

Department of Land and Water Conservation  
Soil and Water Testing Laboratory

Laboratory No.: SCO01/286R1

Australand Holdings Limited  
Locked Bag 2106  
North Ryde 1670

Attention: R.A. Blancato

Dear Sir

**Re: Acid Sulfate Soil Investigation Part Sector 8 Warriewood**

This report presents the results of the acid sulfate soil investigation for Part Sector 8 Warriewood, NSW (Lot 1, D.P. 18303; Lot 1, D.P. 593363; Lot B, D.P. 334543; Lot 12, D.P. 659528; Lot 11 Section C, D.P. 5464). Sector 8 Warriewood is proposed for residential subdivision. The scope of this report was discussed with Ms Lisa Kolinac and was commissioned by R.A. Blancato of Australand Holdings Limited by facsimile dated 16 November 2001.

Acid sulfate soil (ASS) is soil or sediments containing iron sulphides which may produce sulphuric acidity when exposed to oxygen (oxidation) by excavation or drainage and can be classified as either actual acid sulphate soil or potential acid sulphate soil (Ahern *et al.*, 1998). Actual acid sulphate soil (AASS) contain extremely acidic soil horizons or layers resulting from the aeration of soil materials that are rich in iron sulphides. Potential acid sulphate soil (PASS) contain iron sulphides, which have not been exposed to air and oxidised.

**Site Assessment**

Mr Stephen Young of Soil Services (Department of Land and Water Conservation) undertook an assessment of the site on the 16 November 2001. A significant proportion of the site is covered by glass houses, shade houses and other structures. The vegetation consists primarily of grass species with trees and shrubs in some areas.

The site assessment included the excavation of eight test bores to maximum depth of 2.5 m, description of the soil profile and collection of soil samples. The location of the test bores (Appendix 3) was selected to assess the variation in soil types over the study area. The soil profile was found to be similar for each of the test bores (Appendix 2). A typical the soil profile (Test Bore 26) consisted of:

- 0 - 0.50 m: Grey sand, dry
- 0.50 - 0.95 m: Light grey sand, dry
- 0.96 - 1.15 m: Brown loamy sand, orange mottles, moderately moist
- 1.15 - 2.05 m: Pale yellow sand, moderately moist
- 2.05 - 2.50 m: Orange sandy clay, yellow and grey mottles, moderately moist.

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Soils Research Service Centre  
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## Soil Analysis

The variability of the soils found in the test bores was assessed and representative samples were selected for analysis. The selected soil samples were analysed at the Scone Research Service Centre (Appendix 1) according to the methods documented in SRSC Labdoc 0061.3 (21/11/2001).

Table 1. Results of the soil analysis conducted Scone Research Service Centre (SCO01/286R1).

Lab. No.	Sample	EC (dS/m)	pH	pH (H <sub>2</sub> O <sub>2</sub> )
1	23/1 0-0.4 m	0.04	5.7	nt
2	23/2 0.4-0.65 m	0.03	5.4	nt
3	23/3 0.65-1.2 m	0.04	5.1	3.4
4	23/4 1.2-1.9 m	0.04	5.6	3.6
5	23/5 1.9-3.5 m	0.06	4.9	3.4
6	26/1 0-0.5 m	0.06	5.7	nt
7	26/2 0.5-0.95 m	0.03	6.1	nt
8	26/3 0.95-1.15 m	0.06	6.0	3.7
9	26/4 1.15-2.05 m	0.03	6.0	3.5
10	26/5 2.05-3.5 m	0.06	5.1	3.5

nt = not tested

## Salinity

The Electrical Conductivity (EC) was determined in a 1:5 soil to water solution and is used to estimate the salinity or concentration of salts in a soil sample (Hazelton and Murphy, 1992). The EC indicates that all samples tested have low salinity.

## pH

Soil pH is a measure of the acidity or alkalinity of a soil sample with a scale of 0-14. A pH value of 7 is described as neutral, less than 7 acidic and greater than 7 alkaline.

The soil pH was determined in a 1:5 soil to water solution. For all sample tested the pH was slightly to very strongly acidic ranging from 4.9 to 6.1 (Table 1). A pH value of less than 4 indicates that the oxidation of iron sulfides has occurred in the sample prior to analysis and hence the presence of actual acid sulfate soil (Ahern *et al.*, 1998). These results indicate that the samples analysed are not actual acid sulfate soils.

## pH in Hydrogen Peroxide

To identify potential acid sulphate soils, the samples were oxidised using hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) and the pH determined.

For all samples tested the pH (H<sub>2</sub>O<sub>2</sub>) was greater than 3, ranging from 3.4 to 3.7 (Table 1). A pH (H<sub>2</sub>O<sub>2</sub>) of less than 3 indicates that the sample contains iron sulfides and would be regarded as a potential acid sulfate soil (Ahern *et al.*, 1998). Hence these samples are not considered to be potential acid sulfate soils.

## Conclusions

The results of the site assessment and laboratory analysis indicate that no acid sulfate soil were identified at Part Sector 8, Warriewood, NSW (Lot 1, D.P. 18303; Lot 1, D.P. 593363; Lot B, D.P. 334543; Lot 12, D.P. 659528; Lot 11 Section C, D.P. 5464). However, should soils be found during development of this site that are not represented by the soils found in this report, further investigation may be required.

If you have any queries regarding this report please do not hesitate to contact the undersigned.

Yours faithfully,

S.R. Young  
Laboratory Manager  
Scone Research Service Centre  
29 November, 2001

## References

- Hazelton, P.A. and Murphy, B.W. (1992) What Do All the Numbers Mean? A guide for the Interpretation of Soil Test Results. Department of Land and Water Conservation.
- Ahern, C.R., Stone, Y., and Blunden, B. (1998) Acid Sulfate Soils Assessment Guidelines Published by the Acid Sulfate Soil Management Advisory Committee, Wollongbar, NSW, Australia.



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Scone Research Service Centre

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REPORT NO: SCO01/286R1

REPORT TO: R A Blancato  
NSW State Manager - Land  
Australand Holdings Ltd  
Locked Bag 2106  
North Ryde 1670

REPORT ON: Ten soil samples  
Warriewood Sector 8

PRELIMINARY RESULTS  
ISSUED: Not issued


REPORT STATUS: Final

DATE REPORTED: 27 November, 2001

METHODS: Information on test procedures can be obtained from Scone  
Research Service Centre

TESTING CARRIED OUT ON SAMPLE AS RECEIVED.  
THIS DOCUMENT MAY NOT BE REPRODUCED EXCEPT IN FULL.

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G. Holman

G. Holman  
(Technical Officer)

SOIL AND WATER TESTING LABORATORY  
Scone Research Service Centre

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Report No.: SCO01/286R1  
Client Reference: R A Blancato  
NSW Satate Manager - Land  
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Lab No	Method	C1A/4	C2A/3	C2C/2
	Sample Id.	EC (dS/m)	pH	pH (H <sub>2</sub> O <sub>2</sub> )
1	Warriewood Sector 8 23/1 0-0.4m	0.04	5.7	nt
2	Warriewood Sector 8 23/2 0.4-0.65m	0.03	5.4	nt
3	Warriewood Sector 8 23/3 0.65-1.2	0.04	5.1	3.4
4	Warriewood Sector 8 23/4 1.2-1.9m	0.04	5.6	3.6
5	Warriewood Sector 8 23/5 1.9-3.5m	0.06	4.9	3.4
6	Warriewood Sctor 8 26/1 0-0.5m	0.06	5.7	nt
7	Warriewood Sector 8 26/2 0.5-0.95m	0.03	6.1	nt
8	Warriewood Sector 8 26/3 0.95-1.15m	0.06	6.0	3.7
9	Warriewood Sector 8 26/4 1.15-2.05m	0.03	6.0	3.5
10	Warriewood Sector 8 26/5 2.05-3.5m	0.06	5.1	3.5

nt = not tested

*G. Holman*

END OF TEST REPORT