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(18)
Item 4

OPERATOR'S FINAL REPORT

ON

DMEA No. 4795 - Contract No. Idm E-1158

TUNGSTEN MOUNTAIN MINING COMPANY

Arthur Lakes

February 28, 1959

OPERATOR'S FINAL REPORT
ON
DMEA No. 4795 - Contract No. Idm E-1158
TUNGSTEN MOUNTAIN MINING COMPANY

This report is accompanied by following Maps:

Map "A" showing locality of property access roads, other properties, towns. Scale 30-mi. to 1-in.

Map "B" showing claims and camp, Location in T 21-N R 38-E MDM. Scale 1000-ft. to 1-in.

Map "C" General geology and workings, Scale 100-ft. to 1-in.

Map "D" Plan showing work performed under Contract No. Idm E-1158 (yellow) and company work (blue) 40-ft. to 1-in.

Map "E" Plan showing details of showings, ore structures, faults, formations, assays. Scale 40-ft. to 1-in.

Map "F" Longitudinal Section showing ore disclosures, average assays, indicated ore tonnages. Scale 40-ft. to 1-in.

Property The property, known as Tungsten Mountain, comprising 21-unpatented mineral claims, 1-placer claim, and 1-millsite is located in northeast part of Churchill County, Nevada. The claims are in Secs. 21-22 and unsurveyed Secs. 15-16 of Township 21-North, Range 38-East, Mount Diable Meridian. Contract Idm E-1158 concerned only Hilltop and Porter No. 1 claims which include all workings and exploration project at No. 4 Tunnel as shown on Map "B".

Map "A" shows location of the property with relation to improved highways, supply sources, other scheelite sources, etc. The mine workings are 94-miles easterly from supply point at Fallon and are reached via: (1) 59-miles over U. S. Highway #50 to Eastgate, thence (2) 28-miles gravelled County road to camp at Byers ranch, thence (3) 4-miles over County road to millsite whence (4) it is 3-miles up good mountain road to main mine workings at No. 4 Tunnel.

Progress Exploration work under the Contract was confined to No. 4 Tunnel as mapped (Map "D"). Work began December 3rd. 1957 and was completed February 3rd. 1959 at termination of 14-months allowed by the contract.

The following work was completed:

(1)	Drifting	643-feet	@ $32	$20,576.00
(2)	Crosscutting	257-feet	@ $32	8,224.00
(3)	Longhole drilling	600-feet	@ $1.50	900.00
(4)	Timbering	189½-feet	@ $7.00	1,326.50
(5)	Assays	48	@$4.00	192.00
	Total			$31,218.50

Total authorized by the contract was $32,200. The $981.50 difference in the $31,218.50 expended is represented by 110½-feet of timbering @ $773.50 and 52-assays @ $208 which were unused.

Geology The area comprises a series of steeply tilted mudstones containing thin, lenselike, interbeds of limestone, the whole intruded by later granodiorite mass with dike "fingers" out and upwards into the older sedimentary rocks. The granodiorite deeply underlies the sedimentary rocks and engulfs them south and east as shown on Map "C".

The granitic intrusion folded and crumpled the overlying rocks and formed numerous faults, fissures, and shearage zones. In places the limey rocks have been altered to tactite thereby forming host rock for ore deposition with a late phase of the granitic intrusion representing the source rock from which mineralizing solutions progressed upward and laterally to deposit scheelite in certain ore favorable localities shown on Maps "C" and "E".

The sedimentaries within the granodiorite "bay" form a syncline with undulating arms to NW and SE as shown on Map "C". The West arm extends north and northwest and contains most of present workings and most extensive ore tonnage. The South arm extends southeast towards east "bay" of the granodiorite and contains the richest ore extracted from No. 1 Level (See Map "E"). The West arm dips 55-70° in easterly direction whilst the South arm dips 75-80° northerly.

Faulting (Map "E") Faulting caused by the granitic intrusion and its later shrinkage has caused many minor strata disturbances coursing and dipping in various directions from flat lying slips athwart formation dip, faults nearly parallel with formation bedding, and a series of crossing faults in central part of No. 4 Tunnel extending upward into No. 3 Level and north surface (Map "E"). Apparent ore enrichment under flat slips and ore clusters along northwesterly faulting indicates that they both are premineral. Ore vein offsetting by NE striking, south dipping cross faults proves them to be post mineral. The offset by individual post mineral faults amounts to a foot or more but the cumulative effect of the series disclosed in central No. 4 Level could amount to 60-feet or more.

The most prominent fault so far disclosed is "Fault A" opened at No. 2 Tunnel and extending @ 15° NE dip in a northwest direction between No. 1 and No. 3 Levels. It appears to have shifted area above to the west and north sothat the possibly ore bearing South arm of the syncline will be farther south than areas presently penetrated by No. 3 and No. 4 Tunnels (See Longitudinal Section "F").

Ore Occurrence (Refer to Map "E") As stated the most ore favorable host rocks are the limey formations comprising (a) Limestone altered to tactite, (b) silicified limestone, (c) altered limey argillite. Best ore grades have occurred (1) along steep shearage formed along South arm of syncline at No. 1 Level (2) the ore enriches where ore favorable host nears granodiorite (sta. 42 to 44 and between sta. 45 and 46 at No. 4 Level as shown on Map "E"). Flat lying cross slips also locally enrich the ore though they apparently interfere very slightly with its upward (or downward) continuation.

Larger but lesser grade ore occurs along ore favorable limey rock bedding at contact with underlying softer, barren argillite or hornfels. Increased ore width is also indicated by mergence of Structure "A" into Structure "B" followed by No. 4 Tunnel (See Map "E").

The best tungsten ore is liberally accompanied by iron pyrites whose sulphur content is detrimental to finished tungsten concentrate and has to be removed by roasting and magnetic separation. Abundant pyrites, whilst indicative of mineralization, is not sure indication of commercial scheelite occurrence. It is believed that the iron pyrite is a later mineralization into pre-existing scheelite vein or into localities barren of scheelite.

Description of Tungsten Mountain ore occurrences (Maps "C" & "E")

Surface on both arms of the syncline about 400-feet West from the outcrop of granodiorite. The ore occurs where hard tactite and altered limey rocks' host for the ore contacts softer underlying barren argillite or mudstone.

No. 1 Tunnel Ore occurs along both South and West arms of the syncline about 300-feet west from granodiorite outcrop. (1) For 80-feet NW along steep shearage coursing with formation of the South arm. Ore is very rich scheelite,high in silica and pyrite, in tactite wholly enclosed in limestone. (2) For 150-feet in northerly direction along ore favorable limey rock and tactite contacting softer barren argillite in the West arm. Larger but lesser grade ore which extends beyond tunnel face.

No. 3 Tunnel Ore occurs about 270-feet west from granodiorite contact for 215-feet northerly along west arm of the syncline (in downward extension of No. 1 orebody interrupted by Fault "A"). The ore is rich and forms in ore favorable limey rock and tactite underlain by softer barren argillite or mudstone. At north part the vein is crossed by 10-foot granodiorite dike with rich ore beyond to the north for 30-feet to where tunnel was turned off the vein. A series of cross postmineral faults starts here and extends down to central part of No. 4 Tunnel, 147-vertical feet below. Ore indicated to extend past north Tunnel face.

No. 4 Level where Contract Idm E-1158 started at 70-feet in from tunnel portal. This tunnel was preceeded by three ore showings, A-B-C, in cut 25-feet higher than tunnel floor. Cut-A shows 4-feet of scheelite bearing iron oxidized rock. Cut-B shows 8-feet width of scheelite bearing, highly oxidized rock. Cut-C shows about 1-foot of scheelite bearing rock close to granodiorite contact. It was decided to drive the tunnel on the largest central ore showing of "B" structure and to longhole and crosscut "A" and "C" respectively.

In this respect it is timely to state that though longhole drilling into both "A" and "C" presumed southerly extension returned scheelite cuttings as noted on Map "E" subsequent crosscuts into these indicated showings failed to prove their existence: (1) 42-East Crosscut crossed wide ore from collar in, cut 4-feet of scheelite at 25-feet in, thence was in granodiorite that had two blobs of rich WO3 quartzy ore but no structure where the Hole 42-E indicated. (2) 45-x Crosscut driven

west under Drillhole 45-W entered granodiorite and provided only meagre sprinkling of scheelite at contact with granodiorite and barren argillite where cutting from the hole indicated best WO3 values. It is believed that these scheelite cuttings came from one of numerous flat lying 3 to 4-inch scheelite rich quartz stringers that cross the main tunnel. However 45-X crosscut encountered scheelite ore about 5-feet from its portal which subsequently (after termination of Contract) led the company to slab off west side of the original tunnel and run three crosscuts westerly. this work has disclosed from 3 to 8-feet widths of very good ore as shown on Map "E" Assays of five samples returned 1.03% WO3 average but later work lamps even better.

The drillholes indicated existence of southerly extensions of three ore structures (A-B-C). The subsequent crosscutting proves nonexistence of three structures and that (1) "A" structure merges into "B" where the ore widens to 15-feet near sta. 42. Some additional exposure to prove "A" structure's strike proves this contention. The puzzling occurrence of scheelite cuttings from 44-48 feet in Drillhole 43-W is probably due to intersection of a narrow scheelite rich quartz stringer similar to those exposed around sta. 45. (2) "C" structure does not exist where cuttings from Drillhole 42-E indicated but the crosscut shows good ore at contact with granodiorite (see Map "E") and some blobs or bunches of high grade scheelite (too restricted for commercial consideration) occurred in granodiorite away from the contact.

Ore disclosures in No. 4 Tunnel comprise an aggregate 505-feet length out of 713-feet drift tunnel length, a very good showing and encouraging for consistent continuity upwards and below the tunnel level. The recent crosscut work at 45-x has proven noncontinuity of "A" structure and that these ore disclosures are along "B" Structure as mapped on Map "E". The occurrences are as follows:

(1) 240-feet length from tunnel portal to crossing dike at sta. 44. Of this 160-feet length contains ore values varying from 0.23% to 5.5% scheelite, averaging 7½-feet width @ 1.24% WO3.

(2) 150-feet length newly disclosed ore from dike to cross fault series in central part of the tunnel (see Map "E") Ore values vary from 0.25% to 2.5%, averaging 5-feet width @ 1.2% WO3.

(3) Thence 130-feet of barren tunnel that is off the vein to

(4) 90-feet length of ore varying from 0.3% to 2%, WO3, averaging 4-feet width @ 1.36% WO3. The upraise being driven in this ore to connect with No. 3 Tunnel advanced 15-feet (@ company expense) with 5-feet rich ore at north and 4-feet rich ore at south, no assays yet. At the tunnel face is 20-feet length of 0.3% WO3 ore @ 5-feet width. This will be followed later.

"B" Structure starts at No. 4 Tunnel portal about 40-feet west of granodiorite contact and angles toward it until the structure is in close proximity with granodiorite from sta. 42 to sta. 47, a distance of 220-feet. The good ore in southern part of the tunnel between sta. 49 and midway stas. 51 and 52 is in exact downward projection of southern part of No. 3 ore structure and is indicated to be 150-feet or more west of downward projection of main granodiorite mass.

Ore Values Average WO3 tenor of various ore blocks shown on Longitudinal Section "F" were determined by:

(1) Actual production and sale of 958-dry tons of ore that returned 1543-units WO3 @ less than 70% average mill saving. These returns represent 1.61% WO3 net or about 2.3% gross millhead value. The 1.61% WO3 represents a very conservative figure for calculating ore averages above and below No. 1 Tunnel Level.

(2) Sampling southern 70-feet of No. 3 Level returned 6-feet average width @ 2.25% WO3 and 145-feet northern extension returned average 4-feet width @ 0.95% WO3, making total of 215-feet ore length @ 5-feet average width @ 1.75% WO3. No. 3 orebody lamped closely with No. 1 ore body.

(3) No. 4 Tunnel's northern ore disclosures under unexplored surface north of both No. 1 and No. 3 Tunnel faces returned:

(a) 150-feet length from 70-feet inside tunnel portal to cross dike at sta. 44 averaged 7½-feet width @ 1.24% WO3 and
(b) the next 155-feet returned an average 4-feet width @ 1.02% WO3. Recent work has shown wider ore with higher values, assays not yet received.

The next 130-feet of tunnel is off the vein. This area will be tested for ore in the indicated downward projection of No. 3 Tunnel's northerly ore extensions.

(c) The southern part of the tunnel (sta. 49 past sta. 51) discloses 90-feet length averaging 4-feet width @ 1.36% WO3 in downward extension of No. 3 Tunnel's southern ore exposures. Fifteen feet of upraise started to connect No. 4 tunnel to No. 3 tunnel provided an average 4½-feet ore width of high grade not yet assayed.

(d) At the south end of No. 4 Tunnel ore assaying 0.3% WO3 was encountered in SE extension of ore opened @ 0.25 to 0.4% WO3 by two drillholes.

ORE ESTIMATE

Longitudinal Section "F" shows details of method to arrive at following preliminary estimate of ore tonnage probabilities and possibilities that should considerable increase when upraise connections and sublevel are run. Tonnage calculations have been modified by usual deductions where vein is disclosed at only one or two faces.

(1) Ore tonnage at surface dumps	From No. 3 Tunnel	From No. 4 Tunnel
	750-tons @ 1.75% WO3	1050-tons @ 1.20% WO3

Probable Ore Longitudinal Section "F"	Between No. 3 Tunnel and surface Estimated tons	WO3 per ton	Units WO3
	9,236 tons	1.655%	15,296
Possible Ore			
(1) No. 3 to No. 4 Level	5,580 tons	1.50%	8,370
(2) No. 4 to Surface	6,249	1.16	7,250
	11,829	1.32%	15,620
Ore Possibility			
By 50-feet below No. 4	5,387 tons	1.19%	6,406
Total Estimate	26,452-tons	1.41%	37,322-units WO3
On oredumps	1,800	1.43	2,572
TOTAL	28,250-tons	1.412%	39,894-units WO3

Tonnage and values disclosed by Contract Idm E-1158 in which DMEA participates @ 5% royalty until repaid.

	Estimated tons	WO3 per ton	Units WO3
(1) On No. 4 Tunnel ore dump	1,050	1.20%	1,260
(2) Possible Ore			
(a) No. 4 Level North	6,249	1.16	7,250
(b) No. 3 to No. 4 Level	5,580	1.50	8,370
(c) Ore possibility 50-feet under No. 4	5,387	1.19	6,406
Totals	18,266-tons	1.28%	23,286 units WO3

Mining Methods The ore and enclosing rock between surface and No. 1 Tunnel has been widely disrupted by disturbance from Fault "A" which is located closely beneath No. 1 Tunnel floor. It is considered that this ground will be too unstable for underground method hence this block will be mined from surface down.

The ground between No. 1 and No. 4 Tunnels is stable with hard, steeply dipping (55° to 75°) hanginwall over softer footwall and most ore disclosed in No. 3 and No. 4 Tunnels stands without timber. The conditions provide satisfactory conditions for "shrinkage stoping" whereby most broken ore is left in the stope until the latter has been completed when all broken stope filling is withdrawn. Steep dips and firm hanging-wall permit this stoping method with minimum dilution by sloughs. Shrink-age stoping is cheapest mining method and will be generally applied at Tungsten Mountain.

Contract Idm E-1158 progress in No. 4 Tunnel at 5-days per week was mostly on 1-shift basis due to limitations of ventillation in the dead end tunnel. Progress was also slowed by the procedure's exploratory nature into undetermined conditions ahead. Deeper level exploration would not be handicapped because of the information gained at No. 4. The work proceeded efficiently with results that have been eminently satisfactory as described herein.

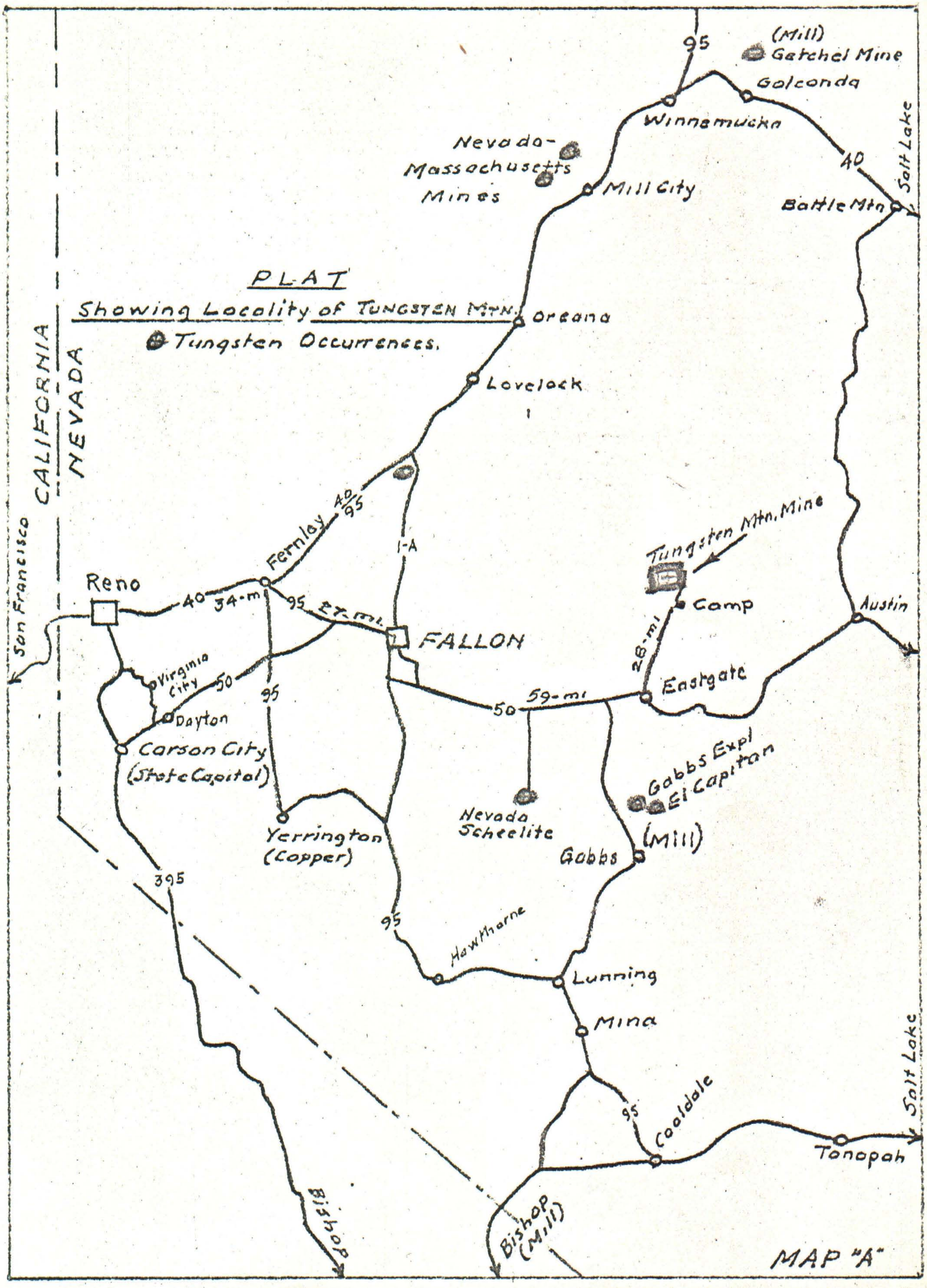
Future Plans (1) The Company is proceeding with Upraise connecting No. 4 to No. 3 Level as shown on Map "E". The objective is for access, transportation, ventillation and it is expected that the upraise and subsequent intermediate level will materially add to the tonnage estimate. (2) The Company purchased a complete modern gravity-flotation mill designed to treat tungsten ore and to eliminate sulphur by roasting and magnetically treating concentrates. The plant including steel building was purchased at bargain and has been delivered to millsite 3-miles by road from No. 4 Tunnel portal as shown on Map "B". (3) The Company has located site for well for mill water supply and now is preparing Application State of Nevada Engineer Water Right Division.

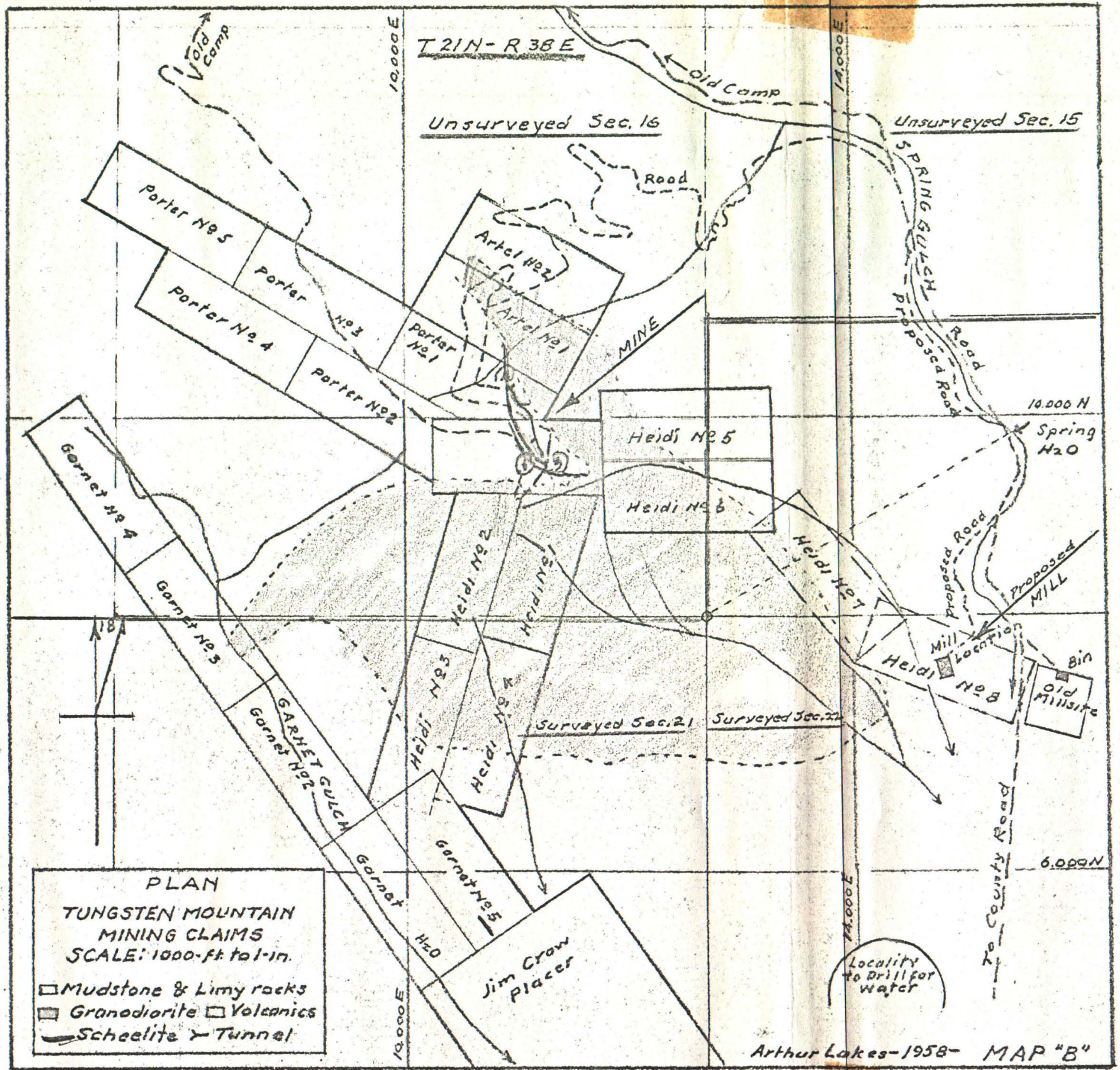
The above about covers pertinent data relative to progress and results of Contract Idm E-1158 but we will furnish any additional data that may be required.

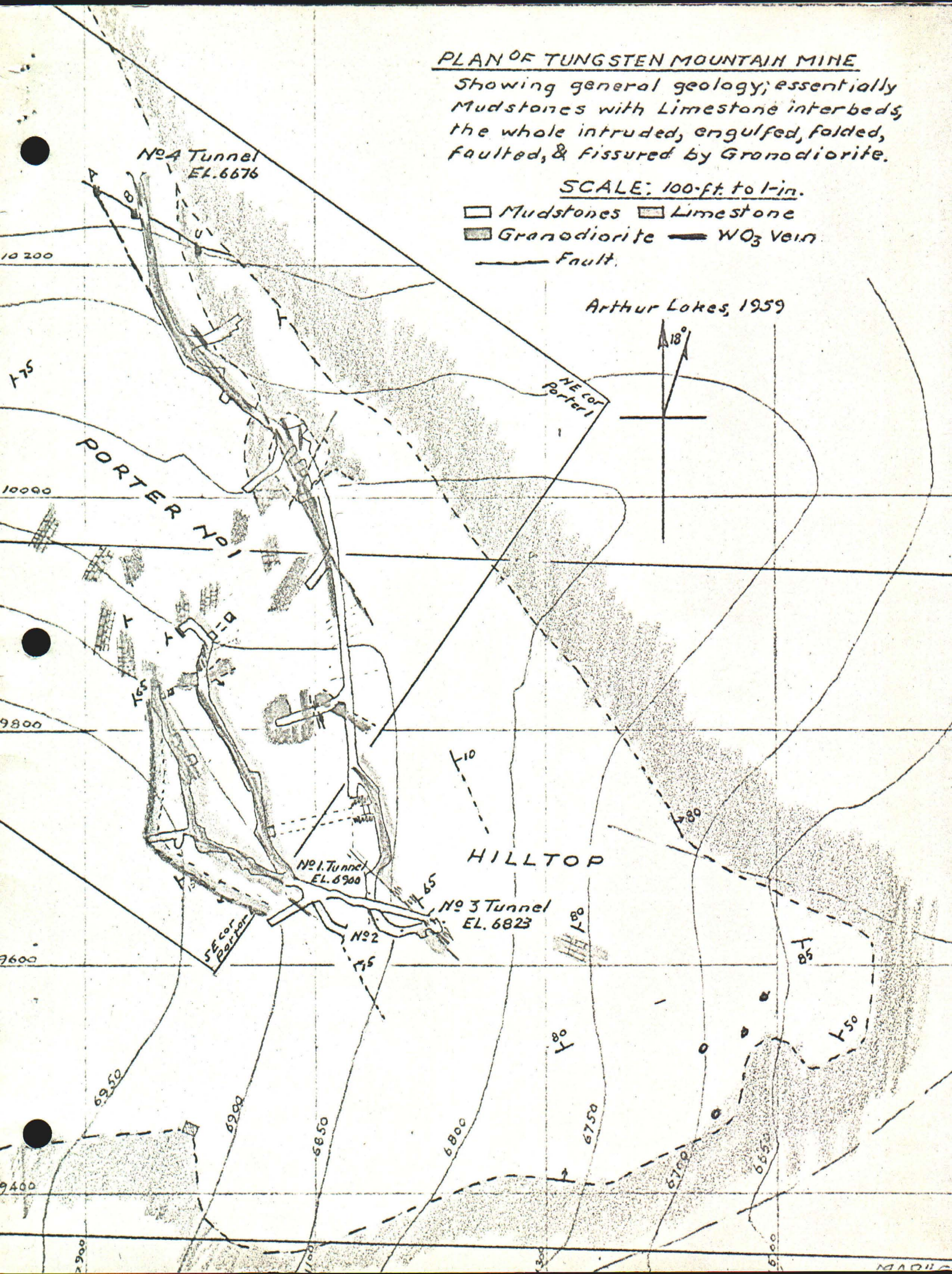
Reno, Nevada.
February 28, 1959

Arthur Lakes

Consulting Engineer & Agent
for TUNGSTEN MOUNTAIN MINING COMPANY


PLAT
Showing Locality of TUNGSTEN MTN.
Tungsten Occurrences.
CALIFORNIA
NEVADA
San Francisco
Reno
40
34-mi
95
27-mi
FALLON
Fernley
40/95
I-A
Lovelock
Oreana
Mill City
Nevada-Massachusetts Mines
Winnemucka
95
(Mill) Getchel Mine
Golconda
40
Salt Lake
Battle Mtn
Tungsten Mtn. Mine
Camp
28-mi
Austin
Eastgate
50
59-mi
Virginia City
50
Dayton
Carson City (State Capital)
95
Yerrington (Copper)
Nevada Scheelite
Gabbs Expl
El Capitan
(Mill)
Gabbs
395
95
Hawthorne
Lunning
Mina
95
Cooldale
Tonopah
Salt Lake
Bishop
Bishop (Mill)
MAP "A"


T21N-R38E
Unsurveyed Sec. 16
Unsurveyed Sec. 15
Old Camp
Old Camp
Road
SPRING GULCH Road
Proposed Road
10,000 N
Spring H2O
Porter No 5
Porter
No 3
Porter No 4
Porter No 2
Porter No 1
Artel No 2
Artel No 1
MINE
Heidi No 5
Heidi No 6
Heidi No 7
Heidi No 2
Heidi No 1
Heidi No 3
Heidi No 4
Heidi No 8
Proposed Road
Proposed MILL
Mill Location
Bin
Old Millsite
Surveyed Sec. 21
Surveyed Sec. 22
To County Road
6,000 N
10,000 E
14,000 E
Gornet No 4
Gornet No 3
GARNET GULCH
Gornet No 2
Gornet
H2O
Gornet No 5
Jim Crow Placer
Locality to Drill for water
PLAN
TUNGSTEN MOUNTAIN
MINING CLAIMS
SCALE: 1000-ft. to 1-in.
Mudstone & Limy rocks
Granodiorite
Volcanics
Scheelite
Tunnel
Arthur Lakes-1958-
MAP "B"


PLAN OF TUNGSTEN MOUNTAIN MINE
Showing general geology; essentially Mudstones with Limestone interbeds, the whole intruded, engulfed, folded, faulted, & fissured by Granodiorite.
SCALE: 100-ft. to 1-in.
Mudstones
Limestone
Granodiorite
WO_3 Vein
Fault.
Arthur Lakes, 1959
18°
No 4 Tunnel
EL. 6676
NE cor Porter 1
PORTER NO 1
No 1 Tunnel
EL. 6900
No 3 Tunnel
EL. 6823
No 2
SE cor Parker
HILLTOP
10200
10000
9800
9600
9400
6950
6900
6850
6800
6750
6700
6650

November 10, 1960

Item 4

MEMORANDUM OF CONVERSATIONS HELD BETWEEN MR. BEN PORTER, PRESIDENT AND GENERAL MANAGER OF TUNGSTEN MOUNTAIN MINING CO. AND FRED H. LENWAY, PRESIDENT OF FRED H. LENWAY AND COMPANY, INC., AT THE OFFICES OF FRED H. LENWAY AND COMPANY, INC. SAN FRANCISCO, on NOVEMBER 9 & 10, 1960

Tungsten Mountain Mining Co. (hereafter referred to as TMM) is a Scheelite Mine located in Nevada near Fallon, that has been known for a number of years, and Mr. Porter's company acquired the mineral rights to approx. 400 acres of mining land several years ago. TMM has done a substantial amount of exploratory work on their own as well as with the assistance of Defense Mineral Exploration Administration, the latter paying for 75% of the cost of the exploration work.

Under the U.S. Government stockpiling program the company shipped approx. $100,000.- worth of Scheelite concentrates, the equivalent of about 1700 units at $63.00 to the G.S.A.

During the past year the company has been engaged in constructing a mill to produce a commercial concentrate from its ore deposits and has completed the construction of this mill which is rated with an input of approx. 100 tons per 24 hours day.

At the present moment there are about 2000 tons of broken ore ready to be milled and there are estimated to be approximately 28,000 tons of ore that is fully developed. The ore in this particular geological occurrance appears to be of an unusually desirable metallurgical character, namely it is alleged to be almost free of contaminating elements and is very much higher in WO3 content than is generally found in the U.S., i.e. average 1.4% WO3.

It is estimated that the existing mill can make an effective recovery in form of concentrates of about 80% by gravity.

Mr. Porter has given us a 5 lbs. sample of his initial cleaned up concentrate which has been submitted to Abbot A. Hanks, Inc. for a full evaluation.

Fred H.Lenway Co.(hereafter referred to as FHL) has promised Mr. Porter to send him a copy of Abbot A. Hanks report when and if available (about the week of November 14).

TMM owns the mill and the mineral lands except that production arising from the ore bodies developed by the Government will be subject to a 5% royalty to the Government when and if produced until the amount of money spent by the Government on their exploratory work has been fully repaid ($28,000.-)

TMM is at the present moment interested in raising some additional working capital in form of a loan and is also desirous to entrust the sale of its tungsten concentrates to a firm specializing in this field and one that has the necessary technical know-how, experience and connections. Their geographical location however, makes them an almost natural supplier of scheelite concentrates to the Kennametal plant near Fallon, Nevada and conversations have taken place for a period of several years between Mr. Porter and Mr. Coldwell of Kennametal. Several days ago Mr. Coldwell gave Mr. Porter to understand that his company would be interested in purchasing approx. a 1000 units per month of concentrates at $23.- delivered(present EMJ quotation for domestic concentrates $22.- $24) beginning January 61.

At FHL's suggestions Mr. Porter and I, however, telephoned Dale Versaw in Pittsburgh to verify Mr. Coldwell;s statements and Mr.Versaw whose statements carry considerably more weight, stated that whereas the company would definitely be interested in buying 1000 units per month, he was not sure that theywould pay $23. which is more than Coldwell is presently paying to the small producers in the area and furthermore, while he thought that they could 1000 units a month quite comfortably, he specifically turned down a request for a firm engagement.

FHL has at the present moment a customer who is interested in purchasing now 20,000 units of scheelite for delivery at the rate of 1650 units approx. per month, during 1961 at a price of $21.- $21.25 per STU fob western railpoint, depending on analysis of the material. This is for the manufacture of Ferro-Tungsten and Lead and Moly are very important and must definitely be below Pb - .10% and Mo -.50%.

Mr. Porter has told us that his company would be interested in considering such a contract without however, making us a firm offer or giving us a definite arrangement. This would serve no purpose at the present moment, as we do not have the findings of Abbot A. Hanks as of this writing.

In view of the fact that Mr. Porter appears to be inclined to let FHL handle sales of tungsten concentrates produced by TMM, a mission which of course, FHL would be very glad to take on; and in view of the fact that the TMM is presently in need of additional operating capital, he has tentatively suggested the following arrangements, subject to reconsideration by him after more careful study:

1. FHL to make a production loan of $60,000.- in cash. The collateralising of this loan has not yet been discussed. The company has a Bond issue out, at present amounting to $50,000.- due in 1964 in one lump sum unless previosly converted into common stock. This bond issue is collateralised by a first mortgage onthe mill and on the mine.

2. Simultaneously with the making of this loan of $60,000.- TMM would appoint FHL its sole sales agents for all its products and pay it a sales and financing commission of 75¢ per unit ,with the understanding that FHL would arrange for sales as best they can in consultation with the management of the mining company. The loan is to be amortized at

the rate of $3. per STU from initial production so that it would be repaid after 20,000 units had been produced. In the meantime, it would carry interest at the rate of 8% p.a. on remaining balances. This arrangement to be good for a period of 3 years.

TMM have offered an inducement of a 10% cash bonus *($6,000.-) and an option to buy from TMM treasury 60,000 shares of their new common stock at $1.00 per share for a period of one year. After the stock has been split there will be 2 million shares outstanding of which Mr. Porter would have 120,000 shares in addition to which there would be 1 million shares in the treasury from whichthe stock option to Lenway would come.

The above is Mr. Porter's proposal. Mr. Lenway has indicated interest in principal but will have to discuss the ramifications with his board of directors and may come up with a counter proposal somewhat different in details but it would not differ basically in character.

However, before any definite deals can be made the following points would have to be established:

a) we have to have the results of Abbot A.Hanks

b) FHL would want to personally go up to the mining property and inspect the installations, possibly accompanied by a geologist or mining engineer of his own to verify the statements made by the mining engineer employed by TMM.

c) the loan for $60,000.- could of course only be granted if the sale of 20,000 unit to Lenway would be authorized by TMM and effected by FHL. In this connection FHL has pointed out to Mr. Porter that irrespective of the high quality of his product the sale of approx. 2500 units per month is not an easy matter, particularly as the large consumers are all captive markets having their own production and that a large increase of tungsten usage in the U.S. would not necessarily compel the samall independents to share in an expanding market.

Xerox 7-copies.

(18) Item 4

REPORT

ON THE

TUNGSTEN MOUNTAIN MINING PROPERTY

Churchill County, Nevada

Arthur Lakes

January 30, 1962

I N D E X

M A P S

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REPORT
ON THE
TUNGSTEN MOUNTAIN MINING PROPERTY
Churchill County, Nevada

This report concerns Tungsten Mountain ore developments and ore extension possibilities at its Hilltop Mine. Details regards Mill and Equipment are referred to Inventory and to Mill Reports too voluminous for this document.

SUMMARY Tungsten Mountain Mining Co. owns approximately 550-acres of mineral locations and one millsite on which property is located Hilltop mine and "New Show" prospect. The property is equipped with modern 100-tons per diem gravity-flotation mill powered by two 100-kw deisel-electric generators and is supplied with water electrically pumped from company well. The Mine is equipped with two 315-cfm portable deisel compressors, drills, cars, mucking machines, and accessory machinery for full production and development requirements.

The mill is located in Clan Alpine valley 92-miles by highway and County road from supply center at Fallon, Nevada. The mine is 2½-miles up mountain road from the mill. Camp is at rented Byers ranch 5-miles from the mill but will be moved to new site adjacent to the mill.

Tungsten Mountain ore showings are opened at two localities: (1) Hilltop Mine on which all underground work has been done and from which all production came. (2) "New Show" bulldozered prospect on indicated 1100-foot NW extension of Hilltop's ore-favorable limey formation. It discloses scattered scheelite ore too low grade for present WO3 market.

Hilltop Mine is opened 300-feet deep by four tunnels and connecting upraises that total 2924-feet of workings. No. 5 tunnel is projected to extend into horizon 220-feet below No. 4 tunnel to total mine depth of 550-feet. This tunnel has been driven 206-feet and has over 1000-feet to go as detailed in the body of this report.

Hilltop workings disclose and partly develop two ore types: (1) Fissure-replacement ore explored a maximum 250-feet length occurs in lenticular and banded form replacing one or both sides of two narrow northerly coursing limey beds some distance removed from granodiorite-sedimentary contact that extends southerly approximately 2000-feet through north part of the property. (2) Contact ore, which was first discovered at No. 4 tunnel where it is presently disclosed for about 300-feet before tunnel turns away toward its original objective in the downward extension of the fissure-replacement ore developed in upper levels. This No. 4 contact exposure provided bodies of high grade ore that extend strongly downward toward the deeper horizon to be opened by No. 5 tunnel. No. 5 tunnel has not yet progressed far enough to enter ore-favorable contact zone but shceelite occurs at its face.

The much greater contact length (in excess of 1200-feet at No. 5) with its proved occurrence of high grade ore, coupled with preponderant evidence that original tungsten deposits are related to igneous intrusives, strongly suggest that Tungsten Mountain's future development into contact ore zones will provide ore possibilities greatly in excess

of those presently disclosed in the more limited fissure-replacement zones.

Hilltop mine produced 7270-tons of ore in two stages: (1) Development ore from No. 1 Tunnel area shipped to various custom mills in 1954-55 when U. S. Government paid $63 per WO3 unit (20#) and (2) Mine ore including 1000-tons of diluted 0.3-0.35% WO3 dump ore into company mill in 1960-61 when Nevada Scheelite M. Co. paid an average $21.08 per unit as follows:

	Mine tons	Saved units	Saving Indicated	Contained units	Ore grade	Returns dollars	@ $ per unit
(1)	958.29	1204.76	77.9%	1543.63	1.61%	$51,170.00	$63
(2)	6310.00	3084.85	50.0% *	6169.70	0.976	63,852.00	$21.08
	7268.29	4289.61	57.0%	7713.33	1.06%	$115,022.00	

Eliminating 1000-tons of diluted dump ore containing estimated 350-units WO3 (175-units saved) the indicated ore grade of remaining 6268-tons is 1.17% WO3. The lenticular and banded nature of the ore is ideal for pre-mill sorting. It is estimated that sorting can bring millhead averages better than 1½% WO3.

The low saving by company mill is due to (1) 55% recovery during tuning in period, later brought to 82½%. However losses estimated at least 30% of original WO3 contents were derived by "dusting" losses of concentrate fines caught in updraft of roasting furnace prior to magnetic treatment. This loss can be eliminated by floating out iron sulphides from concentrates prior to roasting thereby bringing mill recovery up to better than 82% as detailed in the body of this report.

The above ore production came from 8220-square feet of open stopes that contain about 1/3 supporting ore pillars still remaining to be removed when conditions permit. This indicates an average 6½ feet ore width.

Technically speaking Tungsten Mountain has no blocked out ore. The 1960 "Probable and Possible Ore" estimate indicated 26,452-tons containing 37,522 WO3 units. This has since been reduced by structural interruption that cut off ore 25-feet above No. 3 tunnel's NW extension. Recent work at south end of No. 3 tunnel has followed good ore up more than 65-feet indicating that the NW interruption will shortly be solved and tonnage estimate reestablished. On the other hand stope production from only part contained in area between No. 3 and No. 4 Levels returned more than the whole estimate of that section.

Ore showings in vicinity of No. 1-3-Intermediate and No. 4 Levels should materially increase by core drilling and tunnel exploration into the indicated hangingwall and footwall ore potentialities described in the body of this report.

Probably the mine's strongest and most favorable ore potentiality is in the long contact area presently undisclosed at No. 4 and No. 5 Levels as described in the body of this report.

Mine conditions obviously require work to prove up the ore occurrences but indications point to possibility that proposed development should provide in the order of 100,000 WO3 units for profitable mining and milling. Some contact ore, and most of disclosed fissure-replacement ore should be made immediately available for production.

To accomplish the above will require about 1600-feet of core drilling and 2500-feet of tunnelling at estimated $90,000 cost as detailed in the body of this report. The mill will require about $17,000 expenditure for additions and replacements. Total $107,000.

CONCLUSIONS The occurrence of ore bearing limey beds disclosed in Hilltop workings and five presently unexplored surface beds together with important more extensive contact zone provide encouragement for development of important ore bodies. There is sufficient ore exposed to provide production to the mill pending considerable ore addition by completion of recommended short developments in the established Levels.

I am confident that Tungsten Mountain property is capable of yielding substantial amounts of high grade tungsten ore that can be profitably produced by recommended mine work and mill improvement.

The outlook, in view of the findings and indications here reported, justifies expenditure of $110,000 in the proposed exploration and development program and mill improvement.

Details of this report are appended.

Reno, Nevada.
January 30, 1962

Arthur Lakes
Consulting Engineer

PROPERTY Tungsten Mountain property comprises a compact group of 19-mineral claims, 2-placer locations, 1-millsite, and State of Nevada Water permit #17930 developed by 10-inch well 200-feet deep as shown on Map "B". The claims total about 340-acres, Jim Crowe placer location 50-acres, Big 8 placer location 150-acres, millsite 5-acres and water site 5-acres, the whole 550-acres. Salient mineral claims presently are Hilltop and Porter No. 1.

The claims are unpatented, wholly owned by Tungsten Mountain Mining Co., a Nevada corporation. They are held subject to annual assessment work @ $100 per claim. All assessment obligations have been complied with to September 1, 1962. The mining claims all adjoin in a group hence assessment work on Hilltop and Porter No. 1 claims applied for the entire group. Placer locations require separate assessment work. Mill and water sites require no assessment work.

The camp at Byers Ranch is rented from Thos. Ormanchea of Fallon, Nevada. A site has been prepared adjacent to the water well near the mill.

LOCATION & ACCESS Maps A-B The properties are located in Sections 21-22 and unsurveyed Section 16 of T 21-N; R 38-E of Mt. Diablo Mer. The property is in Clan Alpine Mining District, Churchill County, Nevada about 60-airmiles NE from Fallon, the County seat and chief supply point of the region. Fallon is 62-miles from Reno, Nevada.

The mineral claims occupy south part of steep rugged Tungsten Mountain which extends 2000-feet above the Clan Alpine valley. The claims range from 5500-feet to 7200-feet above sealevel. The mill is at foot of the mountain at 5250-feet elevation, about 300-feet above the valley floor.

Climate is semi-arid. Work and tranportation can continue without interruption throughout the year. Mine workings are dry to the bottom No. 5 Level. Water for drilling and other mine purposes has to be hauled to tanks at the various tunnel portals.

Access (Map "A") The property is reached via the following route: From Fallon 59-miles easterly over paved U. S. Highway No. 50 to Eastgate, thence 28-miles northerly over County road to camp at Byers ranch, thence 5-miles northerly over dirt road across Clan Alpine valley to the mill, thence 2¼-miles up Stoney Gulch and switch-back mountain road to portal of No. 4 Tunnel and prospect cuts on Porter No. 1 claim. (Map "B") No. 4 Tunnel is connected by switch-back road and Upraise to No. 3 Tunnel which is connected by road to No. 1 Tunnel and surface cut. The new campsite laid out adjacent to the water well will reduce distance from camp to mine by 5-miles.

Water There is no running water in the region. The Byers camp is supplied from running artesian wells said to be over 75-years old. The mill is supplied with water pumped by 15-HP electric Rada pump, submerged at 200-feet down 10-inch well, thence 3300-feet of 3-inch pipe to reservoir 245-vertical feet higher than well collar and 50-feet above upper part of the mill (Map "B")

Power There is no commercial electric power in the region. Power for the mill is supplied by two 100-KVA Caterpillar deisel-electric generators. The mine is equipped by two 315-cfm deisel portable compressors. A 105-cfm gas portable compressor completes this equipment. Byers camp is equipped with small deisel-electric generator for lighting and refrigeration.

Timber Timber and lumber for camp and mining purposes has to be purchased at Fallon @ from $90 to $105 per thousand B. M.

Communication Tungsten Mountain is not connected by phone to any communication center. Investigation has been made re possibility of a radio-phone in conjunction with Forest Service but nothing concrete has resulted. The mine tunnels are connected to the mill by phone.

HISTORICAL Clan Alpine District had been prospected for gold-silver in the 60-70s and small gold-silver prospects were opened in the 1900s at Stoney Gulch about 1-mile north from Tungsten Mountain workings.

In the spring of 1953 two Nevada prospectors, Staggs & Quilici, filed on Hilltop and six Garnet claims and Jim Crowe Placer, shown on Map "B". They submitted same to Arthur Lakes who submitted to Bennett W. Porter of Seattle who bought out the prospectors for cash and November 30, 1953 incorporated Tungsten Mountain Mining Company under Nevada laws. The few prospect holes on Hilltop claim were expanded into No. 1 tunnel which was advanced 215-feet to maximum 60-feet below surface. This tunnel with small underhand stope at portal and 2-upraises provided 958-tons of ore containing 1543-units of WO3 varying from 0.4% to 4.78% and averaging 1.61% WO3 per ton (Assay Map "F").

Success of No. 1 tunnel inaugurated No. 3 Tunnel, 77-vertical feet lower where a 105-foot crossdut penetrated strong ore, varying from 4 to 9-feet width for 220-feet drift length.

The showings of No. 1 and No. 3 Tunnels brought about a Defense Minerals Exploration loan to drive No. 4 Adit tunnel, 147-vertical feet (176-feet slope) below No. 3 Tunnel. This started December 1, 1957 and continued to January 31, 1959 at $31,218.50 authorized expenditure of which 75% was supplied by DMEA as follows: Drift & Crosscut tunnelling 900-feet @ $32, totalled $28,800, 600-feet of long hole drilling @ $1.50 $900, timbering @ $7 per foot $1,326.50, 48-assays @ $4 $192.00. Total $31,218.50. The work disclosed (1) contact ore, adjacent to or in close proximity of sedimentary-granodiorite contact for first 350-feet from tunnel portal, 150-feet length of "vein ore", 150-feet barren broken area (showing no limestone) and 80-feet ore length in downward extension of No. 3 Tunnel's fissure-replacement ore disclosure. It also showed existence of a fault that displaced the southerly vein extension, to date not explored.

Tungsten Mountain then drove a few crosscuts into ore indications at No. 4 Tunnel, drove 176-foot 2-compratment raise connecting No. 4 to No. 3 tunnel, established 120-foot length Intermediate drift midway No. 4 and No. 3 tunnels, and mined about 6300-tons of ore from No. 3, Intermediate, and No. 4 tunnels as shown on Longitudinal Section

In 1958 the Securities Exchange Commission engineer informed Porter that a 100-tons gravity concentration mill could be procured at bargain price from Mesquite, Nevada. This was purchased and moved to the property and in latter part of 1959 mill construction was started, the mill being completed in latter part of 1960 with addition of ball-mill and flotation equipment also bought at bargain price.

In the meantime Water permit #17930 was obtained and a 10-inch well drill 200-feet depth, reaching water at 125-feet and equipped with submerged automatically controlled electric pump.

Productive History comprises two stages. (1) 1954-55 ore shipments directly from No. 1 Tunnel area to custom mills at Gabbs, Nevada and Bishop, California when WO3 was $63 per unit (20#) on U. S. Government purchase. (2) 1960-61 production from ore's downward extension in No. 3 tunnel into and below Intermediate midway between No. 3 and No. 4 tunnels when WO3 was $22.50 per unit sold to Nevada Scheelite Co.

Stage 1 @ $63 per unit The production comprises development ore taken from 215-feet of No. 1 Tunnel, 2-upraises 45-feet high to surface, and an underhand stope 25-feet long by 20-feet deep at No. 1 tunnel portal. The ore varied from 0.4% to 4.78%.

Returns from 1954-55 Production (Shipped Crude Ore)

	Mine Tons	Dry Tons	Content units	Ore grade	Saved units	Return Dollars	Dollars per ton
(1)	341.06	327.10	628.48	1.91%	628.48	$23,882.29	$73.00
(2)	111.03	106.21	263.95	2.47%	170.14	10,509.54	90.00
(3)	233.80	229.60	430.65	2.02%	229.30	8,766.37	38.18
(4)	272.40	257.10	220.55	0.81%	176.84	8,011.80	31.16
	958.29	920.01	1543.63	1.61%	1204.76	$51,170.00	$56.13

Of the above (1) 327.10 dry tons containing 628.4 units WO3 was bought by Vanadium Cpn. Bishop, Calif. on basis of 100% of contained WO3 @ $38.20 per unit. (2) 107.21 dry tons containing 263.95 units was milled by Inca mill, Gabbs, Nevada returning 170.14 units @ 61.5% recovery, concentrates sold to U. S. Government less $209.28 charges. (3) 229.6 dry tons was shipped to El Diablo, Bishop, Calif. (plus a 10-tons test) containing 430.65 units WO3 returning 229.3 units @ 53% recovery, sold to U. S. Government @ $41.25 per ton after deduction charges. (4) 257.10-dry tons of high grade and mill and dump ore shipped to Yaney flotation mill, Gabbs, Nevada, containing 220.55-units and returning 176.84 units @ 80% recovery, was bought for 100% of WO3 contents @ from $30 to $38.20 per unit. The low grade contained so much lime that Yaney mill refused further flotation treatment because of cost of excess acid required to process flotation concentrates. Dump ore saving was approximately 35%. The above shipments included 79.5-tons of 4.78% WO3, the highest grade mined.

Stage 2 @ $22.50 per unit comprised 6310-tons into company mill. Concentrates were all sold to Nevada Scheelite M. Co. processing plant 75-road miles from Tungsten Mountain mill. Price @ $22.50 per unit. Returns on concentrates sold as follows.

Returns from 1960-61 Production (Mill concentrates)

Dry tons	% WO3	Units WO3	Pounds WO3	Price per unit*	Total paid
44.9638	68.603%	3,084.8487	61,696.97#	$21.08	$68,852.80

* Penalties on two lots reduced the per unit to $19.34 and $20.00 respectively thereby reducing $22.50 per unit to average $21.08.

The 3,084.85-units (61,697#) contained in the concentrates are believed to represent less than 50% of the WO3 content of the mined ore delivered to the mill due to (1) early recovery was @ 55% which was brought to 82½% at later stage of milling but, more importantly, was (2) excessive loss by "dusting" of concentrate fines driven by rotary furnace updraft through smokestack because the concentrate fines were subjected to excessive heat required to desulphurize heavy Iron sulphide content and to render the remaining iron, garnet, etc. magnetic for final processing removing iron, etc. through Sterns magnetic separator prior to shipment product. It is estimated that the "dusting" loss was at least 30% of the original WO3 content.

It is recommended that the WO3-FeS concentrates be put through a Gallagher flotation machine to remove most of the FeS with its sulphur content so that subsequent roasting be limited to sufficient heat only to dry concentrates and desulphurize the small remaining FeS left after float extraction. Addition of Gallagher flotation machine is recommended by mill superintendent.

The 6310-tons milled represents (1) 1000-tons of low grade dump ore from No. 3 and No. 4 Tunnels' stockpile dumps diluted by at least equivalent amount of waste dumped upon the ore. It is doubtful that this dump ore contained as much as 0.35% average WO3.

On the above 50% recovery basis the 6310-tons would contain 6,169.7 units from which 350 units dump ore would leave 5,819.7 units (1.09% WO3 average which is about what assays showed)) in 5310-ore tons that came from stopes as follows:

	Length	Heighth	Square feet	
(1) No. 3 Level stope above level	70-ft	15-ft	1050	
" " Upraise south end	8-ft	65-ft	520	1570
(2) Intermediate Stope up to No. 3	80-ft	40-ft	3200	
" " "	40-ft	30-ft	1200	
Below Intermediate Level	40-ft	30-ft	1200	5600
(3) Stope in "Contact ore, No. 4 Level	35-ft	30-ft	1050	1050
				8220

Figuring scheelite ore @ 10-cu. ft. per ton:
5310 x 10 53,100-cu. ft. $\frac{53,100}{8220}$ is 6.46-ft. (6½-ft) ore width

The intermediate stopes, due to financial exigencies, were open stopes with supporting pillars of good ore left for safety. It is estimated that about 1/3 of the stoped area includes these pillars to be removed when stoping has been completed above No. 3 Level.

GEOLOGY
Maps B-c-E

Regional Geology: The area surrounding Tungsten Mountain property consists of a fault block about 1½-mile square, bounded on the south by Clan Alpine valley and on the other sides by volcanic flow rocks that form most of the mountain range. Some faulting is younger than the flow rocks but the block is probably high point of older faulting. Present top of fault block is at least 2000-feet higher than the valley.

The rock formations consist of folded, faulted, and crushed "mudstones" subdivided into argillite, limey argillite, shale, slate, and hornfels, interbedded by narrow limestone beds, the whole invaded by granodiorite whose surface exposure measures about 5000-feet E-W by 2500-4000-feet N-S and dikes out to the north and west as shown on Maps B-E.

Rock types change without noticeable boundaries. No bedding can be observed in massive hornfels and elsewhere rock attitude determinations are few except along narrow limestone beds that occur in more or less lenticular form, suggesting that they originally were formed by accumulation of calcareous material in undulating mud floor. This results in rapid pinching and swelling of the limestone beds augmented by crushing, strike faulting, stretching and compression and folding to which the structure has been subjected making it difficult to trace the individual beds both laterally and vertically.

Local Geology Tungsten Mountain ore showings comprise (1) Tungsten Mountain or Hilltop ore disclosures on Hilltop claim explored and developed by the tunnels and upraises constituting Tungsten Mountain Mine from which all production has come to date. (2) "New Show" surface prospect 600-900 feet westerly in hillside across steep draw from No. 4 Tunnel portal. The scheelite occurs in limestone and limey argillite indicates 1100-foot northerly extension of the limey beds opened at Hilltop mine surface. The scheelite showings of "New Show" have proven too low grade and scattered for commercial consideration at present WO3 prices.

Hillton Showings The rocks containing Hilltop showings form a syncline with steep northerly pitch. The west arm strikes N 15-25° W, dipping 50-75° east and the east arm strikes S 70-85° E, dipping 70-80° northerly as shown on Maps C-E. The southern extensions of the formations are partly engulfed in a "bay" of granodiorite occurring to east and south as shown on Maps C-E. The granodiorite dikes out westerly and northerly into the sedimentaries as shown on Map "C".

The rocks surrounding and containing Hilltop showings have been extensively metamorphosed, particularly in southern extensions toward granodiorite. The rocks at northern extension, inclusive of sedimentaries and granodiorite are less altered.

The above mentioned rock contortion, crushing, and offsetting by minor faulting make it difficult to trace the narrow ore-favorable beds laterally and into lower levels. Limestones, in numerous places, have lost their calcareous content into tactite. A flat thrust fault "A" occurring just below No. 1 tunnel has offset downward vein, extent presently undetermined, and has shattered overlying rocks so that overhead stoping is impossible hence the good near-surface ore has to be mined by open cut. The rocks below the fault are generally firmer and can be mined by shrinkage stoping.

Preponderant evidence is that scheelite deposits are related to acidic igneous intrusions, the deposits mostly occurring in contacted sedimentaries though some commercial showings occur in granitic rock (one at Gabbe, Nevada). At Tungsten Mountain scheelite occurs sprinkled in non-commercial amount in the granodiorite at No. 4 Level, considerably increasing in No. 5 Tunnel though still non-commercial.

The Tungsten Mountain mineralization is high temperature lime-tungsten scheelite ($CaWO_3$) occuring in two deposit types: (1) veins replacing limestone and associated limey argillite beds dipping towards main granitic mass which is from 150-300 feet away from them. (2) "contact ore" comprising disseminations and bands in tactite zones of metamorphosed limestone at, or in close proximity to, the intrusive acidic granodiorite. The fissure-limestone replacement ore (1) occurs from surface down through Hilltop's No. 1, No. 2, No. 3, Intermediate, and south area of No. 4 tunnel. It also occurs in presently non-commercial amount at "New Show" at 1100-feet northerly extension of Hilltop's ore-favorable limey beds. The Contact ore disclosures occur only where presently explored for 300-feet in from No. 4 tunnel portal and indicated coming in at face of No. 5 tunnel as shown on Map "C".

The tungsten ore formed under "pneumatolytic" conditions wherein the tungsten that forms the orebodies was expelled under pressur (as a chloride) in vapor form from deep-seated molten magma as the magma was cooled towards solidification forcing release of the gases held in magmatic solution. These tungsten vapors, accompanied by other gases, escaped upward along any path that could be utilized and were deposited (under favorable temperature and pressure conditions) by reaction with accompanying gases and reaction with wall rock. In case of Tungsten Mountain deposits the most ore-favorable rocks were limestones and limey argillites described.

Ore deposits can be expected as long as the ore-favorable rocks extend laterally and in depth. Their downward limits would cease where the ore-favorable rocks might truncate at underlying granodiorite floor which is indicated to be at considerable depth at Tungsten Mountain. Hilltop being nearer to the granitic intrusion provides best ore presently disclosed. Exploration along Hilltop's contact zone is expected to provide important ore disclosures similar to the high grade found. "New Show" disclosures being more remote from granodiorite (which dikes out in its vicinity) contain scattered scheelite presently too low grade for commercial consideration. There is possibility that depth might here improve scheelite content in possible zone nearer to underlying igneous.

Ore The ore comprises scheelite accompanied by iron sulphides, minor lead, zinc, copper, phosphorus, etc. as listed on attached Spectrographic Analysis. These minerals were introduced subsequently to

scheelite mineralization and vary from point to point. The iron sulphide content generally exceeds scheelite content of the ore, complicating milling process as outlined in this report. Gangue includes altered country rock, quartz (heavily present in highest grade ore), tactite with high temperature silicates garnet, diopside, etc. Gangue is hard and tough in contrast to chalky, friable scheelite. This tends to "salt" samples cut across the ore hence Tungsten Mountain's most reliable sample is the 958-tons shipped from No. 1 tunnel area returning values varying from 0.45% to 4.78% WO3, averaging 1.61%.

Both fissure-replacement ore (1) and contact ore (2) form in rich bands and lenses averaging up to 6-6½-feet width with from a few inches to several feet interval of low grade ore barren material. This makes it difficult to keep up required mill grade by mass mining but is ideal for hand sorting at the mine. Establishment of sorting house at portal of main transportation tunnel should bring mill feed up to 1½% or better WO3 at estimated 25% waste discard thereby reducing hauling and milling costs 25% or more for production of same amount of WO3 in concentrates from the mill.

DEVELOPMENT Most Tungsten Mountain development is in fissure-replacement ore zone, the contact ore disclosures confined to about 300-feet along No. 4 tunnel to where it passes out into east wall as shown on Maps C-D. Hilltop ore is presently opened by 4-adits and 1-Intermediate as shown below. Completion of No. 5 adit tunnel will open into downward extension of ore zones from 150 to 220-slope depth below No. 4 adit tunnel.

Hilltop Mine Development

Level	Elevation	Drift in ore	Drift off ore	Crosscuts	Raises	Total
Open cut	6900-6980-ft	110-ft	30-ft			140-ft
No. 1 Tunnel	6900-ft	215-ft		40-ft	135-ft	390-ft
No. 2 Tunnel	6874-ft	45-ft		10-ft		55-ft
No. 3 Tunnel	6823-ft	225-ft		230-ft	280-ft	735-ft
Intermediate	6749-ft	65-ft	45-ft	30-ft		140- f
No. 4 Tunnel	6670-ft	521-ft	193-ft	200-ft	447-ft	1461-ft
No. 5 Tunnel	6488-ft	5-ft		201-ft		206-ft
		1186-ft	268-ft	811-ft	862-ft	3127-ft

No. 5 Tunnel is planned to be driven 1000-feet along downward extension of contact ore possibilities (explored 300-feet at No. 4) and drive out at point of expected ore diversion of the fissure-replacement ore into its downward locality below No. 4 Level.

In its progress No. 5 Tunnel will explore (1) about 180-feet ahead from present face to a point under No. 4 tunnel portal, thence (2) about 110-feet farther should enter into indicated downward extension of rich contact ore opened from 100 to 235-feet in from No. 4 portal and thence (3) should explored about 500-feet length along downward extension of presently unprospected contact at No. 4 tunnel which it is recommended to be tested by a series of southeasterly core drill holes extended from area between No. 4 tunnel's 446-449 stations (Map D).

"Contact ore" is expected where ore favorable limey rocks contact SE coursing granodiorite (Map "C"). Strata attitudes show that these ore-favorable contacts will not be continuous and that there will be barren gaps between ore zones. However, in view of rich contact ore already disclosed at No. 4 Level, the probability that they will provide important additions to fissure-replacement ore possibilities warrants the venture.

Map "C" shows limited surface exposure of 7-limestone beds downhill to north of No. 1 and No. 3 tunnel faces. Three of these, inclusive of beds opened in respective tunnels, showed ore but economics demanded early underground production which, coupled with overburden depth, prevented their further exploration. Surface exploration will require D-8 bulldozer and underground exploration of these beds should be performed by core drill and tunnel crosscuts at No. 3, Intermediate, and No. 4 Levels outlined herein.

ORE SHOWINGS Map D

Surface Cut started at No. 1 Tunnel portal and extended 140-feet westerly into mountain to 45-feet above tunnel. The cut follows from 4 to 7 feet width of high grade ore formed along west striking, 80° southerly dipping shearage zone in limestone bed, thence mineralized limestone courses 50-feet NE dipping 50-70° easterly to collar of 2-upraises from No. 1 Tunnel, thence the limestone courses 65-feet N 15-20° W with 50-65° east dip to road above sta. 109 of No. 1 Tunnel whence it is followed no farther. The ore along the westerly striking shear zone is high grade similar to its production of from 1½% to 4.7% WO3 in No. 1 Tunnel. This shear zone continues west past the limestone into hornfels (barren of ore) and should be prospected into southerly extensions of limestone beds disclosed to west of No. 1 Tunnel (Map "C"). The ore coursing NE-NW from the turn provides lenses and bands of replacement ore occurring on both sides of the limestone bed. This ore is indicated by lamping to run from about ½% to 1% and is represented by 310-tons averaging 0.71% WO3 produced from its downward continuation in NW drift of No. 1 Tunnel.

An important high grade ore showing courses S 25° E(with 35-50° easterly dip)offfrom south side of the westerly coursing shearage zone at 55-feet inside Cut portal (old No. 1 tunnel portal). Its SE extension turns easterly forming a syncline like fold. Its downward extension may be strong rich ore extending along fault crossing 43-feet inside No. 1 Tunnel. Its farther downward extension is indicated to be good ore opened 65-feet high (@ 65° east dip) in No. 3 Tunnel's "South raise" which is in upward extension of the important ore mined from No. 3 down through Intermediate and into No. 4 Tunnel.

These showings prove (1) that the ore mined along No. 1 Tunnel's NW extension is not the ore mined from No. 3 Tunnel down. (2) That the Cut's SE showing is either a hangingwall bed untouched below No. 1 Tunnel or (3) might be SE extension of No. 1 Tunnel's NW bed faulted 75-feet easterly by the rich mineralized shear zone. Present indications are No. 1 Tunnel's NW extension is on an ore bed not yet encountered or mined below that Level, and that the important ore bed mined from No. 4 up through Intermediate into No. 3 may yet continue unexplored and unmined in hangingwall country between No. 3, No. 1 and surface.

If the above proves true (1) the ore showings of No. 1 Tunnel provide virgin ore yet to be encountered and mined in donward continuation into No. 3, Intermediate, and No. 4 Levels and (2) the ore showings so far mined from No. 4 up through Intermediate into No. 3 Level are yet virgin above No. 3 to surface.

No. 1 Tunnel (El 6900) Map D — No. 1 Tunnel is driven 78-feet N 65° W along strong shearage zone dipping 80-85° S along limestone bed indicated to have same attitude. This structure produced from 4 to 9-feet of ore varying from 1½% to 4.78% WO3 representing more than half 648-tons shipped at average 2.04% WO3 as shown on Assay Map "F". The tunnel then turns an average N 15° W along limestone bed dipping 45-50° easterly and mineralized on each side by ore lenses and bands with intervening low grade, the ore values from 0.4% to 2% WO3. Locality of strike divergence from westerly to NW course provided 9-feet width of high grade ore by compressive widening along structure bend. The higher grade ore extended NW about 40-feet, giving way to lower grade representing the 0.71% WO3 production from No. 1 Level.

At 42-feet in from portal a NW fault dips 35° easterly across the tunnel. Its NW extension out from the tunnel contains 2 to 3-feet of high grade ore, not explored due to unstable ground.

Conditions at No. 3 Level's "South Raise" and the surface both indicate that the above ore may be the unworked upward extension of the important ore mined from No. 4 up through Intermediate to No. 3 Level and that, on the other hand, the downward extension of ore disclosed at No. 1 NW drift may be virgin down from No. 1 Level to and below No. 4.

No. 2 Tunnel (El 6874) Map D — No. 2 Tunnel is a westerly crosscut 10-feet to NW flat fault "A" which underlies good ore that extends 45-feet along tunnel roof. No ore shows at tunnel floor due to thrust offset of the ore bed. The tunnel top provided 4-feet thickness of ore averaging 4.78% WO3 for 79.8-dry tons mined from stope 25-feet long by 20-feet high to No. 1 portal. Fault "A" strikes N 27° W and dips 15° easterly. It is believed to be a thrust with the two ore beds disclosed at Surface and No. 1 Tunnel above it and presently disclosed oreshowings in No. 3 and below beneath it.

No. 3 Tunnel (El. 6823) Map D — No. 3 Tunnel is a westerly crosscut 120-feet from portal to fissure-replacement structure striking generally N 15-20° W and dipping 50-65° easterly. This is followed 215-feet to a series of NE crossing faults dipping 60-70° southerly into a wide zone of NE-SW faulting near Sta. 448 at No. 4 Level (Map D). At 190-200-feet the ore structure is cut across by a granodiorite dike dipping 50° S, thence the tunnel is off the vein in barren limestone to face 250-feet from ore structure start. A strong Ne fault with 80° south dip crosses the face in barren limestone that dips 70° easterly. The probable ore continuation is east in surface limestone about 30-feet ahead of tunnel face.

The first 120-feet of the ore structure is cut by a series of westerly coursing, 75-80° southerly dipping shears where occurs the higher grade ore, lamping similarly to No. 1 Level's best ore with 70-feet length cut sampling an average 6-feet @ 2½% WO3. Thence the NW

continuation forms a series of ore lenses and bands with intervening low grade. Cut sampling indicated 4-ft. @ 0.95% WOs. As previously noted, the cut samples are believed to assay higher than the actual ore although area mined up from Intermediate to No. 3 (See Map E) provided 2% and better Wo3, the mined ore in some cases being considerably diluted by inclusions from soft gougy footwall.

A crosscut driven SW at 95-feet in from portal cut a thin low grade ore streak enclosed in hornfels but the true SE extension of the ore structure has not yet been encountered at this level.

"South raise", 10-feet NW from ore start, extends up 65-feet in 4-5-feet of good ore dipping 65° easterly into downward continuation of the very good ore stoped up from Intermediate Level (Map E). This raise showing is indicated to be downward continuation of the previously described unexplored ore 43-feet in from No. 1 tunnel portal.

Three raises up 25-feet into 40-foot long sublevel shown good ore to the NW but upraises farther NW driven 15-feet high ran out of ore. Similar conditions occurred at farthest NW ore exposure where DMEA had gotten 2.23% WO3 assay. These upward ore cessations are believed due to structural interruptions to be solved. Ore was found at surface above this area.

No. 4 Tunnel (El 6670) Map D — The ore showings on which No. 4 Tunnel was started were disclosed by road-cut. They comprise (from west to east) "A" 5-feet width in argillite, thence 40-feet to 2-streaks totalling 6-feet width at "B" in hornfels and argillite, thence 65-feet to "C" about 10-inches low grade WO3 at hornfels contact with granodiorite whence it is granodiorite to the east as shown on Maps D-C .

It was decided to start the tunnel in "B" 15-feet below road-cut The tunnel progresses southerly 100-feet along bunchy low grade ore to Sta. 441 where "A" structure junctures in from the west, thereafter dominating strike and widening and enriching the ore structure. At 52-feet farther in a crosscut was driven 50-feet NW to test DMEA long hole drilling showings. No commercial ore widths were found but at 15-feet granodiorite was encountered and followed to face. Enriched ore followed along this contact for 85-feet to east dipping granodiorite cross dike 20-feet thick barren of ore, thence contact ore was followed 25-feet to where it goes out in east wall at sta. 445 as projected on Maps C-D. A crosscut driven 60-feet SW to test DMEA longhole encountered southerly extension of this dike. The long hole indications were not encountered by this crosscut indicative of uncertainties of this exploratory method regards scheelite deposits.

The tunnel progresses southerly from 445, away from the contact's SE extension. It follows scattered mineralization for 150-feet. Better WO3 ore was found by short crosscuts to the west as shown on Map D . This interval is crossed by southerly dipping faults that individually offset ore structure short distances west (Map D).

The next 140-feet of tunnel passes through 50-feet of crushed hornfels crossed by six NE striking, S dipping faults, thence soft, crushed hornfels to where downward continuation of the fissure-replace-

ment ore is encountered at Sta. 449. This structure strikes nearly due south, dipping 60-65° easterly enclosed in tactite cut into bunches by numerous minor faults. At 85-feet the structure is cut off by strong SE striking, NE dipping fault that has offset the ore structure and enclosing rocks out of the tunnel which then follows massive and crushed hornfels to the face. On the premise that the fault is normal the ore structure extension south of the fault would be shifted east beyond present workings. Sampled from 0.3 to 2.0% indicating 4-ft. @ 1.36% WO3.

Two DMEA longholes were drilled NE out from the barren southside of the fault. They showed 0.3% to 0.5% WO3 but their indicated extension provided only thin sprinklings of WO3 in unfavorable hornfels. It is noted that the holes test area on same upper side of the fault as occupied by present ore developments.

No. 4 Tunnel is connected by 2-upraises to Intermediate and No. 3 Tunnels as shown on Maps D-E. The Main 2-compartment Raise was driven about 40-feet along ore structure, then purposely swung into harder hangingwall rock to No. 3 Tunnel, 176-slope feet above No. 4. This because of very soft footwall which would unduly dilute ore byepassed down the untimbered chuteway. The second raise was put up in ore for 60-feet then diverged on an ore streak leading into hangingwall country and finally ended over Intermediate roof. It was then rerun from divergent point and followed up strong high grade ore along the main ore structure to Intermediate Level.

Intermediate, (El. 6749) Map D

The Intermediate Level was run about midway No. 3 and No. 4 Levels. It comprises a 20-foot west crosscut from Main raise chuteway to strong vein that strikes an average N 25° W and dips 50-60° easterly. It is drifted 10-feet NW where it goes out in footwall country and SE for 55-feet in very good ore from 4 to 8-feet thick. It then turns nearly due south for 20-feet in bunchy ore. The ore provided some of the mine's best grade and was open stoped up to No. 3 and halfway down to No. 4 as previously detailed. Drift exploration is warranted both NW and SE and core drilling into both walls is recommended.

No. 5 Tunnel (El. 6488) Map D

No. 5 Tunnel portal is near steep gulch that courses NE down the mountain to Stoney Creek. The tunnel objective is to disclose and develope scheelite ore possibilities along contact zone and open downward extensions of the fissure-replacement ore opened above as outlined in this report.

The tunnel crosses irregular hornfels-granodiorite contact for 93-feet in from portal, then diverts into granodiorite curving 87-feet back toward contact which is indicated to be immediately ahead of the face by a wedge shaped body of hornfels liberally sprinkled with WO3 on south drift side but merging into granite on the north side. The ore showing is presently noncommercial occurring in hornfels which elsewhere in the mine are barren or meagrely mineralized by WO3. The showing is encouraging for good ore occurrence at this horizon when ore-favorable limey rocks are encountered. The WO3 occurrence in granodiorite is much stronger than shown at No. 4 Level. Flat veinlets of quartz liberally mineralized by WO3 occur in the granodiorite and in hornfels near surface.

ORE POSSIBILITIES
Map "E"

The lensing and banding characteristics of Tungsten Mountain ore occurrences make difficult an estimate of tonnage possibilities.

Technically speaking, Tungsten Mountain has no blocked out ore (i.e. opened on 3-sides close together). A 1960 Ore estimate was varied by structural interruption that cut off ore continuation 25-feet above No. 3 Tunnel's NW extension. However recent work at No. 3 South Raise followed up good ore for 65-feet which indicates that the NW interruption will be satisfactorily solved and reestablish the 1960 ore estimate for that area. On the other hand the stope production from only part of the estimated area between No. 3 and No. 4 Levels exceeded estimate for the whole.

The previously estimated fissure-replacement ore possibilities should be materially increased by results of development by short drillhole and tunnel exploration into hangingwall and footwall areas of No. 1-3-Intermediate and No. 4 Levels.

One of the strongest and most favorable ore potentialities comprises the presently undisclosed area along granodiorite-ore favorable sedimentary contact that extends southerly out from No. 4 Tunnel and is to be fully explored by projected No. 5 Tunnel. Heretofore Tungsten Mountain's No. 1-3-Intermediate and No. 4 workings were driven away from contact locality into known points where ore existed at surface and very little work has been done on the contact though high grade ore has been exposed where the contact zone has been opened at No. 4 Level.

The contact zone provided a most ready path for accessibility of WO3 gases expelled from deep seated magma thereby making the ore-favorable contacts highly vulnerable for rich ore deposition as has been proven by rich upper parts of contact bodies in No. 4 Level whose downward continuation is strongly toward No. 5 Level, which also has provided indication of ore occurrence at that deeper horizon.

Whilst it will require more work to prove tonnage, the indications point strongly that presently exposed ore showings and the reasonably expected ore developments should provide in order of 100,000 or more units accessible for profitable mining and milling.

DEVELOPMENT PROGRAM
Map D

The above conditions recommend core drilling, crosscutting and drifting both hangingwall and footwall areas of fissure-replacement zone preparatory to ore production. Development elsewhere in the mine includes core drilling and tunnelling the contact zone at both No. 4 and No. 5 Levels plus exploration for displaced fissure-replacement segment south of No. 4 tunnel's #52-Fault (sta. 452).

First sequence comprises 16-horizontal drillholes averaging 40-50-feet, eight holes into hangingwall and eight holes into footwall of No. 3-Intermediate, and No. 4 Levels. Total drilling about 800-feet. Ore-favorable showings by dilling to be followed by crosscut-drift development into them preparatory to ore production. Total tunnelling about 260-feet crosscut, 700-feet drift.

Second sequence comprises five drill holes drilled northeasterly from 30 to 180-feet at 50-foot intervals between No. 4 Tunnel's sta. 446-449. Drilling total about 500-feet. Two westerly drill holes 40-60-feet from No. 4 tunnel's sta. 452 in search of ore segment and enclosing tactite displaced by #52 Fault. In case of negative results drill two holes at S 50° E and S 45° E in chance that faulting was in opposite direction. Each hole should extend about 125-130 feet from sta. 454, total drilling 300-feet. In event of ore disclosure drive crosscut-drift tunnels preparatory to ore production. Distance presently undeterminable.

Third sequence comprises about 500-feet drift out along contact zone at No. 4 Tunnel according to drillhole indications.

Fourth sequence comprises about 800-feet southerly extension of No. 5 Tunnel along contact zone and crosscut easterly into downward extension of fissure-replacement ore projected down from disclosure at No. 4 tunnel. Crosscut-drifting estimated 150-300-feet.

Estimated Cost on basis of $6 per drill foot if contracted, $3 per foot if Tungsten Mountain purchases drill. Tunnelling cost estimated at $32 per foot.

Drilling	Location	Footage	Cost
(1)	Walls 3-Int-No. 4 Levels	800	$4,800
(2)	Into contact No. 4 Level	500	4,000
(3)	For south ore segment # 4	300	1,800
		1600	$9,600 **

**Cost be about $4,800 if company owned drill.

Tunnelling	Location	Footage	Cost
(1)	Into walls 3-Int.-4 Levels and drift development	900	$28,800
(2)	No. 4 Tunnel contact	500	16,000
(3)	No. 5 Tunnel contact zone	800	25,600
	" into downward extension fissure-replacement ore	300	9,600
		2500	$80,000

MILL Reference is suggested to the following for mill description, milling problems, repairs and alteration data which are too voluminous for this report:

(1) Report on Scheelite Concentrator, Tungsten Mountain Mining Co. by Albert Silver, Metallurgist, Reno, Nevada

(2) Reports by K. W. Dunham, Tungsten Mountain Mining Co Mill & General Superintendent dated December 9, 1960, January 14, 1961, September 2-3, 1961 which latter lists $6,450 requirments for Gallagher flotation cells and other additions to bring mill up to proper saving capacity.

The mill's secondary (Cone) crusher went out of commission in such disrepair that the manfacturer's agent advised against attempting its over haul and repair. He estimated that Tungsten Mountain M. Co. would be economically ahead by purchase of a new crusher at about $10,000.

On basis of above it is indicated that it will require $16,450 to put the mill into high saving efficiency as outlined here under "Productive History".

A D D E N D A

COPY

LABORATORY REPORT, ABBOT A. HANKS, INC.
624 Sacramento Street
San Francisco 11, California

Lab. No. 65823 Date March 29, 1954

Submitted by Tungsten Mountain Mining Co. Sample Mark 1
Box 456, Fallon, Nevada

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals found
and Estimated Percentage Range

Less than .03%	.03% to .30%	.30% to 3.0%	3.0% to 30%	30% to 100%
Nickel	Potassium	Magnesium	Silicon	
Cobalt	Titanium	Manganese	Aluminum	
Chromium	Molybdenum	Sodium	Calcium	
Copper	Lead	Tungsten	Iron	
Bismuth	Vanadium			
Strontium				
Tin				
Zinc				

Respectfully submitted

ABBOT A. HANKS, INC.

By Original signed by

Martin E. Quist
Spectro-Chemist.

TUNGSTEN MOUNTAIN SCHEELITE SHIPMENTS
TO NEVADA SCHEELITE CO.

Date	Tons	% WO3	Units WO3	Price per unit	Total paid
Nov. 26, 1960	3.0125	69.94%	210.6732	$23.00	$4,845.48
Jan. 3 1961	3.1500	50.27% (14.73% low)	158.3253	20.00	3,174.43
Mar. 23 1961	3.9460	69.77%	247.3695	22.50	5,565.80
Apr. 20	4.9865	73.76%	367.7305	22.50	8,273.94
May 11	4.8845	70.71%	345.3141	22.50	7,769.57
May 26	2.6265	70.40%	184.8704	22.50	4,159.58 *
June 12	1.4950	67.75%	101.2659	22.50	2,278.48 *
June 30	3,6705	73.20	268.6623	22.50	6,044.90
July 7	4,4270	69.94	310.2608	22.50	6,980.87
July 13	4,1195	71.00%	292.4490	22.50	6,811.30
July 28	1.7000	64.00%	115.4068	22.50	2,596.66
Aug. 11	3.5853	69.95	250.7917	22.50	5,642.81
Aug. 28 *	0.605	39.21	23.7416	19.34	259.16
Aug. 28	2.3260	69.88	150.9012	22.50	3,395.28
Sept. 5	0.8195	69.66	57.08637	22.50	1,284.44
	44.9638	68.603%	3,084.8487	$21.08	$68,852.80

* May 26-June 12 Accident reduced crew for 2-weeks (May 27, 1961)
* August 28th. Cleanup

1961

NOTE : The above is only part of the 1960 and 1961 production from mine development. Other concentrate shipments were sold to the Union Carbide Corporation and the Fred H. Lenway Company the latter paying a premium for the excellent grade and character products. The mine was not depleted of ore and over $500,000 at present prices of the same ore grade is available from No. 1 to No. 3 with open pit production procedure.

J. H. W. , October 23, 1972

EXHIBIT "A"

Those certain unpatented mining claims and millsite situated in the Clan Alpine Mining District, in Churchill County, State of Nevada, more particularly described and designated as follows:

Hilltop, Heidi No. 1, Heidi No. 2, Heidi No. 3, Heidi No. 4, Heidi No. 5, Heidi No. 6, Artel No. 1, Artel No. 2, Porter No. 1, Porter No. 2, Porter No. 3, Porter No. 4, Porter No. 5, Hattie No. 1, Hattie No. 2, Hattie No. 3, Garnet No. 1, Garnet No. 2, Garnet No. 3, Garnet No. 4, and Garnet No. 5;

Well and appurtenant water rights as evidenced by the State of Nevada Water Use Permit No. 23054.

One millsite, including various buildings and such of the mining and milling equipment described on Certificate of Sale filed in Cause No. 8209, In The First Judicial District Court of the State of Nevada, In and For The County of Churchill, in that certain matter entitled, CECIL N. COLE, for and on behalf of all First Mortgage Bondholders, Plaintiff, vs. TUNGSTEN MOUNTAIN MINING COMPANY, a Nevada corporation, Defendant, as may be presently located upon said property;

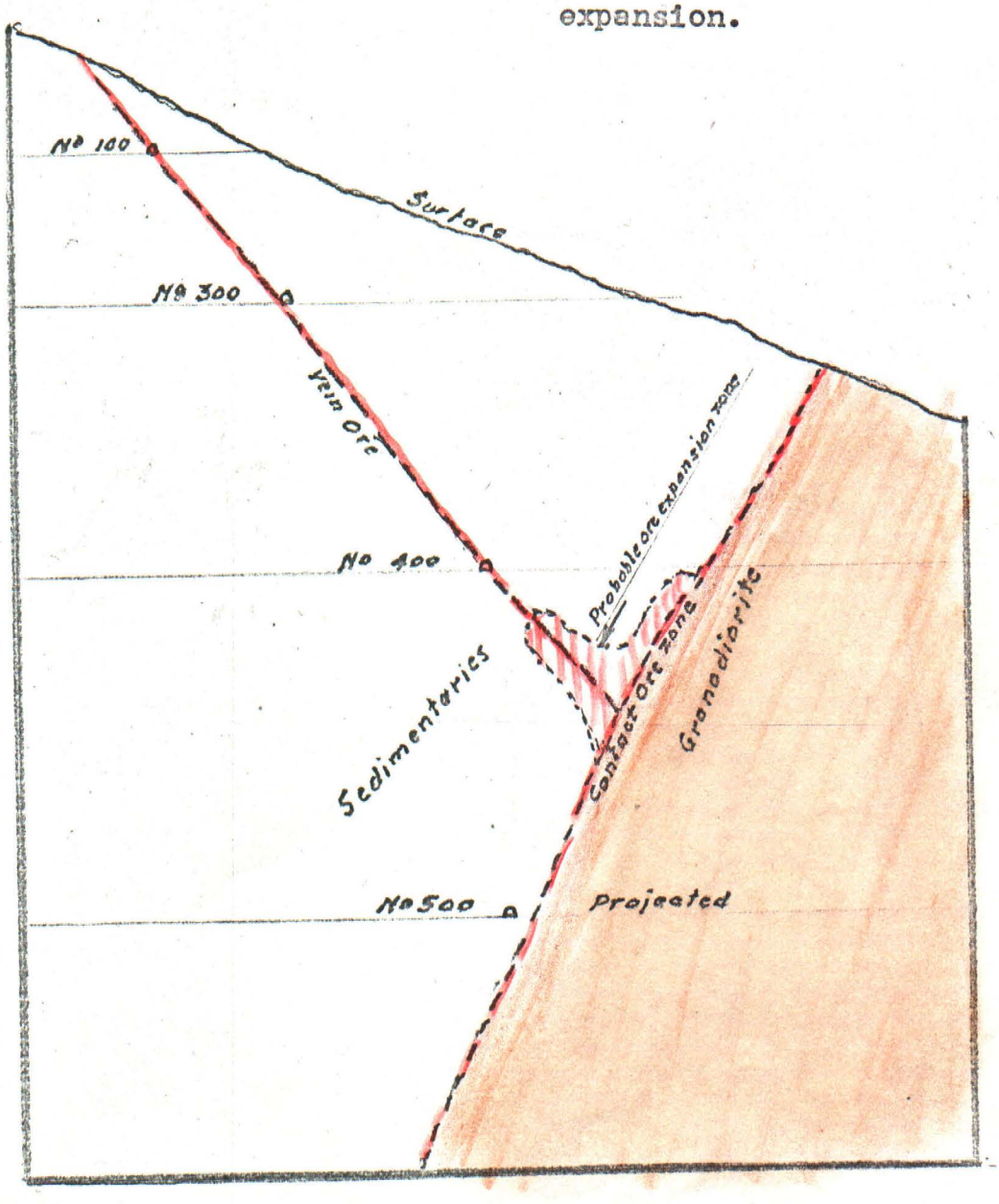
all situate in portions of Sections 21 and 22, and in unsurveyed Section 16 of T. 21 N., Range 38 East, Mt. Diablo Mer., Churchill County, Nevada.

Proposed target area of Bx diamond drilling

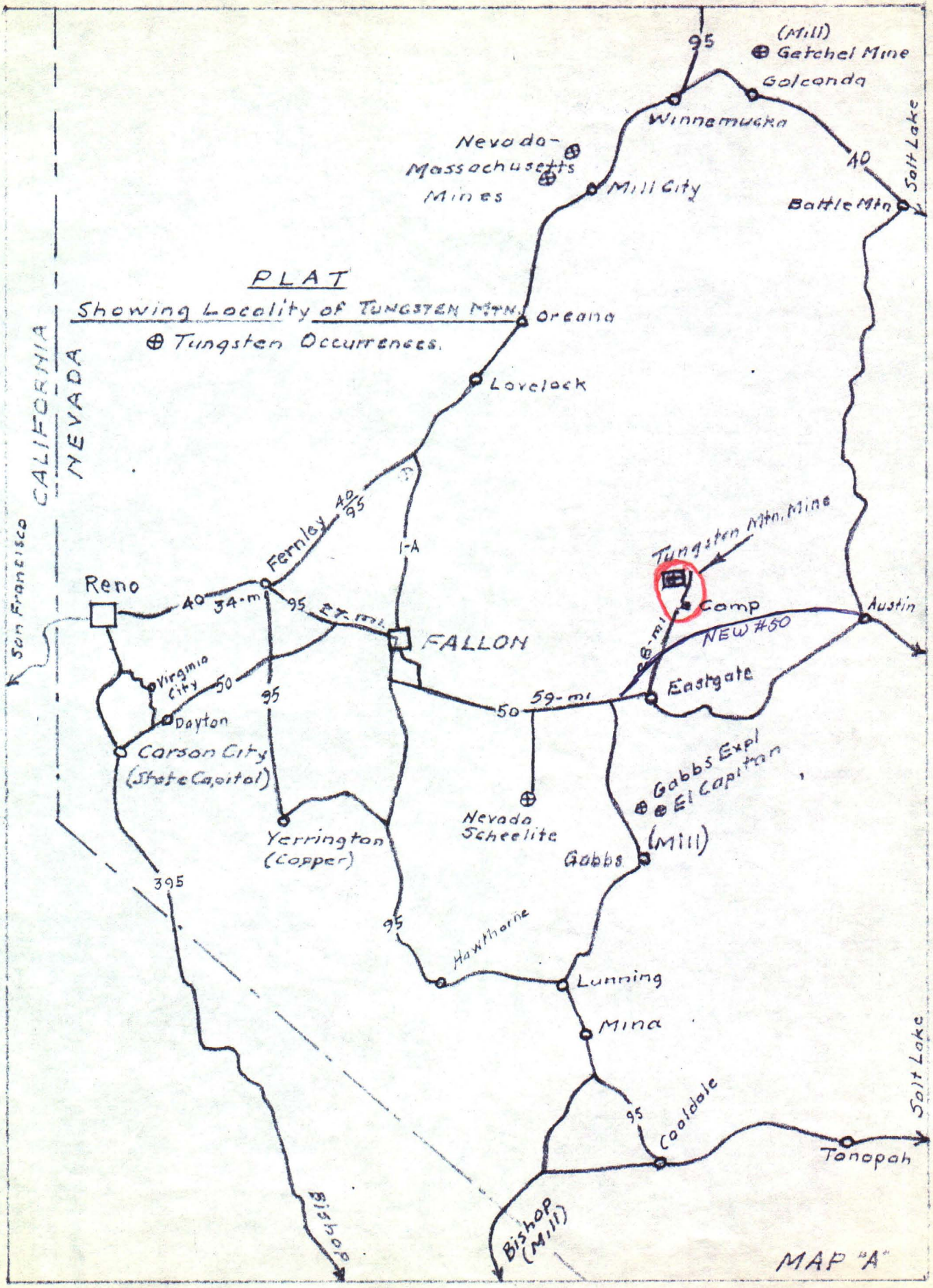
to prove greater ore widths with enriched grade at point of intersection.

DIAGRAMATIC CROSS SECTION
100-feet to 1-inch

Showing approximate zone of Ore Vein juncture with Contact Ore zone and illustrating resultant probable ore expansion.



Jim



Change Highway

(8) Item 4
6 Feb 1967

THE TUNGSTEN MOUNTAIN (HILLTOP MINE)
CHURCHILL CO., NEVADA

Authorization

The examination of the Tungsten Mountain Mine was made at the request of Mr. Arthur E. Symons of Seattle, Washington, who represents the bondholders of the company. Accompanied by Mr. Edwin Stocker, I left Seattle on Thursday, January 19 and returned to Seattle on Monday, January 23, 1967. We visited the mine and surroundings on January 20, 21 and 22.

Location and General Features

The Tungsten Mountain (Hilltop) Mine is located in Churchill County, Nevada, about 60 miles northeast of Fallon. The exact location and other pertinent features such as elevation, climate, power, water, transportation, history, etc. are adequately described elsewhere [1] and need not be repeated here.

Geology

Mr. Lakes [1] describes the host rock as "argillites, shale, slate and hornfels interbedded by narrow limestone beds". These sediments and metasediments form a steeply dipping contact with a younger granodiorite intrusive that strikes in a northwesterly and westerly direction. It is along the easterly contact of the sediments and the granitic stock that the tungsten deposits now in evidence have been formed.

In general, the ore has been classified as a combination of fissure replacement and contact ore. The fissure replacement occurs in a vein (s) within the sediments, striking in a north-south direction and dipping to the east. The contact ore zone, in so far as it is outlined, is exposed on No. 4 level along the contact of the granodiorite and the sediments. It should be observed that since the vein deposit dips to the east and the lime-granite contact appears to dip to the west, then the conflux of the two described orebodies should be somwehere between the 4 and 5 levels. A continuation of the ore below the No. 5 level should show a reverse dip.

Because of limited time, the surface and underground geology at Tungsten Mountain was observed in a general way only. Nevertheless, the contact zone, the massive granitic stock and the sediments were all noted and the general geology as described by Mr. Lakes is presumed to be correct.

Observations on Nevada Tungsten

"Tungsten occurs principally as scheelite ($CaWO_4$, which forms an isomorphous series with powellite, the calcium molybdate) in contact deposits developed in lime-rich rocks by granite intrusions" and "contact deposits have supplied the major portion of U. S. and Nevada production"[2]

At the Nevada Scheelite mine, in Mineral County about 40-50 miles south of Tungsten Mountain, "278,000 units of WO_3 have been mined from underground workings extending to a depth of over 400 feet. The ore contained 0.6 to 1.5% WO_3. Scheelite occurs around the margins of a small granodiorite body in tactite limestone".[2]

Other tungsten deposits in Western Nevada show a similar geologic setting with grades varying from 0.2 to 2% WO_3. Hence it is apparent that the Hilltop mine falls within the typical pattern of tungsten mines located in the western part of the State.

Mineralogy

The principal economic mineral and the one of sole interest to this date is scheelite. Pyrite is present and readily visible, associated with the scheelite in a quartz gangue. The base sulfides of copper, lead and zinc are also reported but were not directly observed. Molybdenum, vanadium and bismuth are frequently found in contact deposits and these are reported in minor amounts at Tungsten Mountain. Should a detailed sampling program be carried out this location, it is recommended that period checks be made for these elements. In addition, it is recommended that the pyrite be checked for gold and silver, particularly if an iron concentrate is made in the process of upgrading the tungsten.

Mine Workings

The mine has been opened on four levels plus an intermediate level. At the time of this examination, the 1st and 2nd levels were caved, hence only the 3rd, 4th and intermediate levels (between 3 & 4) were observed. The 5th level adit has been advanced the short distance of about 150 feet along the contact and within the stock.

On January 21st, entrance to the mine was made on the 4th level which was followed to the south face. Thence up the main raise manway to the intermediate level and finally up to the 3rd level which was observed from the north to the south face and exit. Upon emergence from the 3rd level, a climb was made to the base of the 1st level which is now caved. The 2nd level is also caved and inaccessible.

Small amounts of ore have been gouged from the back of the 4th level, but in general, this level is intact and except for timber in a few places, has remained open unsupported. The ore on the 4th is referred to as "contact ore" from the mine entrance to about 250 feet from the portal. From here it continues spotty to near the main raise where the values improve. From a short distance beyond the raise and on to the south face, tungsten values appear quite low.

Open stoping has extracted ore from a point about 50 feet below the intermediate level to the 3rd level. The ore vein at this location consists of about 4 feet of good ore along the hangingwall and about 2-3 feet of lower grade ore along the footwall, terminating in a 1 foot layer of gouge. Below the intermediate level the ore has been mined full width, taking both the higher grade ore and the lower grade ore along the footwall with the gouge that sloughed off with the blast. Above the intermediate, the higher grade ore along the hangingwall has been selectively mined to a width of about 4 feet. Ore pillers for support have been left throughout this stoped area; the stope length is about 75 feet.

On the 3rd level, a combination of stoping and raising goes to about 25 feet above the level. At this horizon, a sharply rising footwall cuts off the ore. What, if anything, may be found above this cut-off remains to be seen. As previously mentioned, the 2nd and 1st levels are caved.

Values

Mine production is reported to be 958 tons of 1.61% WO_3 from the No. 1 level and 6310 tons of 0.97 WO_3 from the rest of the mine including ore from development and stoping. By eliminating low grade ore, Mr. Lakes presents an indicated ore grade of 1.17% WO_3.

At the time of writing, no assay maps of the mine could be made available; however, an assay map of the 4th level is reported to have been made. This is most significant and important since it will give an indication of the values to be found through additional exploration. For instance, should the No. 5 drift be advanced in ore, for lack of other information it would be wise to assume that tungsten values encountered on the 5 would be similar to those found on the 4.

Ore Reserves

Previous reports 1/ indicate the stoping width to be an average of 6 1/2 feet of ore, and the "probable and possible" tonnage to be 26,452 tons since reduced by structural interruption that cut off ore 25 feet above No. 3 tunnels' N. W. extension. Such a tonnage may exist in the mine but it will require exploration raises, sampling and measurement to confirm it.

Exploration Targets

Additional ore may be found by exploring the hangingwall area of the No. 3 level. (The possibility also exists of ore in the footwall along parallel structures, although this seems unlikely since it is more remote from the granitic stock). In addition, ore might be found by raising above the 3rd tunnel beyond the cut-off previously referred to. The main target, however, should be the 5th level along the contact and the 4th level driven as a crosscut and thence as a drift along the contact. The 5th would be the

better target since it has been already started alongnthe contact and should ore be encountered at this horizon, it could be explored by raising and drifting on the 4.

Although no accurate prediction can be made as to the vertical extent of the Hilltop orebody, tungsten deposits in general can be expected to go to some depth (The Nevada Massachusetts extended to over 1400 feet). Hence an exploration risk on the 5 would be a legitimate and recommended target.

One question, however, that remains unanswered at this time is the anticipated grade of ore that may be encountered. Records are available for overall grade of ore mined throughout the mine but not (at this date) of individual levels or stopes. Every effort should be made to obtain the assay map of the 4th level and if it cannot be obtained, then this drift should be systematically sampled before work on the 5th adit is planned.

The entire contact zone of granite-lime is a legitimate target for exploration. This contact bears southeast from the No. 5 portal for a distance of some 1200 feet, thence westerly for a distance of at least 800 feet. To drive level 5 to a point below the extension of ore showings on the upper levels will require about 1000 feet of drifting from the present face.

Mine Equipment

Equipment at the mine is limited and consists of the following:

An Eimco 12B mucking machine in good condition
A few mine cars in average condition
An old portable compressor that has been partly stripped
A diesel powered semi-portable compressor that appears in good condition.
An air powered locomotive
Several hundred feet of new mine rail ready for use.
One stoper only observed.

Ore Potential

A plan of the 4th level shows it to be about 750 feet in length of which 70-75% or about 520 feet is in ore; the estimated width is 4-6 feet. Should the same ore length and same width be found on the 5th level and should the values continue between levels, then a potential tonnage between these two levels is:

$$\frac{520' \times 182' \text{(vertical distance)} \times 5}{10}$$

= approximately 47,000 tons

Available ore above the 4th level is estimated at 40-50% of the original reserve or about 10,000 tons. Thus, assuming ore is found on No. 5 level, the potential tonnage down to that horizon at a distance of 1000 feet from the portal is estimated at 57,000 tons. It should be emphasized that this is a potential (or a target) assuming conditions as noted above.

Mill

The Tungsten Mountain flow sheet includes primary and secondary crusher, one ball mill and classifier, concentrating tables, thickener, roaster and magnetic separator and flotation cells within the building but not yet installed.

The mill frame is of solid steel construction with corrugated sheet metal covering roof and sides; the building is totally enclosed. The slab concrete for the floors is cracked but the concrete bases for heavy equipment are intact.

The secondary (cone) crusher will have to be replaced. The rake classifier may have to be replaced by a cyclone to fully develop the capacity of the ballmill. Unfortunately, all of the electrical wiring has been removed, as well as many of the smaller motors. The main motors - crusher. ball mill etc. are in place. The diesel electric generating units have been removed.

In summation, the mill is for the most part intact but will require power units and rehabilitation as noted plus installation of the flotation cells.

Should a decision be made at a later date to place the mill in operation, it is strongly recommended that metallurgical test work be carried out to determine whether a tungsten concentrate suitable for shipping can be made by gravity and flotation, thus eliminating the roaster and magnetic separator.

Future Market for Tungsten

The future market for tungsten is difficult to forecast because of the relatively large amount in government stockpile and its gradual release to industry. The demand for tungsten is quite high but the price is not expected to increase because of the G S A stocks.

Personal communication with U.S. Bureau of Mines officials in Seattle and with Nevada Bureau of Mines officials at Reno has revealed that, in their estimation, the price of tungsten will remain more or less at its present level for an indefinite period of time.

Observations

A compilation of all information available to date on the Tungsten Mountain Mine yields the following observations:

This mine has produced a limited amount of relatively good ore

The deposit has a reasonably good chance of continuing to some depth.

For lack of other information, it can be assumed that the value of new ore discovered should be comparable to that now exposed on the 4th level.

From an exploration viewpoint, there is reasonably good chance of developing additional ore in appreciable quantities.

Conclusions and Recommendations

1. Make every effort to obtain the assay map of the 4th level.
2. Failing "1", chip or channel sample the back of the 4th level (plus crosscuts), plot values on an assay map and calculate a weighted average and width of ore.
3. If "1" or "2" is favorable, drive the 5th level drift south along the contact for about 1000 feet.
4. If "3" is favorable, probe the walls of the drift with relatively shallow diamond drill holes. Spacing to be determined as the work progresses but in the neighbourhood of 200 feet.
5. If "4" is favorable, complete the initial development by raises to the 4th level and appropriate drifting on that horizon.

Donald L. Anderson

Seattle, Washington
February 6, 1967

Donald L. Anderson
Professor Mining Engineering
University of Washington

Bib.:

1/ Report on the Tungsten Mountain Mining Property, Churchill Co., Nevada by Arthur Lakes; Jan. 30, 1962

2/ Nevada Bureau of Mines Bulletin 65, page 155

Item 4

ARTHUR LAKES
MINING ENGINEER
700 FOREST STREET
RENO, NEVADA
TELEPHONE 323-8910

August 5, 1969

Wm. G. Kane, E. M.,
1002 Kampman Dr.,
San Antonio, Texas

Dear Mr. Kane:

In accordance with your phoned request I have prepared the following sequel to my 1962 report on Tungsten Mountain Mining Property to bring up to 1969 conditions.

I emphasize the two important exploratory possibilities (1) the probable juncture of the "vein zone" with the "Contact zone" which will occur midway between No. 4 and No. 5 Levels. (2) the other extensive and highly important ore zone possibilities along the periphery of the acid granodiorite (source rock) intrusion into the enclosing sedimentaries which contain the ore favorable limy (host) rock formations. I enclose maps, copies of which you have, but these have been colored to expedite understanding.

NEW ORE EXPLORATION POSSIBILITIES In addition to the 1962 ore possibilities outlined in the report are the two targets outlined above.

(1) The enclosed Diagrammatic Section shows my conception of probable results of dip juncture of the (a) ore vein zone with (b) the ore bearing contact zone. Basis for consideration is the tendency for structure junctures to open expanded zones for ore deposition, often including enriched zones. One of numerous examples is the Tungstar scheelite mine, Bishop, Calif., whose chief and important production of high grade scheelite is reported to me to have been localized at similar juncture. I believe that this juncture should provide a very material and important addition to the 1962 Hilltop mine ore estimate.

(2) From enclosed map you will note that the granitic intrusion-roughly oval in surface exposure-is indented at its NW exposure by injection of older sedimentaries (which include the ore favorable formations) into the granitic mass forming a "bay" of sediments with south contact trending westerly and NE contact trending NW. It is in this "bay" that the mine occurs as well as the close by "New show" which two constitute the chief ore presently disclosed on the property.

I divide the granitic perimeter into two sections (a) the "inside or bay section" which has about 4000-feet surface exposure, about 1900-feet along its NE rim where the presently exposed contact ore occurs and whose SE extension constitutes exploratory targets at No. 4 and No. 5 levels. Its southern contact, extending west, has not been explored although it is to be expected that ore favorable formations will contact it. (b) the "outside perimeter" that extends about 10,000 feet along contact with enclosing sedimentaries which undoubtedly

contain ore favorable formations that offer good chances for ore bodies where they contact the granitic rock. I have discussed this concept with experienced geologists and mining men who agree that it is sound and worthy serious consideration.

WAGES, COSTS ETC. The rather isolated locality of the property may have some effect on wages. However it is estimated that the following wage scale will apply: Experienced miners $4 per hour, mechanics $5 per hour, experienced core driller $5 per hour. In this operation there would be no differentiation between miners and muckers, each alternating on the job at same wages. A big bulldozer with ripper would cost $35 per working hour inclusive of operator, fuel and other charges. It would cost approximately $100 or more for transporting bulldozer to the job according to locality of origin.

The conditions indicate that all work possible should be on contract basis whereby contractor absorbs insurance and other wage obligations into his unit charges.

I have been notified that No. 5 Tunnel can be run, on contract basis, for $65 per foot up to 800-feet advance from present face (150-feet along contact strike) The work would be conducted along the contact with core holes drilled each side at 50-foot intervals. The downward extension of sedimentary-granitic contact extends below the main valley floor which is 1900-vertical feet below No. 3 Tunnel or 1600-feet below No. 5 Tunnel.

An estimate of drilling costs by an experienced driller indicates that they would vary from about $7 to $9 per foot, dependent upon ground conditions. It was suggested that on account of the small footage total the company rent a drill, rods, buy bits, absorb diamond loss and hire the work done thereby probably reducing costs.

DRILLING In my 1962 report I outlined 1600-feet of diamond (core) drilling. Eight hundred feet of this was into walls at Nos. 3-Intermediate-and 4 Levels. Until it has been retimbered and rehabilitated the work in No. 3 would be deferred. Drilling from the Intermediate would also be deferred until later. The targets are noted in the report.

No. 4 Level, which is in excellent condition, is the salient locality for drill exploration (a) into the southerly continuity of the Contact ore zone at the level, (b) Test holes to allocate "Vein ore zone" position outside present No. 4 developments, (c) Test holes down into the "juncture zone" that includes both vein ore and contact ore structures.

On the large scale map herewith I have located in red preliminary holes to test southerly extension of the Contact ore zone at No. 4 Level. Success of these holes will lead to more extensive program Test holes to allocate "Vein ore zone" outside No. 4 Tunnel are marked in red on the map. The test holes into Contact ore zone total about 300-feet, those into Vein orezone another 300-feet. Two holes down from No. 4 Level into the juncture zone between No. 4 and No. 5 levels total another 300-feet. Total preliminary holes 900-feet which

at about $9 per foot would cost $8100.

MARKETING SCHEELITE CONCENTRATES A personal visit to Kennametal processing plant at Fallon, Nev. 82-miles over gravelled road (17-miles) and paved Interstate highway (65-miles) provided the following.

Basis of payment at $1.50 pershort ton unit (20#) less than United States General Service Administration price ($40 per unit at that date which makes K. base price $38.50). Required 60% WO3. At 60% down to 55% 5¢ per # penalty, 55% to 50% 10¢ penalty. No charge for processing. Penalized on copper, lead, zinc, of which Tungsten Mountain ore has nil.

RECOMMENDATIONS Tungsten Mountain's past production and ore developments are considered minor in comparison with the future potential. The venture should be considered (a) essentially on its future possibilities as outlined, (b) its good past performance inadequately conducted on a promotional basis.

The exploration and development potentials warrant an expenditure of at least $100,000 divided into (a) Drive No. 5 Tunnel at direct contract cost of $52,000. (b) About $15-20,000 controlled bulldozer exploration along the "inside perimeter" and about 60% of the "outside perimeter" which is available for bulldozer work (the rest in precipitous areas subject to surface investigation for the most part). (c) Preliminary diamond drilling $8-10,000. Balance for overhead, technical assistance, and contingencies.

MILL As the rehabilitation of the mill will largely depend upon metallurgical tests for changes and additions I am not including it in this summary.

Reno, Nevada
August 5, 1969

Arthur Lakes

(Arthur Lakes)

ARTHUR LAKES
MINING ENGINEER
700 FOREST STREET
RENO, NEVADA
TELEPHONE 323-8910

ADDENDA "B"

I have prepared the following sequel to my 1962 Tungsten Mountain Report in order to bring up to 1969 conditions and considerations.

I emphasize the two important exploratory possibilities (1) the probable juncture of the "Vein zone" with the "Contact zone" which will occur midway between No. 4 and No. 5 Levels. (2) The other extensive and highly important ore zone possibilities along the periphery of the acid granodiorite (source rock) intrusion into the enclosing sedimentaries which contain the ore favorable limy (host) rock formations. I enclose maps "D" and "I" illustrative of the concepts.

NEW ORE EXPLORATION POSSIBILITIES In addition to the 1962 ore possibilities outlined in the report are the targets outlined above.

(1) The attached Diagrammatic Section shows my conception of probable results of dip juncture of the (a) ore vein zone with (b) the ore bearing contact zone. Basis for consideration is the tendency for structure junctures and intersections to open expanded zones for ore deposition, often enclosing enriched zones. An example is the Tungstar Scheelite mine, Bishop, Calif. whose chief and most important production of high grade scheelite is reported to me to have localized at similar juncture. I believe that this juncture should provide a very material and important addition to the 1962 Mine estimate.

(2) From enclosed Map "I" it will be noted that the granitic intrusion-roughly oval in surface exposure- is indented at its NW exposure by older sediments which include the ore favorable beds thus forming a "bay"of sedimentaries with south contact trending westerly and its NE contact trending NW. It is in this "bay" that the mine occurs as well as the close by "New show" which two constitute the chief ore presently disclosed on the property.

I divide the granitic perimeter into two sections (a) the "inside or bay section" which has about 4000-feet surface exposure, about 1900-feetalong its NE rim where the presently exposed contact ore occurs and whose SE extension constitutes exploratory targets at No. 4 and No. 5 levels. Its southern contact, extending west has not been explored though it is to be expected that ore favorable formations will contact it. (b) the "outside perimeter" that extends about 10,000 feet along contact with enclosing sedimentaries which undoubtedly contain ore favorable beds that offer good chances for ore bodies where they contact the granitic rock. This geologic concept constitutes a major factor of consideration of this property.

DRILLING In my 1962 reprt I outlined 1600-feet of diamond drilling. Eight hundred feet of this was into walls at No. 3, Intermediate, and No. 4 Levels. The No. 3 tunnel has largely caved and until it has been rehabilitated and retimbered this wall drilling is deferred. Drilling from the Intermediate would also be deferred until

later. The targets are noted in the 1962 report.

No. 4 Level, which is in excellent condition, is the salient locality for drill exploration (a) into southerly continuity of the contact ore zone at the Level, (b) Test holes to allocate "vein ore zone position outside the present No. 4 developments, (c) Test holes down into the "juncture zone" which includes both vein ore and contact ore structures.

Success of these holes will lead to more extensive program. Test holes into SE extension of contact ore zone total 300-feet, those to allocate vein ore zone another 300-feet, Two preliminary holes down from No. 4 Lvel into the juncture zone midway between No. 4 and No. 5 Levels total another 300-feet. Total preliminary holes 900-feet which at about $9 per foot would cost $8100.

MARKETING SCHEELITE CONCENTRATES Nevada Scheelite Co., subsidiary to Kennametal Cpn., has a processing plant at Fallon, making tungsten carbide. This plant is 82-miles from Tungsten Mountain mill of which 17-miles is gravelled County road and 65-miles is over Interstate Highway 50. The company purchases scheelite contentrates at following terms:

Basis of Payment at $1.50 per short ton unit (20#) less than United States General Service Administration price ($40 per unit at time of inquiry). Require 60% WO3. At 60% down to 55% is at 5¢ per pound penalty. At 55% down to 50% is a 10¢ penalty. No charge for processing. Penalized for copper, zinc and lead of which Tungsten Mountain scheelite has very minor amounts as is noted on page 15 of the 1962 Report.

WAGES, COSTS, ETC. The rather isolated locality of the property may have some effect on wages. However it is estimated that the following wage scale will apply. Experienced miners at $4 per hour, mechanics $5 per hour, experienced core driller $5 per hour. In the operation there would be no differentiation between miners and muckers, each alternating on the job at same wage. A big bulldozer with ripper would cost $35 per hour worked inclusive of operator, fuel, and other charges. It would cost approximately $100 or more for transportation to the job according to locality of origin.

The conditions indicate that all work possible should be on contract basis whereby contractor absorbs insurance and other wage obligations into his unit charges.

I have been notified that No. 5 Tunnel can be run on contract basis for $65 per foot for the 800-feet advance from present face recommended. The work would be conducted along the contact zone with core holes drilled each side of the tunnel at 50-foot intervals. Downward extension of the sedimentary-granitic contact extends below the main valley floor which is 1900-vertical feet below No. 1 Tunnel or 1600-feet below No. 5 Tunnel.

An estimate of drilling costs by an experienced driller

indicates that the holes would vary from $7 to $9 per foot drilled, dependent upon ground conditions. It was suggested that, account of the small footage total, those involved in the exploration program rent a drill, roads, buy bits, absorb diamond loss, and hire the work done. It is quite probable that success of the preliminary drilling will lead to expansion of the program.

RECOMMENDATIONS Tungsten Mountain's pastproduction and ore developments are considered minor in comparison with the exploration and future potentials described herein. The venture should be considered on its future possibilities despite past good showings in the limited area.

The exploration and development potentials warrant envisaging $100,000 divided into (a) Drive No. 5 Tunnel at direct contract cost of about $52,000, (b) About $15-20,000 bulldozer work along the contact area under control of adequate geological supervision, (c) preliminary core drilling $8-10,000 also geologically controlled.

MILL The rehabilitation of the mill will largely depend upon modern metallurgical investigation for changes and additions outside this summary.

Reno, Nevada
August 8, 1969

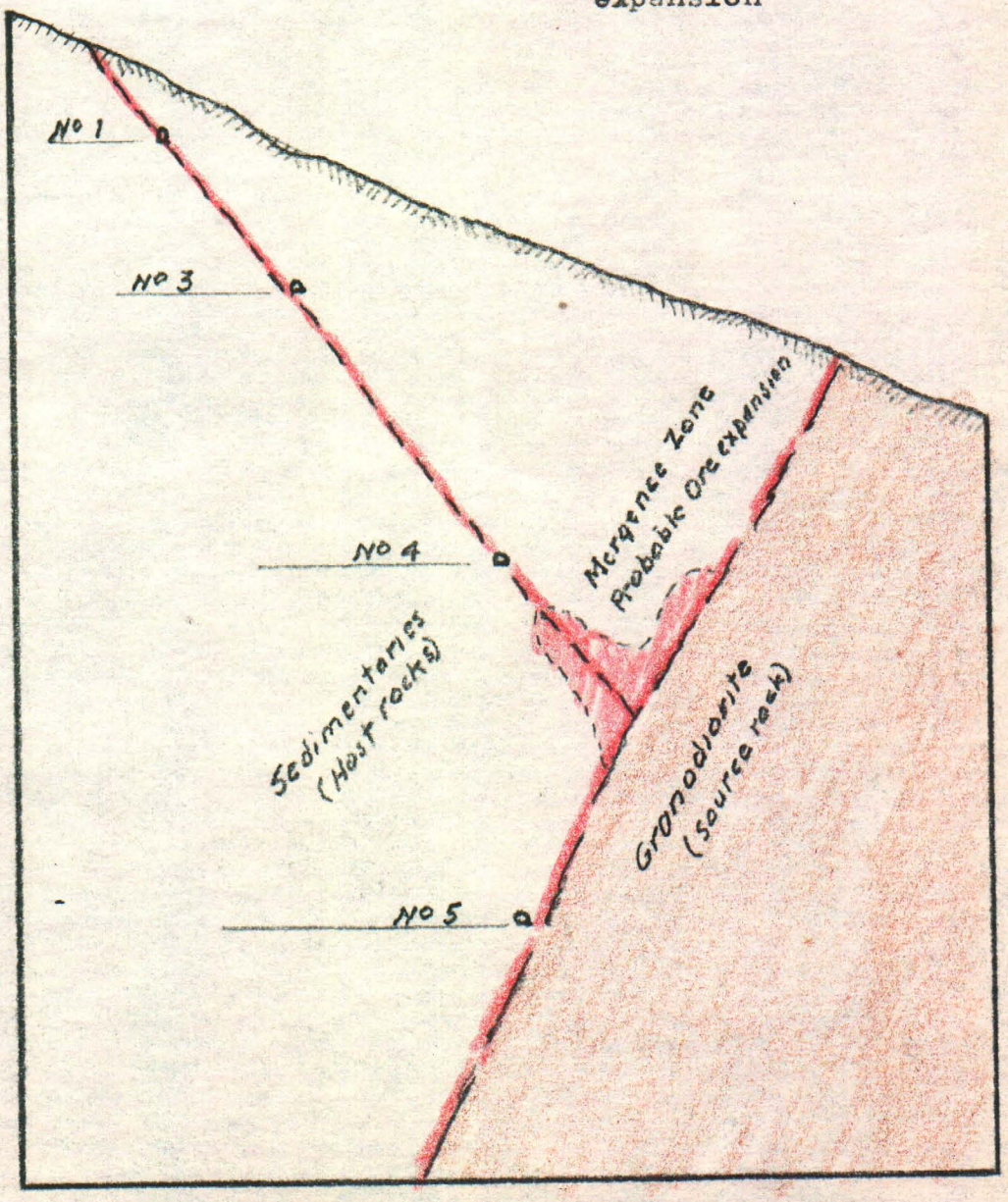
Arthur Lakes

(Arthur Lakes)
Nevada Registered Engineer No. 1408
Life Member British Columbia Assn. of Prof. Eng.

DIAGRAMMATIC CROSS SECTION

100-feet to 1-inch

Showing approximate zone of Ore Vein juncture with Contact Ore zone and illustrating resultant probable ore expansion



A D D E N D A

COPY

LABORATORY REPORT, ABBOT A. HANKS, INC.
624 Sacramento Street
San Francisco 11, California

Lab. No. 65823 Date March 29, 1954

Submitted by Tungsten Mountain Mining Co. Sample Mark: 1
Box 456, Fallon, Nevada

QUALITATIVE SPECTROGRAPHIC ANALYSIS
Metals found
and Estimated Percentage Range

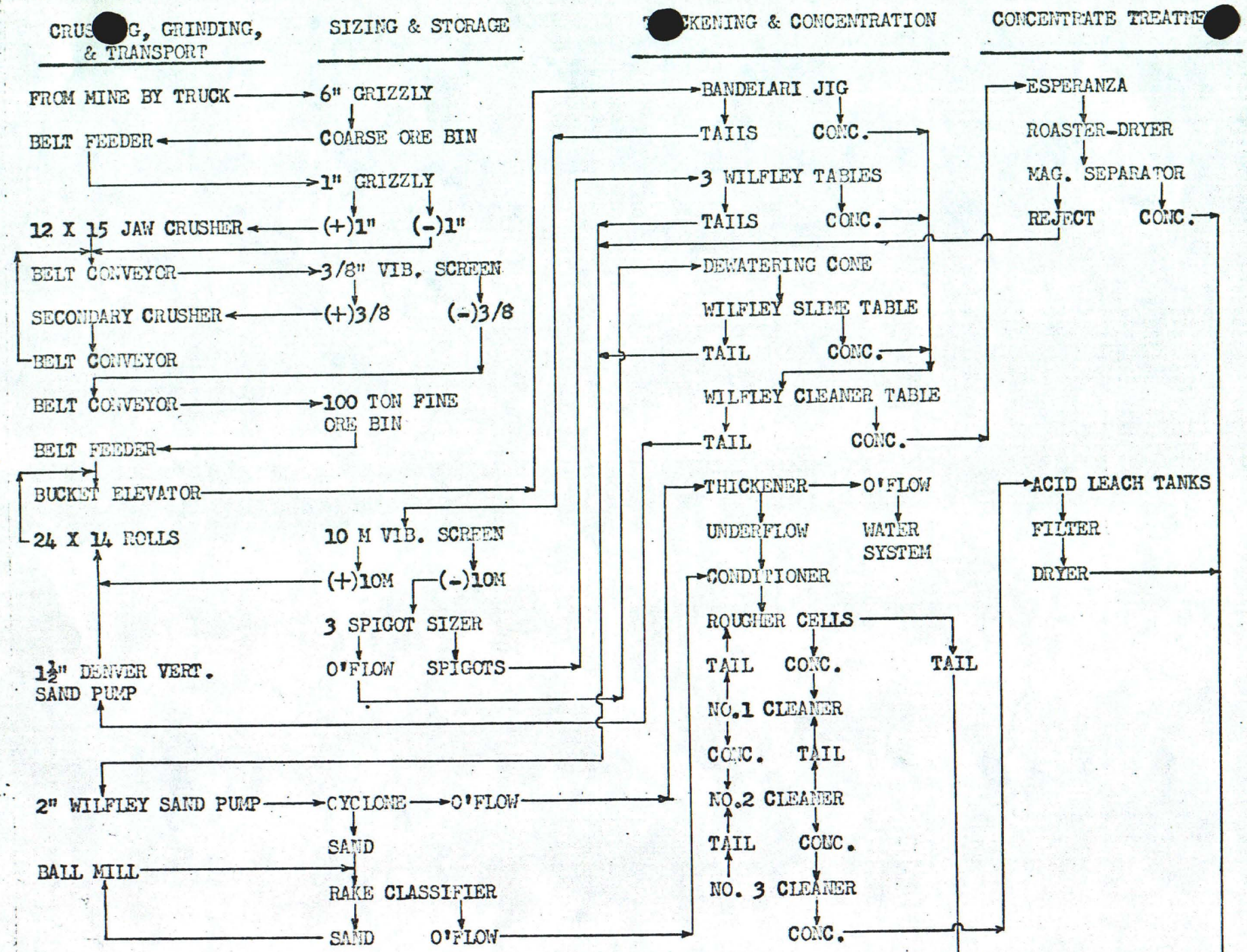
Less than .03%	.03% to .30%	.30% to 3.0%	3.0% to 30%	30% to 100%
Nickel	Potassium	Magnesium	Silicon	
Cobalt	Titanium	Manganese	Aluminum	
Chromium	Molybdenum	Sodium	Calcium	
Copper	Lead	Tungsten	Iron	
Bismuth	Vanadium			
Strontium				
Tin				
Zinc				

Respectfully submitted

ABBOT A. HANKS, INC.

By Original signed by

Martin E. Quist
Spectro-Chemist.

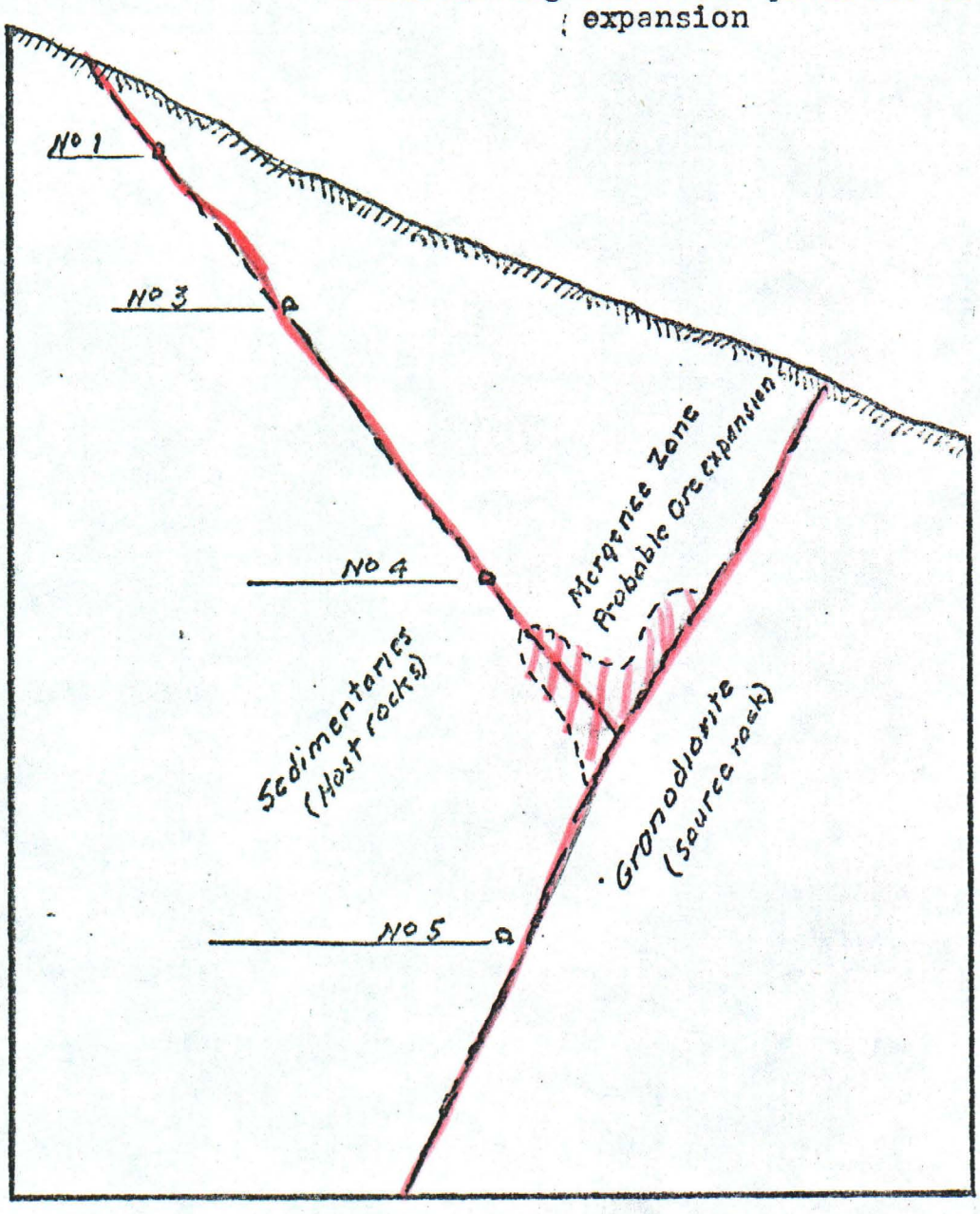


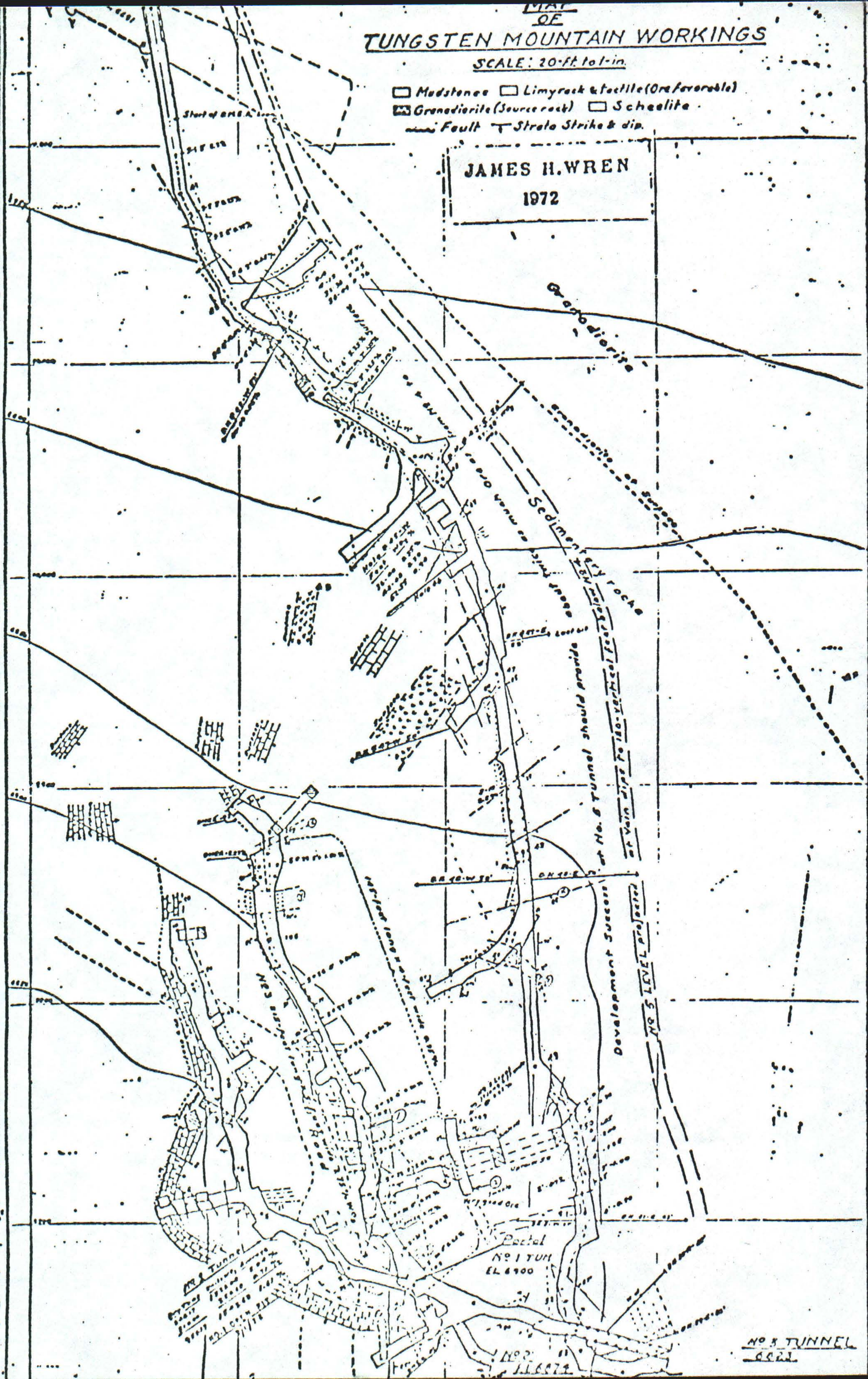
RECOMMENDED REALIGNMENT OF THE TUNGSTEN MOUNTAIN MILL AS PER METALLURGICAL OBSERVATIONS OF : James H. Wren, Ph.D., February 24, 1974

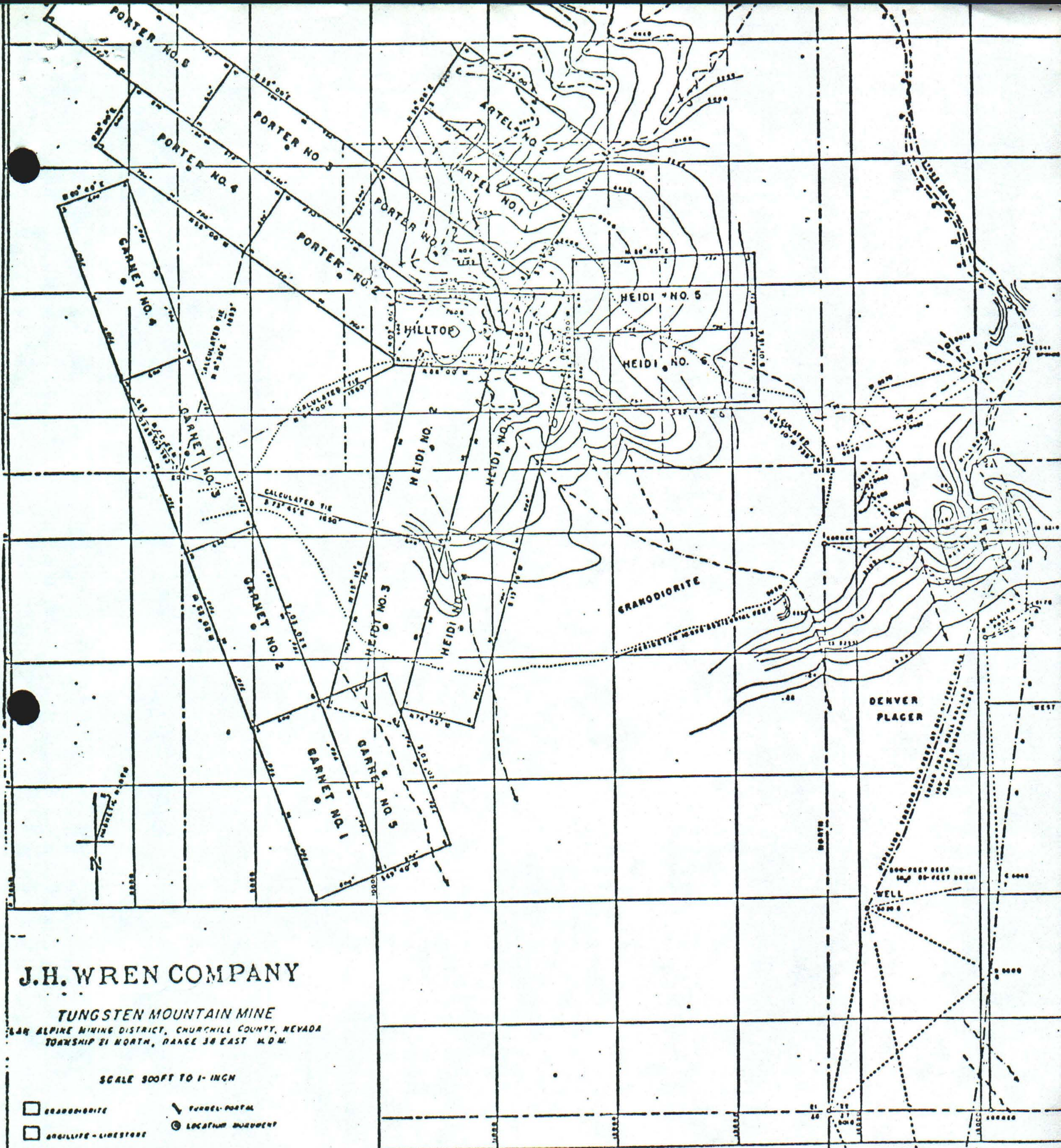
.DIAGRAMMATIC CROSS SECTION

. 100-feet to 1-inch

Showing approximate zone of Ore Vein juncture with Contact Ore zone and illustrating resultant probable ore expansion




MAP
OF
TUNGSTEN MOUNTAIN WORKINGS
SCALE: 20-ft. to 1-in.
Mudstones
Limyrock & tactite (Ore favorable)
Granodiorite (Source rock)
Scheelite
Fault
Strata Strike & dip.
JAMES H. WREN
1972
Granodiorite
Sedimentary rocks
Development Success
No. 5 LEVEL projected
Portal
No. 1 TUN
EL 6900
No. 5 TUNNEL



J.H. WREN COMPANY

TUNGSTEN MOUNTAIN MINE

LAS ALPINE MINING DISTRICT, CHURCHILL COUNTY, NEVADA
TOWNSHIP 21 NORTH, RANGE 38 EAST M.D.M.

SCALE 500FT TO 1- INCH

TUNNEL-PORTAL

LODE CLAIMS:

HILLTOP
PORTER NO 1 – NO 3
ARTEL NO 1 – NO 2
HEIDI NO 1 – NO 6
GARNET NO 1 – NO 5

PLACER CLAIM:

DENVER PLACER

MILL SITE:

FIVE ACRE MILL SITE CLAIM

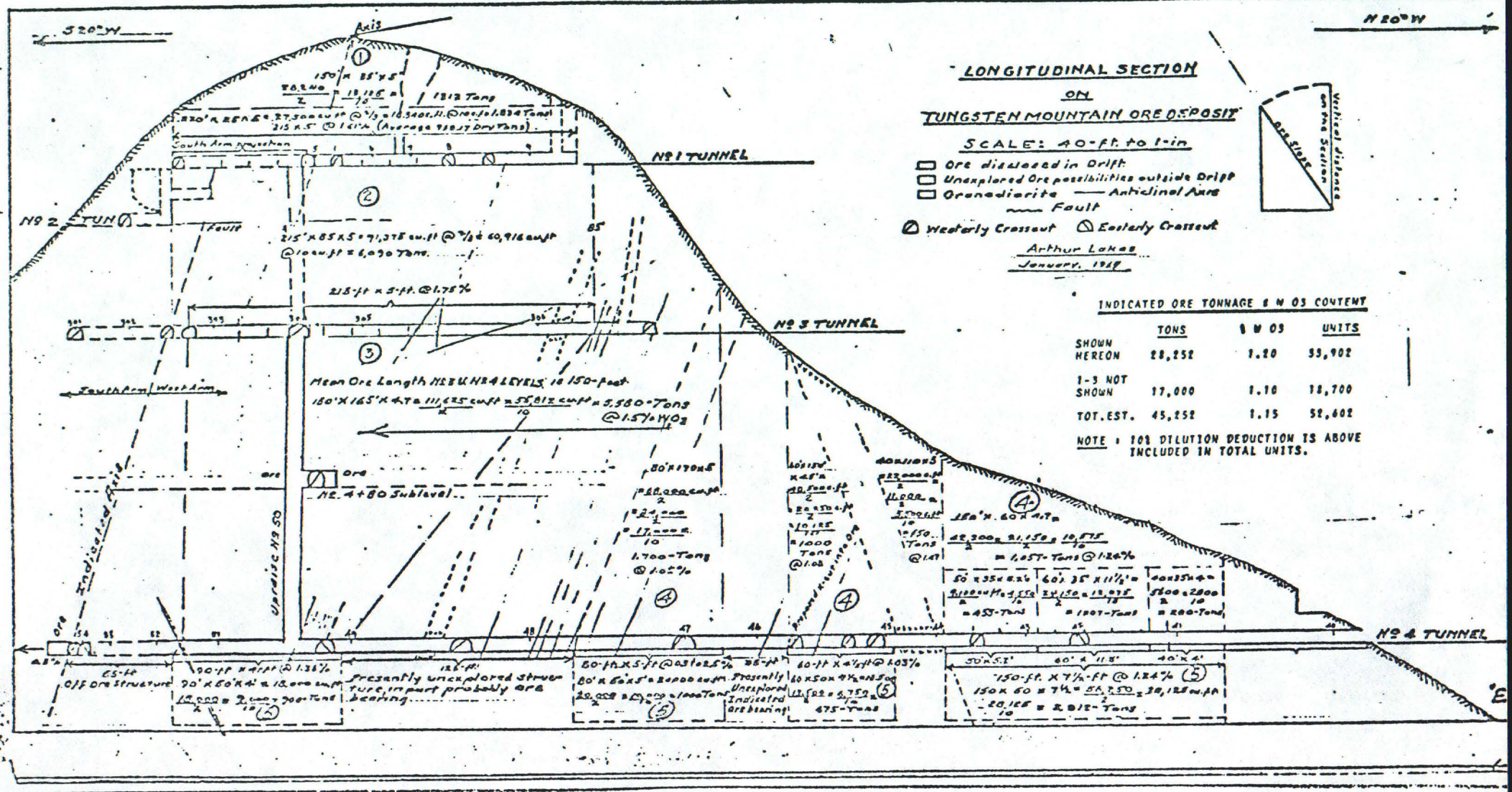
7 – 2 – 72

TUNGSTEN MOUNTAIN MINE

Underground development ...... 3,100 feet.
Tungsten depth proven.......... 500 "
Tungsten probable depth 1,000+

MILL, 100 tons capacity, gravity, flotation, magnetic separation, concrete foundation and flooring, steel frame, sheet iron sheathed. Historical mill head [illegible], plus, ? plant, 3,300' waterline buried, four miles of road facilities, stockpiling area. Proven units : 50,000. Possible units : 100,000.

James H. Wren Ph.D.
January 1, 19[illegible].



INDICATED ORE TONNAGE & W O3 CONTENT

	TONS	% W O3	UNITS
SHOWN HEREON	28,252	1.20	33,902
1-3 NOT SHOWN	17,000	1.10	18,700
TOT. EST.	45,252	1.15	52,602

NOTE : 10% DILUTION DEDUCTION IS ABOVE INCLUDED IN TOTAL UNITS.

Item 4

Mine Management
Mine Production

License
No. 8950

Development
Exploration

J. H. WREN & COMPANY

Mining Contracting Engineers

Cable Address
WRENCO

Post Office Box 2021
Reno, Nevada 89505
Phone (702) 322-4840

May 25, 1970

SUBJECT : TUNGSTEN MOUNTAIN MINE RECOMMENDED EXPLORATION AND DEVELOPMENT. MILL REHABILITATION.ECONOMICS.

1. EXPLORATION-DEVELOPMENT :

With object of an efficient, long range, smoothly functioning operation, it is recommended as follows :

a). Drive the No. 5 Level Adit some 600' on the vein to get under the chief ore shoots on the No. 4 Level. Subsequently this entry will be required to proceed an additional 600' plus, in-order-to get below the excellent grade ore shoots produced out of the No. 1 and No. 2 Levels. Additionally, the No. 5 Level may be driven into the right angle turn of the intrusive-sediments contact some 1,200' from the present penetration of the No. 5 Level. Cost estimate of the initial 600' of advance is as follows:

4" X 6" ties spaced on 24" centers, 3" airline, 1" waterline, 14" ventilation pipe, 20# rail, 1/2 of 1% track grade, 5' X 7" in-the-clear @ $60 per Ft. 600' = ...$ 36,000.00

b). In-order-to release production ore above tbe No. 4 Level , passed down to the No. 5 ore haulage system two three compartment raises should be driven on each side of the best grade encountered in the 600' preliminary drive. They can be used for a shrink stope section between the No. 5 and the No. 4 as well as ventilation and passing No. 4 ore down. Cost..... 15,000.00

c). A possibility exists whereby an open pit area may be proven NW of the present workings. This at .40-.50 percent would act as a serge stockpile ahead of the mill to be processed at any time mine production underground was delayed. This area should produce ore @ $1.50 per ton including haulage to the mill serge pile and amortization for the preliminary bulldozer-ripper, sampling and mapping work. Cost estimate : 100 hours of contracted 46-A bulldozer-heavy duty hydraulic ripper work @ $30 per hour, overhead,sampling assay laboratory fees @ $1,000 = 4,000.00

d). 1,000' of Nx diamond drilling under the No. 1 and No. 2 Levels and in the area of the right angle formation swing some 1,400' in from the portal of the No. 5 Adit. Cost,10,000.00

e). Exploration-development estimate total,$65,000.00
f). Contingency-Overhead @ 15% =..... 9,750.00
g). Estimated total.....

$74,750.00

TUNGSTEN MOUNTAIN MINE OPERATIONAL ESTIMATES OF MAY 25, 1970 :

3. ECONOMICS :

In view of the extensive development in effect, a treatment plant 70% usable, pumping plant, mining machinery and about $30,000 to $35,000 in existing available data in form of engineering, surveying, mapping, assay charting, laboratory fees and results, accurate production statistics, recent expensive title search, the following production economics are made possible, in view of the fact that duplication of the utilities inventory would cost under present inflated prices at least $600,000.

a). As the historical average production grade recovery was 1.47% W. O_3, it is reasonably safe to estimate along production lines of a continous operation a gross mine output grade of 1.25% averaged in with lower grade possible openpit cheap tonnage output, on the basis of 100 tons per day treated.

b). 100 tons per day production @ 1.25% millhead, @ $44 per unit = ...$ 5,500.00

c). Less 15% mill loss = recovery of..... 4,875.00

d). Marketing cost @ $4.00 per unit sold..... 425.00

e). Mining and milling, amortization of $74,750 and $50,000 (development-later mill rehabilitation), @ $20 per ton dry * 2,000.00

f). Gross daily net before taxes..... 2,450.00

g). Gross net per 27 day work month..... 66,150.00

h). Less 15% property purchase amortization, overhead, contingency, per 27 day month... 9,982.50

i). Probable monthly net @ 1.25% millhead..... $56,267.50

4. CONTRACTED EXPLORATION-DEVELOPMENT :

The most economical manner in which to conduct the exploration and development listed herein will be to let straight independent contractors written contracts granted by competetive bids. Contractors to furnish everything including liability and workman's compensation insurance, their own housing and service. The company will need , under that procedure, only an on-the-job contract supervisor checking specifications and measurements, and one senior geologist-engineer to make one weekly inspection trip.

Yours very truly,
J. H. WREN & COMPANY,

BY James H. Wren
James H. Wren,
Mining Engineer.

TUNGSTEN MOUNTAIN MINE OPERATIONAL ESTIMATES OF MAY 25, 1970 :

2. MILL REHABILITATION :

Treatment plant realignment and required units are as follows :

a). Powerline from the pumping plant to the generating plant is needed.

b). The present primary crusher is inadequate. A Kue-Ken shear pin crusher should be installed as a primary with jaws capacity of 10" X 18".

c). A secondary crusher is needed with closed circuit screen. This unit should be a No. 3 Symons Cone that will discharge a product of minus 3/8". Presently the ball mill is acting as a secondary crusher cutting down plant capacity.

d). A jig of approved type should be placed at ball mill discharge followed by a hydraulic classifier to gravity concentrate sands, fines and slimes separately on concentrating tables. The table concentrates would go directly to roaster, thence to the magnetic separator which will deliver a minimum of 60% W O_3 product.

e). Table tailings to go to small rod mill which accepting a 20 minus mesh product will reduce slimes over other types of grind units. Pulp will then go to the flotation circuit. Before availability of a digesting plant flotation concentrates will require an acid bath to bring grade of concentrates to 60%.

f). A 150 and a 100 KW diesel electric plants will have to be purchased @ 80% new condition. Numerous plants are available at very reduced prices from new purchases.

g). A front end loader on tracks with a bucket capacity of at least 1-1/4 Cu. Yd. will be needed to handle No. 5 ore stock-pile, loading out broken tonnage at the possible open-pit area, and to handle the mill's serge pile as well as many other items.

h). The roaster needs realignment, a filter is needed, a weightometer should be installed on the fines ore belt and an automatic tailings sampler should be used on the tailings. Heads for accuracy should be calculated from the tailings with moisture deducted from both heads and tailings.

i). Some $50,000 will be required for mill rehabilitation.

j). It is not recommended to rehabilitate the mill until the herein preliminary exploration-development work has been done. After that stage a balanced grade and consistent daily production can be achieved.

B Item 4

Arthur Lakes, President
James H. Wren, Sec.-Treas.

Office:
702 Forest Street
Reno, Nevada 89502
Phone: 323-8910

LAK-REN VENTURES, INC.

Mining Enterprises

Reply To :

P. O. Box 2021,
Reno, Nevada 89505.
Phone : 322-4840.

SUBJECT :

JAN. 1. 1971

TUNGSTEN MOUNTAIN MINE SALE TERMS

Total purchase price of all Tungsten Mountain Mine inventory is $225,000.

It is available on the basis of a purchase contract to be worked out relative to payments in mutual accord between seller and buyer.

A 60 day option may be granted against specific purchase contract terms for $10,000, during which period the optionee will be responsible for the mining, milling and pumping equipment.

Lak-Ren Ventures, Inc. reserves the right to withdraw this offer at any time without notice prior to the execution of a written option and or purchase contract.

Yours very truly,
LAK-REN VENTURES, INC.,

BY James H. Wren
James H. Wren,
Secretary - Treasurer

lcc : Arthur Lakes.

Arthur Lakes, President
James H. Wren, Sec.-Treas.

Office:
702 Forest Street
Reno, Nevada 89502
Phone: 323-8910

LAK-REN VENTURES, INC.

Mining Enterprises

Reply To :
P. O. Box 2021,
Reno, Nevada 89505.
Phone : 322-4840.

JAN. 8, 1971

TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY

FIRST : PROPERTY EXTENT.

Property consists of nineteen lode mining claims, one millsite, one hundred sixty acres in placer claim, all in good standing, and one water well right granted by the State of Nevada Water Resources Board.

A recent title search , by a title company, was run cuncluding that all ground and equipment title is in good order showing the purchase contract owned by Lak-Ren Ventures, Inc.

SECOND : INVENTORY WORTH ESTIMATE.

a). Water well with steel casing, deep well pump, 4,000 feet of covered pipeline to a point above milling plant..... $ 20,000.00

b). 100 tons per day capacity milling plant, with both gravity and flotation treatment units, magnetic separator, steel building and framework, concrete retaining walls, floor levels, 70% complete..... 100,000.00

c). Mine roads, ramps, etc..... 40,000.00

d). Total underground development = 3,127', of which 2,600' is an inventory asset @ $65 per foot 169,000.00

e). Underground-surface track, pipe, diesel powered compressor, locomotive, mucking machine, ore cars, blowers, etc..... 10,000.00

f). INDICATED DEVELOPED TUNGSTEN UNITS :

39,896 units @ $46 per unit..... $1,835,216.00

g). Total above inventory estimate..... $2,174,216.00

TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY : Continuation.

THIRD : PROBABLE ORE.

The No. 5 Level, now started, when fully developed to some 1,250 feet driven under known ore shoots, in accordance with the average production grade and its some 200' elevation below No. 4 Level is estimated to hold 100,000 units WO_3 & $46 per unit = ... $ 4,600,000.00

FOURTH : POSSIBLE ORE.

As the tungsten occurrence has been proven to go to the elevation of the No. 5 Level, it's downward extent, the North-Westerly and Northerly strike trend of the contact Westerly from present workings, and the area North-Westerly on the contact which has been partly stripped, all with proven tungsten mineralization, is estimated to hold at least 100,000 WO_3 units which at $46 per unit = ... 4,600,000.00

FIFTH : TOTAL ESTIMATES .

In excess of..... $11,374,216.00.

SIXTH : SUMMARY CONCLUSIONS.

Although the physical inventory herein has been appraised at some $339,000, over $600,000 was spent by the former operator during a period when supplies and labor was about 60% of present cost. With the Tungsten Mountain Mine developed on four adit levels and a new mill installed, they were forced to suspend operations as being non-economic by the reduction of the tungsten market price to $22 per unit from the former price of $63 per unit. During the year of suspension in 1961, their average returns were $21.08 per unit. The historical production average ore grade is 1.47% WO_3 .

The extensive contact zone on the property with tungsten mineralization partly proven, holds some liklihood of becoming the largest tungsten mine in the State of Nevada.

There are a number of immediate tungsten markets available in Nevada, California and Utah for concentrates of 30% or better. One market, the U. S. Vanadium Corporation at Bishop, California, reportedly will take crude ore paying 100% of the assay value @ $36 per unit. There is some considerable tonnage on the No 4 Level and the No. 3 Level which probably could stand crude ore shipments to this latter market while the No. 5 Level is being hooked into the known ore shoots and the property's own mill is rehabilitated. A crude ore economic cut-off point would be slightly under 0.75% @ $36 per unit. It is not anticipated that selective mining would have any difficulty of holding mine run ore @ 1.30 to 1.50 % WO_3 .

TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY :

Tungsten concentrate markets vary. However, at this time an average of $46 is being paid. In view of the average historical grade of 1.47% produced to-date, it is quite probable that at least a 1.00% mill recovery could consistently be achieved. At 100 tons per day the plant should recover 100 units @ a gross income of $4,600.00 per working day.

SEVENTH : RECENT WORK.

Lak-Ren Ventures, Inc. has renewed the No. 5 access road, made a truck turn-around near its portal, cut a ramp to an ore stockpile location below the No. 5 dump, brought mapping up-to-date, re-evaluated the property, and added 160 acres to the overall holdings, as well as carrying and completing required assessment work. A new title search was also accomplished and all pertinent documents have been filed and recorded in the Churchill County Recorder's Office, Fallon, Nevada.

EIGHTH : PROPERTY CONTROL.

The Tungsten Mountain Mine, Clan Alpine Valley, Churchill County, Nevada (17 miles over graded gravel county road from Highway No. 50), is under the control of Lak-Ren Ventures, Inc., a Nevada corporation owned by Arthur Lakes and James H. Wren. The are the owners of a purchase contract on the Tungsten Mountain Mine and all of its inventory.

The Tungsten Mountain Mine is now available to be purchased from Lak-Ren Ventures, Inc. That availability may be withdrawn at anytime without notice by Lak-Ren Ventures, Inc., prior to their granting a written option or purchase contract.

Yours very truly,
LAK-REN VENTURES, INC.,

BY James H. Wren
James H. Wren,
Secretary-Treasurer

The following analyses are indicative of Tungsten Mountain gravity table concentrates, as per statements from G.S.A during Government Stockpiling.

	Lot #1	Lot #2
Tungstic Oxide	64.08%	66.02%
Tin	Tr	Tr
Copper	0.01%	0.02%
Arsenic	none	none
Antimony	none	none
Bismuth	0.02%	0.017%
Molybdenum	0.21%	0.20%
Phosphorus	0.09%	0.04%
Sulphur	0.09%	0.09%
Manganese	0.09%	0.12%
Lead	0.12%	
Zinc	0.07%	

Item 5

Arthur Lakes, President
James H. Wren, Sec.-Treas.

Office:
702 Forest Street
Reno, Nevada 89502
Phone: 323-8910

LAK-REN VENTURES, INC.

Mining Enterprises

Reply To :

P. O. Box 2021,
Reno, Nevada 89505.
Phone : 322-4840.

January 14, 1971

SUBJECT :

SUPPLEMENTAL TO JANUARY 1, 1971 TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY.

Since the herewith Assets Summary of January 1, 1971 was made, Nevada Scheelite Company, Fallon, Nevada has commenced paying $50 per unit for tungsten concentrates of 60% of better grade. This will amount to an addition of $159,584.00 to the former $46 per unit estimated marketing net, on our indicated ore.

During the past few days tungsten powder markets have went up from around $3.90 per pound to $4.15 to $4.50 per pound.

It is now anticipated that the ground between No. 5 and No. 4 Levels, a distance of some 200' on the contact dip, will produce at least 100,000 W O_3 units when drifted out to the "BAY AREA" shown on the geologic and assay maps, inclusive of the Tactite Vein Area's intersection with the mineralized intrusive contact with sedimentaries. Said 100,000 units will be over and above the 39,896 units now available through mine development.

LAK-REN VENTURES, INC.

BY James H. Wren
James H. Wren,
Secretary-Treasurer.

Item #

Arthur Lakes, President
James H. Wren, Sec.-Treas.

Office:
702 Forest Street
Reno, Nevada 89502
Phone: 323-8910

LAK-REN VENTURES, INC.

Mining Enterprises

Reply to:

P.O. Box 2021
Reno, Nevada 89505
Phone: 322-4840

January 28, 1971

TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY

PROPERTY EXTENT:

Holdings consist of 19 lode mining claims, one millsite, 160 acre placer claim, all in good standing, and water well rights granted by the State of Nevada Water Resources Division.

The property is located in Clan Alpine Valley, Churchill County, Nevada, 90 miles easterly from Fallon via Highway No. 50.

A recent professional title search has been made showing free and clear ownership. All ownership documents are recorded in the Churchill County Recorder's Office, Fallon, Nevada.

INVENTORY WORTH APPRAISAL:

a). Water well, 200' deep, 10" casing, 35 horsepower deep well pump, 3,300' of 4" underground pipeline to mill . . . . . .$	25,000.00
b). 100 tons per day capacity milling plant, in need of some realignment, with both gravity and flotation circuits, magnetic separator, steel frame building iron sheeting, concrete floors, retaining walls, coarse and fine ore bins, truck dump grizzly, all 70% complete	125,000.00
c). Mine roads, ramps, etc.	40,000.00
d). Total underground development = 3,127 feet, of which 2,600' is an asset, @ $65 per foot = ...	169,000.00
e). Underground-surface track, pipe, diesel powered compressor, locomotive, mucking machine, ore cars, blowers, etc.	10,000.00
Sub-Total $	369,000.00

f). Indicated developed tungsten units:

39,896 units @ $50 per unit local market for 60% scheelite concentrates = ... $1,994,800.00

g). Total existing inventory appraisal 2,363,800.00

PROBABLE ORE:

Scheelite mineralization has been proven to the No. 5 Level elevation, 200' below the No. 4 Level Adit. The No. 5 Level is now in 250'. When it has progressed 1,200 feet making available ore tonnages in the tactite vein intersection with the contact zone and ore above that level in the "Bay Area" it is anticipated that some 150,000 additional units will be opened for production.

150,000 units @ $50 per unit = ... 7,500,000.00

POSSIBLE ORE:

The "Inside Contact" between the intrusives and sedimentaries is over 5,000' long showing tungsten mineralization. One tactite vein in the sedimentaries has averaged three to twenty feet in width with a production record recovery of 1.47% average. Scheelite occurrence has been noted on the property 500 feet below the No. 5 Adit elevation. One possible open pit zone of over 25 feet in width has been partly opened with .45 to .50% grade. It is anticipated that when the aggregate mineralized zones have been developed, an additional 150,000 WO_3 units is possible.

150,000 units of possible ore @ $50 per unit = ... 7,500,000.00

TOTAL ESTIMATE:

In excess of 17,363,800.00

SUMMARY CONCLUSIONS:

Although the herein listed physical inventory is appraised at $369,000.00, more than $600,000.00 was spent by the former operating company. They did not commence milling until the tungsten market had dropped from $63 per unit to $21 per unit after U. S. Government supports were terminated. It was not economically possible to operate at $21 per unit. They did, however, produce a good quality scheelite concentrate of 65% or better, in spite of some poor milling procedures.

There are a number of immediate scheelite crude ore or concentrates markets available. The better ones are Union Carbide Corporation, Bishop, California, for crude ore and concentrates and the Nevada Scheelite Company, Fallon, Nevada, which pays $50 per unit, 60% or better concentrates and is near the Tungsten Mountain Mine.

Judging from historical production grade averages, it does not appear that clean mining would produce a millhead lower than 1.25% WO_3. From development ore out of the No. 1 Adit, 958.17 dry tons produced 1.543.68 units @ 1.61% scheelite recovery.

Recent work accomplished by Lak-Ren Ventures, Inc., consists of a new road into the No. 5 Tunnel Portal, new road to the No. 5 Stockpile area, mill cleanup, assessment work, acquirement of 160 additional acres in vicinity of the mill, straightening out title defects, mapping and sampling.

A voluminous technical report file, metallurgical data, geologic information, map file, evaluation statistics, and ownership legal exhibits all are available for scrutiny in the company office at 1055 Curti Drive, Reno, Nevada 89502.

The Tungsten Mountain Mine assets are available to be purchased from Lak-Ren Ventures, Inc., for a total price of $225,000.00, payable on the basis of installment payments under an escrow account.

Lak-Ren Ventures, Inc., reserves the right to withdraw the Tungsten Mountain Mine availability at any time without notice prior to the execution of a written purchase option or purchase contract.

Yours very truly,

LAK-REN VENTURES, INC.

By James H. Wren

James H. Wren, Secretary-Treasurer

Mine Management
Mine Production

License
No. 8950

Deveolpment
Exploration

J. H. WREN & COMPANY

Mining Contracting Engineers

Cable Address
WRENCO

Post Office Box 2021
Reno, Nevada 89505
Phone (702) 322-4840

January 28, 1971

Subject: Tungsten Mountain Mine Projected Cost - Income

Following are cost estimates relative to putting the Tungsten Mountain Mine into production, development of the first phase of the No. 5 Level and exploration drilling of the high ore potential in the "Bay Area", within 90 days time.

Mill revamping-modernization	$ 42,000.00
300' of No. 5 advance for new staping	19,500.00
1,000 lin drill feet in "Bay Area"	10,000.00
2,000 tons ore delivered to mill on contract	20,000.00
20% contingency and liquid capital	18,300.00
Total direct cost	$109,800.00
Property payment to production income	25,000.00
Total preproduction income	$134,800.00

Operating economics:

@ 1.25% millhead grade x 100 tons @ $50 per unit gross value	$ 6,250.00
20% mill loss	1,250.00
Gross recovery value @ $50 per unit per day	5,000.00
$10 per ton contract ore to mill per day	1,000.00
$10 per ton, milling marketing, overhead	1,000.00
Probable direct net per day before taxes, amortization and property payout	3,000.00
$5 per ton ore produced development charge	500.00
Expectable net profit per working day	2,500.00

Over 5,000 units in reserves above the No. 1 Level can be produced by means of a front end loader after wall stripping with a heavy bulldozer-ripper. The average tonnage grade should be over 1.25% WO_3.

Production stoping sections on the No. 4 Level and the No. 3 Level are ready to be prepared.

Clyde Wright, Fallon, Nevada, mine contractor with good performance record has presented a contract bid for Tungsten Mountain Mine ore production and haulage to the mill on the basis of controlled dilution, everything furnished by

Wright including insurance for $10 per mine run ton. Furthermore he will contract the No. 5 Level's advance @ $65 per foot furnishing 20 pound rail, 4' x 6" ties, 3" air line, 1" water line, 14" ventilation line and liability-workmen's compensation insurance. Contract production and development, at first, would be the most economical method for an operator to use at this time. Other contract bids may be solicited.

On the basis of the projected estimated net profit before taxes and property purchase payments, 25 working days per month will return $62,500.00 at only 80% treatment plant recovery.

There is an excellent possibility that the Tungsten Mountain Mine may become the largest tungsten producer in the State of Nevada.

J. H. WREN & COMPANY

By James H. Wren

James H. Wren, Mining Engineer

Example of Tungsten Mountain Mine Concentrates
(The scheelite is of particularly pure grade)

The following analyses are indicative of Tungsten Mountain gravity table concentrates, as per statements from G.S.A. during Government stockpiling.

	Lot #1	Lot #2
Tungstic Oxide	64.08%	66.02%
Tin	tr	tr
Copper	0.01%	0.02%
Arsenic	none	none
Antimony	none	none
Bismuth	0.02%	0.017%
Molybdenum	0.21%	0.20%
Phosphorus	0.09%	0.044%
Sulphur	0.09%	0.09%
Manganese	0.09%	0.12%
Lead	0.12%	
Zinc	0.07%	

JAMES H. WREN
P.O. Box 2021
Reno, Nevada 89505
Area Code 702, 322-4840

Date and Place of Birth: January 22, 1912 - San Francisco, California
Nevada resident; listed with the Nevada Credit Rating Bureau.

Engineering Education: Post graduate studies, knowledge of the Spanish language, hold valid U.S. passport, member of the American Institute of Mining and Metallurgical Engineers, licensed, bonded, Nevada contractor, author of technical papers.

PROFESSIONAL RECORD

September 1, 1947 to date

Individual fee basis mining engineering and short-term management assignments, specializing in production problems and the alignment of mechanization. Projects: Open pit production to 10,000 tons per day. Underground production to 1,400 tons per day. Metallics and non-metallics. Dredging to 7,000 cubic yards per day. Treatment by gravity, sink-float, selective flotation, bulk flotation and amalgamation. Project locations: Domestic U.S., Alaska, Mexico, Central America, and most countries of South America. Consulting mining engineer to Industrial Development Corporation, Washington, D.C.

Reference: J. M. Van Patten, 1714 Fletcher Avenue, South Pasadena, California.

September, 1945 to September, 1947

General Superintendent and Utah Manager for Metal Producers, Inc. Chief operation: Horn Silver mine, Milford, Utah. This was Southern Utah's largest gold, silver and lead operation during the above interim. Production was raised from 50 tons per day to 400 tons in form of three products. They were complex selective flotation ore, direct shipment crude ore and a beneficiated shipment tonnage. By mechanization was able to pay off a $400,000.00 deficit within the first six months and show a consistent profit thereafter. Activities were suspended August 11, 1947, as a direct result of Metallic Premium's termination and the economic grade of existing reserves.

Reference: J. W. Mangram, 243-1/2 South Elm Drive, Beverly Hills, California.

February, 1944 to September, 1945

Superintendent of Tungstar Mine, Bishop, California. Project produced a monthly average of 3,000 WO_3 units per month, grossing $90,000.00, leaving $60,000.00 profit.

May, 1941 to December, 1943

Supervisory duties connected with military construction on heavy earth moving projects in foreign fields.

For eight years prior to 1941, worked as a miner, millman, shift boss, shaft boss, mine foreman, engineer and superintendent at various Western U.S. mines.

ARTHUR LAKES
EXPERIENCE PROFILE

Registered Nevada Professional Engineer, License No. 1408
Life Member, Association of Professional Engineers of British Columbia

Miner-timberman-sampler-surveyor-assayer
Student assistant in geological and mining examinations
Assayer-chemist, Stephen Rickard Laboratories, Denver, Colorado
Exploration engineer for Colorado Gold Dredging Company, a subsidiary to General Development, New York. Sampling, mapping placer ground prior to installation of two gold dredges.
Editor of Mining Science, monthly magazine, Denver, Colorado.
Manager and Engineer for Alturas Mining Company, Hailey, Idaho. Small development to producing silver-lead property.
Manager, Ymir-Wilcox Dev. Co., Ymir, British Columbia. Production from Wilcox gold mine.
Formed partnership, Larson & Lakes Consulting Mining Engineers and Geologists, Spokane, Washington.
Two years in United States Army - from First Lieutenant to Major and sent overseas.
Resumed partnership, Larson & Lakes. Geologist and engineer in apex lawsuits. Conducted successful operations at Lucky Jim zinc mine and Whitewater Deep lead-zinc mine into outstanding British Columbia producers.
Conducted geologic survey and mapping of Sheep Creek gold camp, Salmo, British Columbia, resulting in discovery of Gold Belt mine, successfully exploited by North American Mines Company, Boston, Massachusetts. Similarly with Reeves McDonald zinc-lead mine from prospect to an outstanding lead-zinc mine. Later sold to Pend Oreille Mining Company.
Manager and Engineer for Emerald mine, Sheep Creek District, British Columbia. Explored and developed extensions of lead-zinc ore zones with my brother, the late Harold Lakes, into 1,800 tons per diem producer, and discovered and opened the large high grade scheelite deposits that made this mine one of the largest tungsten producers of North America.
Conducted geologic and geophysical survey of Texada Island, British Columbia, copper and iron deposits and examined and reported on numerous mines and prospects in Canada and the United States. Discovered and opened Wesko gold mine, Ymir, British Columbia.
Established consulting office at Spokane, Washington, and directed early exploration and development of Lucky Friday mine, Coeur d'Alene, Idaho, to 1,200-level before leaving for Nevada. Property has developed into one of America's outstanding silver-lead-zinc mines with its stock price expanding from 10¢ per share in 1945 to nearly $75 per share today. (Hecla Mining Company gave 1-1/2 shares of Hecla stock for 1 share of Lucky Friday. Hecla is selling around $50 today.)
Member of three-man advisory board to adjust extra lateral conflicts at Coeur d'Alene district mining properties.
Conducted three season geologic survey in Slocan District, British Columbia, geologic mapping easterly extension of Emerald tungsten area, Salmo, British Columbia, and north extension of Pend Oreille mining district, Washington and British Columbia.
Came to Nevada to open Tungsten Mountain Mine into production and established Consulting Engineer Service in Nevada since 1954.

Mine Management
Mine Production

License
No. 8950

(18)
Item 4

Development
Exploration

J. H. WREN & COMPANY

Mining Contracting Engineers

Cable Address
WRENCO

Post Office Box 2021
Reno, Nevada 89505
Phone (702) 322-4840

TUNGSTEN MOUNTAIN MINE

DATA, FEBRUARY 19, 1971

OCCIDENTAL MINERALS CORPORATION
6073 WEST 44TH AVENUE
WHEAT RIDGE, COLORADO U.S.A. 80033
TELEPHONE (303) 421-9440

MINERAL DEPOSIT DATA SHEET

NAME OF PROPERTY: TUNGSTEN MOUNTAIN MINE

Submitted By: LAK-REN VENTURES, INC.

Address: 1055 Curti Dr., Reno, Nevada 89502

Telephone : (AC 702) 322-4840.

LOCATION OF PROPERTY

State: NEVADA

County: CHURCHILL

Section, township and range (or other) ~~GLAN ALPINE MINING DISTRICT~~

COMMODITIES

Past production (if any) (commodity and $$ value if available) Approximately $200,000 out of development tonnage from levels and raises sold as crude ore and gravity-flotation concentrates @ about $21 per unit with 65% concentrate grade.

Potential deposits (commodities) Presently 40,000 W O_3 units developed with 3,100' workings @ $50 per unit = $2,000,000 plus probable and possible ore potential of 300,000 additional units.

TYPE OF DEPOSIT (Choose between A, B, or C)

A. Vein(s)

Depth of oxidation: Very limited Fe S in outcrops.

Mineralogy: Scheelite, Fe S , garnet, quartz, tactite.

Host rock: Limestone and limestone-intrusives contact.

Number of known veins with length, width and depth of known deposit: Tactite Vein on the No. 4 Adit has proven 520' of tungsten mineralization. Mineralized contact zone is 5,000+ long. Ore widths 3' to 20', average grade better than $1.25%

Reserves: 28,252 short tons @ 1.412 % W O_3 developed

Tons: 28,252 short tons

Grade: 1.412% W O_3

Potential reserves 300,000 W O_3 units

B. Dissemenated or stock work

Surface area (length and width) Over 5,000' length 3'20' width

Vertical extent 500' proven, probable over 1,000'

Depth of oxidation 500'

Host rock GRanite and Limestone

Mineralogy Scheelie, Fe S, Garnet, Quartz, Tactite.

Reserves 40,000 W O_3 units developed.

Tons 28,252 short tons

Grade 1.412% W O_3

Potential reserves 300,000 W O_3 units.

C. Bedded Deposit (stratform or stratabound)

Length, width and thickness

Depth of oxidation

Host rock (formation)

Mineralogy

Reserves

Tons

Grade

Potential reserves

DESCRIPTION OF PROPERTY

Ownership - Owners and percent interest (if company, give name of company, officers and principal stockholders):
Lak-Ren Ventures, Inc. Arthur Lakes President, James H. Wren, Secretary-Treasurer, owners of the corporation which in turn has the Tungsten Mountain Mine, See herewith supplemental data for description.

NATURE OF LAND CONTROL

a. Number of patented mining claims (or acres controlled) None

b. Number of unpatented mining claims 19 full lode mining claims

c. Fee land (acres) None

d. State, federal or railroad leases or exploration permits (acres) None

e. Other One five acre millsite and 160 acres of placer claim.

LAND STATUS

1. Owned Title

a. Taxes paid Personal property (mill, etc),paid

b. Taxes not paid

2. Unpatented Claims Good record of all assessment & taxes Churchill Co.

a. Dates staked About 1953

b. Date of location work About 1953

c. Date of last assessment work November 1970.

d. Type of last assessment work (last two years) Road building, adits' cleanup, repair, sampling, surveying, watchman expense.

3. Lease With Option to Purchase

a. Name of lessor and lessee

b. Expiration date of lease

c. Nature of lease (mining, exploration and basic rental and royalty, etc.)

4. Lease

a. Name of lessor and lessee

b. Expiration date of lease

c. Nature of lease (mining, exploration and basic rental and roya

NONE

5. Other (describe) LAK-REN VENTURES, INC. is the owner o
contract agreement on the Tungsten Mountain Mine, mill
equipment, with a balance to pay of $70,000 with our n
of $15,000 being due July 15, 1971 and a like payment
thereafter until balance is paid out. All ownership re

6. Previous Exploration Work (attach copies of reports, maps, drill lo

Name of company(s) Lak-Ren Ventures, Inc. reports, m
legal exhibuts, are too voluminous to forward, the
~~to be inspected in our office.~~

Dates

7. Work Completed

a. Geological mapping All general geology and some
geology is with our map file supported by repo

b. Geophysical surveys (type, amount and results of work)

None

c. Geochemical surveys (type, amount and results of work)

d. Drilling (number of holes, location, depth results)

Drill program needed along with proc
proven ore.

e. Underground development (location, nature and extent)
3,100 feet of adit, raise and cross-cut footage
locomotive haulage, start of stope preparation,

LIST OF MAPS AND DOCUMENTS SENT WITH THIS DATA SHEET

Our engineering and geologic map file including assay charts, technical reports and legal exhibits is so voluminous that it is not convenient to forward copies after duplication. We will, however, send you an old but accurate set of maps to illustrate the development and some production assays.

Sampling permission and examination authority is available. Lak-Ren Ventures, Inc. reserves the right to withdraw the property availability at anytime without notice prior to the delivery of a written option or agreement.

Completed by James H. Wren

Address 1055 Curti Drive,
Reno, Nevada 89502

Date February 19, 1971

Owner of Property LAK-REN VENTURES, INC.

(signature)

BY James H. Wren

James H. Wren,
Secretary-Treasurer.

Arthur Lakes, President
James H. Wren, Sec.-Treas.

Office:
702 Forest Street
Reno, Nevada 89502
Phone: 323-8910

LAK-REN VENTURES, INC.

Mining Enterprises

Reply to:

P. O. Box 2021
Reno, Nevada 89505
Phone: 322-4840

January 28, 1971

TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY

PROPERTY EXTENT:

Holdings consist of 19 lode mining claims, one millsite, 160 acre placer claim, all in good standing, and water well rights granted by the State of Nevada Water Resources Division.

The property is located in Clan Alpine Valley, Churchill County, Nevada, 90 miles easterly from Fallon via Highway No. 50.

A recent professional title search has been made showing free and clear ownership. All ownership documents are recorded in the Churchill County Recorder's Office, Fallon, Nevada.

INVENTORY WORTH APPRAISAL:

a). Water well, 200' deep, 10" casing, 35 horsepower deep well pump, 3,300' of 4" underground pipeline to mill . . . . . .$ 25,000.00

b). 100 tons per day capacity milling plant, in need of some realignment, with both gravity and flotation circuits, magnetic separator, steel frame building iron sheeting, concrete floors, retaining walls, coarse and fine ore bins, truck dump grizzly, all 70% complete 125,000.00

c). Mine roads, ramps, etc. 40,000.00

d). Total underground development = 3,127 feet, of which 2,600' is an asset, @ $65 per foot = ... 169,000.00

e). Underground-surface track, pipe, diesel powered compressor, locomotive, mucking machine, ore cars, blowers, etc. 10,000.00

Sub-Total $ 369,000.00

f). Indicated developed tungsten units:

39,896 units @ $50 per unit local market for 60% scheelite concentrates = ... $1,994,800.00

g). Total existing inventory appraisal 2,363,800.00

PROBABLE ORE:

Scheelite mineralization has been proven to the No. 5 Level elevation, 200' below the No. 4 Level Adit. The No. 5 Level is now in 250'. When it has progressed 1,200 feet making available ore tonnages in the tactite vein intersection with the contact zone and ore above that level in the "Bay Area" it is anticipated that some 150,000 additional units will be opened for production.

150,000 units @ $50 per unit = ... 7,500,000.00

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150,000 units of possible ore @ $50 per unit = ... 7,500,000.00

TOTAL ESTIMATE:

In excess of 17,363,800.00

SUMMARY CONCLUSIONS:

Although the herein listed physical inventory is appraised at $369,000.00, more than $600,000.00 was spent by the former operating company. They did not commence milling until the tungsten market had dropped from $63 per unit to $21 per unit after U. S. Government supports were terminated. It was not economically possible to operate at $21 per unit. They did, however, produce a good quality scheelite concentrate of 65% or better, in spite of some poor milling procedures.

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Yours very truly,

LAK-REN VENTURES, INC.

By James H. Wren

James H. Wren, Secretary-Treasurer

Mine Management
Mine Production

License
No. 8950

Deveolpment
Exploration

J. H. WREN & COMPANY

Mining Contracting Engineers

Cable Address
WRENCO

Post Office Box 2021
Reno, Nevada 89505
Phone (702) 322-4840

January 28, 1971

Subject: Tungsten Mountain Mine Projected Cost - Income

Following are cost estimates relative to putting the Tungsten Mountain Mine into production, development of the first phase of the No. 5 Level and exploration drilling of the high ore potential in the "Bay Area", within 90 days time.

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20% mill loss	1,250.00
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$10 per ton contract ore to mill per day	1,000.00
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Probable direct net per day before taxes, amortization and property payout	3,000.00
$5 per ton ore produced development charge	500.00
Expectable net profit per working day	2,500.00

Over 5,000 units in reserves above the No. 1 Level can be produced by means of a front end loader after wall stripping with a heavy bulldozer-ripper. The average tonnage grade should be over 1.25% WO_3.

Production stoping sections on the No. 4 Level and the No. 3 Level are ready to be prepared.

Clyde Wright, Fallon, Nevada, mine contractor with good performance record has presented a contract bid for Tungsten Mountain Mine ore production and haulage to the mill on the basis of controlled dilution, everything furnished by

Wright including insurance for $10 per mine run ton. Furthermore he will contract the No. 5 Level's advance @ $65 per foot furnishing 20 pound rail, 4" x 6" ties, 3" air line, 1" water line, 14" ventilation line and liability-workmen's compensation insurance. Contract production and development, at first, would be the most economical method for an operator to use at this time. Other contract bids may be solicited.

On the basis of the projected estimated net profit before taxes and property purchase payments, 25 working days per month will return $62,500.00 at only 80% treatment plant recovery.

There is an excellent possibility that the Tungsten Mountain Mine may become the largest tungsten producer in the State of Nevada.

J. H. WREN & COMPANY

By James H. Wren
James H. Wren, Mining Engineer

Example of Tungsten Mountain Mine Concentrates
(The scheelite is of particularly pure grade)

The following analyses are indicative of Tungsten Mountain gravity table concentrates, as per statements from G.S.A. during Government stockpiling.

	Lot #1	Lot #2
Tungstic Oxide	64.08%	66.02%
Tin	tr	tr
Copper	0.01%	0.02%
Arsenic	none	none
Antimony	none	none
Bismuth	0.02%	0.017%
Molybdenum	0.21%	0.20%
Phosphorus	0.09%	0.044%
Sulphur	0.09%	0.09%
Manganese	0.09%	0.12%
Lead	0.12%	
Zinc	0.07%	

JAMES H. WREN
P.O. Box 2021
Reno, Nevada 89505
Area Code 702, 322-4840

Date and Place of Birth: January 22, 1912 - San Francisco, California
Nevada resident; listed with the Nevada Credit Rating Bureau.

Engineering Education: Post graduate studies, knowledge of the Spanish language, hold valid U.S. passport, member of the American Institute of Mining and Metallurgical Engineers, licensed, bonded, Nevada contractor, author of technical papers.

PROFESSIONAL RECORD

September 1, 1947 to date

Individual fee basis mining engineering and short-term management assignments, specializing in production problems and the alignment of mechanization. Projects: Open pit production to 10,000 tons per day. Underground production to 1,400 tons per day. Metallics and non-metallics. Dredging to 7,000 cubic yards per day. Treatment by gravity, sink-float, selective flotation, bulk flotation and amalgamation. Project locations: Domestic U.S., Alaska, Mexico, Central America, and most countries of South America. Consulting mining engineer to Industrial Development Corporation, Washington, D.C.

Reference: J. M. Van Patten, 1714 Fletcher Avenue, South Pasadena, California.

September, 1945 to September, 1947

General Superintendent and Utah Manager for Metal Producers, Inc. Chief operation: Horn Silver mine, Milford, Utah. This was Southern Utah's largest gold, silver and lead operation during the above interim. Production was raised from 50 tons per day to 400 tons in form of three products. They were complex selective flotation ore, direct shipment crude ore and a beneficiated shipment tonnage. By mechanization was able to pay off a $400,000.00 deficit within the first six months and show a consistent profit thereafter. Activities were suspended August 11, 1947, as a direct result of Metallic Premium's termination and the economic grade of existing reserves.

Reference: J. W. Mangram, 243-1/2 South Elm Drive, Beverly Hills, California.

February, 1944 to September, 1945

Superintendent of Tungstar Mine, Bishop, California. Project produced a monthly average of 3,000 WO_3 units per month, grossing $90,000.00, leaving $60,000.00 profit.

May, 1941 to December, 1943

Supervisory duties connected with military construction on heavy earth moving projects in foreign fields.

For eight years prior to 1941, worked as a miner, millman, shift boss, shaft boss, mine foreman, engineer and superintendent at various Western U.S. mines.

ARTHUR LAKES
EXPERIENCE PROFILE

Registered Nevada Professional Engineer, License No. 1408
Life Member, Association of Professional Engineers of British Columbia

Miner-timberman-sampler-surveyor-assayer
Student assistant in geological and mining examinations
Assayer-chemist, Stephen Rickard Laboratories, Denver, Colorado
Exploration engineer for Colorado Gold Dredging Company, a subsidiary to General Development, New York. Sampling, mapping placer ground prior to installation of two gold dredges.
Editor of Mining Science, monthly magazine, Denver, Colorado.
Manager and Engineer for Alturas Mining Company, Hailey, Idaho. Small development to producing silver-lead property.
Manager, Ymir-Wilcox Dev. Co., Ymir, British Columbia. Production from Wilcox gold mine.
Formed partnership, Larson & Lakes Consulting Mining Engineers and Geologists, Spokane, Washington.
Two years in United States Army - from First Lieutenant to Major and sent overseas.
Resumed partnership, Larson & Lakes. Geologist and engineer in apex lawsuits. Conducted successful operations at Lucky Jim zinc mine and Whitewater Deep lead-zinc mine into outstanding British Columbia producers.
Conducted geologic survey and mapping of Sheep Creek gold camp, Salmo, British Columbia, resulting in discovery of Gold Belt mine, successfully exploited by North American Mines Company, Boston, Massachusetts. Similarly with Reeves McDonald zinc-lead mine from prospect to an outstanding lead-zinc mine. Later sold to Pend Oreille Mining Company.
Manager and Engineer for Emerald mine, Sheep Creek District, British Columbia. Explored and developed extensions of lead-zinc ore zones with my brother, the late Harold Lakes, into 1,800 tons per diem producer, and discovered and opened the large high grade scheelite deposits that made this mine one of the largest tungsten producers of North America.
Conducted geologic and geophysical survey of Texada Island, British Columbia, copper and iron deposits and examined and reported on numerous mines and prospects in Canada and the United States. Discovered and opened Wesko gold mine, Ymir, British Columbia.
Established consulting office at Spokane, Washington, and directed early exploration and development of Lucky Friday mine, Coeur d'Alene, Idaho, to 1,200-level before leaving for Nevada. Property has developed into one of America's outstanding silver-lead-zinc mines with its stock price expanding from 10¢ per share in 1945 to nearly $75 per share today. (Hecla Mining Company gave 1-1/2 shares of Hecla stock for 1 share of Lucky Friday. Hecla is selling around $50 today.)
Member of three-man advisory board to adjust extra lateral conflicts at Coeur d'Alene district mining properties.
Conducted three season geologic survey in Slocan District, British Columbia, geologic mapping easterly extension of Emerald tungsten area, Salmo, British Columbia, and north extension of Pend Oreille mining district, Washington and British Columbia.
Came to Nevada to open Tungsten Mountain Mine into production and established Consulting Engineer Service in Nevada since 1954.

Arthur Lakes, President
James H. Wren, Sec.-Treas.

Item 4

Office:
702 Forest Street
Reno, Nevada 89502
Phone: 323-8910

LAK-REN VENTURES, INC.

Mining Enterprises

February 24, 1971

NOTE :

The following report by Donald L. Anderson is not as complete as it could be. He was inconvenienced by the fact that a set of the mine maps were not available when he looked the property over. Arthur Lakes had not been advised of the Anderson visit so was unable to furnish the maps nor assist with the field work.

LAK REN VENTURES, INC.,

BY _____
James H. Wren, Secretary-Treasurer

THE TUNGSTEN MOUNTAIN (HILLTOP MINE)
CHURCHILL CO., NEVADA

Authorization

The examination of the Tungsten Mountain Mine was made at the request of Mr. Arthur E. Symons of Seattle, Washington, who represents the bondholders of the company. Accompanied by Mr. Edwin Stocker, I left Seattle on Thursday, January 19 and returned to Seattle on Monday, January 23, 1967. We visited the mine and surroundings on January 20, 21 and 22.

Location and General Features

The Tungsten Mountain (Hilltop) Mine is located in Churchill County, Nevada, about 60 miles northeast of Fallon. The exact location and other pertinent features such as elevation, climate, power, water, transportation, history, etc. are adequately described elsewhere 1/ and need not be repeated here.

Geology

Mr. Lakes 1/ describes the host rock as "argillites, shale, slate and hornfels interbedded by narrow limestone beds". These sediments and metasediments form a steeply dipping contact with a younger granodiorite intrusive that strikes in a northwesterly and westerly direction. It is along the easterly contact of the sediments and the granitic stock that the tungsten deposits now in evidence have been formed.

In general, the ore has been classified as a combination of fissure replacement and contact ore. The fissure replacement occurs in a vein (s) within the sediments, striking in a north-south direction and dipping to the east. The contact ore zone, in so far as it is outlined, is exposed on No. 4 level along the contact of the granodiorite and the sediments. It should be observed that since the vein deposit dips to the east and the lime-granite contact appears to dip to the west, then the conflux of the two described orebodies should be somwehere between the 4 and 5 levels. A continuation of the ore below the No. 5 level should show a reverse dip.

Because of limited time, the surface and underground geology at Tungsten Mountain was observed in a general way only. Nevertheless, the contact zone, the massive granitic stock and the sediments were all noted and the general geology as described by Mr. Lakes is presumed to be correct.

Observations on Nevada Tungsten

"Tungsten occurs principally as scheelite ($CaWO_4$, which forms an isomorphous series with powellite, the calcium molybdate) in contact deposits developed in lime-rich rocks by granite intrusions" and "contact deposits have supplied the major portion of U. S. and Nevada production"[2]

At the Nevada Scheelite mine, in Mineral County about 40-50 miles south of Tungsten Mountain, "278,000 units of WO_3 have been mined from underground workings extending to a depth of over 400 feet. The ore contained 0.6 to 1.5% WO_3. Scheelite occurs around the margins of a small granodiorite body in tactite limestone".[2]

Other tungsten deposits in Western Nevada show a similar geologic setting with grades varying from 0.2 to 2% WO_3. Hence it is apparent that the Hilltop mine falls within the typical pattern of tungsten mines located in the western part of the State.

Mineralogy

The principal economic mineral and the one of sole interest to this date is scheelite. Pyrite is present and readily visible, associated with the scheelite in a quartz gangue. The base sulfides of copper, lead and zinc are also reported but were not directly observed. Molybdenum, vanadium and bismuth are frequently found in contact deposits and these are reported in minor amounts at Tungsten Mountain. Should a detailed sampling program be carried out this location, it is recommended that period checks be made for these elements. In addition, it is recommended that the pyrite be checked for gold and silver, particularly if an iron concentrate is made in the process of upgrading the tungsten.

Mine Workings

The mine has been opened on four levels plus an intermediate level. At the time of this examination, the 1st and 2nd levels were caved, hence only the 3rd, 4th and intermediate levels (between 3 & 4) were observed. The 5th level adit has been advanced the short distance of about 150 feet along the contact and within the stock.

On January 21st, entrance to the mine was made on the 4th level which was followed to the south face. Thence up the main raise manway to the intermediate level and finally up to the 3rd level which was observed from the north to the south face and exit. Upon emergence from the 3rd level, a climb was made to the base of the 1st level which is now caved. The 2nd level is also caved and inaccessible.

Small amounts of ore have been gouged from the back of the 4th level, but in general, this level is intact and except for timber in a few places, has remained open unsupported. The ore on the 4th is referred to as "contact ore" from the mine entrance to about 250 feet from the portal. From here it continues spotty to near the main raise where the values improve. From a short distance beyond the raise and on to the south face, tungsten values appear quite low.

Open stoping has extracted ore from a point about 50 feet below the intermediate level to the 3rd level. The ore vein at this location consists of about 4 feet of good ore along the hangingwall and about 2-3 feet of lower grade ore along the footwall, terminating in a 1 foot layer of gouge. Below the intermediate level the ore has been mined full width, taking both the higher grade ore and the lower grade ore along the footwall with the gouge that sloughed off with the blast. Above the intermediate, the higher grade ore along the hangingwall has been selectively mined to a width of about 4 feet. Ore pillers for support have been left throughout this stoped area; the stope length is about 75 feet.

On the 3rd level, a combination of stoping and raising goes to about 25 feet above the level. At this horizon, a sharply rising footwall cuts off the ore. What, if anything, may be found above this cut-off remains to be seen. As previously mentioned, the 2nd and 1st levels are caved.

Values

Mine production is reported to be 958 tons of 1.61% WO_3 from the No. 1 level and 6310 tons of 0.97 WO_3 from the rest of the mine including ore from development and stoping. By eliminating low grade ore, Mr. Lakes presents an indicated ore grade of 1.17% WO_3.

At the time of writing, no assay maps of the mine could be made available; however, an assay map of the 4th level is reported to have been made. This is most significant and important since it will give an indication of the values to be found through additional exploration. For instance, should the No. 5 drift be advanced in ore, for lack of other information it would be wise to assume that tungsten values encountered on the 5 would be similar to those found on the 4.

Ore Reserves

Previous reports 1/ indicate the stoping width to be an average of 6 1/2 feet of ore, and the "probable and possible" tonnage to be 26,452 tons since reduced by structural interruption that cut off ore 25 feet above No. 3 tunnels' N. W. extension. Such a tonnage may exist in the mine but it will require exploration raises, sampling and measurement to confirm it.

Exploration Targets

Additional ore may be found by exploring the hangingwall area of the No. 3 level. (The possibility also exists of ore in the footwall along parallel structures, although this seems unlikely since it is more remote from the granitic stock). In addition, ore might be found by raising above the 3rd tunnel beyond the cut-off previously referred to. The main target, however, should be the 5th level along the contact and the 4th level driven as a crosscut and thence as a drift along the contact. The 5th would be the

better target since it has been already started alongnthe contact and should ore be encountered at this horizon, it could be explored by raising and drifting on the 4.

Although no accurate prediction can be made as to the vertical extent of the Hilltop orebody, tungsten deposits in general can be expected to go to some depth (The Nevada Massachusetts extended to over 1400 feet). Hence an exploration risk on the 5 would be a legitimate and recommended target.

One question, however, that remains unanswered at this time is the anticipated grade of ore that may be encountered. Records are available for overall grade of ore mined throughout the mine but not (at this date) of individual levels or stopes. Every effort should be made to obtain the assay map of the 4th level and if it cannot be obtained, then this drift should be systematically sampled before work on the 5th adit is planned.

The entire contact zone of granite-lime is a legitimate target for exploration. This contact bears southeast from the No. 5 portal for a distance of some 1200 feet, thence westerly for a distance of at least 800 feet. To drive level 5 to a point below the extension of ore showings on the upper levels will require about 1000 feet of drifting from the present face.

Mine Equipment

Equipment at the mine is limited and consists of the following:

An Eimco 12B mucking machine in good condition
A few mine cars in average condition
An old portable compressor that has been partly stripped
A diesel powered semi-portable compressor that appears in good condition.
An air powered locomotive
Several hundred feet of new mine rail ready for use.
One stoper only observed.

Potential

[illegible] of the 4th level shows it to be about 750 feet in length [illegible]ch 70-75% or about 520 feet is in ore; the estimated width [illegible]-o feet. Should the same ore length and same width be found [illegible] the 5th level and should the values continue between levels, [illegible]en a potential tonnage between these two levels is:

$$\frac{520' \times 182' \text{(vertical distance)} \times 5}{10}$$

= approximately 47,000 tons

Available ore above the 4th level is estimated at 40-50% of the original reserve or about 10,000 tons. Thus, assuming ore is found on No. 5 level, the potential tonnage down to that horizon at a distance of 1000 feet from the portal is estimated at 57,000 tons. It should be emphasized that this is a potential (or a target) assuming conditions as noted above.

Mill

The Tungsten Mountain flow sheet includes primary and secondary crusher, one ball mill and classifier, concentrating tables, thickener, roaster and magnetic separator and flotation cells within the building but not yet installed.

The mill frame is of solid steel construction with corrugated sheet metal covering roof and sides; the building is totally enclosed. The slab concrete for the floors is cracked but the concrete bases for heavy equipment are intact.

The secondary (cone) crusher will have to be replaced. The rake classifier may have to be replaced by a cyclone to fully develop the capacity of the ballmill. Unfortunately, all of the electrical wiring has been removed, as well as many of the smaller motors. The main motors - crusher. ball mill etc. are in place. The diesel electric generating units have been removed.

In summation, the mill is for the most part intact but will require power units and rehabilitation as noted plus installation of the flotation cells.

S[illegible]decision be made at a later date to place the mill in [illegible], it is strongly recommended that metallurgical test [illegible] carried out to determine whether a tungsten concentrate [illegible]ole for shipping can be made by gravity and flotation, thus [illegible]minating the roaster and magnetic separator.

[illegible]ture Market for Tungsten

The future market for tungsten is difficult to forecast because of the relatively large amount in government stockpile and its gradual release to industry. The demand for tungsten is quite high but the price is not expected to increase because of the U S A stocks.

Personal communication with U.S. Bureau of Mines officials in Seattle and with Nevada Bureau of Mines officials at Reno has revealed that, in their estimation, the price of tungsten will remain more or less at its present level for an indefinite period of time.

Observations

A compilation of all information available to date on the Tungsten Mountain Mine yields the following observations:

This mine has produced a limited amount of relatively good ore

The deposit has a reasonably good chance of continuing to some depth.

For lack of other information, it can be assumed that the value of new ore discovered should be comparable to that now exposed on the 4th level.

From an exploration viewpoint, there is reasonably good chance of developing additional ore in appreciable quantities.

Conclusions and Recommendations

1. Make every effort to obtain the assay map of the 4th level.
2. Failing "1", chip or channel sample the back of the 4th level (plus crosscuts), plot values on an assay map and calculate a weighted average and width of ore.
3. If "1" or "2" is favorable, drive the 5th level drift south along the contact for about 1000 feet.
4. If "3" is favorable, probe the walls of the drift with relatively shallow diamond drill holes. Spacing to be determined as the work progresses but in the neighbourhood of 200 feet.
5. If "4" is favorable, complete the initial development by raises to the 4th level and appropriate drifting on that horizon.

Donald L. Anderson

Seattle, Washington
February 6, 1967

Donald L. Anderson
Professor Mining Engineering
University of Washington

Bib.:

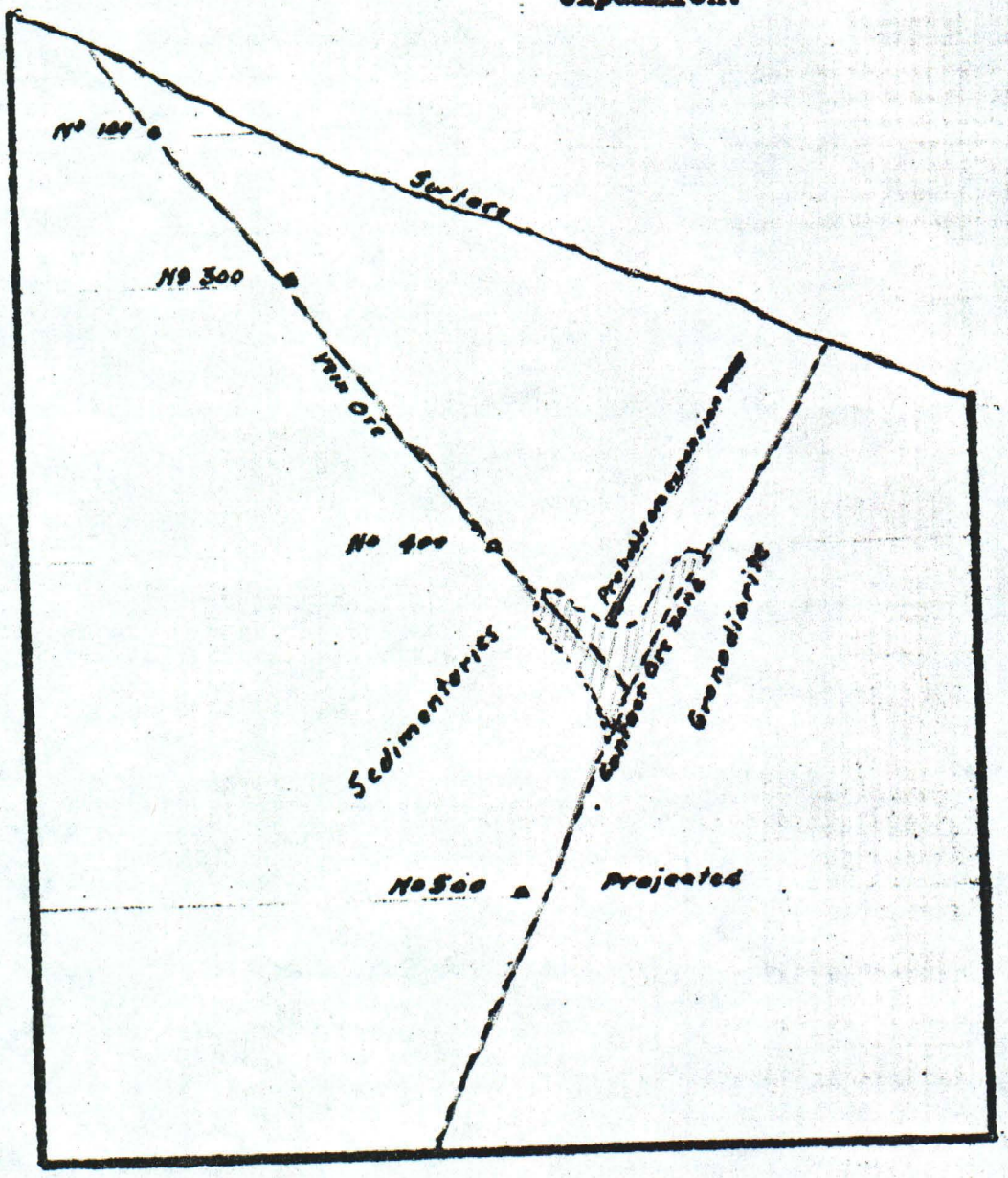
1/ Report on the Tungsten Mountain Mining Property, Churchill Co., Nevada by Arthur Lakes; Jan. 30, 1962

2/ Nevada Bureau of Mines Bulletin 65, page 155

DIAGRAMMATIC CROSS SECTION

100-feet to 1-inch

Showing approximate zone of Ore Vein juncture with Contact Ore zone and illustrating resultant probable ore expansion.



Item 4

Mine Management
Mine Production

License
No. 8950

Development
Exploration

J. H. WREN & COMPANY

Mining Contracting Engineers

Cable Address
WRENCO

Doctorates in Mining Engineering & Geology

Post Office Box 2021
Reno, Nevada 89505
Phone (702) 322-4840

October 1, 1972

TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY

LOCATION:

~~Clan Alpine Mining District,~~ Churchill County, Nevada, 17 miles via graded gravel road from Highway No. 50, 90 miles from Fallon, Nevada, 150 miles from Reno, Nevada, easterly, 45 miles from Austin, Nevada, westerly.

PROPERTY EXTENT:

19 lode mining claims, millsite and water well permit granted by the State of Nevada, in one parcel and under one ownership.

160 acres, adjoining the Tungsten Mountain Mine millsite, known as the Denver Placer Claim, under another ownership. Both properties are available for a purchase contract together.

INVENTORY WORTH APPRAISAL:

a). Water well, deep well pump, 3,300' of 4' underground pipeline to mill	$ 25,000.00
b). Primary ore bin, crusher unit, steel framed, steel sheathed building, reinforced concrete heavy equipment foundations, concrete floors, ramps, etc., gravity, flotation and magnetic scheelite treatment plant equipment installed 2/3rds complete	150,000.00
c). Mine roads, ramps, etc.	40,000.00
d). Total underground development on five adit levels, connecting raises, = 3,127', of which 2,600' is an asset of production @ $65 per foot = ...	169,000.00
e). Underground-surface pipelines, track, diesel powered compressor, mucking machine, ore cars, blowers, etc.	10,000.00
Sub-Total	$ 394,000.00

is listed herein at $394,000.00, the actual cost in the late 1950s was over $600,000.00. Concentration of Tungsten Mountain Mine ore was not commenced on the production site until well after the market had dropped from $63 per unit to less than half of that amount and subsequently to $21 per unit which dictated suspension. However, the present mill did produce an excellent character clean scheelite concentrates of more than 65% with practically no detrimental minerals, in spite of generally poor milling procedure.

Judging from historical production grade averages, a consistent millhead of more than 1.00% nearing 1.25% could be expected. The No. 1 Adit development work produced 958.17 dry tons out of which 1,543.68 units were produced at an average recovery grade of 1.61% WO_3.

Recent work has improved road conditions and commenced laying out an open pit section.

A voluminous technical report file covering engineering, metallurgy, geology, assay evaluation, maps, etc., which have been compiled by unprejudiced technical men is open for inspection in our Reno, Nevada, office. This original file will not be forwarded to a purchase prospect. The property and technical exhibits are available at any prearranged time for scrutiny.

Recent title search has been made and the property is free and clear of obligation. All assessment work has been completed and filed to cover the period September 1, 1972, through August 31, 1973.

The Tungsten Mountain Mine in its entirety with all equipment and well rights is available for a firm price of $235,000.00. A purchase contract will be granted with the requirement of $25,000.00 down payment, followed by mutually agreed installments. The Denver Placer Claim of 160 acres more-or-less will be part of the above delivery. Free and clear title can be placed in escrow account pending the payout of a purchase contract agreement.

We reserve the right to withdraw the Tungsten Mountain Mine and the Denver Placer Claim availability at any time without notice prior to the execution of a written option or purchase agreement.

Yours very truly,

J. H. WREN & COMPANY

By James H Wren Ph. D.

Dr. James H. Wren

Item 4

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Exploration

J. H. WREN & COMPANY

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Post Office Box 2021
Reno, Nevada 89505
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January 17, 1974

Subject :

Tungsten Mountain Mine Report.

Since the herewith Tungsten Mountain Mine Assets Summary was compiled in 1972, some operating economics have been changed. Instead of the local markets paying $36 per stu @ 65% or better concentrates, they now pay $44 per unit for 60% W O3 or better and $40 per unit for 50% products. Therefore the value of proven ore will be greater at this time.

Western United States scheelite deposits seldom in general hold much depth or length. Only a limited number of Nevada and California tungsten properties have been mined over 400' deep by 500' in length. The Tungsten Mountain Mine's scheelite has already been proven to 500 feet of depth and over 1,000 long. It is likely that the mineral occurrence will go down at least 1,000 feet. There is a favorable contact zone of more than 5,000 feet in length with tungsten mineralization visable in the croppings. Scheelite bearing veins also occur in the sedimentaries striking towards the intrusive contact zone.

The herewith attached reports by Arthur Lakes and Donald Anderson were not promotional presentations as they were done at the request of management to throw additional light on its own activities. Arthur Lakes followed the mine's progress from the time it was a prospect without road access through exploration, development, and what production that was achieved, in the capacity of fee basis geologic-engineering consulting. His retainer years ranged from 1954 through 1972.

The Tungsten Mountain Mine and Denver Placers are owned by Norman W. Cedergreen and James H. Wren. No obligation exists on the property and title is in good order. A watchman is engaged full time with living quarters at the mill.

Yours very truly,
J. H. WREN & COMPANY,

BY James H. Wren Ph.D.
James H. Wren, Ph.D.

Mine Management
Mine Production

License
No. 8950

Development
Exploration
Item 4

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January 22, 1974

TUNGSTEN MOUNTAIN MINE ASSETS SUMMARY

LOCATION:

Clan Alpine Mining District, Churchill County, Nevada, 17 miles via graded gravel road from Highway No.50, 90 miles from Fallon, Nevada, 150 miles from Reno, Nevada, easterly, 45 miles from Austin, Nevada, westerly.

PROPERTY EXTENT:

19 lode mining claims, mill site and water well permit granted by the State of Nevada, in one parcel and under one ownership.

160 acres, adjoining the Tungsten Mountain Mine mill site, known as the Denver Placer Claim, under another ownership. Both properties are available for a purchase contract together.

INVENTORY WORTH APPRAISAL:

a.	Water well, deep well pump, 3,300' of 4' underground pipeline to mill	$ 25,000.00
b.	Primary ore bin, crusher unit, steel framed, steel sheathed building, reinforced concrete heavy equipment foundations, concrete floors, ramps, etc., gravity, flotation and magnetic scheelite plant equipment installed - 2/3rds complete	150,000.00
c.	Mine roads, ramps, etc.	40,000.00
d.	Total underground development on five adit levels, connecting raises = 3,127', of which 2,600' is an asset of production @ $65 per foot	169,000.00
e.	Underground-surface pipelines, track, diesel powered compressor, mucking machine, ore cars, blowers, etc.	10,000.00
	Sub-Total	$394,000.00

Tungsten Mountain Mine Assets Summary, January 22, 1974.

DEVELOPED ORE:

50,000 units @ 1.00% WO_3 grade = $2,750,000 at the EM & J quotations; however, local Union Carbide Corp. and Kennemetals, Inc., are now purchasing for $44 unit, 60% or better grade ..... $ 2,200,000.00

TOTAL EXISTING INVENTORY APPRAISAL ..... $ 2,594,000.00

PROBABLE ORE:

Scheelite mineralization has been proven 200' below the No.4 Adit Level of some 900' in length, specifically in the No.5 Adit Level some 250' in on the mineralization. When it has progressed 1,200', making available ore tonnages in the Tactite Vein Intersection with the Contact Vein between the No.4 and No.5, and tonnages below the "Bay Area" (500' of depth), it is anticipated that some additional units of tungsten, estimated at 150,000, will be opened and produced. $44 is being used herein as the price offered by local markets for 60% WO_3 ..... $ 6,600,000.00

POSSIBLE ORE:

The "Inside Contact" between the intrusives and sedimentaries is over 5,000 feet in length showing tungsten mineralization. A single tactite vein in the sedimentaries has averaged 1.47% recovery, as supported by the available production records, from widths of 4' to over 20' in width. One possible open-pit zone has been partly prepared with a grade of .45% to .55%. It is estimated that, when the aggregate of all of the zones have been produced, the minimum possible ore units are 150,000 WO_3 units which at local markets, $44 unit @ 60% or better concentrates = ... $ 6,600,000.00

TOTAL ESTIMATE:

Total herein listed $15,794,000.00

SUMMARY CONCLUSIONS:

Although the existing inventory of physical assets, not inclusive of ore reserves, is listed at $394,000.00, the actual cost in the late 1950's was over $600,000.00. Concentration of Tungsten Mountain Mine ore was not commenced on the production site until well after the market had dropped from $63 per unit to less than half of that amount and, subsequently, to $21 per unit which dictated suspension. However, the present mill did produce an excellent character clean scheelite concentrates of more than 65% with practically no detrimental minerals, in spite of generally poor milling procedure.

Judging from historical production grade averages, a consistent millhead of more than 1.00% nearing 1.25% could be expected. The No.1 Adit development work produced 958.17 dry tons out of which 1,543.68 units were produced at an average recovery grade of 1.61% WO_3.

With but few exceptions, most tungsten mines in Western United States have limited depth and length in connection with the deposits. The majority of scheelite properties have less than 300 feet of depth and less than 300 feet of length. Aggregate grade averages of all western mines is less than 75% WO_3 mine run. The Tungsten Mountain Mine now holds a proven ore length of 1,000 feet and a proven mineralization depth of 500 feet. Visible mineral in outcrops has been noted over a 5,000-foot length on the inside contact between the intrusives and sedimentaries. Scheelite bearing veins also occur in the sedimentaries striking diagonally towards the contact zone. Most of the mine's development and proven ore is in one such vein. It is believed that the tungsten mineralization will persist to a depth greater than one thousand feet in this area. The Tungsten Mountain Mine holds excellent probability of becoming a major United States scheelite producer at the time it has been fully explored and developed.

Recent work has improved road conditions and commenced laying out an open-pit section.

A voluminous technical report file, covering engineering, metallurgy, geology, assay evaluation, maps, etc., which have been compiled by unprejudiced technical men, is open for inspection in our Reno, Nevada, office. This original file will not be forwarded to a purchase prospect. The property and technical exhibits are available at any prearranged time for scrutiny.

Tungsten Mountain Mine Assets Summary, January 22, 1974.

Recent title search has been made and the property is free and clear of obligation. All assessment work has been completed and filed to cover the period September 1, 1973, through August 31, 1974.

The nineteen full lode mining claims, 160 acres of placer ground, mill-site, mining equipment, water well, pump and service line, along with the gravity, flotation and magnetic separation plant, are owned by Norman W. Cedergreen and James H. Wren.

The Tungsten Mountain Mine in its entirety, with all equipment and well rights, is available for a firm price of $235,000.00. A purchase contract will be granted with the requirement of $25,000.00 down payment, followed by mutually agreed installments. The Denver Placer Claim of 160 acres, more or less, will be part of the above delivery. Free and clear title can be placed in escrow account pending the payout of a purchase contract agreement.

We reserve the right to withdraw the Tungsten Mountain Mine and the Denver Placer Claim availability at any time without notice prior to the execution of a written option or purchase agreement.

Yours very truly,

J. H. WREN & COMPANY

By James H. Wren Ph.D.
James H. Wren, Ph.D.

TUNGSTEN MOUNTAIN SCHEELITE SHIPMENTS TO NEVADA SCHEELITE CO.

Date	Tons	% WO3	Units WO3	Price per unit	Total paid
Nov. 26, 1960	3.0125	69.94%	210.6732	$23.00	$4,845.48
Jan. 3 1961	3.1500	50.27% (14.73% low)	158.3253	20.00	3,174.43
Mar. 23 1961	3.9460	69.77%	247.3695	22.50	5,565.80
Apr. 20	4.9865	73.76%	367.7305	22.50	8,273.94
May 11	4.8845	70.71%	345.3141	22.50	7,769.57
May 23	2.6265	70.40%	184.8704	22.50	4,159.58
June 12	1.4950	67.75%	101.2659	22.50	2,278.48
June 29	3,6705	73.20	268.6623	22.50	6,044.90
July 7	4,4270	69.94	310.2608	22.50	6,980.87
July 13	4,1195	71.00%	292.4490	22.50	6,811.30
July 28	1.7000	64.00%	115.4068	22.50	2,596.66
Aug. 11	3.5853	69.95	250.7917	22.50	5,642.81
Aug. 28 *	0.605	39.21	23.7416	19.34	259.16
Aug. 28	2.3260	69.88	150.9012	22.50	3,395.28
Sept. 5	0.8195	69.66	57.08637	22.50	1,284.44
	44.9638	68.603%	3,084.8487	$21.08	$68,852.80

* May 26-June 12 Accident reduced crew for 2-weeks (May 27, 1961)
* August 28th. Cleanup

1961

NOTE : The above is only part of the 1960 and 1961 production from mine development. Other concentrate shipments were sold to the Union Carbide Corporation and the Fred H. Lenway Company the latter paying a premium for the excellent grade and character products. The mine was not depleted of ore and over $500,000 at present prices of the same ore grade is available from No. 1 to No. 3 with open pit production procedure.

J. H. W. , October 23, 1972

Example of Tungsten Mountain Mine Concentrates
(The scheelite is of particularly pure grade)

The following analyses are indicative of Tungsten Mountain gravity table concentrates, as per statements from G.S.A. during Government stockpiling.

	Lot #1	Lot #2
Tungstic Oxide	64.08%	66.02%
Tin	tr	tr
Copper	0.01%	0.02%
Arsenic	none	none
Antimony	none	none
Bismuth	0.02%	0.017%
Molybdenum	0.21%	0.20%
Phosphorus	0.09%	0.044%
Sulphur	0.09%	0.09%
Manganese	0.09%	0.12%
Lead	0.12%	
Zinc	0.07%	

(18)
Item 4

KENNAMETAL INC.,
NEVADA DIVISION

347 NORTH TAYLOR STREET
FALLON, NEVADA

Tel: (702) 423-5131
April 22, 1974

Gentlemen:

I am enclosing a revised copy of our buying schedule for tungsten concentrates which becomes effective April 22, 1974, We are pleased to inform you that our base price for tungsten concentrates containing 60% WO_3 shall be $55.00 stu.

There will be a straight line reduction of 20¢ for each 1% below 60% WO_3 to 40% WO_3.

This increase in tungsten prices reflects a general firming trend in price structure of the world tungsten market.

Sincerely,

Roy Nojima

Roy Nojima
Ore Purchaser

RN/as
Enclosure

Copy

KENNAMETAL INC.,
NEVADA DIVISION

347 NORTH TAYLOR STREET
FALLON, NEVADA

Tel: (702) 423-5131
May 15, 1974

Gentlemen:

I am enclosing a revised copy of our buying schedule for tungsten concentrates which becomes effective May 15, 1974. We are pleased to inform you that our base price for tungsten concentrates containing 60% WO_3 shall be $75.00 stu.

There will be a straight line reduction of 30¢ for each 1% below 60% WO_3 to 60% WO_3.

This increase in tungsten prices reflects a general firming trend in price structure of the world tungsten market.

Sincerely,

Roy Nojima

Roy Nojima
Ore Purchaser

RN/as
Enclosures

Arthur Lakes, President
James H. Wren, Sec.-Treas.

Office:
702 Forest Street
Reno, Nevada 89502
Phone: 323-8910

LAK-REN VENTURES, INC.

Mining Enterprises

February 24, 1971

NOTE :

The following report by Donald L. Anderson is not as complete as it could be. He was inconvenienced by the fact that a set of the mine maps were not available when he looked the property over. Arthur Lakes had not been advised of the Anderson visit so was unable to furnish the maps nor assist with the field work.

LAK REN VENTURES, INC.,

BY _____
James H. Wren, Secretary-Treasurer

Item 4

KENNAMETAL INC.,
NEVADA DIVISION

TUNGSTEN CONCENTRATE BUYING SCHEDULE

Effective May 15, 1974

Base Price

Our base price for tungsten concentrates containing 60% WO_3 shall be $75.00 per short ton unit (20 pounds contained WO_3). Delivered Fallon, Nevada subject to the conditions below:

IMPURITY PENALTIES

Buyers reserve the option of applying prevailing GSA penalty schedule for impurities if the material is considered particularly "dirty".

GRADE AND PENALTY

60% WO_3 and above	$75.00 per unit maximum
60% WO_3 to 40% WO_3	30¢ penalty for each 1% below 60% WO_3 to 40% WO_3

PRICE SCHEDULE BASED ON NO IMPURITY PENALTY

60% WO_3	$75.00
55% WO_3	73.50
50% WO_3	72.00
45% WO_3	70.50
40% WO_3	69.00

OTHER CONDITIONS

(1) Material below 40% may be taken by special negotiations.
(2) A charge of $25.00 for each lot will be made for handling lots under one ton net dry weight.
(3) Material should be dried prior to the delivery. The buyer reserves the right to invoke a drying charge when necessary.
(4) Delivery shall be fob Kennametal Inc., Fallon Plant, 347 North Taylor Fallon, NV 89406.
(5) Deliveries will be accepted Monday through Friday, holidays excepted, between the hours of 8:30 A.M. and 2:30 P.M.
(6) The above schedule applies only to lots acceptable to the buyer.
(7) This schedule is subject to change without notice.
(8) All settlement based on buyers' weight, sampling and analysis.

Jack D. Frank, Division Manager

JDF/as

KENNAMETAL INC.
NEVADA DIVISION

347 NORTH TAYLOR
FALLON, NEVADA 89406

PH. 702-423-5131
TELLEX 35-4436

TUNGSTEN CONCENTRATES PURCHASE CONTRACT

Lot No. N.....

Seller ..... Date .....

Address .....
P. O. Box or Street Address City and State

Origin of Concentrates: Name of Mine .....

County ..... State .....

Type of Ore .....

Sample Copy

Approximate Net Weight of Ore Including Moisture ..... lbs.

Base Price per STU .....Adjusted per

Kennametal's Buying Schedule dated .....

CONDITIONS OF SALE

1. The quoted price is FOB Kennametal Plant, Fallon, Nevada.
2. The weighing and sampling will be conducted by Kennametal Inc., with the Seller encouraged to observe the weighing and sampling procedures. Certified weighs will take precedent over approximate weight shown above and will be binding on buyer and seller.
3. A chemical analysis will be arrived at by taking a composite sample of this Lot and splitting it into three separate portions. One portion will be for the Seller, one for the buyer and one will be sealed and retained by Buyer for umpire purposes in case of a disagreement in the assay between the buyer and the Seller. All three samples will be binding on the buyer and the Seller.
4. If no notification is received by the buyer within ten days from receipt of the "Settlement Sheet," and check in final payment, the settlement shall be deemed complete and binding on both parties to this contract.
5. Should the Seller notify the buyer of his disagreement in analysis, the sealed sample will be mailed to an umpire agreeable to both parties for an analysis. The analysis of the three samples which falls between the other two will be binding on both buyer and seller. The umpire fees will be paid by the party, buyer or seller whose analysis deviates from the umpire by the greater amount.
6. The buyer reserves the right of rejection for material that does not come up to minimum standards of grade, per the buying schedule in effect at the time of the sale. In the event that the material is rejected, the ~~buyer~~ Seller will be notified to pick up the maerial. If the ~~buyer~~ Seller fails to pick up the material within 60 days after the date of sending notice by certified mail, Kennametal has the right to dispose of the material in any manner it sees fit.
7. The Seller certifies that he is the legal owner of the ore which is the subject of this agreement and has all rights pertaining to the selling of this material.

Accepted date .....

Seller .....by .....

Buyers - Kennametal Inc. Nevada Division by.....

SELLER

FAL PUB CO.

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
Bishop, California

SCHEDULE FOR PURCHASING TUNGSTEN CONCENTRATES
WHICH ARE COMPLETELY AMENABLE TO OUR PROCESS*

WO3 Content	Per Short Ton Unit WO3 f.o.b. Upper Scheelite Near Bishop, California
Less than	No Payment
20.00 % to 24.99	$ 65.00
25.00 to 29.99	66.25
30.00 to 34.99	67.50
35.00 to 39.99	68.75
40.00 to 44.99	70.00
45.00 to 49.99	71.25
50.00 to 54.99	72.50
55.00 to 59.99	73.75
60.00 and up	75.00

This schedule is not an offer to purchase tungsten concentrates. Do not ship concentrates unless we issue an order to purchase.

Prices are subject to change without notice.

For materials which originate from foreign sources, Seller/Shipper must arrange to pay applicable U.S. Duty and submit evidence of such payment.

*Based on five-pound sample submitted by Seller. Materials shipped must conform to sample submitted for evaluation.

We require approximately three weeks to conduct test work on samples submitted for evaluation.

Prices apply to Lot deliveries of one dry ton or more. Deductions as shown below will be made from regular purchase schedule for Lots of material delivered in quantities of less than one (1) dry ton:

		Deduct	
Less than	2000 lbs. (Dry)	$ 1.00	Unit WO_3
	1500	1.50	
	1000	2.00	
	500	2.50	

or $50.00, whichever is greater

Concentrate particle size must be less than one-quarter (1/4) inch.

Concentrates which contain excessive moisture (generally in excess of 5% H2O) are not acceptable.

Deliveries are limited from 8:00 A.M. to 3:00 P.M., Monday through Friday, except holidays.

Revised: August 1, 1974

Item #

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
Bishop, California

SCHEDULE FOR PURCHASING TUNGSTEN CONCENTRATES WHICH ARE COMPLETELY AMENABLE TO OUR PROCESS*

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45.00 to 49.99	71.25
50.00 to 54.99	72.50
55.00 to 59.99	73.75
60.00 and up	75.00

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Revised: August 1, 1974

Mine Management
Mine Production

License
No. 8950

Item 4
Development
Exploration

J. H. WREN & COMPANY

Mining Contracting Engineers

Doctorates in Mining Engineering & Geology

Cable Address
WRENCO

Post Office Box 2021
Reno, Nevada 89505
Phone (702) 322-4840

August 26, 1974

TO: John Mumey
Heinz D. Pickell

FROM: James H. Wren

RE: TUNGSTEN MOUNTAIN MINE SUPPLEMENTAL DATA

Gentlemen:

Mr. J. T. Herin of Texas phoned me this morning advising that he planned a trip to Reno soon with associates and had engaged an evaluating engineer to look over the Tungsten Mountain Mine, which is under a conditional sales contract to you.

The January 22, 1974 inventory appraisal is no longer accurate as it was based upon $44.00 per short ton scheelite unit for 60% or better concentrates. Our local market with Kennametal, Inc., came up to $55 per unit on April 22, 1974, and subsequently advanced again May 15, 1974, to $75.00 per unit for delivery at Fallon, Nevada. Union Carbide Corporation, Bishop, California, purchase schedule advanced to $75.00 per short ton unit on August 1, 1974. Herewith please find prints of those purchase schedules advances. In view of the high purity of the Tungsten Mountain Mine's scheelite concentrates character, plus the ability to deliver the first quality product at 65% to 68% $W O_3$, it is believed that a premium price can be obtained above the general schedules on the basis of committed continuous shipments. It is also interesting to note that 65% $W O_3$ concentrates in the August issue of the Engineering & Mining Journal domestic quotation was placed at $96.39 per unit.

The Latrobe, Pennsylvania, office of Kennametal, Inc., has contaced me several times with regard to their being quite anxious to buy concentrates from the property.

The two above companies are the major buyers of scheelite products in this area. However, there are also numerous other firms soliciting tungsten purchases.

On the basis of the Kennametal, Inc., general purchase schedule last offered and before a higher price is negotiated for continuous production shipments, the following reserves estimates illustrate the differential between the $44.00 January 1974 concentrate price and the purchase price now offered:

JANUARY 1974 PRICE:

50,000 units, Positive Ore	$ 2,200,000.00
150,000 units, Probable Ore	6,600,000.00
150,000 units, Possible Ore	6,600,000.00

AUGUST 1974 PRICE:

50,000 units, Positive Ore	3,750,000.00
150,000 units, Probable Ore	11,250,000.00
150,000 units, Possible Ore	11,250,000.00

NOTE: It is naturally understood that the above reserves are calculated at the high-grade gravity concentrate percentage, which should be 80% of the gross assay head value. As the total reserves will probably exceed the estimated units above, the 20% will, no doubt, be balanced as the ultimate production reserves will probably exceed the above estimates, and for the purpose of the outline, which is after all a guesstimate, did not list the 10% of the total recoverable scheelite in the form of beneficiated flotation concentrates at 40% WO_3 @ $69.00 per unit nor the 10% overall tailings loss factor.

During May, 1974, I gave you an estimate of pre-milling rehabilitation, treatment plant alignment and equipment units required installation. At that time I had a firm stripping, selective tungsten ore mining, haulage and stockpiling at the mill site for $10.00 per ton delivered under a written contract. I also had men and units of equipment located with which to commence activity. As there has been no performance towards a production installation in the past

three months, this ground will have to be covered again to align experienced personnel, 80% new equipment at nominal cost, and contractors of reliability and selective mining know-how. Therefore, the following estimates for production setup are based upon what was negotiated three months ago and may not be necessarily exact at this time.

Following estimates relative to placing the property under production within a 90-day period are:

Mill revamping and modernization	$ 42,000.00
300' No.5 advance for stoping area	18,000.00
No.1 pit area preparation	10,000.00
Bay Area pit preparation	10,000.00
2,000 tons $1.00+ delivered to mill	20,000.00
Trailerhouse rentals for camp and setup ...	25,000.00
Officing and Lab work	12,500.00
Total preproduction subscription	$137,500.00
2% contingency	27,500.00
TOTAL PREPRODUCTION SUBSCRIPTION....	$165,000.00

OPERATING ECONOMICS OUTLOOK:

NOTE: The following is based upon only gravity concentrates sale, stock-piling the flotation product for 60 days before the flotation circuit is cut in, to expedite cash flow income as soon as possible. When flotation concentrates are made, the daily income will rise. Every consideration should be given producing a 1.25% W O_3 grade millhead for the first 60 to 90 days of operation. There's enough 2.50% tonnage above the No.4 level to enrich the No.1 Open Pit production and maintain the required head product.

@ 1.25% millhead grade X 100 tons	
@ $75.00 per unit = a gross value of.....	$ 7,500.00
20% gravity circuit tailings loss	1,500.00
Gross per day recovery.....	6,000.00
$10.00 per ton ore to mill contract	1,000.00
$10.00 per ton milling - marketing	1,000.00
$5.00 per ton miscellaneous cost	500.00
Probable net per day before amortization and taxes	$ 3,500.00
Net per 25-day work month	$87,500.00

Note: About 12 - 15 units per day will be stored for flotation treatment, which, at $69.00 per unit = $897 in reserve.

SUMMARY:

The cost estimates to be met will require careful and intelligent distribution of subscribed funds. Cash outlay can be conserved obtaining low prices on 80% new-used equipment. There is no room in the estimates for slack management.

The mill superintendent has to have previous scheelite recovery production experience and, if possible, hold a degree in metallurgy.

The general superintendent should be required to have an extensive scheelite mining and milling experience and that background checkable before engagement, and is a graduate engineer.

A highly experienced tungsten man should be engaged to supervise all ore loaded out of the No.1 and Bay Area pits. Ground to be mined the following day should be lamped at night and designated with spray paint lines of demarcation by the mining supervisor, checked often by the general superintendent, and scrutinize the next day's loading out by contractor of the mill ore product.

Underground development can be expedited and money saved by letting out straight written contracts and performance closely watched.

To start with a mine engineer is unnecessary as the general superintendent can do the surveying, and whatever engineering is required.

In view of your lack of mining background, you should engage an economic mining engineer with a wide record of tungsten production experience. This man can check preliminary setup work about once a week and supervise your general superintendent. I probably will not be available for this consulting engagement. However, as I have about seven millions of dollars of scheelite production behind me, I can readily determine if a candidate for a consulting position is qualified to handle his responsibilities. Cost of this man has been calculated in the foregoing estimates.

To commence with, it is not recommended to set up an officing overhead at the mine. You can engage an accounting frim in Reno to handle payrolls, invoices, etc. Your general utility man at the mine can adequately take care of the simple timekeeping needed on the job.

Disbursement of subscribed capital should be handled under specific written instructions by a licensed accounting firm in Reno, Nevada. Monthly financial

statements should be delivered to management. Cash flow income can either be sent direct to your main management office or divided into its channels by your accounting office. If any suggestions are needed on this capital control, the writer has wide experience along those lines.

With regard to the technical men who have studied the Tungsten Mountain Mine, such as Donald Anderson, Arthur Lakes, DMEA supervising engineers, they were unprejudiced with no interest in the property. Observations by Arthur Lakes and Donald Anderson are herewith attached.

Very few scheelite properties in Western United States hold long-range perspective. Most are single ore shoot mines with limited length and depth. The Tungsten Mountain Mine's exploration and development entries prove long-range perspective. The average ore grade producted to date is quite a bit better grade than the average tungsten property.

On extremely long-range outlook, the writer and other experienced scheelite men, like the geologic staff of Utah International, Inc., have recognized a possibility of a high volume mineralized trough at depth where the dips of the surrounding intrusive rocks converge, perhaps a 1,000+ below the present No.5 Level. If such an occurrence becomes an established fact, this property could be Nevada's largest tungsten producer.

Yours very truly,

J. H. WREN & COMPANY

By_____
James H. Wren, Ph.D.

1 Print: Mr. J. T. Herin

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
Bishop, California

SCHEDULE FOR PURCHASING TUNGSTEN CONCENTRATES WHICH ARE COMPLETELY AMENABLE TO OUR PROCESS*

WO_3 Content	Per Short Ton Unit WO_3 f.o.b. Upper Scheelite Near Bishop, California
Less than 20.00 %	No Payment
20.00 % to 24.99	$ 65.00
25.00 to 29.99	66.25
30.00 to 34.99	67.50
35.00 to 39.99	68.75
40.00 to 44.99	70.00
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or $50.00, whichever is greater

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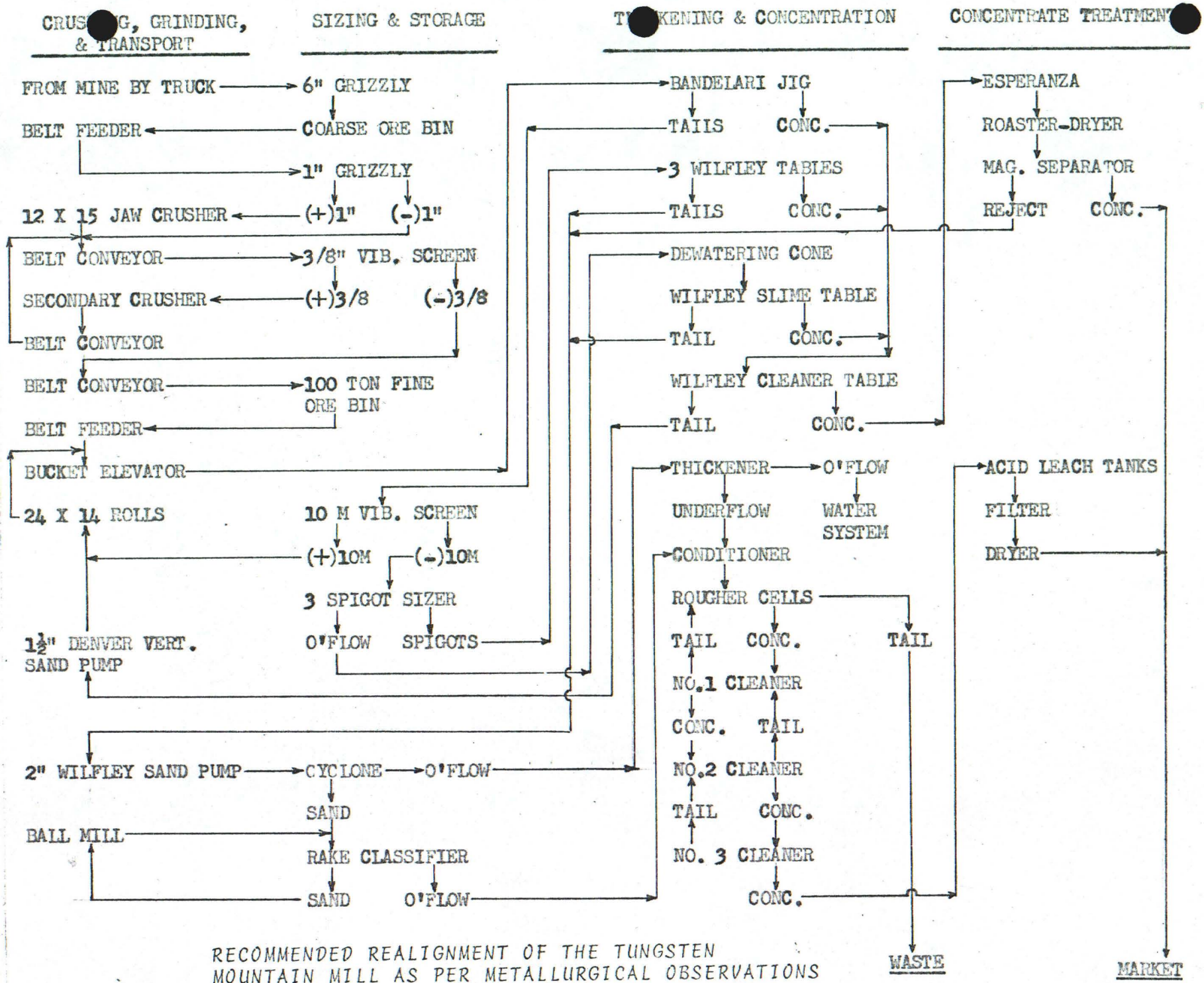
Revised: August 1, 1974

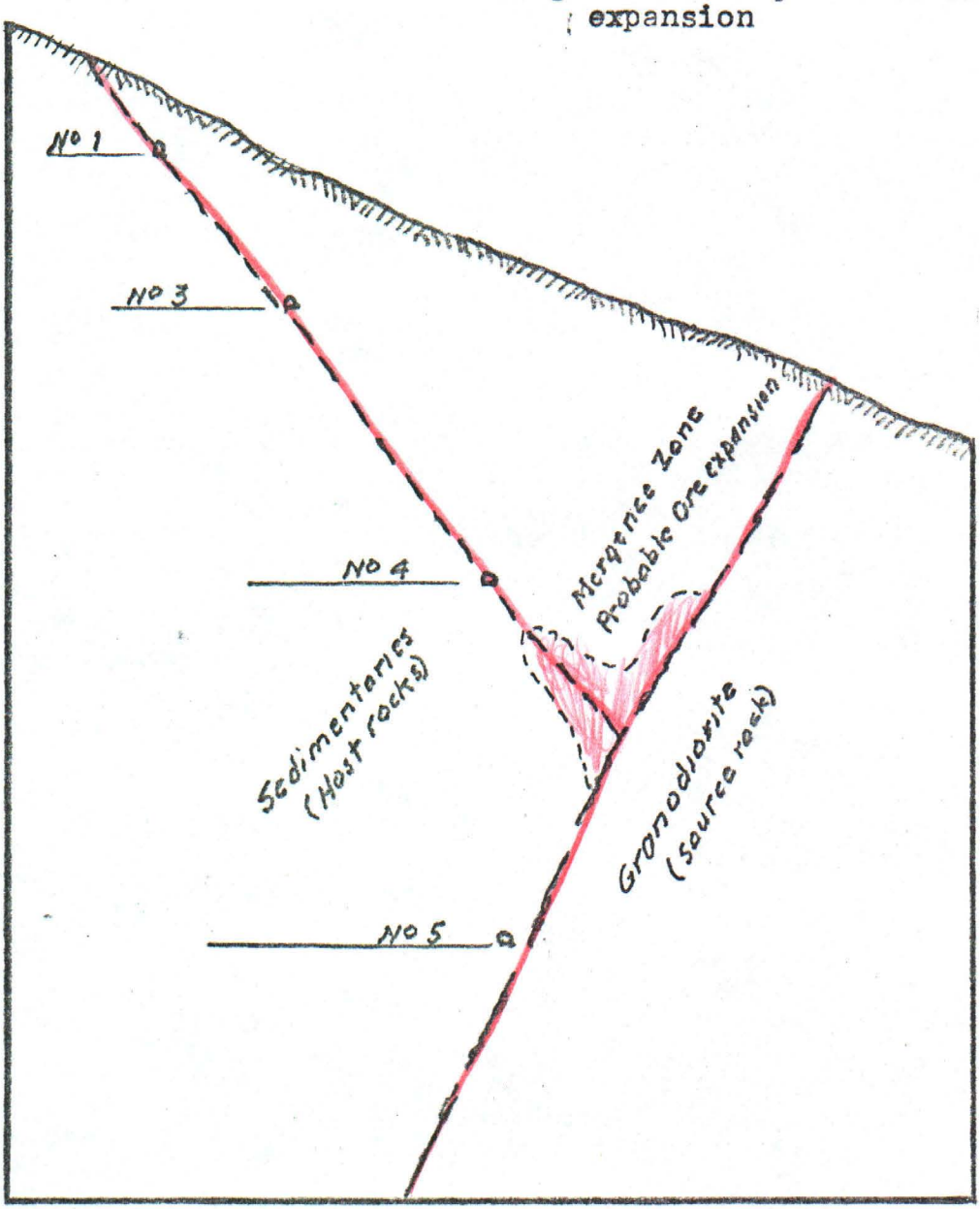


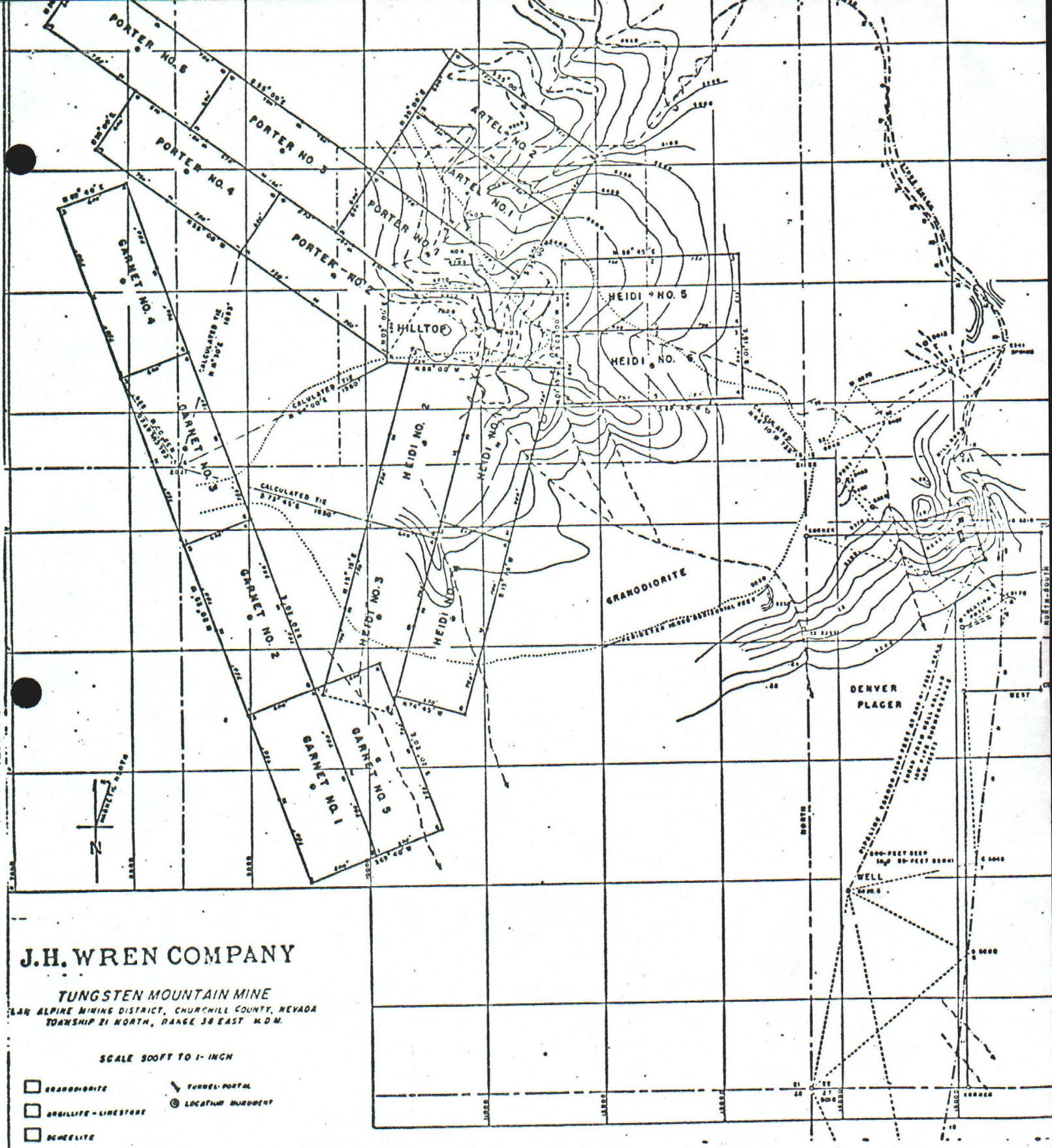
RECOMMENDED REALIGNMENT OF THE TUNGSTEN MOUNTAIN MILL AS PER METALLURGICAL OBSERVATIONS OF : James H. Wren, Ph.D., February 24, 1974

DIAGRAMMATIC CROSS SECTION

100-feet to 1-inch

Showing approximate zone of Ore Vein juncture with Contact Ore zone and illustrating resultant probable ore expansion





J.H. WREN COMPANY

TUNGSTEN MOUNTAIN MINE

LAKE ALPINE MINING DISTRICT, CHURCHILL COUNTY, NEVADA
TOWNSHIP 21 NORTH, RANGE 38 EAST M.D.M.

SCALE 200FT TO 1- INCH

- GRANODIORITE
- ARGILLITE - LIMESTONE
- SCHEELITE
- TUNNEL PORTAL
- LOCATION MONUMENT

LODE CLAIMS:

HILLTOP
PORTER NO. 1 - NO. 5
ARTEL NO. 1 - NO. 2
HEIDI NO. 1 - NO. 6
GARNET NO. 1 - NO. 5

PLACER CLAIM:

DENVER PLACER

MILL SITE:

FIVE ACRE MILL SITE CLAIM

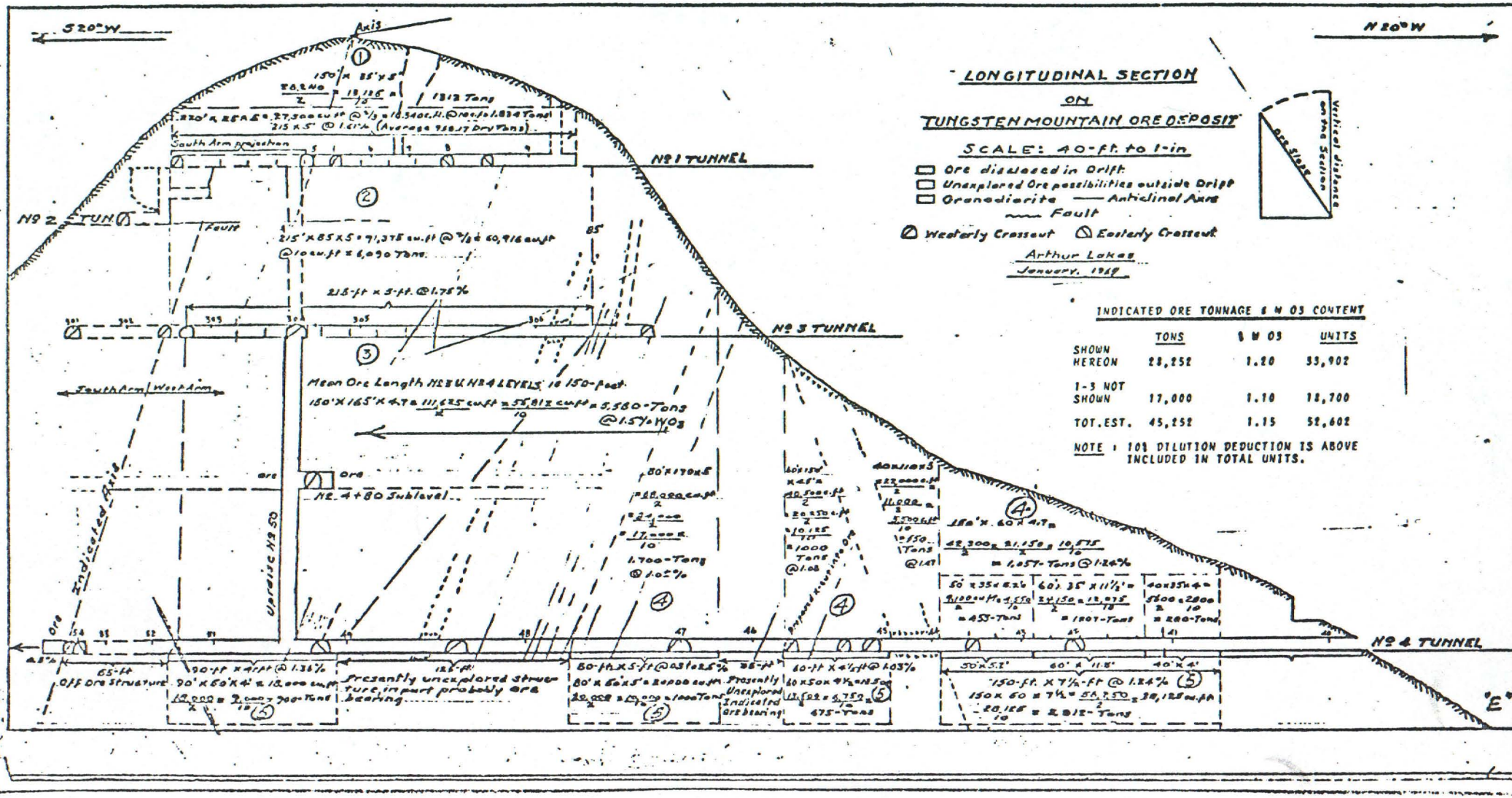
7 - 2 - 72

TUNGSTEN MOUNTAIN MINE

Underground development ..... 3,100 feet.
Tungsten depth proven..... 500 "
Tungsten probable depth 1,000+

MILL, 100 tons capacity, gravity, flotation, magnetic separation, concrete foundation and flooring, steel frame, sheet iron sheathed. Historical mill head 1.03% W.O3 plus. Pump plant, 3,300' waterline buried, four miles of road facilities, stockpiling area. Proven units : 50,000. Possible units : 200,000.

James N. Wren Ph.D.
January 1, 1973.



LONGITUDINAL SECTION
ON
TUNGSTEN MOUNTAIN ORE DEPOSIT

SCALE: 40-ft. to 1-in

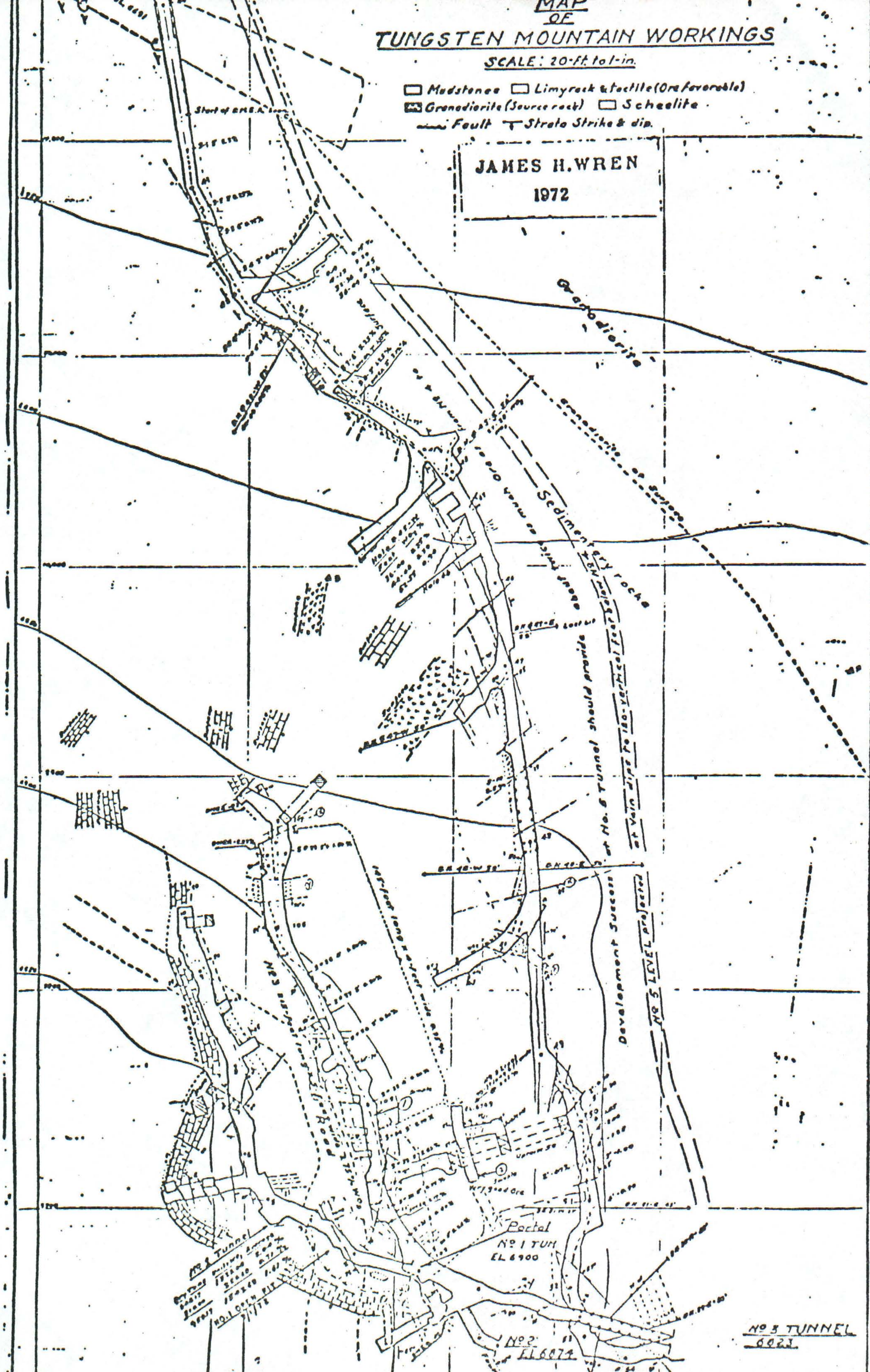
- Ore disclosed in Drift
- Unexplored Ore possibilities outside Drift
- Granodiorite —— Anticlinal Axis
- ~~~ Fault
- Westerly Crosscut
- Easterly Crosscut

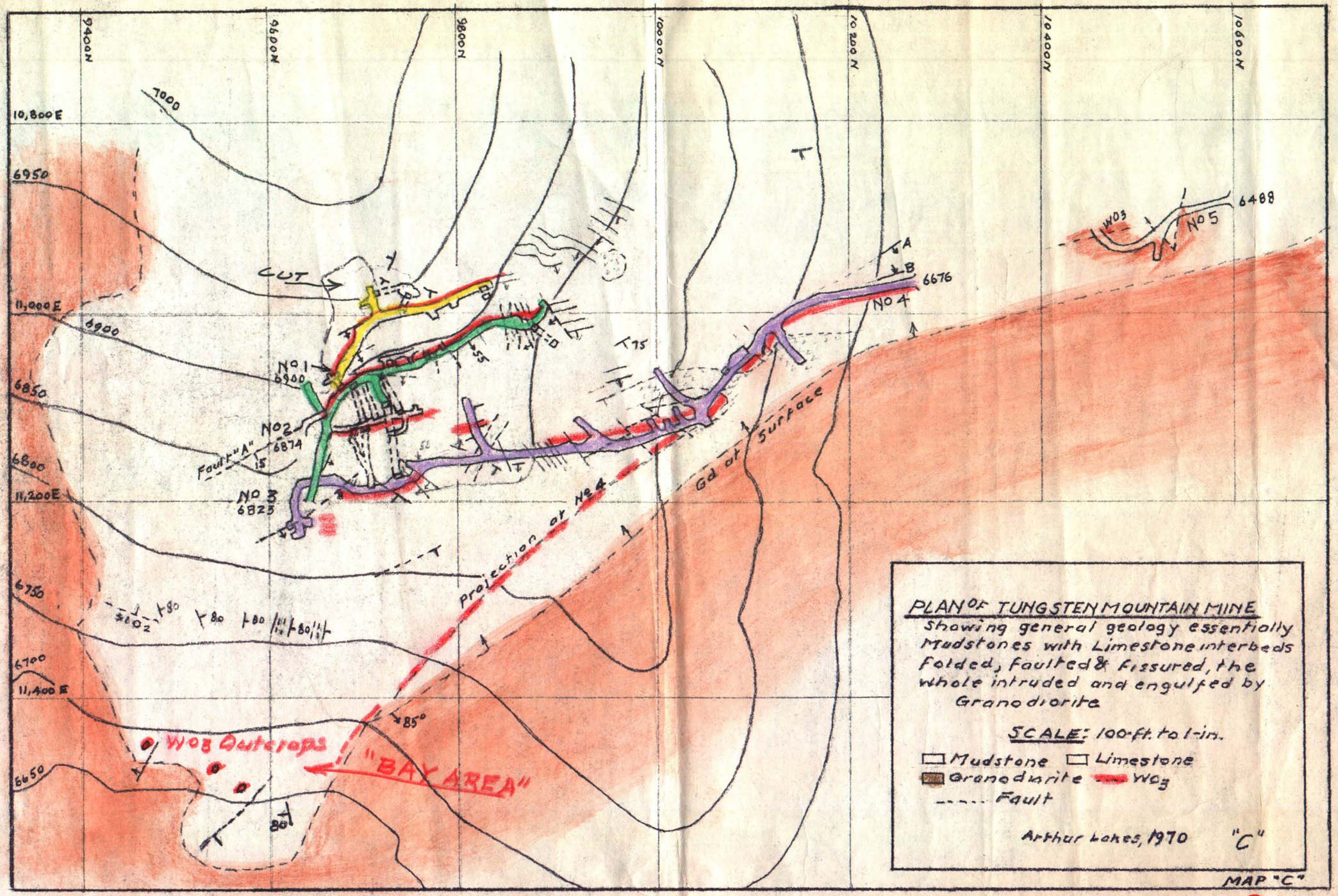
Arthur Lakes
January, 1949

INDICATED ORE TONNAGE & W O3 CONTENT

	TONS	% W O3	UNITS
SHOWN HEREON	28,252	1.20	33,902
1-3 NOT SHOWN	17,000	1.10	18,700
TOT. EST.	45,252	1.15	52,602

NOTE : 10% DILUTION DEDUCTION IS ABOVE INCLUDED IN TOTAL UNITS.


MAP
OF
TUNGSTEN MOUNTAIN WORKINGS
SCALE: 20-ft. to 1-in.
Mudstones
Limyrock & tactite (Ore favorable)
Granodiorite (Source rock)
Scheelite
Fault
Strata Strike & dip.
JAMES H. WREN
1972
Granodiorite
Sedimentary rocks
No 5 LEVEL projected
Portal
No 1 TUN
EL 6900
No 3 TUNNEL
6023
No 2
EL 6874


9400N
9600N
9800N
10000N
10200N
10400N
10600N
10,800E
11,000E
11,200E
11,400E
7000
6950
6900
6850
6800
6750
6700
6650
CUT
NO 1
6900
NO 2
6874
NO 3
6825
NO 4
6676
NO 5
6488
W03
Fault "A"
15
Projection of No 4
Gd at Surface
W03 Outcrops
"BAY AREA"
85°
80°
PLAN OF TUNGSTEN MOUNTAIN MINE
Showing general geology essentially Mudstones with Limestone interbeds folded, faulted & fissured, the whole intruded and engulfed by Granodiorite
SCALE: 100-ft. to 1-in.
Mudstone
Limestone
Granodiorite
W03
Fault
Arthur Lakes, 1970 "C"
MAP "C"

(18)

Item 4

Item 4

JAMES H. WREN, Ph.D.
P.O. Box 2021
Reno, Nevada 89505
Area Code: 702 - 322-4840

Date and Place of Birth: January 22, 1912 - San Francisco, California

Qualifications: Doctorate in Mining Engineering, post graduate studies, knowledge of the Spanish language, hold valid U.S. passport, member of the American Institute of Mining and Metallurgical Engineers '44, licensed, bonded, Nevada contractor, author of technical papers.

Nevada resident; listed with the Nevada Credit Rating Bureau.

PROFESSIONAL RECORD

September 1, 1947, to date

Individual fee basis mining engineering and short term management assignments, specializing in production problems and the alignment of mechanization. Projects: Open-pit production to 10,000 tons per day. Underground production to 1,400 tons per day. Metallics and non-metallics. Dredging to 7,000 cubic yards per day. Treatment by gravity, sink-float, selective flotation, bulk flotation and amalgamation. Project locations: Domestic United States, Alaska, Mexico, Central America, and most countries of South America. Consulting mining engineer to Industrial Development Corporation, Washington, D.C.

Reference: J. M. Van Patten, 1714 Fletcher Avenue, South Pasadena, California.

September, 1945 to September, 1947

General Superintendent and Utah Manager for Metal Producers, Inc. Chief Operation: Horn Silver Mine, Milford, Utah. This was Southern Utah's largest gold, silver and lead operation during the above interim. Production was raised from 50 tons per day to 400 tons in form of three products. They were complex selective flotation ore, direct shipment crude ore and a beneficiated shipment tonnage. By mechanization was able to pay off a $400,000 deficit within the first six months and show a consistent profit thereafter. Activities were suspended August 11, 1947, as a direct result of Metallic Premiums termination and the economic grade of existing reserves. $3,000,000 produced within two years. $1,750,000 net profit.

Reference: Robert E. Simpson, E.M., East 4602 Sprague Street, Spokane, Washington 99206.

February, 1944, to September, 1945

Superintendent of Tungstar Mine, Bishop, California. Project produced a monthly average of 3,000 WO_3 units per month, grossing $90,000.00, leaving $60,000.00 profit.

May, 1941, to December, 1943

Supervisory duties connected with military construction on heavy earth moving projects in foreign fields.

For eight years prior to 1941, worked as a miner, mill man, shift boss, shaft boss, mine foreman, engineer and superintendent at various Western United States mines.

J. BENJ. PARKER

Item 4

NEVADA MINERAL LABORATORIES

336 MORRILL PHONE RENO FA. 2-1001

RENO, NEVADA

ASSAY CERTIFICATE

M Tungsten Mountain Mining Co. 2-6-59

By Arthur Lakes

WE HAVE ASSAYED YOUR ..... SAMPLES AND FIND ..... CONTAINS: (PER TON OF 2000 LBS.)

NO. MARK	GOLD Ozs. per Ton	VALUE GOLD	SILVER Ozs. per Ton	LEAD Per Cent Wet	COPPER Per Cent	MERCURY Lbs. Per Ton	ZINC Per Cent	WO, Per Cent	LIME CaO	Per Cent
1								1.60		
2								1.50		
3								0.25		
4								0.20		
5								0.15		

Remarks:

Charges: $ 37.50

J. Benj. Parker

J. BENJ. PARKER

NEVADA MINERAL LABORATORIES

336 MORRILL PHONE RENO FA. 2-1001

RENO, NEVADA

ASSAY CERTIFICATE

M Tungsten Mountain Mining Co. 6-6-58

WE HAVE ASSAYED YOUR ..... SAMPLES AND FIND ..... CONTAINS: (PER TON OF 2000 LBS.)

NO. MARK	GOLD Ozs. per Ton	VALUE GOLD	SILVER Ozs. per Ton	LEAD Per Cent Wet	COPPER Per Cent	MERCURY Lbs. Per Ton	ZINC Per Cent	WO, Per Cent	LIME CaO	Per Cent
30 Station 103								2.25		
31								0.40		
32								2.55		
33								3.85		
34								2.70		
35								0.20		
36								0.60		
37								0.30		
38								1.80		
39								1.50		

Remarks:

Charges: $ 75.00

(18) Item 4

J. BENJ. PARKER

NEVADA MINERAL LABORATORIES

336 MORRILL PHONE RENO FA. 2-1001

RENO, NEVADA

ASSAY CERTIFICATE

M. Tungsten Mountain Mining Co. 2-28-58

WE HAVE ASSAYED YOUR ..... SAMPLES AND FIND ..... CONTAINS: (PER TON OF 2000 LBS.)

NO.	MARK	GOLD Ozs. per Ton	VALUE GOLD	SILVER Ozs. per Ton	LEAD Per Cent Wet	COPPER Per Cent	MERCURY Lbs. Per Ton	ZINC Per Cent	WO, Per Cent	LIME CaO	Per Cent
1									2.50		
2									0.25		
3									0.75		
4									0.65		
5									2.92		
6									2.64		
7									5.25		
8									1.25		

Remarks:

Charges: $ 60.00

J. BENJ. PARKER

NEVADA MINERAL LABORATORIES

336 MORRILL PHONE RENO FA. 2-1001

RENO, NEVADA

ASSAY CERTIFICATE

M. Tungsten Mt. Mg. Co.
511 Securities Bldg., Seattle, Wash. Dec. 3, 1958

WE HAVE ASSAYED YOUR 6 SAMPLES AND FIND they CONTAINS: (PER TON OF 2000 LBS.)

NO.	MARK	GOLD Ozs. per Ton	VALUE GOLD	SILVER Ozs. per Ton	LEAD Per Cent Wet	COPPER Per Cent	MERCURY Lbs. Per Ton	ZINC Per Cent	WO, Per Cent	LIME CaO	Per Cent
Hole 53E											
	20 - 24ft.								.3		
	24 - 28ft.								.5		
	28 - 32ft.								.25		
	32 - 36ft.								.25		
Hole 53A											
	24 - 28ft.								.25		
	28 - 32ft.								.45		

Remarks:

Charges: $ 45.00

M. B. Parker

J. BENJ. PARKER

[redacted]

Item 4

NEVADA MINERAL LABORATORIES

336 MORRILL ~~P.O. BOX 987~~ PHONE RENO 21001

RENO, NEVADA

ASSAY CERTIFICATE

M. Tungsten Mountain Mining Co. September 26, 1958

By Arthur Lakes

WE HAVE ASSAYED YOUR ..... SAMPLES AND FIND ..... CONTAINS: (PER TON OF 2000 LBS.)

NO. MARK	GOLD Ozs. per Ton	VALUE GOLD	SILVER Ozs. per Ton	LEAD Per Cent Wet	COPPER Per Cent	MERCURY Lbs. Per Ton	ZINC Per Cent	WO3 Per Cent	LIME CaO	Per Cent
S-491								0.30%		
S-492								0.30%		
S-493x								1.85%		
S-494								2.0 %		
S-495-6								1.25%		
S-497								1.40%		
S-498X								1.0 %		
S-499-Face								0.90%		

Remarks: .....

Charges: $60.00

Charles H. Young

4940 0004

Jim

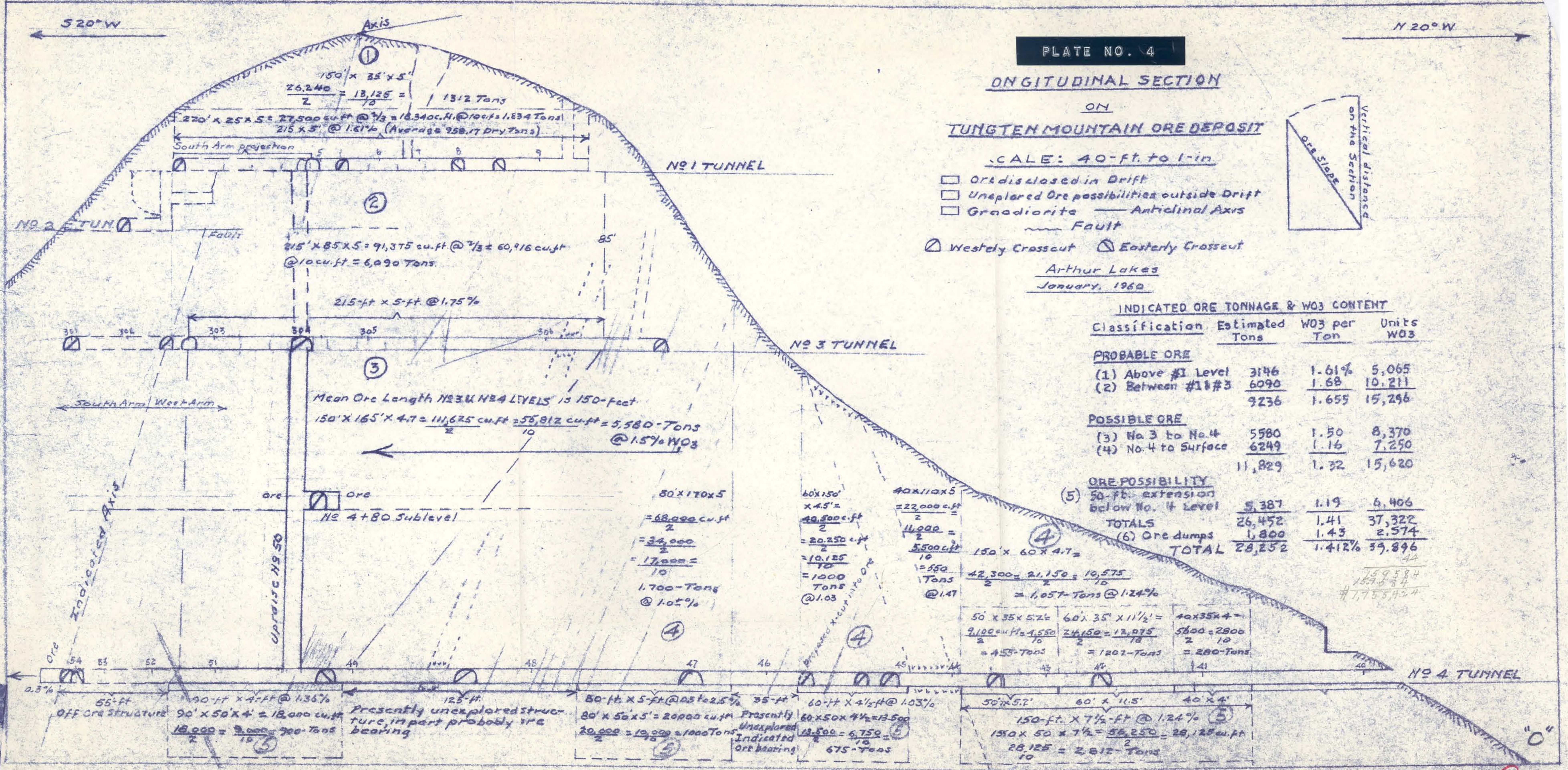
PLATE NO. 4

LONGITUDINAL SECTION ON TUNGTEN MOUNTAIN ORE DEPOSIT

SCALE: 40-ft. to 1-in

Arthur Lakes

January, 1960

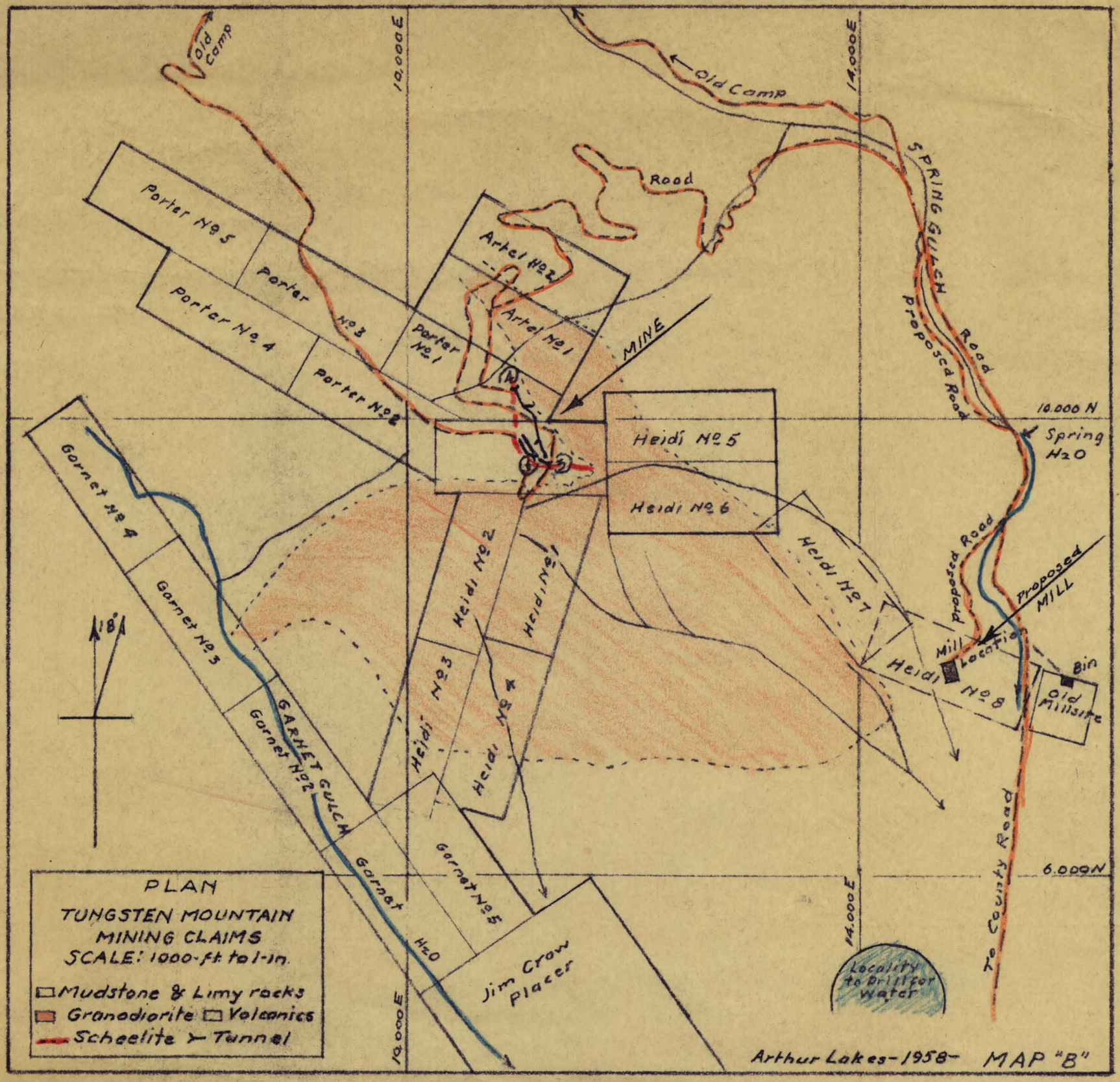


S 20° W
N 20° W
Axis
150' x 35' x 5'
26,240 / 2 = 13,125 / 10 = 1312 Tons
220' x 25 x 5 = 27,500 cu.ft @ 2/3 = 18,340 cu.ft. @ 10 cu.ft = 1,834 Tons
215 x 5' @ 1.61% (Average 958.17 Dry Tons)
South Arm projection
No 1 TUNNEL
No 2 E TUN.
Fault
215' x 85 x 5 = 91,375 cu.ft. @ 2/3 = 60,916 cu.ft @ 10 cu.ft = 6,090 Tons
85'
215-ft x 5-ft @ 1.75%
No 3 TUNNEL
South Arm | West Arm
Mean Ore Length No 3 & No 4 LEVELS is 150-feet
150' x 165' x 4.7 = 111,625 cu.ft / 2 = 55,812 cu.ft / 10 = 5,580-Tons @ 1.5% WO3
Ore
No 4+80 Sublevel
Upraise No 50
Indicated Axis
80' x 170 x 5 = 68,000 cu.ft / 2 = 34,000 / 2 = 17,000 / 10 = 1,700-Tons @ 1.05%
60 x 150' x 4.5' = 40,500 c.ft / 2 = 20,250 c.ft / 2 = 10,125 / 10 = 1000 Tons @ 1.03
40 x 110 x 5 = 22,000 c.ft / 2 = 11,000 / 2 = 5,500 c.ft / 10 = 550 Tons @ 1.47
Proposed X-cut into Ore
150' x 60 x 4.7 = 42,300 / 2 = 21,150 / 2 = 10,575 / 10 = 1,057-Tons @ 1.24%
50 x 35 x 5.2 = 9,100 cu.ft / 2 = 4,550 / 10 = 455-Tons
60 x 35' x 11½' = 24,150 / 2 = 12,075 / 10 = 1207-Tons
40 x 35 x 4 = 5600 / 2 = 2800 / 10 = 280-Tons
No 4 TUNNEL
0.5%
55-ft Off Ore Structure
90-ft x 4-ft @ 1.36% 90' x 50' x 4 = 18,000 cu.ft 18,000 / 2 = 9,000 / 10 = 900-Tons
125-ft Presently unexplored structure, in part probably ore bearing
80-ft x 5-ft @ 0.5 to 2.5% 80' x 50 x 5' = 20000 cu.ft 20,000 / 2 = 10,000 / 10 = 1000 Tons
35-ft Presently Unexplored Indicated Ore bearing
60-ft x 4½-ft @ 1.03% 60 x 50 x 4½ = 13,500 13,500 / 2 = 6,750 / 10 = 675-Tons
50' x 5.2' 60' x 11.5' 40' x 4'
150-ft x 7½-ft @ 1.24% 150 x 50 x 7½ = 56,250 / 2 = 28,125 cu.ft 28,125 / 10 = 2,812-Tons
"C"
Ore disclosed in Drift
Unexplored Ore possibilities outside Drift
Granodiorite
Anticlinal Axis
Fault
Westerly Crosscut
Easterly Crosscut
Vertical distance on the Section
Ore slope

INDICATED ORE TONNAGE & WO3 CONTENT

Classification	Estimated Tons	WO3 per Ton	Units WO3
PROBABLE ORE			
(1) Above #1 Level	3146	1.61%	5,065
(2) Between #1 & #3	6090	1.68	10,211
	9236	1.655	15,296
POSSIBLE ORE			
(3) No. 3 to No. 4	5580	1.50	8,370
(4) No. 4 to Surface	6249	1.16	7,250
	11,829	1.32	15,620
ORE POSSIBILITY			
(5) 50-ft. extension below No. 4 Level	5,387	1.19	6,406
TOTALS	26,452	1.41	37,322
(6) Ore dumps	1,800	1.43	2,574
TOTAL	28,252	1.412%	39,896

(18) Item 4

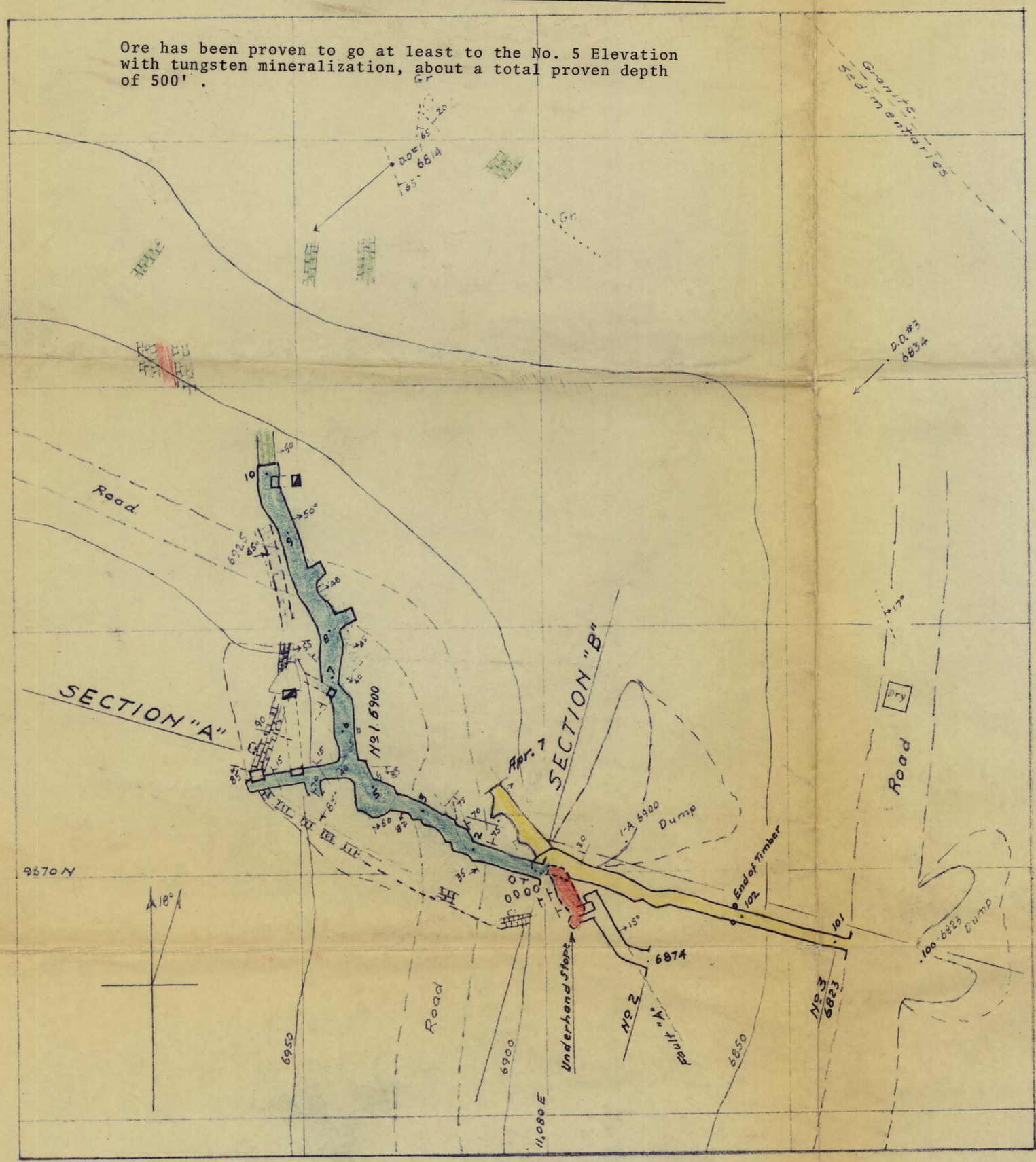


(18)
Item

4940 0004

NOTE : As illustration of the strength of Tungsten Mountain Mine ore occurrence, this April 1957 (after tungsten price had fallen from $63 per unit to $20) map shows the No. 3 Tunnel started. Subsequently it was run on almost all ore as shown by the herewith later longitudinal-vertical section of all levels to and including the No. 4 Level. The short No. 1 Tunnel produced: 958.17 dry tons , out of which 1,543.68 tungsten units were recovered at an average grade of 1.61 %. The whole mine average to-date was a recovery of 1.47% $W O_3$. OCT. 21, 1970 , J. H. W.

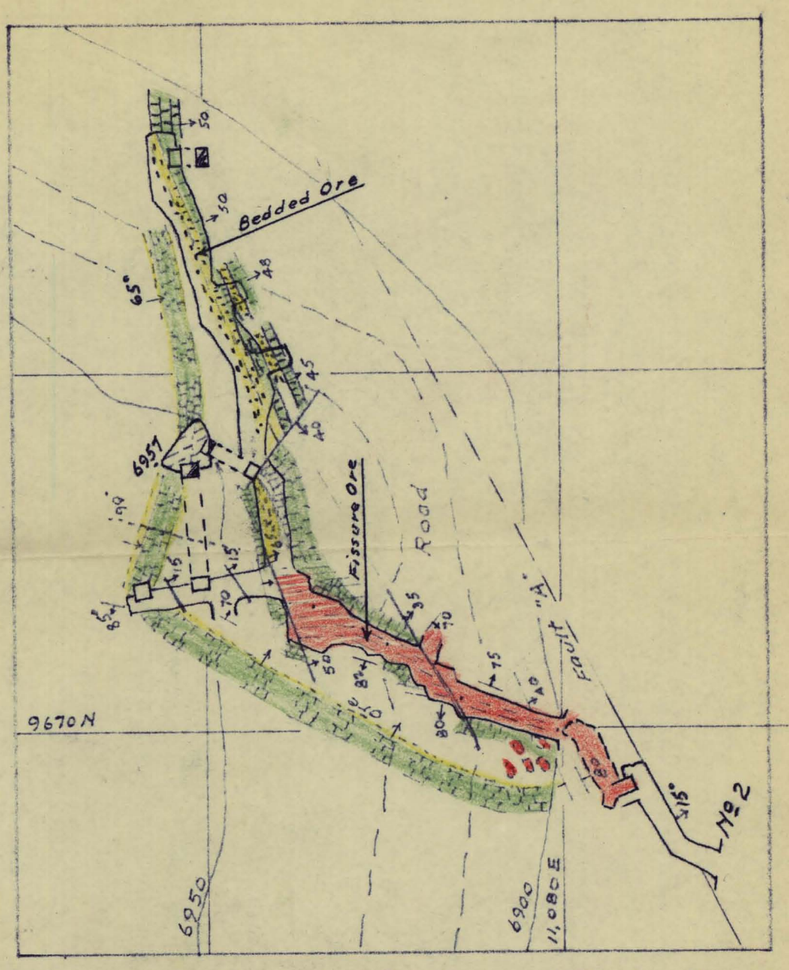
Ore has been proven to go at least to the No. 5 Elevation with tungsten mineralization, about a total proven depth of 500' .



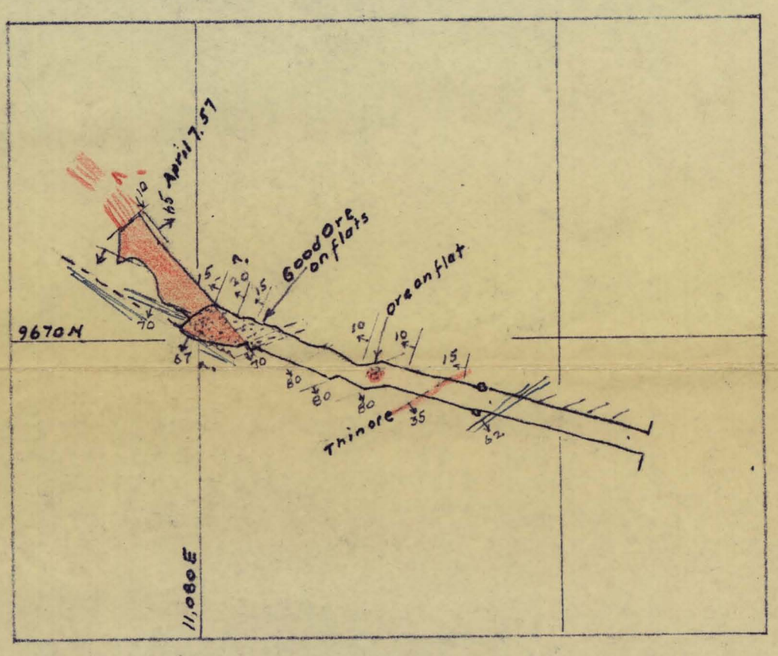
MAP OF Tungsten Mtn. TUNNELS.

SCALE: 40-ft. to 1-in.

Arthur Lakes, April 7, 1957



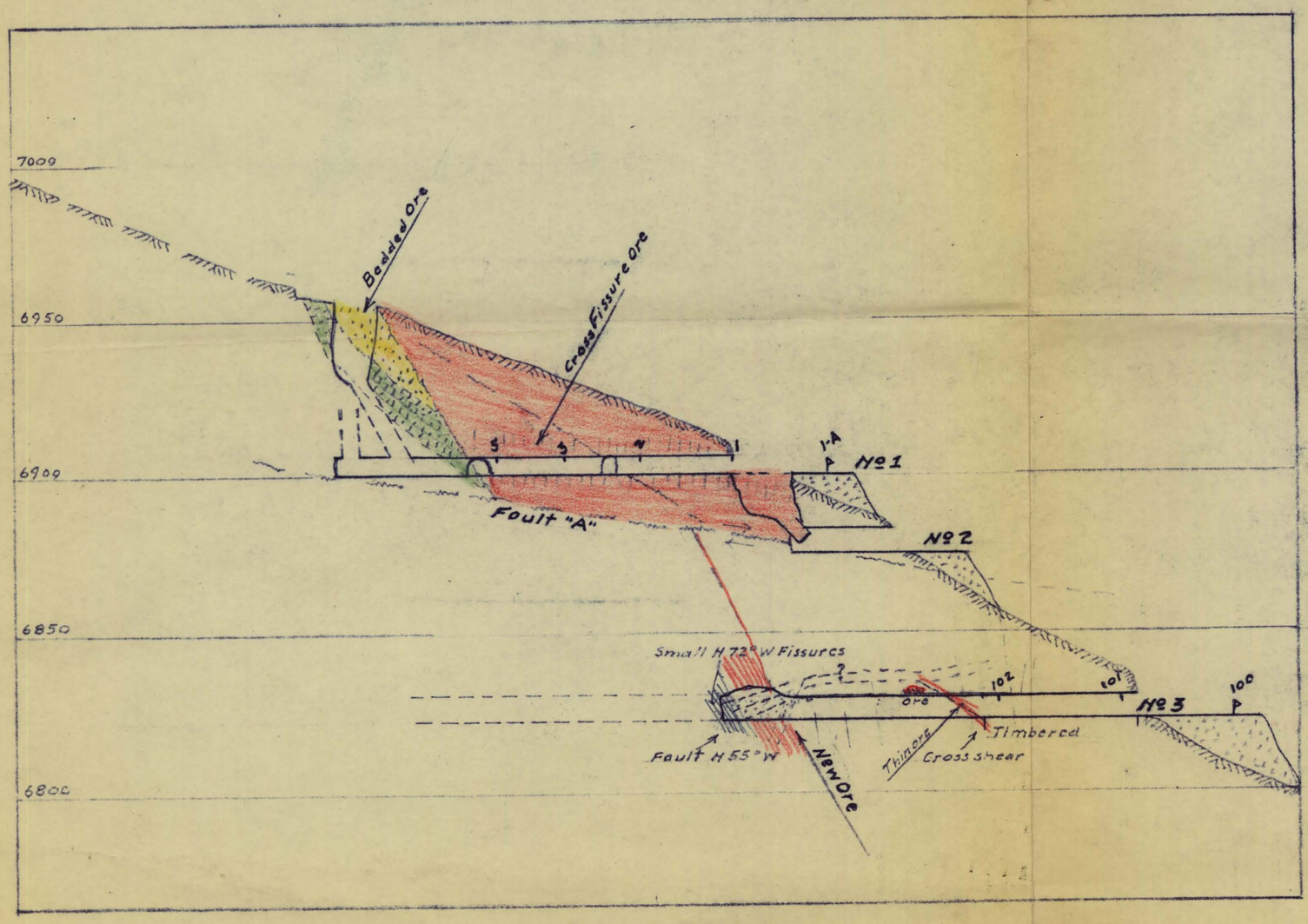
Geologic Plan of No 1 Tunnel & Surface



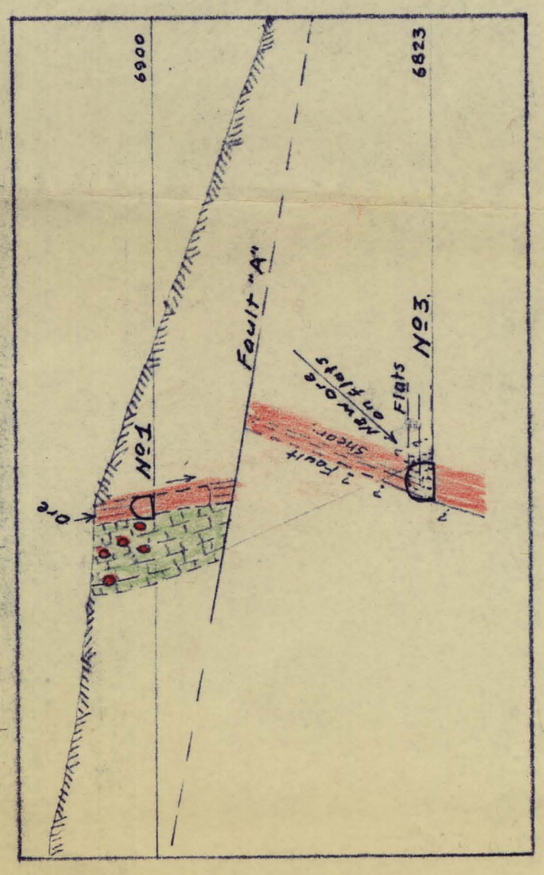
Geologic Plan of No 3 Tunnel

Bedded Ore Fissure Ore Fault

Limestone Hornfels



SECTION "A"



SECTION "B"

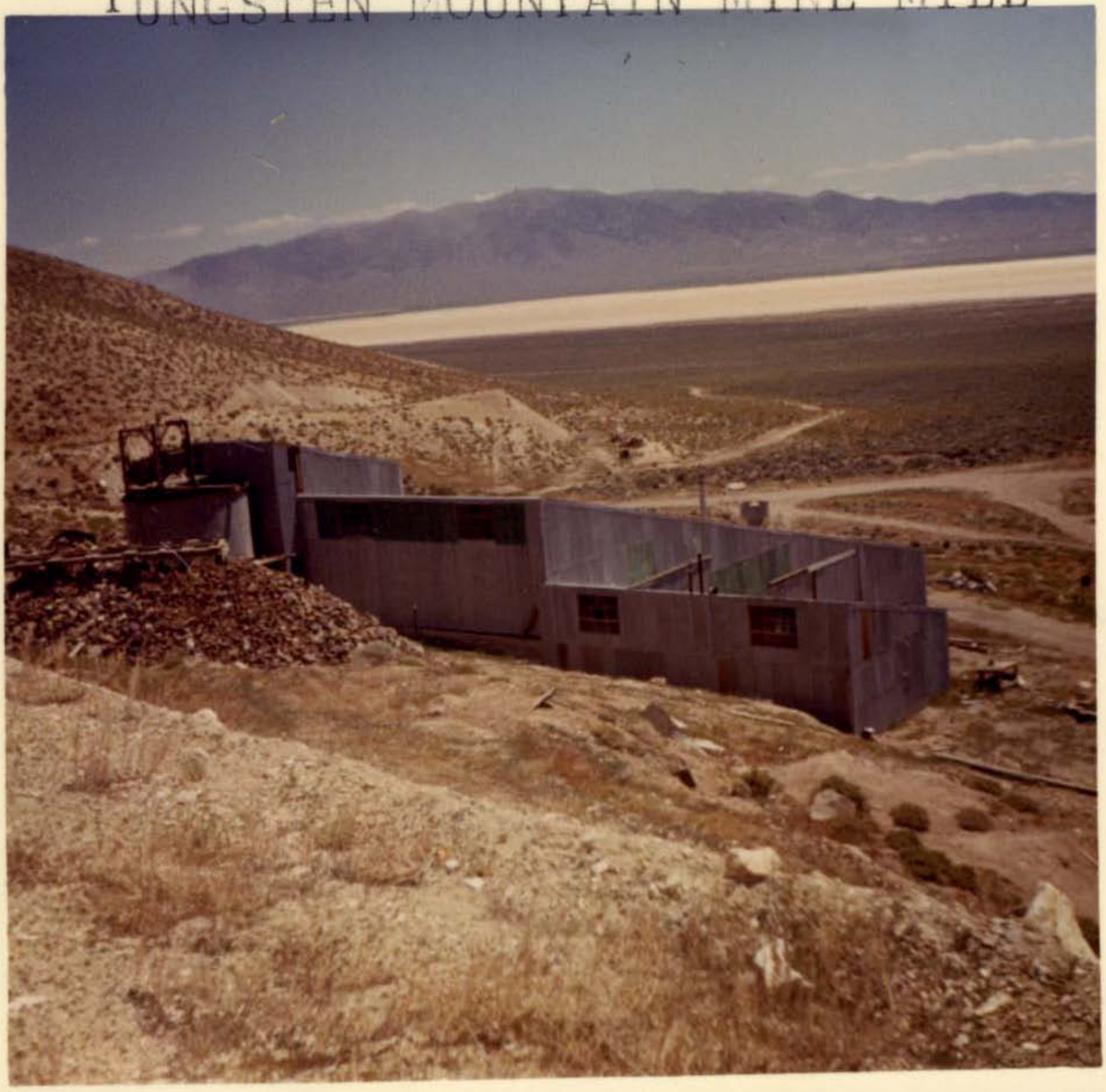
A940 0004

(18) Item 4

TUNGSTEN MOUNTAIN MILL

JUN 69

TUNGSTEN MOUNTAIN MINE MILL



MILL VIEW JUN 69 FROM PUMP STATION

ORE BIN AND PART OF MILL

DEEP WELL JUN INSTALLATION

TUNGSTEN MOUNTAIN MILL

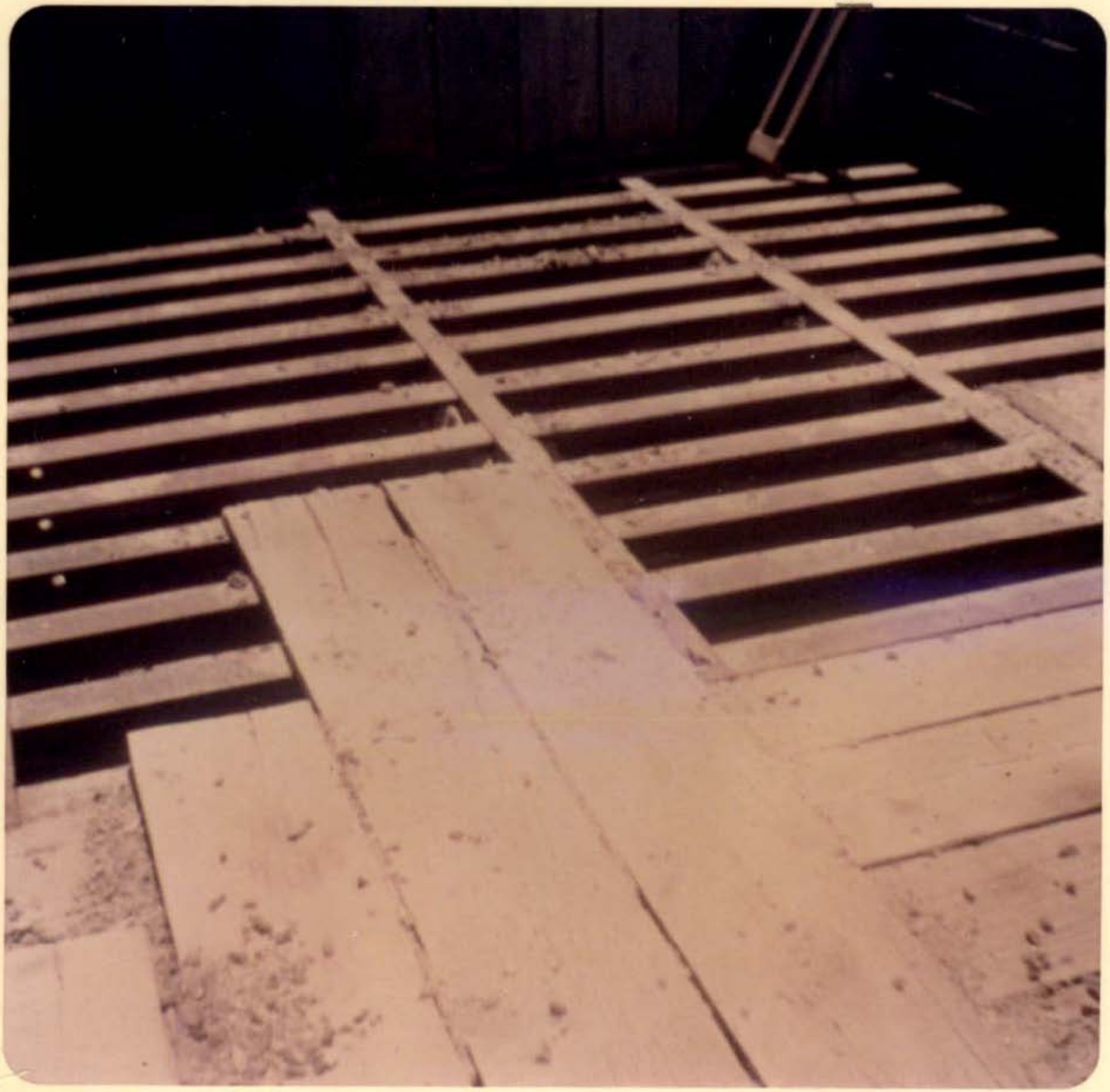
DEEP WELL JUN 59 PUMPING PLANT

ROAD LEADING TO MILL

TUNGSTEN MOUNTAIN MILL

ORE BIN-PRIMARY CRUSHER-MILL

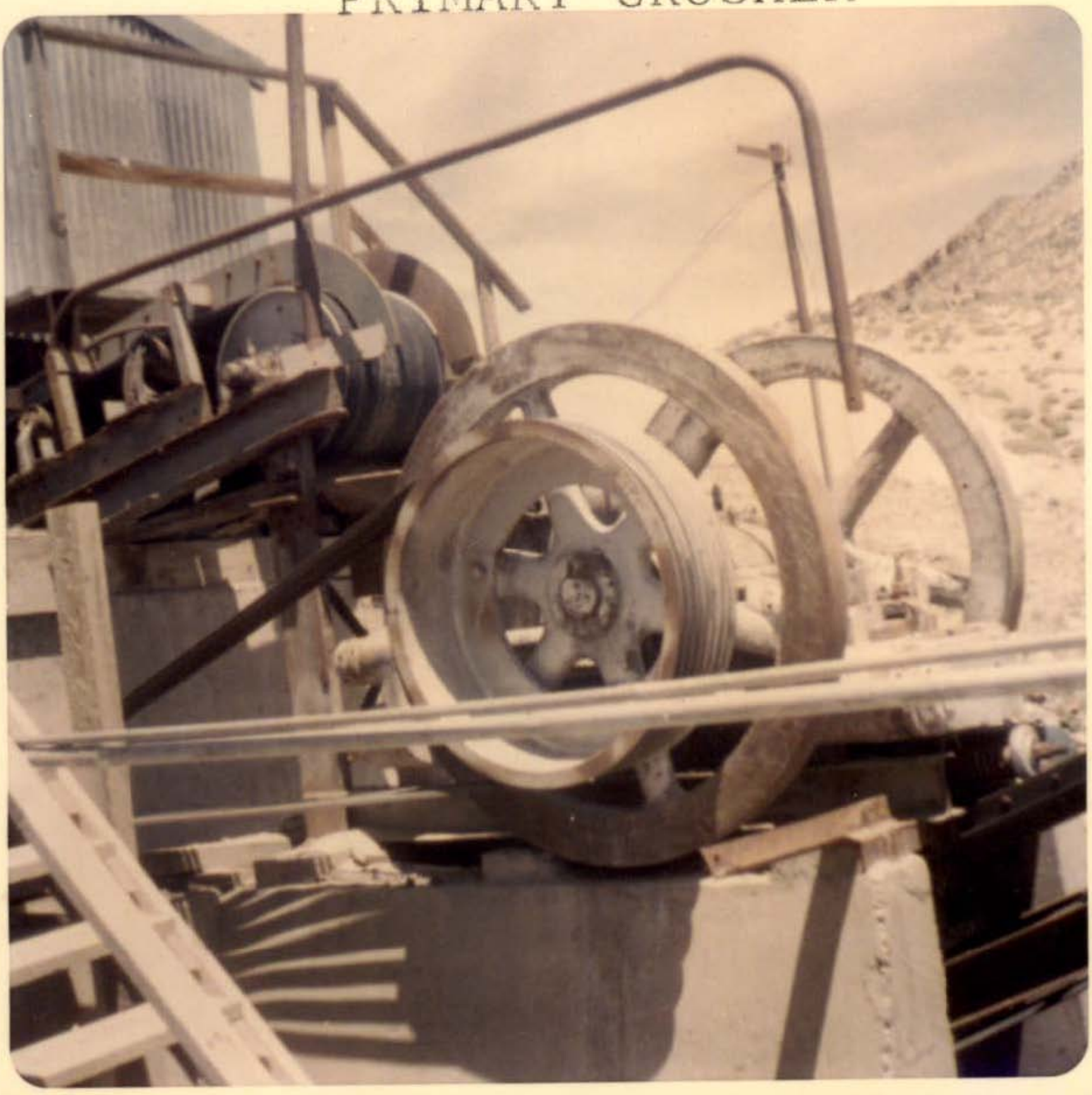
COARSE ORE BIN GRIZZLY



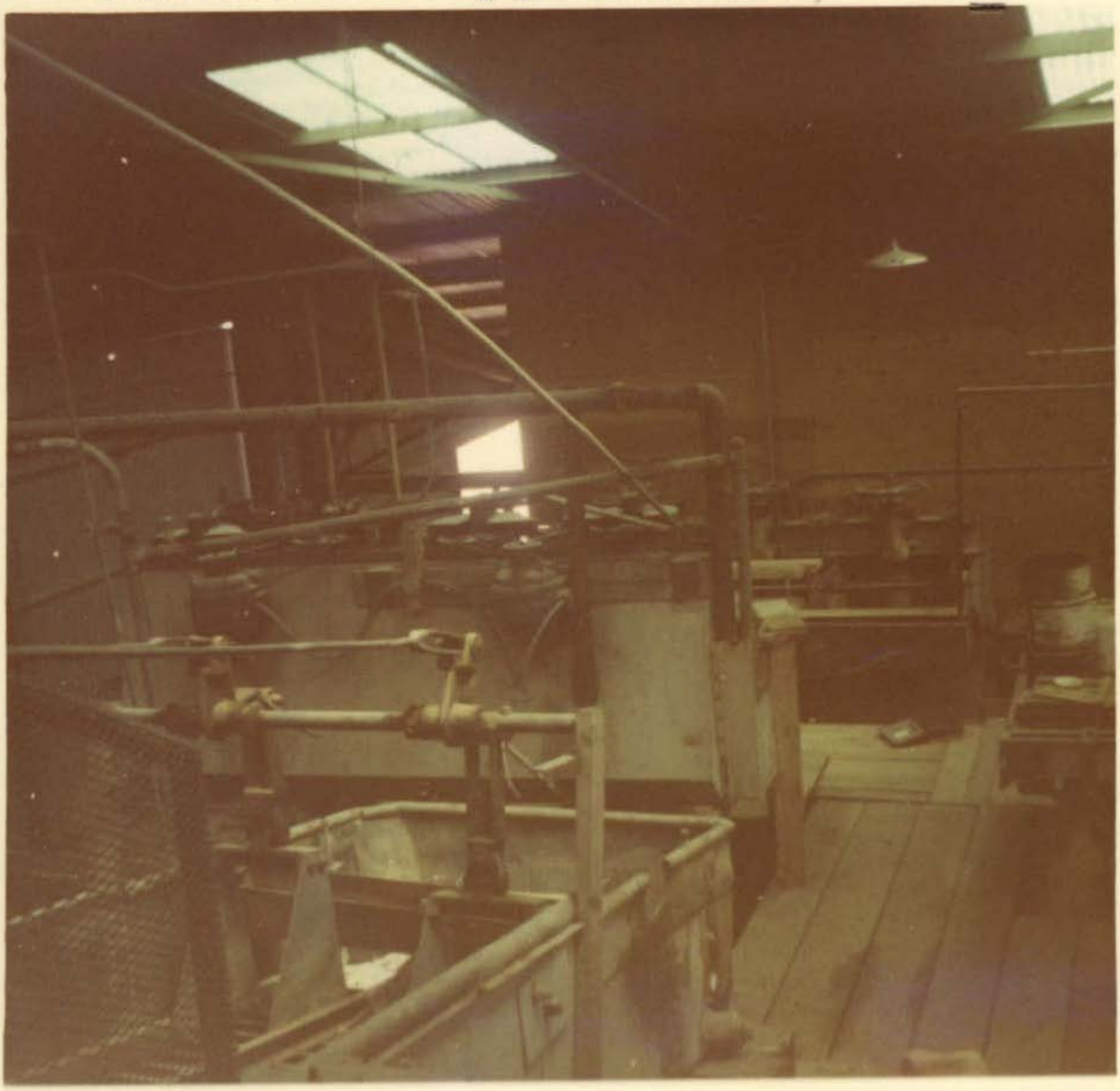
JUN • 69

MILL POWERHOUSE ON LEFT

PRIMARY CRUSHER



CLASSIFIER - FLOTATION CELLS



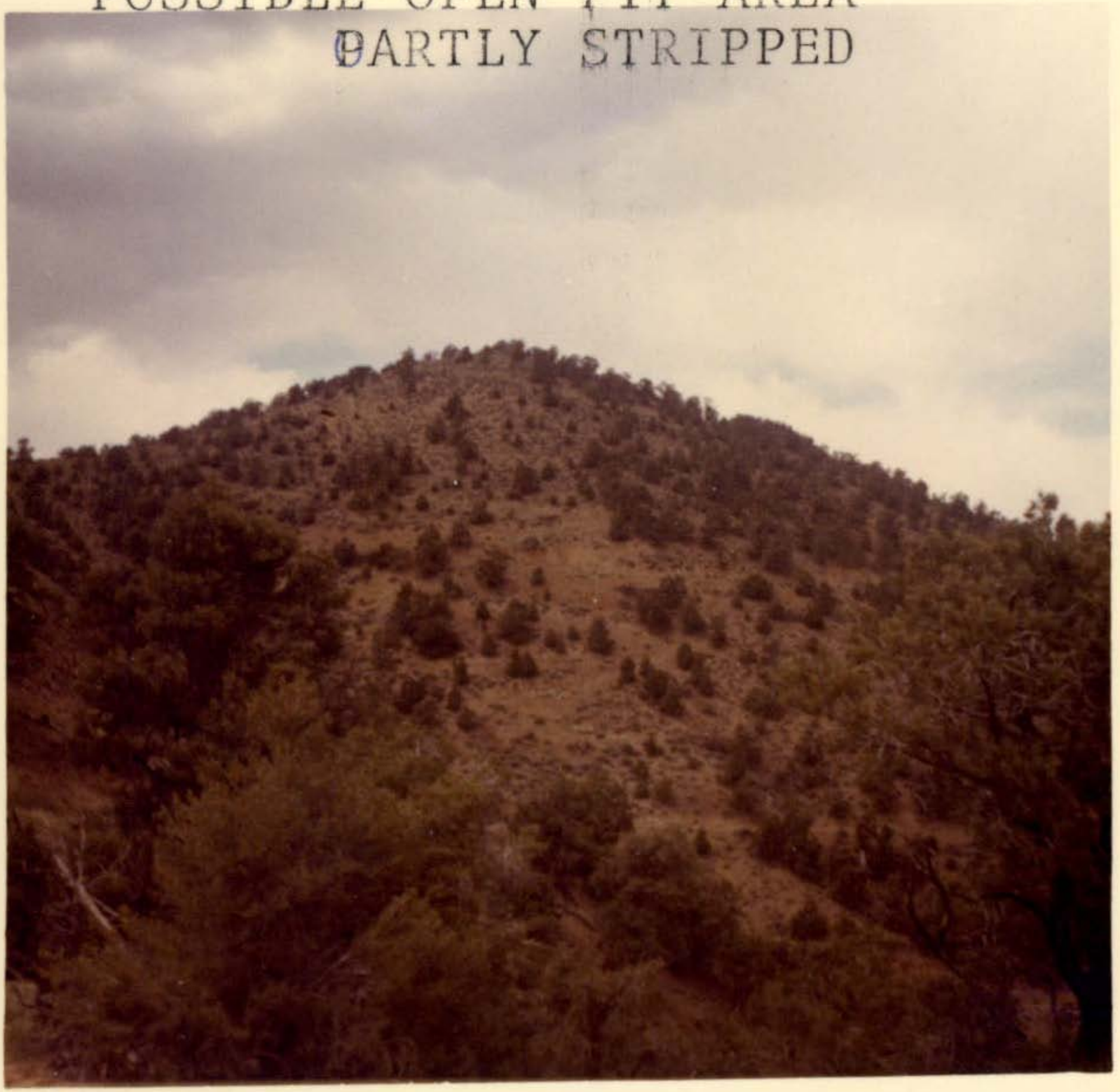
JUN • 69

JUN • 69 1

NO. 4 AND 5 TUNNELS

NO. 4 POWER UNIT & COMPRESSOR

POSSIBLE OPEN PIT AREA
PARTLY STRIPPED



NO. 3 TUNNEL 69 PORTAL

NO. 4 TUNNEL PORTAL

RAISE & ORE CHUTE IN NO. 4

NO. 4 TUNNEL STOPING AREA JUN 69

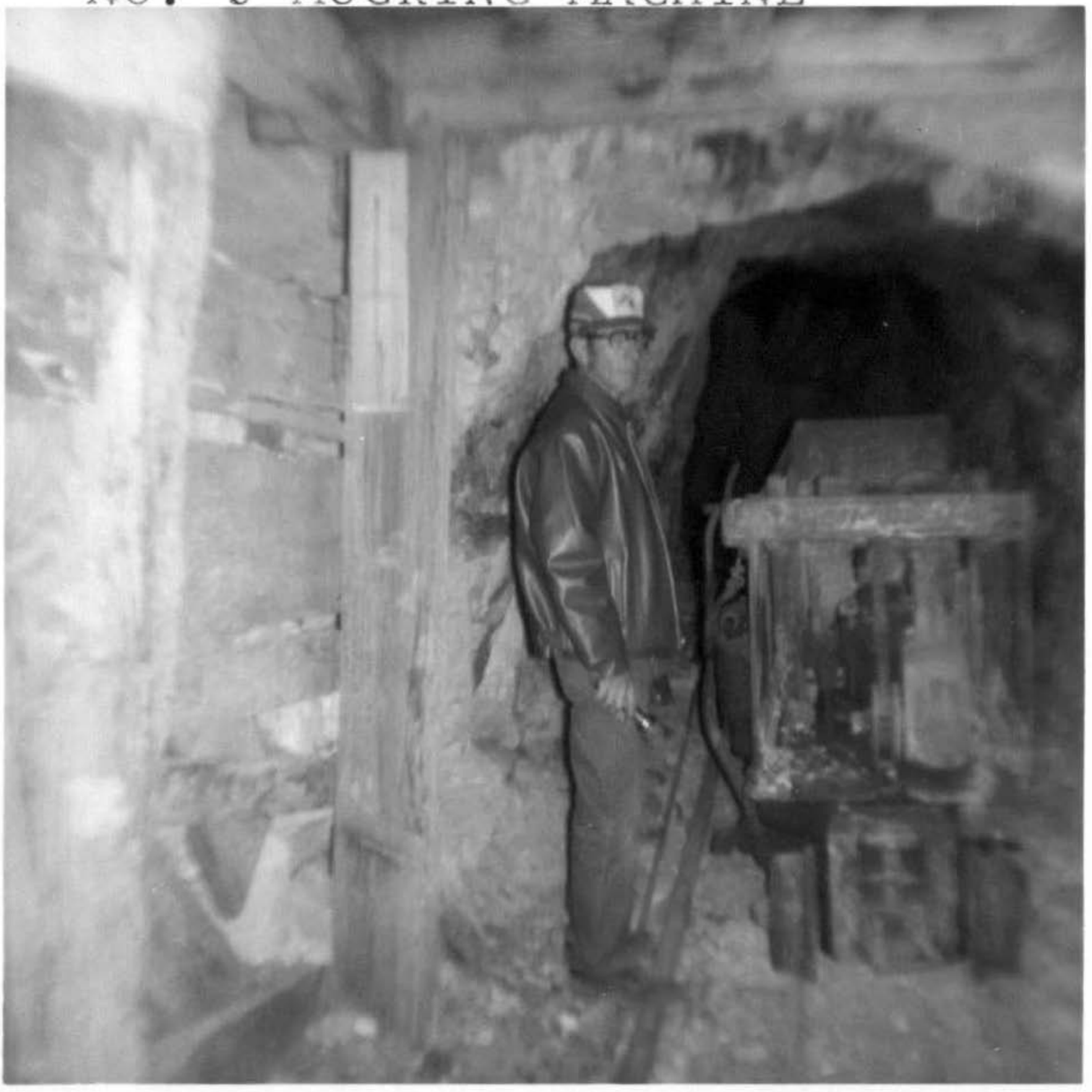
ORE FACE IN NO. 4 TUNNEL JUN 69

NO. 5 FACE NOV. 1969

NO. 5 PORTAL

FINISHED NEW STOCKPILE RAMP
NO. 5 LEVEL 11/69

NO. 5 MUCKING MACHINE



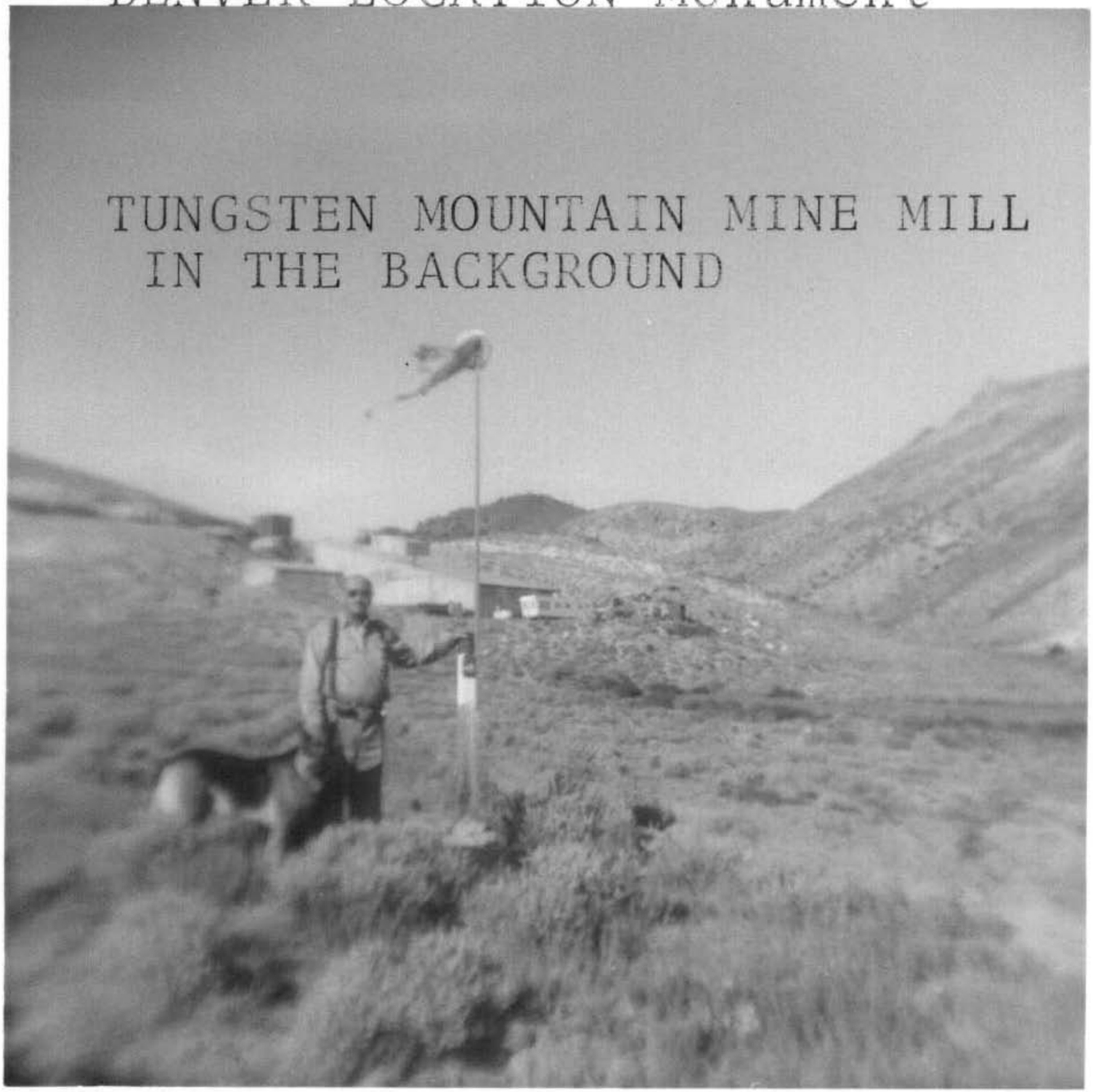
DENVER PLACER CLAIM LOC. SITE

DENVER LOCATION HOLE DIGGING

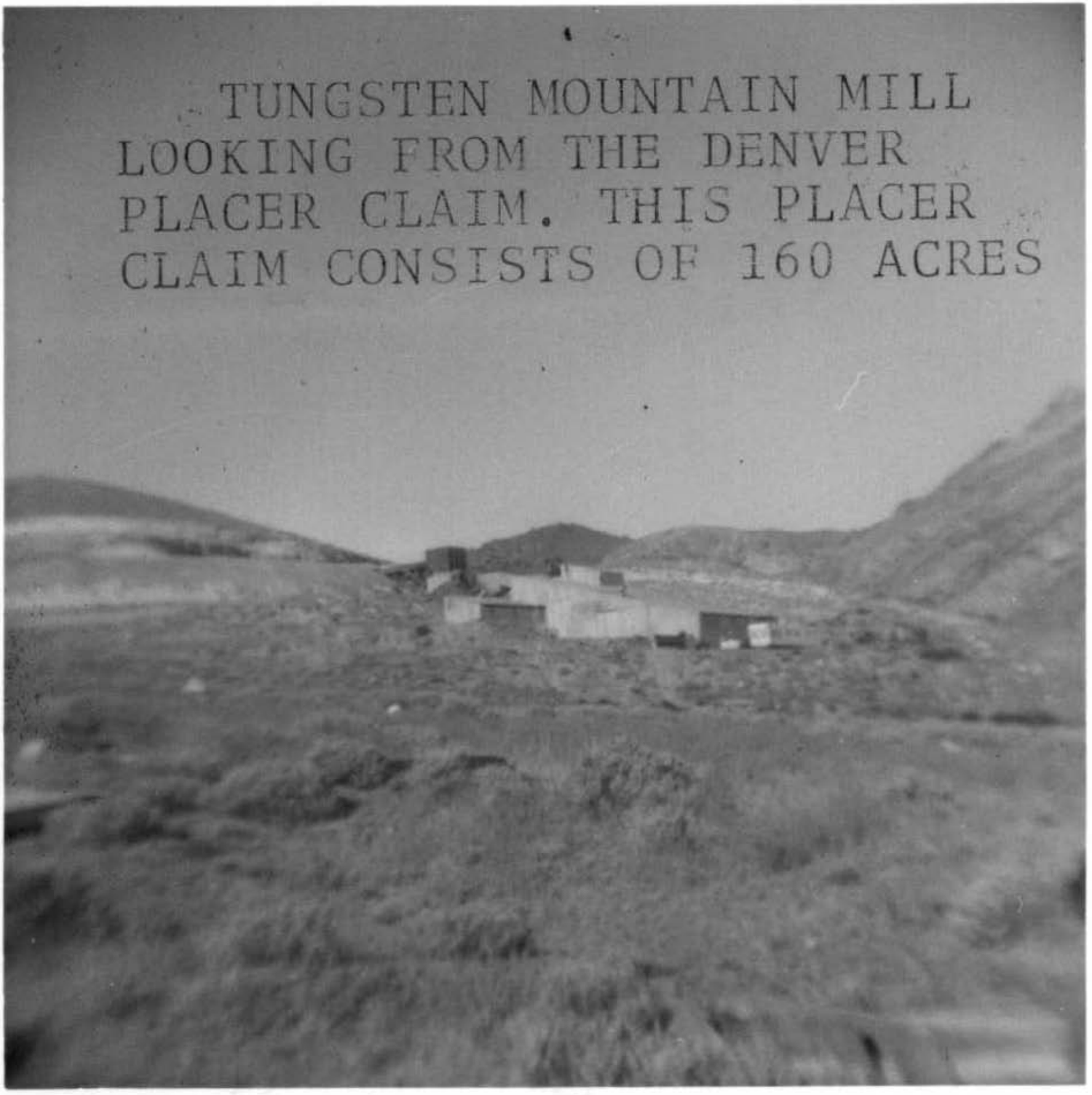
START OF DENVER PLACER LOCATION

DENVER LOCATION HOLE

DENVER LOCATION Monument



TUNGSTEN MOUNTAIN MINE


TUNGSTEN MOUNTAIN MILL
LOOKING FROM THE DENVER
PLACER CLAIM. THIS PLACER
CLAIM CONSISTS OF 160 ACRES

5 Rd. BEFORE REHABILITATION

NO. 5 Road before rehabilitatio

NO. 5 ROAD WORK

NO. 5 Lv. ROAD WORK

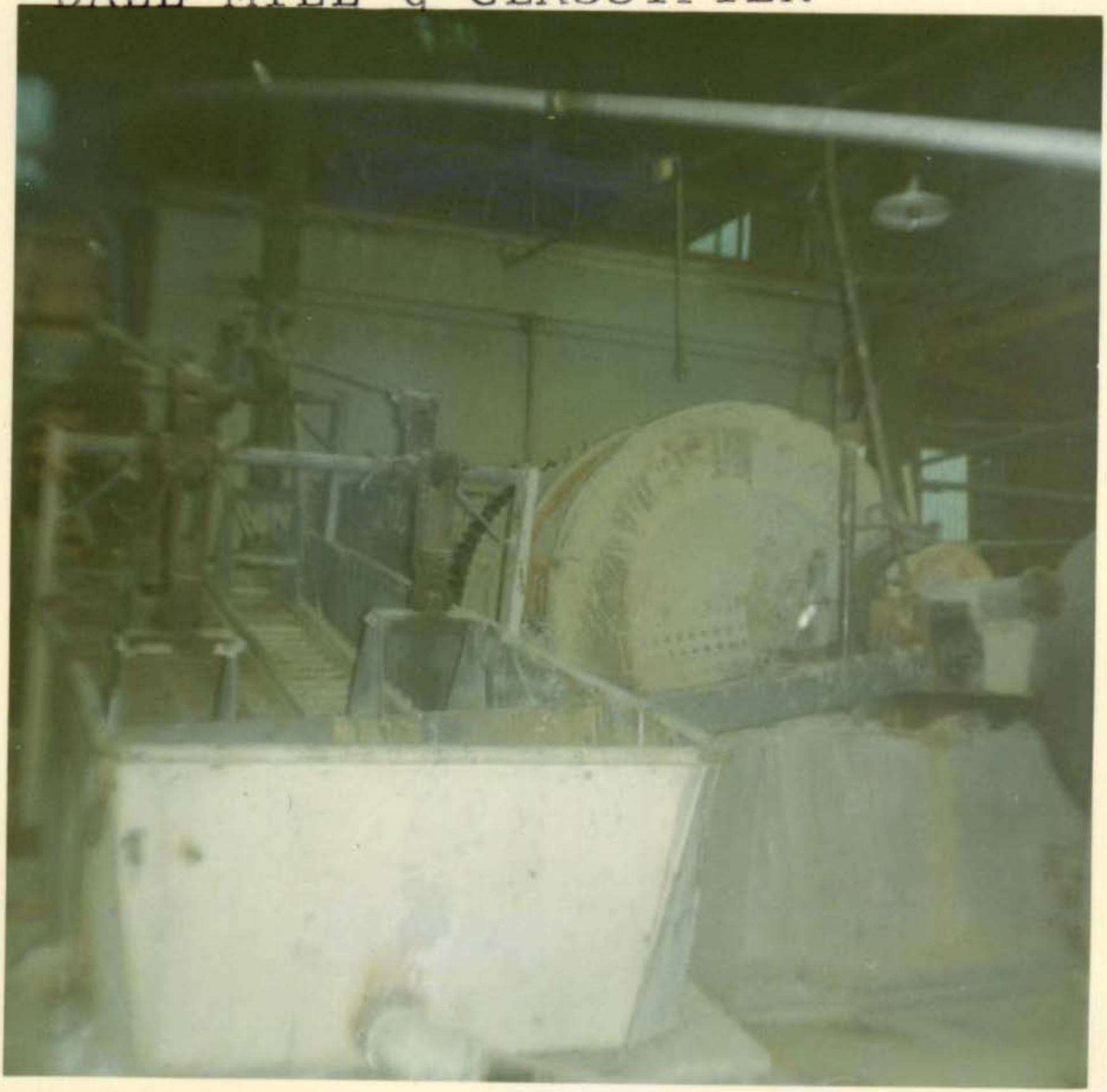
RIPPING ROCK NO! 5 ROAD 11/60

NO % TUNNEL PORTAL

MAGNETIC SEPARATOR

SHOP & CONCENTRATE STORAGE

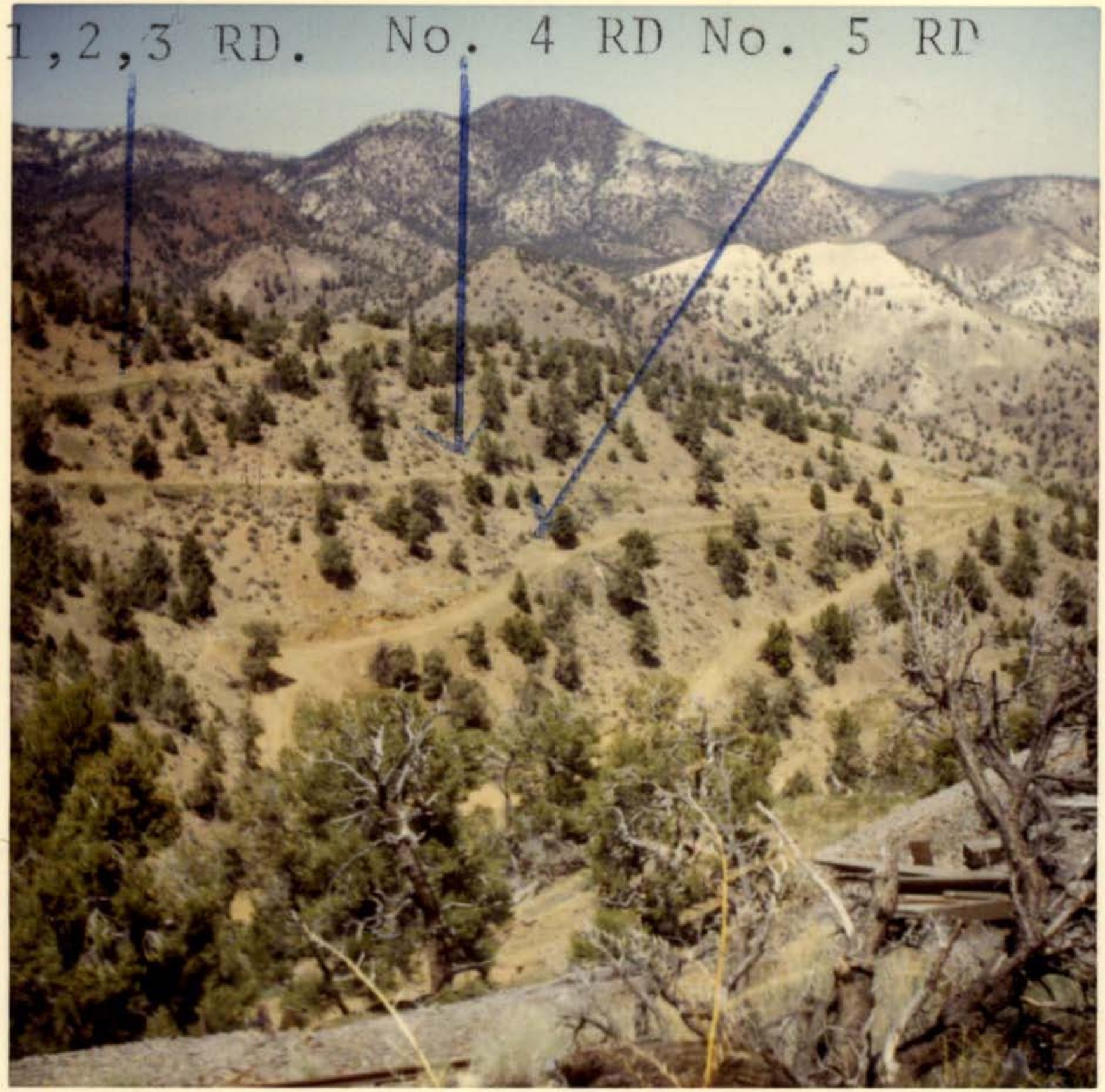
BALL MILL & CLASSIFIER



CLASSIFIER & FLOTATION CELLS

UPPER TABLE FLOOR


POSSIBLE OPEN PIT
TUNGSTEN ¼RODUCTION AREA


1,2,3 RD.
No. 4 RD
No. 5 RD

TO NO.3 NO. 3 NO 4

NO. 5 TUNNEL PORTAL 5/70

(8)
Item 4

SUB-LEVEL BETWEEN THE NO. 3 AND NO, 4 LEVELS
12' ORE WIDTHS @ 2.50% TO 3.25% W. O_3 2/3rds UNMINED