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8 August 2024

Michaela Groenewegen
Planner
Clutha District Council
P.O. Box 25
Balclutha 9420

Sent via email to:
Michaela.Groenewegen@cluthadc.govt.nz
cc: planning@cluthadc.govt.nz

Hi Michaela,

RM3063 – Peter Barnes – 2 Akatore Road – Response to Further Information Request

We received a request for further information from Clutha District Council on 8 May 2024¹.

In the request for further information, Council requested:

1. An analysis of the application in relation to the *National Environmental Standards for Freshwater*, *National Policy Statement of Freshwater Management* and any other objectives, policies or rules relevant to wetlands under the *Clutha District Plan* or where applicable the rules of the *Otago Regional Plan – Water*.
2. A report in compliance with *AS/NZS 1547:2012 Appendix Site and Soil Evaluation for Planning, Rezoning and Subdivision of Land* assessing the ability of the Lots 2 – 5 to manage effluent dispersal.
3. Sight distance measurements.
4. Change to a LINZ amalgamation condition.

Each of these is dealt with in turn below.

Wetland

The further information request states:

“The Wetlands identified as being 90 – 105 metres from the boundaries of proposed Lot 3 and Lot 4, and within the boundaries of Proposed Lot 1 is classified as a Significant Wetland (H135) under the Clutha District Plan. A greater understanding is necessary of whether the activity could adversely affect the wetland, including activities such as earthworks for accessways required to implement the subdivision works or other earthworks activities reasonable anticipated as part of future residential activity on the

¹Copy of Council's further information request appended at Appendix 1.

proposed lots. It is acknowledged that the National Environmental Standards for Freshwater are administered by the Otago Regional Council, however, as noted above a greater understanding of potential adverse effects on the wetland, which is identified in the District Plan as a significant wetland is required. Please provide an analysis of the application against both the:

- *National Environmental Standards for Freshwater; and*
- *National Policy Statement of Freshwater Management*
- *And any other objectives, policies or rules relevant to Wetlands under the Clutha District Plan and where applicable the rules of the Otago Regional Plan – Water.”*

National Policy Statement of Freshwater Management

The National Policy Statement of Freshwater Management² is a central government policy that gives local authorities direction on how freshwater should be managed in New Zealand. It is based on the concept of Te Mana o te Wai (ensuring the life-supporting capacity of freshwater) and requires improvement of degraded water bodies and avoidance of further loss or degradation of natural wetlands and streams. Clauses 3.22 and 3.23 relate to inland wetlands of which the wetland, Coutts Gully Swamp, adjoining the site is an example.

Clause 3.22 sets out changes regional councils must make to their regional plans whilst clause 3.23 details the mapping exercise regional councils must undertake in relation to inland wetlands. The *Regional Plan Water for Otago* includes the mapped extent of Coutts Gully Swamp as shown in Figure 1 below.

² Version dated January 2024.

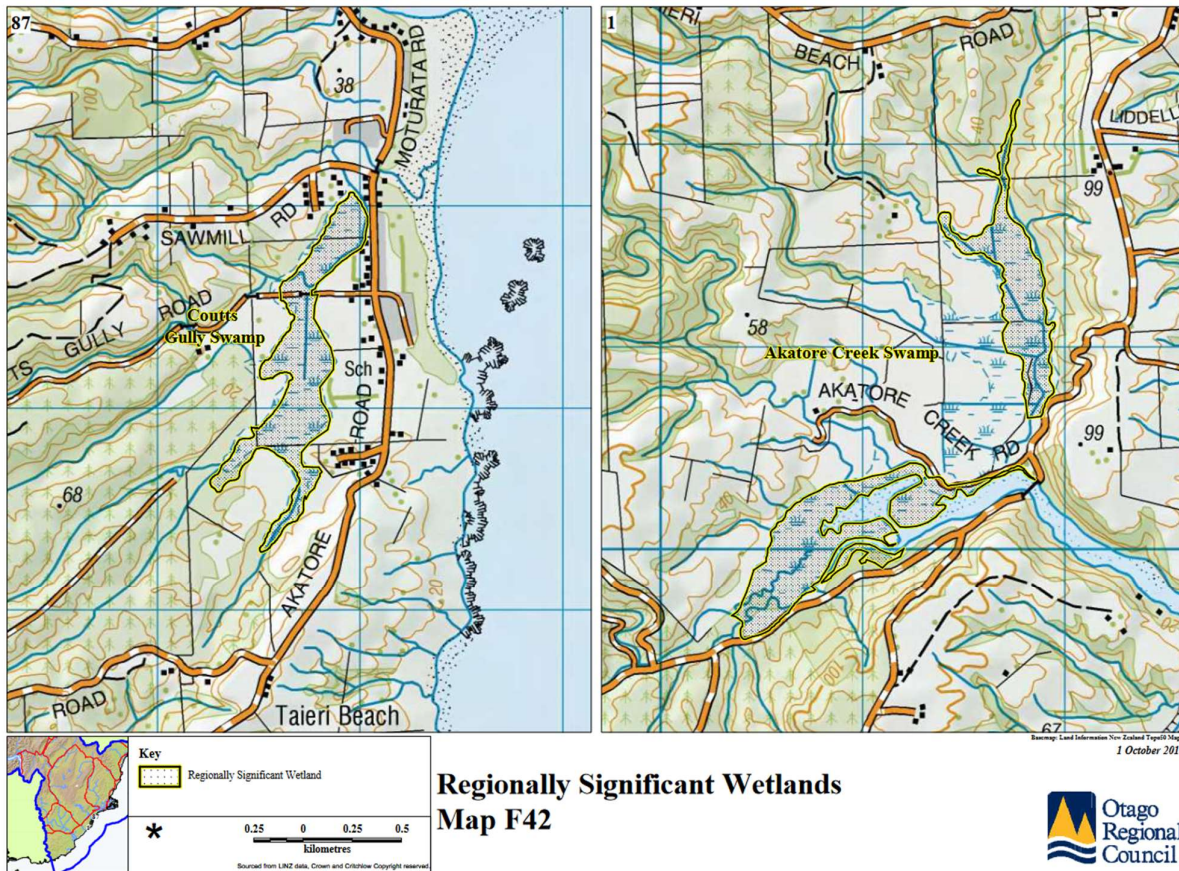


Figure 1: Mapped Extent of Coutts Gully Swamp.

National Environmental Standards for Freshwater

These standards regulate activities that pose risks to the health of freshwater and freshwater ecosystems. Clause 45C sets out urban development activities which have a restricted activity status. Clause 45C proscribes setbacks within which resource consent is required for urban development activities. The urban development activity setbacks proscribed include:

- Vegetation clearance within 10m of the wetland (clause 45C(1)).
- Earthworks or land disturbance within 10m of the wetland (clause 45C(2)) and outside 10m but within 100m of the wetland if it will result in complete or partial drainage of the wetland (clause 45C(3)).
- Taking, use, damming, or diversion of water within 100m of the wetland (clause 45C(4)).
- The discharge of water within 100m of the wetland (clause 45C(5)).

The proposed activity does not include any activities that fall within the ambit of clause 45C(1) – (4).

With respect to clause 45C(5), the subdivision scheme plan has been updated to show the mapped extent of the Coutts Gully Swamp in relation to Lots 2 – 5 and the 100m setback from that mapped extent shown as a dashed line in Figure 2 below.

Mr Scott Cookson, Registered Surveyor, states:

"I found a fairly accurate map online where I could scale the mapped extent of the Coutts Gully Swamp from. The map has been produced by the Otago Regional Council draft Land and Water Regional Plan – Regionally Significant Wetlands. That map can be found at:

<https://www.arcgis.com/apps/mapviewer/index.html?layers=f980b5ca27ca4fcd3ac7249c46cba0e&layerId=10>".



Figure 2: 100m Setback from Coutts Gully Wetland in Relation to Lots 3 & 4.

All the proposed lots are outside the 100m setback from the mapped extent of the Coutts Gully Swamp. This means that no consent is required pursuant to Clause 45C(5) of the National Environmental Standards for Freshwater.

Regional Plan Water for Otago

As stated in the application, the dispersal of treated wastewater will comply with all relevant permitted activity conditions set out in Rule 12.A.1.4.

The discharge of water from the potable water supply (i.e. overspill from full tanks) is permitted pursuant to Rule 12.B.1.6 as it will meet all relevant permitted activity conditions.

The discharge of stormwater from the access to land is a permitted activity pursuant to Rule 12.B.1.9 as the

discharge will not cause flooding of any other person's property, erosion, land instability, sedimentation or property damage.

Earthworks associated with the construction of the access are permitted as the earthworks will comply with all conditions for permitted activities detailed in Rule 14.5.1.1.

District Plan

Coutts Gully Swamp is identified as a natural heritage site, H135, on district planning map U51 and is listed in Table 13.5 as a significant wetland. The descriptor in Table 13.5 for H135 states:

"Salt Rush and Reed Swamp, Succulent Herb Swamp, Rush and Sedge Swamp. Some of habitat tidal. Rather conglomerate wetland, some cleared, partially drained, other parts still in dense vegetation. Excellent breeding and feeding areas."

Table 13.5 refers readers to Rule RRA.13 of the district plan which deals with the clearance, modification, destruction or removal of indigenous vegetation. The proposed activity does not include any clearance, modification, destruction or removal of any indigenous vegetation and so this rule is not applicable to the current application.

The operation of Rule WAT.3 means that resource consent is required for buildings or structures within 20m of the bank of any wetland listed in Table 13.5. However, this rule is not applicable in the current circumstances as any buildings will be located more than 20m from the bank of Coutts Gully Wetland.

Waste Water

The further information request states:

"Proposed Lots 2-5 are smaller than 4000m², rule SUB.4 C requires the capacity of the ground to disperse of stormwater and sewerage effluent by soakage. Soakage capacity required. This determination cannot be left until Building Consent application time as the area for disposal may not be sufficient and needs to be determined before processing this consent. The subdivision design and its appropriateness are subject to the ability for onsite wastewater management.

Because the lots are smaller than 4000m² and rule SUB.4 C.4 and RRA.11 requires Onsite Wastewater Dispersal certification by a suitably qualified person.

To satisfy 2 a report in compliance with AS/NZS 1547:2012 Appendix C Site and soil evaluation for planning, rezoning, and subdivision of land is required. The report must include a C3.9 Final Plan Report. The report shall also identify any cumulative effects that can be expected from effluent management in the catchment. This includes effects

on groundwater quality and depth and surface water quality as well as salinity results.

This report shall help Council determine if the ground and proposed allotment sizes and shapes are capable of effective disposal of effluent safely within the site as the effects could be more than minor.”

The applicant engaged Fluent Solutions to prepare a report in response to this information request³. Fluent Solutions have determined that AS/NZ1547:2012 requirements can feasibly be met with respect to wastewater dispersal for each of Lots 2 – 5 provided that secondary or advanced level treatment with dispersal via mound irrigation and conservative loading rates are utilised. Fluent Solutions recommend that:

“1. Test pits be excavated across each Lot to confirm detailed localised soil characteristics, permeability barriers and localised groundwater depth. 2. Detailed design of systems to be undertaken by a qualified experienced wastewater professional, at an early layout stage of lot development. Detailed design to include wastewater treatment and dispersal system including loading rates, dispersal field location and size, level of effluent treatment. 3. Wastewater management should include secondary level effluent treatment and mound dispersal. 4. Provision of water reduction fixtures in dwellings. 5. Assessment of pervious and impervious surface areas should be undertaken at detailed Lot layout. Stormwater management would be provided by rainfall tanks (for water supply) with any excess stormflows discharging to soak pits or a vegetated swale that drains to Coutts Gully Swamp (as occurs now). Any stormwater should be located away from wastewater treatment and dispersal systems.”

Sight Distance

The further information request states:

“No sight distance measurements have been supplied to determine Site Stopping Distance for the proposed entrance. In particular the access strip exit sight distance to the right (from the south) needs to be confirmed. Please confirm the sight distance from the proposed access.”

Mr Scott Cookson, Registered Surveyor, states:

“The site stopping distances were measured on-site, and these have been added to the plan. The SSD looking south is 75.7m based on current occupation of the area. If the neighbour were to fence all the way to their boundary, the SSD would reduce to 66.5m

³Copy of the report prepared by Fluent Solutions is appended at Appendix 2.

at the worst case. Speed limit is 50km/h.

The SSD looking north is just shy of 180m, but with the removal of a roadside toetoe bush this would increase to probably about 300m."

An updated subdivision scheme plan showing the SSDs is appended at Appendix 3.

LINZ Amalgamation Condition

The further information request states:

"Land Information New Zealand (LINZ) have advised the proposed amalgamation condition wording is not practicable as not all the ¼ shares in Lot 6 have been accounted for. LINZ have suggested it would be practicable if the wording was changed to:

"That Lot 6 hereon (legal access) be held as to four undivided one-quarter shares by the owners of Lots 2-5 hereon as tenants in common in the said shares, and that individual records of title be issued in accordance therewith".

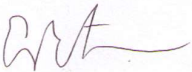
Please advise if you are satisfied with the proposed wording. Once this has been confirmed, Council can then provide a new request to LINZ. If you are not satisfied with the proposed wording from LINZ, please advise what wording you propose to be sent in the new request.

Further to this, please provide an amended Scheme Plan that reflects the updated condition."

Mr Scott Cookson, Registered Surveyor, has included the amalgamation condition suggested by LINZ on the updated subdivision scheme plan appended at Appendix 3.

Please call Emma Peters of our office if you need any further information or would like to discuss anything contained in this response.

Yours sincerely,



Emma Peters Consultant Sweep Consultancy Limited P.O. Box 5724 Dunedin 9054 Phone 0274822214
www.sweepconsultancy.co.nz

Appendix 1: Further Information Request.



**CLUTHA DISTRICT
COUNCIL**

Address all correspondence to:
The Chief Executive

Our Reference
RM3063
ID: 894670

08 May 2024

Peter Barnes
C/- Sweep Consultancy Limited
Po Box 5724
Dunedin 9054

Attention: Emma Peters

Dear Peter Barnes

Receipt of Resource Consent Application- RM3063 – P Barnes – 2 Akatore Road, Taieri Mouth

In accordance with section 92 of the Resource Management Act 1991, Clutha District Council requests that further information be provided for your application.

Information Requested:

Please provide the following information as outlined below.

National Environmental Standards for Freshwater and National Policy Statement of Freshwater Management

1. The Wetlands identified as being 90-105 metres from the boundaries of proposed Lot 3 and Lot 4, and within the boundaries of Proposed Lot 1 is classified as a Significant Wetland (H135) under the Clutha District Plan.

A greater understanding is necessary of whether the activity could adversely affect the wetland, including activities such as earthworks for accessways required to implement the subdivision works or other earthworks activities reasonable anticipated as part of future residential activity on the proposed lots. It is acknowledged that the National Environmental Standards for Freshwater are administered by the Otago Regional Council, however, as noted above a greater understanding of potential adverse effects on the wetland, which is identified in the District Plan as a significant wetland is required.

Please provide an analysis of the application against both the:

- National Environmental Standards for Freshwater; and
- National Policy Statement of Freshwater Management
- And any other objectives, policies or rules relevant to Wetlands under the Clutha District Plan and where applicable the rules of the Otago Regional Plan - Water.

Onsite Wastewater Dispersal

1 Rosebank Terrace
P O Box 25, Balclutha 9240, New Zealand
Telephone + 64 3 4190200 **Fax** + 64 3 4183185
Email help.desk@cluthadc.govt.nz
Website www.cluthadc.govt.nz



2. Proposed Lots 2-5 are smaller than 4000m², rule SUB.4 C requires the capacity of the ground to disperse of stormwater and sewerage effluent by soakage. Soakage capacity required. This determination cannot be left until Building Consent application time as the area for disposal may not be sufficient and needs to be determined before processing this consent. The subdivision design and its appropriateness are subject to the ability for onsite wastewater management. Because the lots are smaller than 4000m² and rule SUB.4 C.4 and RRA.11 requires Onsite Wastewater Dispersal certification by a suitably qualified person.

To satisfy 2 a report in compliance with AS/NZS 1547:2012 Appendix C Site and soil evaluation for planning, rezoning, and subdivision of land is required. The report must include a C3.9 Final Plan Report. The report shall also identify any cumulative effects that can be expected from effluent management in the catchment. This includes effects on groundwater quality and depth and surface water quality as well as salinity results.

This report shall help Council determine if the ground and proposed allotment sizes and shapes are capable of effective disposal of effluent safely within the site as the effects could be more than minor.

Site Distances

3. No sight distance measurements have been supplied to determine Site Stopping Distance for the proposed entrance. In particular the access strip exit sight distance to the right (from the south) needs to be confirmed. Please confirm the sight distance from the proposed access.

LINZ Amalgamation Condition

4. Land Information New Zealand (LINZ) have advised the proposed amalgamation condition wording is not practicable as not all the ¼ shares in Lot 6 have been accounted for. LINZ have suggested it would be practicable if the wording was changed to:

“That Lot 6 hereon (legal access) be held as to four undivided one-quarter shares by the owners of Lots 2-5 hereon as tenants in common in the said shares, and that individual records of title be issued in accordance therewith”.

Please advise if you are satisfied with the proposed wording. Once this has been confirmed, Council can then provide a new request to LINZ. If you are not satisfied with the proposed wording from LINZ, please advise what wording you propose to be sent in the new request.

Further to this, please provide an amended Scheme Plan that reflects the updated condition.

Responding to this Information Request:

You are required to respond to this information request within 15 working days. You have until 28 May 2024 to either:

- Provide the requested information; or
- Provide confirmation in writing that you will provide the requested information, but are unable to provide the requested information within the timeframe (Council will provide a revised timeframe for the information to be provided); or
- Provide written confirmation that you do not agree to provide the requested information.

Until this information is received and assessed by the processing Planner, Council is required to place the processing of your application on hold.

If you have not provided the requested information within the agreed timeframes, or if you do not

provide all of the requested information, the Council will publicly notify your application pursuant to section 95C of the Resource Management Act 1991.

If you should have any question regarding this information request, please do not hesitate to contact me.

Yours faithfully,

A handwritten signature in black ink, appearing to read "Michaela Groenewegen". The signature is written in a cursive style with a large initial "M".

Michaela Groenewegen
Planner
Clutha District Council

MEMORANDUM

TO:	Owners - 2 Akatore Road	Job No.:	842
ATTENTION:	Peter Barnes	Date:	6 August 2024
FROM:	Emma Burford	Page:	1 of 13
SUBJECT:	2 Akatore Rd - Onsite Wastewater Feasibility	Reference:	MM 24-08-01 EB 000842(RevA)

1.0 Introduction

Fluent Solutions have been engaged by Peter Barnes to provide a response for further information associated with RM3063 - 2 Akatore Road, Taieri Beach. This memorandum presents an assessment of the feasibility for onsite wastewater for Lots 2-5, 2 Akatore Road. The assessment is desktop-based and considers the site in terms of AS/NZ1547:2012 requirements for onsite wastewater. It includes a high level assessment of effects and gives some recommendations for the design and construction of onsite wastewater systems on Lots 2-5.

2.0 Site

The site is located off Akatore Road, north of Taieri Beach School. Coutts Gully Swap is located to the west and the coast of the Pacific Ocean to the east, presented in Figure 2.1 below.



Figure 2.1: Site location

MEMORANDUM



Figure 2.2: Site Layout

2.1 Description

The site elevation ranges from around 8m to approximately 10m at the highest point. The site slopes down towards the wetland to the west and slopes gently to the north (as indicated above).

A long section through the swamp, the site (northern boundary) and to the ocean is presented in Figure 2.3 below. A short section elevation is presented in Figure 2.4.

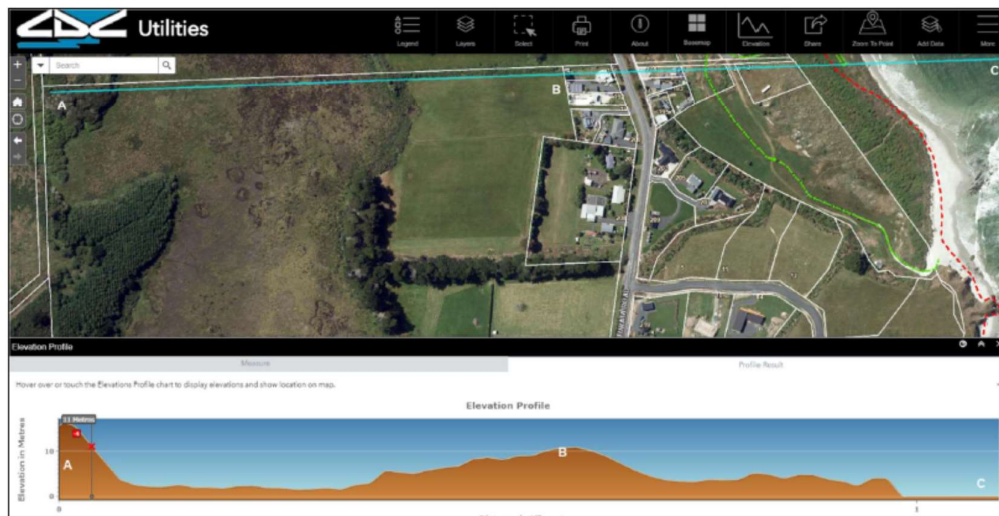


Figure 2.3: Long Section with Elevation Profile through the Site

MEMORANDUM

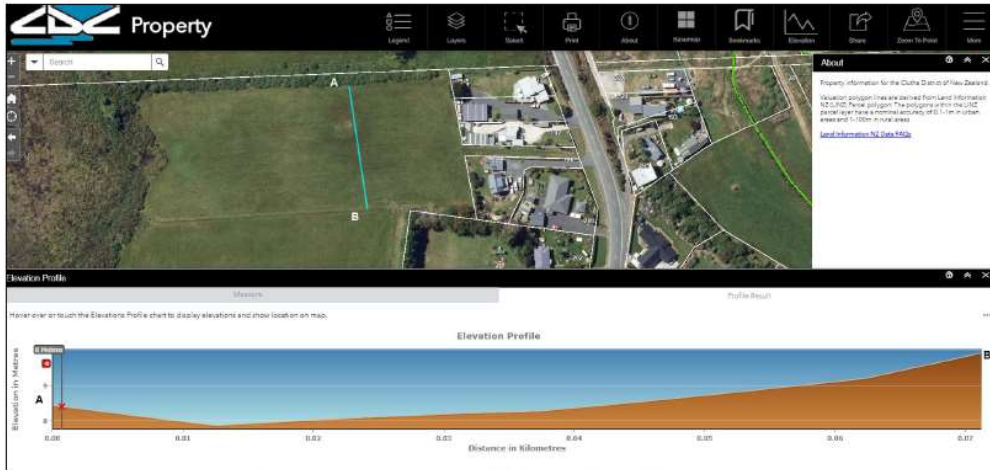


Figure 2.4: Cross Section with Elevation Profile through the Site

The site is currently free draining grass pasture.

2.2 Groundwater

Groundwater depth was estimated based on a high level assessment and local bore information as summarised below.

Groundwater flow direction will generally be east towards the coast, and is therefore likely to have a water elevation of the level of the swamp (2m) dropping to the sea level at the coast.

This is supported by the local bore in the vicinity of the site - I45/0004 presented in Figure 2.5 below. This domestic water supply bore is approximately 250m northeast of the site. The ground level at the bore is approximately 5m¹ and the depth to the ground level is noted as being 3.96m. This results in a calculated ground water level of RL 1.04m above MSL.

MEMORANDUM

¹ Clutha District Council Maps



Figure 2.5: Site Location and Bore Locations Extracted from ORC Website

Groundwater depths on site (assuming a ground elevation on site of 8m) and a ground water elevation of 2m (swamp level), is therefore anticipated to be around 6m. This may decrease in high rainfall, so for the purposes of this assessment we have assumed a depth to groundwater of 5m.

Table R1 of AS/NZ1547:2012 requires a setback from effluent dispersal to groundwater as being 0.6m - >1.5m. Key factors influencing an acceptable setback are the permeability of the soils, sensitivity of the groundwater and receiving environment, rainfall, proximity to drinking water bores, direction of groundwater flow and existing quality of receiving waters.

Meeting this setback requirement is feasible.

2.3 Surface Water

2.3.1 Coutts Gully Swamp

Coutts Gully Swamp is identified as a Regionally Significant Wetland area and is located to the around 133m to the west of the site as shown in Figure 2.6 below.

MEMORANDUM



Figure 2.6: Coutts Gully Swamp Distance

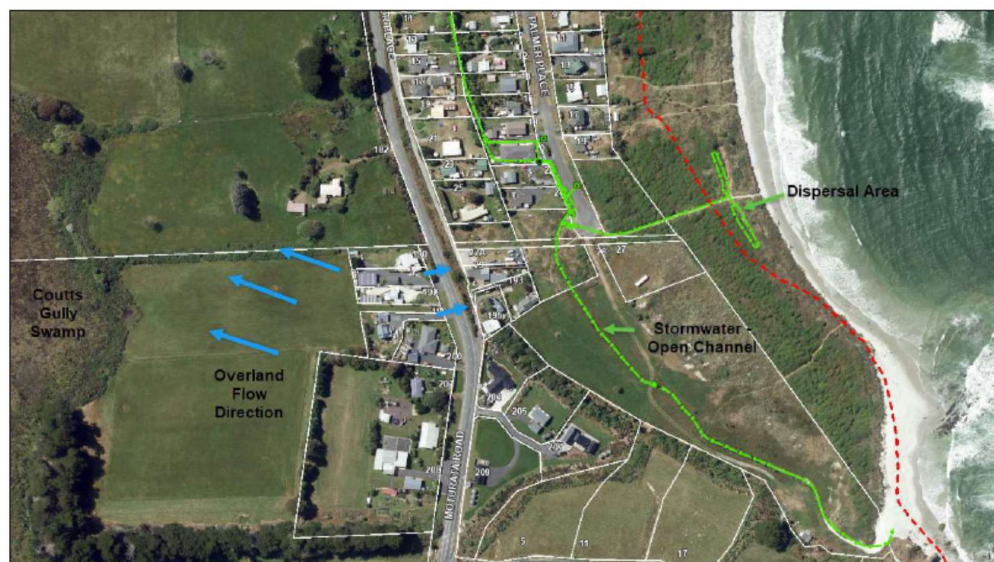
2.3.2 Pacific Ocean

The Pacific Ocean lies around 340m from the site.

2.3.3 Stormwater and Flooding

The site is located outside of Otago Regional Council flood hazard zones. The site is understood to free drain in its predevelopment state, with no known ponding areas. Stormwater overland flow paths are presented in Figure 2.7 below.

The existing stormwater management of the houses to the east is an open channel drainage system to a dispersal area.



2.7: Stormwater Overland Flow Paths

MEMORANDUM

2.4 Receiving Soils

Soils on the site are presented by Landcare Research as a combination of Timaru (60%) and Claremont soils (40%) as presented in Figures 2.8-2.9 below.



Figure 2.8: Site Location and Soil Map. Extracted from Smaps Online.

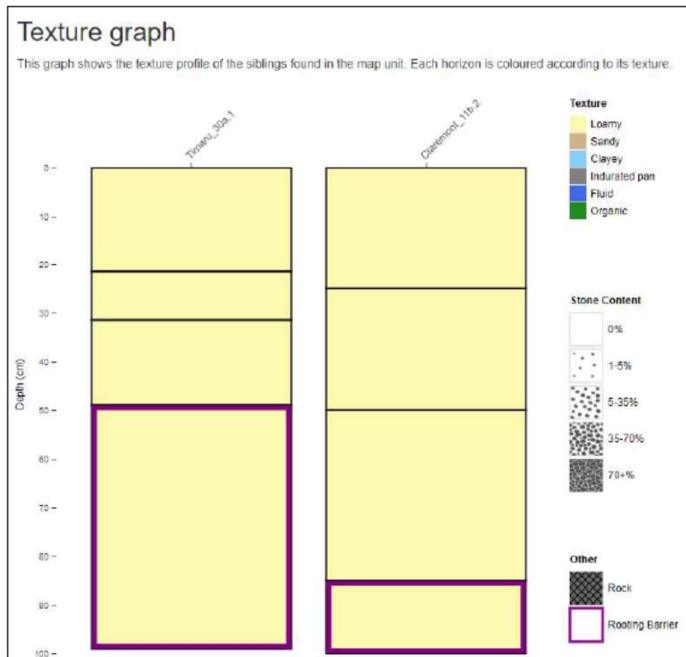


Figure 2.9: Soil Texture. Extracted from, Smaps Online.

MEMORANDUM

The indicative permeability of Claremont and Timaru soils are presented in Figure 2.10 below as being rapid to a depth of 200mm, moderate and moderately slow to depth of 500-850mm with a potential permeability barrier below this.

These permeability rates equate to the following m/day rates:

Permeability	mm/h	m/d
Rapid	>72	1.728
Medium	18 to 72	0.432 to 1.728
MS	4 to 18	0.096 to 0.432

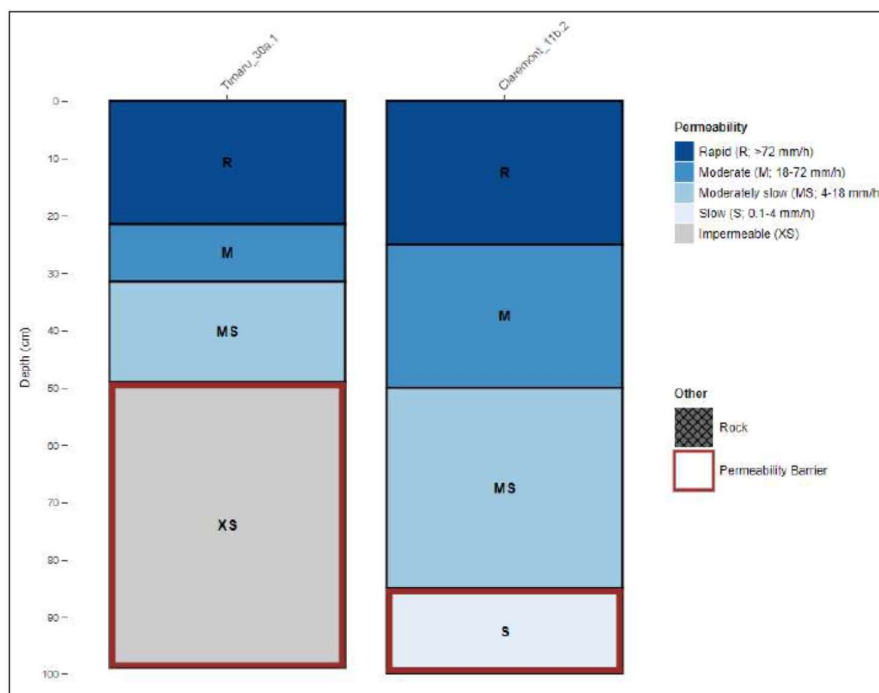


Figure 2.10: Soil Permeability. Extracted from Smaps Online.

Loam soils with these permeability rates are considered to be Category 3 in accordance with AS/NZ15247:2012. The shallow permeability barrier is a constraint to be considered in the design of a dispersal system.

A mound system is recommended in this scenario.

3.0 Onsite Wastewater Management

3.1 Wastewater Flows

Wastewater flows are calculated in accordance with Table H3 AS/NZ1547:2012, presented below. A maximum 180L/person/day is used for this exercise. It is noted that water reduction fixtures in new dwellings can reduce this design flow.

MEMORANDUM

This feasibility assessment assumes a 3-bedroom dwelling on each Lot, accommodating 5 people giving design flows of 900L/day per Lot.

Source	Typical wastewater design flows (L/person/day) (see Note 1)	
	On-site roof water tank supply	Reticulated community or a bore-water supply
Households with standard fixtures (including automatic washing machine)	180	200
Households with standard water reduction fixtures (see Note 2)	145	165
Households with full water-reduction facilities (see Note 3)	120	145
Households (blackwater only) (see Notes 4 and 5)	60	
Households (greywater only) (see Notes 4 and 6)	90	120

Figure 3.1: Wastewater Design Flow Allowances, Table H3 AS/NZ1547:2012

3.2 Wastewater Treatment

Factors that influence the level of wastewater treatment include sensitivity of the receiving environment, proximity to surface water, the permeability of receiving soils, and depth to groundwater.

Secondary level treatment is recommended for Lots 2-5 at 2 Akatore Road. Onsite Wastewater in the Auckland Region GD2021/006 presents expected effluent quality for these levels of wastewater treatment, presented in Figure 3.2 below.

MEMORANDUM

Table 23: Typical wastewater treatment unit stages and associated effluent quality

Treatment unit stage	Primary treatment	Secondary treatment	Advanced secondary treatment	Advanced secondary treatment with nutrient reduction [Note 2]	Advanced secondary treatment with disinfection [Note 3]
BOD ₅ (g/m ³) [Note1]	100-140	≤20	≤10	≤10	≤10
TSS (g/m ³) [Note1]	30-70	≤30	≤10	≤10	≤10
Ammonia (g/m ³)	<30	<5	<5	<5	<5
Total nitrogen (g/m ³)	<100	<40	<40	<25	<40
Total phosphorus (g/m ³)	<20	<10	<10	<8	<10
<i>E. coli</i> (CFU/100 mL) [Note 4]	10 ⁶ - 10 ¹⁰	<10 ⁴	<10 ⁴	<10 ⁴	≤200

Notes:

- 1) 90th percentiles of the samples taken over three testing periods.
- 2) Enhanced and targeted nitrogen reduction is achieved by recycling nitrified wastewater through an anoxic zone and requires specific design and well-controlled operation.
- 3) Disinfection can be achieved by either UV or chlorination. The effectiveness of a disinfection system is affected by the wastewater characteristics. High quality of secondary treated effluent is required to ensure effective disinfection.
- 4) The alternative unit is MPN/100 mL.

Figure 3.2: Wastewater Treatment levels and Effluent Quality. Extracted from Onsite Wastewater in the Auckland Region GD2021/006.

An example of secondary treatment suitable for treating up to 2,000L/day is an Advantex AX 20 Unit, presented below. A smaller unit AX 15, is also available to design flows of up to 1,000L/day. Additional treatment (tertiary), such as UV disinfection, can be added if required.



Figure 3.3: Advantex AX 20 Unit

MEMORANDUM

3.3 Dispersal Method

Mound dispersal systems are suitable for sites with shallow permeability barriers. They can incorporate some planting into the fields, to assist with evapotranspiration.

Figure 3.4 below presents design loading rates for. For Category 3 soils the recommended design loading rate for mound dispersal is 16mm/day.

TABLE 5.2
SOIL CATEGORIES AND RECOMMENDED DESIGN IRRIGATION/LOADING RATES (DIR/DLR) FOR LAND-APPLICATION SYSTEMS

Soil Category	Soil texture	Structure	Indicative permeability (K_{sat}) (m/d)	Design irrigation/loading rate (DIR/DLR) (mm/day)						
				Trenches and beds (see Table L1)			ETA/ETS beds and trenches (Table L1)	Drip and spray irrigation (Table M1)	LPED irrigation (Table M1)	Mounds (basal area) (Table N1)
				Primary treated effluent		Secondary treated effluent				
				Conservative rate	Maximum rate					
1	Gravels and sands	Structureless (massive)	> 3.0	(see Note 1 of Table L1 for DLR values)				5 (see Note 2 of Table M1)	(see Note 3 of Table M1)	32
2	Sandy loams	Weakly structured massive	> 3.0				(see Note 4 of Table L1)	4		24
			1.4 – 3.0	15	25	50				
3	Loams	High/moderate structured	1.5 – 3.0	15	25	50		4 (see Note 1 of Table M1)	3.5	24
		Weakly structured or massive	0.5 – 1.5	10	15	30				16
4	Clay loams	High/moderate structured	0.5 – 1.5	10	15	30	12	3.5 (see Note 1 of Table M1)	3	16
		Weakly structured	0.12 – 0.5	6	10	20	8			8
		Massive	0.06 – 0.12	4	5	10	5			(see Note to Table N1)
5	Light clays	Strongly structured	0.12 – 0.5	5	8	12	8	3 (see Note 1 of Table M1)	2.5 (see Note 4 of Table M1)	8
		Moderately structured	0.06 – 0.12		5	10				
		Weakly structured or massive	< 0.06			8				
6	Medium to heavy clays	Strongly structured	0.06 – 0.5	(see Notes 2 and 3 of Table L1)			(see Notes 2, 3, and 5 of Table L1)	2 (see Note 2 of Table M1)	(see Note 3 of Table M1)	(see Note to Table N1)
		Moderately structured	< 0.06							
		Weakly structured or massive	< 0.06							

Figure 3.4: Soil Categories and Design Loading Rates, Table 5.2 AS/NZ1547:2012

3.4 Dispersal Field Size

Dispersal field footprint sizes for a mound system for a 3 bedroom dwelling is presented below.

- Design Flow: 900L/day
- Design Loading Rate: 16m/day
- Mound Area Required: 56m²

For Lot sizes of 1600m² and 1610m², dispersal fields of 56m² can be easily accommodated if included in early layout design. This footprint size is based on a permeability rate of 0.5-1.5m/day. This should be confirmed with a permeability test prior to detailed design. If permeability was less than this a slightly larger mound system could be feasibly constructed on the site.

MEMORANDUM

4.0 Assessment of Effects of Onsite Wastewater

It is determined that onsite wastewater is feasible for Lots 2-5 presented above. This is conditional to secondary treated effluent and mound dispersal.

A high level assessment of potential effects on the receiving environment has been undertaken. This is the potential effects of onsite wastewater arrangements with conceptual design parameters described in Section 4 above.

4.1 Pathogens

Regarding pathogen attenuation, the main mechanisms that operate within the soil matrix to ensure pathogen removal, are identified as filtration, adsorption and natural physical wear / die-off.

A study by Bohrer and Converse (2000)² was conducted in Wisconsin which evaluated six drip irrigation systems for the treatment of wastewater by septic tanks and aerobic units in soils that ranged from coarse sand to clay loam. They found that beyond approximately 450mm of soil depth the faecal coliform count was below detection limits. At 150 to 300mm soil depth the faecal coliform count ranged from 2 to 24 MPN per gram of soil.

Rubin (2009) (an author of many USEPA publications) in wastewater workshops in NZ stated that they conservatively use one log reduction of bacteria per 150mm of travel through the soil and subsoils.³

A high degree of pathogen removal is achieved in just a short travel distance.

Complete attenuation of pathogens is expected through the underlying soils prior to reaching the groundwater.

The effects of pathogens are considered likely to be less than minor.

4.2 Groundwater

The groundwater level is considered to be > 5m depth. The effects of pathogens from secondary treated effluent dispersed via the mound are considered to be minor, as presented above.

As described in Section 2, the closest bore is approximately 250m to the northeast of the site. AS/NZ1547:2012 requires a setback of 15-50m from bores. Groundwater below the site is not expected to flow in this direction; and is therefore not at risk from contamination from the dispersal fields.

MEMORANDUM

² R. M. Bohrer and J. C. Converse SOIL TREATMENT PERFORMANCE AND COLD WEATHER OPERATIONS OF DRIP DISTRIBUTION SYSTEMS.

³ Rubin, A. R. (2009). Application of Reuse Technology in Onsite Decentralized Systems. Discussion Paper. USEPA Region VI Decentralized Forum.

AS/NZ1547:2012 gives the required depth from the discharge to seasonal water table as being between 0.6m->1.5m. This can feasibly be met with a mound dispersal over ground water depth of 5m.

The level of treatment of the effluent, and the dispersal method over the receiving soils are such that the potential effects of highly treated effluent on groundwater are considered to be minor.

4.3 Surface Water

4.3.1 Stormwater

AS/NZ1547:2012 requires setback of 15-100m⁴ from surface water. Dispersal fields should ideally be located at least 50m from surface water in accordance with permitted activities under the Otago Regional Council Water Plan , including stormwater routes or areas prone to temporary ponding. This is considered feasible on these sites of 1600m² if positioning is considered at an early stage of lot layout design.

4.3.2 Coutts Gully Swamp

Coutts Gully Swamp is a Regionally Significant Wetland greater than 130m to the western boundary of Lots 3 and 4. This is considered a surface water requiring a setback of 15-100m under AS/NZ1547:2012. Constraint factors at 2 Akatore Road, such as Category 3 soils, high quality effluent treatment, a gently site slope and the proposed mound dispersal method mitigate the impacts on surface water and would reduce the set back requirements to less than 100m.

However, being a Regionally Significant Wetland the set back distance should be 100m in accordance with the National Environmental Standards – Freshwater Management. This set back distance of 100m can be met for the development.

The potential effects on Coutts Gully Swamp are considered to be less than minor.

4.3.3 Saline Water

The eastern boundary of Lots 2 and 5 is approximately 340m distance from the edge of the coast. At this distance the highly treated effluent would have nil impacts on the coastal waters.

4.4 Natural Hazards

Secondary treatment systems such as the Advantex example presented above provide storage capacity and an alarm system in order to mitigate against effects from minor earthquake damage to dispersal fields, flooding, or effects of wastewater on floodwater.

Dispersal fields should be positioned away from stormwater routes or areas prone to temporary ponding.

MEMORANDUM

⁴ Table R1: AS/NZS1547:2012 On-site Domestic Wastewater Management

5.0 Stormwater Management

Currently, rainfall in excess of the soils absorbing capacity flows as sheet flow towards Coutts Gully swamp to the north-west. Overland flow paths are presented in Section 2.3 above.

Managing post-development stormwater would be as follows:

- Reduction in site runoff by utilising rainwater storage tanks (required for water supply)
- Excess discharge could be discharged to on-site soak pit / dispersal area or there is potential to create a small vegetated swale to the north that drains clean water to Coutts Gully Swamp (as occurs now).

Details would need to be assessed at the Building Consent stage.

6.0 Recommendations

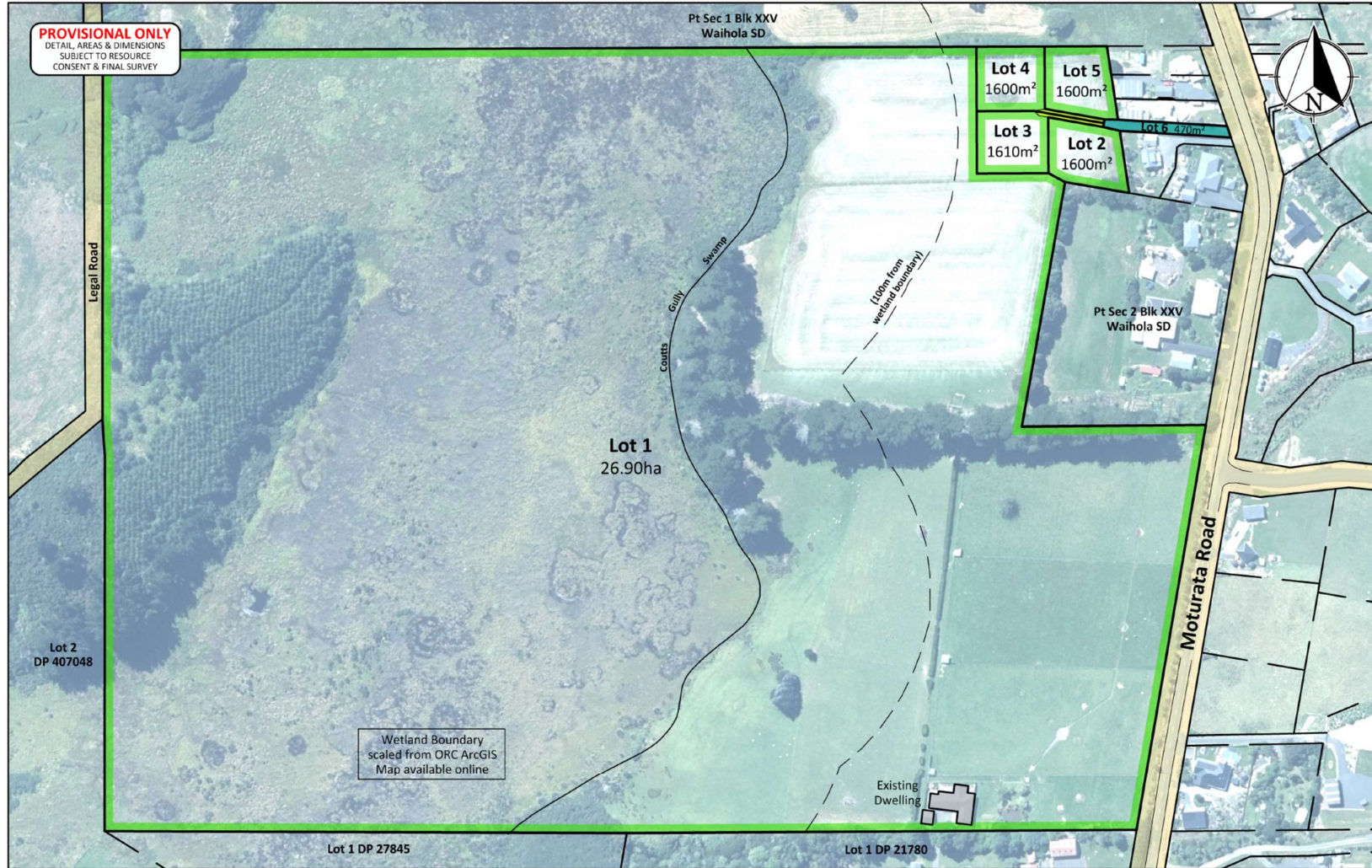
This feasibility assessment is for conceptual secondary or advanced level treatment dispersed via mound irrigation and conservative loading rates.

It is considered that AS/NZ1547:2012 requirements can feasibly be met. The following recommendations are made for wastewater management for the development:

1. Test pits be excavated across each Lot to confirm detailed localised soil characteristics, permeability barriers and localised groundwater depth.
2. Detailed design of systems to be undertaken by a qualified experienced wastewater professional, at an early layout stage of lot development. Detailed design to include wastewater treatment and dispersal system including loading rates, dispersal field location and size, level of effluent treatment.
3. Wastewater management should include secondary level effluent treatment and mound dispersal.
4. Provision of water reduction fixtures in dwellings.
5. Assessment of pervious and impervious surface areas should be undertaken at detailed Lot layout. Stormwater management would be provided by rainfall tanks (for water supply) with any excess stormflows discharging to soak pits or a vegetated swale that drains to Coutts Gully Swamp (as occurs now). Any stormwater should be located away from wastewater treatment and dispersal systems.

MEMORANDUM

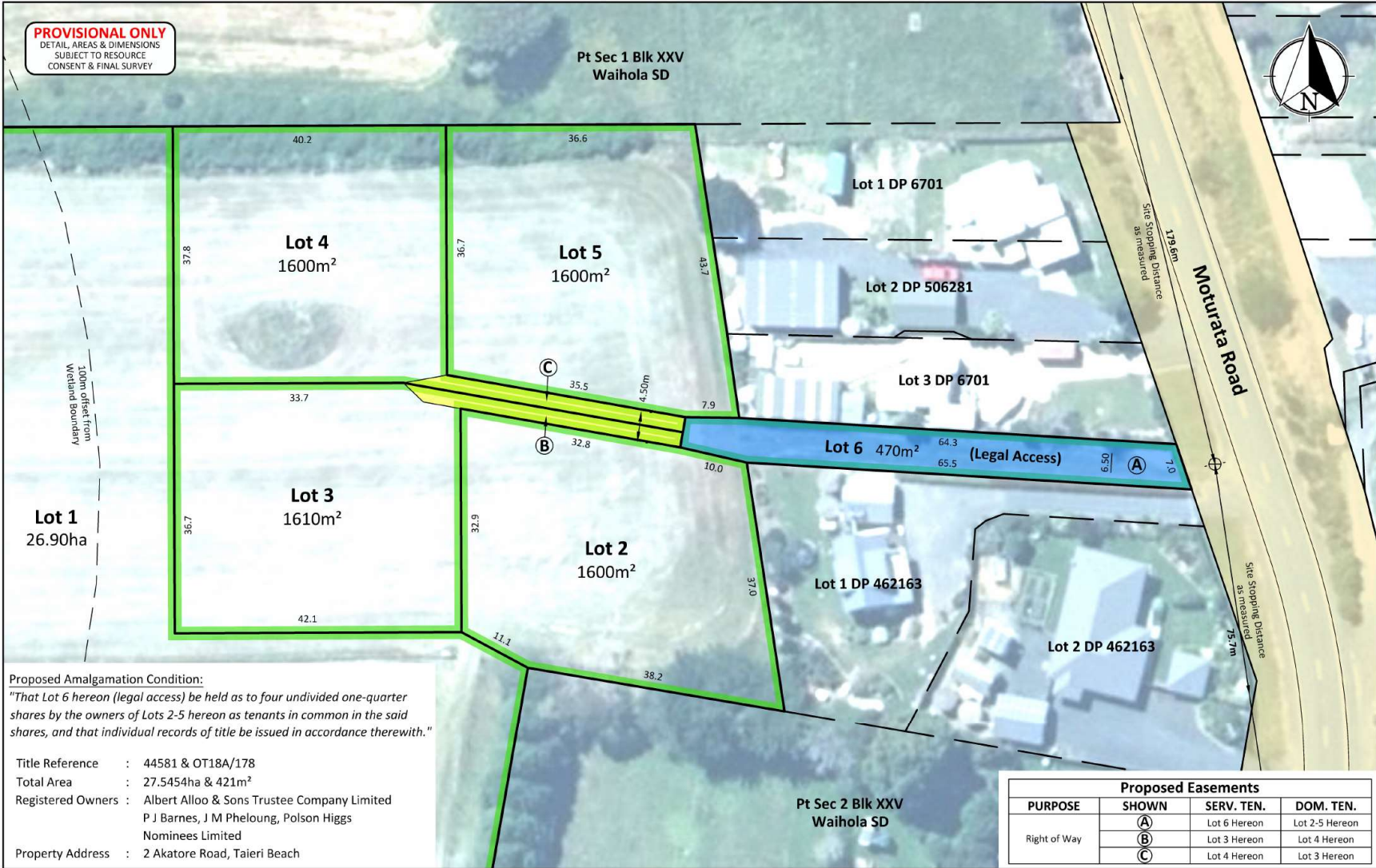
Appendix 3: Amended Subdivision Scheme Plan.



Lots 1-6 Being a Proposed Subdivision of Lot 1 DP 25928 & Lot 1 DP 308807

PROJECT REF.	CLS468	SHEET SIZE	A3	SCALE	1:2000
DRAWN DATE	8 AUGUST 2024	PLAN REF.			
SHEET NO.	SHEET 1 OF 2	PLAN REF.	CLS468-2B		

PROVISIONAL ONLY
 DETAIL, AREAS & DIMENSIONS
 SUBJECT TO RESOURCE
 CONSENT & FINAL SURVEY



Proposed Amalgamation Condition:
"That Lot 6 hereon (legal access) be held as to four undivided one-quarter shares by the owners of Lots 2-5 hereon as tenants in common in the said shares, and that individual records of title be issued in accordance therewith."

Title Reference : 44581 & OT18A/178
 Total Area : 27.5454ha & 421m²
 Registered Owners : Albert Alloo & Sons Trustee Company Limited
 P J Barnes, J M Pheloung, Polson Higgs
 Nominees Limited
 Property Address : 2 Akatore Road, Taieri Beach

Pt Sec 2 Blk XXV
 Waiholā SD

Proposed Easements			
PURPOSE	SHOWN	SERV. TEN.	DOM. TEN.
Right of Way	(A)	Lot 6 Hereon	Lot 2-5 Hereon
	(B)	Lot 3 Hereon	Lot 4 Hereon
	(C)	Lot 4 Hereon	Lot 3 Hereon



Lots 1-6 Being a Proposed Subdivision of Lot 1 DP 25928 & Lot 1 DP 308807

PROJECT REF. CLS468	SHEET SIZE A3	SCALE 1:500
DRAWN DATE 8 AUGUST 2024	PLAN REF.	
SHEET NO. SHEET 2 OF 2	CLS468-2B	