

GEOTECHNICAL REPORT

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Eric Gary and Yaqain Zhang
5 and 9 Grand Hills Lane
Resource Consent Application



Appendix F: Engineering Suitability Report

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ENGINEERS
ARCHITECTS
ENVIRONMENTAL

ENGINEERING SUITABILITY REPORT FOR SUBDIVISION – Rev 1

**PREPARED FOR WAYNE HILL FAMILY TRUST
AT 31 MILLINGTON ROAD, MAUNU**

Lots 1-3 DP 308070



ENGINEERING SUITABILITY REPORT FOR WAYNE HILL FAMILY TRUST - Rev 1


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DOCUMENT TRANSMITTAL

Prepared for: Wayne Hill Family Trust

Job No.:

12696

Revision	Issued To	Copies Issued	Date
0	Client Wayne Hill Family Trust Email: wayne@stratusmanagement.co.nz Cc Katrina Roos Email: KatrinaR@CatoBolam.co.nz	EMAIL	17.02.2022
1	Client Wayne Hill Family Trust Email: wayne@stratusmanagement.co.nz Cc Katrina Roos Email: KatrinaR@CatoBolam.co.nz	EMAIL	24.03.2022

1. Purpose

The purpose of this report is to present the results of the geotechnical investigation completed at 31 Millington Road, Maunu, legally described as Lots 1 - 3 DP 308070, for the proposed subdivision. Advice is given on stability, soil conditions for foundations, earthworks and on-site effluent disposal.

This report is suitable for a resource consent application to Whangarei District Council (WDC).

This report supersedes our previous report of the same reference, dated 17/02/22.

2. Proposal

It is proposed to subdivide the existing Lots, legally described as Lots 1 - 3 DP 308070, into 8 new lots (lots 1 - 8). The new lots will have land areas in the range of 2398m² to 4516m², with the exception of lot 8 at 21.6ha.

Lot 8 will retain an existing dwelling, therefore this lot is not considered further in this report.

Access to the proposed lots (2 - 8) will be from a shared ROW connected to Millington Road. Access to proposed lot 1 will be directly from the road.

The site is not connected to the council reticulated wastewater or potable water networks, therefore water supply will be from rainwater tanks and on-site effluent disposal will be required. An aerial photo overlaid with the proposed subdivision is shown in Figure A below.



Figure A: Proposed subdivision scheme plan (provided by CatoBalam, No: 45265-DR-PLN-1200, Rev A).

3. Hazard Map

The Whangarei District Council (WDC) Hazard Maps show that the property is low instability hazard and medium effluent unsuitability. The property is not subject to Acid Sulphate Soils (ASS). The property is not mapped for flooding.



Figure B: Land instability and effluent unsuitability areas (source: WDC GIS Hazard Maps).

4. Site Description

The property is situated approximately 8km south-west of central Whangarei, immediately west of Millington Road. The suburb is located on a broad volcanic plateau, on the southern side of Pukenui Forest.

The property generally comprises gentle slopes (less than 8°) to near-flat pastoral land descending gradually towards Millington Road, with the existing ground level in the range of 203m to 214m OTPD.

A locally steeper (14° - 18°) area is located on the south-western corner of the property, near the existing dwelling.

The property is entirely in pasture with a line of trees along the northern property boundary.

There are lines of old stone walls throughout the property, and an existing farm shed near the centre of the property within proposed lot 3.



Figure C: Aerial view of the site (source: NRC map).

5. Geological Setting

The geological map of the local area, indicated on GNS Science website, indicates that the property is underlain by “Kerikeri Volcanic Group Pleistocene basalt of Puhipuhi – Whangarei Volcanic Field”. This formation is described as “Basalt lava and volcanic plugs”.

Soils encountered in the hand augered boreholes are consistent with the mapped geology.

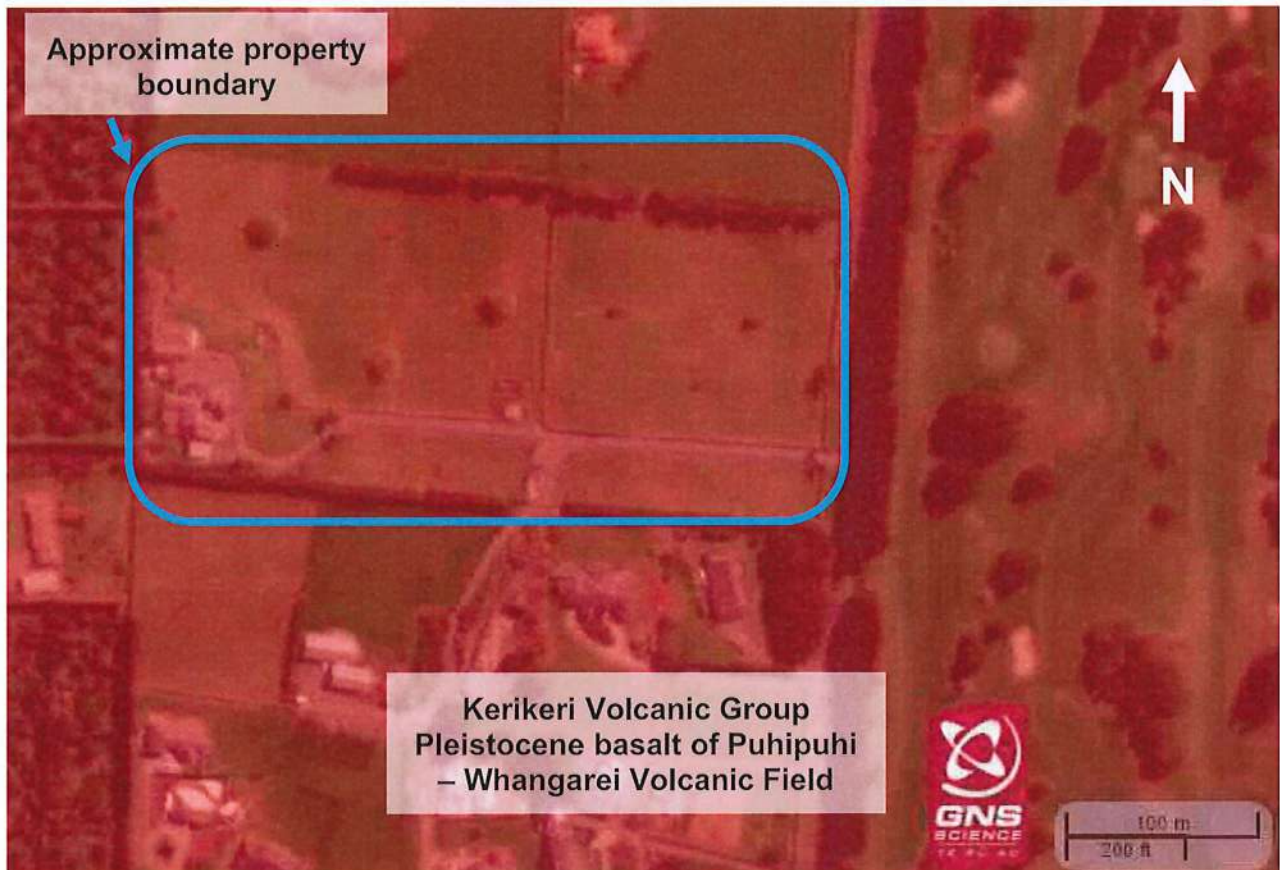


Figure D: Geology of the site (source: GNS Science).

6. Geotechnical Investigation

A geotechnical investigation was carried out across the site on the 18th of January 2022, comprising 18 hand augered boreholes (HA1 – HA18).

Hand augered boreholes were drilled to depths between 0.5m and 3m below ground level (bgl) across the building and effluent sites. Shear vane tests were performed at 0.3m intervals as the holes were advanced.

Logs of the hand augered boreholes and a site plan indicating the locations are attached to this report. The results of the subsoil investigation are summarised in Table 1.

Table 1: Results of Subsoil Investigation

Hand Augered Borehole	Hand Auger Termination Depth	Scala Penetrometer Termination Depth	Topsoil Depth	Groundwater Depth	Shear Vane Soil Strengths	Scala Penetrometer Raw Data in Natural Ground	Description
All depths measured in (m) below current ground level					min - max		
					kPa	Blows/100mm	
HA1	3	3.1	0.2	NE ²	165 - UTP ³	18 - 20	<p>All hand augered boreholes encountered a similar soil profile, comprising 0.1m to 0.3m of silty topsoil.</p> <p>Below the topsoil, brown, moist, slightly to highly plastic silty clay/clayey silt/silt with some clay, to refusal depths between 0.5m and 3m bgl was encountered. Scala penetrometer testing was undertaken at the base of boreholes where augering was refused. All scala penetrometer testing achieved values between 12 and 20+ blows/100mm, and refused at depths between 0.5m and 3.1m indicating hard material or basalt boulders at these depths.</p> <p>No groundwater, or signs of water transmission, were encountered in any of the hand augered boreholes. Based on the site topography and absence of surrounding water courses, the groundwater table is expected to lie at depths below 4m - 5m.</p>
HA2	3	NM ¹	0.2	NE ²	160 - UTP ³	NM ¹	
HA3	1	NM ¹	0.2	NE ²	NM ¹	NM ¹	
HA4	2	2.4	0.2	NE ²	UTP ³	12 - 20	
HA5	1	1	0.2	NE ²	+200 - UTP ³	20	
HA6	1	NM ¹	0.3	NE ²	UTP ³	NM ¹	
HA7	0.8	NM ¹	0.2	NE ²	NM ¹	NM ¹	
HA8	0.6	NM ¹	0.2	NE ²	NM ¹	NM ¹	
HA9	0.5	0.5	0.2	NE ²	UTP ³	20	
HA10	0.9	0.9	0.2	NE ²	UTP ³	20	
HA11	0.8	0.8	0.3	NE ²	UTP ³	20	
HA12	0.6	NM ¹	0.3	NE ²	NM ¹	NM ¹	
HA13	0.6	NM ¹	0.2	NE ²	NM ¹	NM ¹	
HA14	0.6	0.6	0.1	NE ²	UTP ³	20	
HA15	0.8	NM ¹	0.3	NE ²	NM ¹	NM ¹	
HA16	0.8	1	0.2	NE ²	UTP ³	12 - 20	
HA17	0.5	NM ¹	0.1	NE ²	NM ¹	NM ¹	
HA18	0.6	NM ¹	0.2	NE ²	NM ¹	NM ¹	

Table 1 Notes:

- (1) = not measured
- (2) = not encountered
- (3) = unable to penetrate

7. Stability Assessment

A visual stability assessment was undertaken across the site by two geotechnical engineers from HGEA, along with a review of historical aerial photographs (source: Google Earth), and Lidar data.

The building sites are positioned on gentle to near-flat ground. No evidence of instability, including deep-seated or shallow, was observed within the property.

8. On-site Effluent Soil Category

An assessment of the near-surface soils was undertaken for on-site effluent. The soils encountered were identified as "clay loam", or Category 4 in accordance with AS/NZS 1547.

There is adequate area for discharging effluent within each new lot.

9. Liquefaction Potential

Liquefaction is a phenomenon where saturated low plasticity soils temporarily lose strength due to high pore pressure development during earthquake shaking. It predominantly occurs in loose silts and sands below the groundwater table.

The subject property is underlain by very stiff to hard volcanic loams. No low strength material or groundwater was found in any of the hand augered boreholes. Therefore, the site is unlikely to be subject to liquefaction.

10. Recommendations and Conclusions

10.1. Stability

The property is mapped as low-risk instability according to WDC GIS Hazard Map. Slopes across the property are broad, gentle to near flat land (less than 8°) with no indication of shallow or deep-seated instability. We therefore conclude that the proposed development is stable.

10.2. Earthworks

Earthworks for creating flat building platforms and accessways will be minor including no more than stripping of topsoil and some levelling.

10.3. Access

The land over which the driveways will be formed is gentle to flat.

10.4. Foundations

The site is underlain by stiff to hard soil with shear strengths between 160kPa and +230kPa (UTP). The ultimate bearing capacity of this soil is 300kPa.

Soils have been visually assessed to be expansive, therefore are not considered to be "good ground" as described in NZS 3604:2011. We recommend Atterberg limit testing be undertaken at the building consent stage to provide an appropriate minimum foundation embedment depth to accommodate soil expansivity.

There are no other constraints on the type of foundation suitable on the site.

10.5. RMA Section 106

Based on our findings and subject to our recommendations on stability, foundations, earthwork at identified building sites, the risk of future instability affecting the property is low, and in terms of Section 106 of the RMA:

- a) the land in respect of which a consent is sought, or any structure on the land, is not, and is not likely to be, subject to material damage by slippage from any source; and
- c) that sufficient provision has been made for stable physical access to each allotment to be created by the subdivision.

10.6. On-site Effluent Disposal

Soils have been assessed for on-site effluent disposal in terms of AS/NZS 1547:2012 and the Regional Plan for Northland (2019).

Soils are categorised as clay loam, or Category 4 in terms of AS/NZS 1547:2012. Based on the soil type and site topography, secondary treated effluent to surface Pressure Compensated Dripper Irrigation (PCDI) is recommended. A Design Irrigation Rate (DIR) of 3.5mm/day is recommended for this soil type based on AS/NZS 1547:2012.

The proposed effluent sites are situated on gentle slopes. No indication of instability was observed across or near the effluent sites. Excavated topsoil from the earthworks may be used for irrigation areas to be planted with approved vegetation.

Table 2 below shows the effluent field size based on a four-bedroom house with a design occupancy of 6 people.

Table 2: Summary of Disposal Field Sizing

Number of potential bedrooms	4
Design occupancy (Based on Bedrooms)	6
Tank water supply	180l/person/day
Total effluent	1080l/day
Soil category	4
Design irrigation rate	3.5mm/day
Irrigation area required	310m ²
Reserve area required (30%)	95m ²
Total area	405m ²

Table 3 below presents the minimum required and available separation distances from surface features and groundwater.

Table 3: Permitted Activity Effluent Disposal Field Separation Distances

Separation Distances (m) for Secondary Treatment System		
Item	Required	Available
Buildings/houses	3	More than 3
Property boundary	1.5	More than 1.5
Surface water	15	More than 15
Water supply bore	20	More than 20
Groundwater	0.6	More than 0.6
Retaining wall and embankments, escarpments, cuttings	3m or 45° angle from toe of the wall (whichever is greatest)	More than 3m
Flood Plain	1:20	The effluent fields are outside of this zone

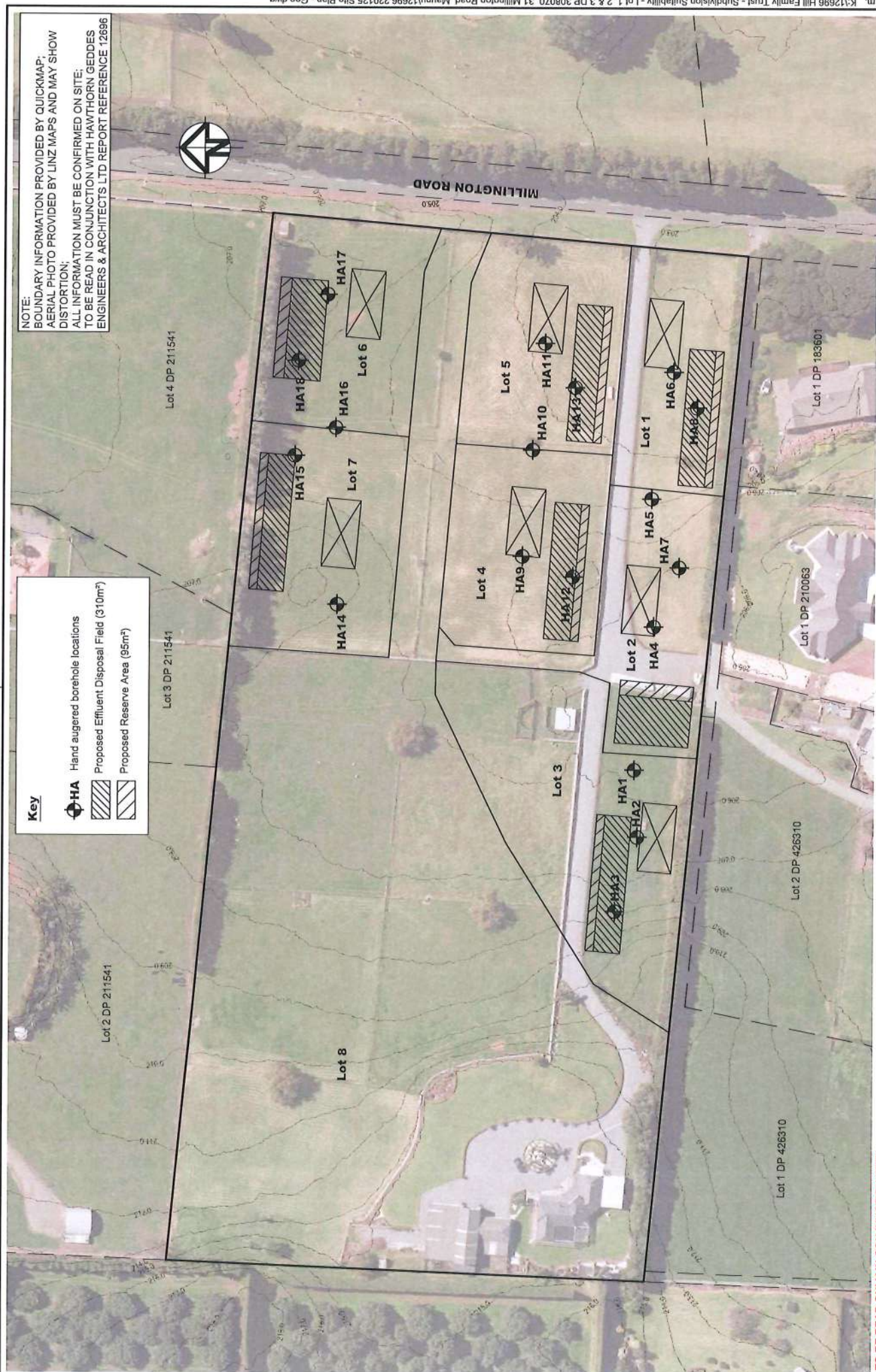
11. Limitation

Recommendations and opinions in this report are based on data from the investigation described herein. The nature and continuity of subsoil conditions away from the boreholes is inferred and it is possible that actual conditions could vary from those assumed. Should subsoil conditions vary from those described in this report, it is essential that Hawthorn Geddes engineers and architects ltd be contacted to confirm the applicability of the recommendations.

This report has been prepared solely for the benefit of our client Wayne Hill Family Trust and the Whangarei District Council in relation to the resource consent application for which this report has been prepared.

The comments in it are limited to the purpose stated in this report. No liability is accepted by Hawthorn Geddes engineers & architects ltd in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk.

Appendix A – Figures



NOTE:
BOUNDARY INFORMATION PROVIDED BY QUICKMAP;
AERIAL PHOTO PROVIDED BY LINZ MAPS AND MAY SHOW
DISTORTION;
ALL INFORMATION MUST BE CONFIRMED ON SITE;
TO BE READ IN CONJUNCTION WITH HAWTHORN GEDDES
ENGINEERS & ARCHITECTS LTD REPORT REFERENCE 12696

Key

HA

Hand augured borehole locations

Proposed Effluent Disposal Field (310m²)

Proposed Reserve Area (95m²)

**TO BE READ ONLY IN CONJUNCTION WITH
ASSOCIATED REPORT**

USE WRITTEN DIMENSIONS. DO NOT SCALE FROM DRAWING.
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SITE PLAN
SCALE - 1:1000

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Whangarei 0110
Phone: 09 438 7139
hg@hgus.co.nz

CLIENT WAYNE HILL FAMILY TRUST
PROJECT GEOTECHNICAL INVESTIGATION
31 MILLINGTON ROAD, MAUNU
DRAWING SITE PLAN

SCALE @ A3 1:1000

PROJECT No 12696

FIGURE No 01

REV R2

24/03/2022 9:27:58 a.m. K:\12696 Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 308070, 31 Millington Road, Maunu\12696 220125 Site Plan - Geo.dwg

Appendix B – Borehole Logs

CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY GS
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
			0.20			
		SV = UTP (GEO287)		silty CLAY; reddish brown, moist, highly plastic, hard		
		SV = UTP (GEO287)				
1		SV = 233+ kPa (GEO287)				
		SV = UTP (GEO287)				
			1.50			
		SV = UTP (GEO287)		clayey SILT; reddish brown, moist, highly plastic, hard		
2		SV = UTP (GEO287)				
		SV = 233+ kPa (GEO287)				
		SV = UTP (GEO287)				
		SV = 166 / 91 kPa (GEO287)				
3	18 20	SV = UTP (GEO287)		3.00 EOH: 3.10m		
				3.0m: some basalt gravels (MPS=5mm)		

Groundwater Not Encountered

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↗ Water Out flow
- ↘ Water In flow

CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY GS
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
			0.20	clayey SILT; reddish brown, moist, hard, highly plastic	Groundwater Not Encountered	
1			1.00 EOH: 1.00m			
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
REMARKS			
<p>SYMBOLS</p> <p>▼ Standing Water Level</p> <p>◁ Water Out flow</p> <p>▷ Water In flow</p>			



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START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY AA
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
			0.20			
		SV = UTP (GEO952)		silty CLAY; reddish brown, moist, highly plastic, hard		
		SV = UTP (GEO952)				
1		SV = UTP (GEO952)				
		SV = UTP (GEO952)				
		SV = UTP (GEO952)				
		SV = UTP (GEO952)				
2	14		2.00	EOH: 2.40m		
	15			2.0m: poor recovery (refusal)		
	12					
	18					
	20					

Groundwater Not Encountered

PHOTO / SKETCH



WATER OBSERVATIONS

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REMARKS

SYMBOLS

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- ↗ Water In flow

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DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY AA
HOLE LOCATION refer to site plan


DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
1	20	SV = 205+ kPa (GEO952)		TOPSOIL: SILT; dark brown, moist, some organics	Groundwater Not Encountered	
		SV = UTP (GEO952)		SILT; some clay, reddish brown, moist, hard, moderately plastic		
		SV = UTP (GEO952)		1.00 EOH: 1.00m 1.0m: No recovery		

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ⚡ Water Out flow
- ▽ Water In flow



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY AA
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
		SV = UTP (GEO952)	0.30	SILT; minor clay, reddish brown, moist, hard, slightly plastic	Groundwater Not Encountered	
1		SV = UTP (GEO952)	1.00 EOH: 1.00m 1.0m: No recovery			
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
REMARKS			
SYMBOLS			
Standing Water Level Water Out flow Water In flow			



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
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DRILLING METHOD 50mm Hand Auger
LOGGED BY AA
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
			0.20	SILT; minor clay, reddish brown, moist, slightly plastic	Groundwater Not Encountered	
1			0.80 EOH: 0.80m 0.8m: No recovery			
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↖ Water Out flow
- ↗ Water In flow



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY AA
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics	Groundwater Not Encountered	
			0.20	SILT; minor clay, reddish brown, moist, hard, slightly plastic		
			0.60 EOH: 0.60m 0.6m: No recovery			
1						
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↖ Water Out flow
- ↗ Water In flow

CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
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 START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
 DRILLING CONTRACTOR _____
 DRILLING METHOD 50mm Hand Auger
 LOGGED BY GS
 HOLE LOCATION refer to site plan

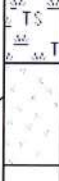
DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
	20	SV = UTP (GEO287)		TOPSOIL: SILT; dark brown, moist, some organics SILT; minor clay, reddish brown, moist, hard, slightly plastic EOH: 0.50m 0.5m: No recovery	Groundwater Not Encountered	

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↖ Water Out flow
- ↗ Water In flow



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY GS
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
		SV = UTP (GEO287)	0.20	SILT; minor clay, reddish brown, moist, hard, slightly plastic	Groundwater Not Encountered	
	20	SV = UTP (GEO287)				
1		SV = UTP (GEO287)	0.90 EOH: 0.90m 0.9m: No recovery			
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↖ Water Out flow
- ↗ Water In flow



LOG OF HAND AUGER

HA11

PAGE 1 OF 1

CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger (2x A3 pages)
LOGGED BY GS
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
		SV = UTP (GEO287)	0.30	SILT; minor clay, reddish brown, moist, hard, slightly plastic	Groundwater Not Encountered	
	20	SV = UTP (GEO287)	0.80 EOH: 0.80m 0.8m: No recovery			
1						
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↗ Water Out flow
- ↘ Water In flow




LOG OF HAND AUGER

HA12

PAGE 1 OF 1

CLIENT	Wayne Hill Family Trust	PROJECT	Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER	12696	PROJECT LOCATION	31 Millington Road, Maunu
START DATE	18/01/22	COMPLETED DATE	18/01/22
COORDINATES	LEVEL 0.00		
DRILLING CONTRACTOR			
DRILLING METHOD	50mm Hand Auger		
LOGGED BY	AA		
HOLE LOCATION	refer to site plan		

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
				0.30		
				SILT; some clay, reddish brown, moist, hard, moderately plastic		
				0.60 EOH: 0.60m		
				0.6m: No recovery		
1						
2						

PHOTO / SKETCH 	WATER OBSERVATIONS			
	Date / Time	Water Level (m)	Type	Remarks
	REMARKS <div> SYMBOLS ▼ Standing Water Level ↖ Water Out flow ↗ Water In flow </div>			



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY AA
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				<p>TOPSOIL: SILT; dark brown, moist, some organics</p> <p>0.20</p> <p>clayey SILT; reddish brown, moist, highly plastic, hard</p> <p>0.60 EOH: 0.60m</p> <p>0.6m: No recovery</p>	Groundwater Not Encountered	

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks
REMARKS			
<p>SYMBOLS</p> <p>▼ Standing Water Level</p> <p>↙ Water Out flow</p> <p>↘ Water In flow</p>			



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY GS
HOLE LOCATION refer to site plan

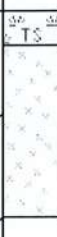
DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
	20	SV = UTP (GEO287)		0.10 TOPSOIL: SILT; dark brown, moist, some organics SILT; some clay, reddish brown, moist, hard, moderately plastic 0.60 EOH: 0.60m 0.6m: No recovery	Groundwater Not Encountered	
1						
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↖ Water Out flow
- ↗ Water In flow



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY AA
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				TOPSOIL: SILT; dark brown, moist, some organics		
			0.30	SILT; minor clay, reddish brown, moist, slightly plastic	Groundwater Not Encountered	
			0.80 EOH: 0.80m 0.8m: No recovery			
1						
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↖ Water Out flow
- ↗ Water In flow



CLIENT Wayne Hill Family Trust PROJECT Wayne Hill Family Trust - Subdivision Suitability - Lot 1, 2 & 3 DP 3
PROJECT NUMBER 12696 PROJECT LOCATION 31 Millington Road, Maunu
START DATE 18/01/22 COMPLETED DATE 18/01/22 COORDINATES _____ LEVEL 0.00
DRILLING CONTRACTOR _____
DRILLING METHOD 50mm Hand Auger
LOGGED BY GS
HOLE LOCATION refer to site plan

DEPTH (m)	SCALA (Blows / 100mm)	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER	DEPTH (m)
				0.10 TOPSOIL: SILT; dark brown, moist, some organics SILT; minor clay, reddish brown, moist, slightly plastic	Groundwater Not Encountered	
				0.50 EOH: 0.50m 0.5m: No recovery		
1						
2						

PHOTO / SKETCH



WATER OBSERVATIONS

Date / Time	Water Level (m)	Type	Remarks

REMARKS

SYMBOLS

- ▼ Standing Water Level
- ↖ Water Out flow
- ↗ Water In flow

HOLE LOCATION refer to site plan

Water in flow

Appendix C – EES-SEW 1 Form

WHANGAREI DISTRICT COUNCIL

Forum North • Private Bag 9023 • Whangarei 0148 • New Zealand
Telephone (09) 430 4200 • 0800 WDC INFO • Facsimile (09) 438 7632
Website <http://www.wdc.govt.nz> • mailroom@wdc.govt.nz

Form EES-SEW1

On-Site Wastewater Disposal Investigation/Site Evaluation Checklist for Resource Consent Application

This form is to be read in conjunction with AS/NZS 1547:2000 (or any amendments as applicable), and, in particular with Part 4: Means of Compliance

PART A – Contact Details

1 Applicant

Name: Wayne Hill Family Trust

Property Address: 31 Millington Road, Maunu.....

Lot/DP Number: Lots 1,2 & 3 DP 308070

2 Consultant/Site Evaluator

Site Evaluator Name: Ayda Azimi

Company Name: Hawthorn Geddes engineers and architects ltd

Postal Address: PO Box 575, Whangarei

Business Phone: 09 438 7139..... Fax:

Mobile: 021704236

Email: aa@hgcs.co.nz

IQP Registered²⁵ (see note below):

☐ Yes ☒ No (If no, details of suitably registered IQP who will countersign the report are to be supplied below)

Name of IQP who is countersigning report: James Blackburn

Company Name: Hawthorn Geddes engineers and architects ltd

Postal Address: PO box 575, Whangarei.....

Business Phone: 09 438 7139..... Fax:

Mobile:0274785033

Email: jcb@hgcs.co.nz.....

²⁵ It is a requirement that the Evaluator be IQP registered to carry out on-site effluent investigations/designs. If not, then evaluation/design will need to be countersigned by a suitably registered IQP.

PART B – Site and Soil Evaluation

1 Desk Study

Requirements (tick appropriate box)

Please complete **all** options (if more than one option applies to land under consideration, please clarify with supporting information).

WDC Requirement	Applies to Lot(s)	Comments
1 Hazard maps/GIS hazard layer – stability		
Low instability risk	All lots	
Medium instability risk		
High instability risk		
2 GIS hazard layer – effluent on slope stability		
Low disposal potential	All lots	Effluent sites are over relatively flat to gentle ground
Moderate disposal potential		
High disposal potential		
3 GIS hazard layer – effluent suitability		
Medium unsuitability	All lots	
High unsuitability		
4 GIS hazard layer – flood susceptibility		
Is flood susceptible		
Is partially flood susceptible		
Is not flood susceptible	All lots	
5 GIS land resource layer – streams		
Are there streams on or adjacent to land under investigation?	<input type="checkbox"/> Yes	
	<input checked="" type="checkbox"/> No	All lots
6 GIS land resources layer – aquifers at risk		
Is land situated over or adjacent to aquifer?	<input type="checkbox"/> Yes	
	<input checked="" type="checkbox"/> No	All lots
7 annual rainfall (HIRDS)	1300mm/year	

Important Note

It is to be noted that **all** information obtained off WDC GIS/Hazard Maps is to be taken as a guide **only**.

All information obtained from the above sites is to be confirmed by a specific site investigation as localised conditions could vary substantially. However, should the above data checks indicate the potential for a hazard/non-complying activity etc, this **must** be further investigated to confirm/deny the indicated situation.

2 Consultant/Site Evaluator

a) Determination of Soil Category (refer table 4.1.1 AS/NZS 1547:2000) (tick appropriate box)

Soil Category	Structure	Applies to Lot(s)	Comments
1 Gravels & Sands	Structureless (massive)		
2 Sandy Loams	Weakly Structured		
	Massive		
3 Loams	High/Moderate Structured		
	Weakly Structured or Massive		
4 Clay Loams	High/Moderate Structured	All lots	
	Weakly Structured		
	Massive		
5 Light Clays	Strongly Structured		
	Moderately Structured		
	Weakly Structured or Massive		
6 Medium to heavy clays	Strongly Structured		
	Moderately Structured		
	Weakly Structured or Massive		

Notes

Refer 4.1.A4 – Soil Assessment AS/NZS 1547:2000 for assessment criteria.

Details of the method used to determine soil type etc are to be clearly stated, along with positions of boreholes/test pits etc clearly marked on a site plan. Borelogs are to be provided. Photos should be included.

The site plan also clearly show the intended area for effluent disposal, along with any site features such as drains, water bores, overland flows etc, along with separation distance achieved.

On-Site Evaluation Continued

b) Site Characteristics for Proposed Disposal Area: (if there is a marked difference between sites, please fill in a separate form for each site and clearly note which site the assessment applies to) (tick appropriate box)

Details	Applies to site(s)
---------	--------------------

1 Flooding potential to proposed field and reserve field

Fields will not flood, or	All lots
---------------------------	----------

Fields will flood in:

20% AEP event	
5% AEP event	
1% AEP event	

2 Surface water separation to proposed field and reserve field

Main/reserve disposal field comply with NRC rules	All lots
Main/reserve disposal field do NOT comply with NRC rules	

3 Winter groundwater separation to proposed field and reserve field

Main/reserve disposal field comply with NRC rules	All lots
Main/reserve disposal field do NOT comply with NRC rules	

4 Slope of ground of proposed field and reserve field

Description: assessed to be flat to low angled

5 Shape of ground of proposed field and reserve field

<input type="checkbox"/> Waxing divergent	<input type="checkbox"/> Linear divergent	<input type="checkbox"/> Waning divergent
<input type="checkbox"/> Waxing planar	<input checked="" type="checkbox"/> Linear planar	<input type="checkbox"/> Waning planar
<input type="checkbox"/> Waxing convergent	<input type="checkbox"/> Linear convergent	<input type="checkbox"/> Waning convergent

Comments:

.....

.....

.....

6 Intended water supply source	Applies to site(s)
Public supply	
Rainwater	All lots
Bore	

7 Proposed method of disposal and recommended Daily Loading Rate (DLR)

Description: 3.5mm/day for recommended DIR, proposed method is secondary treatment to pressure compensated dripper irrigation (PCDI).....

.....

.....

Peak Loading factored in? ☐ Yes ☒ No

Comments:

8 Site Exposure	Description	Applies to Site(s)
Site(s) aspect	Flat to low angled	
Predominant wind direction	West	
Presence of shelter belts	None	
Presence of topographical features or structures	None	

9 Proximity of water bores (include adjacent properties)

More than 100m away from the effluent sites

10 Visible evidence of slip/instability

None

11 Total suitable area available for type of effluent disposal proposed

405m².....

12 Setback areas proposed (if any)

3m from the proposed dwelling, 1.5m from property boundary.....

Notes

- 1 If the WDC hazard maps/GIS indicate a flooding susceptibility on the site being evaluated, an on-site evaluation is to be carried out to determine the effects from 20%, 5% and 1% AEP storm events. This evaluation is to include all calculations to substantiate conclusions drawn. If necessary, include a detailed contour plan and photos.
- 2 NRC Water and Soil plan defines surface water as 'All water, flowing or not, above the ground. It includes water in continually or intermittently flowing rivers, artificial watercourses, lakes and wetlands, and water impounded by structures such as dams or weirs but does not include water while in pipes, tanks, cisterns, nor water within the Coastal Marine area'. By this definition, separation (complying with NRC rules) is to be maintained by both the proposed disposal and reserve areas from any overland flow paths and/or swale drains etc or Resource Consent will be required from NRC. Surface water is to be clearly marked on each site plan, showing the extent of a 1% AEP storm event, and detailing separation distances to main/reserve disposal areas.
- 3 Positions of the test borehole(s) to be shown, and borelogs to be provided. Separation (complying with NRC rules) is to be maintained by both the proposed disposal and reserve areas from winter groundwater levels or Resource Consent will be required from NRC. If the investigation is done outside of the winter period, allowance is to be made in determining the likely winter level.
- 4 Slopes of ground are to be compared with those recommended maximums for type of system proposed (refer Appendix 4.2B AS/NZS 1547:2000). Designs exceeding those maximums will require specific design to justify the proposal, and may also need Resource Consent from NRC.
- 5 Shape of ground is important as it will determine whether there is potential for concentrated overland flows from the upper slopes and also if effluent might be concentrated at base of slope of leeching occurs. Refer Figure 4.1B2 AS/NZS 1547:2000.
- 6 The proposed system (for residential developments) should be sized to accommodate an average three-bedroom house with five people. Site in holiday areas need to take peak loading into effect in determining daily volumes. The design must state what DLR was used to determine area necessary (including reserve area). If ground conditions are marginal for type of disposal proposed, then a soil permeability test utilising the constant head method is to be carried out across the proposed disposal area. Refer Appendix 4.1F AS/NZS 1547:2000.
- 7 The site aspect is important as a north-facing site that is not sheltered from wind and sun by shelterbelts or other topographical features or structures will perform far better than a south-facing site on the lee of a hill that is shaded from wind and sun etc.
- 8 If any effluent disposal area (including reserve area) proposed has or is adjacent to areas that show signs of instability, then a full report from CPEng (Geotech) will be required to justify the viability of the area for effluent disposal.
- 9 If there are any water bores on the subject property or adjacent properties then a site plan will be required showing bore positions in relation to any proposed effluent field(s).
- 10 If setback areas are proposed to mitigate effects, the extent and position(s) need to be shown on a site plan.

