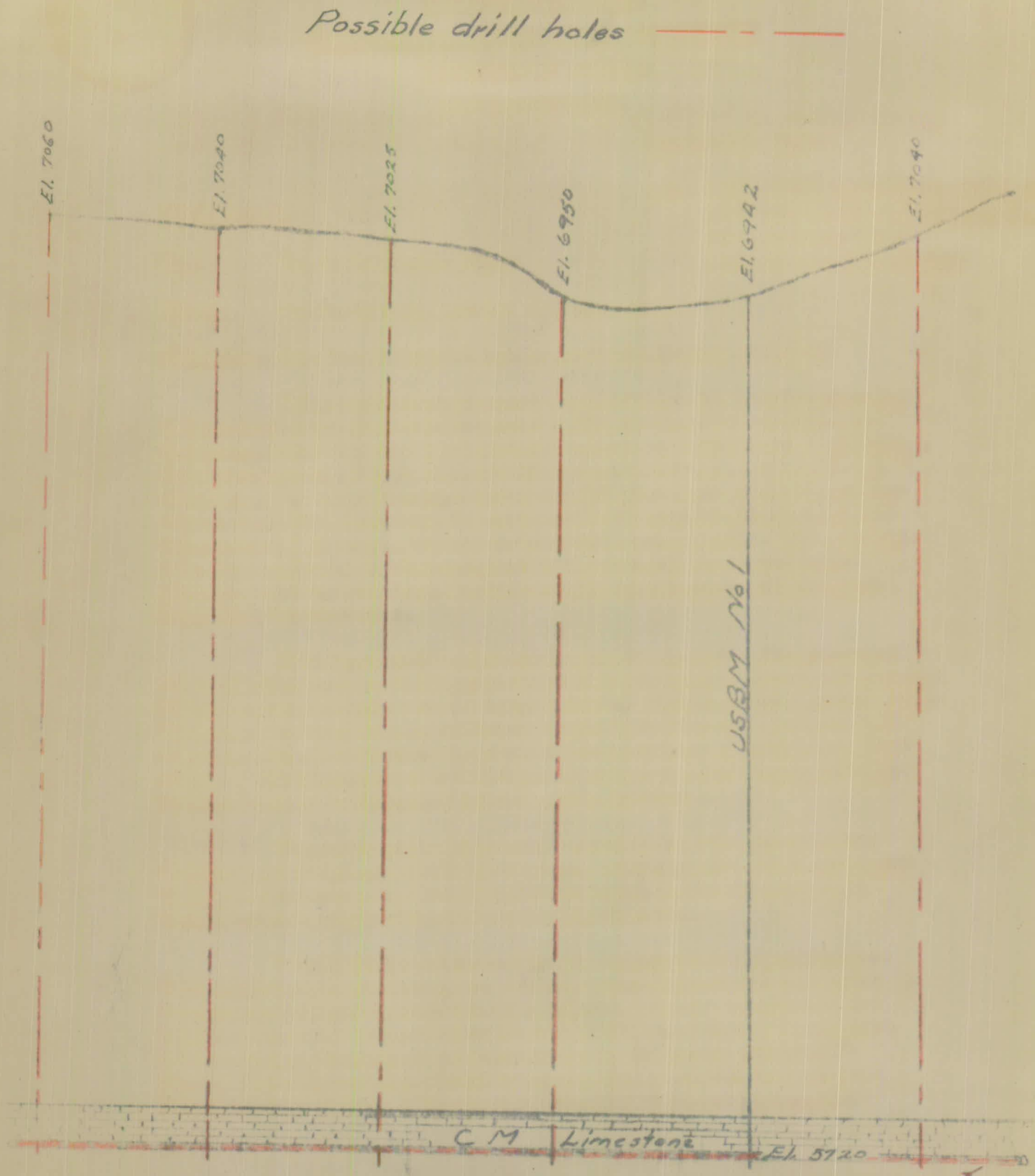
Low grade manganese material is present in the ores but in mode of occurrence (mangano-siderite) it has no known value.

W. R. Griswold

W. R. Griswold

WRG/er

Copy to: ✓Docket
Base Metals
Chron.



CMEA 4096
Combined Metals Reduction Co.
Section in plane of proposed North Drift
scale 1" = 200'

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

RECEIVED
APR 30 1956

April 26, 1956

Re: DMEA-4096; Lead-Zinc, $312,220
Combined Metals Reduction Co.,
Pan American Mine
Lincoln County, Nevada

Memorandum

To: W. R. Griswold, DMEA

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

Subject: Review of field team report dated April 3, 1956

The applicant proposes exploration at the Pan American mine which is estimated to have 1,386,000 tons of sulfide ore (between the 600 and 2300 levels) assaying 1.25% lead, 2.5% zinc, 9.3% manganese, 1.94 ozs. of silver and 0.005 oz. of gold. In addition to this tonnage there are 528,000 tons of oxidized ore above the 600 level which contains 1.4% lead, 1.7% zinc, 11.0% manganese, 1.5 ozs. of silver and 0.01 oz. of gold. The sulfide ore is marginal or submarginal with present costs and metal prices and the oxidized ore is worth less because of the very low mill recoveries.

The proposed exploration is to increase the reserves of sulfide ore to the degree that a large scale, lower cost mining and milling venture would be justified. Three widely spaced holes drilled by the Bureau of Mines in 1947 in the area proposed for exploration, indicated 14 feet of ore analyzing 1.6% lead, 3.3% zinc, 8.7% manganese and 2.6 ozs. of silver, which suggests the possibility of slightly higher grade reserves.

The proposed exploration consists of deepening the existing inclined shaft 1,000 feet, drifting 500 feet south and 2,550 feet north on the 3,300 foot levels, and crosscutting and/or raising 900 feet from the 3,300 level.

The field examiners with the applicant's assistance revised the application to a three stage exploration program costing $271,000 rather than $312,000. Stage I provides for 1,000 feet of 2-cmpt. shaft costing $121 per foot; 1,000 feet of drifting northerly on the ore horizon toward Drill Hole No. 1 @ $46.00 a foot; drifting southerly on the ore horizon 100 feet @ $46.00 a foot; and 200 feet of slusher crosscuts

from the North drift and 100 feet of raises from the slusher crosscuts both at $46.00 a foot for a Stage I total of $185,750.

Work on Stage II is contingent upon the joint Government-Company evaluation of the results in Stage I, and is to consist of a 1,200 foot extension of the North drift along the ore horizon with 500 feet of slusher crosscuts and 150 feet of raises from them (crosscuts and raise locations to be subject to prior approval by the Government). All Stage II work is estimated at $46.00 a foot or a total of $85,450, and the total for both stages is $271,000.

The field team states that the ore grade of the previously developed sulfide ore body has a gross value of $12.49 a ton at present market prices, and that with 70 percent recovery of lead and zinc and 60 percent recovery of the silver the net value would be $8.47. The field team further states that the applicant figures with a head value of $5.08 he will have an operating profit of $1.57 per ton of ore with mining costs of $1.125 per ton, hauling costs of $0.60 per ton, milling costs of $1.581 per ton and other costs of $0.20 per ton which total but $3.51.

In checking the worth of the known sulfide orebody with the range of expected recoveries I calculate the concentrates delivered to the Great Falls and Tooele smelters would yield approximately $5.00 gross revenue per ton of ore mined and milled. Direct costs of mining and milling lead and zinc ores in 1952 averaged $3.94 per ton in Southeast Missouri, $3.00 in the Tri-State area, $3.56 in Northern Illinois and Wisconsin, $13.52 in Nevada and $5.19 in Washington according to Tariff Commission studies. Unless mining and milling costs at the Pan American mine can be reduced to a level approximating those of the Mississippi Valley or the Tri-State it seems doubtful that a profitable operation can be based on the grade of ore presently developed.

In conclusion the field team recommends that the Government participate in the project to the extent of 50 percent, writing a contract on unit costs. I believe the exploration is warranted and recommend it, in the belief that although the ore may not be presently commercial it will become so in the not too distant future, that the ore grade may improve, and the manganese offers some potential revenue.

O. M. Bishop

O. M. Bishop

Copy to: Div. of Minerals
Branch of Base Metals (2)
Mr. Kiilsgaard, Room 5222 - Mr. Geehan, Room 3608
Files

IN REPLY REFER TO:

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

RECEIVED
APR 11 1956
Griswold

April 10, 1956

Re: DMEA 4096
Combined Metals Reduction Co.
Pan American Mine
Lincoln Co., Nevada
Estimated $312,220.00) Lead-
Recommended $271,000.00) Zinc

Memorandum

To: W. R. Griswold, Defense Mineral Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of Field Team report

The applicant now requests assistance in partially proving and developing for mining two possible blocks of ore. To each block the examiners ascribe about 1,500,000 tons of inferred ore. The inference is based on the results obtained by one diamond drill hole in each block (U. S. Bur. Mines holes No. 1 and No. 2). U. S. Bureau of Mines hole No. 3 cut ore of better grade than that cut by Nos. 1 and 2, but "...three offset holes drilled from 100 to 200 feet away on the east, south, and west sides did not cut mineralized material at the ore horizon". (P. 13, Field Report.) The propriety of the inference is questioned.

The work outlined and recommended by the examiners and the Field Team consists of:

Stage I	
Extend shaft 1,000 feet @$121.00 per ft.	$121,000.00
Drift north to No. Drill Holes 1,000 ft @ $46.00 a ft.	46,000.00
Drift south 100 ft. @ $46.00	4,600.00
Slusher crosscuts 200 ft. @ $46.00	9,200.00
Raises 100 ft @ $46.00	4,600.00
Analyses 100 @ $3.50	350.00
Total	$185,750.00
Stage II	
Extend north drift of Stage I, 1,200 ft. @ $46.00 ft.	55,200.00
Slusher crosscuts 500 ft @ $46.00	23,000.00
Raises 150 ft. @ $46.00	6,900.00
Analyses 100 @ $3.50	350.00
Total	$85,450.00

Resume

Stage I	$185,750.00
Stage II	85,450.00
Total	$271,200.00
Government participation	$135,600.00

The applicant estimates that the upper mine contains 1,386,000 tons of ore assaying:

Lead %	Zinc %	Manganese %	Silver Oz.	Gold Oz.
1.25	2.50	9.3	1.94	0.005

Details concerning the estimates are not given. No subordination would be made of this ore, to which at present market prices the examiners ascribe a gross value of $12.49 per ton and a recoverable value of $8.47 per ton. Prices used are not given. The operator, to be conservative, assigns a recoverable value of $5.08 to the ore inferred for the blocks ascribed to the Bureau of Mines holes Nos. 1 and 2, and estimates costs at $3.51 per ton. Assuming the estimates are correct the advance would be liquidated by the mining and treatment of 773,000 tons if the inferred ore is found as expected. If the mine area about 4,000 feet of work indicates 1,386,000 tons of ore, therefore 4,250 feet of project work may indicate the 773,000 tons.

The application would be better supported if the applicant was now cashing in on the indicated mine ore at the prevailing metal prices; however, I consider the staged work program recommended by the examiners and Field Team warranted.

I concur with the recommendation of the examiners and the Field Team.

N. E. Nelson

N. E. Nelson

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

RECEIVED
APR 5 - 1956

1605 Evans Avenue
Reno, Nevada

April 3, 1956

Memorandum

To: Operating Committee, DMEA, Interior Building, Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Reference is made to your letter of January 6, 1956 relative to field examination of subject mine.

Attached are four copies of a report by H. K. Stager, Geological Survey and G. G. Gentry, Bureau of Mines, in which a project at a total cost of $271,200 is recommended. The Government participation would be $135,600.

We realize that most of the contracts with this company have been unproductive but think that the area included in our proposed exploration has merit and meets the requirements of the DMEA program. Therefore, Roscoe Smith and I concur in the recommendations and reasoning as set forth in the report.

S. Ricker

S. Ricker

Attach.

Reviewed by
DMEA OPERATING COMMITTEE
4-9-56
(date)

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ON-SITE Report

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION II

APPLICATION REPORT

DMEA 4096 (lead-zinc)
Combined Metals Reduction Company
Pan American mine
Lincoln County, Nevada

by

G. G. Gentry
Mining Engineer
U. S. Bureau of Mines

H. K. Stager
Geologist
U. S. Geological Survey

March 30, 1956

Reviewed by
DMEA OPERATING COMMITTEE
4-9-56
(date)

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ILLUSTRATIONS

Figure 1 . . . . . .Road map of Pioche district, Lincoln County, Nevada.

" 4 .....Cross section, Diamond Drill Hole No. 1

" 7 ..... " " " " " " 2

" 8 ..... " " " " " " 3

Claim map "A1684"

Assay map "D-1166"

Geologic map "D-1060"

(continued on next page)

Structure contour map "C-1076"

Longitudinal section "C-1082"

EXHIBITS

Operator's estimated cost per foot of drift or crosscut.

" " " " " " shaft.

INTRODUCTION

On December 8, 1955 the Combined Metals Reduction Company, 218 Felt Building (P. O. Box 150), Salt Lake City, Utah, acting through their vice president, Mr. W. H. Kellsey, applied for Government assistance in a $312,220.00 program under the Defense Minerals Exploration Administration, docket DMEA-4096, to explore for lead and zinc at the Pan American mine in Lincoln County, Nevada.

The applicant estimates that the mine contains 1,386,000 tons of ore, assaying 1.25 percent lead, 2.50 percent zinc, 9.3 percent manganese, 1.94 ounces of silver per ton, and 0.005 ounce of gold per ton. The applicant wishes to explore geologically favorable structures east of the mine to determine if a total ore reserve of about 3,000,000 tons can be assured to justify the investment necessary to install the mining equipment and develop the mining methods needed to handle a large tonnage of low-grade ore at a low cost.

A field examination was requested by the Operating Committee and was made by H. K. Stager, U. S. Geological Survey, and G. G. Gentry, U. S. Bureau of Mines, February 2 through February 7, 1956, accompanied by Messrs. Paul Gemmill, R. G. Lee, E. O. Schrader, and Loyal Phillips, representing the applicant.

Inasmuch as the mine workings are flooded below the 1500-level and the company geologists and engineers have mapped and sampled the underground workings in detail, no attempt was made to remap the mine and only 37 samples were taken to check the accuracy of the assay map. The maps were studied and were compared with geologic exposures on the surface and in underground workings.

The U. S. Bureau of Mines drilled three widely spaced diamond drill holes on the property in 1947 (R.I. 4541, September 1949) and the results of this work form the major justification for the proposed exploration program.

CONCLUSIONS AND RECOMMENDATIONS

The Pan American mine contains a large, low grade lead-zinc deposit. The results of this examination and of past exploration indicate that other ore bodies, similar to the one that has been developed, will be found both down dip and along the strike of the C.M. limestone beds.

The applicant proposed to explore for ore bodies northeast of the mine by deepening the inclined shaft 1,000 feet, drifting 500 feet south and 2,500 feet north on the 3300-level, and raising and/or crosscutting 900 feet on the 3300-level. Following the examination the proposal was discussed and some

revisions in the proposed work were considered desirable. The revised program is well suited to explore the deposit and the applicant is well qualified to do the work. The project site is readily accessible and facilities for accomplishing the work are available. The program will require 19 months to complete and the Government's share of the estimated total cost of $271,200 would be $135,600.

From geologic evidence, substantiated by three diamond drill holes, it is probable that a significant tonnage of low grade lead-zinc ore containing some silver will be discovered, and that the grade will be comparable to the ore presently exposed in the Pan American mine workings.

It is therefore recommended that the Government enter into a DMEA contract with the Combined Metals Reduction Company to provide fifty percent of the costs of the exploration program. To facilitate administration of the contract it is recommended that all work be based on unit costs, and that the operator be required to prepare adequate mine maps and reports and also conduct the necessary sampling during the project.

LOCATION, ACCESSIBILITY, AND LOCAL FACILITIES

The Pan American mine is in T. 1 S., R. 66 E., in the Comet mining district, Lincoln County, Nevada, and is 16 miles west by road from the applicant's concentrating mill, known as the Caselton Plant. To reach the mine from Pioche, Nevada, proceed in a northerly direction 3.2 miles via U. S. Highway 93, an all-weather road, thence turn left (west) and travel via Alternate U. S. Highway 93, an all-weather road, for 3.5 miles, thence turn right (west) 13.3 miles via a secondary graded-gravelled Nevada state road. The total distance from Pioche to the mine is 20 miles and the travel usually requires approximately 45 minutes.

All of the roads are maintained by the Nevada State Highway Department and the 13.3 miles of mine access secondary road is expected to be oiled whenever production of ore is begun from the Pan American mine.

A branch line of the Union Pacific Railroad serves the Caselton Plant of the Combined Metals Reduction Company and telephone services may be obtained at the same location. Mail services and truck transportation services may be obtained in the town of Pioche.

The climate is semi-arid and while occasional heavy snow storms may be expected during the winter months year-round operations should be possible.

Experienced mine labor, mine supplies, and necessary mine equipment will be furnished by the applicant who maintains adequate warehouses and repair shops at the Caselton Plant. Sufficient electric power is delivered to the mine via a 22,000-volt transmission line of the Lincoln Power District No. 1. A substation near the mine reduces this voltage to 2,300 volts - 440 volts. The cost of electric power is reported as amounting to between 6 and 7 mills per kilowatt-hour.

Water for mining purposes may be obtained from the mine itself as the inflow is estimated to be approximately 50 gmp. Water for domestic use may be obtained from springs adjacent to the mine or transported by tank truck from the applicant's Caselton mine camp.

HISTORY AND PRODUCTION

Outcrops adjacent to the Pan American inclined shaft and also to the Schodde workings, near diamond drill hole No. 2, were probably discovered in the 1880's and production of lead-zinc-silver ores carrying small amounts of gold came from shallow workings. The Schodde or Lynden mine is credited with a production of $125,000.00 from silver-lead ores. During 1927 attention was again attracted to this area because of its similarity to the Pioche district.

The Comet mine, approximately one mile north of the Pan American mine, was located in 1882 and produced small shipments of lead-zinc ores during 1913-1920. Exploration is presently being conducted on the Comet vein on the 465 level under DMEA contract Idm-E295, docket DMEA-2309.

The Pan American inclined shaft was started in the early 1930's and, after reaching a depth of 2,300 feet, was closed down due to the financial depression. During the period 1947-1952, about 11,000 tons of ore was mined and milled. Records indicate the probable average grade was about 1.28 percent lead, 2.47 percent zinc, and 0.98 ounce silver. Mill tests showed recoveries of 67.6 percent to 77.4 percent lead, 69.3 percent to 76.6 percent zinc, and about 60 percent silver.

In September 1955, 6.066 tons of ore was mined and milled as a test run. This ore was produced from slusher drifts and raises and the weighted average grade was 1.19 percent lead, 2.56 percent zinc, 717 percent manganese, 0.98 ounce silver, and 0.004 ounce gold.

DEVELOPMENT

The mine, west of the Schodde fault, has been developed by a shaft inclined at 12 degrees and extending to a depth of 2,300 feet. From this shaft four levels totaling 2,675 feet have

been driven north and south, and from the levels and slusher drifts 230 feet of raising, together with considerable long hole drilling, has been completed. Subsurface exploration totals about 5,205 feet, excluding drilling. Levels off the shaft are the 800, 1200, 1500, and 2000.

PROPERTY AND OWNERSHIP

The mining claims are owned by the Comet Coalition Mines Company, a Nevada corporation.

Unpatented claims

Name	Location date	Recording date	Book	Page
Mt. Comet No. 5	1/19/19	4/15/19	F-1	389
Central	7/1/26	9/21/26	H-1	107
Central No. 1	7/1/26	9/21/26	H-1	107
Central No. 2	7/1/26	9/21/26	H-1	107
Albert	7/1/25	5/9/27	H-1	185
Boardinghouse	7/1/25	5/9/27	H-1	185
Spearhead	3/1/28	3/17/28	H-1	278
Jennie	8/1/14	10/27/14	E-1	415
Curtis	3/4/29	6/3/29	H-1	484
Great Western No. 2	10/22/28	2/11/29	H-1	390
Lindberg	3/4/29	6/3/29	H-1	484

Patented claims

Mt. Comet No. 6

Mt. Comet No. 1

Additional unpatented claims considered by the examiners as necessary and desirable for the exploration project are:

Calico	Hanna
Calico No. 1	Argentum
Calico No. 2	Argentum No. 1
Harwood	Great Western No. 3
Christianson	Great Western No. 4

The recording data for these claims was not available at the time of the examination but will be furnished by the applicant.

On January 10, 1947 the owners entered into an agreement and lease on the mining claims with the Combined Metals Reduction Company as lessee and International Smelting and Refining Company, for a period of five years expiring December 1, 1951 unless renewed and extended, or unless sooner terminated as provided.

On September 28, 1951 a supplemental agreement and lease between the Comet Coalition Mines Company and Combined Metals Reduction Company and International Smelting and Refining Company was executed extending the lease and agreement to

January 10, 1957, with provisions for further extensions. Copies of the agreement and lease, and supplemental agreement and lease, are attached to the application. Also attached to the application is a copy of the Consent to Lien signed by Mr. J. J. Lillie, president, Comet Coalition Mines Company, and Mr. Rom Warburton, secretary of the company.

GENERAL GEOLOGY

The rocks in the mine area are limestones, dolomites, shales, and quartzite of Lower and Middle Cambrian age. These rocks are gently tilted and are cut by lamprophyre dikes and several sets of faults. The lead-zinc deposits are in the lowermost limestone beds.

The geology and ore deposits of the Pioche district have been studied and mapped in detail by Westgate and Knopf[1].

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[1] Westgate, Lewis G., and Knopf, Adolph, 1932: Geology and Ore Deposits of the Pioche District, Nevada; U. S. Geol. Survey Prof. Paper 171.

Much of the following brief description has been taken from their report.

The sedimentary rocks have been subdivided into five formations. Listed in order of youngest to oldest they are:

Formation	Thickness (in feet)	Age
Highland Peak	2,500	Middle Cambrian
Chisholm shale	150	Middle Cambrian
Lyndon limestone	400	Middle Cambrian
Pioche shale	1,000	Lower Cambrian
Prospect Mountain quartzite	+ 1,500	Lower Cambrian

The Prospect Mountain quartzite is a light- to dark-red, vitreous, fine- to medium-grained, thin- to thick-bedded rock. The base is not exposed in the district and the thickness is not known. It grades into the overlying Pioche shale by interbedding of shaly quartzite and quartzitic shale. The Pioche shale consists of arenaceous and argillaceous? shaly beds interbedded with thin beds of limestone. It is yellow or brown and in places is so micaceous as to approach a schist in appearance. There are four shale members known as the Pioche A, B, C, and D shales. The interbedded limestones range from thin layers a few inches thick to aggregate beds as much as 70 feet thick. They are gray to olive-brown, laminated, nodular, locally fossiliferous, and commonly carbonaceous. The two lowermost limestone layers, known as the C.M. (or Combined Metals) limestone and the Susan Duster limestone, are commonly replaced by sulfide minerals and are the most productive ore zones in the district. The Pioche shale is overlain by the Lyndon limestone. The lower half of the Lyndon is a fine-grained, dark-gray, thick-bedded limestone known locally as the Blue Prince limestone. The upper half is a light-gray, coarsely crystalline

rock known locally as the White Prince limestone. Overlying the Lyndon limestone is the Chisholm shale. It is a yellow- or red-brown, laminated, argillaceous, abundantly fossiliferous shale. Overlying the Chisholm shale is the Highland Peak limestone, a light- to dark-gray, fine- to medium-coarse-grained recrystallized rock. It is thin- to thick-bedded and some of the more crystalline beds are dolomitic. It is locally divided into about 20 members or units. Only the four lowermost members, the Davidson Blue limestone, the Davidson dolomite, the Davidson Black limestone, and the False Prince B limestone are exposed in the mine area.

Locally the sedimentary rocks are cut by dikes, as much as 40 feet thick, of biotite-augite lamprophyre. They consist of blackish, even-grained microgranular rocks made up largely of augite and biotite. They are commonly highly altered.

The sedimentary rocks strike north and dip about 12 degrees east into the Highland Range. They are cut by three sets of steeply dipping normal faults, a N 75° E set, a N 65° W set, and a N 15° W set. Displacement on these faults ranges from several feet to as much as 170 feet.

ORE DEPOSITS

At the Pan American mine a large sulfide replacement type ore deposit has been partially developed. It contains two

or more ore bodies, one near the surface which is developed and one at greater depth which is to be explored, locallized in the lowermost limestone bed (C.M. bed), beneath the relatively impervious "C" shale member of the Pioche shale.

The ore minerals are sphalerite and argentiferous galena. These minerals are intimately intergrown and require grinding to minus 200 mesh in order to obtain clean separations by selective flotation. The ore also contains 0.005 ounce of gold per ton and 9.3 percent manganese. Gangue minerals are pyrite and calcite.

Oxidation is nearly complete to about 250 feet below the surface, or down to the 600-level of the inclined shaft. The lead, gold, and manganese content is slightly higher in the oxidized material and the zinc and silver content is slightly lower. All of the proposed exploration will be below the zone of oxidation.

From the surface to the 2300-level the ore body that has been developed is about 2,200 feet long down a dip of 12 degrees, is from 200 to 600 feet wide, ranges in thickness from about 8 feet to 50 feet, and averages 20 feet. The grade is fairly uniform over the entire body and averages about 2.5 percent zinc, 1.3 percent lead, 10 percent manganese,

1.7 ounces of silver and 0.005 ounce of gold per ton. The body was apparently formed through replacement of the C.M. limestone beds by metal-bearing solutions that worked outward from northeast-trending fissures (maps C-1060 and C-1076). A strong fissure of this type cuts the C.M. beds southeast of the shaft and is exposed throughout the Pioche shale at the surface where it yielded a small high-grade lead and silver ore body.

The grade of the ore body decreases sharply about 50 feet above the bottom of the inclined shaft, indicative of the edge of the body or that the line of the shaft is away from the trend of the body. A diamond drill hole put down by the Bureau of Mines is about 1,000 feet northeast of the bottom of the shaft and on the opposite and downthrown side of the Schodde fault, a north-trending normal fault, cut 12 feet of ore in the bottom C.M. limestone beds. A second hole about 2,000 feet north of the first hole also cut 12 feet of ore in the C.M. beds. A third hole on the west side of the Schodde fault cut 15 feet of ore in the C.M. beds but three offset holes drilled from 100 to 200 feet away on the east, south, and west sides did not cut mineralized material at the ore horizon.

Holes 1 and 2 represent either a single large body of ore similar in size and grade to the known body or two separate bodies. The proposed program is planned to explore the C.M. beds east of the Schodde fault and to determine the size and

grade of the ore body, or bodies, cut by holes 1 and 2. Further exploration in the vicinity of hole 3 is not planned until after the completion of the DMEA project.

SAMPLING

The Pan American mine, west of the Schodde fault, has been extensively sampled by both the Combined Metals Reduction Company and the International Smelting and Refining Company, and a considerable tonnage of ore mined and milled. For these reasons the examiners cut only 37 samples from various locations in the mine for comparison purposes and two samples from surface exposures. The results of these samples are as follows:

Sample No.	Width, feet	Location, shown on Assay Map "D-1166"	Pb.	Zn.	Ag.
			(percent)		
1875	7.5	Shaft	0.1	0.5	0.10
1876	4.0	"	0.3	1.2	0.20
1877	4.8	"	0.6	1.1	0.40
1878	4.8	"	1.0	1.7	0.60
1879	8.0	800 level	1.6	1.9	1.60
1880	7.0	" "	1.4	1.8	0.90
1881	6.0	" "	0.7	1.0	0.90
1882	7.5	" "	0.6	0.6	0.50
1883	8.0	" "	0.7	1.2	0.60
1884	3.5	" "	2.1	7.2	17.40
1885	5.0	" "	0.4	2.0	1.10
1886	5.0	" "	0.4	2.5	4.00
1887	4.5	" "	5.1	4.2	3.80

Sample No.	Width, feet	Location, shown on Assay Map "D-1166"	Pb.	Zn.	Ag.
			(percent)		
1888	4.0	800 level	1.6	3.0	1.90
1889	6.3	Shaft	3.5	1.8	2.40
1890	4.0	1200 level	1.0	2.5	1.00
1891	3.3	" "	1.1	2.2	1.30
1892	6.4	" "	0.9	2.5	1.20
1893	2.5	" "	2.0	2.9	2.60
1894	5.0	" "	1.2	2.7	1.40
1895	5.0	" "	1.8	2.0	1.50
1896	4.3	" "	*0.1	0.3	0.20
1897	2.8	" "	0.8	2.1	1.60
1898	4.0	Shaft	2.1	3.2	3.00
1899	6.0	"	0.7	1.5	5.30
1900	3.4	1500 level	1.7	3.2	1.40
1901	2.0	" "	0.7	2.1	1.10
1902	4.2	" "	2.2	3.2	2.60
1903	6.3	" "	1.5	2.4	1.00
1904	1.7	" "	1.7	2.9	2.70
1905	5.0	" "	1.1	2.3	1.90
1906	4.8	" "	1.2	2.4	1.40
1907	5.0	" "	1.3	2.3	1.50
1908	3.0	" "	1.4	3.4	1.70
1909	5.0	Shaft raise	2.3	3.4	2.70
1910	5.0	Surface	0.8	4.4	0.20

*less than

Sample No.	Width, feet	Location, shown on Assay Map "D-1166"	Pb.	Zn.	Ag.
			(percent)		
1917	3.0	Surface	2.3	1.5	3.40
1918	2.5	1500 level	0.5	2.9	2.20
1919	3.5	" "	0.9	2.4	1.60

	Pb, %	Zn, %	Mn, %	Au, oz/T.	Ag, ozs/T.
Composite sample:	1.3	2.4	8.8	0.005	1.95

Refer to Pan American Assay Map D-1166, attached to this report. The drill logs and assays of Holes Nos. 1, 2, and 3, drilled by the Bureau of Mines, are also attached.

ORE RESERVES

The applicant estimates that the ore reserves at the property, inside the block of ground to be excluded from DMEA royalty payments, total about 1,386,000 tons of measured and indicated ore with an average grade of 2.50 percent zinc, 1.25 percent lead, 9.3 percent manganese, 1.74 ounces of silver per ton, and 0.005 ounce of gold per ton. This ore has been developed by mining and drilling between the 600- and 2300-level. It does not include 528,000 tons of material above the 600-level that contains 1.7 percent zinc, 1.4 percent lead, 11.0 percent manganese, 1.5 ounces of silver per ton, and 0.01 ounce of gold per ton. This material is not considered as ore inasmuch as it is oxidized and cannot be economically treated by the company. A review of the applicant's geologic and assay maps, sections,

metallurgical data, and the results of the 37 check samples taken during the examination reveals that this estimate of reserves is conservative.

The application did not contain an estimate of indicated and inferred reserves east of the Schodde fault, in the ground to be explored by the DMEA project. An estimate contained in a company staff report shown 416,700 tons of indicated reserves and 1,102,800 tons of inferred reserves for this area with an average grade of 2.6 percent zinc, 1.1 percent lead, 9.13 percent manganese, 2.1 ounces of silver, and 0.005 ounce of gold per ton. The applicant also infers the presence of higher grade ore channels in the ore body west of the Schodde fault. This inference is based on the presence of higher grade ore channels in the large replacement deposits at Pioche, 7 miles to the east. Channels of this type have not been found in the area that has been explored at the Pan American mine and the probable presence, or absence, of such channels has not been considered in the estimates of reserves and neither are they considered as targets of the proposed exploration.

The company estimate infers a single north-trending ore body, parallel to the Schodde fault, between holes 1 and 2. This trend is at right angles to that of the known ore bodies in the area. The Schodde fault is not mineralized at the surface and is probably post-ore-deposition in age. It is more probable

that holes 1 and 2 represent two separate northeast-trending ore bodies similar to the body already explored. If such is the case, it can be inferred that each body contains about 1,500,000 tons of ore, or a total of about 3,000,000 tons of inferred reserves for the two bodies. These large low-grade ore bodies are the target of the proposed exploration.

PROPOSED EXPLORATION

The applicant proposed to explore for new ore bodies northeast of the mine by deepening the inclined shaft 1,000 feet on a minus 22 degrees inclination, drifting 500 feet south and 2,550 feet north on the 3300-level, and crosscutting and/or raising 900 feet on the 3300-level. This work is shown on maps C-1060, C-1076, and C-1082.

The diamond drill holes put down by the Bureau of Mines proved the presence of lead-zinc ore of minable thickness and grade in the area to be explored by the proposed project. These holes cut a normal sequence of strata on the east side of the Schodde fault and indicate a displacement on the fault of about 170 feet. Insufficient drilling has been done to determine if these holes are in a single large north-trending ore body or two northeast-trending ore bodies. Although some additional drilling data would be valuable in planning the underground exploration program the applicant is strongly opposed to any additional drilling for the following reasons: (1) the hole

depths would be in excess of 1,500 feet, (2) the area of the drill hole sites is inaccessible because of numerous limestone cliffs, and would require costly access roads, and (3) the underground work would still be required to explore and delineate the deposit. These points are correct and well taken.

After the field examination some revision of the original proposal was considered necessary to protect the best interests of the Government. Inasmuch as the ore body has not been found to extend more than 150 feet south of the inclined shaft on the west side of the Schodde fault, and displacement on the fault would tend to more this limit even further north, the drifting to the south has been reduced from 500 feet to 100 feet. Drifting to the north has been reduced from a total of 2,550 feet to a total of 2,200 feet in two stages, with the second stage of 1,200 feet contingent upon the finding of a minable ore body by the work under Stage I, or further justification based on the results of Stage I. A total of 700 feet of slusher crosscuts to be run up dip in the ore zone, 200 feet under Stage I and 500 feet under Stage II, to explore or delimit the deposit between the drift and the Schodde fault. A total of 250 feet of raises from the drifts or crosscuts to determine the thickness of the ore body. A total of 200 samples is to be allowed, 100 under Stage I and 100 under Stage II, to insure adequate sampling and assaying of the ore zone explored by the project. These revisions are acceptable to the applicant.

EXPLORATION COSTS

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The applicant's proposed exploration and his estimated costs are as follows:

Item	Description of the work	Cost
1	Extend the deeper incline shaft 1,000 feet @ $128.90 per foot.....	$128,900.00
2	Drift north 2,550 feet from near bottom of extended deeper incline shaft @ $46.41 per foot.....	118,345.50
3	Drift south a maximum of 500 feet from near bottom of extended deeper incline shaft @ $46.41 per foot.....	23,205.00
4	Raising and crosscutting to be determined but is not to exceed 900 feet @ $46.41 per foot.....	41,769.00
Total estimated cost:		$312,219.50

The applicant estimates that four months will be required to erect hoist house, headframe and ore bins and to install machinery. Therefore, the additional four months preparation period should be allowed. The operator will furnish all supervision, labor, machinery, supplies, and any other facilities needed, and has estimated the project can be completed in twenty four months, or a total of 28 months. The applicant's representatives stated they have sufficient funds available with which to pay their share of the exploration project.

The drifting and crosscutting costs itemized by the operator have been reviewed and are considered to be reasonable for this project. These costs are comparable to approved costs for the Raymond-Combined Mines Company exploration project, DMEA-2482, Contract Idm-E409, namely $46.00 per foot. The size of the shaft (7 feet by 10 feet) and the equipment to be purchased and installed by the operator are also intended to serve for development and production and are not designed solely for an exploration project where a 6 foot by 9 foot shaft would be sufficient. The cost of drilling, blasting, and removing the additional 16 cubic feet of waste per foot of advance, estimated to be about $8.00, should be borne by the applicant. Therefore, the cost per foot for shaft sinking has been reduced from $128.90 to $121.00.

Stage I

Extend the incline shaft a distance of 1,000 feet @ $121.00/ft. $121,000.00

Size of the extended shaft to be 7 feet by 10 feet in the clear of timber. It is estimated that approximately 60 percent of the shaft will require timber support. The unwatering of the present shaft to be completed by the operator at his expense.

From a point approximately 25 feet above the face of the extended shaft (after providing sufficient sump area) extend a drift in a northerly direction, following the ore horizon toward the

bottom of diamond drill hole No. 1, for a distance of 1,000 feet @ $46.00/ft. ..... $ 46,000.00

From the same shaft station extend a drift in a southerly direction, following the ore horizon, for a distance of 100 feet @ $46.00/ft. 4,600.00

(size of drift: 5 feet by 7 feet in clear of timber)

From the north drift, extend slusher crosscuts up the dip of the bedding, for a total distance of 200 feet @ $46.00/ft. 9,200.00

(size of crosscuts: 5 feet by 7 feet in clear of timber)

From the slusher crosscuts, extend a total of 100 feet of raises to determine the thickness of the mineralized C.M. beds @ $46.00/ft. ... 4,600.00

(size of raises: 5 feet by 7 feet in clear of timber)

The operator to take a maximum of 100 samples and analyze for lead, zinc, and silver @ $3.50 each 350.00

Total estimated cost, Stage I $185,750.00

Stage II

To be contingent upon:

(1) The discovery of a minable lead-zinc ore body in the area of diamond drill hole No. 1, or geologic data that indicate the probability of discovering additional ore bodies.

(2) Prior approval by the Government.

Beginning at the face of the north drift, extended under Stage I, continue the extension of the drift, following the ore horizon in a general northerly direction, for a distance of 1,200 feet @ $46.00/ft. $55,200.00

(size of drift: 5 feet by 7 feet in clear of timber)

From this drift extend slusher crosscuts up the dip of the bedding for a total of 500 feet @ $46.00/ft. 23,000.00

(size of slusher crosscuts: 5 feet by 7 feet in clear of timber)

From the slusher crosscuts extend a total of 150 feet of raises @ $46.00/ft. 6,900.00

(size of raises: 5 feet by 7 feet in clear of timber)

The operator to take a maximum of 100 samples and analyze for lead, zinc, and silver @ $3.50 ea. 350.00

Total estimated cost, Stage II $85,450.00

The slusher crosscuts and raising to be conducted upon the best mineralized exposures and the locations of such work to be subject to prior approval by the Government.

Resume of costs:

Stage I	$185,750.00
Stage II	85,450.00
Total:	$271,200.00

Government participation

at 50 percent: $135,600.00

Period required to complete the contract: 19 months

Independent contracts: None

New buildings, installations, and

rehabilitation: None

The operator will furnish all necessary equipment, labor and supplies, and such other facilities or services, as required.

PRODUCTION PLAN

Ore of the average grade developed by the Pan American upper workings would have a gross value of $12.49 per ton at present market prices of these metals. Assuming the recoverable value of lead and zinc at 70 percent and that of silver at 60 percent, the net value of the ore would be $8.47.

However, in order to be conservative, the operator considers that a block of ore containing 863,860 tons, having a gross value of $4,388,408.00, can be successfully treated at a moderate profit, as follows:

Head Value:		$5.08/ton
Less: Mining costs	@	$1.125/ton
Hauling "	@	0.60/ton
Milling "	@	1.581/ton
Other "	@	0.20/ton
		$3.506/ton (use $3.51/ton)
Net operating profit:		$1.57/ton

The applicant owns and has ready for operation a suitable milling plant and would expect to produce and mill about 1,200 to 1,300 tons of crude ore per 24-hour day. The zinc concentrate would be shipped to the Anaconda Copper Company at Great Falls, Montana, and the lead concentrate to the same company at Tooele, Utah.

In addition to the lead-zinc and silver metals in the ore, the applicant expects to accumulate a large tonnage of manganese, in the form of mangano-siderite, in the mill tailings which will be impounded and may be retreated at some future date.

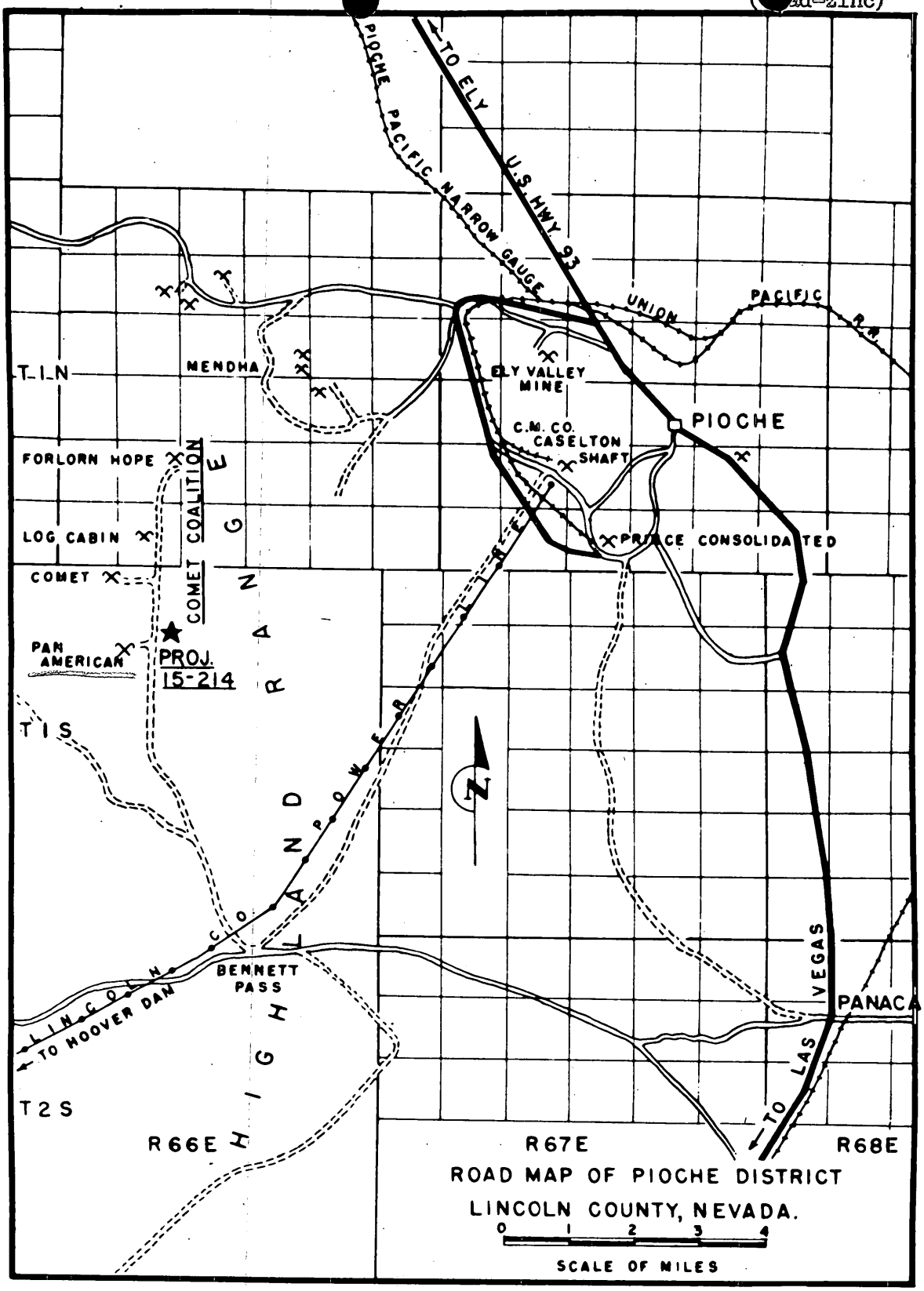
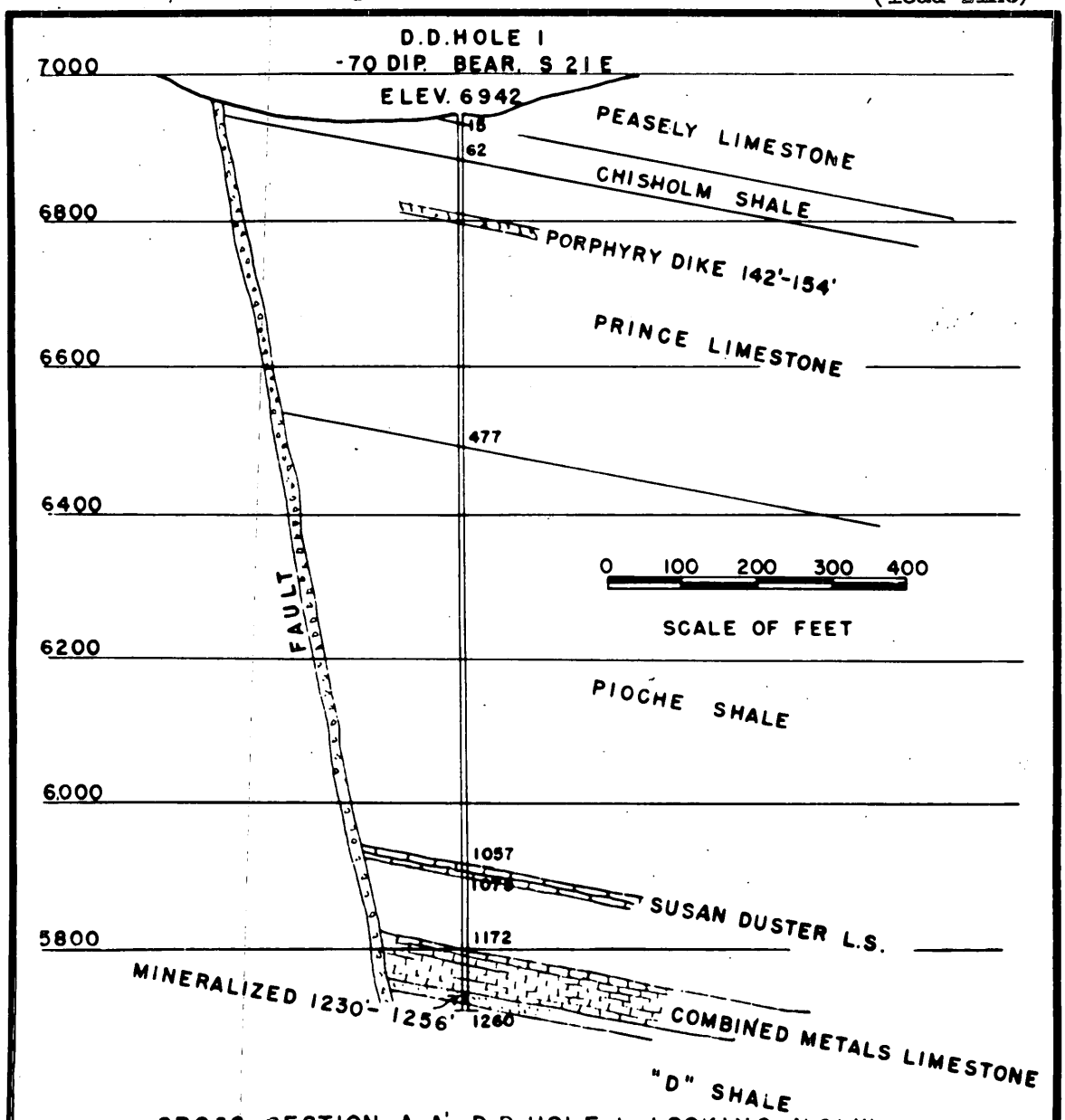


Figure 1. - Road map of Pioche district, Lincoln County, Nev.

RECEIVED
APR 5 - 1956



CROSS-SECTION A-A' D.D.HOLE I LOOKING N 21 W

	AG.(OZ)	PB.(%)	ZN.(%)	MN.(%)
1230				
1233	0.30	0.1	0.1	0.2
1238	2.12	1.4	2.1	7.2
1242	4.19	1.4	3.2	10.2
1245	2.93	1.2	3.2	9.9
1248	2.54	1.1	2.0	5.6
1252	TR.	0.3	0.1	1.6
1256	TR.	0.2	0.1	2.2
1260				

Figure 4. - Cross section A-A' through diamond-drill hole I, looking N. 21 W. (see fig. 3).

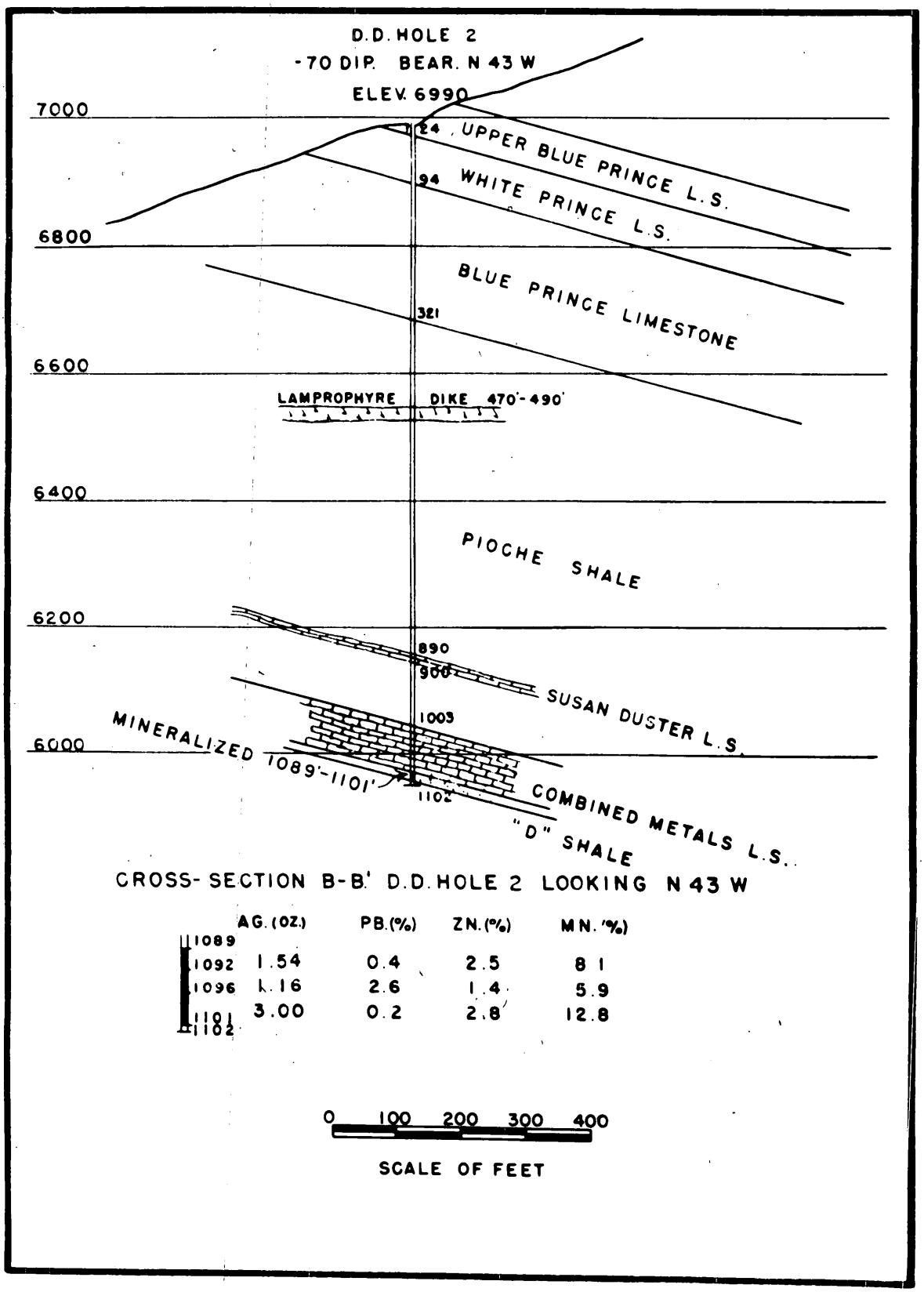


Figure 7. - Cross section B-B' through diamond-drill hole 2, looking N. 43 W. (see fig. 3).

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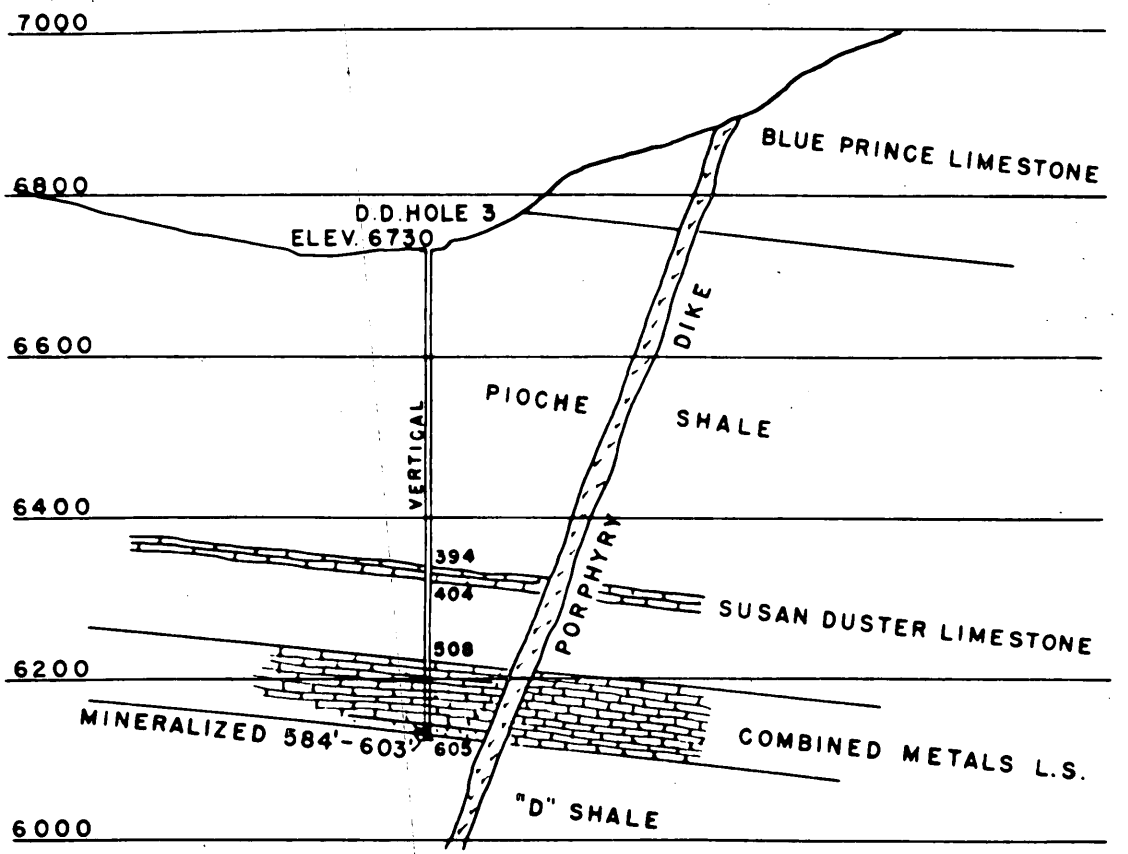
APR 5 - 1956



CROSS-SECTION C-C' D.D.HOLE 3. LOOKING N 61 E

	AG.(OZ)	PB.(%)	ZN.(%)	MN.(%)
584–587	3.85	2.9	7.9	6.8
587–590	1.80	1.8	4.6	7.4
590–594'-6"	2.41	2.7	5.7	11.1
594'-6"–599'-6"	2.86	2.1	2.7	8.5
599'-6"–603	0.30	0.2	0.1	1.3

0 100 200 300 400

SCALE OF FEET

Figure 8. - Cross section C-C' through diamond-drill hole 3, looking N. 61 E. (see fig. 3).

RECEIVED
APR 5 - 1956

NO. A-1684

REFERENCES

COMBINED METALS REDUCTION CO.

PAN AMERICAN

Lincoln County, Nevada

CLAIM MAP

October 15, 1953

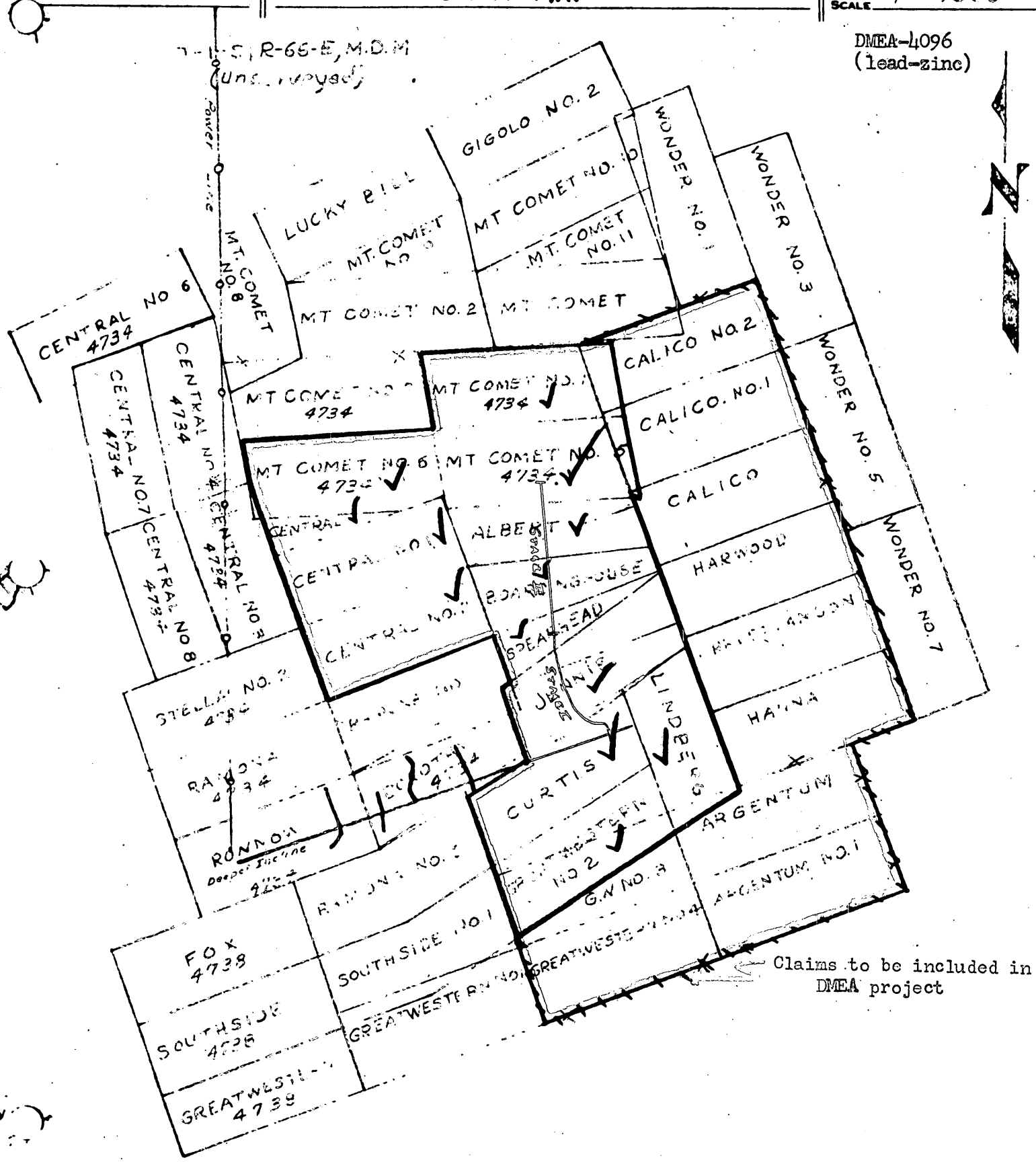
MADE BY Schrader

TRACED BY

CHECKED BY R.G. Lee

SCALE 1" = 1000'

DMEA-4096
(lead-zinc)



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APR 5 - 195-

ESTIMATED COST PER FOOT OF DRIFT ON CROSS-CUT

	Man-hours per foot of drift Z-cut	Timber & Supervision $	Explosives $	Timber $	Rails & Ties $	Air & Water Lines Power Cable $	Ventilation Tubing $	Equip. Rental $	Equip. Repair $	Drill Steel $	Electric Power $	Total Cost $
Drilling & Blasting	2.2	5.21	3.25					0.30	0.60	2.60		12.1
Marking & Trimming	2.8	6.64						0.75	0.75			8.1
Timbering	1.1	2.61		4.75								7.
Hoisting	1.4	3.32						0.20	0.20		0.80	4.
Ventilation	0.2	0.47					0.50	0.15	0.20		0.60	2.
Sumping & Draining	0.3	0 .71						0.25	0.75		1.20	2.
Compressed Air	0.3	0.71						0.30	0.15		1.00	2.1
Power Cable	0.2	0.47				0.40						0.8
Air & Water Lines	0.3	0.71				1.85						2.56
Rail & Ties	0.8	1.90			2.40							4.3
Waste Disposal	0.3	0.71						0.10	0.10			0.91
Supervision	0.6	1.42										1.42
Miscellaneous	0.8	1.90						0.20	0.20			2.30
Total	11.3	$26.78	$3.25	$4.75	$2.40	$2.25	$0.50	$2.45	$2.95	$2.60	$3.60	$ 51.93

Miner cost is figured flat = $10.00 per shift or $2.37 per hour.

Less Timbering 7.

Cost less timbering $ 44.57

Average Cost (20% require timbering) $ 46.41

	Man-hours per foot of Shaft	Mining Labor and Supervision $	Explosives $	Timber $	Rails & Ties $	Air & Water Lines Power Cable $	Ventilation Tubing $	Equip. Rental $	Equip. Repair $	Drill Steel $	Electric Power $	Total Cost $
Drilling & Blasting	5.8	14.50	7.40					1.25	1.50	3.60	6.55	30.15
Mucking	6.8	17.00						1.50	[illegible]			20.00
Timbering	3.7	9.25		13.50					[illegible]			[illegible].75
Hoisting	4.8	12.00						0.90	0.50		1.80	14.[illegible]
Ventilation	0.4	1.00					1.75	0.15	0.20		0.60	3.70
Pumping & Drainage	2.4	6.00						0.60	3.[illegible]		2.25	12.25
Compressed Air	0.8	2.00						1.25	0.50		2.20	5.95
Power & Signal Cables	0.8	2.00				1.00						3.00
Air & Water Lines	0.8	2.00				3.30						5.30
Rails & Ties	1.4	3.50			5.40							8.90
Waste Disposal	0.7	1.75						0.25	0.25			[illegible]
Supervision	1.8	4.50						—				[illegible]
Miscellaneous	1.5	3.75						0.80	0.50			[illegible]
Totals	31.7	$ 79.25	$ 7.40	$13.50	$5.40	$4.30	$1.75	$6.00	$8.35	$5.50	$6.55	$[illegible]

Labor cost is figures at flat $20 per shift or $2.50 per hour.

Less Timbering

Cost less timbers

Average Cost less of [illegible]

RECEIVED
APR 3 - [illegible]

File Copy
Surname

Griswold
Selfridge
Bjornson
Butterworth

500

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

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Ricker:

Referring to the cited application, we are enclosing copies of memorandums dated December 20 and 27, 1955, by N. E. Nelson, USGS, and O. R. Bishop, USBM, respectively. You will note they recommend a field examination.

The argument of the applicant that it is reasonably sure that high grade ore channels exist in the area seems open to question and to be based upon little more than surmise. We have had various projects with this company, both in Nevada and Utah, and all work done to date has been barren of any significant results.

We especially call your attention to the suggestions of the reviewers that perhaps some diamond drilling would be more in order at this time rather than a program of underground work, assuming, of course, that a favorable recommendation should be made.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (SWB)

Enclosures

WRGriswold/bjl (1/4/56)

APPROVED:

/s/ Robert W. Geehan (SWB)
Member, Bureau of Mines

Thor H. Kiilsgaard (SWB)
Member, Geological Survey

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

File Copy
Surname

Griswold
Keelon
Kilsgaard
Selfridge
Johnson

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

JAN 6 1956

Mr. M. J. Kennard, Vice President
Combined Metals Reduction Company
P. O. Box 150
Salt Lake City 10, Utah

Re: Docket No. DMEA-4096 (Lead-Zinc)
Combined Metals Reduction Co.
Pan American Mine
Lincoln County, Nevada

Dear Mr. Kennard:

The application of your company for Government assistance to explore its property has been reviewed by the Base Metals Division of the Defense Minerals Exploration Administration and has been referred for a field examination to:

Mr. Spangler Ricker
Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

The Regional Office will contact you at an early date as to when a field examination is to be made. Any assistance that you may give the members of the Field Team during the examination will be greatly appreciated.

Sincerely yours,

C. O. Mitchell

Administrator

WRGriswold/bjl (1/4/56)

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

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

RECEIVED
DEC 27 1955

December 27, 1955

Re: DMEA-4096 (Pb-Zn; $312,220)
Combined Metals Reduction Co.
Specified Claims
Pan American Mine
Lincoln County, Nevada

Memorandum

To: W. R. Griswold, DMEA

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

Subject: Application dated December 8, 1955 received December 13, 1955

The applicant proposes (1) to extend Deeper Incline shaft by 1,000 feet; (2) to drift 2,550 ft. north and 500 feet south from near bottom of deepened shaft and (3) miscellaneous raising and crosscutting not to exceed 900 feet to explore the downfaulted segment of the Combined Metals limestone bed.

Although there has been no mining in the area to be explored, it is known that the 50-foot Combined Metals bed is at present being overlain by the impervious "C" shale and that beneath the reactive and generally-considered favorable Combined Metals bed, there is a siliceous, easily fractured formation which may well have permitted mineralizing solutions to have reached the Combined Metals' beds. Bureau of Mines D.D.H. #1 drilled through the Combined Metals' beds ---- 19, indicated 15 feet of mineralization in the immediate area of the target which assayed .005 oz. gold and 2.9 oz. silver per ton with 1.3 percent lead, 2.6 percent zinc and 8.2 percent manganese. This drill hole together with exploration in the Pan American Mine on the up-dip side of the Schodde fault which indicates 1,386,000 tons of ore containing 0.005 oz. gold and 1.74 oz. silver per ton with 1.25% lead, 2.5% zinc and 9.3 % manganese, suggests that the area deserves further exploration and development.

I recommend that the application be referred to the field team for appraisal and field examination. Generally speaking the project appears sound, both as to outlined work and costs, but it might be well to consider whether the project does not carry a considerable element of development, and whether the area could not properly be explored by 2 or more relatively low-cost drill holes that would establish the continuity of the ore.

Richard H. Wooten
for O. M. Bishop

Copy to - Division of Minerals
Branch of Base Metals
Mr. Kiilsgaard, Rm. 5222
Mr. Geehan, Rm. 3608
O. M. Bishop,
Files

IN REPLY REFER TO:

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

RECEIVED
DEC 22 1955

Griswold

December 20, 1955

Re: DMEA 4096
Combined Metals Reduction Co.
Pan American Shaft
Lincoln Co., Nevada
$312,220.00 - Lead-Zinc

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of application.

The application concerns the search for possible concentrations of ore grade material, similar to the Pioche channels, in the C. M. beds, this time in the Comet area west of Pioche.

The proposed work program and the estimated costs are:--

(1)	Extend the Deeper Incline, 1000 feet at $128.90/ft.	$128,900.00
(2)	Drift 2,550 feet north from bottom at $46.41/ft.	118,346.00
(3)	Drift 500 feet south from bottom at $46.41/ft.	23,205.00
(4)	Raise and crosscut 900 feet at $46.41/ft.	41,769.00
		$312,220.00

The work in the incline would extend that 2300-foot opening to and beyond the Schodde fault, giving a total length of 3,300 feet.

The south drift would seem to have no specific target other than the prospecting of the C. M. beds.

The north drift, raise and crosscut would "run down" showings in 2 holes drilled from the surface by the U. S. Bureau of Mines. Hole No. 1 penetrated the C. M. bed at a depth of 1,214 feet, about 400 feet north of the bottom of the proposed extension of the incline. Hole No. 2 penetrated the C. M. beds at a depth of 1,050 feet, 2,700 feet north of the bottom of the proposed extension of the incline.

The drill holes show mineralization as:--

Hole No.	Thickness (feet)	Au oz.	Ag oz.	Pb %	Zn %	Mn %
B. of M. 1	12.0	.005	2.8	1.3	2.9	9.1
B. of M. 2	12.0	.005	2.23	0.3	2.4	9.6
B. of M. 3	15.5	.007	2.3	2.4	4.5	8.4
Workings along the Lower incline	8-50	.005	1.7	1.25	2.5	9.3*

* Estimated reserves 1,386,000 tons of this grade.

Hole No. 3 is 2,000 feet north of the incline and on the west side of the Schodde fault.

Four holes, Pan American 2, 3, 7 and 8, also drilled on the west side of the fault, are shown on the map C-1076. No data are given concerning the intersections except that the C. M. beds were penetrated.

The reasons given for expecting higher grade material in the area to be explored are not too acceptable. Two widely-spaced holes on the east side of the fault, B. of M. 1 and 2, show almost the same grade of material as found in extensive workings and one drill hole on the west side of the fault. That the uniformly low-grade mineralization is widespread is indicated, but that the area across the fault is a greener pasture, a better place to look for high-grade channels, is not demonstrated. In fact, there might be more fracturing on the west side than on the east side of the fault since numerous faults are shown.

Perhaps the Field Team can learn from the applicants why they are reasonably sure that unfound high-grade channels exist in the area east of the fault and why such channels are likely to be found by the proposed work. Extensive work west of the fault failed to find such a channel.

At Pioche, diamond drilling is relied upon when prospecting for channels. Would more drilling be of use here?

Referral to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

December 14, 1955
Subject: DMEA-4096
Re: Exploration Assistance
Pan American Mine

Combined Metals Reduction Company
P. O. Box 150
218 Felt Building
Salt Lake City, Utah

Gentlemen:

The receipt of your application dated December 8, 1955, for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-4096 and referred to the Base Metals Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

60932

December 14, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region II

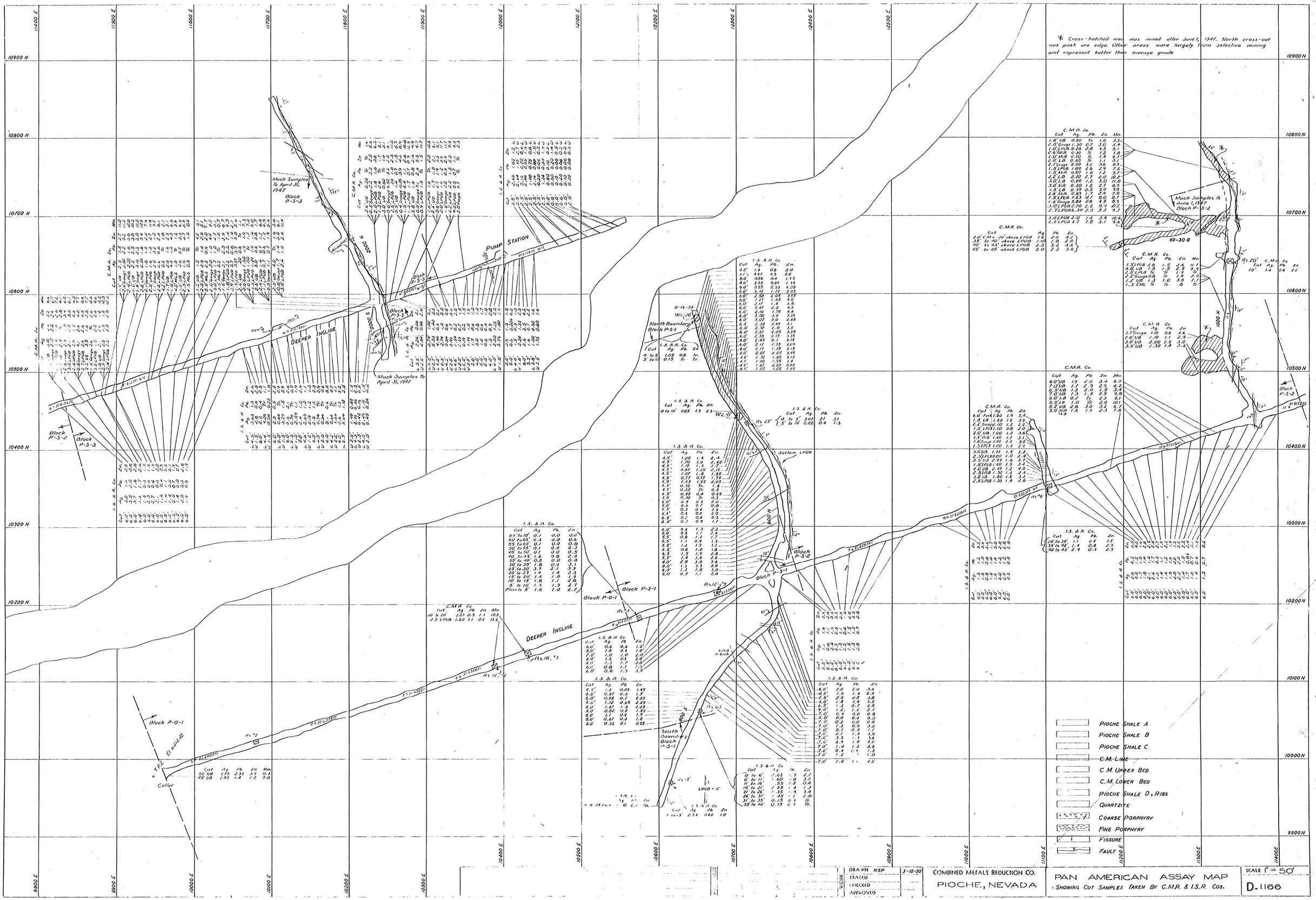
From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

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

DMEA - 4096 Combined Metals Reduction Company

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


* Cross-hatched area was mined after June 1, 1947. North cross-cut was past ore edge. Other areas were largely from selective mining and represent better than average grade
Muck Samples To April 31, 1947
Block P-5-3
PUMP STATION
DEEPER INCLINE
Muck Samples To April 31, 1947
Block P-5-2
Block P-5-3
Muck Samples To June 1, 1947
Block P-5-2
69-30 B
North Boundary Block P-5-1
Bottom LPUB
Block P-3-2
Block P-3-1
Block P-0-1
Block P-5-1
DEEPER INCLINE
Block P-0-1
Collar
South Boundary Block P-5-1
Pioche Shale A
Pioche Shale B
Pioche Shale C
C.M. Line
C.M. Upper Bed
C.M. Lower Bed
Pioche Shale D, Ribs
Quartzite
Coarse Porphyry
Fine Porphyry
Fissure
Fault
DRAWN HSP 3-10-50
TRACED
CHECKED
APPROVED
COMBINED METALS REDUCTION CO.
PIOCHE, NEVADA
PAN AMERICAN ASSAY MAP
SHOWING CUT SAMPLES TAKEN BY C.M.R. & I.S.R. Cos.
SCALE 1" = 50'
D-1166

DMEA-4076
(LEAD-ZINC)

* Cross-hatched area was mined after June 1, 1947. North cross-cut was past ore edge. Other areas were largely from selective mining and represent better than average grade

Muck Samples To April 31, 1947
Block P-S-3
PUMP STATION
DEEPER INCLINE
Muck Samples To April 31, 1947
Block P-S-2
Block P-S-3
Muck Samples To June 1, 1947 Block P-S-2
69-30 B
SHAFT FILLED WITH WATER TO THIS LEVEL
Block P-S-2
SUMMER DRIFT
North Boundary Block P-S-1
Bottom LPUB
SLUMMER DRIFTS
Block P-S-1
Block P-S-2
Block P-S-1
"A" Fault
DEEPER INCLINE
Block P-O-1
Collar
South Boundary Block P-S-1
DRIFT
Pioche Shale A
Pioche Shale B
Pioche Shale C
C.M. Line
C.M. Upper Bed
C.M. Lower Bed
Pioche Shale D, Ribs
Quartzite
Coarse Porphyry
Fine Porphyry
Fissure
Fault

No. U.S.B.M.	Cut	Ag	Pb	Zn	Mn
1879	8.0	1.60	1.6	1.9	
1880	7.0	0.90	1.4	1.8	
1881	6.0	0.90	0.7	1.0	
1882	7.5	0.80	0.6	0.6	
1883	8.0	0.60	0.7	1.2	
1884	3.5	17.60	2.1	7.2	
1885	5.0	1.10	0.4	2.0	
1886	5.0	4.00	0.4	2.5	
1887	4.5	2.80	5.1	4.2	
1888	4.0	1.90	1.6	3.0	

No. U.S.B.M.	Cut	Ag	Pb	Zn	Mn
1890	4.0	1.80	1.0	2.5	
1891	3.3	1.70	1.1	2.2	
1892	6.4	1.20	0.9	2.5	
1893	2.5	2.60	2.0	2.9	
1894	5.0	1.40	1.2	2.7	
1895	5.0	1.50	1.8	2.0	
1896	4.3	0.20L	0.1	0.3	
1897	2.8	1.60	0.8	2.1	
1898	4.0	3.00	2.1	3.2	
1899	6.0	5.30	0.7	1.5	

No. U.S.B.M.	Cut	Ag	Pb	Zn	Mn
1900	3.4	1.80	1.7	3.2	
1901	2.0	1.10	0.7	2.1	
1902	4.2	2.60	2.2	3.2	
1903	6.3	1.00	1.5	2.4	
1904	1.7	2.70	1.7	2.9	
1905	5.0	1.90	1.1	2.3	
1906	4.8	1.40	1.2	2.4	
1907	5.0	1.50	1.3	2.3	
1908	3.0	1.70	1.4	3.4	
1918	2.5	2.20	0.5	2.9	
1919	3.5	1.60	0.9	2.4	

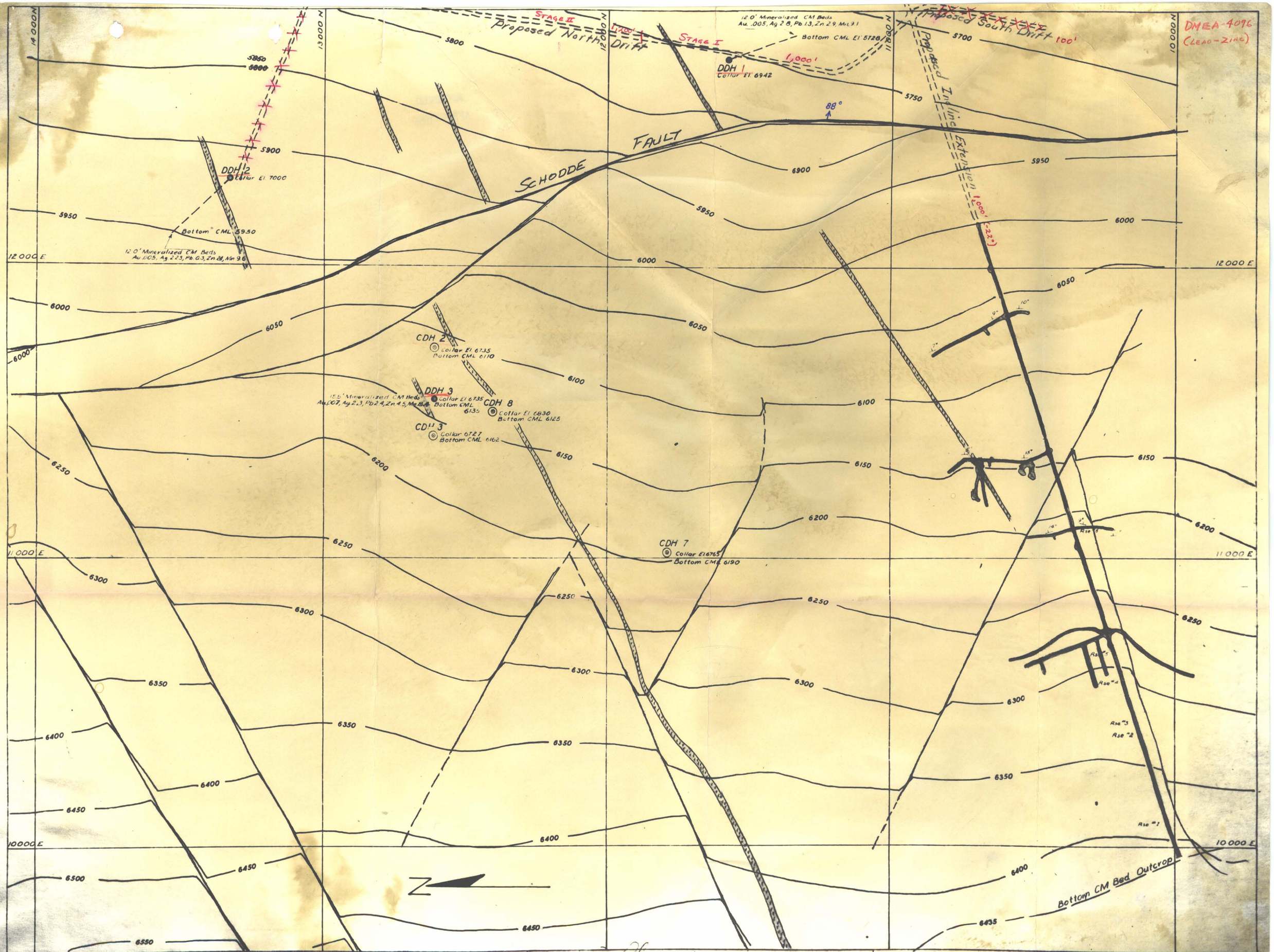
Composite Sample: B/M 1875-1910 — 1.3 2.4 8.8
" " 1875-1919 — 1.95

DRAWN HSP 3-10-50
TRACED
CHECKED

COMBINED METALS REDUCTION CO.
PIOCHE, NEVADA

PAN AMERICAN ASSAY MAP

SCALE 1" = 50'
D-1166



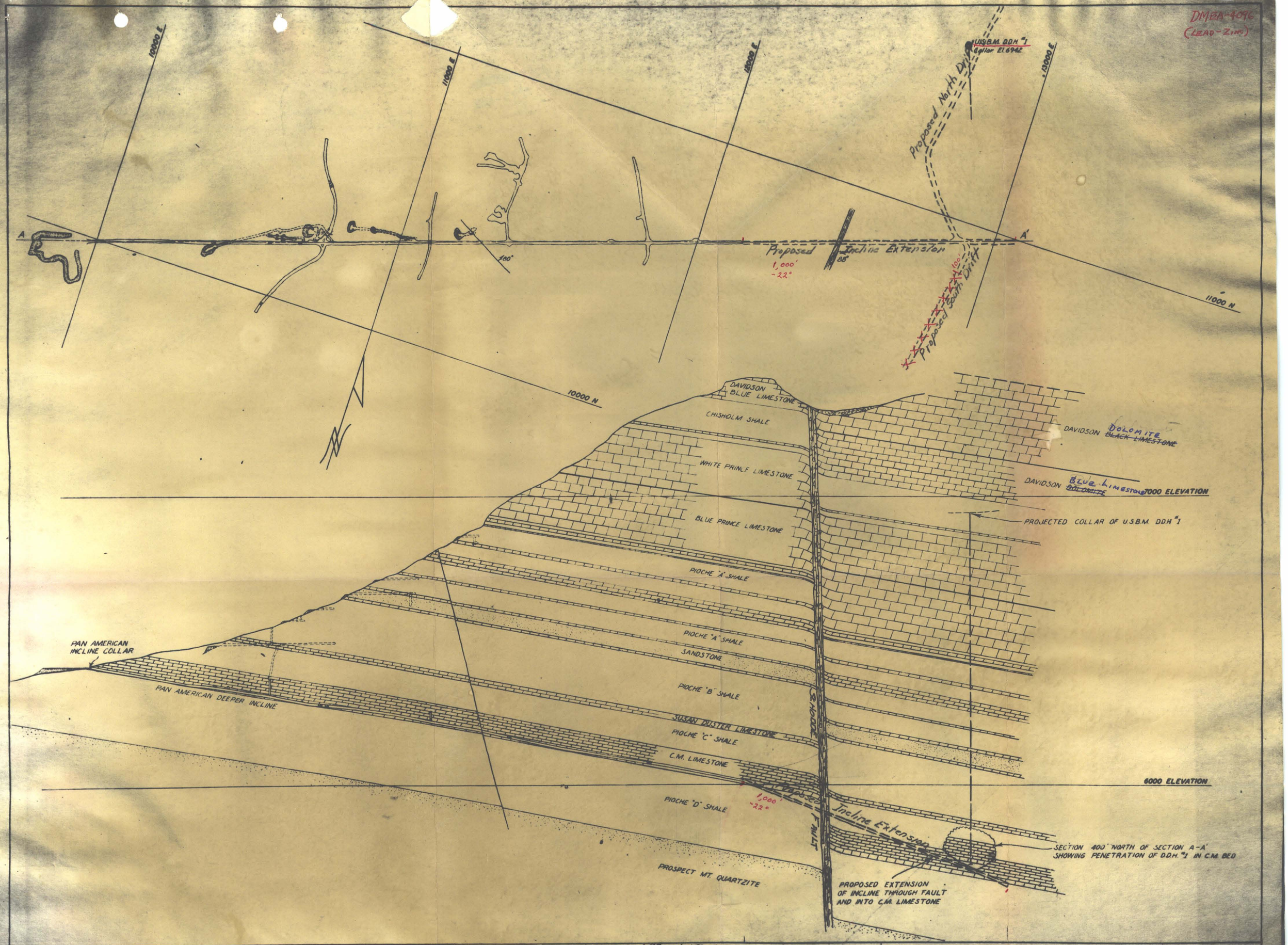
REVISIONS	REFERENCES	WORK: DRAWN Paul Emmill 3-26-50; TRACED N.P.; CHECKED; APPROVED	COMBINED METALS REDUCTION CO. PIOCHE NEVADA — APPLICANTS PROPERTY

PAN AMERICAN AREA ~ COMET DISTRICT
CONTOUR MAP OF C.M. BED, FOOTWALL CONTACT AND DRILL HOLES

SCALE 1" = 200'

C-1076

DMBA-4096
(LEAD-ZINC)

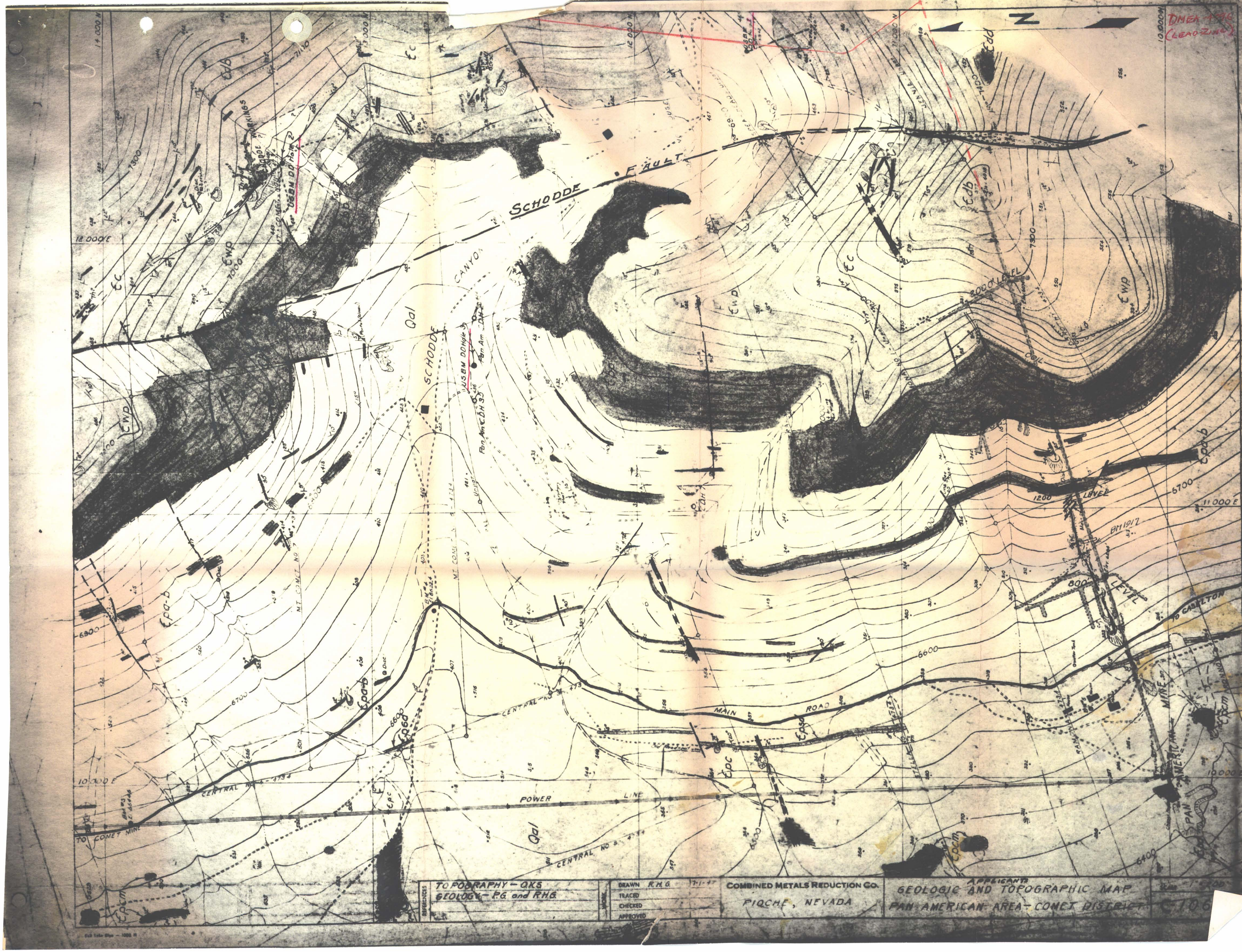


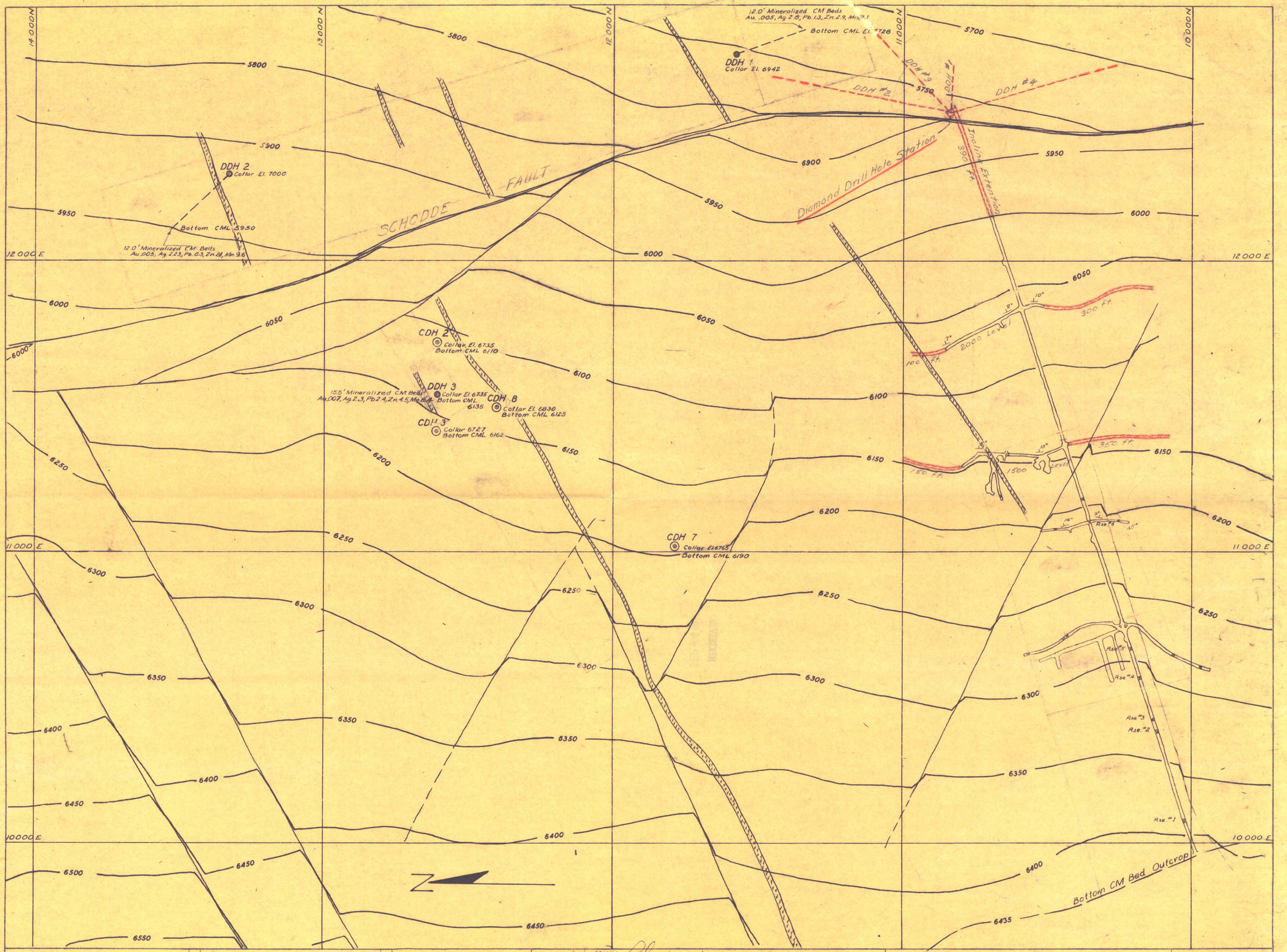
REVISIONS	REFERENCES	WORK		
		DRAWN Hardy & Hilton	12/9/50	COMBINED METALS REDUCTION CO. PIOCHE, NEVADA APPLICANTS PROPOSAL
		TRACED		
		CHECKED		
		APPROVED		

LONGITUDINAL SECTION
PAN AMERICAN DEEPER INCLINE

SCALE 1" = 200'

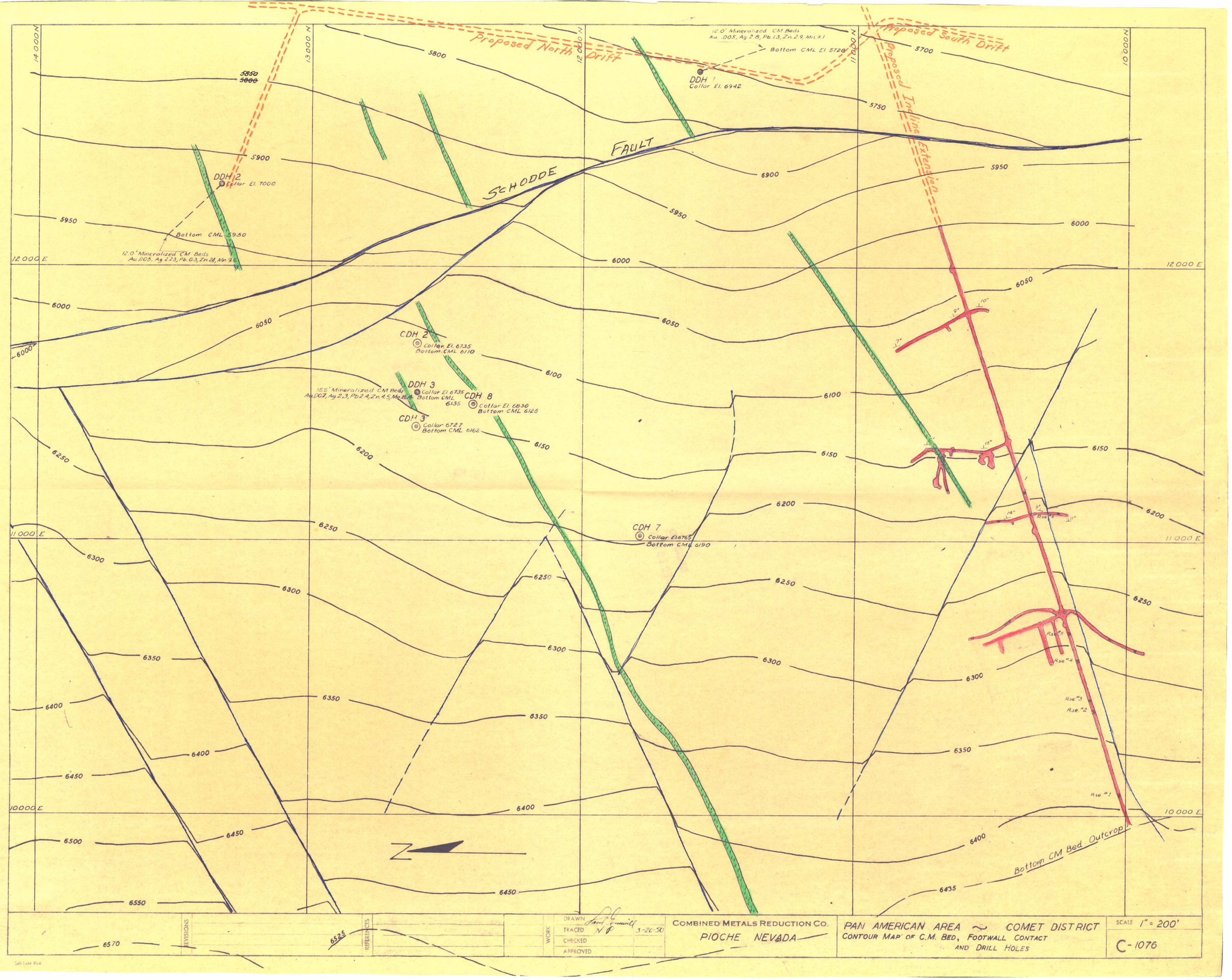
C-1082


DMEA-1996 (LEAD-ZINC)
N
14 000 N
13 000 N
12 000 N
11 000 N
10,000 N
12 000 E
11 000 E
10 000 E
SCHODDE FAULT
SCHODDE CANYON
WORKINGS
USBM DD Hole 2
USBM DD Hole 3
Pan Am CDH 3
Pan Am DH 2
MT. COMET NO. 7
MT. COMET NO. 4
CENTRAL NO. 3 - 4734
CENTRAL NO. 4 - 4734
CENTRAL NO. 8 - 4734
JENNIE U. 1983
RAMONA NO. 1
STELLA NO. 1
MAIN ROAD
POWER LINE
TO COMET MINE
TO CASELTON
PAN AMERICAN MINE
200' LEVEL
800' LEVEL
1200 LEVEL
BM 1917
Qal
Ɛc
Ɛwp
Ɛdb
Ɛpa-b
Ɛpc
Ɛpcm
7400
7300
7200
7100
7000
6900
6800
6700
6600
6500
6400
TOPOGRAPHY — OKS
GEOLOGY — P.G. and R.H.G.
REFERENCES
WORK
DRAWN R.H.G. 7-1-47
TRACED
CHECKED
APPROVED
COMBINED METALS REDUCTION CO.
PIOCHE, NEVADA
APPLICANTS
GEOLOGIC AND TOPOGRAPHIC MAP
PAN AMERICAN AREA — COMET DISTRICT
SCALE 1" = 200'
C 106



REVISIONS	REFERENCES	WORK	DRAWN Paul Emmill 3-26-50	COMBINED METALS REDUCTION CO. PIOCHE NEVADA	PAN AMERICAN AREA ~ COMET DISTRICT CONTOUR MAP OF C.M. BED, FOOTWALL CONTACT AND DRILL HOLES
			TRACED N.P.		SCALE 1" = 200'
			CHECKED		C-1076
			APPROVED		

Salt Lake Blue



REVISIONS	REFERENCES	WORK			
		DRAWN	Paul Summitt		
		TRACED	N.P.	3-26-50	
		CHECKED			
		APPROVED			

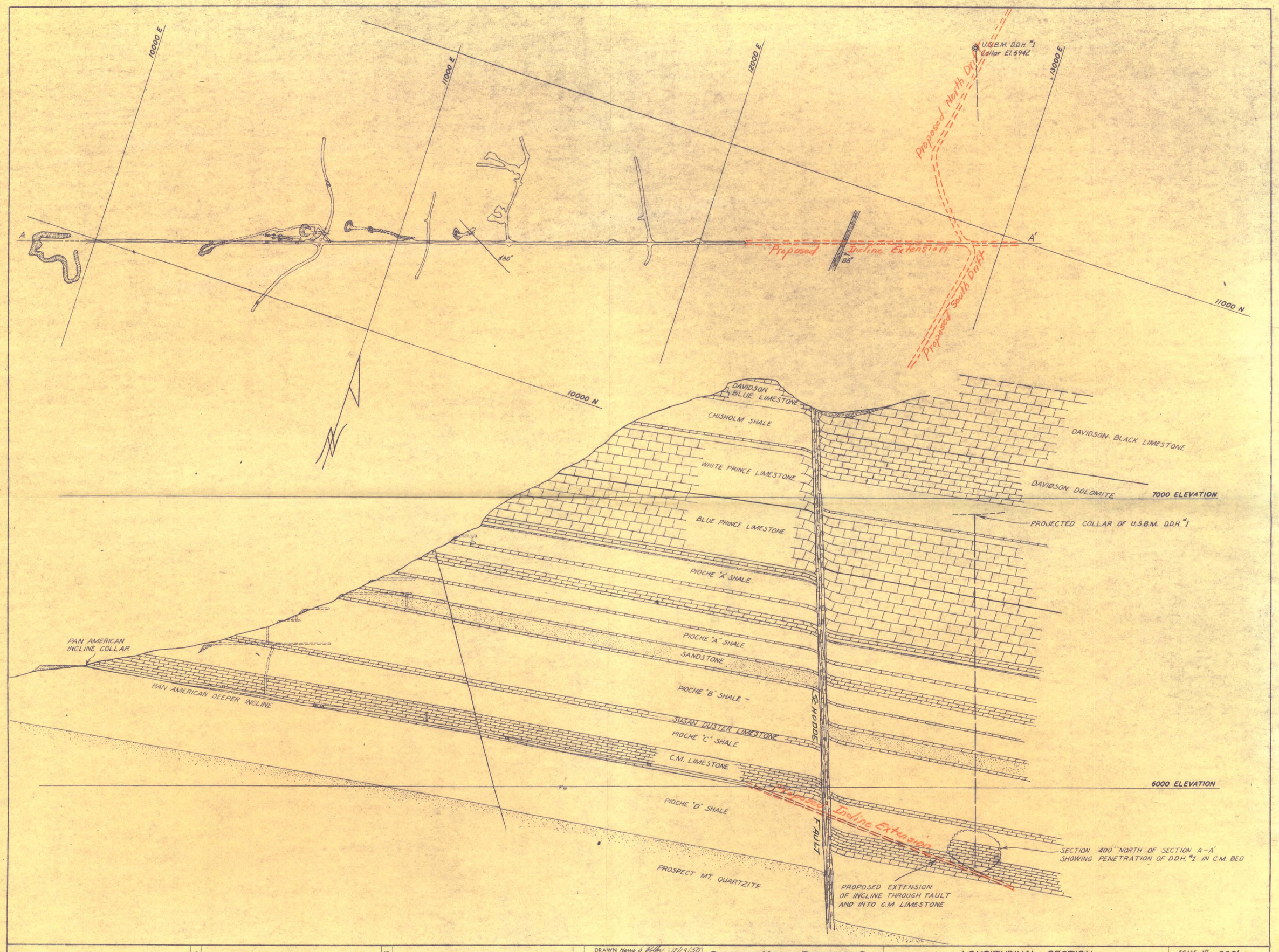
COMBINED METALS REDUCTION CO.
PIOCHE NEVADA

PAN AMERICAN AREA ~ COMET DISTRICT
CONTOUR MAP OF C.M. BED, FOOTWALL CONTACT AND DRILL HOLES

SCALE 1" = 200'

C-1076

Salt Lake Blue



REVISIONS	REFERENCES	WORK		
		DRAWN Harry S Archer	12/13/50	
		TRACED		
		CHECKED		
		APPROVED		

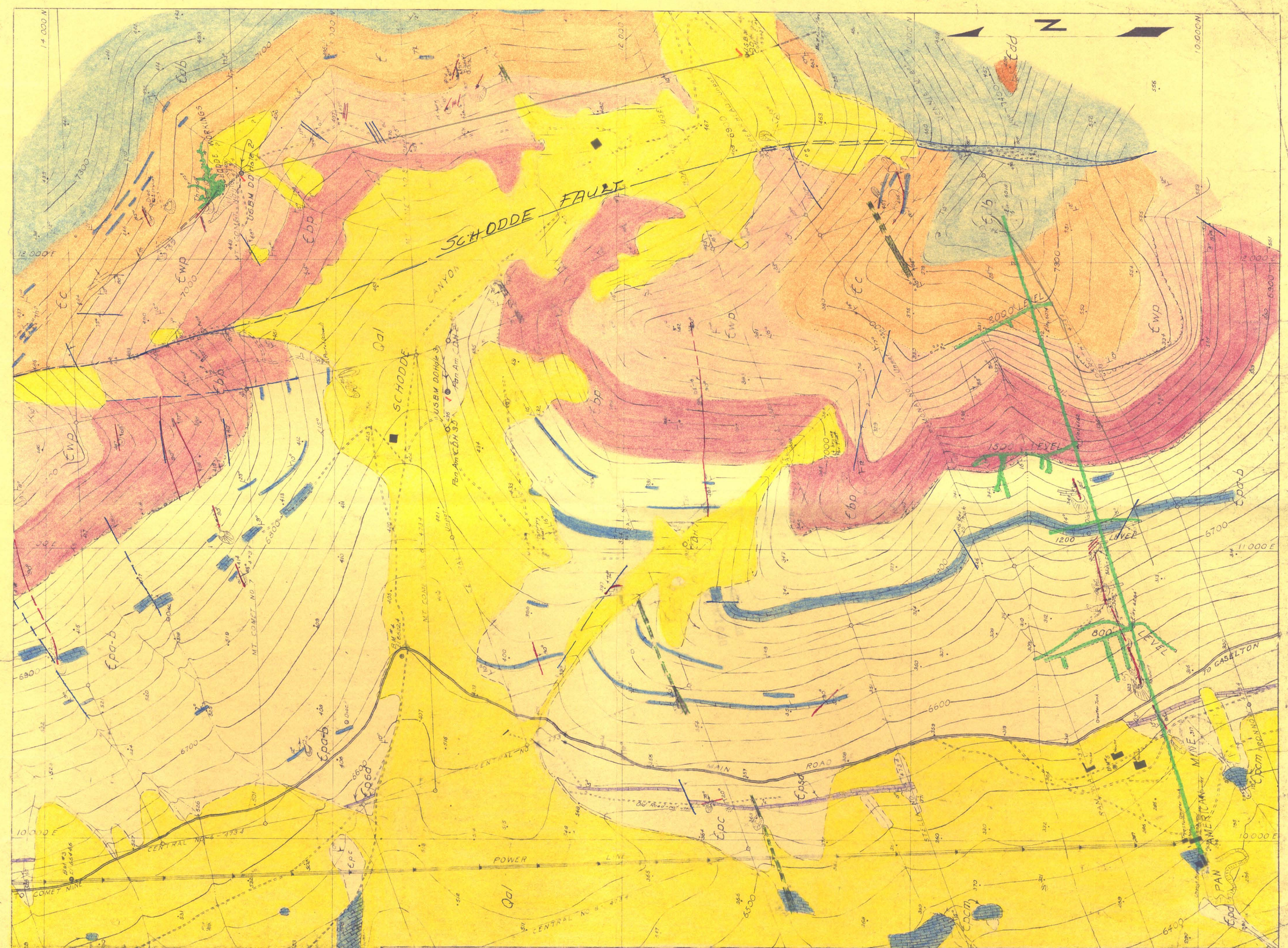
COMBINED METALS REDUCTION CO.
PIOCHE, NEVADA

LONGITUDINAL SECTION
PAN AMERICAN DEEPER INCLINE

SCALE 1" = 200'

C-1082

Salt Lake Blue



REFERENCES: TOPOGRAPHY — OKS GEOLOGY — P.G and R.H.G	WORK: DRAWN R.H.G. 7-1-47 TRACED CHECKED APPROVED	COMBINED METALS REDUCTION CO. PIOCHE, NEVADA	GEOLOGIC AND TOPOGRAPHIC MAP PAN AMERICAN AREA — COMET DISTRICT	SCALE 1" = 200' C-1060