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1980/9. A seismic refraction survey at Mathinna

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Abstract

A test seismic refraction survey in the Dan Rivulet area at Mathinna [EQ742086] shows that the seismic velocity of the alluvium (650 m/s) is too high to allow detection of channels between one and two metres deep at the base of the alluvium using conventional seismic refraction equipment. A full scale contract survey is thus not recommended.

INTRODUCTION

At the request of Tasminex N.L. this Department recorded a series of seismic refraction profiles at Mathinna on 12-13 March 1980. The profiles were shot to determine whether conventional seismic techniques are suitable for profiling the base of the shallow alluvial deposits prior to testing by back-hoe or drilling. The alluvial deposits overlie weathered Mathinna Beds and consist mainly of poorly consolidated clays and alluvium.

Shots were recorded on a SIE RS-4 12-channel seismograph and interpreted using the reciprocal method (Hawkins, 1961). A spread with a 2-metre geophone separation was used for accurate determination of the alluvium velocity.

RESULTS

The short spread showed the alluvium velocity to be 650 m/s with the underlying Mathinna Beds having a velocity of 2100 m/s. Vertical travel times at both recording sites (at holes TA15 and TA21) were between 4 and 6 ms. The accuracy of arrival time measurement is ± 2 ms and this corresponds to an uncertainty in depth measurement of ± 1.5 m using a conversion factor of 711 m/s.

A full scale survey would not be expected to locate shallow (1-2 m) channels at the base of the alluvium.

REFERENCE

HAWKINS, L.V. 1961. The reciprocal method of routine shallow seismic refraction investigations. *Geophysics* 26:806-819.

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