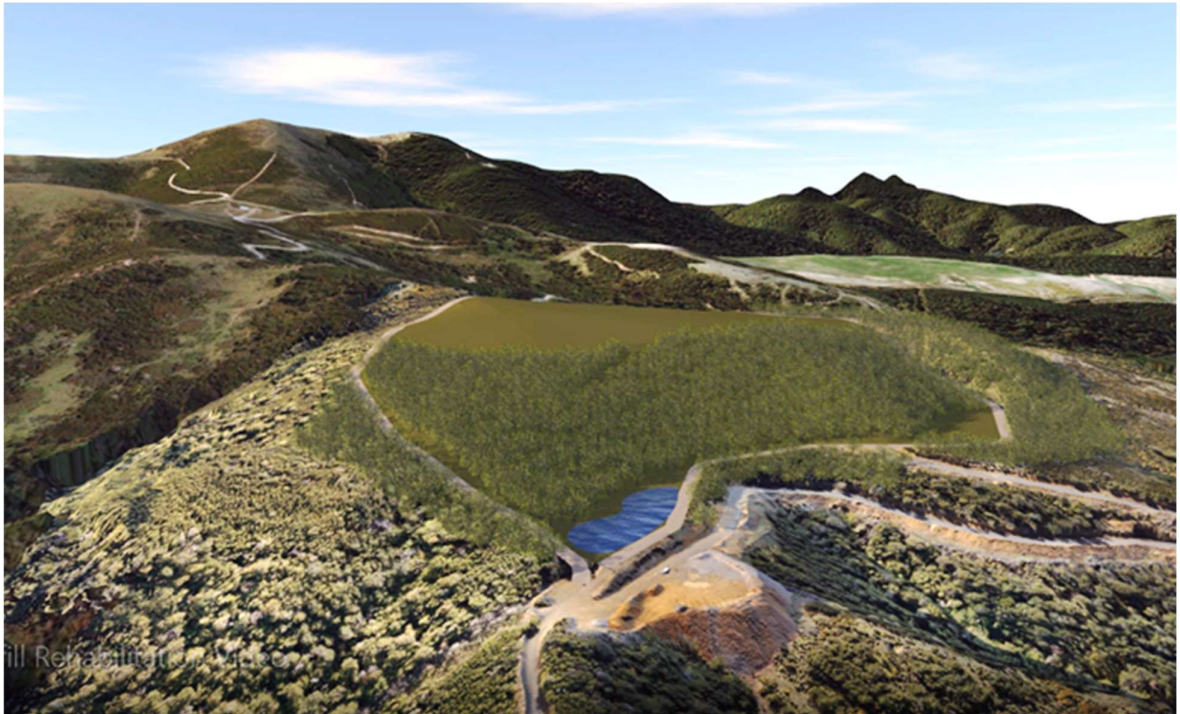


# **Woodstock Landfill**

## **Application**

### **Assessment of Environmental Effects**



**INDIGENOUS REGENERATION *through* INNOVATIVE LANDFILL PRACTICE**

**April 2021**



**DISCHARGE AND LAND USE CONSENT APPLICATION**

**PREPARED FOR:**

**WOODSTOCK QUARRIES LIMITED**

**513 TRIG ROAD, WOODSTOCK**



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## Form 9

### Section 88 Resource Management Act 1991

To Environment Canterbury  
P O Box 345  
CHRISTCHURCH 8140

From Scope Resource Management Limited  
P: 0276965258  
E: scope.resm@gmail.com

1. Woodstock Quarries Limited apply for the following resource consents:

No	Type and term sought	Sub-type	Activity	Rule	Consent status
<b>Canterbury Land and Water Regional Plan/PC7: Waimakariri River Regional Plan/PC2: Canterbury Air Regional Plan</b>					
1	Land use consent (S9 RMA)	Land use	• Excavation of material (quarry rock) over an aquifer.	5.176	Restricted Discretionary
	35 years		• Deposition of material (C & D waste) over an aquifer within 5 metres of highest groundwater	5.178	Restricted Discretionary
	35 years		• Deposition of hazardous waste (contaminated soil) onto land where the contaminant may enter water	5.89	Discretionary
2	Water permit (S14 RMA)	Drain groundwater	• Drain water using subsoil drainage pipes	5.6 LWRP and 5.3 WRRP	Discretionary Non-complying
3	Discharge permit (S15 RMA)	Discharge stormwater to water or to land	• Discharge of clean stormwater and drainage water to land from a contaminated site.	5.76 and 5.97 LWRP	Discretionary
		Discharge contaminant to land	• Discharge of landfill leachate back into landfill	6.2 WRRP	Non-complying
4	Discharge permit (S15 RMA)	Discharge to air	• Discharge landfill gas, leachate, dust and odour to air from an industrial activity (quarry and landfill)	5.6 LWRP	Discretionary
	35 years			7.63(2) CARP	Discretionary

No	Type	Sub-type	Activity (relevant section of the application)	Regulation	Consent status
<b>National Environmental Standard for Freshwater</b>					
5	Land use consent (s9 RMA)	Land use	Taking or discharge of water near wetlands.	54	Permitted
No	Type	Sub-type	Activity (relevant section of the application)	Regulation	Consent status
<b>National Environmental Standard for Air Quality</b>					



6	Discharge permit (S15 RMA)	Discharge to air	Discharge landfill gas, leachate, dust and odour to air from an industrial activity	25 - 27	Discretionary
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2. A description of the activity to which the application relates is:

- To establish and operate a landfill operation accepting construction and demolition waste and contaminated soil within an area excavated for quarrying.

A detailed description of the proposal is contained in the attached Assessment of Environmental Effects.

3. The names and addresses of the owners of the land to which the application relates:

Woodstock Quarries Limited  
C/- Baker Tilly Staples Rodway Christchurch Ltd  
Level 2  
329 Durham Street  
Christchurch Central  
CHRISTCHURCH 8013

4. The location to which the application relates is:

Lot 1 DP 481768  
513 Trig Road  
Woodstock

5. Land Use Consent application will be submitted to the Waimakariri District Council.

6. Attached, in accordance with Schedule 4 of the Resource Management Act 1991, is a description of the proposed activity and an assessment of the actual and potential effects the proposal may have on the environment.

7. Attached is any other information required to be included in the application by the Resource Management Act 1991, or any relevant plans or regulations made under that Act.

Signature of person authorised to sign on behalf of the applicant:



Scope Resource Management Limited  
16 April 2021

**Address for service:**

Scope Resource Management Limited  
E: scope.resm@gmail.com  
P: 0276965258

**Address for Council fees:**

Woodstock Quarries Limited  
C/- Baker Tilly Staples Rodway Christchurch Ltd  
Level 2  
329 Durham Street  
Christchurch Central  
CHRISTCHURCH 8013

Attention: Darryn Shepherd

P: 021373582  
E: [darryn@wql.co.nz](mailto:darryn@wql.co.nz)

## Introduction

### Background

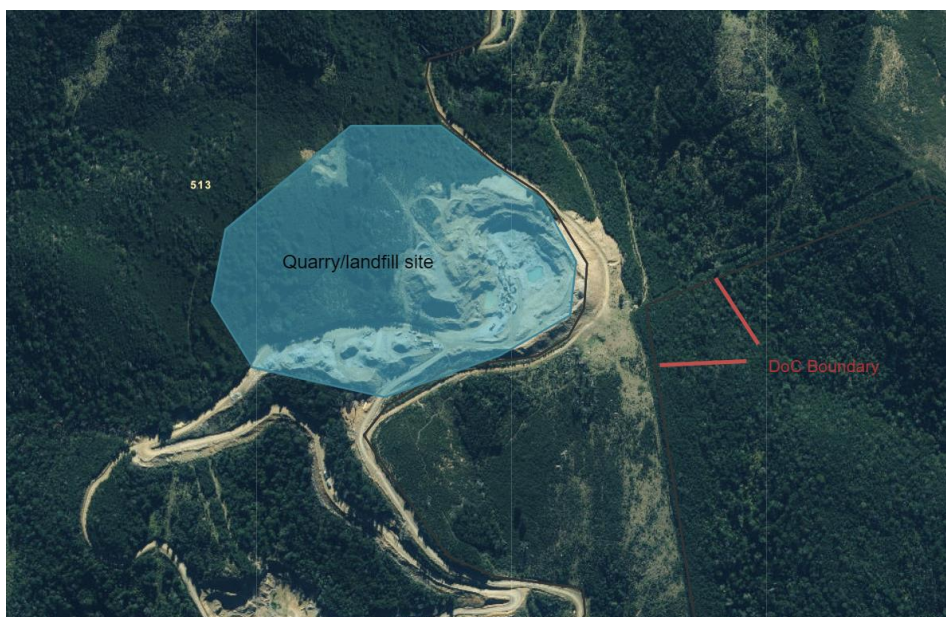
1. This application has been prepared in accordance with Section 88 and the Fourth Schedule of the Resource Management Act 1991 (RMA). It provides a detailed description of the site and the proposal, an assessment of actual and potential effects that may arise from the proposal, and an assessment of the proposal against the relevant statutory framework, including the Canterbury Land and Water Regional Plan and Canterbury Air Regional Plan.

Appendices 1 to 9 are attached in support of, and form part of, the application.

### Proposal overview

2. The proposal is to establish and operate a landfill operation. The landfill is to be located within an area subject to quarrying and will utilise areas where quarrying has resulted in removal of material, thereby creating a void into which material can be deposited (Appendix 2 (Drawing B1)). Waste material will be placed within these previously excavated areas, compacted, filled to a level consistent with adjacent natural landforms, capped with unsaleable material from quarrying (including topsoil), and contained or rehabilitated by planting with grasses or native vegetation over the contained or closed areas (Appendix 2 (Drawings B2, B4, B5)).
3. The extent of the proposed landfill is to be determined by the extent of the quarrying operation, with deposit of material being limited to areas where quarrying has been completed. Figure 1 below illustrates the approximate location of the existing quarry and proposed landfill within the application site, along with the immediately surrounding area.

Figure 1: Landfill location



Source - Canterbury Maps

## Consents sought

4. This application seeks land use consent (s9), and water (s14) and discharge (s15) permits under the Canterbury Land and Water Regional Plan, Waimakariri River Regional Plan, the Canterbury Air Regional Plan and approval under the National Environmental Standard for Fresh Water to enable excavation for quarrying purposes and the establishment and operation of a landfill within the excavated area. More specific detail of consents required is provided below.

## Applicant and property details

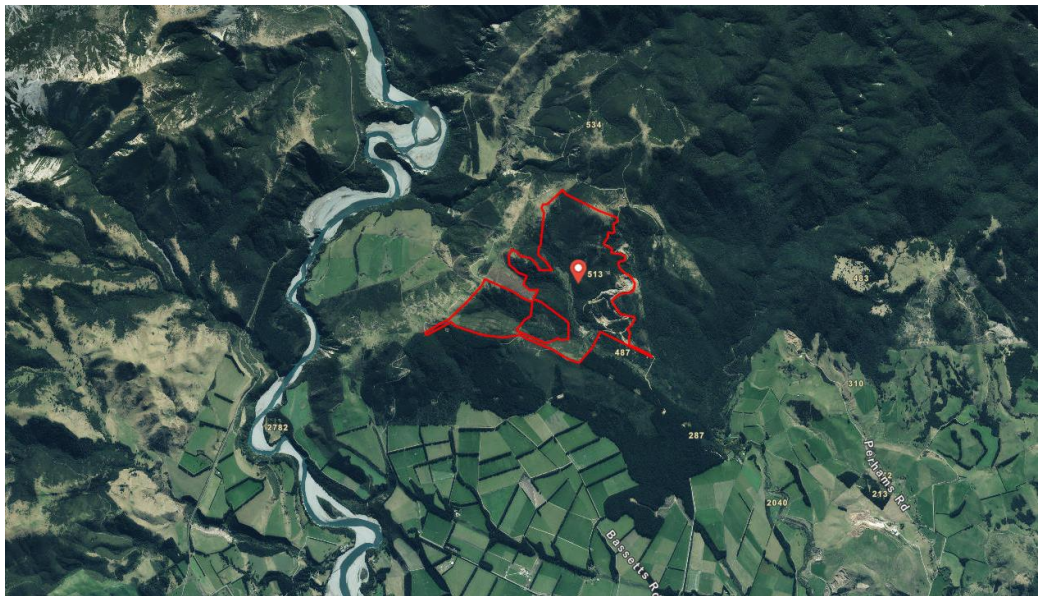
Applicant	Woodstock Quarries Limited.
Property address	513 Trig Road, Woodstock
Property legal	Lot 1 DP 481768. The relevant Record of Title is included in Appendix 1.
Property area	200 hectares
Property owner	Woodstock Quarries Limited
Zone	Rural, Waimakariri District Plan.
Relevant overlays	Waimakariri District Plan: <ul style="list-style-type: none"> <li>• Buffer Outstanding Landscape Area.</li> </ul>

## Site Description

### Site location

5. The application site is located remotely in the foothills between Oxford township and the Waimakariri River gorge at the western end of Trig Road. Oxford township is about 16.5km to the east of the site. Figures 2 and 3 illustrate the wider locational context and distance from Oxford and the Waimakariri River.

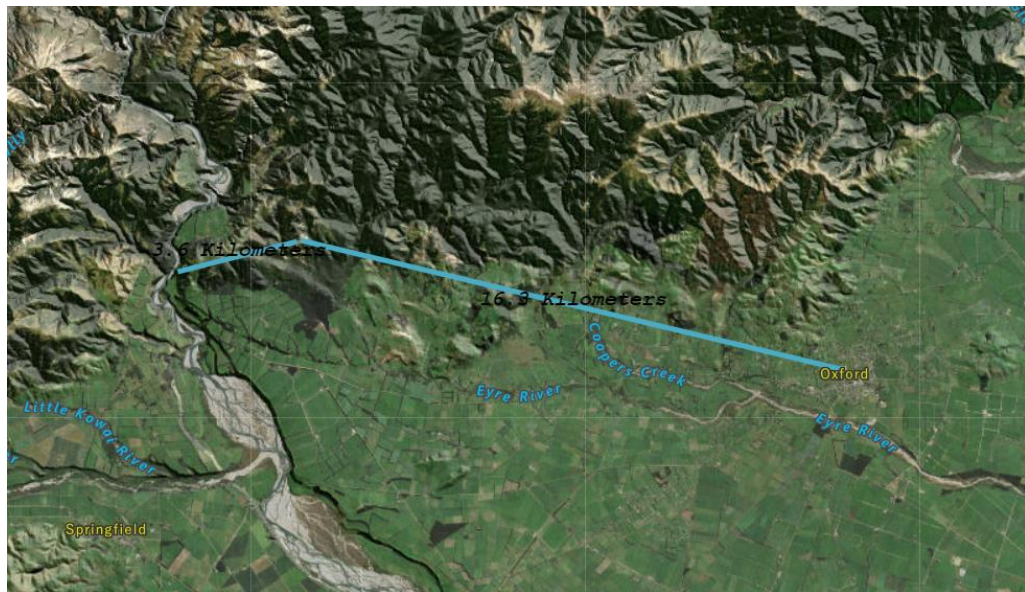
Figure 2: Property location and boundaries





Canterbury Maps

Figure 3: Distance to significant features



Canterbury Maps

### Site history and Current land use

6. The site has a history of native forest logging and pastoral farming, with the site historically being of a significantly larger land area. A recent subdivision created the lot within which the landfill is to be sited. Current land use is focused on quarrying of rock, with the site having been subject to quarrying for a number of years. During this time the quarrying operation has been active in various locations within the site, but is currently focused on one area, where a large excavation has been created. Established infrastructure such as haul roads, working areas and storage areas have been developed in association with the quarrying activity, and is concentrated around the current working area.
7. Stormwater flows from the current quarried area are channelled to a single sedimentation pond via a road side open drain. Discharges from the sedimentation pond is to land, dispersing over the downhill slope in the same area as the discharge point from the proposed sedimentation ponds is proposed. As quarrying operations expand, the sedimentation pond is to be upgraded as proposed in this application.

### Neighbouring sites

8. The site is surrounded by farmland and production forestry to the south, farmland to the west and north, while to the east is land administered by the Department of Conservation and which is part of the Oxford Forest Conservation Area.

### Topography and relative location to significant features

9. The site lies at an elevation of between 440 and 680 metres above mean sea level. Topography within the site varies from flat at the lower elevations, to steep

rough hill country at higher elevations and within gullies. The general land-form consists of two main ridge systems originating at a dominant high point, with a central gully containing a stream leading down from the high point. Within this system there are a number of side ridges and associated minor gullies.

10. No water bodies are present in the immediate area of the proposed landfill, although both adjacent gullies contain streams. Distance to these streams from the quarry/landfill site is 200 metres to the east, and 600 metres to the west, as illustrated in Figure 4 (Canterbury Maps). It is noted that this figure indicates the presence of a waterway to the east and immediately downhill from the quarry/landfill site, however, there is no permanent waterway in this gully.

Figure 4: Distance to streams



11. These streams run to the east and join with the Eyre River approximately 1500 metres from the landfill site. The Eyre River in turn joins with the Waimakariri River approximately 50km from the landfill site.

## Wetlands

12. There are three potential wetland areas identified in the Environment Canterbury Wetland Layer on Canterbury Maps within the site (Figure 5).

Figure 5: Potential wetlands





13. An assessment of these areas by an ecologist (Appendix 6) resulted in the upper 'wetland' area not meeting the criteria set out in the Landcare Research vegetation tool for wetlands. The lower two were found to meet the wetland criteria with a ground survey confirming it as being a continuous area rather than two separate areas as indicated on the Wetland Layer. The confirmed wetland area is some distance from the quarry/landfill site, with the survey confirming no indication of any direct ground or surface water linkage between the current quarry/proposed landfill site and the identified wetland area.

## Vegetation

14. Vegetation in the vicinity of the proposed land fill and immediately surrounding area consists of native and introduced plants of a type that can tolerate poor dry soils. Native vegetation consists mainly of regenerating Beech forest and associated sub-canopy species, all of which has been cut over in both the past and in more recent times. Other native vegetation includes mainly scrubby species such as manuka and matagouri. Areas of improved native grassland are present, as well as formerly cultivated areas consisting entirely of introduced pasture species. These areas were maintained when the site was part of a larger farming operation, but are now being overtaken by invasive weed species. There are no areas of significant indigenous vegetation or significant habitats of indigenous fauna identified in the Waimakariri District Plan on or near the landfill site.

## Buffer Outstanding Landscape Area

15. The site is located within the Buffer Outstanding Landscape Area as identified in the Waimakariri District Plan. This area extends around the front face of the foothills facing the plains, with a key purpose of ensuring maintenance of existing character reflected in the land use outcomes resulting from a working farm environment and dominance of natural topographical features. All approvals required under the Waimakariri District Plan for the quarrying operations have been obtained.

## Climate

16. Climate in the area is generally temperate in nature, although influenced by the foothills location and elevation. North west winds prevail, particularly during spring and autumn, during which times significant rainfall can occur over relatively short periods of time. Summer months are typically hot and dry, while winter is typically cold with wet spells following rain and snow events and frosts following clear calm nights. Significant winds and rainfall can occur at any time of year.
17. There are no known rain gauges or weather stations in the immediate vicinity of the application site, however, estimates of maximum rainfall events have been provided in the Hydrogeology Report in Appendix 4. These estimates are based on the HIRDS system developed by NIWA, include potential future changes in climate and establish a worst-case scenario. These figures have been used as inputs in the design of stormwater management infrastructure.

## Proposal Description

### Concept philosophy

18. A proposed draft Landfill Management Plan (LMP) covering operation and management of the landfill has been developed and is included as Appendix 8. This document includes methods to ensure all aspects of the construction, operation and closure of the landfill site are carried out in accordance with best practise management techniques to ensure uncontrolled discharges of contaminants to the environment are avoided and that the landfill is managed in accordance with legislative and consenting requirements.
19. An overview of construction, operation and closure of the quarry/landfill is set out in the following sections.

### Landform

20. The landfill will be developed in a manner that will:
  - Be constructed in accordance with standards applicable to a Class 1 landfill as defined in the Technical Guidelines for Disposal to Land (August 2018).
  - Utilise an existing excavated area;



- Provide a graded free draining landform to enable run-off of surface water to ensure surface water ponding is avoided;
- Provide stable slopes;
- Allow for future access for maintenance, rehabilitation and/or monitoring;
- Provide economically viable refuse placement capacity;
- Provide a final landform consistent with the surrounding area and suitable for planting.

### Filling/placement

21. The placement of refuse will be done in a manner that is consistent with best practise waste disposal principals and that will minimise potential adverse effects of the activity. This will include filling of the airspace in a series of cells that will enable discrete operating areas to be completed and either a containment or final cover established before moving on to the next cell in a progressive manner. The cell approach will allow:

- Minimisation of the extent of the working face;
- Use of daily and intermediate covers to minimise the adverse effects of waste placement, including dust and attraction of pests;
- Containment and stabilisation of intermediate areas;
- Increased ability to control access.

### Containment

22. The landfill has been designed using multiple lines of defence to ensure containment and avoidance of adverse effects on groundwater, surface water and air. These are illustrated in the diagrams included in Appendix 2. Defence measures include:

- Installation of a multi-layered containment liner between the natural bedrock and waste;
- Installation of cut-off drainage around uphill areas of the landfill to reduce inflow of surface water;
- Installation of compartmentalised leachate collection system which will also collect stormwater entering the operating area or surface seepages of leachate, with discharge to collection tanks and recycling back into the landfill to assist with dust management and compaction of waste;
- Installation of compartmentalised sub-liner drainage layers to provide for groundwater flow underneath the liner, and to act as a secondary collection system for leachate should the liner be breached;
- Installation of a final capping layer and creation of a contoured free draining landform that will be revegetated with plants consistent with those occurring naturally in the area and which produces a stormwater quality acceptable for discharge to the surrounding area;
- Minimisation of the working area and using daily cover to minimise emissions of dust or odour to air;
- Installation of a landfill gas collection system utilising vertical piping and/or a horizontal collection system to ensure gas can be collected, if required;
- Treatment of landfill gas through flaring or as otherwise necessary to manage adverse environmental effects in compliance with the NES for Air Quality if required.

23. Following completion of waste deposition and closure of the landfill, ongoing management will include:
- Flaring of landfill gas as required;
  - Monitoring and maintenance of a continuous, vegetated and free draining capping layer;
  - Monitoring of stormwater discharges and water quality in Woodstock Stream.
  - Collection and disposal of leachate.

## Waste characteristics and volume

### Waste composition

24. Material to be deposited in the landfill will include demolition and construction waste, and potentially hazardous waste less than the specified maximum total concentrations as detailed in Appendix D of the WasteMINZ guidelines. It will not include putrescible waste, or municipal solid waste.
25. Relevant definitions from the Technical Guidelines for Disposal to Land (August 2018) produced by the Waste Management Institute New Zealand are:

Construction and demolition (C & D) waste:

*Non-household, non-putrescible construction and demolition wastes. This includes waste generated from the construction, renovation, repair and demolition of structures such as residential and commercial buildings, roads and bridges. The composition of C & D waste varies for these different activities and structures. Overall, C & D waste is composed mainly of wood products, asphalt, plasterboard and masonry. Other components often present in significant quantities include metals, plastics, earth, shingles, insulation, paper and cardboard.*

Municipal Solid Waste:

*Any non-hazardous, solid waste from household, commercial and/or industrial sources. It includes putrescible waste, garden waste, biosolids, and clinical and related waste sterilised to a standard acceptable to the Ministry of Health. All municipal solid waste should have an angle of repose of greater than five degrees (5°) and have no free liquid component.*

Hazardous Waste:

*Any waste that:*

- *contains hazardous substances at sufficient concentrations to exceed the minimum degrees of hazard specified by Hazardous Substances (Minimum Degrees of Hazard) Regulations 2000 under the Hazardous Substances and New Organism Act 1996; or*
- *meets the definition for infectious substances included in the Land Transport Rule: Dangerous Goods 1999 and NZ Standard 5433: 1999 - Transport of Dangerous Goods on Land; or*

- *meets the definition for radioactive material included in the Radiation Protection Act 1965 and Regulations 1982.*

## Landfill area and volume

26. The total footprint of the landfill will be approximately 12.4 hectares, with an approximate total volume of 3.61 million cubic metres. Material to be landfilled, which includes waste, daily cover and intermediate capping, will ultimately compact over time to about 1.2m<sup>3</sup> per tonne, which equates to about 3.2 million tonnes of material in the landfill. The capping layer is in addition to this volume. The overall area of the landfill is illustrated in Appendix 2 (Drawing B3).

## Landfill operations

### Access and vehicle movements

27. Material will be transported to the site in trucks via existing public and internal private haul roads constructed for the quarrying operation. It is expected that a maximum of 100,000 tonnes of landfill material will be received per year, being split consistently throughout the year. This means that up to 400 tonnes per day, or 2000 tonnes per week will be received at the landfill. Between 15 and 20 trucks per day are expected to be required for this maximum volume of material.

### Land fill creation

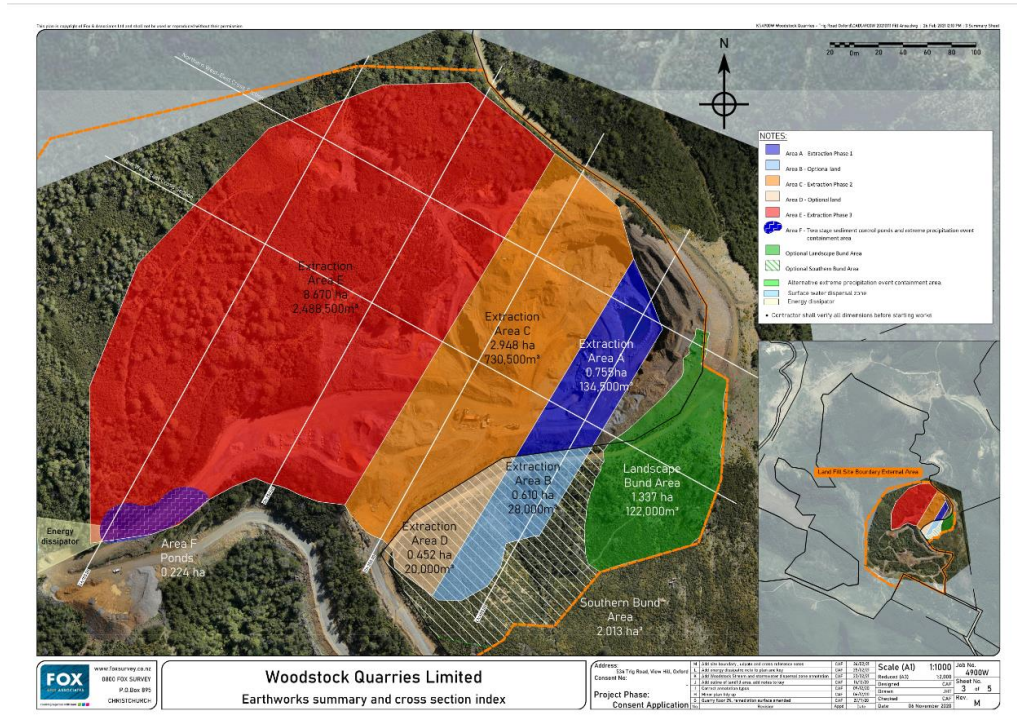
28. The landfill will occupy an area excavated by quarrying operations. To be clear this application includes any approvals required for the continued operation of the quarry.
29. Creation of the landfill will follow three key steps, being:
- Staging and construction.
  - Operation.
  - Closure and remediation.

### Staging and Construction

#### *Staging*

30. The land fill operation will occur in areas where quarrying has been completed. Completion of quarrying will result in an area below natural ground level surrounded by stable excavated faces on three sides with an approximately flat and roughly smoothed surface which will provide the base and supporting backdrop on which the landfill will be placed. As quarrying over the entire area to be used for landfill has not yet been completed, it is intended that landfilling will occur in stages as area becomes available from quarrying operations. Landfilling will begin at the eastern end and progress generally westward. The proposed staging is illustrated in Figure 5 and Appendix 2.

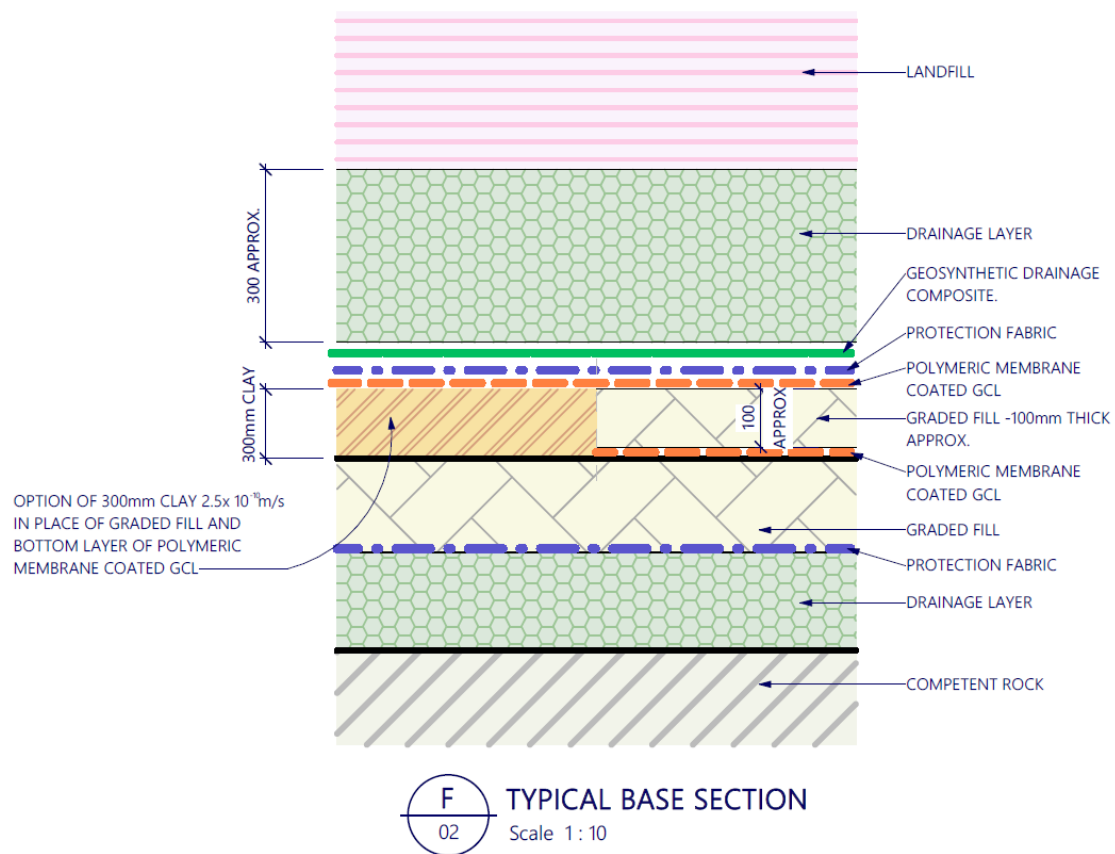
Figure 5: Landfill staging plan



### Construction

31. A multi-layered base layer consisting of permeable and impermeable materials will be constructed to line the base of the landfill (Figure 6). Two self-healing Polymeric Membrane coated bentonite clay liners will be installed above and below a 100mm thick graded fill layer to provide a hydraulic barrier. Above and below this are free draining layers to allow groundwater and leachate to be drained and collected. At the downslope edge of each cell will be a weir to contain any surface stormwater runoff from rain falling within the landfill operational area, which will join with discharges from the subsurface leachate collection system. Other measures, such as grouting, may be required to seal inflow of water prior to the liner being constructed, and this will occur as required and in accordance with direction from engineering advice. This construction system will result in the landfill being a closed system with the ability to capture and control the discharge of clean stormwater and recycling or disposal off-site of contaminated leachate.

Figure 6: Landfill base cross section



32. Cell development will generally follow the sequence below with variation as required to suit the location and stage of land fill development:
1. Provision of temporary access for cell construction;
  2. Establishment of erosion and sediment control systems including cut-off drains and sedimentation ponds as required;
  3. Installation of liner layers as required for each cell;
  4. Connection of liner discharge systems as required;
  5. Placement and connection of leachate collection tanks;
  6. Placement of refuse;
  7. Placement of gas collection system if and as required.
33. The liner will be installed at grade to ensure collection of leachate and surface water entering the cells is directed to the leachate collection system.

## Operation

### *Waste placement*



34. Waste material will be unloaded at the tipping area prior to being spread across the landfill area by an excavator.

#### *Daily cover*

35. At the end of each day the waste deposited during that day will be covered using suitable compacted clean waste material from quarry operations. No landfill material will be left exposed overnight, with covering at more frequent intervals as required if weather conditions require more immediate cover. Daily cover material will be of a compacted minimum depth of 150mm to all exposed waste faces.

#### *Intermediate cover*

36. Completed cells located in areas that will have additional cells layered on top will be capped with an intermediate layer which will be contoured to ensure run-off of surface water to the collection system and stabilised using grass.

#### *Closure and remediation*

37. A final minimum 600mm thick capping layer will be placed when cells reach the final contour level. Additional capping layers of clay and/or top-soil may be used if available or considered necessary. The capping layer will be graded to assist surface water run-off to the stormwater management system and planted in grasses and/or indigenous vegetation reflecting that occurring naturally within the site.

#### *Containment*

38. The overall design philosophy of the landfill is that any contaminated/waste materials or associated discharges will be contained within the landfill footprint. This is to be achieved by installation of a containment liner, collection and recycling or disposal off-site of leachate, separation and discharge of clean stormwater and flaring of any gas produced.

#### *Liner*

39. The purpose of the multi-layered liner is two-fold, being firstly to prevent waste material or leachate entering the wider environment, and secondly to prevent surface or groundwater entering the landfill. The liner system will be approximately 600mm thick and will line the base of the landfill, as illustrated in Appendix 2 (Drawings C2, C3).
40. Leachate will be collected in perforated pipes in the upper free draining aggregate layer of the liner system and transported to a drainage system connected to storage tanks. The free draining aggregate layer will enable leachate drainage should the pipes become blocked. Flushing pipes will also be included to allow flushing of the leachate collection pipes to prevent or clear blockages. Leachate will then be returned to the landfill to assist with compaction and dust management. Should the quantity of leachate exceed the capacity of the tanks, it will be transported off site and disposed of at an approved facility. Suitable

facilities are available at all Council owned and operated waste water treatment plants, several of which are available within the Waimakariri, Selwyn and Christchurch districts. In addition, there are leachate package plant treatment systems that could be installed on site to avoid transporting the leachate off site.

41. The liner will be raised around the perimeter of each cell as illustrated in Appendix 2 (Drawing C3) to prevent any leachate exiting the cell. Should any areas of weakness within the rock be encountered these will be assessed by an appropriately qualified and experienced engineer, with remediation measures put in place as required to ensure a seal. This could include grouting or use of some other liner system suitable for the circumstance (this will be determined at the time).
42. The liner has been designed to be flexible and is of sufficient thickness to accommodate likely seismic displacements. This has been confirmed in the assessment provided in Appendix 3A.

#### Side wall leachate filter/drainage

43. The sides of the landfill will be keyed into competent rock, with the base liner raised at the foot of the wall to assist with sealing and transport of water draining down the side of the face to the leachate drainage system. Preferential drainage down the cut face will be assisted by the use of benched free draining layers as shown in Appendix 2 (Drawing C3). This system will also allow any groundwater draining from the cut face to be captured in the leachate system. The permeability of the cut face rock will be significantly lower than that of the drainage material and therefore leachate infiltration into the side walls is not anticipated.
44. With regard to the potential for landfill gas (if developed) to preferentially exit the landfill via the side wall drainage system, this will be prevented by sealing of the sidewall drainage layer with clay or other low permeability material at the time of cell completion. This material will be removed before placement of the next layer of side wall drainage material.

#### Sub-liner drainage

45. The hydrogeology report completed in support of this application has indicated potential artesian ground water at the landfill site. A sub-liner drainage system is therefore proposed to capture and transport groundwater away from the landfill to protect the liner from uplift and prevent intrusion of ground water into the landfill. Each cell adjacent to the bed rock will have its own dedicated subliner groundwater drainage system terminating in an inspection manhole prior to linking and discharging into the common discharge network to the sedimentation ponds. The groundwater discharge system within each cell will be able to be isolated in case leachate penetrates the liner and enters the subliner drainage system. This will then allow contaminated ground water to be diverted to the leachate system and disposed of accordingly. Detection of contamination in the groundwater from each cell will be enabled by continual monitoring of discharges for changes in conductivity and pH.
46. The sub-liner drainage system arrangement, in conjunction with the upward hydraulic groundwater gradients, will assist with secondary leachate control should part of the liner be compromised.

47. Any groundwater entering the area of the quarry/pit not utilised for landfill purposes will be discharged to the swale constructed around the outer edge of the lined area and from there to the stormwater system. Any rainfall landing within the area being utilised for landfill will be captured within the leachate management system. Any water captured in the stormwater system will be conveyed to the stormwater management/sedimentation pond located to the south and downhill of the landfill site. Two ponds joined by a weir will be constructed to enable settlement of any sediment, before discharge of clean water to land downhill of the ponds via an engineered energy dissipating and dispersal outflow system to avoid scouring. The direction of discharge will be to the west with water spreading out over a wide area covered in scrub and regenerating beech forest before reaching a gully which in turn leads to a stream. The stream is located approximately 400 metres from the discharge point and it is therefore unlikely that discharges from the sedimentation pond/s will directly enter any water body, with soakage to ground the most likely outcome. However, application has been included for discharge of both ground and surface water to this stream to ensure these discharges are consented if they do occur.

## Storm water management

### Perimeter drainage

48. The landfill will be provided with perimeter clean water diversion to divert surface water flows away from the landfill. This will be achieved by construction of a sloped vehicle track around the entire perimeter. Surface flows will then follow natural drainage paths in a downhill direction. The contour of the land surrounding the landfill is such that this system will largely reflect that which occurred on the site prior to quarrying.
49. Downslope of the landfill the vehicle access track will slope in towards a swale drain to be constructed at the lower edge of the landfill toe bund, as illustrated on in Appendix 2 (Drawing C3). This swale will connect to the sedimentation ponds and final discharge to land to the south of the landfill site.
50. This system will significantly reduce the amount of stormwater directed to the landfill stormwater management system and will remain following final capping and rehabilitation of the landfill. Run-off collected in this system will contain only sediment, with no other contaminants from the landfill area able to enter the system due to design features (toe bund, impermeable liner) preventing entry of flows from the landfill.
51. With regard to the capacity of this system, the perimeter stormwater drain will be designed to accommodate 1% AEP storm event. The sedimentation pond will be designed to retain the flows from a 10% AEP storm event, with an overflow structure that will be able to safely pass a 1% AEP storm event. The proposed conditions of consent in Appendix 10 reflect these design requirements.

### Cell drainage

52. Run-off, seepage and stormwater from active cells will be collected within the leachate system, with bunds around active cells containing stormwater and seepage. Run-off from sealed cells will be directed away from active cells, with



this clean water run-off collected in the downslope swale and diverted to the sedimentation ponds prior to final discharge.

53. Leachate will be piped to the leachate collection system, consisting of sealed tanks contained within a bunded area, or self bunded tanks, of sufficient capacity to contain 125% of the tank volume. The tanks will be fitted with overflow prevention mechanisms. Leachate will then be pumped back onto active cells for use as a dust suppressant and compaction aid. Should the capacity of the tanks be exceeded and the overflow mechanisms be triggered, back up of leachate within the cells will be contained by bunds around the working area. Following emptying of the tanks, any leachate contained within the landfill will be able to flow through to the tanks. Stored leachate can then be removed until such time that active management within the landfill and tanks can re-occur.

### Landfill gas management

54. The National Environmental Standard for Air Quality requires landfill gas to be collected and combusted to minimise its greenhouse gas effect. It is anticipated that gas production from the material to be deposited in this landfill will be minimal. However, provision has been made for inclusion of a gas collection system and this will be installed as a matter of course during landfill construction. Monitoring and testing for gas production will be done regularly. Should gas be produced it can then be flared off.
55. Condensate from the gas collection system will be drained back to the landfill and/or trapped and treated as leachate.

### Environmental management and monitoring

56. Management of adverse environmental effects during quarrying, construction and operation of the landfill will be achieved through compliance with existing Waimakariri District Council consent conditions relating to the quarrying operations, any Construction Management Plan requirements set out in conditions of consent, and the Landfill Management Plan included in Appendix 8. As the site is in a remote location, construction and operational effects on people are expected to be less than minor.
57. Ongoing monitoring of ground and surface water quality will be done in accordance with the Landfill Management Plan. Monitoring of leachate and groundwater discharges will be required to ensure the liner is functioning as expected and leachate is not entering the subliner drainage system and subsequently the stormwater system.
58. Air quality will be maintained by implementation of methods to ensure dust creation is minimised, that putrescible materials are not accepted, and that any gas produced is flared off.

## Receiving Environment

### Geology

59. An engineering geological assessment, including both desktop and on-site ground investigations was carried out in September-October 2020 (Appendix 3). While use was made of bores drilled from hydrological investigations, no holes were drilled specifically for geotechnical investigations as the quarry face and outcrops along access roads provided good geological information.
60. The geological assessment determined that the landfill is sited within greywacke bedrock that forms the foothills of the Southern Alps. It is noted that Greywacke is a strong but brittle rock that characteristically develops natural fractures and defects in response to tectonic deformation processes. There are active faults (Porters Pass, Coopers Creek and Townsend) located within 1 km of the site, although the relatively poor preservation of scarps suggests relatively low slip rates, with recurrence intervals difficult to determine. No clearly unstable slopes are evident within the landfill area.
61. Site observations showed that the soil materials overlying the bedrock greywacke are a mixture of weathered rock and erosion products (colluvium) derived from the rock and some wind-blown silt (loess), which is thin to non-existent on the ridges and may exceed 2.5 metres depth in gullies.
62. Fresh unweathered rock occurs from 10 to 15 metres below the natural ground level at the landfill site. This material is considered suitable for use as a low permeability liner and for capping or drainage areas. Discontinuities found in the greywacke are bedding planes, joints, faults and minor shear zones. However, the assessment has demonstrated that the rock structure is favourable for pit slope design, with no unstable natural slopes observed during mapping or identified from review of LIDAR data. Within the quarried area only minor instability was observed in pit slopes due to the favourable orientation of bedding and batters. With regard to rock strength the conclusion is that the unweathered or slightly weathered greywacke within the landfill area is relatively high strength, with any fractures created by quarrying likely to be closed by the weight of backfill associated with the landfill, resulting in no reason to anticipate any foundation stability issues. With regard to slope instability, it is anticipated that normal quarry management techniques will be able to manage any issues, with periodic review required as pit face orientation changes.
63. The overall conclusions of the geological assessment are that the rock structure is favourable for pit slope design, that the rock below the weathered zone has very low permeability and that soils and weathered rock are acceptable for use as a capping/cover material.
64. In terms of the Ministry for the Environment requirements for a landfill to cater for the waste proposed, it is concluded that:
  - The landfill will not be sited in an area subject to direct seismic instability (ground displacement) but is within 1 km of mapped active faults and may experience severe shaking at some time in the future. It will therefore be designed to remove seismic risks to liner integrity, landfill stability and leachate system operation.
  - The landfill will not be sited over permeable material nor above a viable groundwater supply.
  - The landfill will not be sited on compressible or unstable foundation materials.
  - The landfill site is not within a floodplain, and

- The landfill can be designed such that surface runoff is controlled away from active operations.

## Hydrogeology

65. A hydrogeology investigation was carried out by Verum Group (Appendix 4). The investigation involved the installation of 11 monitoring wells at 5 locations south and south-west of the main quarry pit area, with two wells installed adjacent to the stream 700m south-west of the quarry. Two wells were installed within approximately 2 metres of each other at each of the five locations, one to a depth of 4 metres and one to a depth of 8 metres. A single well was installed to a depth of 20 metres.
66. Data from monitoring of the wells allowed groundwater level monitoring, hydraulic conductivity testing and surface water flow rate determination.

## Groundwater levels and gradient

67. Artesian groundwater (0.04 – 1.04m agl) was noted in two of the five shallow wells and three of the deep wells. Water levels at other wells was between 0.1 – 7.92 metres below ground level. Artesian wells were all located near the active pit suggesting that groundwater in the pit area may be near ground level.
68. Horizontal groundwater levels generally followed the topography of the area and showed a groundwater flow generally to the south south-west, although indications were also that there may be flows following the topography. Groundwater levels were highest in the pit area and lower at low elevations near the stream. Vertical groundwater gradients varied depending on the location and over time. Overall, the investigations found that upward groundwater gradients may occur.
69. The report concludes that artesian groundwater and upward groundwater gradients should be considered in the engineering design of the landfill liner and groundwater collector system.

## Hydraulic conductivity

70. The results from hydraulic conductivity testing indicated decreasing hydraulic conductivity with increasing depth, probably resulting from increased fracturing and weathering of rock near the surface, although there are differing rock types in the area that exhibit differing conductivities, and areas closer to the quarry pit exhibited higher conductivity. Overall, the assessment shows that the un-weathered and slightly weathered bed-rock is virtually impermeable and that groundwater infiltration and flow occurs within the upper weathered and fractured rock zone where it will be recharged by rainfall and run-off.

## Groundwater velocity

71. Groundwater velocities were estimated using groundwater gradient and hydraulic conductivity, with an average groundwater velocity of 12 metres per year estimated, although that is considered to be influenced by fractures, joints, bedding planes, faults and shear zones, and is likely to be greatest in weathered

zones. In more permeable zones groundwater velocity may be closer to 100 metres per year, while in unfractured bedrock it may be nil.

### Surface water

72. The nearest surface water body likely to be subject to run-off from the landfill site is the Woodstock Stream located to the west of the quarry/landfill. This stream has been assessed by an ecologist, with his description being of a hard bottomed permanent stream of 2 metres width and 0.3 metres depth, with diverse instream habitat consisting of riffle, run and pool sequences, undercut banks and being well shaded by aquatic macrophytes and native vegetation. He assessed the current discharge point from the perspective of potential impacts on this stream and noted that all evidence of saturated soil disappeared about 120 metres from the stream, with no evidence of sedimentation within the stream in the vicinity of the discharge point.
73. Given the evidence of very low groundwater flow rates and the proposal to contain, direct and treat surface water discharges from the quarry and landfill area, it is concluded that adverse effects on surface water from quarry and/or landfill discharges will be less than minor.

### Overall conclusion

74. The conclusion of the hydrogeology report is that:
- Hydraulic characteristics of the greywacke aquifer in the vicinity of the proposed landfill is likely a function of climate, site topography, and the frequency and size of fracture zones within the bedrock, with groundwater flow rates greatest in where there are dense, extensive and open fractures, predominantly at shallower depths.
  - Significant differences in groundwater elevation create strong vertical gradients that are likely to dominate groundwater flow.
  - Recharge of groundwater is likely to be greatest in the vicinity of the higher elevations above the Woodstock Quarry.
  - Groundwater likely percolates downwards in strong vertical gradients in the steeper area above the quarry, resulting in shallow groundwater in the relatively flat area in the vicinity of the active pit, with potential upward vertical gradients and potential artesian conditions.
  - At the topographical inflection area where the ground drops steeply down to the gully, the vertical gradients are steeply downwards, and at the bottom of the valley floor, vertical gradients are upwards, and are strongest, where the groundwater discharges to the stream.
  - At depths below 10 to 15 metres the bedrock is dominated by hard, strong sandstone with very low matrix porosity. Any groundwater flow in the bedrock (below 10 to 15m depth) is likely localised in fault and fracture networks.

### Future work required to effectively manage surface and groundwater

75. To assist with managing surface water and groundwater, a water balance model for the site will need to be developed.

76. The main objectives of the water management model will be to:
1. Provide a water balance for the site that enables sizing and performance criteria for water infrastructure at the different stages of the landfill.
  2. Support the design of water management infrastructure.
  3. Assist with design of water quality monitoring for the site.
  4. Provide information for assessment of any ecological impacts on stream ecology that could occur as a result of the landfill.
77. The concept adopted for water management will be that all water from active and disturbed areas are managed through water management infrastructure. During the early phases of the landfill, water from undisturbed areas will be diverted away from the landfill without impact on water quality. Surface runoff water from areas where rehabilitation is completed is likely able to be directly discharged to the environment, with appropriate monitoring.
78. In addition to the above, a comprehensive monitoring programme based on the site conceptual model will be developed.

### Air quality

79. The location of the site is such that the landfill site is remote from any land use likely to be adversely affected by any discharge to air from the landfill. Distances to boundaries also mean that adverse effects of any discharge will be contained within the site.
80. The current quarry land use results in minimal discharges of dust, which are contained within the site and do not result in any adverse effect on neighbouring sites. It is expected that the proposed landfill use will also not result in discharge of dust that will be noticeable outside the site. Particularly given the discharge of leachate back into the landfill which will assist with dampening of any dust.
81. With regard to discharge of gas, the nature of the materials to be accepted at the landfill are such that minimal gas production from decomposition is expected. Odour associated with the decomposition process is not expected due to the non-putrescible nature of the waste to be accepted. However, a gas collection system will be incorporated to enable monitoring and collection of gas should it be detected, and a permit under s15 RMA has been applied for as part of the suite of approvals to ensure this matter is covered off during the consenting process.

### Surrounding land uses

82. Sites surrounding the application site are in both private and public ownership. Land in private ownership is utilised for forestry and grazing. Areas downslope from the site are heavily vegetated with either indigenous forest administered by the Department of Conservation, or forestry plantation. Upslope and to the west are farms, with vegetative cover varying from cultivated areas to regenerating indigenous scrub and bush or gorse. Other quarrying and landfill activities are present in the wider area, with quarrying being clustered around a distinctive land-form to the north east on Washpen and Limeworks Roads.

83. The proposed landfill site is located approximately 80 metres from the nearest boundary with DoC land, although public access into this area is difficult due to land tenure, topography and thick vegetation.
84. An ecological assessment (Appendix 6) of the site has concluded ecological values at and immediately surrounding the site are low and therefore that adverse effects to fauna and flora will be less than minor.
85. The site of the landfill is therefore relatively remote, not easily visible from outside the site and therefore not subject to public scrutiny and of low ecological value.

### Planning history

86. The quarrying operation on the site has been fully consented by Waimakariri District Council.

## Resource Consent Requirements

### Land and Water Regional Plan/Waimakariri River Regional Plan/Canterbury Air Regional Plan

87. The Canterbury Land and Water Regional Plan (LWRP), Waimakariri Regional River Plan (WRRP) and Canterbury Air Regional Plan (CARP) are operative documents. Proposed Plan Change 7 to the LWRP and Proposed Plan Change 2 to the WRRP have effect within the area of this proposal, although does not impact on this application due to the site being outside the area to be removed from the WRRP. Both the LWRP and the WRRP therefore remain relevant to the application site. Relevant rules have been identified through pre-application consultation and are addressed in Appendix 3.
88. Overall, the activity is to be regarded as a non-complying activity under the LWRP and WRRP, and a discretionary activity under the CARP.

Table 1: Summary of resource consents required:

No	Type and term sought	Sub-type	Activity	Rule	Consent status
<b>Canterbury Land and Water Regional Plan/PC7: Waimakariri River Regional Plan/PC2: Canterbury Air Regional Plan</b>					
1	Land use consent (S9 RMA)	Land use	<ul style="list-style-type: none"> <li>Excavation of material (quarry rock) over an aquifer.</li> </ul>	5.176	Restricted Discretionary
	35 years		<ul style="list-style-type: none"> <li>Deposition of material (C &amp; D waste) over an aquifer within 5 metres of highest groundwater</li> </ul>	5.178	Restricted Discretionary
	35 years		<ul style="list-style-type: none"> <li>Deposition of hazardous waste (contaminated soil) onto land where the contaminant may enter water</li> </ul>	5.89	Discretionary
2	Water permit (S14 RMA)	Drain groundwater	<ul style="list-style-type: none"> <li>Drain water using subsoil drainage pipes</li> </ul>	5.6 LWRP and	Discretionary

	35 years			5.3 WRRP	Non-complying
3	Discharge permit (S15 RMA) 35 years	Discharge stormwater to water or to land	• Discharge of clean stormwater and drainage water to land from a contaminated site.	5.76 and 5.97 LWRP 6.2 WRRP	Discretionary Non-complying
		Discharge contaminant to land	• Discharge of landfill leachate back into landfill	5.6 LWRP	Discretionary
4	Discharge permit (S15 RMA) 35 years	Discharge to air	• Discharge landfill gas, leachate, dust and odour to air from an industrial activity (quarry and landfill)	7.63(2) CARP	Discretionary

No	Type	Sub-type	Activity (relevant section of the application)	Regulation	Consent status
<b>National Environmental Standard for Freshwater</b>					
5	Land use consent (s9 RMA)	Land use	Taking or discharge of water near wetlands.	54	Permitted
No	Type	Sub-type	Activity (relevant section of the application)	Regulation	Consent status
<b>National Environmental Standard for Air Quality</b>					
6	Discharge permit (S15 RMA)	Discharge to air	Discharge landfill gas, leachate, dust and odour to air from an industrial activity	25 - 27	Discretionary

## National Environmental Standard for Fresh Water

89. The NESF focuses on farming and land use intensification, in particular, in areas close to water bodies and wetlands. In this case there are no wetland areas present within, or within close proximity to, the landfill site, and no construction or location of structures within or in close proximity to water bodies is proposed. The activity therefore maintains permitted activity status under the National Environmental Standard for Fresh Water.

## National Environmental Standard for Air Quality

90. Regulations 25 to 27 of the NESAQ are relevant to landfills. The NESAQ is relevant to the proposed landfill, with approval for the proposed landfill being required due to the total capacity being more than one million tonnes and the waste to be accepted potentially containing more than 5% biodegradable matter<sup>1</sup>.

## Other consents and approvals

91. Land Use consent from the Waimakariri District Council is required and has been applied for. There are no additional approvals required under other legislation.

<sup>1</sup> It is noted that the landfill will not accept putrescible waste. Any potentially biodegradable material is likely to be limited to wood within C & D waste.



## Assessment of Actual and Potential Effects on the Environment

### Positive effects

92. Positive effects associated with this proposal include:
- Reduction in reliance on existing landfills;
  - Removal of high volume lower toxicity waste from other landfills approved to accept more toxic waste;
  - Reduction in greenhouse gas emissions due to shorter cartage distances from waste source;
  - Remote location of site will reduce adverse public amenity effects;
  - The site of landfill has been shown to be geologically stable and hydraulically isolated.

### Ground and surface water

93. Groundwater in the area of the proposed landfill has been assessed in the attached hydrogeology report to be potentially artesian in nature, although with a relatively small head. The liner proposed has been designed to take into account the effects of this artesian groundwater, with drainage included under the liner. This will discharge to a collection/drainage swale, which will in turn channel the water to sedimentation ponds located to the west of the landfill (Appendix 2, Drawing C4), with final discharge to ground some distance from the nearest surface water body.
94. The ponds have been specifically designed for the proposal with discharges being via a controlled release to land downslope of the ponds. Energy dissipation and erosion control will ensure cumulative and ongoing discharges do not result in scouring or destabilisation of land.
95. In the unlikely event that pond capacity is exceeded, stormwater discharges will continue to be collected, channelled to the ponds and discharged over an overflow structure in a wide energy dispersing manner to land to the west of and down gradient of the pond/s. In this case there will be significant surface flow over the entire area resulting from the storm event, with the stormwater discharge from the landfill/sedimentation pond/s being a small component of overall flows.
96. The quality of the discharge will also be of the same nature, being clean run-off water containing sediment from the surrounding area. The geology and hydrogeology assessments attached confirm the presence of groundwater within the upper 10 to 15 metres of weathered rock, and the impermeability of bedrock below this level. Therefore, some seepage to groundwater may occur, but this will be of clean water from the sedimentation ponds only and will reflect the quality of discharges currently occurring within the site. There are no wells near the site and therefore the drainage of groundwater flows from under the landfill containment layer will not adversely impact on the function or viability of any well.
97. Overall, any adverse effects to, or potential for contamination of, groundwater will be avoided.



98. In addition to the above, the matters to which discretion have been restricted in Rule 5.176 are:
  1. *The actual and potential adverse environmental effects on the quality of water in aquifers, rivers, lakes, wetlands; and*
99. The hydrogeology assessment completed by Verum Group has found that groundwater flows are present in the upper approximately 10 metres of weathered soil and rock material, while the bedrock underlying this weathered layer is largely impermeable, with ground water flow only occurring where the rock is fractured. Previous quarrying activity has removed a portion of the upper weathered layer within the overall quarry area, but there remains a significant area of this upper layer to be removed. With regard to actual or potential adverse environmental effects of the excavation, any ground or surface water flows entering the quarry site are channelled into collection systems and discharged to land downhill from the quarry area. This discharge then disperses over a wide area well clear of any surface water body, with no evidence from the ecologist's site inspection indicating erosion at the discharge point or direct discharge to any surface water body. Adverse effects on water quality within the aquifer and adjacent surface water bodies is therefore less than minor.
  2. *Any need for remediation or long-term treatment of the excavation; and*
100. The excavated area is to be used for the landfill, with final contours approximating the existing landform (Appendix 2). The landfill will be capped with soil and replanted in vegetation similar to that existing naturally in the area. Remediation of the site will ensure adverse visual effects will be avoided.
  3. *The protection of the confining layer and maintaining levels and groundwater pressures in any confined aquifer, including any alternative methods or locations for the excavation; and*
101. The site is not over a confined aquifer and therefore no confining layer is present. Based on the findings of the hydrogeology assessment, excavation into the largely impermeable bedrock will also not result in penetration of any confining layer.
  4. *The management of any exposed groundwater, and*
102. Excavations will expose groundwater. This is managed by contouring of the quarry floor to enable passive drainage of water from within the quarry area. This water is then conveyed to the sedimentation ponds located in the position shown on the plans in Appendix 2 and then discharged to land downslope from the ponds.
  5. *Any adverse effects on Ngāi Tahu values or on sites of significance to Ngāi Tahu, including wāhi tapu and wāhi taonga.*
103. There are no known values or sites of importance to Ngai Tahu within the area to be subject to quarry activities. Discharges of groundwater and stormwater are to land, with treatment and removal of sediment achieved by engineered sedimentation ponds, the ground surface and associated vegetation. No discharges are direct to surface water and therefore no adverse effects to values associated with surface water are apparent.

## Stormwater discharges

104. The discharge of stormwater from the landfill site will be via a constructed drainage channel to a two-stage sedimentation pond and then to land via a restricted outflow or overflow channel from the sedimentation ponds. Matters that are relevant in assessing actual or potential effects associated with this discharge are:
  1. *The actual and potential effects of the discharge on the quality of surface water, aquatic ecosystems, Ngāi Tahu cultural values;*
105. Discharges from the site during construction of the landfill will not be to any surface water body. A stormwater management system will be put in place to ensure any surface runoff from the construction area is captured and channelled to sedimentation ponds prior to discharge over land. While some soakage to groundwater may occur, there will be no contaminants, and silt will be removed in the sedimentation ponds. There is a considerable distance to the nearest surface water and therefore any contribution of groundwater to these surface waters is unlikely to be unaffected by soakage to ground water.
  2. *The actual and potential effects of the discharge on the quality and safety of human and animal drinking water;*
106. No human or animal drinking water supplies will be impacted on by either construction or operational stormwater discharges due to the distance to any surface water body, and the remoteness of the site.
  3. *The actual and potential adverse environmental effects of the quantity of water to be discharged on the banks or bed of a waterbody or on its flood carrying capacity, and on the capacity of the network to convey that discharge;*
107. The discharge point is a considerable distance from any surface water body. No adverse effect on the matters listed will result during construction of the landfill.
  4. *The potential benefits of the activity to the applicant, the community and the environment.*
108. The landfill proposal will benefit the applicant financially, while benefits to the wider community will accrue due to the additional security offered by the availability of an additional landfill of significant volume in the Canterbury region which will provide an alternative option should existing landfill sites become unavailable, as well as providing increased longevity to existing sites through diversion of waste. With regard to environmental benefits, the site has been shown to be stable and suitable for the landfill purpose, with design to a high standard which will ensure the containment of waste. The proposed landfill is therefore unlikely to pose a particularly high risk and remediation of the ground surface following completion of the landfill will return the site to a near natural surface state.
  5. *Erosion*
109. The discharge from the sedimentation ponds will be via a controlled release mechanism to an area engineered to provide energy dissipation and erosion control. This will result in the discharge being spread over as wide an area as

possible, which will increase opportunities for the rapid soakage of water to ground. At times of high rainfall and higher discharge volumes, water will discharge from the ponds via a high flow weir device which will maximise spread of the water. Energy dissipation and erosion control mechanisms will be constructed in this area to ensure destabilisation of downslope areas does not occur, and to provide increased opportunity for soakage to ground or mixing with other surface flows.

#### 6. *Effects on groundwater*

110. While there will be some infiltration of stormwater discharges into land, those discharges will be of treated water only, which will also be dispersed over a wide area. Any adverse effects to ground water are therefore considered to be less than minor.

### Landfill

111. The matters to which discretion has been limited in Rule 5.178 are:

1. *The potential for adverse effects on the quality of water in aquifers, rivers, lakes, wetlands and mitigation measures; and*

112. An impermeable liner is to be installed which will ensure all discharges from the site can be contained and managed. There is no discharge of leachate outside the site of the landfill. Stormwater run-off from rain falling within the landfill area will be collected and diverted to the leachate system and then either returned to the landfill or removed to an approved facility. There will be no interaction of the leachate with ground or surface water outside the contained landfill area. Discharge of clean stormwater from the sedimentation ponds will be discharged to land a significant distance from any surface water body, and while it may be possible for the discharge to reach the stream in the gully bottom ('Woodstock Stream'), this is a highly unlikely scenario given the distance, with it most likely that the wide dispersal of the flow will soak to ground well before reaching the stream.

2. *The proportion of any material other than cleanfill and its potential to cause contamination; and*

113. The landfill will accept all waste other than putrescible waste. However, it has been designed to a standard exceeding that required to accept this level of waste and as a closed system, with geology and hydrogeology assessments confirming the stability and suitability of the site to maintain that closed system status. This, coupled with detailed landfill design, indicates that the potential for contamination of areas outside the landfill area is very low.

3. *The content and adequacy of the management plan prepared in accordance with Section 8.1 and Appendix B of "A Guide to the Management of Cleanfills", Ministry for the Environment, January 2002.*

114. A detailed draft LMP has been prepared and is provided in Appendix 8.

4. *Methods for reinstatement of the site following completion of the activity;*

115. The site is to be capped, contoured and planted in indigenous vegetation reflecting that existing on the wider site. The reinstated site will therefore appear as an integral part of the wider site.
5. *The content and adequacy of the site rehabilitation plan if submitted with the application for resource consent; and*
116. A site rehabilitation plan has been submitted with the application and contains sufficient detail to determine that waste within the landfill will be contained and that any longer term visual adverse effects will be avoided.
6. *Any adverse effects on Ngāi Tahu values or on sites of significance to Ngāi Tahu, including wāhi tapu and wāhi taonga.*
117. There are no known sites of significance to Ngai Tahu within the landfill footprint, or across the wider site or area. No adverse effects to Ngai Tahu values or site of significance are therefore anticipated.

## Ecology

### Terrestrial ecology

118. There are no areas of significant indigenous vegetation or significant habitats of indigenous fauna within or near the site. An ecological assessment has confirmed this.
119. With regard to fauna, an ecological assessment has concluded that the site has low ecological values and provides habitat of low quality. A ground survey resulted in no indigenous fauna of note being identified.
120. With regard to the potential for the landfill to become an attraction for pests, the nature of the waste material to be accepted is not a food source and the landfill site will not provide good habitat. Therefore, it is considered the proposed landfill will not result in an increase in pests in the area.

### Aquatic ecology

121. The ecological assessment concluded that discharges from the sediment pond would be unlikely to reach any water body. That assessment also concluded that it is unlikely that there is any hydrological connection between the quarry/landfill site and the wetlands within the wider site, which is also backed up by the conclusions of the hydrogeology assessment. Therefore, it is considered that any adverse effects on adjacent streams and wetlands will be less than minor and therefore that any adverse effects to aquatic ecology will also be less than minor.

## Air quality

122. Landfills may affect air quality by the discharge of odours and/or dust. In this case the materials to be landfilled are inert and therefore are not likely to produce odour. The exception may be some types of contaminants in contaminated soils. Dust may be generated by rock extraction activities, traffic movements and during compaction of landfill material. However, the site is remote, with the nearest

dwelling approximately 2.3km from the landfill. While boundaries with other sites are relatively close to the landfill, these are either densely vegetated inaccessible public land, or an access area to the site to the north. Dust discharges from activities associated with the landfill may be associated with vehicles or equipment used in the landfill. However, these will be low level and contained within the site. The nature of the rock to be excavated is that little dust is produced during excavation and processing, with no issues apparent over the preceding years of quarry activity. With regard to landfill gas discharges, a gas collection system is to be installed during the landfill operation to ensure the system is available should gas production become an issue. This will allow collection and flaring of gas in the manner required under the NESAQ, with any associated air quality issues being avoided. Overall, given the combination of remoteness and material not susceptible to production of odour, it is considered any adverse effects to air quality will be less than minor.

## Earthquake

123. An engineering geological assessment of the likely effects on the site of a large, nearby earthquake has been completed. This assessment in particular considered the potential for catastrophic damage to the landfill, including liner rupture, as a result of a large, nearby earthquake occurring on a known close active fault.
124. Active faults identified within about 100km of the landfill site are the Alpine, Hope, Greendale, Poulter, Porters Pas, Townshend and Coopers Creek faults. These faults have varying recurrence intervals with varying single event displacement.
125. Most of the highly active faults within this group are considered too distant to cause significant ground damage, but could cause significant shaking. The Porters fault is considered to be the most likely source of seismic activity at the landfill site and is one of the most active faults in the Selwyn District, with the Townshend and Coopers Creek continuation faults passing less than 1 km to the north of the quarry site. It is noted that these continuations of the Porters fault do not display evidence of being as active as the main fault.
126. The consequences of seismic activity are noted as relating to:
  - *Earthquake magnitude* – the Porters Fault is estimated to have the potential to generate an earthquake of about magnitude 7.3;
  - *Distance from fault* – careful consideration of displacement effects is required if within about 150 metres of well-mapped faults, or if within about 300 metres of poorly defined or complex fault traces. In this case the landfill site is more than 300 metres from any known or inferred active fault;
  - *Ground conditions* – generally softer, deeper soils will result in more severe shaking than hard rock. In this case the landfill site is located in an area of hard rock, with shaking predicted to be less severe than a soft soil site;
  - *Age of faulting* – Research has indicated that landfills should not be located within 60 metres of a fault that has had displacement within Holocene time. While the Porters fault has ruptured in this time, the landfill is more than 60 metres from the fault; and
  - *Secondary ground ruptures* – ground rupture on secondary faults has been shown to be less likely and of lesser severity than that on primary faults, although displacements of up to 35cm may occur on secondary faults. In

this case the landfill site is assessed as being subject to much less movement than the primary Porters fault, with ground ruptures likely to be distributed over a number of defects in the rock mass given that there are no known secondary faults passing through the site.

127. In the case of the proposed landfill, a 7.3 magnitude earthquake of the Porters fault is assumed as a worst-case scenario. No direct rupture is anticipated given the absence of faults at the landfill site, so secondary displacements on joints and shears are considered more likely, with offsets expected to be in the order of 10% of the primary fault if the earthquake occurred within about 10km of the landfill site. Assuming a 5 to 7 metres displacement on the Porters fault a realistic worst case scenario is considered to be 50 to 70cm of displacement under the landfill. However, it is considered this displacement would be distributed across multiple shears and joints, with any individual displacement considered to not be capable of rupturing the proposed double liner. A more likely scenario is considered to be that joints and shears would open and/or displace slightly resulting in increased groundwater flow to the drainage system for a period of weeks or months without damaging the liner. Rockfall from open batter slopes is also likely, although the consequences of this are difficult to determine given unknown locations and quantities.
128. Overall, it is therefore considered the potential adverse effects on the integrity of the landfill, during either operation or post closure, are less than minor and that disruption of the integrity of the liner will be very unlikely.

## Conclusion

129. In conclusion, it is considered the potential adverse effects on surface and groundwater and air quality resulting from the development of a landfill on the site excavated during quarry operations will be less than minor. The site has been shown to be geologically stable and is unlikely to be particularly affected by seismic activity.

## Statutory Assessment

### RMA assessment (s104)

#### Section 104

130. Section 104 of the RMA sets out the matters to which a consent authority must have regard to, subject to Part 2 of the RMA, when considering an application for resource consent. These are:
- Any actual and potential effects on the environment of allowing the activity (refer Section 5 above);
  - Any relevant provisions of:
    - a national environmental standard;
    - other regulations;
    - a national policy statement;
    - a New Zealand coastal policy statement;

- a regional policy statement or proposed regional policy statement;
- a plan or proposed plan; and
- Any other matter the consent authority considers relevant and reasonably necessary to determine the application.

131. Relevant documents and provisions are considered in the following sections.

## Part 2 of the RMA

132. Recent Case Law (R J Davidson Family Trust vs Marlborough District Council (2017)) has determined that an application does not require assessment against Part 2 of the Act where the relevant plan is not invalid, incomplete or uncertain. In this case, while Proposed Plan Change 7 is relevant to Chapter 5 of the LWRP, it does not impact on the provisions relevant to this application, and therefore the relevant provisions of the LWRP are not invalid, incomplete or uncertain, and no assessment against Part 2 is required. A similar situation exists with the WRRP and Proposed Plan Change 2, with the application of the WRRP not being affected by that proposed change. However, in the interests of completeness, an assessment against Part 2 has been made.

133. Part 2 of the RMA contains the purpose and principles of the Act. When considering an application for resource consent, a consent authority must take into consideration the purpose and principles of the Act.

134. Section 5 states the purpose of the Act as being the promotion of sustainable management of natural and physical resources. Sustainable management is further defined as the management of;

*‘the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—*

- (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment’.*

135. Section 6 requires that in achieving the purpose of the Act, listed Matters of National Importance must be recognised and provided for. Of the matters listed I consider the following are relevant:

- (b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*

136. The quarry and landfill site is located within the Buffer Outstanding Landscape Area (BOLA) identified in the Waimakariri District Plan (WDP). The BOLA is recognised in the WDP as being a working farm environment with associated infrastructure and land uses. The purpose of the BOLA is therefore not to preserve or promote the retention of any particular natural values, rather to ensure land uses that impact on the visual impression of a relatively remote large scale farming area from the plains is maintained. In this case the landfill site is to



be located in an area excavated for quarrying and which will be eventually remediated by capping and replanting in vegetation naturally occurring in the area. The consents issued by Waimakariri District Council for the quarry require a landscaping bund to be maintained to shield the view from the plains directly into the quarry site and this will be maintained and become part of the capping and rehabilitation planting area for the landfill. The protection of the attributes which are key to the BOLA will therefore be at least maintained.

137. Section 7 lists matters to which particular regard must be had. Relevant matters are:

- (aa) *the ethic of stewardship:*
- (b) *the efficient use and development of natural and physical resources:*
- (d) *intrinsic values of ecosystems:*
- (f) *maintenance and enhancement of the quality of the environment:*
- (h) *the protection of the habitat of trout and salmon:*

138. The proposal includes design features to ensure the land fill is contained in perpetuity and to contain discharges of leachate within the site. Of particular relevance is that the applicant has provided a detailed risk assessment and offered a financial bond to ensure appropriate stewardship and ongoing management of the landfill site in the event of an adverse event or default by the Consent Holder (Appendix 9). Any groundwater or stormwater generated within the site will be captured and treated prior to discharge a significant distance from any surface water. Measures will be put in place to ensure visibility of the operation is minimised, while longer term the site will be capped and vegetated to blend in with the surrounding area. It is therefore considered that the proposed activity will achieve positive outcomes with regard to these matters.

139. Section 8 requires the 'principles of the Treaty of Waitangi' to be taken into account. In this case the principles of the Treaty of Waitangi have been met through use of best practice stormwater management techniques to avoid adverse effects on ground and surface water and surrounding aquatic ecosystems. There are no known items of particular interest to Tangata Whenua in the area.

140. Overall, it is considered that the proposal is consistent with Part 2 of the Act.

## National Policy Statements

141. The only National Policy Statement considered to be of relevance to this proposal is the National Policy Statement for Freshwater Management 2020

### National Policy Statement for Freshwater Management 2020

142. The National Policy Statement for Freshwater Management 2020 sets out the objectives and policies for freshwater management under the Resource Management Act 1991. It came into effect on 3 September 2020 and replaced the National Policy Statement for Freshwater Management 2014 (amended 2017).

143. The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:



- (a) first, the health and well-being of water bodies and freshwater ecosystems
- (b) second, the health needs of people (such as drinking water)
- (c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

144. Policies of relevance to this proposal are:

Policy 1: Freshwater is managed in a way that gives effect to Te Mana te Wai.

Policy 3: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.

Policy 6: There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.

Policy 9: The habitats of indigenous freshwater species are protected.

Policy 10: The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.

Policy 12: The national target (as set out in Appendix 3) for water quality improvement is achieved.

Policy 13: The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.

**Assessment:**

The concept of Te Mana o te Wai at a local level has not yet been specified for the Canterbury region. However, the Mahaanui Iwi Management Plan is considered to be good proxy and provides a values-based policy framework for the protection and enhancement of Ngāi Tahu values, and for achieving outcomes that provide for the relationship of Ngāi Tahu with natural resources across Ngā Pākihi Whakatekateka o Waitaha and Te Pātaka o Rākaihautū and is therefore relevant to the application site. The Mahaanui Iwi Management Plan sets out a number of relevant provisions in relation to water quality (WM6.8, WM6.16, WM6.17, WM 10.1) and in particular management of stormwater, waste and discharges to land (P6, P7, P8). The key points are that on-site management of stormwater is required, discharges to existing natural waterways and wetlands is avoided, catchments are managed in an integrated way, waste discharges protect cultural values and mahinga kai resources, any discharges to land are in appropriate locations with regard to soil type and slope and do not result in contaminated run-off, and ensuring the mauri of the soil resource is not compromised. Tangata whenua engagement and recognition of tangata whenua values at the concept stage is considered important in achieving the outcomes sought.

In this case water quality will be maintained through specific design to avoid contamination of ground and surface water through use of an impermeable liner, recirculation of leachate within the landfill site or disposal of excess leachate to an approved facility, treatment of clean stormwater discharges and distance of the site and discharge points from any surface water body. Soil in the area of the land fill is non-existent or shallow and of low life supporting capacity, and has been removed

as part of the quarry operation. Furthermore, the life supporting capacity of the site, once remediated with the proposed capping layer, will be the equivalent of, or potentially better than, that which currently exists. The outcomes sought by these policies are therefore considered to be achieved.

In addition to the above, the site is not within an identified Silent File area or an area otherwise known to be of particular interest to Tangata Whenua.

It is therefore considered the outcomes sought by the Mahaanui Iwi Management Plan will be achieved, and therefore that the concept of Te Mana o te Wai will also be achieved.

Of the other relevant policies in the NPSFW, containment and/or discharge quality control will ensure the habitats of indigenous freshwater species and salmon and trout are protected, water quality will not be adversely impacted on and monitoring of the proposed sediment and run-off control mechanisms will be ongoing throughout construction and operation to ensure they are operating in an effective manner.

Overall, it is considered the outcomes sought by the NPSFW will be achieved by the proposal. In particular, the health and well-being of water bodies in the area will be at least maintained, the health needs of people, and in particular drinking water quality will not be adversely impacted, and the proposal will not undermine the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

145. There are a number of implementation provisions contained in Part 3 of the NPSFW, however, none of these are considered directly relevant to this proposal as they are more consistent with directives relating to provisions to be contained in Regional and District Plans.

## National Environmental Standards

### National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2012

146. The National Environmental Standard for Assessing and Managing Contaminants in Soil (NЕСS) to Protect Human Health came into effect on 1 January 2012. One of its key features is to provide national planning controls directing the consenting requirements for activities on contaminated or potentially contaminated land.
147. No activities identified on the HAIL have occurred within the landfill site and therefore the NESCS does not apply to the site at this time. It is noted that after the landfill operation begins the site will be subject to an activity listed on the HAIL and therefore that the NESCS will become relevant. Required approvals under the NESCS will be obtained from the Waimakariri District Council if, and when, they are required.

### National Environmental Standards for Freshwater 2020

148. The Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NESF) came into effect on 3 September 2020. The purpose of the NESF is to regulate activities that pose risks to the health of freshwater and freshwater ecosystems.
149. The NESF focuses on farming and land use intensification, in particular where those activities may adversely impact on wetlands, streams and aquatic habitat. In this case there are no wetland areas present within the landfill footprint or in close proximity to the landfill site, and no construction or location of structures within or close to water bodies is proposed. Three potential wetland areas have been identified within the wider site by Ecan staff reviewing aerial photographs. Survey by an ecologist has resulted in one of the wetland areas not meeting established criteria, with the other two sites being acknowledged as a continuous wetland area. However, as confirmed in the ecology assessment (Appendix 6) there are no indications that this wetland area has any surface or groundwater linkage to the quarry/landfill area and therefore no adverse effects on the wetland area will result from the proposal.
150. The activity therefore maintains permitted activity status under the National Environmental Standard for Fresh Water.

#### National Environmental Standards for Air Quality 2004

151. The Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NESAQ) came into force on 8 October 2004. Relevant regulations relate to the lighting of fires or burning of waste at landfills and to the control and flaring of gas. Lighting of fires and burning of waste is prohibited unless the burning is of gas formed at the landfill. The ability of the Regional Council to issue discharge consent for flaring of gas is maintained under Regulation 25(1) provided any gas produced is collected in a gas collection system and is flared off at the site in the manner prescribed in Regulation 27. In this case the landfill will have a capacity of more than 1 million tonnes and biodegradable waste material<sup>2</sup> may potentially make up more than 5% of the total waste. However, a gas collection system is to be installed and any gas produced will be flared off at the site in the manner and with the equipment prescribed. The landfill will therefore operate in accordance with the NESAQ and discharges of particulate will not result in adverse effects to air quality that breach the regulations.

#### Regional Policy Statement

152. The Canterbury Regional Policy Statement (CRPS) was made operative on 15 January 2013. The CRPS gives an overview of the significant resource management issues facing the region and sets out objectives and policies to resolve those issues. The Canterbury Regional Council and territorial authorities are required to give effect to the CRPS through their regional and district plans.
153. Given the relatively recent operative status of the LWRP it can be assumed that compliance with the provisions of that plan will ensure consistency with the CRPS. This approach is consistent with recent case law. While Plan Change 7 is relevant to Chapter 5, the provisions relating to this application are not affected.

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<sup>2</sup> It is noted that the landfill will not accept putrescible waste. Any potentially biodegradable material is likely to be limited to wood within C & D waste.

Assessment of the provisions considered relevant to the landfill proposal have been assessed below:

<b>Chapter 7 – Fresh water</b>
<b>Objectives</b>
<p>7.2.4 Integrated management of fresh water resources</p> <p>Fresh water is sustainably managed in an integrated way within and across catchments, between activities, and between agencies and people with interests in water management in the community, considering:</p> <ol style="list-style-type: none"> <li>1. the Ngāi Tahu ethic of Ki Uta Ki Tai (from the mountains to the sea);</li> <li>2. the interconnectivity of surface water and groundwater;</li> <li>3. the effects of land uses and intensification of land uses on demand for water and on water quality; and</li> <li>4. kaitiakitanga and the ethic of stewardship; and 5. any net benefits of using water, and water infrastructure, and the significance of those benefits to the Canterbury region.</li> </ol>
<b>Policies</b>
<p>7.3.5 Water quantity and land uses</p> <p>To avoid, remedy or mitigate adverse effects of land uses on the flow of water in surface water bodies or the recharge of groundwater by:</p> <ol style="list-style-type: none"> <li>1. controlling the diversion of rainfall run-off over land, and changes in land uses, site coverage or land drainage patterns that will, either singularly or cumulatively, adversely affect the quantity or rate of water flowing into surface water bodies or the rate of groundwater recharge; and</li> <li>2. managing the planting or spread of exotic vegetation species in catchments where, either singularly or cumulatively, those species are or are likely to have significant adverse effects on flows in surface water bodies.</li> </ol> <p>7.3.7 Water quality and land uses</p> <p>To avoid, remedy or mitigate adverse effects of changes in land uses on the quality of fresh water (surface or ground) by:</p> <ol style="list-style-type: none"> <li>1. identifying catchments where water quality may be adversely affected, either singularly or cumulatively, by increases in the application of nutrients to land or other changes in land use; and</li> <li>2. controlling changes in land uses to ensure water quality standards are maintained or where water quality is already below the minimum standard for the water body, it is improved to the minimum standard within an appropriate timeframe.</li> </ol> <p>9.2.3 Protection of significant indigenous vegetation and habitats</p> <p>Areas of significant indigenous vegetation and significant habitats of indigenous fauna are identified and their values and ecosystem functions protected.</p>
<b>Assessment</b>

Ground and surface water from under and around the landfill site will be either diverted around the site and thereafter resume natural flow paths, or will be captured in the stormwater management system and discharged from the sedimentation ponds to land. These discharges will then be able to re-enter the surface and groundwater systems and therefore the quantity of ground and surface water will not be reduced.

With regard to water quality, the landfill is being constructed as a containment structure where the only discharges of water will be via managed and controlled avenues, with continual monitoring of discharges to ensure clean stormwater or ground water is not being contaminated by leachate. These flows will be directed to a sedimentation pond which is to be constructed to the west of the landfill site and which will allow sediment in discharges from the landfill site to be removed prior to discharge of clean water to land. The discharge point is some distance from the nearest stream, with dense vegetation present in the overland flow zone. Given the distance to the stream it is unlikely that discharges of clean water from the sedimentation pond will directly enter the stream, but if they do the prior treatment will ensure adverse effects to water quality in the stream are avoided. Measures included in the landfill design will therefore ensure discharges from the landfill do not result in reduction of ground or surface water quality.

Overall, it is considered the proposal will result in outcomes consistent with those sought by the relevant Objectives and Policies in this chapter.

## **Chapter 9 - Ecosystems and Indigenous Biodiversity**

### **Objectives**

#### **9.2.1 Halting the decline of Canterbury's ecosystems and indigenous biodiversity**

The decline in the quality and quantity of Canterbury's ecosystems and indigenous biodiversity is halted and their life-supporting capacity and mauri safeguarded.

### **Policies**

#### **9.3.5 Wetland protection and enhancement**

In relation to wetlands:

1. To assess an ecologically significant wetland against the matters set out in Policy 9.3.1 and the national priorities listed in Policy 9.3.2 For the purposes of this policy, ecologically significant wetlands do not include areas that are predominantly pasture and dominated by exotic plant species and where they are not significant habits of indigenous fauna.
2. To ensure that the natural, physical, cultural, amenity, recreational and historic heritage values of Canterbury's ecologically significant wetlands are protected.
3. To generally promote the protection, enhancement and restoration of all of Canterbury's remaining wetlands.
4. To encourage the formation of created wetlands that contribute to the restoration of indigenous biodiversity.
5. To protect adjoining areas of indigenous and other vegetation which extend outside an ecologically significant wetland and are necessary for the ecological functioning of the wetland.

**Assessment**

There are no wetlands present in or around the landfill site. Three possible wetland areas have been identified by Environment Canterbury from assessment of aerial photographs. An ecological assessment of these possible wetlands has been carried out by a qualified and experienced ecologist, with one dismissed as not meeting the required criteria and the other two being confirmed as a single wetland area. As confirmed by the ecological assessment, no adverse effects on the ecological integrity or function of the wetland resulting from either the quarry or landfill operations are anticipated.

**Chapter 12 - Landscape****Objectives****12.2.1 Identification and protection of outstanding natural features and landscapes**

Outstanding natural features and landscapes within the Canterbury region are identified and their values are specifically recognised and protected from inappropriate subdivision, use, and development.

**Policies****12.3.2 Management methods for outstanding natural features and landscapes**

To ensure management methods in relation to subdivision, use or development, seek to achieve protection of outstanding natural features and landscapes from inappropriate subdivision, use and development.

**Assessment**

The site is located within the Buffer Outstanding Landscape Area identified in the Waimakariri District Plan. The provisions of this Plan identify the aspects of the area to be protected, which principally includes physical attributes such as prominent ridgelines and avoidance of adverse effects associated with lighting. The area is recognised as being a working farm environment, with visual components of farming practices being recognised as an integral component of the Buffer OLA.

In this case the activity is largely screened from view by inclusion of a visibility bund around the lower edge of the quarry, which will be maintained and increased as a result of the proposed landfill operation. Eventual planting of the landfill cover post closure will ensure full remediation of natural visual aspects when viewed from outside the site boundaries.

Overall, it is considered the proposal will result in outcomes consistent with those sought by the relevant Objectives and Policies in this chapter.

**Chapter 14 – Air Quality****Objectives****14.2.2 Localised adverse effects of discharges on air quality**

Enable the discharges of contaminants into air provided there are no significant localised adverse effects on social, cultural and amenity values, flora and fauna, and other natural and physical resources.

<b>Policies</b>
<p><b>14.3.5 Relationship between discharges to air and sensitive land-uses</b></p> <p>In relation to the proximity of discharges to air and sensitive land-uses:</p> <ol style="list-style-type: none"> <li>1. To avoid encroachment of new development on existing activities discharging to air where the new development is sensitive to those discharges, unless any reverse sensitivity effects of the new development can be avoided or mitigated.</li> <li>2. Existing activities that require resource consents to discharge contaminants into air, particularly where reverse sensitivity is an issue, are to adopt the best practicable option to prevent or minimise any actual or likely adverse effect on the environment.</li> <li>3. New activities which require resource consents to discharge contaminants into air are to locate away from sensitive land uses and receiving environments unless adverse effects of the discharge can be avoided or mitigated.</li> </ol>
<b>Assessment</b>
<p>The site is remote, located within an area of large rural land parcels used for extensive conservation, grazing or forestry purposes and it is highly unlikely that the area will be subject to any more intensive land use than currently exists. Any discharge of odour or other contaminants to air will therefore not result in adverse effects on people. Discharges of landfill gas will be captured and managed in accordance with best practice, with flaring as required. Dust discharges from the site will be managed by irrigation of working landfill areas with recycled leachate discharges.</p> <p>Overall, it is considered the proposal will result in outcomes consistent with those sought by the relevant Objectives and Policies in this chapter.</p>

<b>Chapter 18 – Hazardous Substances</b>
<b>Objectives</b>
<p><b>18.2.1 Avoid, remedy or mitigate adverse effects</b></p> <p>Adverse effects on the environment from the storage, use, disposal and transportation of hazardous substances are avoided, remedied or mitigated.</p> <p><b>18.2.2 New contamination of land</b></p> <p>To avoid contamination of land.</p>
<b>Policies</b>
<p><b>18.3.1 Protection of sensitive areas and activities</b></p> <p>Avoid actual or potential adverse effects, resulting from the use, storage or disposal of hazardous substances, in the following locations:</p> <ol style="list-style-type: none"> <li>1. High hazard areas</li> <li>2. Within a community drinking water protection zone, or within such a distance from a community drinking water supply that there is a risk of contamination of that drinking water source</li> <li>3. In areas of unconfined or semi-confined aquifer, where the depth to groundwater is such that there is a risk of contamination of that groundwater</li> <li>4. Within the coastal marine area and in the beds of lakes and rivers</li> </ol>



5. Within any area identified by a district or regional plan as being sensitive to the potential effects of hazardous substances, which may include, but are not limited to, areas such as wāhi tapu, urupā, institutions and residential areas.

#### 18.3.2 Avoid, remedy or mitigate adverse effects

To avoid, remedy or mitigate adverse effects on the environment, including contamination of land, air and water, associated with the storage, use, transportation or disposal of hazardous substances.

#### 18.3.4 Reduction, Awareness and Promotion

To promote hazardous substances management practices that prevent or mitigate adverse effects on the environment, including practices that, wherever possible, reduce the use of hazardous substances.

#### 18.3.5 Emergency response

To encourage appropriate information to be made available to response agencies, including Local Authority Emergency Operations Centres, in the event of an emergency, so that adverse effects of hazardous substances may be prepared for, responded to, mitigated, and recovered from as effectively as practicably possible.

### Assessment

The landfill is located in an area of hard and impermeable bedrock which forms a stable natural containment system, while the design includes a containment liner and capping system that will, as far as is practically possible, avoid contaminants entering groundwater and the surrounding environment. The containment system has been designed to withstand natural hazards likely to affect the landfill site, in particular earthquakes.

A Risk Management Plan has been developed which identifies potential risk factors and includes emergency response procedures to those identified risks (Appendix 7).

Overall, it is considered the proposal will result in outcomes consistent with those sought by the relevant Objectives and Policies in this chapter.

## Chapter 19 – Waste Minimisation and Management

### Objectives

#### 19.2.2 Minimise adverse effects of waste

Adverse effects on the environment caused by residual waste and its management are avoided, remedied or mitigated.

### Policies

#### 19.3.3 Integrated management of waste

Promote an integrated approach to waste management in the region.

### Assessment

The landfill is designed to best practice standards which will provide a containment structure that will avoid adverse effects on the surrounding environment. The landfill will also provide another option for waste disposal in the Canterbury Region, with benefits for promoting the longevity of existing landfills and opportunities for

integration of use of those other landfills through diversion of C and D waste away from the likes of Kate Valley, which can then be used more appropriately for disposal of other, more hazardous, waste.

Overall, it is considered the proposal will result in outcomes consistent with those sought by the relevant Objectives and Policies in this chapter.

## Canterbury Land and Water Regional Plan

154. The proposal has been assessed against the relevant Objectives and Policies of the Canterbury Land and Water Regional Plan, including Proposed Plan Change 7. Relevant Objectives and Policies are considered below:

Objective No.	LWRP Objective
3.1	Land and water are managed as integrated natural resources to recognise and enable Ngāi Tahu culture, traditions, customary uses and relationships with land and water.
3.2	Water management applies the ethic of ki uta ki tai – from the mountains to the sea – and land and water are managed as integrated natural resources recognising the connectivity between surface water and groundwater, and between fresh water, land and the coast.
3.8	The quality and quantity of water in fresh water bodies and their catchments is managed to safeguard the life-supporting capacity of ecosystems and ecosystem processes, including ensuring sufficient flow and quality of water to support the habitat and feeding, breeding, migratory and other behavioural requirements of indigenous species, nesting birds and, where appropriate, trout and salmon.
3.13	Groundwater resources remain a sustainable source of high quality water which is available for abstraction while supporting base flows or levels in surface water bodies, springs and wetlands and avoiding salt-water intrusion.
3.16	Freshwater bodies and their catchments are maintained in a healthy state, including through hydrological and geomorphic processes such as flushing and opening hāpua and river mouths, flushing algal and weed growth, and transporting sediment.
3.17	The significant indigenous biodiversity values of rivers, wetlands and hāpua are protected.
3.23	Soils are healthy and productive, and human-induced erosion and contamination are minimised.
3.24	All activities operate at good environmental practice or better to optimise efficient resource use and protect the region's fresh water resources from quality and quantity degradation.

Policy no.	<b>National direction</b>
2.A.1	<p>(1) When considering any application for a discharge the consent authority must have regard to the following matters:</p> <ul style="list-style-type: none"> <li>(a) the extent to which the discharge would avoid contamination that will have an adverse effect on the life-supporting capacity of fresh water including on any ecosystem associated with fresh water; and</li> <li>(b) the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided.</li> </ul>

	<p>(2) When considering any application for a discharge the consent authority must have regard to the following matters:</p> <ul style="list-style-type: none"> <li>(a) the extent to which the discharge would avoid contamination that will have an adverse effect on the health of people and communities as affected by their contact with fresh water; and</li> <li>(b) the extent to which it is feasible and dependable that any more than minor adverse effect on the health of people and communities as affected by their contact with fresh water resulting from the discharge would be avoided.</li> </ul> <p>(3) This policy applies to the following discharges (including a diffuse discharge by any person or animal):</p> <ul style="list-style-type: none"> <li>(a) a new discharge or</li> <li>(b) a change or increase in any discharge – of any contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.</li> </ul> <p>(4) Paragraph 1 of this policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management 2011 took effect on 1 July 2011.</p> <p>(5) Paragraph 2 of this policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management 2014 takes effect.</p>
2A.2	<p>(1) When considering any application the consent authority must have regard to the following matters:</p> <ul style="list-style-type: none"> <li>(a) the extent to which the change would adversely affect safeguarding the life-supporting capacity of fresh water and of any associated ecosystem; and</li> <li>(b) the extent to which it is feasible and dependable that any adverse effect on the life-supporting capacity of fresh water and of any associated ecosystem resulting from the change would be avoided.</li> </ul> <p>(2) This policy applies to:</p> <ul style="list-style-type: none"> <li>(a) any new activity and</li> <li>(b) any change in the character, intensity or scale of any established activity –</li> </ul> <p style="padding-left: 40px;">that involves any taking, using, damming or diverting of fresh water or draining of any wetland which is likely to result in any more than minor adverse change in the natural variability of flows or level of any fresh water, compared to that which immediately preceded the commencement of the new activity or the change in the established activity (or in the case of a change in an intermittent or seasonal activity, compared to that on the last occasion on which the activity was carried out).</p> <p>(3) This policy does not apply to any application for consent first lodged before the National Policy Statement for Freshwater Management 2011 took effect on 1 July 2011.</p>
2A.3	<p>The loss of extent of natural inland wetlands is avoided, their values are protected, and their restoration is promoted, except where:</p> <p>(a) the loss of extent or values arises from any of the following:</p> <ul style="list-style-type: none"> <li>(i) the customary harvest of food or resources undertaken in accordance with tikanga Māori</li> <li>(ii) restoration activities</li> <li>(iii) scientific research</li> <li>(iv) the sustainable harvest of sphagnum moss</li> <li>(v) the construction or maintenance of wetland utility structures (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020)</li> <li>(vi) the maintenance or operation of specified infrastructure, or other infrastructure (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020)</li> </ul>

	<p>(vii) natural hazard works (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020); or</p> <p>(b) the regional council is satisfied that:</p> <ul style="list-style-type: none"> <li>(i) the activity is necessary for the construction or upgrade of specified infrastructure; and</li> <li>(ii) the specified infrastructure will provide significant national or regional benefits; and</li> <li>(iii) there is a functional need for the specified infrastructure in that location; and</li> <li>(iv) the effects of the activity are managed through applying the effects management hierarchy.</li> </ul>
<b>Assessment</b>	
<p>Discharges of ground and surface water from the landfill will be free from contaminants associated with the landfill activity, with management practices in place to ensure contaminants are detected quickly and diversion of contaminated water into the leachate management system. The presence of contaminants in discharges will therefore be avoided, as will adverse effects on fresh water and associated ecosystems, and on the health of people and communities. Adverse effects on the life-supporting capacity of freshwater and associated ecosystems will be avoided.</p> <p>The landfill will not result in the loss of any wetlands or their current extent. A ground based ecological assessment of potential wetlands identified by Environment Canterbury based on assessment of aerial photographs has confirmed no indication of surface or ground water linkage with the identified wetland, which is also confirmed by the hydrogeological report findings. The distance of the wetland from the quarry/landfill site will also avoid adverse effects to the ecological integrity and function of the wetland. Therefore, there will be no reduction in the values of existing wetland areas.</p>	
	<b>Strategic Policies</b>
4.4	<p>Groundwater is managed so that:</p> <ul style="list-style-type: none"> <li>(a) groundwater abstractions do not cause a continuing long-term decline in mean annual groundwater levels or artesian pressures;</li> <li>(b) the individual and cumulative rate, duration and volume of water pumped from bores is controlled so as to prevent seawater contamination;</li> <li>(c) the rate and duration of individual abstractions is controlled to ensure that individually or cumulatively, localised pressure reversal does not result in the downward movement of contaminants;</li> <li>(d) in any location where an overall upwards pressure gradient exists, restrict the taking of groundwater so that at all times the overall upward pressure difference is maintained between any one aquifer and the next overlying aquifer;</li> <li>(e) overall water quality in aquifers does not decline; and</li> <li>(f) the exercise of customary uses and values is supported.</li> </ul>
<b>Assessment</b>	
<p>Groundwater will be drained from under the landfill liner and discharged to a clean water management system, including a sedimentation pond to remove sediment and discharge back to land within the site. The groundwater drainage system is a passive system, with no pumping proposed. Upward groundwater pressures are expected to be maintained. The liner to be used will prevent contamination of the underlying groundwater, while discharges from the sedimentation ponds will be of clean water only. Customary uses and values are not impacted on.</p>	

<b>Activity and Resource Policies</b>	
	<b><i>Discharges of Contaminants to land or water</i></b>
4.12	There are no direct discharges to surface water bodies or groundwater of: <ul style="list-style-type: none"> <li>(a) untreated sewage, wastewater (except as a result of extreme weather related overflows or system failures) or bio-solids;</li> <li>(b) solid or hazardous waste or solid animal waste;</li> <li>(c) animal effluent from an effluent storage facility or a stock holding area;</li> <li>(d) organic waste or leachate from storage of organic material; and</li> <li>(e) untreated industrial or trade waste.</li> </ul>
4.13	For other discharges of contaminants into or onto land where it may enter water or to surface water bodies or groundwater (excluding those passive discharges to which Policy 4.26 applies), the effects of any discharge are minimised by the use of measures that: <ul style="list-style-type: none"> <li>(a) first, avoid the production of the contaminant;</li> <li>(b) secondly, reuse, recovers or recycles the contaminant;</li> <li>(c) thirdly, minimise the volume or amount of the discharge; or</li> <li>(d) finally, wherever practical utilise land-based treatment, a wetland constructed to treat contaminants or a designed treatment system prior to discharge; and</li> <li>(e) in the case of surface water, results in a discharge that after reasonable mixing meets the receiving water standards in Schedule 5 or does not result in any further degradation in water quality in any receiving surface waterbody that does not meet the water quality standards in Schedule 5 or any applicable water conservation order.</li> </ul>
4.14	Any discharge of a contaminant into or onto land where it may enter groundwater (excluding those passive discharges to which Policy 4.26 applies): <ul style="list-style-type: none"> <li>a. will not exceed the natural capacity of the soil to treat or remove the contaminant; and</li> <li>b. will not exceed available water storage capacity of the soil; and</li> <li>c. where meeting (a) and (b) is not practicable, the discharge will:               <ul style="list-style-type: none"> <li>i. meet any nutrient limits in <u>Schedule 8</u> or Sections <u>6</u> to <u>15</u> of this Plan; and</li> <li>ii. utilise the best practicable option to ensure the size of any contaminant plume is as small as is reasonably practicable; and</li> <li>iii. ensure there is sufficient distance between the point of discharge, any other discharge and drinking-water supplies to allow for the natural decay or attenuation of pathogenic micro-organisms in the contaminant plume; and</li> <li>iv. not result in the accumulation of pathogens, or a persistent or toxic contaminant that would render the land unsuitable for agriculture, commercial, domestic, cultural or recreational use or water unsuitable as a source of potable water or for agriculture; and</li> <li>v. not raise groundwater levels so that land drainage is impeded.</li> </ul> </li> </ul>
4.14B	Have regard to Ngāi Tahu values, and in particular those expressed within an iwi management plan, when considering applications for discharges which may adversely affect statutory acknowledgement areas, nohoanga sites, surface waterbodies, silent file areas, culturally significant sites, Heritage New Zealand sites, any listed archaeological sites, and cultural landscapes, identified in this Plan, any relevant district plan, or in any iwi management plan.
<b>Assessment</b>	
There will be no direct discharges to surface water bodies of the contaminants listed in 4.12. Containment of landfill leachate by the liner and discharge of clean water only to land will avoid contamination of ground or surface water bodies. It is expected Ngai Tahu values relating to freshwater will be at least maintained by the discharge management systems proposed.	

	<b><i>Stormwater and community wastewater systems</i></b>
4.17	Stormwater run-off volumes and peak flows are managed so that they do not cause or exacerbate the risk of inundation, erosion or damage to property or infrastructure downstream or risks to human safety.
4.19	<p>The discharge of contaminants to groundwater from earthworks, excavation, waste collection or disposal sites and contaminated land is avoided or minimised by ensuring that:</p> <ul style="list-style-type: none"> <li>(a) activities are sited, designed and managed to avoid the contamination of groundwater;</li> <li>(b) existing or closed landfills and contaminated land are managed and monitored where appropriate to minimise any contamination of groundwater; and</li> <li>(c) there is sufficient thickness of undisturbed sediment in the confining layer over the Coastal Confined Aquifer System to prevent the entry of contaminants into the aquifer or an upward hydraulic gradient is present which would prevent aquifer contamination.</li> </ul>
<b>Assessment</b>	
<p>Stormwater originating from the landfill site will be managed in systems designed for that purpose and able to accommodate an appropriate critical storm event. Energy dissipation mechanisms will be installed at the discharge point from the sedimentation pond to ensure erosion or destabilisation of land does not occur. The discharge volume will be controlled to avoid the risk of adverse downstream effects. Discharge of contaminants to groundwater will be avoided through use of an impermeable liner and collection and re-use of leachate.</p>	
	<b><i>Earthworks, land excavation and deposition of material into land over aquifers</i></b>
4.18	The loss or discharge of sediment or sediment-laden water and other contaminants to surface water from earthworks, including roading, works in the bed of a river or lake, land development or construction, is avoided, and if this is not achievable, the best practicable option is used to minimise the loss or discharge to water.
4.19	<p>The discharge of contaminants to groundwater from earthworks, excavation, waste collection or disposal sites and contaminated land is avoided or minimised by ensuring that:</p> <ul style="list-style-type: none"> <li>(a) activities are sited, designed and managed to avoid the contamination of groundwater;</li> <li>(b) existing or closed landfills and contaminated land are managed and monitored where appropriate to minimise any contamination of groundwater; and</li> <li>(c) there is sufficient thickness of undisturbed sediment in the confining layer over the Coastal Confined Aquifer System to prevent the entry of contaminants into the aquifer or an upward hydraulic gradient is present which would prevent aquifer contamination.</li> </ul>
<b>Assessment</b>	
<p>The use of a sedimentation pond will ensure sediment is removed from stormwater prior to discharge to the environment. Contamination of ground or surface water will be avoided.</p>	
	<b><i>Hazardous Substances and hazardous activities</i></b>
4.26	Any discharges of hazardous substances from contaminated land, including existing and closed landfills, are managed to ensure that adverse effects beyond the site boundary on people's health or safety, on human or stock water supplies, or on surface water are avoided.
4.27	Landfills and other waste collection or disposal sites are designed and sited to avoid the contamination of groundwater or surface water either through the direct discharge of hazardous substances to water or the leaching of contaminants into or onto land where they may enter water.



<b>Assessment</b>	
The proposed liner system will create an impermeable barrier that is designed to survive significant natural hazard events, while the landfill will be located on impermeable bedrock. No discharge of hazardous substances from the landfill is therefore anticipated.	
	<b>Abstraction of water</b>
4.52	<p>The abstraction of groundwater outside of any groundwater allocation zone in Sections 6 to 15, may occur only if the applicant demonstrates that:</p> <p>(a) the groundwater abstraction has a low stream depleting effect, or does not contribute to the over-allocation of any surface waterbody;</p> <p>(b) the groundwater is not hydraulically connected to any groundwater allocation zone in Sections 6 to 15 of this Plan which is fully or over allocated for abstraction;</p> <p>(c) the total amount of groundwater abstracted cannot result in any continuing long-term decline in mean annual groundwater levels or artesian pressures; and</p> <p>(d) the abstraction will not result in any seawater contamination of the aquifer.</p>
4.57	Any abstraction of groundwater does not result in cross-contamination between aquifers or water-bearing layers that results in, or may result in, adverse effects on water quality.
4.58	Non-consumptive groundwater takes, including the taking of heat from or adding heat to groundwater and any taking which in conjunction with other activities on a site results in a neutral or positive water balance, will not be subject to any groundwater allocation zone limits, and will generally be supported, provided the water either remains in the aquifer, or is returned to the same groundwater allocation zone within 24 hours and is protected from contamination, other than heat.
<b>Assessment</b>	
The passive drainage of groundwater from under the landfill and discharge of that water to land nearby is not expected to result in a stream depleting effect. There is no indication of direct connection to any groundwater allocation zone and the passive drainage nature of the abstraction is not expected to result in a decline in groundwater levels or artesian pressures, particularly once the landfill operation begins and results in downward pressure on the excavated surface. The discharge point from the sedimentation pond is close to the point of abstraction and part of the same aquifer. No cross-contamination of aquifers is anticipated.	
	<b>Natural hazards</b>
4.96	The consequential effects of seismic activity are recognised and timely and appropriate responses to such activity are facilitated.
<b>Assessment</b>	
<p>An assessment of seismic potential and subsequent effects at the landfill site has been completed by Don Macfarlane, the key points from which are noted below:</p> <p><i>'Most of the highly active faults considered as potential seismic sources for an earthquake affecting the Woodstock Quarry site area are too distant to cause significant ground damage but could cause significant shaking.</i></p> <p><i>There are no known or suspected active faults closer than about 1 km from the Woodstock Quarry site so direct rupture of the site is an extremely low likelihood event. A large earthquake on the Porters Pass Fault Zone (including the Townshend and Coopers Creek faults) could cause secondary displacements on shears passing through the site. Based on international records, the secondary offsets would be expected to be in the order of 10% of the primary fault offset if the earthquake occurred within about 10 km of the site.</i></p>	

*Based on a single event displacement of 5-7m on the Porters Pass Fault, a realistic worst-case scenario is to 50-70 cm of displacement within the rock beneath the landfill if the epicentre is at the closest point of the PPFZ. This would most likely be distributed across multiple shears and joints rather than concentrated on a single defect. In our opinion, such distributed deformation would not be sufficient to rupture the proposed liner.*

*A more likely scenario is that shaking of the rock mass will cause joints/fractures within the rock to open and/or displace slightly resulting in increased groundwater flow to the drainage system for a period of a few weeks or months without damaging the liner’.*

The effects of seismic activity have been taken into account in the design of the landfill and liner. Based on the seismic impact assessment it is considered the design will ensure the liner remains intact in likely seismic events and therefore that landfill contents and discharges will continue to be contained and manageable.

### LWRP Conclusion

155. Overall, it is considered the proposal will achieve the outcomes sought by the relevant Objectives and Policies in the Canterbury Land and Water Regional Plan, including the relevant changes within Proposed Plan Change 7.

### Waimakariri River Regional Plan (WRRP)

156. The purpose of this Plan is to promote the sustainable management of rivers, lakes and hydraulically connected groundwater, and river and lake beds in the Waimakariri River Catchment; to maintain and enhance the environment; and to achieve integrated management of these resources. Point and non-point source discharges of contaminants to water bodies in the Waimakariri River Catchment are identified as a particular issue to be addressed through the Objectives and Policies of this Plan. Proposed Plan Change 2 to this plan proposes to remove provisions that relate to the area covered by Section 8 (Waimakariri sub-region) of the Canterbury Land and Water Regional Plan. This proposed change effectively proposes to remove all lowland waterbodies to the east of Woodstock from relevance under the WRRP. The site is within the area indicated in the WRRP as being ‘below Woodstock’, with the WRRP remaining relevant to the application should PC2 become operative in its current form.
157. Provisions within the WRRP of relevance to the application site are assessed in the following table:

Chapter 5 – Water quantity
Objective
Objective 5.1 Enable present and future generations to gain cultural, social, recreational, economic, health and other benefits from the rivers, lakes and wetlands in the Waimakariri River Catchment, and from hydraulically connected groundwater while:

- (a) safeguarding their existing value for efficiently providing sources of drinking water for people and their animals;
- (b) safeguarding the life-supporting capacity of the water, including its associated: aquatic ecosystems, significant habitats of indigenous fauna, and areas of significant indigenous vegetation;
- (c) safeguarding their existing value for providing mahinga kai for Tangata Whenua;
- (d) protecting wahi tapu and other wahi taonga of value to Tangata Whenua;
- (e) preserving the natural character of rivers, lakes and wetlands and protecting them from inappropriate use and development;
- (f) protecting outstanding natural features, and landscapes from inappropriate use and development;
- (g) maintaining and enhancing amenity values; and
- (h) protecting the significant habitat of trout and salmon.

#### Policies

##### Policy 5.1

- (1) Set and maintain water flow, water level and water allocation regimes and control the taking, use, diversion, discharge and damming of surface water, and the taking of water from hydraulically connected groundwater, while achieving (a) to (h) of Objective 5.1, so that:
  - (a) above Woodstock (Figure 4 and Map 1):
    - (i) the range or rate of change of levels or flows of water in or entering lakes Blackwater, Grace, Grasmere, Hawdon, Letitia, Marymere, Mavis, Minchin, Pearson, Rubicon, Sarah, and Vagabonds Inn are preserved in their natural state;
    - (ii) the natural flows, including flow patterns and variability, in the Waimakariri River and tributaries are protected;
    - (iii) the natural water levels in wetlands are protected;
  - (b) below Woodstock (Figure 4 and Map 1):
    - (i) the braided character of the Waimakariri River, aquatic ecosystems and habitats, wetlands, amenity based on the river, and groundwater recharge from the river, are protected;
    - (ii) the aquatic ecosystems and habitats, wetlands and amenity based on the Kaiapoi-Cam-Cust, Otukaikino Creek, Styx, Kowai and upper Eyre River systems, are protected.
- (2) Maintain water flow and water allocation regimes that are consistent with Policy 5.1(1) by:
  - (i) Requiring the taking or diverting of surface water from the Waimakariri River, including its tributaries, or the taking of hydraulically connected groundwater, to be in accordance with the flow and allocation regimes specified in Table 2, unless Objective 5.1 would be achieved.
  - (ii) Prohibiting the taking or diverting of surface water from the Waimakariri River, including its tributaries, or the taking of hydraulically connected groundwater, where the taking or diverting would occur at or below the “A” permit minimum flow for the water resource specified in Table 2, unless the taking or diverting is part of an “AA” allocation block specified in Table 2.
- (3) Ensure that any new water permit (i.e., a water permit that did not exist at the time that the Waimakariri River Regional Plan - Plan Change 1 became operative and is not an exact replacement or transferred permit in terms of the instantaneous rate of take and annual volume taken) does not reduce the reliability of water availability associated with any existing water permit.

- (4) Recognise that the achievement of Objective 5.1 may be assisted through making or diverting water for storage while complying with the flow and allocation regimes specified in Table 2.
- (5) Require the installation and maintenance of water-measuring, recording and data transfer systems, including real-time telemetry, for all takes and diversions greater than 5 litres per second, unless the take or diversion returns the same amount of water to the same water body at or about the location from which it was taken or diverted and there is no significant delay between the taking or diverting and returning of the water.
- (6) Require the cessation or significant reduction of water permit takes and diversions, other than for permits within an “AA” allocation, during a fresh that occurs after a period of 21 days or more of river flows at or below the minimum flow specified in Table 2 if downstream periphyton (including cyanobacteria) biomass/coverage has reached levels that could increase and result in significant adverse effects.

#### **Assessment**

The proposal is not to take water for an abstractive use. Any ground or surface water that is drained from the landfill site will be discharged back to land in the near vicinity of the landfill via the sedimentation ponds. The water level and water flows in nearby streams will therefore be maintained and therefore the associated aquatic ecosystems and habitats, wetlands and amenity associated with those surface water bodies will not be adversely impacted on. For the same reason there will be no impact on any existing water permit.

### **Chapter 6 – Water quality**

#### **Objectives**

##### **Objective 6.1**

Enable present and future generations to gain cultural, social, recreational, economic, health and other benefits from the rivers, lakes and wetlands in the Waimakariri River Catchment (excluding the Styx River catchment) while:

- (a) safeguarding their existing value for efficiently providing sources of drinking water for people and their animals;
- (b) safeguarding the life-supporting capacity of the water, including its associated: aquatic ecosystems, significant habitats of indigenous fauna, and areas of significant indigenous vegetation;
- (c) safeguarding their existing value for providing mahinga kai for Tangata Whenua;
- (d) protecting wahi tapu and other wahi taonga of value to Tangata Whenua;
- (e) preserving the natural character of rivers, lakes and wetlands and protecting them from inappropriate use and development;
- (f) protecting outstanding natural features and landscapes from inappropriate use and development;
- (g) maintaining and enhancing amenity values; and
- (h) protecting the significant habitat of trout and salmon.

#### **Policies**

##### **Policy 6.1**

Set and maintain water quality standards for, and control the discharge of contaminants into, surface water bodies in the Waimakariri River Catchment, excluding the Styx River catchment, as outlined in Figure 6 and defined in Map 2 to:

- (a) protect the natural state of the water in lakes and rivers upstream of the confluence of the Waimakariri River with the Otukaikino Creek;
- (b) ensure water quality is suitable for drinking water for animals, contact recreation, fisheries, fish spawning, aquatic ecosystems and is not altered in those characteristics that have a direct bearing upon the aesthetic values of water or Tangata Whenua cultural values, in the mainstem of the Waimakariri River downstream of the confluence of the Waimakariri River with the Otukaikino Creek;
- (c) ensure water quality is suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems and is not altered in those characteristics that have a direct bearing upon the aesthetic values of water, in the Kaiapoi River, Otukaikino Creek downstream of the Groyne picnic area, and their tributaries; and
- (d) ensure that, in the Otukaikino Creek and its tributaries at, and upstream of, the Groyne picnic area:
  - (i) water quality is suitable for drinking water for animals, fisheries, fish spawning, and aquatic ecosystems;
  - (ii) the natural water quality with respect to organisms of public health significance is maintained; and
  - (iii) water quality is suitable aesthetically and visually for contact, and other forms of, recreation.

#### Policy 6.2

Promote land management practices in:

- (a) the Waimakariri River Catchment which assist in achieving water quality standards; and
- (b) the catchment of the Groyne picnic area of the Otukaikino Creek which improve water quality at the picnic area to a level suitable for contact recreation.

#### Policy 6.3

Within ten years of this plan becoming operative, except for stormwater, no direct discharge of contaminants into the Waimakariri River or its tributaries, excluding the Styx River catchment, should occur unless the discharge is of a standard that ensures the quality of the receiving water is not reduced outside of a reasonable mixing zone.

#### **Assessment**

No discharge from the landfill will be directly to any surface water body, nor will it contain any contaminant, other than sediment. It is also unlikely that any discharge from the sedimentation ponds will reach any surface water body, but if it does it will have travelled a significant distance across land and through vegetation which will ensure removal of sediment. The natural state of any nearby surface water body and the quality of water within it will therefore be protected and maintained.

## WRRP Conclusion

158. Overall, it is considered the proposal will achieve the outcomes sought by the relevant Objectives and Policies in the Waimakariri River Regional Plan, including the relevant changes within Proposed Plan Change 2.

## Canterbury Air Regional Plan

159. Relevant Objectives and Policies within the Canterbury Air Regional Plan are as follows:

Objective number	Objective
5.1	Air quality protects the mauri and life supporting capacity of the environment.
5.2	Ambient air quality provides for the health and wellbeing of the people of Canterbury.
5.5	Air quality is managed in a way that provides for the cultural values and traditions of Ngāi Tahu.
5.6	Amenity values of the receiving environment are maintained.
5.7	Discharges from new activities are appropriately located to take account of adjacent land uses and sensitive activities.
5.9	Offensive and objectionable effects and noxious or dangerous effects on the environment are generally avoided.
<b>General Policies</b>	
6.1	Discharges of contaminants into air, either individually or in combination with other discharges, do not cause: <ul style="list-style-type: none"> <li>a. adverse effects on human health and wellbeing; or</li> <li>b. adverse effects on the mauri and life supporting capacity of ecosystems, plants or animals; or</li> <li>c. significantly diminished visibility; or</li> <li>d. significant soiling or corrosion of structures or property.</li> </ul>
<b>Assessment</b>	
The remoteness of the site, in combination with the inert nature of the waste to be accepted at the landfill, will ensure that adverse effects on human health and wellbeing do not occur and that significant soiling or corrosion of structures or property will not occur. Discharges to air will include only dust and potentially gas (or combusted gas) from the landfill, neither of which are expected to be particularly significant and therefore will not adversely affect the mauri and life supporting capacity of ecosystems, plants or animals or significantly diminish visibility.	
6.2	Recognise the value of air quality as a taonga to Tangata Whenua and manage adverse effects of discharges into air on wāhi tapu, wāhi taonga, and places of significance to Ngāi Tahu.



<b>Assessment</b>	
The nature of the discharge to air (dust and combusted gas) will not result in adverse effects beyond the boundaries of the site and therefore air quality will be maintained. There are no features of places of known significance to Tangata Whenua near the landfill site.	
6.8	Offensive and objectionable effects are unacceptable and actively managed by plan provisions and the implementation of management plans.
<b>Assessment</b>	
The nature of materials to be accepted at the landfill means that offensive or objectionable effects (dour, visual) will not occur. A management plan has been developed to ensure management of the landfill is to a high standard and that material received are limited to the materials specified.	
6.9	Discharges into air from new activities are appropriately located and adequately separated from sensitive activities, taking into account land use anticipated by a proposed or operative district plan and the sensitivity of the receiving environment.
<b>Assessment</b>	
The site is remote with no sensitive activities located nearby.	
6.12	Where activities locate appropriately to mitigate adverse effects on air quality a longer consent duration may be available to provide on-going operational certainty.
<b>Assessment</b>	
The remoteness of the site will avoid adverse effects on surrounding sites. A longer consent duration should therefore be considered.	

### CARP Conclusion

160. Overall, it is considered the proposal will achieve the outcomes sought by the Objectives and Policies of the Canterbury Air Regional Plan.

### Waimakariri District Plan

161. Land use consent under the Waimakariri District Plan has been applied for. Given the consent processes underway with regard to this plan, no further assessment is provided in this application.

### Mahaanui Iwi Management Plan

162. Relevant provisions within the Mahaanui Iwi Management Plan have been assessed previously as part of the assessment of the concept of Te Mana o te Wai within Policy 1 of the NPSFW. Based on that assessment, it is considered the outcomes sought by this plan will be achieved.

### Other matters

163. There is clear direction from Central Government that there is an expectation of increased housing construction, and therefore C & D waste quantities, and possibly quantities of low level contaminated soils, are likely to expand proportionately. This will result in increased pressure on existing waste disposal facilities with subsequent reduction in the period over which Kate Valley and other

existing landfills can remain in operation. The provision of an additional facility for disposal of high volume waste, such as C & D waste and contaminated soils, will result in increased longevity of other landfills designed to receive more harmful waste, such as municipal solid waste. In particular, the closure of the Bromley landfill and ongoing development in Christchurch and surrounding areas means that extra capacity demand will fall on Kate Valley. The proposed landfill is therefore considered to provide a viable and secure alternative which will provide an additional disposal site should any of the other existing landfills become unusable for any period of time and that will ensure increased longevity of landfills designed to accept more toxic waste material.

## Notification

### Public notification

164. Section 95A of the RMA is relevant when a consent authority is considering whether a consent application should be considered with or without public notification.
165. Section 95A identifies a four step process to determine whether public notification is required. Having regard to the steps in section 95A, the following points are noted:

Step 1 (mandatory public notification pursuant to section 95A(2)):

- The applicant does not request public notification of the application; and
- The application is not made jointly with an application to exchange recreation reserve land.

Notification is therefore not mandatory.

Step 2 (public notification precluded pursuant to section 95A(4)):

- There is no rule or national environmental standard that precludes public notification of this application; and
- The application is for a discretionary activity, but does not involve a boundary activity.

Public notification is therefore not precluded.

Step 3 (public notification required pursuant to section 95A(7)):

- There is no rule or national environmental standard that requires public notification of this application; and
- The adverse effects on the environment are less than minor in accordance with section 95D.

Public notification is therefore not required.

Step 4 (public notification in special circumstances pursuant to section 95A(9)):

- The landfill proposal is considered to not be unusual or exceptional because there are a number of existing landfills in the Canterbury region and in relatively close proximity to the application site, and it is an activity that is a requirement for the sustainable function of communities. The material to be accepted is also inert in nature and not particularly harmful when contained. The proposal is therefore not 'out of the ordinary' when considered in the context of location, existing activities of a similar nature and location. Therefore, no special circumstances warranting notification are considered to exist in relation to the application.

166. Based on the assessment provided in the sections above, it is considered that this proposal meets the tests of the RMA to be processed without public notification.

### Limited notification

167. For applications that are not publicly notified the consent authority must, under section 95B, determine whether to make limited notification of an application to any affected parties. Section 95B identifies a four-step process. Having regard to the steps in section 95B, the following points are noted:

Step 1 (certain affected groups and affected persons must be notified)

- There are no affected protected customary rights groups; and
- The activity is not on land, or adjacent to land, subject to a statutory acknowledgement.

Accordingly, no parties must be notified.

Step 2 (limited notification precluded in certain circumstances)

- There are no applicable rules or national environmental standards precluding limited notification;

Limited notification is therefore not precluded.

Step 3 (if not precluded by step 2, certain other affected persons must be notified)

- The application is not for a boundary activity; and
- Section 95E states that a consent authority must consider a person to be an affected person if the activity's adverse effects on the person are minor or more than minor (but not less than minor). As adverse effects have been determined to be less than minor, limited notification is not required. For the same reason no affected party consents have been sought or obtained.

Step 4 (further notification in special circumstances)

- The landfill proposal is considered to not be unusual or exceptional because there are a number of existing landfills in the Canterbury region and within relatively close proximity to the application site, and it is an activity that is a requirement for the sustainable function of communities.

The material to be accepted is also inert in nature and not particularly harmful when contained. The proposal is therefore not ‘out of the ordinary’ when considered in the context of location, existing activities of a similar nature and the location of some of those activities. Therefore, no special circumstances warranting notification or limited notification are considered to exist in relation to the application.

168. Having regard to these requirements, and as the adverse effects of the proposal are less than minor, it is considered there is no requirement for limited notification of the proposal.

## Section 95 conclusion

169. Following the steps set out in sections 95A and 95B, it is considered the application can be processed without public or limited notification.

## Assessment of alternatives

170. The proposed landfill will receive rather than generate waste. The processes that generate the waste and therefore result in the need for the landfill are outside the control of the applicant and therefore no alternatives in this regard can be assessed. Alternatives to landfilling, such as incineration or recycling, are also matters that need to be addressed earlier in the waste generation pathway and are therefore also out of the control of the applicant.
171. The waste material to be received has been carefully considered with regard to both the waste stream and location of the application site. Restriction of waste to exclude putrescible materials is considered to be both the most manageable option in terms of avoidance or mitigation of potential adverse effects on surrounding areas and also in terms of diversion of high volume waste from other landfills thereby allowing them to concentrate on accommodating waste requiring more intense ongoing management.
172. With regard to the landfill itself, the location has been selected because the pit within which the landfill is to be located has, or will be, created from quarrying activities, the site is remote and therefore adverse impacts on people will be avoided, the site has been shown to be stable and suitable, there is a significant distance to any surface water bodies with the topography of the land enabling achievement of directional flows of water discharges towards an area that will provide for soakage and that is of sufficient distance from any surface water body that any discharges to surface water are highly unlikely. The site selected is therefore suitable from a number of perspectives. No other areas within the site were considered.

## Consultation

173. Consultation has been undertaken with Environment Canterbury Customer Service staff, consents planning, contaminated sites and groundwater services.

174. Consultation with the Department of Conservation, Mahaanui Kurataio has commenced.

## Conclusion

175. Woodstock Quarries Limited are applying for consents required to establish and operate a landfill activity at 513 Trig Road, Woodstock. Works are required to excavate the landfill pit as a quarrying operation, prepare the excavated area for installation of the landfill liner and operate the landfill operation. While the intention of the applicant is to target high volume construction and demolition waste and contaminated soils, the landfill will accept all waste except putrescible waste and has been designed accordingly. Landfilling will proceed in conjunction with the quarrying operation, occupying areas where quarrying has been completed.
176. Site conditions have been assessed following geological, hydrological and ecological investigations. Assessment of likely seismic effects at the site has also been completed. These investigations have shown that the site is suitable for the proposed landfill. In particular:
- The landfill will not be sited in an area subject to direct seismic instability (ground displacement) but is within 1 km of mapped active faults and may experience severe shaking at some time in the future. It will therefore be designed to remove seismic risks to liner integrity, landfill stability and leachate system operation.
  - The landfill will not be sited over permeable material nor above a viable groundwater supply.
  - The landfill will not be sited on compressible or unstable foundation materials.
  - The landfill site is not within a floodplain, and
  - The landfill can be designed such that surface runoff is controlled away from active operations.
  - The landfill site does not cover an area of high ecological value and has no direct linkages, or adverse effects on, nearby streams or wetland areas, or areas of significant indigenous flora or habitats of indigenous fauna.
177. The construction methodology of the landfill will follow best practice design, with containment and management of waste materials to avoid adverse effects on the surrounding area. Leachate discharges will be collected and returned to the landfill to assist with compaction.
178. Detailed Landfill and Risk Management Plans have been provided, and set out operational and management requirements to ensure best practice is followed and risks are considered and accounted for at all times and stages. Closure of the landfill will be accomplished by capping with overburden and waste material from quarrying and replanting in indigenous plant species reflecting those present in the wider area.
179. Overall, the effects of the proposal are considered to be less than minor, and the outcomes considered to be consistent with those sought by the Purpose and Principles of the Resource Management Act 1991, the National Policy Statement on Fresh Water, relevant National Environmental Standards, relevant Objectives

and Policies of the Canterbury Land and Water Regional Plan, the Canterbury Air Regional Plan and the Waimakariri River Regional Plan. As effects are less than minor no notification process or affected party consents are considered to be required.

180. On the basis of this assessment, it is considered that the application for consents required to undertake quarrying operations and to establish and operate a landfill operation as described can be granted under section 104 of the Resource Management Act 1991, subject to appropriate conditions, recommendations for which have been provided in Appendix 9.



[Appendix 1:](#) Application Form and Record of Title (under separate cover)

[Appendix 2:](#) Drawings (under separate cover)

[Appendix 3:](#) Geology Report (under separate cover)

[Appendix 4:](#) Hydrogeology Report (under separate cover)

[Appendix 5:](#) Engineering Report (under separate cover)

[Appendix 6:](#) Ecological Assessment (under separate cover)

[Appendix 7:](#) Risk Assessment (under separate cover)



Appendix 8: Draft Landfill Management Plan (under separate cover)

[Appendix 9:](#) Assessment of relevant rules

## **Land and Water Regional Plan Rules Assessment - Summary**

### **Woodstock Quarries Landfill**

<b>Land and Water Regional Plan/PC 7 and Waimakariri River Regional Plan/PC2</b>	
<b>Land use (s9)</b>	
<p><b>LWRP</b></p> <p><b>5.175 The use of land to excavate material is a permitted activity, provided the following conditions are met:</b></p> <ol style="list-style-type: none"> <li>Over the Coastal Confined Gravel Aquifer System, as shown on the Planning Maps:             <ol style="list-style-type: none"> <li>there is more than 1 m of undisturbed material between the deepest part of the excavation and Aquifer 1; and</li> <li>if more than 100 m<sup>3</sup> of material is excavated, the excavation does not occur within 50 m of any surface waterbody; or</li> </ol> </li> <li>Over an unconfined or semi-confined aquifer:             <ol style="list-style-type: none"> <li>the volume of material excavated is less than 100 m<sup>3</sup>; or</li> <li>the volume of material excavated is more than 100 m<sup>3</sup> and:                 <ol style="list-style-type: none"> <li>there is more than 1 m of undisturbed material between the deepest part of the excavation and the seasonal high water table level; and</li> <li>the excavation does not occur within 50 m of any surface waterbody.</li> </ol> </li> </ol> </li> </ol>	<p><b>Does not comply</b></p>
<p><b>LWRP</b></p> <p><b>5.176 The use of land to excavate material that does not comply with one or more of the conditions of Rule 5.175 is a restricted discretionary activity.</b></p> <p><i>The exercise of discretion is restricted to the following matters:</i></p> <ol style="list-style-type: none"> <li>The actual and potential adverse environmental effects on the quality of water in aquifers, rivers, lakes, wetlands; and</li> <li>Any need for remediation or long-term treatment of the excavation; and</li> <li>The protection of the confining layer and maintaining levels and groundwater pressures in any confined aquifer, including any alternative methods or locations for the excavation; and</li> <li>The management of any exposed groundwater, and</li> </ol>	<p><b>Restricted discretionary</b></p>

5. Any adverse effects on Ngāi Tahu values or on sites of significance to Ngāi Tahu, including wāhi tapu and wāhi taonga.	
<p><b>LWRP</b></p> <p><b>5.177 The use of land for the deposition of more than 50 m<sup>3</sup> of material in any consecutive 12 month period onto land which is excavated to a depth in excess of 5 m below the natural land surface and is located over an unconfined or semi-confined aquifer, where the seasonal high water table is less than 5 m below the deepest point in the excavation is a controlled activity, provided the following conditions are met:</b></p> <ol style="list-style-type: none"> <li>1. The material is only cleanfill; and</li> <li>2. The volume of vegetative matter in any cubic metre of material deposited does not exceed 3%; and</li> <li>3. The material is not deposited into groundwater placed in the land at least 1 m above the highest groundwater level at the site; and</li> <li>4. Any cured asphalt deposited is placed in the land at least 1 m above the highest groundwater level expected at the site. The material is not concrete slurry, coal tar or hydro-excavated waste; and</li> <li>5. The material is not deposited onto or into land that is listed as an archaeological site; and</li> <li>6. A management plan has been prepared in accordance with Section 8.1 and Appendix B of “A Guide to the Management of Cleanfills”, Ministry for the Environment, January 2002; and</li> <li>7. A site rehabilitation plan has been prepared for the site and is submitted with the application for resource consent.</li> </ol> <p><b>The CRC reserves control over the following matters:</b></p> <ol style="list-style-type: none"> <li>1. The potential for adverse effects on the quality of water in aquifers, rivers, lakes, wetlands and mitigation measures; and</li> <li>2. The content and adequacy of the management plan prepared in accordance with Section 8.1 and Appendix B of “A Guide to the Management of Cleanfills”, Ministry for the Environment, January 2002; and</li> <li>3. The content and adequacy of the site rehabilitation plan to address any adverse effects after the deposition of material is completed.</li> </ol>	<p><b>Does not comply</b></p>
<p><b>LWRP</b></p> <p><b>5.178 The use of land for the deposition of more than 50 m<sup>3</sup> of material in any consecutive 12 month period onto land which is excavated to a depth in excess of 5 m below the natural land surface and is located over an unconfined or semi-confined aquifer, where the seasonal high water table highest groundwater level is less than 5 m below the deepest point in the excavation, and the associated discharge of contaminants onto or into land where it may enter water, that does not comply with the conditions of Rule 5.177 is a restricted discretionary activity.</b></p> <p><b>The CRC will restrict its discretion to the following matters:</b></p> <ol style="list-style-type: none"> <li>1. The potential for adverse effects on the quality of water in aquifers, rivers, lakes, wetlands and mitigation measures; and</li> <li>2. The proportion of any material other than cleanfill and its potential to cause contamination; and</li> <li>3. The content and adequacy of the management plan prepared in accordance with Section 8.1 and Appendix B of “A Guide to the Management of Cleanfills”, Ministry for the Environment, January 2002.; and</li> <li>4. Methods for reinstatement of the site following completion of the activity</li> <li>5. The content and adequacy of the site rehabilitation plan if submitted with the application for resource consent; and</li> <li>6. Any adverse effects on Ngāi Tahu values or on sites of significance to Ngāi Tahu, including wāhi tapu and wāhi taonga.</li> </ol>	<p><b>Restricted discretionary</b></p>
<p><b>5.89 The discharge of municipal solid waste or hazardous waste into or onto land, or into or onto land in circumstances where a contaminant may</b></p>	<p><b>Discretionary</b></p>

<b>enter water and is not categorised as a prohibited activity is a discretionary activity.</b>	
<b>Water permit (s14)</b>	
<p>LWRP</p> <p>5.6 Any activity that—</p> <ul style="list-style-type: none"> <li>(a) would contravene sections 13(1), 14(2), s14(3) or s15(1) of the RMA; and</li> <li>(b) is not a recovery activity; and</li> <li>(c) is not classified by this Plan as any other of the classes of activity listed in section 87A of the RMA</li> </ul> <p>— is a discretionary activity.</p> <p><b>Section 14 RMA</b> <b>Restrictions relating to water</b></p> <p>(2) No person may take, use, dam, or divert any of the following, unless the taking, using, damming, or diverting is allowed by subsection (3):</p> <ul style="list-style-type: none"> <li>(a) water other than open coastal water; or</li> <li>(b) heat or energy from water other than open coastal water; or</li> <li>(c) heat or energy from the material surrounding geothermal water.</li> </ul>	<p>Contravenes RMA s14(2)</p> <p><b>Discretionary activity</b></p>
<p><b>WRRP</b></p> <p>Rule 5.1 Discretionary Activity for which the Canterbury Regional Council has restricted its discretion.</p> <p>Within the area of the Waimakariri River Catchment “below Woodstock” defined in Figure 4 and Map 1, the taking of water from:</p> <ul style="list-style-type: none"> <li>(i) any surface waters of the Waimakariri River or its tributaries; or</li> <li>(ii) hydraulically connected groundwater<sup>19</sup>;</li> </ul> <p>is a discretionary activity for which the Canterbury Regional Council has restricted its discretion.</p> <p>This rule does not apply to:</p> <ul style="list-style-type: none"> <li>(a) the taking of water specified as a permitted activity in the Canterbury Natural Resources Regional Plan; or</li> <li>(b) abstractions from hydraulically connected groundwater where it can be established, using the "Jenkins" method or other scientifically accepted hydrological calculations that the surface water depletion resulting from a 30 day pumping period will not exceed 5 litres per second.</li> </ul> <p><sup>19</sup> Hydraulically connected groundwater is groundwater that is laterally connected to a river, with a stream depletion factor less than 100 days calculated using the method published by Jenkins, C T (1977) Computation of rate and volume of stream depletion by wells, in Techniques of Water Resources Investigation of the United States Geological Survey, Chapter D1, Book 4, 3rd Printing. (Note that the taking of groundwater which is not defined as hydraulically connected, and therefore is not affected by the rule, may still need to be authorised by another regional plan or by a resource consent.)</p>	<p>Site not below Woodstock</p>

<p>Rule 5.3 Non-complying Activities</p> <p>(1) Within the area of the Waimakariri River Catchment “above Woodstock” defined in Figure 4 and Map 1:</p> <ul style="list-style-type: none"> <li>(a) the taking of water from the Waimakariri River or its tributaries, including lakes, or from hydraulically connected groundwater;</li> <li>(b) the “use” of any water in tributaries, including lakes and wetlands, of the Waimakariri River;</li> <li>(c) the diversion of water from, or the discharge of water into, the Waimakariri River or its tributaries, including lakes and wetlands;</li> </ul> <p>is a non-complying activity.</p> <p>(2) Within the area of the Waimakariri River Catchment “below Woodstock” defined in Figure 4 and Map 1, the taking or diverting of surface water or hydraulically connected groundwater that does not meet the standards and terms for Rule 5.1, and is not listed as a discretionary activity or a prohibited activity, is a non-complying activity.</p> <p>This rule does not apply to taking, uses, diversions or discharges which are specified as permitted activities in the Canterbury Natural Resources Regional Plan;</p>	<p>Site is ‘above Woodstock’.</p> <p>Water may be discharged from the stormwater management pond to the tributary to the west (Woodstock Stream). May not comply.</p> <p><b>Non-complying</b></p>
<b>Discharge permit (s15)</b>	
<b>Drainage water</b>	
<p><b>5.75 The discharge of drainage water from a drainage system into an artificial watercourse, constructed wetland or into or onto land is a permitted activity, provided the following conditions are met:</b></p> <ul style="list-style-type: none"> <li>1. The discharge into an artificial watercourse or constructed wetland, beyond the Mixing Zone as defined in Schedule 5, does not: <ul style="list-style-type: none"> <li>(a) produce conspicuous oil or grease films, scums or foams, or floatable or suspended materials; and</li> <li>(b) produce any conspicuous change in the colour or visual clarity; and</li> </ul> </li> <li>2. The discharge does not: <ul style="list-style-type: none"> <li>(a) occur within a Community Drinking-water Protection Zone as set out in Schedule 1; and</li> <li>(b) contain any hazardous substance; and</li> <li>(c) originate from or enter contaminated or potentially contaminated land.</li> </ul> </li> </ul>	<p>No discharge to an artificial watercourse, or within a community drinking water protection zone. While stormwater discharges will be separate from leachate, the discharge will originate from the area covered by the landfill and therefore will be contaminated land.</p> <p><b>Does not comply</b></p>

<p><b>5.76 The discharge of drainage water from a drainage system into an artificial watercourse, constructed wetland or into or onto land that does not meet one or more of the conditions of Rule 5.75 is a discretionary activity.</b></p>	<p><b>Discretionary</b></p>
<p><b>Stormwater</b></p>	
<p><b>LWRP</b></p> <p><b>5.95 The discharge of stormwater, other than into or from a reticulated stormwater system, into a river, lake, wetland or artificial watercourse or onto or into land in circumstances where a contaminant may enter a river, lake, wetland, or artificial watercourse is a permitted activity, provided the following conditions are met:</b></p> <ol style="list-style-type: none"> <li>1. The discharge is not from, into or onto contaminated or potentially contaminated land; and</li> <li>2. The discharge is not into: <ol style="list-style-type: none"> <li>(a) a water race, as defined in Section 5 of the Local Government Act 2002; and</li> <li>(b) a wetland, unless the wetland is part of a lawfully established stormwater or wastewater treatment system; and</li> <li>(c) a waterbody that is Natural State, unless the discharge was lawfully established before 1 November 2013; and</li> </ol> </li> <li>3. The discharge does not result in an increase in the flow in the receiving waterbody at the point of discharge of more than 1% of a flood event with an Annual Exceedance Probability of 20% (one in five year event); and</li> <li>4. The discharge meets the water quality standards in Schedule 5 after reasonable mixing with the receiving waters, in accordance with Schedule 5; and</li> <li>5. The concentration of total suspended solids in the discharge shall not exceed: <ol style="list-style-type: none"> <li>(a) 50 g/m<sup>3</sup>, where the discharge is to any spring-fed river, Banks Peninsula river, or to a lake except when the background total suspended solids in the waterbody is greater than 50 g/m<sup>3</sup> in which case the Schedule 5 visual clarity standards shall apply; or</li> <li>(b) 100 g/m<sup>3</sup> where the discharge is to any other river or to an artificial watercourse except when the background total suspended solids in the waterbody is greater than 100 g/m<sup>3</sup> in which case the Schedule 5 visual clarity standards shall apply; and</li> </ol> </li> <li>6. The discharge to water is not within a Community Drinking-water Protection Zone as set out in Schedule 1; and</li> <li>7. The discharge does not occur where there is an available reticulated stormwater system.</li> </ol>	<p>Land will be contaminated when landfill operating</p> <p><b>Does not comply</b></p>
<p><b>5.96 The discharge of stormwater, other than into or from a reticulated stormwater system, onto or into land where contaminants may enter groundwater is a permitted activity, provided the following conditions are met:</b></p> <ol style="list-style-type: none"> <li>1. The discharge is not from, into or onto contaminated or potentially contaminated land; and</li> <li>2. The discharge: <ol style="list-style-type: none"> <li>(a) does not cause stormwater from up to and including a 24 hour duration 10% Annual Exceedance Probability rainfall event to enter any other property; and</li> <li>(b) does not result in the ponding of stormwater on the ground for more than 48 hours, unless the pond is part of the stormwater treatment system; and</li> </ol> </li> </ol>	<p>Land will be contaminated when landfill operating</p> <p><b>Does not comply</b></p>



<p>(c) is located at least 1 m above the seasonal high water table that can be reasonably inferred for the site at the time the discharge system is constructed; and</p> <p>(d) is only from land used for residential, educational or rural activities; and</p> <p>(e) does not occur where there is an available reticulated stormwater system, except where incidental to a discharge to that system; and</p> <p>(f) is not from a system that collects and discharges stormwater from more than five sites.</p>	
<p><b>5.97 The discharge of stormwater, other than from a reticulated stormwater system, into a river, lake, wetland or artificial watercourse or onto or into land in circumstances where a contaminant may enter water that does not meet one or more of the conditions of Rule 5.95 or Rule 5.96; and the discharge of stormwater or construction-phase stormwater into a reticulated stormwater system that does not meet the condition of Rule 5.93A; is a discretionary activity except that within the boundaries of Christchurch City it is a noncomplying activity.</b></p>	<p><b>Discretionary</b></p>
<p><b>WRRP</b></p> <p><b>Rule 6.1 Discretionary Activity</b></p> <p>The discharge of contaminants into surface water bodies in the Waimakariri River Catchment, excluding the Styx River Catchment, or onto or into land within 20 metres of surface water bodies, or onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering surface water bodies, is a discretionary activity.</p> <p>This rule does not apply to discharges which are specified as permitted activities in the Canterbury Natural Resources Regional Plan.</p> <p><b>Standards and Terms</b></p> <p>The activity shall comply with the following standards and terms.</p> <p>The water quality standards set out below shall be observed. The standards listed for each class apply after reasonable mixing of any contaminant with the receiving water and disregard the effect of any natural perturbations that may affect the water body.</p> <p>The water quality standards shall be the sum total of all substances in the water body, whether they are contaminants from discharges or are existing in the background state.</p>	<p>Discharge from stormwater management pond may enter tributary to the west (Woodstock Stream).</p> <p><b>Discretionary activity</b></p>
<p><b>WRRP</b></p> <p><b>Rule 6.2 Non-Complying Activity</b></p> <p>The discharge of contaminants into surface water bodies in the Waimakariri River Catchment, excluding the Styx River catchment, or onto or into land within 20 metres of surface water bodies, or onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering surface water bodies, that does not comply with the water quality standards and terms set by Rule 6.1, is a Non-Complying activity.</p>	<p>Discharge from stormwater management pond may enter tributary to the west (Woodstock Stream) and may not comply with water quality standards set by Rule 6.1.</p>

	<b>Non-complying</b>
<b>LWRP</b> <b>5.98 Any discharge of water or contaminants onto or into land in circumstances where a contaminant may enter groundwater that is not classified by any of the above rules, is a permitted activity, provided the following conditions are met:</b> <ol style="list-style-type: none"> <li>1. The volume of the discharge does not exceed 10 m<sup>3</sup> per day and the application rate does not exceed 10 mm per day; and</li> <li>2. The discharge is not directly into groundwater; and</li> <li>3. The discharge does not result in any overflow or runoff into any surface water body or onto neighbouring site; and</li> <li>4. The discharge does not, in groundwater, render fresh water unsuitable or unpalatable for consumption by animals or humans; and</li> <li>5. The discharge does not contain any hazardous substance, hazardous waste or added radioactive isotope; and</li> <li>6. The discharge does not occur when the soil moisture exceeds field capacity; and</li> <li>7. The discharge is not from or into contaminated or potentially contaminated land; and</li> <li>8. The discharge is not within <ol style="list-style-type: none"> <li>(a) 50 m of a bore used for water abstraction; or</li> <li>(b) within a Community Drinking-water Protection Zone as set out in Schedule 1; and</li> </ol> </li> <li>9. Where the discharge is from the use of live ammunition associated with military training under the Defence Act 1990, conditions 1 to 8 do not apply.</li> </ol>	NA – Rule 5.97 applies
<b>5.99 Any discharge of water or contaminants into surface water or onto or into land in circumstances where it may enter surface water that is not classified by any of the above rules, is a permitted activity, provided the following conditions are met:</b> <ol style="list-style-type: none"> <li>1. The discharge is not from or into contaminated or potentially contaminated land; and</li> <li>2. The discharge is not into a Natural State water body; and</li> <li>3. The discharge meets the water quality standards in Schedule 5 after reasonable mixing with the receiving waters, in accordance with Schedule 5; and</li> <li>4. The concentration of total suspended solids in the discharge shall not exceed: <ol style="list-style-type: none"> <li>(a) 50 g/m<sup>3</sup>, where the discharge is to any Spring-fed river, Banks Peninsula river, or to a lake; or</li> <li>(b) 100 g/m<sup>3</sup> where the discharge is to any other river or to an artificial watercourse; and</li> </ol> </li> <li>5. The discharge does not result in more than a 20% change in the rate of flow of the receiving surface water body; and</li> <li>6. The discharge does not contain any hazardous substance, hazardous waste or added radioactive isotope.</li> </ol>	NA -Rule 5.97 applies
<b>5.100 Any discharge that is not permitted by either Rule 5.98 or 5.99 and is not classified by any other rule in this Plan is a discretionary activity.</b>	NA

<p><b>5.6 Any activity that—</b></p> <p><b>(a) would contravene sections 13(1), 14(2), s14(3) or s15(1) of the RMA; and</b></p> <p><b>(b) is not a recovery activity; and</b></p> <p><b>(c) is not classified by this Plan as any other of the classes of activity listed in section 87A</b></p> <p><b>of the RMA</b></p> <p><b>— is a discretionary activity.</b></p> <p><b>RMA</b>  <b>15 Discharge of contaminants into environment</b>  (1) No person may discharge any—  (a) contaminant or water into water; or  (b) contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or  (c) contaminant from any industrial or trade premises into air; or  (d) contaminant from any industrial or trade premises onto or into land—  unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.</p>	<p>Leachate will contain contaminants.</p> <p><b>Discretionary activity</b></p>
<p><b>Canterbury Air Regional Plan</b></p>	
<p><b>Discharge permit to air (s15)</b></p>	
<p>Activities not otherwise provided for</p> <p>7.63 The discharge of contaminants into air:</p> <ol style="list-style-type: none"> <li>1. that does not comply with one or more of the conditions of Rules 7.47 to 7.62, excluding condition 1 of Rules 7.47, 7.48, 7.49, 7.50 7.51, 7.55, 7.59 and 7.62; or</li> <li>2. that is from an industrial or trade premise and is not managed by Rules 7.47 -7.62; and is not a prohibited activity, is a discretionary activity.</li> </ol>	<p>Industrial activity not managed by 7.47 – 7.62</p> <p><b>Discretionary activity</b></p>

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<b>Other activities</b>  <b>54 Non-complying activities</b> The following activities are non-complying activities if they do not have another status under this subpart: (a) vegetation clearance within, or within a 10 m setback from, a natural wetland; (b) earthworks within, or within a 10 m setback from, a natural wetland; (c) the taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland.	Permitted
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<b>Relevant Definitions</b>		
Cleanfill	Cleanfill means material that, when buried, will have no adverse effects on people or the environment. Cleanfill material includes virgin natural materials such as clay, soil and rock, and other inert materials such as concrete or brick that are free of: 1. combustible, putrescible, degradable or leachable components; 2. Hazardous substances; 3. products or materials derived from hazardous waste treatment, hazardous waste stabilisation, or hazardous waste disposal practices; 4. materials that may present a risk to human or animal health, such as medical and veterinary waste, asbestos, or radioactive substances; or 5. liquid waste	Does not apply
Contaminant	Contaminant Includes any substance (including gases, odorous compounds, liquids, solids, and microorganisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy, or heat– (a) when discharged into water, changes or is likely to change the physical, chemical, or biological condition of water; or (b) when discharged onto or into land or into air, changes or is likely to change the physical, chemical, or biological condition of the land or air onto or into which it is discharged	Applies
Schedule 4 Hazardous Substances	<b>Part A – Hazardous Substances</b>  Hazardous substance means, unless expressly provided otherwise by regulations, any substance defined in the Hazardous Substances (Minimum Degrees of Hazard) Regulations 2001 —	Some waste to be disposed of will be hazardous as defined.

	<p>(a) with one or more of the following intrinsic properties:</p> <ul style="list-style-type: none"> <li>(i) explosiveness:</li> <li>(ii) flammability:</li> <li>(iii) a capacity to oxidise:</li> <li>(iv) corrosiveness:</li> <li>(v) toxicity (including chronic toxicity):</li> <li>(vi) ecotoxicity, with or without bioaccumulation; or</li> </ul> <p>(b) which on contact with air or water (other than air or water where the temperature or pressure has been artificially increased or decreased) generates a substance with any one or more of the properties specified in paragraph (a) of this definition; and</p> <p>(c) is environmentally persistent or will bio-accumulate to a level that has acute or chronic toxic effects on humans or other non-target species.</p>	
Municipal solid waste	Municipal solid waste means any non-hazardous, solid waste from a combination of domestic, commercial and industrial sources. It includes putrescible waste, garden waste, uncontaminated biosolids and clinical and related waste (including contaminated waste sterilised to a standard acceptable to the Department of Health).	Does not apply
Solid waste	Solid waste means primarily solid contaminants for which disposal by discharge into the environment is intended, or which disposal by discharge into the environment would be necessary if other processes such as re-use, recycling or recovering cannot be applied.	Applies

Appendix 10: Proposed Conditions of Consent (under separate cover)