

Q5a N°1

MT. PELION WOLFRAM PROSPECT
TASMANIA

50-0107

526E

13 November, 1950.

Memo.No.167.

526002

Memorandum to : M. Mawby.

MT.PELION WOLFRAM PROSPECT. TASMANIA.

INTRODUCTION

This report is the result of a visit to the prospect with Mr. R. S. Knight, one of the partners of the Syndicate holding the lease. We arrived on 27th October and departed on 29th. Most of the first and third day was spent on horseback on the track.

SUMMARY & RECOMMENDATION

The wolfram occurs in a narrow quartz lodge, average width 14" which is fully exposed on the surface for 460 feet. Actual length of the deposit may be much greater. Assuming 1.5% WO_3 as average grade, some 9,000 tons of readily mineable ore may be available above the level of the adit - the only mine opening. This ore represents £135,000 value of recoverable wolfram. The downward extension below the adit is not known but may be considerable.

It is recommended that an option be obtained to allow the deposit to be thoroughly sampled and also that other wolfram showings in the district be examined.

GENERAL FEATURES

Location & Accessibility. The deposit (approximately 1,200 feet above sea level) is located on the eastern slopes of the valley of the Forth River which has its source in the rugged and spectacular terrain of the north western central Tasmanian highlands. Cradle Mountain (5,069 feet) is $7\frac{1}{2}$ miles to the north west and the range including Mt. Pelion East and Mt. Pelion west (4,958 feet) lies about 6 miles to the south of the prospect. The lease is located within the Lake St. Clair-Cradle Mountain Scenic Reserve.

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The wild topography dense vegetation and running streams make travel difficult and limit it to feet only in the surrounding country. It is a tribute to the hardihood of the early prospectors in this area that so many small veins have been found. Fortunately in 1916 a reasonably well graded road was cut along the eastern bank of the Forth River from Lorinna (a small farming settlement 23 miles to the north of the prospect) to the old Mt. Pelion Copper Mines. The first six miles is well formed road but Knight and party spent many months in 1944 clearing the remaining 17 miles of track of fallen timber and repairing the dozen log and corduroy structures which bridge the creeks. At the time of our inspection a number of fallen trees 4 feet in diameter and much smaller timber blocked the road for vehicles. We were able to travel by horseback near the site of Sloanes' Bridge, where we were stopped by a deep creek and travelled the remaining 3 miles on foot. Several days work should make the entire road to the prospect passable for a jeep. To make road travel safe for heavier vehicles an expenditure of up to £2,000 may be required for some road cutting, bridge building and repair.

The remaining section of the road south of the prospect and the old tracks showing on Reid's map are now impassable.

Meteorology Water Supply. The annual precipitation is approximately 50" and is heaviest from July to September. Snow falls are common in the winter. Because of topographic protection the climate of the Forth Valley is relatively mild compared with the bleak plateau contry where in winter ice 12 to 20 inches thick forms on the lakes.

east? *east?*
Water supply is adequate for all mining operations. The creek north-west of the mine is at present flowing strongly and has an average width of 8 feet and depth about 9 inches. It flows over the cliff 400 feet west of the opencut as a spectacular waterfall with a fall of about 80 feet. Here the old Pelion Company planned to erect a Pelton wheel for power supply. In summer the creek diminishes to a trickle but adequate water storage could be had by damming or by constructing a race to larger creeks to the south.

Timber. Most of the country below 3,000 feet is covered with dense rain forest. Big timber comprises the eucalypts, white gum, stringy bark gum and peppermints which grow to 150 feet or more and would provide an inexhaustible supply of mining timber. A timber mill is at present operating about six miles south of Lorinna. Smaller trees are musk, dogwood, wattle, myrtle,

sassafras and celery-top pine which often form dense thickets. Above 3,000 feet in certain areas there are stands of King-William and cyprus pine, but these for the present remain inaccessible.

HISTORY OF THE DISTRICT & LEASE HOLDINGS

In 1892 the Mt. Pelion copper lodes were discovered and the Windermere lodes in 1893, but only spasmodic prospecting was attempted. In 1898 the larger Barn Bluff copper lodes were discovered and the following year exploration of these lodes commenced, but operations were abandoned in 1903 when the lodes were found to be too low in grade after considerable opencutting, trenching and some 500 feet of tunnelling had been done. No production is recorded from these mines.

In 1916 the wolfram showings were discovered during the construction of the Pelion road. All of these showings were taken up by the Mt. Pelion Mining Company (N.L.) as an adjunct to their copper and coal leases. After a little development work on several leases the company ceased operations (c.a. 1920). No records are available of production, if any.

On 28th February 1944 a syndicate of prospectors comprising W.J.B loomfield, R.B. Knight and J. Martin applied for a mineral lease (Application 3M/44) of 30 acres covering the prospect, originally included by leases 7585M and 7584M of the old Pelion Company. Permit to mine till 31st March 1949 was granted pending survey of lease. Part of the Scenic Reserve including the lease was thrown open for prospecting for the five years from 1939. It is understood that the present lease is the only one applied for within the Reserve; extensions of the application are obtained from the Director of Mines. The syndicate worked the lease until 1948. Work was confined to shallow opencutting of the lodes and a little underhand stoping in the adit put in by the old Pelion Company.

No person had been on the lease for two years prior to our visit. The lease application is still registered in the Mines Department at Launceston in the names of the syndicate members.

PRODUCTION OF THE PELION WOLFRAM PROSPECT

<u>Year</u>	<u>Concentrate (Tons)</u>	<u>WO₃(tons)</u>	<u>Value</u>
1916-44	No record ^x		
1944	2.1147 ^{xx}	1.2788	A£660.90
1945	0.6353	0.0932	41.94
1946	- No record	-	
1947	0.4379	0.2408	153.63
1948	1.9611	1.3265	819.71
1949-50	- No production	-	
<hr/> Total..5.1490		2.9393	A£1676.18

GEOLOGY

Literature. The report by McIntosh Reid in Geological Survey Department of Mines Tasmania, Bulletin No.30 (1919) is the only published report on the area. Full use was also made of a private report by the late W.B.Hitchcock on the Mt.Pelion Wolfram Mine.

Regional. The older rocks in the area are the mica schists (the Lower Algonkian of Reid) which are overlain by a great thickness of quartzite and quartz schist and argillaceous metasediments (Upper Algonkian). These quartzitic rocks, which are the host rocks of the wolfram deposit, are probably Upper Pre Cambrian in age (Browne). They show considerable lithological similarities to the Cambro-Ordovician quartzites and shales in the vicinity of the tin and tungsten orebodies at Storey's Creek and Aberfoyle. The quartzites are gently folded along East-West axes.

The Pre-Cambrian rocks are intruded by several small granite bosses. The granites are middle Devonian or Lower Carboniferous in age (Browne) and are associated with tin-tungsten mineralization. Dykes of "porphyroid" - a term embracing a variety of altered acid intrusives appear to be associated with the Cu-Pb-Zn mineralization. The age of these intrusives is uncertain.

The Ordovician and Silurian sediments which occur further north in the Forth Valley are not represented in the Mt.Pelion area. Here the PreCambrian(?) quartzites are overlain by about 1,500 feet of various Permo-Carboniferous sediments including tillites. Narrow "cannel" coal seams are exposed in a number

x original Mt.Pelion Company dump, believed well picked over by itinerant prospectors prior to 1944. However some of the dump probably contributed to 1944 production figures.

xx includes 0.0513 tons metallic tin.

of places in the succession. An adit was driven in by the Pelion Company for 157 feet along the lode. Wolfgram is showing in the face. The difference in level between the adit and the north end of the open cut is approximately 220 feet.

In detail the lode consists of overlapping quartz veins which vary in width from 1" to 23". All quartz veins exposed in the adit and open cut have an average combined width of about 14". The lode channel containing these veins has an average width of about 3 feet and although it contains weak planes of shearing resembling cleavage, evidence of pronounced movement such as breccia and fault gouge are absent. Steep westerly dipping joints are parallel to the lode. In the crosscut several minor vertical East-West faults can be seen. Underground the ore breaks very cleanly and the flat bedding planes in the quartzite make excellent, flat backs. Rarely small quartz veins appear to have followed the bedding planes of the quartzite but these veins are of very limited extent.

2. Mineralogy. Wolfgram occurs most commonly as bunches of coarse crystals apparently distributed at random in the vein. Wolfgram-rich seams also occur near the vein walls and in the quartzite near vein extremities. Reid considers (and Knight agrees with him) that the wolfram tends to form south pitching shoots. Hitchcock on the other hand considers that "the values do not occur in shoots". I was unable to find definite evidence of the existence of shoots during my inspection.

Cassiterite, which occurs as small well developed crystals, is associated with the clear crystalline quartz which lines vughs in the veins. Sulphide mineralisation is generally sparsely developed but appears to increase towards the south end of the open cut. Sulphides present are molybdenite, arsenopyrite, chalcopyrite, pyrite. Minor bismuth is also reported.

The chief gangue mineral is quartz which occurs as a white opaque variety or as large transparent crystals in vughs. Other gangue minerals are fluorite, gilbertite or pinite (a hydro-mica), tourmaline and a little topaz.

3. Sampling & Grade Estimate. Eleven chip samples were taken but are very little use even as a guide to the grade of the deep deposit. A large number of deep channel samples are required before a direct assessment of grade can be made. Appendix A shows assay results of the above samples.

It is estimated that the total amount of ore mined is 382 tons (exclusive of mullock), 104 tons of which came from the adit (less stoping).

It is not known how much, if any, of the production of 2.9393 tons of WO_3 by the syndicate came from the old adit dump, it therefore may represent a recovered grade of

$$\text{from } \frac{2.9393}{382} = 0.77\% \text{ to } \frac{2.9393}{278} = 1.06\% \text{ } WO_3$$

The syndicate used a crude method of sluicing into boxes along the open cut, followed by hand-breaking of the crude concentrate. The concentrate was then heated on an iron plate for decrepitation of fines and a final effort at concentration was made in a home-made hand jig. Mr. Muir, the Chief Inspector of Mines, Launceston, estimates that the recovery may have been as low as 50%.

Therefore assuming the above production is a complete record 1.5% WO_3 appears to be a conservative and safe estimate for the average grade of ore of the deposit. Reid, on the other hand, quotes (p.49) as an assay of an average adit sample -

WO_3	4.66%
Sn	0.30%

Hitchcock gives the same figures in his report and in addition states that lode samples which were taken at 20 feet intervals on the roof and floor of the adit by a Mr. A.T. Brown average 5% WO_3 over a width of 12 inches.

This anomaly between apparent grade of the ore as determined by production and sampling is very serious and makes a thorough resampling of the deposit most pressing. Dunkin (1946) quotes Aberfoyle veins as containing a content of 6% of economic minerals (wolfram and cassiterite). Visual comparison between the two ores strongly suggests that Pelion ore is definitely lower grade ore.

4. Ore Reserve and Cost estimate.

Ore mined ^x	open cut -	248 tons
	stope	30
	drive	104
	total	<u>382 tons</u>

x - assumed, 13.4 c.ft. = 1 ton; width = 14"; dip = 74°

Block A^x before mining - 5,100 tons
 ore mined - -380
 available ore 4,720 tons

Block B^x available - 5,930

Total 10,650 tons

stope pillars, say 1,650

Mineable total ... 9,000 tons

Assume average grade - 1.5% WO₃
 Value - 200/- sterling per unit (Sept. price)
 - 250/- Australian per unit

Total value per ton - 375/-

Assume 80% recovery
 then recoverable value - A£15 per ton

Value of probable available ore
 above adit level - 9,000 x 15 = A£135,000.

Costs estimate

Milling[∂] - 15/- per ton
 Mining[∂] @ 40/-
 per ton for ore
 mullock ore width
 ratio 2:1 - 120/- per ton
 development - 40/- " "

∴ total cost per ton - A£8/15/- - say £9
 profit per ton - A£6. (on present prices and 1.5%
 grade) If grade higher will
 show considerable increase

Ore reserve - A£135,000
 Mining and Milling 81,000
 Profit 54,000
 ∴ allow for mill 20,000
 leaving for power plant,
 housing and road £34,000

x - assumed 13.4 c.ft. - 1 ton width 14"; dip 74°
 * - Aberfoyle 1946, 8/3 per ton
 ∂ - Aberfoyle 1945, 35/3 per ton milled
 Noresman 1949, Mining and milling 47/-

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Other lodes

1. Cliff lode. These lodes lie 350 to 400 feet east of the main lode and strike a little west of north. They are relatively poorly exposed and have been opened up in a number of places by pits, costeans and short crosscuts which are now largely obscured by regrowth of timber. The lodes consist of a number of quartz veins from 1" to 12" wide. Arsenopyrite and tourmaline are abundantly developed; wolfram and cassiterite are present, the cassiterite predominating. This change in the wolfram/cassiterite ratio compared with the main lode is of interest. In the lowest level at Aberfoyle the ratio is of the order of 3:1 compared with upper level 1:6 ratio. At Storey's Creek approx. 1½ miles distant the ratio is 2:1 on the No.5 level (Dunkin 1946).

Hitchcock quotes the following assays of samples taken of five veins in a short crosscut at the highest level of the cliff lode (this crosscut not seen by me) :-

No.	Width	% wt. dish concentrates	Assay value		Equiv. Sn%	Original ore WO ₃ %
			dish concentrates Sn%	WO ₃ %		
1	4" to 5"	5.14	45.2	1.45	2.33	0.74
2	3"	11.54	33.8	7.77	3.90	0.089
3	4" to 9"	24.82	53.4	1.70	13.25	0.042
4	2"	13.86	33.8	1.00	4.68	0.014
5	2"	17.48	23.1	1.77	4.04	0.031

Average aggregate width - 17"; average value 6.94% Sn and 0.053% WO₃. The veins are spread over about 14 feet and the bulk average over this width - .69% Sn. This approaches ore grade at Aberfoyle - average grade milled has been 1.5% Sn and 0.25% WO₃ (Dunkin 1946).

2. Waterfall lode. This lode apparently outcrops under the brink of the waterfall and at the time of my visit was inaccessible. Hitchcock reports that it has a width of 8" to 9" and has a high arsenopyrite content. He quotes an assay by Dodd as showing 2.6% WO₃ and 0.6% Sn.

3. Minor Lodes. A number of 1" and 2" veins containing wolfram, cassiterite and tourmaline are exposed in the long costean between the main and cliff lodes. They are of little direct economic interest but indicate an impressive width of feeble tin tungsten mineralization that may be significant if ever deep development is carried out.

4. "Alluvial". Cassiterite and wolfram are present in the talus on the hill slope. Hitchcock states that a small area was sluiced (c.a.1920) and the results indicated about .5% cassiterite in the surface material. Possible recovery of this metal must not be overlooked.

Other tin-Tungsten Prospects in the District.
(None of these was inspected. The following information is mainly from Reid).

1. The Big Blow Lode. Reported by Reid to be 50 chains south of the Mt. Pelion wolfram prospect. Actual position uncertain. The lode is reported by Reid to be exposed in open cuts up to a width of 10 feet in hydrothermally (?) altered hornblende schist containing shpalerite pyrite and galena with some chalcopyrite, cassiterite and arsonopyrite. Graham Hall of Electrolytic Zinc examined this prospect several years ago. His sampling indicated unpayable zinc mineralisation but his tin assays were said to be of interest. Knight, who was present at the time of the inspection, may know the average tin assay.

2. Birthday Mine or Douglas' Prospect and adjoining leases. Situated approx. 60 chains north of Mt. Pelion wolfram prospect is a small quartz vein 1" to 9" wide with wolfram, cassiterite and the usual sulphides. All the lodes appear to be very small. Veins in granite are tourmaline-greisen type but apparently unassociated with worthwhile cassiterite and wolfram.

3. Lone Pine Prospect. 1½ miles north of Douglas' prospect. The wolfram and cassiterite quartz veinlets strike N48°E. Two veins 4" and 8" wide containing "high grade ore" (wolfram) were exposed in 1916 in the road cutting. Also said to be exposed in two shallow open cuts a vein up to 5" wide with wolfram. This is a lost prospect, as several parties are said to have since spent weeks searching for it without success.

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4. Brook Prospect. An undeveloped prospect said to be located on the old zig-zag crossing the western flank of Mt. Oakleigh. Said to consist of quartz-wolfram veinlets in a pyritic body which outcrops North-south for 4 chains. Could not be located during several searches by Knight's party.

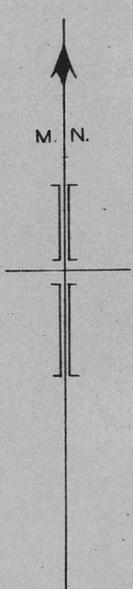
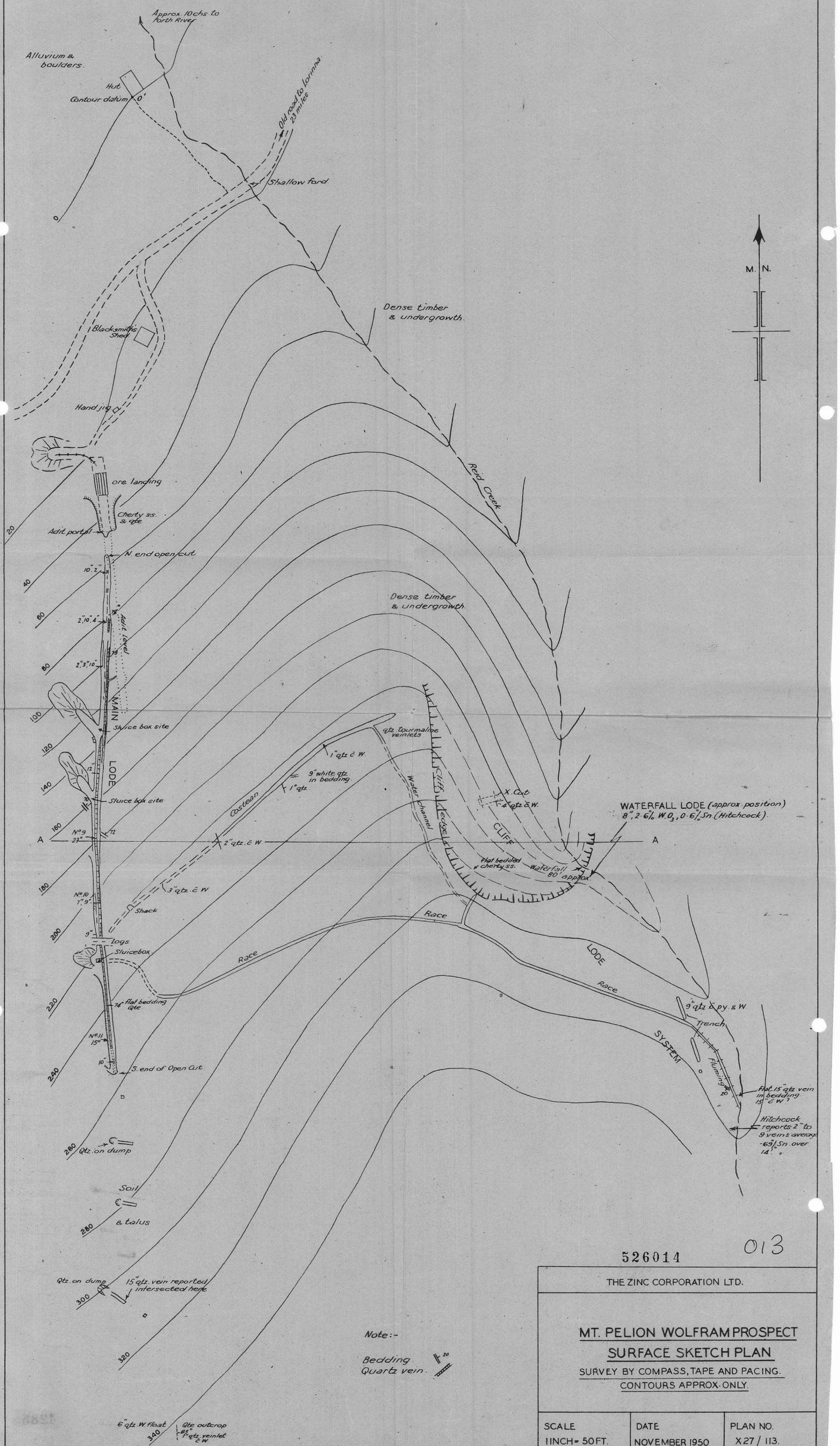
(Sgd.) Brendan P. Thomson.

APPENDIX A

Sample No.		WO ₃ %	Sn %	Bi %
1	Mt. Pelion	0.20	Tr.	0.002
2		Nil	"	0.016
3		0.14	"	0.007
4		0.82	"	0.002
5		Nil	"	0.005
6		1.00	"	0.004
7		0.48	"	0.004
8		0.54	"	0.006
9		1.06	"	0.020
10		0.06	"	0.003
11		Nil	"	0.013

REFERENCES

- A. McIntosh Reid (1919) "The Mt. Pelion Mineral District,
"Tasmania", Dept. of Mines,
Geol. Survey Bulletin No. 30.
- H.H. Dunkin Chem. Eng. Min. Review. No. 11, 1946
"Tin Mining at Storey's Creek"
1946 - 1951.
- Chem. Eng. Min. Review, April. 10,
1946, "Tin Mining and Milling at
Aberfoyle ", 1, pp. 241-251
- Chem. Eng. Min. Review, May 10, 1946
"Tin Mining and Milling at Aberfoyle,
11 pp. 283-294.
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WATERFALL LODE (approx. position)
8% 2.6% W.O., 0.6% Sn (Hitchcock)

013

526014

THE ZINC CORPORATION LTD.

MT. PELION WOLFRAM PROSPECT
SURFACE SKETCH PLAN
SURVEY BY COMPASS, TAPE AND PACING.
CONTOURS APPROX. ONLY.

SCALE 1 INCH = 50 FT.	DATE NOVEMBER 1950	PLAN NO. X 27 / 113.
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Note:-
Bedding
Quartz vein

6" qtz. w. float
340
Qtz outcrop
15" qtz. veinlet
2" w.

Qtz. on dump
15" qtz. vein reported
intersected here

Flat 15" qtz vein
in bedding
15" e. w.
Hitchcock
reports 2" to
9 veins average
69% Sn over
14'

Alluvium & boulders.

Approx. 10 chs. to
Forth River

Hut
Contour datum 0'

Old road to Larima
2.5 miles

Shallow ford

Blacksmiths
Shed

Hand jig

ore landing

Cherty ss.
& qtz

Adit portal

N end open cut

Adit level

MAIN

Sluice box site

LODE

Sluice box site

N^o 9
23"

N^o 10
7, 9"

200

220

240

260

280

300

320

Soil
& talus

Qtz. on dump

340

360

380

400

420

440

Dense timber
& undergrowth.

Dense timber
& undergrowth.

Reid Creek

qtz tourmaline
veinlets

1" qtz. e. w.

9" white qtz
in bedding
1" qtz.

2" qtz. e. w.

3" qtz. e. w.

Shack

Logs

Sluicebox

7 1/2" flat bedding
qtz.

N^o 11
15"

S. end of Open Cut

Qtz. on dump

Soil
& talus

Qtz. on dump

15" qtz. vein reported
intersected here

340

360

380

400

420

440

Costean

2" qtz. e. w.

3" qtz. e. w.

Shack

Logs

Sluicebox

7 1/2" flat bedding
qtz.

N^o 11
15"

S. end of Open Cut

Qtz. on dump

Soil
& talus

Qtz. on dump

15" qtz. vein reported
intersected here

340

360

380

400

420

440

X. Cut
1" qtz. e. w.

2" qtz. e. w.

3" qtz. e. w.

Shack

Logs

Sluicebox

7 1/2" flat bedding
qtz.

N^o 11
15"

S. end of Open Cut

Qtz. on dump

Soil
& talus

Qtz. on dump

15" qtz. vein reported
intersected here

340

360

380

400

420

440

CLIFF

Waterfall
80' approx

CLIFF

Shack

Logs

Sluicebox

7 1/2" flat bedding
qtz.

N^o 11
15"

S. end of Open Cut

Qtz. on dump

Soil
& talus

Qtz. on dump

15" qtz. vein reported
intersected here

340

360

380

400

420

440

CLIFF

Waterfall
80' approx

CLIFF

Shack

Logs

Sluicebox

7 1/2" flat bedding
qtz.

N^o 11
15"

S. end of Open Cut

Qtz. on dump

Soil
& talus

Qtz. on dump

15" qtz. vein reported
intersected here

340

360

380

400

420

440

CLIFF

Waterfall
80' approx

CLIFF

Shack

Logs

Sluicebox

7 1/2" flat bedding
qtz.

N^o 11
15"

S. end of Open Cut

Qtz. on dump

Soil
& talus

Qtz. on dump

15" qtz. vein reported
intersected here

340

360

380

400

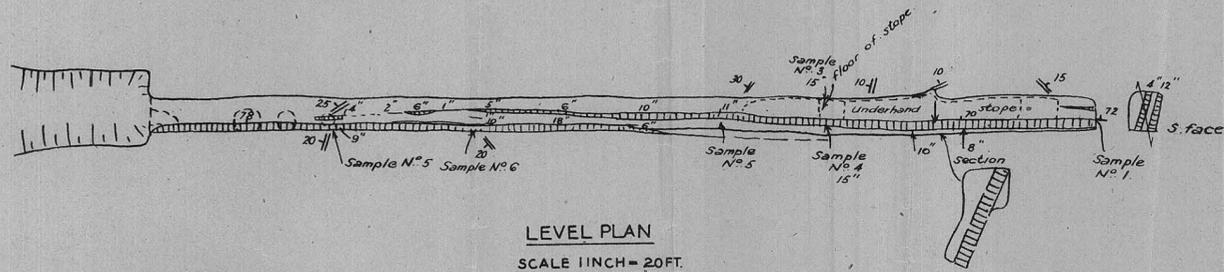
420

440

Race

LODE

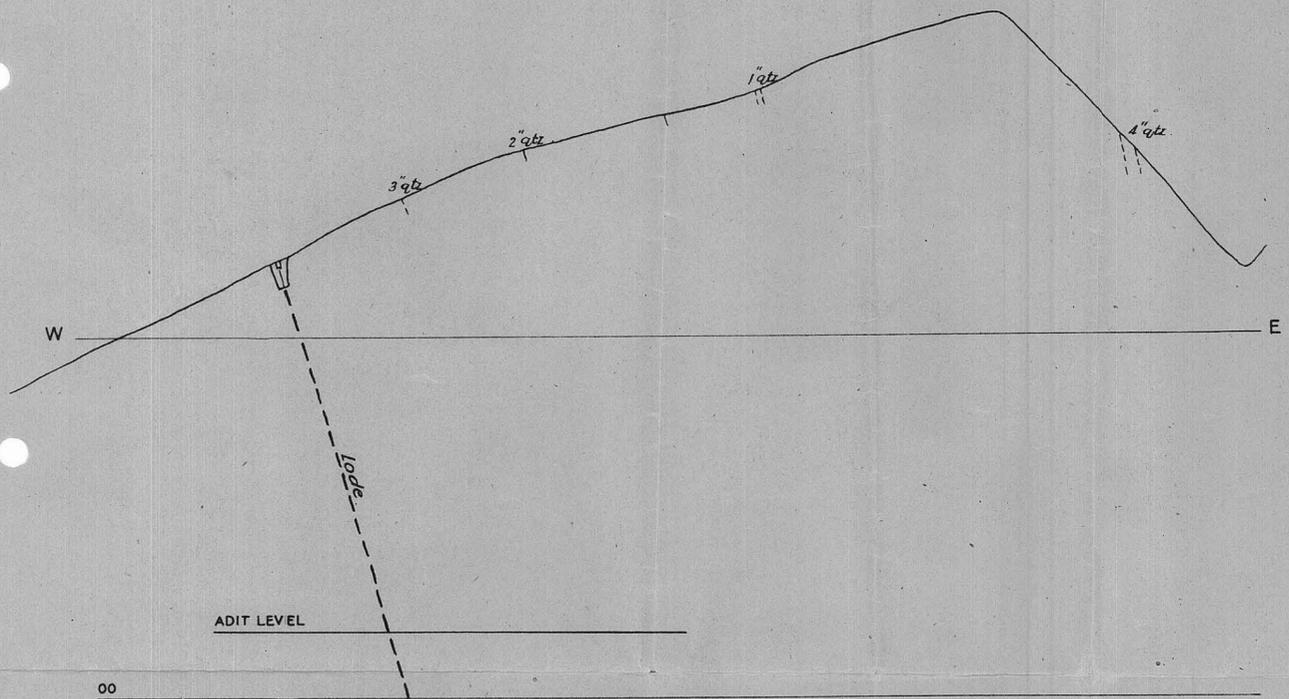
SYSTEM



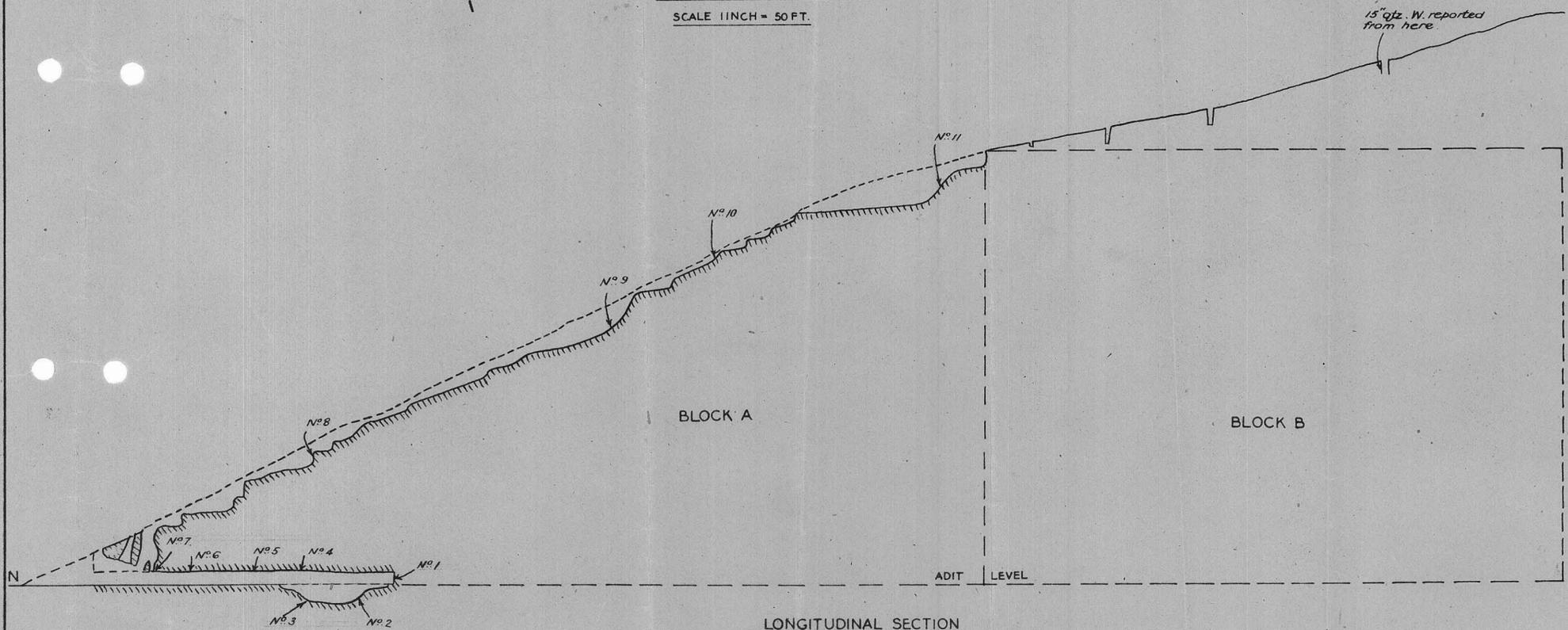
LEVEL PLAN
SCALE 1 INCH = 20 FT.

ASSAY DATE

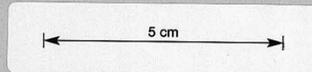
Sample No.	% WO ₃	% Sn	% Bi
1.	0.20	Tr.	0.002
2.	Nil	Tr.	0.016
3.	0.14	Tr.	0.007
4.	0.82	Tr.	0.002
5.	Nil	Tr.	0.005
6.	1.00	Tr.	0.004
7.	0.48	Tr.	0.004
8.	0.54	Tr.	0.006
9.	1.06	Tr.	0.020
10.	0.06	Tr.	0.003
11.	Nil	Tr.	0.013



CROSS SECTION A-A
SCALE 1 INCH = 50 FT.



LONGITUDINAL SECTION
SCALE 1 INCH = 50 FT.



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THE ZINC CORPORATION LIMITED

PLAN & SECTIONS
MT. PELION WOLFRAM PROSPECT

NOVEMBER 1950

PLAN NO. X27/114