

5556

REFRACTION SEISMIC SURVEY

on

82G/7E

THE FLATHEAD PHOSPHATE CLAIMS

for

WESTERN WARNER OILS LTD.

and

MEDESTO EXPLORATION LTD.

August, 1975

Dornian Consultants Ltd.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 5556 MAP

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LOCATION AND ACCESS

Phosphate claims held by Western Warner Oils Ltd. and Medesto Exploration Ltd. are located 17 miles south of B.C. Highway #3 and the Crowsnest line of Canadian Pacific Railway. The claims are situated along the Flathead forestry access road which intersects Highway #3 seven miles west of the town of Blairmore, Alberta. The properties lie five miles south of the abandoned coal mining town of Corbin, to which a spur railway is under construction concurrent with re-activation of the coal mines of the area. The Flathead access road is a good secondary road and affords easy access to the vicinity of the claims. Western Warner has constructed bush trails providing access by four-wheel drive vehicles from the Flathead road to the principal group of claims.

Although the terrain of the Flathead area is mountainous, grades along the Flathead road are low and the terrain in the locality of the claims is gently rolling, with relief not much in excess of 500 ft. Most of the area has been logged and subsequently burned and light second growth of pine, spruce and alder constitutes the bulk of the present forest cover.

CLAIMS AND OWNERSHIP

Claims WW 1, WW 2, WW 4, WW 6 to WW 12 incl., WW 45 to WW 60 incl., WW 83 to WW 88 incl. and WW 97 to WW 104 incl. are registered in the name of S.R. Dunn and held under option by Western Warner Oils Ltd.

Claims PH 7 to PH 12 incl., PH 14, PH 16 and PH 17 are registered in the name of Medesto Exploration Ltd.

The outlines of the above claims are shown on the 1:50,000 Index Map, together with the location of the four refraction profiles which are the subject of this report.

Also shown on the Index Map are the Flathead road, secondary access roads to the claims and the axes of the Squaw Creek and Coal Mountain anticlines, on the flanks of which the basal Fernie phosphate beds are exposed.

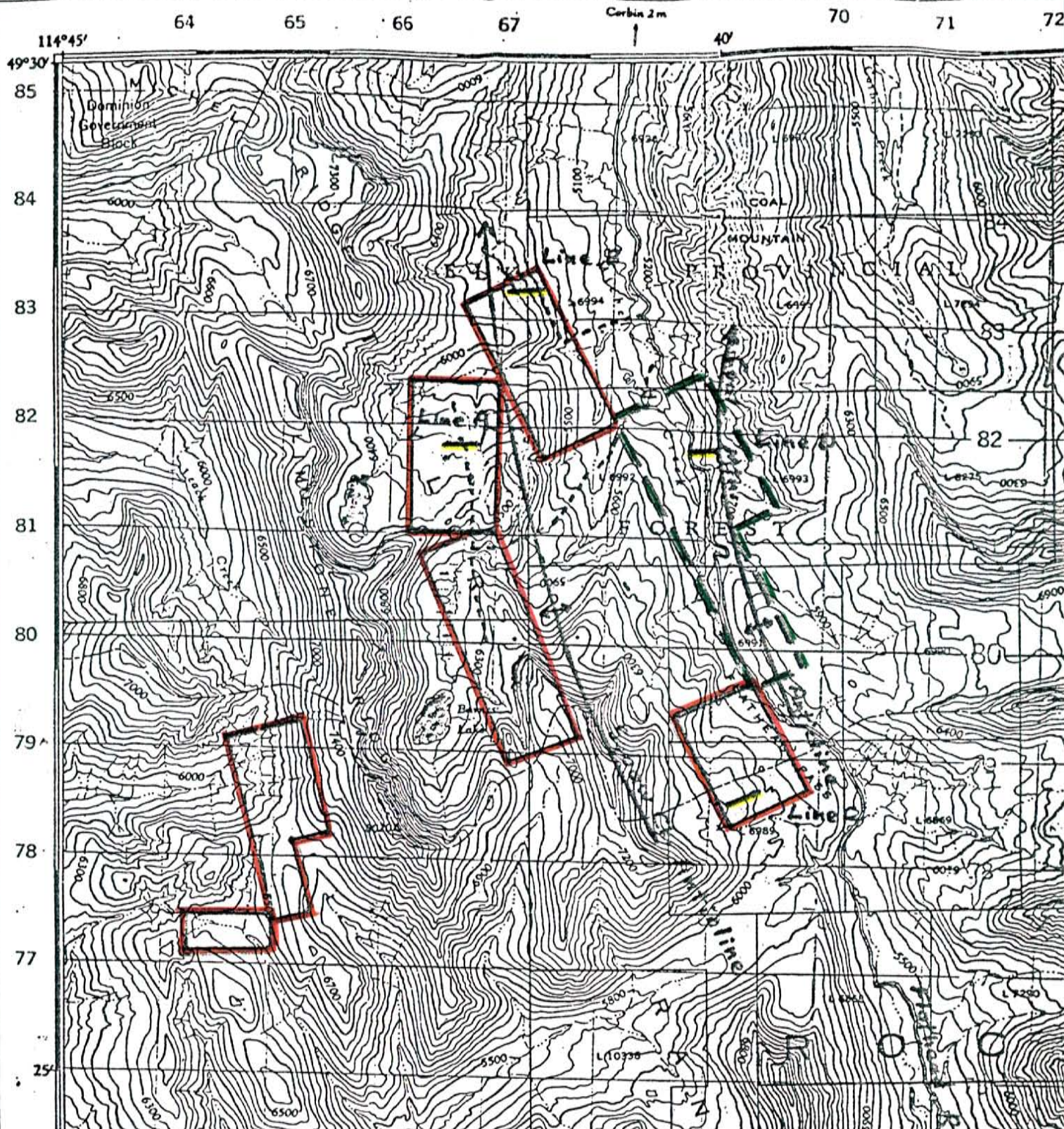
PURPOSE OF SURVEY

This survey was designed to confirm previous geological inferences that the phosphate bed lay at potential strip-mineable depth over a substantial area on the flanks of Squaw Creek and Coal Mountain anticlines. Four refraction profiles were shot for a total length of 4,350 ft. of control. These profiles were oriented perpendicular to the known geological strike.

Initial field testing was carried out in early June, 1975. The results were sufficiently encouraging to warrant a more detailed survey, which was conducted by Terra-Flex Exploration Services Ltd. during the period July 3 - 16, 1975. The survey was conducted with a portable seismograph Model FS-3, manufactured by Huntex Ltd. of Toronto, Ontario.

Technical supervision and interpretation of the results were provided by the author of this report N. Dornian, President of Dornian Consultants Ltd. This firm holds Permit No. 695 from the Association of Professional Engineers, Geologists and Geophysicists of Alberta, for the practise of Professional Geology and Geophysics.

Corbin 2 m



INDEX MAP

5556

MAP 1

Scale - Miles

- Western Warner Claims
- Medesto Claims
- Seismic Lines

GEOLOGY AND SEISMIC CRITERIA

The Phosphate Zone under investigation in this area is an oolitic bed 3 to 4 feet in thickness, lying at the base of the dark Fernie (Jurassic) marine shales. The phosphate bed lies directly on rather massive sandstones of the Spray River Formation (Triassic).

The basic requirement of a refraction survey is that the stratum to be investigated possesses a higher seismic velocity than the overlying beds. In this instance, the phosphate bed itself is too thin to be detected. However, there is a strong velocity contrast between the Spray River sandstones, with an average velocity of 12,000 ft./sec. and the overlying Fernie Formation, which has a velocity of 4,000 to 7,000 ft./sec. Velocity of the thin mantle of near-surface drift varies from 1,000 to 2,000 ft./sec.

It should be noted from the above that what has been mapped is the top of the Spray River Formation, which is inferred from known occurrences to coincide with the base of the phosphate bed.

FIELD SURVEY TECHNIQUES

The seismic lines were laid out with a transit, chained and flagged and lightly brushed to facilitate movement. Station elevations were measured with an altimeter without calibration to a known elevation, ie: the noted elevations are relative only.

The Huntec FA-3 seismograph is a single channel instrument. It incorporates controls to adjust sensitivity to a level suitable to exclude ambient noise. Recording is on electro-sensitive paper. Two geophones were planted close to the instrument and remained stationary during the shooting of a given profile, while successive shot points are progressively recorded down the line.

Experimental shooting on Line A showed that a hammer energy source was not adequate. Therefore detonators and, at greater distances, small charges of high velocity seismic powder were used. Charges were detonated electrically by a control box incorporated into the recorder. Charges were buried six inches to two feet, as ground conditions permitted, to improve seismic coupling.

All profiles were reversed, ie: shot in both directions to permit averaging of observed velocities and cancellation of dip effects. Distance between shooting stations was 20 ft. for the first five stations closest to the recorder, and 100 ft. thereafter. Line A was shot as a single reversed profile over a distance of 950 ft. All other lines were shot as reversed 600 ft. profiles.

INTERPRETATION

Time-distance plots for profiles on each of the four lines are presented on the accompanying sections, together with the topographic profile and the depth profile for the top of the Spray River Formation. It might be mentioned that obviously spurious early arrivals which were observed on the records and which are believed to be due to cross-feed between shooting wire and geophone cables have been omitted from the time-distance plots.

Three different methods were used to calculate the depth to the Spray River:

1. Intercept time method.
2. Critical distance method.
3. Hawkin's method.

Theory, formulae and nomograms for these three methods are described in detail in the Huntec FS-3 manual, and were applied after correction of observed velocities for dip of the beds.

The close agreement between the depth interpretations by these three methods is gratifying and lends credence to the validity of the overall results.

DISCUSSION OF RESULTS

Line A, on the west flank of Squaw Creek anticline, lies approximately $\frac{1}{4}$ mile north of a diamond drill hole which encountered a 4 ft. thickness of phosphate (averaging P_2O_5 19.25%) directly overlying Spray River. Observed dips within the Spray River beds are in the 15-20 degree range, to the west. The seismic depth profile shows a depth range for the Spray River of 0 to 65 ft. Dip at the east end of the line is about 15 degrees, flattening to the west to give an overall west dip of 6 degrees.

Line B, on the east flank of Squaw Creek anticline, has no nearby drill control. Surface dips varying from 32 degrees east to 12 degrees east have been measured in Spray River beds to the west of the line. The seismic depth profile shows a depth range for the Spray River of 43 to 102 ft., with an overall east dip of 18 degrees.

Line C, The South Warner line, is also located on the south flank of Squaw Creek anticline, some $2\frac{1}{2}$ miles south of Line B. Nearest observed bedding dip is 20 degrees east. The seismic depth profile shows a depth range for the Spray River of 30 to 40 ft., with overall east dip of 11 degrees.

Line D, The Medesto Line, is located on the west flank of Coal Mountain anticline, approximately 1/8 mile north of a diamond drill hole which encountered 3½ ft. of phosphate, not analyzed.

Nearest bedding dips, located in Spray River beds, to the east of the line, are 18 degrees west. The seismic depth profile shows a depth range for the Spray River of 26 to 53 ft., with an overall west dip of 13 degrees.

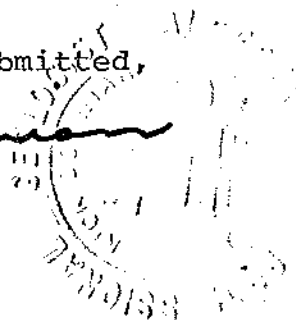
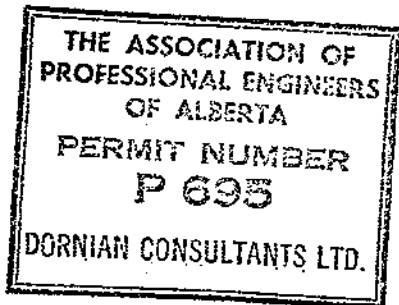
CONCLUSIONS AND RECOMMENDATIONS:

Results of this survey indicate that the Spray River lies at strip-mineable depth over substantial strike widths on the Western Warner and Medesto Claims.

A logical followup to this survey would be to drill several holes on each survey line to confirm results and establish thickness and grade of the phosphate bed which is known to overly the Spray River.

Respectfully submitted,

N. Dornian
N. Dornian



WW Claims 80% - PH Claims 20%

PERSONS EMPLOYED

<u>EMPLOYEE</u>	<u># DAYS WORKED</u>	<u>DATES WORKED</u>	<u>DAILY WAGE</u>	<u>TOTAL AMOUNT</u>	<u>80% WW CLAIMS</u>	<u>20% PH CLAIMS</u>
Management	3	May 18, 19 and 20	\$60	\$180		
Supervisor	20	May 18, 19, 20 and 31 June 1 and 2. July 3 to 16	\$60	1200		
Labor (1)	20	May 18, 19, 20 and 31 June 1 and 2. July 3 to 16	\$50	1000		
Labor (2)	20	May 18, 19, 20 and 31 June 1 and 2. July 3 to 16	\$50	1000		
Labor (3)	14	July 3 to 16th	\$50	700		
Labor (4)	14	July 3 to 16th	\$50	700		
Geologist	3	May 31, June 1 and 2	\$180	540		
Geophysicist	3	May 31, June 1 and 2	\$100	<u>300</u>		
				\$5620	\$4496	\$1124

Period May 18, 19 and 20 and Period May 31, June 1 and 2 were used to test seismic equipment, determine results, lay out program and flag lines to be surveyed.

Period July 3rd to 16th was used to cut lines, do seismic survey and complete reclamation program.

TOTALS carried forward.....\$5620 \$4496 \$1124

WW Claims 80% - PH Claims 20%

	<u>TOTAL AMOUNT</u>	<u>80% WW CLAIMS</u>	<u>20% PH CLAIMS</u>
Brought forward.....	\$5620	\$4496	\$1124
Cost of food and accommodation	970	776	194
Cost of ground transportation:			
Dodge 4 wheel drive 20 days @ \$55/day	1100		
GMC ½ ton truck 14 days @ \$40/day	560		
Pontiac Wagon 14 days @ \$20/day	280		
	<u>1940</u>	1552	388
Rental on tools and instruments:			
Kenting FS3 Portable Seismic Instrument, Chain saws, Walki-Talki, altimeter and portable generator for charging equipment.	834	667	167
Preparation of report pertaining to investigation	800	640	160
Reclamation work included in labor costs.			
TOTALS.....	<u>\$10,164</u>	<u>\$8,131</u>	<u>\$2,033</u>

Per: G.E. Evans

B. DRILLING

(Details as per report submitted)

COST

I wish to apply \$ _____ of this work to the claims listed below.
 (State number of years to be applied to each claim and its month of record)

C. PROSPECTING

(Details as per report submitted)

COST

I wish to apply \$ _____ of this work to the claims listed below.
 (State number of years to be applied to each claim and its month of record)

D. GEOLOGICAL, GEOCHEMICAL, GEOPHYSICAL (Includes line cutting)
 (State type of work)

NEAR SURFACE REFRACTION SEISMIC SURVEY *	COST
Labor-Line cutting-Seismic Survey-Reclamation	\$4,496
Food & accommodation	776
Ground Transportation	1,552
Rental on tools & equipment	667
Preparation of report pertaining to investigation	640
* Report enclosed	TOTAL \$8,131

I wish to apply \$ 8,000 of this work to the claims listed below.
 (State number of years to be applied to each claim and its month of record)

2033
10,164

WW1, WW2, WW4	1 year each claim	Aug. 22
WW6 to WW 12 incl.	1 year each claim	Aug. 22
WW45 to WW 60 incl.	1 year each claim	Aug. 26
WW83 to WW88 incl.	1 year each claim	Aug. 26
WW97 to WW104 incl.	1 year each claim	Aug. 26

NOTE—Dollar value of work done under A, B, C, or D sections, totalling \$200, may be applied as one year's work.

Who paid for the above-described work?

Name Western Warner Oils Ltd.

Address 215A-10th Street N.W.

Calgary, Alberta T2N 1V5

If you intend to claim a refund of cash in lieu under the provisions of the *Mineral Act*, you must make application on this affidavit under A, B, C, or D sections as applicable.

4. That I have not and will not use the work declared herein in any way for the purposes of obtaining tax exemption on a Crown-granted mineral claim under the terms of the *Mineral Land Tax Act*.

SWORN and subscribed to at Calgary
 this 12 day of August
 1975, before me
[Signature]

[Signature]

* This affidavit may be taken by a person empowered to take affidavits by the Evidence Act of British Columbia.

B. DRILLING

(Details as per report submitted)

COST

I wish to apply \$ _____ of this work to the claims listed below.
(State number of years to be applied to each claim and its month of record)

C. PROSPECTING

(Details as per report submitted)

COST

I wish to apply \$ _____ of this work to the claims listed below.
(State number of years to be applied to each claim and its month of record)

D. GEOLOGICAL, GEOCHEMICAL, GEOPHYSICAL (Includes line cutting)
(State type of work)

NEAR SURFACE REFRACTION SEISMIC SURVEY *

	COST
Labor- line cutting-seismic survey-reclamation	\$1,124
Food and accommodation	194
Ground transportation	388
Rental on tools and instruments	167
Preparation of report pertaining to investigation	160
* Report enclosed	
TOTAL	\$2,033

I wish to apply \$ 1,800 of this work to the claims listed below.
(State number of years to be applied to each claim and its month of record)

PH 7 to PH 12 incl.	1 year each claim	November
PH 14	1 year each claim	November
PH 16 and PH 17	1 year each claim	November

NOTE—Dollar value of work done under A, B, C, or D sections, totalling \$200, may be applied as one year's work.

Who paid for the above-described work? Name Medesto Exploration Ltd.
 Address 215A-10th St. N.W.
Calgary, Alberta

If you intend to claim a refund of cash in lieu under the provisions of the Mineral Act, you must make application on this affidavit under A, B, C, or D sections as applicable.

4. That I have not and will not use the work declared herein in any way for the purposes of obtaining tax exemption on a Crown-granted mineral claim under the terms of the Mineral Land Tax Act.

SWORN and subscribed to at Calgary, Alberta
 this 12 day of August
 1975, before me
[Signature]
 a notary public in and for Alberta

* This affidavit may be taken by a person empowered to take affidavits by the Evidence Act of British Columbia.

114d 45'

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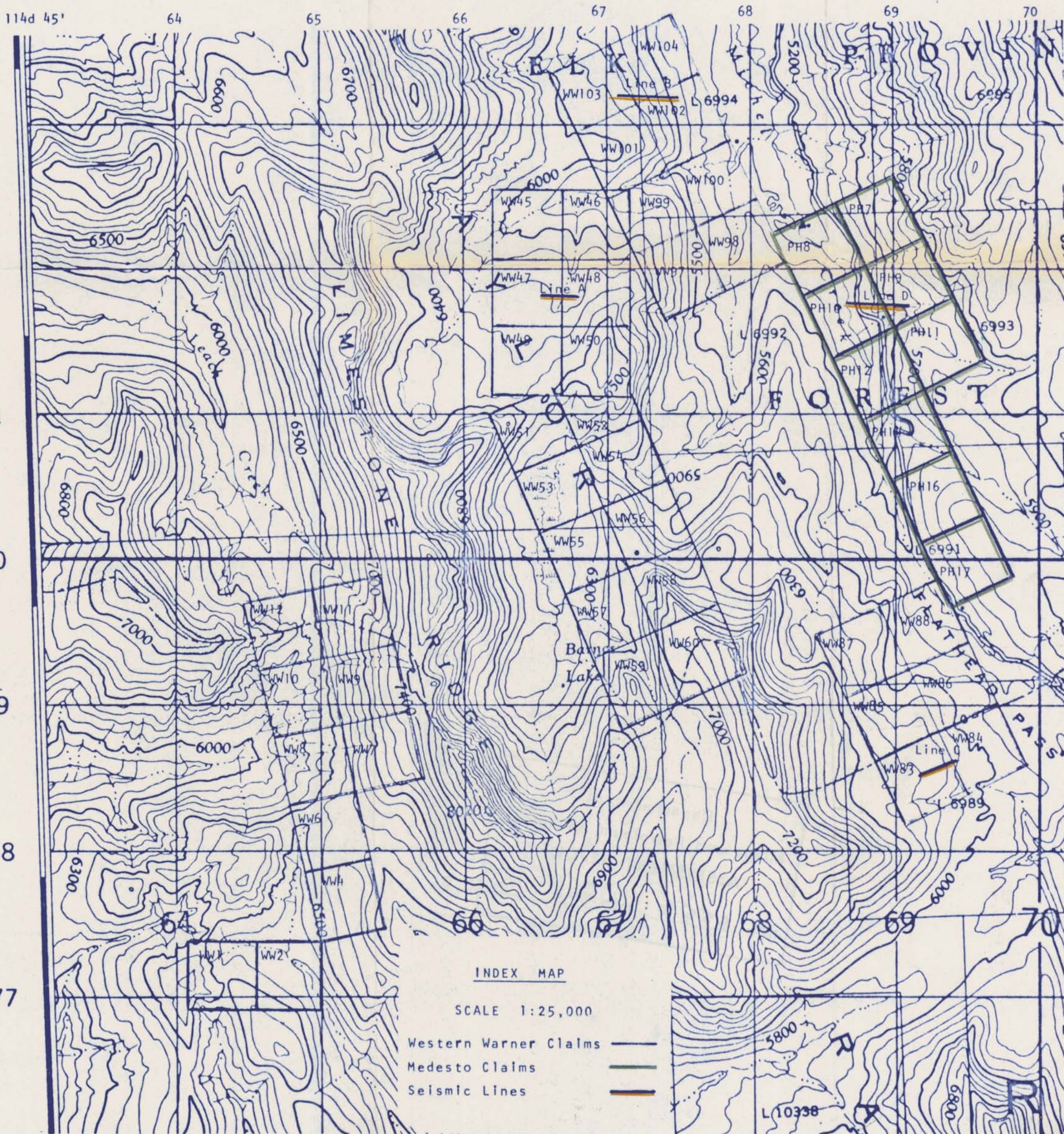
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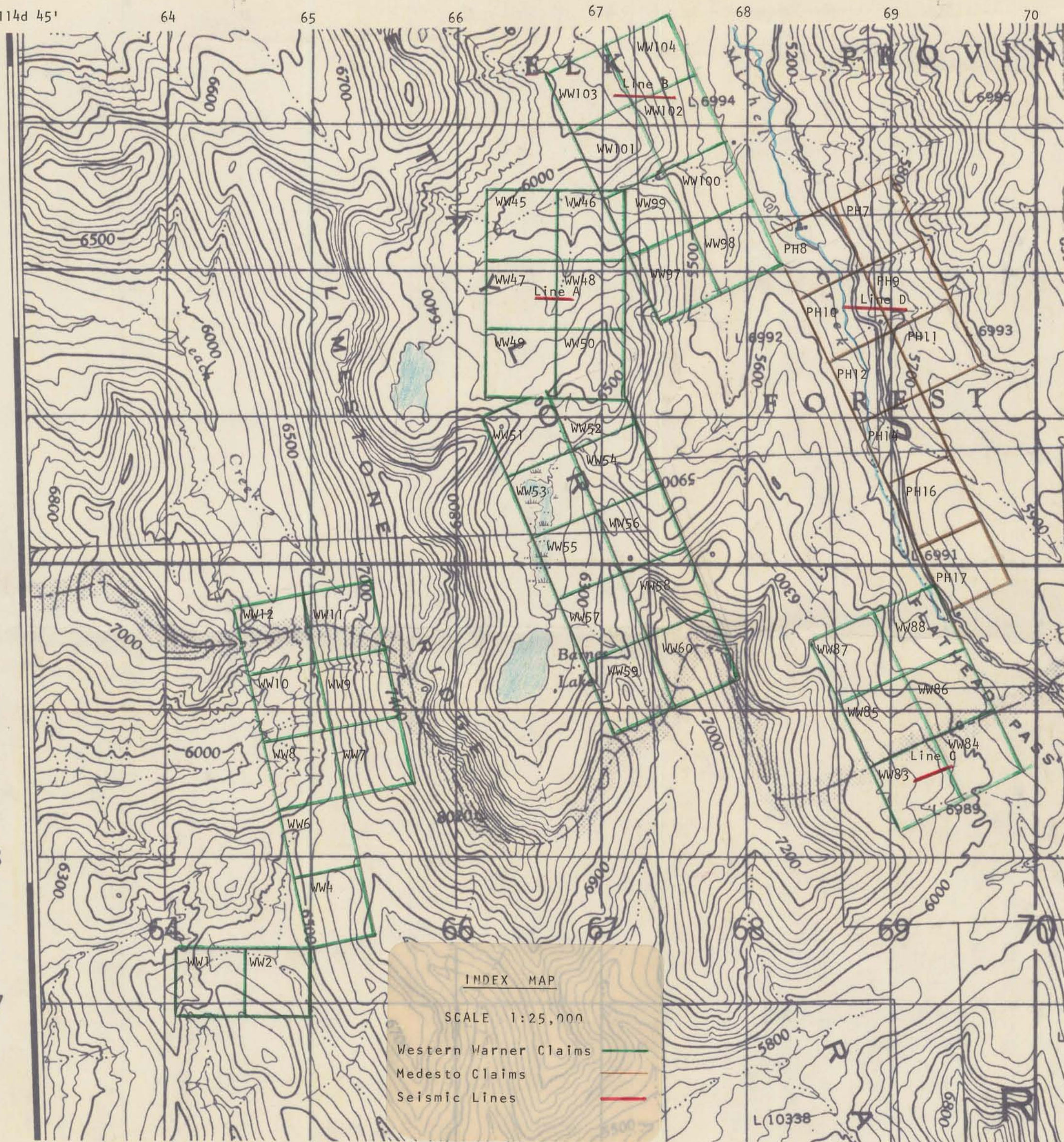
INDEX MAP

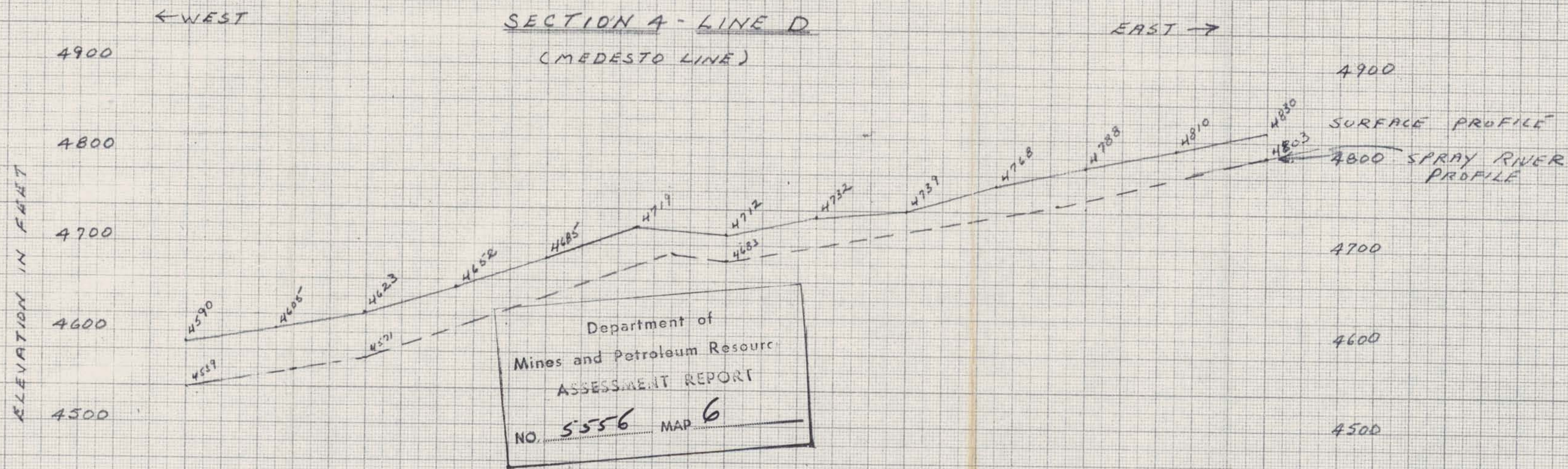
SCALE 1:25,000

Western Warner Claims

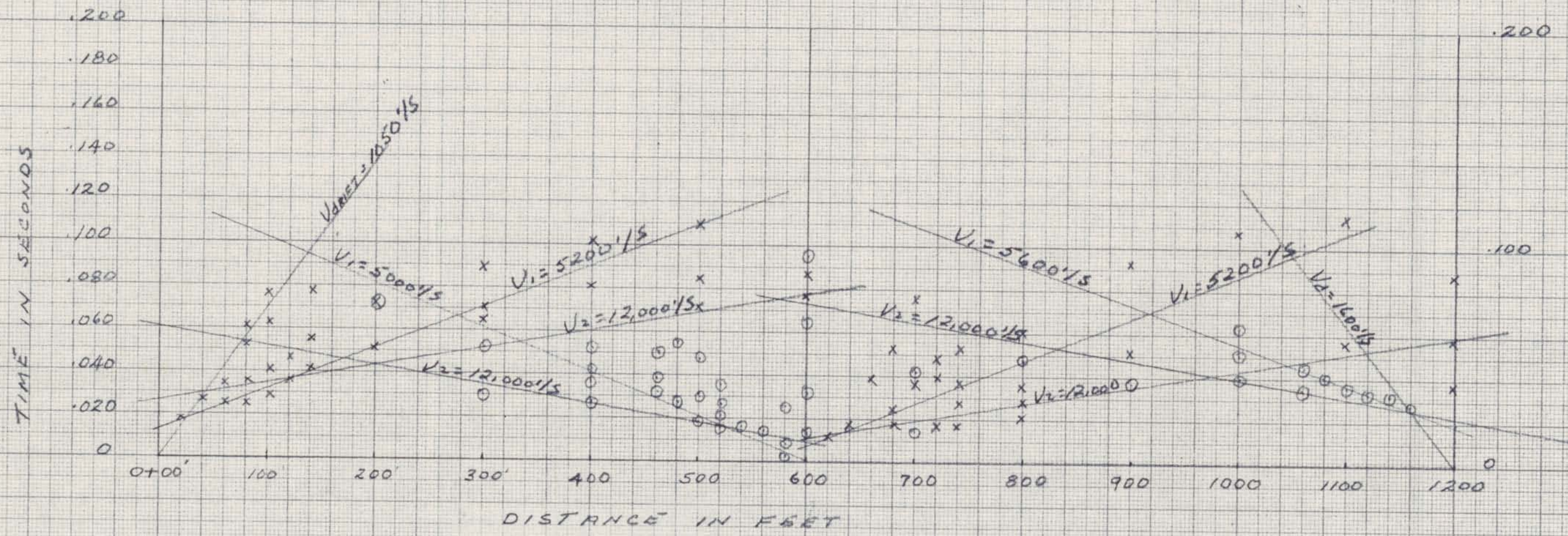
Medesto Claims

Seismic Lines





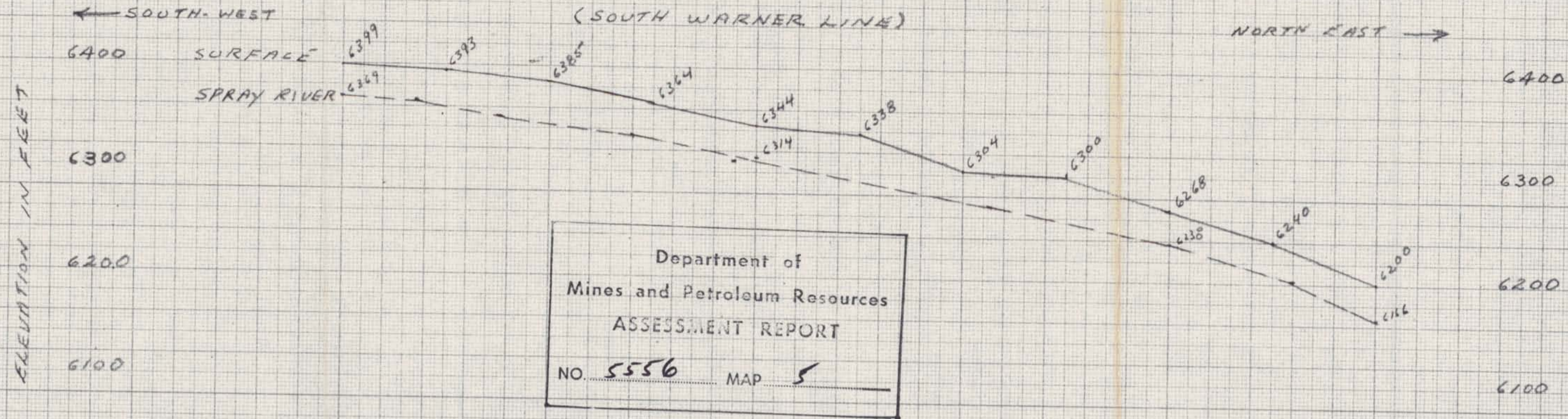
	*	*	*	x	x	x	x x
DRIPT =	12'	12'		0	0		15' 15' DRIFT
INTERCEPT	41'			25'	29'		13' 12'
CRITICAL DIST		35'					28' 27' DEPTH TO SPRAY RIVER
HAWKINS			52'			36'	
TOTAL	51'	47'		25'	29'		



HORIZONTAL SCALE 1 INCH = 100 FT
 VERTICAL SCALE 1 INCH = 100 FT
 TIME SCALE 1 INCH = .050 SEC.
 INTERPRETATION: N. DORNHIAN
 AUG. 1975

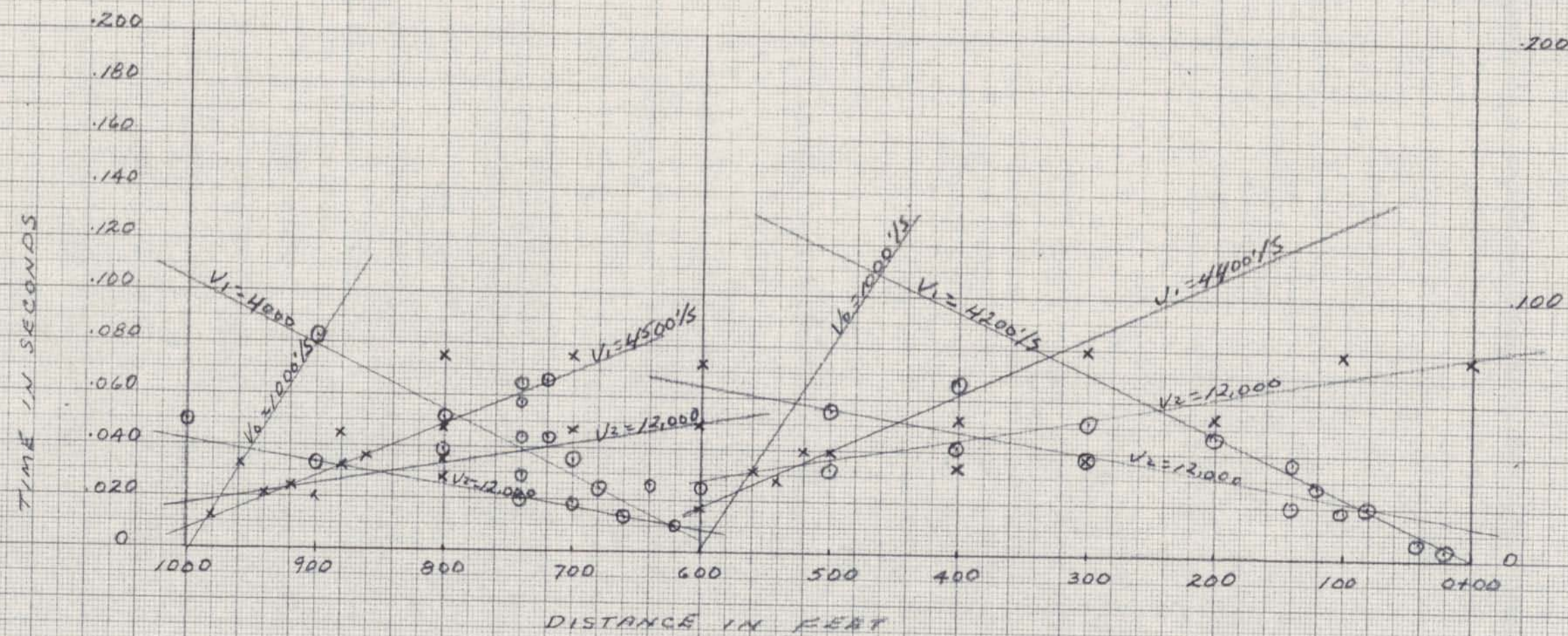
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 MAP 6

SECTION 3 - LINE C



	*	*	*	*	**	*	*	*	*
DRIFT	8'	8'			9' 9"				
INTERCEPT METHOD	22'				30' 21"			0	0
CRITICAL DIST.		22'						28'	34'
HAWKINS METHOD			38'	34'					
TOTAL DEPTH TO SP. RIVER	30'	30'	38'	34'	39' 30"	30'	30'	28'	34'
			38'	34'	39' 30"	30'	30'	28'	34'

TOTAL DEPTH TO SPRAY RIVER



HORIZONTAL SCALE 1 INCH = 100 FT.
 VERTICAL SCALE 1 INCH = 100 FT.
 TIME SCALE 1 INCH = .050 SEC.
 INTERPRETATION N. D. GARNIAN AUG. 1975

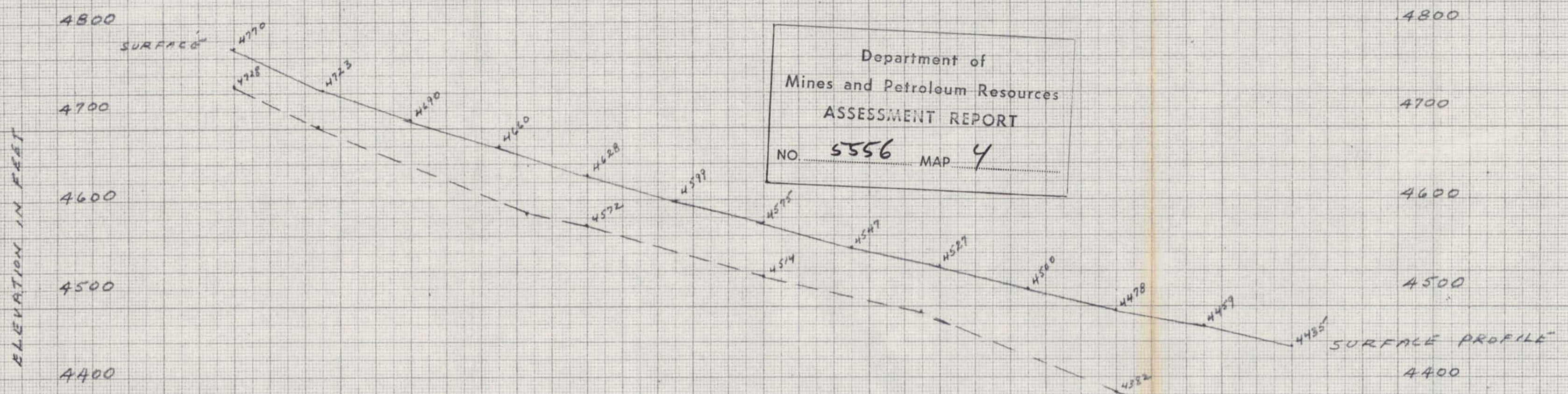
SECTION 2 - LINE B

(EAST SQUAW MOUNTAIN LINE)

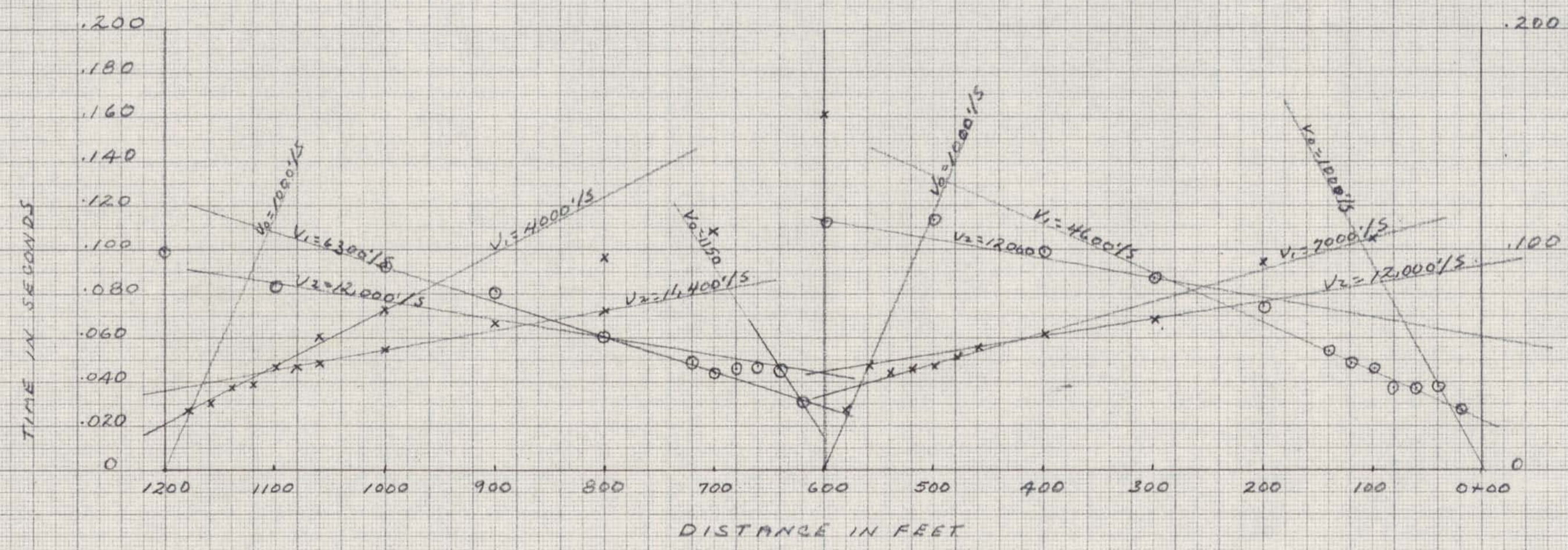
← WEST

EAST →

Department of
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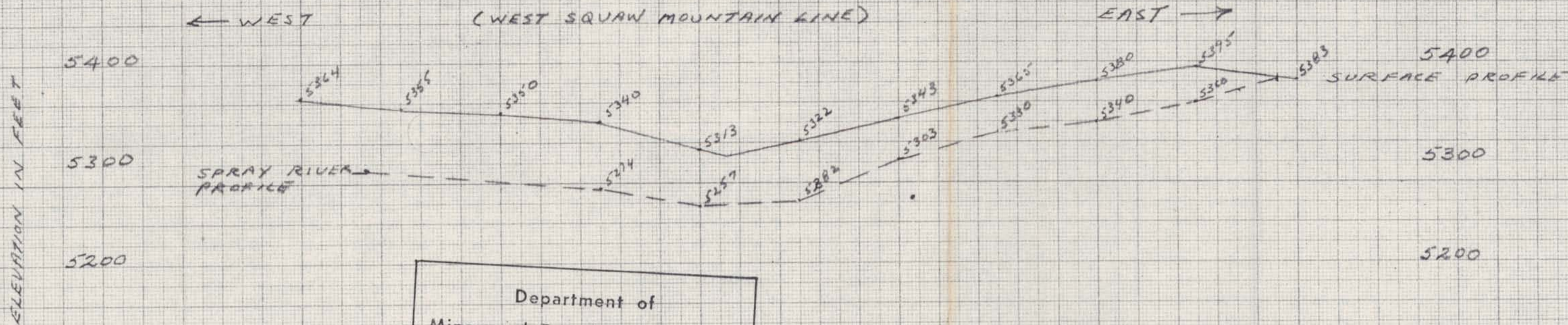
	*	*		*	*		*	*		*		*
DRIPT	8'	8'		11'	11'		11'	11'		12'		12'
INTERCEPT METHOD	34'	35'		45'	50'		43'	43'		90'		90'
CRITICAL DISTANCE				59'	56'		61'	54'		96'		102'
HAWKINS METHOD				59'	56'		61'	54'		96'		102'
TOTAL DEPTH TO SP.R.	42'	43'		59'	56'		61'	54'		96'		102'
												TOTAL DEPTH TO SPRAY RIVER



HORIZONTAL SCALE 1 INCH = 100 FT.
VERTICAL SCALE 1 INCH = 100 FT.
TIME SCALE 1 INCH = 0.050 SEC.
INTERPRETATION N. DORNIAH AUG. 1975

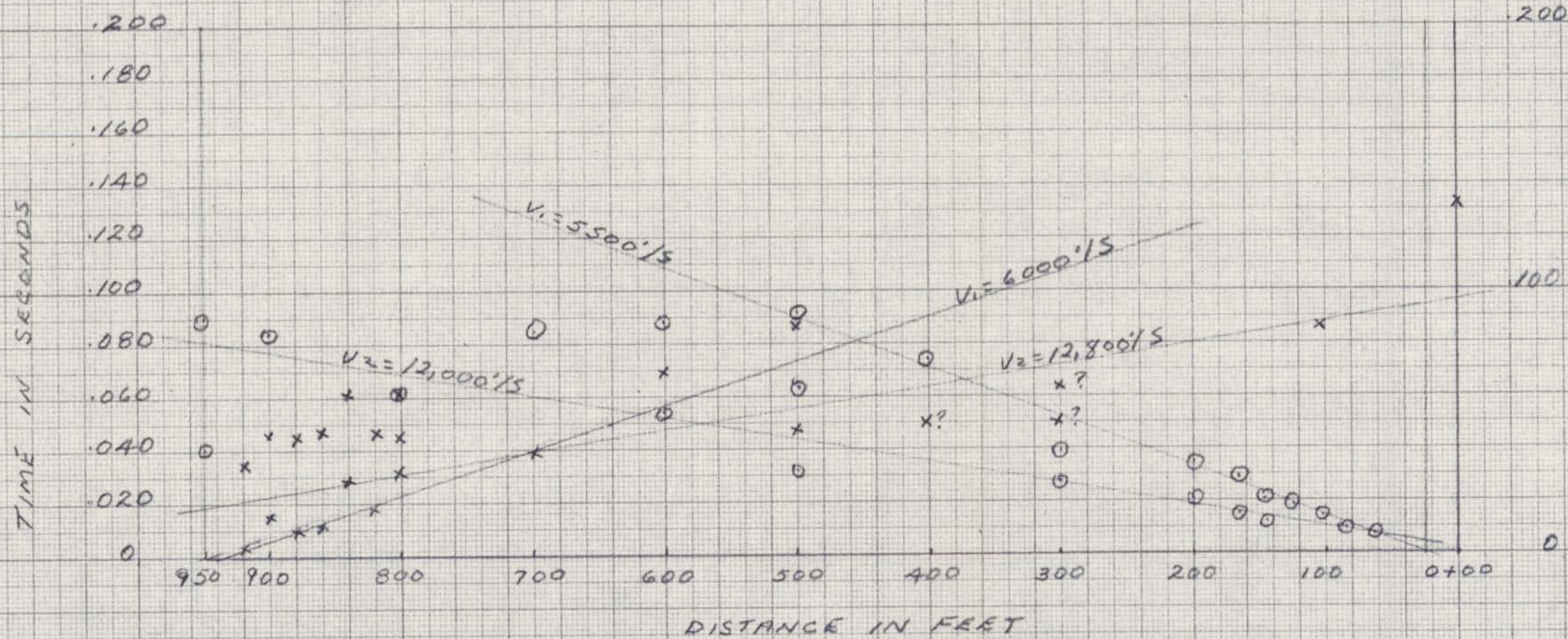
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MAP 4

SECTION 1 - LINE A



Department of
Mines and Petroleum Resources
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	x		x	x	x	x	x	x	x	x	x	x	
DRIFT													
INTERCEPT METHOD	62'												
CRITICAL DISTANCE		66'	46'	40'	40'	35'	40'	35'	12'				
HAWKINS METHOD			46'	40'	40'	35'	40'	35'	12'				
TOTAL DEPTH TO SP.R.	62'	66'	46'	40'	40'	35'	40'	35'	12'				
													TOTAL DEPTH TO SPRAY RIVER



HORIZONTAL SCALE 1 INCH = 100 FT.
VERTICAL SCALE 1 INCH = 100 FT.
TIME SCALE 1 INCH = .050 SEC.
INTERPRETATION N. DORNIAN
AUG. 1975