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APPLICATION FOR

MINING DEVELOPMENT LOAN

Pursuant to
Sections 302 and 303
of the

DEFENSE PRODUCTION ACT OF 1950

Submitted To

DR. JAMES A. BOYD, ADMINISTRATOR
DEFENSE MINERALS ADMINISTRATION
DEPARTMENT OF THE INTERIOR

WASHINGTON 25, D.C.

By

MT. WHEELER MINES, INC.
218 Felt Building, Room 332
Salt Lake City 1, Utah

Applicant

MT. WHEELER MINES, INC.
218 Felt Building
Salt Lake City 1, Utah

November 24, 1950

Dr. James A. Boyd, Administrator
Defense Minerals Administration
Department of the Interior
Washington 25, D.C.

Dear Sir:

We are submitting herewith three copies of an application for a Mine Exploration and Development Loan, pursuant to Sections 302 and 303 of the Defense Production Act of 1950, and in accordance with the recent information releases from your department covering this subject. Any additional information which may be required will be promptly forwarded to you upon request.

The Abstract of Application, which follows this letter, will serve to give you a concise summary of our loan request. The elements of the Application are based upon the findings of three independent groups of examining geologists, and their separate reports, maps and recommendations are appended thereto as exhibits.

For additional information regarding the Operator who will direct this development program, reference is made to your U.S.B.M. Information Circular Number 7497, dated April, 1949.

Thank you for your kind consideration in this matter.

Very truly yours,

MT. WHEELER MINES, INC.
By
James D. Williams
James D. Williams
President

JDW-K

ABSTRACT OF APPLICATION

1. Property

Situated in T. 12 N., R. 68 E., Mt. Diablo B. & M., White Pine County, Nevada. Seven patented and nine located claims, under lease and option to purchase to James D. Williams, and assigned to Mt. Wheeler Mines, Inc.

2. Geology and Ore

The measured Cambrian section is very similar to that of the Pioche and Eureka, Nevada, districts where large bodies of replacement ore have been developed and mined. Main N. 10° E. St. Lawrence fissure zone can be traced for 12,000 feet on surface of patented claims from elevation 9,200 to 11,800 feet, with widths varying from 4 to over 30 feet. Fissure is well mineralized over its entire length with lead-silver ore shoots making at intersections with N. 60° - 70° E. cross fractures.

3. Proposed Development

(a) Extension of Bonanza adit at elevation 8,075 feet, a distance of 2,100 feet on N. 66° E. course, to intersect N. 10° E. St. Lawrence fissure at depth of 1,580 feet, in Upper St. Lawrence limestone. This is considered a favorable horizon because of the thin bedded carbonous nature of limestone.

(b) Drift on St. Lawrence fissure N. 10° E., a distance of 3,400 feet through base of St. Lawrence limestone to shale contact where a strong N. 70° E. fissure intersection projects. This is the most important and, therefore, the primary objective.

(c) Diamond drilling into upper and lower favorable beds as drift advances north.

(d) Raises into upper favorable beds at points 1,100, 2,100 and 3,300 feet north in drfit.

4. Manpower and Equipment

All proposed development will be contracted on a footage basis. Contractor has immediately available a full crew and all necessary equipment to complete this development program as outlined. Ample mine labor is currently available in this area for subsequent production requirements.

5. Cost and Time Estimates

(a) Estimated Cost

(1)	Road construction		$ 5,000.00
(2)	2,100 feet crosscut @	$26.50/Ft.	55,650.00
(3)	3,400 feet drift	30.00	102,000.00
(4)	5,000 feet D.D.	3.50	17,500.00
(5)	800 feet raise	30.00	24,000.00
			$204,150.00
(6)	Contingency	10%	20,415.00
(7)	Supervision and overhead		25,435.00
	Total		$250,000.00

(b) Estimated Time

(1)	Preparation	1	Month
(2)	2,100 ft. drive to fissure	6	"
(3)	3,400 ft. drift and D.D.	8	"
(4)	800 ft. raises	3	"
		18	Months

6. Inferred Ore

(a) Tonnage (projected from surface workings)

(1)	Red Oxide projection	83,400	Tons
(2)	Black Oxide projection	120,750	"
(3)	Old Moon projection	100,067	"
	Total	304,217	Tons

(b) Grade (average of recent shipments from surface)

Silver	8.55	Oz.
Lead	19.2	%
Insol	4.7	%
Iron	4.6	%
Lime	27.3	%

7. Production Forecast (After completion of development)

50 tons per day after one month
100 tons per day after six months
150 tons per day after one year

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APPLICATION FOR DEVELOPMENT LOAN
Submitted By
MT. WHEELER MINES, INC.

I NAME OF MINE

A This property is known as the St. Lawrence Mine and is located in Township 12 N., Range 68 E., Mt. Diablo Base and Meridian, White Pine County, Nevada, approximately five miles south of Wheeler Peak, the highest point of the Snake Range. Present operator is the Mt. Wheeler, Mines, Inc., 218 Felt Building, Salt Lake City, Utah.

B The mine has had only desultory small lessee operations during the past thirty-one years. The most recent operations were conducted by Messrs. Hulse, Cottino and Robison, of Pioche, Nevada, during the years 1948 and 1949.

C Prior to 1919, the mine was operated by the present owner, St. Lawrence Mining Company, 803 Wilder Building, Rochester 4, New York.

II PRODUCTION AND HISTORY

A Production prior to 1919 consisted of a few hundred tons of high grade lead-silver ore produced from the area of the Hudson tunnel at elevation 9,687 to 9,890 feet, and averaged about 75% lead and 18 ounces silver per ton. The ore was undoubtedly sorted very closely for pack-train transportation off the mountain.

B The last named lessees built a winding "Jeep" road from Pole Canyon to the Hudson tunnel area in 1948 and mined four lots of lead-silver ore from the Red Oxide and Black Oxide claims aggregating some 46 tons averaging 19.2% lead and 8.55 ounces silver per ton. Hauling costs down the mountain were excessive and the working season very short, thus prompting the lessees to cease operations.

C Brief History of Property

The seven patented claims were originally located in the early '70's by Frank Williams and William Bacon. Several small lot shipments of high grade lead-silver ore were made up to 1903. In that year the present company was incorporated, and the Hudson tunnel, at elevation 9,687 feet, was driven. A number of high grade shipments were made from this tunnel. In June of 1917, U.S. patents were granted on the seven claims to the St. Lawrence Mining Company. In 1919 the Bonanza tunnel in Lincoln Canyon, at elevation 8,075 feet, was started and driven some 350 feet on a N. 66° E. course. Financial difficulties forced a cessation of operations in 1920 and the property has remained idle from that date except for intermittent lessee operations, all of which were on a very small scale. In April and June of 1943, James D. Williams examined the property, but was unable to conclude a satisfactory contract with the owners at that time. In August, 1948, Messrs. Hulse, Cottino and Robison of Pioche, Nevada, secured a lease and option to purchase from the owner and located nine additional claims covering the Bonanza tunnel site. In July, 1950, James D. Williams negotiated an option and assignment from these lessees on both groups of claims. In November, 1950, the Mt. Wheeler Mines, Inc., was organized and all contracts were assigned to this company. Preliminary financ-

ing in the amount of $25,000.00 was completed for the purpose of engineering and geology, legal services, location of protective claims, the establishment of field headquarters, and to provide for the option payments.

III PROPOSED WORK AND COST ESTIMATES

A. Proposed program of development anticipates the following work:

1. Extending the Bonanza crosscut adit N. 66° E., in the upper St. Lawrence limestone in Lincoln Canyon, at elevation 8,075 feet, a distance of 2,100 feet, to cut the main N. 10° E. St. Lawrence fissure at approximately 1,580 feet below the surface as shown by Exhibit "A".

2. Drifting north on the St. Lawrence fissure a distance of 3,400 feet to cut through the base of the St. Lawrence limestone in the area where the Canaan quartz fissure (striking N. 70° E.) intersects the St. Lawrence fissure (striking N. 7° - 10° E.) on the Red Oxide claim.

3. Diamond drilling the upper and lower favorable horizons as follows:

(a)	Upper St. Lawrence	3,000	Feet
(b)	Base of St. Lawrence	500	"
(c)	Lower bed in shale	1,500	"
	Total	5,000	Feet

4. Raises from adit level into upper beds as follows:

(a)	Upper St. Lawrence		
	1. At 1,100 feet in North drift	300	Feet
	2. At 1,700 feet in North drift	400	"
(b)	Base of St. Lawrence		
	1. At 3,300 feet in North drift	100	"
	Total	800	Feet

5. Estimated Costs

(a) Proposed development work

1. Road construction	$ 5,000.00
2. 2,100 feet adit @ $26.50/Ft.	55,650.00
3. 3,400 feet drift @ 30.00/Ft.	102,000.00
4. 5,000 feet D.D. @ 3.50/Ft.	17,500.00
5. 800 feet raises @ 30.00/Ft.	24,000.00
Subtotal	$204,150.00
6. Contingency - 10%	20,415.00
7. Supervision and overhead	25,435.00
Total Development Program	$250,000.00

(b) Camp and mine after development

1. Camp for 30 men	$ 39,000.00
2. Mine equipment	98,410.00
3. Construction labor	13,500.00
	$150,910.00
Total Overall Requirements	$400,910.00

Note It will not be necessary to provide for camp and mine facilities until such time as the development program is fully completed and the several ore zones well explored.

B Equipment available:

No equipment or other facilities are available at the property at this time.

C New equipment and facilities required (after development):

1. Mine equipment

(a)	Buildings and bins	$ 7,500.00
(b)	Powder magazine	1,000.00
(c)	Fuel storage tank	1,000.00
(d)	Power lines	1,000.00
(e)	Compressor - 1,075 ft. 3/min - diesel	25,000.00
(f)	Drills (2 sinkers @ $315.00 (10 stoppers 500.00 (2 drifters 815.00	7,260.00
(g)	Drill accessories	1,200.00
(h)	Ore cars- 12 @ 500.00	6,000.00
(i)	Diesel-electric generator 25 KVA 440/60/3 Ph	4,500.00
(j)	Timber	3,000.00
(k)	Pipe lines, etc.	3,500.00
(l)	Steel, bits and repair parts	5,000.00
(m)	Blacksmith tools and supplies	500.00
(n)	Timber framing equipment	750.00
(o)	Electric and gas welding equipment	1,000.00
(p)	Battery locomotive - batteries and charge panel	12,000.00
(q)	Eimco 12-B mucking machine	3,200.00
(r)	Slushing equipment and tuggers	10,000.00
(s)	Powder and other mine supplies	5,000.00
		$ 98,410.00
(t)	Add construction labor	6,000.00
	Subtotal	$104,410.00

2. Camp equipment (for 30 men)

(a)	Bunkhouse facilities	$ 17,000.00
(b)	Messhall and equipment	12,000.00
(c)	Engineering and business office	5,500.00
(d)	Water supply, sewage & grading	3,000.00
(e)	Electrical and gas facilities	1,500.00
		$ 39,000.00
(f)	Add: construction labor	7,500.00
	Subtotal	$ 46,500.00
	Total	$150,910.00

D Present employees:

There are no present employees other than the Operator. All accounting, legal, engineering and geological services are being furnished without cost by arrangement with Combined Metals Reduction Company.

E Estimated additional employees:

1. Development period

It is planned to complete the development program by contracting all work on a footage basis. At present a firm bid has been made by the Centennial Development Company, Inc., of Eureka, Utah, to drive the Bonanza adit 2,100 feet to the N. 10° E. St. Lawrence fissure and to drift an initial distance of 1,000 feet north on the fissure. This company has its own staff and crew of miners; therefore, no additional new labor will be required during the development period. See Exhibit "B" for terms of contract bid.

2. Production period

Based upon a minimum production of 100 tons of ore per day, the following additional employees will be required:

Number	Classification	Rate/Day
1	Mechanic and welders	$13.00
1	Blacksmith	13.00
1	Cook	10.00
3	Cook's helpers	8.00
2	Motormen	13.00
2	Swampers	12.00
16	Miners	13.00
4	Timbermen	13.00
6	Slusher operators	12.00
4	Muckers	12.00
40		

Experienced labor of all classifications is available in this area because of its nearness to the two important mining centers; i.e., Pioche, Nevada, 80 miles to the south, and Ely, Ruth, Kimberly and McGill, Nevada, 40 miles to the northwest. United States and Nevada Employment services list these districts as surplus labor areas.

F Milling ore:

1. Ore of milling grade will be treated at the Caselton mill of Combined Metals Reduction Company, near Pioche, Nevada.

2. The distance to this mill is approximately 76 miles.

3. The ore will be hauled by truck, probably on a contract basis, since a number of hauling contractors have their headquarters in Pioche and Ely, Nevada.

G Estimated production:

Initial production has been estimated at not less than 50 tons per day within a period of 30 days after completion of the development work as outlined in this application. If ore conditions reasonably approximate those found in other districts of similar geologic nature, it seems reasonable to predicate a gradual increase in this initial production to about 100 tons per day at the end of six months and possibly 150 tons per day by the end of the first year, after completion of development.

H Estimated development time:

1.	Time required for preparation	1 Month
2.	Driving 2,100 feet adit	6 "
3.	Drifting 3,400 feet and diamond drilling	8 "
4.	Raising and preparation for production	3 "
	Total Time	18 Months

It is estimated that initial production of 50 tons per day will be accomplished in eighteen months from the time of starting the development program.

I Accessibility of mine:

A typical desert road winds approximately 4 miles from the county highway, in the valley floor, to the upper campsite in Lincoln Canyon at elevation 7,710 feet. There is no present road from this point to the Bonanza tunnel site, a distance of some 1,200 feet. Construction of an adequate road between these two points presents no great problem, and can probably be accomplished in about two weeks at a cost not to exceed $3,500.00. This road would be fully adequate to meet all development needs.

It is anticipated that the road from the valley floor to the campsite will be aligned and properly graded, which will probably take two weeks and cost about $1,500.00. Considerable assistance has been promised from White Pine County in building these roads.

J Estimated price of metals required:

Under current price levels for wages, freight, treatment and operating supplies, the present market prices for metals appear to be adequate for successful operation on the grade of ore anticipated. These quotations as of November 15, 1950, are as follows:

Silver	$0.90 Per Ounce
Lead	0.17 " Pound
Zinc	0.175 " Pound

IV ESTIMATED ORE RESERVES (TO BE DEVELOPED)

A Measured ore:

There is no measured ore which can be produced at a profit because of the uneconomic operating conditions at the elevations where known ore exists.

B Indicated ore:

There is no indicated ore for the same reasons given in A above.

C Inferred ore:

Sufficient geological evidence has been adduced permitting an analogy to be made with the Pioche and Eureka, Nevada, districts. Based upon this geological inference and similarity with geological conditions in the Pioche area, the examining geologists feel that commercial orebodies are to be anticipated.

Many ore shoots occur along the strike length of the St. Lawrence fissure which would be commercial if the location were such as to be readily accessible for trucking and all-year operation. The Bonanza adit and North drift, at elevation 8,075 feet, will cut these ore shoots on projection and will, therefore, render them commercial by providing accessibility. See projections, Exhibit "A", pages 1 and 2 inclusive.

The known lengths of these surface ore shoots, within the area encompassed by this proposed development, are as follows:

1.	Red Oxide claim - Elevation 10,160 feet		
	(a) At open cut above cabin	30 Feet	
	(b) In tunnel below cabin	90 "	
		120 "	120 Feet
2.	Black Oxide claim - Elevation 9,800 feet		
	(a) Upper Hudson tunnel	40 Feet	
	(b) Lower Hudson tunnel	170 "	
		210 "	210 "
3.	Old Moon claim - Elevation 9,600 feet		
	(a) Lincoln Canyon to dike	190 Feet	190 "
	Total		520 Feet

Thus, $\frac{520}{3400}$ = 15.3%, representing the percentage of the total fissure length in this immediate area known to contain shipping ore on the surface.

The average width of the fissure zone at these points is in excess of fifteen feet with at least four feet of shipping ore in the central portion, as indicated by the assay map which accompanies this application.

The inferred ore in these three shoots may be calculated as follows (at 12 cu. ft. per ton in place):

Red Oxide claim

Elevation	10,160 Feet	
Elevation drift	8,075 "	
Difference	2,085 "	
$\frac{(2.085)\ (120)\ (4)}{12}$	= 83,400 Tons	83,400 Tons

Black Oxide claim

Elevation	9,800 Feet	
Elevation drift	8,075 "	
Difference	1,726 "	
$\frac{(1.725)\ (210)\ (4)}{12}$	= 120,750 Tons	120,750 "

Old Moon claim

Elevation	9,655	Feet
Elevation drift	8,075	"
Difference	1,580	"

$$\frac{(1.580)\ (190)\ (4)}{12} = 100{,}067 \text{ Tons}$$ 100,067 Tons

Total Inferred Tonnage on Projection 304,217 Tons

The grade of this inferred ore should approximate that of recent lessee operations, in which little effort was made to sort the ore, since loading was from surface cuts by means of a slusher. These shipments averaged (see shipping records, Exhibit "B", pages 6 to 9, inclusive):

Gold	0.01	Oz.
Silver	8.55	Oz.
Lead	19.2	%
Zinc	1.2	%
Insol	4.7	%
Iron	4.6	%
Lime	27.3	%

The impossibility of making an accurate forecast of the tonnage and grade of this inferred ore is fully realized by all who have contributed to this application. However, the very strong mineralization along this St. Lawrence fissure, over a known strike length of some 12,000 feet, must be given full weight and consideration in making such an evaluation. In view of this, we submit that our calculated inferred tonnage is of the proper magnitude.

It will be noted that no effort has been made to infer ore which will undoubtedly make in the three most favorable beds; i.e., upper St. Lawrence, base of St. Lawrence and lower shale bedding. Materially added ore reserves are to be anticipated from these horizons.

V REPORTS ON PROPERTY

Attached hereto are the following reports covering recent examinations of this property.

(a) By Louis W. Cramer and Alfred M. Buranek, 512 Atlas Building, Salt Lake City, Utah, dated July 20, 1950, marked Exhibit "D".

(b) By Earl B. Young, Paul Gemmill and L. G. Thomas, 218 Felt Building, Salt Lake City, Utah, dated October, 1950, marked Exhibit "C".

(c) By P. A. Laylander, Fallon, Nevada, dated November 20, 1950, marked Exhibit "E". (This report covers aerogeologic mapping of the area, based upon large-scale vertical stereoscopic color air photography.)

VI EXPERIENCE OF OPERATOR

This proposed development program will be under the direction of James D. Williams, Manager of Mt. Wheeler Mines, Inc. Mr. Williams is a graduate engineer with fifteen years' experience as a mine operator on his own account, as follows:

1935-1937	Imperial Mine	Ludlow, California
1937-1940	Black Eagle Mine	Indio, California
1940-1944	Darwin Lead-Silver	Darwin, California
1944-1950	Harrington Mine	Milford, Utah
1950-	St. Lawrence Mine	Shoshone, Nevada

Operator became associated with Combined Metals Reduction Company in November, 1948, while at the Harrington Mine, near Milford, Utah, and reference is made to that Company for additional information regarding Operator's qualifications. See also U.S. Bureau of Mines Information Circular No. 7497.

VII ADDITIONAL INFORMATION

(a) Mr. A. C. Johnson, Chief, Mining Division, Region III, U.S. Bureau of Mines, Reno, Nevada, has informed us that Region III has previously examined this property. See letter, Exhibit "B", pages 2 and 3.

(b) Mr. Joshua E. Spurr of the United States Geological Survey, covered this area in 1903, and his report may be found in U.S.G.S. Bull. No. 208 at pages 25 to 35, inclusive.

(c) Vertical photographic coverage was made by the U.S. Geological Survey in October, 1945, under project GS-BW, Shoshone No, 2, Nevada.

VIII ATTEMPTED FINANCING

This mining venture has been submitted to three operating mining companies during the past four months. The merit of the proposed development program was not questioned in any instance, but, notwithstanding this, funds were not forthcoming. The only reason given was that of the present unfavorable tax treatment of risk, or venture, capital in the highly speculative field of mining. From this it appears that private capital is not available for this project.

Respectfully submitted,

MT. WHEELER MINES, INC.

By James D. Williams

James D. Williams
President

November 24, 1950

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PLAN AND SECTION
OF
BONANZA ADIT DEVELOPMENT
TO ACCOMPANY
LOAN APPLICATION
EXHIBIT "A"

NATIONAL

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HAROLD B. SPENCER, PRESIDENT
ROBERT E. WATT, SEC'Y-TREASURER

CENTENNIAL DEVELOPMENT COMPANY, INC.

MINING CONTRACTORS
EUREKA, UTAH

August 23, 1950

Mr. James D. Williams
757 South Berendo 501
Los Angeles 5, California

Dear Mr. Williams:

Our price for driving of your tunnel located at the St. Lawrence mining property in White Pine County, Nevada would be $26.50 per linear foot, plus conditional prices listed below. Our understanding of the specifications is as follows:

1. Length: approximately 2100' to vein, plus 700' along vein
2. Size: 6 x 7' minimum, 1 x 1½' open ditch on left side
3. Grade: ½ of 1%
4. Track: 20 lb. rail, 18" gauge, 4 x 6" ties on 3' centers
5. Pipe: 3" air line, 1" water line, 16" steel vent line
6. Time schedule: 500' per month, after two weeks setting up.

In case of ground requiring timber (by standards of safe mining practice) our price would be an additional $10.00 per foot of tunnel, which would cover standard Oregon Fir 6 x 8", 2" lagged drift sets on 6' centers and removal of enough additional ground to allow 6 x 7' inside of timbers. In case of exceptionally bad ground, requiring spiling or heavier timber than specified above, we would require a clause allowing for a negotiated contract for the duration of the special conditions. In regard to water, we are prepared to handle any reasonable amount, and are as experienced as anyone in dealing with it. We would ask that we be allowed release only if water conditions become obviously impossible, decision on this to be by mutual agreement between owner and contractor.

We would require full payment by the 10th of the month following completion of work done according to specifications, measurement to be by owner.

Very truly yours

CENTENNIAL DEVELOPMENT COMPANY, Inc.

H. B. Spencer

H. B. Spencer

NOV 17 1950

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO

September 19, 1950

Mr. James D. Williams
757 South Berendo #501
Los Angeles 5, California

Dear Jim:

I am returning the report by Cramer and Buranek on your lead-silver deposits in White Pine County, Nevada. I read the report with considerable interest, as I am familiar with the general area. The report, maps, and pictures together present the story rather well.

As you know, Nevada is outside of my jurisdiction. I suggest you send the data to Mr. A. C. Johnson, U. S. Bureau of Mines, P. O. Box 1551, Reno, Nevada. I'm sure Mr. Johnson will be interested in the report, whether he can do anything about it is another matter.

I thought you were going to get out of the mining game, but I guess you are like the others who get bitten by the bug.

Sincerely yours,

Paul T. Allsman

Paul T. Allsman
Chief, Mining Division

Enclosure 1

Copy to: A. C. Johnson

Sent to A.C. Johnson
9/22/50
J.

NOV 17 1950

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region III

Nevada - California

P. O. Box 1551
Reno, Nevada

Sept. 29, 1950

James D. Williams
757 South Berendo, #501,
Los Angeles 5, California

Dear Mr. Williams:

This will acknowledge your letter of September 22 enclosing a report on the St. Lawrence mine prepared by Cramer and Buranek.

The Mining Division of Region III has examined the St. Lawrence mine in White Pine County, Nevada. In the event that you are in Reno during the week of October 1, I will be glad to discuss the property with you.

Very truly yours,

A. C. Johnson

A. C. Johnson, Chief
Mining Division
Region III

10/13/50
J.

17 1959

HAROLD B. SPENCER, PRESIDENT
ROBERT E. WATT, SEC'Y-TREASURER

CENTENNIAL DEVELOPMENT COMPANY, INC.

MINING CONTRACTORS

EUREKA, UTAH

c/o Eagle Mt. Mine
Desert Center, Calif.

Desert Center, Cal.

Oct. 16, 1950

Mr. James D. Williams
757 South Berendo # 501
Los Angeles 5, Cal.

Dear Mr. Williams:

Confirming our conversation of Sunday, you ask that we submit a new bid covering 5000' of 8' wide by 7½ to 8' high tunnel, the price to be firm for the 2100 feet to the vein, but to be open for re-negotiation when conditions to be met along the vein are known. Track gauge is to be 24", vent line 18", with 20 lb. rail and 3" and 1" air and water lines. Vent line and rail will not necessarily be new, but will be in good serviceable condition. You will supply 12 mine cars, 35 cu. ft. capacity, at no charge to us, we to guarantee their return in good condition on completion of the job. You will build a truck road to the dump and will keep a small snow plow on the job.

In connection with the work beyond 2100', we are quite sure that additional ventilation, beyond a 25 HP fan at the portal, will be required if a footage rate of anywhere near 500' per month is to be maintained. If it is needed, the cost would be considerable and it would have to be stood by you, since we are not in a position to gamble on the possibility, and have not allowed for the equipment in our bid.

If a contract is signed, we cannot guarantee a starting date earlier than January 15, 1951, although we expect we could start by Jan. 1.

Under the above conditions, our bid would be $32.50 per linear foot.

In connection with our original bid for the 6 x 7' tunnel, with 18" track gauge and 16" vent line, you have stated that the used rail and vent line would be acceptable. If you want this size tunnel, with a change to 24" track gauge and 18" vent line, we will do it for the original price, with you supplying 9 35 cu. ft. cars as above. With these concessions, our bid will stand for the 2100' to the

vein, but we must ask that a renogotiation clause be inserted for the work on the vein, and that the possible increased ventilation requirements be included in the renegotiation as above.

Our original bid was made before the effects of the war condition were fully realized, and with the increases in wages, taxes and material and machinery costs which have already occurred, we are afraid it is a little low. However, we will stand by it under the above conditions. I hope that if you and the Combined Metals people use their Pioche costs for 8 x 8 drifts as a yardstick, you will realize that there are some very considerable extra costs involved in operating out in a place like that. I know you must understand this from your own experience, and you can be sure that we are well aware of it. I frankly feel that the $32.50 price is still pretty low, but am willing to take the chance on it because of the good possibilities of considerably more work being done.

I certainly hope that you are successful in getting this work under way and that we will be able to do the work for you.

Sincerely yours

H. B. Spencer

H. B. Spencer

Acknow.
10/22/50
J.

FORM C.O. 77-2

UNITED STATES SMELTING REFINING AND MINING COMPANY

NINTH FLOOR NEWHOUSE BUILDING

FINAL SETTLEMENT 9780-A

Salt Lake City, Utah, SEPTEMBER 22, 1948

Purchased From J. G. HULSE AND V. COTTINO

Pay JAMES G. HULSE, V. COTTINO, AND SHIRLEY ROBINSON, c/o J. G. HULSE, BOX 77, PIOCHE, NEVADA
SP: ELY, NEVADA

Ore CRUDE *Lot No.* 1 *Gold License No.*

Sampled by MIDVALE *Received* 9/15/48 *Sampled* 9/17/48 *Assayed* 9/18/48

Metal Quotations—Gold *Silver* 90.00 *Copper, N. Y.* - *Lead, N. Y.* 19.50 *Zinc*

ASSAYS	GOLD OZS. PER TON	SILVER OZS. PER TON	PER CENT CO. PER WET	PER CENT LEAD	PER CENT INSOLUBLE	PER CENT IRON	PER CENT ZINC	PER CENT SULPHUR	PER CENT LIME	PER CENT
U. S. S. R. & M. Co.	-	13.90		*30.60						
C&N	.01	14.00		*30.20						
Umpire										
New Sulphide										
Settlement Assay	.005	13.95	.05	*30.40	4.80	2.9	1.0	3.20	20.00	

CAR NOS.	WET WEIGHT	METAL VALUE			WORKING CHARGE	
Via Own Truck		Gold			Treatment Base 30 % Lead	4 65
		Silver 95 %	90.00	11 93	Credit Acct Over 30 % Pb.	04
*Assay shown for lead is wet assay less 1½%		Copper		-	Debit Acct Under 30 % Pb.	
		Lead		96 27	Insoluble	48
		Zinc			Zinc Charge, excess over 8%	
					Sulphur Charge, excess over 2%	30
					Arsenic Charge, excess over 2%	
Total Wet Weight						
Sacks					Total Debit	5 39
Net Weight	12400	Gross Value		108 20	Iron Credit	17
Less H O .60	74	Less Working Charge		4 22	CaO Net Working Charge	1 00 / 4 22

Dry Weight, lbs. 12326 Payment for 6.163 tons @ 103 98 per ton 640.83

Freight advanced @ per ton

Handling Charge:	7.50	
Assay Charges	4.00	
~~Sampling~~ Watching Charges	4.00	
Hauling Charges		
Royalty 12½% of $633.33	79.17	94 67

Union Trust Company of Rochester, N.Y. For the account of The St. Lawrence Mining Co.

Amount Withheld Pending Receipt of Silver Affidavit

Net Payment 546 16

-9-

FORM C.O. 77-2

UNITED STATES SMELTING REFINING AND MINING COMPANY

NINTH FLOOR NEWHOUSE BUILDING

FINAL SETTLEMENT 9780-A *Salt Lake City, Utah,* NOVEMBER 26, 1948

Purchased From JAMES G. HULSE

Pay JAMES G. HULSE, BOX 77, PIOCHE, NEVADA

SP: PIOCHE, NEVADA

Ore CRUDE - ST. LAWRENCE *Lot No.* 2 *Gold License No.*

Sampled by MIDVALE *Received* 11/16/48 *Sampled* 11/18/48 *Assayed* 11/19/48

Metal Quotations—Gold *Silver* 90.00 *Copper, N. Y.* *Lead, N. Y.* 21.50 *Zinc*

ASSAYS	GOLD OZS. PER TON	SILVER OZS. PER TON	PER CENT COPPER WET	PER CENT LEAD	PER CENT INSOLUBLE	PER CENT IRON	PER CENT ZINC	PER CENT SULPHUR	PER CENT LIME	PER CENT
U. S. S. R. & M. Co.	-	5.2		*11.3						
C&N	.01	5.25		*11.8						
Umpire										
Non Sulphide										
Settlement Assay	.005	5.23	-	*11.55	4.0	2.2	1.2	1.6	28.2	

CAR NOS.	WET WEIGHT	METAL VALUE			WORKING CHARGE	
UP 64326		Gold			Treatment Base 30% Lead	4 65
		Silver MD 1 oz.	90.00	4 26	Credit Acct Over 30% Pb.	
See Louis H. Scott Lot 1		Copper			Debit Acct Under 30% Pb.	1 85
		Lead		40 73	Insoluble	40
*Assay shown for lead is wet assay less 1.5%		Zinc			Zinc Charge, excess over 6%	
					Sulphur Charge, excess over 2%	
					Arsenic Charge, excess over 2%	
Total Wet Weight						
Sacks					Total Debit	6 90
Net Weight	63580	Gross Value		44 99	Iron Credit	13
Less H_2O 2.0 %	1272	Less Working Charge		5 36	CaO Net Working Charge	~~1 41~~ 5 36

Dry Weight, lbs. 62308	Payment for 31.154 tons @	39 63	per ton		1234.63
Freight advanced @ 4.08	per ton			129.70	
Federal Tax 3%				3.89	
Assay Charges				4.00	
Watching Charges				4.00	
Hauling Charges					
Royalty 12½% of $1101.04				137.63	279 22
The St. Lawrence Mining Company, 803 Wilder Building					
Rochester 4, New York					
			Amount Withheld Pending Receipt of Silver Affidavit		
			Net Payment		955 41

1234.63
279.22
955.41

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FORM C.O. 77-2

UNITED STATES SMELTING REFINING AND MINING COMPANY

NINTH FLOOR NEWHOUSE BUILDING

FINAL SETTLEMENT L-2 *Salt Lake City, Utah,* SEPTEMBER 20, 1949

Purchased From J. G. HULSE AND V. COTTINO

Pay JAMES G. HULSE AND VICTOR COTTINO, P.O. BOX 77, PIOCHE, NEVADA

SP: ELY, NEVADA

Ore CRUDE (ST. LAWRENCE CLAIM) *Lot No.* 3 *Gold License No.*

Sampled by MIDVALE *Received* 9/12/49 *Sampled* 9/14/49 *Assayed* 9/15/49

Metal Quotations—Gold *Silver* 90.00 *Copper, N. Y.* *Lead, N. Y.* 15.125 *Zinc*

ASSAYS	GOLD OZS. PER TON	SILVER OZS. PER TON	PER CENT COPPER WET	PER CENT LEAD	PER CENT INSOLUBLE	PER CENT IRON	PER CENT ZINC	PER CENT SULPHUR	PER CENT LIME	PER CENT
U. S. S. R. & M. Co.		6.10		18.60						
C&N	.01	6.45		18.00						
UNION Umpire				18.20						
~~xxxxxxxx~~ Less				1.50						
Settlement Assay	.005	6.28		16.70	4.10	1.70	1.00	2.80	28.40	

CAR NOS.	WET WEIGHT	METAL VALUE			WORKING CHARGE	
Truck (1 load) US 9		Gold 100% @			Treatment Base 30% Lead	5 25
		Silver MD½oz. 90.00	5	20	Credit Acct Over 30% Pb.	
		Copper			Debit Acct Under 30% Pb.	1 33
		Lead	39	45	Insoluble	41
		Zinc			Zinc Charge, excess over 6%	
					Sulphur Charge, excess over 2%	20
					Arsenic Charge, excess over 2%	
Total Wet Weight						
Sacks					Total Debit	7 19
Net Weight	9580	Gross Value	44	65	Iron Credit ~~Gab~~	10
Less H_2O 0.5 %	48	Less Working Charge	5	67	Net Working Charge	1 42 5 67

Dry Weight, lbs. 9532	Payment for 4.766 tons @	38 98	per ton		185.78
Freight advanced @	per ton				
Handling Charge:				7.50	
Assay Charges				4.00	
~~xxxxxxxx~~ Watching Charges				4.00	
Hauling Charges if any to be paid by shipper.					
Royalty 12½% of $178.28 - The St. Lawrence Mining Co., 803 Wilder Building Rochester 4, New York				22.29	37 79
Amount Withheld Pending Receipt of Silver Affidavit					
Net Payment					147 99

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FORM C D. 77-2

UNITED STATES SMELTING REFINING AND MINING COMPANY

NINTH FLOOR NEWHOUSE BUILDING

FINAL SETTLEMENT L-2 *Salt Lake City, Utah,* SEPTEMBER 20, 1949

Purchased From J. G. HULSE AND V. COTTINO

Pay JAMES G. HULSE AND VICTOR COTTINO, P.O. BOX 77, PIOCHE, NEVADA

SP: ELY, NEVADA

Ore CRUDE (ST. LAWRENCE CLAIM) *Lot No.* 4 *Gold License No.*

Sampled by MIDVALE *Received* 9/14/49 *Sampled* 9/16/49 *Assayed* 9/17/49

Metal Quotations—Gold *Silver* 90.00 *Copper, N. Y.* *Lead, N. Y.* 15.125 *Zinc*

ASSAYS	GOLD OZS. PER TON	SILVER OZS PER TON	PER CENT COPPER WET	PER CENT LEAD	PER CENT INSOLUBLE	PER CENT IRON	PER CENT ZINC	PER CENT SULPHUR	PER CENT LIME	PER CENT
U. S. S. R. & M. Co.	.01	7.10		18.90						
C&N	.01	7.05		19.40						
Umpire				avg.19.15						
~~xxxxxxx~~ Less				1.50						
Settlement Assay	.01	7.08	.15	17.65	12.40	23.40	1.70	1.20	9.10	

CAR NOS.	WET WEIGHT	METAL VALUE			WORKING CHARGE	
Truck (1-load)		Gold 100% @			Treatment Base 30% Lead	5 25
		Silver MD½oz. @ 90.00	5	92	Credit Acc't Over 30% Pb.	
		Copper			Debit Acc't Under 30% Pb.	1 24
		Lead	41	70	Insoluble	1 24
		Zinc			Zinc Charge, excess over 6%	
					Sulphur Charge, excess over 2%	
					Arsenic Charge, excess over 2%	
Total Wet Weight						
Sacks					Total Debit	7 73
Net Weight	6870	Gross Value	47	62	Iron Credit	1 40
Less H O 1.7 %	116	Less Working Charge	5	87	CaO Net Working Charge	5 87

Dry Weight, lbs. 6754 Payment for 3.377 tons @ 41 75 per ton 140.99

Freight advanced @ per ton

Handling Charge:	7.50	
Assay Charges	4.00	
~~xxxxxxx~~ Weighing Charges	4.00	
Hauling Charges if any to be paid by shipper		
Royalty 12½% of $133.49 - The St. Lawrence Mining Co. 803 Wilder Building Rochester 4, New York	16.69	32 19
Amount Withheld Pending Receipt of Silver Affidavit		
Net Payment		108 80

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EXHIBIT "G"

PRELIMINARY REPORT
on

ST. LAWRENCE MINE
WHITE PINE COUNTY, NEVADA

By

Earl B. Young

Paul Gemmill

L. G. Thomas

October, 1950

Looking East at Mt. Washington from Kirkaby Ranch

PRELIMINARY REPORT ON THE
ST. LAWRENCE MINE
WHITE PINE COUNTY, NEVADA

SUMMARY

1. The St. Lawrence Mine is located near the summit of the Snake Range at an elevation of about 10,000 feet, is reached by a narrow mountain road with many switchbacks, and because of this inaccessibility and short operating season cannot be operated profitably with present facilities.

2. The lead-silver ore of the St. Lawrence Fissure occurs as blobs or narrow streaks along a steeply dipping zone in rather massive limestone, the zone striking N 7 to 10 E. These blobs consist of galena and cerussite which carry silver in a ratio of about one ounce of silver to two to four percent of lead. The ore occurrences seem to be localized by intersection of the zone with cross breaks that strike N 30 to 60 E and usually dip steeply. Between the intersections the zone is undeveloped and is probably low-grade or barren. The greatest crossfracturing, greatest development and strongest mineralization was observed in the vicinity of North Fork of Lincoln Canyon. This canyon itself may well mark strong northeast fracturing with a dike or two. There is no present ore reserve.

3. Two other fissures were observed in the area. One is a strong quartz fissure which can be followed by intermittent outcrops for a mile or more. It strikes N 75 E and dips about 75 degrees to the north and is marked on the map by the old Canaan lode claim, Lot No. 39. The other fissure outcrops on the Sheffield Lot No. 40, strikes N 45 E, dips about 75 northwest and contains high grade silver-lead ore. Associated with it we observed a 30-foot band of dolomatized limestone.

4. Igneous activity is represented - (1) By the large granitic batholith, conspicuous on the east slopes of Mt. Wheeler, extending for many miles along the east side of the Snake Range and probably underlying much of the area; and (2) by several porphyritic dikes which strike northeasterly and are found in both the Lincoln and Pole canyon areas. The largest dike outcrops on the Canaan claim and has been traced for several hundred feet.

5. Faulting is abundant in the area and occurs with much variation in strikes and dips. In general, displacements are small.

6. Two examinations, covering five days and three days, were made of the property. Several plans for development were discussed and after studying the larger geological features of the mountain, the detail of the various mineral showings and making careful measurement of the Cambrian log in Pole Canyon, we agreed on a general plan of exploration.

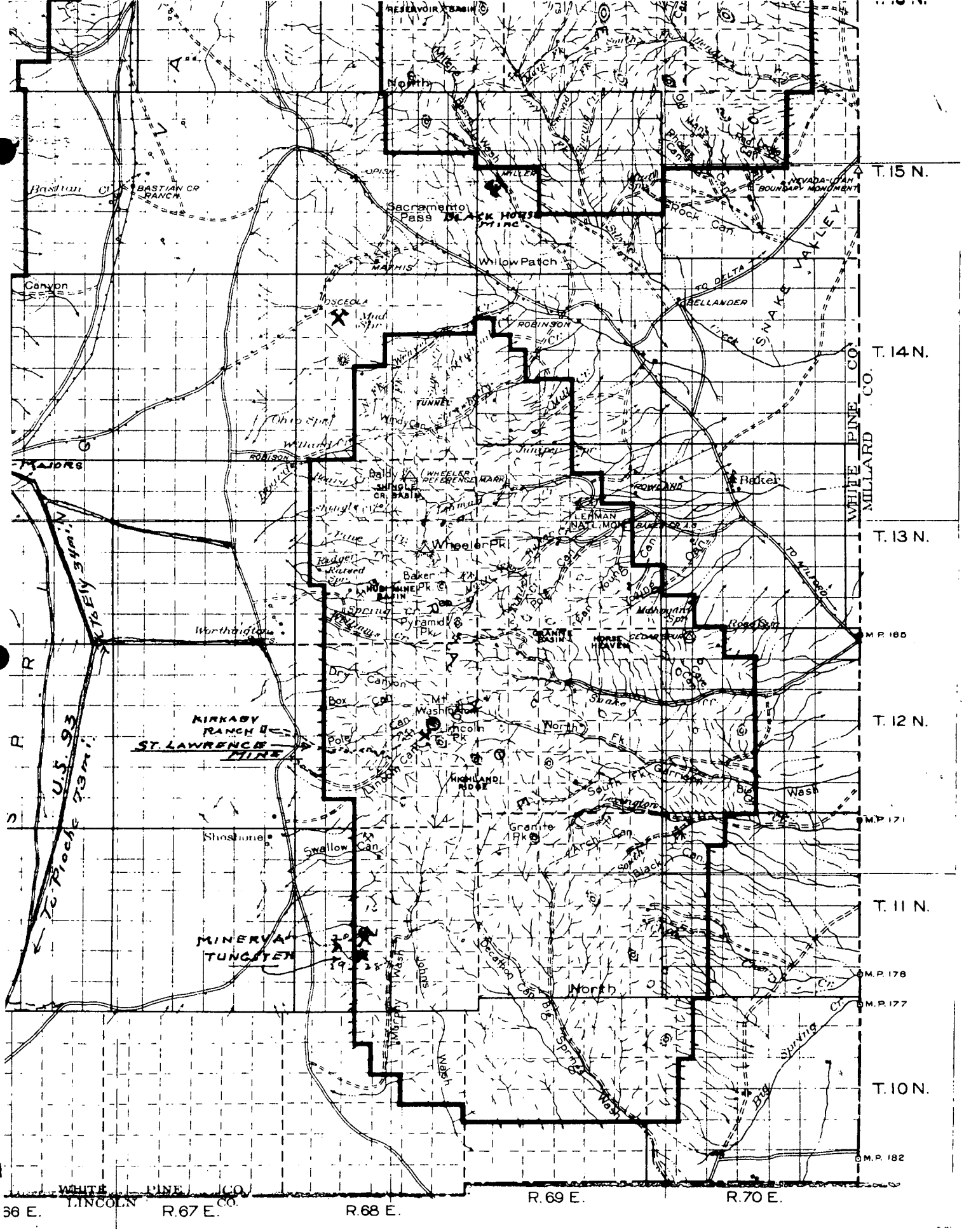
Many years ago an adit was started in Lincoln Canyon at elevation 8075 to be driven about N 66 E some 2100 feet to intersect the St. Lawrence Fissure, then explore the zone by drifting northerly and southerly to develop favorable intersection in favorable lime beds. This adit was advanced 350 feet and is now in good condition. We believe that continuation of this crosscut adit and drift offers the most practical method of exploring the property with

the hope of successful and profitable operation. This adit, known as the "Bonanza Tunnel", should intersect the zone at a depth of about 1600 feet below present workings and should be in the St. Lawrence limestone which, because of its thin bedding and carbonaceous nature, should be favorable for ore deposition. Study of our maps will show that the entire St. Lawrence limestone has favorable characteristics as a host for ores, with the upper section and the basal portion being especially attractive. Intersection of these beds will require 3400 feet of drifting northerly on the zone. This drifting of 3400 feet should reach the intersection of the strong N 75 E Canaan fissure with the St. Lawrence fissure zone. Possibility of an orebody at this point seems very good.

7. Our investigations lead us to believe that there are at least three favorable horizons. Factors considered important are such things as favorable stratigraphic position, contacts of beddings with different physical and chemical characteristics, thin bedded structure in certain limestones, and the abundance of carbonaceous material in certain horizons. In the entire log three beds believed to be most favorable are - (1) The 15 foot limestone about 45 feet above the quartzite; (2) the basal portion of the St. Lawrence limestone, and (3) the upper portion and contact of the St. Lawrence limestone with the overlying Lincoln limestone.

8. Preliminary work such as location of protective claims, the building of a good mine road, a suitable temporary camp, organizational expense and funds to meet early option payments are estimated to require $25,000.00.

9. The success of this exploratory project would develop an important new mining district, and would add materially to our national mineral resources.



U S DEPARTMENT OF AGRICULTURE
FOREST SERVICE
LYLE F WATTS, CHIEF
T W NORCROSS, CHIEF, DIVISION OF ENGINEERING

Snake Range looking East from Spring Valley

PRELIMINARY REPORT ON THE ST. LAWRENCE MINE WHITE PINE COUNTY, NEVADA

By
Earl B. Young
Paul Gemmill
L. G. Thomas

Introduction

In early October, accompanied by J. D. Williams and Harry Poller, we made a five day examination of the St. Lawrence Mine and the area adjacent thereto. As it was obvious that the presently known deposits could not be worked profitably because of inaccessibility and short season, the examination became largely a study of general geological conditions and determination of some method of development which would permit of year-round work and offer some hope of profit.

Several weeks later we spent three days making additional observations in the area. During this second visit we examined the strong N 75 E quartz fissure which outcrops on the patented Canaan lode, Lot No. 39 and the silver-lead fissure that outcrops on the patented Sheffield Lode Lot 40, these claims having been acquired after our first visit. Also, we found much additional evidence of dikes and of secondary dolomatization in the area.

As a result of our studies and much discussion, we agreed on the location of the exploratory adit at elevation 8075 in Lincoln Canyon, using the old adit as the starting place. In this report we attempt to present the geological evidence to justify the driving of this adit.

At the conclusion of our report we have added the report on the property by Cramer and Buranek, made in July of this year. It contains some data that will not be repeated in our report.

General Comments

This property, the St. Lawrence Mine, is located high in the Snake Range of eastern White Pine County, Nevada. Elevation varies from 9,000 to 12,000 feet. The property is reached by a jeep mine road with many switchbacks which is about eight miles from the Kirkeby Ranch on one of the valley roads.

Climate is typical of this area and elevation. Snows prevent operation except for a few months each year. There is a large stand of good mine timber on the patented claims. Water of good quality is available from springs in South Fork of Lincoln Canyon. We are informed that a water right of 100 inches on Grouse Springs is part of the deal.

The topography is extremely rugged being marked by many deep, precipitous camyons and sheer cliffs. The area is entered by roads, such as they are, up Pole Canyon and Lincoln Canyon.

Property Ownership

The property consists of seven patented mining claims owned by the St. Lawrence Mining Company, Rochester, New York, known as Cave, Snow Bird, Green Land, Pass Word, Red Oxide, Black Oxide and Old Moon, all under Survey 4289; nine unpatented lode claims owned by Victor Cottino and associates of Pioche, Nevada, known as Bonanza Nos. 2 to 10 inclusive; and four patented claims recently acquired by J. D. Williams by tax sale from White Pine County; Washington Lot No. 37, Young America Lot No. 38, Canaan Lot No. 39 and Sheffield Lot No. 40. Control of all groups now rests with Mr. Williams of Los Angeles, California. All of these claims are shown on the property map.

There are several old log cabins on the mountain which could be used temporarily, but there is little equipment other than a small hoist and slusher on the Red Oxide claim.

History

The claims were located in the '70's by Frank Williams and William Bacon. They are reported to have shipped high grade lead ore but few records are available. Small operations continued from time to time until 1903. In that year the Hudson Tunnel was driven at elevation 9687 on the fissure in the north wall of Lincoln Canyon and shipments were made to the U.S. Smelting Company. Shipments are said to have averaged about 75% lead and 18 ounces silver. In June, 1917, the claims were patented by the St. Lawrence Mining Company. U.S. Smelting Refining & Mining Company is said to have examined the property and reported favorably but that war prevented action.

In 1919 the Bonanza Tunnel was started at elevation 8075 in Lincoln Canyon and advanced 350 feet. Desultory leasing prevailed until 1948, when James Hultz, Victor Cottino and Shirley Robison took a lease and option on the property and built the jeep road to the summit. Shipments from surface workings ran from 11.5% lead to 30.4%, with silver assaying from 5.23 ounces to 13.95 ounces per ton. Gold is negligible. Iron runs from 2.2% to 7.6%; lime from 20% to 30% and insoluble about 5%.

Mr. J. D. Williams first examined the claims in 1943, but did not become interested until 1950. At that time he took an assignment of the lease and option on the patented claims and an option to lease and purchase the unpatented claims. He now proposes to extend the Bonanza Tunnel 2100 feet and develop the main fissure zone about 1600 feet below the old workings.

Financial Matters

The Mt. Wheeler Mines, Inc. has been incorporated in the State of Nevada for 2,000,000 shares at $1.00 par, and has plans to develop the mineral resources of the area.

The patented claims owned by the St. Lawrence Mining Company are optioned at a total price of $100,000.00. Under the terms of the agreement $5000.00 is to be paid on or before December 31, 1951. The balance is to be paid by December 31, 1958, with royalty of 10% of the net smelter value applying on the purchase.

The unpatented claims are optioned at a total price of $26,000.00; $6,000.00 is to be paid by May 31, 1951. The balance is to be paid by December 31, 1954, with a royalty of 5% applying. Royalty applies on all production from the unpatented claims and on the production from the patented claims after deduction of the 10% outlined above.

Description of Workings on
the St. Lawrence Fissure

The several adits and numerous diggings are all located on or near the one strong North 10° East fault-fissure zone, dipping 75 to 85° West, and which extends for more than 12,000 feet along the surface through the property. The fissure appears as a brownish stained dolomitized shear zone which varies in widths from a few inches to a maximum of over 30 feet at generally North-East crossings.

The principal or best exposed workings are listed and described as follows:

Upper Cabin at Elevation
10160 on Red Oxide Claim

Face of 20 foot adit shows spots of galena up to 8 inches in size. Hoist and slusher installed here for sorting dump. Stained fracture zone of principal N 10° E fissure is about 20 feet wide, possibly 50 feet throw with west side down. Rounded chunks of galena ore in talus showing in open cut.

Small shafts and caved workings along the fissure to the south show low-grade mineralization in zone from 10 to 20 feet widths. Spots of galena from specks to 8 inch pieces in the vein.

Paul Gemmill sampled the best showing in the face of the 10100 drift - an 1.8 foot cut of: .01 ounces gold; 5.99 ounces silver; 11.4% lead; and 1.2% zinc. Also the 10000 foot adit, near face, an 18 inch cut of reddish oxide assaying: 1.2 ounces silver; 7.7% lead and 2.9% zinc.

Hudson Tunnel at Elevation 9687 and
Upper Hudson at Elevation 9890 on
Black Oxide Claim

The Hudson Tunnel (adit) is about 700 feet in length, driven along the principal fissure. The portal is caved, but old stopes indicate about three foot lenses of galena at intersections with N-E cross fissures. Samples taken by Mr. Cramer show the best one foot remaining at: .015 ounces gold; 13.2 ounces silver and 26.1% lead. Two other fissures which are parallel to the main N 10° E zone are indicated.

The Upper Hudson workings at 9890 has strong mineralization and ore on three foot widths by 40 foot in length with replacement of about one foot of high grade lead to east in bedding and a downward extension as a chimney and open water course to the Hudson Tunnel, some 200 feet below. This ore forms at a N 60° E series of crossings which dip from 75° NW to vertical.

Highest and Most Northerly
Workings at Elevation about 11800
on Rim of Cliff. Cave Claim

A 12 foot shaft on the edge of Mt. Washington, east cliff, in black Washington limestone shows 4 inch pieces of semi-oxidized high grade lead and limonite in a 38 foot stained fissure zone at intersection of East-West and North-East fractures. Principal N 10° E fissure appears to continue on northwards towards the peak of Mt. Wheeler (elevation 13,061 feet).

There are several shallow pits along the zone to the south towards the Upper Cabin workings which expose some limonite and indications of mineral. These have not been deepened enough to reveal other than the continuity of the main fissure.

South Side of Lincoln Canyon
Adit at Elevation 9500
Old Moon Claim

The principal showing on the south side of Lincoln Canyon is found on the main N 10° E fissure at its intersection with a porphyry dike (N 65° E dipping 85° NW) at the portal of Adit 9500. This adit is about 50 feet in length exposing numerous small spots of galena scattered through the soft dolomite on footwall of the porphyry.

Several tons of high grade lead ore has previously been mined with about one ton remaining on the dump.

Paul Gemmill sampled a 15 inch cut of yellow oxides, here, which assayed: 3.6 ounces silver and 5.2% lead.

Another cut by Paul Gemmill taken from a small pit on the fissure below these workings showed 2 feet of: 4.7 ounces silver, 5.0% lead.

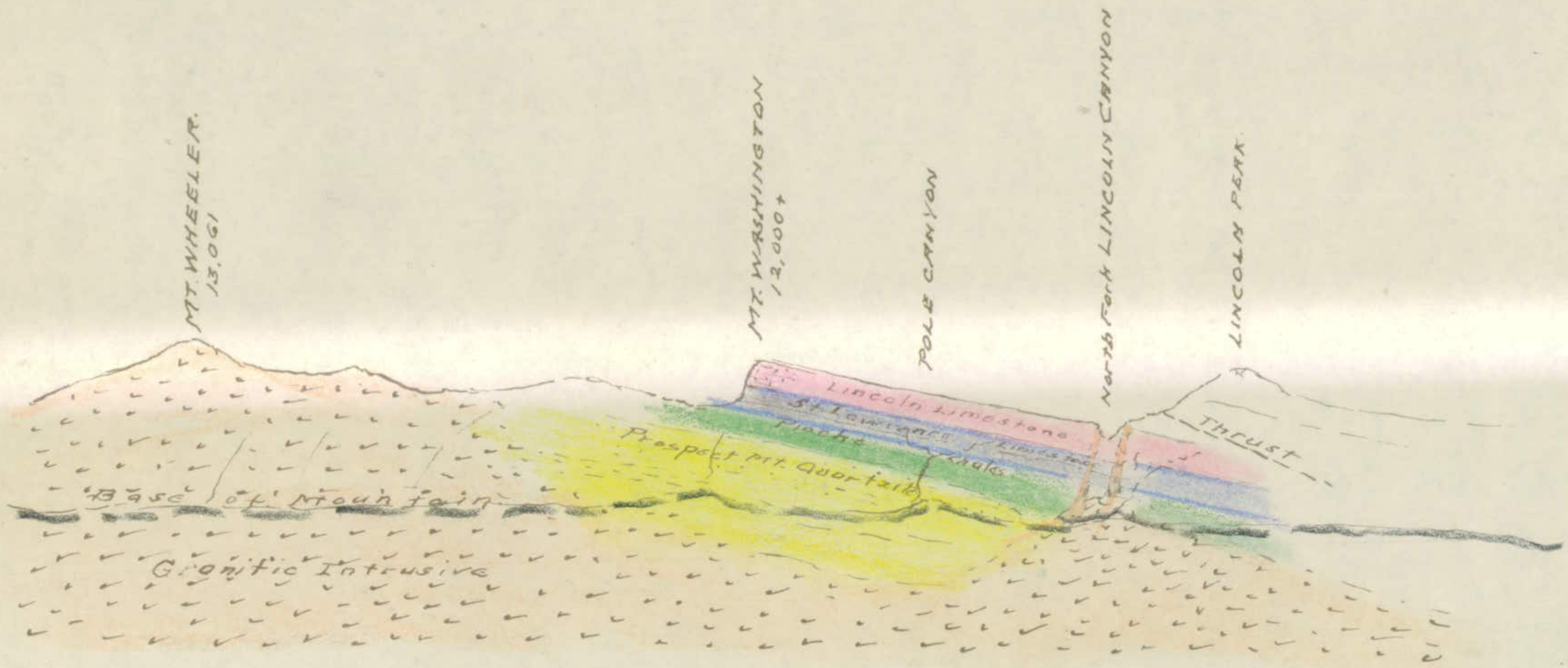
The other two or three diggings here on the south side of Lincoln Canyon, such as the 9320, 9400 and 9655, were mostly caved or filled with snow; they appeared to be of lesser importance, except to expose parts of the principal fissure.

A map showing the workings and sampling accompanies this report. It is drawn on scale of 100 feet to one inch.

General Geology

This investigation was largely geological in nature and our observations will be recorded in considerable detail. Pictures, sketches and maps are presented to show the theory developed and the detail in support of the theory.

The sketch which shows an idealized north-south section through a portion of the Snake Range, contains the following elements. At the north end, it shows Mt. Wheeler, which until recently was considered the highest mountain in Nevada, elevation 13,061. The mountain is part of a large central granitic intrusive mass probably of Mesozoic age. Two thin sections made from pieces of float show the



Sketch showing idealized North-South Section through a portion of the Snake Range looking east. No scale.

Note the batholith assumed to underly the range and the assumed cupola with known dikes near Lincoln Canyon area.

A

REFERENCES

COMBINED METALS REDUCTION CO.

ST. LAWRENCE MINE

WHITE PINE COUNTY, NEVADA

MADE BY 10/14/50 19.

TRACED BY

CHECKED BY

SCALE No scale.

Mt. Washington and Upper Pole Canyon
from Pole - Lincoln Divide - looking Northeast

presence of considerable plagioclase feldspar and without careful study the rock should classify as quartz monzonite to quartz diorite. It extends for many miles, no doubt underlying the Cambrian sediments of the area that we visited and being connected genetically with the various mineral deposits of the range.

We have indicated the probability that a minor cupola of igneous rock may be located in the neighborhood of Lincoln Canyon. This idea is based on the presence of several dikes that outcrop in the area where the strongest mineralization is seen. This cupola could be the concentrating point in the magma from which the silver-lead vapours migrated up the northeast fractures to deposit the metals in favorable beddings.

The sketch also shows the general attitude of the Cambrian sediments which strike roughly east-west and dip southerly about 12°. The presently known orebodies seem at times to have been localized near the top of the Lincoln lime, because the contact with the overlying Washington formation (possibly upper Cambrian) would have offered the conditions favorable for precipitation.

However, in Lincoln Canyon, sulphides are seen several hundred feet below the contact with the Washington Formation.

The region is marked by metamorphism of several types. First, there is the regional metamorphism as evidenced by the abundance of sericite in the shales. Then there is the bleaching of the limestones by vulcanism. This is more noticeable toward the north end of the area as Mt. Wheeler is approached. Locally, there is dolomitization of the limestones near the fissures. Finally, we have the effects of oxidation of the orebodies.

Stratigraphy

We wish to call attention to two sketches submitted by Paul Gemmill. Sketch No. 1 shows the detail as measured on the slopes in Pole Canyon. Sketch No. 2 shows the correlation of the log thus determined with previously published logs of Eureka, Nevada and Pioche, Nevada. With these sketches will also be found a print from Dr. H. E. Wheeler's Composite Correlation Diagram appearing in Bull. Geol. Soc. Am., Vol. 54, with the Mt. Wheeler section inserted.

Also submitted with the report is a panorama picture showing the location of the measured section as viewed from the south rim of Pole Canyon, looking northerly. Sketch No. 1, referred to above, shows much detail of the measured section which will not be repeated here.

Generalization of the log is as follows:

Prospect Mountain Quartzite

Thickness cannot be determined although this formation extends for miles along the west flank of the range from Pole Canyon northward. In Pole Canyon there is several hundred feet of thin-bedded quartzite with varying hardness. This has weathered into a step-like topography somewhat reminiscent of the transitional zone in Pioche.

Pioche Shale

The measured section shows a total thickness of 350 feet. The shale contains much sericite, ripple marks and worm trails. In places it resembles Pioche Shale A. Forty-five feet above the highest quartzitic layer there is a 15 foot lime bed which is thin-bedded and medium gray (may be bleached) in color. At one point this limestone is altered almost white where scheelite and garnet appear associated with a fairly strong east-west fissure. It is probably a good ore horizon.

St. Lawrence Limestone

The total thickness of this limestone which we wish to designate the St. Lawrence limestone is considered as 670 feet. This is divided into a lower, dark gray, algal, medium to thin bedded lime 500 feet thick and an upper thin-bedded black carbonaceous limestone 170 feet thick. The lower 500 feet portion has several variations as indicated on the drawing which may be used as marker beds. This section is the most densely inhabited algal area we have ever had opportunity to study.

The Bonanza Tunnel was started and advanced 350 feet in the top of the upper thin-bedded section. At this location the limestone is extremely carbonaceous, being much darker than in the measured section. This is one instance of increased bleaching as one goes northward toward Mt. Wheeler.

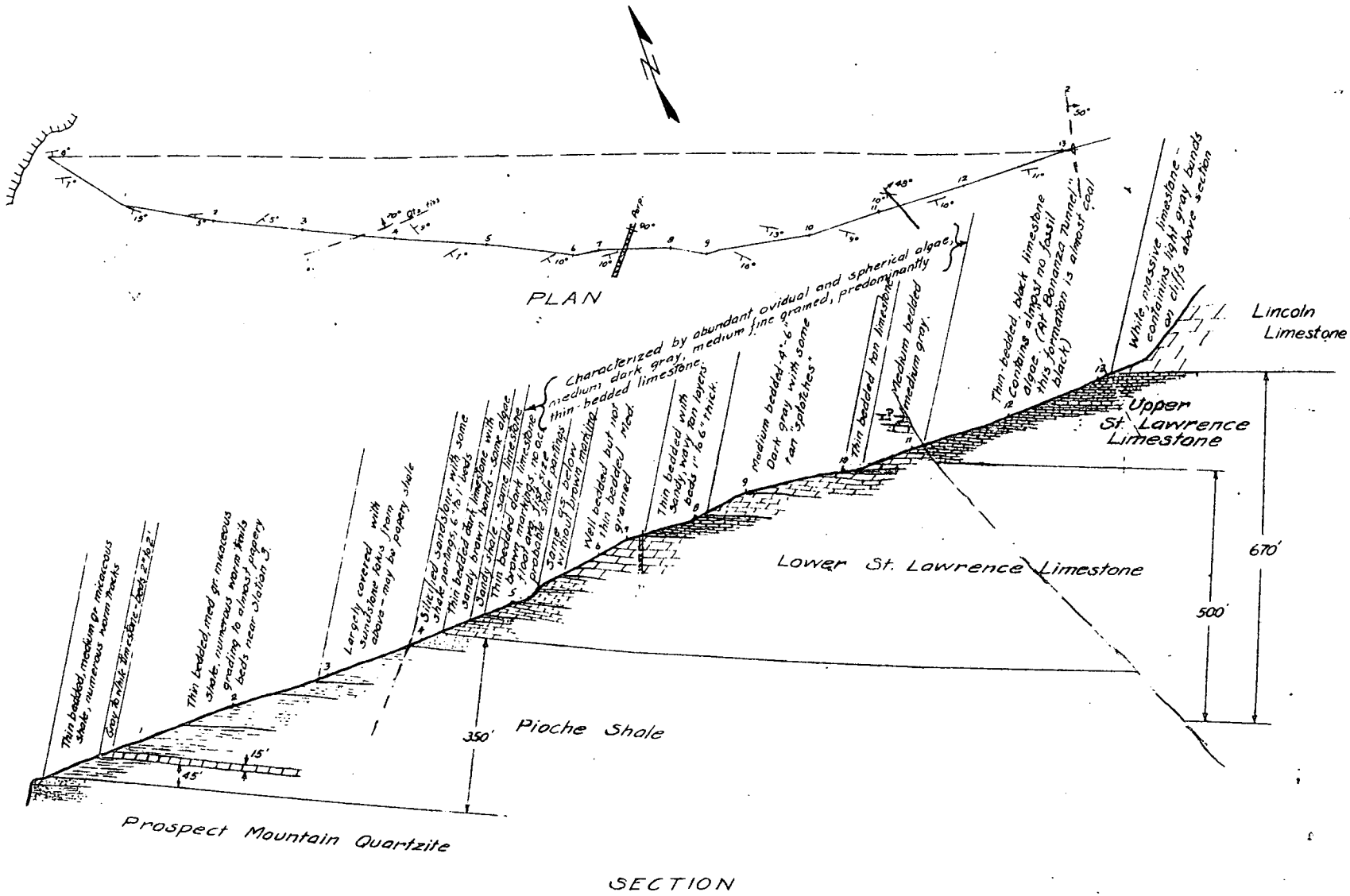
This limestone is believed to contain at least two good ore horizons - one near the base, the other near the top in the thin, carbonaceous layers.

Lincoln Limestone

It seemed appropriate to designate this thick, outstanding limestone as the Lincoln Limestone. It forms the impressive cliffs seen from Highway 93 and in Lincoln Canyon. By rough triangulation the thickness was determined to be 1300 feet. This checks closely with the section as measured by difference of elevation in Lincoln Canyon. This massive lime is white to gray in color and shows much bleaching on the sides of the cliffs, being more intense toward the north. The presently known ore deposits are near the top of this limestone. The central portion contains a softer layer of medium light to gray formation which is indicated by the tree-line in the panorama photograph, and forms a broad shelf among the cliffs. No fossils of consequence were found in this limestone.

Washington Formation

This name has been chosen from Mt. Washington which rises to over 12,000 feet a short distance north of the mine. The formation was not measured but is known to extend for several hundred feet up the slopes on the south side of North Fork, Lincoln Canyon. Near the north cabin it covers the Lincoln limestone on the west side of the main fissure, but not on the east side. This indicates a drop of the western block of from 50 to 100 feet. The formation is thin bedded and shaly in places. That it may be Upper Cambrian has been suggested by government geologists. Probably the middle Cambrian formation mentioned by Lemon as shale is the shale Williams described as exposed in South Fork, Lincoln



SECTION

REFERENCES	WORK	DRAWN Oct 12 '59	COMBINED METALS REDUCTION CO. ST. LAWRENCE MINE WHITE PINE COUNTY, NEVADA	SECTION OF PIOCHE SHALE AND ST. LAWRENCE LIMESTONE TAKEN IN POLE CANYON
		TRACED		SCALE 1" = 200'
		CHECKED		B-
		APPROVED		

REFERENCES

COMBINED METALS REDUCTION CO.

CORRELATION OF LOWER TO MIDDLE CAMBRIAN FORMATIONS OF MT. WASHINGTON WITH EUREKA - PIOCHE

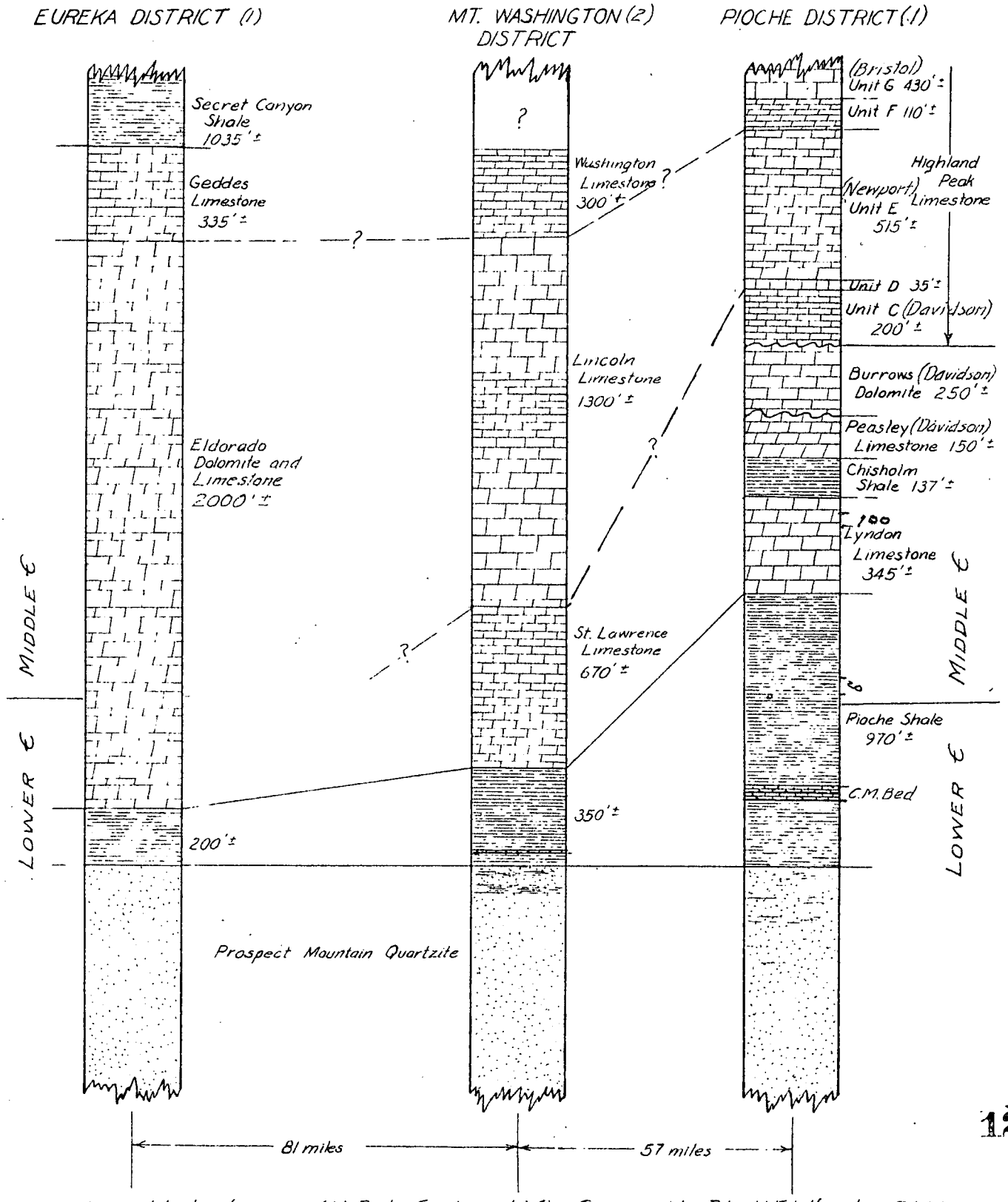
Oct. 12 1950

MADE BY Harry S. Voller

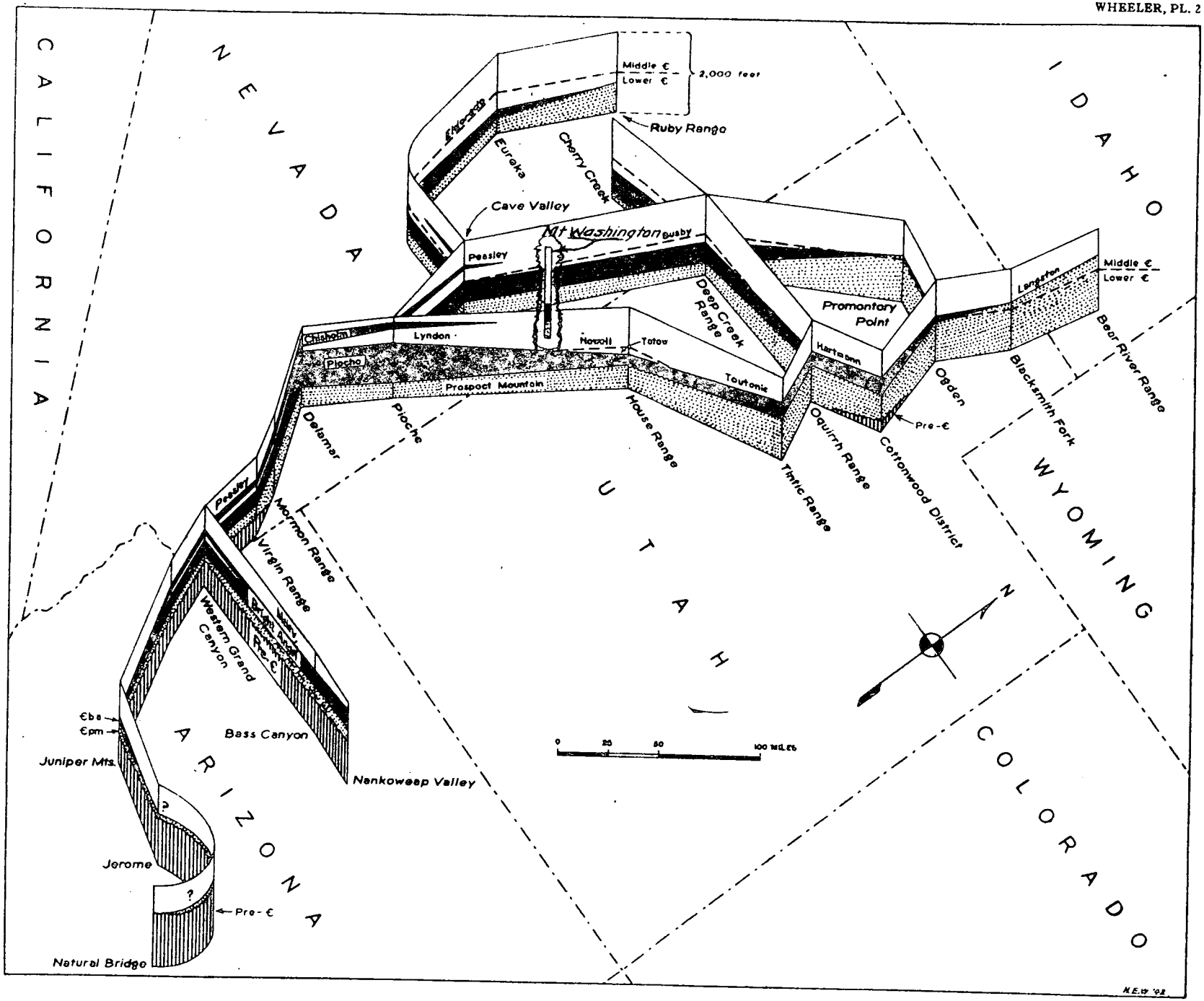
TRACED BY

CHECKED BY

SCALE 1" = 500'



(1) As published in U. of N. Bul. Geol. and Min. Series No. 31, H.E. Wheeler, D.M. Lemmon
(2) This report



COMPOSITE CORRELATION DIAGRAM

Showing relationships of Prospect Mountain, Pioche, Lyndon, Chisholm, and Bright Angel formations in Great Basin area

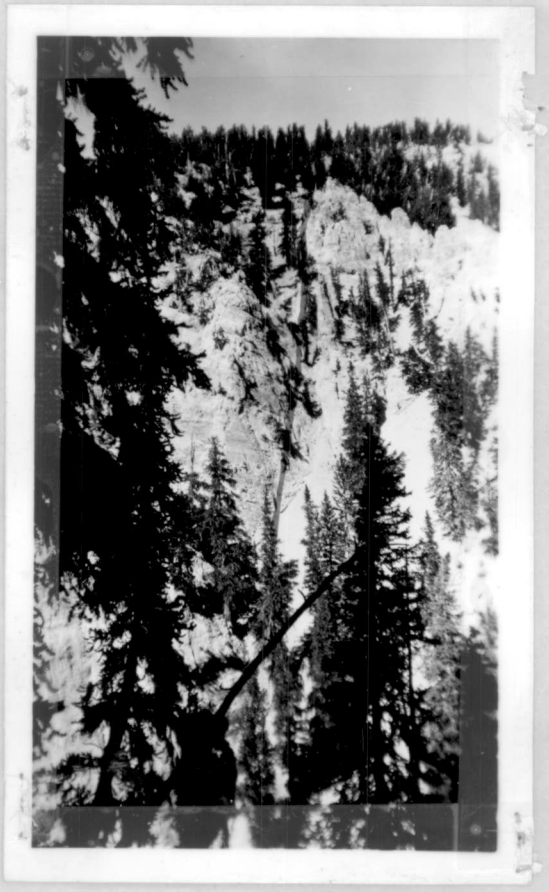
INSERT OF MT. WASHINGTON SECTION ADDED BY PAUL GEMMILL.

OCT 17 1950

Panorama of Pole Canyon looking Northeast from Pole - Lincoln Divide
Geological section was measured along the ridge ——— ———

North ridge in Pole Canyon showing Quartzite-Pioche Shale contact.

Pole Canyon looking northeast



Lincoln Fissure looking north from south rim of North Fork of Lincoln Canyon.

Canyon. That could even be above some thrusting but anyway should be above our Washington limestone.

Fissuring

The outstanding fissure zone of the area strikes N 7 to 10 E, is nearly vertical or dipping slightly to the west, and can be traced for at least 12,000 feet. It is not a simple fissure but a zone consisting of numerous slips and mineralized bands with a total width varying from a few feet to 35 feet or more. It has been exposed in many places by pits, tunnels and shafts.

There is a strong series of fractures which strike northeasterly from 30 to 60° and usually dip steeply to the southeast. The junction of these northeasters with the N 7 E zone causes only small displacement but seems to determine the loci of greatest mineralization.

The Sheffield vein which strikes N 45 E and dips 75 degrees to the northwest contained high grade silver lead ore. Dolomitization around the vein extends for about 30 feet and is considered as indicative of the strength and character of the mineralizing solutions.

The Canaan vein which strikes N 75 E, dips about 75 degrees to the northwest and can be traced by intermittent outcrops for a long distance across the top of the mountain. In one shaft it is over seven feet wide and in another large pit the quartz stringers are scattered over at least twelve feet. These silicious outcrops are believed to be indicative of the existence of a very large amount of mineralizing solutions. If this interpretation is correct, the intersections with the lower favorable limestone should mark the loci of very substantial orebodies. It is proposed to extend the drift northward far enough to test this probability.

Faulting

A study of the aerial photograph suggested numerous powerful faults. Strangely enough detail examination on the mountain failed to reveal many of these supposed faults. Erratic dips on the north and west slopes of Lincoln Mountain indicated a strong thrust, but as it would not project into the area presently under consideration, it was not investigated.

In general, on the property there are many small faults of varying strikes and dips. There is a displacement along the N 7 E zone which varies in places from zero to at least 50 feet in others, with the west side down. There is much topographic evidence that there is a great series of faults which strike from N 30 to 60 E. Many small faults of this type were seen during the examination and they seem to be most numerous in the North Fork area and on the ridge immediately to the northwest of this canyon.

Near the point where the mine road crosses the Pole Canyon-Lincoln Canyon divide there is a zone of fault brescia which strikes north-south.

Dikes

Several dikes outcrop on the property. One dike, which crosses the mine

road strikes N 65 E and is about 200 feet wide. An interesting feature at this point was provided by the timber growth. On the limestone the trees were all mountain mahogany while on the dike large pines were growing.

Another dike with similar strike outcrops near the workings on the south side of North Fork. Somewhat to the east there is another dike striking about N 20 E.

The presence of these dikes together with other evidence has led to the belief that there may be a buried cupola in the Lincoln Canyon North Fork area. Porphyry float was found at many places in the Lincoln-Pole canyon area, indicating the presence of additional dikes.

Dikes

Microscopic Study

Four thin sections were made, two of the N 65 E dike exposed on the mine road and two of the N 20 E dike material lying east of the mine workings.

The N 65 E dike, being much wider, is much coarser grained than the N 20 E dike but microscopic study shows they are of about the same composition, so study was concentrated on the coarser grained rock.

The rock is revealed to be porphyritic in texture, with phenocrysts of quartz in a ground of fine-grained crystals composed mostly of quartz and sericite. Scattered grains of limonite after pyrite appear throughout the specimens.

The quartz phenocrysts have diamond, hexagonal and possible octagonal shapes with the fine-grained groundmass showing ghost-like rings and solution channels into the crystals. Our conclusion is that at least most of these crystals were originally feldspars and ferro-magnesium minerals which were largely resorbed, then silicified by end-stage solutions. Thus the quartz phenocrysts are pseudomorphs. Paul Gemmill suggested that the pyrite was likely formed simultaneously with silicification by sulphur bearing solutions gathering the iron from ferro-magnesium minerals to form pyrite crystals.

Mineralization

The numerous old tunnels and pits give opportunity to study the mineralization. First we would mention that dolomitization is associated with the deposits. This reaction has spread out several feet in the places of most intense mineralization. There is very little free silica found in the workings. The valuable minerals are galena, cerussite and some unknown silver mineral. There is a considerable iron gossan which gives the impression that the original iron mineral is pyrite. The workings show mineralization extending at least 200 feet below the surface with no indication of exhaustion of the solutions. Open fractures suggest possible migration downward by leaching. The Lincoln limestone, in which these orebodies occur, and which is massive, white to gray, and at least 1300 feet thick, does not have the earmarks of an especially favorable host rock. Our wonder and speculation is not concerned so much with the small size of the orebodies, but with the fact that there are any orebodies at all at so great a distance from a possible source and in such

unfavorable environment. We believe that this argues well for the possibilities of ore at the intersections in the lower limestones.

Costs

As stated in the summary, the preliminary work such as location of protective claims, organization expense, building of a suitable mine road and temporary camp, together with funds for satisfaction of early option payments are estimated to require $25,000.00.

An estimate of the cost of continuing the Bonanza Tunnel 2100 feet, drifting 3400 feet northerly on the St. Lawrence Fissure, raising a total of 800 feet and 5000 feet of diamond drilling is $214,500.00. Crosscut and drift are figured at $30.00 per foot, raises at $40.00 per foot, and diamond drilling at $3.50 per foot.

An agreement has been entered into with Mr. Harold Spencer of the Centenial Development Company which is the basis of the above estimates. Additional cost is anticipated where timbering is needed.

Assays

As Mr. Gemmill has previously sampled the workings, we submit a copy of his results. We also submit copies of sampling by Hulse and Cottino. See assay sheet at end of this report.

Proposed Development

If substantial investment is to be made in the property several claims should be located for protection. A suitable road is needed to the old camp site in Lincoln Canyon - about four miles, and a workable jeep road from the camp site to the adit portal - about 1200 feet. Temporary quarters can be secured by use of tent houses or trailers. There is sufficient water of good quality in South Fork for all present needs.

Former operators drove the Bonanza Tunnel about 350 feet in a N 66 E direction at a point in the log about 20 feet below the top of the St. Lawrence limestone. This seems to be excellent. This adit must be continued 2100 feet to intersect the main St. Lawrence Fissure, assuming a vertical dip. If the dip is 85 degrees to the west this distance will be shortened about 130 feet.

This intersection should be at a point several hundred feet south of the porphyry dike that shows in the canyon walls and about 100 feet below the top of the St. Lawrence limestone. It may be desirable to swing this crosscut a few degrees to the north, but this is not essential. A drift should then be driven northward on the St. Lawrence Fissure for 3400 feet, with raises at 1100, 1700 and 3300. Reference is made to the longitudinal section submitted herewith. The first two raises are designed to prospect the Upper St. Lawrence beds in the North Fork area which may be mineralized by the same northeast fissures seen in the surface workings. The raise at 3300 is designed to prospect the base of the St. Lawrence Lower limestone and to investigate the effect of probably intersection with the N 75 E Canaan fissure previously described.

As the work progresses it will be desirable to do several thousand feet of diamond drilling, hence provision is made for this contingency.

Respectfully submitted,

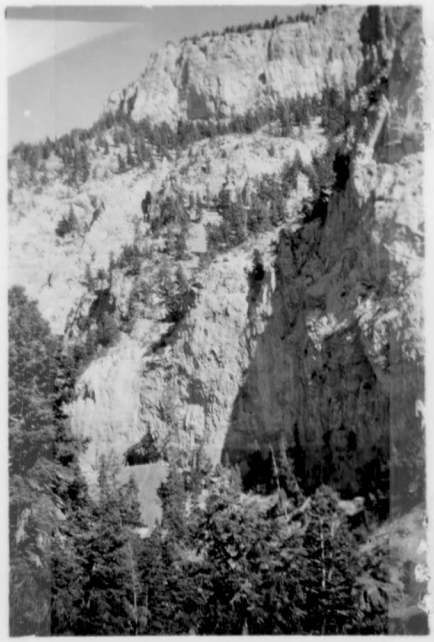
Earl B. Young

Earl B. Young
Chief Geologist

Note This report is the result of the joint efforts of Paul Gemmill, Leonard Thomas and Earl B. Young.

Old stone cabin on patented mill sites in
Lincoln Canyon

Thin-bedded quartzite in
Pole Canyon



Portal of Bonanza Tunnel
in Lincoln Canyon

FORM 29

COMBINED METALS REDUCTION CO.

PIOCHE PLANT

ST. LAWRENCE MINE Samples Date AUGUST 31, 1948.

No.	DESCRIPTION		Au Oz.	Ag Oz.	Pb %	Zn %	Fe %	Ins. %	Mn %	CaO %	Cu %
	BY. PAUL GEMMILL	SAMPLE NO.									
	1st tunnel below upper cabin. 1.8 ft.cut on N 10 E.- 65-70 Deg.dip West	"A"	.01	5.99	11.4	1.2			REMARKS Sample in back at shaft near cabin (Only 20 ft of tunnel exposed after going in thru shaft -probably 8 ft of ore shoot)		
	8 ft. red iron at raise -tunnel at lower cabins.	"B"	Tr.	.7	1.8	3.1	44.2	6.0			
	2 ft. cut above bottom tunnel on south side of Lincoln Canyon.	"C"	Tr.	4.7	5.0			3.0	Fissure exposed by small pit between bottom and middle tunnel.		
	#1 dump sample below cabin	"D"	TR.	1.6	2.2						
	#2 dump sample below cabin	"E"	.01	2.19	3.0						
	9500 Tunnel - below cabin- South side Lincoln Canyon Sand from fissure S. of lead ore in tunnel. 15 inch cut	"F"	Tr.	3.6	5.2				Sandy material in face of adit at porphyry dike- no galena at face.		
	#2 tunnel- 1 ft.cut left side streak in face H.G. streak not sampled- this is iron & dolomite.	"G"	.01	5.19	5.8	1.8			Where Thomas & I entered with flash-light		
	18 inch cut red ore in floor five foot back from face of "2 tunnel	"H"	Tr.	1.2	7.7	2.9					
	2 ft. cut in timber raise first tunnel below cabin	"I"	Tr.	.5	1.1	Tr.			Same location as Sample "A"-stained dolomite east of fissure.		
	50 ton red dump above second tunnel	"J"	Tr.	.8	1.0				From shaft east of adit.		

ASSAYED BY: E.S.PERKES

Assayer

FORM 29

COMBINED METALS REDUCTION CO.

PIOCHE PLANT

ST. LAWRENCE MINE Samples Date SEPTEMBER 2, 1948.

No.	DESCRIPTION		Au Oz.	Ag Oz.	Pb %	Zn %	Fe %	Ins. %	Mn %	CaO %	Cu %
	BY: JAMES HULSE & VICTOR COTTINO										
		SAMPLE NO.									
	1st North Dump	5	.005	6.2	15.5						
	2nd North Dump	6	Tr.	1.8	5.6						
	Screened material from 2nd North Dump	7	Tr.	3.7	10.0						
	2 ft cut bedding in first North tunnel	8	Tr.	.2	Tr.						
	2 ft. cut 1st North tunnel across water course 30 ft west of vein	9	Tr.	Tr.	.6						
	Grab sample of second dump below cabin-W side	10	Tr.	Tr.	.9						
	Grab sample-East side 2nd dump below cabin	11	Tr.	.30	.6						
	Dump sample - West side 2nd below cabin -near portal	12	.01	1.19	1.9						
	Grab from 1st dump below cabin	13	.07	7.73	16.0						
	Dump at cabin - West side	14	.005	.8	1.3						

NOTE: Samples taken by Hulse same day David Gemmill and I visited the property
Paul Gemmill

These samples are not shown on the accompanying map as the locations are somewhat obscure.
LGT.

Assayer

FORM 29

COMBINED METALS REDUCTION CO.

PIOCHE PLANT

ST. LAWRENCE MINE Samples Date SEPTEMBER 11, 1948

No.	DESCRIPTION	Sample No.	Au Oz.	Ag Oz.	Pb %	Zn %	Fe %	Ins. %	Mn %	CaO %	Cu %
	Samples By: Hulse & Cottino										
	18" Cut -12' down in open cut above upper cabin	1	Tr.	1.0	3.7						
	12' Cut - 10' down in open cut above upper cabin	2	Tr.	3.9	10.8						
	12" cut bedding on right side of open cut 16' above upper cabin.	3	Tr.	4.6	9.7						
	Gray rock from North end of claims	4	Tr.	1.1	9.5						
	Black iron from North end of claims	5	Tr.	.6	4.7						
	Small fissure about 200' North of upper claim	6	Tr.	.6	3.1						
	OTHER SAMPLES TAKEN BY HULSE & COTTINO - AUG. 19,1948										
	Sample #1 -No Description		.02	27.58	15.0		1.9	8.8		30.2	
	" #4 - Possible shipment		.005	11.5	28.1	1.4	2.1	2.0	Tr.	25.5	Tr.

Copy —E.S.Perkes

Assayer

Telephone 9-9962

Mr. James D. Williams
Los Angeles, California

CERTIFICATE OF ASSAY

DEASON & NICHOLS
ASSAYERS & CHEMISTS

C. Iven Nichols Wm. J. Deason

160 So. West Temple Street
Salt Lake City 1, Utah

ASSAY PER TON OF 2000 POUNDS

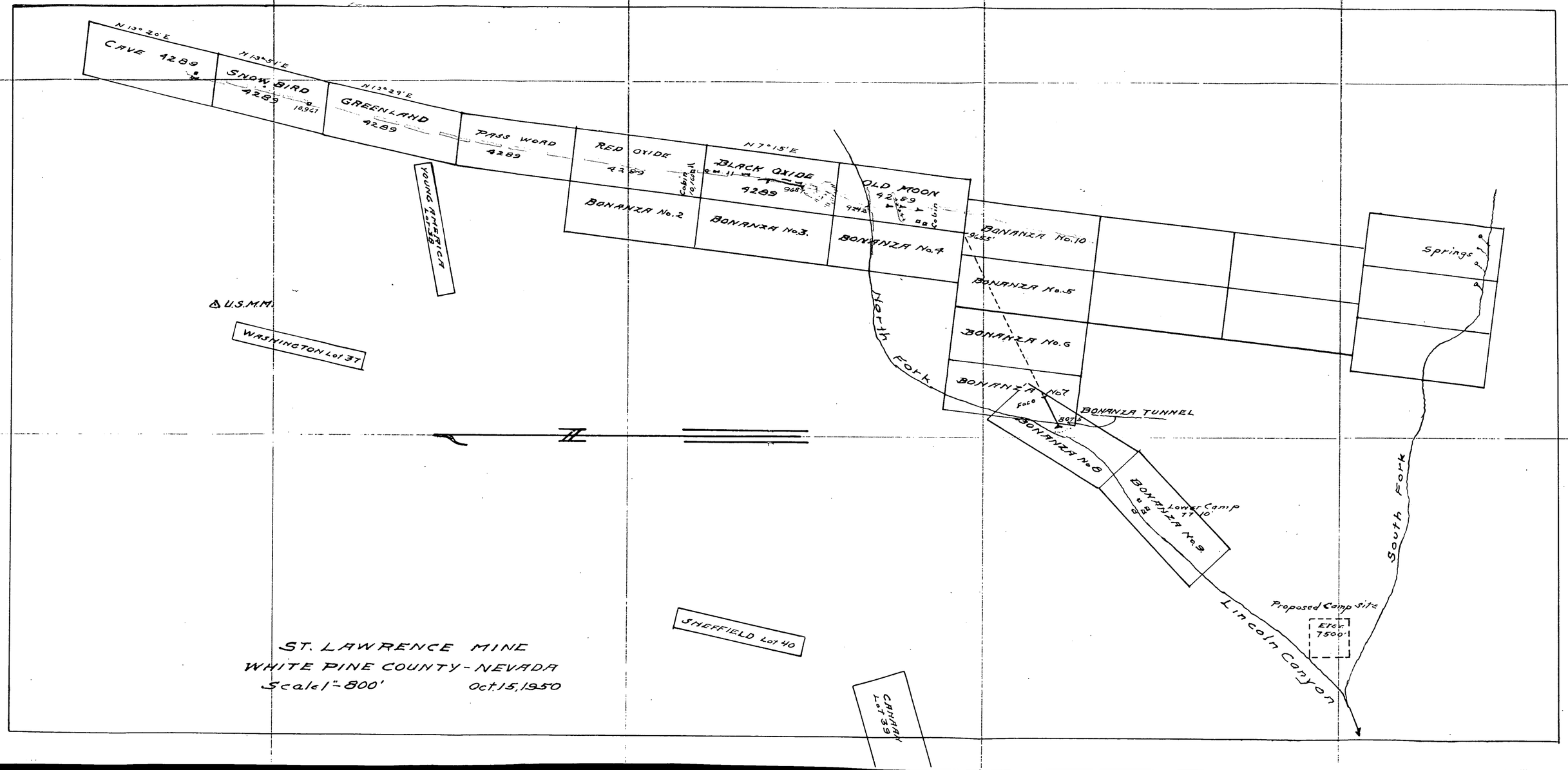
November 8, 1950

DESCRIPTION	NO.	GOLD OUNCES	SILVER OUNCES	WET LEAD %	COPPER %	ZINC %	INSOL %	%	%	%	%
Canaan Fissure West end	1	0.012	20.60	1.45	0.6						
Sheffield Qtz. in Dolimite	2	0.005	2.80	0.25							
Sheffield Lead Ore	3	0.01	12.60	8.60							

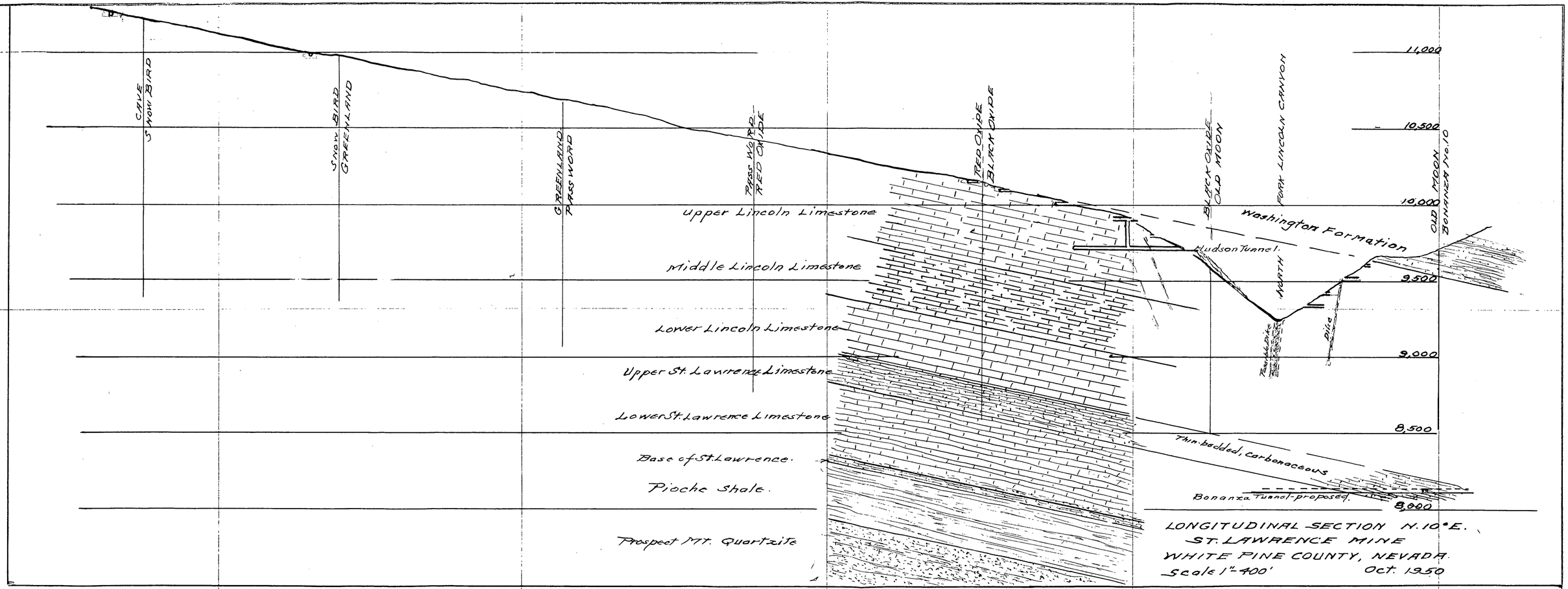
CHARGES $ 5.00 - Paid

C. Iven Nichols

LARGE FORMAT DOCUMENTS AT END OF FILE



ST. LAWRENCE MINE
WHITE PINE COUNTY - NEVADA
Scale 1" = 800' Oct. 15, 1950



LONGITUDINAL SECTION N. 10° E.
ST. LAWRENCE MINE
WHITE PINE COUNTY, NEVADA.
Scale 1" = 400' Oct. 1950

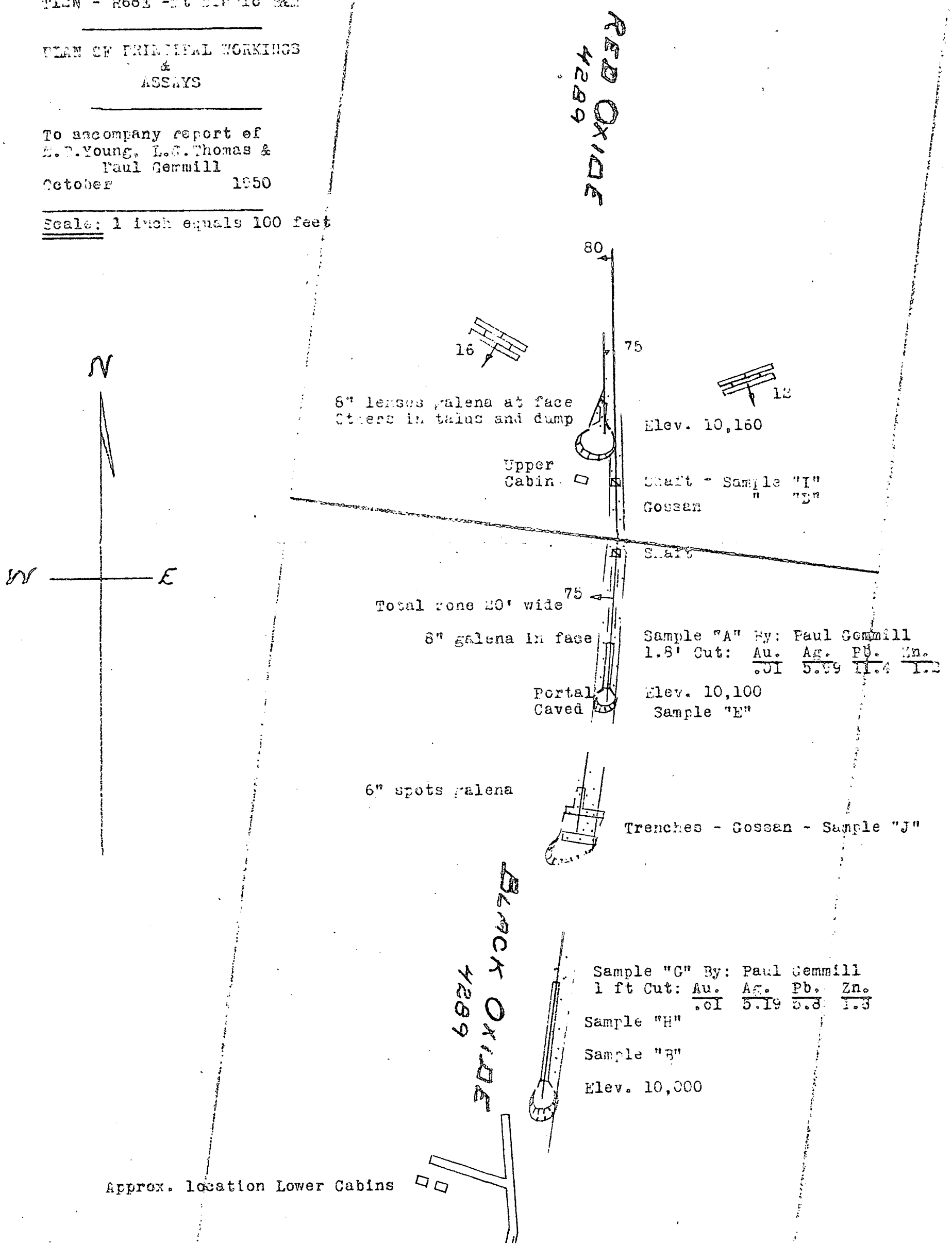
ST. LAWRENCE MINE

White Pine County - Nevada
T12N - R68E - Mt Diablo B&M

PLAN OF PRINCIPAL WORKINGS
&
ASSAYS

To accompany report of
E.P.Young, L.G.Thomas &
Paul Gemmill
October 1950

Scale: 1 inch equals 100 feet



70

65

Heavy Gossan on Surface.

Sample #3 By: Cramer
1 ft.Cut in 3 ft ore lense

Au.	Ag.	Pb.
.015	13.2	26.1

90

75

75

12

Open Fissure

12

Elev.9810 -
3' by 40' ore @ intersection
1' high grade in bedding

90°

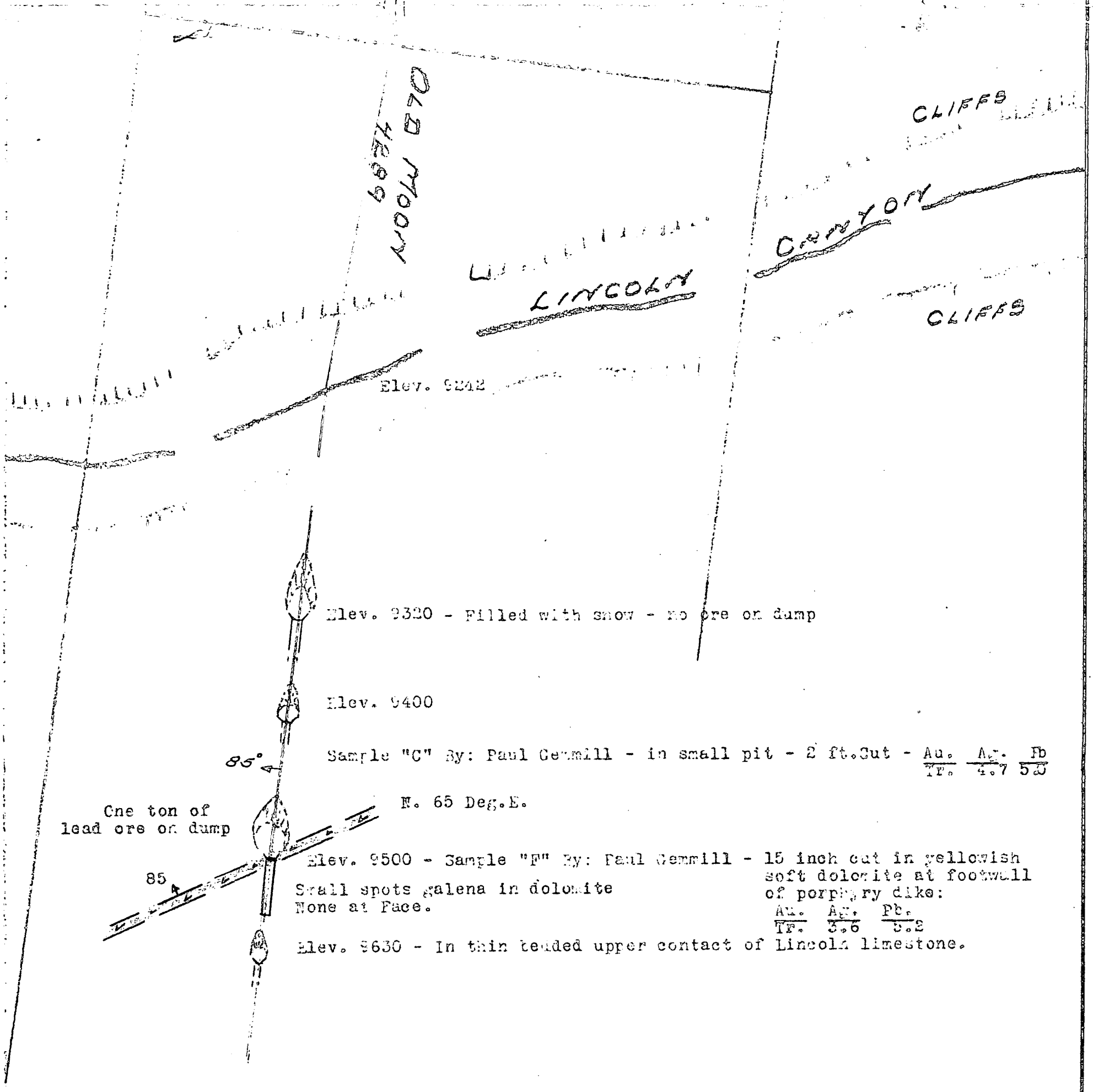
Spots lead in 3' bedding
Elev. 9780

15

Grab Sample from Dump
By: Cramer

Au.	Ag.	Pb.
.02	5.8	17.8

(Caved)
Portal - Hudson Tunnel - Elev. 9687



PRELIMINARY REPORT OF THE LEAD-SILVER DEPOSITS
St. Lawrence Mining Co.
White Pine County, Nevada.
by
CRAMER & BURANEK

ABSTRACT:

The lead silver deposits of the St. Lawrence Mining Company are high on the west slope of the Snake Range, White Pine County, Nevada. Average elevation is 10,000 feet above sea level. The area is inaccessible except for a jeep trail that climbs about 4,000 feet over a distance of about 7 miles from a ranch on the valley floor to the crest of the range.

The rocks in the vicinity of the ore deposits consist of a thick series of massive-bedded Cambrian limestone. Major faulting was not observed. Minor faults and joint fractures are common.

The limestone beds are cut by a remarkably straight fissure vein of nearly vertical dip and N. 10° E. strike. The surface length of the fissure with important lead-silver ore indications along it as exposed on all of the patented claims plus the known vertical component of the fissure - elevation differences of nearly 2,000 feet - indicate unusual strength of mineralizing solutions which entered the fissure zone and were essentially confined to it. Between the walls of the fissure is a coarsely crystalline grayish blue limestone different from the sedimentary limestone. This material acts as a host rock for the ore minerals, chiefly galena, anglesite, cerussite, obscure silver minerals, and minor amounts of gold. Bedded ore occurs along the fissure where apparently controlled by north-east and possibly north-west fractures. These conform to the normal jointing and in such areas open cracks are filled with secondary lead and iron minerals and mammillary aragonite.

Preliminary sampling indicated the tenor of ore in the fissure to be from 14.20% lead and 4.85 ozs. silver to 26.10% lead and 13.20 ozs. of silver.

PRELIMINARY REPORT OF THE LEAD-SILVER DEPOSITS
St. Lawrence Mining Co.,
White Pine County, Nevada

by
Cramer & Burasek

INTRODUCTION:

The lead-silver deposits of the St. Lawrence Mining Company were examined by the writers during June 24th to 28th, 1950.

OWNERSHIP:

The St. Lawrence Mining Co. of Rochester, New York owns 7 patented mining claims. Victor Cottino and associates of Pioche, Nevada own 9 adjoining unpatented mining claims, each of which is 600 ft. wide by 1500 ft. long (See claim map attached.) Control of the claims is now vested in Mr. James Williams of Los Angeles, California who requested the examination made by the writers.

LOCATION:

The mining claims of the St. Lawrence Mining Company are at high elevation on the west slope of the Snake Range of Mountains, White Pine County, Nevada. The proximity of the mining claims to the crest of the range results in extremely rugged local topography. Deep, precipitous canyons and sheer cliffs prevail. Elevation differences of 1,000 feet over short distances along the main fissure are common. Wheeler Peak, 13,058 feet in elevation, the second highest peak in Nevada, is immediately to the north. The property is in the Mt. Washington Mining district in T. 12 N., R. 68 E., Mt. Diablo B. & M., several miles south of the Osceola Mining District. The nearest habitation is the Kirkaby Ranch about 7 miles by road to the west. This Ranch is approximately 13 miles southeast from Majors Gas Station at the intersection of U. S. Highways #6 and 93.

TRANSPORTATION FACILITIES, ETC.:

Access to the claims of the St. Lawrence Mining Company is via a jeep road from the Kirkaby Ranch on the valley floor immediately west of

the claims. This road is approximately seven miles in length and rises in elevation some 4,000 feet from the Ranch to the mine. It is unsuitable for ore haulage, and in fact is practically impossible to any type of vehicle other than a jeep.

Timber for mining purposes is abundant. Water for both domestic and mining use could probably be developed.

GEOLOGY:

The rocks in the vicinity of the claims consist entirely of massive bedded gray limestone of Cambrian age at least 2,000 feet in thickness. These beds rest upon the Pioche shale formation, which in turn are superadjacent to the thick series of basal Cambrian quartzite of the Prospect Mountain formation. This Cambrian section of rocks in analogous to the Cambrian section as exposed in the Pioche Mining District some 60 miles to the south and to the Eureka, Utah Mining District roughly 100 miles to the northeast. Structurally these rocks appear to be near the crest of a north-south anticline which plunges south at approximately 12 degrees. The formation steepens on the west flank of the anticline. Major faulting in the area was not discerned. The beds are essentially undisturbed. Minor faults and prominent northeast-southwest and northwest-southeast joint fractures are common. The important ore bearing fissure along which all of the prospects have been developed is a remarkably straight fissure of nearly vertical dip and a N. 10° E. strike. Meager evidence substantiates some movement along this zone. From observation of small faults in a shallow surface working on the Red Oxide claim, the east side of the fissure appears to be the down throw side. Further indications of movement along this fissure was suggested on the Black Oxide claim where entirely different types of limestone are exposed on either side of the fissure. The throw of this apparent faulting is not known.

Young, [illegible] [illegible] [illegible]

ORE DEPOSITS:

The surface length of the fissure with important ore indications along it as exposed on all of the patented claims, plus the known vertical component of the fissure - elevation differences of nearly 2,000 feet - indicate unusual strength of mineralizing solutions which entered the fissure zone and were essentially confined to it.

The ore minerals associated with the fissure consist of galena, anglesite, cerussite, obscure silver minerals and minor amounts of gold. These are associated with abundant limonite, lesser amounts of jarosite (some of which may be the plumbojarosite type), and barite. Host rock for the ore minerals within the walls of the fissure is a bluish gray, coarsely crystalline limestone entirely different from the sedimentary limestone beds. Also included within altered limestone are small quartz veins seldom exceeding 1 inch in thickness. Much secondary stalagtitic aragonite is present in open rooms and cracks associated with the main fissure. The greatest development of aragonite was observed on the Black Oxide claim. A dump sample taken by the writers, and verbal reports of prior ore mined, suggest that the oxidized ores of lead and silver have been found in relative abundance in the floors of some of these cavities.

PRODUCTION:

Mr. James Williams has records of the following production:

	#1	#2	#3	#4	#5
Au	-	0.005	0.005	-	-
Ag	18.5	13.95	5.23	6.75	8.20
Pb	75.0	30.4	11.55	17.0	18.0
CaO	8.0	20.0	28.2	30.7	30.5
Fe	8.0	2.9	2.2	7.6	5.7
Insol.	0.8	4.8	4.0	5.3	4.8
	(1911)	(1948)	(1948)	(1949)	(1949)

Total tonnage approximately 170 tons.

Most of the development work on the claims was made prior to 1911, during which shipments of high-grade ore are reported to have been made. No records of this production however are available.

RED OXIDE CLAIM

A small open cut and a 10 foot drift of recent development exposes the ore bearing fissure near the southern extremities of the Red Oxide claim. The fissure zone at this point may exceed 5 feet in width, although overburden and soil obscured actual measurement. About 3 feet of the fissure was measured at the end of the short drift, although the foot wall was not yet penetrated.

Secondary aragonite as mammillary incrustations occurs lining open cavities at the face of the drift. Coarse-grained galena and associated secondary lead minerals are confined to the fissure and have bedded outward from the fissure in the adjacent limestone within a member approximately 1 foot in thickness. Galena nodules observed in the fissure weigh up to 20 lbs or more. A sample taken across the 1 foot zone at the face of the drift - ore and waste included - assayed:

Gold	-	0.015 oz.
Silver	-	4.85 oz.
Wet Lead	-	14.20 oz.

This ore outcropped at the surface, and from this shallow workings, 27 tons of high grade ore was shipped. Smelter returns from this development are attached to this report.

Immediately south of this working is a shaft apparently connected underground by the tunnel at the extreme northern portion of the Black Oxide claim. The shaft was caved and thus was not examined. However, the abundant gossan material and some ore minerals indicate that the ore bearing fissure was explored.

BLACK OXIDE CLAIM:

Considerable work has been expended on the surface development of the ore bearing fissure the entire length of this claim. The Hudson Tunnel, approximately 700 feet in length is the greatest underground development on the claim. Most of the past production has been from the Hudson Tunnel.

For convenience the workings along the main fissure on the Black Oxide claim will be described from north to south (see attached claim map). The tunnel at reference point elevation 10,100 feet is caved, but apparently it intersected the shaft along the fissure to the north. Dump material is essentially iron gossan and abundant white stalagtitic aragonite.

Immediately south along the fissure about 150 ft. are two surface trenches that barely have penetrated through the soil mantle. The fissure has been intersected, however, as evidenced by the abundance of iron gossan material in the bottom of the trenches. The lower trench contains some visible lead minerals. A large piece of altered limestone with no ore minerals visible assayed:

Gold	-	0.02 ozs. a ton
Silver	-	trace
Wet lead	-	none

At reference point elevation 10,000 feet, a short drift exposes the fissure for approximately a distance of 100 feet. At the face of the drift the central one foot portion of the fissure contains admixtures of galena and oxidized lead and iron minerals. About 50 feet from the portal, the limestone host rock has been completely altered. Samples numbers 5 and 6 were taken from this area.

No. 5	Gold	-	0.01 ozs. a ton
	Silver	-	1.70 ozs. a ton
	Wet Lead	-	5.30 %

No. 6	Gold	-	0.01 ozs. a ton
	Silver	-	0.20 ozs. a ton
	Wet Lead	-	none

At reference point elevation 9890 feet, an upper tunnel approximately 125 feet in length has been drifted along the fissure. Relatively large stoped areas were observed and considerable amounts of galena and oxidized ore minerals remain. Near the portal of the tunnel, the mineralized areas are strong and approximately 8 feet along the drift contains good bedded ore. The stronger galena "shows" seldom exceed one foot in thickness although "sand carbonates" and scherous material flank the latter. About 25 feet beyond this point a northeast fault of vertical dip is intersected by a northwest fault. These fractures may have caused localization of ore in this area along the fissure. This point is directly under a large undeveloped gossan zone on the surface. Near the portal, vertical pipe-like openings (old water courses) contain ore in places. The largest opening connects with the Hudson Tunnel approximately 200 feet below.

Immediately south of the portal of the upper tunnel a small northeast trending fissure contains about 3 ft. of lead ore along bedding and in the vertical fissure proper. This outcropping is on the surface and has not been developed.

HUDSON TUNNEL:

At reference point elevation 9687 feet is the portal of the Hudson tunnel. Sample No. 4 consists of a composite grab sample of the Hudson tunnel dump. It analyzed as follows:

Gold	-	0.04 ozs. a ton
Silver	-	5.80 ozs. a ton
Wet Lead	-	17.80 %

The portal of the Hudson tunnel is caved thus it was necessary to examine the underground workings of it by climbing down the open water course that connects the upper tunnel (reference point elevation 8090 previously described) with the Hudson tunnel.

Time did not permit a complete examination of all the workings of the Hudson tunnel but sufficient work was done to show the pattern of localized ore shoots along northeast trending fissures where they intersect the main fissure vein. The nearly vertical northeast trending fault exposed in the upper tunnel was observed on the Hudson tunnel level and here also contained strong shows of ore minerals. Approximately 50 feet north of this point considerable overhead stoping had been performed in the past and lead ore of approximately 3 feet in thickness remains, the central 1 ft. of which is excellent ore. A cross cut sample of this ore (sample No. 3) analyzed as follows:

Gold	-	0.015 ozs. a ton
Silver	-	13.20 ozs. a ton
Wet Lead	-	26.10 %

Little ore is exposed from this point northward except in the northeast shear zones. However, a northwest trending drift near the end of the Hudson tunnel shows approximately 60 feet of bedded altered limestone. A composite sample taken along the walls of this drift for 60 feet (sample No. 2) assayed as follows:

Gold	-	0.01 ozs. a ton
Silver	-	trace
Wet Lead	-	0.15 %

To the left of the raise that connects the Hudson tunnel with the upper tunnel 200 feet above, is a northwest cross cut that intersects two

fissures that parallel the main fissure. Both of these fissures are open and contain mammillary aragonite and ore minerals. Abundant gossan material fills the western most fissure and sample No. 7, that consisted of hard lumps of limonitic material, assayed as follows:

Gold	-	0.02 ozs. a ton
Silver	-	0.35 ozs. a ton
Wet Lead	-	2.50 %

No fines were included in this sample.

Total production from the Hudson tunnel is not known, but considerable quantities of good ore must have been extracted from the several stopes observed as the walls still show some unmined ore and where the central portion of the fissure still remains such as sample No. 3, an approximate appraisal of the type of ore mined can be surmised. Early operators must have sorted the ore to essentially pure lead minerals, because the Hudson tunnel dump contains no quantities of visible galena but still assays 17% lead and about 6 ozs. silver (sample No. 4) per ton.

OLD MOON CLAIM:

Various workings on the fissure were noted from the dump of the Hudson tunnel looking south. The surface expression of the fissure is very pronounced (see attached photo). Time did not permit an examination of these workings, although it is believed they will be similar to what has already been observed on the Red and Black Oxide claims. Good ore is reported by Victor Cottino and James Williams to be developed.

Respectfully submitted,

CRAMER & HURANEK

Louis W. Cramer

July 20, 1950

Alfred H. Huranek

CONCLUSIONS:

1. The fissure vein on the property of the St. Lawrence Mining Company is unusually strong, being continuous on all of the patented claims of the Company. Further, the fissure can be traced beyond the end lines of the northernmost and southernmost patented claims.

2. Vertical exposures of ore in the fissure are known to be about 2,000 feet because of present elevation differences along it, and therefore ore should be developed on the level of the deep cross-cut tunnel.

3. Field examination indicates a definite continuity of the fissure vein both horizontally and vertically with strong mineralized areas confined to it.

4. The fissure vein is in Cambrian limestone and along its entire length is mineralized to a greater or lesser degree. Where shallow surface work has been performed, important lead-silver occurrences can be observed. In the more intense mineralized areas, much of the vein fill contains important concentrations of lead and silver as indicated by the high metal content in the fissure penetrated by the Hudson Tunnel. Dump samples from this workings assayed:

Gold	-	0.04 ozs.
Silver	-	5.8 ozs.
Wet lead	-	17.80 ozs.

5. Geologically the vein fissure cuts through a series of Cambrian rocks strikingly similar to both the settings of the important ore deposits of Pioche, Nevada and Tintic, Utah. This analogy infers a possible very important metalliferous zone to be present within the Pioche shale formation immediately underlying the great thickness of limestones that make up the rock formations in the vicinity of the property.

6. An attempt to work the ore deposits from the surface would be inadequate because:

(a) A very short working season

(b) The very high cost of either a road or tram project for ore and supply haulage.

RECOMMENDATIONS:

Because it is believed that the intense mineralized areas along the fussure are strong and continuous, it is recommended that the property be developed by means of a long cross-cut tunnel. This tunnel would be approximately 2,600 feet in length, and is illustrated on the accompanying maps. This haulage tunnel would develop 1,500 feet of 'backs' as the elevation at the portal is 8,075 feet, whereas the surface elevation immediately above the tunnel where it would intersect, the fissure is 9,655 feet. Such a proposal would not only develop ore at depth, but would permit year around working conditions and mining costs to be held at a minimum.

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EXHIBIT "D"

PRELIMINARY REPORT OF THE LEAD-SILVER DEPOSITS
St. Lawrence Mining Co.
White Pine County, Nevada
by
CRAMER & BURANEK

ABSTRACT:

The lead silver deposits of the St. Lawrence Mining Company are high on the west slope of the Snake Range, White Pine County, Nevada. Average elevation is 10,000 feet above sea level. The area is inaccessible except for a jeep trail that climbs about 4,000 feet over a distance of about 7 miles from a ranch on the valley floor to the crest of the range.

The rocks in the vicinity of the ore deposits consist of a thick series of massive-bedded Cambrian limestone. Major faulting was not observed. Minor faults and joint fractures are common.

The limestone beds are cut by a remarkably straight fissure vein of nearly vertical dip and N. 10° E. strike. The surface length of the fissure with important lead-silver ore indications along it as exposed on all of the patented claims plus the known vertical component of the fissure - elevation differences of nearly 2,000 feet - indicate unusual strength of mineralizing solutions which entered the fissure zone and were essentially confined to it. Between the walls of the fissure is a coarsely crystalline grayish blue limestone different from the sedimentary limestone. This material acts as a host rock for the ore minerals, chiefly galena, anglesite, cerussite, obscure silver minerals, and minor amounts of gold. Bedded ore occurs along the fissure where apparently controlled by north-east and possibly north-west fractures. These conform to the normal jointing and in such areas open cracks are filled with secondary lead and iron minerals and mammillary aragonite.

Preliminary sampling indicated the tenor of ore in the fissure to be from 14.20% lead and 4.85 ozs. silver to 26.10% lead and 13.20 ozs. of silver.

CONCLUSIONS:

1. The fissure vein on the property of the St. Lawrence Mining Company is unusually strong, being continuous on all of the patented claims of the Company. Further, the fissure can be traced beyond the end lines of the northernmost and southernmost patented claims.

2. Vertical exposures of ore in the fissure are known to be about 2,000 feet because of present elevation differences along it, and therefore ore should be developed on the level of the deep cross-cut tunnel.

3. Field examination indicates a definite continuity of the fissure vein both horizontally and vertically with strong mineralized areas confined to it.

4. The fissure vein is in Cambrian limestone and along its entire length is mineralized to a greater or lesser degree. Where shallow surface work has been performed, important lead-silver occurrences can be observed. In the more intense mineralized areas, much of the vein fill contains important concentrations of lead and silver as indicated by the high metal content in the fissure penetrated by the Hudson Tunnel. Dump samples from this workings assayed:

Gold	-	0.04 ozs.
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5. Geologically the vein fissure cuts through a series of Cambrian rocks strikingly similar to both the settings of the important ore deposits of Pioche, Nevada and Tintic, Utah. This analogy infers a possible very important metalliferous zone to be present within the Pioche shale formation immediately underlying the great thickness of limestones that make up the rock formations in the vicinity of the property.

6. An attempt to work the ore deposits from the surface would be inadequate because:

(a) A very short working season

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RECOMMENDATIONS:

Because it is believed that the intense mineralized areas along the fissure are strong and continuous, it is recommended that the property be developed by means of a long cross-cut tunnel. This tunnel would be approximately 2,600 feet in length, and is illustrated on the accompanying maps. This haulage tunnel would develop 1,500 feet of 'backs' as the elevation at the portal is 8.075 feet, whereas the surface elevation immediately above the tunnel where it would intersect, the fissure is 9,655 feet. Such a proposal would not only develop ore at depth, but would permit year around working conditions and mining costs to be held at a minimum.

PRELIMINARY REPORT OF THE LEAD-SILVER DEPOSITS
St. Lawrence Mining Co.,
White Pine County, Nevada

by
Cramer & Buranek

INTRODUCTION:

The lead-silver deposits of the St. Lawrence Mining Company were examined by the writers during June 24th to 28th, 1950.

OWNERSHIP:

The St. Lawrence Mining Co. of Rochester, New York owns 7 patented mining claims. Victor Cottino and associates of Pioche, Nevada own 9 adjoining upatented mining claims, each of which is 600 ft. wide by 1500 ft. long (See claim map attached.) Control of the claims is now vested in Mr. James Williams of Los Angeles, California who requested the examination made by the writers.

LOCATION:

The mining claims of the St. Lawrence Mining Company are at high elevation on the west slope of the Snake Range of Mountains, White Pine County, Nevada. The proximity of the mining claims to the crest of the range results in extremely rugged local topography. Deep, precipitous canyons and sheer cliffs prevail. Elevation differences of 1,000 feet over short distances along the main fissure are common. Wheeler Peak, 13,058 feet in elevation, the second highest peak in Nevada, is immediately to the north. The property is in the Mt. Washington Mining District in T. 12 N., R 68 E., Mt. Diablo B. & M., several miles south of the Osceola Mining District. The nearest habitation is the Kirkaby Ranch about 7 miles by road to the west. This ranch is approximately 13 miles southeast from Majors Gas Station at the intersection of U. S. Highways #6 and 93.

TRANSPORTATION FACILITIES, ETC.:

Access to the claims of the St. Lawrence Mining Company is via a jeep road from the Kirkaby Ranch on the valley floor immediately west of

the claims. This road is approximately seven miles in length and rises in elevation some 4,000 feet from the Ranch to the mine. It is unsuitable for ore haulage, and in fact is practically impassable to any type of vehicle other than a jeep.

Timber for mining purposes is abundant. Water for both domestic and mining use could probably be developed.

GEOLOGY:

The rocks in the vicinity of the claims consist entirely of massive bedded gray limestone of Cambrian age at least 2,000 feet in thickness. These beds rest upon the Pioche shale formation, which in turn are superadjacent to the thick series of basal Cambrian quartzite of the Prospect Mountain formation. This Cambrian section of rocks in analogeous to the Cambrian section as exposed in the Pioche Mining District some 60 miles to the south and to the Eureka, Utah Mining District roughly 100 miles to the northeast. Structurally these rocks appear to be near the crest of a north-south anticline which plunges south at approximately 12 degrees. The formation steepens on the west flank of the anticline. Major faulting in the area was not discerned. The beds are essentially undisturbed. Minor faults and prominent northeast-southwest and northwest-southeast joint fractures are common. The important ore bearing fissure along which all of the prospects have been developed is a remarkably straight fissure of nearly vertical dip and a N. 10° E strike. Meager evidence substantiates some movement along this zone. From observation of small faults in a shallow surface working on the Red Oxide claims, the east side of the fissure appears to be the down throw side. Further indications of movement along this fissure was suggested on the Black Oxide claim where entirely different types of limestone are exposed on either side of the fissure. The throw of this apparent faulting is not known.

ORE DEPOSITS:

The surface length of the fissure with important ore indications along it as exposed on all of the patented claims, plus the known vertical component of the fissure - elevation differences of nearly 2,000 feet - indicate unusual strength of mineralizing solutions which entered the fissure zone and were essentially confined to it.

The ore minerals associated with the fissure consist of galena, anglesite, cerussite, obscure silver minerals and minor amounts of gold. These are associated with abundant limonite, lesser amounts of jarosite (some of which may be the plumbojarosite type), and barite. Host rock for the ore minerals within the walls of the fissure is a bluish gray, coarsely crystalline limestone entirely different from the sedimentary limestone beds. Also included within altered limestone are small quartz veins seldom exceeding 1 inch in thickness. Much secondary stalagtitic aragonite is present in open room and cracks associated with the main fissure. The greatest development of aragonite was observed on the Black Oxide claim. A dump sample taken by the writers, and verbal reports of prior ore mined, suggest that the oxidized ores of lead and silver have been found in relative abundance in the floors of some of these cavities.

PRODUCTION:

Mr. James Williams has records of the following production:

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Au	-	0.005	0.005	-	-
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CaO	8.0	20.0	28.2	30.7	30.5
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	(1911)	(1948)	(1948)	(1949)	(1949)

Total tonnage approximately 170 tons.

Most of the development work on the claims was made prior to 1911, during which shipments of high-grade ore are reported to have been made. No records of this production however are available.

RED OXIDE CLAIM

A small open cut and a 10 foot drift of recent development exposes the ore bearing fissure near the southern extremities of the Red Oxide claim. The fissure zone at this point may exceed 5 feet in width, although overburden and soil obscured actual measurement. About 3 feet of the fissure was measured at the end of the short drift, although the foot wall was not yet penetrated.

Secondary aragonite as mammillary incrustations occurs lining open cavities at the face of the drift. Coarse-grained galena and associated secondary lead minerals are confined to the fissure and have bedded outward from the fissure in the adjacent limestone within a member approximately 1 foot in thickness. Galena nodules observed in the fissure weigh up to 20 lbs. or more. A sample taken across the 1 foot zone at the face of the drift-ore and waste included - assayed:

Gold	-	0.015 oz.
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This ore outcropped at the surface, and from this shallow workings, 27 tons of high grade ore was shipped. Smelter returns from this development are attached to this report.

Immediately south of this working is a shaft apparently connected underground by the tunnel at the extreme northern portion of the Black Oxide claim. The shaft was caved and thus was not examined. However, the abundant gossan material and some ore minerals indicate that the ore bearing fissure was explored.

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Considerable work has been expended on the surface development of the ore bearing fissure the entire length of this claim. The Hudson Tunnel, approximately 700 feet in length is the greatest underground development on the claim. Most of the past production has been from the Hudson Tunnel.

For convenience the workings along the main fissure on the Black Oxide claim will be described from north to south (see attached claim map). The tunnel at reference point elevation 10,100 feet is caved, but apparently it intersected the shaft along the fissure to the north. Dump material is essentially iron gossan and abundant white stalagtitic aragonite.

Immediately south along the fissure about 150 ft. are two surface trenches that barely have penetrated through the soil mantle. The fissure has been intersected, however, as evidenced by the abundance of iron gossan material in the bottom of the trenches. The lower trench contains some visible lead minerals. A large piece of altered limestone with no ore minerals visible assayed:

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At reference point elevation 10,000 feet, a short drift exposes the fissure for approximately a distance of 100 feet. At the face of the drift the central one foot portion of the fissure contains admixtures of galena and oxidized lead and iron minerals. About 50 feet from the portal, the limestone host rock has been completely altered. Samples numbers 5 and 6 were taken from this area.

No. 5	Gold	-	0.01 ozs. a ton
	Silver	-	1.70 ozs. a ton
	Wet Lead	-	5.30 %

No. 6	Gold	-	0.01 ozs. a ton
	Silver	-	0.20 ozs. a ton
	Wet Lead	-	none

At reference point elevation 9890 feet, an upper tunnel approximately 125 feet in length has been drifted along the fissures. Relatively large stoped areas were observed and considerable amounts of galena and oxidized ore minerals remain. Near the portal of the tunnel, the mineralized areas are strong and approximately 8 feet along the drift contains good bedded ore. The stronger galena "shows" seldom exceed one foot in thickness although "sand carbonates" and ocherous material flank the latter. About 25 feet beyond this point a northeast fault of vertical dip is intersected by a northwest fault. These fractures may have caused localization of ore in this area along the fissure. This point is directly under a large undeveloped gossan zone on the surface. Near the portal, vertical pipe-like openings (old water courses) contain ore in places. The largest opening connects with the Hudson Tunnel approximately 200 feet below.

Immediately south of the portal of the upper tunnel a small northeast trending fissure contains about 3 ft. of lead ore along bedding and in the vertical fissure proper. This outcropping is on the surface and has not been developed.

HUDSON TUNNEL:

At reference point elevation 9687 feet is the portal of the Hudson tunnel. Sample No. 4 consists of a composite grab sample of the Hudson tunnel dump. It analyzed as follows:

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Time did not permit a complete examination of all the workings of the Hudson tunnel but sufficient work was done to show the pattern of localized ore shoots along northeast trending fissures where they intersect the main fissure vein. The nearly vertical northeast trending fault exposed in the upper tunnel was observed on the Hudson tunnel level and here also contained strong shows of ore minerals. Approximately 50 feet north of this point considerable overhead stoping had been performed in the past and lead ore of approximately 3 feet in thickness remains, the central 1 ft. of which is excellent ore. A cross cut sample of this ore (sample No. 3) analyzed as follows:

Gold	-	0.015 ozs. a ton
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To the left of the raise that connects the Hudson tunnel with the upper tunnel 200 feet above, is a northwest cross cut that intersects two

fissures that parallel the main fissure. Both of these fissures are open and contain mammillary aragonite and ore minerals. Abundant gossan material fills the western most fissure and sample No. 7, that consisted of hard lumps of limonitic material, assayed as follows:

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Total production from the Hudson tunnel is not known, but considerable quantities of good ore must have been extracted from the several stopes observed as the walls still show some unmined ore and where the central portion of the fissure still remains such as sample No. 3, an approximate appraisal of the type of ore mined can be surmised. Early operators must have sorted the ore to essentially pure lead minerals, because the Hudson tunnel dump contains no quantities of visible galena but still assays 17% lead and about 6 ozs. silver (sample No. 4) per ton.

OLD MOON CLAIM:

Various workings on the fissure were noted from the dump of the Hudson tunnel looking south. The surface expression of the fissure is very pronounced (see attached photo). Time did not permit an examination of these workings, although it is believed they will be similar to what has already been observed on the Red and Black Oxide claims. Good ore is reported by Victor Cottino and James Williams to be developed.

Respectfully submitted,

CRAMER & BURANEK

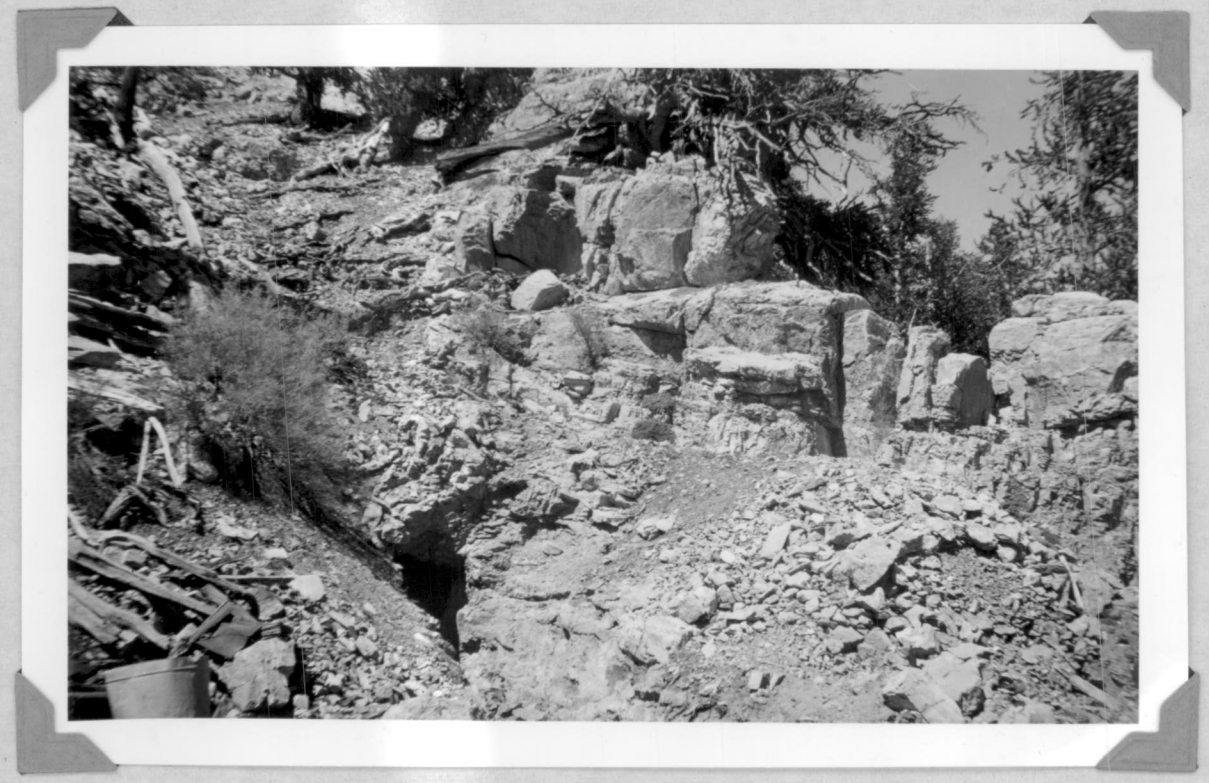
/s/ Louis W. Cramer
Louis W. Cramer

/s/ Alfred M. Buranek
Alfred M. Buranek

July 20, 1950

Bold limestone cliffs that constitute much of the west face of the range in the vicinity of the ore deposits. Note massive character of the limestone.

Grass root discovery in 1949 on Red Oxide Claim - reference point elevation 10,160' - from which 27 tons of silver-lead ore was shipped.



Undeveloped surface outcrop of silver-lead ore below Hudson Tunnel - Black Oxide Claim.

Looking south across Lincoln Canyon at fissure from Hudson Tunnel dump - reference point elevation 9687'. The four tunnels on the fissure (Old Moon Claim) are faintly discernible.

MAPS TO ACCOMPANY REPORT
By
CRAMER and BURANEK.

COLUMBIAN NATURAL CLASP NO. 83N
PAT. 1,290,083 PAT. 1,593,048
THE UNITED STATES ENVELOPE CO. SPRINGFIELD, MASS.
8½ X 11½

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PRELIMINARY REPORT
To Accompany Geologic Map of
Mt. Washington - Lincoln Area, Nevada

The area covered by this map and report covers an area approximately ten miles E-W across the range, by five miles N-S, a total of fifty square miles.

The rocks of the area are a thick quartzite terrain overlain by a succession of fairly thick shale and limestone formations in aggregate several thousand feet thickness, which probably range in age from the beginning to late Cambrian. The approximate thicknesses of the units are given on the stratigraphic column on the map. From aerial observation during the photographic flight, the quartzite (Prospect Mountain formation) extends with fairly flat bedding to the top of Mt. Wheeler about five miles to the north, which would give a total thickness of more than 5,000 feet, of which 2,000 feet are represented in the mapped area.

The Cambrian formations of the area dip generally gently southerly from the contact with the quartzite. The highest point of the contact is about 5,000 feet south along the quartzite ridge extending down from Pyramid Peak. This basal contact runs generally E-W through the range. The basal Cambrian formations (Pioche Sh. and St. Lawrence ls.) have a domal relation to the intrusive quartz-monzonite-porphyry exposed in the N-E quadrant of the mapped area. The Mt. Wheeler Mines prospect is on a longitudinal fissure which is symmetric with the inferred extension of the aforementioned quartzite ridge. The strata shows a gentle anticlinal folding with respect to the ridge, to the east and west from the nearly N-S ridge line. This indicates that the fissure may be a longitudinal anticlinal fracture.

The basal Cambrian units - the Pioche shale and St. Lawrence limestone - on the west side of the ridge are apparently conformable with the underlying quartzite and overlying thick bedded Lincoln limestone with very little folding. However, on the east side of the ridge there is considerable distortion of the units - twisting and folding - south and southeast of the QMP. There is also apparent thinning of the clastic units northward along the quartzite ridge. This indicates a thrusting from the southeast (parallel to the bedding for the most part) in which the quartzite ridge line below the Mt. Wheeler Mines fracture was a structural buffer protecting the relatively soft Pioche shale and St. Lawrence limestone to the west. Those rocks on the east side of the ridge lacking the protection of the ridge were compressed between the underlying competent quartzite and the overlying moving thick limestone units and suffered marked folding and twisting. There is a possibility that the intrusion of the QMP was accompanied by compression and movement and was responsible for the distortion; however, the lack of crosscutting relationships or displacements along the contact zone minimize this possibility. Some of the domal relationship around the QMP may be the result of later isostatic adjustment - somewhat of a piercement activity.

The ore mineralization was probably derived from the magmatic activity responsible for the quartz-monzonite-porphyry (QMP) and related dikes, which are well exposed in the N-E and N part of the area. The QMP is surrounded principally by quartzite showing considerable hydrothermal alteration. For a few thousand feet where the QMP comes into contact with the Pioche shale-St. Lawrence limestone formations, there is considerable typical contact-metamor-

phic alteration and mineralization (which the writer believes from study of many such areas, is probably only "contact" in that the late-magmatic hydrothermal solutions permeated the QMP readily and were impeded by the surrounding rocks, giving a shell of alteration which has an apparent contact-relationship - but which in fact is a late-magmatic type mineralization). The spatial relationships of the rock masses in the N-E area suggest that the QMP assimilated the bulk of the aforementioned 5,000 feet of quartzite during its formation. There is no evidence of the quartzite being removed prior to intrusion by faulting. Also where the quartzite-QMP contact is exposed, the quartzite shows mixed-rock type alteration suggestive of granitization. The QMP itself is a very light-colored rock which indicates that the ferromagnesian minerals are originally in small amount or have been bleached by late or post-magmatic hydrothermal activity, most likely the latter. This late-magmatic activity (from recent study of many square miles of such mineralized areas in the Basin-Range Province) represents the passage of great volumes of dilute aqueous colutions which alter (expressed in greatest part in field study by bleaching) many cubic miles of rock. The amount and type of alteration depends on the temperature, pressure, and composition of the late-magmatic solutions, and the porosity, permeability, and reactivity of the rocks through which they migrate. The number of variable factors vitiate a calculable analysis of a particular area. However, generalizations may be made to the effect that: the larger the bulk and reactivity of the late-magmatic solutions, the larger and better the grade of the related orebodies. The estimates of the writer are based on objective and empirical comparative field-relation observations rather than detailed chemical and petrographic analysis of the rocks involved. The observations of the writer (of which this district is one of many) are in general agreement with the published studies of Sales and Myers who relate alteration and mineralization to a "field" concept of iso-intensity irregular ellipsoids, and also to the work of T. S. Lovering who has found more than one stage of alteration and mineralization in the history of formation of a mineralized district. The writer believes that a combination of the two concepts is of most general application, in which more than one stage of alteration and mineralization are represented, and for which stages individual iso-intensity representation is generally possible. The iso-intensity fields of the individual stages are variable in their spatial relationships. The above generalizations are included in this report as they are a part of the basis of analysis and evaluation of the district. The details of the stages and iso-intensity fields as shown by present preliminary study are too indistinct and controversial to include in this report. In a general way, they indicate that spatially the Mt. Wheeler mine prospect is on the S.W. edge of the coincidence of iso-intensity and stage which are required for large orebodies of mineable grade, and that exploration to the north and east will probably provide stronger mineralization.

The writer believes that a necessary basis for a reliable analysis and evaluation of a mineralized area is the study of a large enough area to show all the rocks, structures, alteration, and mineralization closely and genetically related to the potential ore deposits - in general at least twenty or thirty square miles, with a sound knowledge of the regional setting. The most efficient approach to such a study in a new area is the stereoscopic study of large-scale vertical color air photographs. A study of thousands of square miles of mineralized area this past three years, checked by ground investigation and independent mapping by other geologists, has shown that such preliminary studies (of which this report is typical) are in general from 75-90%

accurate in delineation of the geologic features necessary to analyze and evaluate an area. The large-scale color photographs which are the basis of such study contain several times the detailed information with shadings than can be represented on the preliminary map. That additional detailed information provides a better basis for precise estimates of particular areas than the map - which is a generalization and simplification - though the map shows graphically those larger features fundamental to any evaluation. (The writer realizes that such an approach to mineral exploration is new and unconventional in the mining industry and will probably not be independently substantiated by other geologists for several years.)

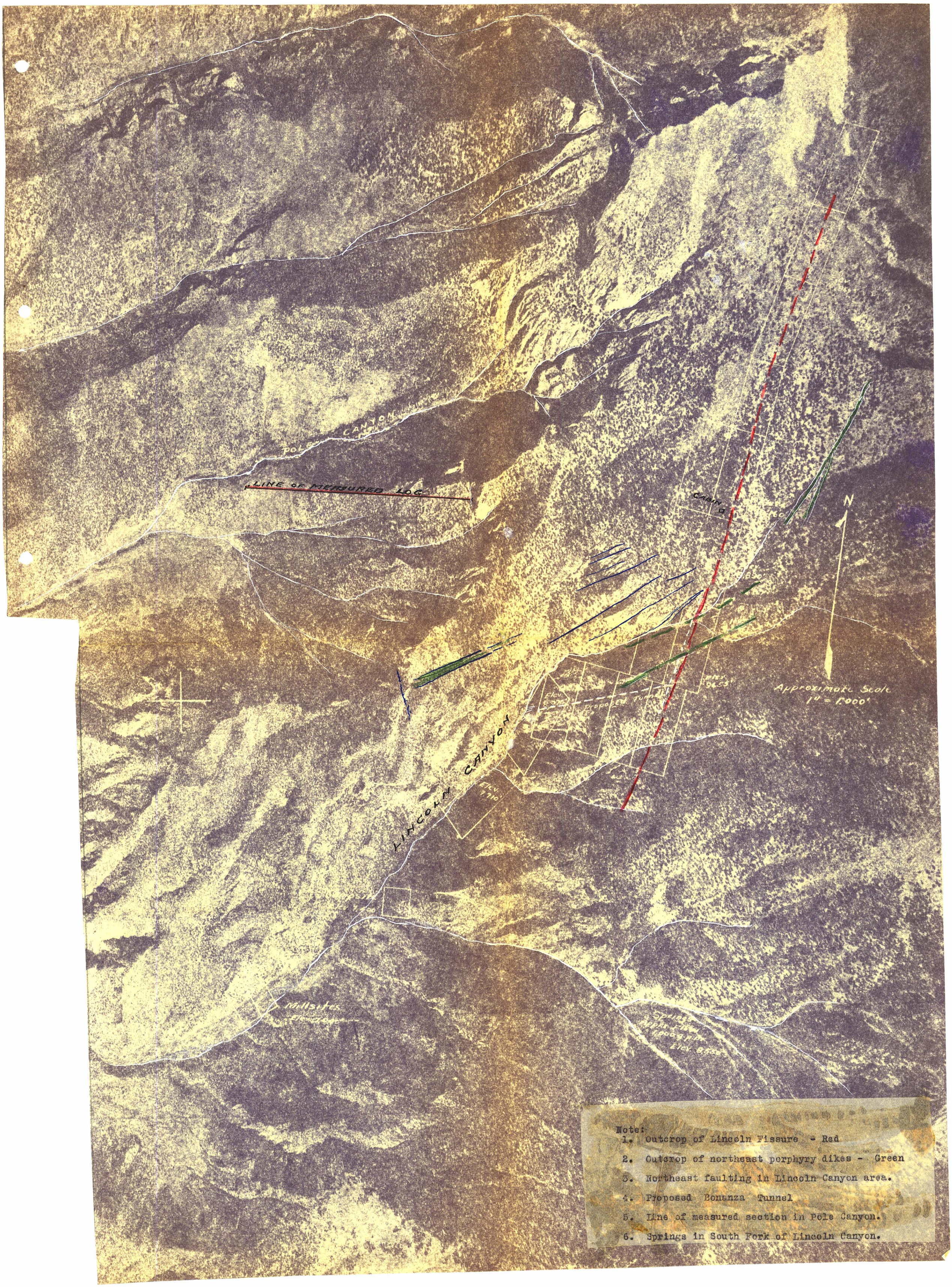
In Summary: The study of the writer indicates that the Mt. Wheeler Mine prospect is on a strong, unique fracture along an anticlinal ridge. The proximity of a large quartz-monzonite-porphyry intrusive, with accompanying late and post-magmatic hydrothermal activity, together with the favorable beds for mineralization (in the Pioche shale and St. Lawrence limestone) at depth on the fracture, indicate that the Mt. Wheeler Mine is worthy of exploration. The logistics of the situation favor the proposed tunnel at the head of the main part of Lincoln Canyon. (The type and amount of ore mineralization that has been found and mined along the surface of the prospect are out of the province of the writer's study and do not enter into his evaluation. That they do occur in a logical position in the geologic situation is coincidental. The mineralization would be anticipated by the study of the writer as indicated by the map and report, though it had not already been mined.)

Philip A. Laylander
P. A. Laylander

November 20, 1950

MAP TO ACCOMPANY
REPORT BY
P.A. LAYLANDER

LARGE FORMAT DOCUMENTS AT END OF FILE

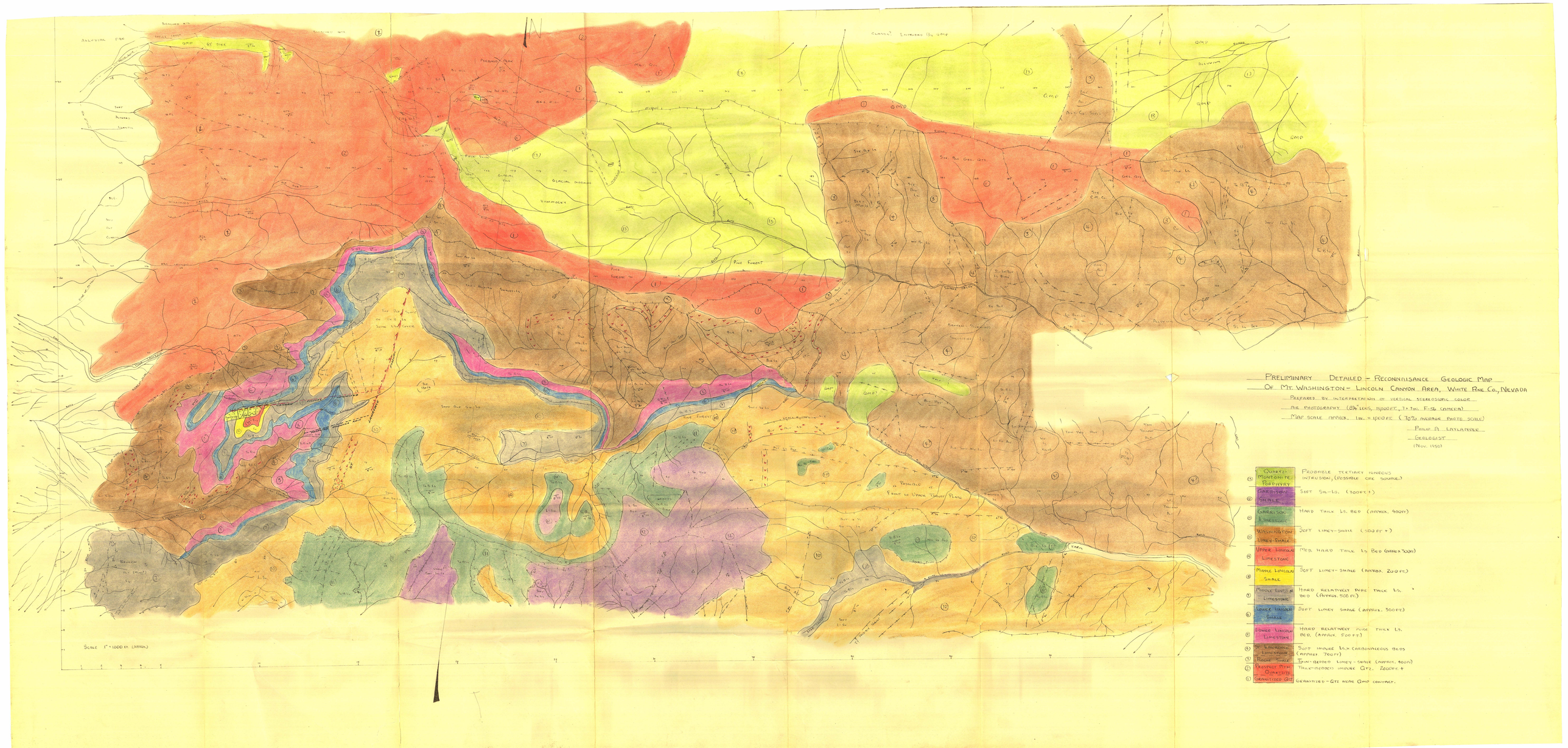

POLE CANYON
LINE OF MEASURED LOG
CABIN
N
Approximate Scale
1" = 1,000'
LINCOLN CANYON
Elev. 7710
Mill site
Note:
1. Outcrop of Lincoln Fissure - Red
2. Outcrop of northeast porphyry dikes - Green
3. Northeast faulting in Lincoln Canyon area.
4. Proposed Bonanza Tunnel
5. Line of measured section in Pole Canyon.
6. Springs in South Fork of Lincoln Canyon.

LEAD-SILVER DEPOSITS
ST. LAWRENCE MNG. CO

T. 12 N. R 68 E. MT DIABLO B&M WHITE PINE
COUNTY – NEVADA – MT WASHINGTON MNG. DIST.

1" = 100'

CRAMER AND BURANEK
CONSULTING GEOLOGISTS – SALT LAKE CITY, UTAH
JUNE 1950


PRELIMINARY DETAILED - RECONNAISSANCE GEOLOGIC MAP
OF MT. WASHINGTON - LINCOLN CANYON AREA, WHITE PINE CO., NEVADA
PREPARED BY INTERPRETATION OF VERTICAL STEREOSCOPIC COLOR
AIR PHOTOGRAPHY (8¾" LENS, 15000 FT., 1:20 TRI. F-56 CAMERA)
MAP SCALE APPROX. 1IN. = 1000 FT. (70% AVERAGE PHOTO SCALE)
PHILIP A. LAYLANDER
GEOLOGIST
(NOV. 1950)
QUARTZ-MONZONITE PORPHYRY
PROBABLE TERTIARY IGNEOUS INTRUSION, (POSSIBLE ORE SOURCE)
GARRISON SHALE
SOFT SH.-LS. (300FT.+)
GARRISON LIMESTONE
HARD THICK LS. BED (APPROX. 400FT)
WASHINGTON LIMEY-SHALE
SOFT LIMEY-SHALE (500FT.+)
UPPER LINCOLN LIMESTONE
MED. HARD THICK LS. BED (APPROX. 200FT)
MIDDLE LINCOLN SHALE
SOFT LIMEY-SHALE (APPROX. 200FT.)
MIDDLE LINCOLN LIMESTONE
HARD RELATIVELY PURE THICK LS. BED (APPROX. 500 FT.)
LOWER LINCOLN SHALE
SOFT LIMEY SHALE (APPROX. 300FT)
LOWER LINCOLN LIMESTONE
HARD RELATIVELY PURE THICK LS. BED. (APPROX. 500FT.)
ST. LAWRENCE LIMESTONE
SOFT IMPURE LS.w CARBONACEOUS BEDS (APPROX. 760FT)
PROCTOR SHALE
THIN-BEDDED LIMEY-SHALE (APPROX. 400FT)
PROSPECT MTN. QUARTZITE
THICK-BEDDED IMPURE QTZ. 2000FT.+
GRANITIZED QTZ
GRANITIZED-QTZ NEAR QMD CONTACT.
SCALE 1" = 1000 FT. (APPROX.)