ARIS SUMMARY SHEET

District Geologist, Smithers Off Confidential: 89.05.18

ASSESSMENT REPORT 17349 MINING DIVISION: Atlin

PROPERTY: Spruce Creek
LOCATION: LAT 59 34 00 LONG 133 34 21
UTM 08 6603812 580660
NTS 104N12E
CLAIM(S): Placer Lease 13377
OPERATOR(S): Carnes Creek Ex.
AUTHOR(S): Hillman, R.A.
REPORT YEAR: 1988, 11 Pages
COMMODITIES
SEARCHED FOR: Gold
GEOLOGICAL
SUMMARY: The present Spruce Creek valley parallels a very large Tertiary river channel cut into the "gold series" of pyroxenites, greenstones and magnesian rocks. This Tertiary valley in-filled to a depth of 24.4-30.5 metres with reddish coloured gold-bearing gravels covered by approximately 60.9 metres of grey glacial gravels.

WORK
DONE: Geophysical
SEIS 0.9 km
Map(s) - 6; Scale(s) - 1:2500,1:1500

CARNES CREEK EXPLORATIONS LTD.

REPORT ON

SEISMIC REFRACTION INVESTIGATION

SPRUCE CREEK PLACER PROJECT

ATLIN, B.C.

Atlin Mining Division
NTS 104 N/12
59° 34'N 133° 34' W

by

Russell A. Hillman, P. Eng.

February, 1988

CONTENTS

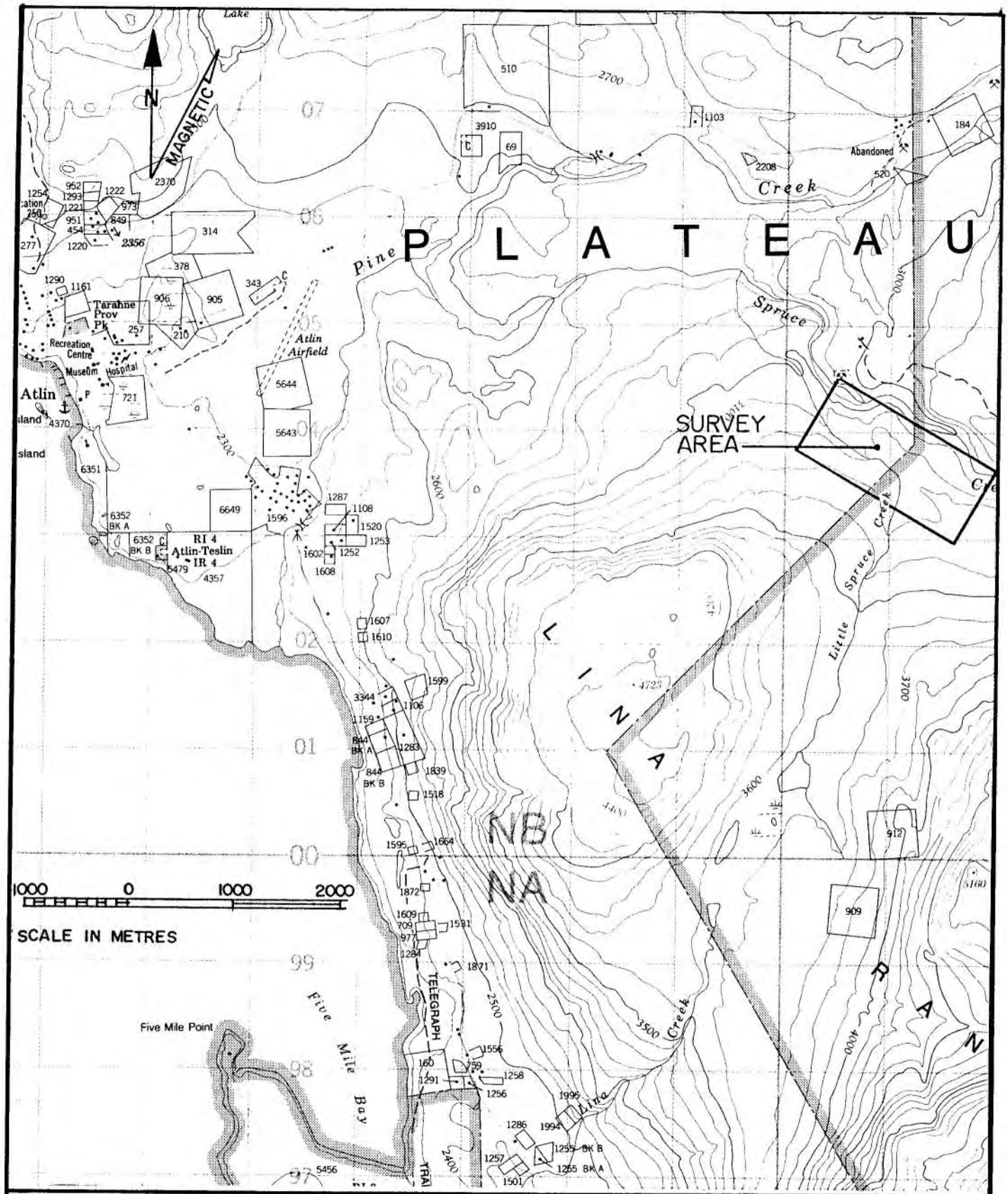
FIGURES

1. INTRODUCTION

During the period February 16 to February 22, 1988, Foundex Geophysics Inc. carried out a seismic refraction investigation for Carnes Creek Explorations Ltd. at their property on Spruce Creek located approximately 7.5 km due east of Atlin, B.C. The investigation was carried out along five separate seismic lines within placer leases staked to cover the postulated position of buried Tertiary gold bearing channels currently being mined at the site. The investigation was carried out to determine the thickness of overburden soils overlying bedrock, the general nature of these soils and the configuration of the bedrock surface.

A site location plan is presented in Figure 1. All seismic lines were run parallel and at a bearing of North 25 degrees East. A more detailed site survey plan is shown in Figure 2, in Appendix A.

In total, 3.82 km of seismic refraction survey work was carried out at the site.



CARNES CREEK EXPLORATIONS LTD. SPRUCE CREEK PLACER PROJECT	FOUNDEX GEOPHYSICS INC.	
SEISMIC REFRACTION SURVEY SITE LOCATION PLAN NTS 104 N/12 ATLIN	FEBRUARY, 1988 FGI-045	FIG. 1

2. SEISMIC REFRACTION SURVEY METHOD

2.1 EQUIPMENT

The seismic refraction investigation was carried out using a Geometrics Model ES-1225, 12 Channel, signal enhancement seismograph. A 305 metre, together with a 152.5 metre cable was used for all seismic refraction lines. The use of a long cable shortened at some geophone points allowed for optimum spacing of geophones along the seismic lines. Geophone spacings ranged from 3.8 to 18.3 metres. Explosive charges were detonated electrically using a Geometrics HVB-1 high voltage, capacitor-type blaster.

2.2 SURVEY PROCEDURE

For each spread, the seismic cables were stretched out in a straight line and the geophones implanted. Six different shot holes were then excavated: one at either end of the twenty-four geophone line, one at the mid-point where the cables joined, one at the centre of the 305 metre cable, and one off each end of the line to ensure adequate coverage of the basal layer. Seventy-five percent Forcite was utilized as an energy source in the survey. Shots consisting generally of two to twelve sticks of Forcite were detonated individually and arrival times for each geophone were

automatically recorded in the seismograph. Hard copy records were made on electrically sensitive recording film. Data recorded during field surveying operations was generally of good to excellent quality.

Throughout the survey, notes were recorded regarding seismic line position in relation to topographic and geological features of the area. Elevation surveying was carried out at the site by P.A.C. Surveys of Nanaimo, B.C. All seismic lines were initiated in relatively flat terrain in the vicinity of Little Spruce Creek and surveyed north over the "esker" feature to terminate at or close to the base of the Spruce Creek Valley.

3. SEISMIC REFRACTION ANALYSIS METHODS

3.1 INTERPRETATION

Interpreted geological conditions at the site indicate shallow to deep bedrock overlain by one to three layers of overburden. In general, the velocity contrast between refractive layers was more than adequate for interpretation, however in some locations the contrast between the basal layer and the layer immediately overlying it was small, requiring careful application of the standard interpretive methods to arrive at final profiles. In addition, isolated strong lateral velocity changes in the principal overburden layer and the presence of a hidden layer further complicated the interpretation of the data. Interpreted boundaries between layers with different velocities are indicated by dashed lines in the profiles. The basal dashed line in all cases represents the interpreted competent bedrock surface.

3.2 INTERPRETIVE METHODS

The final interpretation of the seismic data was arrived at using the method of differences technique. This method utilizes the time taken to travel to a geophone from shotpoints located to either side of the geophone. Using the total time, a small vertical time is computed which represents the time taken to travel from the refractor up to

the ground surface. This time is then multiplied by the velocity of each overburden layer to obtain the thickness of each layer at that point.

3.3 LIMITATIONS

The depths to subsurface boundaries derived from seismic refraction surveys are generally accepted as accurate to within fifteen percent of the true depths to the boundaries. In some cases, unusual geological conditions may produce false or misleading seismic arrivals with the result that computed depths to subsurface refractors may be less accurate.

In this survey, the small velocity contrast between the basal layer and the principal overburden layer may result in larger depth to bedrock errors in some locations. In addition, the presence of a hidden layer which is really a velocity reversal may result in some additional errors for seismic spreads in close proximity to Spruce Creek.
The results are interpretive and are considered, however, to be overall, a reasonably accurate presentation of existing subsurface conditions within the limitations of the seismic refraction method.

4. GEOPHYSICAL RESULTS

4.1 GENERAL

Seismic refraction profiles at a natural scale of 1:1500 are shown in Appendix A. The topographic information was based on detailed topographic surveying.

4.2 SURFICIAL LAYER

A thin, surficial layer having a velocity range of 440 m.p.s. to 930 m.p.s. is evident underlying the seismic lines. This layer which ranges up to 27 metres in thickness has been correlated with loose, silt, sand, gravel, cobbles and occasional boulders evident in exposures throughout the survey area and intersected in shallow, hand-excavated shotholes. The greatest thicknesses for this layer are consistent with the axis of the esker-like feature intersected on all seismic lines.

4.3 INTERMEDIATE LAYERS

An intermittent thin intermediate layer ranging in velocity from 995 m.p.s. to 1635 m.p.s. was detected on lines 10+00E, 10+33E and 10+66E. In the immediate vicinity of Little Spruce Creek, these materials have been correlated with saturated sands, gravels and cobbles. In other locations, these velocities are believed to be representative of

coarse, compact, sands, gravels and cobbles.

The principal overburden layer was detected throughout the area of the seismic survey. Displaying velocities ranging from 1890 m.p.s. to 2900 m.p.s., this unit is relatively thin to the extreme south but attains thicknesses of up to 85m to the north. The velocities detected in the extreme north for this layer are considerably lower due in part to a strong lateral velocity decrease and the presence of an underlying layer having an anomalously low velocity which reduces the apparent overall velocity. This main layer has been correlated in drillholes and in the pit exposure with very dense, bedded, silt, sand, gravel and cobble layers, the basal segment of which is currently being mined in the open pit operation. The high computed velocities suggest that the density and composition of the materials in this layer are relatively consistent throughout the surveyed area. The higher velocities detected in some locations are believed to be due to either a higher coarse materials content or cementation of the materials.

4.4 BASAL LAYER

The basal layer having velocities ranging from 3200 m.p.s. to 6775 m.p.s. is interpreted as the competent bedrock surface composed of sediments, metamorphic rock and possibly intrusives. The bedrock surface overall dips gently from

south to north, but does form an apparent broad channel that is roughly centred on the baseline on line 10+00E and strikes eastward to 0+50N on line 20+66E. The base of the postulated channel in the bedrock surface is consistent with the 870 m elevation mark. Lines 10+00E, 10+33E and 10+66E and to a lesser extent 20+33E and 20+66E display an abrupt bedrock rise to the south which supports the channel interpretation. Additional bedrock depressions to the north suggest narrow channels in the bedrock, however, these features were difficult to delineate due to the apparent presence of a velocity inversion in these areas.

5. SUMMARY AND RECOMMENDATIONS

A total of 3.82 km of detailed seismic refraction work has been completed on Carnes Creek Explorations Ltd.'s placer claims on Spruce Creek near Quesnel, B.C.

The seismic work was carried out along five separate seismic lines and the results reveal a broad bedrock depression with a consistent base at approximately 870 metre elevation. The presence of a generally thick, high velocity layer consistent from Seismic Lines 10+00E to 20+66E overlying the bedrock surface and correlated with cemented Tertiary sand, gravels, cobbles and boulders, supports the presence of a buried channel at the site.

Based on the results of the seismic and drilling results to date, it is recommended that additional drilling be carried out to delineate the major bedrock depression. In addition, some shallow drilling should be carried out to explore detected smaller bedrock depressions at the extreme north end of the seismic lines.

FOUNDEX GEOPHYSICS INC.

Russell A. Hillman, P.Eng.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA Russell A. Hillman

February 29, 1988

Carnes Creek Explorations Ltd.
406 - 837 West Hastings Street
Vancouver, B.C.
V6C 1B6

RE: SPRUCE CREEK PROJECT

Field Costs	
-Mobilization & Demobilization	$ 2,950.00
-Crew Day Costs, including field interpretation	
7 days @ $1,545.00 per day	$10,815.00
Sub Total Field Costs	$13,765.00
Office Costs	
-interpretation & computer, analysis, drafting	$ 5,940.00
TOTAL COSTS	$19,705.00

CERTIFICATE

I, RUSSELL ALEXANDER HILLMAN, resident of Vancouver, Province of British Columbia, hereby certify as follows:

1. I am a Consulting Geophysicist with an office at #7 - 84 Lonsdale Avenue in North Vancouver, B.C.

2. I graduated with a degree of Bachelor of Science, Geophysics, from the University of British Columbia.

3. I have practised my profession for 19 years. I am a Professional Engineer in the Province of British Columbia.

4. I am a member of good standing with the European Society of Exploration Geophysicists.

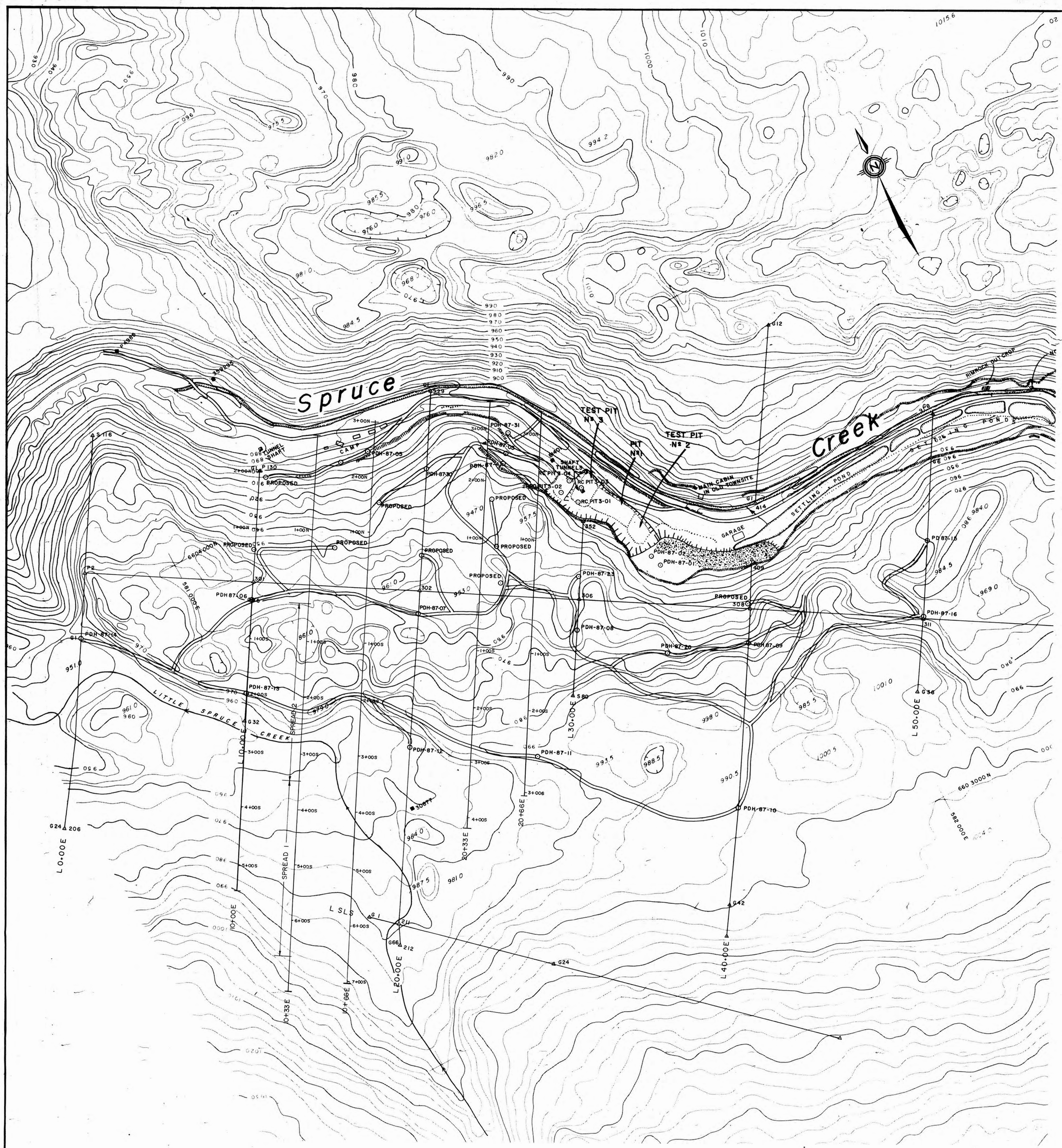
5. I have no direct, indirect, or contingent interest in the shares or business in the property of CARNES CREEK EXPLORATIONS LTD. nor do I intend to have any interest.

6. I supervised and interpreted the results of a seismic refraction survey carried out on the property of CARNES CREEK EXPLORATIONS LTD. near Atlin, B.C. in the period February 16, 1988 to February 22, 1988.

DATED at Vancouver, Province of British Columbia
this 29th day of February, 1988.

Russell A. Hillman

Russell A. Hillman, P.Eng.



GEOLOGICAL BRANCH
ASSESSMENT REPORT

17,349

0 50 100 200 300 metres

CARNES CREEK EXPLORATION LTD.

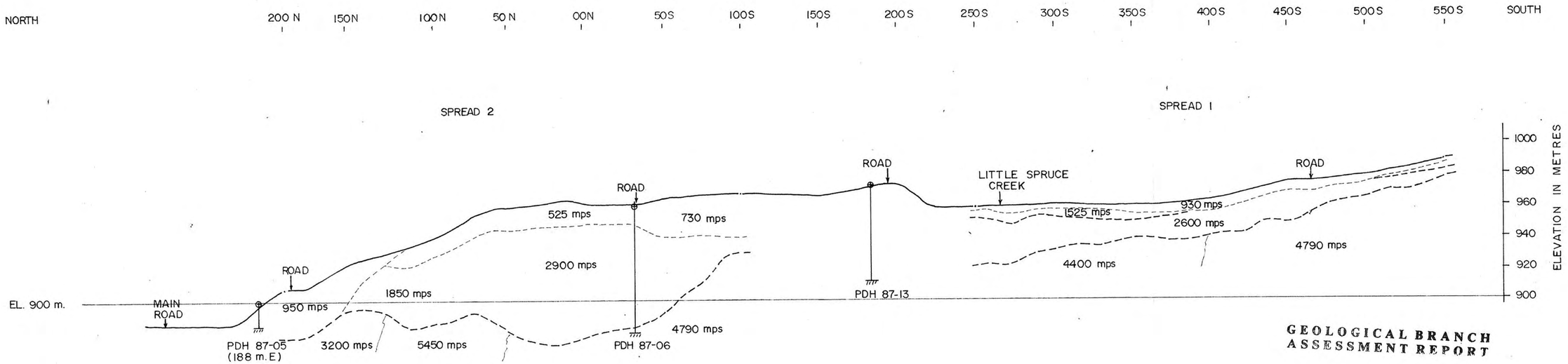
SPRUCE CREEK PROJECT
ATLIN MINING DIVISION, B.C.

FOUNDEX GEOPHYSICS INC.

SITE SURVEY PLAN

SCALE: 1:2500 | FIG. 2

DATE: FEB., 1988 | PSL-045



GEOLOGICAL BRANCH
ASSESSMENT REPORT

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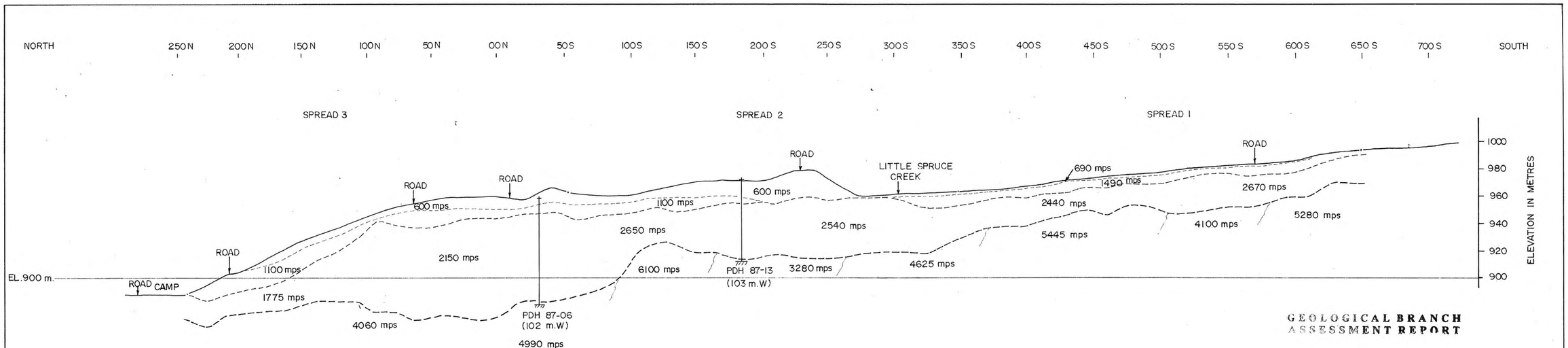
CARNES CREEK EXPLORATIONS LTD. SPRUCE CREEK PLACER PROJECT	FOUNDEX GEOPHYSICS INC.	
SEISMIC REFRACTION SURVEY INTERPRETED SECTION 10+00E SCALE 1:1500	FEBRUARY , 1988 FGI- 045	FIG.3



GEOLOGICAL BRANCH
ASSESSMENT REPORT

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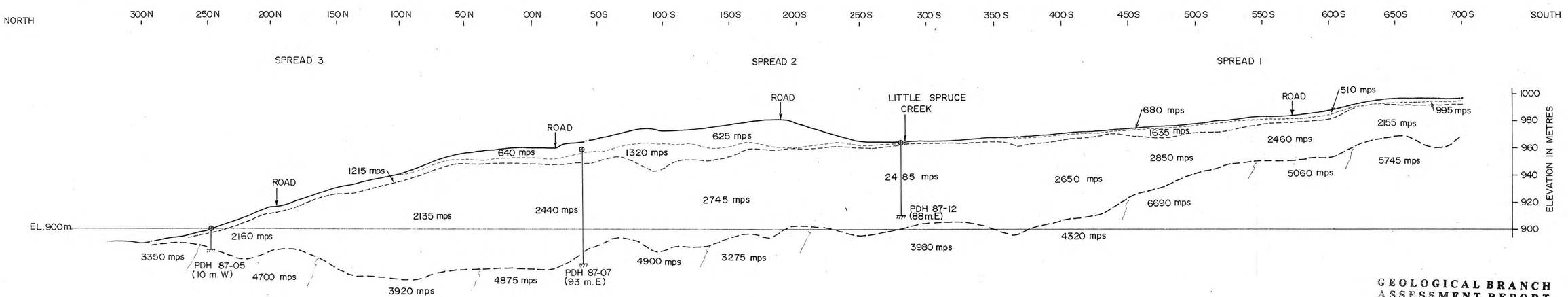
CARNES CREEK EXPLORATIONS LTD. SPRUCE CREEK PLACER PROJECT	FOUNDEX GEOPHYSICS INC.	
SEISMIC REFRACTION SURVEY INTERPRETED SECTION 10 + 33 E SCALE 1: 1500	FEBRUARY, 1988 FGI-045	FIG. 4



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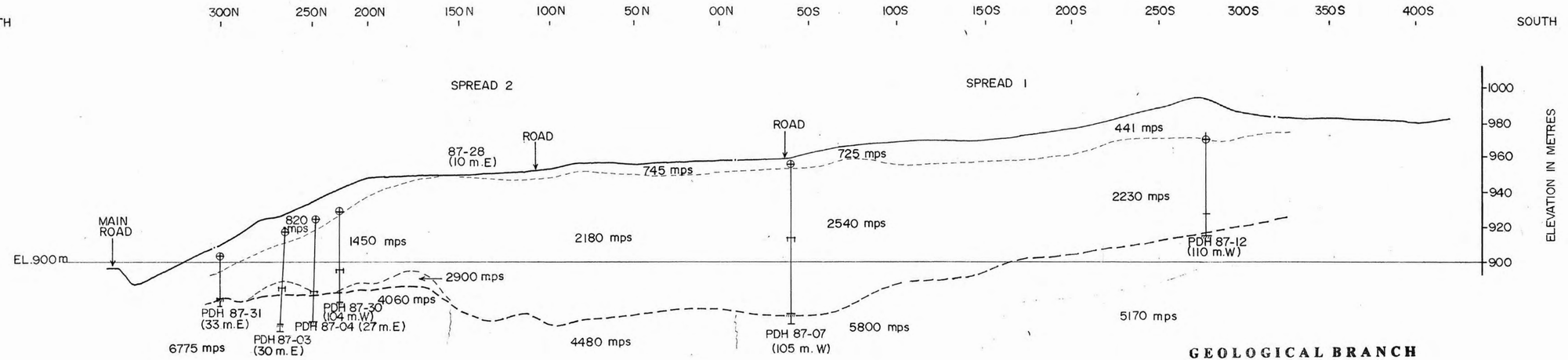
CARNES CREEK EXPLORATIONS LTD. SPRUCE CREEK PLACER PROJECT	FOUNDEX GEOPHYSICS INC.	
SEISMIC REFRACTION SURVEY INTERPRETED SECTION 10+66 E SCALE 1:1500	FEBRUARY, 1988 FGI-045	FIG. 5



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ASSESSMENT REPORT

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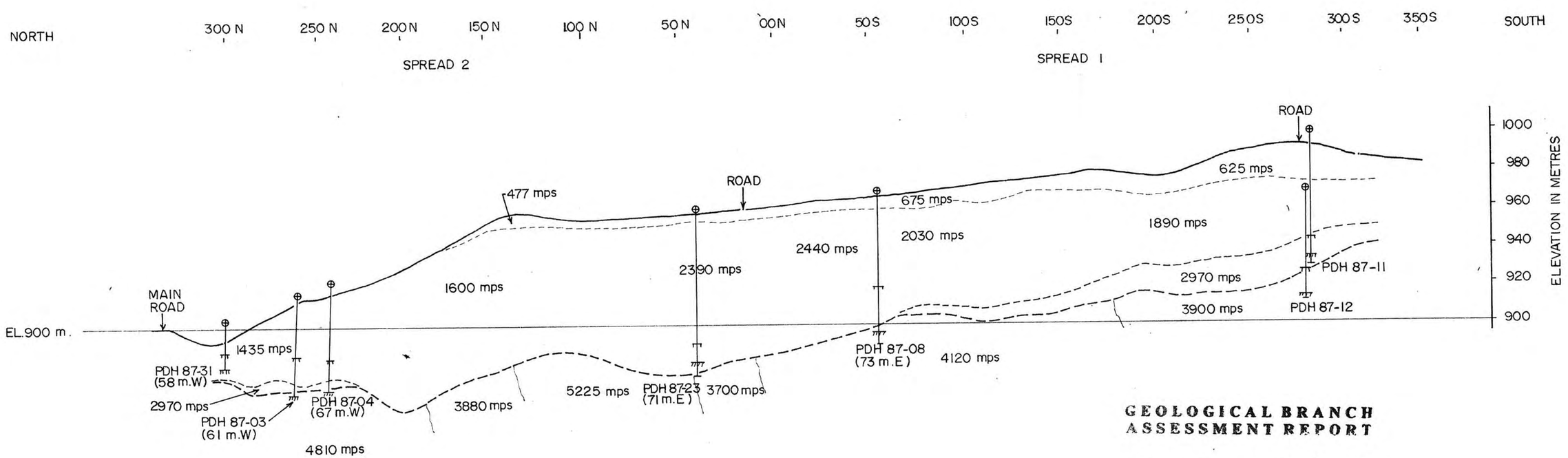
CARNES CREEK EXPLORATIONS LTD. SPRUCE CREEK PLACER PROJECT	FOUNDEX GEOPHYSICS INC.	
SEISMIC REFRACTION SURVEY INTERPRETED SECTION 20+33E SCALE 1:1500	FEBRUARY, 1988 FG1 - 045	FIG. 6



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CARNES CREEK EXPLORATIONS LTD. SPRUCE CREEK PLACER PROJECT	FOUNDEX GEOPHYSICS INC.	
SEISMIC REFRACTION SURVEY INTERPRETED SECTION 20+66 E. SCALE 1:1500	FEBRUARY, 1988 FG1-045	FIG. 7