GEOTECHNICAL REPORT

BLACKWOOD BAY LTD
BLACKWOOD BAY

Our Ref: 25403
Date: December 2015

davidson group

PROJECT PLANNERS
RESOURCE MANAGERS
CIVIL & STRUCTURAL ENGINEERS
BUILDING DESIGNERS
ENVIRONMENTAL ENGINEERS

Our Ref: 25403

22 December 2015

GEOTECHNICAL REPORT
BLACKWOOD BAY LTD
BLACKWOOD BAY

LOCATION DETAILS: Blackwood Bay

LEGAL DESCRIPTION: Pt Lot 2 DP 1045

DATE OF SITE VISIT: Various 2013 - 2015

ZONING: Sounds Residential and Rural One Zone and Natural Hazard Zone (Instability) (Marlborough Sounds Resource Management Plan)

C O N T E N T S

A SYNOPSIS

A1 Scope of the Investigation

Seven holiday cottages are present and the treated wastewater is discharged to the sea via a long sea outfall.

The Resource Consent for this outfall has expired and will not be renewed. It is proposed to discharge treated effluent to land on the owner's property.

We have been engaged to investigate and confirm a suitable land area for the final discharge which has an acceptable risk from instability and flooding.

A2 Summary and Conclusions

A suitable land application area (LAA) has been identified on the slopes uphill and west of the cottages.

The slopes are moderate to steep and have signs of historic land movement, but the proposed low application rate is not considered to increase the risk of further movement significantly.

A3 Recommendations

The area site shown on the plans is suitable for land application of treated wastewater provided that;

a) the areas identified as 1 - 4 on drawing number 25403 / R1 be used as land application areas only, and

b) the land application be restricted to irrigation methods only at a maximum application rate of 2.0 mm/day with the lines spaced at 1.5 m centres around even contours.

B REPORT

B1 Introduction

Our investigation to confirm a suitable LAA on this property included;

- a general visual inspection,
- geomorphological walkover,
- inspection of cuts and slip areas,
- assessment of wastewater management including potential effects on the stability of the site,
- inspection of aerial photographs.

B2 Site Description

The property (Pt Lot 2 DP 1045) is located on the western side of Blackwood Bay and consists of south, east and west facing, moderate to steep slopes which are well vegetated with regenerating natives.

A water course bisects the property and is piped through the low lying, flat area where most of the dwellings are located, before discharging at the beach.

View from the South

B3 Geotechnical Investigations

The Marlborough Sounds Resource Management Plan (MSRMP) (Map 100) indicates that the site is in a Natural Hazards Zone for instability.

The Institute of Geological & Nuclear Sciences, Map 10, describes the underlying rock in this area as Marlborough Schist, consisting of weakly metamorphosed, undifferentiated well bedded grey/green sandstone/siltstone. The map indicates that the bedrock dips steeply to the north.

Aerial photographs taken in 1973 do not show any significant, recent or ongoing instability.

A geomorphological walkover survey was undertaken over the proposed disposal areas. Rock fragments were present on the surface and some slopes were over 30°. A recent slip (probably within the last decade) was noted west of the cottages in the form of a long, narrow slide in a gully, as shown on the drawing attached.

The cottages themselves are located on an alluvial fan from old catchment slip debris transported and deposited by water in the creek.

B4 Geotechnical Assessment

The rock debris on the slopes indicate past movement, but apart from one recent slip in a gully, there was no recent or active instability on the slopes inspected.

Nevertheless, gullies should be avoided and ridges and side faces should be used for LAA's, preferably areas 1 - 4 on the western side.

The areas identified as suitable for LAA's are considered to have a low to moderate risk of instability and the use of these areas for wastewater application is expected to have a negligible increase in the instability risk if the land application method is restricted to drip irrigation at less than 2 mm/day.

We also consider it prudent to limit vegetation clearance on the slopes in these areas in order to benefit from the assistance that vegetation provides to the stability of surface soils and control of soil moisture.

The sites identified have no risk from flooding.

B5 Disclaimer

B5.1 This report has been prepared solely for the benefit of you as our client and the relevant Local Authority with respect to the particular brief given to us, and data or opinions contained in it may not be used in other contexts or for any other purpose without our prior review and agreement.

B5.2 This disclaimer shall apply notwithstanding that the report may be made available to any other person in connection with any application for permission or approval, or pursuant to any requirement of law.

This report is based on conditions presently found on site and is consistent with standards currently being applied.

B6 References

Marlborough District Council 'Marlborough Sounds Resource Management Plan'.

Stereoscopic aerial photographs, flown by NZ Aerial Mapping Ltd in 1975, numbers SN 3781 D/28 & 29.

Institute of Geological & Nuclear Science, Geological Map 10, 'Geology of the Wellington Area' by M R Johnston and J G Begg

NZ Geotechnical Society Inc., December 2005, 'Field Description of Soil and Rock'.

Davidson Group Ltd, Dec 2015 'Wastewater Management Report - Blackwood Bay Ltd, Blackwood Bay'

DAVIDSON GROUP LTD

W L McGlynn

WLM:LW

C APPENDIX

C1. Professional Opinion

C2. Geotechnical Risk Matrix

C3. Plan 25403 sheet;

R1 ‘A’ Locality and Site Plans

davidson group
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RESOURCE MANAGERS
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BUILDING DESIGNERS
ENVIRONMENTAL ENGINEERS

Our Ref: 25403

22 December 2015

STATEMENT OF PROFESSIONAL
OPINION AS TO LAND STABILITY FOR ON-SITE WASTEWATER

DESCRIPTION: Pt Lot 2 DP 1045, Blackwood Bay

FOR: Blackwood Bay Ltd

I, **William Leigh McGlynn,** of Davidson Group Ltd, PO Box 256, Blenheim,

hereby confirm that:

1. I am experienced in the field of soils engineering and more particularly land and foundation stability and am formally recognised by the Marlborough District Council. I am familiar with and understand the purpose of the Marlborough District Council's geotechnical reporting standards. This professional opinion is furnished to the Marlborough District Council alone, on the express condition that it will not be communicated to or be relied upon by any other person. It is based on conditions presently found on site and is consistent with standards currently being applied.

2. Site investigations have been carried out under my direction and are described in our site investigation report dated 22 December 2015 attached. The following professional opinion is based on the assumption that the data obtained from these investigations is representative of the whole area under consideration. In my professional opinion having examined the site it is reasonable for Council to assume that the data referred to above is representative of the whole area under consideration.

ACENZ

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3. In my professional opinion, not to be construed as a guarantee, and having regard to the specifics of the site which I have investigated to the extent that acceptable engineering practices require giving due regard to acceptable engineering principles and practices for land stability and on-site wastewater management then the areas shown on the plans are suitable for wastewater disposal, providing that the following recommendations described in our accompanying report (Geotechnical Report for Blackwood Bay Ltd) are adhered to:

a) The areas identified as 1 - 4 on drawing number 25403 / R1 be used as land application areas only.

b) The land application be restricted to irrigation methods only at a maximum application rate of 200 mm/day with the lines spaced at 1.5 m centres around even contours.

4. This professional opinion shall remain current for a maximum of two years.

DAVIDSON GROUP LTD

W L McGlynn

LM:LW

Encl.

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22 December 2015

BLACKWOOD BAY LTD, BLACKWOOD BAY
GEOTECHNICAL RISK MATRIX
(for the Wastewater Land Application Areas)

(ex MDC 'Geotechnical Reporting Requirements 2005')

Likelihood / **Consequence**		No risk to life, minor financial loss (<$5k). Potential for small-scale instability only.	No risk to life, minor financial loss (<$50k). Potential for small-scale instability only.	Very low risk to life, moderate damage and financial loss (<$150k). Potential for moderate scale instability.	Low risk for loss of life, significant damage and financial loss (<$500k). Potential for large-scale instability.	High risk for loss of life, extensive and significant damage and financial loss (>$500k). Potential for large-scale instability.
Almost Certain	Extensive evidence of active creep and active instability. Steep Slope.	**M**	**H**	**H**	**E**	**E**
Likely	Evidence of active creep and/or historic instability. Steep to Moderate Slopes.	**M**	**M**	**H**	**H**	**E**
Moderate	Evidence of historic soil creep and/or historic instability. Steep to Moderate Slopes.	**L - M**		**M**	**H**	**H**
Unlikely	No evidence of soil creep or historic instability, but evidence of instability on similar slopes. Moderate Slopes.	**L**	**L**	**L**	**M**	**H**

North

STREAM (APPROXIMATE)

POWER LINE

PT LOT 2 DP 1045

PP

TP1

TP2

TP3

TP4

EXISTING SEPTIC TANKS

OLD SLIP

SPRING

SPRING/ WATER COURSE

OLD SLIP

SEA OUTFALL (TO BE ABANDONED)

LOT 3 DP 5269

80

60

40

20

1

2

3

4

5

6

5437183mN

1690973mE

BLACKWOOD BAY

LOCALITY PLAN (NZTM)

1:50000

PLAN

1:1000

NOTES:

LOCATIONS OF FEATURES ARE APPROXIMATE ONLY AND HAVE NOT BEEN PRECISELY SURVEYED.

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BLACKWOOD BAY LTD
BLACKWOOD BAY, QCS.
WASTEWATER INVESTIGATION

location and site plan

DATE	ORIGINAL SIZE	DRAWING No.	SHEET	ISSUE
10/13	A3	25403	R1	A

DES	DRN	CK	REF
L.M.	W.H.	L.M.	

0mm 100mm