

86-157-14507

**GEOPHYSICAL REPORT**

**ON A**

**SEISMIC REFRACTION SURVEY**

**ON**

**THE MCKEE CREEK PROPERTY**

**PLACER LEASES 3041, 13222, 13223 AND 13224**

**ATLIN AREA**

**ATLIN MINING DIVISION**

**BRITISH COLUMBIA**

**PROPERTY** : On McKee Creek 13 km S30°E of the Village of Atlin, British Columbia.  
 : 59° 28.2' North Latitude  
 : 133° ~~34'~~<sup>33.2'</sup> West Longitude  
 : N.T.S. 104N/5E

**WRITTEN FOR** : NOLAN MINES LTD.  
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**DATED** : March 31, 1986



GEOTRONICS SURVEYS LTD.  
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14507  
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**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

LIST OF ILLUSTRATIONS

MAPS - At End of Report

**14,507**

MAP #

Claim Map

1: 50,000

**FILMED**

1

Profile SL-1

1: 500

2

### SUMMARY

Seismic refraction work was carried out over placer leases 3041, and 13224 located near Atlin on McKee Creek in the Atlin Mining Division, B.C., during the period March 9th to 11th, 1986. The object of the survey was to locate a buried creek channel carrying placer gold and to determine the depths to bedrock.

The leases are underlain by Pennsylvanian and Permian sediments and volcanics, as well as intrusions of ultramafics. The overburden is glacial till and fluvial sands and gravels.

The survey was carried out using a 24-channel seismic refraction system with a 350-meter spread, 15-meter geophone spacings, and employing explosives as the energy source. Only one spread was done. The data were analyzed using the general reciprocal method.

### CONCLUSIONS

1. The seismic refraction survey revealed a buried creek channel near the south end of the survey line. A second probable channel was detected within the center of the survey line.
2. The bedrock velocity obtained is indicative of the cherts and ultramafics that occur in the area. The overburden velocities are indicative of relatively dry to water-saturated tills, sands and/or gravels.
3. The overburden thickness (depth to bedrock) varies from as little as 3 and 4 m at each end of the survey line to 48 m within the center.

### RECOMMENDATIONS

Further seismic work should be done to more definitely determine the existence of the probable channel, to better define the location of the definite channel, and to extend the strike lengths. This should not only consist of seismic work to the east and to the west of SL-1 but also velocity spreads to obtain more accurate overburden layering.

GEOPHYSICAL REPORT  
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SEISMIC REFRACTION SURVEY  
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ATLIN MINING DIVISION  
BRITISH COLUMBIA

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INTRODUCTION AND GENERAL REMARKS

This report discusses the field procedure, compilation of data, and interpretation of results of seismic refraction work carried out over placer leases near Atlin on McKee Creek during the period March 9th to 11th, 1986.

The field work was carried out under the supervision of Andrew Rybaltowski, geophysicist, with one geophysical technician and one helper. Only one 350-meter seismic spread was done.

The prime object was to locate an ancient buried creek channel known to cross the property and known to carry placer gold. A secondary object was to determine the thickness of overburden which would become important if placer mining was to take place.

The work was done at the request of Michael G. Stoner, P.Eng., mining engineer, on behalf of Nolan Mines Ltd.

### PROPERTY

The placer property consists of 4 placer leases staked within the Atlin Mining Division, B.C. as shown on Map 1 and as described below:

<u>Placer Lease</u>	<u>Expiry Date</u>
3041	Mar. 31, 1989
13223	Dec. 31, 1988
13224	Dec. 31, 1988
13222	Dec. 31, 1988

The above-noted expiry dates take into account the work discussed within this report as being accepted for assessment credits.

### LOCATION AND ACCESS

The property is located 13 km S30°E of the village of Atlin on McKee Creek, 2 km upstream from its confluence with Atlin Lake.

The geographical coordinates are 59° 28' north latitude and 133° 34' west longitude.

Atlin can be reached by car from Whitehorse with paved and gravelled highways over a distance of 183 km. The northern boundary of the leases is reached by a gravel road about 15 km south of Atlin.

### PHYSIOGRAPHY

The property is located on the west side of the physiographic unit known as the Teslin Plateau which is a division of the Yukon Plateau. The terrain is generally moderate with slopes varying from gentle to steep. Mountains in the area reach elevations in excess of 2,100 m (6,900 feet) a.s.l.

The placer leases are located within the McKee Creek valley. The slopes are moderate to steep with the elevations varying from 750 m to 1,040 m (2,475 feet to 3,400 feet) a.s.l.

### HISTORY OF PREVIOUS WORK

Placer gold was first discovered in the area in the 1800's and through the years since the creeks in the general area have been worked off and on.

There is no known previous work done on the property known to the writer. However, Geotronics carried out seismic refraction work further upstream during early 1977.

### GEOLOGY

The bedrock underlying the leases consists of limestone; Atlin ultramafic and ultrabasic intrusions; Pennsylvanian and Permian sediments and volcanics consisting of argillite, chert, andesite and carbonatized andesite; and Cretaceous diorite dykes.

The overburden consists of fluvial sands and gravels and glacial till.

### INSTRUMENTATION

Two 12-channel seismographs, Model 1210F, manufactured by Geometrics/Nimbus of Sunnyvale, California, were used on the project. The two were interfaced together to make up a 24-channel system. The 1210F features signal enhancement by stacking repeated signals in a digital memory. A CRT (cathode ray tube) continuously displays the signal stored in the memory on all channels. The stored signal can then be printed on a permanent paper record by a built-in electric-writing oscillograph. The instrument also contains active signal filters on each amplifier.

Two 168-meter geophone cables were used, as well as 8 cycle/sec marsh geophones, manufactured by Mark Products of Houston, Texas.

The blasting was done with 1 encoder and 1 decoder, series 200, manufactured by Input/Output of Houston, Texas. These were interfaced with Motorola portable FM radios.

### FIELD PROCEDURE

The 'two-way, in-line shot' seismic refraction method was used for SL-1. The technique consisted of laying out 24 geophones in a straight line and recording arrival times from shots fired at either end of the spread. The arrival times from 3 additional shot points approximately every 1/4 of the spread length within the spread were also recorded. This provided the overburden depth and velocity variations along the spread, and also gave additional information about the deeper layers. Finally for each spread, two off-end shots were fired at a distance of up to one-half the spread length from the nearest geophone. Since the off-end shots were a good distance from the nearest geophone, it was assumed that the first arrivals were in fact from the bedrock surface.



This was felt necessary so that the refractions received from other shot points could be correlated and assigned the correct layer number.

There was only one 24-channel spread done, which consisted of a length of 350 m. The geophone separation was 15 m. The shots ranged in size from 2 to 10 kg, and were placed in holes no deeper than 0.3 m due to frozen ground. Very large shots had to be used due to an energy attenuation problem probably caused by a very dry surface layer.

#### COMPUTING METHOD

The seismic data was analyzed using the generalized reciprocal method. This method is a technique for delineating undulating refractors at any depth from in-line seismic refraction data consisting of forward and reverse travel times. The arrival times at two geophone positions, separated by a variable distance, XY, are used in refractor velocity analysis and time-depth calculations. At the optimum XY separation, the rays to each geophone emerge from near the same point on the refractor and the refractor velocity analysis and time depths are the most detailed. Perpendicular thicknesses are obtained from time-depths and the depth conversion factor.

The interpreted seismic profile is plotted on map #2 at a scale of 1:500. The location of the line is shown on the claim map, or map #1, which is at a scale of 1:50,000.

#### DISCUSSION OF RESULTS

A suggested classification of the velocities is as follows:

<u>Velocity (meters/seconds)</u>	<u>Suggested Material</u>
770 - 1080	Overburden: tills, sands, & gravels
1670	Overburden: water-saturated tills, sands & gravels
3500	Bedrock: probably cherts and/or ultramafics

The bedrock is assumed to be cherts and/or ultramafics since these are known to occur in the area.

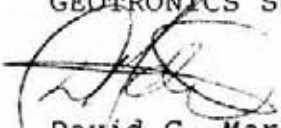
The survey has revealed one definite channel located below geophone 14. It is probably deeper than is shown, which is 30 m, since the bottom of the channel probably contains material of a faster velocity that is not seen in the seismic records.

The survey also revealed a probable channel within the center of the spread. The doubt as to the existence of the channel is caused by the fact that there was not enough information to accurately assign the correct time to each overburden layer. Depth to the bottom of this channel is 45 m. The alternate interpretation does not show a channel at all.

The question mark below the probable channel indicates a velocity change, or slow-zone, within the bedrock, of unknown velocity. It could be a fault or in-filled canyon-like channel.

Along the spread, the depths to bedrock vary from 3 and 4 m at each end of the spread, respectively, to 48 m below geophone 11.

Respectfully submitted,  
GEOTRONICS SURVEYS LTD.



David G. Mark  
Geophysicist

March 31, 1986

GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify that:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.
2. I have been practising my profession for the past 18 years and have been active in the mining industry for the past 21 years.
3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.
4. This report is compiled from data obtained from a seismic refraction survey carried out under the supervision of Andrew Rybaltowski, geophysicist, during the period March 9th to 11th, 1986.
5. I do not hold any interest in Nolan Mines Ltd. nor in placer leases 3041, 13222, 13223, and 13224, nor do I expect to receive any interest as a result of writing this report.

  
David G. Mark  
Geophysicist

March 31, 1986

AFFIDAVIT OF EXPENSES

This is to certify that the seismic refraction survey carried out on Placer Leases 3041 and 13224 near Atlin in the Atlin M.D., B.C., from March 9th to 11th, 1986, was done to the value of the following:

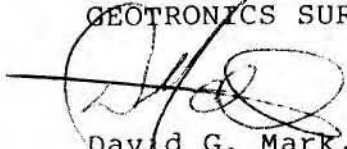
Field:

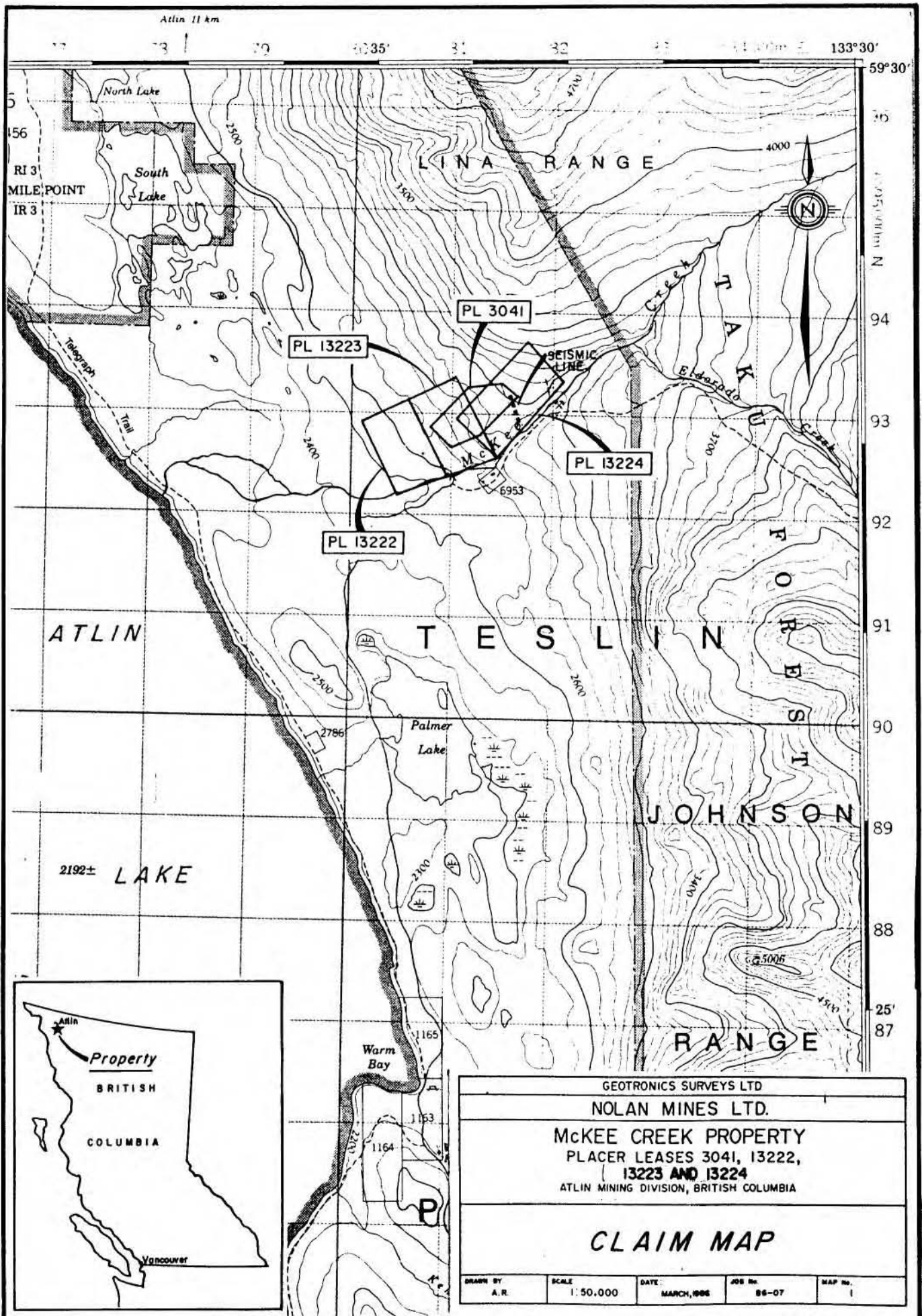
3-man geophysics crew, 25 hours at \$95/hour	\$2,375.00
Room and board	555.00
Instrument rental, 3 days @ \$250/day	750.00
Truck rental and gas	375.00
Explosives and seismocaps	200.00
	<u>\$4,250.00</u>

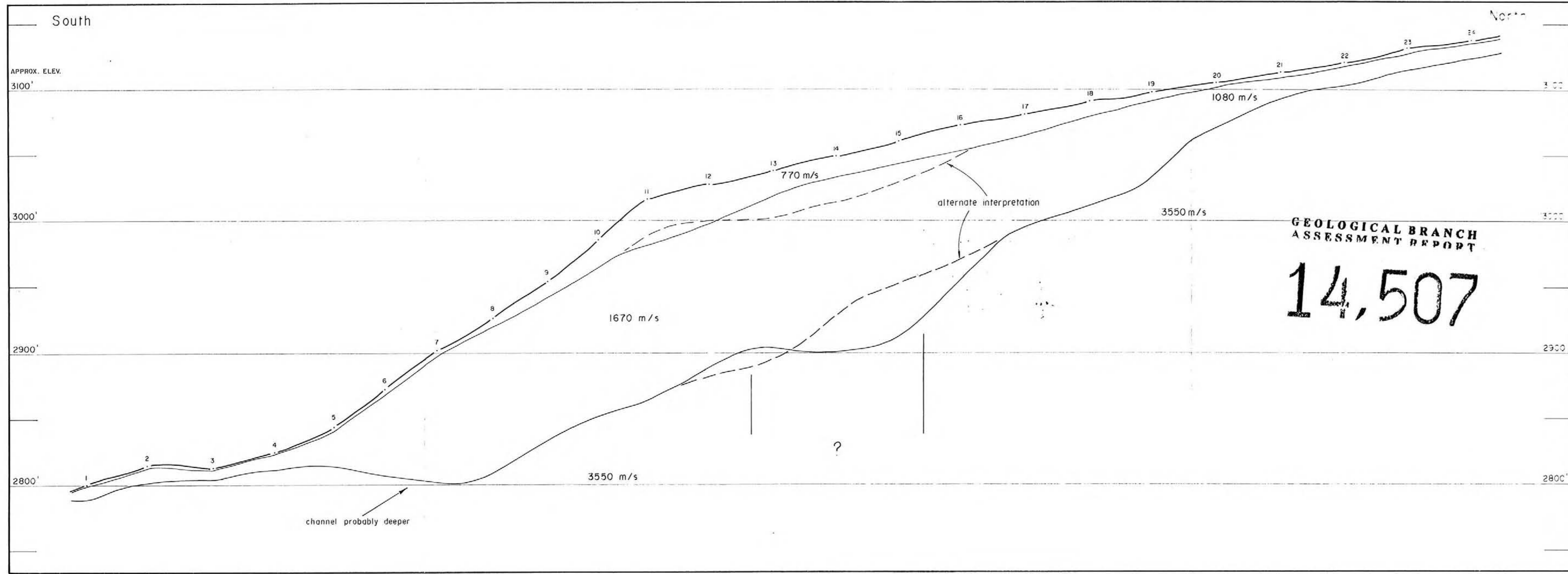
Report:

Geophysicist, 20 hours at \$45/hour	\$ 900.00
Drafting and printing	200.00
Report typing and compilation	100.00
	<u>\$1,200.00</u>
	<u><u>\$5,450.00</u></u>

Respectfully submitted,  
GEOTRONICS SURVEYS LTD.

  
David G. Mark,  
Geophysicist





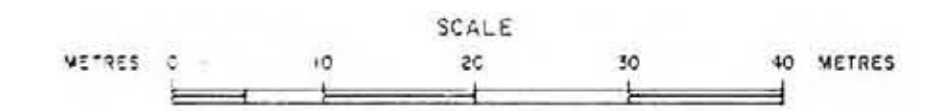
**LEGEND**

- Ground surface showing geophone numbers
- 670 Average seismic velocity in homogenous material (metres per second)
- Intermediate seismic horizon (within overburden)
- Fractured bedrock surface

**SUGGESTED VELOCITY CLASSIFICATION**

- 1080 metres/sec - Overburden - sand, gravel, till
- 670 metres/sec - Overburden - till, possibly sand, gravel; water-saturated, very compact
- 3550 metres/sec - Bedrock; probably ultramafics and/or cherts.

DIRECTION OF SEISMIC PROFILE - 345° E



**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

GEOTRONICS SURVEYS LTD.				
NOLAN MINES LTD.				
McKEE CREEK PROPERTY PLACER LEASES 3041, 13222, 13223 AND 13224 ATLIN MINING DIVISION, BRITISH COLUMBIA				
<b>SEISMIC REFRACTION STUDY PROFILE SL - 1</b>				
DRAWN BY A R	SCALE 1:500	DATE MARCH, 1986	JOB No. 86-07	MAP No. 2