



Velocity changes due to the presence of a water table cannot normally be distinguished from the seismic data alone. The effect may be inferable from the geological setting and the interpreted velocities, but can only be confirmed by drilling.

A4.3 Anisotropy

Field velocities may vary with the direction of the seismic line. Usually if the velocity measured in different directions agree to within $\pm 10\%$ the condition is treated as isotropic. Anisotropy is most common in steeply dipping sediments or metasediments but can occur in other settings.

When measured across strike the velocity is an average for the different materials present. Along strike the higher velocity of the fresher or more competent materials is measured. This effect may be detectable from cross spreads which show a markedly higher or lower velocity than longitudinal traverses. However it may not be detected, depending on the relative orientations of the traverses and the strike of the subsurface materials.

A more subtle form of anisotropy occurs in many sedimentary rocks where the vertical velocity differs from the horizontal velocity. Normally seismic refraction studies provide information on the horizontal velocities which are commonly higher than the vertical velocities. The possible effects of anisotropy are similar to those discussed above in section A3

REFERENCES

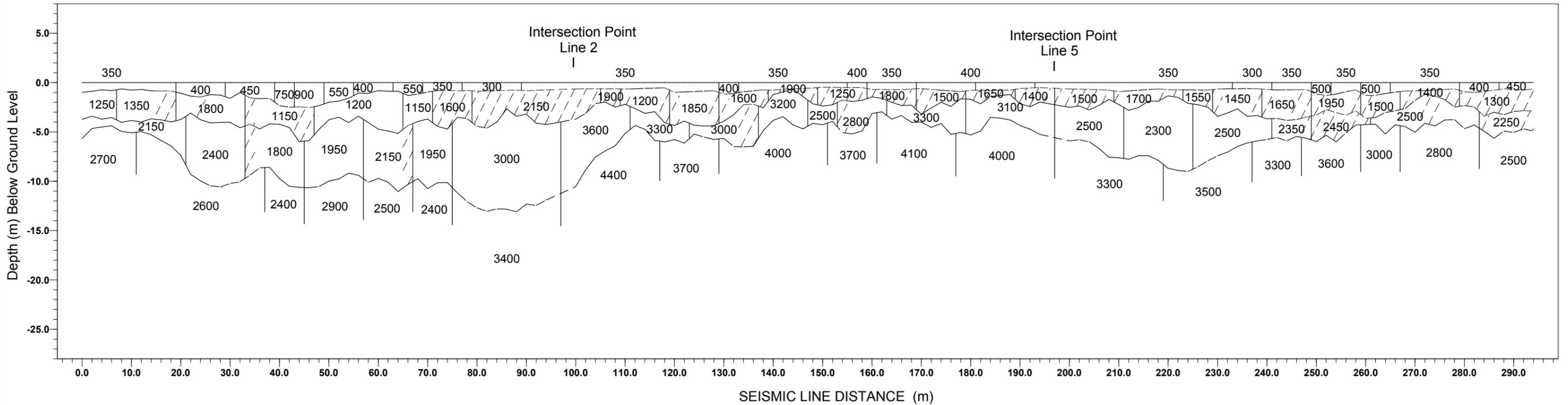
Dampney, CNG and Whiteley, RJ (1978). Velocity determination and error analysis for the seismic refraction method. *Geophysical Prospecting*, **28**, pp. 1-17.

Dobrin, MG (1976). *Introduction to geophysical prospecting*. 3rd edition. McGraw-Hill, New York.

Hawkins, LV (1961). The reciprocal method of routine shallow seismic refraction investigations. *Geophysics*, **26(6)**, 806-19.

Walker, C., Leung, T.M., Win, M.A. and Whiteley, RJ (1991). *Engineering Seismic Refraction: An Improved Field Practice and a New Interpretation Program*, REFRACT.

INTERPRETED SEISMIC SECTION : LINE 1 (Longitudinal Line - Site #3)



South
Line 1 - 0m Start
E: 365237mE
N: 6711833mN
RL:

North
Line 1 - 300m End
E: 365347mE
N: 6712105mN
RL:

Scale H 1:800 (@ A3)
V 1:400

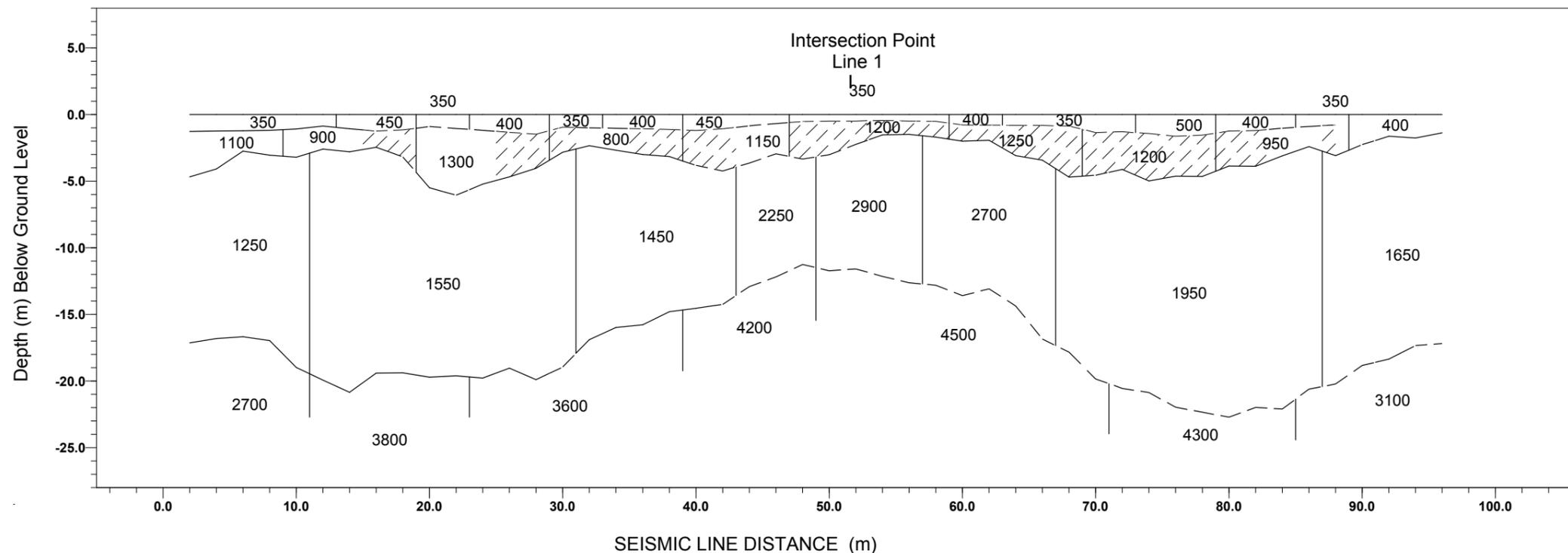
LEGEND

- Seismic velocity (m/s) and interpreted refractor boundary based on reciprocal method minus time and time depths
- Seismic velocity (m/s) based on reciprocal method minus times, interpreted refractor boundary based on reciprocal method time depths (solid line) or limited data* [(2), (3)] (dashed line)
- Seismic velocity based on limited data* [(1), (3)] (hatched area) and the value of the hatched area is the same as the adjacement minus times velocity
- Seismic velocity (m/s) based on limited data* [(1), (3)] (hatched area) and interpreted refractor boundary based on limited data* [(1), (2) & (3)] (dashed line)
- Lateral seismic velocity boundary

* NB - Limited data includes harmonic mean velocity (1), interpolated time depth (2) or edited data (3)

EARTH TECHNOLOGY SOLUTIONS PTY LTD ABN 12 078 325 658		ETS
AUTHORISED : PF	SMEC / GLEN INNES COUNCIL "WATTLE VALE" SITE INVESTIGATION SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTION LINE 1	
DATE : 22 Mar 2016	DRAWN BY PF FOR ETS	REPORT ET458/ 1
		SCALE H 1: 800 @ A3
		Figure No. 458-2

INTERPRETED SEISMIC SECTION : LINE 2 (Transverse Line - Site #3)



West (10m off fence)
Line 2 - 0m Start
E: 365216mE
N: 6711947mN
RL:

East
Line 2 - 100m End
E: 365309mE
N: 6711913mN
RL:

Scale H 1:400 (@ A3)
V 1:400

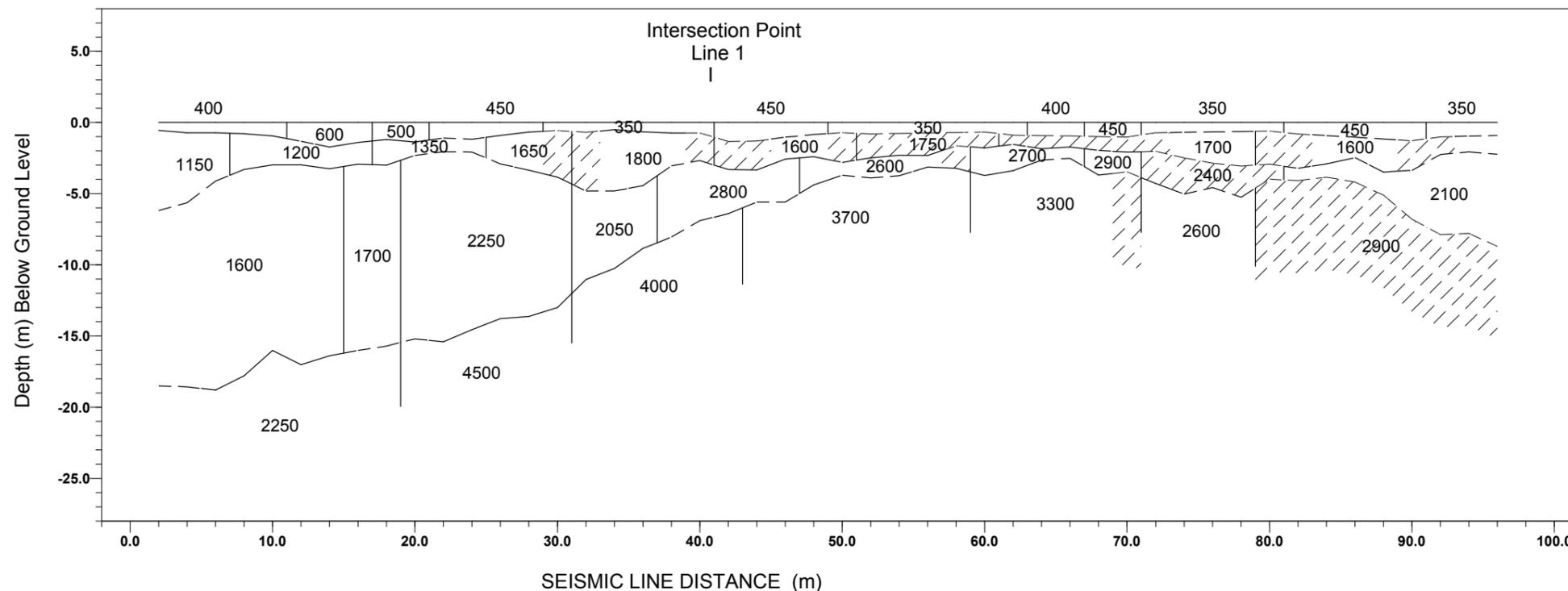
LEGEND

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- Lateral seismic velocity boundary

* NB - Limited data includes harmonic mean velocity (1), interpolated time depth (2) or edited data (3)

EARTH TECHNOLOGY SOLUTIONS PTY LTD ABN 12 078 325 658		ETS
AUTHORISED : PF	SMEC / GLEN INNES COUNCIL "WATTLE VALE" SITE INVESTIGATION SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTION LINE 2	
DATE : 22 Mar 2016	DRAWN BY PF FOR ETS	REPORT ET458/ 1
		SCALE H 1: 400 @ A3
		Figure No. 458-2

INTERPRETED SEISMIC SECTION : LINE 5 (Transverse Line - Site #3)



West (10m off fence)
 Line 5 - 0m Start
 E: 365258mE
 N: 6712045mN
 RL:

East
 Line 5 - 100m End
 E: 365341mE
 N: 6711992mN
 RL:

Scale H 1:400 (@ A3)
 V 1:400

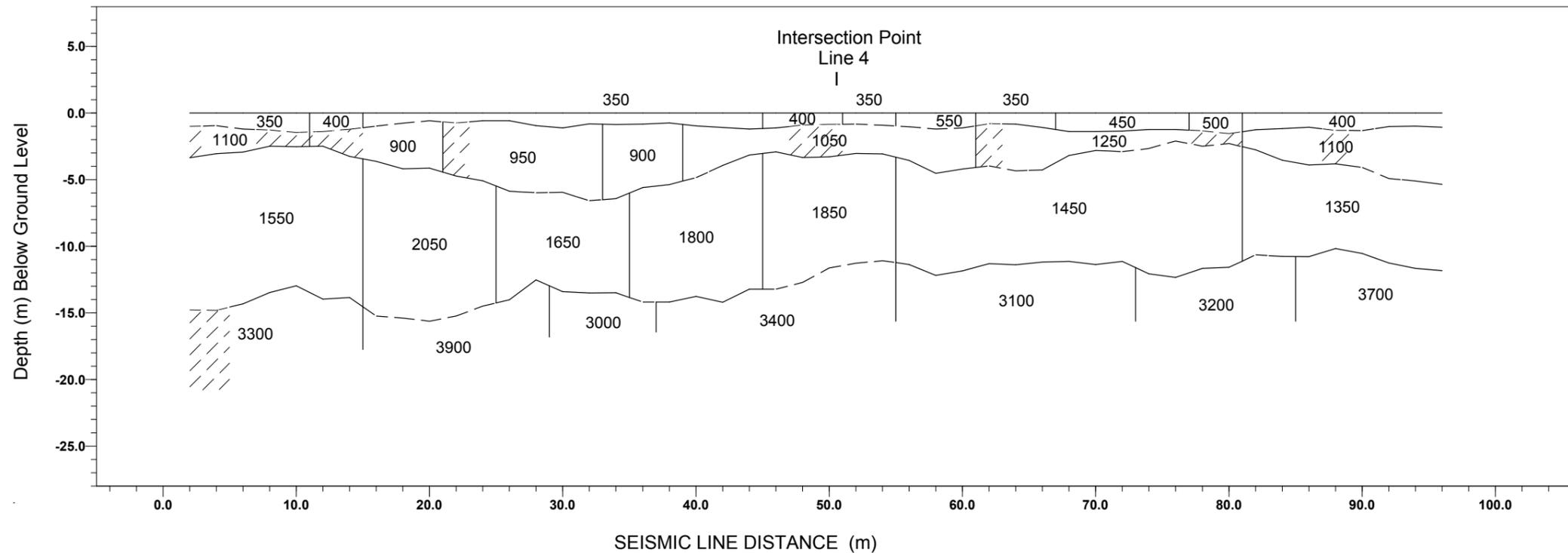
LEGEND

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- Seismic velocity (m/s) based on reciprocal method minus times, interpreted refractor boundary based on reciprocal method time depths (solid line) or limited data* [(2), (3)] (dashed line)
- Seismic velocity based on limited data* [(1), (3)] (hatched area) and the value of the hatched area is the same as the adjacement minus times velocity
- Seismic velocity (m/s) based on limited data* [(1), (3)] (hatched area) and interpreted refractor boundary based on limited data* [(1), (2) & (3)] (dashed line)
- Lateral seismic velocity boundary

* NB - Limited data includes harmonic mean velocity (1), interpolated time depth (2) or edited data (3)

EARTH TECHNOLOGY SOLUTIONS PTY LTD ABN 12 078 325 658		ETS
AUTHORISED : PF	SMEC / GLEN INNES COUNCIL "WATTLE VALE" SITE INVESTIGATION SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTION LINE 5	
DATE : 22 Mar 2016	DRAWN BY PF FOR ETS	REPORT ET458/ 1
		SCALE H 1: 400 @ A3
		Figure No. 458-6

INTERPRETED SEISMIC SECTION : LINE 3 (Transverse Line - Site #1)



West (10m off fence)
Line 3 - 0m Start
E: 365047mE
N: 6711296mN
RL:

East
Line 3 - 100m End
E: 365146mE
N: 6711260mN
RL:

Scale H 1:400 (@ A3)
V 1:400

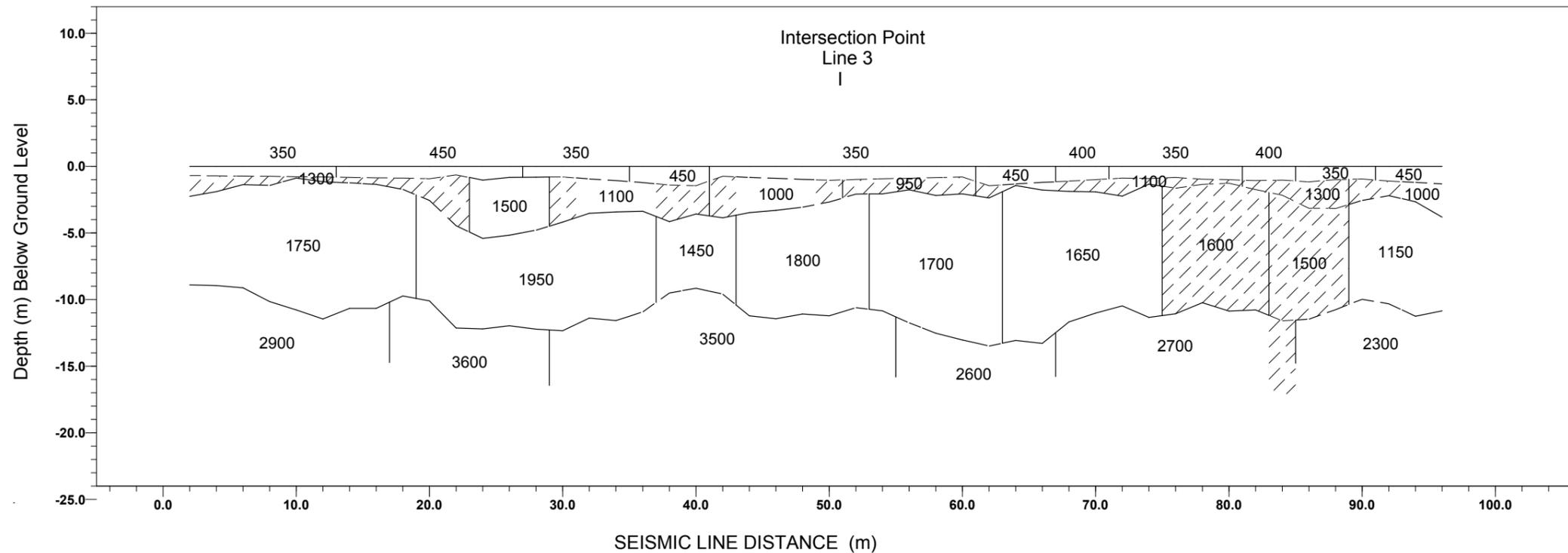
LEGEND

- Seismic velocity (m/s) and interpreted refractor boundary based on reciprocal method minus time and time depths
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- Seismic velocity (m/s) based on limited data* [(1), (3)] (hatched area) and interpreted refractor boundary based on limited data* [(1), (2) & (3)] (dashed line)
- Lateral seismic velocity boundary

* NB - Limited data includes harmonic mean velocity (1), interpolated time depth (2) or edited data (3)

EARTH TECHNOLOGY SOLUTIONS PTY LTD ABN 12 078 325 658		ETS
AUTHORISED : PF	SMEC / GLEN INNES COUNCIL "WATTLE VALE" SITE INVESTIGATION SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTION LINE 3	
DATE : 22 Mar 2016	DRAWN BY PF FOR ETS	REPORT ET458/ 1
SCALE H 1: 400 @ A3		Figure No. 458-4

INTERPRETED SEISMIC SECTION : LINE 4 (Longitudinal Line - Site #1)



South
Line 4 - 0m Start
E: 365075mE
N: 6711234mN
RL:

North
Line 4 - 100m End
E: 365114mE
N: 6711326mN
RL:

Scale H 1:400 (@ A3)
V 1:400

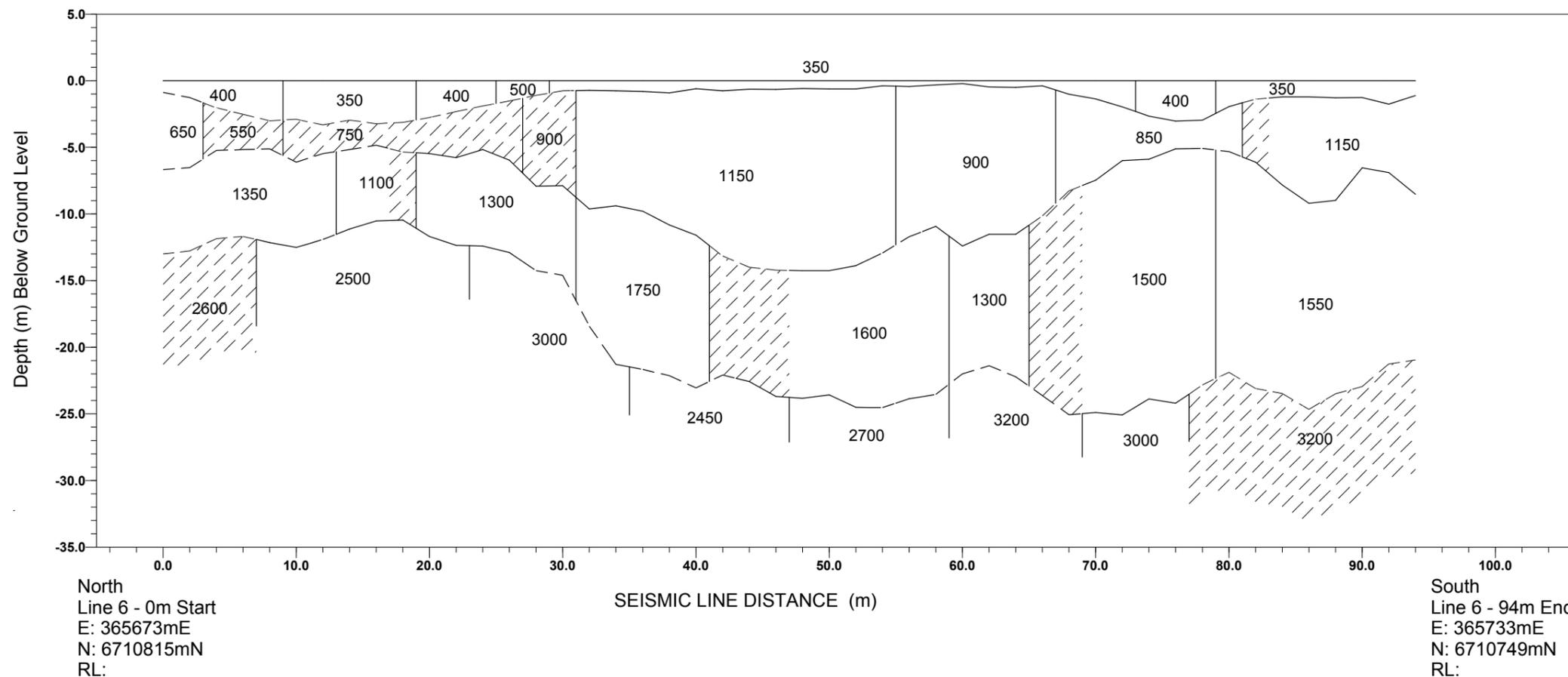
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EARTH TECHNOLOGY SOLUTIONS PTY LTD ABN 12 078 325 658		ETS
AUTHORISED : PF	SMEC / GLEN INNES COUNCIL "WATTLE VALE" SITE INVESTIGATION SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTION LINE 4	
DATE : 22 Mar 2016	DRAWN BY PF FOR ETS	REPORT ET458/ 1
SCALE H 1: 400 @ A3		Figure No. 458-5

INTERPRETED SEISMIC SECTION : LINE 6 (Transverse Line - Site #4)



Scale H 1:400 (@ A3)
V 1:400

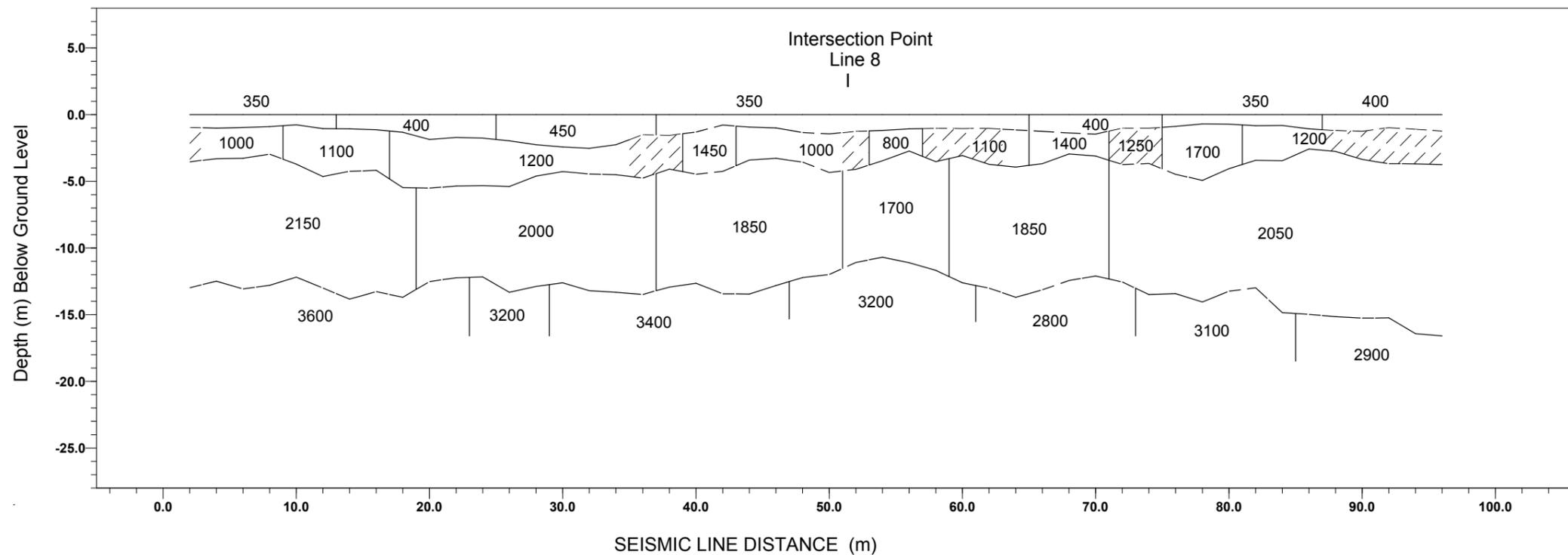
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- Seismic velocity (m/s) based on reciprocal method minus times, interpreted refractor boundary based on reciprocal method time depths (solid line) or limited data* [(2), (3)] (dashed line) 1800
- Seismic velocity based on limited data* [(1), (3)] (hatched area) and the value of the hatched area is the same as the adjacement minus times velocity 1800
- Seismic velocity (m/s) based on limited data* [(1), (3)] (hatched area) and interpreted refractor boundary based on limited data* [(1), (2) & (3)] (dashed line) 1800
- Lateral seismic velocity boundary

* NB - Limited data includes harmonic mean velocity (1), interpolated time depth (2) or edited data (3)

EARTH TECHNOLOGY SOLUTIONS PTY LTD ABN 12 078 325 658		ETS
AUTHORISED : PF	SMEC / GLEN INNES COUNCIL "WATTLE VALE" SITE INVESTIGATION SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTION LINE 6	
DATE : 22 Mar 2016		
DRAWN BY PF FOR ETS	REPORT ET458/ 1	SCALE H 1: 400 @ A3
		Figure No. 458-7

INTERPRETED SEISMIC SECTION : LINE 7 (Transverse Line - Site #4)



West
Line 7 - 0m Start
E: 365310mE
N: 6710681mN
RL:

East
Line 7 - 100m End
E: 365407mE
N: 6710701mN
RL:

Scale H 1:400 (@ A3)
V 1:400

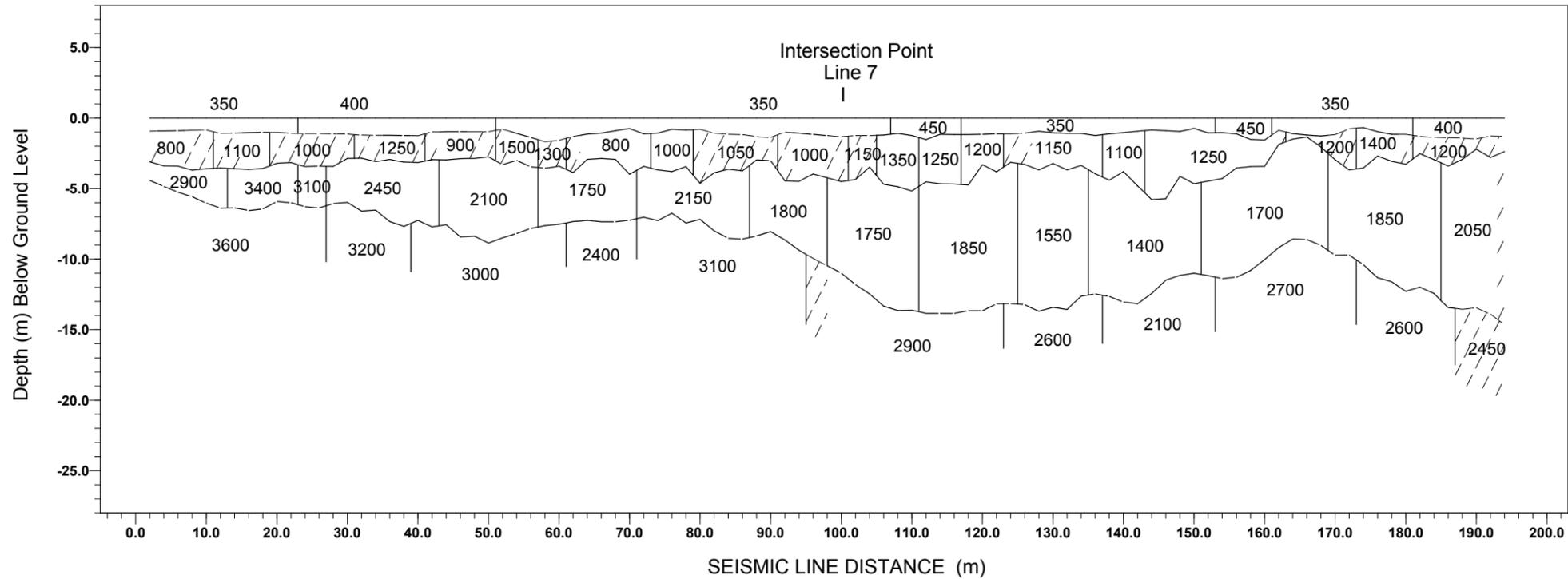
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EARTH TECHNOLOGY SOLUTIONS PTY LTD ABN 12 078 325 658		ETS
AUTHORISED : PF	SMEC / GLEN INNES COUNCIL "WATTLE VALE" SITE INVESTIGATION SEISMIC REFRACTION SURVEY INTERPRETED SEISMIC SECTION LINE 7	
DATE : 22 Mar 2016	DRAWN BY PF FOR ETS	REPORT ET458/ 1
		SCALE H 1: 400 @ A3 Figure No. 458-8

INTERPRETED SEISMIC SECTION : LINE 8 (Longitudinal Line - Site #4)



South
Line 8 - 0m Start
E: 365376mE
N: 6710590mN
RL:

North
Line 8 - 200m End
E: 365341mE
N: 6710783mN
RL:

Scale H 1:800 (@ A3)
V 1:400

LEGEND

- Seismic velocity (m/s) and interpreted refractor boundary based on reciprocal method minus time and time depths
- Seismic velocity (m/s) based on reciprocal method minus times, interpreted refractor boundary based on reciprocal method time depths (solid line) or limited data* [(2), (3)] (dashed line)
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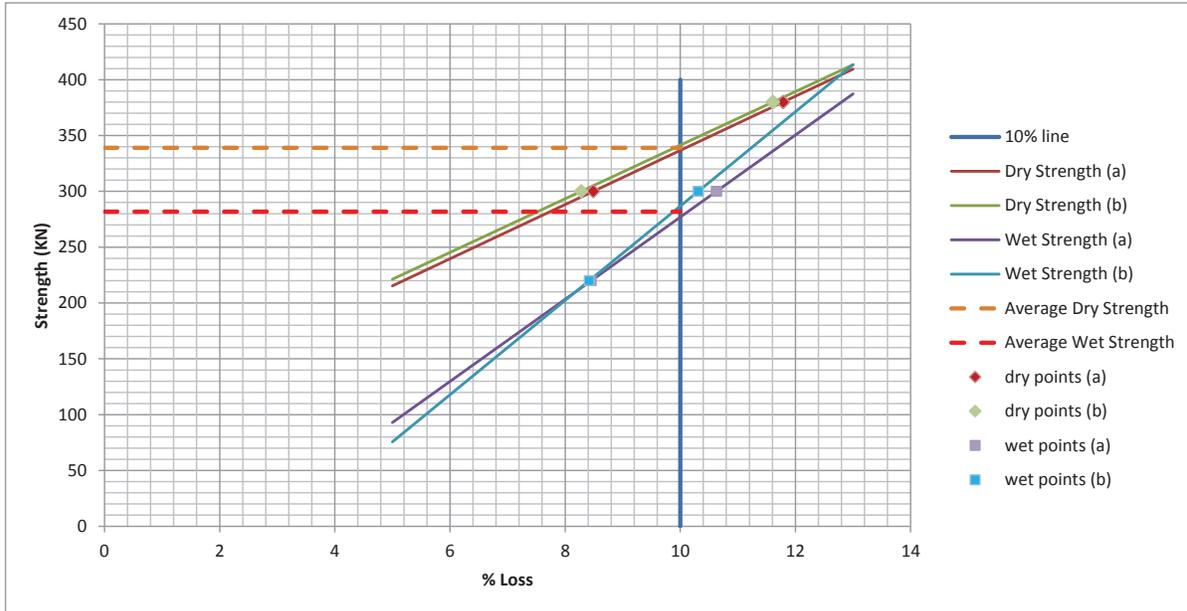
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DATE : 22 Mar 2016	DRAWN BY PF FOR ETS	REPORT ET458/ 1
		SCALE H 1: 800 @ A3
		Figure No. 458-9

APPENDIX G LABORATORY TESTING RESULTS

WET/DRY STRENGTH VARIATION REPORT

Client:	SMEC	Source:	BH09 6.0-13.5m
Address:	Level 5, 20 Berry Street, North Sydney, NSW, 2060, Australia. (PO Box 1052, North Sydney, NSW, 2060, Australia)	Sample Description:	Crushed Rock Core
Project:	Material Testing	Report No.:	B27580-WD
Job No.:	B16198	Lab No.:	B27580

Test Procedure:	<input checked="" type="checkbox"/> RMS T215 Wet/dry strength variation	Date Sampled:	Unknown
Sampling:	Sampled by Client		
Preparation:	Prepared in accordance with the test method		



Mould Size (mm):	150	Breakdown during Washing (%):	6
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Aggregate Size (mm)	Nature of Sample	Average Aggregate Wet Strength (kN)	Average Aggregate Dry Strength (kN)	Average Wet/Dry Variation (%)
-19 to +9.5	Crushed Rock	282	339	17



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NATA Accredited Laboratory Number: 14874

Authorised Signatory:

Robert Cox

22/04/2016

Date:

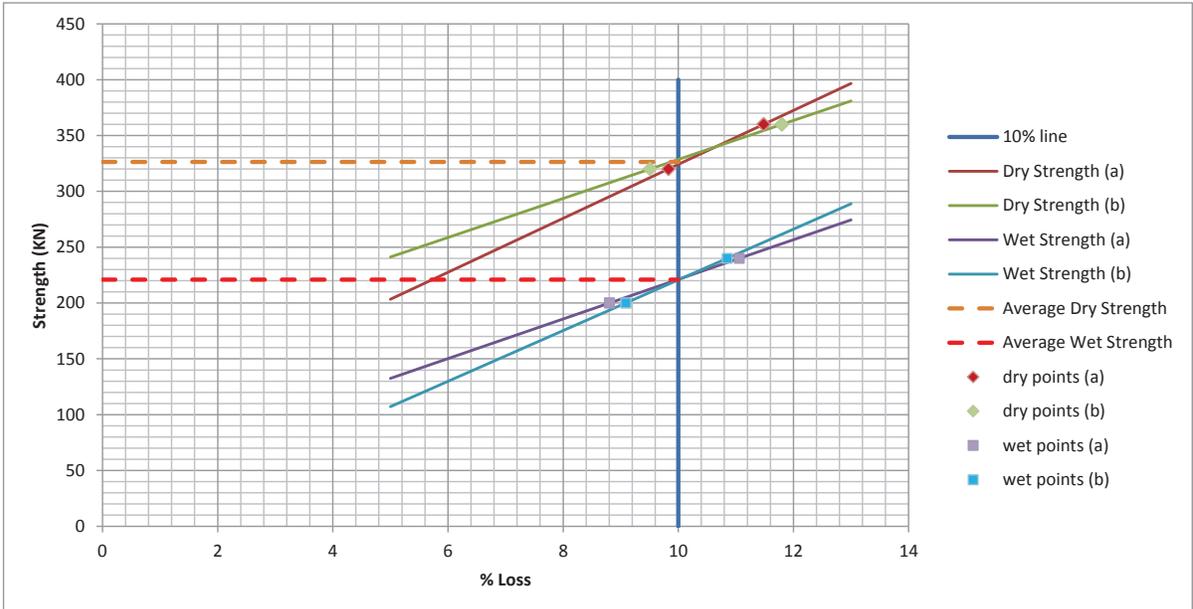


Macquarie Geotechnical
3 Watt Drive
Bathurst NSW 2795

WET/DRY STRENGTH VARIATION REPORT

Client:	SMEC	Source:	BH10 3.0-8.3m
Address:	Level 5, 20 Berry Street, North Sydney, NSW, 2060, Australia. (PO Box 1052, North Sydney, NSW, 2060, Australia)	Sample Description:	Cruahed Rock Core
Project:	Material Testing	Report No.:	B27579-WD
Job No.:	B16198	Lab No.:	B27579

Test Procedure:	<input checked="" type="checkbox"/> RMS T215 Wet/dry strength variation
Sampling:	Sampled by Client
Date Sampled:	Unknown
Preparation:	Prepared in accordance with the test method



Mould Size (mm):	150	Breakdown during Washing (%):	8.3
-------------------------	-----	--------------------------------------	-----

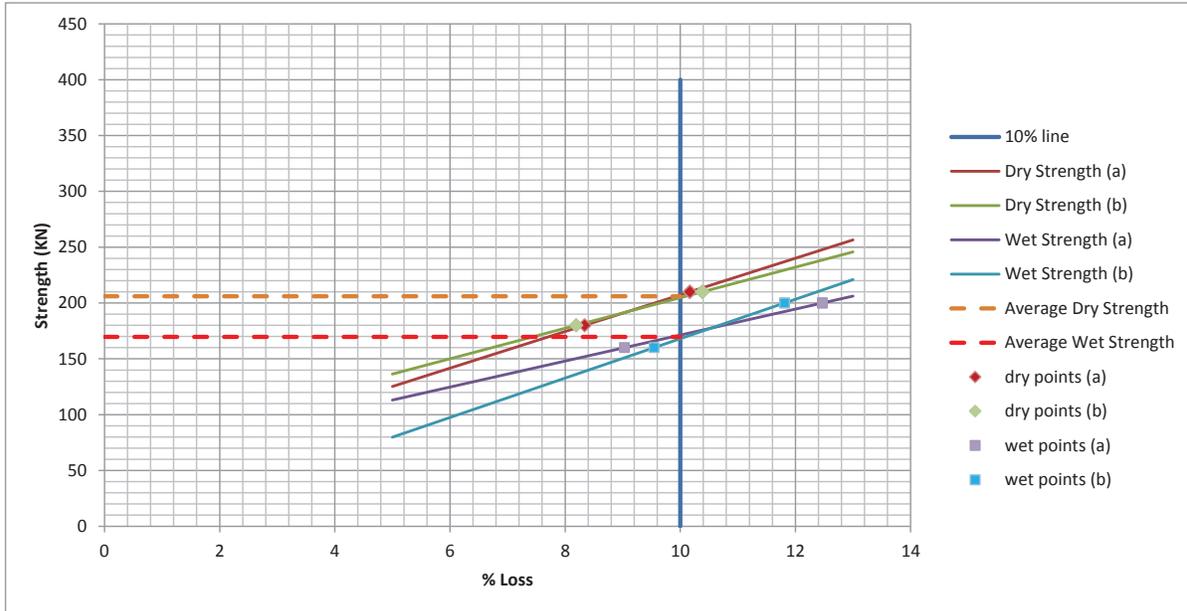
Aggregate Size (mm)	Nature of Sample	Average Aggregate Wet Strength (kN)	Average Aggregate Dry Strength (kN)	Average Wet/Dry Variation (%)
-19 to +9.5	Crushed Rock	221	326	32

	The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced, except in full.	Authorised Signatory: <hr style="width: 100%;"/> Robert Cox	22/04/2016 <hr style="width: 100%;"/> Date:
NATA Accredited Laboratory Number: 14874			
		Macquarie Geotechnical 3 Watt Drive Bathurst NSW 2795	

WET/DRY STRENGTH VARIATION REPORT

Client:	SMEC	Source:	BH11 14.7-20.0m (Exc 16.9-17.3m)
Address:	Level 5, 20 Berry Street, North Sydney, NSW, 2060, Australia. (PO Box 1052, North Sydney, NSW, 2060, Australia)	Sample Description:	Crushed Rock Core
Project:	Material Testing	Report No.:	B27581-WD
Job No.:	B16198	Lab No.:	B27581

Test Procedure: <input checked="" type="checkbox"/> RMS T215 Wet/dry strength variation	
Sampling: Sampled by Client	Date Sampled: Unknown
Preparation: Prepared in accordance with the test method	



Mould Size (mm):	150	Breakdown during Washing (%):	8.6
-------------------------	-----	--------------------------------------	-----

Aggregate Size (mm)	Nature of Sample	Average Aggregate Wet Strength (kN)	Average Aggregate Dry Strength (kN)	Average Wet/Dry Variation (%)
-19 to +9.5	Crushed Rock	170	206	18



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Robert Cox

22/04/2016

Date:



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3 Watt Drive
Bathurst NSW 2795

APPENDIX H EXTRACT OF ASRIS ASC ATLAS

www.asris.csiro.au/mapping/viewer.htm

ASRIS

Australian Soil Resource Information System

Home About Maps Methods Themes Help Collaborators Contacts

Maps - Identify

Atlas Tracts, 1 feature found

Atlas ASC Soil Order, 1 feature found

Rec	Map Unit	ASC Soil Order	PPF1	PPF2	PPF3	PPF4	PPF5
1	Rh6	CH	D63.12	Dy3.42			

Atlas PAWC, 1 feature found

Base Map, 1 feature found

GDA94 Longitude: 151.4202 Latitude: -29.8382 Bookmark: -select- Approx Scale: 1 : 216,785

Appendix C DCP considerations

DCP Part	Application	Response
Chapter 2 – Notification Procedures		
2.1 – Purpose	This Chapter of the DCP outlines Council’s policy for community notification in the assessment of development applications and the formulation of development guidelines and policies. The Chapter also outlines the necessary procedures involved in carrying out such notification.	Noted
2.2 – Aims and Objectives	<ul style="list-style-type: none"> • Clearly state Council’s requirements for the notification of development applications and formulation of guidelines and policy. • Provide for public participation in the DA process for certain development proposals. • Allow for a reasonable time for inspection and making submissions on applications while recognising the obligations of the Council to determine applications within prescribed periods. • Provide a direct avenue of access to the application process by affected residents and owners who wish to express their concerns about proposals to Council staff, Councillors or the relevant Council Committee. • Explain matters for which the Council will have regard when forming its opinion as to whether or not the enjoyment of adjoining land may be detrimentally affected by a proposed development. • Specify the circumstances when notification is not required. • Detail the form that notification will take and an applicant’s responsibility to provide a notification plan. 	Noted
2.3 – Notification procedures and	Notification of Applications	As the Project is located on land zoned RU1 (Primary Production), the DCP

DCP Part	Application	Response
guidelines for applications	<p>Adjoining landowners will be given notice of an application if, in the opinion of Council, land adjoining the development may be detrimentally affected by a development proposal. The following issues will be considered in the assessment and determination of a development:</p> <ul style="list-style-type: none"> • Views to from the land • Overshadowing • Privacy and amenity • Noise, odour, dust, light spill or other polluting emissions • Proposed hours of use for the development • The scale or bulk of the proposed development • The positioning of the development in relation to site boundaries. <p>Written notice of a Development Application will be sent to those persons who appear to the Council to own or occupy adjoining land and neighbouring land if, in the Council's opinion, the enjoyment of the land may be detrimentally affected by the development proposal. This could include adjoining and nearby land.</p>	requires neighbour notification to be undertaken.
	<p>Other Referrals</p> <p>Certain Development Applications require notification and/or referral to other government authorities. Notice will also be given to the adjoining Councils listed below, if the proposed development is located in proximity to the LGA boundaries of:</p> <ul style="list-style-type: none"> • Inverell Shire • Tenterfield Shire • Clarence Valley Council • Guyra Shire Council 	The Project is located within Glen Innes Severn LGA and is more than seven (7) kilometres from Inverell LGA. Notice to these council's is not required for the Project.

DCP Part	Application	Response
	<p>Integrated Development is development that requires consent or a permit from another Government agency. Council must refer Integrated Development to the relevant agency and include their General Terms of Approval in the development consent.</p>	<p>The Project is integrated development (refer to Section 4.4)</p>
	<p>Statutory notification requirements exist under the EP&A Act for certain categories of development such as:</p> <ul style="list-style-type: none"> • Integrated Development; • Designated development; • Regionally Significant Development; and • Other types of Approvals, including assessment of “activities” under Part 5 of the EP&A Act. <p>These must be advertised and exhibited in accordance with the requirements as outlined in the EP&A Act and the Regulations.</p>	<p>Noted.</p>
<p>Chapter 4 – Rural Development</p>		
<p>4.1 – About This Chapter</p>	<p>This section refers to dwellings, dual occupancy development, rural worker’s dwellings, additions, tourist development and other forms development permitted in the Rural and Environmental Zones contained within Glen Innes Severn Local Environmental Plan 2012.</p>	<p>Noted</p>
<p>4.2 – Where This Chapter Applies</p>	<p>All rural, rural residential and environmental zoned land (RU1, RU2, R5 and E3) within the Glen Innes Severn LGA that is subject to a development proposal.</p>	<p>The Project is located on land zoned RU1 (Primary Production) and therefore Section 4 is applicable.</p>
<p>4.3 – Aims and Objectives</p>	<ul style="list-style-type: none"> • To enhance the character of the rural areas. • To encourage the use of existing or potentially productive land for agricultural purposes. 	<p>Noted</p>

DCP Part	Application	Response
	<ul style="list-style-type: none"> • To reduce potential for rural land use conflict. • To protect old-growth, significant hollow-bearing trees and conservation significant vegetation through recognition of their ecological value and scarcity in the landscape. • To improve the ecological function of riparian areas within the landscape. • To improve the stability of the bed and banks of waterways through the management of riparian vegetation. 	
4.4 – General Controls	Rural dwellings and dual occupancies are subject to the provisions of Clause 4.2A of the GISC LEP 2013.	Not applicable.
	Council may require the consolidation of undersized rural lots (vacant lots with an area of less than the minimum rural lot size) within the same rural property holding as a condition of consent for new rural dwellings.	Not applicable.
	Buildings shall be sited so that they are not located or project above ridgelines or knolls and are sensitively placed within the rural landscape.	Building design and appearance will comply with this requirement.
	Rural buildings, including garages and sheds should be clustered to form a group and where possible, buildings shall be broken into smaller elements rather than presenting a large building mass.	Not applicable.
	All buildings should be setback at least 15 metres from the front property boundary (with frontage to a public road).	Building design and appearance will comply with this requirement.
	Materials and/or finishes should not give rise to visual intrusion by virtue of texture, colour or arrangement. The use of recessive earthy tones is required. The use of reflective materials is discouraged.	Building design and appearance will comply with this requirement.

DCP Part	Application	Response
	Development involving the on-site management of wastewater must comply with Council's <i>Onsite Sewage Management Strategy</i> .	Building design and appearance will comply with this requirement.
	Development within bushfire prone land must meet the relevant requirements of the Rural Fire Service and <i>Planning for Bushfire Protection 2006</i> .	Building design and appearance will comply with this requirement.
	The carrying out of development ('works' including excavation or deposition of material) on waterfront land requires a Controlled Activity Approval (CAA) under the <i>Water Management Act 2000</i> . Council will refer DAs involving works within waterfront land to the NSW Office of Water as integrated development.	Not applicable, the Project is not located on waterfront land.
4.5 – Vehicular Access Arrangements	Where access from a public road to a private property is required:	
	<ul style="list-style-type: none"> Access to a development shall be located having regard to its potential impact on the landscape and native vegetation and shall be unobtrusive and sympathetic to the existing landform and neighbouring development. 	Vehicular access arrangements will comply with this requirement.
	<ul style="list-style-type: none"> All development is required to have coincidental legal and physical access from a public road to the development site. In this regard, Council may require evidence from a registered surveyor that this is the case. 	Vehicular access arrangements will comply with this requirement.
	<ul style="list-style-type: none"> Where a part of any access is via an unformed Crown road, the road may first require dedication as a Council public road, and then construction to an appropriate standard once Council approval has been gained for the work. For a single residential dwelling, the minimum standard of construction where the owner will be responsible for ongoing track maintenance is in accordance with the former Department of Land and Water Conservation publication "<i>Guidelines for the Planning, Construction and Maintenance of Tracks</i>". 	Not applicable.

DCP Part	Application	Response
	<ul style="list-style-type: none"> Road and drainage designs may need to be submitted to Council at the applicant's expense prior to approval of any roadworks within a Council public road reserve. 	<p>Vehicular access arrangements will comply with this requirement.</p>
	<ul style="list-style-type: none"> The developer will be responsible for construction or upgrading of any vehicle access in accordance with Council standards, including: <ul style="list-style-type: none"> A suitable width all-weather pavement from the road to the entrance gate or stock grid. Where the access crosses a table drain, a minimum 375mm diameter pipe with headwalls, or concrete dish drain on the alignment of the table drain. Any entrance gate or stock grid should be set back a minimum distance of 15 metres from the edge of the traffic lane for single unit truck access, or 22 metres for semi-trailer access. The access is to be located at where safe intersection sight distances can be achieved, including a minimum gap sight distance of 5 seconds. A Council Road Opening Permit is required prior to performing any work within a public road reservation. Forms and advice on relevant fees can be obtained from Council's Engineering Services department. 	<p>Vehicular access arrangements will comply with this requirement.</p>
<p>4.6 – Environmental Considerations – Requirements</p>	<p>Development shall not be carried out on slopes greater than 20%. If development on slopes greater than 20% is unavoidable, Council may require a geotechnical assessment.</p>	<p>The Project is not on land with a slope greater than 20%.</p>
	<p>Clearing of native vegetation – applications are to identify the area and number of trees to be cleared as part of the application. Clearing which does not form part of a Development Application to Council must be approved by the relevant Local Land Services (LLS) (refer to Note below).</p>	<p>The <i>Flora and Fauna Impact Assessment</i> (refer to Appendix E) provides detail in relation to proposed clearing for the Project and has been summarised in Section 7.5 of the EIS main text.</p>

DCP Part	Application	Response																
	<p>Where development is likely to have a significant impact on threatened species, populations or ecological communities, or their habitats within the meaning of the Threatened Species Conservation Act 1995, Environment Protection and Biodiversity Conservation Act (EPBC) Act 1999 and Fisheries Management Act 1994., Council will require the submission of the following:</p> <ul style="list-style-type: none"> • An ecological assessment prepared by a suitably qualified, experienced and independent person or persons; and/or • A preliminary Vegetation Management Plan (VMP) prepared by a suitably-qualified and experienced person such as an Ecologist, Bush Regenerator, Horticulturist or Landscape Architect with practical, demonstrated experience in bush regeneration., and/or • Compensatory planting prepared in accordance with Table 4.1. <p style="text-align: center;">Table 4.1: Tree Replacement Rates for Various Habitat Types I</p> <table border="1" data-bbox="638 794 1485 1305"> <thead> <tr> <th data-bbox="638 794 1261 858">Significance category</th> <th data-bbox="1261 794 1485 858">Ratio</th> </tr> </thead> <tbody> <tr> <td data-bbox="638 858 1261 922">Old growth or hollow-bearing tree</td> <td data-bbox="1261 858 1485 922">1:20*</td> </tr> <tr> <td data-bbox="638 922 1261 986">Endangered ecological community (EEC)</td> <td data-bbox="1261 922 1485 986">1:10</td> </tr> <tr> <td data-bbox="638 986 1261 1050">Koala habitat</td> <td data-bbox="1261 986 1485 1050">1:5</td> </tr> <tr> <td data-bbox="638 1050 1261 1114">Wildlife corridors</td> <td data-bbox="1261 1050 1485 1114">1:10</td> </tr> <tr> <td data-bbox="638 1114 1261 1177">Riparian zones</td> <td data-bbox="1261 1114 1485 1177">1:10</td> </tr> <tr> <td data-bbox="638 1177 1261 1241">Steep lands</td> <td data-bbox="1261 1177 1485 1241">1:3</td> </tr> <tr> <td data-bbox="638 1241 1261 1305">Other</td> <td data-bbox="1261 1241 1485 1305">1:2</td> </tr> </tbody> </table>	Significance category	Ratio	Old growth or hollow-bearing tree	1:20*	Endangered ecological community (EEC)	1:10	Koala habitat	1:5	Wildlife corridors	1:10	Riparian zones	1:10	Steep lands	1:3	Other	1:2	<p>An <i>Flora and Fauna Impact Assessment</i> (refer to Appendix E) was prepared for the Project and has been summarised in Section 7.5 of the EIS main text.</p>
Significance category	Ratio																	
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Riparian zones	1:10																	
Steep lands	1:3																	
Other	1:2																	

DCP Part	Application	Response
	<p><i>*Denotes 20 replacement trees for every tree removed.</i></p>	
	<p>Riparian lands within a subdivision are to be stabilised and revegetated according to stream order and buffer category. Water courses classified as stream order 3 or greater (Strahler method) require a riparian buffer of at least 40 m</p>	<p>Noted</p>
	<p>Roads are to be located outside riparian buffer areas where possible. Where roads traverse the riparian buffer area, the road design is to minimise the area of disturbance and demonstrate minimal impact on the riparian function and integrity.</p>	<p>Not applicable.</p>
	<p>Driveway/roadway crossings/other infrastructure located over waterways are to have regard to the requirements for fish passage in accordance with relevant NSW State Government requirements under the Fisheries Management Act 1994.</p>	<p>Not applicable.</p>
<p>4.7 – Flooding</p>	<p>In low-lying areas a flood study may be required to determine appropriate floor levels for habitable structures. Waterway crossings on any access roadways should be designed to permit two-wheel drive access from a public road to the residence during a critical one (1) in 100 year storm event.</p>	<p>The Project site is located at an elevation of approximately 1,180 mAHD on the Waterloo Range, with little risk of flooding (refer to Section 7.2 and Appendix F of the EIS).</p>
<p>4.8 – Land Use Buffers</p>	<p>Buffers from development to rural land uses are to be established in accordance with the NSW <i>DPI Land Use Conflict Risk Assessment Guide</i>.</p>	<p>The nearest sensitive receiver is located about 1.5 km away from the Project and the noise and air assessments indicate there would be minimal impact on these receivers.</p>
	<p>Where a proposed development for a dwelling or tourist accommodation will adjoin an agricultural enterprise on an adjoining property, a minimum 100m separation shall be provided. Where the 100m buffer cannot be achieved, Council will consider the use of vegetative buffers on the proposed development site</p>	<p>Not applicable, the Project is not for a dwelling or tourist accommodation.</p>

DCP Part	Application	Response
	Any new residence should be located a minimum distance of 2kilometres from any active or proposed wind turbine, unless suitable measures are taken in the design and construction of the dwelling to ameliorate any noise or other impacts	Not applicable, the Project does not propose the construction of any new residences on the Project site.
4.9 – Glen Innes Aerodrome	<p>Where a development will be located in the vicinity of the Glen Innes Aerodrome, the following additional controls will apply:</p> <ul style="list-style-type: none"> • All structures, and the mature height of any vegetation, is to remain below the obstacle limitation surface for Glen Innes Aerodrome, Further details of these levels are available from Council’s Department of Infrastructure Services • The dwelling and any landscaping, including dams, shall be designed and located so as to discourage feeding and nesting sites for birds in the vicinity of flight paths • All building materials and outdoor lighting shall be designed or shielded so as to minimise any upward glare in the vicinity of flight paths • Any residence is to be located and designed in accordance with the provisions of AS2021 ‘Acoustics – Aircraft Noise Intrusion – Building Siting and Construction’, outside the 20 ANEF noise contour for Glen Innes Aerodrome. 	Not applicable, the Glen Innes Aerodrome is located approximately 9 kilometres north-west of the Project site.
4.10 – Services	<p>Electricity and Telecommunications Infrastructure</p> <ul style="list-style-type: none"> • Any structures associated with the provision of electricity and telecommunications to the development shall be sited to have minimal environmental impact including vegetation removal and visual impact. • Applications are required to demonstrate the method of power supply. • Council supports the use of solar energy supplies. • Where generators are proposed, controls shall be placed on the hours of operation and levels of noise emission having regard to the proximity of neighbouring development and the environment. 	<p>Utilities and services are discussed in Section 3.10.6 of the EIS.</p> <p>Refer to Section 3.10.6 of the EIS.</p> <p>Noted</p> <p>Not applicable. However, if generators are required for the Project, their use would</p>

DCP Part	Application	Response
		be undertaken within working hours detailed in Section 3.6 of the EIS.
	<p>Water</p> <p>Rural buildings without a reticulated water supply shall have water storage facilities containing a minimum of 22,000 litres of potable water for domestic purposes.</p>	Not applicable
4.11 – Farm Dams	<p>The NSW Office of Water regulates and licenses farm dams. Dams that do not need a licence or development consent are:</p> <ul style="list-style-type: none"> • Dams that capture up to 10 per cent of run-off • Dams up to one megalitre on small properties: <ul style="list-style-type: none"> – Licences are not required for dams up to one megalitre in size on small properties where the Maximum Harvestable Right Dam Capacity (MHRDC) is less than one megalitre and where the property was approved for subdivision before 1 January 1999. No further harvestable right dams may be constructed; any new dams above this allowance must be licensed. 	Refer to Section 4.2
Chapter 7 – Access and Parking		
7.1 – About This Chapter	This chapter of the DCP has been prepared as a guide to Council's requirements for car parking, access and loading facilities as part of development proposals.	Noted
7.2 – Where This Chapter Applies	This Chapter applies to all zones under the GISC LEP 2012. This chapter applies to new development and re-development of existing sites.	Noted
7.3 – Aims and Objectives	<p>To ensure that new development:</p> <ul style="list-style-type: none"> • maintains or improves traffic safety and management; • provides adequate provision for access and parking for people with disabilities; • minimises the visual impact of on-site parking. and 	Noted

DCP Part	Application	Response
	<ul style="list-style-type: none"> provides for the ongoing maintenance of on-site car parking and manoeuvring areas. 	
7.4 – Access and Traffic Generation	<p>Minor development proposals are unlikely to significantly impact the receiving road network, however, consideration of traffic generation and access locations is still required. For more significant developments, Council may require a Traffic Impact Assessment to be prepared addressing the following matters:</p> <ul style="list-style-type: none"> Development involving access off a classified road (New England Highway and Gwydir Highway) will be referred to the Roads and Maritime Services (RMS) for comment. Traffic Generating Development (Schedule 3 of SEPP Infrastructure) will be referred to the RMS as Integrated Development and will require their General Terms of Approval. The rate of traffic generation associated with the proposed development. Any impact additional traffic generated may have on traffic efficiency, amenity, safety, and road pavement life. 	A Traffic Impact Assessment (refer to Appendix I) for the Project was prepared in accordance with the SEARs, with a summary of this assessment provided in Section 7.6.
7.5 – Vehicular Crossover and Driveway Width	<p>Footway crossings shall generally be constructed from concrete. Applicants are to lodge a Road Opening Application Form with Council, and receive a Road Opening Permit, prior to performing any work within a public road reservation. Any conditions of the Road Opening Permit are to be complied with in association with the work.</p> <p>Generally, the internal driveways and crossovers associated with multi dwelling housing development shall have a minimum clear trafficable width of 5.5 metres. However, a minimum of 4.5 metres may be acceptable where justified in an assessment of site access requirements and traffic usage.</p>	<p>Not applicable, no footway crossings are proposed for the Project.</p> <p>Not applicable, the Project is not for the purpose of a multi-dwelling housing development.</p>

DCP Part	Application	Response
	<p>All existing vehicular crossings not utilised by the development will generally be required to be removed, and the area restored to match the adjoining section of kerb and footpath, prior to occupation or use of the development.</p>	<p>Not applicable, the Project site does not contain any existing vehicular crossings.</p>
	<p>Design Requirements</p> <p>The following requirements must be taken into consideration at the design stage of a medium density development:</p> <ul style="list-style-type: none"> • driveways, manoeuvring areas and parking areas are generally to be designed in accordance with the provisions of AS2890.1 Parking Facilities: Off-Street Parking • long straight driveways are to be avoided • all vehicles must enter and leave the site in a forward direction • the location of visitor parking facilities should be evident from the street so that their use is encouraged • the location of resident and visitor parking shall be behind the building line; • one car parking space per unit is to be enclosed and form part of the unit entitlement should the development be strata subdivided and, • all driveways, parking areas and vehicular turning areas are to be constructed with a base course of adequate depth to suit design traffic, and are to be sealed from kerblines with either bitumen, asphaltic concrete or interlocking pavers. Full details should be indicated on the plans submitted with the Development Application. The use of decorative paving e.g. interlocking pavers, grasscrete etc for access and visitor parking is strongly encouraged. • each resident car parking space is to have minimum dimensions of 6m x 3m. Other parking spaces are to have minimum dimensions of 5.5m x 2.6m. Car parking spaces are to be adequately delineated and maintained at all times. 	<p>Not applicable, the Project is not for the purpose of a medium-density development.</p>

DCP Part	Application	Response
	<p>Concessions for Dual Occupancy</p> <p>Vehicles exiting dual occupancy developments may be permitted to leave the site in a reverse direction if it can be demonstrated that it will not adversely affect traffic on the adjoining street. The width of internal driveways and crossovers for dual occupancy development may be reduced depending on the site constraints.</p> <p>Stack car parking is permitted for dual occupancy developments.</p>	<p>Not applicable, the Project is not for a dual occupancy development.</p>
<p>7.6 – Parking Controls</p>	<p>General:</p> <ul style="list-style-type: none"> • Car-parking spaces are to be provided on the same lot as the proposed development. Multi-lot land holdings may require consolidation to comply with this control. (Reason: To ensure car parking remains annexed to the approved development.) • Additional parking spaces required for any new development or redevelopment shall comply with the controls of this chapter and Table 7.1: Off-street Parking Rates. • Accessible car parking spaces are to be provided in accordance with the Disability (Access to Premises - Buildings) Standards 2010. • Accessible car parking spaces are to be located as close as possible to the main pedestrian entrance and should have regard to the use and function of the building. • Council will apply the controls of this Chapter if it considers a proposed Change of Use requiring consent will produce a substantially different parking requirement than those attributable to the previous use of premises. • Development proposals that provide less parking than required by this Chapter shall be supported by a parking study. 	<p>Car-parking arrangements will comply with this requirement.</p>

DCP Part	Application	Response
	<ul style="list-style-type: none"> • On-site parking design must meet the relevant Australian Standards (AS 2890.1 and 2890.2 2004). • All required car parking areas, driveways, turning areas and loading areas are paved in either a bitumen seal coat, asphaltic or bituminous concrete, cement concrete, concrete paving blocks, or brick paving blocks. The standard of paving required will be dependent upon the type of development proposed, with regard to traffic loadings including turning movements of heavy vehicles. • In villages and rural areas all-weather paving of driveways, turning areas, loading areas and car parking areas is required. Surface materials to be at the discretion of Council's Director of Infrastructure Services. • All parking spaces shall be suitably line-marked and sign-posted and be graded and drained to Council's stormwater system. • Free and uninterrupted access to car parking areas shall be maintained at all times. • Stacked car parking is only permissible in conjunction with single dwelling houses and dual occupancies. Exceptions to this control are at the discretion of Council. • Car parking areas are to be incorporated into the building or provided at, or behind, the front setback of the building. 	

Appendix D Aboriginal Cultural Heritage Assessment

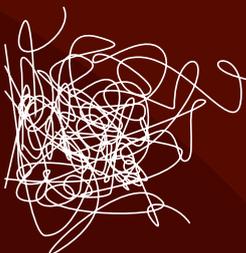


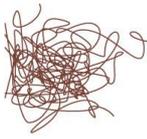
WATTLE VALE QUARRY DEVELOPMENT ABORIGINAL CULTURAL HERITAGE ASSESSMENT

PREPARED FOR GLEN INNES SEVERN COUNCIL

EVERICK HERITAGE CONSULTANTS

NOVEMBER 2016





Report Reference:

T. Hill, P. Fowler and T. Robins. 2016 *Aboriginal Cultural Heritage Assessment Report for proposed Wattle Vale Quarry, Glen Innes NSW*. Everick Heritage Consultants Pty Ltd unpublished report prepared for Glen Innes Severn Council.

EVERICK HERITAGE CONSULTANTS PTY LTD

ABN: 78 102 206 682

47 Arthur Terrace

PO Box 146

RED HILL, QLD 4059

T: (07) 3368 2660

F: (07)3368 2440

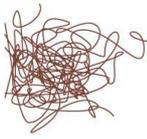
E: info@everick.com.au

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EXECUTIVE SUMMARY

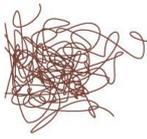
The following is a report detailing the Aboriginal Cultural Heritage Assessment for the proposed development of the Wattle Vale Quarry at 1296 Gwydir Highway via Glen Innes N.S.W, (the 'Project'). The lands subject to assessment comprise parts of Lot 113 DP 753319 (the 'Quarry area'). The intent of this investigation is to identify the potential for the Project to impact on any Aboriginal cultural heritage which may reside within the Quarry area and to outline appropriate amelioration measures for future development applications.

The brief for this project was to undertake an Aboriginal Cultural Heritage Assessment of a suitable standard to consider the potential impact of the proposed quarry development on Aboriginal and non-Aboriginal heritage values. In accordance with the relevant administrative and legislative standards for New South Wales (see Section 2 below), the methods employed in this assessment included:

- a) a search of relevant Aboriginal heritage registers;
- b) an archaeological investigation of the Quarry area;
- c) a brief review of the archaeological and cultural heritage assessments pertinent to the potential heritage values associated with the Quarry area;
- d) a review historic aerial photographs of the Quarry area;
- e) consultation with the Aboriginal Community via Glen Innes Local Aboriginal Land Council; and
- f) assessment of the potential for the Project site to contain significant Aboriginal heritage and the impact on the Project may have on said heritage, consistent with the *Office of Environment and Heritage Due Diligence Code for the Protection of Aboriginal Objects in NSW* (2010).

The assessment of the proposed Wattle Vale Quarry included four pedestrian transects over the quarry area and the surrounding landscape which were determined to have the potential to contain archaeological sites (the 'Project site'). This survey was affected by grass growth, however grass cover was not considered to significantly constrain the survey. Based on the distance of the Project site from water, the absence of archaeological materials at surface and the extent of historic land clearing the Project site is not considered to be a Potential Archaeological Deposit (PAD). No items of European heritage value were identified during the survey. As such, no further recommendations for historic heritage are required.

The Consultant is of the opinion that the proposed works are unlikely to lead to harm to Aboriginal objects. However as a precautionary measure the following recommendations are provided:



Recommendation 1: Aboriginal Object Find Procedure.

If it is suspected that Aboriginal material has been uncovered as a result of development activities within the Project site:

- a) work in the surrounding area is to stop immediately;
- b) a temporary fence is to be erected around the site, with a buffer zone of at least 10 metres around the known edge of the site;
- c) an appropriately qualified archaeological consultant is to be engaged to identify the material; and
- d) if the material is found to be of Aboriginal origin, the Aboriginal community is to be consulted in a manner as outlined in the *ACHCRP Guidelines* (2010).

Recommendation 2: Aboriginal Human Remains

Although it is unlikely that Human Remains will be located at any stage during earthworks within the Project site, should this event arise it is recommended that all works must halt in the immediate area to prevent any further impacts to the remains. The Site should be cordoned off and the remains themselves should be left untouched. The nearest police station (Glen Innes), the Glen Innes LALC and the OEH Regional Office (Coffs Harbour) are all to be notified as soon as possible. If the remains are found to be of Aboriginal origin and the police do not wish to investigate the Site for criminal activities, the Aboriginal community and the OEH should be consulted as to how the remains should be dealt with. Work may only resume after agreement is reached between all notified parties, provided it is in accordance with all parties' statutory obligations.

It is also recommended that in all dealings with Aboriginal human remains, the Proponent should use respectful language, bearing in mind that they are the remains of Aboriginal people rather than scientific specimens.

Recommendation 3: Conservation Principles

It is recommended that all effort must be taken to avoid any impacts on Aboriginal Cultural Heritage values at all stages during the development works. If impacts are unavoidable, mitigation measures should be negotiated between the Proponent, OEH and the Aboriginal community.



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DEFINITIONS

The following definitions apply to the terms used in this report:

Aboriginal Object means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

Aboriginal Place means any place declared to be an Aboriginal place (under s. 84 of the NPW Act) by the Minister administering the NPW Act, by order published in the NSW Government Gazette, because the Minister is of the opinion that the place is or was of special significance with respect to Aboriginal culture. It may or may not contain Aboriginal Objects.

ACHCR Guidelines means the *OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010).

Archaeological Code of Practice means the *OEH Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (2010).

Due Diligence Code means the *OEH Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (2010).

LALC means Local Aboriginal Land Council.

NPW Act means the *National Parks and Wildlife Act 1974* (NSW).

NPW Regulations means the *National Parks and Wildlife Regulations 2009* (NSW).

OEH means the New South Wales Office of Environment and Heritage.

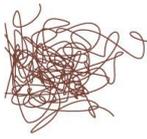
Project site means the land subject to this assessment, and is situated on parts of Lot 1 of DP 728579, Lots 133 and 134 of DP 753274, and Lots 249, 174, 253, 101, 175, 87 and 113 of DP 753319 located at 1296 Gwydir Highway via Glen Innes N.S.W, illustrated in Figure 1.

Proponent means Glen Innes Severn Council, and all associated employees and contractors and subcontractors of the same.

Quarry Area means the area identified for the proposed extractive quarry, and is situated on parts of Lot 113 DP 753319 located at 1296 Gwydir Highway via Glen Innes N.S.W, illustrated in Figure 2.

The Project means the construction and operation of Wattle Vale Quarry to which the development application relates, and as identified in Figure 2.

The Consultant means qualified archaeological staff and/or contractors of Everick Heritage Consultants Pty Ltd.



1. INTRODUCTION

1.1 Purpose of the Archaeological Investigation

The following is a report detailing the Aboriginal Cultural Heritage Assessment for the proposed development of the Wattle Vale Quarry at 1296 Gwydir Highway via Glen Innes N.S.W, (the 'Project site'). The lands subject to assessment comprise parts of Lot 113 DP 753319 (the 'Quarry Area'). The intent of this investigation is to identify the potential for the Project to impact on any Aboriginal cultural heritage which may reside within the Quarry area and to outline appropriate amelioration measures for future development applications.

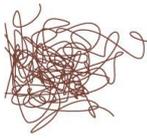
The intent of this investigation is to identify the potential for the Project to impact on any Aboriginal cultural heritage which may reside within the Project site and to outline appropriate amelioration measures for future development applications.

1.2 Proponent, Project Brief & Methodology

The proponent is seeking consent to develop the Quarry Area as an extractive quarry (the 'Project'). Everick Heritage Consultants (the 'Consultant') were commissioned by GHD to undertake this assessment on behalf of Glen Innes Severn Council.

The brief for this project was to undertake an Aboriginal Cultural Heritage Assessment of a suitable standard to consider the potential impact of the proposed quarry development on Aboriginal and non-Aboriginal heritage values. In accordance with the relevant administrative and legislative standards for New South Wales (see Section 2 below), the methods employed in this assessment included:

- a) a search of relevant Aboriginal heritage registers;
- b) an archaeological investigation of the Quarry area;
- c) a brief review of the archaeological and cultural heritage assessments pertinent to the potential heritage values associated with the Quarry area;
- d) a review historic aerial photographs of the Quarry area;
- e) consultation with the Aboriginal Community via Glen Innes Local Aboriginal Land Council; and



- f) assessment of the potential for the Project site to contain significant Aboriginal heritage and the impact on the Project may have on said heritage, consistent with the *Office of Environment and Heritage Due Diligence Code for the Protection of Aboriginal Objects in NSW* (2010).

The methods used for this assessment are in compliance with the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010* and all relevant legislation as described in Section 2 of this Report. The following report complies with the accepted methodology for undertaking an Aboriginal Cultural Heritage Assessment under the *National Parks and Wildlife Act 1974* (NSW).

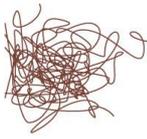
1.3 Description of Development Proposal

Site Details: The Project site is identified as the land subject to this assessment, and is situated on parts of Lots 87, 101, 113, 174, 175, 249, and 253 DP 753319 located at 1296 Gwydir Highway via Glen Innes N.S.W, illustrated in Figure 1. The Quarry area is identified as parts of Lot 113 DP 753319 and is located at 1296 Gwydir Highway via Glen Innes, NSW (Figure 2). The Quarry Area is west of the township of Glen Innes and is located on the southern side of the Gwydir Highway to the west of Wattle Vale Station homestead. At the time of the assessment the Quarry Area consisted of open grass and had been used for sheep and cattle grazing. No permanent infrastructure is present on the site.

Proposal: The Project involves the establishment of a single hard rock quarry with an extraction rate of up to 300,000 tonnes per year. The total disturbance area of the Project is approximately 8 hectares which includes an extraction area of approximately 6 hectares. The primary purpose of the Project is to supply suitable aggregate resources for the construction of proposed wind farm projects in the area and Glen Innes Shire Council.

Project activities will be generally as follows:

- Progressive installation of environmental controls including erosion and sediment control measures;
- Construction of site access road, intersection with highway and signage;
- Construction of fencing ;
- Delineation of the site and stockpiling areas;
- Vegetation clearance, soil stripping and stockpiling;
- Construction of temporary drainage controls;
- Commence quarry operations; and



- Close and rehabilitate the quarry.

Access: The Quarry Area is currently accessed from the Gwydir Highway, Glen Innes NSW. Access is proposed from the south via the Glen Innes Wind Farm project road.

1.4 Report Authorship

The desktop study was undertaken by Senior Archaeologist Tim Hill and Graduate Archaeologist Pauline Fowler. The field assessment was conducted by Senior Archaeologist Tim Hill and Jayden Potter from Glen Innes Local Aboriginal Land Council (LALC). This report was written by Tim Hill, Pauline Fowler and Everick Director Tim Robins.