DMEA Form 9

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE

DMEA NO. 4571

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(Withdrawn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
(3) 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

9776

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ASSIGNMENT OF A LEASE

This assignment, made this 29 day of [illegible] 1956 by United Devel pment Co. Inc., Grantors, to Pacific Midwest Gas & Oil Development Co., Inc., Grantees.

WITNESSETH:

For the sum of TEN DOLLARS and other valuable consideration, receipt whereof is hereby acknowledged, Grantors do hereby Grant, Bargin, Sell, and convey to Grantees all rights, title, and interests which may have accrued or which may hereafter accrue under and by virtue of a certain Mining Lease covering certain unpatented mining claims, Situated in T31S, R13W, Sec. [illegible] under [illegible] mining district in Iron County Utah, to-wit:

Ginna Mine Nos. 1 to 9 inclusive,

Notices of Location of said unpatented mining claims are recorded in the office of the County Recorder of Iron County, Utah, as follows:

Name	Date of Location	Date of Recording	Place of Recording	Name of Locators
Ginna Mines				
#1	8-22-49	8-22-49	Parowan	
#2	8-22-49	8-22-49	"	
#3	8-22-49	8-22-49	"	
#4	8-22-49	8-22-49	"	Gail P. Huffington
#5	8-22-49	8-22-49	"	George [illegible]
#6	8-22-49	8-22-49	"	Horace L. Carter
#7	8-22-49	8-22-49	"	Harold V. Howard
#8	8-22-49	8-22-49	"	
#9	8-22-49	8-22-49	"	

The herein mentioned Lease covering the above Property has been filed for record at 10:30 A.M. September 27, 1955, in Book 24 Agno Page 133-135 by Marvin E. Mitchell, Iron County Recorder, Recording No. being 16[illegible].

Grantors hereby covenant and warrant that they have not previously sold or encumbered the above described Mining Lease or any of the Property covered thereby.

IN WITNESS WHEREOF, these presents are executed the day and year first above written.

STATE OF UTAH }
COUNTY OF SEVIER } SS.

On the [illegible] day of [illegible], 1956, Personally appeared before me, Howard Albrecht, Velma Albrecht, G. K. Horan, Signers of the above instrument, who duly Acknowledged to me that they executed the same.

[illegible]
Notary Public, Residing at,
[illegible]

Howard Albrecht, President

Velma Albrecht, Secretary

G.K. Horan, General Manager

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ATTORNEYS AND COUNSELLORS AT LAW
OFFICES AT
MILFORD, FILLMORE AND BEAVER, UTAH

LEASE OF MINING PROPERTY

THIS LEASE, made and entered into in triplicate this 6th day of September, 1955, by and between GAIL P. BUFFINGTON and HELEN BUFFINGTON, his wife; GEORGE BUSH and GLADYS BUSH, his wife; HORACE L. CARTER and MADGE CARTER, his wife; and HAROLD HUH V. HOWARD and NATRONA HOWARD, his wife, hereinafter referred to as Lessors, and HOWARD ALBRECHT, a resident of Salina, Utah, hereinafter referred to as Lessee,

W I T N E S S E T H :

That the said Lessors, for and in consideration of the royalties, covenants and agreements hereinafter reserved and by the said Lessee to be paid, kept and performed, have leased and let, and by these presents do hereby lease, let and demise unto the said Lessee, all of the following described unpatented mining claims located in an unknown mining district in Iron County, Utah, to-wit:

Cinna Mine Nos. 1 to 9 inclusive,

Notices of Location of said unpatented mining claims are recorded in the office of the County Recorder of Iron County, Utah, as follows:

Name	Date of Location	Date of Recording	Place of Recording	Name of Locators
Cinna Mines				
#1	8-20-49	8-22-49	Parowan	Gail P.Buffington
#2	8-20-49	8-22-49	"	George C. Bush
#3	8-20-49	8-22-49	"	Horace L. Carter
#4	8-20-49	8-22-49	"	Harold V. Howard
#5	8-20-49	8-22-49	"	
#6	8-25-49	8-30-49	"	
#7	8-25-49	8-30-49	"	
#8	8-25-49	8-30-49	"	
#9	8-25-49	8-30-49	"	

In consideration of the said Lease, the parties hereto covenant and agree to and with each other as follows:

1. The primary term of this Lease shall commence on the ____ day of _____, AD. 1955, and shall continue and run

for a term of five (5) years unless sooner forfeited through a violation of any covenants herein contained and by Lessee to be paid, kept and performed, such forfeiture to be as hereinafter provided and not otherwise.

2. Any and all work performed by Lessee hereunder shall be in a good and workmanlike manner with due regard to the safety, development and perservation of said mining claims and premises as workable mining property.

3. Lessee shall be solely responsible for all labor, materials and supplies purchased by it and used in the operation of said mining claims and premises as herein contemplated, and it agrees to indemnify and save harmless the Lessors from any and all liabilities by reason of this Lease and its operations hereunder.

Lessee agrees to give and post any and all notices which may be legally required to show its responsibility in this connection and to relieve Lessors therefrom.

4. The Lessee shall carry and pay for Industrial Compensation Insurance for all persons employed by it when required to do so by the laws of the State of Utah, shall pay for all Social Security Taxes and Assessments, Unemployment Insurance, and any and all other taxes and assessments required to be paid by the Laws of the State of Utah and/or the Laws of the United States of America.

Royalty payments hereunder shall be made to Lessors by delivering or sending the same to them or any of them at Milford State Bank at Milford, Utah, by the 15th day of each month following returns received by Lessee for sale of ore or Mercury. In the event the royalty payments hereunder are made payable to less than all of the Lessors, such payments shall nevertheless be a sufficient acquittance and discharge to the Lessee the same as if said royalty payments had been made to all of the Lessors, and the Lessors

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receiving such payments shall be entitled to do so as agents of and for all of Lessors and shall be responsible for the division thereof among the Lessors. Royalties shall not bear interest in case of litigation.

The said Lessors shall give directions to the Milford State Bank as to the disposition of any such royalty payments, and it is understood that the Milford State Bank shall have the responsibility only of paying whatever money is deposited in accordance with this agreement as directed by the Lessors.

5. Lessors and their agents shall be allowed at all reasonable times the privilege of entering in and upon the leased premises and claims and any and all parts thereof, for purposes of examination and inspection, PROVIDED HOWEVER, that the rights hereby accorded shall be exercised in such manner as not to interfere with operations being carried on by Lessee, its successors and assigns hereunder.

6. In the event this Lease covers and describes any unpatented mining claims, Lessee shall be responsible for the performance of the annual assessment work, if any, required thereon, such annual assessment work to be done pursuant to the Laws of the United States of America and of the State of Utah, which said assessment work shall be done and the Affidavits of such work and labor shall be recorded not less than thirty (30) days prior to the last date when such work and labor must be performed by law.

7. All mining equipment and machinery, excepting stationary equipment, brought upon the premises by the Lessee shall constitute and remain personal property which said Lessee shall have the right to remove within ninety days after the termination of this lease by forfeiture, abandonment or cancellation, or the expiration of the

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lease or any renewal thereof. Lessee shall not have the right to remove anything else.

8. Lessors hereby give and grant to Lessee the right to renew for successive five-year periods the Lease on the said Mining claims and premises above described, that is, Lessee shall have the right to renew its Lease on said claims and mining property for a like period of five years by giving notice of intention so to do on or before thirty days prior to the expiration of the primary lease term, said notice to be given by personal service thereof on any one of Lessors or by registered mail addressed to any of them at his or her place of residence. This Lease, if thus renewed, shall be and continue upon the same terms and subject to the said conditions, covenants and provisions as herein set forth. Subsequent five-year renewals may be made in the same manner at the option of Lessee for a total term of _____years, including the primary and all renewal terms. Lessee shall not have the right of renewal in the event he is in default.

9. On demand of Lessee, Lessors agree to take immediately any and all proper and necessary steps to perfect and render marketable their rights in and to said mining claims and properties and to remove therefrom any and all clouds upon title, save and except the paramount and superior rights of the United States of America until said claims are patented.

10. During the life and existence of the Lease hereunder, including the primary term and any and all renewals thereof, royalties shall be paid to Lessors on the following basis:

TEN PER CENT (10%) Gross royalty on all ores mined and sold from mining claims herein listed.

The benefits of Lessors hereunder shall be based solely on such royalty allowances.

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11. It is expressly agreed, understood and declared by all parties hereto that the relationship of the parties is and shall continue to be that of Lessors and Lessee and not that of employers and employee, and that such Lessee will be engaged in the independ- and established trade, occupation and business of mining under Lease for its profit and benefit; that Lessors shall not control or direct the work of the Lessee, and that Lessee is free from control or direction over the performance of the work, or any work which it may choose to do by virtue of and under and pursuant to the terms and provisions of this Lease, excepting that such work must be done as hereinabove stated and stipulated, and that a failure to comply with each and every term and condition of this Agreement herein more particularly set forth shall constitute a breach of this Agreement.

12. It is further understood and agreed that this Agreement shall be binding upon and shall inure to the benefit of the heirs, administrators, executors, successors and assigns of the respective parties hereto, and Lessee shall have the right to sublet and underlease or assign all or part of the premises hereinabove described without the conset of Lessors and without the consent of Lessors and may assign this Agreement and its rights hereunder. Lessee shall notify said Lessors of any such subletting, underleasing or assignment so that Lessors shall at all times be apprised of the parties interested.

13. Lessors agree to give Lessee ninety (90) days written notice of their intention to cancel the instant Lease by reason of default made in any of the conditions herein contained by the Lessee to be kept and performed. During said ninety day term, Lessee shall have the right to comply with the conditions or condition of this Agreement then in default and to which attention has been called by

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said notice. If Lessee does perform and make good the condition or conditions in default and which are made the basis of the notice of intention to cancel, this lease shall continue in full force and effect and shall not be forfeited or cancelled, but shall be fully reinstated.

Lessee agrees to move in on property within thirty (30) days from date of completion of foregoing instrument. Work shall proceed at twenty (20) work days per month thereafter (weather permitting).

IN WITNESS WHEREOF, Lessee and Lessors have hereunto affixed their signatures the day and year above written.

Harold K Howard
Natona Howard
Gail P. Buffington
Helen T. Buffington
Lessors

Lessee

STATE OF OREGON,)
) SS.
County of JACKSON.)

On this 17 day of September, 1955, personally appeared before Me Gail P. Buffington and Helen Buffington, husband and wife, two of the signers of the above instrument, who each duly acknowledged to me that they executed the same.

Notary Public
Residing at MEDFORD, OREGON

My Commission Expires MY COMMISSION EXPIRES MAR. 14, 1958

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OFFICES AT
MILFORD, FILLMORE AND BEAVER, UTAH

STATE OF UTAH,)
) SS.
County of Beaver.)

On this 6 day of September, 1955, personally appeared before me George Bush and Gladys Bush, husband and wife, two of the signers of the above instrument, who each duly acknowledged to me that they executed the same.

Vernon M Burns
Notary Public
Residing at Milford, Utah

My Commission Expires:
July 16th 1959

STATE OF ~~CALIFORNIA~~ UTAH,)
) SS.
County of Beaver)

On this 6 day of September, 1955, personally appeared before me Horace L. Carter and Madge Carter, husband and wife, two of the signers of the above instrument, who each duly acknowledged to me that they executed the same.

Vernon M Burns
Notary Public
Residing at

My Commission Expires:
July 16th 1959

STATE OF CALIFORNIA,)
) SS.
County of Los Angeles.)

On this 8th day of September, 1955, personally appeared before me Harold V. Howard and Natrona Howard, husband and wife, two of the signers of the above instrument, who each duly acknowledged to me that they executed the same.

Roy O. Lloyd
Notary Public
Residing at

My Commission Expires:
My Commission Expires Oct. 12, 1957

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STATE OF UTAH,)
COUNTY OF ~~SEVIER~~ Beaver.) SS.

5 On this 6 day of September, 1955, personally appeared before me Howard Albrecht, one of the signers of the above instrument, who duly acknowledged to me that he signed the same.

Vernon M. Burns
Notary Public
Residing at

My Commission Expires:
July 16 1955

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OFFICES AT
MILFORD, FILLMORE AND BEAVER, UTAH

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United States Senate

COMMITTEE ON
INTERSTATE AND FOREIGN COMMERCE

December 7, 1956

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C. O. Mittendorf, Administrator
Defense Minerals Exploration Administration
Department of Interior
Washington, D. C.

Dear Mr. Mittendorf:

This is with reference to the accompanying applications of the Pacific Midwest Gas & Oil Development Company, Inc., 170 South State Street, Salina, Utah, for a DMEA loan. The forms are made out in quadruplicate.

The applicant, a Nevada corporation, is most anxious to secure this assistance which is needed for the further development of their mining property located in southern Utah.

It is hoped that an early consideration of this application will be possible and any courtesy you may extend will be appreciated.

Cordially,

Alan Bible

ALAN BIBLE

ENCS.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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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. 4571
Metal or Mineral Cinnibar (Merc.)
Date Received 12-13-56
Estimated Cost Not Given
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: Pacific Midwest Gas & Oil Developement Co., Inc. 170 South State, Salina, Utah, Nevada Corporation, Alfred Taylor, President, George K. Hogan, Vice-President, Dale Prows, Sec-Treas. All Available at 170 South State, Salina, 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. Not Applicable

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 Cina Mine Claims No 1 Through to 9, Twp 31 S, Range 15 W, Sections 5 and 6.

(*b*) State any mine name by which the property is known. None

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Leesee, See Enclosed Lease and Assignment.

(*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 None

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

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

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

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

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

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

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

(*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 17 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 Feb. 1, 1956

PACIFIC GOLD-ART OIL & GAS CO., INC.

(Applicant)

By Alfred Fryer

G. K. Harper

Neil F. Brown

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

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PACIFIC MID-WEST GAS & OIL DEVELOPMENT CO., INC.

4. All work done to present time performed by United Development Co., Inc. See accompanying report, abstract and introduction sections.

4. (b) No production or ore blocked out. Ore indicated, but extent unknown.

4. (c) See accompanying report, Geology Section.

4. (d) See accompanying report. Location and Access Section.

4. (e) Present equipment includes two trailer houses, one TD18 with Dozer blade, one TD9 with dozer blade, one pickup truck and one jeep, and 1 1/2 ton Chev. Truck. Manpower supplies and water are all locally available. Power will be furnished by applicant. Some materials and equipment must come from Salt Lake City, 250 miles away, but most items are obtainable at Beaver, Milford, Cedar City or St. George, Utah.

5. (b) See accompanying report Section II entitled Drilling Project Procedure.

(d) The United Development Co., Inc., Howard Albrecht experience in many of years as a mine operator. The general manager of the Pacific Mid-West Gas & Oil Development Co., Inc. has had many years of experience in mining and drilling of minerals and petroleum and is G. K. Hogan.

6. (a) None independent drillers in this area has refused this job at $10.00 per foot.

(b)

Maintenance man	1 man at $700 per month
Geologic mapping and logging	1 man at $750 per month
Instrument man and assayer	1 man at $600 per month
Bulldozer operator	1 man at $600 per month
Cooking for men above and contractors' personnel	1 man at $350 per month
1 Miner to shoot for road building	1 man at $400 per month

Food and lodging at $5 per man per day for 7 men
(Contractors) to furnish own lodging and pay $3.00 per day per man for meals in Messhall.

Supervisor 10 days each month	at $800 per month
7 men (3 shifts) labor on rig	at $4000 per month

(d)

1 TD 18 Dozer	$1950 per month
1 105 Schramm Compressor	195 per month
100' 1" Air Hose, 1 Gardner Denever Jack Hammer and steel	50 per month
Light plant (1)	80 per month
1 Jeep for Engineer	150 per month
1 Water truck	600 per month
1 24 Bucyrus-Erie Standard Rig (fully equip)	$3000 per month
1 Chev. Station Wagon (for transportation to and from on job for personnel)	$200 per month

(e) None

(f)

2 new buildings 16' x 24'	$2000.00
Laboratory equipment as listed The Mine & Semlter	$1711.77

	Supply Co. of Denver, Colorado (enclosed	
	1 Stadia rod, 15 feet	$46.00
	1 Alidade, plane table and tripod	702.00
	Office and drafting supplies (incl. logs)	200.00
(g)	Repairs to and maintenance of operation equipment	$1000.00 per month
	Insurance	255.00 per month
	Social Security	165.00 per month
	Unemployment Compensation	225.00 per month
	Accounting	300.00 per month
(h)	Contingent expenses	$500.00 per month

7. (a) Yes.

(b) We have the equipment to do all the work and the necessary funds to carry the first month's payroll.

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A REPORT ON THE CINA MINE CLAIMS
IN
IRON COUNTY, UTAH

by

Raymond J. Garcia

Geologist

August 20, 1956

RJS

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DEC 13 1956
D.M.E.A.

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PLATE V	Sketch of Mercury Reduction Plant	In Pocket

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ABSTRACT

The nine Cina Mine claims lie in Sections 5 and 6, Township 31 S, Range 15 W, in Iron County Utah. Access to the property is by graded gravel roads that are normally open all year.

The claims are staked to include a normal fault on the south flank of the Beaver Uplift. A series of volcanics are faulted down against Paleozoic limestones. The faults and associated hot springs provide the control for localization of cinnabar (mercury sulfide). Altered rhyolite and brecciated limestone in drag folds are the host rocks.

The workings consist of five open cuts and a shallow incline. All the workings but Open Cut no. 5 contain ore grade cinnabar concentrations. The area contains features common to several of the different geologic types of mercury deposits. Among them are the presence of opalite, sulfur springs, altered volcanics and limestone breccia all cut by faults. Thus far all the cinnabar has been found in the altered rhyolite and opalite.

Minerals include, native sulfur, hematite, gypsum, clay minerals and cinnabar. Alteration extends into the limestone several feet at Open Cut no. 4 and an area of heavily silicified limestone is exposed as talus just south of the claims along the fault.

The property shows enough promise to justify a serious exploration program of a rather extensive nature. It is recommended that present funds be supplemented by a D. M. E. A. loan if some can be secured.

INTRODUCTION

Location and Access

The nine Cina Mine claims lie in sections 5 and 6, Township 31 S., Range 15 W. in Iron County, Utah. (See Plate I). This places them about 10 airline miles west of the Union Pacific main line road between Salt Lake City and Los Angeles. Lund, twenty-five road miles away is the nearest railhead point. The towns of Milford, Minersville and Beaver are all within fifty miles of the property and are the nearest sources of supplies.

Roads from Milford and Beaver to Minersville are hard surfaced. From Minersville into the claims all roads are graded gravel and provide easy access throughout the year except in rare heavy snow conditions when high winds may drift the roads closed. All roads are such that haulage of heavy equipment on trucks and trailers would present no problems during normal weather.

Climate, Flora and Fauna

The climate is much like that of the rest of southern Utah with hot dry summers broken by a few July thunderstorms and comparatively mild winters with little snow. Year round operations are the rule for either exploration or actual mining.

Summer temperatures may reach ninety degrees but the nights are always cool enough to make a light blanket welcome. Winter temperatures may drop to zero for very short periods during the nights

but days are usually sunny with above freezing temperatures.

Ground cover consists mainly of pinion pine and juniper trees with few or no shrubs beneath them on the hill slopes. Bunch grasses are nearly the only small plant except for sage on the flats and valley floors.

Nutrient values of this sparse vegetation must be very high, however, for game abounds everywhere. Elk, deer, antelope, several varieties of rabbit and other rodents are the major vegetarians. Lack of a severe program of trapping or poisoning has allowed a proper balance of predators to be retained in the form of coyotes, bobcats, badgers, ferrets and even an occasional lion.

GEOLOGY

Physiography, Topography and Drainage

The Cina Mine area lies on the south flank of the Beaver Uplift, one of the major structures of the state. These "uplift" areas have produced over ninety percent of the ores mined in Utah regardless of mineral type. A chain of these mineralized highs extends in an arc from north central to southwestern Utah. They are accompanied by a group of persistent regional faults trending north-south. It is on one of these faults that the Cina Mine claims are staked.

The average elevation of the property is nearly 5500 feet. Variations occur as high, rounded, tree covered hills rising two to five hundred feet above the drainage floors. It is not what is considered rough country and as would be expected little exposed rock outcrops except on the crests of ridges.

The streams are all intermittent and the nearest water supply is eleven miles from camp at a stock well which is pumped by a small gasoline powered unit. The ground water supply should be adequate for large scale irrigation, however, and some artesian water undoubtedly exists. The water supply at the well is large enough to fill the needs of a small scale exploration program but expansion, if warranted later, would probably necessitate the drilling of another well somewhere on or near the claims.

Lithology and Structure

The claims are staked over a valley and the hills that flank either side. Both hills are composed of Paleozoic (Carboniferous?) limestones while the valley is cut into a narrow belt of altered rhyolite. The rhyolite-limestone contact on the west side of the valley is obscured by mantle, but a careful search of the talus disclosed little evidence of deformation of the contact or limestones on the hill above. There are some heavily silicified limestone fragments on the slope. The dips checked in several places on the top and flanks of the hill substantiated the first impression that the limes are flat lying.

The contact on the east side of the valley is normally faulted and an examination of slickensides in Open Cut No. 1 indicated diagonal slip to the south, at least in the final phase of movemnt. Dips taken on the limestones east of the fault show some downward drag folding and severe brecciation. The fault itself, marked everywhere by a dark red-brown earthy, hematite filling, has the following dips and strikes along its rather sinuous trace. (See Plate II.)

Location	Dip	Strike
Open Cut No. 1	44° W	N 35° E
Open Cut No. 2	44° W	N 9° W
Open Cut No. 3	55° N	N 59° E
Incline	64° W	N 49° E

Open cuts no. 4 and 5 do not expose the fault. East of these cuts some rather complex folding appears in the limestones and some beds may be overturned. A complete solution to these structures was not attempted since only somewhat precise plane table mapping could give the true picture. The fault was followed both south and north of the claims for several hundred yards and was found to be persistent. The abrupt white and gray contact can be seen on distant hills in both directions. Just south of the Cinn Mine group an area in the limestones along the fault has been silicified for a width of 100 feet and for about 200 feet along the fault.

In Cut No. 2 a second fault parallel to the main one can be seen on the north bank. It dips 64° W but no definite strike could be determined as only a cross section of the trace is exposed. If the average dips on both faults persist, an intersection at depth is inevitable. It is also probable that the rocks surrounding this postulated intersection will be heavily crushed and altered to form an excellent host rock for mineral emplacement.

On the south end of each hill flanking the valley, large masses of "opalite" outcrop. (See Plate II.) "Opalite" is a term used in Nevada to cover any sinter or replacement deposits of impure silica

of a characteristic type usually associated with cinnabar deposits in volcanics. The opalites on the Gina Mine group are identical to those in many places in Nevada. The conformity of these masses to the topography, the thickening of the deposits downslope and the presence of vertical structures at the upper ends all point to hot spring origin. As such, they are probably representative of the final stages of volcanism. Cinnabar within the opalites was the first indication of the prospector that mineralizing solutions had been active in the area. The first work was done at the present location of Cut No. 1 in opalite which has all, but for a few boulders, been stripped off.

The last and most interesting structures exposed by these workings are a pair of what appear to have been subsurface sulfur springs. They have been sectioned by Cut No. 2. (See Plate 3.) The material they contain is unconsolidated flakes and needles of silica. Along the margins of the "apophyses" of tuff and in the throat of the conduits are masses of crystalline and massive sulfur up to fifteen feet across. ?

These sulfur springs were probably active concurrently with the opalites and were dammed by the faults. The sulfur is confined wholly to them and little or no cinnabar is contained. The rhyolites surrounding them are strongly altered to a gray clayey tuffaceous material. This is the cinnabar host rock. ?

Minerals and Ore

The longest portion of fault trace (100 feet) is exposed in Cut No. 1. It contains irregular masses of sulfur up to two feet across in the limestone breccia of the footwall. Earthy cinnabar

in streaks up to an inch thick parallels the fault in secondary fractures. The crush zone proper is filled with finely crystalline colonite gypsum in lenticular masses up to eight feet thick and fifty feet long. Cinnabar occurs in the gypsum also.

In Cut No. 2 assays of samples cut down the whole twenty feet of the north wall are reported to have run .37 percent or 7.4 pounds of mercury per ton. This, of course, is good stripping ore. The sulfur should give no problem in smelting since selective stripping can eliminate it.

Cut No. 3 contains pannable cinnabar throughout but no assay data are at this time available. The fifteen foot incline just south of Cut No. 3 contains cinnabar in both opalite and altered rhyolite along the fault. The limestone is argillized as much as two feet from the fault trace itself.

Cut No. 4 exposes a four foot thick section of ore grade cinnabar in siliceous sinter now darkened to gray on the exposure. The fault passes a few feet east of the cut and a halo of altered limestone surrounds both the fault and the end of the cut.

Cut No. 5 has been cored with one EX drill hole. Like Cut No. 4, it does not expose the fault which passes about twenty feet to the east. Assays on the core from fifteen to forty-six feet showed a .15 per cent or three pound per ton concentration of mercury. Assays of short units of the interval might have shown higher values in places.

Assay Method

It is well here to mention that the standard technique

(Whitton method) used by all the assay houses in the western states has proven in the author's experience to be neither consistent nor cheap. As a result mercury mining operations are for the most part poorly controlled and filled with disappointments for the operators. The notable exceptions to the rule are the large producers (Cordero Mine, New Almaden, etc.) who not only have carefully developed ore but can control its mined grade to very close limits. Consequently, accurate ore blending is possible and furnace intakes always are of uniform and optimum grade, resulting in higher recovery.

The key to all this apparent skill on the part of the large operators is the thiocyanate titration method of assaying. This method is highly accurate and consistent, it is very cheap per assay and it is amenable to "mass production" with which one man can easily run 100 assays per day. These features allow the operator to assay anything he is in the least doubt about and to keep a constant running check on ore values every time a round is shot or a load goes into the bins.

Procedures for the system are listed below.

To exactly one gram of pulverized sample, add a gram of flux consisting of half and half copper and calcium oxides.

Mix thoroughly and place in test tube not less than six inches long.

Place only bottom of tube (portion containing sample) horizontally into furnace or Fisher burner flame. Rotate to heat all sides of sample cherry red. (See sketch in pocket showing Multi Hearth Furnace.)

RJS

Remove from furnace before moisture ring migrates to mouth of tube. Hold tube horizontal at all times.

Fracture bottom of tube (and containing sample) by covering with cold wet cloth and strike off with knife or spatula.

Wash remainder of tube and contents in 25 or 30 ml. of boiling nitric acid in 100 ml. beaker.

Rinse tube with few drops of distilled water draining carefully into acid and discard tube remains.

Stir into cooled acid two or three drops of saturated potassium permanganate solution to obtain color. Clear the solution by stirring in one drop of hydrogen peroxide.

Add one dropper full of Indicator Solution made up by dissolving twenty grams of ferric sulfate in 500 ml. of distilled water.

Titrate using 100 ml. of 1/200 normal potassium thiocyanate solution. (May be made by dissolving 4.856 grams of potassium thiocyanate in 1000 ml. of distilled water to make a 1/20 normal solution. Then dilute to 1/200 normal in convenient amounts).

Stir while slowly adding potassium thiocyanate solution from the burett. The stoichiometric point is reached when the first streak of brown color appears and does not clear away.

Values may be read directly from the burett. Each ml. of solution used corresponds to one pound of mercury per ton of sample.

Materials List

Materials necessary for the completion of 10 samples are as follows:

5	grams copper oxide
5	grams calcium oxide
10	test tubes six inches long
1	gas burner
1	square of cloth
1	table knife or chemical spatula
500	ml. of concentrated nitric acid
10	beakers of 100 ml. capacity
1	gal. distilled water
1	large dropper
4	oz. dropper bottle of potassium permanganate solution
4	oz. dropper bottle of hydrogen peroxide
20	grams of ferric sulfate
5	grams potassium thiocyanate
100	ml. buret in .10 ml. gradations
1	laboratory scale
1	graduated cylinder 100 ml.
1	wash bottle
2	beakers 1000 ml.
2	siphon bottles 1 gal. and siphons with pinch clamps

Except for the test tubes and reagents most of the items listed above become permanent laboratory equipment subject to replacement only on accidental breakage. Naturally the more assays run, the lower unit costs become until they are only a few cents above the cost of the test tube and the reagents used for one assay. The number of

assays which can be run successively without washing glassware depends only on the number of 100 ml. beakers on hand.

Equipment necessary for sample preparation can be anything from laboratory jaw crusher, pulverizer, sample splitters and screens to whatever can be devised as substitutes in the field. However, it must be remembered that the speed with which an assay can be run depends largely on the amount of time it takes to reduce the sample to its final pulverized and split size. All samples should be reduced to minus eighty mesh before assaying.

CONCLUSIONS

An appraisal of all the general types of cinnabar deposits in Nevada and Utah shows those in volcanics to be the most productive with interbedded sediments, limestone replacement, metamorphic, dike and opalite type deposits following in that order.

The Cordero Mining Company operating at McDermitt, Nevada is the largest producer in the state and ranks third in the United States. The ore is disseminated through an altered andesite or rhyolite (depending on the authority) cut by a normal fault. Small masses of slightly mineralized opalite outcrop along the fault. The present ore horizon was encountered in a cable tool drill hole at a depth of 367 feet.

In many respects the Cinn Mine claim area can be compared with Cordero. Exceptions are a lack of primary sulfides and a finer tuffaceous rhyolite at the Cinn Mine area coupled with the presence of a limestone unit. The sulfides may exist at depth, for iron oxides

are common over the property except in the vicinity of the sulfur springs. (One large oxidized area can be seen near the upper end of the east opalite mass.) The rhyolite may or may not change in character with depth but this factor may have no great bearing on the concentration of cinnabar. Certainly the limestone unit cannot be considered detrimental, for it merely offers another favorable host rock for ore concentration. The drag folds along the fault present ideal places for high grade replacement deposits and fracture fill deposits in the breccia.

The west fault as well as the main fault offers an excellent structural control for the localization of minerals. Furthermore, the presence of cinnabar in the opalite indicates the movement of mineralizing solutions to the very end of the volcanic phase of activity, which may point to commercial concentrations under the east opalite cap.

Finally and most important, with cinnabar of apparent ore grade present in all the prospect cuts but one, the conclusion is forced that enough mineral has been made available for the emplacement of a commercial concentration. The area therefore warrants much more exploration on a carefully planned basis.

RECOMMENDATIONS

The following recommendations are based on the author's opinion that an excellent chance exists for the discovery of enough commercially mineable ore to justify the installation of a furnace and condenser circuit for the reduction of the cinnabar.

First, the present method of prospecting, by open cutting with a tractor and dozer, should be immediately discontinued. In its place a drilling program to fully examine the faulted area from Open Cut No. 1 to No. 5 should be instituted. The work should be planned with an eye toward penetrating both sides of both faults and the area between to depths of 500 feet.

Problems to be considered are the soft sponge-like texture of much of the altered rhyolite, open cavities and brecciation of the limestone, and finally the extreme hardness and abrasiveness of the opalites. Lenses of opalite occur within the rhyolite at irregular intervals. Past experience has shown that these thin "ribs" when encountered unexpectedly can completely remove the stones from the matrix of a standard diamond bit in a single revolution.

The only drill to the author's knowledge that has been successfully used to drill all the grounds present on the Cima Lime claims is a cable tool or "churn" drill. The rhyolite-lime zone will undoubtedly present difficulty in circulation losses and caving unless heavily mudded or cased. Drilling the opalite with rotary equipment has cost up to $14.00 per foot on other projects of the author's acquaintance.

The rhyolite itself may be amenable to penetration by a Winter-Weiss Portadrill, particularly with air circulation, to the top of the water table. At that point water or mud circulation will become necessary accompanied by probable heavy losses and washing in the more altered rhyolite. Since casing is very difficult with a Portadrill, holes that cannot be held with mud will probably be lost.

Second, a complete geologic mapping program should be effected to give precise information concerning the relationship of all structures both igneous and sedimentary on the claims and in the area immediately surrounding them.

Third, a field laboratory for assaying all samples should be established on the project to aid in the immediate recognition of ore zones and to facilitate efficient direction of offset hole placement. The potassium thiocyanate titration method should be used.

Fourth, a Defense Minerals Exploration Administration loan should be sought to help defray the costs of the rather extensive drill footage requirements of a project of the type necessary to adequately explore the property.

Last, in the event of the discovery of an ore body large enough to justify a furnace installation, a survey should be made of the equipment and procedures at the properties of the successful operators in California and Nevada before equipment orders are placed. See sketch in pocket of a typical plant arrangement of an efficient mercury smelter and condenser system.

To Whom it May Concern

I, Raymond J. Garcia, certify that I have personally visited on August 12 and 13, 1956 the property discussed in this report, that I have no personal interest in the property or the holding company and that I am retained solely on a consulting basis for which I am fully paid.

My qualifications are a Bachelor of Science degree in Geology from the University of Kansas and seven years experience in property evaluation and exploration drilling in uranium mercury and lead deposits.

Only pages bearing my initials may be considered authentic.

Raymond J Garcia

DRILLING PROJECT PROCEDURE

ON THE

CINA MINE CLAIMS

RECEIVED DEC 13 1956 D.M.E.A.

SURVEY CONTROL AND GEOLOGIC MAPPING

Since the geology in the accompanying report is of a reconnaisance nature only, a program of mapping with alidade and plane table should be instituted to provide control for both drill hole placement and geologic structure correlation. This mapping should be superimposed over a previously laid triangulation net with permanent flagged stations close enough together to allow control over normal stadia distances (not over 1200 feet). Elevations (actual or reference) should be carried to all stations, substations and reference points. Accuracy should be limited to 1 foot in 100 feet horizontally and .10 feet in 100 feet vertically. Accuracy of this order is maintainable with alidade and plane table.

Geologic mapping should include all contacts, faults, joints, alteration, dips and strikes where available and other structural features such as hot springs or areas of associated mineral concentrations. Present roads and workings should be mapped in proper relationship to other features.

At completion of the mapping phase, first stage drill hole sites should be located with the instrument to allow for most efficient placement of access roads. Drills should be brought on the property as soon as enough sites are finished to allow the dozer to keep ahead of the drills in preparing future sites. Completed holes must be shot in accurately and plotted on a map.

DRILLING

First stage drilling will be done as such, solely to provide information to supplement or correct existing geologic

interpretations. At completion of these holes any indicated corrections in hole placement and depth estimation should be made and these changes submitted to the San Francisco office of the D.M.E.A. for approval.

Immediately on receipt of approval, if such is necessary, the balance of the drill sites should be prepared and drilling commenced to complete all the holes in the block. It is necessary, since ore bodies of chimney type as well as disseminated or blanket types may be present, that all holes on 100 foot centers be drilled. Discovery of ore in any holes should automatically be accepted to mean additional drilling on 50 foot centers to determine persistence and shape of the deposit. All hole depths are sufficient, in the light of present knowledge, to penetrate the brecciated limestone in the drag folds to any replacement or fracture fill ore that is likely to exist.

First stage drilling will total 4400 feet as follows:

No. of Holes	Depth	Totals
4	125	500
4	275	1100
7	400	2800
		4400

The remaining holes not including offset allowances total 15,350 feet. Total footage including first stage drilling, but not offsets, is 19,750 feet.

A total of 10,000 feet or about half the basic footage should be added for offset drilling on 50 foot centers in the event of ore discovery. This brings the total footage to

29,750 feet. The overall breakdown is as follows:

No. of Holes	Depth	Totals
35	125'	4375'
21	275'	5775'
24	400'	9600'
? Offsets	?	10000'
	Grand Total	29,750 feet

SAMPLING AND ASSAYING

Samples should be taken every two feet, examined with a hand lens, logged and carefully panned for cinnab ar. All samples having any "colors" whatsoever should be assayed. Correct depths must be recorded for all samples, whether mineralized or not. Logging should be done on a strip log with a vertical scale of 1 inch equals 10 feet and a total depth limit of 200 feet. The following features should be logged.

1. Rock type
2. Color
3. Texture
4. Alteration (if any)
5. Mineral content (if any)
6. Contamination (if any)
7. Drilling operations which might contribute to sample contamination or loss or loss of hole

Holes must be marked with a wooden or other suitable plug bearing the number of the hole.

Assaying should be done on the project using the thiocynate titration method. This, of course, will involve sample

preparation and the purchase of a laboratory size jaw crusher, a pulvizor, a sample splitter, set of pans and a set of screens of 10, 40 and 80 mesh complete with cover and bottom pan. Cost of this equipment and the necessary glassware and reagents to run 1000 assays is included on the enclosed estimate.

The Mine & Smelter Supply Co.

SALT LAKE CITY, UTAH DENVER, COLORADO EL PASO, TEXAS

This quotation is from our Salt Lake City Office Date August 28, 1956 19

RECEIVED DEC 18 1956

Your Inquiry

Our Quotation No.
Please Show This on Your Order

To United Development Company

Address 160 South State
Salina, Utah

F. O. B. Point Destination

Shipping Point Salt Lake City

Probable Date of Shipment

★CASH DISCOUNT TERMS—KEY—T - 2% 10 Days; TP - 2% 10th Prox.; I - 1% 10 Days; H - ½ of 1% 10 Days; F - 5% 10 Days; FP - 5% 10 Prox.; A - 3% 10 Days; N - Net 30.

Quantity	DESCRIPTION	Weight	List	Unit	Total List	Disc.	Amount	Cash Disc. ★
1 ea.	Laboratory Jaw Crusher MS330 with motor				370.00			N
	MS335 without motor				345.00			N
1 ea.	Pulverizer - 9-1/2 McCool Model "K" with motor				773.00			N
1 ea.	Sampler 8 x 10 MS2415				35.00			N
1 ea.	Tyler Sieve (L10040) 10-mesh				9.85			N
1 ea.	Ditto 40-mesh				9.85			N
1 ea.	Ditto 80-mesh				9.85			N
1 ea.	Cover for above (L10041)				2.90			N
1 ea.	Pan for above (L10043)				5.50			N
5 lb.	Cupric Oxide AR M-4832		2.69		13.45			I
5 lb.	Calcium Oxide AR M-4243		.97		4.85			I
1000	Test Tubes - Pyrex (A11134) 15 x 150 MM				47.33			N
1 ea.	Spatula, Chemical (A10112) 6"				1.50			N
7 lb.	Bottle Nitric Acid CP				3.05			I
100	Beakers (A950) 100 ML		.33	ea.	33.00			N
	Cont'd.							

All prices are exclusive of any tax which is now or may be assessed on the part of the Federal or State Governments and any such tax shall be paid by the purchaser.

Sales, contracts and quotations are made subject to the following terms: Stenographic and clerical errors subject to correction; prices subject to change without notice; quotations, unless otherwise stated, are for immediate acceptance and subject to prior sale; all agreements made contingent upon strikes, accidents and other causes beyond our control; our liability is limited to the value of the goods sold or furnished; if goods are defective we will not be responsible beyond the value of the defective piece at the factory; we will not be responsible for any damage, loss or expense occasioned by defective goods. Goods are not subject to return without our permission; if fault is clearly ours credit will be allowed in full, otherwise a handling charge of not less than 10% will be made. Reels, carboys and other containers not subject to discount and must be returned at your expense to point designated when credit will be allowed. Quotations are based on United States currency.

"Our prices contemplate cash, subject to the usual payment dates of regular customers. When buyer is not known to us from ledger record, a cash payment ample to cover all costs of transportation, packing, etc., should accompany order. C. O. D. shipments made only where parties are known to us. Where goods are special, full amount of quotation from parties unknown should accompany order. No cash discount unless so stated."

The Mine & Smelter Supply Co.

Salt Lake City
Branch

To United Development Company

Page No. 2 Quotation No. Date August 27, 1956

Quantity	DESCRIPTION	Weight	List	Unit	Total List	Disc.	Amount	Cash Disc.
1 gal.	Distilled Water				1.00			I
12 ea.	Droppers (A9420)				.35			N
4 oz.	Potassium Permanganate AR M-7068				.71			I
1 lb.	Hydrogen Peroxide AR M-5240				3.21			I
	Bottles - Dropping 125 ML A-2022			ea	1.30			N
5 lb.	Ferric Sulfate AR M-5036		1.26	lb	6.30			I
5 lb.	Potassium Thiocyanate AR M-7168		2.62		2.62		13.10	I
2 ea.	Burettes 100 ML A-2408		4.80		9.60			N
1 ea.	Wash Bottle A2108 32 oz.				1.60			N
2 ea.	Beakers (A950) 1000 ML		.90		1.80			N
1 ea.	Balance L-522 A150 (See Catalog)				19.15			N

THE MINE & SMELTER SUPPLY CO.

BY Don Anderson
DON ANDERSON - Quotation Clerk

RECEIVED DEC 13 1956 D.M.E.A.

PACIFIC MID-WEST GAS & OIL DEVELOPMENT CO.

Balance Sheet as of
11-30-56

ASSETS		LIABILITIES	
Mines - potential Value	$500,000.00	Accts & Notes Payable	$107,000.00
Oil leases - 6,000 acres, option on approx. 100,000 acres 8 producing wells	500,000.00	Stock issued	72,000.00
Equipment	100,000.00	Surplus	921,000.00
TOTAL ASSETS	$1,100,000.00	TOTAL LIABILITIES	$1,100,000.00

RECEIVED OCT 18 1946 GENERAL

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respectively.

2. Discussion of Gould rotary furnaces by Gould.
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3. Discussion of several flow sheets and methods-detailed descriptions.
U.S. Bureau of Mines Report of Investigations; no.3627; March, 1942.

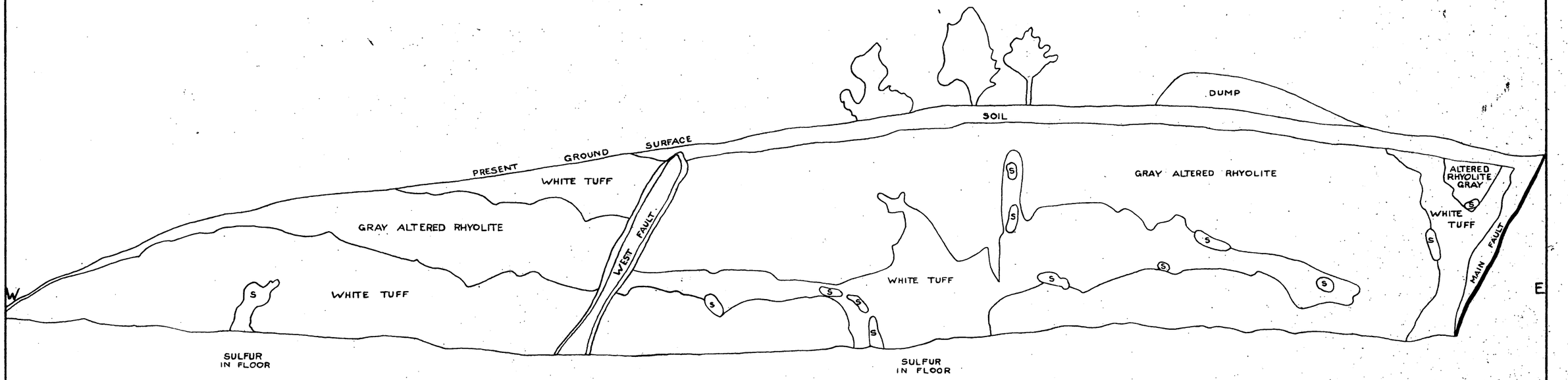
4. Report on problems and solutions on typical property.
Canadian Institute of Mining and Metalurgical Engineers Transactions; vol.48; pp.13-26; 1945.

5. Contains information and details on firing fuel consumption and an open ore feed system.
Mining Congress Journal; vol.29; no.6; pp.28-30; June 1943.

6. Description of good loss detection equipment and discussion of usual loss points.
Engineering and Mining Journal; vol.142; no.5; pp.50-51; May 1941.

Rgb

PLATE III



NORTH WALL OF OPEN CUT No. 2 SHOWING
SULFUR SPRINGS

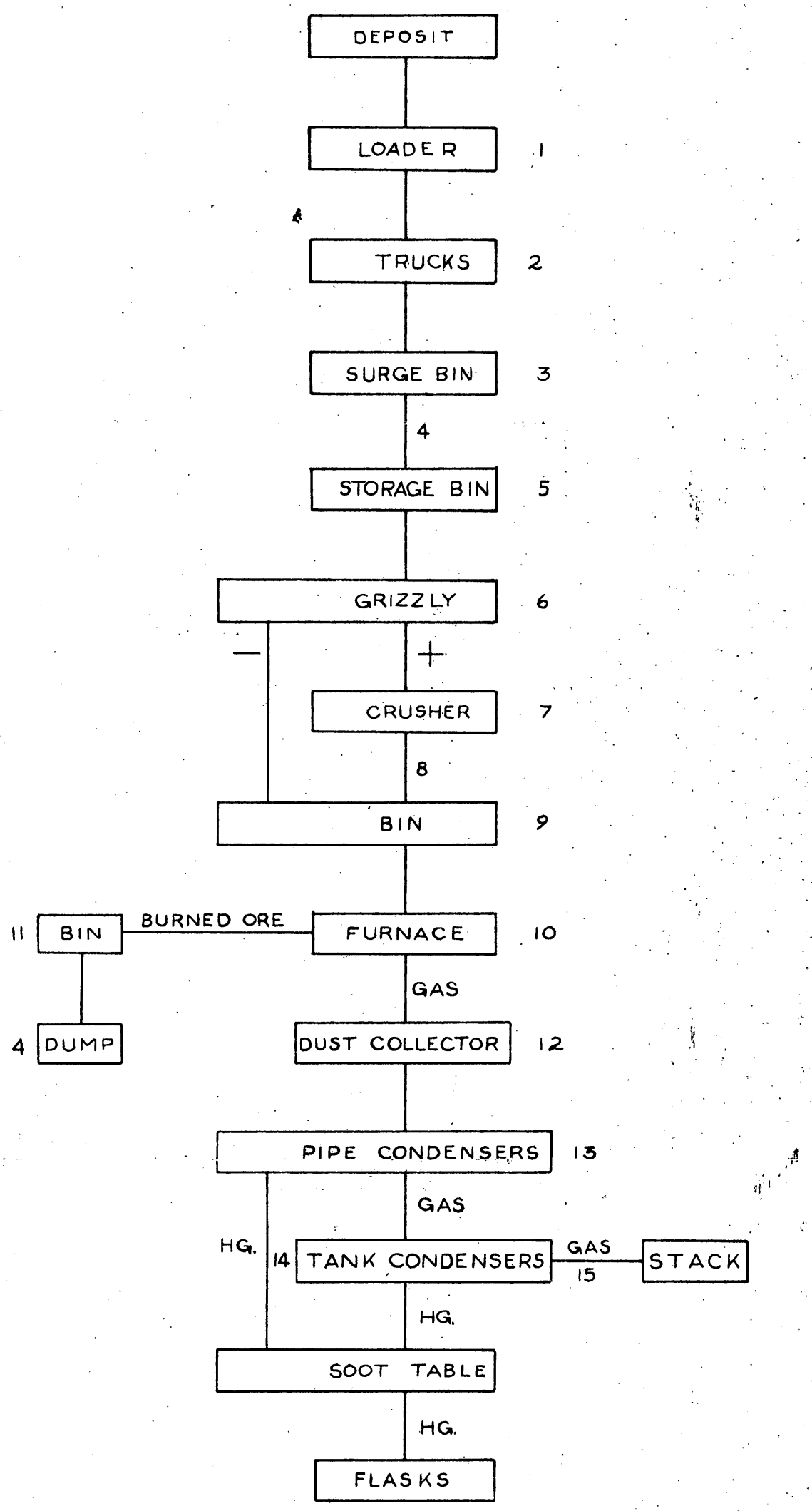
Explanation of Reduction Plant Sketch

Direction of flow is downward. Details such as water seals and sprinklers have been omitted. Capacity is rated at 100 tons per day.

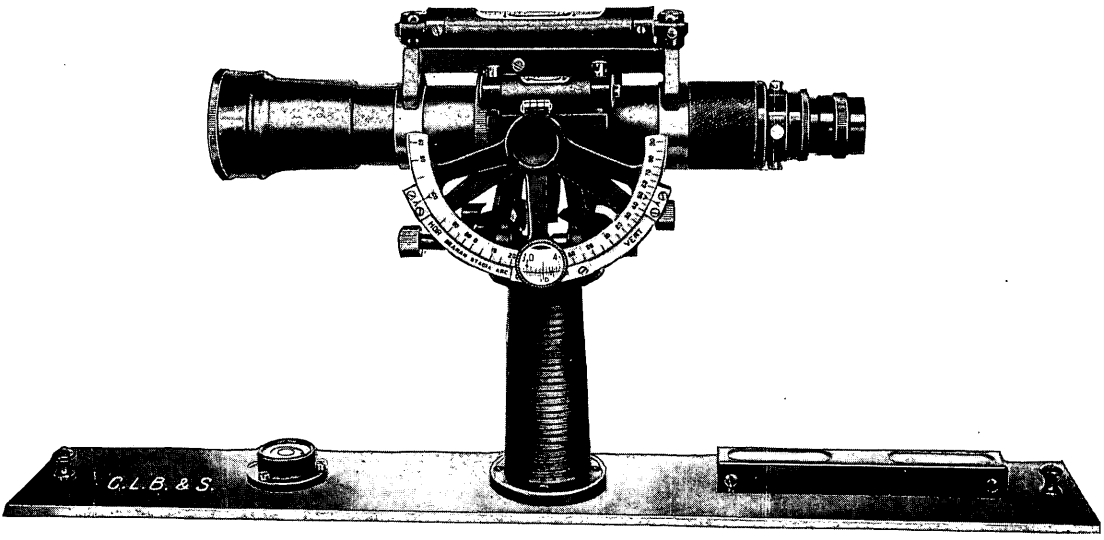
1. Gardner Denver loader
2. Chevrolet trucks, 2.5 cu. yd.
3. Concrete surge bin, 200 ton
4. Joshua Hendy end dump cars
5. Wooden storage bin, 100 ton
6. Steel grizzley, 2 inch openings
7. Joshua Hendy jaw crusher, 10 X 20 inch
8. Belt conveyor, 18 inch concave
9. Hopper bottom steel bin, 100 ton
10. Rotary furnace 4 X 64 feet, 1 rpm, oil fired, slope 3/4 inch per foot, temperature at firing zone 1100 deg.-1200 deg.F, at discharge 450 deg.F. This furnace rates 100 tons per day maximum.
11. Hopper bottom steel bin, 100 ton
12. Sirocco dust collector
13. Spun cast iron pipes 18 inch X 24 feet. Total length 720 feet connected by inverted U's at top and V's at bottom.
14. Redwood tanks, three 10 X 20 feet
15. Sirocco fan driven by Stirling variable speed motor

Mercury (Hg.) from condensers is caught in glazed earthenware jars and removed to soot table. Contents are raked through soot sprinkled with lime. Coalesced Hg. particles are drawn off through valve at table corner into flask on scale.

PLATE V



SKETCH OF MERCURY REDUCTION PLANT



Berger Alidade with Beaman Stadia Arc

(U. S. Geological Survey Type)

The Stadia Arc has an adjustable reading glass which can be detached.

Focusing is accomplished by means of a large knurled ring located near the eye end of the telescope.

The vernier arm of the 4-inch arc has a level attached at top for the ready control of zero of the vernier.

For Size and Particulars, as well as Extras, see opposite and pages 76-b, 77
Beaman Stadia Arc described on page 18. For Diagram, see Fig. 8, page 69

Alidade alone, (*Inverting* Telescope) Code Word: **APPLY**..... **Price $**
Alidade alone, (*Erecting* ") " " **APOWL**..... "

Other cuts of Arcs with their respective Verniers, see pages 68, 69

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Berger Alidades

(U. S. Geological Survey Type)
(For Explorers and Oil Geologists)

(For cuts of this Alidade see opposite page. For Extras see pages 76-b, 77)

Specifications

Graduations on Sterling Silver

Telescope *Inverting** (Interior Focusing System, pages 2–5). Length 9 inches, aperture 1 3/16 inches, power 14 dia. (For adjusting the line of collimation, the telescope can be revolved 180° on its longitudinal axis). Achromatic eyepiece with special focusing movement. Focusing of distant objects is accomplished by means of a knurled focusing ring revolving about the optical axis of the telescope. This ring is located near the eye end.

Stadia Wires Ratio 1:100 (Page 16).

Prism

Clamp to Telescope with Tangent Screw. (Threads of Clamp and Tangent Screws are of nickel silver, heads of brass. Screws are inserted in replaceable bushings).

Beaman Stadia Arc, 4 inches, having face graduations with a single vernier reading to minutes. Reads angles of elevation 25° and angles of depression 23°. For Diagram, see Fig. 8, page 69.

Adjustable Reading Glass for Beaman Stadia Arc.

Control Level to Vernier Arm, sensitiveness 60 seconds of arc for each 2 mm division; level protected by a revolvable guard. (This level is for the ready control of the zeros of arc and verniers when telescope is horizontal.)

Striding Level (detachable) 4 inches overall with finder sights, sensitiveness 60 seconds of arc for each 2 mm. division, (level protected by a revolvable guard).

Ruler Length 11½ inches, width 3¼ inches, thickness 9/64 inches, chrome plated on bottom, with Special Graduated Scales on beveled edges of ruler, one edge graduated to 50 parts to the inch, and one edge 4 inches to the mile.

Circular Spirit Level mounted on Ruler.

Box Compass located on center line of ruler under eye end of telescope. Magnetic Needle 4 inches long. (Cover of compass is removable for balancing of needle).

Height of Alidade 3½ inches.

Instrument Leather Finished (some parts lacquered).

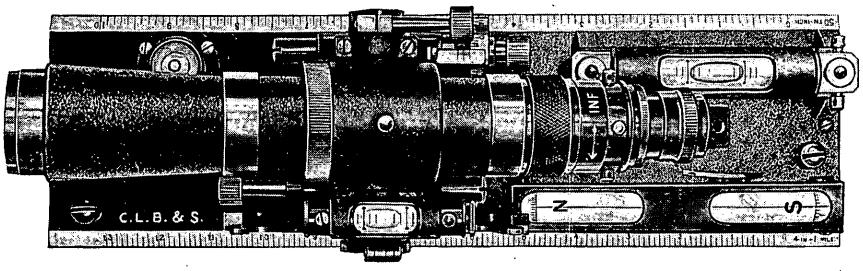
Leather Case, size about 12⅝" x 4¼" x 4½" overall, with shoulder strap; containing sunshade, adjusting pin, hand reading glass and screwdriver.

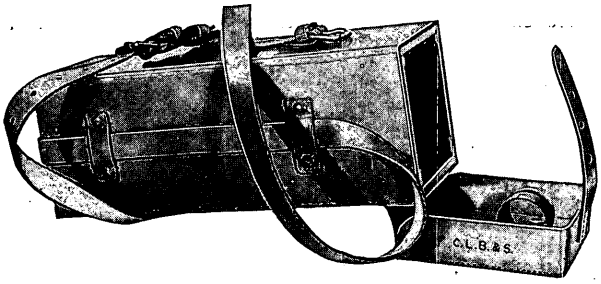
Weight of Alidade about 4¾ lbs.

Weight of Alidade in case about 7 lbs.

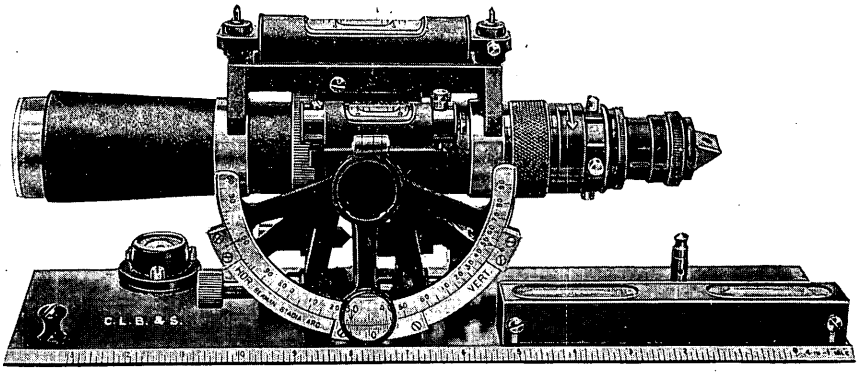
Code Word: **APERN** (*Inverting* Telescope) ..... **Price $**
" " **APIZE** (*Erecting* ")* ..... "

For Synopsis Table of Alidade Telescopes, page 5
Extras to Alidades **APERN** *and* **APIZE**, *pages 72, 76-b, 77*
Plane Table Lower Motions and Tripods, pages 70, 72, 76-b, 77
Boards and Canvas Cases, pages 71, 76-b, 77





Leather Case with Straps



Berger Explorer's Alidade with Beaman Stadia Arc

(U. S. Geological Survey Type)

The Stadia Arc has an adjustable Reading glass which can be detached.

Focusing is accomplished by means of a large knurled ring located near the eye end of the telescope.

The vernier arm of the 4-inch arc has a level attached at top for the ready control of zero of the vernier.

For Size and Particulars, as well as Extras, see opposite and pages 76-b, 77
Beaman Stadia Arc described on page 18. For Diagram, see Fig. 8 page 69

Alidade alone, (*Inverting* Telescope) Code Word: **APERN**..... **Price $**
Alidade alone, (*Erecting* ") " " **APIZE**..... "

Other cuts of Arcs with their respective Verniers. (see pages 68, 69)

ALIDADE
TRIPOD
24 x 31 [illegible]
#6 [illegible]
12 SHEETS SNGMT
VERDURE GREEN 2 [illegible]
PHOTO BLUE 15'
STADIA ROD 46 [illegible]
$ 755.18

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Arcs and Verniers for Berger Alidades

Sterling Silver Graduations

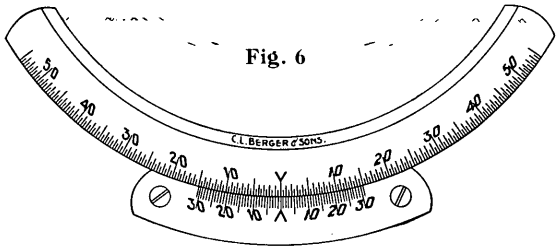


Fig. 6

(Customary Style)

4½″ Vertical Arc having Face Graduations with **Double** Verniers reading to minutes.

(*See Alidades* **APAMY, APCUP** *in Table, page 72*)

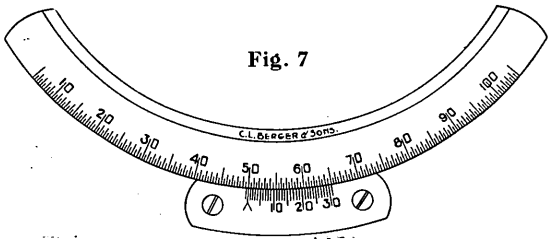


Fig. 7

4½″ Vertical Arc having Face Graduations with a **Single** Vernier reading to minutes.

(*See Alidades* **APASS, APCȲA** *in Table, page 72*)

Arcs and Verniers for Berger Alidades

(with Beaman Stadia Arc)

For a general description of this Stadia Arc see page 18.

Sterling Silver Graduations

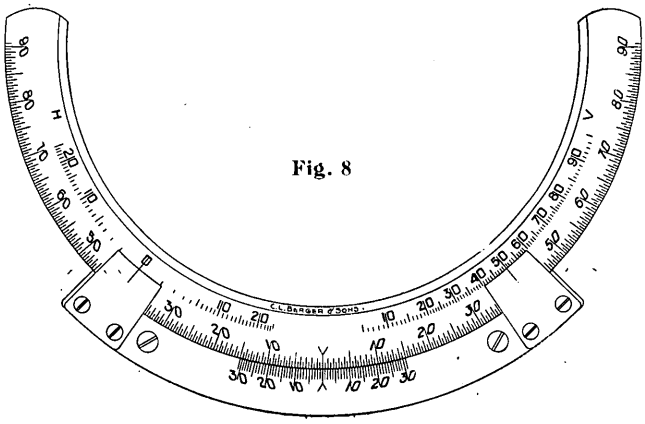


Fig. 8

Customary Style

4½″ Vertical Arc and with a Beaman Stadia Arc having Face Graduations with **Double** Verniers reading to minutes. Stadia Arc has **two** indices.

(*See Alidades* **APATE, APGAM,** *in Table, page 72*)

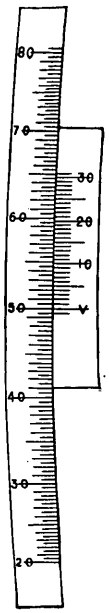


Fig. 11

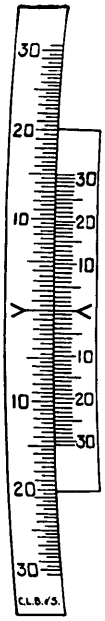


Fig. 12

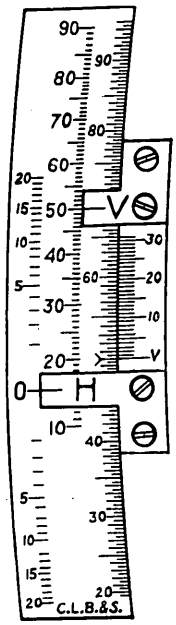


Fig. 13

Fig. 11—5″ Vertical Arc having Edge Graduations with a **Single** Vernier reading to minutes.

(*See Alidades* **APAZI, APTOS** *in Table, page 72*)

Fig. 12—5″ Vertical Arc having Edge Graduations with a **Double** Vernier reading to minutes.

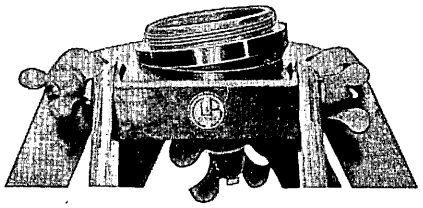
(*See Alidades* **APCOD, APPEG** *in Table, page 72*)

Fig. 13—5″ Beaman Stadia Arc having Edge Graduations with a **Single** Vernier reading to minutes. Stadia Arc has **two** indices.

(*See Alidades* **APCIN, APRET, APONO, APLAT, APENA, APFLO** *in Table, page 72*)

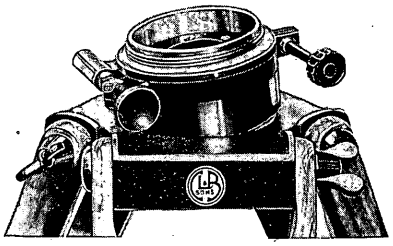
Berger Lower Motions for Alidades

(See Code Words **ASOAK*, ASTRA, ASPEN,** *on pages 76-b, 77)*
Instrument Screw for Drawing Boards has 8 threads



***Berger (Johnson) Lower Motion (without Clamp and Tangent Screw)**

Drawing Board 24″ x 31″ with Canvas Case.
Code Word: **ASOAK** ..... $
For Tripod with extension legs see page 12 ..... $

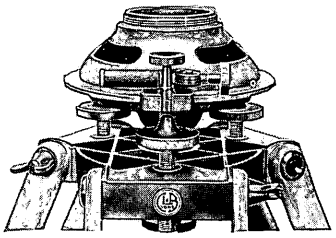


Berger (Johnson) Lower Motion (with Clamp, Tangent Screw and Opposing Spring Plunger)

Drawing Board 24″ x 31″ with Canvas Case.
Code Word: **ASTRA** ..... $
For Tripod with extension legs see page 12 ..... $

Non-Extension Tripod Leg
(View from Front)

Non-Extension Tripod Leg
(View from Side)



Berger Lower Motion

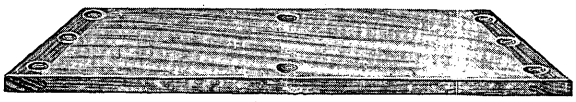
With Rim Clamp, Tangent Screw, and Opposing Spring Plunger
Three Screw Leveling Base with Instrument Fastener

Drawing Board 24″ x 31″ with Canvas Case.
Code Word: **ASPEN** ..... $

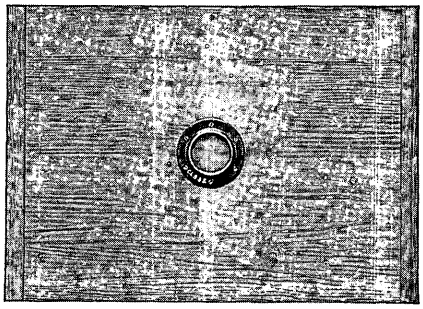
* **Lower Motion "ASOAK"** can be supplied with an Instrument Screw on top of the ball piece having a diameter of ⅝″ instead of the present screw which is 3½″ when it is desirable to attach a Board having the instrument nut as formerly supplied.
Code Word: **ASBET** ..... $

Alidades see pages 60–67. Arcs and Verniers see pages 68, 69

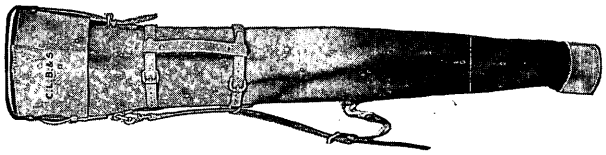
Berger Drawing Board, Canvas Cases and Umbrella



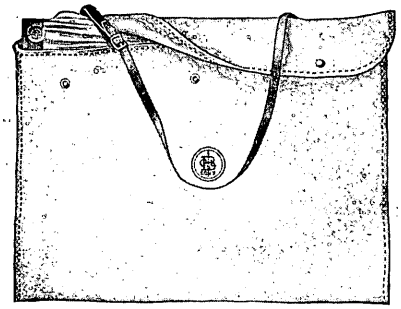
Drawing Board (Top View)



Drawing Board (view from beneath)



Canvas Case for Tripods with Lower Motions
Code Word: **CLELI** $



Canvas Case with Shoulder Strap for Drawing Board

Surveyor's Umbrella
TYCUM ..... $

The Plane Table Board (usual size) 24 x 31 inches is made of seasoned pine of 1″ stock, cleated on the ends, well made, and free from warpage. The eight milled screws used for fastening the paper to the drawing board, when in position, are below the level of the paper. Boards can also be furnished with bottom cleats.

Other Boards and Canvas Cases, see page 76-b, 77
Lower Motions see pages 70, 72, 76-b, 77
Alidades, see pages 60–67. For Arcs and Verniers, see pages 68, 69

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TABLE OF BERGER ALIDADES AND PLANE TABLES

(Telescopes have Interior Focusing)

(For Size, Weight and Particulars as well as Extras, see pages 60–67, 68, 69, 76-b, 77)

SPECIFICATIONS OF ALIDADES All Alidades listed in the table have telescopes with Interior Focusing (see pages 2–5)	ALIDADE ALONE		PLANE TABLE (Alidade, Tripod, Berger-Johnson Lower Motion without Clamp and Tangent, Board, Canvas Case)	
	Telescope		Telescope	
	Erect	*Invert*	*Erect*	*Invert*
	Codeword	Codeword	Codeword	Codeword
Alidade with 4½″ Vertical Arc has **Face** Graduations with a **Double** Vernier reading to minutes. (See Page 61 and Fig. 6, page 68.)	APAMY $	APCUP $	APACH $	APIUM $
Alidade as above, with Vertical Arc, but having a **Single** Vernier reading to minutes. (See Page 68, Fig. 7)	APASS $	APCYA $	APAGT $	APLAS $
Alidade with 4½″ Vertical Arc has **Face** Graduations, and with a Beaman Stadia Arc with **Double** Verniers reading to minutes. (See page 69, Fig. 8)	APATE $	APGAM $	APALA $	APLOM $
Alidade with Beaman Stadia Arc as above, but with Vertical Arc having a **Single** Vernier reading to minutes.	APAYO $	APGIE $	APEPS $	APOCO $
Alidade with 5″ Arc has Berger **Edge** Graduations with **Single** Vernier reading to minutes. (See Fig. 11, page 69)	APAZI $	APTOS $	APPAR $	APODE $
Alidade as above, with Vertical Arc but having a **Double** Vernier reading to minutes. The Zeros of Arc and Verniers coincide when telescope is horizontal. (See Fig. 12, page 69)	APCOD $	APPEG $	APHAN $	APOTH $
Alidade with 5″ Beaman Arc has an **Edge** Graduation with a **Single** Vernier reading to minutes. (See page 63 and Fig. 13, page 69)	APCIN $	APRET $	APHEL $	APSIS $
Alidade with 4″ Vertical Arc has **Face** Graduations, and with a Beaman Stadia Arc with **Single** Verniers reading to minutes. (See page 65 and Fig. 8, page 69)	APOWL $	APPLY $	AKALE $	ALCEA $
Alidade as above, with 4″ Beaman Stadia Arc **Edge** Graduation with a **Single** Vernier reading to minutes (see Fig. 13, page 69)	APONO $	APLAT $	APTON $	APTAO $
Alidade with 4″ Vertical Arc has **Face** Graduations, and with a Beaman Stadia Arc with **Single** Verniers reading to minutes. (See page 67.)	APIZE $	APERN $	ALPEC $	ATRAK $
Alidade as above, with 4″ Beaman Stadia Arc **Edge** Graduation with a **Single** Vernier reading to minutes (See Fig. 13, page 69)	APENA $	APFLO $	APLUA $	APTEA $

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(12-56)

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Date	Surname	Code
6-21	Hopkins	400
6-21	Martin	400
		180
6/24	Yopp	130
6/24	Nelson	130
6/24	Selbudge	130
"	Johnson	100
"	Mittendorf	100
		225

JUN 24 1957

Pacific Midwest Gas and Oil
Development Company, Inc.
170 South State Street
Salina, Utah

Re: Docket No. DMEA 4571 - Mercury
Cinna (Cina) Mine claims
Iron County, Utah

Gentlemen:

Your application for aid for an exploration project and other data available to us in Washington relative to the above-named property have been carefully reviewed.

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

Careful study of our information indicates that, although mercury mineralization occurs on the property, the probability of disclosing minable ore reserves is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

Your interest in the Defense Minerals Exploration Administration program is greatly appreciated. Thank you for bringing this property to our attention.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

JHopkins/dlm 6-20-57
cc to: Docket
Code 400
Adm. R. File
Oper. Comm.
FT. REG. III
Messrs. J. W. Pennington, USBM
T. H. Kiilsgaard, USGS

8623

DMEA Form 7
(12-56)

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Date	Surname	Code
6-21	Hopkins	400
6-21	Martin	400
		110
		100

June 21, 1957

MEMORANDUM

To: Administrator

From: Division of Iron and Ferro-Alloys

Subject: Denial of the subject application for exploration assistance in the amount of $290,000.00
Docket No. DMEA 4571 - Mercury
Pacific Midwest Gas and Oil Development Co. Inc.
Cinna claims
Iron County, Utah

Denial of the subject application is recommended by this Division on the following information:

The applicant on December 1, 1956, requested exploration assistance in the amount of $290,000.00 to conduct a churn-drilling project. A field examination was made March 20, 1957, by F. B. Moore, U. S. Geological Survey and M. M. Gilkey, U. S. Bureau of Mines, accompanied by Howard Albrecht who represented the applicant. The property was reexamined April 17, 1957, by the same personnel.

Applicant: Pacific Midwest Gas and Oil Development Co. Inc.
170 South State Street, Salina, Utah

Property: The property consists of nine contiguous unpatented lode mining claims, the Cina Mine No. 1 through 9, located in secs. 5 and 6, T. 31 S., R. 15 W., Salt Lake Base and Meridian.

Name	Date of location	Date of Recording
Cina (Cinna) Mine No. 1	8/20/49	8/22/49
2	8/20/49	8/22/49
3	8/20/49	8/22/49
4	8/20/49	8/22/49
5	8/20/49	8/22/49
6	8/25/49	8/30/49
7	8/25/49	8/30/49
8	8/25/49	8/30/49
9	8/25/49	8/30/49

Geology: The Cina cinnabar deposit occurs along a N 30 degrees E. striking fault between rhyolite and limestone. The rhyolite is highly altered while the limestone shows very little alteration.

8623

The cinnabar occurs in thin seams parallel to the main fault, in narrow fractures in the rhyolite and as disseminations in the rhyolite. It occurs as the result of fumarolic or hot springs action.

Although large (2000 feet long) the deposit is everywhere low in grade and there is no geologic evidence that the grade will be appreciably better at greater depths.

Workings: The claims were locatd in 1949. The only evidence of early exploratory work is a 12 - foot inclined shaft. Recent work consists of rather extensive surface excavations. Pits as deep as 30 feet have been excavated by bulldozing at the reported cost of $37,000.00.

Reserves: There has been no production from the property. Sampling of the pits by the examining engineers indicates that there are no known ore reserves.

Comments and Conclusions:

Weak, sporadic mercury mineralization, in a shattered fault zone in highly altered rhyolite and tuff is exposed in surface excavations on Cina mine claims Nos. 1 and 2.

The Field Team recommended that the request for Government assistance be denied on the basis of the weakness of the mineralization and the lack of evidence of the possibility of improvement in depth, as well as the anticipated high cost and ~~the~~ unsatisfactory results of the applicant's proposed drilling program.

The Commodity Divisions of the Geological Survey and the Bureau of Mines concur in the recommendation.

W S Martin

W. S. Martin, Director
Division of Iron and Ferro-Alloys

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

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DATE		CODE
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6/10	WSM	400

June 7, 1957

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: Assistant Chief, Branch of Base Metals

Subject: Review of Field Team Examination Report, Docket No. DMEA 4571 (mercury), Pacific Midwest Gas and Oil Development Company, Inc., Cina Claims, Iron County, Utah

The applicant proposed to explore for mercury mineralization by 29,750 feet of churn drilling in three stages at an estimated total cost of $290,000.

Examination of the property showed that mercury mineralization exposed in surface excavations on Cina mine claims No. 1 and 2 is weak and sporadic. Furthermore, there is lack of evidence that the mineralization will improve with depth.

Because of the indicated lack of mineralization and the anticipated high costs and unsatisfactory results of the proposed drilling, the Field Team recommends denial of the application for Government assistance.

I concur with that recommendation.

J. W. Pennington

J. W. Pennington

Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U.S.G.S.
F. D. Lamb
F i l e s

IN REPLY REFER TO:

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DATE	INITIALS	CODE
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6/10	WSM	400

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

June 6, 1957

Re: DMEA 4571
Pacific Midwest Gas & Oil
Development Company
Cina Mine Group
Iron Co., Utah
$290,000.00 - Mercury

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

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

Subject: Review of Field Team Report.

The applicant requested assistance in mapping and drilling a 2000-foot mercury-bearing fault zone. Low grade mercury mineralization is found in the rocks of the footwall of the zone.

The low grade material shows for 2,000 feet. Several cuts and shallow pits have been excavated in the footwall rocks and show the low grade material, but sampling indicates the quantity of ore grade material is very limited. In the opinion of the examiners, there is no reason for expecting better grade material with depth.

The examiners and the Field Team recommend that the application be denied.

I concur with the recommendation.

N. E. Nelson

N. E. Nelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
224 New Customhouse
Denver 2, Colorado

June 3, 1957

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DATE	INITIALS	CODE
6/5	JWB	220
		130
6/10	C	220
6/10	WSM	400

Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region III

Subject: Docket DMEA-4571 (Mercury) Pacific Midwest Gas and Oil Development Company, Inc. (Cina claims) Iron County, Utah - Reports of Examination

Enclosed are the original and three copies of the Reports of Examination on the subject property by M. M. Gilkey, USBM, and F. B. Moore, USGS.

The field examiners conclude that the probability for making a significant discovery is not sufficiently promising to justify Government participation. Accordingly, they recommend that the Applicant's work proposal be denied to which the Field Team concurs.

E. N. Harshman

By E. N. Harshman
Acting Executive Officer

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
6-7-57
(date)

ON SITE EXAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
1600 EAST FIRST SOUTH STREET
SALT LAKE CITY 1, UTAH

DMEA
DEPARTMENT OF THE INTERIOR
MAY 31 1957
REGION III
DENVER, COLORADO

May 29, 1957

Memorandum

To: E. N. Harshman, Acting Executive Officer, DMEA Field Team, Region III

From: Supervising Mining Engineer

Subject: Docket No. DMEA-4571 (Mercury), Pacific Midwest Gas and Oil Development Co., Inc., Cinna (Cina mine) claims, Iron County, Utah

Enclosed are nine copies of an engineering report covering examination of the Cinna mercury claims in Iron County, Utah. The examination was made by M. M. Gilkey jointly with F. B. Moore, Geological Survey.

The applicant has requested Government assistance to conduct a churn-drilling project estimated to cost approximately $290,000. Rocks in the immediate vicinity of the property are composed of Cambrian limestone and younger extrusive rocks. Mercury mineralization occurs in sheared volcanic debris in a northeasterly striking fault zone. A wide zone of the extrusive material has been affected by alteration. Mineralization appears to have originated with hot-spring activity.

The examining engineer believes that mercury mineralization on the Cinna claims is not sufficiently intense to warrant Government participation in exploration. The proposed churn drilling would be high-cost exploration because of the extreme ground conditions. Gilkey recommends that the applicant's request for aid be denied. I am in accord with this recommendation.

A copy of the brochure is returned herewith.

Stephen R. Wilson

Stephen R. Wilson

Enclosure

cc: J. B. Clemmer

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DATE	INITIALS	CODE
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		220

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JUN 3 1957

Reviewed by
DMEA OPERATING COMMITTEE
6-7-57
(date)

FOR UNITED STATES GOVERNMENT USE ONLY

DMEA
DEPARTMENT OF THE INTERIOR
MAY 31 1957
REGION III
DENVER, COLORADO

PACIFIC MIDWEST GAS AND OIL DEVELOPMENT CO., INC.
CINA MINE CLAIMS
IRON COUNTY, UTAH
DMEA-4571
Mercury

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DATE	INITIALS	CODE
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Engineering Report

By M. M. Gilkey
Mining Engineer
Bureau of Mines

TRANSMITTED
JUN 3 1957

May 22, 1957

Reviewed by
DMEA OPERATING COMMITTEE
6-7-57
(date)

PACIFIC MIDWEST GAS AND OIL DEVELOPMENT CO., INC.
CINA MINE CLAIMS
IRON COUNTY, UTAH

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ILLUSTRATIONS

Fig. 1 Location map, Pacific Midwest Gas and Oil Development Co., Inc., Cina Mine claims, Iron County, Utah
Fig. 2 Claim map
Fig. 3 Plan showing proposed churn drill holes for Stages I and II

SUMMARY

The Cina Mine mercury property in Iron County, Utah, was examined by DMEA personnel in March and April 1957 to appraise a request for Government assistance in exploration. A project proposal was submitted by Pacific Midwest Gas and Oil Development Co., Inc., under docket No. DMEA-4571. Total estimated cost of the project is not given in the application. On the basis of itemized costs submitted, the total estimated cost is approximately $290,000.

The property is situated in an easily accessible area 43 miles by road southwest of Milford, Utah. The climate is favorable for year-round project operations.

Nine unpatented lode mining claims, Cina Mine claims Nos. 1 through 9, are included in the proposed project area. The property is held by the applicant under an assignment of a lease.

There has been no production from the claims, and there are no known ore reserves. Existing workings consist of five open pits and one shallow prospect shaft.

The claims lie in a low range of hills in an area of Cambrian sedimentary rocks and more recent extrusive igneous rocks. Cinnabar occurs sporadically in a northeasterly striking fault zone in highly altered and bleached rhyolite and tuff, in the vicinity of a limestone and shale footwall. The porosity of the host rock and near-surface position of the exposed areas of mineralization are factors favorable to deposition of cinnabar. Assays of 15 DMEA samples, however, indicate low-intensity mineralization. The highest grade sample, a selected sample of a 2-inch

stringer, assayed 0.32 percent mercury. (Minimum minable grade with a mining width of cinnabar ore is usually about 0.50 percent mercury.) Exposures of cinnabar on the property are found principally in pits Nos. 1 and 2.

The proposed exploration consists of 29,750 feet of churn drilling in three stages. Estimated depths of the holes range from 125 feet to 400 feet. Two drilling areas are to be explored: the above-mentioned fault zone and an "opalite cap." The latter area is not known to be mineralized. Length of the proposed drilling area along the fault zone is 2,000 feet. A grid pattern on 100-foot spacing is specified for 19,750 feet of the drilling. Fifty-foot spacing to delimit ore bodies is proposed for the remaining 10,000 feet.

Overall estimated unit cost of the churn drilling is $9.75 a foot, assuming a project of 16 months' duration. High cost is to be expected, considering the nature of the ground. The applicant states that drilling contractors have declined an offer of a contract in the project area, at a price of $10 a foot.

It is recommended that the requested Government aid be denied, primarily because of the weakness of the mercury mineralization.

INTRODUCTION

Pacific Midwest Gas and Oil Development Co., Inc., submitted an application, under docket No. DMEA-4571, dated December 1, 1956, for Government assistance in an exploratory project on the Cina Mine mercury claims in Iron County, Utah. The property was examined March 20, 1957, by F. B. Moore of the Geological Survey and M. M. Gilkey of the Bureau

of Mines. Howard Albrecht represented the applicant. Because of the extent of the mineralized zone and erratic distribution of mineralization, the above-mentioned Government personnel reexamined the property on April 17, 1957.

The proposed exploration consists of 29,750 feet of churn drilling. Total estimated cost of the proposed project has not been computed by the applicant. From detailed cost estimates presented in the application, and on the basis of an estimated 16 months' duration of the project, the total estimated cost is approximately $290,000. Inasmuch as the property does not warrant DMEA exploration and the examining team recommends denial of the application, no attempt has been made to modify the proposed program or to revise the cost estimate.

LOCATION

The property is situated in secs. 5 and 6, T. 31 S., R. 15 W., S.L.B. and M., in the northwestern part of Iron County, Utah, near the Beaver County line (fig. 1). From Lund, Utah, a shipping point on the Union Pacific Railroad, the property lies to the northwest approximately 11 airline miles, or 23 miles by dirt road. Access to the property from the Salt Lake City, Utah, area (from the northeast) is through Milford, Utah (population 1,673), also on the Union Pacific Railroad, and the nearest source of supplies.

The property is reached from Milford by driving 37.7 miles southwesterly on a good, graded, dirt road ("Cougar Spar" road) to a conspicuous reseeded area, thence 5.3 miles southerly on an unimproved road to the Cina Mine claims. Directions at road junctions are as follows:

Travel westerly from Milford 1.9 miles; thence left (southerly) 16.6 miles; thence right (westerly) 13.5 miles to Adams's Well (from this point a connecting road leads southerly 12 miles to Lund, Utah); thence (from Adam's Well) right (northerly) 5.7 miles to reseeded area; thence left (southwesterly through gate and continue 4.0 miles southerly to airplane landing strip; thence left (easterly) 1.3 miles to Cina Mine pit No. 1. Total distance from Milford is 43.0 miles.

TOPOGRAPHY AND CLIMATE

Relief in the vicinity of the Cina Mine claims is moderate to low. Altitudes range from 6,500 feet to 7,000 feet, approximately. The mineralized area lies along the gently sloping west flank of a low, northerly trending, juniper-covered range of hills.

Vegetation in the area includes a heavy growth of juniper trees, some pinon and yellow pine, and sagebrush.

The climate is favorable for year-round operation of a project. The nearest source of water is reported to be at Adam's Well, 11 miles distant on the road to Milford, Utah.

OWNERSHIP AND EXTENT

The property involved in the proposed project consists of nine contiguous, unpatented lode mining claims, the Cina Mine Nos. 1 through 9 (see fig. 2).

The claims are owned by Gail P. Buffington, George C. Bush, Horace L. Carter, and Harold V. Howard, and are recorded at Parowan, Utah, as shown in the following tabulation:

Name	Date of location	Date of recording
Cina (Cinna) Mine No. 1	8/20/49	8/22/49
2	8/20/49	8/22/49
3	8/20/49	8/22/49
4	8/20/49	8/22/49
5	8/20/49	8/22/49
6	8/25/49	8/30/49
7	8/25/49	8/30/49
8	8/25/49	8/30/49
9	8/25/49	8/30/49

The property is leased to United Development Co., Inc., and is held by the applicant, Pacific Midwest Gas and Oil Development Co., Inc., under a lease assignment dated June 29, 1956. Expiration date of the lease is not known, as no copy of the lease is attached to the application.

HISTORY, PRODUCTION, AND ORE RESERVES

The claims were first located in 1949. The only observed remaining evidence of early exploratory work consists of a 12-foot-deep, inclined prospect shaft sunk in the mineralized zone on claim No. 2. This work is reported to have been done in 1950. Recent work consists of rather extensive surface excavation in the five areas indicated on figures 2 and 3. The largest pit, as to volume of material removed, is pit No. 2, which is approximately 30 feet deep near its east end. In pit No. 1, the second in size, a maximum of approximately 15 feet of surface material has been removed. Mr. Albrecht stated that much of the material is so compact that blasting is required before bulldozing is possible. He also estimated that excavation of the five pits cost a total of $37,000.

There has been no production from the property and there are no known ore reserves.

GENERAL GEOLOGY AND DESCRIPTION OF THE DEPOSITS

The Cina Mine claims are situated in low hills near the eastern extremity of the Basin and Range Province. Characteristic of the Basin and Range Province is a series of north-south-trending ranges rising above broad, flat desert valleys. Rocks forming the ranges may be sedimentary, intrusive, or extrusive, or a combination of two or all three of these types. Rocks exposed in the vicinity of the Cina Mine claims are principally Cambrian limestone and younger extrusive igneous rocks.

Cinnabar is exposed on Cina Mine claims Nos. 1 and 2, in pits Nos. 1, 2, and 4, and a 12-foot prospect shaft (figs. 2 and 3). The mineralization occurs in sheared volcanic material in a northeasterly striking fault zone. The southeast side of the fault zone, or footwall, is in contact with limestone and shale beds which dip gently to the north. Dip of the fault contact is to the northwest and averages approximately 50°.

Alteration of the limestone and shale appears to be limited generally to the immediate vicinity of the contact, but in the volcanic material a wide zone is affected. In pit No. 2, overburden has been removed to expose a width of approximately 200 feet of highly bleached rocks inferred to be alteration products of rhyolite and tuff. (Comparatively unaltered rhyolite outcrops on Cina Mine claim No. 3). The jumbled igneous material in the fault zone is light gray to white, and varies in degree of consolidation (or disintegration) from loose sand to compact pseudostrata. The relatively firm material contains numerous holes, usually a few inches

in diameter, that are apparently of hot-spring origin. Siliceous sinter is present in irregular masses several feet in width.

Minerals occurring in the deposit in considerable quantity, often intimately associated with the cinnabar, include native sulfur, chalcedony, and gypsum. The gypsum occurs principally near the limestone footwall. The sulfur, in lenticular and veinlike bodies ranging from a few inches to 3 feet in thickness, and the chalcedony, generally in 1- to 2-inch ribs and as incrustations, are not restricted in occurrence to the vicinity of the footwall. The type of mineralization, presence of hot-spring cavities and siliceous sinter, and the bleached and altered condition of the volcanic material, indicate that the deposit is of aqueous origin.

The cinnabar tends to be concentrated near the sedimentary footwall of the fault zone, although small amounts of the mineral are disseminated in the altered rhyolite and tuff as far away as 30 or 40 feet. Little is visible, however, beyond 10 feet from the footwall. The individual concentrations of cinnabar are commonly in the form of irregular, erratically distributed streaks and small lenses in the porous rock and loose sand. Few areas of continuous visible mineralization exceed 2 feet in length. The mineral has its characteristic scarlet color with an earthy luster. It appears that the cinnabar tends to occur in the form of a thin coating on the rock particles, inasmuch as assays of samples are considerably lower than might be expected from visual examination.

A total of 15 samples was cut by the examining team in the mineralized areas, which are sporadically distributed along approximately 1,000 feet of the fault zone. No cinnabar was noted south of pit No. 4. Locations and assays of the samples are given in figure 3. Only four contain an appreciable amount of mercury. These four, selected samples of small concentrations of cinnabar representing the highest grade of mineralization observed on the property, are described below:

Sample No.	Description
DMEA-9	(0.32 percent Hg), from pit No. 1, was cut from a 2-inch stringer through loose, fault breccia and gouge in the immediate vicinity of the footwall of the fault zone.
DMEA-13	(0.15 percent Hg), from pit No. 2 at ± 30 feet below the surface, represents a lenticular occurrence of cinnabar-stained, sandy material about 1 foot in greatest cross-sectional dimension, approximately 8 feet from the footwall.
DMEA-14	(0.07 percent Hg), from 12-foot inclined prospect shaft on Cina Mine claim No. 2, at 10 feet below the surface, is a 6-inch channel sample taken at the south end of the shaft, across mineralized streaks parallel to and approximately 2 feet from the footwall.
DMEA-15	(0.27 percent Hg), from pit No. 4, is a sample of a 2-foot chunk of cinnabar-stained, siliceous sinter. (No other mercury mineralization was noted in pit No. 4.)

Outstanding characteristics of the deposit are the weakness of the mercury mineralization, the limited extent, irregularity and erratic distribution of individual mineralized areas, and the high degree of alteration of the volcanic host rock.

PROPOSED EXPLORATION AND COSTS

Drilling Program

Exploration proposed by the applicant consists of 29,750 feet of churn drilling in three stages. Estimated depths of the holes range from 125 feet to 400 feet. The locations of 80 holes, spaced at 100-foot centers and totaling 19,750 feet, are shown in figure 3. The remaining 10,000 feet is for offset drilling on 50-foot centers, to delimit ore bodies penetrated by the first 80 holes. The program is designed to explore the fault zone and penetrate the underlying northwesterly dipping sedimentary footwall, and to explore an "opalite cap" area lying to the west of the fault zone. Three lines of holes shown in the area of the fault zone are 35 feet, 135 feet, and 235 feet, respectively, from the footwall, and extend approximately 2,000 feet parallel to the fault.

First-stage drilling, consisting of 15 holes totaling 4,400 feet, is intended primarily for geologic information in both the fault zone and the opalite-cap area. The 15 holes are distributed throughout the two drilling areas.

Drilling proposed for Stages II and III totals 25,350 feet. Apparently the 10,000 feet of offset holes is considered third-stage drilling, but for operational reasons, this might, in part at least, be accomplished during the time the second stage is in progress. The second-stage work presumably consists of 65 of the holes shown on the applicant's map, or 15,350 feet of drilling. Stage II is designed to complete the grid pattern at 100-foot spacing initiated in Stage I.

Costs

The applicant has not computed the total estimated cost of the proposed project. Based on the unit costs submitted, and allowing 16 months for completion, the project would cost approximately $290,000. For the proposed total footage of 29,750 feet, the overall unit cost would be $9.75 a foot, an unusually high figure for churn drilling.

Three categories of work included are building construction, geologic mapping, and drilling and related operations. Several of the estimated costs are excessively high; for example, the item, "Supervisor 10 days each month at $800 per month." The proposed purchase of equipment for assaying at the site of the project would probably result in extremely high costs for this item.

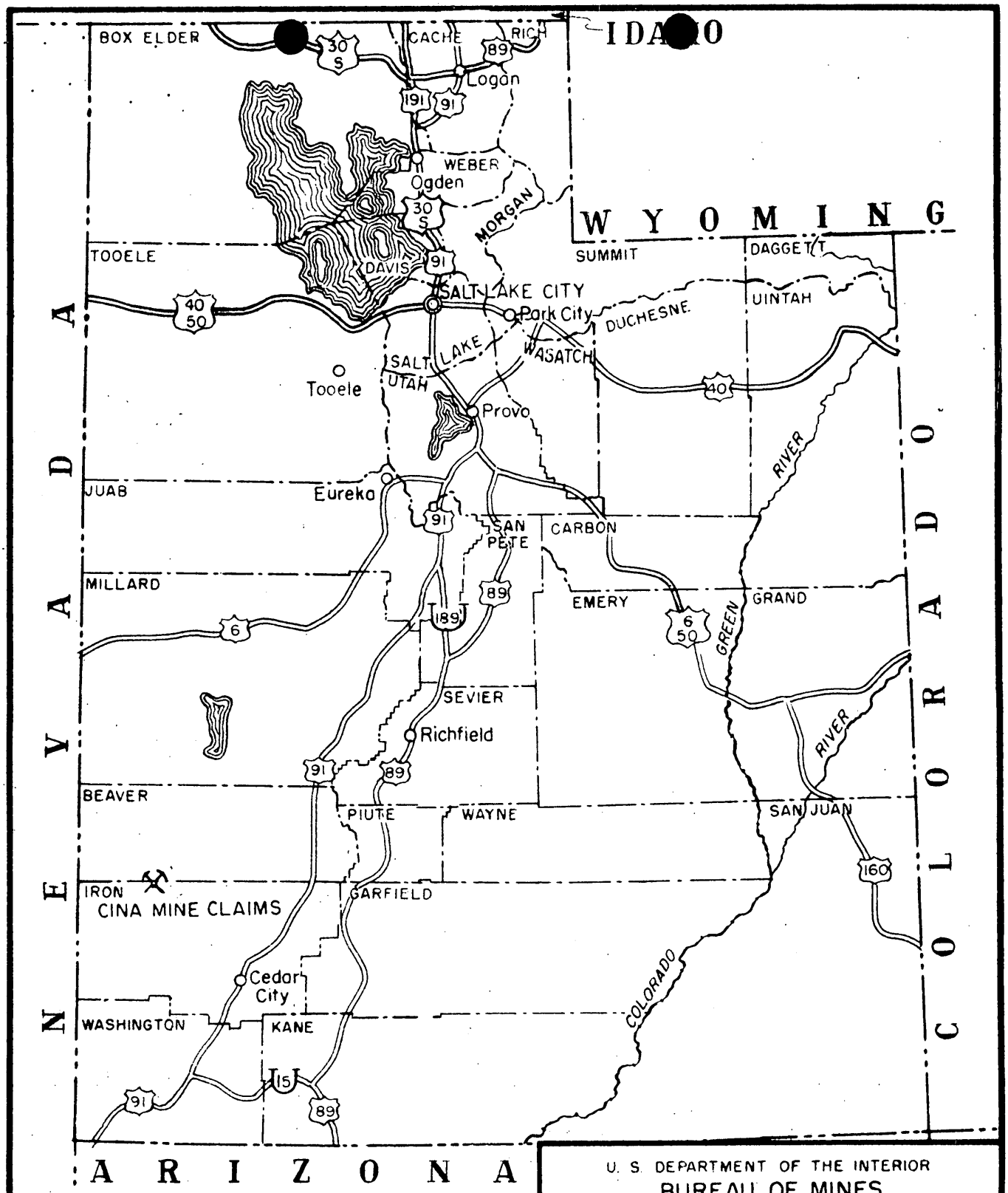
The usual means of determining cost per foot of drilling, through bids submitted by independent contractors, appears to be eliminated in this instance, inasmuch as the applicant states in Item 6(a), "Independent drillers in this area have refused this job at $10 per foot." Obviously, the consulted drilling contractors feel that the drilling would be extremely difficult.

CONCLUSIONS AND RECOMMENDATIONS

Weak, sporadic mercury mineralization, in a shattered fault zone in highly altered rhyolite and tuff, is exposed in surface excavations on Cina Mine claims Nos. 1 and 2. The geologic setting is favorable with regard to porosity of the host rock, and proximity to the surface. (Cinnabar is usually deposited at relatively shallow depths as a result of its instability at high temperatures.)

Because of the broken-up condition of the ground, it is probable that the unit cost of the proposed drilling would be high, and the results unsatisfactory.

It is recommended that the request for Government assistance be denied on the basis of the weakness of the mineralization and the lack of evidence of the possibility of improvement in depth, as well as the anticipated high cost and unsatisfactory results of the proposed drilling.



U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Fig. 1 DMEA Docket No. 4571

Location Map

PACIFIC MIDWEST GAS AND OIL DEVELOPMENT CO. INC.

CINA MINE CLAIMS

IRON COUNTY, UTAH

ENGINEER: M. M. GILKEY	DATE: MAY 15, 1957
TRACED: MAY, 1957; BY: A.P.T.S.	300 - 142 - G
CHECKED:	

IN REPLY REFER TO:

DMEA

DEPARTMENT OF THE INTERIOR

MAY 6 - 1957

REGION III

DENVER, COLORADO

UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Defense Minerals Exploration Administration

Denver Federal Center

Denver, Colorado

May 3, 1957

Memorandum

To: Acting Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman

Subject: DMEA Docket 4571 (Mercury), Pacific Midwest Gas and Oil Development Company, Inc. (Cina claims) Iron County, Utah

Enclosed are the original and eight copies of a geological report, by Frank B. Moore, U. S. Geological Survey, covering his examination of the subject property.

The property was examined on March 20, 1957, in company with M. M. Gilkey, U. S. Bureau of Mines, and Howard Albrecht, the applicant's representative. The mercury content of the samples taken during the examination was very low and the property was re-sampled on April 17, 1957.

Minor amounts of mercury occur along a shear zone in volcanic and sedimentary rocks which have been altered by hot spring activity.

Moore concludes and I concur that the proposed exploration will not result in the discovery of significant amounts of mercury ore and denial of the application for exploration is recommended.

Reviewed by
DMEA OPERATING COMMITTEE
6-7-57
(date)

E. N. Harshman
Member, Field Team

Enclosures (9)
ENHarshman:mp

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JUN 3 1957

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UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

TRANSMITTED
JUN 3 1957

DMEA 4571

Pacific Midwest Gas and Oil Development Company, Inc.

Cina Claims

Iron County, Utah

Mercury

1302
220

Geologic Report

by

F. B. Moore, Geologist
Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE
6-7-57
(date)

May 2, 1957

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ILLUSTRATIONS

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1. Index map of Utah showing location of Cina claims, Iron County, Utah.	1
2. Geologic sketch of prospect pits showing detail of Pits 1 and 2 and sample locations, Cina claims, Iron County, Utah.	4

DMEA 4571

PACIFIC MIDWEST GAS AND OIL DEVELOPMENT COMPANY, INC.
CINA CLAIMS
IRON COUNTY, UTAH

INTRODUCTION

The Cina claims, Iron County, Utah, were examined on March 20, 1957, by M. M. Gilkey, U. S. Bureau of Mines, and F. B. Moore, U. S. Geological Survey. Howard Albrecht, grantor of the lease and representative of the company, accompanied the examining team. Because of the insignificant mercury content of the samples taken at the time of the examination and the large area of mineralized ground, the property was revisited on April 17 for the purpose of taking more samples and to check the possibility of having overlooked some high grade spots.

The claims are in secs. 5 and 6, T. 31 S., R. 15 W., SLM about 35 miles southwest of Milford, Utah (fig. 1). The property can be reached from Milford, Utah, by taking an uncharted road, known locally as the Cougar Spar road, as follows: at 18.5 miles take right fork; 13.5 miles from fork to Adam's Well, turn north; 5.7 miles to reseeded area, turn south on mine road; 4 miles to airstrip, cross and recross strip; mine is 1.1 miles beyond strip or 43 road miles from Milford.

The Pacific Midwest Gas and Oil Development Company, Inc., holds a lease on the Cina claims from the United Development Company--Howard Albrecht, president.

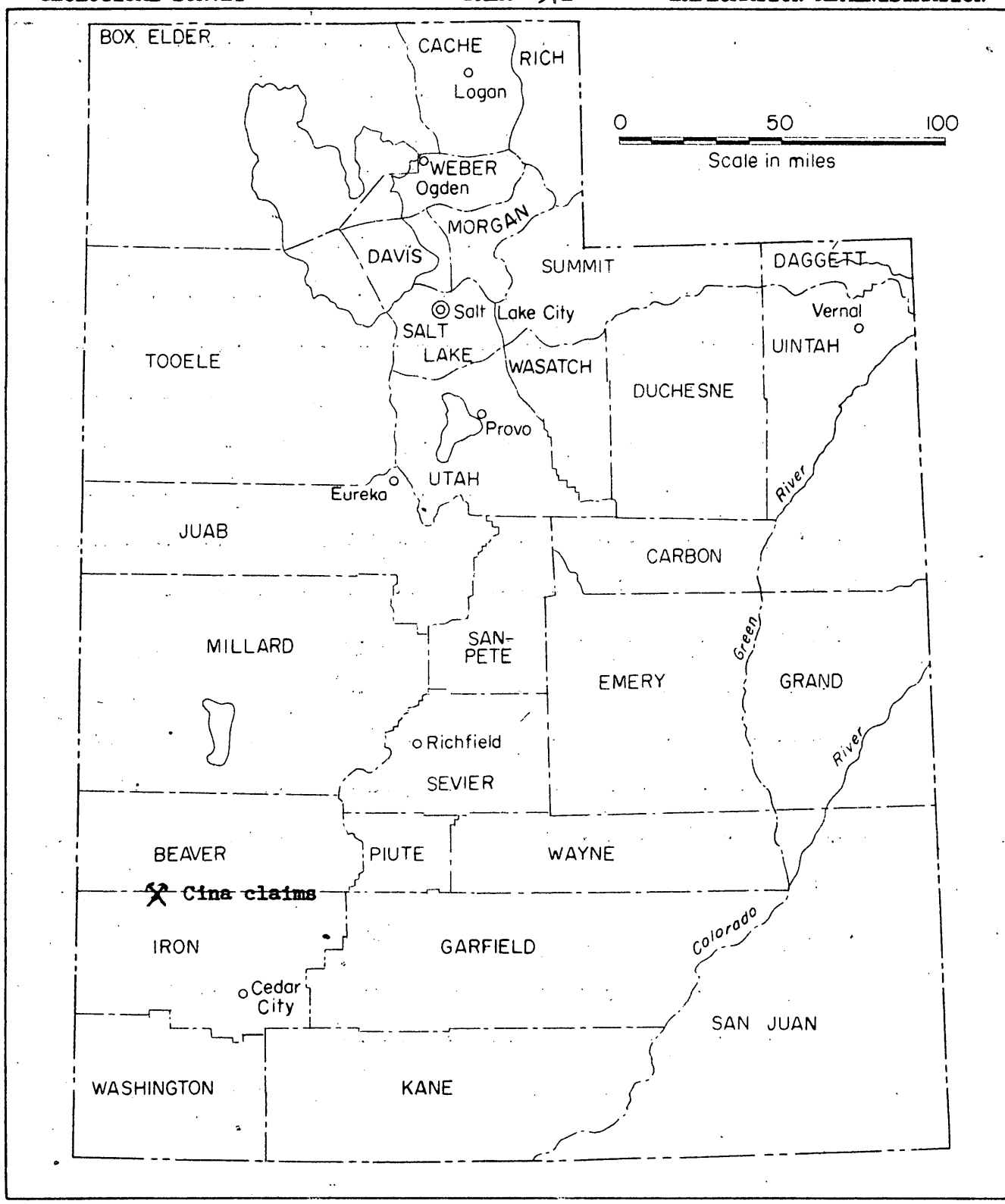

FIGURE 1—INDEX MAP OF UTAH **SHOWING LOCATION OF CINA CLAIMS, IRON COUNTY, UTAH**

GEOLOGY

The Cina cinnabar deposit occurs along a N. 30° E. striking fault that brings rhyolite and possibly tuff into contact with limestone (fig. 2). The cinnabar occurs in the fault and in the rhyolite for a distance of 20 to 30 feet from the fault. The rhyolite is highly altered for distances as great as 200 feet from the fault; the limestone is little altered.

The deposits are in an area affected by hot gases or hot waters. Fumarolic or hot spring action has left deposits of sulfur, gypsum, and mercury in several places along a strike length of nearly 2,000 feet. Several fumarole or hot spring holes can be seen in pits 1 and 2 (fig. 2). Opalite and/or chalcedony form ribs in the altered rhyolite. A highly siliceous area near the fault between pits 3 and 4 produces outcrops of opalite as much as 40 feet wide. A larger area to the south, capped by opalite according to the applicant, was not examined.

The fault has a sharp footwall which in places contains iron-stained gouge as much as 1 foot thick. The hanging wall is generally not distinct. In places it consists of crushed rock grading into altered volcanic rock; in other places a layer or rib of opalite or siliceous sinter is present between the sheared rock and gouge and the altered volcanic rocks.

The cinnabar occurs in thin seams parallel to the main fault, in narrow fractures angling into the rhyolite from the fault, and as disseminations in the rhyolite for distances of 20 to 30 feet from the fault.

In pit 1 cinnabar occurs with gypsum and sulfur along the hanging wall side of the fault; in pit 4 it occurs in pore spaces in a siliceous sinter. At no place was there more than small amounts.

Analyses of 15 samples (see fig. 2 for locations) gave results as follows:

Sample No.	Type	Length	Distance from fault	Hg (percent)
1	Channel	5 ft.	0 to 5 feet	< 0.01
2	"	5 ft.	5 to 10 feet	< 0.01
3	"	10 ft.	10 to 20 feet	< 0.01
4	"	10 ft.	20 to 30 feet	< 0.01
5	"	10 ft.	30 to 40 feet	< 0.01
6	"	10 ft.	21 to 31 feet	< 0.01
7	"	5 ft.	1 to 6 feet	< 0.01
8	"	1 ft.	0 to 1 foot	0.02
9	Selected chip	1 ft.	0	0.32
10	Channel	5 ft.	0 to 5 feet	< 0.01
11	"	6 ft.	5 to 11 feet	< 0.01
12	"	10 ft.	5 to 15 feet	< 0.01
13	Selected channel	1 ft.	8 feet	0.15
14	Channel	6 in.	2 feet	0.07
15	Selected grab	--	0	0.27

PROPOSED EXPLORATION

The applicant proposed to drill 80 holes in three fences to test the fault at depths of 125, 275, and 400 feet. An additional 10,000 feet of drilling was proposed for offset holes contingent on the results of earlier drilling. Total footage is 29,750 feet but no cost estimate is given.

In talking with Mr. Albrecht during examination of the property, the impression was gained that the company planned to use churn drills. Although the original proposal was considered too ambitious by Mr. Albrecht, no revised plan was presented.

CONCLUSIONS AND RECOMMENDATIONS

Cinnabar occurs in small amounts for 2,000 feet along a fault which brings limestone in contact with volcanic rocks. Fumarole holes, sulfur, gypsum, and opalite are evidence that the deposit was formed as the result of fumarolic or possibly hot spring activity. Although large, the deposit is everywhere low in grade, and there is no geologic evidence that the grade will be appreciably better at greater depths.

Because of the very low grade of the cinnabar occurrence at the Cina claims, it is recommended that the application for assistance be denied.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

1500 EAST FIRST SOUTH STREET
SALT LAKE CITY 12, UTAH

March 1, 1957

DMEA
DEPARTMENT OF THE INTERIOR
MAR 1957
REGION 3
DENVER, COLORADO

Mr. Dale Prows
Secretary-Treasurer
Pacific Midwest Gas & Oil
Development Co., Inc.
170 So. State Street
Salina, Utah

Re: Docket No. DMEA-4571

Dear Mr. Prows:

Your application for DMEA assistance under the above-referenced docket has been referred to this office for field investigation.

We will appreciate advice from you concerning accessibility of the property at present and availability of a representative of your organization to accompany the field examiners. It is probable that our field men will be able to make an examination of your property either March 13 or March 20, 1957. We could arrange a meeting at Milford, Utah, with your representative early on the date set for examination.

Your prompt reply concerning the above information will be appreciated.

Very truly yours,

Stephen R. Wilson

Stephen R. Wilson,
Supervising Mining Engineer

cc: W. M. Traver
J. B. Clemmer
file
df

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3/12 WSM 400

Sec. Op. Comm

224 New Customhouse
Denver 2, Colorado

February 26, 1957

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Mr. Alfred T. Taylor, President
Pacific Midwest Gas and Oil
Development Company, Inc.
1202 Stewart Street
Las Vegas, Nevada

Re: Docket No. DMEA 4571

Dear Mr. Taylor:

I wish to thank you for your letter of February 18, 1957 in which you offer your assistance in helping to expedite examination of your property. Your application has been forwarded to our Salt Lake office for field examination. It is my understanding that the property is now inaccessible due to snow.

I am not aware that a remapping of your property will be necessary before the field examination is made, as implied by Senator Alan Bible. However, I suggest that you contact Mr. S. R. Wilson, U. S. Bureau of Mines, 1600 East First Street South, Salt Lake City 1, Utah (under whose supervision the examination will be made) in regard to the date of the field examination and any supplemental data that may be needed.

I regret that I have only one copy of the application in this office and since it must remain here for our use, I suggest that you contact Mr. Wilson and attempt to borrow his copy for reproduction.

Very truly yours,

Original signed by
E. N. HARSHMAN

E. N. Harshman
Acting Executive Officer
DMEA Field Team, Region III

ENH:jy
cc: Sec. Op. Comm. (2)
Wilson
Harshman (2)
Docket
Chron.

w/copy of applicant's letter of Feb. 18, 1957

Field to talk to Mont

Mr. Bay

DMEA
DEPARTMENT OF THE INTERIOR
FEB 19 1957
REGION III
DENVER, COLORADO

PACIFIC MIDWEST GAS & OIL
DEVELOPMENT COMPANY, INC.
1202 Stewart Street
Las Vegas, Nevada

February 18, 1957

Regional Director
Defense Minerals Exploration Administration
Department of Interior
Federal Center
Denver, Colorado

Re: Docket No. DMEA 4571

My dear Director:

In a conversation with United States Senator Alan Bible here in Las Vegas over the week-end, I was advised of the possibility that a remapping of our property might be necessary before your geologists and engineers can make a field report for your use as a basis for consideration of the loan application made last December.

I want you to know that our offices at 1202 East Stewart Street here, and those at 170 South State Street in Salina, Utah, will assist you in every way possible with any maps or other material we might have, in the interests of expeditious action on our application. It was suggested by Senator Bible that we follow this procedure and I want you to know that we stand ready to aid in every way possible.

Likewise, I wonder if we might secure from you a copy of our initial loan application. Through a secretarial error in our offices, we failed to retain a copy of this application. If one of the forms we sent in initially could be provided to us, we will copy the information and return it to you at the earliest time.

I will await some further word from you on the matters set forth above. Your courtesy is appreciated.

DMEA
RECEIVED FEB 28 1957
DATE | INITIALS

Sincerely yours,

Pacific Midwest Gas & Oil
Development Company, Inc.

By Alfred P. Taylor
President

AT/CHS/bl

224 New Customhouse
Denver 2, Colorado

February 26, 1957

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Mr. Alfred T. Taylor, President
Pacific Midwest Gas and Oil
Development Company, Inc.
1202 Stewart Street
Las Vegas, Nevada

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E. N. HARSHMAN

E. N. Harshman
Acting Executive Officer
DMEA Field Team, Region III

ENH:jy
cc: Sec. Op. Comm. (2)
Wilson
Harshman (2)
Docket
Chron.
} w/copy of applicant's letter of Feb. 13, 1957

Hold to talk to Mr. [illegible]

[illegible]

DMEA
DEPARTMENT OF THE INTERIOR
FEB 19 1957
REGION III
DENVER, COLORADO

PACIFIC MIDWEST GAS & OIL
DEVELOPMENT COMPANY, INC.
1202 Stewart Street
Las Vegas, Nevada

DMEA
RECEIVED FEB 28 1957

February 18, 1957

Regional Director
Defense Minerals Exploration Administration
Department of Interior
Federal Center
Denver, Colorado

Re: Docket No. DMEA 4571

My dear Director:

In a conversation with United States Senator Alan Bible here in Las Vegas over the week-end, I was advised of the possibility that a remapping of our property might be necessary before your geologists and engineers can make a field report for your use as a basis for consideration of the loan application made last December.

I want you to know that our offices at 1202 East Stewart Street here, and those at 170 South State Street in Salina, Utah, will assist you in every way possible with any maps or other material we might have, in the interests of expeditious action on our application. It was suggested by Senator Bible that we follow this procedure and I want you to know that we stand ready to aid in every way possible.

Likewise, I wonder if we might secure from you a copy of our initial loan application. Through a secretarial error in our offices, we failed to retain a copy of this application. If one of the forms we sent in initially could be provided to us, we will copy the information and return it to you at the earliest time.

I will await some further word from you on the matters set forth above. Your courtesy is appreciated.

Sincerely yours,

Pacific Midwest Gas & Oil
Development Company, Inc.

By [signature]
President

AZ/CLB/bl

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

OFFICIAL FILE COPY
DMEA
RECEIVED FEB 4 1957

DATE	INITIALS	CODE
2/4	C	220
2/5	WSM	400

224 New Customhouse
Denver 2, Colorado

January 31, 1957

Mr. Dail A. Prows
Secretary-Treasurer
Pacific Mid-West Gas & Oil Development Co., Inc.
170 South State Street
Salina, Utah

Re: Docket DMEA 4571 (Mercury)
Cinna (Cina Mine) claims
Iron County, Utah

Dear Mr. Prows:

Your application for DMEA assistance has been referred to the field for an examination. You will be notified by the field, in advance, as to the date the examination can be made so that you will have sufficient time to make any necessary preparations.

Yours very truly,

Original signed by
W. M. TRAVER
W. M. Traver
Executive Officer, DMEA
Field Team, Region III

JDC:ytl
cc
Chmn. Op. Comm. (2)
Harshman (2)
Wilson
Docket 4571
Chron.

DMEA
DEPARTMENT OF THE INTERIOR
JAN 23 1957
REGION III
DENVER, COLORADO

OFFICIAL FILE COPY
DMEA
RECEIVED JAN 28 1957

DATE	INITIALS	CODE
1·28	C	220
1/28	WSM	400

January 23, 1957

Memorandum

To: S. R. Wilson

From: Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4571 (Mercury) Pacific Midwest Gas and Oil Development Company, Inc., (Cinna-Cina) Mine Claims, Iron County, Utah

Enclosed please find the application for Pacific Midwest Gas and Oil Development Company, Inc.

A field examination and suitable report are required. The completed report should be forwarded directly to the Executive Officer with a copy of the memorandum of transmittal to this office.

W. H. KING

W. H. King

Enclosure

cc: W. M. Traver (3)
E. H. Harshman (2)
J. B. Clemmer
See Op. Com. (2)

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

224 New Customhouse
Denver 2, Colorado

OFFICIAL FILE COPY
DMEA
RECEIVED JAN 25 1957

DATE	INITIALS	CODE
1·25	C	220
1/25	WSM	400

January 22, 1957

Memorandum

To: E. N. Harshman (2) (w/1 copy brochure)
W. H. King (2) (" " ")

From: DMEA Field Team, Region III

Subject: Docket DMEA 4571 (Mercury) Pacific Midwest Gas and Oil Development Company, Inc.
Cinna (Cina) Mine Claims
Iron County, Utah

Enclosed is a copy of the subject application consisting of the following:

1. Form MF-103 and two answer sheets.

2. A list of laboratory equipment from the Mine & Smelter Supply Company.

3. Photo copy of the assignment of lease.

4. Drilling project procedure on the Cina mine claims.

5. Map showing the proposed drilling program of the Cina Mine area.

We have received no copies of the maps, Plate II and Plate III mentioned in the Chairman's letter dated January 15, 1957, copy of which is attached.

Also enclosed are copies of memoranda of review of the application by N. E. Nelson and J. W. Pennington.

A field examination and suitable report are requested. Please return the Bureau of Mines copy of the brochure to this office, with your report of examination.

DMEA Field Team, Region III
Original signed by
W. M. TRAVER

By W. M. Traver
Executive Officer

Enclosures
HMC:ytl

cc: Sec. Op. Comm. (2) Docket 4571 Chron.

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
1/14	Chapman	400
1/14	Martin	400
1/14	Selfridge	130
	[illegible]	110
[illegible]	[illegible]	100
1-15	[illegible]	220

JAN 15 1957

Mr. W. M. Traver, Executive Officer
DMEA Field Team, Region III
224 New Custom House
Denver 2, Colorado

Re: Docket No. DMEA 4571 - Mercury
Pacific Midwest Gas and Oil
Development Company, Inc.
Cinna (Cina) Mine claims
Iron County, Utah

Dear Mr. Traver:

The above docketed application for Exploration assistance is being referred to your office for a field examination of the property.

Copies of memoranda dated December 21 and 28, 1956, by J. W. Pennington, Bureau of Mines, and N. E. Nelson, Geological Survey, respectively, relating to the project are enclosed. Also enclosed are extra copies of the application for use of the Field Team. Reference is made to Basic Report 80.1640 of Strategic Minerals Examination by William E. Young, Bureau of Mines.

The extra copies of the application lack the following:

1 map showing "Proposed Drill Program Cina Mine Area."

2 maps, Plate II, Cina Mine Claims.

2 maps, Plate III, North Wall of Open Cut No. 2, Showing Sulfur Springs.

If a project is to be recommended, please determine correct spelling Cina or Cinna for use in any proposed contract.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

APPROVED:

Frank D. Lamb (FDL)

Member, Bureau of Mines

Thor H. Kiilsgaard (THK)

Member, Geological Survey

Enclosure

TLChapman:am 1-11-57 - 1-14-57
cc to: Docket
Code 400
Admr. Read. File
Oper. Comm.
FT REG III
Messrs. J. W. Pennington, USBM
T. H. Kiilsgaard, USGS

R.C.R.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
1/14	Chapman	400
1/14	Martin	400
1/14	Selfridge	130
	Fly	110
1/14	Mitendorf	100
1-15	cw	220

JAN 15 1957

Pacific Midwest Gas and Oil
Development Company, Inc.
170 South State Street
Salina, Utah

Re: Docket No. DMEA 4571 - Mercury
Cinna (Cina) Mine claims
Iron County, Utah

Lamb
Kilsgaard

Gentlemen:

The above docketed application for exploration assistance for mercury ores has been reviewed by the Defense Minerals Exploration Administration and referred to Mr. W. M. Traver, Executive Officer, DMEA Field Team, Region III, 224 New Custom House, Denver 2, Colorado, for a field examination of the property.

Any assistance you can give the members of the Field Team will be appreciated.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

TLChapman:am 1-11-57 - 1-14-57
cc to: Docket
Code 400
Admr. Read. File
Oper. Comm.
FT REG III
Messrs. J. W. Pennington, USBM
T. H. Kiilsgaard, USGS

8623

OFFICIAL FILE COPY
DMEA
RECEIVED JAN 3 1957

	INITIALS	CODE
1/4/57	WSM	400

IN REPLY REFER TO:
Mercury

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

December 28, 1956

Re: DMEA 4571
Pacific Midwest Gas &
Oil Devel. Co.
Cina Mine Claims
Iron Co. Utah
No estimate of cost
Mercury

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

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

Subject: Review of application.

The applicant requests assistance in mapping, (topography and geology) an area traversed by a fault. The mapping would be followed by a large 3-Stage drilling program.

A map depicts an area about 2800 feet long in which are shown 5 open cuts and an 'opalite cap'. Three fences of drill holes are laid out, the Stage I holes 35 feet from the fault line and spaced 100 feet apart. The Stage II holes are to be 135 feet from the fault line and the Stage III holes 235 feet from the line. The total proposed drilling is estimated to be 28,750 feet.

No data, whatever are given as to what was found in the open cuts. Presumedly cinnabar is the object of the search as it is to be panned for in the drill core and cuttings.

The applicant appears to know very little concerning the prospect, and has made available so little information an examination has not been justified.

If and when more information has been obtained a referral to the Field Team may be warranted.

N. E. Nelson

N. E. Nelson

Copy retained 400

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

RECEIVED DEC 27 1956 D.M.E.A.

December 21, 1956

Docket

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: Assistant Chief, Branch of Base Metals

Subject: Review of Application, Docket No. DMEA 4571 (Mercury), Pacific Midwest Gas and Oil Development Co., Inc., Cina Mine Claims, Iron County, Utah. No amount given.

The applicant proposes to explore for mercury mineralization on the Cina Mine Claims by drilling. Estimated total costs are not given.

Several of the unit costs appear excessive and others unjustified. A few display inexperience; for example the item of 1 gallon of distilled water would be insufficient to prepare the analytical solutions required for the assays planned. All of the proposed items and costs should be evaluated.

According to an examination report on the Cina Mine Claims, dated June 20, 1950, by W. E. Young, Bureau of Mines, "the cinnabar occurs as thin seams in the chalcedony along the contact. It grades out from the fissure in some places as much as 12 inches into the chalcedony. Usually it is very thin if present at all. No conditions or geologic features were observed that might cause localized enrichment of mineralization."

I recommend that the application be referred to the Field Team for appraisal.

My copy of the application which did not include a Geologic Section, Location and Access Section, or a Drilling Project Procedure Section is returned herewith.

J. W. Pennington

J. W. Pennington

Enclosure

Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U. S. G. S.
F. D. Lamb
Files

William E. Young, Bureau of Mines engineer, examined the Cina Mine claims June 15, 1950 disclosed the following:

(1) Occurrence of cinnabar along a limestone - rhyolite contact can be traced for nearly a mile.

(2) Small pits along the contact disclose a fault of low dip between the rhyolite and limestone

(3) The rhyolite shows a great deal of alteration for a considerable distance from the fissure; the limestone very little alteration, even near the fissure.

(4) Cinnabar occurs as thin seams in the chalcedony along the contact and is usually very thin, if present at all.

(5) No conditions or geologic features were observed that might cause localized enrichment of mineralizations.

(6) Conclusion: "No further consideration of the property by the Bureau of mines is recommended until additional development is completed.

From - Basic Report 80.1640, Summary Report of Strategic Minerals Examination, Cina Mine Claims, Iron Co., Utah.

Report obtained by Pennington from Mt. Weather 12-18-56.

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

400

DOCKET
SURNAME
Martin
Selfridge
Pfefferkorn

DEC 21 1956

Hon. Alan Bible
United States Senate
Washington 25, D. C.

My dear Senator Bible:

Your letter of December 7, 1956, transmitting an application of the Pacific Midwest Gas & Oil Development Company, Inc., for aid in an exploration project for mercury, was received on December 13, 1956.

The same Nevada Corporation was advised at its 170 South State, Salina, Utah, address that its application had been assigned Docket No. DMEA 4571 and submitted to our office at Denver, Colorado.

The application will have early consideration. We thank you for bringing this property to our attention.

Sincerely yours,

C. O. Mittenhoff

Administrator

WSMartin:foc
12/14/56
cc to: Docket
Code 400
Admr. Read. File
FT. REG. III
Messrs. J. W. Pennington, USBM
T. H. Kiilsgaard, USGS

R.G.S.

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

December 14, 1956

Pacific Midwest Gas & Oil
Development Co, Inc.
170 S. State
Salina, Utah

Subject: DMEA-4571

Gentlemen

Your application for exploration assistance, dated December 1, 1956 submitted to our office at Denver, has been assigned Docket Number DMEA-4571 and referred to the Iron and Ferro-Alloys Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

(Sgd) Allen S. Dakan

Allen S. Dakan, Director
Operations Control and
Statistics Division

Copy to:

Region III. Denver 2, Colorado

Code 400

6816

U. S. Government Messenger Envelope

Standard Form No. 65 (Rev. 1/46)

1. Use blocks consecutively, one at a time.
2. Void previous block.
3. Write clearly.

NAME OR TITLE OF PERSON, DEPARTMENT, ADDRESS, AND ROOM		NAME OR TITLE OF PERSON, DEPARTMENT, ADDRESS, AND ROOM	
Miss Crizer Solicitor 6440	RUN / STOP		RUN / STOP
Administrator	RUN / STOP		RUN / STOP
~~Administrator Mexican Embassy Room 4459~~	RUN / STOP		RUN / STOP
Room 400	RUN / STOP		RUN / STOP
	RUN / STOP		RUN / STOP
	RUN / STOP		RUN / STOP
	RUN / STOP		RUN / STOP
	RUN / STOP		RUN / STOP
	RUN / STOP		RUN / STOP
	RUN / STOP		RUN / STOP

Send surplus envelopes to supply room for reissue.

Use other side

Use RUN and STOP only when messenger service between Government buildings in Washington is required. Your mail room has RUN and STOP information.

PROPOSED DRILL PROGRAM
CINA MINE AREA

SCALE 1 INCH = 100 FEET

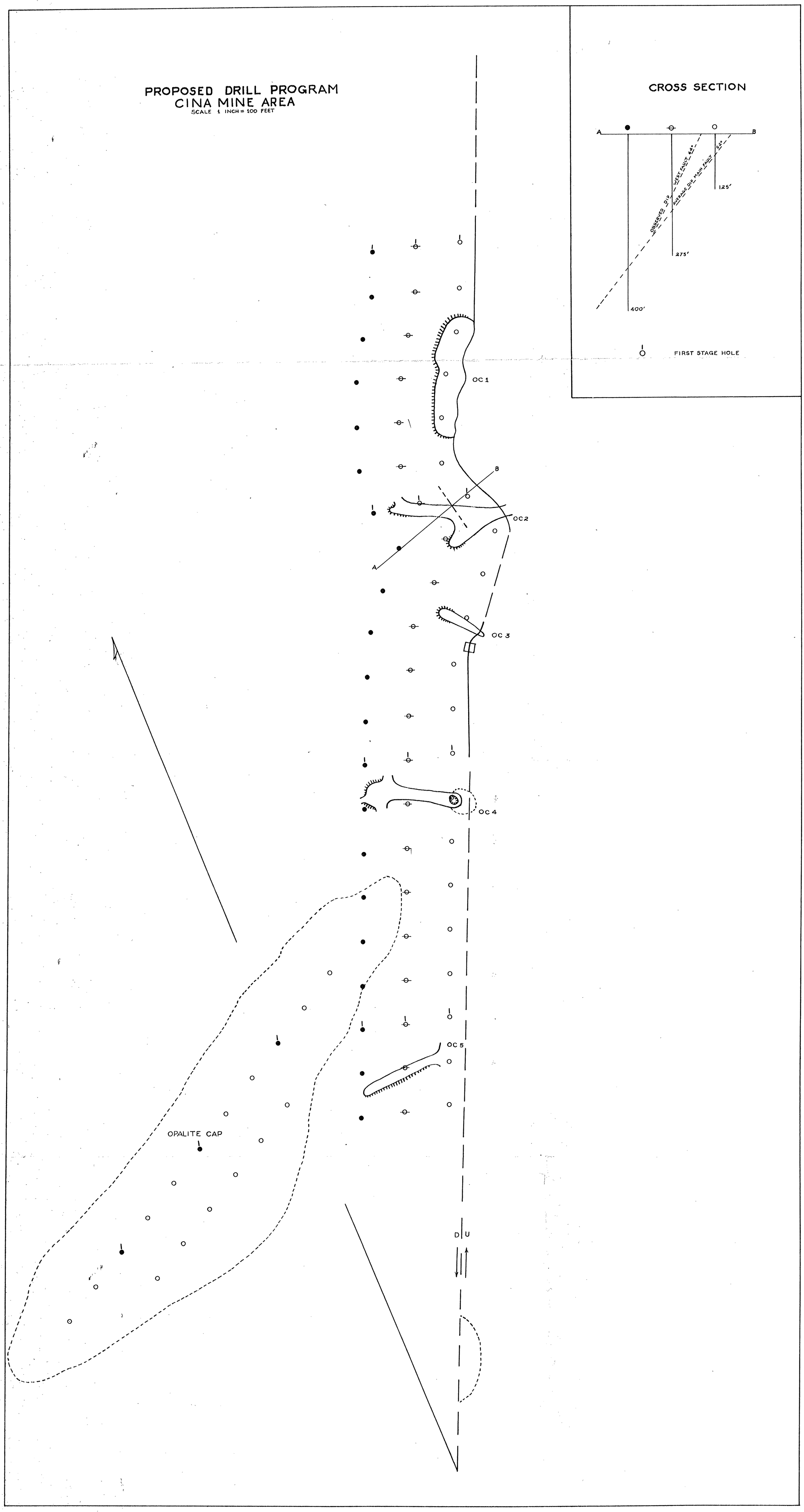


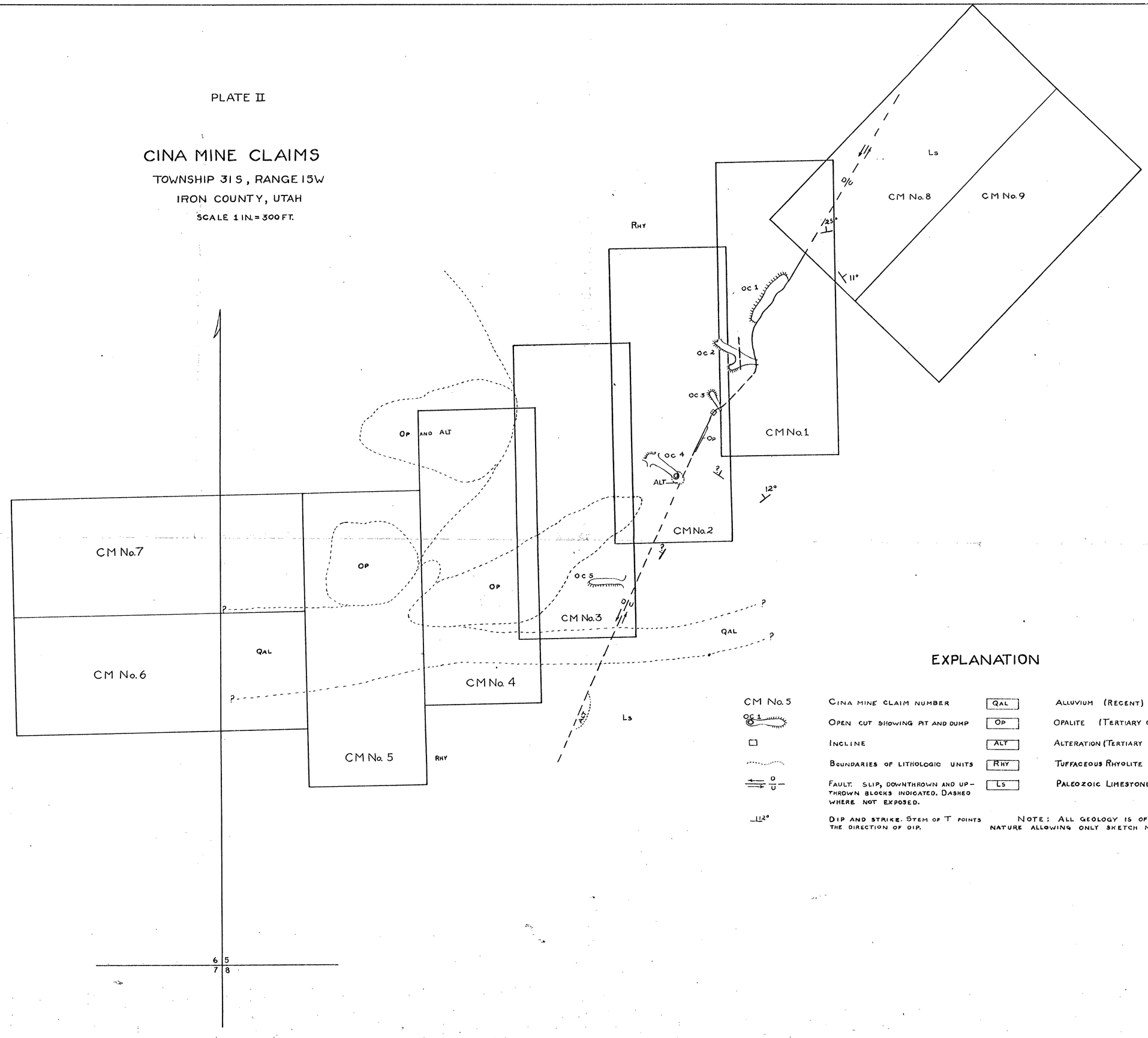
PLATE II

CINA MINE CLAIMS

TOWNSHIP 31 S, RANGE 15W

IRON COUNTY, UTAH

SCALE 1 IN. = 300 FT.



EXPLANATION

CM No. 5	Cina mine claim number	QAL	Alluvium (Recent)
OC 1	Open cut showing pit and dump	OP	Opalite (Tertiary or Post Tertiary)
	Incline	ALT	Alteration (Tertiary or Post Tertiary)
	Boundaries of lithologic units	RHY	Tuffaceous Rhyolite (Tertiary)
D U	Fault. Slip, downthrown and upthrown blocks indicated. Dashed where not exposed.	Ls	Paleozoic Limestone (Carboniferous)
12°	Dip and strike. Stem of T points the direction of dip.		

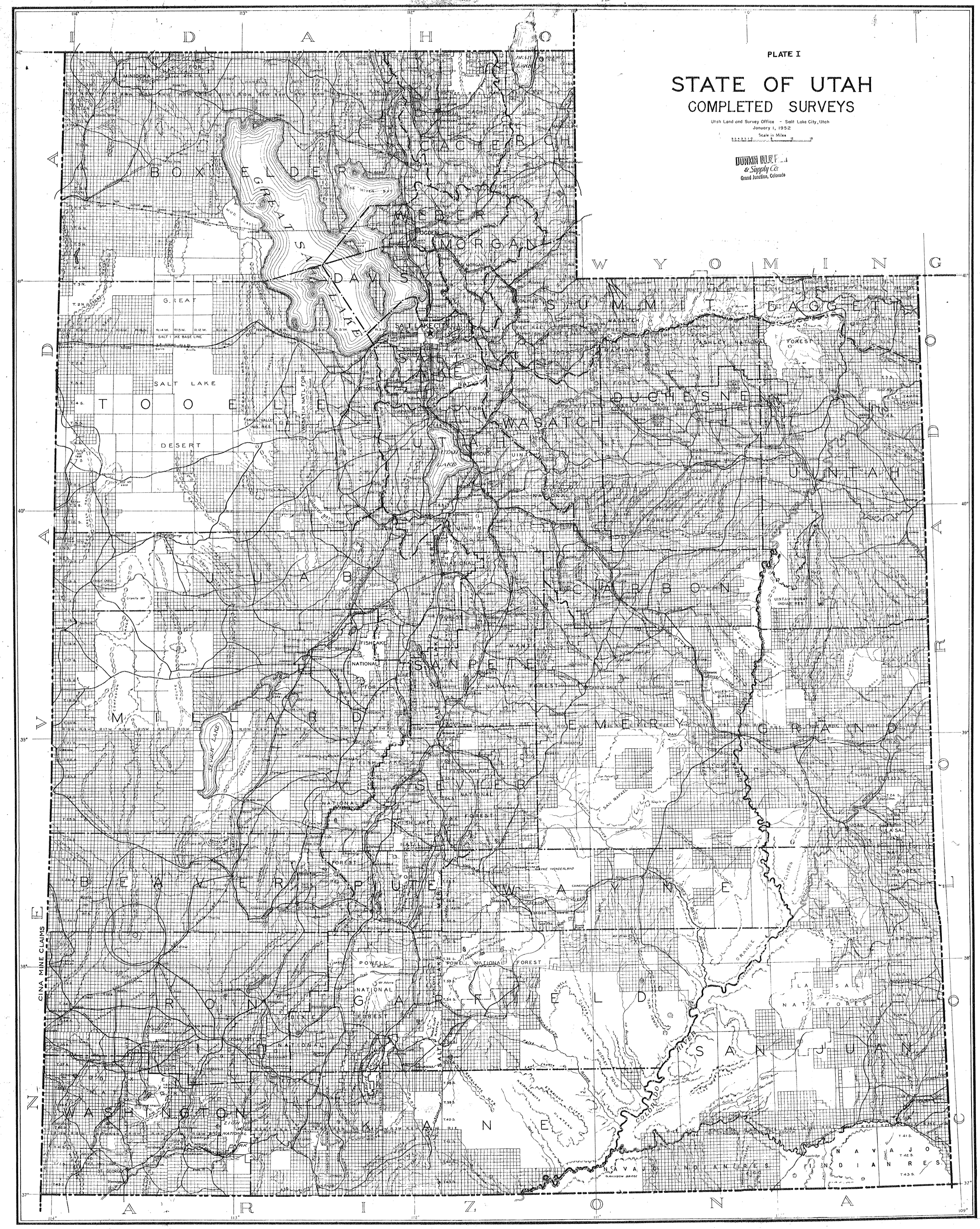
Note: All geology is of a reconnaisance nature allowing only sketch map accuracy.

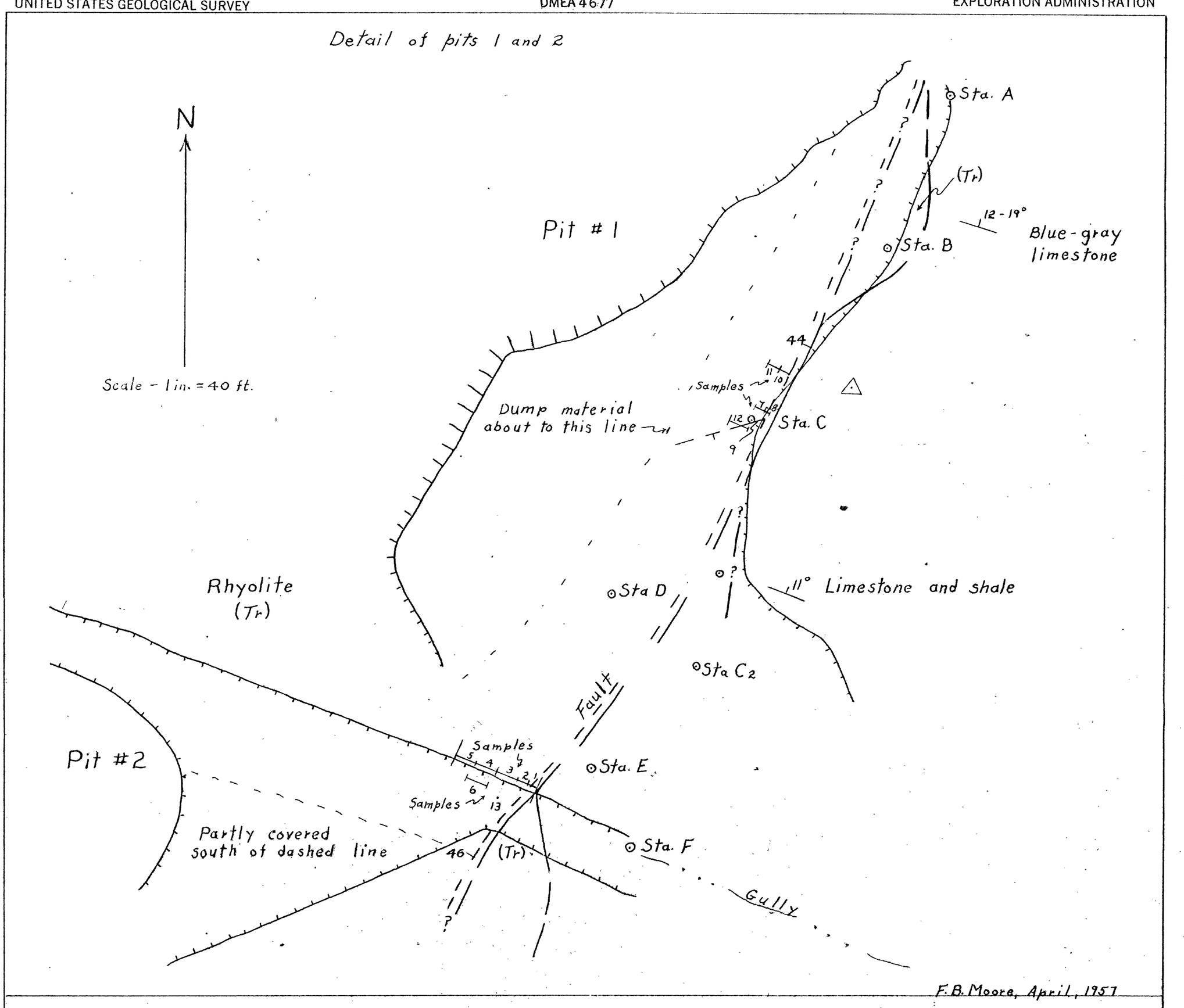
PLATE I

STATE OF UTAH
COMPLETED SURVEYS

Utah Land and Survey Office - Salt Lake City, Utah
January 1, 1952

Scale in Miles





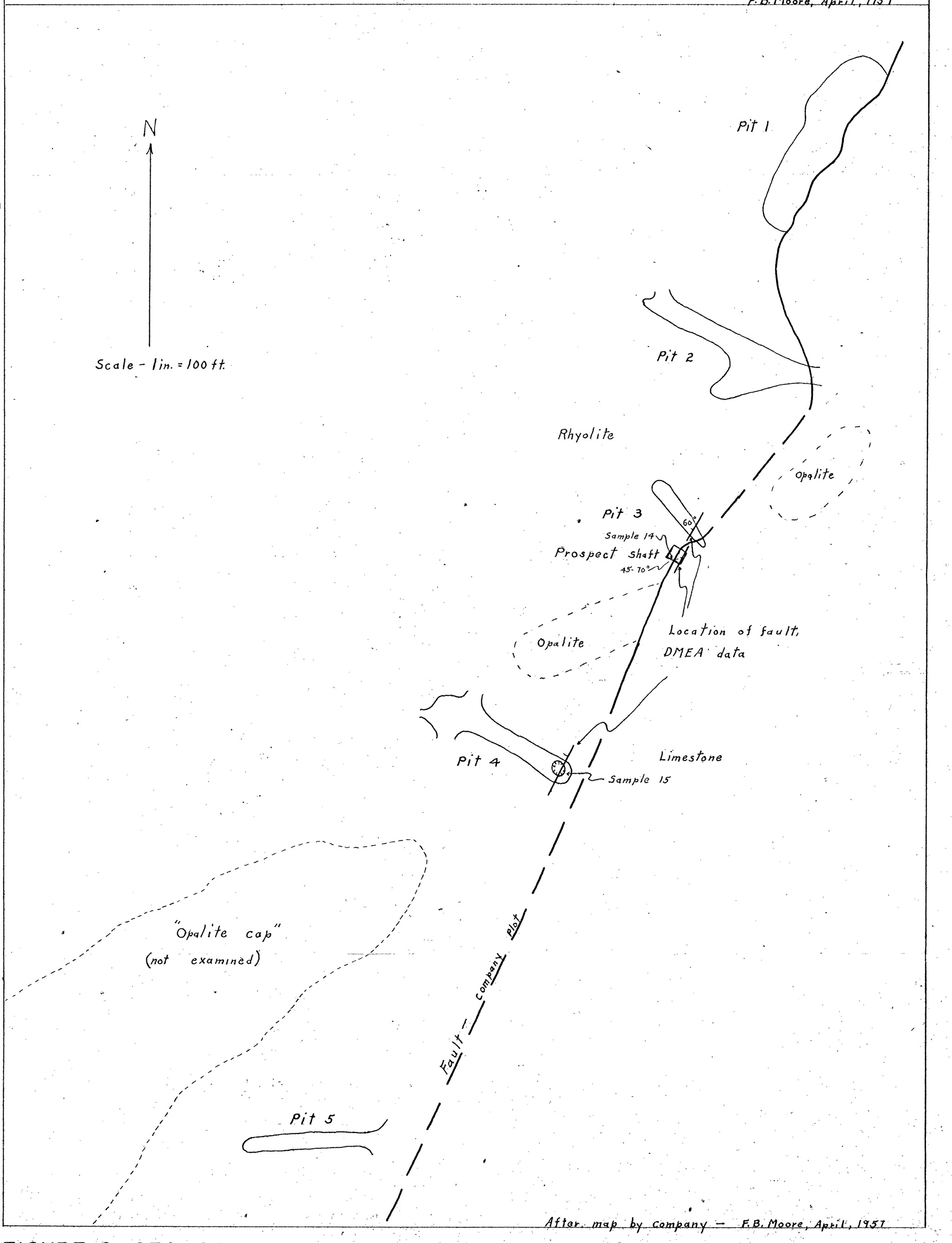


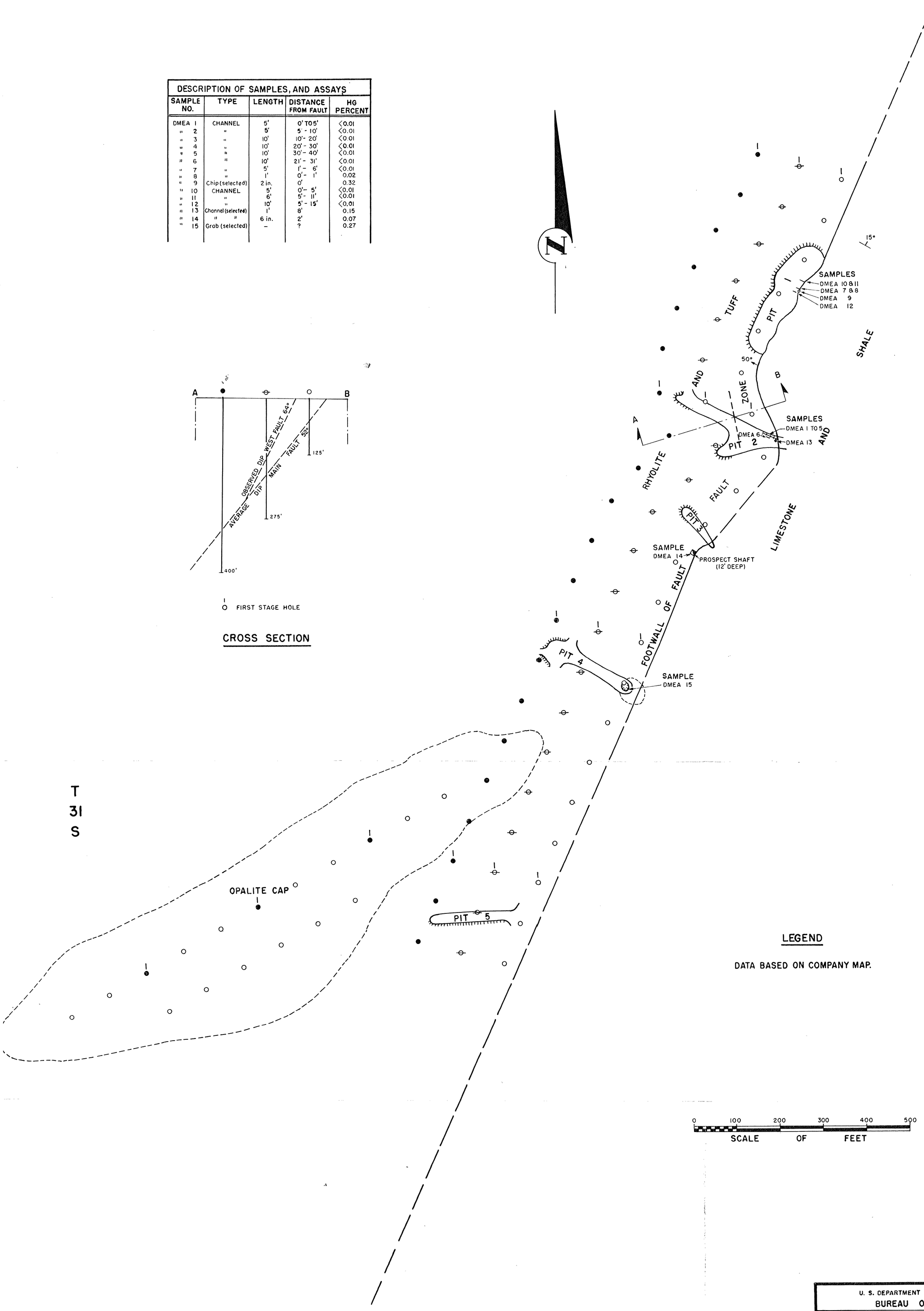
FIGURE 2 - GEOLOGIC SKETCH OF PROSPECT PITS SHOWING DETAIL OF PITS 1 AND 2 AND SAMPLE LOCATIONS, CINA CLAIMS, IRON COUNTY, UTAH

R 15 W

DESCRIPTION OF SAMPLES, AND ASSAYS				
SAMPLE NO.	TYPE	LENGTH	DISTANCE FROM FAULT	HG PERCENT
DMEA 1	CHANNEL	5'	0' TO 5'	<0.01
" 2	"	5'	5' - 10'	<0.01
" 3	"	10'	10' - 20'	<0.01
" 4	"	10'	20' - 30'	<0.01
" 5	"	10'	30' - 40'	<0.01
" 6	"	10'	21' - 31'	<0.01
" 7	"	5'	1' - 6'	<0.01
" 8	"	1'	0' - 1'	0.02
" 9	Chip (selected)	2 in.	0'	0.32
" 10	CHANNEL	5'	0' - 5'	<0.01
" 11	"	6'	5' - 11'	<0.01
" 12	"	10'	5' - 15'	<0.01
" 13	Channel (selected)	1'	8'	0.15
" 14	" "	6 in.	2'	0.07
" 15	Grab (selected)	–	?	0.27

FIRST STAGE HOLE

CROSS SECTION



LEGEND

DATA BASED ON COMPANY MAP.

0 100 200 300 400 500
SCALE OF FEET

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Fig. 3 DMEA Docket No. 4571

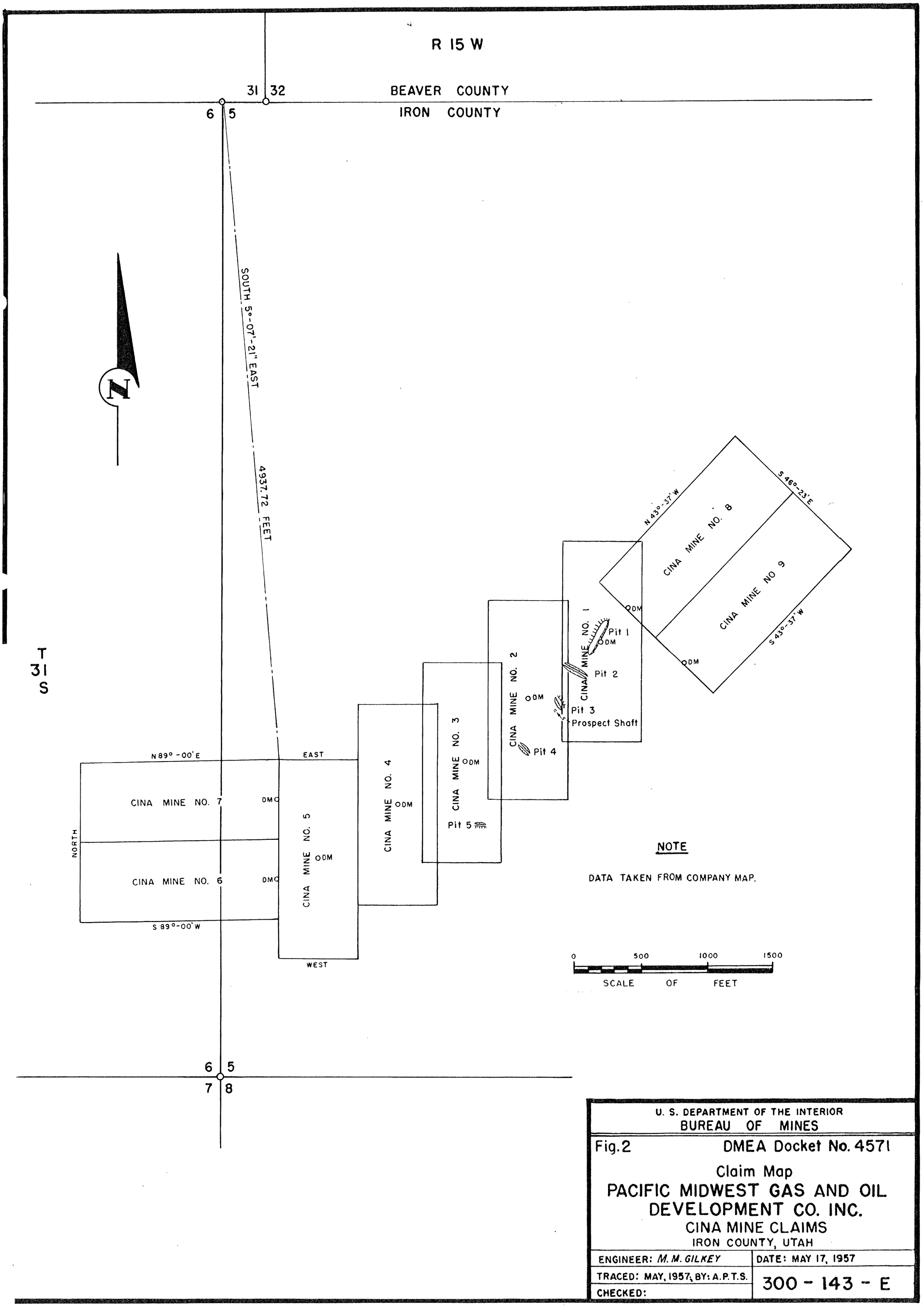
Proposed Churn Drill Holes For Stages I & II

PACIFIC MIDWEST GAS AND OIL DEVELOPMENT CO. INC.

CINA MINE CLAIMS

IRON COUNTY, UTAH

ENGINEER: *M. M. GILKEY*	DATE: MAY 20, 1957
TRACED: MAY, 1957, BY: A.P.T.S.	300 - 144 - B
CHECKED:	



U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Fig. 2 DMEA Docket No. 4571

Claim Map

PACIFIC MIDWEST GAS AND OIL DEVELOPMENT CO. INC.

CINA MINE CLAIMS

IRON COUNTY, UTAH

ENGINEER: *M. M. GILKEY*	DATE: MAY 17, 1957
TRACED: MAY, 1957; BY: A.P.T.S.	300 - 143 - E
CHECKED:	