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Engineering Report

Proposed Wastewater System

758 Wakamarina Road
Canvastown

for

Rod Dornbusch

Jan Dimmendaal
Chartered Engineer
Smart Associates Ltd
2 February 2006

Project D06-1606

Table of Contents

Appendices

1. Introduction

1.1 Rod Dornbusch is proposing to install a new wastewater treatment and disposal system on his property to service a 3-bedroom dwelling being constructed.

1.2 The property slopes slightly towards the north and is in grass. There are no streams within 30 metres of the proposed effluent disposal area or existing effluent disposal areas within 50 metres.

1.3 The property legal description is Lot 2 DP 11657 and the land area is 1.1.ha.

2. Design - Wastewater Treatment and Disposal

2.1 The site investigation identified that a suitable wastewater disposal area exists to the north of the dwelling being constructed on the site (refer site plan Appendix A). Based on the soil assessment carried out, an average drainage category of 3 has been adopted.

2.2 Three test pits were located at the site in the proposed effluent disposal area and their locations are shown on the site plan. The representative soil properties are:

W 1

(m)	Horizon or Layer and boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture condition	
0.10	Ah	Topsoil	Dark brown	Silty clay loam	None	Very Loose	V.Soft	V.Strong	Moist	2
0.40	B gradual	Residual	Pale brown	Silty clay	None	Loose	Soft	Strong	Dry	3
0.60	C gradual	Residual	Pale yellow brown	Clayey silt	5% some 100mm	Loose	Firm	Moderate	Dry	3.5

W 2

(m)	Horizon or Layer and boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture condition	
0.10	Ah	Topsoil	Dark brown	Silty clay loam	None	Very Loose	V.Soft	V.Strong	Moist	2
0.30	B gradual	Residual	Pale brown	Silty clay	None	Loose	Soft	Strong	Dry	3
0.60	C gradual	Residual	Pale yellow brown	Clayey silt	None	Loose	Firm	Moderate	Dry	3.5

W 3

(m)	Horizon or Layer and boundary	Genesis	Description							Drainage Category
			Colour	Field Texture	% + 2mm Fragments	Compactness	Consistency	Structure	Moisture condition	
0.10	Ah	Topsoil	Dark brown	Silty clay loam	None	Very Loose	V.Soft	V.Strong	Moist	2
0.40	B gradual	Residual	Pale brown	Silty clay	20% some 100mm	Loose	Soft	Strong	Moist	3
0.60	C gradual	Residual	Pale yellow brown	Clayey silt	None	Loose	Firm	Moderate	Moist	3.5

2.3 The proposed land application is on westerly aspect slopes of 0° to 6°. The landform element is linear planar.

2.4 A primary treatment system (conventional septic tank conforming to NZS 1546.3:1998) including outlet filter and dose pumped effluent trench disposal are considered the most suitable option and is recommended for this site as there are no constraints with regard to available land area, slope, soil drainage characteristics or proximity to watercourses. The septic tank recommended is manufactured and supplied by Lawrence in Havelock.

2.5 A primary treatment system fitted with an outlet filter normally produces an average effluent with:

BOD after 5 days	< 100 g/m^3
Suspended solids	< 100 g/m^3

2.6 The design loading rate for Category 3, high/moderate structured soil, is 15mm/day.

2.7 The recommended location of the proposed land application area is indicated on the site plan (Appendix A).

2.8 The total length of 600mm wide dose pumped trench required is 120m (refer wastewater design sheets Appendix B). It is recommended that this length of trench be constructed as 6 trenches of 20m. A typical effluent trench detail is provided in Appendix B.

2.9 The wastewater flow design allowance of 180l/person/day has been used in the design of the system. This allowance is in accordance with Appendix 4.2D of AS/NZS 1547:2000 and is based on a well water source for the dwelling. The new dwelling will have 3 bedrooms giving a potential permanent occupancy of 6 people (as per MDC Guidelines for new on-site wastewater management systems). A minimum wastewater storage capacity of 4000 litres is required.

2.10 Prior to the proposed system becoming operational the system designer must inspect and certify that the system has been installed according to the design. This certification must then be forwarded to Council.

2.11 Vehicular access to the system for desludging will be available via the house access.

3. Recommendation

A Lawrence conventional septic tank fitted with an outlet filter and conforming to NZS 1546.3:1998 and combined with dose pumped effluent disposal trenches is recommended for this site. Installation is to be in accordance with requirements and recommendations of NZS1547:2000.

4. Limitations

This report is valid for two years from the date of issue and covers the design of a wastewater treatment and disposal system for Rod Dornbusch at 758 Wakamarina Road, Canvastown. Any other areas are outside the scope of this report.

The reliance by other parties on the information or opinions in the report shall, without our prior review and agreement in writing, be at such parties' sole risk.

5. References

1. NZS 1547:2000 On-site Domestic Wastewater Management
2. NZS 1546.3:1998 On-site Domestic wastewater Treatment Units (Part1: Septic Tanks).

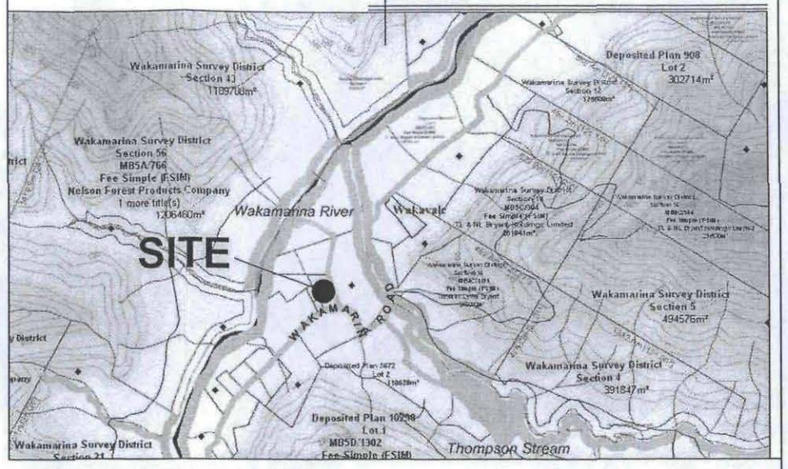
Jan Dimmendaal, Chartered Engineer

2 February 2006

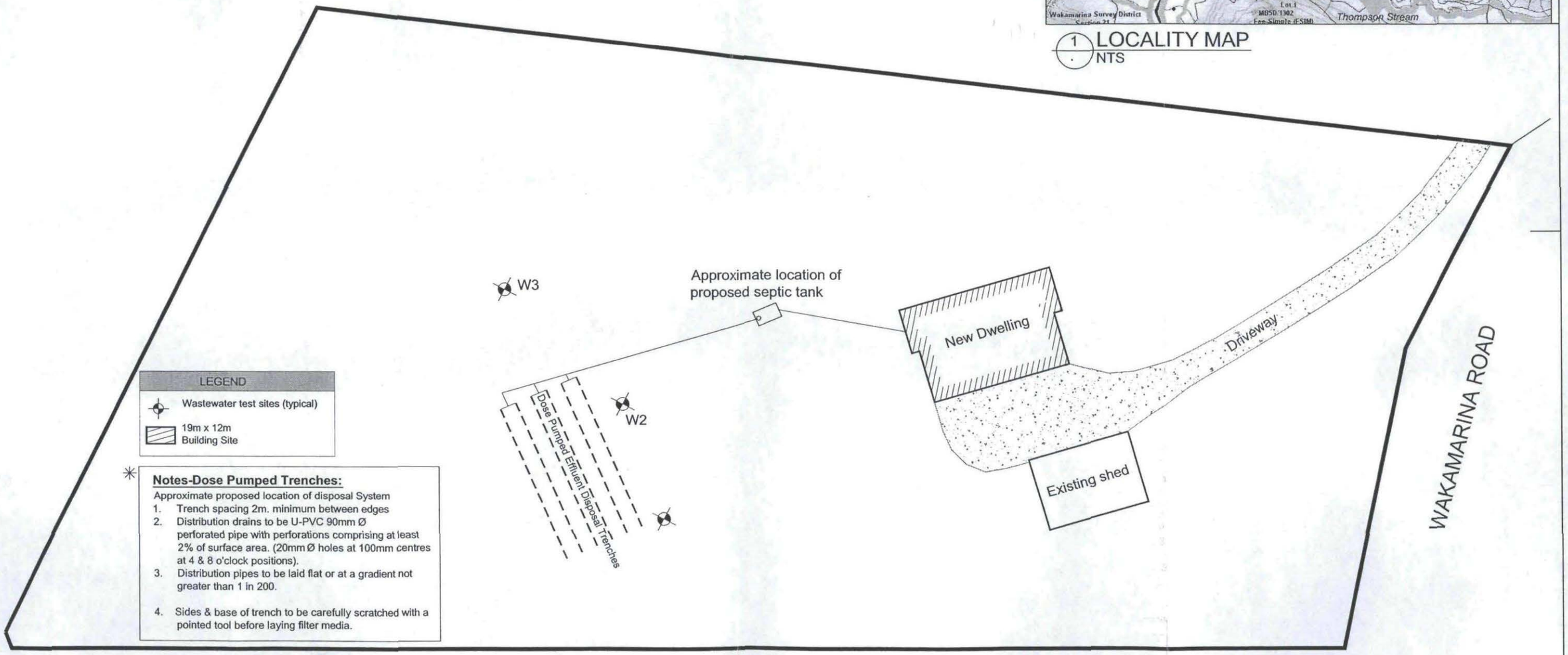
Appendix A

Site Plan

REVISIONS



1. LOCALITY MAP
NTS



2. PROPOSED SITE LAYOUT
Scale 1:500

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WASTEWATER PLAN
758 WAKAMARINA ROAD
for: ROD DORNBUSCH

PROJECT No. **D06-1606**

NOTES
Do not scale from this drawing. Only figured dimensions are to be taken from this drawing. The contractor must verify all dimensions on site before commencing any ordering of materials, work or shop drawings. The contractor must report any discrepancies to the Engineer before commencing work. If this drawing exceeds the quantities taken in any way, the Engineer is to be informed before the work is started. This drawing is Copyright and must not be reproduced without the consent of Smart Associates Ltd. The Engineer is to be given at least 2 weeks notice of the beginning of construction works, and at least 48 hours notice of critical items (eg concrete pours, prelining etc). The Engineer reserves the right to alter the design in light of site circumstances including previously unforeseen design issues.

LOCALITY MAP, SITE LAYOUT & WASTEWATER PLAN			DRAWING No. 001
DRAWN bjl	CHECKED jis	SCALE (A3) As Shown	DATE 2/2/06
COMPUTER FILE: drawings\			REVISION /

Appendix B

Wastewater Design Sheets

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SOIL PERMEABILITY ASSESSMENT / EFFLUENT DESIGN SHEET

To AS/NZS 1547:2000

Site Evaluation: Dornbusch **Job No: D06-1606**

Intended water Supply:

~~*Public Supply*~~ ~~*Rain water (roof collection)*~~ *Bore/Well/Dam*

Local experience with existing on-site systems:

Septic Tank or similar (Primary treatment):

OK when installed properly with a correctly sized drainage area and maintained.

Secondary treatment:

Work very well in domestic situation producing a relatively high quality effluent.

Recommendation for this site: *Primary Wastewater Treatment System with outlet filter and dose pumped effluent disposal trenches*

DRAINAGE CONTROLS:

Need for surface water collector / cut-off drains?

AVAILABILITY OR RESERVE / SETBACK AREAS

Reserve area available for extensions, % of design area:

Setback distance? (between development and disposal system): *Min. as required by Resource Management Act*

Ksat, (m/day): ESTIMATED SOIL CATEGORY: *Category 3 - Moderately well drained loam*

4.0 Design

RECOMMENDED D.L.R. *15* mm/day

(NOTE: Where DIR is 10mm/week or less, ETA/ETS trenches to Fig 4.5A7 NZS1547:2000 should be specified to enable the utilisation of such soils)

6 Permanent People At 180L/person/day: *1080* L/day from Appendix 4.2D AS/NZS 1547:2000

DESIGN DAILY FLOW: *1080* L/week

Septic tank size (min): *4,000* (Table 4.3A1)

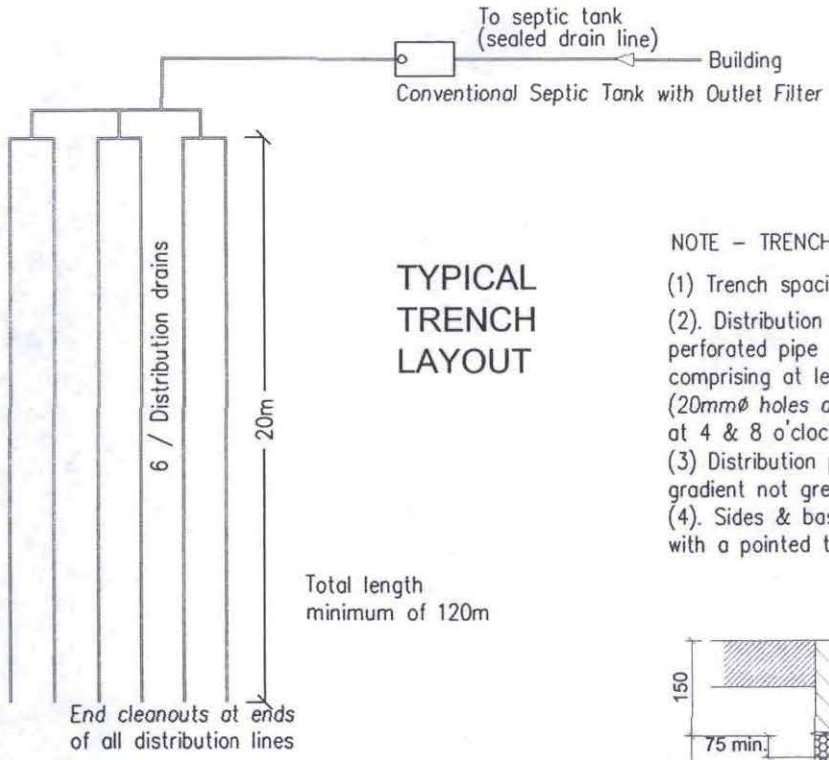
AREA REQUIRED: *72.0* m^2

LENGTH REQUIRED: *120.0* m with 600 wide trench

RESERVE AREA REQUIRED: *100%* of specified drainage area

RECOMMENDATION :

Primary Wastewater Treatment System fittted with outlet filter (Zabel or equivalent) and dose pumped effluent disposal trenches to be a minimum total length of 120m (Lines to be laid at 1.6m centres, Pump sized by manufacturer).



TYPICAL TRENCH LAYOUT

Total length
minimum of 120m

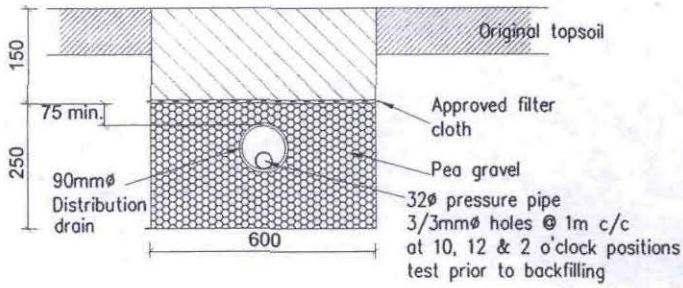
NOTE – TRENCHES

(1) Trench spacing 2m. minimum between edges

(2). Distribution drains to be U-PVC 90mmø perforated pipe with perforations comprising at least 2% of surface area. *(20mmø holes at 100mm centres at 4 & 8 o'clock positions).*

(3) Distribution pipes to be laid flat or at a gradient not greater than 1 in 200.

(4). Sides & base of trench to be carefully scratched with a pointed tool before laying filter media.



TYPICAL TRENCH CONSTRUCTION

SYSTEM USE & MAINTENANCE

1. The household sewage should not contain anything other than human waste and toilet paper, and food material such as may go down a kitchen sink drain. *Garbage grinders are not recommended, although they need not be forbidden.* More frequent de-sludging of the septic tank may be needed if a garbage grinder is used.

Normal use in the house of soaps, detergents, bleaches, plumbing fixture cleaners, drain cleaners and disinfectants will not harm the functioning of the septic tank or the soil absorption system.

2. Prohibited discharge to the septic tank
* Oil/grease from a deep frier (for example).
* Stormwater or any drainage other than sewerage generated in the house.
* Petrol, oil or other flammable/explosive substances
* Garden, garage, and workshop chemicals (e.g. pesticides, paint cleaners, photographic chemicals, motor oil or trade waste.
* Disposable nappies & sanitary napkins.

3. It is an MDC requirement that any wastewater treatment system be regularly serviced and maintained by a contractor experienced in this field.

PROJECT	Rod Dornbusch 758 Wakamarina Road, Canvastown		
PROJECT No.	D06-1606		
TITLE	DRAINAGE FIELD SPECIFICATION		DRAWING No. C
DRAWN JD	CHECKED	SCALE NTS	DATE 01/06
COMPUTER FILE:			REVISION .

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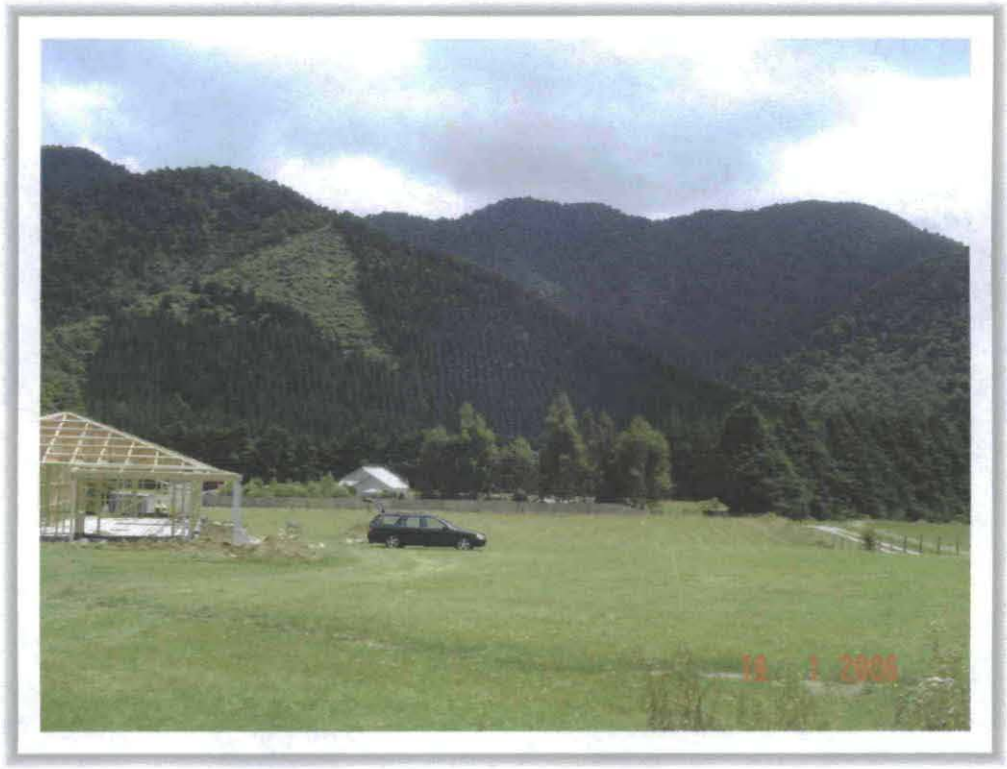
Appendix C

Biolytix System and
Oasis Clearwater TEXASS System
Specifications

Rod Dornbusch
Wakamarina Road
January 2006
Project D06-1606



Looking northwest towards proposed effluent field