DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
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MAR 16 1953

REQUEST FOR AN AMENDMENT TO EXPLORATION PROJECT D.M.E.A. 2082- TUNGSTEN CONTRACT Idm-E 248

For the Purpose of

1. Exploring the Productive East-West Shear Zone Opened by the Pole Tunnel.

2. Exploring Other Productive East-West Shear Zones Northward from the Pole Tunnel, and

3. Extending the Pole Tunnel Eastward to the Sheffield Fissure Shear Zone.

Submitted To

MR. H. C. MILLER, EXECUTIVE OFFICER
D.M.E.A. FIELD TEAM
DEFENSE MINERALS EXPLORATION ADMINISTRATION
DEPARTMENT OF THE INTERIOR
1012 FLOOD BUILDING, 870 MARKET STREET
SAN FRANCISCO 2, CALIFORNIA

By

MT. WHEELER MINES, INC.
P.O. Box 150
SALT LAKE CITY 10, UTAH

February 28, 1953

MT. WHEELER MINES, INC.
P. O. BOX 150
SALT LAKE CITY 10, UTAH

February 28, 1953

Mr. H. C. Miller, Executive Officer
DMEA Field Team, Region III
1012 Flood Building
870 Market Street
San Francisco 2, California

Re: Contract Idm-E 248
Docket DMEA-2082-Tungsten
Mt. Wheeler Mines, Inc.
Amendment to Contract

Dear Mr. Miller:

In accordance with our several conferences and discussions, we are submitting four copies of a requested amendment to Contract Idm-E 248 to provide for additional exploration under the above captioned docket.

This amendment has been under consideration for the past three months, during which time numerous conferences were held between the Operator and Messrs. Johnson and Gentry of the Reno office, Mr. Roscoe Smith of the U.S.G.S., Salt Lake office, yourself and Mr. Bailey, and has evolved into its present scope as a cooperative effort. We are authorized to state that Messrs. Johnson, Gentry and Smith are in complete accord with the exploration program as outlined herein. At the same time we wish to thank all these gentlemen for the extraordinary efforts expended in their examination, analysis and reporting of this project.

The Abstract of Amendment, which follows this letter, will serve to give you a concise summary of the scope of the proposed work. We should also like to call your attention to the brief "Explanations of Items" which follows at the end of Stage I and Stage II "Statement of the Proposed Work". This explanatory narrative has been designed to clarify the items in the body of the amendment. Your attention is also called to Exhibit "E" which gives a complete analysis of unit costs of the program just completed, and to Exhibits "B" and "D", the work sheets showing the conversion of project costs to the various MF-104 classifications under which they will be reported monthly.

Thank you for your very kind consideration.

Very truly yours,
MT. WHEELER MINES, INC.
By
James R. Williams
President

ABSTRACT OF AMENDMENT

1. Property

Situated in Section 15, Township 12 North, Range 68 East, Mt. Diablo Base and Meridian, White Pine County, Nevada.

2. Geology and Ore

Mine is in sedimentary rocks of lower Cambrian age consisting of quartzites, shales and limestones. Productive ore zone open by present exploration in 22 foot Wheeler limestone bedding within Pioche shale series 45 feet above Basal Prospect Mountain Quartzite. The scheelite ore occurs in the lower 10 foot section of this Wheeler bed where cut by East-West trending quartz fissure shear zones having widths of 100 feet plus. Three such E-W shear zones are known to exist over a distance of 900 feet north from the Pole adit. Concentrations of scheelite usually occur where these intersections are cut by N-S fissuring.

3. Preliminary Production

(a) The initial work done by the Company in "A" and "B" Laterals South produced approximately 90 tons of ore. Grab samples taken from the cars as dumped into the stockpile averaged 2.25% WO_3.

(b) Exploration drifting, within the bedding, just completed, produced approximately 150 tons of ore. Grab samples taken from the cars as dumped into the stockpile averaged 0.85% WO_3. Since this came from exploration as broken, it contained considerable waste which would ordinarily not be mined.

4. Proposed Exploration

(a) Stage I

1305 feet of exploration within the Wheeler productive bedding where cut by the E-W shear zone. This work to be done from faces opened in the bedding by exploration just completed.

(b) Stage II

1. Main Bedding Drive North

2050 feet of exploration within the Wheeler productive bedding, north up bedding dip, from No. 5 Lateral North, 800 feet east of portal in Pole adit.

2. Pole Adit Drive Easterly

4210 feet of exploration to the east of the present face of the Pole adit; 1200 feet of which will advance the adit to the important Sheffield fissure area and the balance of 3010 feet will be exploration within the Wheeler bedding north from the adit at appropriate intervals.

5. Cost and Time Estimates (As per MF-104 Items)

(a) Estimated Cost

1. Stage I

Labor and Supervision	$ 39,458.70	
Operating Materials and Supplies	13,764.65	
Operating Equipment	31,761.95	
Initial Reh. and Repairs	None	
New Buildings and Improvements	18,710.40	
Miscellaneous	8,252.44	
Contingencies	4,860.68	
Total - Stage I	116,698.82	$116,698.82

2. Stage II

Labor and Supervision	$137,777.60	
Operating Materials and Supplies	70,092.51	
Operating Equipment	36,591.34	
Initial Reh. and Repairs	None	
New Buildings and Improvements	34,532.70	
Miscellaneous	23,079.60	
Contingencies	4,841.47	
Total - Stage II	306,915.22	306,915.22
Total - Amendment		$423,614.04

(b) Estimated Time to Complete

1. Stage I

Surface Facilities	2 Months	
Underground Facilities	1	
Underground Exploration	5	
Total - Stage I	8 Months	8 Months

2. Stage II

Surface Facilities	1 Month	
Underground Facilities	1	
Underground Exploration	14	
Total - Stage II	16 Months	16
Total - Amendment		24 Months

No. 4780SI
Colored Tabs

No. 4781SI
Clear Tabs

MADE IN U. S. A.

NATIONAL INSERTABLE-TAB INDEXES ENABLE YOU TO MAKE YOUR OWN SUBJECT ARRANGEMENT, USING PLAIN INSERTS ON WHICH TO WRITE YOUR OWN CAPTIONS.

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1. Statement of the Proposed Work (See Maps - Exhibit "A")

A Underground Exploration

1. Miscellaneous Bedding Exploration

(a) From the end of "A" Lateral South, drive a 5' x 7' drift within the ore bed 40.0 feet in a southerly direction (approximately S 15° E), to cut the south quartz fissure as indicated.

(b) From the end of the above drift drive a 5' x 7' side drift easterly and westerly on the south quartz fissure, 20.0 feet in each direction to explore the south quartz fissure ore zone.

(c) Extend "A" Lateral northerly 20.0 feet to cut the north quartz fissure as indicated on the map. Drive four side drifts easterly and westerly on ore showings opened for a total of 60.0 feet.

(d) From the end of the bedding drift in Raise No. 2, No. 1 Lateral South, drive a 5' x 7' drift within the ore bed 100.0 feet northerly (approximately N 15° W), to cut the north quartz fissure, and 20 feet easterly. From the North drift drive six short side drifts easterly and westerly in favorable ore showings opened, for a total of 90 feet.

(e) From the end of the bedding drift in Raise No. 1, No. 1 Lateral South, drive a 5' x 7' drift within the ore bed 70.0 feet northeasterly (approximately N 70° E), to determine the effect of this N 70° E fissuring upon ore deposition within the productive bed.

(f) From the end of the bedding drift in the raise in No. 3 Lateral North, drive a 5' x 7' drift within the ore bed 85.0 feet north to cut the north quartz fissure. Explore the favorable ore zones thus opened by driving six side drifts easterly and westerly for a total of 90.0 feet.

(g) From the same starting point in (f), above, drive a 5' x 7' drift within the ore bed 110.0 feet northeasterly (approximately N 70° E), to determine the nature of the mineralization within the productive bed in the area of these N 70° E quartz fissures.

(h) From the top of the raise in No. 5 Lateral North, drive a 5' x 7' drift within the ore bed 160.0 feet north to cut the north quartz fissure. Drive eight side drifts easterly and westerly to explore the ore zones opened up for a total of 120.0 feet.

(i) Other miscellaneous drifting within the productive zone, as may be reasonably indicated from the foregoing exploration, in the amount of 300 feet. This work to be approved by the Field Team before it is actually started.

B Additional Underground Facilities Required

1. Miscellaneous Bedding Exploration

(a) Build chutes and manways as follows -

1. Slide chute at "A" Lateral South.
2. Slide chute at "A" Lateral North.
3. Chute and manway at Raise No. 1, No. 1 Lateral South.
4. Chute and manway at Raise in No. 3 Lateral North.
5. Chute and manway at Raise in No. 5 Lateral North.

(b) Timber for, and install slushers as follows -

1. Install present slusher equipment at No. 1 Lateral South area for bedding exploration.
2. When exploration in (1) above is completed move slusher equipment to No. 3 Lateral North area for bedding exploration.
3. Install new slusher equipment at No. 5 Lateral North for bedding exploration.

(c) Other Preparation

1. Run air, water and ventilation lines from main tunnel to working faces.

2. Install underground air receiver.

3. Place 12 drift sets in main adit from No. 1 Lateral South, 60 ft. easterly, where bedding drifts will cross overhead.

C Additional Surface Facilities Required

1. Bins for Bulk Mill Sampling

(a) Construct a 50 ton bin at the Pole tunnel, install necessary switches and trackage and grade truck road to bin. This facility is necessary to accomplish bulk sampling of the exploration within the productive zone.

(b) Construct a wing bin at the bottom of Pole canyon for storage of the bulk sampling product in lots of 250-500 tons and for transfer into larger trucking units for haul to the mill.

Out

2. Other Facilities

(a) Under Amendment No. 2, to Contract Idm-E-248, authorization was given to add a change room to the blacksmith shop at a

cost of $650.00. It is now requested that this change room be made into a small warehouse and a separate 16' x 20' change house, complete with all necessary facilities, be constructed at the Pole tunnel.

(b) Construct a 12' x 12' powder magazine in accordance with standard specifications of the U.S. Bureau of Mines. This facility has been ordered by the State Industrial Commission of Nevada.

(c) Prepare waste dump facilities for side dump operation.

(d) Make permanent installation of ventilating blower.

D Additional Equipment Required

1. Drilling Equipment as Follows

(a) 3 Jackhammers (2 3/4" machines)
(b) 3 Jackleg units (6 foot leg)
(c) 2 Stopers (2 5/8" machines)
(d) 3 Sets 50' x 3/4" Air hoses
(e) 3 Sets 50' x 1/2" Water hoses
(f) 1 Hitchcutter

2. Ten - 27 cubic foot capacity side dump mine cars. Amendment No. 1 to Contract Idm-E-248, provided for the rental of mine cars in the amount of $1050.00. This sum was not expended because 10 - 15 cubic foot cars were borrowed from another operation. These cars must now be returned.

3. A four-wheel drive truck of 5 ton capacity will be required for year around hauling in the canyon. This unit will be equipped with an oversize bed for also hauling supplies and a snowplow.

4. Eight underwriters approved fire extinguishers for the mine buildings; two to each.

5. One double drum slusher with necessary accessory equipment.

6. Purchase of present rental units.

2. Estimated Cost of Proposed Work (See Exhibit "E" - Past Costs)

A Underground Exploration

1. Miscellaneous Bedding Exploration - 1305 Feet

(a) "A" Lateral North and South Area - 160 Feet

1.	Contract labor	@	$13.50/Ft.	$2160.00	
2.	Pipe & ventilation		1.63	260.80	
3.	Powder, fuse & caps		2.70	432.00	
4.	Steel & bits		1.53	244.80	
5.	Timber		0.46	73.60	
6.	Fuel & Lube Air generation		1.37	219.20	
7.	Misc. small tools		0.55	88.00	
8.	Comp. Insurance		0.95	152.00	
9.	Payroll taxes		0.61	97.60	
	Total 160 Feet	@	23.30/Ft.	$3728.00	$3728.00

(b) No. 1 Lateral South Area - 280 Feet

1.	Contract labor	@	$13.50/Ft.	$3780.00	
2.	Pipe & ventilation		2.11	590.80	
3.	Powder, fuse & caps		2.70	756.00	
4.	Steel & bits		1.53	428.40	
5.	Timber		0.46	128.80	
6.	Fuel & Lube Air generation		1.37	383.60	
7.	Misc. small tools		0.55	154.00	
8.	Slusher cable		0.25	70.00	
9.	Comp. Insurance		0.95	266.00	
10.	Payroll taxes		0.61	170.80	
	Total 280 Feet	@	24.03/Ft.	$6728.40	6728.40

(c) No. 3 Lateral North Area - 285 Feet

1.	Contract labor	@	$13.50/Ft.	$3847.50	
2.	Pipe & ventilation		2.11	601.35	
3.	Powder, fuse & caps		2.70	769.50	
4.	Steel & bits		1.53	436.05	
5.	Timber		0.46	131.10	
6.	Fuel & Lube Air generation		1.37	390.45	
7.	Misc. small tools		0.55	156.75	
8.	Slusher cable		0.25	71.25	
9.	Comp. Insurance		0.95	270.75	
10.	Payroll taxes		0.61	173.85	
	Total 285 Feet	@	24.03/Ft.	$6848.55	6848.55

(d) No. 5 Lateral North Area - 280 Feet

1.	Contract Labor	@ $13.50/Ft.	$3780.00	
2.	Pipe-Ventilation	2.11	590.80	
3.	Powder-fuse-caps	2.70	756.00	
4.	Steel and bits	1.53	428.40	
5.	Timber	0.46	128.80	
6.	Fuel & Lube Air Generator	1.37	383.60	
7.	Misc. small tools	0.55	154.00	
8.	Slusher cable	0.25	70.00	
9.	Comp. Insurance	0.95	266.00	
10.	Payroll taxes	0.61	170.80	
	Total 280 Feet @	24.03/Ft.	$6728.40	6,728.40

(e) Other Miscellaneous Bedding Exploration 300 Feet

1.	Contract Labor	@ $13.50/Ft.	$4050.00	
2.	Pipe-Ventilation	2.11	633.00	
3.	Powder-fuse-caps	2.70	810.00	
4.	Steel and bits	1.53	459.00	
5.	Timber	0.46	138.00	
6.	Fuel & Lube	1.37	411.00	
7.	Misc. small tools	0.55	165.00	
8.	Comp. Insurance	0.95	285.00	
9.	Payroll taxes	0.61	183.00	
	Total 300 Feet @	23.78/Ft.	$7134.00	7,134.00
	Total Underground Exploration-Direct Costs			$31,167.35 $31,167.35

B Underground Facilities

1. Miscellaneous Bedding Exploration

a Chutes and Manways as follows-

1. Slide chute at "A" Lateral South

(a)	Timber and supplies		$ 127.00	
(b)	Labor 4 Man-shifts @ $15.70		62.80	
(c)	Comp. Insurance	7.01%	4.40	
(d)	Payroll taxes	4.5 %	2.82	
			$ 197.02	$ 197.02

2. Slide chute at "A" Lateral North

(a)	Timber and supplies		$ 127.00	
(b)	Labor 4 shifts	@ $15.70	62.80	
(c)	Comp. Insurance	7.01%	4.40	
(d)	Payroll taxes	4.5 %	2.82	
			$ 197.02	$ 197.02

3. Chute and Manway at No. 1 Lateral South

(a)	Mining supplies		$117.20	
(b)	Timber and supplies		246.00	
(c)	Fuel and Lube			
	Air Generation		33.40	
(d)	Labor- 20 shifts	@ $15.70	314.00	
(e)	Comp. Insurance	7.01%	22.01	
(f)	Payroll taxes	4.5 %	14.13	
			$746.74	$ 746.74

4. Chute and Manway at No. 3 Later North

(a)	Mining supplies		$117.20	
(b)	Timber and supplies		246.00	
(c)	Fuel and Lube			
	Air Generation		33.40	
(d)	Labor- 20 shifts	@ $15.70	314.00	
(e)	Comp. Insurance	7.01%	22.01	
(f)	Payroll taxes	4.5 %	14.13	
			$746.74	746.74

5. Chute and Manway at No. 5 Lateral North

(a)	Mining supplies		$117.20	
(b)	Timber and supplies		246.00	
(c)	Fuel and Lube			
	Air Generation		33.40	
(d)	Labor- 20 shifts	@ $15.70	314.00	
(e)	Comp. Insurance	7.01%	22.01	
(f)	Payroll taxes	4.5 %	14.13	
			$746.74	746.74

b Install 3 slushers as follows-
(Cost of each setup will be about the same - below is an example)

1. In No. 1 Lateral South

(a)	Mining supplies		$ 87.10	
(b)	Timber and misc.		79.00	
(c)	Fuel and Lube			
	Air Generation		24.71	
(d)	Switches, bolts, etc.		90.00	
(e)	Labor- 12 shifts	@ $15.70	188.40	
(f)	Comp. Insurance	7.01%	13.21	
(g)	Payroll taxes	4.5 %	8.48	
	Total 3	@	$490.90	1472.70

c. Other Preparation

1. Air, Water & Vent Lines to Working Faces

(a)	250 Ft. 2" air line		$ 87.50	
(b)	250 Ft. 1" water line		50.00	
(c)	250 Ft. 8" vent tube		190.00	
(d)	Misc fittings & valves		75.00	
(e)	Labor- 10 shifts @ $15.70		157.00	
(f)	Comp. Insurance	7.01%	11.01	
(g)	Payroll taxes	4.5 %	7.07	
			$577.58	$ 577.58

2. Install Underground Air Receiver

(a)	4' x 8' Welded tank		$564.00	
(b)	Fittings, valves, etc.		46.50	
(c)	Labor- 6 shifts @ $15.70		94.20	
(d)	Comp. Insurance	7.01%	6.60	
(e)	Payroll taxes	4.5 %	4.24	
			$715.54	715.54

3. Drift Sets in Adit No. 1 Lateral South Area

(a)	Timber and supplies		$738.00	
(b)	Labor-18 shifts @ $15.70		282.60	
(c)	Comp. Insurance	7.01%	19.81	
(d)	Payroll taxes	4.5 %	12.72	
			$1053.13	1053.13

4. Electric Light line in Pole Tunnel and Laterals

(a)	2000' #10/2 Conc B-x		$ 235.00	
(b)	Switches and fuses		42.00	
(c)	Insulators-junction boxes		38.00	
(d)	Lights and sockets		23.00	
(e)	Labor- 6 shifts @ $15.70		94.20	
(f)	Comp. Insurance	7.01%	6.60	
(g)	Payroll taxes	4.5 %	4.24	
			$ 443.04	443.04

Total Underground Facilities	$6896.25	$6896.25

C Additional Surface Facilities Required

1. Bins for Bulk Mill Sampling

a Mine Bin

1.	Timber and materials		$1355.00	
2.	Grading for site & road		240.00	
3.	Foundations		250.00	
4.	Trackage and switches		510.00	
5.	Labor- 74 shifts @ $15.70		1161.80	
6.	Comp. Insurance	7.01%	81.44	
7.	Payroll taxes	4.5 %	52.28	
			$3650.52	3650.52

b Wing Bin for Transfer

1.	Timber and materials		$984.00	
2.	Grading		260.00	
3.	Foundations		275.00	
4.	Labor- 52 shifts @ $15.70		816.40	
5.	Comp. Insurance	7.01%	57.23	
6.	Payroll taxes	4.5 %	36.74	
			$2429.27	$2429.27

2. Other Facilities

a Change House at Mine - 16'x20'

1.	Materials and supplies		$1383.00	
2.	Showers and toilets		570.00	
3.	Hot water & heating eqt.		425.00	
4.	Labor- 60 shifts @ $15.70		942.00	
5.	Comp. Insurance	7.01%	66.03	
6.	Payroll taxes	4.5 %	42.39	
			$3428.42	3428.42

b Powder Magazine - 12'x12'

1.	Timber and supplies		$ 529.00	
2.	Grading and excavation		160.00	
3.	Labor- 24 shifts @ $15.70		376.80	
4.	Comp. Insurance	7.01%	26.41	
5.	Payroll taxes	4.5 %	16.96	
			$1109.17	1109.17

c Waste Dump Preparation

1.	Timber and supplies		$ 316.00	
2.	Trackage and switches		315.60	
3.	Labor- 20 shifts @ $15.70		314.00	
4.	Comp. Insurance	7.01%	22.01	
5.	Payroll taxes	4.5 %	14.13	
			$ 981.74	981.74

d Permanent Blower Installation

1.	Timber and supplies		$ 55.00	
2.	Electrical supplies		90.00	
3.	Labor- 4 shifts @ $15.70		62.80	
4.	Comp. Insurance	7.01%	4.40	
5.	Payroll taxes	4.5 %	2.83	
			$ 215.03	215.03

Total Surface Facilities	$11814.15	$11,814.15

D Additional Equipment Required

1. Drilling Equipment

(a)	3 Jackhammer & jackleg units complete @ $535.00	$2675.00	
(b)	2 Stopers 550.00	1100.00	
(c)	3 Sets air & water hose	180.00	
(d)	1 Hitchcutter	125.00	
		$4080.00	$4080.00

2. Mine Cars

(a)	10-27 Cu. Ft. side dump ore cars @ $506.50	$5065.00	5065.00

3. General Purpose Truck

(a)	1 1/2 Ton Ford chasis	$2700.00	
(b)	4-Wheel drive conversion	1390.00	
(c)	Hydraulic dump bed	1200.00	
(d)	Snowplow	750.00	
		$6040.00	6040.00

4. Fire Extinguishers

(a)	8 Model 60 CO_2 Units	$ 480.00	480.00

5. Double Drum Slusher

(a)	1 Joy Model AAF-212	$2125.00	3 Air S-211 for the small amount
(b)	1 30" Scraper	282.00	1
(c)	3 8" Sheave blocks	129.00	
(d)	2 Eyes and wedges	28.40	
(e)	Cable for slusher	212.50	
		$2776.90	2776.90

6. Purchase of Present Rental Units

Note: Under the original Contract Idm-E-248 and Amendment No. 2, monthly rental was authorized on five pieces of equipment. A "Gentlemen's" agreement has been worked out with our suppliers granting an option to apply these rentals 100% on the purchase of these units if the transactions are completed by the payment of the cash balances plus interest by February 28, 1953. It is requested this be done.

Purchase price, rental credit and cash balances as of February 28, 1953, will be as follows -

Rental Item	Purchase Price Plus Interest	DMEA Rent Payment	Cash Balance		
Compressor	$ 9,724.22	$ 4,230.00	$ 5,494.22		
Generator	2,009.60	1,550.46	459.14		
Trammer	7,726.73	3,800.00	3,926.73		
Mucker	3,104.85	2,360.00	744.85		
Jumbo	2,338.86	770.00	1,568.86		
	$24,904.26	$12,710.46	$12,193.80	12,193.80	
		Total Additional Equipment Required		$30,635.70	$30,635.79

E Supervisory and Supporting Labor

1. Supervisory and Technical

(a)	Supt., Engineer and Geologist 8 Mo @ $650/Mo		$ 5,200.00	
(b)	Working Foreman 8 Mo.	500	4,000.00	
			$ 9,200.00	9,200.00

2. Supporting Labor (Mine Operations Only)

(a)	Timekeeper, warehouseman & compressorman 8 Mo @ $450/Mo		$ 3,600.00	
(b)	Cook 8 Mo	300	2,400.00	
(c)	Combination underground and surface maintenance man -2 shifts $14.50/day & O.T. 8 Mo	408.20	6,531.20	
			$12,531.20	12,531.20

3. Comp. Insurance & Payroll Taxes

(a)	Comp. Insurance	@ 7.01%	$ 1,523.38	
(b)	Payroll taxes	4.5 %	977.90	
			$ 2,501.28	2,501.28
		Total Supervisory and Supporting		$24,232.48	24,232.48

F Other Costs

1. Freight on Supplies (Salt Lake to Mine)

(a)	Pipe & vent lines 5200# @ $0.75/Cwt.	$ 390.00	
(b)	Timber and lumber 105300# 0.75/Cwt.	789.75	
(c)	Miscellaneous supplies 17500# 0.75/Cwt.	131.25	
		$ 1,311.00	1,311.00

2.	Freight on Equipment		
	(a) Factory to Salt Lake	$ 712.50	
	(b) Salt Lake to mine - 116,200#	413.75	
		$ 1126.25	1,126.25
3.	Truck Operation		
	(a) 2392 miles per month @ 10¢/ mile operation and maintenance 7 months	$ 1674.40	
	(b) Operator's wages @ $14.50/ shift & O.T.-7 Mo 408.20	2857.40	
	(c) Comp. Insurance @ 7.01	200.30	
	(d) Payroll taxes 4.5 %	128.58	
		$ 4860.68	4,860.68
4.	Accounting and Blueprinting		
	(a) Project accounting 8 Mo @ $100/Mo	$ 800.00	
	(b) Report printing and copy 8 Mo @ 55/Mo	440.00	
		$ 1240.00	1,240.00
5.	Jeep Mileage (Rental)		
	(a) Allowance for actual mileage required for reasonable and necessary project travel-Est. 1200 M/Mo @ $.08/Mile - 8 Mo.	$ 768.00	768.00
6.	Assaying		
	(a) Est. 78 samples per month @ $2.00/Sample - 8 Mo.	$ 1248.00	1,248.00
7.	Equipment Repairs (Incl. Freight)		
	(a) On basis of past experience 1305 Ft. @ $0.352/Ft.	$ 459.36	459.36
8.	Misc. Operating Supplies (Purchased Locally)		
	(a) On basis of past experience 1305 Ft. @ $0.72/Ft.	$ 939.60	939.60
	Total Other Costs		$11,952.89	11,952.89
	Total Estimated Cost of Project			$116,698.82

RECAP OF COSTS - STAGE I

A	Underground Exploration - Direct		$ 31,167.35
B	Underground Facilities		6,896.25
C	Surface Facilities		11,814.15
D	Additional Equipment		
	1. New Equipment	$18,441.90	
	2. Purchase Present Rental Units	12,193.80	
		$30,635.70	30,635.70
E	Supervisory & Supporting Labor		24,232.48
F	Other Costs		11,952.89
		Total Estimated Cost of Project	$116,698.82

RECAP OF ESTIMATED COSTS - STAGE I

Amendment to Contract Idm- E-248
Conforming to MF-104 Classification of Items
(See Worksheet - Exhibit "B" For Conversion)

		Unit Detail	Unit Total
1.	Independent Contracts	$ None	$ None
2.	Labor and Supervision		
	(a) Labor	30,148.70	
	(b) Supervision	9,200.00	
	(c) Technical	None	
		$39,348.70	39,348.70
3.	Operating Materials and Supplies		
	(a) Misc. Operating Supplies	$ 939.60	
	(b) Timber	600.30	
	(c) Explosives	3,523.50	
	(d) Pipe and Ventilation	2,676.75	
	(e) Track	None	
	(f) Fuel and Lube	1,787.85	
	(g) Steel and Bits	1,996.65	
	(h) Misc. Small Tools	929.00	
	(i) Freight	1,311.00	
		$13,764.65	13,764.65
4.	Operating Equipment		
	(a) Purchase and Freight	$31,761.95	31,761.95
5.	Initial Rehabilitation and Repairs	None	None
6.	New Buildings and Improvements		
	(a) Materials and Labor	$18,710.40	18,710.40
7.	Miscellaneous		
	(a) Accounting and Blueprinting	$ 1,240.00	
	(b) Repairs to Equipment	459.36	
	(c) Assaying	1,248.00	
	(d) Payroll Taxes	1,773.95	
	(e) Compensation Insurance	2,763.13	
	(f) Administrative (Jeep Mileage)	768.00	
		$ 8,252.44	8,252.44
8.	Contingencies		
	(a) Truck Operation	$ 4,860.68	4,860.68
		Total Estimated Project Cost	$116,698.82

EXPLANATION OF STAGE I ITEMS

A Basis of the Exploration (Please refer to Exhibit "A")

The work, as set forth in items (a) to (h) on page 1, has been designed for the specific purpose of securing the necessary information regarding the nature and extent of scheelite mineralization in the area where the Wheeler bed and the East-West trending quartz fissure shear zone intersect. We do not know the North-South extent of this shear zone, but for the purpose of Stage I we have set an arbitrary width of 100 feet as indicated on Exhibit "A". The lateral drives in the bed, as indicated, will serve to explore this ore zone sufficiently to establish known limits, nature and extent of the ore and probable mining grade. This geological information is necessary in order to plan properly the Exploration requested in Stage II.

Item (h) on page 1, provides for 300 feet of miscellaneous work in the bed as may reasonably be indicated from the other exploration. This footage has been requested on the theory that some additional work may become a necessity. For example, in the drives northerly within the bed it may be that the arbitrary north limit of the East-West trending shear zone can be moved north by adding footage to the drive. This would certainly be true if, at the end of the authorized footage, ore were still in the face. Or, as another example, if the short East-West drives in the bed should show some unusual or different condition it may be that some additional footage might be required. Or, as yet another example, we may wish to drive in the bed from the top of the raise in No. 6 Lateral North to determine the effect of the fault just ahead. There may be many such reasons for this contingent footage.

B Additional Underground Facilities

These are self-explanatory. The chutes and manways are required for muck storage and subsequent loading into cars for tramming either to the waste dump or the ore bin. The slushers, of course, keep the labor cost down and provide a rapid means of removing the muck from the face so that the drilling cycle may have maximum time. The air receiver serves to maintain more constant air pressure and to remove moisture from the lines. The drift sets in the Pole adit in the vicinity of No. 1 Lateral South are necessary because the ground in this area is quite broken and the bottom of the bedding drifts will pass overhead at not more than five feet. This timber will keep the bedding drifts from breaking thru into the Pole adit.

C Additional Surface Facilities

The bins are required as a part of the bulk sampling of the bedded ore produced by this exploration. This program was originally suggested by Mr. Glen Gentry of the U.S.B.M., Reno office, and Mr. Roscoe Smith of the U.S.G.S., Salt Lake office, and concurred in fully by the operator. It is clearly recognized that this method of collecting large tonnages (250-500 tons) of the ore as mined, and milling this ore in one batch will provide the only practical means by which acceptable assay values may be obtained.

The 1305 feet of 5' x 7' exploration in the bed will produce approximately 4500

tons of muck. We have no definite basis upon which to estimate the proportion which will be ore but experience indicates that it may be considerable. In the main, the waste and ore fractions will be selected by estimation under the ultra violet light on each muck pile broken each day.

Under other facilities we have requested a change house by itself. During the past operation the need for a small warehouse was clearly demonstrated. We have no storage space for supplies; as a result they get scattered, lost, damaged by weather, etc. Shortages develop which holds up work because there is no control over inventory. By constructing a change house we can then use the space previously given to it for a small warehouse. This is really a must.

The powder magazine is also a must. We purchase our explosives in half carload lots to gain the advantage of price and free delivery to the mine. State law requires that we provide a U.S. Bureau of Mines approved storage magazine. Heretofore we have stored this powder underground.

The waste dump preparation and permanent blower installation are items that will facilitate the operation materially. They were deferred from the original project in the interests of time.

D. Additional Equipment Required

The drilling equipment is necessary to the performance of the exploration. Under the original contract no provision was made for the purchase of stopers or jackhammers for the raise and bedding drift work. Five such units were borrowed from another operation, at no cost to this project, but must now be returned. The item of ten mine cars is on this same basis.

A 4-wheel drive truck unit is a necessity because of the steep grades, switchbacks, and snow and ice conditions during the winter months. A snowplow attachment will solve the road maintenance problem during the snow season.

The balance of the items is self-explanatory.

E. Project Costs

These are based upon past experience and are considered very representative of what we may actually expect. The contract labor rate of $13.50 per foot allows a little leeway over past costs of $10.81 per foot but the drives in the bed with manual setup, double handling of the muck and numerous side drifts will probably add at least $2.00 per foot over past costs. This $13.50 represents maximum cost to be allowed; if it can be done for less it will be so done.

On other item which may require analysis is that of Supervisory and Supporting Labor. In this amendment an effort has been made to be more realistic than in the prior contract, as regards supervision, technical and clerical services. This is a very isolated operation at 8000 foot altitude. It is difficult to get good men to stay, especially those with families. In the past we failed to provide adequate supervision for the night shift with the result that in two sections of the adit grades became too steep and the tunnel section became

undersize. Considerable time and expense was involved in correcting these conditions. Salaries have been set to conform to those offered for similar work at Pioche and Ely where city living prevails.

A clerical office must be provided for; this for time card use in properly distributing costs of the project, purchasing and warehouse withdrawals, and for payroll at the mine. This latter item is of greatest importance as our mail delivery is but twice per week and we must drive 18 miles to get it. This results in late arrival of the payroll at the Salt Lake office and no matter how quickly the checks are mailed back, pay day is usually 3-5 days late and the men raise hell about it.

The other supporting labor is self-explanatory. A cook is as much a necessity as the compressor or powder. One man on each shift for maintenance, repair and equipment operation is an absolute minimum requirement.

F Time Estimate

The time required to complete Stage I of this amendment is estimated as follows -

1.	Construction of bins, Change House, Powder Magazine and other surface facilities	2 Months
2.	Installing chutes, manways, slushers and other underground facilities	1
3.	Underground exploration, 1305 feet @ 260 feet per month	5
	Total Estimated Time	8 Months

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Colored Tabs

No. 4781SI
Clear Tabs

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EXHIBIT "A"

MAP SHOWING PROPOSED EXPLORATION

STAGE I

KAROLTON KLASP—8¾ x 11¼
MADE BY
THE AMERICAN ENVELOPE CO.
WEST CARROLLTON, OHIO

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EXHIBIT "B"

WORK SHEETS SHOWING
CONVERSION OF ESTIMATED
COSTS TO MF-104 ITEMS

STAGE I

KAROLTON KLASP—8¾ x 11¼
MADE BY
THE AMERICAN ENVELOPE CO.
WEST CARROLLTON, OHIO

No. 4780SI
Colored Tabs

No. 4781SI
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STAGE II

FOREWORD TO STAGE II

In discussing this program with Mr. Roscoe Smith of the U.S.G.S., Salt Lake Office, and Messrs. A. C. Johnson and Glen Gentry, U.S.B.M., Reno Office, agreement was reached that the commencement of Stage II should be contingent upon certain results of Stage I. Briefly, these conditions are as follows -

1. The Pole adit drive easterly shall not be started until the bedding exploration from No. 5 Lateral North, as outlined in paragraph (h) on page 1 of the Statement of the Work for Stage I, shall have demonstrated commercial tungsten ore within the East-West shear zone as indicated in Exhibit "A". In the event this bedding exploration is negative, then part of the 300 feet of miscellaneous drifting in the bed, as provided for in paragraph (i) on page 1 of the Statement of the Work for Stage I, shall be used to drive a bedding drift northerly in the region of No. 6 Lateral North, and if this exploration shall find commercial tungsten ore in the East-West shear zone, then the Pole adit drive easterly may be started.

2. The Main Bedding Drive North, cannot, of course, be started until the exploration of Stage I is completed northerly from No. 5 Lateral North. While this drive is not to be contingent upon positive results from Stage I work, nevertheless the Main North Bedding Drive is to proceed only in 525 foot sections with the second, or last, 525 foot section contingent upon the results of the first section.

The operator is in full accord with these limitations. It is suggested that authority to proceed, under the conditions above outlined be secured by request to the Executive Officer, DMEA Field Team, San Francisco, California.

1. Statement of the Proposed Work (See Map - Exhibit "C")

A Underground Exploration

1. Main Bedding Drive North

a Starting at the end of the bedding drift driven 160 ft. northerly from the raise in No. 5 Lateral North, as outlined in Stage I of this request, drive a 5'x 7' slusher drift, within the productive bed, up bedding dip, approximately 1050 feet to explore the intersections of additional E-W shear zones with the Wheeler bed and to cut the strong north quartz fissure shear zone as indicated

b At appropriate intervals, as indicated from the advance, drive twelve short side drifts easterly and westerly, within the bed, on favorable E-W shear zones. While the exact location and extent of these side drifts will be dictated by conditions found at the time, their total footage shall not exceed 600 feet.

c At approximately the center of the drive, run two side drifts within the E-W shear zone, easterly and westerly, a distance of 100 feet each.

d Drive a side drift easterly and westerly within the north quartz fissure zone a distance of 100 feet each.

2. Pole Tunnel Drive Easterly

a Extend the Pole tunnel 1200 feet easterly (approximately S-80° E to E-W), following just under the lime-shale contact as heretofore, to cut the Sheffield fissure and accompanying north trending shear zone.

b Drive six short laterals northerly approximately 40 feet within the strongest N-S trending shear zones cut by the tunnel advance. If practical, these laterals should be driven near the center of each 200 foot section of advance.

c From the end of each lateral drive a short raise into the productive ore bed (approximately 25 ft.).

d From the top of each raise drive a 5' x 7' drift northerly within the ore bed to cut the productive E-W zone. These drifts will probably vary in length but their total is not to exceed 900 ft.

e From each of these drifts up bedding, at appropriate points of ore occurrence as indicated from the advance, drive six side drifts easterly and westerly to explore the E-W ore zone. The total of these six side drifts not to exceed 120 ft. in each area.

f Drive a 5'x 7' slusher drift 500 ft. northerly up bedding dip at the Sheffield fissure-Wheeler bed intersection, with 8 side drifts to explore favorable ore zones. These 8 side drifts not to exceed an aggregate of 200 ft.

(g) Drive a 5'x 7' drift southerly on the Sheffield fissure, with 4 side drifts to explore favorable ore zones. These 4 side drifts not to exceed an aggregate of 100 ft.

B Additional Underground Facilities Required

1. Main Bedding Drive North

(a) Install power line in Pole tunnel with necessary branch circuits.

(b) Replace air slusher with electric slusher at No. 5 Lateral North.

(c) Install permanent blower line in Pole tunnel with necessary take-offs for laterals.

2. Pole Tunnel Drive Easterly

(a) Cut passing track at interval 1100-1150 ft. from portal (to be cut concurrently with advance by widening).

(b) "Cherry-Picker" for drive easterly.

(c) Install second underground air receiver.

(d) Install 6 chutes and manways in raises at end of short laterals.

C Additional Surface Facilities Required

1. Mine Water System

(a) Excavate a 4'x 4' cribbed well at North Pole Canyon Springs, approximately 25 ft. in depth, in order to collect sub-surface water flowing in wash.

(b) Install a 1 H.P., 25 g.p.m. pump to elevate water approximately 150 ft. vertically into mine storage tank. Length of this line will be approximately 250 feet; 1 1/2" pipe will be used. Construct a small shelter over well and pump.

(c) Install a 10,000 gal. capacity redwood water storage tank at north bulldozer cut. This will give an effective pressure head of 90 ft. at the portal of the Pole tunnel.

(d) Run a 2" supply line from this storage tank to the Pole tunnel. This line will be approximately 900 ft. in length and be buried 3 ft. to prevent freezing.

(e) Run a single phase 240 volt power line from the generator building to the pump for remote control operation.

2. Generator Building and Facilities

(a) Construct a 16'x 20' wood frame generator building with sheet metal

outside covering, sheetrock inside finish and concrete floor. To contain the necessary windows, doors and heating equipment.

(b) Pour a 4'x 7'x 3' concrete foundation for the generator unit.

(c) Install switchboard containing the necessary meters and control equipment.

(d) Install a 2250 gal. fuel storage tank with necessary foundations, valves, fittings and piping. Run feed and return lines into generator building.

(e) Install 2- 5 KW., 480/240/110 volt single phase transformers; one for surface lights and water pump and one for the underground light circuit.

3. Other Facilities

(a) Construct a 28'x 36' bunkhouse to accommodate 6 additional men. This unit will be of frame construction, sheet metal covered outside, sheetrock inside finish and will contain the necessary wash, shower, toilet and heating facilities. With the completion of this unit a crew of 16 can be adequately housed and fed. The balance of camp has been constructed with company funds.

(b) Cooling Tower for Compressed Air.
Construct a 5'x 5'x 8' evaporation cooling tower with simple header heat exchanger to cool compressed air and remove excess moisture before entering underground lines. Water in the air lines has been a very serious problem during the past operations.

D Additional Equipment Required

1. One electric generator, 50 K.W., at 0.8 P.F., 480 volt, 60 cycle, 3 phase direct connected to a Cummins diesel engine, Model HGA-601 rated at 77 H.P. continuous at 1200 r.p.m. up to 10,000 ft. altitude. This unit to be equipped with Woodward Hydraulic Governor, Sylphone safety shut down, 24 volt starting system and a switchboard complete with automatic voltage regulator, circuit breaker, voltmeter ammeter and continuous KW demand meter.

2. One 315 cu. ft. diesel driven air compressor.

3. Ten - 27 cu. ft. capacity side dump ore cars. These additional cars will be used exclusively in the Pole heading.

4. Electric Slushers as Follows -

(a) 1 - 15 H.P. and 2 - 7 1/2 H.P. slushers for main bedding drive north for tandem slusher setup. Complete with necessary accessory equipment.

(b) 1- 15 H.P. slusher for drive up Sheffield-Wheeler bed intersection, complete with all necessary accessory equipment.

2. Estimated Cost of the Proposed Work

A Underground Exploration

1. Main Bedding Drive North - 2050 Feet

a Main Drift - 1050 Feet 5'x 7' Section

(1)	Contract labor	@ $13.50/Ft.	$14,175.00	
(2)	Pipe-Ventilation	2.11	2,215.50	
(3)	Powder-fuse-caps	2.70	2,835.00	
(4)	Steel and bits	1.53	1,606.50	
(5)	Timber	0.46	483.00	
(6)	Fuel and Lube Air Generation	1.37	1,438.50	
(7)	Misc. small tools	0.55	577.50	
(8)	Slusher cable	0.25	262.50	
(9)	Power cable	1.00	1,050.00	
(10)	Comp. Insurance	0.95	997.50	
(11)	Payroll taxes	.61	640.50	
	Total - 1050 Ft.	@ $25.03/Ft.	$26,281.50	$26,281.50

b Side Drifts- 1000 Ft. 5'x 7' Section

(1)	Contract labor	@ $13.50/Ft.	$13,500.00	
(2)	Pipe-Ventilation	1.03	1,030.00	
(3)	Powder-fuse-caps	2.70	2,700.00	
(4)	Steel and bits	1.53	1,530.00	
(5)	Fuel and Lube Air Generation	1.37	1,370.00	
(6)	Misc. small tools	0.55	550.00	
(7)	Comp. Insurance	0.95	950.00	
(8)	Payroll taxes	0.61	610.00	
	Total - 1000 Ft.	@ $22.24/Ft.	$22,240.00	22,240.00

2. Pole Tunnel Drive Easterly - 4210 Feet

a Main Adit - 1200 Feet

(1)	Contract labor	@ $13.50/Ft.	$16,200.00
(2)	Trackage	2.60	3,120.00
(3)	Pipe-Ventilation	2.11	2,532.00
(4)	Powder-fuse-caps	2.70	3,240.00
(5)	Steel and bits	1.53	1,836.00
(6)	Timber	0.46	552.00

(7)	Fuel and Lube Air Generation	@ $ 1.37/Ft.	$ 1,644.00	
(8)	Mis. small tools	0.55	660.00	
(9)	Comp. Insurance	0.95	1,140.00	
(10)	Payroll taxes	0.61	732.00	
	Total - 1200 Ft.	@ $26.38/Ft.	$31,656.00	$31,656.00

b Laterals and South Sheffield Drift - 540 Feet

(1)	Contract labor	@ $13.50/Ft.	$ 7,290.00	
(2)	Installing switch. 7 @ $29 - $203	0.38	205.20	
(3)	Trackage	2.60	1,404.00	
(4)	Powder-fuse-caps	2.70	1,458.00	
(5)	Steel and bits	1.53	826.20	
(6)	Timber	0.46	248.40	
(7)	Fuel and Lube Air Generation	1.37	739.80	
(8)	Misc. small tools	0.55	297.00	
(9)	Comp. Insurance	0.98	529.20	
(10)	Payroll taxes	0.63	340.20	
	Total - 540 Ft.	@ $24.70/Ft.	$13,338.00	13,338.00

c Raises and Bedding Drifts - 1770 Feet

(1)	Contract labor	@ $13.50/Ft.	$23,895.00	
(2)	Pipe-Ventilation	1.63	2,885.10	
(3)	Powder-fuse-caps	2.70	4,779.00	
(4)	Steel and bits	1.53	2,708.10	
(5)	Timber	0.46	814.20	
(6)	Fuel and Lube Air Generation	1.37	2,424.90	
(7)	Mis. small tools	0.55	973.50	
(8)	Comp. Insurance	0.95	1,681.50	
(9)	Payroll taxes	0.61	1,079.70	
	Total - 1770 Ft.	@ $23.30/Ft.	$41,241.00	41,241.00

d Drift up Intersection of Sheffield Fissure-Wheeler Bed - 700 Feet

(1)	Contract labor	@ $13.50/Ft.	$ 9,450.00	
(2)	Pipe-Ventilation	1.63	1,141.00	
(3)	Powder-fuse-caps	2.70	1,890.00	
(4)	Steel and bits	1.53	1,071.00	
(5)	Timber	0.46	322.00	
(6)	Fuel and Lube Air Generation	1.37	959.00	
(7)	Misc. small tools	0.55	385.00	
(8)	Slusher cable	0.25	175.00	
(9)	Comp. Insurance	0.95	665.00	
(10)	Payroll taxes	0.61	427.00	
	Total - 700 Ft.	@ $23.55/Ft.	$16,485.00	16,485.00
	Total Underground Exploration - Stage II		151,241.50	$151,241.50

B Additional Underground Facilities Required

1. Main Bedding Drive North

a Power Line in Pole Tunnel

(1)	1200 Ft. #4/3 cond. cable (used if possible)		$ 1,980.00	
(2)	Switches, fuses, etc.		125.00	
(3)	Hangers, wire, etc.		75.00	
(4)	Labor- 8 shifts @	$15.70	125.60	
(5)	Comp. Insurance	7.01%	8.80	
(6)	Payroll taxes	4.5 %	5.65	
			$2,320.05	$2,320.05

b Replace Air Slusher at No. 5 North with Electric Slusher

(1)	Switches, fuses, etc.		$ 75.00	
(2)	Materials and supplies		25.00	
(3)	Labor-10 shifts @	$15.70	157.00	
(4)	Comp. Insurance	7.01%	11.00	
(5)	Payroll taxes	4.5 %	7.07	
			$ 275.07	275.07

c Install Permanent Ventilation Line in Pole Tunnel

(1)	1200 Ft. 18"x 24 gauge galv. line @ $1.75/Ft.		$2,100.00	
(2)	Fittings-gates-hangers		275.00	
(3)	Tape-tar-tie wire, etc.		75.00	
(4)	Labor-16 shifts @	$15.70	251.20	
(5)	Comp. Insurance	7.01%	17.61	
(6)	Payroll taxes	4.5 %	11.30	
			$2,730.11	2,730.11

2. Pole Tunnel Drive Easterly

a Passing Track

(1)	Extra footage allowance for enlarged section 75 Ft. @	$ 5.00	$ 375.00	
(2)	Installing switches		58.00	
(3)	Extra powder, steel bits, etc.		150.00	
(4)	Switches, rail, ties		412.00	
(5)	Comp. Insurance @	7.01%	30.35	
(6)	Payroll taxes	4.5 %	19.49	
			$1,044.84	1,044.84

b "Cherry Picker"

(1)	Lifting mechanism		$ 250.00		
(2)	Beam-rollers & chain		175.00		
(3)	Valves-piping-hose		75.00		
(4)	Labor- 2 shifts @	$15.70	31.40		
(5)	Comp. Insurance	7.01%	2.20		
(6)	Payroll taxes	4.5 %	1.41		
			$ 535.01	$ 535.01	

c Air Receiver

(1)	4'x 8' Welded tank		$ 564.00		
(2)	Fittings-valves, etc.		46.50		
(3)	Labor- 6 shifts @	$15.70	94.20		
(4)	Comp. Insurance	7.01%	6.60		
(5)	Payroll taxes	4.5 %	4.24		
			$ 715.54	715.54	

d Chutes and Manways in Laterals

(1)	Mining supplies		$ 117.20		
(2)	Timber and supplies		246.00		
(3)	Fuel and Lube Air Generation		33.40		
(4)	Labor-20 shifts @	$15.70	314.00		
(5)	Comp. Insurance	7.01%	22.01		
(6)	Payroll taxes	4.5 %	14.13		
	6 Units @		$ 746.74	4,480.44	
		Total			
	Underground Facilities - Stage II			12,101.06	$12,101.06

C Additional Surface Facilities Required

1. Mine Water System

a Cribbed Well

(1)	Timber		$ 190.50		
(2)	Small building		250.00		
(3)	Labor-20 shifts @	$15.70	314.00		
(4)	Comp. Insurance	7.01%	22.01		
(5)	Payroll taxes	4.5 %	14.13		
			$ 790.64	$ 790.64	

b Pump and Pump Line

(1)	1 H.P. Pump		$ 225.00		
(2)	Electric eqt.-supplies		90.00		
(3)	Pipe-fittings-valves		137.50		
(4)	Labor-12 shifts @	$15.70	188.40		
(5)	Comp. Insurance	7.01%	13.21		
(6)	Payroll taxes	4.5 %	8.48		
			$ 662.59	662.59	

c Water Storage Tank

(1)	10,000 Gal. tank		$ 900.00	
(2)	Foundations		150.00	
(3)	Labor-20 shifts @	$15.70	314.00	
(4)	Comp. Insurance	7.01%	22.01	
(5)	Payroll taxes	4.5 %	14.13	
			$1,400.14	$ 1,400.14

d Water Supply Line to Pole Tunnel

(1)	950 Ft. 2" Pipe		$ 332.50	
(2)	Labor - laying pipe		94.20	
(3)	Labor - trenching		471.00	
(4)	Comp. Insurance @	7.01%	39.62	
(5)	Payroll taxes	4.5 %	25.43	
			$ 962.75	962.75

e Power Line to Pump

(1)	Poles and hardware		$ 350.00	
(2)	Wire & insulators		475.00	
(3)	Control equipment		75.00	
(4)	Labor-20 shifts @	$15.70	314.00	
(5)	Comp. Insurance	7.01%	22.01	
(6)	Payroll taxes	4.5 %	14.13	
			$1,250.14	1,250.14

2. Generator Building and Facilities

a & b Building - 16'x 20' and Foundations

(1)	Materials-supplies		$1,383.00	
(2)	Foundations-materials		265.00	
(3)	Labor-56 shifts @	$15.70	879.20	
(4)	Comp. Insurance	7.01%	61.63	
(5)	Payroll taxes	4.5 %	39.56	
			$2,628.39	2,628.39

c Switchboard

(1)	All switchboard equipment is included in the price of the generator unit quoted in Section D below.			
(2)	Materials and supplies		$ 106.40	
(3)	Labor- 6 shifts @	$15.70	94.20	
(4)	Comp. Insurance	7.01%	6.60	
(5)	Payroll taxes	4.5%	4.24	
			$ 211.44	211.44

d Fuel Storage Tank

(1)	2250 Gal. steel tank		$ 318.50	
(2)	Foundations		75.00	
(3)	Pipes-valves-fittings		35.00	
(4)	Labor- 6 shifts @	$15.70	94.20	
(5)	Comp. Insurance	7.01%	6.60	
(6)	Payroll taxes	4.5 %	4.24	
			$ 533.54	$ 533.54

e Transformers

(1)	2- 5 K.W. 480/240/110 V.		$ 240.00	
(2)	Switches and wiring		62.50	
(3)	Labor- 4 shifts @	$15.70	62.80	
(4)	Comp. Insurance	7.01%	4.40	
(5)	Payroll taxes	4.5 %	2.83	
			$ 372.53	372.53

3. Other Facilities

a Bunkhouse for Added Crew

(1)	Materials-supplies		$ 6,915.00	
(2)	Shower-toilet facilities		790.00	
(3)	Room furnishings		652.75	
(4)	Hot water & heating		565.00	
(5)	Labor-234 shifts @	$15.70	3,673.80	
(6)	Comp. Insurance	7.01%	257.53	
(7)	Payroll taxes	4.5 %	165.32	
(8)	Site preparation		160.00	
			$13,179.40	13,179.40

b Cooling Tower

(1)	Lumber-supplies		$ 90.00	
(2)	Heat exch. and trap		175.00	
(3)	Labor-10 shifts @	$15.70	157.00	
(4)	Comp. Insurance	7.01%	11.01	
(5)	Payroll taxes	4.5 %	7.07	
			$ 440.08	440.08
	Total Surface Facilities - Stage II			22,431.64 $22,431.64

D Additional Equipment Required

1. Diesel - Electric Generator

(a)	1- Model HGA-601, 50 K.W. @ 0.8 P.F., 480 V., 60 cycle, 3 phase generator unit complete with switchboard and control	$ 7,880.25
(b)	Installation- 8 shifts @ $15.70	125.60

D Additional Equipment Required - (Cont.)

(c)	Comp. Insurance	@	7.01%	$ 8.80	
(d)	Payroll taxes		4.5 %	5.65	
				$ 8,020.30	$ 8,020.00

2. Air Compressor

(a)	1- 315 Cu. Ft. Joy Model WK-80 skid mounted diesel unit			$ 8,514.00	
(b)	Foundation			225.00	
(c)	Piping-valves-etc.			75.00	
(d)	Installation 12- shifts	@	$15.70	188.40	
(e)	Comp. Insurance		7.01%	13.21	
(f)	Payroll taxes		4.5%	8.48	
				$ 9,024.09	9,024.09

3. Mine Cars

(a)	10- 27 Cu. Ft. side dump ore cars	@	$506.50	$ 5,065.00	5,065.00

4. Electric Slushers

(a)	1- 15 H.P. Mod. B-2F-211			$ 2,900.00	
	2- 7 1/2 H.P. Mod. AAF-212			4,250.00	
(b)	1- 15 H.P. Mod. B-2F-211			2,900.00	
(c)	2- Welded scrapers - 36"			630.00	
(d)	6- 8" Sheave blocks			258.00	
(e)	6- Eyes and wedges			85.20	
(f)	Cable for above units			1,350.00	
				$12,373.20	12,373.20

Total New Equipment - Phase II	34,482.59	$34,482.59

E Supervisory and Supporting Labor

1. Supervisory and Technical

(a)	Gen. Supt. 16 Mo.	@	$650/Mo	$10,400.00	
(b)	Engineer-Geologist 16 Mo.		550	8,800.00	
(c)	Working Foreman 16 Mo.		500	8,000.00	
				$27,200.00	27,200.00

2. Supporting Labor (Mine Operations Only)

(a)	Timekeeper, warehouseman and compressorman - 16 Mo.	@	$450/Mo	$ 7,200.00	
(b)	Cook - 16 Mo.		350	5,600.00	
(c)	2 Combination underground & surface maintenance men - @ $14.70 Day- 2 @ $408.20/Mo. 16 Mo.			13,062.40	
				$25,862.40	$25,862.40

3. Comp. Insurance & P.R. Taxes

(a)	Comp. Insurance	@	7.01%	$ 3,719.67	
(b)	Payroll taxes		4.5%	2,387.81	
				$ 6,107.48	6,107.48

Total Supervisory and Supporting - Stage II	59,169.88	$59,169.88

F Other Costs

1. Freight on Supplies (Salt Lake to Mine)

(a)	Trackage-45,160#	@	$ 0.75/Cwt	$ 338.70	
(b)	Pipe lines-42,450#		0.75	318.38	
(c)	Timber & lumber-195,300#		0.75	1,464.75	
(d)	Mine supplies-27,500#		0.75	385.00	
				$2,506.83	2,506.83

2. Freight on Equipment

(a)	Factory to Salt Lake 47,500#			$1,662.50	
(b)	Salt Lake to Mine 59,500#			446.25	
				$2,108.75	2,108.75

3. Truck Operation

(a)	750 Miles per mo. @ 10¢ per mile operation & maintenance 16 mo.			$1,200.00	
(b)	Wages of operator-1/2 shift @ $14.50 + O.T. $204.10 - 16 mo.			3,265.60	
(c)	Comp. Insurance	@	7.01%	228.92	
(d)	Payroll taxes		4.5%	146.95	
				$ 4,841.47	4,841.47

4. Electric Power Generation (Basis 3/4 Load)

(a)	Fuel- 3.26 gal/hr. (3.26)(24)(26)(16)(.178)		$ 5,793.52	
(b)	Lubrication-390 gal @	$ 0.80	312.00	
(c)	Filters & misc. repairs		239.26	
			$ 6,344.78	$6,344.78

5. Accounting and Blueprinting

(a)	Project accounting @ 16 Mo.	$100	$ 1,600.00	
(b)	Reporting printing & copy- 16 Mo.	55	880.00	
			$ 2,480.00	2,480.00

6. Jeep Mileage (Rental)

(a)	Allowance for actual mileage required for all reasonable & necessary project trans. Est. 1200 miles/mo. @	0.08	$ 1,536.00	1,536.00

7. Assaying

(a)	Estimated 30 samples per mo. @ $2.00/sample - 16 Mo.		$ 960.00	960.00

8. Equipment Repairs (Inc. Freight)

(a)	On basis of past experience 6260 Ft. @ $0.352/Ft.		$ 2,203.52	2,203.52

9. Misc. Operating Supplies (Purchased Locally)

(a)	On basis of past experience 6260 Ft. @ $0.72/Ft.		$ 4,507.20	4,507.20
	Total Other Costs - Stage II			27,488.55
	Total Estimated Cost - Stage II			$306,915.22

RECAP OF COSTS - STAGE II

A	Underground Exploration - Direct		
	1. Main Bedding Drive North	$ 48,521.50	
	2. Pole Tunnel Drive Easterly	102,720.00	
		$151,241.50	$151,241.50
B	Underground Facilities		
	1. Main Bedding Drive North	$ 5,325.23	
	2. Pole Tunnel Drive Easterly	6,775.83	
		$ 12,101.06	12,101.06
C	Surface Facilities	$ 22,431.64	22,431.64
D	New Equipment	$ 34,482.59	34,482.59
E	Supervisory & Supporting Labor	$ 59,169.88	59,169.88
F	Other Costs	$ 27,488.55	27,488.55
	Total Estimatec Cost - Stage II		$306,915.22

RECAP ESTIMATED COSTS - STAGE II

Amendment to Contract Idm- E-248
Conversion to Classification of MF-104 Items
(See Worksheet - Exhibit "D" for Conversion)

		Unit Detail	Unit Total
1.	Independent Contracts	$ None	$ None
2.	Labor and Supervision		
	(a) Labor	110,577.60	
	(b) Supervision	18,400.00	
	(c) Technical	8,800.00	
		137,777.60	137,777.60
3.	Operating Materials & Supplies		
	(a) Misc. Operating Supplies	4,507.20	
	(b) Timber	2,419.60	
	(c) Explosives	16,902.00	
	(d) Pipe and Ventilation	9,803.60	
	(e) Track	4,524.00	
	(f) Fuel and Lube	14,920.98	
	(g) Steel and Bits	9,577.80	
	(h) Misc. Small Tools	4,930.50	
	(i) Freight	2,506.83	
		70,092.51	70,092.51
4.	Operating Equipment		
	(a) Equipment & Freight	36,591.34	36,591.34
5.	Initial Rehabilitation & Repairs	None	None
6.	New Buildings & Improvements		
	(a) Materials and Labor	34,532.70	34,532.70
7.	Miscellaneous		
	(a) Accounting and Blueprinting	2,480.00	
	(b) Repair to Equipment	2,203.52	
	(c) Assaying	960.00	
	(d) Payroll Taxes	6,217.21	
	(e) Comp. Insurance	9,682.87	
	(f) Administrative (Jeep Mileage)	1,536.00	
		23,079.60	23,079.60
8.	Contingencies		
	(a) Truck Operation	4,841.47	4,841.47
	Total Estimated Project Cost - Stage II		$306,915.22

EXPLANATION OF STAGE II ITEMS

A Basis of Exploration (Please refer to Exhibit "C")

1. Main Bedding Drive North

The work, as outlined in items (a) to (d) on page 1, has been designed to crosscut the Wheeler bed in a North-South direction by driving a 5' x 7' drift, within the bed, up bedding dip 1050 feet (approximately +6°-9°). It is based upon studies made on the surface which show the definite existence of two other major East-West trending quartz fissure shear zones, both of which have a significant scheelite showings where opened by surface cuts. Other E-W shear zones may exist and this drive should expose them also. The northernmost exposure, designated as the North Quartz fissure shear zone, actually has greater surface expression and scheelite mineralization than the zone of Stage I.

The many side drifts from the main drift north, as provided for, will allow ample footage to explore the favorable ore showings exposed within the bed, and provides extra footage for east-west exploration of the two major shear zones already exposed.

2. Pole Adit Drive Easterly

The objective of this work is to reach the Sheffield fissure shear zone. This is, by far, the most important north-south trending shear zone area in the Pole Canyon amphitheater. It is comprised of a series of N 15° E fissures, dipping 75° westerly, covering an east-west distance of 500 feet on the surface, and the limestone within this shear zone shows heavy alteration and dolomitization. The fissures are highly mineralized and can be traced for more than 5000 feet on the surface. The colored aerial photography of this area gives a splendid exposition of the importance of this exploration.

The adit will be advanced on much the same basis as heretofore, viz., driving on, or just under the line-shale contact insofar as it is practical. Calculations indicate that the first 600 feet can be driven on an east course since the start will be in the extreme top portion of the down faulted Wheeler bed. This is particularly advantageous because the first two, and possibly three, laterals can be driven north from the adit into the productive portion of the bed without the necessity of raising and subsequent sub-level drifting.

The bedding exploration from the laterals has been designed to avoid the deficiencies which were inherent in the first contract, insofar as it will provide what is believed to be sufficient exploration in the east-west shear zone and within the productive portion of the Wheeler bed.

The work provided in exploration up bedding on the main Sheffield fissure (500 feet) is believed adequate to define the limits of the east-west trending shear zone and possibly reach the second zone north. Also, the 200 foot drift southerly on the Sheffield fissure would explore the suggested E-W shear zone to the south. Ample side drifts from both drives will permit a sufficient exploration east and west of ore exposures opened.

B Additional Underground Facilities

In Stage II all slushing will be done electrically because of the greater speed and efficiency. This, of course, calls for a 3-phase underground power cable. It is believed that sufficient No. 4, 3-conductor used cable can be obtained for this installation. This would reduce the cost by about $1000.00.

A permanent metal ventilating line will be required for the drives in Stage II in order that sufficient volume will be available for both drives. The fabric line now being used will be utilized from the end of the metal line as the drives advance.

A passing track at 1100 feet in the adit will provide for switching and storage of loaded cars and facilitate the movement of muck from the adit face. By providing this convenience we eliminate the need of a separate motorman as each crew will haul and dump its own muck on a staggered schedule after the face is clear and the drilling cycle starts. For example, the bedding drive north crew will tram in the afternoon and the Pole adit crew in the morning. This rotation will follow on both shifts.

The remainder of the items is self-explanatory.

C Additional Surface Facilities

The drilling water must now be hauled from the end of the pipeline approximately three-fourths mile to the Pole adit. The elevation of the North Pole Canyon springs does not permit a direct flow to the mine. This haul is not much trouble when only one or two machines are operating underground; however, under Stage II there may be as many as five machines per shift. In addition to this factor there is the need of additional water for shower and toilet facilities in the change house. These make the hauling of water prohibitive in money as well as time and tie-up of truck equipment.

The water system, as outlined on page 2, is designed to provide an adequate water supply for all mine requirements during the exploration program.

The generator building, foundations and auxiliary fixtures are necessary to the installation of a diesel-electric generator for slushing operations underground.

The additional bunkhouse will be necessary to accommodate the increased crew needed during Stage II of this exploration. The Company has provided, at its own expense, a fully equipped messhall, bunkhouse and staff house, which now accommodates 10 men, at a cost of $26,000.00 plus.

The cooling tower is definitely needed to remove moisture from the compressed air before entering the mine lines. Very serious trouble resulted from this condition all through the current winter. The air lines froze, the machines froze and considerable time was lost.

D Additional Equipment

It is believed that one 50 KW diesel-electric unit will be sufficient to provide the necessary electric power for the slushers. The cost of providing this same slusher capacity and the air compressor capacity to operate it would be prohibitive because of the extremely low efficiency of air power conversion and transmission.

The increased air requirements of Stage II makes an additional compressor necessary. This new unit will be the same as the present unit and will be mounted in the same building. This will give us a total of 630 cubic feet of air per minute which should take care of all demands during this stage of exploration.

The additional 10 mine cars will be required for the adit advance so that adequate car capacity is available during the mucking cycle.

The three electric slushers to be used in the main Bedding Drive North will be set approximately 450-350-350 feet apart. This is about the maximum efficient slushing distance. They will be operated in tandem. The other slusher will be needed for the 500 foot drive up bedding at the Sheffield fissure.

E Project Costs

Labor, supervision and supporting labor has been fully discussed under "Explanation" of Stage I. No change is anticipated in Stage II operations. However, a Geologist-Engineer has been added for Stage II because the volume of underground sampling, mapping and surveying will be greatly increased. In addition to this, much greater time and effort will be required for the monthly detailed MF-104 reports. Most of this work will be done on the job by the staff.

The other costs are based upon experience in past operations and should be fairly close to actual costs. The past footage contract labor cost of $10.81 per foot will probably have to be increased by about $2.50 per foot for the main Bedding Drive North because of the number of times the muck must be handled. Also, it is estimated that we will have to increase the footage payment in the Pole adit by $1.50 per foot because of the longer tram. However, the $13.50 figure should be ample to cover these drives. The balance of the cost items are self-explanatory.

F Estimated Time

The time required to complete Stage II of the exploration is estimated as follows -

1.	Surface Preparation	1	Month
2.	Underground Preparation	1	
3.	Underground Exploration	14	
	Total	16	Months

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Colored Tabs

No. 4781SI
Clear Tabs

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EXHIBIT "C"

EXHIBIT "C"

MAP SHOWING PROPOSED EXPLORATION

STAGE II

KAROLTON KLASP—8¾ x 11¼
MADE BY
THE AMERICAN ENVELOPE CO.
WEST CARROLLTON, OHIO

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EXHIBIT "D"

WORK SHEETS SHOWING
CONVERSION OF ESTIMATED
COSTS TO MF-104 ITEMS

STAGE II

KAROLTON KLASP—8¾ x 11¼
MADE BY
THE AMERICAN ENVELOPE CO.
WEST CARROLLTON, OHIO

No. 4780SI
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RESUME OF EXPLORATION COMPLETED TO DATE

The following is a brief resume of exploration work completed under Contract Idm-E-248 for the 12 month period February 1, 1952, to January 29, 1953, inclusive. Approximately two months were lost because of heavy snowfall in February and March, 1952, leaving a net operating period of 10 months.

1. Surface Facilities and Preparation

A 16' x 24' compressor building with concrete floor and concrete foundations for the compressor, generator and battery charging set was constructed. Necessary fuel and water tanks and air receiver were installed. A 3" air and 1" water line were run to the portal of the Pole adit.

A 18' x 30' combination blacksmith shop and change room was started. The concrete foundation and outside frame have been completed. The balance of the structure is now being finished on Company account.

The portal of the Pole adit was enlarged, straightened and timbered. Trackage and switches were installed from the portal to the compressor house, waste dump and ore stockpile.

A water supply line, approximately 4000 feet in length, was layed from the North Pole Canyon springs and a 2500 gallon storage tank installed.

Floodlights were installed on the mine dump for night operations.

Approximately 78 tons of equipment, materials and supplies were transferred by hand and hauled from the bottom of Pole Canyon to the mine dump in a smaller truck unit rented locally.

Trackage, air and water lines and ventilating line were installed in the Pole adit. A 5 HP blower was installed just south of the portal.

2. Underground Exploration

Mining started on July 6, 1952, on a one shift basis. A second shift was added on August 6, 1952, and thereafter operations were maintained on a two shift per day basis. Exploration advance was as follows -

(a) Pole Adit		965.0 Ft.
(b) No. 1 Lateral South Area		
No. 1 Lateral	99.0 Ft.	
Nos. 1-2-3 Raises	25.5	
Nos. 1-2-3 Bedding Drifts	37.5	
	162.0	162.0

(c) No. 2 Lateral South Area

No. 2 Lateral	36.0 Ft.	
Raise	17.5	
Bedding Drift	9.0	
	62.5	62.5 Ft.

(d) No. 3 Lateral North Area

No. 3 Lateral	61.0	
Raise	19.0	
Bedding Drifts	22.0	
	102.0	102.0

(e) No. 4 Lateral North Area

No. 4 Lateral	36.0	
Raise	4.0	
Bedding Drifts	42.0	
	82.0	82.0

(f) No. 5 Lateral North Area

No. 5 Lateral	35.5	
Raise	9.0	
	44.5	44.5

(g) No. 6 Lateral North Area

No. 6 Lateral	32.0	
Raise	15.0	
	47.0	47.0
Total Advance		1465.0 Ft.

3. Project Costs

Total project expenditures amounted to $82,809.41 as follows (basis MF-104 reports) -

A Labor and Supervision

1. Labor	$23,790.62	
2. Supervision	3,500.00	
	$27,290.62	$27,290.62

B Operating Materials and Supplies		
1. Misc. Operating Supplies	$ 744.08	
2. Timber	407.73	
3. Explosives	4,047.15	
4. Pipe	1,962.75	
5. Track	3,271.20	
6. Fuel and Lube	2,621.99	
7. Steel and Bits	2,367.18	
8. Vent Tube	1,151.60	
9. Freight	937.70	
	17,511.38	$17,511.38
C Operating Equipment		
1. Rental	$14,335.46	
2. Purchase and Freight	4,207.14	
	18,542.60	18,542.60
D Initial Rehabilitation and Repairs		2,472.30
E New Buildings and Improvements		8,866.06
F Miscellaneous		
1. Repairs to Equipment	$ 720.77	
2. Sample and Analysis	39.00	
3. Payroll Taxes	1,439.77	
4. Liability Insurance	2,586.66	
5. Administrative (Project Only)	2,537.16	
6. Truck Rental	500.00	
7. Aerial Maps	250.00	
	8,073.36	8,073.36
G Contingencies		
1. Bulldozer-Snow Removal	$ 646.00	646.00
		83,402.32
Less Suspension by Audit of 12-31-52		592.91
Total Project Cost		$82,809.41

The total project expenditure of $82,809.41 was $7,333.41 in excess of the contract authorization of $75,476.00. This excess was expended on Company account in order that the full program of underground exploration might be completed in accordance with the original program. Various analysis of unit costs are given in Exhibit "E" attached hereto.

4. Geology and Ore

A Summary

The results of this initial 1465 feet of exploration were most encouraging. It is our opinion that tungsten (scheelite) mineralization has been reasonably demonstrated within the entire block opened by this exploration, viz., some 1100 feet East-West and 125-150 feet North-South. However, it is recognized that insufficient exploration, within the productive Wheeler bed, was provided for in the original contract, and, therefore, no basis has been developed upon which an accurate estimate of tonnage and mining grade can be made. However, an attempt was made to arrive at some reasonably indicated ore basis and this resulted in the suggestion of some 15,000 tons of 1% WO_3. This analysis is presented in Exhibits "F" and "G", reports by the Geological Staff of Combined Metals Reduction Company and Earl B. Young, Chief Geologist, attached hereto. The need for additional work within the productive bedding, to be executed from present workings in the bed, forms the basis of Stage I of this requested amendment. This added exploration within the Wheeler bed, as shown in Exhibit "A", has been designed to accomplish this objective.

B Detail of Exploration

1. Pole Adit

Total advance was 965.0 feet. Start was at portal plus 108.0 feet; finish at portal plus 1073.0 feet. At start, the lime-shale contact was breast high (rail plus 5.0 ft.). This rose slowly as the adit advanced on a S 82° E course and passed over the back at 75 feet. (All distances will be given from start of DMEA project.) The adit was continued on this course to 214 feet at which point it was turned to S 66° E in order to bring the contact down. This turn, coupled with a N 10° W reverse fault at 322 feet, dropped the contact to the breast high position at that point. Between 75 and 322 feet the adit was entirely in shale, which proved to be very stable ground. The N-S fracturing showed up quite well in the shale but required close observation because of tightness.

At 322 feet the course of the adit was turned to S 73° E and at 365 feet further changed to S 80° E. At 598 feet a N 20° W normal fault raised the contact to the breast high position and at 628 feet a N 30° W normal fault raised the contact above the back of the adit. The adit was continued to 692 feet where the course was changed to S 73° E. The adit then continued in shale to 935 feet where a strong N 10° W normal fault dropped the contact 27 feet. Beyond this fault the adit was in the blue mottled lime in the extreme top portion of the Wheeler bed. The course was changed to S 83° E for the balance of the advance. On the last round the "burn cut" broke a small hole, in the center of the face, into an open cave of considerable size.

Map D-1005, Exhibit "A" of Stage I, clearly shows the progress of the Pole adit and the geological shifting resulting from faulting. Most faults encountered were reverse ones having very small throws (many less than 1 foot; a few 3 to 5 feet); the only normal fault of significance was the one at 935 feet which had a vertical movement of 27 feet.

2. No. 1 Lateral South

This lateral was started at 72 feet and driven 99.0 feet on a S 20° E course. Numerous E-W trending quartz filled fissures carrying scheelite were cut over the entire 99 feet. Three raises were driven into the productive bedding at 25 foot intervals. From these raises drifts were driven easterly within the ore bed. The entire product from these raises and bedding drifts (an estimated 125 tons), grab sampled 0.62% WO_3. These samples were taken from the mine cars as they were dumped into the stockpile. It is estimated that all three bedding faces, as they would be mined, will run plus 1% WO_3.

The important result of the exploration in this area is that the bedded ore has been demonstrated in No. 3 Raise which is 70 feet south of the Pole adit. It also suggests a continuity of bedded ore between the three raises thus opened into the ore bed.

3. No. 2 Lateral South

This lateral was started at 279 feet and driven 36.0 feet on a S 8° E course. This was entirely in the shale and only one important E-W quartz filled fissure was cut. A raise was driven on this to cut the ore bed, but cut a strong N 10° W fault which dropped the bed. Only scattered scheelite mineralization was observed and 40 cars from this work grab sampled 0.12% WO_3. No further exploration was done in this area because of the difficulty and expense involved in reaching the bed in this fault area. It was also thought that the position of this raise was somewhat south of the East-West shear zone upon which this exploration program was suggested.

4. No. 3 Lateral North

This lateral was started at 366 feet and driven 61.0 feet on a N 20° E course. Important scheelite mineralization was cut in the bed just off the adit. Several strong E-W trending quartz filled fissures showing scheelite were cut in the advance. At 50 feet a raise was driven easterly into the ore bed and 22 feet of drift was driven easterly within the bed. The first 14 feet produced 35 cars of ore which grab sampled 1.08% WO_3. The last 8 feet, driven on a series of N 70° E quartz fissures, produced 20 cars of ore which grab sampled 2.96% WO_3. These were all placed in the stockpile.

The exploration in this area has produced the best showing of bedded ore (other than the original work done by the Company in "A" and "B" laterals south) so far observed in the project. This occurs at the south boundary of the East-West shear zone previously mentioned.

5. No. 4 Lateral North

This lateral was started at 509 feet and driven 36.0 feet on a N 40° E course. At the end an inclined raise was driven into the bedding and 42.0 feet of drifting was done in a general NE direction. Two very strong E-W quartz filled fissures were cut just off the raise. Two mine cars of ore, selected from these fissures, grab sampled 24.3% WO_3 and were stockpiled.

Two strong faults cut this area and complicated the exploration considerably. To the east the bed had dropped while to the north the drift followed a fault. The bed in this zone was entirely replaced by an ankerite mud. However, on the west side good scheelite mineralization was observed in the unaltered bedding.

6. No. 5 Lateral North

This lateral was started at 681 feet and driven 35.5 feet on a N 40° E course. At the end a vertical raise was driven 9.0 feet into the Wheeler bed on a series of E-W quartz fissures. The scheelite mineralization in this area was somewhat scattered, but none the less, considerable. There is definite replacement in the limestone. However, this face is about 60 feet south of the E-W shear zone and this may account for the lesser showing of ore.

7. No. 6 Lateral North

This lateral was started at 894 feet and driven 32.0 feet on a N 50° E course. At the end a vertical raise was driven 15.0 feet into the bottom of the Wheeler bed. At this point only scattered scheelite mineralization was observed. This face is approximately 125 feet south of the E-W shear zone and this may again account for the limited ore showings in the bedding.

5. Conclusions

From this completed exploration, the following conclusions are suggested -

1. The 22 foot Wheeler productive limestone bedding is a continuous structure, well prepared structurally by numerous N-S and E-W trending fractures.

2. Numerous faults, striking from N 10° W to N 30° W and in the main dipping rather steeply to the west, have been cut by the Pole adit. In most instances the vertical displacement has been very small (less than one foot); in a few it has been up to 3 feet; and in one approximately 27 feet.

3. It would be difficult to drive an adit within this ore zone since small vertical displacements produce a rather large horizontal shift because of the low angle of dip of the beds (6°-9° southerly), combined with the almost easterly strike of the bed (S 73° E to S 85° E).

4. The scheelite mineralization occurs as a definite replacement of the limestone in the lower 8 to 10 feet of the Wheeler bed immediately above the shale. It is also true, however, that high grade "hot spots" of scheelite occur within E-W trending quartz fissures where they intersect the lower portion of the Wheeler bed. In several instances this same concentration was observed in N-S trending fissures, but it is not a general situation.

5. An East-West trending shear zone, at least 100-125 feet wide, is rather definitely suggested. It has been observed that apparently the best ore occurrence is within this zone. This zone may be considerably wider than 100 feet but we have no underground exploration extending beyond this width.

6. Additional exploration within the Wheeler bed and the E-W trending shear zone, as requested in Stage I, and shown in detail in Exhibit "A", is firmly indicated at this time.

7. At least 2 other such E-W trending shear zones containing scheelite are indicated to the north of the Pole adit by surface cuts. A 1000 foot drive to the north, up bedding dip from the Pole tunnel, as requested in Stage II, and shown in detail in Exhibit "C", would explore these and others which may exist.

8. There is every reason to assume this pattern of scheelite mineralization within the Wheeler bed will continue easterly to the important Sheffield fissure N-S trending shear zone. This exploration is also requested in Stage II and shown in detail in Exhibit "C".

9. The initial project has shown that commercial scheelite occurs within the Wheeler productive bedding over a large area. The program requested in Stages I and II of this amendment represents the logical next step necessary to demonstrate the existence of a new domestic tungsten producing area of significant national importance.

No. 4780SI
Colored Tabs

No. 4781SI
Clear Tabs

MADE IN U. S. A.

NATIONAL INSERTABLE-TAB INDEXES ENABLE YOU TO MAKE YOUR OWN SUBJECT ARRANGEMENT, USING PLAIN INSERTS ON WHICH TO WRITE YOUR OWN CAPTIONS.

EXHIBIT "E"

COST ANALYSIS OF
INITIAL 1465 FT. OF
EXPLORATION COMPLETED

KAROLTON KLASP—8¾ x 11¾
MADE BY
THE AMERICAN ENVELOPE CO.
WEST CARROLLTON, OHIO

No. 4780SI
Colored Tabs

No. 4781SI
Clear Tabs

MADE IN U. S. A.

NATIONAL INSERTABLE-TAB INDEXES ENABLE YOU TO MAKE YOUR OWN SUBJECT ARRANGEMENT, USING PLAIN INSERTS ON WHICH TO WRITE YOUR OWN CAPTIONS.

EXHIBITS

EXHIBITS "F" and "G"

GEOLOGICAL REPORTS

COMBINED METALS REDUCTION COMPANY
P. O. BOX 150
SALT LAKE CITY 10, UTAH

October 24, 1952

REPORT ON THE GEOLOGICAL DEVELOPMENTS AT MT. WHEELER MINES, INC.

Prospecting work at the Mt. Wheeler Mines, Inc., having reached the stage where tungsten ore is known to occur in the Wheeler bed in significant quantities, the management requested an independent appraisal of the ore possibilities. Consequently Requa, Thomas and Hagen visited the property for the desired examination. Mr. Young, being unable to accompany them, has reviewed the report in the light of his previous observations.

This examination was for the particular purpose of investigating the scheelite ore occurrence and of evaluating the adequacy of the present program of exploration. A transit survey of the workings was made by Mr. Hagen, with adjustment to the true meridian.

The country rock at the mine consists of a series of sediments in the Lower Cambrian formation, which occur in a broad, flat-lying dome that pitches at a low angle to the south. Erosion has developed a striking amphitheatre, which drains into Pole Canyon. This type of erosion naturally suggests the presence of numerous cross fractures which have made the formation of the amphitheatre possible.

A large exposure of granitic material, a mile or more to the northeast, suggests that the doming may be associated with this intrusion and that the multiple fracturing in Pole Canyon may be the result of gradual settling due to the cooling of the magma below this area. Thus many channels have been provided for the entry of hydrothermal solutions and gases into the favorable beds.

The total thickness of the Wheeler limestone bed is about 22 feet. This bed lies only a few feet above the contact with the underlying Prospect Mountain quartzite. The Wheeler bed is part of the Pioche shale formation. The middle portion of the Wheeler bed has been found favorable for replacement by scheelite and has been highly altered by hydrothermal solutions. The favorable portion is usually four to five feet thick. In the exposed faces the ore has been found to be a combination of scheelite bearing quartz and replaced limestone.

This bed has been highly fractured, but not greatly displaced, over quite a wide area, which is at least 1000 feet in a north-south direction by about 600 feet in an east-west direction as evidenced by surface exposures and recent development work.

Quartz has been deposited on most of these fractures, as well as ankerite and scheelite. This is best developed at fracture intersections where limestone replacement ore occurs.

The development program, under the present DMEA project, has been confined to driving a tunnel under the productive bed, which has a flat dip to the south and by raising into this bed at selected places. This program has demonstrated ore, but fails to give sufficient information on the extent of such ore.

As exposed to date the ore shoots have been assumed to constitute a tabular body of ore four to five feet thick, twenty or more feet wide and of unknown length. The long dimension of the ore evidently follows east-west fracturing.

This zone does not contain all of the ore possibilities of the Mt. Wheeler property. Fracturing of the Wheeler bed is sufficiently widespread in the Pole Canyon area to provide other loci of ore deposition and these should eventually be investigated.

The known ore zone has been referred to as a shear zone, which is probably a misnomer. It is our belief that this structure should be called a fracture pattern, which would provide a much wider area for ore deposition than the zone now under consideration.

Knowledge of the continuity of the ore shoots is now vital and the present program fails to provide this information. The raises, now in ore, fail to give sufficient information for the calculation of an ore reserve.

To get some adequate idea of the tonnage we suggest that a certain portion of the prospecting footage be allocated to driving in the ore bed. What portion of the total footage should be devoted to this purpose will be a matter that experience will dictate, but for an initial effort in this direction and for footage that can be allocated from the remaining footage in the present DMEA contract, we suggest the following -

Slusher drifts should be run from the following raises:

1. From the #1 South Lateral, Raise #2, in a N 20° W direction, up dip in the bed for a distance of 70 feet.

2. From the #2 South Lateral, Raise #1, in a N 10° W direction, up dip in the bed for a distance of 105 feet.

3. From the #3 North Lateral, Raise #1, in a northerly direction for 60 feet up dip in the bed and, from this same raise, a drive in an easterly direction for 40 feet in the bed.

This is a total footage of 275 feet and in order that this work may be permissible under the DMEA contract it is suggested that it be deducted from the 1000 feet which has been allowed for the main adit.

Any future extension of the DMEA project should allow amply for such prospecting work in the Wheeler bed.

In all drives on ore we suggest that continuous samples be taken. We consider cut samples unreliable in the irregular mineralization pattern usually found in most tungsten mines. We, therefore, suggest systematic muck samples be taken from the cars of ore, or waste, removed from each heading in the ore bed.

For the above reason we cut no samples on this examination but did carefully examine each ore face with the tungsten light. The management advised us that the stock pile muck samples taken from the ore removed from all DMEA exploration faces averaged 0.62% WO_3 and that these faces by selective mining, or with sorting, should produce plus 1% ore.

It should be noted that no faults having any significant displacement have been encountered so far. As the main tunnel advances some faults will be found, also some quartz veins. Our examination did not include the consideration of these possibilities, but we believe such structures should be studied in more detail. A real dislocation of the Wheeler bed, along a strong mineralizer, could result in a very significant deposition of tungsten ore.

The Sheffield fissure is the first strong quartz vein known to exist immediately ahead of the main tunnel. This vein runs about north and south and should be cut in another 1000 feet, more or less, of advance by the main tunnel. Where the Sheffield fissure has been explored it consists of a five foot quartz filled fissure containing high temperature lead ore.

In general we can say that the Mt. Wheeler development is very encouraging. It is a type of replacement deposit that is not well known to the tungsten industry. If successfully developed, and we believe that it has such possibilities, it should open up a new field for tungsten exploration.

While our inspection was not a general mine examination we would like to comment on the neat and orderly condition of the camp and the mine. It was a pleasure to see such efficiency and organization at such an early stage of this operation. We also wish to thank Mr. Williams, president and general manager of this company, for his complete cooperation and kind hospitality during the course of this examination.

L. K. Requa

Earl B. Young

L. G. Thomas

C. R. Hagen

K

COMBINED METALS REDUCTION COMPANY

P. O. BOX 150

SALT LAKE CITY 10, UTAH

Subject: Tungsten Ore Reserve at Mt. Wheeler Mine
To : Mr. E. H. Snyder

From : Earl B. Young
Date : December 16, 1952

Sufficient development has been completed at the Mt. Wheeler Mine in its Pole Canyon tunnel to justify a restatement of the geological conditions that exist and to make a "guesstomate" of probable ore reserves as of this date. "Probable" as used in this letter includes "positive" and "probable" as ordinarily used.

The tunnel has advanced past the 900 foot mark and with its side crosscuts, raises and subdrifts, it has revealed a very interesting pattern of ore occurrence. We have dubbed this the waffle-iron, and an explanation may be necessary. The first work in the tunnel was based on the belief that there were several shear zones trending easterly across the area which would serve as guides for mineralizing solutions and gases. This conception must now be expanded to include another series of fracture zones which extend in a north-south direction across the amphitheatre. To date five of these N-S zones have been identified and designated A, B, C, D and E.

Zone "A" is cut in the tunnel from 24 feet to 95 feet from the portal. About 80 feet of sub-level work in the orebed produced 105 cars which assayed 3.68 WO_3 and a considerable amount of low grade. We feel justified in assigning a width to the zone at this point of 72 feet, extend it for 100 feet in a north-south direction and consider the ore thickness as 5 feet, although in some places it is up to 7 feet. Allowing 12 cubic feet to the ton, we obtain an estimated probable reserve of 3000 tons.

Zone "B" is cut from 142 to 216 feet from the portal and is also considered as 72 feet wide. The bed has been exposed by three raises from the No. 1 Lateral-South and by short drifts in the bed. Replacement by scheelite again occurs over a thickness which in places is six to seven feet. Again allowing 100 feet north and south with an average thickness of five feet, we have an additional probable reserve indicated of 3000 tons. The average assay from 125 cars from this zone was 0.62% WO_3.

Zone "C" is cut from 355 feet to 434 feet from the portal and is considered as 60 feet wide. The bed was entered by one raise from which 40 cars averaged 0.12% WO_3. While this raise was driven on an east-west fracture, it seems to be in a lean part of the zone and is outside of our estimated block. Here, we assume a block 60 feet wide by 100 feet north and south and 5 feet thick. This gives 2500 tons. Grade is unknown, but as the zone is strong further work into the block is indicated.

Zone "D" is cut from 471 feet to 520 feet from the portal and is considered as 60 feet wide. The zone has been developed by No. 3 Lateral-North with a raise and 20 feet of sub-level. Strong mineralization shows along both the north-south and the east-west fractures and as replacement in the bed. The first 35 cars from the sub-level assayed 1.08% WO_3. Specimen ore occurs in the east-west fractures.

The very conservative estimate of 60 feet by 100 feet north-south by a thickness of five feet adds another 2500 tons to the probable reserve.

Zone "E" is cut from 582 to 682 feet from the portal and is considered as 90 feet wide. It is developed by No. 4 Lateral-North and a short incline up the beds parallel to the north-south fracturing. No assays are yet available but specimen ore was seen in the muck pile. We wish to estimate a block here 90 feet wide by 100 feet north-south by five feet thick, to contain 3750 tons of ore over 1% WO_3.

The total probable reserve from the five blocks outlined above totals 14,750 tons. This is enough to supply a 25-ton mill for nearly two years.

The possible reserve runs into such fantastic figures that they would probably only provoke doubt. Hence we content ourselves with a brief statement concerning the north-south zones which were not given due significance in our first studies, even though we did emphasize the long-range objectives offered by the Shefield, the Washington and the St. Lawrence fissures, all of which trend north-south. Now we find that these north-south fracture zones, separated by relatively tight areas are an important part of the fracture pattern. They are plainly seen in the quartzite walls of Pole Canyon about 1200 feet north of the portal of the tunnel. Also of special significance is the new series of colored air-photos taken by Phillip A. Laylander which show definite north-south alteration zones on the surface of the area being crossed by Pole tunnel.

In view of the recent developments we are now forced to expand our conception of the ore possibilities of Pole Canyon to include both east-west and north-south zones. The areas of intersection will be of better grade while the areas between the zones will be low grade or possibly waste. In general, the east-west fractures are frequently filled with quartz, sometimes carrying scheelite, while the north-south fractures tend to be open or filled with aragonite, mud and pebbles. The displacement on the fractures is usually a matter of inches, but is obviously sufficient to have prepared the zones for the entry of tungsten bearing solutions and gases. With such impressive mineralization in the north-south zones already encountered, we eagerly look forward to the intersection with the Shefield, now only about 1200 feet to go.

Respectfully submitted,

Earl B. Young

Earl B. Young

K

Distribution of Misc. Grp Items EMCA-2082; Edm-E248.

	Month	Account	Accounting	Truck Rental	Jeep Mileage	EMCA report Printing	Freight Supplies	Freight Opt.	Misc. opr. Supplies	Crating	Opt. Apparatus
1952	February	$ 134.82	100.00		34.32						
	April-May	578.83	100.00	100.00	43.50 62.00 133.68			165.38 105.06	2.39		
	June	515.71	100.00	50.00	18.50	23.60			10.71 153.90		53.32
	July	336.34	100.00	50.00	62.30	25.20	3.96		94.38		63.28 3.59
	August	597.38	100.00	50.00	67.80 64.00	53.25			41.19 47.66 57.35		53.70 3.77
	September	364.01	100.00	50.00		23.90	14.39		148.38	6.00	14.14
	October	497.42	100.00	50.00	155.52		19.82		49.79 32.05 54.30	3.00	32.95
	November	566.23	100.00	50.00	132.64	13.00	6.79		46.40 56.50		30.66 6.66 22.00 61.71 39.39
	December	496.27	100.00	50.00	101.60	10.55	41.42 9.90		11.23 66.83 5.34 11.31	20.00	13.95 13.35 5.00 6.84
		$ 4037.01	900.00	450.00	846.36	152.50	96.28	270.44	889.36	39.00	436.07
1953	January	214.57	100.00	50.00	214.82	22.30	218.01		41.44		67.02
		4301.58	1000.00	500.00	1061.16	132.80	314.29		930.80		503.09
	Fixed Ann. 1965.0"	$ 3.278	0.683	0.342	0.724	0.128	0.215	0.185	0.635	0.026	0.343

Recap. of Project Cost

DMEA-2082; T4m-8248

Total Advance 1465.0 Ft.

Sheet 1

Item No.	Item of Expense			Total.	Cost per Foot.
1-a	Compressor Building			$199603	1.362
1-b-1	20# rail			2009.98	1.372
1-b-2	Rail splices			155.80	0.106
1-b-3	4"x6" ties			351.19	0.240
1-b-4	Track spikes			141.76	0.096
1-b-5	Track bolts			33.30	0.023
1-b-6	Switches			862.86	0.589
1-b-7	Freight			342.00	0.233
1-c-1	3" air line			827.81	0.566
1-c-2	2" air line			172.87	0.118
1-c-3&4	1" water line			810.21	0.553
1-c-5	Vent tube			1151.60	0.787
1-c-6	Air receiver			40.00	0.027
1-c-7	Valves and fittings			251.02	0.171
1-c-8	Freight			220.00	0.150
1-d-1	Bulldozer - Bldg. sites			192.00	0.131
1-d-2	" Pipe lines			352.00	0.240
1-d-3	" Snow removal			646.00	0.441
2-a	Rental - Compressor			4700.00	3.208
2-b	" Muckers			2655.00	1.812
2-c	" Generator			1550.46	1.058
2-e	" Trammer			4275.00	2.918
2-f	" Jumbo			1155.00	0.788
3-a	Fuel tanks			89.17	0.061
3-b	Blower			518.63	0.354
3-c	Drifters (2)			1750.00	1.195
3-d	Misc. small tools			820.94	0.560
3-e	Slusher equipment			591.80	0.404
4-a	Supporting labor			11509.63	7.856
4-b	Cook			2300.00	1.570
4-c	Supt. - Engr.			5000.00	3.413
4-e	Labor - Pole Adit	1465.0'	$10,299.53	15833.69	10.911
4-f	" - Laterals		4116.81		
4-g	" Raises		1422.35		
4-h	Comp. Insp. & P.R. taxes			4026.43	2.749
5-a	Blacksmith shop & change room			1382.42	0.944
6-a	Powder, fuse & caps			4056.23	2.769
6-b	Steel and bits			2367.18	1.616
6-c	Fuel and lube			2621.99	1.790
6-d	Timber			57.16	0.039
6-e	Misc. expense			4801.58	3.278
6-f	Aerial Photo			250.00	0.171
6-g	Jackleg, etc.			526.58	0.359
				$83402.32	$56.910
	Less suspension by Wilfer Audit			572.91	0.415
				$82829.41	$56.525

Breakdown of Project Costs — Sheet 2

DMSA-2082; Idm-6248

Total advance 1465.0 ft.

		Total	Cost Per Foot
1. Direct Underground costs.			
A. Trackage			
1-b-1	20# rail	2,009 98	1.372
1-b-2	Rail splices	155 80	0.106
1-b-3	4"x6" ties	351 19	0.240
1-b-4	Track spikes	141 76	0.096
1-b-5	Track bolts	33 30	0.023
1-b-6	Switches	862 86	0.589
1-b-7	Freight on above.	342 00	0.233
		3896 39	2.659
B. Pipe and Vent lines			
1-c-1	3" air line	839 81	0.546
1-c-2	2" air line	172 87	0.118
1-c-3+4	1" water line	810 21	0.553
1-c-5	Vent tube	1151 60	0.787
1-c-7	Valves and fittings	251 02	0.171
1-c-8	Freight on above	220 00	0.150
		3435 51	2.345
C. Equipment Rental			
2-a	Compressor	4700.00	3.208
2-b	Mucker	2655.00	1.812
2-c	Generator	1550.46	1.058
2-d	Trammer	4275.00	2.918
2-f	Jumbo	1155.00	0.789
		14335.46	9.785
D. Labor and Supervision			
4-a	Supporting labor	11509.63	7.856
4-b	Cooks	2300.00	1.570
4-c	Supt - Engr.	5000.00	3.413
4-e	Clerk		
4-f	Laterals	15838.61	10.810
4-g	Raises		
4-h	Comp. Ins. & P.R. taxes	4026.43	2.749
		38674.75	26.398
E. Supplies			
6-a	Powder, fuse & caps	4056.23	2.768
6-b	Steel and bits	2362.18	1.612
6-c	Fuel and lube	2681.99	1.830
6-d	Timber	57.16	0.040
3-e	Misc. small tools	826.94	0.564
		9923.54	6.775

		Total	Cost Per Foot
2. Other costs			
1-d-3	Bull dozer - overburden removal	646.00	0.441
6-f	Aerial photography	250.00	0.170
6-e	Miscellaneous expense		
	1. Accounting	1000.00	0.683
	2. Truck rental	500.00	0.341
	3. Jeep Mileage	1861.16	0.127
	4. Report printing - DMEA	182.80	0.125
	5. Freight-in - supplies	314.29	0.215
	6. Freight in - Equipment	270.44	0.185
	7. Misc. operating supplies	930.80	0.635
	8. Assaying	37.00	0.026
	9. Equipment repairs	503.09	0.343
		5697.58	3.890
3. New Facilities and Equipment			
A. New Facilities			
1-a	Compressor building	1996.03	1.362
5-a	Blacksmith shop & change room	1382.42	0.944
1-d-1	Bulldozer - bldg. access	192.00	0.131
1-d-2	" Pipe line	352.00	0.240
		3922.45	2.677
B. New Equipment			
1-c-6	Air receiver	40.00	0.027
3-a	Fuel tanks	89.17	0.061
3-b	Blowers	518.63	0.354
3-e	Slushers	591.80	0.404
6-g	Jackleg	526.58	0.359
3-c	Drifters (2)	1250.00	1.853
		3516.18	2.400
		83102.32	56.930
Less suspension by 12/31/52 Audit		592.91	0.406
		$82809.41	56.524

Analysis of Project Costs
DMBA-2092; Idm-5248
Total Advance 1465.0 ft.

Sheet 4

	Total	Cost per foot
1. Direct Underground Costs.		
Trackage	3896.89	2.659
Pipe and Vent lines	3435.51	2.345
Labor and Supervision (Inc. ex. & P.R. taxes)	23259.81	15.877
Supplies	9923.50	6.775
Miscellaneous expense	4801.58	3.278
	45317.29	30.934
2. Supporting Costs.		
Equipment rental	14335.46	9.785
Outside labor (inc. ex. & P.R. taxes)	15414.94	10.522
Bulldozer - snow removal	646.00	0.441
	30396.40	20.748
3. Facilities and Equipment		
New Facilities	3922.45	2.677
New Equipment	3516.18	2.400
Aerial photos	250.00	0.171
	7688.63	5.248
	83402.32	56.930
Less: Expenses by audit of 12/31/52	592.91	0.405
	$82809.41	$56.525

Table No. 1 Work Sheet Showing Conversion of Amendment Bill Items to Classification of Mr. Ira Farm - Stage II

Cost Items as shown in Appraisal Amendment - Stage II		1. Labor and Supervision: Labor	Supervision	Technical	2. Operating Materials and Supplies: Mine Gas Supplies	Timber	Explosives	Operate Ventilation	Reach	Steel and Lube	Steel and Bits	Misc. Small Tools	Freight	3. Operating Equipment: Eqt.	Freight	4. Drilled Rib & Spaces: Materials	Labor	5. Rec. Alloy & Improv.: Materials	Labor	6. Miscellaneous: Decanting Aluminum	Repairs to Equipment	Assaying	Payroll Taxes	Garage Insur.	Admin.	7. Intangibles: Building	Trucking
A. Underground Exploration																											
1. Mine Building Dam Mech																											
a. Mine drift	150'																										
1. Contract labor		1118.00																									
2. Pipe and ventilation								221.50																			
3. Powder fuse & caps							2835.00																				
4. Steel and bits											606.50																
5. Timber						493.00																					
6. Tool and lube										438.50																	
7. Misc. small tools												57.75															
8. Shelter cabs												262.50															
9. Power cable												1050.00															
10. Garage insurance																								997.50			
11. Payroll taxes																							640.50				
b. Side drifts	100'																										
1. Contract labor		1300.00																									
2. Pipe and ventilation								1030.00																			
3. Powder fuse & caps							2700.00																				
4. Steel and bits											530.00																
5. Tool and lube										370.00																	
6. Misc. small tools												550.00															
7. Garage insurance																								950.00			
8. Payroll taxes																							610.00				
2. Rib Tunnel Drive Easterly																											
a. Main adit	120'																										
1. Contract labor		1620.00																									
2. Trackage									3120.00																		
3. Pipe and ventilation								2682.00																			
4. Powder fuse & caps							3240.00																				
5. Steel and bits											1836.00																
6. Timber						552.00																					
7. Tool and lube										1440.00																	
8. Misc. small tools												660.00															
9. Garage insurance																								1140.00			
10. Payroll taxes																							732.00				
b. Extend a S. Muffled Rift	540'																										
1. Contract labor		7290.00																									
2. Install switches		2070.20																									

Sheet No. 2 - Stage II

		2. Labor and Supervision			3. Operating Materials and Supplies									4. Operating Equipment		5. Initial Rib & Repairs		6. New Bldg & Improv.		7. Miscellaneous							8. Contingencies	
		Labor	Supervisors	Technical	Misc. Ope. Supplies	Timber	Explosives	Pipe and Ventilation	Track	Fuel and Lube	Steel and Bits	Misc. Small Tools	Freight	Equipment	Freight	Materials	Labor	Materials	Labor	Mining Supplies	Repairs to Equipment	Assaying	Payroll Taxes	Comp. Ins.	Misc.	Building	Trucking
3. Trackage									140.00																		
4. Powder, fuse & caps							1458.00																				
5. Steel and bits											826.20																
6. Timber						248.40																					
7. Fuel and lube										739.80																	
8. Misc. small tools												297.00															
9. Comp. Insurance																								529.20			
10. Payroll taxes																							343.20				
C. Raise and Bed Drift	1770'																										
1. Contract labor		23.895.00																									
2. Pipe and ventilation								2895.10																			
3. Powder, fuse & caps							4779.00																				
4. Steel and bits											2708.10																
5. Timber						814.20																					
6. Fuel and lube										2424.90																	
7. Misc. small tools												973.50															
8. Comp. Insurance																								1691.50			
9. Payroll taxes																							1079.70				
d. Muffled Bed Drift	700'																										
1. Contract labor		9450.00																									
2. Pipe and ventilation								1141.00																			
3. Powder, fuse & caps							1890.00																				
4. Steel and bits											1071.00																
5. Timber						322.00																					
6. Fuel and lube										959.00																	
7. Misc. small tools												385.00															
8. Shaker cable												175.00															
9. Comp. Insurance																								665.00			
10. Payroll taxes.																							427.00				
2. Underground Facilities																											
1. Main Bedding Drive North																											
a. Power line in tunnel																		2180.00	140.05								
b. Nylon air shaker																		100.00	175.07								
c. Permanent Vent. line																		2450.00	280.11								
2. Sub Tunnel Drive Easterly																											
a. Passing tracks																		568.00	482.84								

Sheet No. 3 - Stage II

	1. Labor and Supervision			2. Operating Materials and Supplies									3. Operating Equipment		4. Installed Eq. & Repairs		5. Other Mfg. & Improv.		6. Miscellaneous						7. Contingencies	
	Labor	Supervisn. & Technical		Misc. Oper. Supplies	Timber	Explosives	Pipe and Installation	Track	Fuel and Oils	Steel and Bits	Misc. Small Tools	Freight	Expl.	Freight	Materials	Labor	Materials	Labor	Accounting & Reports	Repairs to Equipment	Assaying	Payroll Taxes	Insur. Bonds	Adm.	Building	Working
b. "Chery-Picker"																	500.00	35.01								
c. Ore receiver																	410.50	105.04								
d. Chutes and manways																	2379.60	310.04								
C. Surface facilities																										
1. Mine Water system																										
a. Drilled Well																	400.50	350.14								
b. Pumps & Pump line																	452.50	210.09								
c. Storage tank																	1050.00	350.14								
d. Supply line																	426.70	535.05								
e. Power line to pump																	400.00	350.14								
2. Generator Building																										
a & b. Building																	1648.00	980.39								
c. Switchboard																	106.40	105.04								
d. Fuel tank																	428.50	105.04								
e. Transformers																	302.50	70.03								
3. Other Facilities																										
a. Bunkhouse																	906.75	4096.65								
b. Hoisting tower																	265.00	175.09								
D. Additional Equipment																										
1. Diesel-Electric generator													9020.30													
2. Air compressor													9024.09													
3. Mine Cars													9065.00													
4. Electric Shovels													12373.20													
E. Supervisory & Supporting Labor																										
1. Supervisory & Technical		18400.00	8500.00																							
2. Supporting labor	25962.40																									
3. Comp. Insurance																							3119.41			
4. Payroll Taxes																					2387.81					
F. Other Costs																										
Freight on Supplies												2506.93														
Freight on Equipment														2108.75												
Schools Operation																										1806.42
Power Generation									2611.50																	
Accounting & Bookkeeping																			2480.00							
Jeep Mileage																										
Assaying																					760.00					
Equipment & repairs																				2403.52						
Misc. operating supplies				2301.20																				1856.40		
	11057.60	18400.00	8500.00	2301.20	2417.60	6700.00	7805.60	4127.00	14320.80	5477.80	1430.60	2506.93	30492.59	2108.75			23334.95	10647.75	2480.00	2403.52	760.00	6211.23	7620.37	1856.40		1806.42

Sheet No. 1 Work that showing conversion of Arrangement Cost Sheet to classification of MP-104 Forms - Stage I.

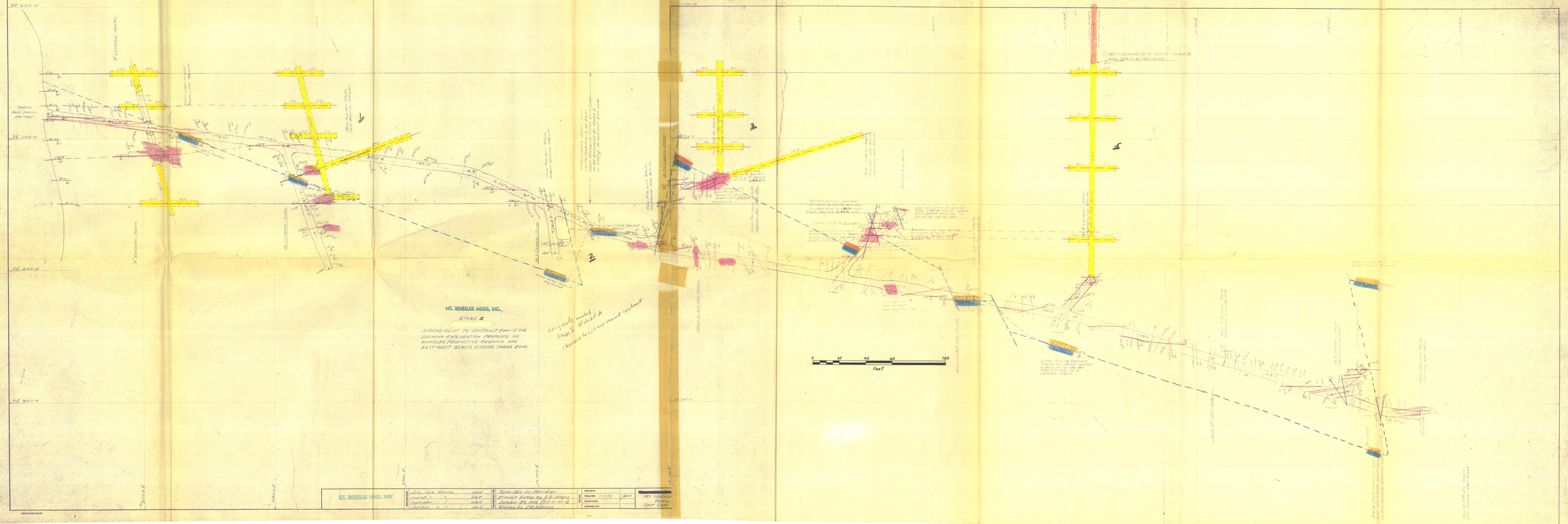
	Cost Items as shown in Approved Amendment Stage I.		1. Labor and Supervision: Labor	Supervision	Technical	2. Operating Materials and Supplies: Mine Gas Supplies	Timber	Explosives	Pipe and Ventilation	Track	Fuse and Tube	Steel and Bits	Misc. Small Tools	Freight	4. Operating Equipment: Equip.	Freight	5. Surface Rds. & Repairs: Materials	Labor	6. Non-Bldg. & Impr.: Materials	Labor	7. Miscellaneous: Accounting Blueprint	Repairs to Equipment	Assaying	Payroll Taxes	Comp. Ins.	Admin.	8. Contingencies: Building	Trucking
A.	Underground Exploration																											
	1. Misc. Adding Exploration																											
	(a) N. Lateral North & South	160'																										
	1. Labor		3160.00																									
	2. Pipe and Ventilation								260.80																			
	3. Powder, fuse & caps							432.00																				
	4. Steel and bits											244.80																
	5. Timber						73.60																					
	6. Fuse and tube										214.20																	
	7. Misc. small tools												88.00															
	8. Comp. Insurance																								152.00			
	9. Payroll taxes																							97.60				
	(b) No. 1 Lateral South	280'																										
	1. Contract labor		3780.00																									
	2. Pipe and Ventilation								570.80																			
	3. Powder, fuse & caps							756.00																				
	4. Steel and bits											428.40																
	5. Timber						128.80																					
	6. Fuse and tube										373.60																	
	7. Misc. small tools												154.00															
	8. Slusher cable												70.00															
	9. Comp. Insurance																								266.00			
	10. Payroll taxes																							170.80				
	(c) No. 3 Lateral North	285'																										
	1. Contract labor		3877.50																									
	2. Pipe and ventilation								601.35																			
	3. Powder, fuse & caps							769.50																				
	4. Steel and bits											436.05																
	5. Timber						131.10																					
	6. Fuse and tube										380.45																	
	7. Misc. small tools												156.75															
	8. Slusher cable												71.25															
	9. Comp. Insurance																								270.75			
	10. Payroll taxes																							173.95				

Sheet No 2.

		2. Labor and Supervision			3. Operating Materials and Supplies									4. Operating Equipment		5. Indirect Pch & Expense		6. Mine Bldg & Improv				7. Miscellaneous						8. Contingencies
		Labor	Supervision	Technical	Misc. Gen Supplies	Timber	Explosives	Pipe and Ventilation	Track	Fuel and Lube	Steel and Bars	Misc. small Tools	Freight	Equipt	Freight	Materials	Labor	Materials	Labor	Accounting Equipment	Repairs to Equipment	Surveying	Payroll Taxes	Insurance	Admin.	Building Building
(b) No. 5 Lateral North	290'																											
1. Anthracite Labor		3770.00																										
2. Pipe and Ventilation								1430																				
3. Powder, fuse & caps							156.00																					
4. Steel and bits											229.40																	
5. Timber						1830																						
6. Fuel and lube										398.60																		
7. Misc. small tools												154.00																
8. Slusher cable												70.00																
9. Comp. Insurance																								266.00				
10. Payroll Taxes																							170.80					
(c) Other Building drives	300'																											
1. Anthracite Labor		1050.00																										
2. Pipe and ventilation								633.00																				
3. Powder, fuse & caps							910.00																					
4. Steel and bits											159.00																	
5. Timber						138.00																						
6. Fuel and lube										411.00																		
7. Misc. small tools												165.00																
8. Comp. Insurance																								280.00				
9. Payroll Taxes																							188.00					
2. Mine Development and Equipment																												
1. Misc. Building Exploration																												
(a) Shafts and Manways																												
1. N. Lateral South																		127.00	70.02									
2. N. Lateral North																		127.00	70.02									
3. No. 1 Lateral South																		336.60	350.14									
4. No. 3 Lateral North																		336.60	350.14									
5. No. 2 Lateral North																		336.60	350.14									
(b) Anthracite Mine Slopes																		843.43	430.27									
(c) Other Preparation																												
1. Air and water lines																		602.50	178.08									
2. Air stations																		610.50	108.04									
3. & Pump outfit																		338.00	315.13									
4. Electric Lights																		338.00	105.84									

Sheet No. 2

	2. Labor and Supervision			3. Operating Materials and Supplies									4. Other Equipment		5. Initial Rch & Repairs		6. Mine Bldg & Improvements		7. Miscellaneous						8. Contingencies	
	Labor	Supervision	Technical	Misc. Sp. Supplies	Timber	Explosives	Pipe and Installation	Track	Fuel and Lube	Shop and Bits	Misc. Small Tools	Freight	Eqt.	Freight	Materials	Labor	Materials	Labor	Accounting Blueprint	Appeal to Eqt.	Assaying	Payroll Office	Corp. Serv.	Adm.	Accounting	Auditing
C. Surface Facilities																										
1. Bins - Bank Sampling																										
a. Mine Bin																	2355.00	1298.52								
b. Manager Bin																	1518.00	919.37								
2. Other Facilities																										
a. Change House																	237.00	1050.12								
b. Powder Magazine																	689.00	420.17								
c. Water Pump																	631.60	350.14								
d. Blower installation																	145.00	70.03								
D. New Equipment																										
1. Drilling equipment													4080.00													
2. Mine cars													3065.00													
3. Hoists													600.00													
4. Fire extinguishers													880.00													
5. Slusher													2776.30													
6. Punch. rental units													12193.30													
E. Engineering & Supporting																										
1. Engineering & Technical		9200.00																								
2. Supporting Labor	12531.20																									
3. Camp. Generama																							1523.39			
4. Payroll taxes																						977.30				
F. Other Costs																										
1. Freight - supplies												1311.00														
2. Freight - equipment														1126.35												
3. Hoists operations																									1160.00	
4. Accounting & Blueprint																			1210.00							
5. Jeep mileage																								788.00		
6. Assaying																					1248.00					
7. Equipment repairs																				457.36						
8. Misc. Operating supplies				989.60																						
	20148.70	9200.00		989.60	600.30	3523.50	2676.75		1387.95	1996.65	922.00	1311.00	30635.70	1126.35			12092.75	6617.67	1210.00	457.36	1248.00	1977.30	1523.39	788.00	1160.00	


MT. WHEELER MINES, INC.,
STAGE II
AMENDMENT TO CONTRACT IAA-E248
SHOWING EXPLORATION PROPOSED IN
WHEELER PRODUCTIVE BEDDING AND
EAST-WEST QUARTZ FISSURE SHEAR ZONE.
Originally mined
Stage of Exhibit A
Should be built our mined contract
MAIN DRIFTING DRIVE NORTH - STAGE II
Feet
MT. WHEELER MINES, INC.
DRAWN
TRACED 11-11-52
CHECKED
APPROVED
MT. WHEELER
Salt Lake

COLUMN SHOWING
MEASURED CAMBRIAN SECTION
POLE CANYON AREA
LINCOLN 1800'±
UPPER ST. LAWRENCE 170'
LOWER ST. LAWRENCE 360'
BASE OF ST. LAWRENCE 190'
PIOCHE SHALE 350'
WHEELER BED 22'
BASAL QUARTZITE +2000'
MIDDLE Є
LOWER Є
NOTE:
SHEFFIELD FISSURE AREA CONSISTS OF FIVE VERY PRESENT N 15° E FISSURES OVER AN EAST-WEST DISTANCE OF 1,000'. WITH HEAVY DOLOMITIZATION THROUGH THE FISSURE ZONE.
ST. LAWRENCE LIMESTONE
PIOCHE SHALE
ZONE "E"
ZONE "D"
ZONE "C"
ZONE "B"
ZONE "A"
TUNGSTEN
NORTH FISSURE - 8' WIDE QUARTZ FILLED
PORTAL NORTH TUNNEL
PORTAL POLE TUNNEL
HEAVY
LIMESTONE
TALUS
EXPLORATION OF PRODUCTIVE ZONE BY POLE TUNNEL FOR DETAILED DATA WHICH CAN BE CORRELATED
INFERRED SOUTH SHEAR ZONE BASED UPON TOPOGRAPHY, AERIAL STEREOSCOPIC PHOTOGRAPHY AND ABUNDANT SCHEELITE PLANT.
PLAN OF POLE TUNNEL - TUNGSTEN RIDGE AREA
SHOWING POLE ADIT, SURFACE CUTS, MINERAL AREA PLACERS, WHEELER BEDS AND EXPOSED F.W. AND H.W. SHEAR ZONES.
APPROXIMATE LOCATION POLE TUNNEL
LAT. 38°54' NORTH - LONG. 114°13' WEST
SEC. 12, T.12N., R.48E., M.D.B.&M.
WHITE PINE COUNTY, NEVADA.
ELEVATION - LOOKING EAST
SHOWING EXPOSED WHEELER PRODUCTIVE BED BUILDING AND F.W. SHEAR ZONES.
REVISIONS
REFERENCES
PROPOSED MINE - STAGE III
EXHIBIT "A"
WORK
DRAWN
TRACED
CHECKED
APPROVED
MT. WHEELER MINES, INC.
P.O. BOX 720
SALT LAKE CITY 10, UTAH
COMPOSITE MAP SHOWING:
1. Exploration Completed (MAY-1952)
2. Phase II - Extension Pole Adit to Sheffield Fissure
3. North Drift and Proposed Mining Exploration
D. 100-6
SCALE 1" = 100'