Discharge Permit

Taylorville Resource Park

Taylorville Road - Lot 1-2 Deposited Plan 584105

Assessment of Environmental Effects and Statutory Analysis

19 September 2024

B&A
Urban & Environmental

Prepared for:
Taylorville Resource Park

APPLICATION FOR RESOURCE CONSENT

FORM 1: ADMINISTRATION

Office Use Only

THE WEST COAST REGIONAL COUNCIL

Notes

- You must **fully** complete both this administration form and all related activity forms. Provide as much detail as you can.
- **You must pay the required initial fee (as stated on page 9 of this form) when you submit your consent application forms, or your application will be returned to you.**
- Failure to provide the required information and payment will delay the processing of your application. If you do not provide adequate information then we will not be able to process your application, and will return it to you.
- Remember to sign and date all forms. A signature is not required if you email or submit your application by electronic means.

If you need any further help, please phone a member of the Consents team on **(03) 768 0466 or 0508 800 118.**

Office use only

Application Number: _____

Initial Fee Paid:

$_____

Date Initial Fee Paid:

_____

Contact details

Applicant details

For **individuals**, you must provide the full names of all individuals (such as John Robert Smith and Mary Jane Williams).
For **companies and other incorporated entities** you must provide the company name and you must also provide the name of a person or persons who will represent your company and be responsible for the application.
For **partnerships, groups** and **unincorporated entities** (such as private or family trusts or unincorporated societies) we must have the details of all authorised partners, trustees, members or officers. We may also request a copy of your society's rules to verify your status as a formal body or society.

Full name/s of applicant/s This is the name/s that the consent will be issued to. We will not accept applications made in the name of unregistered companies.	Taylorville Resource Park Limited			
Applicant's postal address	P O Box 2103 Washdyke Timaru 7941			
Applicant's residential address If different from postal address				
Primary contact person/s	Ray Singer			
Email address	[redacted]			
Phone number/s	Home:		Business:	
	Mobile: [redacted]		Fax:	

Partnership / Groups / Unincorporated entity details

For **partnerships, groups** or **unincorporated entities** (such as private or family trusts or unincorporated bodies or societies) you must provide details of all authorised partners, trustees or members. Any consent granted will then include these names, and all individuals will be legally responsible for the consent and any associated costs. Should these persons change, then you must notify us.

Name of person: **Status** (such as partner, member or trustee): **Residential address:**	
Name of person: **Status** (such as partner, member or trustee): **Residential address:**	
Name of person: **Status** (such as partner, member or trustee): **Residential address:**	
Name of person: **Status** (such as partner, member or trustee): **Residential address:**	

Include details of any further partners/trustees/members on a separate page if necessary.

Application consultant/agent details (if applicable)

Name/company name	Barker & Associates			
Contact person	Kerstin Ghisel			
Postal address	Level 3, 61 Cambridge Terrace, Christchurch Central 8011			
Email address	KerstinG@barker.co.nz			
Phone number/s	Home:		Business:	
	Mobile:	027 203 0901	Fax:	

Who should we send application correspondence to?

☑ Applicant ☑ Consultant/Agent

Have you discussed this application with a West Coast Regional Council staff member: ☑ Yes ☐ No

Name of staff member(s):

Chris Barnes, Selva Selvarajah, Michael Durand

Consultation

Please list the persons that you believe to have an interest in, or that may be affected by, the proposal.

Affected Party name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	
Affected Party name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	
Affected Party name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	

Have you discussed your proposal with your neighbours and other parties who may be affected, eg, Fish & Game, Department of Conservation, Iwi, New Zealand Transport Agency, user groups and interest groups:

☐ Yes ☐ No

If yes, who was consulted (Attach any correspondence if appropriate):

Do they have any concerns:

How can these concerns be met:

Location

Property address / Location:	Taylorville Road
Legal description / Site description:	Lot 1-2 Deposited Plan 584105 contained within Record of Title 1097679
Name of closest road/street or nearest settlement/town	
Map reference (NZTM):	

Territorial Authority in which the activity will be located

☐ Buller ☑ Grey ☐ Westland

Note: West Coast Regional Council can help you create a base map to assist with your location plan. Please call us on (03) 768 0466 or 0508 800 118 during office hours for assistance, or call in to our office at 388 Main South Road, Paroa, Greymouth.

If the owner and/or occupier of the activity site differ from the applicant please provide their names and contact details

Owner name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	

Occupier name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	

Resource consents sought

Provide a brief description of the activity to which your application(s) relates

Please see attached AEE

Tick the type/s of resource consent/s you are seeking from the West Coast Regional Council.
If you are replacing any existing or previous consents, please state the existing or previous consent number(s) in the space below, and complete the Section "Value of Consent Holder Investment".
Remember that for each consent application you must complete the relevant 'activity form'.

☐ **Coastal permit** For activities that are within the coastal marine area (CMA).	Previous Consent Number/s
☑ **Discharge permit** For activities outside the CMA that may discharge contaminants into the air, water and onto or into land.	Previous Consent Number/s
☐ **Land use** For activities and structures outside the CMA that are on land, or in, on or over a river or lake bed.	Previous Consent Number/s
☐ **Water** For activities outside the CMA that involve the abstraction, impoundment (damming), diversion and/or use of ground, geothermal or surface water.	Previous Consent Number/s

Are related consents required from other authorities? ☐ Yes ☐ No

If **yes**, please provide details.

Consent required	Consent authority (such as district council, DoC, NZHPT)	Date applied for	Date granted

Should your application/s be granted, do you have a consent term or expiry date you would prefer for your consent/s?

☑ Yes ☐ No

If **yes**, provide details:

6 months ☐ Months ☐ Years

Provide information to demonstrate that the degree of adverse environmental effect of the activity is likely as a result of this application. The following information requirements were introduced by the Resource Management Amendment Act 2013 and took effect on 3 March 2015. These are mandatory requirements for all applications. The sections require varying degrees of familiarity with the RMA and documents produced under the RMA. If you need any further help, please phone a member of the Consents team.

Related permitted activities

List any activities that are part of your proposal and are permitted (allowed without resource consent) under the Regional Air Quality Plan, the Regional Coastal Plan for the West Coast and the Regional Land and Water Plan.

Please see attached AEE

Provide information that shows how each permitted activity will comply with the conditions of the relevant rule.

Please see attached AEE

Other activities

Describe any other activities related to your proposal that you think the West Coast Regional Council may need to be aware of.

Please see attached AEE

Part 2 of the RMA

Part 2 of the RMA is attached at the end of this document.

Provide an assessment of your proposed activity/activities against the matters set out in Part 2.

Please see attached AEE

Other policies, rules and requirements

Assess your proposal against any relevant provisions of:

- national environmental standards
- other regulations
- national policy statements
- the West Coast Regional Policy Statement (RPS)
- Regional Air Quality Plan, the Regional Coastal Plan for the West Coast and the Regional Land and Water Plan

Please see attached AEE

Please complete an assessment of environmental effects in the detail that corresponds with the scale and significance of the effects that the activity may have on the environment (This may be covered by the appropriate activity form(s)).

Advice Note: Please attach a separate sheet(s) if required.

Schedule 4 of the RMA is attached at the end of this document.

Value of Consent Holder investment

Please complete this section only if your application is to renew an existing consent

Important: You must complete this question if your application is intended to replace a currently operative resource consent, and this application will be lodged with the West Coast Regional Council at least 3 months before that consent expires.

1. Provide an assessment of the value of your investment. You need to:
    - specify the value of investment of the activities/infrastructure that are reliant on the resource consent/s you are applying for here. This must be the 'book value' of the investment (not the replacement value).

☐	**< $10,000**	☐	**$1 Million to $5 Million**
☐	**$10,000 to $50,000**	☐	**$5 Million to $50 Million**
☐	**$50,000 to $250,000**	☐	**>$50 Million**
☐	**$250,000 to $1,000,000**		

- include evidence that supports the assessment.

Application fees

Initial Fee

- You will be charged the West Coast Regional Councils full actual and reasonable costs for processing this application.
- The minimum estimated initial fee is required to be paid when you submit your application. For simple consents that are processed quickly the initial fee is likely to cover your full costs.
- For complex proposals that exceed the initial fee, you will generally receive an invoice monthly. A final invoice will be sent to you after you receive the final decision on your application.

Please refer to the table below for the **minimum estimated initial fee** required for your application (updated 25 August 2023).

Description	Minimum estimated initial fee $ excluding GST	Minimum estimated initial fee $ including GST
RESOURCE CONSENTS		
Land use consent and associated consents for dry bed gravel extraction	$930	$1,069.50
Land use consent and associated consents for river protection works	$1,500	$1,725
Discharge permits for dairy effluent discharges	$1,500	$1,725
Land use consent	$1,500	$1,725
Land use consent and associated consents for land based alluvial gold mining operations	$2,240	$2,576
Coastal permits	$1,500	$1,725
All other resource consents	$1,500	$1,725
CONSENT ADMINISTRATION		
Application for a change or cancellation of consent conditions	$750	$862.50
Application for a Certificate of Compliance or an Existing Use Certificate	$750	$862.50
Application to extend the lapsing period for a consent	$750	$862.50
Transfer of consents from the consent holder to another (payable by the person requesting the transfer)	$185	$212.50
Request for a change to consent holders name (payable by the person requesting the change)	$185	$212.50
TRANSFER EXISTING WATER PERMIT BETWEEN SITES WITHIN A CATCHMENT		
Non-notified	$185	$212.50

Payment can be made in the following ways:

- **at the West Coast Regional Council Office by cash or cheque**
- **by electronic banking using the details below:**

WEST COAST REGIONAL COUNCIL

WESTPAC BANK ACCOUNT NUMBER:

0	3	0	8	4	6	0	1	2	1	5	0	0	0	0	
Bank		Branch Number				Account Number							Suffix		

Payer particulars – **Name of applicant**

Payer reference - **RCAPPLN**

Payer particulars (max 12 characters)	*Payer code (max 12 characters)*	*Payer reference (max 12 characters)*

Declaration

"I/the applicant, hereby certify that, to the best of my knowledge and belief, the information given in this application is true and correct. I/the applicant, agree to pay all actual and reasonable costs incurred by the West Coast Regional Council in processing the consent application/s regardless of whether or not the application is granted. I/the applicant, also agree to pay 10% penalty interest on amounts not paid within 30 days of the due date. This also applies to any subsequent compliance monitoring charges relating to the resource consent.

Signature of applicant or applicant's agent	Date
	19.9.24

Print Name (BLOCK CAPITALS)

Kerstin Ghisel

A signature is not required if the application is made by electronic means.

Final checklist

Have you?
Please tick

- ☐ Filled in all parts of this form.
- ☐ Completed and attached all related activity forms.
- ☐ Included a sketch or location map that shows us exactly where your activity will take place.
- ☐ Attached any written approvals obtained from parties potentially affected by your proposal.
- ☐ Supplied a detailed assessment of environmental effects.
- ☐ Paid the required deposit/fee.

Important information – please read carefully

Official information

The information you provide with your application is public information. It is used to help process your resource consent application and assess the impact of your activity on the environment and other people.

Your information is held and administered by the West Coast Regional Council in accordance with the Local Government Official Information and Meetings Act 1987 and the Privacy Act 1993. This means that your information may be disclosed to other people who request it in accordance with the terms of these Acts. It is therefore important you let us know if your application includes trade secrets, commercially sensitive material or any other information you consider should not be disclosed.

Consent holder costs – Ongoing responsibilities

If your application is granted, the Consent Holder has a legal obligation to comply with any conditions of the consent. Consent conditions will be monitored. Monitoring will incur additional fees which will be charged to the Consent Holder. Please contact us if you have any queries regarding your deposit/fee or processing costs or the monitoring charges for your activity.

Consultation

Consultation with other parties who may be interested in or affected by your activity is encouraged. This involves discussing your activity with others who may have some concerns, listening to what others have to say, considering their responses and deciding what will be done.

More information

For more information on the application process or resource consents, visit our website at **www.wcrc.govt.nz** or phone the Consents team on (03) 768 0466 or 0508 800 118.

Form updated 25 August 2023

THE WEST COAST REGIONAL COUNCIL

388 Main South Road, Paroa, Greymouth 7805
PO Box 66, Greymouth 7840
Telephone (03) 768 0466
Toll Free 0508 800 118
Facsimile (03) 768 7133
Email info@wcrc.govt.nz
Website www.wcrc.govt.nz

Part 2 of the Resource Management Act 1991

Purpose and principles

5 Purpose

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, *sustainable management* means managing 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.

6 Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

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

(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

(f) the protection of historic heritage from inappropriate subdivision, use, and development:

(g) the protection of protected customary rights.

7 Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—

(a) kaitiakitanga:

(aa) the ethic of stewardship:

(b) the efficient use and development of natural and physical resources:

(ba) the efficiency of the end use of energy:

(c) the maintenance and enhancement of amenity values:

(d) intrinsic values of ecosystems:

(e) [Repealed]

(f) maintenance and enhancement of the quality of the environment:

(g) any finite characteristics of natural and physical resources:

(h) the protection of the habitat of trout and salmon:

(i) the effects of climate change:

(j) the benefits to be derived from the use and development of renewable energy.

8 Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Schedule 4
Information required in application for resource consent

1 Information must be specified in sufficient detail

Any information required by this schedule, including an assessment under clause 2(1)(f) or (g), must be specified in sufficient detail to satisfy the purpose for which it is required.

2 Information required in all applications

(1) An application for a resource consent for an activity (the *activity*) must include the following:

- (a) a description of the activity:
- (b) a description of the site at which the activity is to occur:
- (c) the full name and address of each owner or occupier of the site:
- (d) a description of any other activities that are part of the proposal to which the application relates:
- (e) a description of any other resource consents required for the proposal to which the application relates:
- (f) an assessment of the activity against the matters set out in Part 2:
- (g) an assessment of the activity against any relevant provisions of a document referred to in section 104(1)(b).

(2) The assessment under subclause (1)(g) must include an assessment of the activity against—

- (a) any relevant objectives, policies, or rules in a document; and
- (b) any relevant requirements, conditions, or permissions in any rules in a document; and
- (c) any other relevant requirements in a document (for example, in a national environmental standard or other regulations).

(3) An application must also include an assessment of the activity's effects on the environment that—

- (a) includes the information required by clause 6; and
- (b) addresses the matters specified in clause 7; and
- (c) includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

3 Additional information required in some applications

An application must also include any of the following that apply:

- (a) if any permitted activity is part of the proposal to which the application relates, a description of the permitted activity that demonstrates that it complies with the requirements, conditions, and permissions for the permitted activity (so that a resource consent is not required for that activity under section 87A(1)):
- (b) if the application is affected by section 124 or 165ZH(1)(c) (which relate to existing resource consents), an assessment of the value of the investment of the existing consent holder (for the purposes of section 104(2A)):
- (c) if the activity is to occur in an area within the scope of a planning document prepared by a customary marine title group under section 85 of the Marine and Coastal Area (Takutai Moana) Act 2011, an assessment of the activity against any resource management matters set out in that planning document (for the purposes of section 104(2B)).

4 Additional information required in application for subdivision consent

An application for a subdivision consent must also include information that adequately defines the following:

- (a) the position of all new boundaries:
- (b) the areas of all new allotments, unless the subdivision involves a cross lease, company lease, or unit plan:
- (c) the locations and areas of new reserves to be created, including any esplanade reserves and esplanade strips:
- (d) the locations and areas of any existing esplanade reserves, esplanade strips, and access strips:
- (e) the locations and areas of any part of the bed of a river or lake to be vested in a territorial authority under section 237A:
- (f) the locations and areas of any land within the coastal marine area (which is to become part of the common marine and coastal area under section 237A):
- (g) the locations and areas of land to be set aside as new roads.

5 Additional information required in application for reclamation

An application for a resource consent for reclamation must also include information to show the area to be reclaimed, including the following:

- (a) the location of the area:
- (b) if practicable, the position of all new boundaries:
- (c) any part of the area to be set aside as an esplanade reserve or esplanade strip.

Assessment of environmental effects

6 Information required in assessment of environmental effects

(1) An assessment of the activity's effects on the environment must include the following information:

- (a) if it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:
- (b) an assessment of the actual or potential effect on the environment of the activity:
- (c) if the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment that are likely to arise from such use:
- (d) if the activity includes the discharge of any contaminant, a description of—
  - (i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
  - (ii) any possible alternative methods of discharge, including discharge into any other receiving environment:
- (e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:
- (f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted:
- (g) if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved:
- (h) if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).

(2) A requirement to include information in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

(3) To avoid doubt, subclause (1)(f) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not—

- (a) oblige the applicant to consult any person; or
- (b) create any ground for expecting that the applicant will consult any person.

7 Matters that must be addressed by assessment of environmental effects

(1) An assessment of the activity's effects on the environment must address the following matters:

- (a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:
- (b) any physical effect on the locality, including any landscape and visual effects:
- (c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:
- (d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:
- (e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants:
- (f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.

(2) The requirement to address a matter in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

Consent No. (for office use only)

6

Discharge Permit Application
To Discharge Contaminants to Land

Please answer all questions fully. You should discuss your application with Council officers before completing this form.

Show the location of the diversion and adjoining properties on your map on Form 1. Include design plans and details with this application.

Part A: General

1. What is the source of the contaminant (eg. sewage treatment, industry, water treatment, rural activity, solid waste etc.)?
   From a retention pond

2. Describe the contaminant including, where appropriate, the physical and chemical content.
   Please see attached AEE

3. Is the contaminant treated in any way before being discharged? Yes ✓ No ○
   If Yes, describe treatment Please see attached AEE

4. What is the location of the discharge? lot 112 DP 584105

5. For liquid contaminants, what method of discharge will be used (eg. spray irrigation, soakage, etc.)?

6. Describe the soils, topography and vegetation cover of the land onto which the discharge will be made:
   Please see attached AEE

7. What is the total area of land on to which the discharge is to be made: ..... hectares
   What is the area of land over which the discharge is made each day: ..... hectares

Part A: General (Continued)

8. **Discharge Rate Information** Please see attached AEE

Maximum flow rate: ..... litres per second or cubic metres per second
Maximum daily discharge rate: ..... cubic metres

Is the discharge: continuous O or intermittent O ?

What will be the maximum discharging period? ..... hours per day
..... days per week
..... weeks per year

9. For animal manure, what is the source of the manure? NA

Cows O Pigs O Poultry O Other, specify: .....

How many animals in your herd? .....

What maximum herd size are you planning? .....

What is the volume of waste produced daily? .....

If you have treatment ponds, how many do you have? .....

What are their dimensions?

..... metres long, ... metres wide, ... metres deep

10. For septic tanks, what is the source of waste? NA

Multiple dwelling O Motel/Restaurant O Park/Recreation facility O

Other, specify: .....

Is the waste: toilet and hand washing? O toilet, bathroom and kitchen waste? O

Other, specify: .....

What is the estimated number of people using the facility per day? .....

Please provide details of your design, design calculations, soils, percolation tests and site plan which justify your choice of septic tank size, type and layout.

.....

.....

11. Does the discharge also involve: Please see attached AEE

Outlet structure?	Yes O	No O
Diversion?	Yes O	No O
Discharge to air?	Yes O	No O
Discharge to water?	Yes O	No O

If you answered Yes to any of 11 above, a separate consent application may be required.

Part B: Assessment of Effects on the Environment

Where your discharge could have a significant adverse effect on the environment a more detailed environmental assessment is required in accordance with the Fourth Schedule of the Resource Management Act 1991.

1. Comment on the possible effect the discharge may have on the drainage capacity, fertility, ground or surface water of or near the site:

Please see attached AEE

2. Within the vicinity of the discharge are there any: Please see attached AEE

	Yes	No
(1) Water bodies, ground water or ground water bore?	O	O
(2) Water abstractions?	O	O
(3) Obvious signs of biota (eg. fish, eels, insect life, aquatic plants)?	O	O
(4) Areas where food is gathered (eg. watercress, fish, kaimoana, blackberries)?	O	O
(5) Wetlands (eg. swamp areas)?	O	O
(6) Recreational activities carried out (eg. swimming, fishing, canoeing)?	O	O
(7) Areas of particular aesthetic or scientific value (eg. archaeological sites)?	O	O
(8) Areas or aspects of significance to iwi?	O	O

If you have answered yes to any of the above, describe what effects your discharge may have and the steps you propose to take to mitigate these.

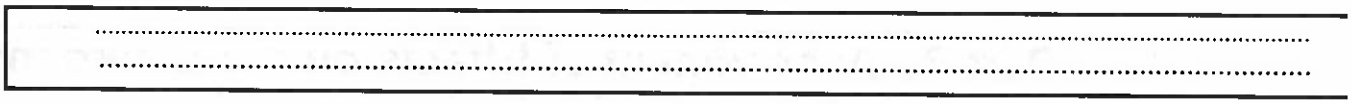
(Continue on a separate page if necessary)

3. What alternative methods of disposal or discharge locations have you considered?

Please see attached AEE

4. Why did you choose the proposed method of disposal and location point?

Please see attached AEE



Part B: Assessment of Effects on the Environment (continued)

5. How will the equipment controlling the discharge be operated and maintained to prevent equipment failure, and what measures will be implemented to ensure that the effects of any malfunction are remedied?

Please see attached AEE

6. What, if any, monitoring do you propose to carry out to ensure that the discharge does not have any adverse effect?

Please see attached AEE

B&A Reference:

CH025279

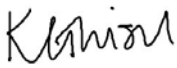
Status:

Final Revision

Date:

19 September 2024

Prepared by:



Kerstin Ghisel

Senior Associate, Barker & Associates Limited

Reviewed by:

Karl Cook

Director, Barker & Associates Limited

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1.0 Applicant and Property Details

To:	West Coast Regional Council
Site Address:	Taylorville Road
Applicant Name:	Taylorville Resource Park Limited
Address for Service:	Barker & Associates Ltd Level 3, 61 Cambridge Terrace Christchurch Central City Christchurch 8013 Attention: Kerstin Ghisel
Legal Description:	Lot 1-2 Deposited Plan 584105 contained within Record of Title 1097679 (refer to Record of Title as Appendix 1)
Site Area:	19.342 ha
Site Owner:	Taylorville Resource Park Limited
Regional Plan:	Regional Land and Water Plan (RLWP)
District Plans:	Operative Grey District Plan Proposed Te Tai o Poutini Plan
GDP Zoning:	Rural Environmental Area
Locality Diagram:	Refer to Figure 1
Brief Description of Proposal:	Temporary discharge from retention pond to land, via a soakage area
Summary of Reasons for Consent:	RLWP: Discretionary Activity

2.0 Introduction and Background

2.1 Introduction

This report addresses the relevant matters under the RMA for an application for a resource consent under s88 of the Resource Management Act 1991 (the Act) and a change to conditions of a consent under s127 of the Act for an existing landfill activity at Lot 1-2 DP 584105 at Taylorville.

2.2 Background

The application site, which is known as the 'Taylorville Resource Park', is a demolition and clean fill disposal facility. Consents granted for activities on the site are outlined below.

2.2.1 Regional Consents

The onsite operations were original consented by the WCRC in August 2021, involving the following consents:

- RC-2021-0097-01 Land Use Consent - To undertake earthworks, including land-based gravel extraction to construct, operate and rehabilitate a demolition fill site, Taylorville.
- RC-2021-0097-02 Discharge Permit - To discharge demolition waste to land, Taylorville.

Consent was granted for a 20 year term from August 2021. Subsequent variations to the above consents have allowed asbestos and coal tar contaminated material to also be accepted in two lined cells. Consent conditions also allow for 'other hazardous materials' at the discretion of the West Coast Regional Council (WCRC). The latest variation (RC-2021-0097-V3) is subject to the consent conditions outlined at Appendix 2.

2.2.2 District Consents

Land use resource consent was obtained from the Grey District Council in 2022 (reference LU3084/22) to undertake discharge of demolition waste to land which does not comply with the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) 2011.

3.0 Site Context

3.1 Site Description

The application site is located to the west of the township of Taylorville and approximately 3.5km east of Greymouth. The application site is legally described as Lot 1-2 DP 584105 and is contained within one Record of Title (1097679) and the overall area is over 19ha. The application site is positioned on the northern side of Taylorville Road (Figure 1). The Grey River is located to the south of the application site and is the source of water for the GDC water treatment plant on the opposite side of Taylorville Rd.

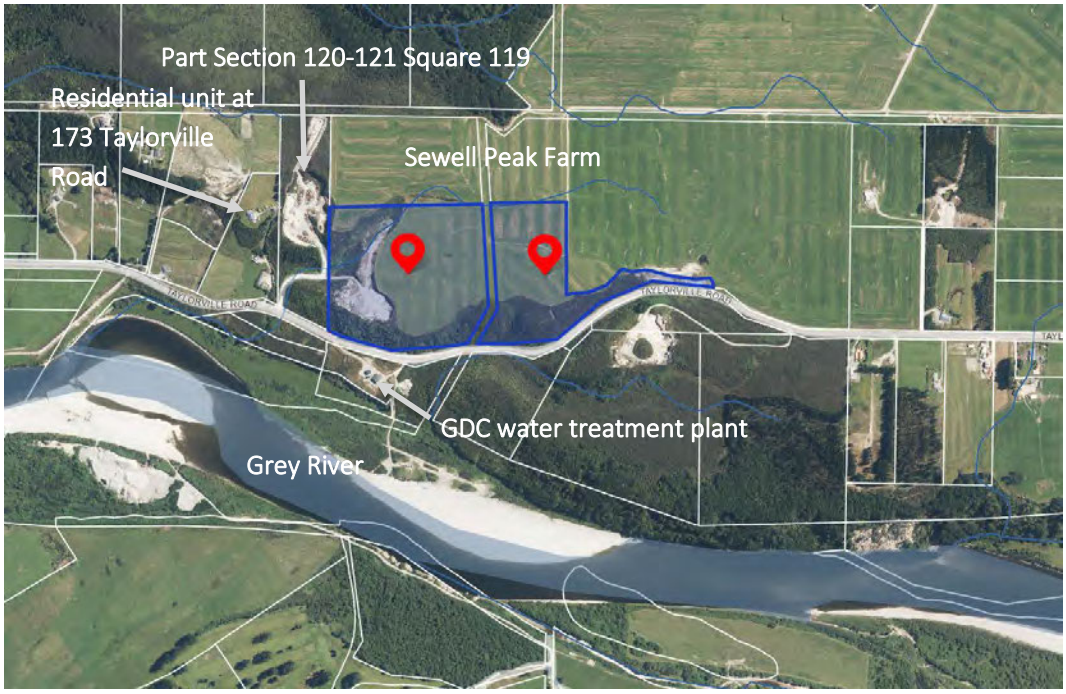

Figure 1: Application site outlined in blue (Source: EMaps)

The application site is located in a flat to gently undulating area between Mount Buckley and Cobden Hill, on the northern side of the Grey River. The local topography dips gently to the southwest with an average grade of approximately 1.6% (1:64). The application site is located between the floodplain of the Grey River and the channel of Noname Creek, which forms a downstream tributary of the Grey River and flows through the eastern portion of the application site (Figure 2).

Noname Creek flows in a southwest direction approximately 15m from the north-northeast boundary of the site. The creek also receives water from the fill operation located on the adjacent landholding to the west of the application site. Noname Creek runs through a culvert under Taylorville Road and discharges into an unnamed tributary/wetland on the south side of the road, before joining with the Grey River approximately 350m westward (downstream) of the confluence with the wetland. Downstream of the site, the Grey River meanders westward in a wide channel for approximately 7km before discharging onto the Tasman Sea.

The western portion of the application site (approximately 12.5ha) has been developed with three waste cells (Cells A–C), with one cell (Cell D) identified for a future development (Figure 2). Cell B is closed and capped; Cells A and C are active.

Figure 2: Layout of application site

As noted above, regional consent reference RC-2021-0097-V3, allows for the disposal to land of demolition waste (including cleanfill), asbestos, coal tar and coal pitch, shredded tyres, and other hazardous materials approved by the Consent Authority (Figure 3).

Cell	Aerial Extent	Approximate Depth	Approximate Volume	Received Materials	Cell Construction
Cell A	5,000 m^2	~10–15 m (to mudstone)	~40,000–60,000 m^3	Demolition waste (including cleanfill), whole or shredded tyres	Unlined cell.
Cell C	6,400 m^2	10 m	37,000 m^3	Demolition waste (including cleanfill), whole or shredded tyres, asbestos, coal tar and coal pitch, other approved hazardous materials	Cell is lined with geomembrane underlain with geofabric.

Figure 3: Cell descriptions and received material types (Source Engeo Hydrogeological Assessment)

The site operations also include two large water treatment / retention devices with a combined capacity of approximately 15,000m^3 for treated leachate and stormwater captured by the onsite operations (Figure 4).

Figure 4: Retention pond

3.2 Onsite Water Management System

Stormwater Management

Stormwater management at the application site is currently primarily focused on the diversion of clean water from the waste cells and mitigation measures to prevent sediment loading in stormwater. Stormwater that falls on the operational areas (e.g., roadways) is directed via roadside swales towards undisturbed areas of the application site for infiltration through the permeable gravels. Stormwater that falls on or immediately adjacent to Cell A, Cell C, the retention pond, and settlement pond is directed into the cell / pond to prevent erosion and scouring of the cell / pond bunding. Stormwater that falls onto Cell B (closed and capped with 1,500mm of gravel and low-permeability, compacted silts, proposed upgrades include the installation of an impermeable membrane cap) runs off the cell surface due to the contouring of the cap.

Leachate Management

Leachate from Cell A is captured via a sump installed west of the cell. The sump was installed into an excavation that extended below the base of Cell A, into the underlying mudstone, to provide a preferential flowpath for Cell A leachate. As Cell A is unlined, the sump could potentially be receiving groundwater that intersects with the base of Cell A. Water from the sump is then pumped via a submersible pump on a float switch into the first stage of the lined settlement pond. The daily flow from Cell A is estimated to be on the order of 100 – 150m^3/day.

Leachate from the lined Cell B and Cell C is collected via sumps and risers installed in the cells and pumped (using a submersible pump on a float switch in the sumps) west through a GM700 hydrogen sulphide scrubbing system. As Cell B has been capped, no leachate has been observed flowing from this cell for the past 18 months; however, it is possible that negligible amounts may be generated. From the scrubbing system, the leachate is piped to a pumping station near the western site boundary and into the first stage of the lined settlement pond. The daily flow from Cells B and C are estimated to be on the order of 15 – 20m^3/day.

The first stage of the settlement pond has a capacity of approximately 2,700m^3, allowing for an approximate residence time of 135-180 days. Following settlement in Stage 1, the water decants

over a baffle into stage two, which has a capacity of approximately 1,300m^3. Stage 2 is equipped with a float switch that, when triggered, pumps the water to a flocculation system that includes two tubes of poly-aluminium chloride and three sealed and baffled containers for additional removal of sediment and insoluble metals. The treated water decants to the retention pond for storage.

Water from the retention pond is piped through a siphon system to draw water through an additional treatment stage comprising two pumice pods and an additional baffled container that feeds into the DC/C3 sump. The DC/C3 sump has a cutoff valve, which is currently preventing off-site discharges of water from the retention pond. In the interim, water from the retention pond and D3/C3 are being directed back to the settlement pond for on-site recirculation.

3.3 Surrounding Locality

The immediate adjoining neighbour to the north and east is a dairy farm (Sewell Peak Farm). The immediately adjoining neighbour to the west (legally described as being Part Section 120-121 Square 119) has a regional discharge permit (RC-2019-0024-01) for the discharge of demolition waste and cleanfill to land.

The closest residential unit to the application site is located to the west at 173 Taylorville Road, which is approximately 170m east of the application site's western boundary.

The Grey District Council's water treatment plant is located opposite the application site, on the southern side of Taylorville Road (Lot 1 Deposited Plan 343801) (Figure 5). This networked public drinking water supply (GRE001) is located approximately 430m south of the application site. The supply provides drinking water to approximately 10,000 people in the area. The source of the water supply (RC01092.3) is a subsurface infiltration system that takes water from the Grey River for treatment and distribution from bores located 320m - 420m to the south-southeast from the application site.

Figure 5: Grey District Council's water treatment plant

Noname Creek flows in a southwest direction approximately 15m from the north-northeast boundary of the site. The creek also receives water from the property to the west that includes a filling operation located 100m west of the site. The creek is located approximately 60m from the

fill operation. The creek runs through a culvert under Taylorville Road and discharges into an unnamed tributary / wetland on the south side of the road before joining with the Grey River approximately 350m westward (downstream) of the confluence with the wetland.

Grey District Council's waste management centre, 'McLean's Pit Landfill and Recycling Centre' is located approximately 900m (as the crow flies) to the north of the application site, at 142 McLeans Pit Road.

4.0 Proposal

This report relates to an application for resource consent under s88 of the Act for a temporary discharge (for a period of six months) from the existing onsite retention pond to land, via a proposed soakage area. This report also addresses a s127 application to vary condition 11 of RC-2021-0097-03.

As noted earlier, the site operations include two large water treatment / retention devices with a combined capacity of approximately 15,000m^3 for treated leachate and stormwater captured by the onsite operations. The devices are currently at capacity and with heavy rainfall predicted for the coming months, the applicant is seeking temporary consent to discharge water to land, to help in creating a freeboard within the retention pond. This will assist in avoiding any uncontrolled discharges. The proposed discharges are likely to contain contaminants exceeding the permitted activity standards outlined in Rule 67(a) of the 'Regional Land and Water Plan '.

Attached at Appendix 3 is a Hydrogeological Assessment which has been prepared by Engeo. The purpose of that report, is to provide a summary of hydrogeological investigation works undertaken to date and assess potential effects on the environment from a short-term discharge of treated waters to land.

On-site soakage area

The proposed works include the development of an on-site soakage area and the discharge to land of water from the retention pond. Engeo have modelled for a 10m x 10m soakage area, with a maximum depth of 2m, to accommodate a rainfall event of 50mm (approximately equivalent to the 1-hour peak of a 2% AEP storm event for this location). Water would be pumped from the retention pond at a flow that is no greater than the infiltration capacity of the basin. They have modelled for a maximum discharge of 800m^3 of water per day (~9 L/s).

To avoid scour, the soakage area will be lined with a geofabric, suitably-sized pipework will be used to reduce the flow velocity to less than 1.3m/s (MBIE, 2020), and, if necessary, the outlet will be manifolded to discharge at more than one point in the area.

Monitoring

The pumping equipment, pipework, and discharge area will be monitored at least three times daily (morning, mid-day, afternoon during the discharge period) to monitor the water level in the retention pond and ensure that there are no leaks in the system or scour/overtopping in the discharge area. Discharges will preferably be taken during dry weather with little to no surface precipitation, to create freeboard in the retention pond; however, discharging may be required during wet weather as a contingency measure.

The applicant will also undertake a monitoring programme for groundwater and surface water at the application site. Monitoring will be undertaken on a monthly basis during discharges to the soakage area and quarterly thereafter, with a review after one year of monitoring. As a component of this programme, the applicant is in the process of installing six additional monitoring bores at locations upgradient and around the site to further assess and monitor groundwater quality. The proposed bores will be established in the following locations (Figure 6):

- Approximately 20m downgradient of the discharge area;
- Southwest of Cell A;
- Between the discharge area and Noname Creek; and
- Intermediate between the discharge area and boundary wells.

Figure 6: Groundwater flow path and proposed monitoring bore locations (Source: Engeo Report)

Based on the current availability of drilling subcontractors, we anticipate that the new monitoring bores will be installed in September/October 2024, prior to the arrival of the plume. Once the new monitoring bores have equilibrated, the applicant will also be undertaking aquifer testing, to establish a site-specific hydraulic conductivity.

Adaptative Discharge

Based on the inferred seepage velocity of the plume (0.5 m/d) changes in water quality will likely be detectable at the bore nearest the discharge area approximately one month after the commencement of discharges. Consequently, it is proposed that an initial two-week discharge duration is followed by the collection and analysis of groundwater samples from the nearest bore at intervals of four weeks, five weeks, and six weeks (following commencement). After receipt of

the results from the post-commencement monitoring, Engeo will ensure the RISC5 model will be calibrated to identify if the effects of the discharges are likely to differ from those detailed within their report and/or if modifications to the proposed discharges (e.g., flow rate) are needed.

4.1 Proposed Changes to Conditions

Due to the proposed temporary discharge from the existing onsite retention pond to land, via a soakage area, the applicant requires changes to consent condition 11 of RC-2021-0097-03, which currently reads:

- The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265) as a result of the exercise of this consent.

It is proposed to reword it as follows:

- The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (~~Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265~~Lot 1-2 DP584105) as a result of the exercise of this consent, unless a separate discharge permit has been obtained from the West Coast Regional Council.

5.0 Reasons for Consent

A rules assessment against the provisions of the Regional Land and Water Plan ('RLWP') is attached at Appendix 4. The proposal relates to a temporary discharge from the existing onsite retention pond to land, via a soakage area, which daylights via Noname Creek and a roadside drain, and may ultimately discharge to the Grey River.

Consent is required for the matters outlined below.

5.1 Regional Land and Water Plan (RLWP)

18.1 Activities on Land

- The proposed earthworks associated with the construction of the soakage area is classified as a **Permitted Activity** under Rule 3 of 18.1.1 'Permitted Activities on Land'.

18.4 Discharges to Water

- Rule 71 'Discharge of any contaminant, or water to water, not complying with Rules 63 to 70' outlines that unless permitted by Rules 63, 64, 65, 66, 67, 68, 69 or 70 the discharge of any contaminant or water to water is a discretionary activity. The proposal activity is not captured under any of these rules and is therefore a **Discretionary Activity** under Rule 71.

18.5 Discharges to Land

- Rule 91 'Discharges to land discretionary activity Rule' outlines that any discharge of contaminants into or onto land is a discretionary activity, unless it is permitted by Rules 72 to 86, or controlled by Rules 87 to 90. The proposal activity is not captured under any of these rules and is therefore a **Discretionary Activity** under Rule 91.

5.2 Section 127 of the Resource Management Act 1991

The proposal involves changes to the conditions of regional resource consent RC-2021-0097-03.

Section 127 of the Act allows for the change or cancellation of a condition or conditions of resource consent (other than a condition as to the duration of the consent).

Sections 88 to 121 of the Act apply to the consideration of the application, with all necessary modifications, as if:

a) the application was for resource consent for a discretionary activity; and

b) the references to the resource consent and the activity were references only to the change or cancellation of a condition and the effects of the change or cancellation respectively.

c) For the purposes of determining who is adversely affected by the change or cancellation of condition, a local authority must consider, in particular, every person who:

d) made a submission on the original application; and

e) may be affected by the change or cancellation of condition.

The main point to consider when assessing whether an application should be processed as a section 127 change of conditions or a new application, is whether the proposed change in conditions will result in a "fundamentally different activity" or "an activity having materially different adverse effects" to those that lawfully exist or that were assessed under the original application.

In this instance, the proposed changes to conditions are required to facilitate the temporary discharge to land associated with an approved landfill activity on the site. It is considered suitable for condition 11 to be amended as consent is also being sought in parallel for the discharge to land.

Pursuant to section 127 of the Act, resource consent is required for a discretionary activity.

5.3 Resource Management (National Environmental Standards for Freshwater) Regulations 2020

Resource consent is not required under the provisions of the National Environmental Standard Resource Management (National Environmental Standards for Freshwater) Regulations 2020('NESFW'), as the proposed soakage area will be located over 100m from Noname Creek.

5.4 National Environmental Standard for Sources of Human Drinking Water

The National Environmental Standard for Source of Human Drinking Water (NES-SDW) sets the requirements for protecting sources of human drinking water from becoming contaminated. The NES-SDW requires regional councils to ensure that effects of activities on drinking water sources are considered in decisions on resource consents and regional plans.

Under the NES-SDW regional councils are required to:

- Decline discharge or water permits that are likely to result in community drinking water becoming unsafe for human consumption following existing treatment; and
- Place conditions on relevant resource consents that require notification of drinking water suppliers if significant unintended events occur that may adversely affect sources of drinking water.

The proposed discharges will not be occurring within, or in close proximity to the protection zone for any water supply well as there are no consented groundwater takes mapped on the West Coast GIS website [1] within 1km downgradient of the site. The closest downgradient bore to the application site is located at 2 Sids Road, Coal Creek, which is approximately 1.3km to the west of the application site's western property boundary (Figure 7).

Figure 7: Down gradient bores (Source: West Coast Maps)

It is noted under the RLWP that the take and use of surface water from the Grey River, downstream of the Clarke River confluence, is a permitted activity at Rule 39 at 18.3.1 'Permitted Activities', however, condition (d) outlines that the Council needs to be informed in writing of the location, expected rate and frequency of the take prior to the take occurring and contact details of the person taking. In addition to this, the take and use of groundwater is a permitted activity at Rule 44 at 18.3.1 'Permitted Activities' but again condition (g) outlines that the Council needs to be informed in writing of the location, expected rate and frequency of the take prior to the take occurring and contact details of the person taking. The taking and use of surface water and/or groundwater for a community water supply is a controlled activity at Rules 52 and 53 at 18.3.2 'Controlled Takes, Uses, Diversions and Damming of Water'. Consequently, the WCRC would be aware of all water takes from both surface water and groundwater through the requirement to comply with the conditions associated with outlining the Council to location, expected rate and frequency of any take prior to it occurring.

5.5 Activity Status

Overall, this application is for a **discretionary activity**.

[1] https://gis.westcoast.govt.nz/WestMaps/

6.0 Public Notification Assessment (Sections 95A, 95C and 95D)

6.1 Assessment of Steps 1 to 4 (Sections 95A)

Section 95A specifies the steps the council is to follow to determine whether an application is to be publicly notified. These are addressed in statutory order below.

6.1.1 Step 1: Mandatory public notification is required in certain circumstances

Step 1 requires public notification where this is requested by the applicant; or the application is made jointly with an application to exchange of recreation reserved land under section 15AA of the Reserves Act 1977.

The above does not apply to the proposal.

6.1.2 Step 2: If not required by step 1, public notification precluded in certain circumstances

Step 2 describes that public notification is precluded where all applicable rules and national environmental standards preclude public notification; or where the application is for a controlled activity; or a restricted discretionary, discretionary or non-complying boundary activity.

In this case, the applicable rules do not preclude public notification, and the proposal is not a controlled activity or boundary activity. Therefore, public notification is not precluded.

6.1.3 Step 3: If not required by step 2, public notification required in certain circumstances

Step 3 describes that where public notification is not precluded by step 2, it is required if the applicable rules or national environmental standards require public notification, or if the activity is likely to have adverse effects on the environment that are more than minor.

As noted under step 2 above, public notification is not precluded, and an assessment in accordance with section 95A is required, which is set out in the sections below. As described below, it is considered that any adverse effects will be no more than minor.

6.1.4 Step 4: Public notification in special circumstances

If an application is not required to be publicly notified as a result of any of the previous steps, then the council is required to determine whether special circumstances exist that warrant it being publicly notified.

Special circumstances are those that are:

- Exceptional or unusual, but something less than extraordinary; or
- Outside of the common run of applications of this nature; or
- Circumstances which make notification desirable, notwithstanding the conclusion that the adverse effects will be no more than minor.

It is considered that there is nothing noteworthy about the proposal as it relates to the discharge of water to land, which is provided for under the RLWP subject to conditions. It is therefore considered that the application cannot be described as being out of the ordinary or giving rise to special circumstances.

6.2 Section 95D Statutory Matters

In determining whether to publicly notify an application, section 95D specifies a council must decide whether an activity will have, or is likely to have, adverse effects on the environment that are more than minor.

In determining whether adverse effects are more than minor:

- Adverse effects on persons who own or occupy the land within which the activity will occur, or any land adjacent to that land, must be disregarded.

  The land to be excluded from the assessment is listed in section 6.3 below.

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded.

  In this case the regional plan permits the discharge of water to water if it can comply with all the conditions associated with Rule 67. This proposal cannot comply with condition (a) as the discharge is likely to contain contaminants exceeding this standard.

- Trade competition must be disregarded.

  This is not considered to be a relevant matter in this case.

- The adverse effects on those persons who have provided their written approval must be disregarded.

  No persons have provided their written approval for this proposal.

The sections below set out an assessment in accordance with section 95D, including identification of adjacent properties, and an assessment of adverse effects.

6.3 Land Excluded from the Assessment

In terms of the tests for public notification (but not for the purposes of limited notification or service of notice), the adjacent properties to be excluded from the assessment are shown in Figure 8, and include:

- North and West – Lot 3-4 Deposited Plan 584105
- East – Part Section 120-121 Square 119
- South – Section 2-3 Survey Office Plan 338671, Lot 1 Deposited Plan 343801, Lot 4 Deposited Plan 2432

Figure 8: Adjacent properties (coloured in blue) in relation to application site (coloured in red) (Source: Emaps)

6.4 Assessment of Effects on the Wider Environment

The following sections set out an assessment of wider effects of the proposal, and it is considered that effects in relation to the following matters are relevant:

- Effects on groundwater quantity;
- Effects on groundwater quality;
- Effects on surface water quality and aquatic ecosystems;
- Effects on the quality and safety of human and animal drinking water; and
- Effects on Tangata Whenua Values.

These matters are set out and discussed below.

6.4.1 Effects on groundwater quantity

Engeo have advised that the proposed discharge from the retention pond to land will contribute approximately 800m^3 of treated water to the unconfined aquifer. Based on the results of their Hantush model, this will result in a maximum mounding of 0.55m directly below the discharge area, with a perturbation of the water table elevation extending approximately 250m from the source; however, the effect is minor (<0.01 m) beyond approximately 75m. It is possible that the change in hydraulic head below the discharge area may result in an increase of the groundwater flowrate; however, this effect will likely not persist beyond the mounding area or have an effect that it outside the range of natural variability.

The absolute potential radius for any effect on groundwater quantity is limited due to seepage outflow where the contact between the unconfined Gravel 1 aquifer and underlying Kaiata Formation is exposed. Following the derived groundwater flow gradient as illustrated within Figure

4 of the Engeo report, the maximum potential flowpath in the unconfined aquifer before daylighting is approximately 420m.

Consequently, any potential adverse effects relating to groundwater quantity is considered to be less than minor.

6.4.2 Effects on groundwater quality

Engeo outline within their report that the application site is located at the westernmost extent of the Pleistocene glacial outwash deposits (e.g. Gravel 1). The contact between Gravel 1 and the mudstone (Kaiata Formation) is located on the exposed slope, approximately 10m above the surrounding ground level. Groundwater that daylights will be captured in the drain that runs around the site's western property boundary and along Taylorville Road. Any water that does infiltrate to ground will be confined by the alignment of Noname Creek. Consequently, Engeo confirm that there is no hydraulic connection between the application site and off-site Holocene aquifer and the effect of the proposed discharges to off-site groundwater quality is likely to be less than minor.

6.4.3 Effects on Surface Water Quality and Aquatic Ecosystems

The only surface water near this application site is Noname Creek which is located over 100m away from the proposed soakage area within the site. Engeo calculated the load of contaminants in the proposed discharges and the dilution factor in Noname Creek and the Grey River (i.e., assuming an undiluted discharge into the receiving waterbody). Contaminant loading was calculated based on the maximum concentrations detected in samples collected from the water treatment system and the maximum discharge rate (800m^3 of water per day). Furthermore, to be conservative, Engeo used the low flow of 0.02m^3/s and 80m^3/s for Noname Creek and the Grey River, respectively.

Based on the loading calculations, a direct discharge to Noname Creek would potentially result in an exceedance of one or more of the assessment criteria. However, the creek is located at least 100m away from the proposed discharge area and 310m away along the inferred direction of groundwater flow. Any contaminants in the discharges will be diluted significantly in groundwater prior to entering Noname Creek and it is highly unlikely that the diluted concentrations will exceed the range of natural variability or analytical error.

Direct discharge to the Grey River would result in concentrations of contaminants that are orders of magnitude below any of the assessment criteria. We further note that, based on local topography (e.g., ridge on south side of Taylorville Road) and infrastructure (Taylorville Road), discharging in the Grey River above the GRE001 abstraction would be a practical impossibility.

Based on the calculated load of contaminants and resulting concentrations in the receiving waterbodies, the effect of the proposed discharges to surface water quality is highly likely to be less than minor.

As noted earlier in Section 6.4.2, Engeo have confirmed that discharging into the Grey River above the GRE001 abstraction would be a practical impossibility. Consequently, the proposal is unlikely to have any potential adverse effects on surface water quality and aquatic ecosystems.

6.4.4 Effects on the quality and safety of human and animal drinking water

The proposed stormwater discharges will not occur in close proximity to any bore used for drinking water. Engeo assessed the potential effects on households who receive potable water from the networked public drinking water supply (GRE001) and calculated the load of contaminants in the proposed discharges and the dilution factor in the Grey River (i.e., assuming the proposed discharges go directly to the river). Engeo note that GRE001 is oblique to the water flow direction with no apparent hydraulic connectivity. Furthermore, the contaminant loading was calculated based on the maximum concentrations detected in samples collected from the water treatment system and the maximum discharge rate, and to be conservative (Engeo used the anticipated low flow of 800m^3/s).

Direct discharge to the Grey River would result in concentrations of contaminants that are orders of magnitude below any of the assessment criteria. Engeo conclude, based on local topography (e.g. ridge on south side of Taylorville Road) and infrastructure (Taylorville Road), discharging into the Grey River above the GRE001 abstraction would be a practical impossibility. Based on modelled maximum concentrations to the nearest receptor, the effect of the proposed discharges to receptors (human or ecological) are highly likely less than minor.

In summary, any potential adverse effects in regards to the quality and safety of human and animal drinking water is considered to be less than minor.

6.4.5 Effects on Tangata Whenua Values

The application site is not listed as a site of significance to Ngāi Tahu, nor is it located within a Statutory Acknowledgement Area, a silent file, or within an archaeological site. Furthermore, there are no Heritage New Zealand sites or New Zealand Archaeological Association sites registered on the property. Consequently, there are no specifically identified cultural values associated with this site. However, below the site there is groundwater aquifers that may have cultural value to Ngāi Tahu.

The following is noted in regards to avoiding any potential adverse effects on Tangata Whenua values:

- All works will be subject to the ESCP, which will assist in preventing contaminant and sediment discharge from the application site;
- The Engeo report concludes that based on modelled maximum concentrations to the nearest receptor, the effect of the proposed discharge to receptors (human or ecological) are highly likely to be less than minor; and
- The discharge will be for a short term, involves a comprehensive monitoring programme and an adaptive approach will be taken.

Taking the above into account, it is considered that the proposal will not cause any significant effects on natural resources including water (waterways, waipuna (springs), groundwater, wetlands); mahinga kai; indigenous flora and fauna; cultural landscapes and land and they will therefore be adequately protected.

6.5 Summary of Effects

Overall, it is considered that any adverse effects on the environment relating to this proposal will be less than minor.

6.6 Public Notification Conclusion

Having undertaken the section 95A public notification tests, the following conclusions are reached:

- Under step 1, public notification is not mandatory;
- Under step 2, public notification is not precluded;
- Under step 3, public notification is not required as it is considered that the activity will result in less than minor adverse effects; and
- Under step 4, there are no special circumstances.

Therefore, based on the conclusions reached under steps 3 and 4, it is recommended that this application be processed without public notification.

7.0 Limited Notification Assessment (Sections 95B, 95E to 95G)

7.1 Assessment of Steps 1 to 4 (Sections 95B)

If the application is not publicly notified under section 95A, the council must follow the steps set out in section 95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

7.1.1 Step 1: Certain affected protected customary rights groups must be notified

Step 1 requires limited notification where there are any affected protected customary rights groups or customary marine title groups; or affected persons under a statutory acknowledgement affecting the land.

The above does not apply to this proposal.

7.1.2 Step 2: If not required by step 1, limited notification precluded in certain circumstances

Step 2 describes that limited notification is precluded where all applicable rules and national environmental standards preclude limited notification; or the application is for a controlled activity (other than the subdivision of land).

In this case, the applicable rules do not preclude limited notification and the proposal is not a controlled activity. Therefore, limited notification is not precluded.

7.1.3 Step 3: If not precluded by step 2, certain other affected persons must be notified

Step 3 requires that, where limited notification is not precluded under step 2 above, a determination must be made as to whether any of the following persons are affected persons:

- In the case of a boundary activity, an owner of an allotment with an infringed boundary;
- In the case of any other activity, a person affected in accordance with s95E.

The application is not for a boundary activity, and therefore an assessment in accordance with section 95E is required and is set out below.

Overall, it is considered that any adverse effects on persons will be less than minor, and accordingly, that no persons are adversely affected.

7.1.4 Step 4: Further notification in special circumstances

In addition to the findings of the previous steps, the council is also required to determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined as eligible for limited notification.

In this instance, having regard to the assessment in section 6.1.4 above, it is considered that special circumstances do not apply.

7.2 Section 95E Statutory Matters

If the application is not publicly notified, a council must decide if there are any affected persons and give limited notification to those persons. A person is affected if the effects of the activity on that person are minor or more than minor (but not less than minor).

In deciding who is an affected person under section 95E:

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded;
- Only those effects that relate to a matter of control or discretion can be considered (in the case of controlled or restricted discretionary activities); and
- The adverse effects on those persons who have provided their written approval must be disregarded.

These matters were addressed in section 6.2 above, and no written approvals have been sought.

Having regard to the above provisions, an assessment is provided below.

7.3 Assessment of Effects on Persons

Adverse effects in relation to the proposed discharges on persons are considered below. Wider effects were considered in section 0 above, and considered to be less than minor.

7.3.1 Adjacent Properties

Any adverse effects on persons at adjacent properties are considered to be less than minor for the following reasons:

- The proposal will not result in any potential adverse flooding effects. Engeo note that while it is possible that the change in hydraulic head below the discharge area may result in an increase of the groundwater flowrate, this effect will likely not persist beyond the mounding area or have an effect that it outside the range of natural variability.

- Engeo confirm there is no hydraulic connection between the application site and the off-site Holocene aquifer and any potential adverse effects of the proposed discharges to off-site groundwater quality is likely to be less than minor.
- Any discharge water that may intersects the catchment of Noname Creek will undergo significant dilution and the resulting concentrations of contaminants will have less than minor effects.
- The proposed discharge will be short-term nature and, due to the proposed monitoring programme of both groundwater and surface water as outlined within the Engeo report, any potential adverse effects on surface water quality and aquatic ecosystems is considered to be less than minor.
- The proposed soakpit area will be located over 100m from Noname Creek, which is the closest surface waterbody to the application site. Any discharge water that intercepts the catchment of Noname Creek will undergo significant dilution and the resulting concentrations of contaminants will have less than minor effects. Furthermore, the proposed discharge will be short-term in nature and due to the proposed monitoring programme of both groundwater and surface water as outlined within the Engeo report, any potential adverse effects on surface water quality and aquatic ecosystems is considered to be less than minor.
- Engeo have confirmed that discharging into the Grey River above the GRE001 abstraction would be a practical impossibility.

7.3.2 Summary of Effects

Taking the above into account, it is considered that any adverse effects on persons at the aforementioned properties will be less than minor in relation and therefore it is considered, that there are no adversely affected persons in relation to this proposal.

7.4 Limited Notification Conclusion

Having undertaken the section 95B limited notification tests, the following conclusions are reached:

- Under step 1, limited notification is not mandatory;
- Under step 2, limited notification is not precluded;
- Under step 3, limited notification is not required as it is considered that the activity will not result in any adversely affected persons; and
- Under step 4, there are no special circumstances.

Therefore, it is recommended that this application be processed without limited notification.

8.0 Consideration of Applications (Section 104)

8.1 Statutory Matters

Subject to Part 2 of the Act, when considering an application for resource consent and any submissions received, a council must, in accordance with section 104(1) of the Act have regard to:

- Any actual and potential effects on the environment of allowing the activity;
- Any relevant provisions of a national environmental standard, other regulations, 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 a council considers relevant and reasonably necessary to determine the application.

As a discretionary activity, section 104B of the Act states that a council:

(a) may grant or refuse the application; and

(b) if it grants the application, may impose conditions under section 108.

9.0 Alternatives to the Proposed Discharge to Land

The applicant has considered alternatives for the discharge required from the retention pond and below is an assessment of alternatives for completeness.

Reticulated Network

The application site is not connected to the reticulated stormwater/wastewater network and consequently, there are no opportunities for the proposed discharge to go directly into the reticulated network.

Trucking to GDC WWTP

Another alternative which was considered was removing a portion of the water within the retention pond and trucking and discharging it to the Grey District Council's Wastewater Treatment Plant (WWTP). The two key issues with this option are feasibility of transporting the water to the WWTP and capacity at the WWTP.

The TRP water treatment systems collect rainwater that falls on the active waste cells, settlement pond, and retention pond, and area comprising of approximately 16,500m^2. During a 50mm/day storm event, this amounts to 825m^3 of water that has to be added to the capacity of the settlement and retention ponds. Based on the volume of a standard sucker truck (e.g. 3–5m^3), this amounts to 164-274 truck movements for each event. Furthermore, two companies have been identified within Greymouth that own sucker trucks; each company with one truck in its fleet. As such, the local availability of sucker trucks would limit the operations to approximately 15 – 20 truck movements per day, which would not be adequate for anything greater than a 5mm/day rainfall event. Additionally, the introduction of large volumes of fresh water would have a significantly disruptive effect on operations at the WWTP. According to the GDC Group Manager Operations (Aaron Haymes) at the Greymouth WWTP, who has confirmed that they cannot accept the

application site's discharges. As such, removal via sucker truck to the WWTP is not considered feasible.

In addition to the above, it is noted that the rules within the Operative Grey District Plan for non-rural activities within the Rural Environmental Area are limited to a permitted maximum number of 20 heavy vehicle trips per day. The applicant's approved land use resource consent from the Grey District Council did not seek resource consent to breach this permitted activity rule.

Discharge to Surface Water Bodies

Other alternatives which were considered included discharging the water directly to a nearby surface water feature. Due to the very low flow in the roadside drain (0.001 – 0.002m^3/s), this is not considered a suitable receiving environment. This is because the flows from the discharge would exceed the capacity of this drain and the receiving waters would not be able to dilute contaminant concentrations so it would have a greater effect on the water quality within the drain.

Another alternative considered is discharging into Noname Creek. To assess the potential effects on water quality in the creek, Engeo calculated the load of contaminants in the proposed discharges and the dilution factor in the creek (i.e., assuming that the proposed discharges go directly to the creek). Contaminant loading was calculated based on the maximum concentrations detected in samples collected from the water treatment system and the maximum discharge rate. To be conservative, Engeo used the anticipated low flow of 0.02m^3/s. Based on estimates of diluted concentrations, direct discharge to Noname Creek would likely result in an exceedance of one of more of the assessment criteria. While it is highly unlikely that this water is being used as a source of potable water, there is potential for an effect to ecological health. As such, discharge to Noname Creek is not deemed a suitable alternative to the proposed discharge to land.

Conclusion

Based on the review summarised above, no feasible alternative currently exists to the proposed temporary discharge.

10.0 Effects on the Environment (Section 104(1)(A))

Having regard to the actual and potential effects on the environment of the activity resulting from the proposal, it was concluded in the assessment above that any wider adverse effects relating to the proposal will be less than minor and that no persons would be adversely affected by the proposal.

In terms of planned further works the applicant is continuously exploring options to improve the water management system at the site. Current planned upgrades include the installation of an aeration fountain in Stage 2 of the settlement pond (anticipated completion in September 2024) and assessing the feasibility of reconfiguring the sequence of the treatment train to allow for flocculation prior to Stage 1 of the settlement pond. As the process is improved and revised, this report will be updated to reflect the current water management practices on-site.

Furthermore, it is considered that the proposal will also result in positive effects including manging the discharge from the retention pond in a controlled manner and avoid the uncontrolled overtopping of the pond. Furthermore, the proposed monitoring programme will provide an opportunity for groundwater and surface water quality at the site to be further monitored.

Overall, it is considered that when taking into account the positive effects, any actual and potential adverse effects on the environment of allowing the activity are acceptable.

11.0 Regional and District Plan and Statutory Documents (Section 104(1)(B))

11.1 National Policy Statement For Freshwater Management 2020

It is noted that the new Government, has agreed to replace the National Policy Statement for Freshwater Management 2020 (NPS-FM) and work on the replacement was due to commence at the end of last year[2]. Notwithstanding this, below is an assessment against the NPS-FM for completeness.

The National Policy Statement for Freshwater Management 2020 sets out the objectives and policies for freshwater management under the Resource Management Act 1991. The objective of the policy statement is as follows:

> *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.*

Fifteen policies support this objective, with the following being of relevance to the proposal:

- Policy 1: Freshwater is managed in a way that gives effect to Te Mana o te Wai.
- Policy 2: Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for. The application site is not located within a statutory acknowledgement area, rūnanga sensitive area or silent file area.
- 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 5: Freshwater is managed (including through a National Objectives Framework) to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.
- Policy 15: Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

[2] https://www.beehive.govt.nz/release/government-takes-first-steps-towards-pragmatic-and-sensible-freshwater-rules

It is considered that the proposal is consistent with the relevant provisions of the NPS:FM for the reasons outlined as follows:

- The effects on the receiving waterbody, being groundwater, have been assessed as no more than minor because there is no hydraulic connection between the application site and the off-site Holocene aquifer.
- The nearest bore to the application site is located over 1.3km to the west of the application site and no drinking supply wells being identified as being affected by the proposal. Furthermore, the proposal includes treatment and monitoring to ensure that the discharge quality is of an acceptable level;
- The WTP to the south of the application site will also be unaffected due to the location separation and water gradient, along with the positioning of the intakes within the Grey River;
- A monitoring program will be implemented as part of this discharge application to monitor both groundwater and surface water at the application site and the nearby Noname Creek;
- The proposal will enable the continued operation of a landfill facility, whilst not degrading the receiving waterbody and drinking water supply providing opportunities to benefit the social economic and cultural well-being of the local community.

11.2 Objectives and Policies of the West Coast Regional Policy Statement (2020)

Below is an assessment against the relevant objectives and policies within Chapter 6 and 8 of the West Coast Regional Policy Statement (RPS). Consideration has also been given to other objectives and policies within the RPS, including Chapters 7 and 7A, however for the reasons that there are no direct effects on any indigenous biodiversity, that ecosystems will be protected from treatment of the discharge and dilution, and there will be no additional impacts on natural character beyond the current landfill operation.

11.2.1 Chapter 6 - Regionally Significant Infrastructure (RSI)

Chapter 6 outlines that there is a need to recognise the social, economic, and environmental benefits that accrue locally, regionally and nationally from the establishment and continued operation of regionally significant infrastructure (RSI), which is defined within the RPS to include 'public or community solid waste storage and disposal facilities'.

The key objective of this chapter is to enable the safe, efficient and integrated development, operation, maintenance, and upgrading of regionally and nationally significant infrastructure. This objective is supported by a number relevant policies which seek to:

- Policy 1 - Provide for the development, operation, maintenance and upgrading of new and existing RSI…
- Policy 4 - Recognise that RSI important to the West Coast's wellbeing needs to be protected from the reverse sensitivity effects arising from incompatible new subdivision, use and development, and the adverse effects of other activities, which would compromise the effective operation, maintenance, upgrading, or development of the infrastructure.
- Policy 5 - When considering any adverse environmental effects of RSI that cannot be avoided, remedied or mitigated, other than effects on indigenous biological diversity, decision-makers

must have regard to any offsets and compensation proposed which benefit the natural environment or the community affected.

- Policy 8 - Land use and infrastructure should be integrated to avoid as much as practicably possible the constraints through the lack of supporting infrastructure; unsustainable demands being placed on infrastructure to meet new growth; and significant adverse effects on existing land uses.

Comments:

The proposal will be supporting the above objectives and policies for the following reasons:

- Having resilient regionally significant infrastructure is important for the region and the application site, which currently operates as a landfill, assists in providing for the social and economic wellbeing of the West Coast.
- Enabling the temporary discharge of water from the retention pond to land via a new soakage area will enable the continued operation of the site as a landfill activity.

11.2.2 Chapter 8 – Land and Water

- Objective 1 - The life-supporting capacity of freshwater is maintained or improved.
- Objective 2 - Provide for a range of land and water uses to enable the economic, social and cultural wellbeing of West Coast communities while maintaining or improving water quality and aquatic ecosystems.
- Objective 3 - Determine allocation of water within environmental controls.
- Objective 4 - Identify and protect the significant values of wetlands and outstanding freshwater bodies.
- Objective 5 - Achieve the integrated management of water and the subdivision, use and development of land within catchments, recognising the interconnections between land, fresh water, and coastal water, including by managing adverse effects of land and water use on coastal water quality.

The policies seek to:

- Policy 1 - Adverse effects on fresh and coastal water quality and aquatic ecosystems arising from:
    - Subdivision, use or development of land;
    - Discharges of contaminants to water and to land in circumstances which may result in contaminants entering water;
    - Water use and take; and
    - Activities in, or on, water including damming and diversion, will be avoided, remedied or mitigated, to ensure that water quality and aquatic ecosystems are maintained or improved.
- Policy 2 - To give effect to Objective 2 of Chapter 3, the adverse effects of subdivision, use and development on Poutini Ngāi Tahu cultural values will be avoided, remedied or mitigated taking into account the following matters:

- A preference by Poutini Ngāi Tahu for discharges to land over water where practicable;
- The value of riparian margin vegetation for water quality and aquatic ecosystems; and
- Effects on the sustainability of mahinga kai, and protection of taonga areas.

- Policy 3 - To give effect to Objective 2 of Chapter 3, manage land and water use in a way that avoids significant adverse effects (other than those arising from the development, operation, maintenance, or upgrading of RSI and local roads) and avoids, remedies or mitigates other adverse water quality effects on sites that are significant to Poutini Ngāi Tahu, including the following:
  - Estuaries, hāpua lagoons, and other coastal wetlands; and
  - Shellfish beds and fishing areas.
- Policy 4 - Until priority frameworks for water take and use are developed through the FMU processes and added to a regional plan, consent applications will be processed on a "first-come, first served'' basis, and in making decisions, the following matters must be considered:
  - The reasonably foreseeable future requirements for domestic and community water supply needs, stock drinking, and firefighting;
  - The degree of community, regional or national benefit from the take, use, damming or diversion of water;
  - Any adverse environmental effects from the take, use, damming or diversion of water will be avoided, remedied or mitigated including where applicable by applying provisions of the regional plan;
  - Applying rates of take, volume limits and residual flows at the point of take to ensure that there is enough water for the purpose of the take, and to maintain or improve water quality and aquatic ecosystems;
  - The extent to which the proposal maximises the efficient allocation and efficient use of water; and
  - The reasonable needs of other water users.
- Policy 5 - Maintain or improve water quality within freshwater management units.
- Policy 6 - Identify the significant values of wetlands and outstanding freshwater bodies in regional plans and protect those values.
- Policy 7 - Encourage the coordination of urban growth, land use and development including the provision of infrastructure to achieve integrated management of effects on fresh and coastal water.
- Policy 8 - Provide for the social, economic and cultural wellbeing derived from the use and development of land and water resources, while maintaining or improving water quality and aquatic ecosystems.
- Policy 9 - Implement the National Policy Statement for Freshwater Management including the National Objectives Framework.

Comments:

The proposal will be supporting the above objectives and policies for the following reasons:

- The proposed installation of the soakage areas will be located away from Noname Creek which is the closest surface waterbody. Furthermore, the proposal is a discharge to land instead of a discharge to Noname Creek.
- Engeo have confirmed within their report that the effect of the proposed discharges to receptors (human or ecological) are highly likely to be less than minor as any contaminants in the proposed discharges will be significantly diluted in groundwater prior to entering Noname Creek and it is highly unlikely that the diluted concentrations will exceed the range of natural variability or analytical error.
- The proposal is short in duration and consent is only being sought for a period of 6 months.
- The pumping equipment, pipework, and discharge area will be monitored at least three times daily (morning, mid-day, afternoon) to monitor the water level in the retention pond and ensure that there are no leaks in the system or scour / overtopping in the discharge area.
- The proposal also involves the implementation of a monitoring programme to assist in monitoring the quality of groundwater and surface water at the application site to ensure any potential adverse effects remain at less than minor.
- The proposed discharge into a soakage area within the application site has been confirmed by Engeo that discharging into the Grey River above the GRE001 abstraction would be a practical impossibility.
- Enabling the temporary discharge of water from the retention pond to land via a new soakage area will enable the continued operation of the site as a landfill activity which is an important facility for the West Coast Region and assists in providing for the social and economic wellbeing of those working and living within the area.

11.3 Objectives and Policies of the Regional Land and Water Plan

11.3.1 3 - Natural and Human Use Values

- Objective 3.2.1 - To provide for the sustainable use and development of land and water resources.
- Objective 3.2.2 - To protect water bodies from inappropriate use and development by maintaining and where appropriate enhancing their natural and amenity values including natural character and the life supporting capacity of aquatic ecosystems.
- Policy 3.3.1 In the management of any activity involving water to give priority to avoiding, in preference to remedying or mitigating:
    - Adverse effects on:
        - The habitats of threatened species identified in Schedule 7A;
        - Water supply values identified in Schedule 7B;
        - Spiritual and cultural values and uses of significance to Poutini Ngäi Tahu identified in Schedule 7C;

- The significant natural character of wetlands, and lakes and rivers and their margins;
- Outstanding natural features and landscapes;
- Significant indigenous vegetation and significant habitat of indigenous fauna assessed in accordance with Policy 9.2 of the West Coast Regional Policy Statement;
- Existing public access to and along lakes and rivers;
- Significant historic heritage;

  - Adverse effects which cause or exacerbate flooding, erosion, land instability, sedimentation or property damage;
  - Adverse effects on existing lawful uses including regionally significant infrastructure.

- Policy 3.3.7 - In the management of any activity involving water, to avoid, remedy, or mitigate adverse effects on:
  - Water quality;
  - Amenity values;
  - Indigenous biological diversity;
  - Intrinsic values of ecosystems;
  - The natural character of wetlands, and lakes and rivers and their margins, not described in 3.3.1(1)(d); and
  - Historic heritage not described in 3.3.1(1)(h).
- Policy 3.3.8 - To recognise Poutini Ngäi Tahu's interests by promoting opportunities for their involvement in resource consent processing.

11.3.2 10 – Groundwater

Objective 10.2.1 - To sustain existing uses of the West Coast's groundwater, by protecting water quantity and quality and avoiding depleting surface water flows.

Comments:

It is recognised that groundwater is an important resource to many West Coast communities, where it serves a number of recognised uses, including domestic and public water supply, stock drinking water, irrigation and industrial uses. This water is largely accessed from shallow aquifers. High rainfall on the West Coast assists recharge of these aquifers. There is often a hydrological connection between surface water and groundwater. Furthermore, the effects of inappropriate land, water use and development on groundwater quantity and quality are often long term, and in some cases may be permanent.

In this case, the discharge will be treated and while having levels exceeding background concentrations of contaminants will be discharged to land and protect water quality.

11.3.3 14 - Solid Contaminants

- Objective 14.2 - To ensure that the adverse effects from the discharge of solid contaminants into or onto land, on water and soil quality, social, cultural and amenity values, and human health are avoided, remedied or mitigated.
- Policy 14.3 - To ensure that solid waste disposal facilities are sited, designed, constructed and managed to avoid, remedy, or mitigate any adverse effects on the environment

Comments:

It is acknowledged that if not properly managed, solid waste disposal facilities may generate harmful environmental effects, such as the contamination of groundwater and surface water. The proposal will mitigate potential adverse effects through the treatment and dilution of the discharged water, along with the proposed monitoring programme and the review of the groundwater samples, which will be undertaken at intervals of four weeks, five weeks, and six weeks from the nearest bore to the discharge area.

11.3.4 15 – Hazardous Substances

- Objective 15.2 - To ensure that the adverse effects from the discharge of hazardous substances[3].
- into or onto land, on water and soil quality, social, cultural, and amenity values, indigenous flora and fauna, and human health are avoided, remedied, or mitigated.
- Policy 15.3.1 - To avoid inappropriate disposal or discharge of hazardous substances to land.
- Policy 15.3.2 - To recognise, where appropriate, relevant industry codes of practice or guidelines relating to the management of hazardous substances and potential associated discharges.

Comments:

It is acknowledged that the disposal of hazardous substances in the West Coast Region can be an issue of concern. Avoiding uncontrolled or inappropriate discharges of hazardous substances to land involves the provision of alternatives for safe collection, storage, treatment, and disposal. If not properly managed the discharge of hazardous substances may result in harmful environmental effects such as the contamination of the site where the activity is carried out, or contamination of water. The proposed mitigation measures included within this application will ensure that any potential adverse effects can be appropriately avoided, remedied, or mitigated.

11.4 Summary

It is considered that the proposed discharge is appropriate in terms of the objectives and policies of the RPS and RLWRP.

[3] Defined as "is, unless expressly provided otherwise by regulations, any substance--
(a) With one or more of the following intrinsic properties: (i) Explosiveness: (ii) Flammability: (iii) A capacity to oxidise: (iv) Corrosiveness: (v) Toxicity (including chronic toxicity): (vi) Ecotoxicity, with or without bioaccumulation; or (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."

12.0 Part 2 Matters

Section 5 of Part 2 identifies the purpose of the RMA as being the sustainable management of natural and physical resources. This means managing the use, development and protection of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being and health and safety while sustaining those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

Section 6 of the Act sets out a number of matters of national importance including (but not limited to) the protection of outstanding natural features and landscapes and historic heritage from inappropriate subdivision, use and development.

Section 7 identifies a number of "other matters" to be given particular regard by Council and includes (but is not limited to) Kaitiakitanga, the efficient use of natural and physical resources, the maintenance and enhancement of amenity values, and maintenance and enhancement of the quality of the environment.

Section 8 requires Council to take into account the principles of the Treaty of Waitangi.

Overall, as the effects of the proposal are considered to be less than minor, and the proposal accords with the relevant RLWP'S objectives and policies, it is considered that the proposal will not offend against the general resource management principles set out in Part 2 of the Act.

13.0 Other Matters (Section 104(1)(C))

13.1 Record of Title Interests

The Record of Title for the site are subject to a number of interests (refer Appendix 1). None of these are anticipated to affect the resource consent application as discussed in Table 1 below:

Table 1: Record of Title interests

Interest	Comment
Land Covenant in Covenant Instrument 12630203.5	Relates to a no objection and support of activities and development on the application site.
12630203.3 Consent Notice pursuant to Section 221 Resource Management Act 1991	Relates to the following: • Site being used for either farming and landfill activities and not residential development. • Prior to the construction of any building, a minimum storage of 20,000l of water for fire-fighting purposes is required. • At the time of constructing any building development, a stormwater disposal system needs to be designed and consented. • Prior to the construction of a residential unit a sewage disposal system has to be designed and constructed. • The site is not serviced by way of electricity or telecommunications.

Interest	Comment
12630203.2 Consent Notice pursuant to Section 221 Resource Management Act 1991	This relates to the NESCS on the application site. The NESCS is administered by the district council and is not applicable to this application.

13.2 Non-Statutory Documents

13.2.1 Paetae Kotahitanga ki Te Tai Poutini Partnership Protocol

This agreement is for a partnership between Council and iwi, however, as it informs the way in which Council make resource consent decisions, we have had regard to this. With regard to consent processing, the partnership document notes that the practice of granting retrospective consents for unlawful activities or breaches of consent conditions is not consistent with a Treaty partnership approach to resource management, as the ability of Poutini Ngāi Tahu to influence the activity is greatly diminished, and undesirable consent holder/applicant behaviour is rewarded. In this case, Taylorville Research Park has been operating for many years and is subject to many previous regional and district consents. We are not aware of any previous objection by iwi to these applications or approvals.

The Partnership also states that Council will support the development of iwi management plans. These will inform the development of Council policies, planning frameworks and resource consent decisions. In this participation agreement the parties agree that acting in accordance with iwi management plans is a primary means by which a Treaty partnership approach to resource management can be achieved.

13.2.2 Iwi Management Plans

In addition to the Partnership Protocol, the RMA requires that Council take into account any relevant planning document recognised by an iwi authority and lodged with the council. There are two iwi management plans relevant to this application site, Te Rūnanga o Makaawhio Pounamu Management Plan and Ngāti Waewae Pounamu Resource Management Plan. These are considered below:

These iwi management plans address how Te Runanga o Ngāi Tahu can best look after pounamu allowing for on-going use and ensuring its sustainability for the future. This application relates to an existing Taylorville Resource Park and the iwi management plans are of limited specific relevance to the proposal. The iwi management plans require the use of accidental discovery protocol which will be adopted for the application site. Therefore, the application is considered to be consistent with the iwi management plans.

13.3 District Plans

13.3.1 Grey District Plan

Under the provisions of the Grey District Plan (GDP) the application site is located within the Rural Environmental Area. The rural environments of the Grey District contain extensive resources, including indigenous forest, exotic forest, farmland, minerals, rivers, lakes, buildings and infrastructure. They are all used to a greater or lesser extent to provide social, economic and cultural wellbeing of the community.

13.3.2 Proposed Te Tai o Poutini Plan

The Proposed Te Tai o Poutini Plan (PTTPP) is the combined District Plan for the Buller, Grey and Westland District Councils. It will replace the current individual district plans. The PTTPP sets out the objectives, policies, rules and methods to manage land use activities and subdivision across the districts. The hearing on the PTTPP commenced in October 2023 and it is envisaged hearings will be held through to November 2024.

The application site is zoned 'General Rural' within the PTTPP, which recognises that rural land is an important resource as it underpins the social and economic well-being of the West Coast/Te Tai o Poutini. Furthermore, the rural area is a dynamic environment, influenced by changing farming practice and by a wide range of productive activities.

Under the PTTPP, the application site is not located within the following areas:

- Site of significance to Maori;
- Aotea Management Area;
- Contain any notable trees, Historic Heritage Items and Areas or Archaeological Areas; or

Furthermore, the application site is not subject to any hazard or risk overlays or any natural environment overlays.

The site is located within the 'Pounamu Management Area', which are meant to be given priority as areas of protection and 'Poutini Ngāi Tahu[4]' whānui access, including through the use of local planning instruments.

[4] Means the members of the two Ngāī Tahu hapū from the West Coast/Tai o Poutini - Ngāti Waewae and Ngāti Mahaki.

14.0 Section 105 Discharge and Coastal Permits

Under section 105(1) of the Act, in addition to the matters in section 104(1) of the Act, a consent authority must have regard to:

- the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
- the applicant's reasons for the proposed choice; and
- any possible alternative methods of discharge, including discharge into any other receiving environment.

As noted within the report, any potential adverse effects of the discharge are considered to be less than minor. Furthermore, other alternatives have been considered but have been ruled out for the reasons outlined at section 9.0. A discharge to land is required, as there is no reticulated stormwater network available to receive the discharges from the retention pond.

15.0 Section 107 Discharge Permit Restrictions

Under section 107 of the Act, unless there are exceptional circumstances, or the discharge is temporary, or it is associated with maintenance work, a consent authority cannot grant a discharge permit that would have following effects:

- if, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:
    - the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:
    - any conspicuous change in the colour or visual clarity:
    - any emission of objectionable odour:
    - the rendering of fresh water unsuitable for consumption by farm animals:
    - any significant adverse effects on aquatic life.

The proposed discharge from the retention pond to land will be designed to ensure that it does not give rise to the above effects. Furthermore, for the reasons outlined within this report (i.e. the short-term duration sought and proposed monitoring programme) the proposed discharge from the retention pond to land is not considered to give rise to the above effects.

16.0 Conclusion

The proposal involves an application for resource consent under s88 for a temporary discharge from the existing onsite retention pond to land, via a proposed soakage area at the application site, which is legally described as Lot 1-2 DP 584105. The proposal also addresses a s127 application to vary condition 11 of RC-2021-0097-03.

Based on the above report it is considered that:

- Public notification is not required as adverse effects in relation to groundwater quality and quantity and surface water quality are considered to be less than minor. There are also positive effects including manging the discharge from the retention pond in a controlled manner and avoid the uncontrolled overtopping of the pond. Furthermore, the proposed monitoring programme will provide an opportunity for groundwater and surface water quality at the site to be further monitored.;
- Limited notification is not required as the proposed discharges will be significantly diluted in groundwater prior to entering Noname Creek and it is highly unlikely that the diluted concentrations will exceed the range of natural variability or analytical error;
- The proposal accords with the relevant RLWP objectives and policies; and
- The proposal is considered to be consistent with Part 2 of the Act.

It is therefore concluded that the proposal satisfies all matters the consent authority is required to assess, and that it can be granted on a non-notified basis.

Appendix 1

Record of Title

B&A

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RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **1097679**

Land Registration District **Westland**

Date Issued 25 January 2023

Prior References

WS8A/1037 WS8A/1038 WS8B/1265
WS8B/1266

Estate Fee Simple

Area 19.3420 hectares more or less

Legal Description Lot 1-2 Deposited Plan 584105

Registered Owners

Taylorville Resource Park Limited

Interests

Subject to Section 8 Coal Mines Amendment Act 1950 (affects part Lot 1 DP 584105 formerly Lot 3 DP 2432)

Subject to Section 8 Atomic Energy Act 1945 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 3 Geothermal Energy Act 1953 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 3 Petroleum Act 1937 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 6 Mining Act 1971 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 8 Mining Act 1971 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934)

Subject to Section 5 Coal Mines Act 1979 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 261 Coal Mines Act 1979 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Part IV A Conservation Act 1987 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 241(2) Resource Management Act 1991 (affects DP 584105)

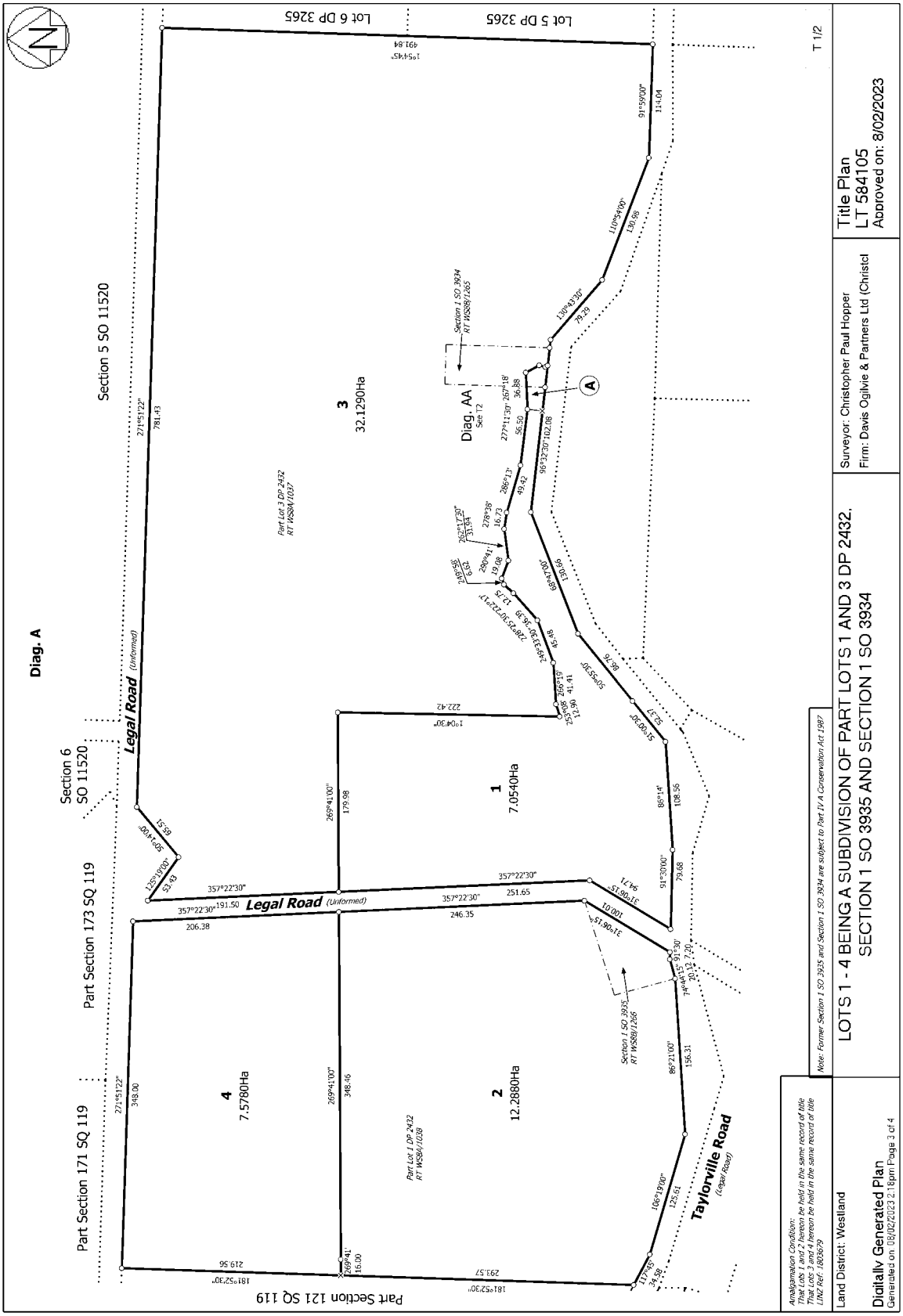
12630203.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 25.1.2023 at 8:27 am

12630203.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 25.1.2023 at 8:27 am

Subject to a right of way over part Lot 1 DP 584105 marked A on DP 584105 created by Easement Instrument 12630203.4 - 25.1.2023 at 8:27 am

The easements created by Easement Instrument 12630203.4 are subject to Section 243 (a) Resource Management Act 1991

Land Covenant in Covenant Instrument 12630203.5 - 25.1.2023 at 8:27 am


Lot 5 DP 3265
Lot 6 DP 3265
Part Section 121 SQ 119
Part Section 171 SQ 119
Part Section 173 SQ 119
Section 5 SO 11520
Section 6 SO 11520
Legal Road (Unformed)
Legal Road (Unformed)
Taylorville Road (Upper Road)
Diag. A
Diag. AA See T2
1 7.0540Ha
2 12.2880Ha
3 32.1290Ha
4 7.5780Ha
Part Lot 3 DP 2432 RT WS8A/1037
Part Lot 1 DP 2432 RT WS8A/1038
Section 1 SO 3934 RT WS29B/1265
Section 1 SO 3935 RT WS29B/1266
T 1/2
Title Plan LT 584105 Approved on: 8/02/2023
Surveyor: Christopher Paul Hopper
Firm: Davis Ogilvie & Partners Ltd (Christcl
LOTS 1 - 4 BEING A SUBDIVISION OF PART LOTS 1 AND 3 DP 2432, SECTION 1 SO 3935 AND SECTION 1 SO 3934
Note: Former Section 1 SO 3935 and Section 1 SO 3934 are subject to Part IV A Conservation Act 1987
Amalgamation Condition: That Lots 1 and 2 hereon be held in the same record of title That Lots 3 and 4 hereon be held in the same record of title LINZ Ref: 1803679
Land District: Westland
Digitally Generated Plan
Generated on 08/02/2023 2:18pm Page 3 of 4

Appendix 2

RC-2021-0097-V3

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RC-2021-0097-V3 Consent Conditions

(1) The deposition/discharge shall be carried out in general accordance with the details contained in the consent application and the applications to change or cancel consent conditions received 23 March 2022, and 4 July 2022 and 29 September 2022 submitted to the Consent Authority, except where inconsistent with these conditions.

(2) The Consent Holder shall supply any agent or contractor working under this consent with a copy of the consent.

(3) Any person working under this consent shall have a copy of the consent conditions on site and present it to an officer of the Consent Authority upon request.

(4) Any refuelling, lubrication or mechanical repairs shall be undertaken in such a manner so as to ensure that no spillages of hazardous substances onto the land surface or into water occur. If a fuel spillage in excess of 20 litres occurs, the Consent Holder shall inform the Consent Authority immediately.

(5) The Consent Holder shall only deposit fill material initially in the area outlined in red and labelled Dump Cells Stage 1,2,3 on the attached aerial photograph labelled Annexure 1 "RC-2021-0097 Application Area" or asbestos and coal tar or coal pitch only in the areas labelled Existing Lined ACM Cell and New Application Area Lined ACM Cell on the attached aerial photograph titled RC-2021-0097 Annexure 3. Variation September 2022. Should an "Expansion of Fill Area Report" be supplied to and approved by the Consent Authority then filling may occur within the wider area outlined in maroon on the attached aerial photograph.

(6) The "Expansion of Fill Area Report" required by Condition 5 shall contain the following as a minimum:-

- The location, size and approximate development time for any new cells to accept fill material;
- The base material present and the porosity of that material;
- How the leachate system will be extended into the new areas;
- Type and location of monitoring and sediment control for the new areas to be developed.

(7) The Consent Holder shall:

- Ensure all works are undertaken in such a manner so as to minimise soil erosion and to avoid slope instability;
- Ensure the works do not cause or exacerbate flooding of another person's property, erosion, land instability, sedimentation or property damage;
- Ensure that surface water is diverted around the fill site, as far as practicable.

(8) In addition to Condition 7, the Consent Holder shall install an appropriate sediment pond in the approximate location and constructed in the manner detailed in the attached annexure titled "Infrastructure Consultants Water Management Structure July 2021".

(9) Only demolition waste (including clean fill) and whole or shredded tyres, but not including the disposal of asbestos or other hazardous materials may be disposed of in the location

identified in Annexure 1. Asbestos and other hazardous materials approved by the Consent Authority can only be disposed of in the dedicated, lined cells identified in Annexure 3.

(10) The volume of deposited demolition waste shall not exceed a maximum volume of 30,000m_3 per calendar year.

(11) The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265) as a result of the exercise of this consent.

(12) Notwithstanding Condition 11 the Consent Holder shall install and maintain a groundwater monitoring bore in the approximate location identified in the annexure title "Infrastructure Consultants Water Management Structure July 2021" and attached to this consent. The Consent Holder shall monitor that groundwater bore annually for the following parameters:

- Groundwater level
- pH
- Turbidity
- Conductivity
- BOD
- Nitrate Nitrogen
- Ammoniacal Nitrogen
- Chloride
- Manganese
- Zinc (total)
- Iron
- Chromium IV (total)
- Copper (total)
- Lead (total)
- Arsenic (total)
- Aluminium (total)
- Cadmium (total)
- Mercury (total)
- Benzo(A)pyrene

(13) The Consent Holder shall conduct annual surface water monitoring at the locations identified on the annexure titled "Sewell Peak Farm Sampling Areas June 2021 – For Infrastructure Consultants" and attached to these consents. The Consent Holder shall monitor for the following parameters:

- pH
- Conductivity

- Turbidity
- Dissolved oxygen
- BOD
- Nitrate Nitrogen
- Ammoniacal Nitrogen
- Chloride
- Dissolved reactive phosphorus
- Zinc
- Chromium
- Arsenic
- Lead
- Aluminium
- Manganese

(14) Macroinvertebrate monitoring shall be undertaken at the request of the Consent Authority.

(15) When material is received for deposition onsite:

- The volume of all material shall be recorded before deposition;
- For each load, delivery documentation shall include confirmation that the material is consistent with what is consented;
- The delivery documentation shall clearly identify:
  - The contractor delivering the material;
  - The physical address of the original source of the material;
  - That the material is not contaminated.

(16) The Consent Holder shall undertake an inspection of the site and the material which has been deposited at least once every 30 days or before any deposited material is covered, whichever is the lesser. Confirmation that the material deposited is consistent with what is consented is to be documented for each inspection undertaken.

(17) Should the inspection undertaken in accordance with Condition 16 indicate materials deposited on site are not consistent with what is consented, these should be removed from the site immediately and deposited at an appropriate facility that is authorised to receive such material and the actions recorded.

(18) All documentation and information recorded regarding consented materials delivered to the consent holder's site, and regarding site inspections, is to be retained by the Consent Holder and provided in an electronic format to the Consent Authority on request.

(19) The management on site shall include:

- The site shall be surrounded by fencing and lockable gates to prevent, as far as practicable, the unauthorised deposition of material;

- All entrances to the site shall be securely locked when the site is not supervised unless monitored in a way that can identify responsibility for any deposition/discharge that is contrary to these consent conditions.
- Notwithstanding Condition 19 b) all entrances to the site shall be securely locked at the completion of each day's deposition/discharge activities.

(20) The Consent Holder shall compile and supply the Consent Authority with an annual monitoring report at intervals no greater than 12 months. As a minimum the report shall include the following information:

- A summary of all monitoring results obtained in accordance with the conditions of these consents supported by analysis and discussion by a suitably qualified person;
- The effectiveness of any treatment method in meeting the compliance limits of the consents;
- The environmental implications of any significant trends in monitoring data gathered with respect to the consented activities;
- Any incidences or problems experienced with achieving consent compliance;
- The summary of any complaints received and any mitigation measures that were adopted;
- Any maintenance works needed, proposed or that have been undertaken to ensure compliance with consent conditions;
- (g) Any modifications to more effectively control the quality of the discharge; and
- (h) Adverse effects from the discharge and the steps taken or proposed to be taken to
- correct or mitigate these effects.

(21) At the completion of filling activities the fill material shall be compacted, covered with a suitable growing medium and grassed, as soon as practicable.

(22) Pursuant to Section 128 of the Resource Management Act 1991, the Consent Authority may review the conditions of this consent by serving notice within a one month period of each anniversary of the date of commencement of the consent for any of the following purposes:

- To deal with any adverse effect on the environment which may arise from the exercise of this consent and which it is appropriate to deal with at a later stage.
- To require the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment.

Appendix 3

Hydrogeological Assessment (Engeo)

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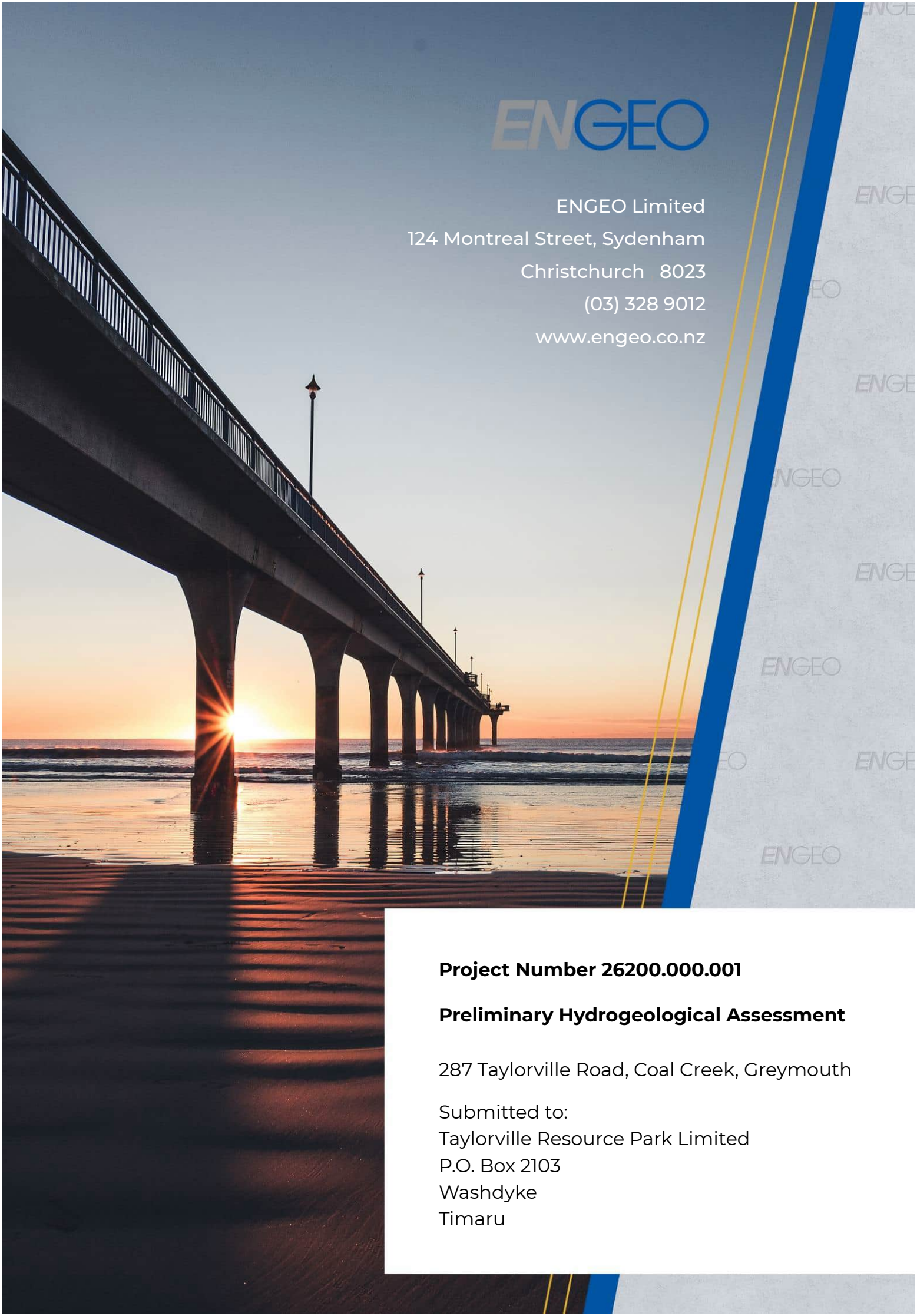

ENGEO Limited
124 Montreal Street, Sydenham
Christchurch 8023
(03) 328 9012
www.engeo.co.nz

Project Number 26200.000.001

Preliminary Hydrogeological Assessment

287 Taylorville Road, Coal Creek, Greymouth

Submitted to:
Taylorville Resource Park Limited
P.O. Box 2103
Washdyke
Timaru

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Appendix 1: Supporting Geological Information

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Appendix 4: Flocculant Specifications

Appendix 5: Summary of Laboratory Analytical Results

Appendix 6: Laboratory Report (July 2024)

Appendix 7: Hantush Modelling Results

Appendix 8: RISC5 Modelling Results

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ENGEO Document Control:

Report Title	Preliminary Hydrogeological Assessment – 287 Taylorville Road, Coal Creek			
Project No.	26200.000.001	**Doc ID**	04	
Client	Taylorville Resource Park Limited	**Client Contact**	Bruce Tinnelly	
Distribution (PDF)				
Date	**Revision Details / Status**	**Author**	**Reviewer**	**WP**
05/09/2024	Issued to Client	LN / JW	DR	HO
11/09/2024	Revised to reflect client comments	LN	DR	HO
19/09/2024	Revised to reflect planner comments	LN	DR	DF

SQEP Certifying Statement

I certify that the site has been assessed in accordance with current New Zealand Regulations and guidance documents and that this report has been prepared in general accordance with the Ministry for the Environment's Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand, 2021.

I am considered by ENGEO Limited to be a suitably qualified and experienced practitioner (SQEP) able to certify reports pursuant to the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, based on the company's definition of a SQEP as given below.

Dave Robotham

19 September 2024

ENGEO Limited requires that a SQEP has the following Qualifications / Experience:

- *Tertiary science or engineering qualification relevant to environmental assessment.*
- *A minimum of ten years of relevant experience.*
- *Registration with a professional body that assess and certifies environmental professionals in the competency criteria of training, experience, professional conduct, and ethical behaviour.*

1 Introduction

ENGEO Ltd was requested by Taylorville Resource Park Limited (TRPL) to undertake a Preliminary Hydrogeological Assessment at the Taylorville Resource Park, located at 287 Taylorville Road, Coal Creek, (herein referred to as 'the site', shown in Figure 1). This work has been carried out in accordance with our signed agreement dated 12 June 2024. The purpose of the assessment is to provide a summary of hydrogeological investigation works undertaken to date and assess potential effects due to a short-term discharge of treated waters to land.

The site covers approximately 12.5 hectares (ha) in a generally rural area located approximately 3.5 km east of Greymouth township. The site currently operates as a disposal facility under resource consent RC-2021-0097-V3, which was granted by the West Coast Regional Council (WCRC) on 6 August 2021 and amended on 7 October 2022. The site has been developed with three waste cells (Cells A, Cell B, Cell C); additionally, one cell (Cell D) is planned for development.

Cell B is closed and capped; Cells A and C are active (refer Table 1). RC-2021-0097-V3 allows for the disposal to land of demolition waste (including cleanfill), asbestos, coal tar and coal pitch, shredded tyres, and other hazardous materials approved by the Consent Authority. The materials received in each of the disposal cells are summarised in Table 1.

Table 1: Cell Descriptions and Received Material Types

Cell	Aerial Extent	Approximate Depth	Approximate Volume	Received Materials	Cell Construction
Cell A	5,000 m^2	~10 – 15 m (to mudstone)	~40,000 – 60,000 m^3	Demolition waste (including cleanfill), whole or shredded tyres	Unlined cell.
Cell C	6,400 m^2	10 m	37,000 m^3	Demolition waste (including cleanfill), whole or shredded tyres, asbestos, coal tar and coal pitch, other approved hazardous materials	Cell is lined with geomembrane underlain with geofabric

Condition 11 of RC-2021-0097 states that:

> *"The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (Secs 1-3 5-6 Pt Secs 4 & 8 SO 113520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2342 Lots 1-5 DP 3265) as a result of the exercise of this consent."*

TRPL received an abatement notice from WCRC (dated 4 May 2023) relating to offsite discharges that were odorous and contained elevated concentrations of heavy metals.

The site operations include two large water treatment / retention devices with a combined capacity of ~15,000 m^3 for treated leachate and stormwater captured by the operations. The devices are currently at capacity, with heavy rainfall predicted in the coming months. TRPL is seeking consent to discharge water to land, to create freeboard in the retention pond and avoid uncontrolled discharges. Based on laboratory analytical results, the proposed discharges contain contaminants exceeding the permitted activity standards outlined in Rule 67(a) of the West Coast Regional Land and Water Plan (RLWP) (WCRC, 2020).

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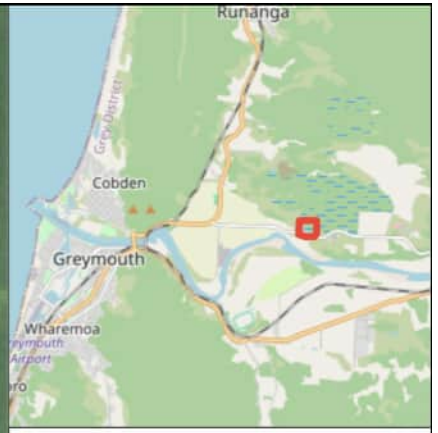

Legend

Site Boundary

0 50 m 100 m

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ENGEO

Produced by **Datanest.earth**

Title: Overarching Site Plan		
Client: Taylorville Resource Park Ltd		Size: A4
Project: Taylorville Resource Park	Drawn: LN	Figure No.: 1
Date: 24-07-2024	Checked: -	
Proj No: 26200.000.001	Scale: 1:3968	Version: draft

As such, a change on Condition 11 of RC-2021-0097 may be required under Section 127 of the Resource Management Act (RMA) and consent will be required under the following Rules in the RLWP:

18.4 Discharges to Water

- Rule 71 'Discharge of any contaminant, or water to water, not complying with Rules 63 to 70' outlines that unless permitted by Rules 63, 64, 65, 66, 67, 68, 69, or 70 the discharge of any contaminant or water to water is a discretionary activity. The proposal activity is not captured under any of these rules and is therefore a Discretionary Activity under Rule 71.

18.5 Discharges to Land

- Rule 91 'Discharges to land discretionary activity Rule' outlines that any discharge of contaminants into or onto land is a discretionary activity, unless it is permitted by Rules 72 to 86, or controlled by Rules 87 to 90. The proposal activity is not captured under any of these rules and is therefore a Discretionary Activity under Rule 91 of the RLWP.

The objectives of this assessment are to characterise the geology of the site and surrounds, summarise the site hydrology and ambient water quality (groundwater and surface water), and assess the potential effects on off-site receptors (human and ecological) due to discharges of contaminants to water and to land where it might enter water. We note that investigation works are ongoing, and this report will be updated and revised as additional information comes available. However, this report is considered to provide an adequate assessment of the effects related to the proposed, short-term discharges.

2 Site Setting

2.1 Site Location

The site is located in a flat to gently undulating area between Mount Buckley and Cobden Hill, on the northern side of the Grey River, at an elevation of approximately 44 m reduced level (RL). The local topography dips gently to the southwest with an average grade of approximately 1.6% (1:64). The nearest townships are Greymouth (~3.5 km east) and Dobson (~3.5 km west).

A filling operation is located adjacent to the western site boundary (refer Figure 2 appended). The operation is authorised (RC-2019-0024-01) to receive cleanfill and demolition material. Surrounding properties to the north and east are agricultural / pastoral in use. Two residences are located less than 250 m west of the site. The nearest recorded water bore is located approximately 1.3 km west (2 Sids Road). There are no consented groundwater takes on file with the WCRC within 1 km downgradient of the site.

A networked public drinking water supply (GRE001) is located approximately 430 m south of the site. The supply provides drinking water to approximately 10,000 people in the area. The water supply (RC01092.3) comprises three bores (located 320 m to 420 m south-southeast of the site) that abstract from a subsurface infiltration system that takes water from the Grey River for treatment and distribution.

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Legend

- Recorded Groundwater Bores
- Filling Operation (RC-2019-0024-01)
- GDC Infiltration System
- Site Boundary

0 100 m 200 m

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Produced by **Datanest.earth**

Title: Local Features		
Client: Taylorville Resource Park Ltd		Size: A4
Project: Taylorville Resource Park	Drawn: JDW	Figure No.: 2
Date: 10-09-2024	Checked: LN	
Proj No: 26200.000.001	Scale: 1:10718	Version: 1.0

2.2 Geological Setting

The site and surrounds are underlain by the Paleogene (33 – 55 myr) Kaiata Formation (Rapahoe Group), comprising brown, carbonaceous mudstone. An array of generally north-south trending faults have been mapped to the north and east of the site; however, no faults have been identified in the Kaiata Formation within 1.7 km of the site.

The thickness of the Kaiata Formation has not been directly investigated at the site; however, the approximate thickness has been assessed based on a published geology (Rattenbury & Isaac, 2012) and geological cross-section drawn for an area approximately 4 km north of the site (Ballance, 2009). The Kaiata Formation overlies the Brunner Coal Measures, which outcrop approximately 4.5 km to the east. Based on published field measurements, the bedding within the Kaiata Formation dips approximately 15˚ – 20˚ to the west-southwest. Assuming some offset to the line of strike and an apparent dip of 10˚, the depth at the site to the Kaiata Formation – Brunner Coal Measures contact is on the order of 700 m below the ground surface. Supporting documentation is provided in Appendix 1.

During the Middle- to Late-Pleistocene (last approximately 100,000 years), intervals of glaciation resulted in erosion of the mudstone surface and the deposition of 14 m – 19 m of glacial outwash. The outwash deposits generally comprise sandy gravel with varying quantities of fines (e.g., silts and clays).

Based on existing borehole information, three layers of outwash deposits have been identified at the site (refer Figure 3). The oldest deposit (Gravel 3) comprises a gray, small to medium gravel. This deposit has been identified on the eastern portion of the site in contact with the mudstone (~13 – 17 m below ground level [bgl]). Above the Gravel 3 lies a 3 - 4 m thick layer of claybound gravel (Gravel 2). The youngest gravel formation (Gravel 1) is a small to medium gravel, which overlies the claybound gravel and extends across the site. Due to the abrupt transition between the gravel layers, it is inferred that these contacts represent disconformities between depositional sequences.

Following deposition of the surficial gravel, the area was downcut due to erosion along the alignments of the Grey River and tributaries. The gravel deposits in the river channel were eroded away and Holocene fluvial deposits have been deposited on the erosional surface of the mudstone.

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Figure 3: Site Depositional Sequence

Photo 1: Inferred Gravel 3 extents (green) over the Kaiata Mudstone (yellow)

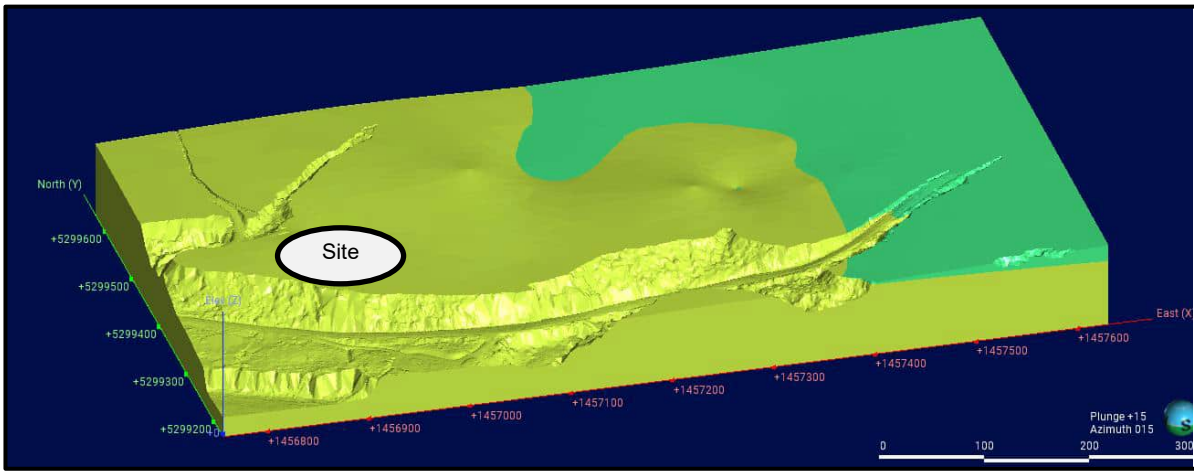


Photo 2: Inferred Gravel 2 extents (blue)

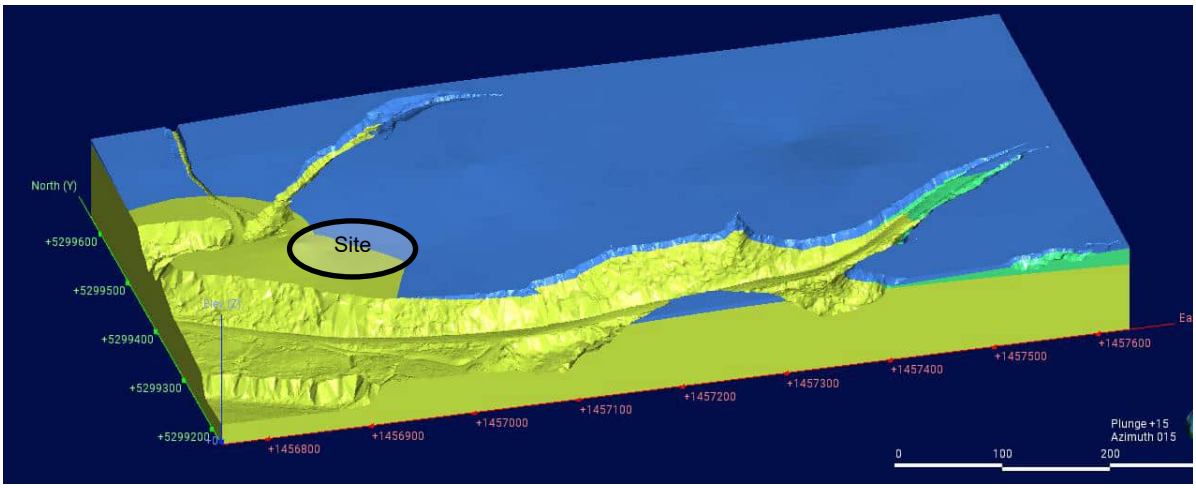
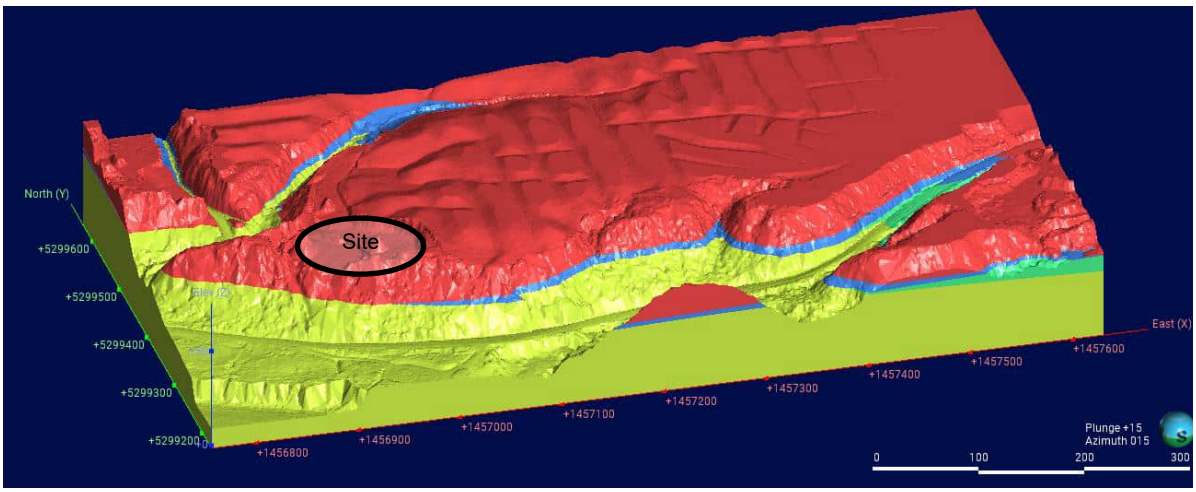


Photo 3: Inferred Gravel 1 extents (red)



Source: LINZ data service (West Coast LiDAR 1 m DEM).

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2.3 Hydrological Setting

The site is located between the floodplain of the Grey River and the channel of Noname Creek, which forms a downstream tributary of the Grey River (refer Figure 4). Downstream of the site, the Grey River meanders westward in a wide (~300 m) channel for ~ 7 km to discharge in the Tasman Sea. The site is understood to be outside of the normal tidal influence zone; however, no specific backwater study has been completed as part of this assessment.

Noname Creek flows in a southwest direction approximately 15 m from the north-northeast extent of the operations. The creek also receives water from the fill operation located 100 m west of the site. It runs through a culvert under Taylorville Road and discharges into an unnamed tributary / wetland on the south side of the road before joining with the Grey River approximately 350 m westward (downstream) of the confluence with the wetland at an elevation of approximately 1 m RL. (refer Figure 5 below).

Based on flow readings in the Grey River collected at the Dobson monitoring point (~3.5 km upstream of the site) by WCRC, the river flow ranges from approximately 80 m^3/s in dry weather to 1,750 m^3/s following high rainfall events, with seasonal long-term median flows ranging from 165 m^3/s to 320 m^3/s. No flow readings have been collected from Noname Creek; however, based on observations made by ENGEO on 31 July 24, the flow rate is on the order of 0.02 – 0.03 m^3/s. Noname Creek is spring-fed; as such, it is inferred that the flow rate is generally stable with transient high flow following high rainfall events.

Depth to groundwater measurements were collected on 30 July 24 from six on-site monitoring bores (MB1, MB2s, MB2d, MB3, MB4d, and TSB1). The depth to groundwater ranged from 4.48 m (TSB1) to 12.4 m (MB4d) below the top of the well casing. The depth to groundwater was subtracted from the surveyed elevation at the top of the well casing to derive the elevation of the water table (in RL). Based on the calculated groundwater elevations, the general groundwater flow direction is towards the west-southwest (247˚) with a gradient of 0.0018 m/m. The hydraulic conductivity of the gravel(s) has not yet been characterised; however, based on published estimates (Fetter, 2021) aquifer testing undertaken by ENGEO in sites with similar deposits, it is inferred that the horizontal conductivity is in the order of 84 m/d.

The median annual rainfall is 2,800 – 3,000 mm NIWA, 2024), of which approximately 1,000 mm infiltrates to ground (Westerhoff, 2018). It is inferred that infiltrated water encounters the water table and then flows laterally with groundwater in the gravel deposits. Daylighting groundwater can be observed in a drain on the western end of the site and at several (~10) locations on the southern flank of the site, along Taylorville Road. The discharge points could not be directly observed due to heavy ground cover; however, it is inferred that groundwater is emerging from either the gravel deposits and / or at the mudstone contact.

Daylighting groundwater accumulates in a drain that runs around the western property boundary and along Taylorville Road. The drain also receives water from springs, creeks, and surface runoff from uphill of the site and along a 1 km length of Taylorville Road. Based on observations made by ENGEO on 31 July 24, the water in the drain is generally stagnant with minimal flow (0.001 – 0.002 m^3/s) in some areas. The water in the drain is piped under the road to the unnamed tributary / wetland on the south side of Taylorville Road, before joining with the Grey River approximately 550 m downstream.

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Legend

- Groundwater Monitoring Well Locations
- Inferred Groundwater Level Contours (RL)
- Inferred Groundwater Flow Direction
- GDC Infiltration System
- Site Boundary

0 50 m 100 m

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ENGEO

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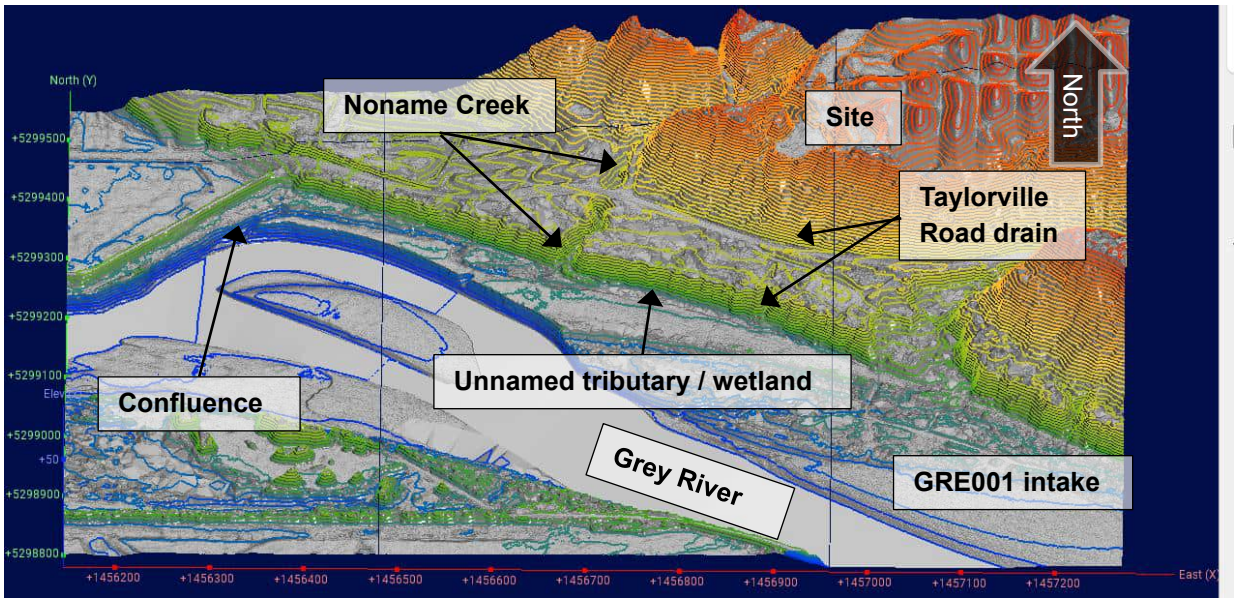
Title: Hydrological Setting		
Client: Taylorville Resource Park Ltd		Size: A4
Project: Taylorville Resource Park	Drawn: JDW	Figure No.: 4
Date: 05-09-2024	Checked: LN	
Proj No: 26200.000.001	Scale: 1:3968	Version: 1.0

Figure 5: Local Topography



Source: LINZ data service (West Coast LiDAR 1 m DEM). Note 3x vertical exaggeration.

Some water from the unnamed tributary / wetland may infiltrate into the Holocene Gravels and encounter groundwater that will discharge into the Grey River. Based on the flow direction in the Grey River (inferred groundwater flow direction), water from the drain will daylight *at least* 250 – 300 m downstream of the intake for GRE001.

The hydraulic conductivity of the mudstone has not yet been characterised; however, based on published estimates (Freeze, 1979) the inferred horizontal conductivity ranges from 0.9 m/d to 9 x 10^{-4} m/d, with a ratio of horizontal to vertical conductivity of 10:1 (Domenico, 1990). Considering the likely relative hydraulic conductivities between the gravel and the mudstone, it is inferred that groundwater flow is predominantly in the gravel deposits with only minor horizontal flow in the mudstone and negligible vertical infiltration.

3 Water Management System

3.1 Stormwater Management

Stormwater management at the site is primarily focused on the diversion of clean water from the waste cells and mitigation measures to prevent sediment loading in the stormwater. Stormwater that falls on the operational areas (e.g., roadways) is directed via roadside swales towards undisturbed areas of the site for infiltration through the permeable gravels. Stormwater that falls on or immediately adjacent to Cell A, Cell C, the retention pond, and settlement pond (refer Appendix 2) is directed into the cell / pond to prevent erosion and scouring of the cell / pond bunding. Stormwater that falls onto Cell B (closed and capped with 1,500 mm of gravel and low-permeability, compacted silts, proposed upgrades include the installation of an impermeable membrane cap) runs off the cell surface due to the contouring of the cap.

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3.2 Leachate Management

Details of the leachate management system are provided in Appendix 2. Leachate from Cell A is captured via a sump that was installed west of the cell. Anecdotal information provided by the site manager indicates that the underlying mudstone layer slopes towards the sump. The sump was installed into an excavation that extended below the base of Cell A, into the underlying mudstone, to provide a preferential flowpath for Cell A leachate. As Cell A is unlined, we infer that the sump is also receiving groundwater that intersects with the base of Cell A. Water from the sump (herein, "Deep Sump") is then pumped via a submersible pump on a float switch into the first stage of the lined settlement pond. The daily flow from Cell A is estimated to be on the order of 100 - 150 m^3/day.

Leachate from the lined Cell B and Cell C is collected via sumps and risers installed in the cells and gravity fed through a GM700 hydrogen sulphide scrubbing system, (refer to Appendix 3 for specifications). As Cell B has been capped, no leachate has been observed flowing from this cell for the past 18 months; however, it is possible that negligible amounts may be generated. From the scrubbing system, the leachate is piped to a pumping station near the western site boundary and into the first stage of the lined settlement pond. The daily flow from Cell B / C is estimated to be on the order of 15 – 20 m^3/day.

The first stage of the settlement pond has a capacity of ~2,700 m^3, allowing for an approximate residence time of 135 – 180 days. Following settlement in Stage 1, the water decants over a baffle into stage two, which has a capacity of ~1,300 m^3. Stage 2 is equipped with a float switch that, when triggered, pumps the water to a flocculation system that includes two tubes of poly-aluminium chloride and three sealed and baffled containers for additional removal of sediment and insoluble metals, (refer to Appendix 4 for further information). The treated water decants to the ~ 14,000 m^3 retention pond for storage.

Water from the retention pond is piped through a siphon system to draw water through an additional treatment stage comprising two pumice pods and an additional baffled container that feeds into the DC/C3 sump. The DC/C3 sump has a cutoff valve, which is currently preventing off-site discharges of water from the retention pond. In the interim, water from the retention pond and D3/C3 are being directed back to the settlement pond for on-site recirculation.

It is intended that future discharges will be pumped past DC/C3 to a geobag and into a staggered polishing zone / wetland that will slow the flow of water prior to the final discharge in the roadside drain.

4 Comprehensive Water Quality Monitoring Results

A comprehensive monitoring round was undertaken at the site on 30 – 31 July 2024 to better characterise background / ambient concentrations of contaminants of concern (COC), potential source area(s), and likely effect(s) to off-site receptors. Water samples were collected from the following locations (refer Figure 6):

- On-site groundwater monitoring bores (MB1, MB2s, MB2d, MB3, MB4d, TSB1). We note that two monitoring bores (MB4s and MB5) were dry on the day of sampling.
- Daylighting groundwater from the drain on the western end of the site (TCD1) and springs along Taylorville Road (SP1 – SP3, SPE)
- Surface water in Noname Creek (SPFUS, SPFMS, SPFDS)
- Surface water in the drain along Taylorville Road (TRD1 – TRD5)

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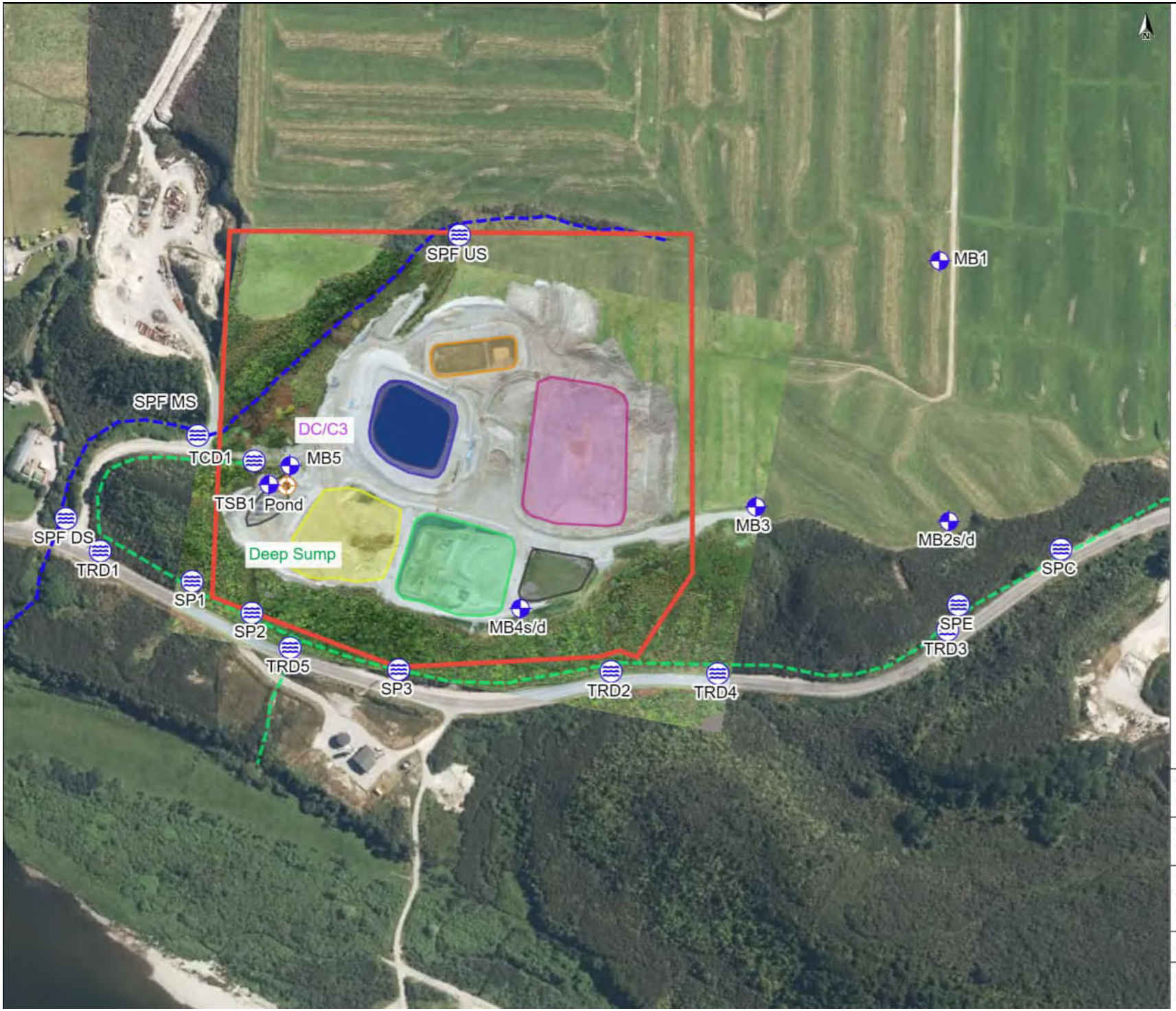

Legend

- Groundwater Monitoring Well Locations
- Discharge Sample Locations
- Surface Water Sample Locations
- Site Boundary
- Retention Pond
- Former Settlement Pond
- Settlement Pond
- Cell B (lined and capped)
- Cell C (lined)
- Proposed Cell D (lined)
- Cell A (unlined)
- Drainage
- Noname Creek

0 50 m 100 m

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Title: Comprehensive Monitoring Sample Locations		
Client: Taylorville Resource Park Ltd		Size: A4
Project: Taylorville Resource Park	Drawn: JDW	Figure No.: 6
Date: 05-09-2024	Checked: LN	
Proj No: 26200.000.001	Scale: 1:4103	Version: 1.0

- Locations in the water treatment system including the Cell A sump, leachate outlet from Cell A, leachate outlet from Cell B / C, the second stage of the settlement pond, and the discharge from the retention pond (DC / C3)
- The former sediment pond

All samples were collected in general accordance with methodology and QA / QC procedures in the National Environmental Monitoring Standard (NIWA 2019). Groundwater samples were collected using a low flow method after field parameters (temperature, pH, dissolved oxygen) stabilised. All samples were placed into laboratory supplied containers and placed in a chilled container for transport to Hill Laboratories under a standard chain of custody for the following determinands:

- General water quality indicators (e.g., pH, electrical conductivity [eC], alkalinity, hardness, chemical oxygen demand [COD]).
- Anions and cations (e.g., Cl^-, SO_4^{2-}, Na^+).
- Nitrogen species as nitrogen (i.e., Nitrite-N, Nitrate-N, Ammoniacal-N).
- Total and dissolved heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, and zinc).

4.1 Assessment Criteria

All samples were assessed relative to the following criteria:

- New Zealand Drinking Water Standards (MoH, 2018) to assess for potential risk to the potable water supply at GRE001. Where derived, we have used the human health-based maximum acceptable value (MAV); if no MAV has been derived, we used the guideline value (GV) based on aesthetic effect (e.g., taste, odour).
- The Guidelines for Fresh & Marine Water Quality (NZWQS) (Commonwealth of Australia, 2024) to assess for potential risk to aquatic receptors. Where derived, we have used the toxicant default guideline values (DGV); if no DGV has been derived, we used the guidelines for physical and chemical (PC) stressors. We note that an ecological assessment is currently underway; however, no information is yet available to assess the sensitivity of species in the receiving environment. As a conservative measure, we have assessed against the values for 80%, 90%, and 95% level of protection.

4.2 Water Quality Analytical Results

Water analytical results were tabulated and reviewed to identify exceedances of the assessment criteria and determinands concentrations in samples collected at upgradient / upstream locations. The concentrations at upgradient / upstream locations were used to develop the trace concentrations (defined as 120% of the background concentrations). Several of the determinands exceeded the assessment criteria in samples collected at upgradient / upstream locations; as such we classified downstream / downgradient concentrations using the decision tree in Figure 7 below.

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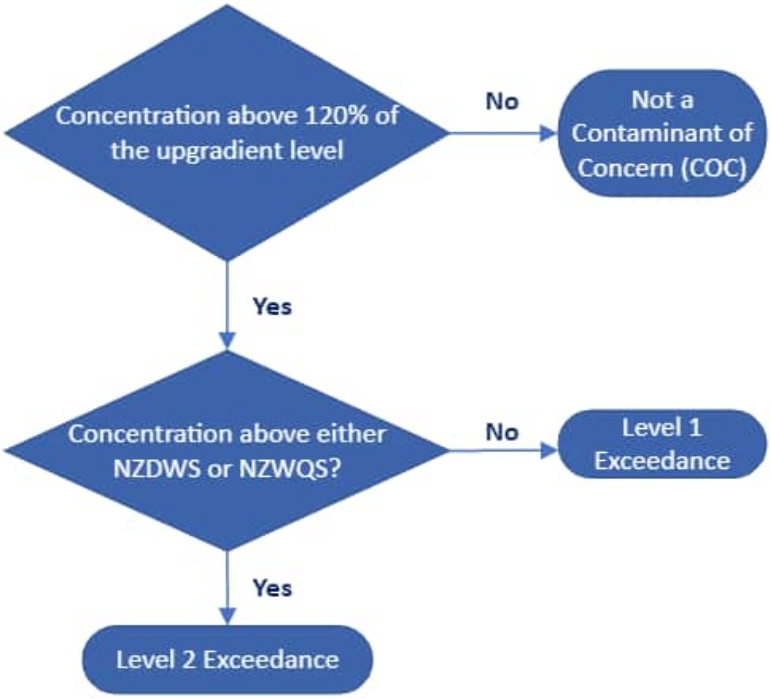
Figure 7: Contaminant Classification Decision Tree



Analytical results (current and historical) and a summary of exceedances are provided in Appendix 5; the laboratory report is provided in Appendix 6.

Based on the findings of the July 2024 monitoring round:

- Water in the treatment system contains elevated levels / concentrations of total hardness, electrical conductivity, total iron, dissolved manganese, ammoniacal-N, sulphate, and dissolved and total metals (arsenic, chromium, copper, and zinc)
- Water samples collected from daylighting groundwater and the monitoring bores generally contained concentrations that were below trace (background / ambient) levels, with the exception of the sample collected at location TSB1. We note that concentrations at TSB1 differ significantly from those in samples collected from the Cell A leachate and other locations in the water treatment system (e.g., concentrations of total hardness, ammoniacal-N, sulphate). As such, these Level 1 Exceedances are not obviously the result of site operations and may be due to differing natural geochemistry.
- Water samples collected from daylighting groundwater and the monitoring bores contained concentrations that exceeded the NZDWS (total iron, dissolved aluminium and / or manganese) and concentrations that exceeded one or more of the NZWQS; however, concentrations were generally near or below the trace levels, indicating that Level 2 Exceedances may be due to background / ambient water quality and operations are unlikely to be significantly degrading groundwater.

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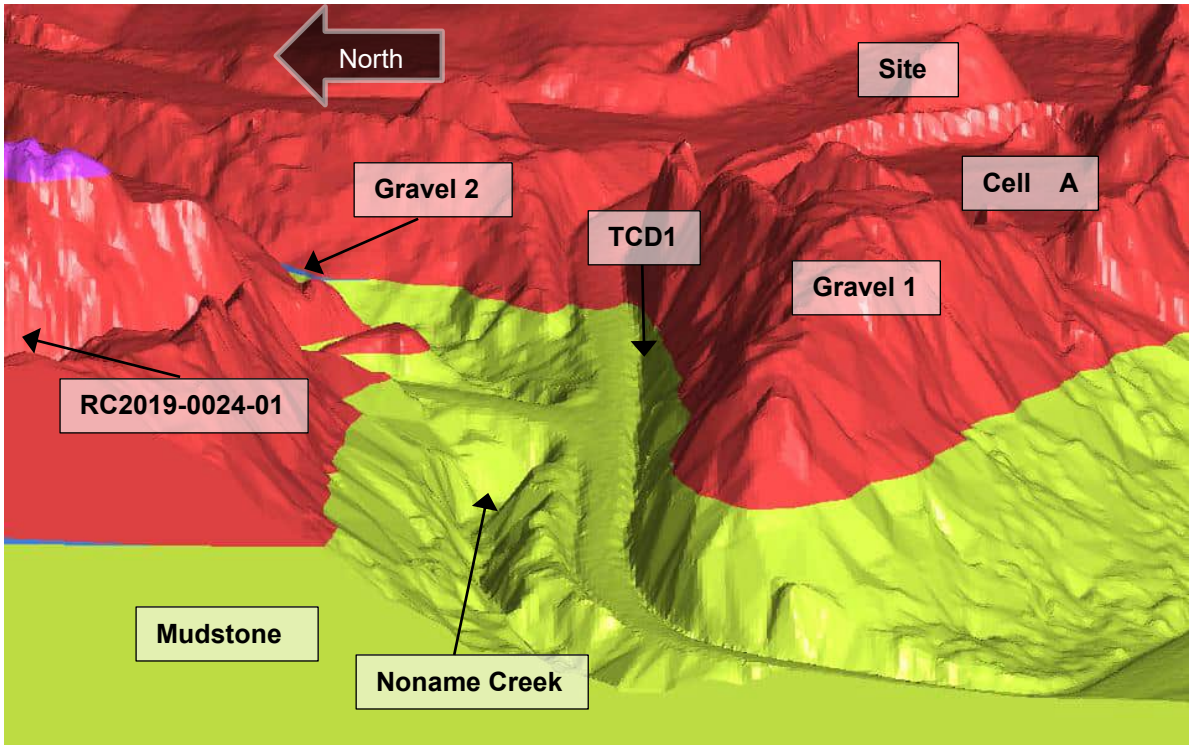
- Samples collected from the drain locations contained several Level 1 Exceedances (derived from the upstream drain location, TRD3) and Level 2 Exceedances; however, they were generally below the trace concentrations for groundwater. Based on field observations, the drain receives water from daylighting groundwater, creeks, and surface runoff from uphill of the site and along a 1 km length of Taylorville Road. As such, while the site operations may contribute to changes in water quality, there are likely multiple sources for the Level 1 / Level 2 exceedances in the drain samples.

- Samples collected from mid and downstream locations in Noname Creek contained several Level 1 Exceedances. Additionally, the levels of electrical conductivity exceeded the NZWQS PS stressor criteria. The alignment of the creek runs between the site and the fill operations on the adjacent property (RC2019-0024-01). We have requested monitoring data for samples collected at the adjacent operations from WCRC. In the absence of off-site monitoring data, it is inferred that the Level 1 / Level 2 Exceedances in Noname Creek samples may be all or partially due to off-site activities. We further note that, based on site topography (refer Figure 8), the gravel formation appears discontinuous between the site operations and the drain; as such, the changes in water quality in Noname Creek are not obviously the result of site operations.

Figure 8: Topography and Gravel Contacts near Noname Creek



5 Proposed Discharge to Land

The proposed works include the development of an on-site soakage area at least 100 m away from Noname Creek (refer Figure 9) where water from the retention pond will be discharged to land. We have modelled for a 10 m x 10 m soakage area with a depth of at least 2 m, to accommodate a rainfall event of 50 mm (approximately equivalent to the 1-hour peak of a 2% AEP storm event for this location).

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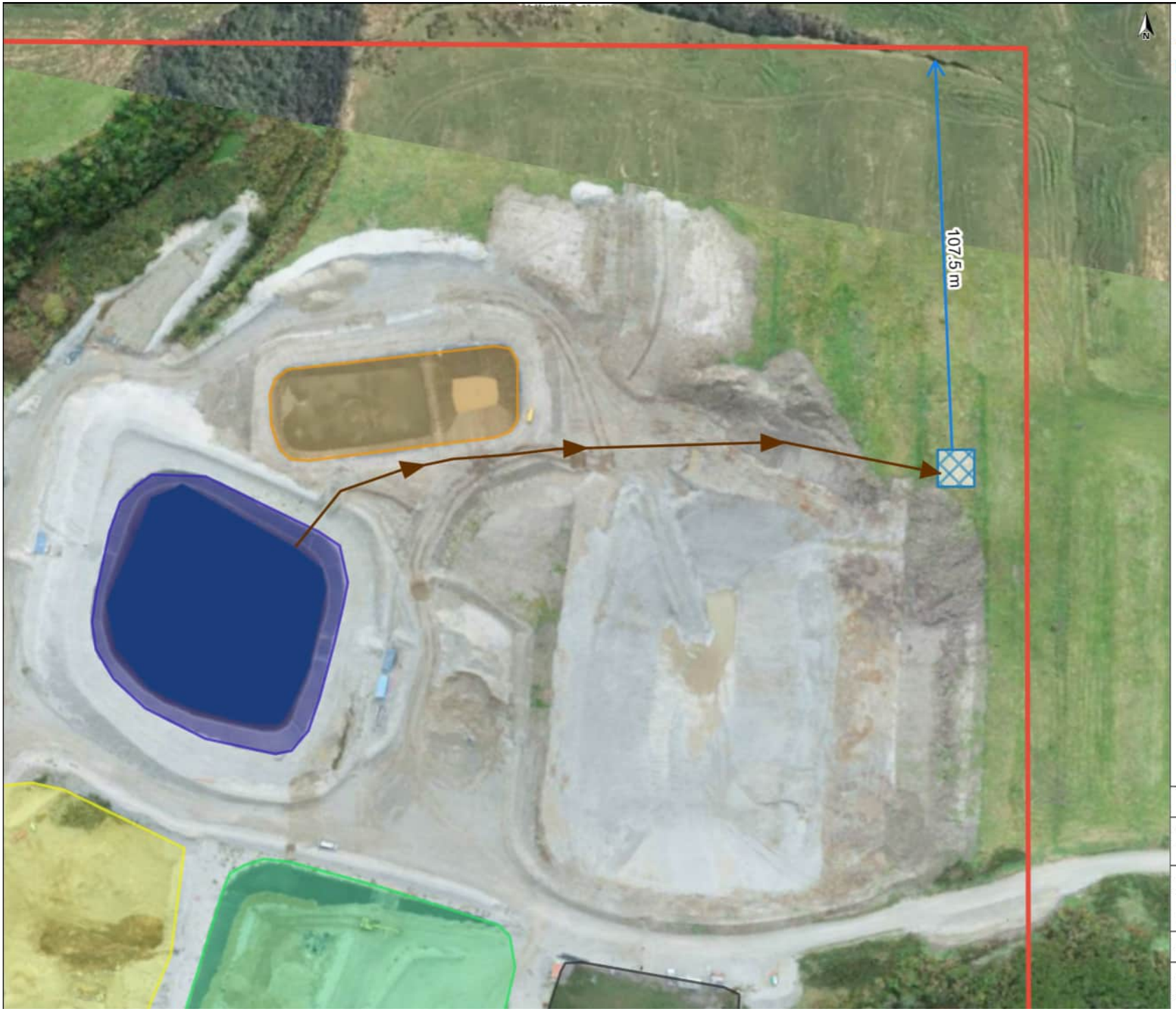

Legend

- Post-settlement leachate piping
- Proposed Soakage Pit
- Site Boundary
- Retention Pond
- Former Settlement Pond
- Settlement Pond
- Cell B (lined and capped)
- Cell C (lined)
- Cell A (unlined)

0 25 m 50 m

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ENGEO

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Title: Proposed Water Management System		
Client: Taylorville Resource Park Ltd		Size: A4
Project: Taylorville Resource Park	Drawn: JDW	Figure No.: 9
Date: 29-08-2024	Checked: LN	
Proj No: 26200.000.001	Scale: 1:1417	Version: 1.0

Water would be pumped from the retention pond at a flow that is no greater than the infiltration capacity of the basin. We have modelled for a maximum discharge of 800 m^3 of water per day (~9 L/s). To avoid scour, the soakage area will be lined with a geofabric, suitably-sized pipework will be used to reduce the flow velocity to less than 1.3 m/s (MBIE, 2020), and, if necessary, the outlet will be manifolded to discharge at more than one point in the area.

The duration of discharge is anticipated to be six months. Discharges will preferably be taken during dry weather with little to no surface precipitation, to create freeboard in the retention pond; however, discharging may be required during wet weather as a contingency measure.

6 Assessment of Effects on the Environment

The primary transport pathway is infiltration to the water table followed by migration to the west-southwest with groundwater flow. There are no users of groundwater at this site or within 1 km downgradient of the site; however, groundwater daylights in the drain that runs around the western property boundary and in springs along Taylorville Road. From the drain, receptors may come into contact with the water either in the drain or the receiving environment (unnamed tributary / wetland and the Grey River). The potential effects of the proposed discharge have been considered along with measures for avoiding, remedying or mitigating adverse effects.

Effects on On-Site Groundwater Quality Contaminant fate and transport modelling was undertaken using RISC5 software to assess for the migration of contaminants in groundwater that daylights either in the drain that runs around the western property boundary or in springs along Taylorville Road.

6.1.1 Input Parameters

The input parameters selected in the model were based on published values and conservative proxy values. A summary of the parameters and source material are presented below.

Source Area Characteristics

In our model, we have assumed no attenuation in the vadose zone; as such, the source area has been modelled as mounded discharge water below the groundwater table. Hantush (Hantush, 1967) formulated a well-known approach for evaluating groundwater mounding. The Hantush method provides analytical solutions for the development of transient groundwater mounds below a rectangular recharge source with a consistent infiltration rate. To facilitate the application of the Hantush method, the United States Geological Survey (USGS) developed an open-source spreadsheet analytic tool. This spreadsheet tool was used for analytical modelling to determine the groundwater mounding that could potentially occur from the discharge to ground at the proposed soakage area.

The analytical model uses various parameters to estimate groundwater mounding these parameters include recharge rate (infiltration rate), recharge duration, specific yield, horizontal hydraulic conductivity (K-value), soakage pit size, and aquifer thickness. Assumption and limitations of the Hantush analytical model includes:

- The model shown does not account for dissipation in water level.
- The model assumes steady state and does not account for transient conditions.

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The input values used for the analytical models were determined as follows:

- Recharge rate: The recharge rate (8 m/d) was calculated based on the size of the area and the maximum discharge rate (refer Section 5).
- Specific yield: The specific yield (0.13) was determined from the literature (Fetter, 2021).
- Horizontal hydraulic conductivity (K_h): The horizontal hydraulic conductivity (84 m/d) was determined from the literature (ibid).
- Soakage area size: The soakage area dimensions (10 m x 10 m) were based on the area required to accommodate the maximum discharge rate at the inferred recharge rate.
- Infiltration duration: To be conservative, we estimated for discharges from a 50 mm rainfall event (one hour peak for the 2% AEP [50-year ARI]).
- Aquifer thickness: The aquifer thickness was assumed to be 8.0 m below the soakage area.

The Hantush model calculates the groundwater mounding heights from the centre of the soakage area in two directions, orientated parallel to the width and length of the soakage area. The groundwater mounding is estimated from the centre of infiltration and at the distances from the edge of the soakage area. Hantush modelling results are provided in Appendix 7.

Based on the output of the Hantush model highest modelled groundwater mounding occurs in the centre of the soakage area, with a mounding height of 0.55 m.

To be conservative, in our RISC5 model we have assumed a source area of 10 m perpendicular to the flow direction and a height of 1 m, with a pulse duration of 6 months.

Aquifer Characteristics

The hydraulic gradient (0.0018 m/m) was calculated using the measured groundwater elevation at BH1 and TSB1. Dispersity was calculated by the model (Gelhar, 1985). As a conservative measure, the model was run using a fraction organic carbon (foc) of 0.001 g/g.

Chemical Characteristics

The source area concentrations were derived from the highest concentrations detected in samples collected from locations in the water treatment system in July 2024. To simplify the model, we model only contaminants with concentrations that exceed one of more of the health-based assessment criteria (MAV or DGC, refer Section 4.1) including:

Table 2: Modelled Contaminants of Concern

Contaminant of Concern	[Max] (mg/L)	[Max] Sample ID	NZDWS	NZWQS 95%	NZWQS 90%	NZWQS 80%
Total aluminium	0.21	Settlement Stage 2	0.1	0.055	0.08	0.15
Total manganese	2.6	Cell B/C	0.4	1.9	2.5	3.6
Total ammoniacal-N	16.1	Cell B/C	0.82	0.9	1.43	2.3
Nitrate-N	0.34	Cell B/C	11.3	0.092	0.092	0.092
Total arsenic	0.05	Cell B/C	0.01	0.013	0.42	1.4
Total chromium	0.0164	Cell B/C	0.05	0.0033	0.006	0.04
Total copper	0.178	Cell B/C	2	0.0014	0.0018	0.0025
Total lead	0.00057	Settlement Stage 2	0.01	0.0034	0.0056	0.0094
Total nickel	0.0037	Settlement Stage 2	0.08	0.011	0.013	0.017
Total Zinc	0.056	Settlement Stage 2	1.5	0.008	0.015	0.031

Note: Refer Appendix 6 for full laboratory results and criteria references.

In our model, we have assumed no degradation along the flowpath.

Receptor Characteristics

To be conservative, we have modelled to a hypothetical well that is located 310 m downgradient of the soakage area, directly on the flowpath of the plume, and with a screen that intersects the water table. This will give a maximum concentration for groundwater daylighting in the drain that runs around the western property boundary or in springs along Taylorville Road.

An input summary is provided in Appendix 8a.

6.1.2 RISC5 Modelling Results

Based on the modelling results (refer Appendix 8b), contaminants in discharges to the soakage area will generally be attenuated through dilution / dispersion in the unconfined aquifer. Very low concentrations of aluminium, ammoniacal-N, manganese, and nitrate-N may reach the point of discharge (hypothetical well), with the concentration maximum in 1.6 years. The highest modelled concentrations are for aluminium and nitrate-N; however, these concentrations are negligible (0.00031 mg/L and 0.00050 mg/L, respectively) and below the range of natural variability or analytical error. A concentration graph is included in Appendix 8c.

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6.1.3 RISC 5 Model Limitations / Considerations

There are limitations to the RISC5 modelling results. Significant limitations are discussed, and likely implications are discussed below:

- RISC5 assumes a homogenous, isotropic aquifer. As such, it will not account for the presence of the mudstone or variability in the gravel (e.g., differences in the quantity of fines). To compensate our model, we assumed a screened interval that spanned the depth of the saturated water column; however, the model may underestimate concentrations slightly due to restricted dispersion along the z-axis. Based on the very low concentrations detected at the hypothetical well, this limitation does not alter the findings of the model or the conclusions of our assessment.

- We have derived groundwater flow contours based on the dataset available; however, we acknowledge that this dataset does not include any locations between the flow path and Noname Creek and it does not allow us to assess for seasonal variability in the flow direction. To compensate for this uncertainty, the soakage area was located roughly equidistant between Noname Creek and the edge of the site along Taylorville Road. It is assumed that any discharge water that intersects the catchment of Noname Creek will undergo significant dilution along the 200 m flowpath and the resulting concentrations will have a less than minor effect. Additionally, we have considered a potential variability of 45˚ in the flow direction (225˚ – 270˚) without any potential receptors nearer to the source area (refer Figure 10). As such, this limitation does not alter the findings of the model or the conclusions of our assessment.

- The model does not account for the influence of site features (i.e., the settlement / retention pond, Cell D excavations) on the flow path or contaminant concentrations. None of these features have been constructed to a depth that will intersect with groundwater and the settlement / retention ponds are lined; as such, they should not significantly influence the plume. However, in Cell D, which is presently unlined, surface water may accumulate and infiltrate to ground. This may increase dispersion along the flowpath, but it will likely also dilute concentrations. As such, this limitation does not alter the findings of the model or the conclusions of our assessment.

Based on modelled maximum concentrations to the nearest receptor, the effect of the proposed discharges to off-site groundwater quality is highly likely to be less than minor.

6.2 Effects on Off-Site Groundwater Quality

Based on published geology of the area (refer Appendix 1), the site is located at the westernmost extent of the Pleistocene glacial outwash deposits (E.g., Gravel 1). As shown in Figure 8, the contact between Gravel 1 and the mudstone (Kaiata Formation) is located on the exposed slope, approximately 10 m above the surrounding ground level. Groundwater that daylights will be captured in the drain that runs that around the western property boundary and along Taylorville Road. Any water that does infiltrate to ground will be confined by the alignment of Noname Creek.

As such, there is no hydraulic connection between the site and off-site Holocene aquifer and the effect of the proposed discharges to off-site groundwater quality is highly likely to be less than minor.

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Legend

- Proposed Monitoring Well Locations
- Proposed Soakage Pit
- Inferred Range of Potential Flowpath

0 50 m 100 m

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ENGEO

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Title: Inferred Groundwater Flow Path and Proposed Monitoring Bore Locations		
Client: Taylorville Resource Park Ltd		Size: A4
Project: Taylorville Resource Park	Drawn: JDW	Figure No.: 10
Date: 11-09-2024	Checked: LN	
Proj No: 26200.000.001	Scale: 1:2813	Version: 1.0

6.3 Effects on Groundwater Quantity

The proposed discharges will contribute a maximum of 800 m^3 / day of treated water to the unconfined aquifer. Based on the results of the Hantush model, this will result in a maximum mounding of 0.55 m directly below the discharge area, with a perturbation of the water table elevation extending approximately 250 m from the source; however, the effect is minor (< 0.01 m) beyond approximately 75 m. It is possible that the change in hydraulic head below the discharge area may result in an increase of the groundwater flowrate; however, this effect will likely not persist beyond the mounding area or have an effect that it outside the range of natural variability.

The absolute potential radius for any effect on groundwater quantity is limited due to seepage outflow where the contact between the unconfined Gravel 1 aquifer and underlying Kaiata Formation is exposed. Following the derived groundwater flow gradient shown in Figure 4, the maximum potential flowpath in the unconfined aquifer before daylighting is approximately 420 m.

As such, the effect of the proposed discharges to groundwater quantity is highly likely to be less than minor.

6.4 Effects on Surface Water Quality

To further assess potential effects on surface water, we have calculated the load of contaminants in the proposed discharges and the dilution factor in Noname Creek and the Grey River (i.e., assuming an undiluted discharge into the receiving waterbody). Contaminant loading was calculated based on the maximum concentrations detected in samples collected from the water treatment system (refer Table 2) and the maximum discharge rate (refer Section 5). To be conservative, we used the low flow of 0.02 m^3/s and 80 m^3/s for Noname Creek and the Grey River, respectively.

Diluted concentrations are shown in Table 3.

Based on the loading calculations, a direct discharge to Noname Creek would potentially result in an exceedance of one or more of the assessment criteria. However, the creek is located at least 100 m away from the proposed discharge area and 310 m away along the inferred direction of groundwater flow. Any contaminants in discharges will be diluted significantly in groundwater prior to entering Noname Creek and it is highly unlikely that the diluted concentrations will exceed the range of natural variability or analytical error.

Direct discharge to the Grey River would result in concentrations of contaminants that are orders of magnitude below any of the assessment criteria. We further note that, based on local topography (e.g., ridge on south side of Taylorville Road) and infrastructure (Taylorville Road), discharging in the Grey River above the GRE001 abstraction would be a practical impossibility.

Based on the calculated load of contaminants and resulting concentrations in the receiving waterbodies, the effect of the proposed discharges to surface water quality is highly likely to be less than minor.

Table 3: Indicative Concentrations in the Surface Water

Contaminant of Concern	[Max] (mg/L)	Noname Cr (mg/L)	Grey River (mg/L)	NZDWS	NZWQS 95%	NZWQS 90%	NZWQS 80%
Total aluminium	0.21	**0.066**	2.4×10^{-6}	0.1	0.055	0.08	0.15
Total manganese	2.6	**0.82**	3.0×10^{-5}	0.4	1.9	2.5	3.6

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Contaminant of Concern	[Max] (mg/L)	Noname Cr (mg/L)	Grey River (mg/L)	NZDWS	NZWQS 95%	NZWQS 90%	NZWQS 80%
Total ammoniacal-N	16.1	**5.07**	1.9×10^{-4}	0.82	0.9	1.43	2.3
Nitrate-N	0.34	**0.11**	3.9×10^{-6}	11.3	0.092	0.092	0.092
Total arsenic	0.05	**0.02**	5.8×10^{-7}	0.01	0.013	0.42	1.4
Total chromium	0.0164	**0.0052**	1.9×10^{-7}	0.05	0.0033	0.006	0.04
Total copper	0.178	**0.056**	2.1×10^{-6}	2	0.0014	0.0018	0.0025
Total lead	0.00057	0.0012	6.6×10^{-9}	0.01	0.0034	0.0056	0.0094
Total nickel	0.0037	**0.018**	4.3×10^{-4}	0.08	0.011	0.013	0.017
Total Zinc	0.056	**0.066**	6.4×10^{-7}	1.5	0.008	0.015	0.031

Notes: Values in **bold** exceed one of more of the assessment criteria.

7 Proposed Monitoring Programme

The pumping equipment, pipework, and discharge area will be monitored *at least* three times daily (morning, mid-day, afternoon) to monitor the water level in the retention pond and ensure that there are no leaks in the system or scour / overtopping in the discharge area.

We propose a monitoring programme of groundwater and surface water at the site. As a component of this programme, TRPL is in the process of installing six additional monitoring bores at locations upgradient and around the site to further assess and monitor groundwater quality. On-site bores will be located in the following locations (refer Figure 10):

- Approximately 20 m downgradient of the discharge area;
- Southwest of Cell A;
- Between the discharge area and Noname Creek; and
- Intermediate between the discharge area and boundary wells.

Based on the inferred seepage velocity of the plume (0.5 m/d) changes in water quality will likely be detectable at the bore nearest the discharge area approximately one month after the commencement of discharges. We propose an initial two-week discharge duration followed by the collection and analysis of groundwater samples from the nearest bore at intervals of four weeks, five weeks, and six weeks (following commencement).

After receipt of the results from the post-commencement monitoring, the RISC5 model will be calibrated to identify if the effects of the discharges are likely to differ from those in Section 6 and / or if modifications to the proposed discharges (e.g., flow rate) are needed.

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Based on the current availability of drilling subcontractors, we anticipate that the new monitoring bores will be installed in September / October 2024, prior to the arrival of the plume. Once the new monitoring bores have equilibrated, we will also be undertaking aquifer testing, to establish a site-specific hydraulic conductivity.

The RISC5 model will be updated with new information to assess for likely changes to the assessment of effects. WCRC will be provided with an updated hydrogeological report.

8 Alternatives to the Proposed Discharge to Land

We have assessed potential alternatives to the proposed discharge to land. The site is not connected to the reticulated stormwater / wastewater network. As such, discharge directly to the reticulated network is not possible.

Another alternative would be removing the water via sucker truck and discharging to the Grey District Council (GDC) Wastewater Treatment Plant (WWTP). The water treatment systems capture rainwater that falls on the active waste cells, settlement pond, and retention pond, and area comprising ~16,500 m^2. During a 50 mm / day storm event, this amounts to 825 m^3 of water that in being added to the capacity of the settlement and retention ponds. Based on the volume of a standard sucker truck (3 – 5 m^3), this amounts to 164 – 274 truck movements for each event.

We have identified two companies in Greymouth that own sucker trucks; each company with one truck in its fleet. As such, the local availability of sucker trucks would limit the operations to approximately 15 – 20 truck movements per day, which would not be adequate for anything greater than a 5 mm/day rainfall event. Additionally, the introduction of large volumes of fresh water would have a significantly disruptive effect on operations at the WWTP. According to the GDC Group Manager Operations (Aaron Haymes), the Greymouth WWTP will not accept site discharges. We have yet to receive a response regarding acceptance at the Runanga WWTP. As such, removal via sucker truck is not deemed practicable or sustainable.

Other alternatives include discharging the water directly to a nearby surface water feature. Due to the very low flow in the roadside drain (0.001 – 0.002 m^3/s), this is not considered a suitable receiving environment as the receiving waters will likely be unable to attenuate changes in water quality. As an alternative, we have considered a discharge to Noname Creek.

Based on estimates of diluted concentrations (refer Table 3), direct discharge to Noname Creek would likely result in an exceedance of one of more of the assessment criteria. While it is highly unlikely that this water is being used as a source of potable water, there is potential for an effect to ecological health. As such, discharge to Noname Creek is not deemed a suitable alternative to the proposed discharge to land.

9 Planned Further Works

TRPL is continuously exploring options to improve the water management system at the site. Current planned upgrades include the installation of an aeration fountain in Stage 2 of the settlement pond (anticipated completion in September 2024) and assessing the feasibility of reconfiguring the sequence of the treatment train to allow for flocculation prior to Stage 1 of the settlement pond. As the process is improved and revised, this report will be updated to reflect the current water management practices on-site.

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10 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Taylorville Resource Park Limited, their professional advisers, and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

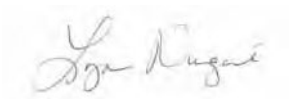
iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the Engineering NZ / ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by



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Environmental Scientist

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Principal Environmental Consultant

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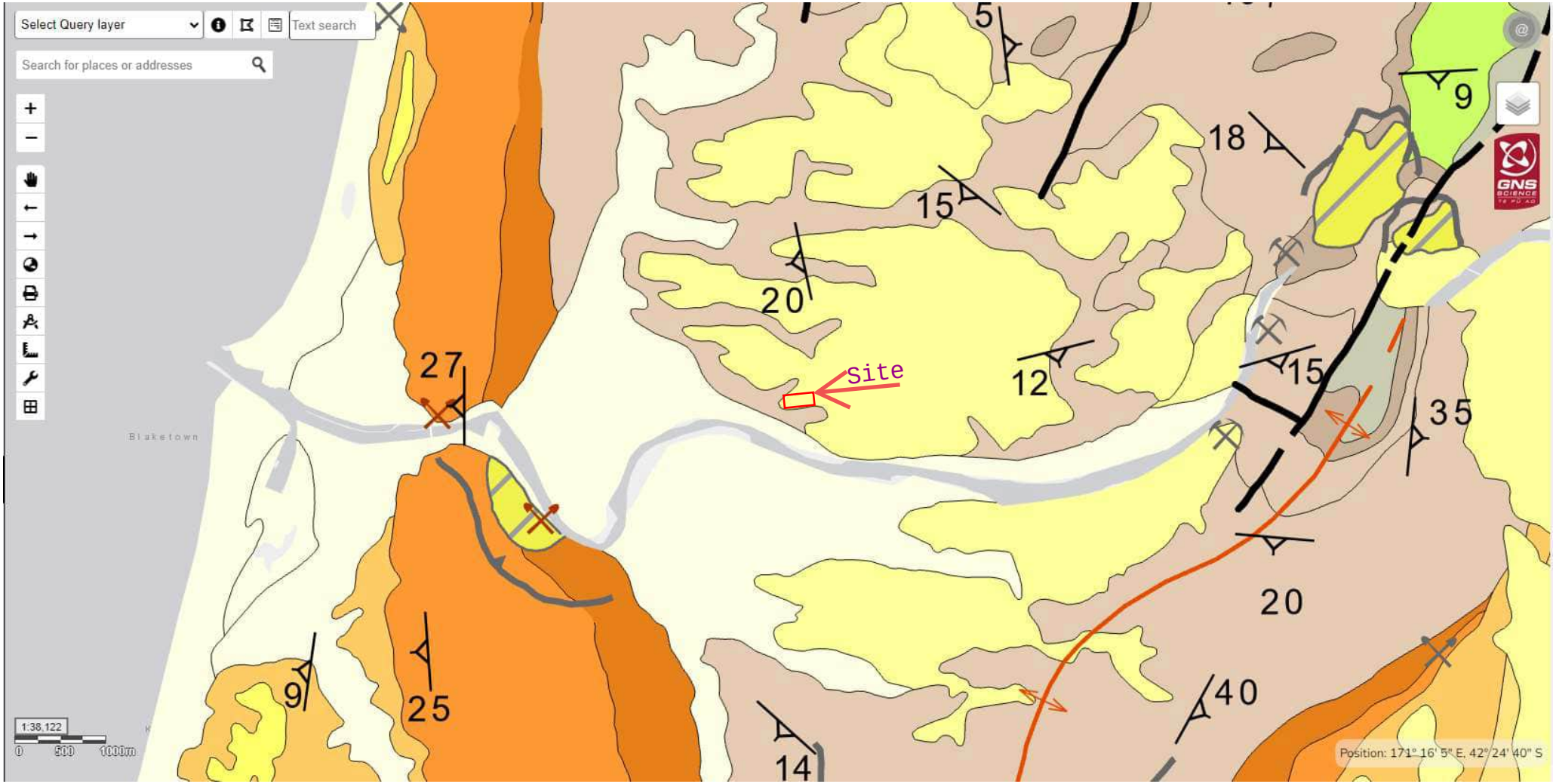
APPENDIX 1:

Supporting Geological Information


Select Query layer
Text search
Search for places or addresses
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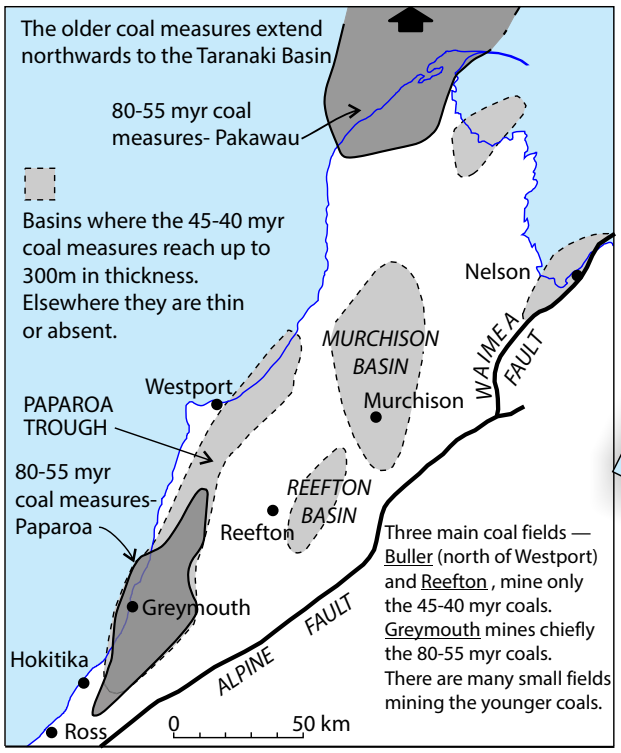
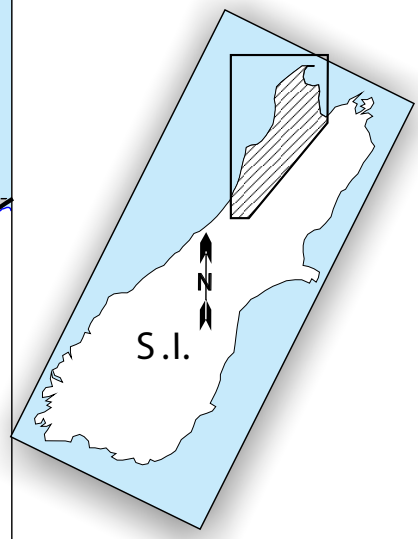
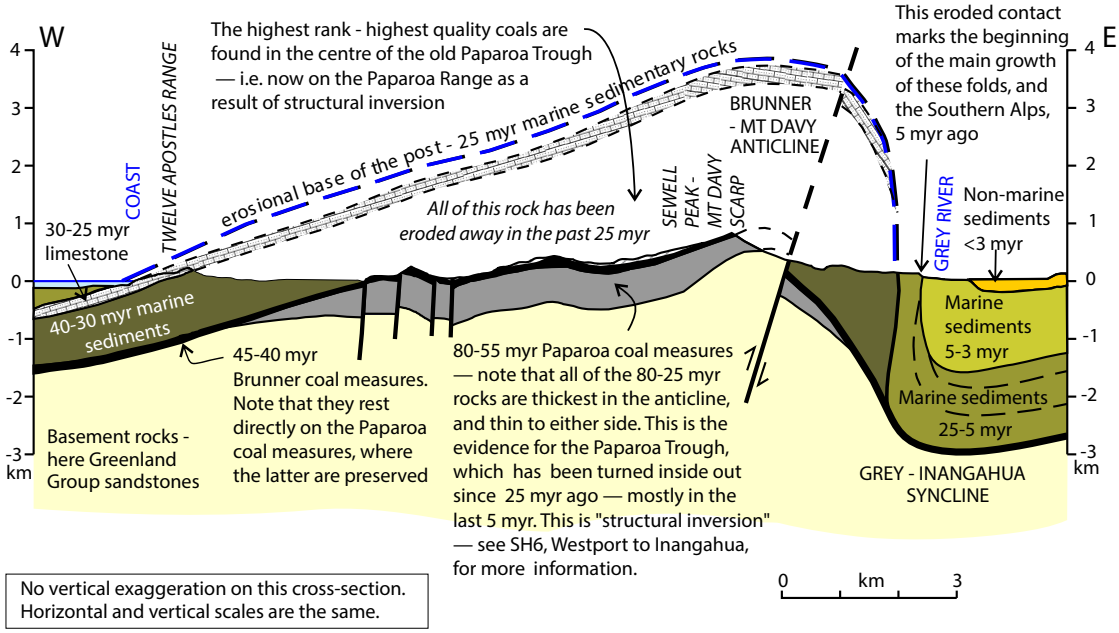
Position: 171° 16' 5" E, 42° 24' 40" S

Box 20.4 A. West Coast coal measures.





Note the 7 km of "structural relief". It may be as high as 9 km, according to calculations of maximum temperature reached by the coal measures (180°C) using coal rank and other evidence.



No vertical exaggeration on this cross-section. Horizontal and vertical scales are the same.

West-to-east cross section located just north of Greymouth, to show the relationship of the two sets of coal measures to each other and to the old Paparoa Trough, and the structural inversion of the trough to form the Brunner - Mt Davy anticline/Paparoa Range.

APPENDIX 2:

TRP On-Site Water Management Layout

Treatment Bypass Line

Cutoff Valve

H2S Odour Filters

V-notch Weir

Discharge from Cell B & C

Discharge from Cell A

Treated Discharge Water

Floc Treatment System x 2

C 3,2,1 Sealed Baffled Containers

NEW Lined Sediment Pond

Submersible Pump

Proposed CELL D

A

C 2

C 1

C&B

Lined Retention Pond

C 3

Lined CELL B

Lined CELL C

Flow Direction

A

Mudstone Based CELL A

Geo Bag

Polishing Area

Pumping Station

Flow Direction

Flow Direction

Flow Direction

A

C&B

Capped CELL A discharge Pipe

Raiser

Sump

Sump

Submersible Pump

Collection from CELL C and CELL B

Collection from CELL A

To Floc Treatment System

NEW Lined Sediment Pond

APPENDIX 3:

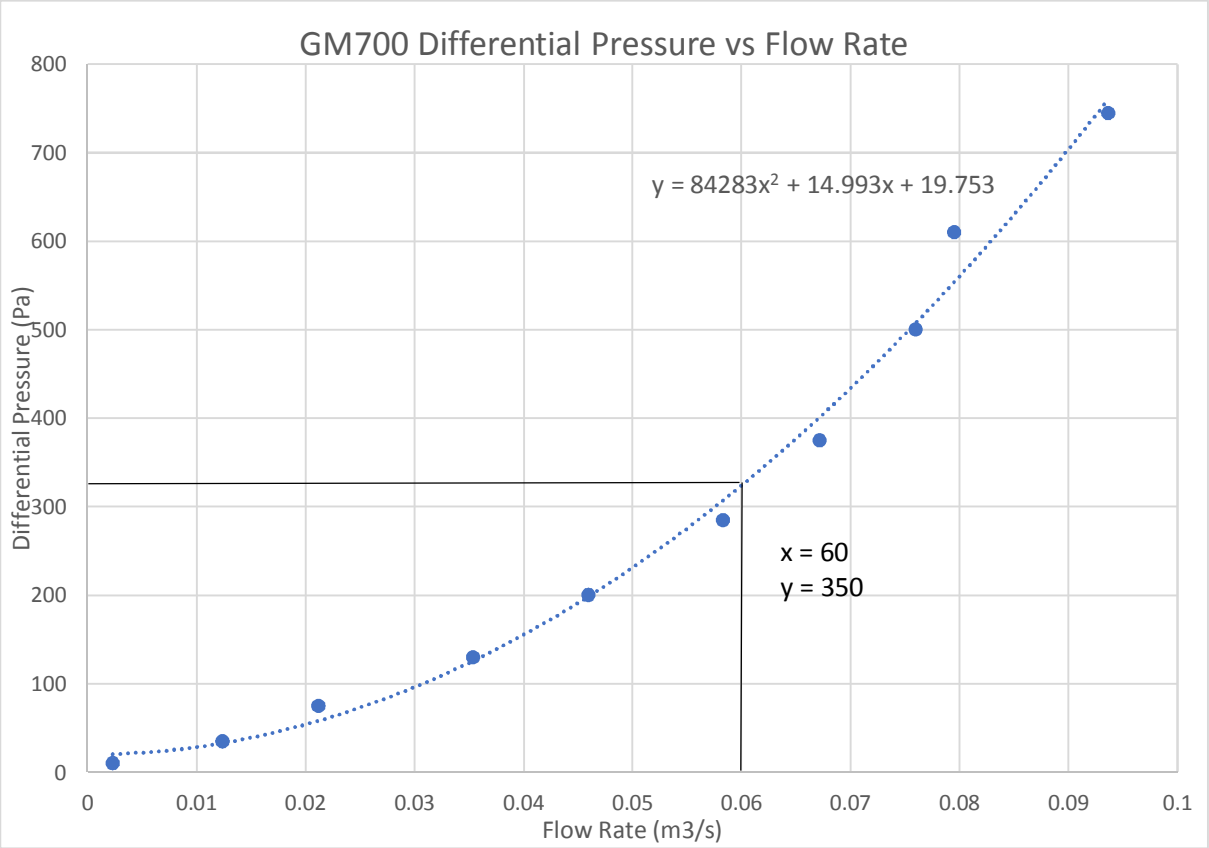
Odour Filter Specifications

11 Tectonic Crescent Kunda Park Qld Australia 4556
Ph: 61 7 5445 1646 I Fax: 61 7 5445 1743
mail@mcberns.com I www.mcberns.com

GM700 - Specifications

Process Overview	The air filtration system is designed to treat wastewater odour emissions entering the unit by the four McBerns Proprietary Combined Media Cartridges, which is emitted to atmosphere.	
Filtration Properties	H_2S Adsorption Capacity	11kg
	Total Media Volume	0.1m³
	Media Mass	
	McBerns Combined Media (Cartridges)	4 x F375MC
	Total Media Mass	56kg
Flow Properties	Max Flow	60 L/s
	Fan Flow Properties	
	Storm 10 (Valve Controlled)	60L/s
	Differential Pressure (refer to figure at back)	324 Pa
Unit Properties	Dimensions	
	Unit Housing	880 x 821 x 609 mm
	Inlet Duct	DN150 UPVC
	Outlet Duct	DN150 UPVC
	Material Properties	
	Fabrication Material	UPVC
	Specific Gravity	1.42g/cm³
	Max Continuous Operating Temperature	50°C
	Max Short Term Operating Temperature	60°C
	Tensile Strength	51MPa
	Brinell Hardness	15kg/mm²
	Mass	
	Unit Housing	32kg
	Overall	88kg

11 Tectonic Crescent Kunda Park Qld Australia 4556
Ph: 61 7 5445 1646 I Fax: 61 7 5445 1743
mail@mcberns.com I www.mcberns.com



Responsibility:	*Cathi Southern*	Identification Number:	*800*
Version:	*1*	Version Date:	*12/02/2020*

APPENDIX 4:

Flocculant Specifications

TURBOFLOC™

PORTABLE WATER TREATMENT SYSTEM

FLOCCULANT INTRODUCTION AND MIXING SYSTEM FOR USE WITH APPLIED POLYMER SYSTEMS FLOC LOGS®

REMOVE SEDIMENT, METALS, AND NUTRIENTS FROM WATER - FAST!

In-pipe water treatment for dewatering applications and clarification of ponds and lakes

Rapid flocculant introduction and mixing system that removes >95% of turbidity in seconds

Metal and phosphorus removal efficiency of >70%

Easy to use, environemtally safe

Untreated Pond

Treated Pond

THE SECRET TO RAPID WATER CLARIFICATION

The Turbo Floc System is optimized for use with Applied Polymer Systems Floc Logs - the industries first and leading anionic polyacrylamide logs.

The Turbo Floc system provides rapid Floc Log dosing and mixing in a portable, easy to use system.

Floc Logs are site specific and tailored to each project, ensuring effective turbdidty reduction.

Floc Log

IY Progen Systems
www.turbofloc.com
info@turbofloc.com
404-353-3546

Applied Polymer Systems, Inc.
www.siltstop.com
info@siltstop.com
678-494-5998

TURBO FLOC RAPID WATER TREATMENT SYSTEM

COMPONENTS

- **Doser -** Easy insert and removal of APS Floc Logs to dose turbid water with powerful and environmentally friendly water clarifying polymers
- **Mixer -** Inline mixer allows for rapid polymer-sediment reaction and floc formation
- **Connectors (OPTIONAL) -** Allow for 90 and 180 degree hose direction changes. Makes hose connections easy and saves space. Connectors also create turbulence and additional mixing for superior floc formation.
- **Floc Logs -** Site specific anionic polyacrylamide logs that dissolve, target, and bind turbidity
- Lay flat hose and pump sold separately

Top: Doser; Bottom: Mixer

SIZE AND CAPACITY

4 inch system - Up to 500 GPM
6 inch system - Up to 1000 GPM
Multiple systems may be used together to increase treatment capacity
DO NOT EXCEED FLOW AND PRESSURE LIMITS

Connectors

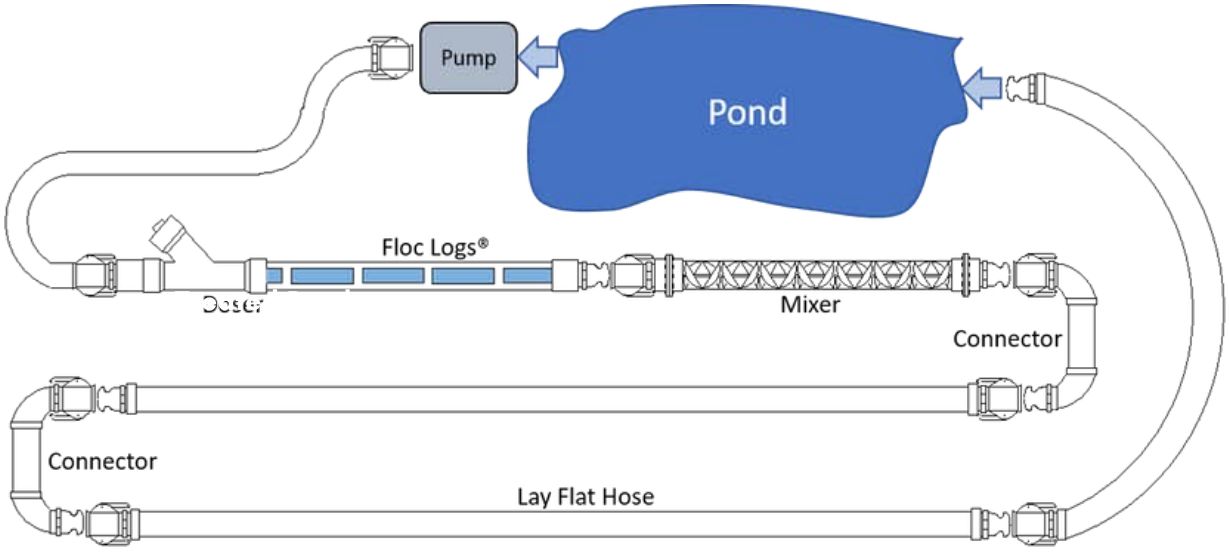
SPECIFICATIONS

Schedule 40 PVC
Aluminum Camlock Couplings
Max Pressure: 220 PSI (4 inch system)
180 PSI (6 inch system)

FLOC CAPTURE

Flocculated sediment should be captured prior to discharge of treated water off site. Floc may be settled in a sediment trap or basin, or using other sediment retention devices (jute matting, dispersion field, rock checks, wattles, SRBs).

Turbo Floc System



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www.turbofloc.com
info@turbofloc.com
404-353-3546

Applied Polymer Systems, Inc.
www.siltstop.com
info@siltstop.com
678-494-5998

APPENDIX 5:

Summary of Laboratory Analytical Results

Table A6.1: TRP Water Treatment System Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	Leachate (Cell A)		Leachate (Cell B/C)							
					20/06/24	31/07/24	06/07/23	18/07/23	27/09/23	04/10/23	20/06/24	31/07/24	08/06/23	18/07/23
Sum of Anions					-	14	-	-	-	-	-	14.2	-	-
Sum of Cations					-	14.2	-	-	-	-	-	14.6	-	-
An/Cat balance (%)					-	-1%	-	-	-	-	-	-1%	-	-
pH		7.7	7.7	7.7	-	7.7	7.5	7.2	7.1	7	-	6.9	***7.8***	***7.8***
Total Alkalinity					-	330	-	-	-	-	-	310	-	-
Bicarbonate					-	400	-	-	-	-	-	380	-	-
Total Hardness	200				-	590	-	-	-	-	-	550	-	-
Electrical conductivity (mS/m)		10.7	10.7	10.7	-	***125.1***	***503***	***523***	***349***	***427***	-	***130.1***	-	***89.5***
Dissolved aluminium	0.1	0.055	0.08	0.15	<0.06	0.005	***0.185***	-	-	***0.22***	***0.1***	0.05	-	-
Total aluminium		0.055	0.08	0.15	<0.063	*0.071*	***0.23***	-	-	***0.24***	***0.76***	***0.082***	***0.52***	-
Dissolved calcium					-	220	-	-	-	-	-	196	-	-
Dissolved iron						0.1						0.51		
Total iron	0.2				-	1.96	-	-	-	-	-	0.68	-	-
Dissolved magnesium					-	11.3	1.72	-	-	1.4	-	15.6	-	-
Total magnesium					-	11.7	1.77	-	-	1.42	-	15.4	-	-
Dissolved manganese	0.4	1.9	2.5	3.6	***3.1***	*1.97*	-	-	-	-	***2.7***	***2.7***	-	-
Total manganese		1.9	2.5	3.6	***3.6***	*2.1*	-	-	-	-	***2.8***	***2.6***	-	-
Dissolved potassium					-	22	-	-	-	-	-	29	-	-
Dissolved sodium	200				-	33	-	-	-	-	-	34	-	-
Chloride	250				30	17.7	79	89	64	79	19.8	19.7	-	18.3
Total Ammoniacal-N	0.82	0.9	1.43	2.3	-	***5.4***	***96***	***98***	***68***	***94***	-	***16.1***	***4.7***	***3***
Nitrite-N	0.912				-	0.069	<0.1	<0.2	0.37	0.06	-	0.025	0.023	0.089
Nitrate-N	11.3	0.092	0.092	0.092	-	0.079	<0.1	<0.2	<0.002	***0.72***	-	***0.34***	***0.37***	***2.2***
Nitrite+Nitrate-N					0.005	0.148	<0.1	<0.2	0.34	0.78	0.94	0.36	0.39	2.3
DRP		0.009	0.009	0.009	-	< 0.004	-	-	-	-	-	***0.024***	-	-
Sulphate	250				-	330	-	-	-	-	-	350	-	-
cBOD5					-	3	-	-	-	-	-	11	-	-
COD					-	74	-	-	-	-	-	114	-	-
Dissolved arsenic	0.01	0.013	0.42	1.4	0.0123	0.0112	***0.89***	***0.96***	***0.53***	*0.37*	*0.024*	*0.041*	*0.026*	*0.0151*
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	<0.00005	< 0.00005	<0.0003	<0.000053	<0.00011	<0.000053	<0.00005	< 0.00005	<0.0005	<0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	***0.008***	*0.006*	***0.21***	***0.22***	***0.12***	***0.144***	***0.0061***	***0.0139***	***0.007***	***0.0075***
Dissolved copper	2	0.0014	0.0018	0.0025	*0.0017*	***0.0054***	***0.003***	*0.00178*	<0.0011	***0.058***	0.001	***0.033***	<0.005	0.0011
Dissolved lead	0.01	0.0034	0.0056	0.0094	<0.00010	< 0.00010	0.0024	0.00123	0.00066	0.00024	<0.00010	0.00012	0.0021	<0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	0.0054	0.0029	***0.016***	***0.0146***	***0.014***	***0.0147***	0.0046	0.0026	<0.005	0.003
Dissolved zinc	1.5	0.008	0.015	0.031	***0.02***	***0.024***	*0.012*	*0.0133*	*0.0139*	0.0066	***0.041***	0.0077	***0.093***	***0.063***
Total arsenic		0.013	0.42	1.4	*0.052*	*0.026*	***0.98***	***0.97***	***0.56***	*0.15*	*0.044*	*0.05*	*0.03*	*0.025*
Total cadmium		0.0002	0.0004	0.0008	0.000178	< 0.000053	<0.000053	<0.00053	<0.000053	<0.00027	<0.000053	< 0.000053	0.000074	0.000127
Total chromium (IV)		0.0033	0.006	0.04	***0.0112***	***0.0082***	***0.22***	***0.22***	***0.115***	***0.149***	***0.008***	***0.0164***	***0.0105***	***0.0087***
Total copper		0.0014	0.0018	0.0025	***0.0127***	***0.009***	***0.0087***	***0.008***	0.00125	***0.193***	***0.023***	***0.178***	***0.0056***	***0.0055***
Total lead		0.0034	0.0056	0.0094	*0.0044*	0.00033	***0.013***	***0.0109***	0.0023	0.0025	0.00038	0.00021	*0.0041*	0.00135
Total nickel		0.011	0.013	0.017	0.0056	0.0031	***0.0145***	***0.0149***	*0.0129*	***0.0145***	0.0049	0.0028	0.0037	0.0035
Total zinc		0.008	0.015	0.031	***0.197***	***0.036***	***0.071***	***0.09***	***0.026***	***0.0158***	***0.042***	***0.0164***	***0.11***	***0.21***

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.1: TRP Water Treatment System Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	Sediment Pond					SWSDP	Settlement Stage 2	DC/C3	Deep Sump
					17/09/23	03/10/23	16/01/24	19/06/24	31/07/24	16/01/24	31/07/24	31/07/24	31/07/24
Sum of Anions					-	-	11.6	-	0.46	12.5	14.3	14.2	14.1
Sum of Cations					-	-	12.4	-	0.44	13	14.6	14.8	14.5
An/Cat balance (%)					-	-	7.2	-	2%	-2%	-1%	-2%	-1%
pH		7.7	7.7	7.7	7.5	7	7.2	7.4	6.3	7.7	***8.1***	***8.2***	***7.8***
Total Alkalinity					-	-	200	-	3.2	210	340	310	320
Bicarbonate					-	-	240	-	4	250	410	380	390
Total Hardness	200				-	-	530	-	13.4	550	600	610	600
Electrical conductivity (mS/m)		10.7	10.7	10.7	***101.9***	***116.1***	***106.8***	***136.5***	***5.4***	***114***	***125.6***	***126.2***	***125.9***
Dissolved aluminium	0.1	0.055	0.08	0.15	-	0.05	-	0.004	< 0.003	-	0.016	0.013	0.008
Total aluminium		0.055	0.08	0.15	-	***0.103***	***0.086***	***0.096***	***0.67***	0.035	***0.21***	0.035	0.041
Dissolved calcium					-	-	197	-	3.7	210	220	230	220
Dissolved iron									*< 0.02*		*0.05*	*0.04*	*0.1*
Total iron	0.2				-	-	3.9	-	0.29	-	1.56	0.41	0.89
Dissolved magnesium					-	0.57	8.7	3.5	1.04	9.2	11.6	11.6	11.4
Total magnesium					-	0.55	-	3.2	1.11	-	11.9	12.3	11.7
Dissolved manganese	0.4	1.9	2.5	3.6	-	-	-	-	0.056		***2.6***	1.71	1.85
Total manganese		1.9	2.5	3.6	-	-	***3.2***	-	0.061	***3***	***2.6***	1.8	*1.95*
Dissolved potassium					-	-	16.5	-	0.52	18.7	23	23	22
Dissolved sodium	200				-	-	27	-	3.7	29	36	34	33
Chloride	250				20	25	18.1	20	3.8	19.6	19.6	18.2	18.1
Total Ammoniacal-N	0.82	0.9	1.43	2.3	*0.98*	***7.6***	***3.8***	***6.4***	0.015	***4.2***	***5.4***	***5.9***	***5.5***
Nitrite-N	0.912				0.34	0.013	0.057	0.011	< 0.002	0.022	0.053	0.082	0.074
Nitrate-N	11.3	0.092	0.092	0.092	***6.5***	***0.33***	0.026	0.009	***0.107***	0.013	***0.1***	0.064	0.075
Nitrite+Nitrate-N					6.8	0.34	0.083	0.02	0.108	0.035	0.154	0.145	0.15
DRP		0.009	0.009	0.009	-	-	<0.004	-	< 0.004	***0.01***	< 0.004	< 0.004	< 0.004
Sulphate	250				-	-	340	-	13.6	320	330	360	340
cBOD5					-	-	4	-	< 2	<2	3	3	3
COD					-	-	56	-	< 6	62	84	80	70
Dissolved arsenic	0.01	0.013	0.42	1.4	*0.021*	*0.057*	-	*0.021*	< 0.0010	-	0.0125	*0.022*	*0.0146*
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	0.00007	0.00006	-	< 0.00005	< 0.00005	-	< 0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	***0.0099***	***0.0179***	-	***0.0071***	< 0.0005	-	***0.0065***	***0.0069***	***0.0063***
Dissolved copper	2	0.0014	0.0018	0.0025	***0.0049***	***0.0183***	-	0.0013	< 0.0005	-	***0.0077***	***0.0078***	***0.0061***
Dissolved lead	0.01	0.0034	0.0056	0.0094	0.00082	0.00061	-	< 0.00010	< 0.00010	-	< 0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	0.0041	0.0037	-	0.005	< 0.0005	-	0.0037	0.0031	0.003
Dissolved zinc	1.5	0.008	0.015	0.031	***0.182***	***0.069***	-	***0.025***	0.0033	-	***0.044***	***0.023***	***0.023***
Total arsenic		0.013	0.42	1.4	*0.026*	*0.068*	*0.043*	*0.037*	< 0.0011	0.000069	*0.021*	*0.026*	*0.024*
Total cadmium		0.0002	0.0004	0.0008	*0.00022*	0.00009	0.000053	0.000102	< 0.000053	***0.0092***	< 0.000053	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	***0.0105***	***0.0184***	***0.0088***	***0.0085***	< 0.00053	***0.0192***	***0.0086***	***0.0084***	***0.0082***
Total copper		0.0014	0.0018	0.0025	***0.0106***	***0.113***	***0.039***	***0.006***	0.00061	0.00058	***0.021***	***0.0108***	***0.009***
Total lead		0.0034	0.0056	0.0094	0.0021	0.00101	0.00057	0.00191	0.0007	*0.0041*	0.00057	0.00025	0.00014
Total nickel		0.011	0.013	0.017	0.0039	0.004	0.0033	0.0049	< 0.00053	***0.156***	0.0037	0.0031	0.0031
Total zinc		0.008	0.015	0.031	***0.34***	***0.099***	***0.115***	***0.066***	0.0064	***1.62***	***0.056***	***0.03***	***0.027***

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.2: TRP Spring and Groundwater Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 Trace [3]	Upgradient groundwater springs												
						SPA	SPC	SPE		TCD1/Discharge								
						25/08/23	28/08/23	28/08/23	31/07/24	31/01/24	19/07/24	27/09/24	03/10/24	16/01/24	14/02/24	22/05/24	19/06/24	31/07/24
Sum of Anions					4.68	-	-	-	0.64	-	-	-	-	2.4	-	-	-	3.1
Sum of Cations					4.68	-	-	-	0.67	-	-	-	-	2.4	-	-	-	3.1
An/Cat balance (%)									-2%					0%				0%
pH		7.7	7.7	7.7			6.2	7	7.1	7.4	7.2	***7.9***	6.7	6.3	6.3	6.8	7.1	6.6
Total Alkalinity					211.2	-	-	-	11.8	-	-	-	-	46	-	-	-	55
Bicarbonate					252	-	-	-	14.4	-	-	-	-	56	-	-	-	67
Total Hardness	200				60	-	-	-	21	-	-	-	-	95	-	-	-	125
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96		***7.9***	***7.1***	***7.7***	***60.1***	***66.1***	***89.6***	***27.7***	***26.6***	***41.4***	***41.5***	***95.3***	***32.8***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	0.01	***0.104***	0.037	0.043	-	-	-	0.008	-	0.011	0.012	0.008	0.012
Total aluminium		0.055	0.08	0.15	23.16	0.042	-	-	***0.39***	***0.82***	-	-	***2.6***	0.026	0.024	0.024	0.022	0.038
Dissolved calcium					15.96	-	-	-	6.7	-	-	-	-	32	-	-	-	43
Dissolved iron					< 0.02				0.02	-	-	-	-	-	-	-	-	< 0.02
Total iron	0.2				18.36	-	-	-	0.38	-	-	-	-	0.131	-	-	-	0.032
Dissolved magnesium					4.92	0.048	0.0174	0.0179	1.08	-	-	-	-	3.4	-	-	-	4.0
Total magnesium					8.4	0.055	-	-	1.1	-	-	-	-	-	-	-	-	4.0
Dissolved manganese	0.4	1.9	2.5	3.6	0.66				0.0039	-	-	-	0.0019	-	1.7	1.84	*2.4*	0.92
Total manganese		1.9	2.5	3.6	0.9	-	-	-	0.147	0.87	-	-	2.3	1.81	1.62	1.72	*2.5*	0.94
Dissolved potassium					1.908	-	-	-	0.68	-	-	-	-	2.3	-	-	-	3.7
Dissolved sodium	200				76.8	-	-	-	5	-	-	-	-	11	-	-	-	11.8
Chloride	250				13.32	-	6.4	6.5	7.4	12.7	14.4	19.6	10.4	10.3	-	11.4	15.8	7.7
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	<0.010	-	-	< 0.010	*1.32*	*1.42*	0.28	0.032	0.152	0.18	0.012	***3.4***	0.011
Nitrite-N	0.912				< 0.002	<0.002	<0.002	<0.002	< 0.002	0.28	0.119	0.199	0.005	0.01	0.011	0.005	0.03	0.008
Nitrate-N	11.3	0.092	0.092	0.092	1.476	***0.24***	***1.06***	***1.4***	***1.38***	0.005	***2.7***	***5.8***	***1.53***	***0.58***	***0.7***	***1.54***	***0.43***	***2.6***
Nitrite+Nitrate-N					1.476	0.24	1.06	1.4	1.39	0.28	2.8	6	1.54	0.59	0.71	1.55	0.46	2.6
DRP		0.009	0.009	0.009	0.1932	-	-	-	< 0.004	-	-	-	-	< 0.004	-	-	-	< 0.004
Sulphate	250				8.28	-	-	-	4.8	-	-	-	-	56	-	-	-	75
cBOD5					< 2	-	-	-	< 2	-	-	-	-	<2	-	-	-	< 2
COD					36	-	-	-	6	-	-	-	-	6	-	-	-	8
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	<0.0010	<0.0010	<0.0010	< 0.0010	-	0.0083	0.007	0.0017	-	0.0025	< 0.0010	*0.0149*	0.001
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	<0.00005	<0.00005	<0.00005	< 0.00005	-	<0.00005	<0.00005	<0.00005	-	0.00006	< 0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	<0.0005	<0.0005	<0.0005	< 0.0005	-	*0.0042*	***0.0067***	0.0005	-	0.0011	0.001	*0.0037*	0.0007
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	<0.0005	<0.0005	<0.0005	< 0.0005	-	0.0008	***0.0025***	0.0011	-	***0.0046***	*0.0018*	***0.002***	*0.0015*
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	<0.00010	<0.00010	<0.00010	< 0.00010	-	<0.00010	0.00018	<0.00010	-	<0.00010	< 0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	<0.0005	<0.0005	<0.0005	< 0.0005	-	0.0025	0.0034	0.0007	-	0.0019	0.002	0.0025	0.0012
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	0.0018	0.0011	<0.0010	< 0.0010	-	***0.044***	***0.073***	0.0051	-	***0.025***	0.0051	*0.0117*	0.005
Total arsenic		0.013	0.42	1.4	0.0252	<0.0011	-	-	< 0.0011	*0.026*	0.0093	0.0084	0.0113	0.0023	0.0025	< 0.0011	*0.0179*	< 0.0011
Total cadmium		0.0002	0.0004	0.0008	0.00072	<0.000053	-	-	< 0.000053	0.000103	0.000062	0.000069	0.000102	<0.000053	0.000053	< 0.000053	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	0.01344	<0.00053	-	-	< 0.00053	***0.0064***	*0.0044*	***0.0068***	0.0033	0.00069	0.00162	0.00127	*0.0042*	0.00092
Total copper		0.0014	0.0018	0.0025	0.0288	0.00054	-	-	< 0.00053	***0.0079***	***0.0021***	***0.0041***	***0.0088***	***0.0024***	***0.0052***	***0.00193***	***0.0022***	*0.00169*
Total lead		0.0034	0.0056	0.0094	0.036	<0.00011	-	-	0.00041	0.0021	0.00028	0.00083	***0.007***	0.00029	<0.00011	< 0.00011	< 0.00011	< 0.00011
Total nickel		0.011	0.013	0.017	0.01632	<0.00053	-	-	< 0.00053	0.0026	0.0026	0.0031	0.0036	0.00141	0.00182	0.00193	0.0027	0.00135
Total zinc		0.008	0.015	0.031	0.0708	0.0023	-	-	0.0033	***0.174***	***0.059***	***0.105***	***0.048***	***0.0198***	***0.024***	0.0053	*0.0123*	0.0053
Dissolved boron	1.4	0.94	1.5	2.5	-	0.005	-	-	-	-	-	-	-	-	0.33	-	-	-
Total boron		0.94	1.5	2.5	-	<0.0053	-	-	-	0.67	-	-	-	-	0.32	-	-	-
										-	-	-	-	-	-	-	-	-
										-	-	-	-	-	-	-	-	-

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Values in red exceed the trace level (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.2: TRP Spring and Groundwater Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 Trace [3]	Cross/downgradient groundwater springs						Upgradient			
						SP1		SP2		SP3		MB1			
						17/01/24	31/07/24	17/01/24	31/07/24	17/01/24	31/07/24	06/07/23	09/10/23	19/06/24	30/07/24
Sum of Anions					4.68	3.4	0.4	2.6	0.37	4.9	2.8	-	-	-	0.73
Sum of Cations					4.68	3.6	0.4	2.7	0.39	5.2	2.7	-	-	-	0.77
An/Cat balance (%)							0%		-3%	-3%	2%				-3%
pH		7.7	7.7	7.7		6.6	6	6.1	4.9	6.7	6.4	6.7	6.3	6.3	6.1
Total Alkalinity					211.2	5.5	4.1	2.7	1.4	8.4	4.3	-	-	-	17.2
Bicarbonate					252	6.7	5	3.4	1.7	10.2	5.2	-	-	-	21
Total Hardness	200				60	151	7	112	5.9	210	109	-	-	-	25
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96	***36.4***	***4.5***	***28.5***	***4.7***	***50***	***30.4***	***8.8***	***8.3***	***8.2***	***8.4***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	-	***0.093***	-	***0.31***	-	0.047	*0.058*	***0.088***	*0.062*	***0.093***
Total aluminium		0.055	0.08	0.15	23.16	***1.33***	***0.196***	***0.2***	***0.49***	***0.7***	***0.155***	***1.02***	-	***0.87***	***0.29***
Dissolved calcium					15.96	53	1.45	35	0.85	63	36	-	-	-	7.6
Dissolved iron					< 0.02		< 0.02		0.03		< 0.02				< 0.02
Total iron	0.2				18.36	0.62	0.053	0.076	0.138	1.31	0.19	-	-	-	0.115
Dissolved magnesium					4.92	4.9	0.81	5.8	0.91	13.3	4.6	0.021	0.0094	0.0078	1.39
Total magnesium					8.4	-	0.82	-	0.85	-	4.6	0.039	-	0.0165	1.39
Dissolved manganese	0.4	1.9	2.5	3.6	0.66		0.0061		0.0118		0.0019				0.0077
Total manganese		1.9	2.5	3.6	0.9	0.052	0.0182	0.067	0.0117	0.067	0.005	-	-	-	0.0104
Dissolved potassium					1.908	0.26	0.13	0.07	0.25	0.27	0.6	-	-	-	0.61
Dissolved sodium	200				76.8	13.1	5.5	11.3	5.1	21	12.2	-	-	-	5.6
Chloride	250				13.32	12	8.4	13.5	7.2	19	11.5	7.2	6.6	-	6.7
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	<0.010	0.011	<0.010	0.013	<0.010	< 0.010	0.035	-	< 0.010	< 0.010
Nitrite-N	0.912				< 0.002	<0.002	< 0.002	<0.002	< 0.002	<0.002	< 0.002	0.74	<0.002	0.004	< 0.002
Nitrate-N	11.3	0.092	0.092	0.092	1.476	***0.32***	***0.66***	0.008	***1.13***	***0.3***	***0.22***	***0.115***	***1.17***	***1.17***	***1.07***
Nitrite+Nitrate-N					1.476	0.32	0.66	0.008	1.13	0.3	0.22	0.85	1.17	1.17	1.07
DRP		0.009	0.009	0.009	0.1932	<0.004	< 0.004	<0.004	< 0.004	<0.004	< 0.004	-	-	-	0.005
Sulphate	250				8.28	139	1.7	102	2.9	200	112	-	-	-	5.6
cBOD5					< 2	<2	< 2	<2	< 2	<2	< 2	-	-	-	< 2
COD					36	17	10	13	< 6	32	14	-	-	-	< 6
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	-	< 0.0010	-	< 0.0010	-	< 0.0010	<0.0010	<0.0010	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	-	< 0.00005	-	< 0.00005	-	< 0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	-	< 0.0005	-	< 0.0005	-	< 0.0005	<0.0005	<0.0005	< 0.0005	< 0.0005
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	-	< 0.0005	-	< 0.0005	-	< 0.0005	***0.027***	*0.0015*	0.0011	< 0.0005
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	-	< 0.00010	-	< 0.00010	-	< 0.00010	0.00077	<0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	-	< 0.0005	-	< 0.0005	-	< 0.0005	0.0033	<0.0005	< 0.0005	< 0.0005
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	-	< 0.0010	-	0.001	-	< 0.0010	***0.133***	***0.0193***	***0.017***	0.0016
Total arsenic		0.013	0.42	1.4	0.0252	<0.0011	< 0.0011	<0.0011	< 0.0011	<0.0011	< 0.0011	0.0018	-	< 0.0011	< 0.0011
Total cadmium		0.0002	0.0004	0.0008	0.00072	<0.000053	< 0.000053	0.000067	< 0.000053	0.000055	< 0.000053	<0.000053	-	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	0.01344	0.00083	< 0.00053	0.00065	< 0.00053	0.00122	< 0.00053	0.00131	-	0.00095	< 0.00053
Total copper		0.0014	0.0018	0.0025	0.0288	0.00109	< 0.00053	<0.00053	< 0.00053	0.00077	< 0.00053	***0.04***	-	***0.0041***	< 0.00053
Total lead		0.0034	0.0056	0.0094	0.036	0.00057	0.00011	<0.00011	0.00012	0.00085	0.00013	***0.0132***	-	0.0021	0.00034
Total nickel		0.011	0.013	0.017	0.01632	0.0058	< 0.00053	0.0023	< 0.00053	0.0039	< 0.00053	0.0053	-	0.0009	< 0.00053
Total zinc		0.008	0.015	0.031	0.0708	*0.0102*	0.0019	0.0028	0.0026	0.0072	0.0014	***0.153***	-	***0.022***	0.003
Dissolved boron	1.4	0.94	1.5	2.5	-	-	-	-	-	-		0.008	-	-	-
Total boron		0.94	1.5	2.5	-	-	-	-	-	-		0.008	-	-	-

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Values in red exceed the trace level (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.2: TRP Spring and Groundwater Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 Trace [3]	Upgradient/crossgradient								Up/crossgradient		
						MB2s				MB2d				MB3		
						04/10/23	09/10/23	19/06/24	30/07/24	09/10/23	16/01/24	19/07/24	30/07/24	09/10/23	19/06/24	30/07/24
Sum of Anions					4.68	-	-	-	0.84	-	3.8	-	3.9	-	-	0.74
Sum of Cations					4.68	-	-	-	0.89	-	4	-	3.9	-	-	0.8
An/Cat balance (%)									-3%		-3%		0%			-4%
pH		7.7	7.7	7.7		6.4	-	6	6.1	7.3	7.4	7	6.8	6.5	6	6
Total Alkalinity					211.2	-	-	-	19.2	-	171	-	176	-	-	16.2
Bicarbonate					252	-	-	-	23	-	210	-	210	-	-	19.8
Total Hardness	200				60	-	-	-	32	-	59	-	50	-	-	28
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96	***12.1***	-	***10.5***	***9.8***	***35***	***36.1***	***36.1***	***35.8***	***9.2***	***8.4***	***8.9***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	0.022	0.032	*0.056*	*0.069*	0.006		0.005	0.004	0.033	*0.064*	*0.062*
Total aluminium		0.055	0.08	0.15	23.16	-	-	***8.5***	***1.22***	-	***0.89***	***12.8***	***19.3***	-	***2.5***	***0.68***
Dissolved calcium					15.96	-	-	-	11.1	-	15.3	-	13.3	-	-	9.4
Dissolved iron					< 0.02				< 0.02				< 0.02			< 0.02
Total iron	0.2				18.36	-	-	-	0.96	-	1.15	-	15.3	-	-	0.5
Dissolved magnesium					4.92	0.72	0.62	0.102	1.1	1.58	5	0.76	4.1	0.9	0.39	1.04
Total magnesium					8.4	-	-	0.21	1.29	-	-	0.94	7	-	0.42	1.16
Dissolved manganese	0.4	1.9	2.5	3.6	0.66				0.075				0.55			0.146
Total manganese		1.9	2.5	3.6	0.9	-	-	-	0.088	-	0.84	-	0.75	-	-	0.151
Dissolved potassium					1.908	-	-	-	0.89	-	2.1	-	1.59	-	-	0.69
Dissolved sodium	200				76.8	-	-	-	4.9	-	64	-	64	-	-	4.9
Chloride	250				13.32	8.9	-	-	7.8	11.2	12.2	-	11.1	6.6	-	7
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	-	-	< 0.010	< 0.010	-	<0.010	0.104	0.25	-	< 0.010	< 0.010
Nitrite-N	0.912				< 0.002	0.009	-	< 0.002	< 0.002	<0.002	<0.002	0.003	< 0.002	0.003	< 0.002	< 0.002
Nitrate-N	11.3	0.092	0.092	0.092	1.476	***1.03***	-	***1.05***	***1.23***	<0.002	0.019	0.036	< 0.002	***1.21***	***1.2***	***1.42***
Nitrite+Nitrate-N					1.476	1.04	-	1.05	1.23	<0.002	0.019	0.039	< 0.002	1.21	1.2	1.42
DRP		0.009	0.009	0.009	0.1932	-	-	-	< 0.004	-	***0.02***	-	***0.161***	-	-	< 0.004
Sulphate	250				8.28	-	-	-	6.9	-	0.6	-	0.6	-	-	5.8
cBOD5					< 2	-	-	-	< 2	-	<2	-	< 2	-	-	< 2
COD					36	-	-	-	< 6	-	<6	-	30	-	-	< 6
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	<0.0010	<0.0010	< 0.0010	< 0.0010	0.0042	-	0.0032	0.0075	<0.0010	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005	<0.00005	-	0.00006	< 0.00005	<0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	<0.0005	<0.0005	< 0.0005	< 0.0005	<0.0005	-	< 0.0005	< 0.0005	<0.0005	< 0.0005	< 0.0005
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	<0.0005	<0.0005	< 0.0005	< 0.0005	<0.0005	-	0.0009	< 0.0005	<0.0005	< 0.0005	< 0.0005
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	<0.00010	<0.00010	< 0.00010	< 0.00010	<0.00010	-	< 0.00010	< 0.00010	<0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	0.0024	0.002	0.0007	< 0.0005	0.0008	-	0.0012	< 0.0005	0.0021	< 0.0005	< 0.0005
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	0.0029	0.0072	0.0028	0.0034	0.0043	-	0.0027	< 0.0010	0.0032	0.0079	0.0033
Total arsenic		0.013	0.42	1.4	0.0252	-	-	0.0038	< 0.0011	-	0.0051	0.0121	*0.021*	-	0.0013	< 0.0011
Total cadmium		0.0002	0.0004	0.0008	0.00072	-	-	< 0.000053	< 0.000053	-	0.000096	***0.00102***	***0.0006***	-	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	0.01344	-	-	*0.0045*	0.00083	-	0.00099	***0.01***	***0.0112***	-	0.0023	< 0.00053
Total copper		0.0014	0.0018	0.0025	0.0288	-	-	***0.0084***	*0.0015*	-	***0,0069***	***0.028***	***0.024***	-	***0.0025***	0.00072
Total lead		0.0034	0.0056	0.0094	0.036	-	-	***0.0108***	0.00169	-	0.003	***0.036***	***0.03***	-	0.0033	0.00082
Total nickel		0.011	0.013	0.017	0.01632	-	-	0.0064	0.00129	-	0.0061	***0.0136***	***0.0136***	-	0.00157	0.00063
Total zinc		0.008	0.015	0.031	0.0708	-	-	***0.027***	0.007	-	***0.029***	***0.081***	***0.059***	-	*0.0141*	0.0053
Dissolved boron	1.4	0.94	1.5	2.5	-	-	-	-	-	-	-	-	-	-	-	-
Total boron		0.94	1.5	2.5	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Values in red exceed the trace level (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.2: TRP Spring and Groundwater Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 Trace [3]	Downgradient							Downgradient		
						MB4s			MB4d				MB5		
						09/10/23	19/07/24	30/07/24	09/10/23	16/01/24	19/06/24	30/07/24	04/10/23	19/07/24	30/07/24
Sum of Anions					4.68	-	-	-	-	3.6	-	1.8	-	-	-
Sum of Cations					4.68	-	-	-	-	3.7	-	1.91	-	-	-
An/Cat balance (%)						-	-	-		-1%		-3%			
pH		7.7	7.7	7.7		-	-	-	-	6.3	6.6	6.5	-	-	-
Total Alkalinity					211.2	-	-	-	-	48	-	43	-	-	-
Bicarbonate					252	-	-	-	-	58	-	53	-	-	-
Total Hardness	200				60	-	-	-	-	153	-	76	-	-	-
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96	-	-	-	-	***38.3***	***23.3***	***19.9***	-	-	-
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	-	-	-	*0.07*		0.006	0.009	-	-	-
Total aluminium		0.055	0.08	0.15	23.16	-	-	-	-	***2.1***	***2.8***	***0.34***	-	-	-
Dissolved calcium					15.96	-	-	-	-	56	-	28	-	-	-
Dissolved iron					< 0.02							< 0.02			
Total iron	0.2				18.36	-	-	-	-	2.2	-	0.31	-	-	-
Dissolved magnesium					4.92	-	-	-	0.146	3.3	0.24	1.64	-	-	-
Total magnesium					8.4	-	-	-	-	-	0.26	1.64	-	-	-
Dissolved manganese	0.4	1.9	2.5	3.6	0.66							0.191			
Total manganese		1.9	2.5	3.6	0.9	-	-	-	-	0.189	-	0.192	-	-	-
Dissolved potassium					1.908	-	-	-	-	0.7	-	0.79	-	-	-
Dissolved sodium	200				76.8	-	-	-	-	14.8	-	8.4	-	-	-
Chloride	250				13.32	-	-	-	19.4	10.6	-	7	-	-	-
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	-	-	-	-	<0.010	0.015	0.039	-	-	-
Nitrite-N	0.912				< 0.002	-	-	-	0.007	0.045	0.014	0.034	-	-	-
Nitrate-N	11.3	0.092	0.092	0.092	1.476	-	-	-	***4.5***	***3.2***	***1.8***	***1.92***	-	-	-
Nitrite+Nitrate-N					1.476	-	-	-	4.5	3.2	1.82	1.95	-	-	-
DRP		0.009	0.009	0.009	0.1932	-	-	-	-	<0.004	-	< 0.004	-	-	-
Sulphate	250				8.28	-	-	-	-	103	-	29	-	-	-
cBOD5					< 2	-	-	-	-	2	-	< 2	-	-	-
COD					36	-	-	-	-	20	-	< 6	-	-	-
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	-	-	-	0.0023	-	< 0.0010	< 0.0010	-	-	-
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	-	-	-	0.00006	-	< 0.00005	< 0.00005	-	-	-
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	-	-	-	0.0006	-	< 0.0005	< 0.0005	-	-	-
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	-	-	-	0.0008	-	< 0.0005	< 0.0005	-	-	-
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	-	-	-	<0.00010	-	< 0.00010	< 0.00010	-	-	-
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	-	-	-	0.0008	-	< 0.0005	< 0.0005	-	-	-
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	-	-	-	0.0032	-	*0.0089*	0.0018	-	-	-
Total arsenic		0.013	0.42	1.4	0.0252	-	-	-	-	0.002	0.0014	< 0.0011	-	-	-
Total cadmium		0.0002	0.0004	0.0008	0.00072	-	-	-	-	<0.000053	< 0.000053	< 0.000053	-	-	-
Total chromium (IV)		0.0033	0.006	0.04	0.01344	-	-	-	-	0.0022	0.0017	< 0.00053	-	-	-
Total copper		0.0014	0.0018	0.0025	0.0288	-	-	-	-	***0.0057***	***0.0028***	0.00081	-	-	-
Total lead		0.0034	0.0056	0.0094	0.036	-	-	-	-	*0.0041*	*0.0035*	0.00065	-	-	-
Total nickel		0.011	0.013	0.017	0.01632	-	-	-	-	0.0047	0.00173	< 0.00053	-	-	-
Total zinc		0.008	0.015	0.031	0.0708	-	-	-	-	***0.038***	***0.0175***	0.0035	-	-	-
Dissolved boron	1.4	0.94	1.5	2.5	-	-	-	-	-	-	-	-	-	-	-
Total boron		0.94	1.5	2.5	-	-	-	-	-	-	-	-	-	-	-

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Values in red exceed the trace level (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A3.2: TRP Spring and Groundwater Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 Trace [3]	Downgradient TSB1			
						04/10/23	16/01/24	19/06/24	30/07/24
Sum of Anions					4.68	-	0.34	-	0.29
Sum of Cations					4.68	-	0.34	-	0.51
An/Cat balance (%)							0%		-28%
pH		7.7	7.7	7.7		5.8	5.8	5.7	5.6
Total Alkalinity					211.2	-	4	-	3.5
Bicarbonate					252	-	4.8	-	4.3
Total Hardness	200				60	-	7.6	-	7.8
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96	***3.3***	***4.1***	***3.1***	***3.5***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	0.044		0.038	***1.77***
Total aluminium		0.055	0.08	0.15	23.16	-	***37***	***48***	***60***
Dissolved calcium					15.96	-	2.3	-	2.5
Dissolved iron					< 0.02				< 0.02
Total iron	0.2				18.36	-	29	-	41
Dissolved magnesium					4.92	0.0119	0.42	0.0126	0.38
Total magnesium					8.4	-	-	0.6	10.3
Dissolved manganese	0.4	1.9	2.5	3.6	0.66				0.033
Total manganese		1.9	2.5	3.6	0.9	-	0.52	-	0.76
Dissolved potassium					1.908	-	0.43	-	0.52
Dissolved sodium	200				76.8	-	4	-	3.3
Chloride	250				13.32	4.9	6	-	4.7
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	-	<0.010	< 0.010	< 0.010
Nitrite-N	0.912				< 0.002	<0.002	<0.002	< 0.002	< 0.002
Nitrate-N	11.3	0.092	0.092	0.092	1.476	***0.31***	***0.44***	***0.167***	***0.3***
Nitrite+Nitrate-N					1.476	0.31	0.44	0.167	0.3
DRP		0.009	0.009	0.009	0.1932	-	<0.004	-	< 0.004
Sulphate	250				8.28	-	3.2	-	3.3
cBOD5					< 2	-	<2	-	< 2
COD					36	-	340	-	43
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	<0.0010	-	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	<0.00005	-	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	<0.0005	-	< 0.0005	< 0.0005
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	<0.0005	-	< 0.0005	***0.0032***
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	<0.00010	-	< 0.00010	0.00054
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	<0.0005	-	< 0.0005	< 0.0005
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	<0.0010	-	< 0.0010	***0.026***
Total arsenic		0.013	0.42	1.4	0.0252	-	*0.014*	*0.0183*	*0.021*
Total cadmium		0.0002	0.0004	0.0008	0.00072	-	0.000077	0.000077	0.00012
Total chromium (IV)		0.0033	0.006	0.04	0.01344	-	***0.021***	***0.022***	***0.029***
Total copper		0.0014	0.0018	0.0025	0.0288	-	***0.04***	***0.053***	***0.062***
Total lead		0.0034	0.0056	0.0094	0.036	-	***0.049***	***0.063***	***0.075***
Total nickel		0.011	0.013	0.017	0.01632	-	***0.03***	***0.034***	***0.04***
Total zinc		0.008	0.015	0.031	0.0708	-	***0.121***	***0.129***	***0.172***
Dissolved boron	1.4	0.94	1.5	2.5	-	-	-	-	-
Total boron		0.94	1.5	2.5	-	-	-	-	-

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Values in red exceed the trace level (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.3: Taylorville Road Drain Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 GW Trace [3]	31/07/24 TRD 4 Trace [4]	SPF Pit/TRD1								
							31/01/23	06/07/23	19/07/23	25/08/23	27/09/23	03/10/23	17/01/24	22/05/24	31/07/24
Sum of Anions					4.68	0.89									2.6
Sum of Cations					4.68	0.91									2.7
An/Cat balance (%)															-2%
pH		7.7	7.7	7.7	-	-	***7.8***	***7.9***	7.1	***7.9***	7.4	7.5	-	7.6	7.7
Total Alkalinity					211.2	19.6									53
Bicarbonate					252	23.8									64
Total Hardness	200				60	31.2									109
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96	9.7	***61.7***	***70.7***	***10.4***	***71.6***	***93.8***	***26.2***	-	***33.4***	***28.3***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	0.032	-	0.005	-	0.018	-	0.019	0.006	0.007	0.027
Total aluminium		0.055	0.08	0.15	23.16	0.2	***0.115***	***0.138***	-	***0.133***	-	***0.27***	***0.22***	***0.189***	***0.28***
Dissolved calcium					15.96	9.8									38
Dissolved iron					< 0.02	< 0.02									0.04
Total iron	0.2				18.36	0.042									1.2
Dissolved magnesium					4.92	1.57									3.3
Total magnesium					8.4	1.49									3.3
Dissolved manganese	0.4	1.9	2.5	3.6	0.66	0.013	-	<0.0005	-	0.125	-	0.0101	0.041	0.022	0.0064
Total manganese		1.9	2.5	3.6	0.9	0.017	0.5	1.2	-	0.24	-	0.149	0.29	0.091	0.04
Dissolved potassium					1.908	0.6									3.2
Dissolved sodium	200				76.8	6.1									10.5
Chloride	250				13.32	9.7	13.3	15.9	7.8	15	19.4	9.8	-	10.3	9.6
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	< 0.010	*1.2*	***1.99***	<0.010	<0.010	*1.12*	<0.010	0.012	< 0.010	< 0.010
Nitrite-N	0.912				< 0.002	< 0.002	0.01	0.006	<0.002	<0.002	0.3	<0.002	-	< 0.002	0.003
Nitrate-N	11.3	0.092	0.092	0.092	1.476	1.02	0.061	***0.7***	***0.37***	***3.2***	***5.2***	***0.7***	-	***0.137***	***1.22***
Nitrite+Nitrate-N					1.476	1.02	0.071	0.71	0.37	3.2	5.5	0.71	0.23	0.137	1.22
DRP		0.009	0.009	0.009	0.1932	< 0.004									< 0.004
Sulphate	250				8.28	7.2									59
cBOD5					< 2	< 2									< 2
COD					36	< 6									26
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	< 0.0010	-	0.0085	<0.0010	0.0031	0.0104	0.0014	0.0015	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	< 0.00005	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	< 0.0005	-	*0.0042*	<0.0005	0.0028	***0.0072***	0.001	0.0019	0.0005	0.0007
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	< 0.0005	-	0.0011	<0.0005	0.0012	***0.0027***	0.001	0.0014	0.0006	0.0008
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	< 0.00010	-	<0.00010	<0.00010	<0.0001	0.0003	<0.00010	<0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	< 0.0005	-	0.0024	0.0036	0.0022	0.0032	0.0012	0.0013	0.0007	0.0007
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	< 0.0010	-	0.0012	0.0027	***0.03***	***0.1***	***0.0177***	0.0041	0.004	0.0012
Total arsenic		0.013	0.42	1.4	0.0252	< 0.0011	*0.0151*	0.0092	-	0.0043	0.012	0.0033	0.0023	0.0013	0.0014
Total cadmium		0.0002	0.0004	0.0008	0.00072	< 0.000053	0.000054	<0.000053	-	<0.000053	0.000088	<0.000053	<0.000053	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	0.01344	< 0.00053	*0.0043*	*0.005*	-	*0.0039*	***0.0073***	0.00144	0.0023	0.00094	0.0013
Total copper		0.0014	0.0018	0.0025	0.0288	< 0.00053	***0.0041***	*0.00145*	-	***0.00191***	***0.0052***	***0.0023***	*0.00168*	0.00106	0.00113
Total lead		0.0034	0.0056	0.0094	0.036	< 0.00011	0.00056	0.00033	-	0.00057	0.00088	0.00106	0.00041	0.00065	0.00046
Total nickel		0.011	0.013	0.017	0.01632	< 0.00053	0.0029	0.0032	-	0.0022	0.003	0.00178	0.00165	0.00095	0.00093
Total zinc		0.008	0.015	0.031	0.0708	< 0.0011	***0.081***	*0.0088*	-	***0.046***	***0.139***	***0.034***	*0.0112*	*0.0088*	0.007

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

[4] Trace concentration (defined as the upgradient [TRD3] concentration ± 20%).

Values in red exceed the trace level (defined as the upgradient [TRD3] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

- Not analysed

< Below the laboratory reporting limit (<RL)

Table A6.3: Taylorville Road Drain Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 GW Trace [3]	31/07/24 TRD 4 Trace [4]	TRD2						TRD3		
							31/01/23	06/07/23	28/08/23	17/01/24	22/05/24	31/07/24	17/01/24	22/05/24	31/07/24
Sum of Anions					4.68	0.89						2.4			0.74
Sum of Cations					4.68	0.91						2.4			0.76
An/Cat balance (%)												0%			-1%
pH		7.7	7.7	7.7	-	-	6.9	6.2	7	-	7.2	6.4	-	7	7
Total Alkalinity					211.2	19.6						7			16.3
Bicarbonate					252	23.8						8.6			19.8
Total Hardness	200				60	31.2						96			26
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96	9.7	***13***	***13.8***	***6.7***	-	***24.2***	***26.2***	-	***10.4***	***8.1***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	0.032	-	*0.069*	***0.13***	0.021	0.027	*0.064*	0.03	0.032	0.027
Total aluminium		0.055	0.08	0.15	23.16	0.2	***0.29***	***0.139***	-	***0.77***	***0.66***	***0.51***	*0.071*	***0.15***	***0.143***
Dissolved calcium					15.96	9.8						32			8.2
Dissolved iron					< 0.02	< 0.02						< 0.02			< 0.02
Total iron	0.2				18.36	0.042						0.105			0.035
Dissolved magnesium					4.92	1.57						4.1			1.31
Total magnesium					8.4	1.49						4.1			1.24
Dissolved manganese	0.4	1.9	2.5	3.6	0.66	0.013	-	0.0067	0.0027	0.0016	0.0113	0.063	0.0018	0.091	0.0107
Total manganese		1.9	2.5	3.6	0.9	0.017	0.084	0.0087	-	0.084	0.047	0.074	0.0065	0.12	0.0143
Dissolved potassium					1.908	0.6						0.44			0.5
Dissolved sodium	200				76.8	6.1						10.7			5.1
Chloride	250				13.32	9.7	6.7	13.8	7	-	8.7	9.7	-	6.6	8.1
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	< 0.010	<0.010	0.045	-	<0.010	< 0.010	< 0.010	<0.010	0.031	< 0.010
Nitrite-N	0.912				< 0.002	< 0.002	<0.002	<0.002	<0.002	-	< 0.002	< 0.002	-	< 0.002	< 0.002
Nitrate-N	11.3	0.092	0.092	0.092	1.476	1.02	0.08	0.092	***0.42***	-	***0.54***	0.015	-	0.079	***0.85***
Nitrite+Nitrate-N					1.476	1.02	0.082	0.092	0.42	0.81	0.54	0.016	0.7	0.08	0.85
DRP		0.009	0.009	0.009	0.1932	< 0.004						< 0.004			< 0.004
Sulphate	250				8.28	7.2						93			6
cBOD5					< 2	< 2						< 2			< 2
COD					36	< 6						12			< 6
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	< 0.0010	-	0.0012	<0.0010	<0.0010	< 0.0010	< 0.0010	<0.0010	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	< 0.00005	-	<0.00005	<0.00005	<0.00005	< 0.00005	0.00005	<0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	< 0.0005	-	<0.0005	<0.0005	<0.0005	< 0.0005	< 0.0005	<0.0005	< 0.0005	< 0.0005
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	< 0.0005	-	<0.0005	<0.0005	<0.0005	< 0.0005	0.001	<0.0005	< 0.0005	< 0.0005
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	< 0.00010	-	<0.00010	0.00011	<0.00010	< 0.00010	0.00014	<0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	< 0.0005	-	<0.0005	<0.0005	0.0029	0.0024	*0.0129*	<0.0005	< 0.0005	< 0.0005
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	< 0.0010	-	0.0016	0.0011	0.0016	0.0017	*0.0143*	<0.0010	< 0.0010	< 0.0010
Total arsenic		0.013	0.42	1.4	0.0252	< 0.0011	<0.0011	0.0012	-	<0.0011	< 0.0011	< 0.0011	<0.0011	< 0.0011	< 0.0011
Total cadmium		0.0002	0.0004	0.0008	0.00072	< 0.000053	<0.000053	<0.000053	-	<0.000053	< 0.000053	0.000063	<0.000053	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	0.01344	< 0.00053	<0.00053	<0.00053	-	0.00088	0.00109	< 0.00053	<0.00053	< 0.00053	< 0.00053
Total copper		0.0014	0.0018	0.0025	0.0288	< 0.00053	0.00089	<0.00053	-	0.00065	0.0009	0.00127	<0.00053	< 0.00053	< 0.00053
Total lead		0.0034	0.0056	0.0094	0.036	< 0.00011	0.00019	<0.00011	-	0.00063	0.00068	0.00055	<0.00011	0.00046	< 0.00011
Total nickel		0.011	0.013	0.017	0.01632	< 0.00053	0.0082	<0.00053	-	0.0045	0.0038	***0.0132***	<0.00053	< 0.00053	< 0.00053
Total zinc		0.008	0.015	0.031	0.0708	< 0.0011	0.0057	<0.0011	-	0.0071	0.0057	***0.0159***	<0.0011	0.0036	< 0.0011

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), T

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protecti

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

[4] Trace concentration (defined as the upgradient [TRD3] concentration ± 20%).

Values in red exceed the trace level (defined as the upgradient [TRD3] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

- Not analysed

< Below the laboratory reporting limit (<RL)

Table A6.3: Taylorville Road Drain Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 GW Trace [3]	31/07/24 TRD 4 Trace [4]	TRD4					TRD5/EPAS2				
							19/07/23	18/08/23	17/01/24	22/05/24	31/07/24	25/08/23	17/01/24	22/05/24	19/06/24	31/07/24
Sum of Anions					4.68	0.89					2.1					2.9
Sum of Cations					4.68	0.91					2					3.1
An/Cat balance (%)											2%					-3%
pH		7.7	7.7	7.7	-	-	6.8	6.9	-	7	7.3	6.9	-	6	6.8	6.9
Total Alkalinity					211.2	19.6					22					11.4
Bicarbonate					252	23.8					27					13.8
Total Hardness	200				60	31.2					82					122
Electrical conductivity (mS/m)		10.7	10.7	10.7	42.96	9.7	***5.7***	***5.8***	-	***6.9***	***23.3***	***13.9***	-	***30.3***	***30.5***	***31.1***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.1116	0.032	-	***0.093***	***0.136***	***0.093***	0.021	*0.067*	0.045	***0.136***	***0.133***	***0.132***
Total aluminium		0.055	0.08	0.15	23.16	0.2	-	-	***0.92***	***0.147***	***2.6***	-	***0.98***	***0.61***	***0.18***	***0.21***
Dissolved calcium					15.96	9.8					28					39
Dissolved iron					< 0.02	< 0.02					0.02					0.08
Total iron	0.2				18.36	0.042					6.5					0.183
Dissolved magnesium					4.92	1.57					2.9					6.3
Total magnesium					8.4	1.49					3.3					6.4
Dissolved manganese	0.4	1.9	2.5	3.6	0.66	0.013	-	0.006	0.0025	0.0069	0.0012	0.028	0.084	0.031	0.023	0.026
Total manganese		1.9	2.5	3.6	0.9	0.017	-	-	0.032	0.009	0.3	-	0.121	0.035	0.024	0.027
Dissolved potassium					1.908	0.6					0.47					1.01
Dissolved sodium	200				76.8	6.1					9.1					13.5
Chloride	250				13.32	9.7	7.6	7.1	-	7.9	9.2	9.7	-	12.4	12.6	12.8
Total Ammoniacal-N	0.82	0.9	1.43	2.3	0.3	< 0.010	<0.010	-	<0.010	< 0.010	< 0.010	-	<0.010	0.039	0.052	< 0.010
Nitrite-N	0.912				< 0.002	< 0.002	<0.002	<0.002	-	< 0.002	< 0.002	<0.002	-	< 0.002	0.003	< 0.002
Nitrate-N	11.3	0.092	0.092	0.092	1.476	1.02	***0.27***	***0.44***	-	***0.29***	***0.56***	***0.188***	-	0.037	***0.176***	***0.21***
Nitrite+Nitrate-N					1.476	1.02	0.27	0.44	0.194	0.29	0.56	0.19	0.116	0.037	0.178	0.21
DRP		0.009	0.009	0.009	0.1932	< 0.004					< 0.004					< 0.004
Sulphate	250				8.28	7.2					66					109
cBOD5					< 2	< 2					< 2					< 2
COD					36	< 6					50					8
Dissolved arsenic	0.01	0.013	0.42	1.4	0.009	< 0.0010	<0.0010	<0.0010	<0.0011	< 0.0010	< 0.0010	<0.0010	<0.0010	< 0.0010	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	< 0.00005	<0.00005	<0.00005	<0.000053	< 0.00005	< 0.00005	<0.00005	<0.00005	< 0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	< 0.0005	<0.0005	<0.0005	0.00077	< 0.0005	< 0.0005	<0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	< 0.0005	<0.0005	<0.0005	<0.00053	< 0.0005	< 0.0005	0.0006	<0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	< 0.00010	0.00018	<0.00010	0.0009	< 0.00010	< 0.00010	<0.00010	<0.00010	< 0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	< 0.0005	<0.0005	<0.0005	0.0009	< 0.0005	0.0036	<0.0005	0.0013	0.0008	0.001	0.001
Dissolved zinc	1.5	0.008	0.015	0.031	0.00408	< 0.0010	0.0017	<0.0010	0.0037	0.0015	< 0.0010	0.0025	0.0017	0.0046	0.0027	0.0031
Total arsenic		0.013	0.42	1.4	0.0252	< 0.0011	-	-	<0.0010	< 0.0011	0.0021	-	<0.0011	< 0.0011	< 0.0011	< 0.0011
Total cadmium		0.0002	0.0004	0.0008	0.00072	< 0.000053	-	-	<0.00005	< 0.000053	0.000064	-	<0.000053	< 0.000053	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	0.01344	< 0.00053	-	-	<0.0005	< 0.00053	0.0023	-	0.00125	< 0.00053	< 0.00053	< 0.00053
Total copper		0.0014	0.0018	0.0025	0.0288	< 0.00053	-	-	<0.0005	< 0.00053	***0.0024***	-	0.0011	< 0.00053	< 0.00053	< 0.00053
Total lead		0.0034	0.0056	0.0094	0.036	< 0.00011	-	-	<0.00010	0.00013	0.0025	-	0.00119	0.00025	< 0.00011	< 0.00011
Total nickel		0.011	0.013	0.017	0.01632	< 0.00053	-	-	<0.0005	< 0.00053	*0.0113*	-	0.0021	0.00101	0.00105	0.00099
Total zinc		0.008	0.015	0.031	0.0708	< 0.0011	-	-	<0.0010	0.0017	***0.031***	-	*0.0097*	0.0061	0.0027	0.0034

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), T

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protecti

[3] Trace concentration (defined as the highest upgradient [MB1, MB2s, MB2d] concentration ± 20%).

[4] Trace concentration (defined as the upgradient [TRD3] concentration ± 20%).

Values in red exceed the trace level (defined as the upgradient [TRD3] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

- Not analysed

< Below the laboratory reporting limit (<RL)

Table A6.4: Noname Creek Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 Trace [3]	SPFUS					SPFMS			
						31/01/23	06/07/23	16/01/24	22/05/24	31/07/24	31/01/23	06/07/23	22/05/24	31/07/24
Sum of Anions					0.90	-	-	0.69	-	0.75	-	-	-	1.51
Sum of Cations					0.94	-	-	0.7	-	0.78	-	-	-	1.62
An/Cat balance (%)								-1%		-2%				-4%
pH		7.7	7.7	7.7	8.3	7.2	7.4	6.7	7.4	6.9	7.4	7.5	7.2	7.4
Total Alkalinity					18	-	-	15.2	-	15	-	-	-	38
Bicarbonate					22.0	-	-	18.5	-	18.3	-	-	-	46
Total Hardness	200				34	-	-	25	-	28	-	-	-	64
Electrical conductivity (mS/m)		10.7	10.7	10.7	10.6	***11***	***11.8***	***7.9***	***16.9***	***8.8***	***11.2***	***12.6***	***26.5***	***17.1***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.055	-	0.006	-	0.008	0.046	-	0.011	0.011	0.019
Total aluminium		0.055	0.08	0.15	0.084	*0.069*	0.039	0.027	0.025	*0.07*	***0.108***	***0.193***	0.0198	*0.062*
Dissolved calcium					11.3	-	-	8.3	-	9.4	-	-	-	23
Dissolved iron					0.048					0.04				0.04
Total iron	0.2				0.11	-	-	0.026	-	0.09	-	-	-	0.3
Dissolved magnesium					1.25	-	-	0.98		1.04	-	-	-	1.81
Total magnesium					1.3	-	-	-		1.1	-	-	-	1.8
Dissolved manganese	0.4	1.9	2.5	3.6	0.0089	-	0.0011		0.0143	0.0074	-	0.0017	0.075	0.0164
Total manganese		1.9	2.5	3.6	0.0094	0.132	0.023	0.0086	0.0185	0.0078	0.142	0.05	0.077	0.051
Dissolved potassium					1.2	-	-	0.89	-	0.96	-	-	-	1.91
Dissolved sodium	200				5.3	-	-	4.2	-	4.4	-	-	-	6.6
Chloride	250				9.0	7.4	6.5	6.4	8.3	7.5	7.3	6.7	9.3	7.9
Total Ammoniacal-N	0.82	0.9	1.43	2.3	< 0.010	0.025	0.019	<0.010	< 0.010	< 0.010	0.024	0.029	< 0.010	< 0.010
Nitrite-N	0.912				0.002	0.003	0.004	<0.002	0.003	0.002	0.003	0.006	0.007	0.005
Nitrate-N	11.3	0.092	0.092	0.092	1.52	***0.32***	***1.44***	***0.95***	***1.13***	***1.27***	***0.31***	***1.39***	***1.19***	***1.03***
Nitrite+Nitrate-N					1.52	0.33	1.44	0.95	1.13	1.27	0.31	1.39	1.2	1.04
DRP		0.009	0.009	0.009	0.018	-	-	0.007	-	***0.015***	-	-	-	< 0.004
Sulphate	250				8.5	-	-	6.4	-	7.1	-	-	-	22
cBOD5					< 2	-	-	<2	-	< 2	-	-	-	< 2
COD					7.2	-	-	<6	-	6	-	-	-	18
Dissolved arsenic	0.01	0.013	0.42	1.4	< 0.0010	-	<0.0010	-	< 0.0010	< 0.0010	-	<0.0010	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	-	<0.00005	-	< 0.00005	< 0.00005	-	<0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	-	<0.0005	-	< 0.0005	< 0.0005	-	<0.0005	0.0006	< 0.0005
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	-	0.0006	-	< 0.0005	< 0.0005	-	0.0007	0.0006	0.0006
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	-	<0.00010	-	< 0.00010	< 0.00010	-	<0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	-	<0.0005	-	< 0.0005	< 0.0005	-	<0.0005	< 0.0005	< 0.0005
Dissolved zinc	1.5	0.008	0.015	0.031	< 0.0010	-	0.0047	-	0.005	< 0.0010	-	0.0067	0.0069	0.0034
Total arsenic		0.013	0.42	1.4	< 0.0011	<0.0011	<0.0011	<0.0011	< 0.0011	< 0.0011	<0.0011	<0.0011	< 0.0011	< 0.0011
Total cadmium		0.0002	0.0004	0.0008	< 0.000053	<0.000053	<0.000053	<0.000053	< 0.000053	< 0.000053	<0.000053	<0.000053	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	< 0.00053	<0.00053	<0.00053	<0.00053	< 0.00053	< 0.00053	<0.00053	0.00058	0.0006	< 0.00053
Total copper		0.0014	0.0018	0.0025	< 0.00053	0.00097	0.00062	<0.00053	0.00076	< 0.00053	0.00117	0.00075	0.00068	0.00071
Total lead		0.0034	0.0056	0.0094	< 0.00011	0.00052	0.00022	<0.00011	0.00015	< 0.00011	0.00073	0.00056	0.00017	0.00042
Total nickel		0.011	0.013	0.017	< 0.00053	<0.00053	<0.00053	<0.00053	< 0.00053	< 0.00053	<0.00053	<0.00053	< 0.00053	< 0.00053
Total zinc		0.008	0.015	0.031	0.002	*0.0094*	*0.012*	0.0017	0.0053	0.0013	*0.0086*	*0.0125*	0.0052	0.0059

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (health based), Table 2.3 (aesthetic)

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, level of protection specified. Where no Toxicant DGV has been derived, values are for physical chemical (PC) stressors (based on MfE REC CX/L)

[3] Trace concentration (defined as the upgradient [SPFUS] concentration ± 20%).

Values in red exceed the trace level (defined as the upgradient [SPFUS] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.4: Noname Creek Sample Results

Analyte	NZDWS [1]	NZWQS (95%) [2]	NZWQS (90%) [2]	NZWQS (80%) [2]	31/07/24 Trace [3]	SPFDS			
						31/01/23	06/07/23	22/05/24	31/07/24
Sum of Anions					0.90	-	-	-	1.51
Sum of Cations					0.94	-	-	-	1.6
An/Cat balance (%)									-3%
pH		7.7	7.7	7.7	8.3	7.6	7.6	***7.8***	7.6
Total Alkalinity					18	-	-	-	39
Bicarbonate					22.0	-	-	-	47
Total Hardness	200				34	-	-	-	62
Electrical conductivity (mS/m)		10.7	10.7	10.7	10.6	***11.3***	***13***	***28.7***	***17.1***
Dissolved aluminium	0.1	0.055	0.08	0.15	0.055	-	0.021	0.012	0.033
Total aluminium		0.055	0.08	0.15	0.084	***0.083***	***0.26***	0.035	*0.079*
Dissolved calcium					11.3	-	-	-	22
Dissolved iron					0.048				0.05
Total iron	0.2				0.11	-	-	-	0.157
Dissolved magnesium					1.25	-	-	-	1.76
Total magnesium					1.3	-	-	-	1.87
Dissolved manganese	0.4	1.9	2.5	3.6	0.0089	-	0.0009	0.0062	0.001
Total manganese		1.9	2.5	3.6	0.0094	0.032	0.039	0.031	0.0136
Dissolved potassium					1.2	-	-	-	1.94
Dissolved sodium	200				5.3	-	-	-	6.8
Chloride	250				9.0	7.3	6.9	10	7.8
Total Ammoniacal-N	0.82	0.9	1.43	2.3	< 0.010	<0.010	0.014	< 0.010	< 0.010
Nitrite-N	0.912				0.002	<0.002	0.005	0.002	0.002
Nitrate-N	11.3	0.092	0.092	0.092	1.52	***0.3***	***1.33***	***1.16***	***0.96***
Nitrite+Nitrate-N					1.52	0.3	1.34	1.16	0.96
DRP		0.009	0.009	0.009	0.018	-	-	-	< 0.004
Sulphate	250				8.5	-	-	-	21
cBOD5					< 2	-	-	-	< 2
COD					7.2	-	-	-	12
Dissolved arsenic	0.01	0.013	0.42	1.4	< 0.0010	-	<0.0010	< 0.0010	< 0.0010
Dissolved cadmium	0.004	0.0002	0.0004	0.0008	< 0.00005	-	<0.00005	< 0.00005	< 0.00005
Dissolved chromium	0.05	0.0033	0.006	0.04	< 0.0005	-	<0.0005	0.0007	< 0.0005
Dissolved copper	2	0.0014	0.0018	0.0025	< 0.0005	-	0.0007	0.0006	0.0007
Dissolved lead	0.01	0.0034	0.0056	0.0094	< 0.00010	-	<0.00010	< 0.00010	< 0.00010
Dissolved nickel	0.08	0.011	0.013	0.017	< 0.0005	-	<0.0005	< 0.0005	< 0.0005
Dissolved zinc	1.5	0.008	0.015	0.031	< 0.0010	-	0.0042	0.0028	0.0016
Total arsenic		0.013	0.42	1.4	< 0.0011	<0.0011	0.0012	< 0.0011	< 0.0011
Total cadmium		0.0002	0.0004	0.0008	< 0.000053	<0.000053	<0.000053	< 0.000053	< 0.000053
Total chromium (IV)		0.0033	0.006	0.04	< 0.00053	<0.00053	0.00076	0.00102	< 0.00053
Total copper		0.0014	0.0018	0.0025	< 0.00053	0.00123	0.00076	0.00071	0.00086
Total lead		0.0034	0.0056	0.0094	< 0.00011	0.00036	0.00074	0.00017	0.00022
Total nickel		0.011	0.013	0.017	< 0.00053	<0.00053	<0.00053	< 0.00053	< 0.00053
Total zinc		0.008	0.015	0.031	0.002	0.0036	*0.0103*	0.0028	0.0029

Notes:

All values provided in units of miligrams per liter (mg/L) unless otherwise specified.

[1] Ministry of Health (2018). Drinking-water Standards for New Zealand 2005 (revised 2018). Table 2.2 (h

[2] Australia and New Zealand Guidelines from Fresh & Marine Water Quality. Default Guideline Values, lesed on MfE REC CX/L)

[3] Trace concentration (defined as the upgradient [SPFUS] concentration ± 20%).

Values in red exceed the trace level (defined as the upgradient [SPFUS] concentration ± 20%).

Bordered values exceed the NZDWS (MAV or GV)

Values in *italics* exceed the NZWQS, 95% level of protection

Values in **bold** exceed the NZWQS, 90% level of protection

Gray highlighted values exceed the NZWQS, 80% level of protection

< Below the laboratory reporting limit (<RL)

Table A6.5: Summary of Exceedances

Analyte	Groundwater			Drain			Noname Creek			WTS (DC/C3)		Pond		TCD1	
	Level 1 COC	Level 2 COC		Level 1 COC	Level 2 COC		Level 1 COC	Level 2 COC		Level 2 COC		Level 2 COC		Level 2 COC	
		NZDWS	NZWQS		NZDWS	NZWQS		NZDWS	NZWQS	NZDWS	NZWQS	NZDWS	NZWQS	NZDWS	NZWQS
pH				X											
Total Alkalinity	X			X			X								
Bicarbonate	X			X			X								
Total Hardness	X			X			X			GV					
Electrical conductivity (mS/m)						80/90/95			80/90/95		80/90/95				80/90/95
Dissolved aluminium		GV	80/90/95		GV										
Total aluminium			80/90/95			80/90/95			95				80/90/95		
Dissolved calcium	X			X			X								
Dissolved iron	X			X			X								
Total Iron		GV		X			X	GV		GV		GV			
Dissolved magnesium				X			X								
Total magnesium				X			X								
Dissolved manganese				X			X			MAV				MAV	
Total Manganese				X			X								
Dissolved potassium				X			X								
Dissolved sodium				X			X								
Chloride				X											
Total Ammoniacal-N										MAV	80/90/95				
Nitrite-N	X														
Nitrate-N			80/90/95			80/90/95							80/90/95		80/90/95
Sulphate	X			X			X			GV					
COD	X			X			X								
Dissolved arsenic										MAV	95				
Dissolved chromium											95				
Dissolved copper			90/95								80/90/95				90/95
Dissolved nickel						95									
Dissolved zinc			95			95					95				
Total arsenic											90/95				
Total chromium			95								95				
Total copper			90/95			90/95					80/90/95				90/95
Total lead			90/95												
Total nickel			90/95			90/95									
Total zinc			90/95			90/95	X				90/95				

APPENDIX 6:

Laboratory Report (July 2024)

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Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	3642348	SPv1
Contact:	Jimmy Whitmore	**Date Received:**	05-Aug-2024	
	C/- Engeo Limited	**Date Reported:**	13-Aug-2024	
	PO Box 373	**Quote No:**	132451	
	Christchurch 8140	**Order No:**		
		Client Reference:	26200.000.001	
		Submitted By:	Jimmy Whitmore	

Sample Type: Aqueous

Sample Name:		TRD1	TRD2 31-Jul-2024 2:40 pm	TRD3 31-Jul-2024	TRD4 31-Jul-2024 3:00 pm	TRD5 / EPA_S2 31-Jul-2024 2:20 pm
Lab Number:		3642348.1	3642348.2	3642348.3	3642348.4	3642348.5
Individual Tests						
Sum of Anions	meq/L	2.6	2.4	0.74	2.1	2.9
Sum of Cations	meq/L	2.7	2.4	0.76	2.0	3.1
pH	pH Units	7.7	6.4	7.0	7.3	6.9
Total Alkalinity	g/m³ as $CaCO_3$	53	7.0	16.3	22	11.4
Bicarbonate	g/m³ at 25°C	64	8.6	19.8	27	13.8
Total Hardness	g/m³ as $CaCO_3$	109	96	26	82	122
Electrical Conductivity (EC)	mS/m	28.3	26.2	8.1	23.3	31.1
Dissolved Aluminium	g/m³	0.027	0.064	0.027	0.021	0.132
Total Aluminium	g/m³	0.28	0.51	0.143	2.6	0.21
Dissolved Calcium	g/m³	38	32	8.2	28	39
Dissolved Iron	g/m³	0.04	< 0.02	< 0.02	0.02	0.08
Total Iron	g/m³	1.20	0.105	0.035	6.5	0.183
Dissolved Magnesium	g/m³	3.3 #1	4.1 #1	1.31 #1	2.9	6.3
Total Magnesium	g/m³	3.3 #1	4.1 #1	1.24 #1	3.3	6.4
Dissolved Manganese	g/m³	0.0064	0.063	0.0107	0.0012	0.026
Total Manganese	g/m³	0.040	0.074	0.0143	0.30	0.027
Dissolved Potassium	g/m³	3.2	0.44	0.50	0.47	1.01
Dissolved Sodium	g/m³	10.5	10.7	5.1	9.1	13.5
Chloride	g/m³	9.6	9.7	8.1	9.2	12.8
Total Ammoniacal-N	g/m³	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nitrite-N	g/m³	0.003	< 0.002	< 0.002	< 0.002	< 0.002
Nitrate-N	g/m³	1.22	0.015	0.85	0.56	0.21
Nitrate-N + Nitrite-N	g/m³	1.22	0.016	0.85	0.56	0.21
Dissolved Reactive Phosphorus	g/m³	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Sulphate	g/m³	59	93	6.0	66	109
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	g O_2/m³	< 2	< 2	< 2	< 2	< 2
Chemical Oxygen Demand (COD)	g O_2/m³	26	12	< 6	50	8
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Dissolved Arsenic	g/m³	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Dissolved Cadmium	g/m³	< 0.00005	0.00005	< 0.00005	< 0.00005	< 0.00005
Dissolved Chromium	g/m³	0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Copper	g/m³	0.0008	0.0010	< 0.0005	< 0.0005	< 0.0005
Dissolved Lead	g/m³	< 0.00010	0.00014	< 0.00010	< 0.00010	< 0.00010
Dissolved Nickel	g/m³	0.0007	0.0129	< 0.0005	0.0036	0.0010
Dissolved Zinc	g/m³	0.0012	0.0143	< 0.0010	< 0.0010	0.0031

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Aqueous						
Sample Name:		TRD1	TRD2 31-Jul-2024 2:40 pm	TRD3 31-Jul-2024	TRD4 31-Jul-2024 3:00 pm	TRD5 / EPA_S2 31-Jul-2024 2:20 pm
Lab Number:		3642348.1	3642348.2	3642348.3	3642348.4	3642348.5
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m^3	0.0014	< 0.0011	< 0.0011	0.0021	< 0.0011
Total Cadmium	g/m^3	< 0.000053	0.000063	< 0.000053	0.000064	< 0.000053
Total Chromium	g/m^3	0.00130	< 0.00053	< 0.00053	0.0023	< 0.00053
Total Copper	g/m^3	0.00113	0.00127	< 0.00053	0.0024	< 0.00053
Total Lead	g/m^3	0.00046	0.00055	< 0.00011	0.0025	< 0.00011
Total Nickel	g/m^3	0.00093	0.0132	< 0.00053	0.0113	0.00099
Total Zinc	g/m^3	0.0070	0.0159	< 0.0011	0.031	0.0034

Sample Name:		EPA_S1 31-Jul-2024 10:40 am	SP1	SP2	SP3	SPE
Lab Number:		3642348.6	3642348.7	3642348.8	3642348.9	3642348.10
Individual Tests						
Sum of Anions	meq/L	0.46	0.40	0.37	2.8	0.64
Sum of Cations	meq/L	0.44	0.40	0.39	2.7	0.67
pH	pH Units	6.3	6.0	4.9	6.4	7.1
Total Alkalinity	g/m^3 as $CaCO_3$	3.2	4.1	1.4	4.3	11.8
Bicarbonate	g/m^3 at 25°C	4.0	5.0	1.7	5.2	14.4
Total Hardness	g/m^3 as $CaCO_3$	13.4	7.0	5.9	109	21
Electrical Conductivity (EC)	mS/m	5.4	4.5	4.7	30.4	7.7
Dissolved Aluminium	g/m^3	< 0.003	0.093	0.31	0.047	0.043
Total Aluminium	g/m^3	0.67	0.196	0.49	0.155	0.39
Dissolved Calcium	g/m^3	3.7	1.45	0.85	36	6.7
Dissolved Iron	g/m^3	< 0.02	< 0.02	0.03	< 0.02	0.02
Total Iron	g/m^3	0.29	0.053	0.138	0.190	0.38
Dissolved Magnesium	g/m^3	1.04	0.81	0.91 #1	4.6	1.08
Total Magnesium	g/m^3	1.11	0.82	0.85 #1	4.6	1.10
Dissolved Manganese	g/m^3	0.056	0.0061	0.0118 #1	0.0019	0.0039
Total Manganese	g/m^3	0.061	0.0182	0.0117 #1	0.0050	0.147
Dissolved Potassium	g/m^3	0.52	0.13	0.25	0.60	0.68
Dissolved Sodium	g/m^3	3.7	5.5	5.1	12.2	5.0
Chloride	g/m^3	3.8	8.4	7.2	11.5	7.4
Total Ammoniacal-N	g/m^3	0.015	0.011	0.013	< 0.010	< 0.010
Nitrite-N	g/m^3	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Nitrate-N	g/m^3	0.107	0.66	1.13	0.22	1.38
Nitrate-N + Nitrite-N	g/m^3	0.108	0.66	1.13	0.22	1.39
Dissolved Reactive Phosphorus	g/m^3	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Sulphate	g/m^3	13.6	1.7	2.9	112	4.8
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	$g\ O_2/m^3$	< 2	< 2	< 2	< 2	< 2
Chemical Oxygen Demand (COD)	$g\ O_2/m^3$	< 6	10	< 6	14	6
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Dissolved Arsenic	g/m^3	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Dissolved Cadmium	g/m^3	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Dissolved Chromium	g/m^3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Copper	g/m^3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Lead	g/m^3	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Dissolved Nickel	g/m^3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Zinc	g/m^3	0.0033	< 0.0010	0.0010	< 0.0010	< 0.0010
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m^3	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011
Total Cadmium	g/m^3	< 0.000053	< 0.000053	< 0.000053	< 0.000053	< 0.000053
Total Chromium	g/m^3	< 0.00053	< 0.00053	< 0.00053	< 0.00053	< 0.00053
Total Copper	g/m^3	0.00061	< 0.00053	< 0.00053	< 0.00053	< 0.00053
Total Lead	g/m^3	0.00070	0.00011	0.00012	0.00013	0.00041

Sample Type: Aqueous						
Sample Name:		EPA_S1 31-Jul-2024 10:40 am	SP1	SP2	SP3	SPE
Lab Number:		3642348.6	3642348.7	3642348.8	3642348.9	3642348.10
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Nickel	g/m³	< 0.00053	< 0.00053	< 0.00053	< 0.00053	< 0.00053
Total Zinc	g/m³	0.0064	0.0019	0.0026	0.0014	0.0033

Sample Name:		SPF_US 31-Jul-2024 2:00 pm	SPF-MS	SPF_DS	TCD1 31-Jul-2024 10:30 am	TSB1 31-Jul-2024 11:00 am
Lab Number:		3642348.11	3642348.12	3642348.13	3642348.14	3642348.15
Individual Tests						
Sum of Anions	meq/L	0.75	1.51	1.51	3.1	0.29
Sum of Cations	meq/L	0.78	1.62	1.60	3.1	0.51
pH	pH Units	6.9	7.4	7.6	6.6	5.6
Total Alkalinity	g/m³ as $CaCO_3$	15.0	38	39	55	3.5
Bicarbonate	g/m³ at 25°C	18.3	46	47	67	4.3
Total Hardness	g/m³ as $CaCO_3$	28	64	62	125	7.8
Electrical Conductivity (EC)	mS/m	8.8	17.1	17.1	32.8	3.5
Dissolved Aluminium	g/m³	0.046	0.019	0.033	0.012	1.77
Total Aluminium	g/m³	0.070	0.062	0.079	0.038	60
Dissolved Calcium	g/m³	9.4	23	22	43	2.5
Dissolved Iron	g/m³	0.04	0.04	0.05	< 0.02	< 0.02
Total Iron	g/m³	0.090	0.30	0.157	0.032	41
Dissolved Magnesium	g/m³	1.04	1.81 #1	1.76	4.0 #1	0.38
Total Magnesium	g/m³	1.10	1.80 #1	1.87	4.0 #1	10.3
Dissolved Manganese	g/m³	0.0074	0.0164	0.0010	0.92	0.033
Total Manganese	g/m³	0.0078	0.051	0.0136	0.94	0.76
Dissolved Potassium	g/m³	0.96	1.91	1.94	3.7	0.52
Dissolved Sodium	g/m³	4.4	6.6	6.8	11.8	3.3
Chloride	g/m³	7.5	7.9	7.8	7.7	4.7
Total Ammoniacal-N	g/m³	< 0.010	< 0.010	< 0.010	0.011	< 0.010
Nitrite-N	g/m³	0.002	0.005	0.002	0.008	< 0.002
Nitrate-N	g/m³	1.27	1.03	0.96	2.6	0.30
Nitrate-N + Nitrite-N	g/m³	1.27	1.04	0.96	2.6	0.30
Dissolved Reactive Phosphorus	g/m³	0.015	< 0.004	< 0.004	< 0.004	< 0.004
Sulphate	g/m³	7.1	22	21	75	3.3
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	g O_2/m³	< 2	< 2	< 2	< 2	< 2
Chemical Oxygen Demand (COD)	g O_2/m³	6	18	12	8	43
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Dissolved Arsenic	g/m³	< 0.0010	< 0.0010	< 0.0010	0.0010 #1	< 0.0010
Dissolved Cadmium	g/m³	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Dissolved Chromium	g/m³	< 0.0005	< 0.0005	< 0.0005	0.0007	< 0.0005
Dissolved Copper	g/m³	< 0.0005	0.0006	0.0007	0.0015	0.0032
Dissolved Lead	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00054
Dissolved Nickel	g/m³	< 0.0005	< 0.0005	< 0.0005	0.0012	< 0.0005
Dissolved Zinc	g/m³	< 0.0010	0.0034	0.0016	0.0050	0.026
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m³	< 0.0011	< 0.0011	< 0.0011	< 0.0011 #1	0.021
Total Cadmium	g/m³	< 0.000053	< 0.000053	< 0.000053	< 0.000053	0.000120
Total Chromium	g/m³	< 0.00053	< 0.00053	< 0.00053	0.00092	0.029
Total Copper	g/m³	< 0.00053	0.00071	0.00086	0.00169	0.062
Total Lead	g/m³	< 0.00011	0.00042	0.00022	< 0.00011	0.075
Total Nickel	g/m³	< 0.00053	< 0.00053	< 0.00053	0.00135	0.040
Total Zinc	g/m³	0.0013	0.0059	0.0029	0.0053	0.172

Sample Type: Aqueous						
Sample Name:		Cell A Leachate	Cell B + C Leachate 30-Jul-2024 4:00 pm	Sed Basin Stage 2 31-Jul-2024 12:30 pm	DC/C3 31-Jul-2024	MB1 30-Jul-2024 1:10 pm
Lab Number:		3642348.16	3642348.17	3642348.18	3642348.19	3642348.20
Individual Tests						
Sum of Anions	meq/L	14.0	14.2	14.3	14.2	0.73
Sum of Cations	meq/L	14.2	14.6	14.6	14.8	0.77
pH	pH Units	7.7	6.9	8.1	8.2	6.1
Total Alkalinity	g/m³ as $CaCO_3$	330	310	340	310	17.2
Bicarbonate	g/m³ at 25°C	400	380	410	380	21
Total Hardness	g/m³ as $CaCO_3$	590	550	600	610	25
Electrical Conductivity (EC)	mS/m	125.1	130.1	125.6	126.2	8.4
Dissolved Aluminium	g/m³	0.005	0.050	0.016	0.013	0.093
Total Aluminium	g/m³	0.071	0.082	0.21	0.035	0.29
Dissolved Calcium	g/m³	220	196	220	230	7.6
Dissolved Iron	g/m³	0.10	0.51	0.05	0.04	< 0.02
Total Iron	g/m³	1.96	0.68	1.56	0.41	0.115
Dissolved Magnesium	g/m³	11.3	15.6 #1	11.6	11.6	1.39 #1
Total Magnesium	g/m³	11.7	15.4 #1	11.9	12.3	1.39 #1
Dissolved Manganese	g/m³	1.97	2.7 #1	2.6	1.71	0.0077
Total Manganese	g/m³	2.1	2.6 #1	2.6	1.80	0.0104
Dissolved Potassium	g/m³	22	29	23	23	0.61
Dissolved Sodium	g/m³	33	34	36	34	5.6
Chloride	g/m³	17.7	19.7	19.6	18.2	6.7
Total Ammoniacal-N	g/m³	5.4	16.1	5.4	5.9	< 0.010
Nitrite-N	g/m³	0.069	0.025	0.053	0.082	< 0.002
Nitrate-N	g/m³	0.079	0.34	0.100	0.064	1.07
Nitrate-N + Nitrite-N	g/m³	0.148	0.36	0.154	0.145	1.07
Dissolved Reactive Phosphorus	g/m³	< 0.004	0.024	< 0.004	< 0.004	0.005
Sulphate	g/m³	330	350	330	360	5.6
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	g O_2/m³	3	11	3	3	< 2
Chemical Oxygen Demand (COD)	g O_2/m³	74	114	84	80	< 6
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Dissolved Arsenic	g/m³	0.0112	0.041	0.0125	0.022	< 0.0010
Dissolved Cadmium	g/m³	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Dissolved Chromium	g/m³	0.0060	0.0139	0.0065	0.0069	< 0.0005
Dissolved Copper	g/m³	0.0054	0.033	0.0077	0.0078	< 0.0005
Dissolved Lead	g/m³	< 0.00010	0.00012	< 0.00010	< 0.00010	< 0.00010
Dissolved Nickel	g/m³	0.0029	0.0026	0.0037	0.0031	< 0.0005
Dissolved Zinc	g/m³	0.024	0.0077	0.044	0.023	0.0016
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m³	0.026	0.050	0.021	0.026	< 0.0011
Total Cadmium	g/m³	< 0.000053	< 0.000053	< 0.000053	< 0.000053	< 0.000053
Total Chromium	g/m³	0.0082	0.0164	0.0086	0.0084	< 0.00053
Total Copper	g/m³	0.0090	0.178	0.021	0.0108	< 0.00053
Total Lead	g/m³	0.00033	0.00021	0.00057	0.00025	0.00034
Total Nickel	g/m³	0.0031	0.0028	0.0037	0.0031	< 0.00053
Total Zinc	g/m³	0.036	0.0164	0.056	0.030	0.0030

Sample Name:		MB2(S) 31-Jul-2024 9:00 am	MB2(D) 31-Jul-2024 9:45 am	MB3 30-Jul-2024 12:20 pm	MB4D 30-Jul-2024 3:10 pm	Deep Sump 31-Jul-2024 11:40 am
Lab Number:		3642348.21	3642348.22	3642348.23	3642348.24	3642348.25
Individual Tests						
Sum of Anions	meq/L	0.84	3.9	0.74	1.80	14.1
Sum of Cations	meq/L	0.89	3.9	0.80	1.91	14.5
pH	pH Units	6.1	6.8	6.0	6.5	7.8
Total Alkalinity	g/m³ as $CaCO_3$	19.2	176	16.2	43	320
Bicarbonate	g/m³ at 25°C	23	210	19.8	53	390

Sample Type: Aqueous						
Sample Name:		MB2(S) 31-Jul-2024 9:00 am	MB2(D) 31-Jul-2024 9:45 am	MB3 30-Jul-2024 12:20 pm	MB4D 30-Jul-2024 3:10 pm	Deep Sump 31-Jul-2024 11:40 am
Lab Number:		3642348.21	3642348.22	3642348.23	3642348.24	3642348.25
Individual Tests						
Total Hardness	g/m³ as $CaCO_3$	32	50	28	76	600
Electrical Conductivity (EC)	mS/m	9.8	35.8	8.9	19.9	125.9
Dissolved Aluminium	g/m³	0.069	0.004	0.062	0.009	0.008
Total Aluminium	g/m³	1.22	19.3	0.68	0.34	0.041
Dissolved Calcium	g/m³	11.1	13.3	9.4	28	220
Dissolved Iron	g/m³	< 0.02	< 0.02	< 0.02	< 0.02	0.10
Total Iron	g/m³	0.96	15.3	0.50	0.31	0.89
Dissolved Magnesium	g/m³	1.10	4.1	1.04	1.64	11.4
Total Magnesium	g/m³	1.29	7.0	1.16	1.64	11.7
Dissolved Manganese	g/m³	0.075	0.55	0.146	0.191	1.85
Total Manganese	g/m³	0.088	0.75	0.151	0.192	1.95
Dissolved Potassium	g/m³	0.89	1.59	0.69	0.79	22
Dissolved Sodium	g/m³	4.9	64	4.9	8.4	33
Chloride	g/m³	7.8	11.1	7.0	7.0	18.1
Total Ammoniacal-N	g/m³	< 0.010	0.25	< 0.010	0.039	5.5
Nitrite-N	g/m³	< 0.002	< 0.002	< 0.002	0.034	0.074
Nitrate-N	g/m³	1.23	< 0.002	1.42	1.92	0.075
Nitrate-N + Nitrite-N	g/m³	1.23	< 0.002	1.42	1.95	0.150
Dissolved Reactive Phosphorus	g/m³	< 0.004	0.161	< 0.004	< 0.004	< 0.004
Sulphate	g/m³	6.9	0.6	5.8	29	340
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	g O_2/m³	< 2	< 2	< 2	< 2	3
Chemical Oxygen Demand (COD)	g O_2/m³	< 6	30	< 6	< 6	70
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Dissolved Arsenic	g/m³	< 0.0010	0.0075	< 0.0010	< 0.0010	0.0146
Dissolved Cadmium	g/m³	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Dissolved Chromium	g/m³	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0063
Dissolved Copper	g/m³	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0061
Dissolved Lead	g/m³	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010
Dissolved Nickel	g/m³	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0030
Dissolved Zinc	g/m³	0.0034	< 0.0010	0.0033	0.0018	0.023
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m³	< 0.0011	0.021	< 0.0011	< 0.0011	0.024
Total Cadmium	g/m³	< 0.000053	0.00060	< 0.000053	< 0.000053	< 0.000053
Total Chromium	g/m³	0.00083	0.0112	< 0.00053	< 0.00053	0.0082
Total Copper	g/m³	0.00150	0.024	0.00072	0.00081	0.0090
Total Lead	g/m³	0.00169	0.030	0.00082	0.00065	0.00014
Total Nickel	g/m³	0.00129	0.0136	0.00063	< 0.00053	0.0031
Total Zinc	g/m³	0.0070	0.059	0.0053	0.0035	0.027

Analyst's Comments

#1 It has been noted that the result for the dissolved fraction was greater than that for the total fraction, but within analytical variation of the methods.

Appendix No.1 - Chain of Custody

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn	0.45µm Filtration, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00005 - 0.0010 g/m³	1-25
Heavy metals, totals, trace As,Cd,Cr,Cu,Ni,Pb,Zn	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B (modified) : Online Edition / US EPA 200.8.	0.000053 - 0.0011 g/m³	1-25

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Filtration, Unpreserved	Sample filtration through 0.45 µm membrane filter. Analysed at Hill Laboratories - Chemistry; Unit 1, 17 Print Place, Middleton, Christchurch.	-	1-25
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1-25
Total anions for anion/cation balance check	Calculation: sum of anions as mEquiv/L calculated from Alkalinity (bicarbonate), Chloride and Sulphate. Nitrate-N, Nitrite-N. Fluoride, Dissolved Reactive Phosphorus and Cyanide also included in calculation if available. APHA 1030 E : Online Edition.	0.07 meq/L	1-25
Total cations for anion/cation balance check	Sum of cations as mEquiv/L calculated from Sodium, Potassium, Calcium and Magnesium. Iron, Manganese, Aluminium, Zinc, Copper, Lithium, Total Ammoniacal-N and pH (H^+) also included in calculation if available. APHA 1030 E : Online Edition.	0.05 meq/L	1-25
pH	pH meter. Analysed at Hill Laboratories - Chemistry; Unit 1, 17 Print Place, Middleton, Christchurch. APHA 4500-H^+ B (modified) : Online Edition. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	1-25
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. Analysed at Hill Laboratories - Chemistry; Unit 1, 17 Print Place, Middleton, Christchurch. APHA 2320 B (modified for Alkalinity <20) : Online Edition.	1.0 g/m³ as $CaCO_3$	1-25
Bicarbonate	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO_2 D : Online Edition.	1.0 g/m³ at 25°C	1-25
Total Hardness	Calculation from Calcium and Magnesium. APHA 2340 B : Online Edition.	1.0 g/m³ as $CaCO_3$	1-25
Electrical Conductivity (EC)	Conductivity meter, 25°C. Analysed at Hill Laboratories - Chemistry; Unit 1, 17 Print Place, Middleton, Christchurch. APHA 2510 B : Online Edition.	0.1 mS/m	1-25
Filtration for dissolved metals analysis	Sample filtration through 0.45µm membrane filter and preservation with nitric acid. APHA 3030 B : Online Edition.	-	1-25
Dissolved Aluminium	Filtered sample, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.003 g/m³	1-25
Total Aluminium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.0032 g/m³	1-25
Dissolved Calcium	Filtered sample, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.05 g/m³	1-25
Dissolved Iron	Filtered sample, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.02 g/m³	1-25
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m³	1-25
Dissolved Magnesium	Filtered sample, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.02 g/m³	1-25
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m³	1-25
Dissolved Manganese	Filtered sample, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0005 g/m³	1-25
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition / US EPA 200.8.	0.00053 g/m³	1-25
Dissolved Potassium	Filtered sample, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.05 g/m³	1-25
Dissolved Sodium	Filtered sample, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.02 g/m³	1-25
Chloride	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m³	1-25
Total Ammoniacal-N	Filtered Sample from Christchurch. Phenol/hypochlorite colourimetry. Flow injection analyser. (NH_4-N = NH_4^+-N + NH_3-N). APHA 4500-NH_3 H (modified) : Online Edition.	0.010 g/m³	1-25
Nitrite-N	Filtered sample from Christchurch. Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO_3^- I (modified) : Online Edition.	0.002 g/m³	1-25
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - Nitrite-N. In-House.	0.0010 g/m³	1-25
Nitrate-N + Nitrite-N	Filtered sample from Christchurch. Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO_3^- I (modified) : Online Edition.	0.002 g/m³	1-25

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Dissolved Reactive Phosphorus	Filtered sample from Christchurch. Molybdenum blue colourimetry. Flow injection analyser. APHA 4500-P G (modified) : Online Edition.	0.004 g/m^3	1-25
Sulphate	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m^3	1-25
Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)	Incubation 5 days, DO meter, nitrification inhibitor added, seeded. Analysed at Hill Laboratories - Chemistry; Unit 1, 17 Print Place, Middleton, Christchurch. APHA 5210 B (modified) : Online Edition.	2 g O_2/m^3	1-25
Chemical Oxygen Demand (COD), trace level	Dichromate/sulphuric acid digestion in Hach tubes, colorimetry. Trace Level method. APHA 5220 D : Online Edition.	6 g O_2/m^3	2-3, 5-14, 20-21, 23-24
Chemical Oxygen Demand (COD), screen level	Dichromate/sulphuric acid digestion, colorimetry. Screen Level method. APHA 5220 D : Online Edition.	25 g O_2/m^3	1, 4, 15-19, 22, 25

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 06-Aug-2024 and 13-Aug-2024. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

3/3

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

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Private Bag 3205
Hamilton 3240, New Zealand

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E mail@hill-labs.co.nz
W www.hill-laboratories.com

Job No: **364 2348**

Date Recv: 05-Aug-24 13:34

Received by: Findabair Joynes

313642348

Quote No	132451
Primary Contact	Jimmy Whitmore
Submitted By	"
Client Name	ENGEO Ltd [160117]
Address	124 Montreal Street
Christchurch	*Postcode* 8023
Phone 03 328 9012	*Mobile* +64 27 200 6898
Email	JDWhitmore@engeo.co.nz
Charge To	ENGEO Ltd
Client Reference	26200.000.001
Order No	

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ Email Primary Contact ☐ Email Submitter ☐ Email Client

☑ Email Other LNugent@engeo.co.nz

☐ Other

Dates of testing are not routinely included in the Certificates of Analysis. Please inform the Laboratory if you would like this information reported.

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories	*Date & Time:* 05/08/2024
	Name: JDWhitmore
☐ *Tick if you require COC to be emailed back*	*Signature:*
Received at Hill Laboratories	*Date & Time:*
	Name:
	Signature:
Condition ☐ Room Temp ☐ Chilled ☐ Frozen	Temp: 6

ADDITIONAL INFORMATION / KNOWN HAZARDS

BH2 (bottle label) = MB2 (COC Label)
BH1 (bottle label) = MB1 (COC Label)

Priority ☐ Low ☑ Normal ☐ High
☐ **Urgent** (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	TRD1	30-31/07/2024	-	SW	As per quote for all samples.
2	TRD2			SW	
3	TRD3			SW	
4	TRD4			SW	
5	TRD5 / EPA_S2			SW	
6	EPA_S1			SW	
7	SP1			SW	
8	SP2			SW	
9	SP3			SW	
10	SPE			SW	
11	SPF_US			SW	
12	SPF-MS			SW	

Continued on next page

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
13	SPF_DS			SW	
14	TCD1			SW	
15	TSB1			GW	
16	Cell A Leachate			GW	
17	Cell B + C Leachate			GW	
18	Sed basin Stage 2			SW	
19	DC/C3			GW	
20	MB1			GW	
21	MB2(S)			GW	
22	MB2(D)			GW	
23	MB3			GW	
24	MB4			GW	
25	Deep Sump			GW	
26					
27					
28					
29					
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32					
33					
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38					
39					
40					

APPENDIX 7:

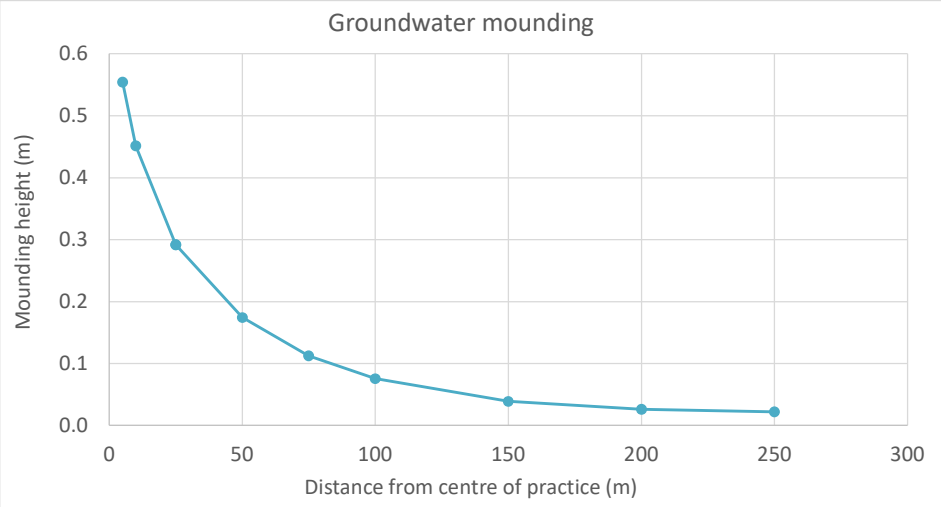
Hantush Modelling Results

This spreadsheet will calculate the height of a groundwater mound beneath an stormwater infiltration BMP.
More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102
"Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

[Go to the USGS report]

	Input Values	
Recharge (infiltration) rate (m/day)	*8.000*	*R*
Specific yield, S_y (dimensionless)	*0.130*	Sy
Horizontal hydraulic conductivity, K_h (m/day)	86.400000	K
1/2 length of basin (x direction, in m)	5.0	x
1/2 width of basin (y direction, in m)	5.0	y
Duration of infiltration period (days)	1	t
Initial thickness of saturated zone (m)	8.0	hi(0)

CALCULATE



Distance from center of infiltration BMP (m)	Ground-water mounding (m)
5	0.55
10	0.45
25	0.29
25	0.29
50	0.17
75	0.11
100	0.08
150	0.04
200	0.03
250	0.02

IF YOU CHANGE THE SCALE OF THE DISTANCE MEASUREMENTS (OR ANY OTHER PARAMETER), YOU MUST RECALCULATE!!

APPENDIX 8:

RISC5 Modelling Results

Summary of Input Values Used in Fate and Transport Model

Model Description:

Source media: Groundwater (dissolved phase concentration)
Saturated zone model (dissolved phase source)

Aquifer Properties		
Effective porosity	cm3/cm3	3.0E-01
Fraction organic carbon	g oc/g soil	1.0E-03
Hydraulic conductivity	m/d	8.4E+01
Soil bulk density	g/cm3	1.6E+00
Hydraulic gradient	m/m	1.8E-03

Groundwater Source Geometry		
***Pulse Source. Length of pulse:	yr	5.0E-01
Total thickness of source	m	1.0E+00
Length of source	m	1.0E+01
Width of source	m	1.0E+01

Receptor Well Location		
Distance downgradient	m	3.1E+02
Distance cross-gradient	m	0.0E+00
Depth to top of well screen	m	0.0E+00
Depth to bottom of well screen	m	5.0E+00
Number of vertical points used to calculate conc.	-	2.0E+00
Longitudinal dispersivity code calculated. See output file.		
Transverse dispersivity code calculated. See output file.		
Vertical dispersivity code calculated. See output file.		

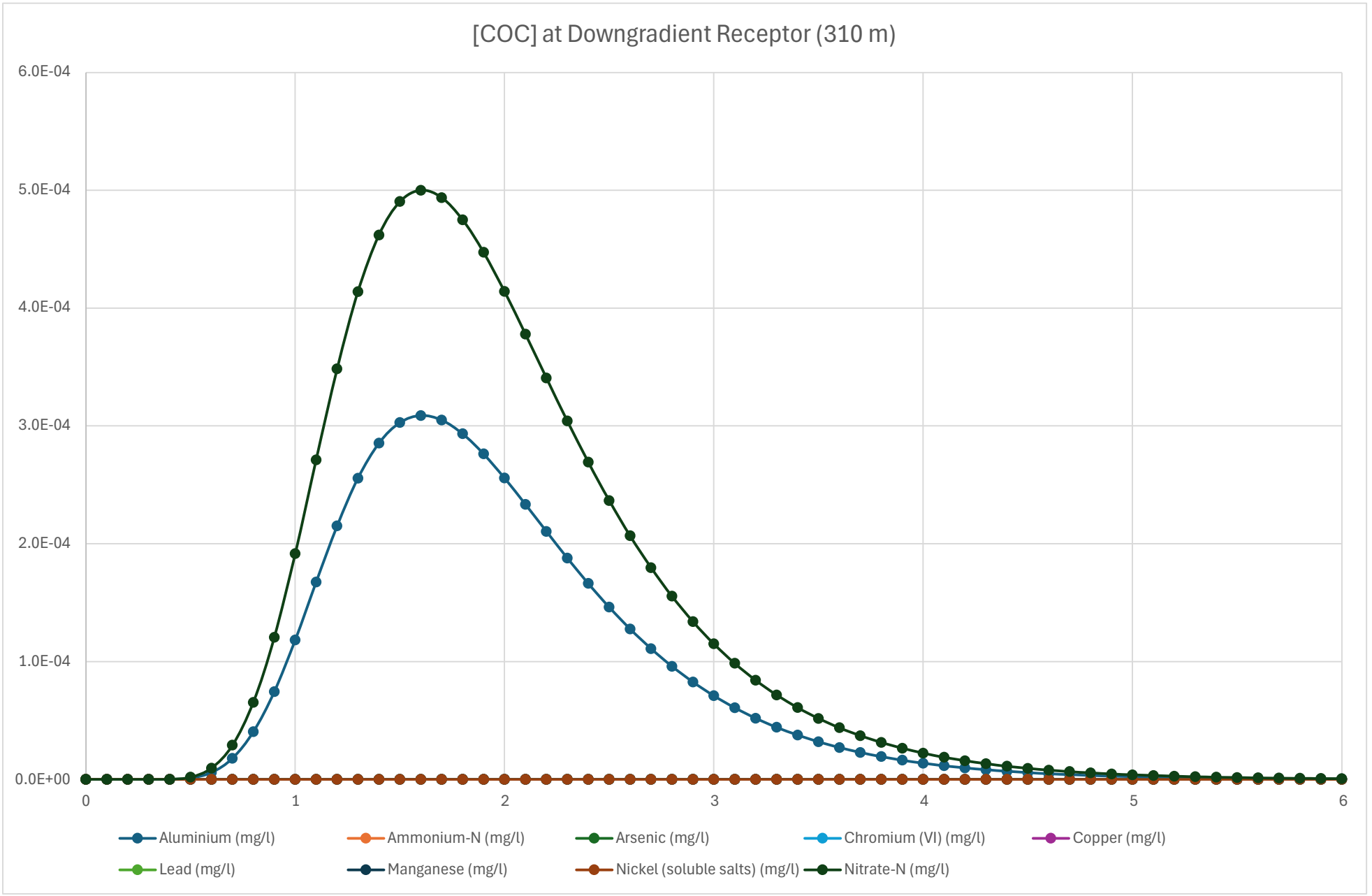
Dissolved Source for Groundwater Model [mg/l]		
Aluminium	mg/l	2.1E-01
Ammonium-N	mg/l	1.6E+01
Arsenic	mg/l	5.0E-02
Chromium (VI)	mg/l	1.6E-02
Copper	mg/l	1.8E-01
Lead	mg/l	5.7E-04
Manganese	mg/l	2.6E+00
Nickel (soluble salts)	mg/l	3.7E-03
Nitrate-N	mg/l	3.4E-01

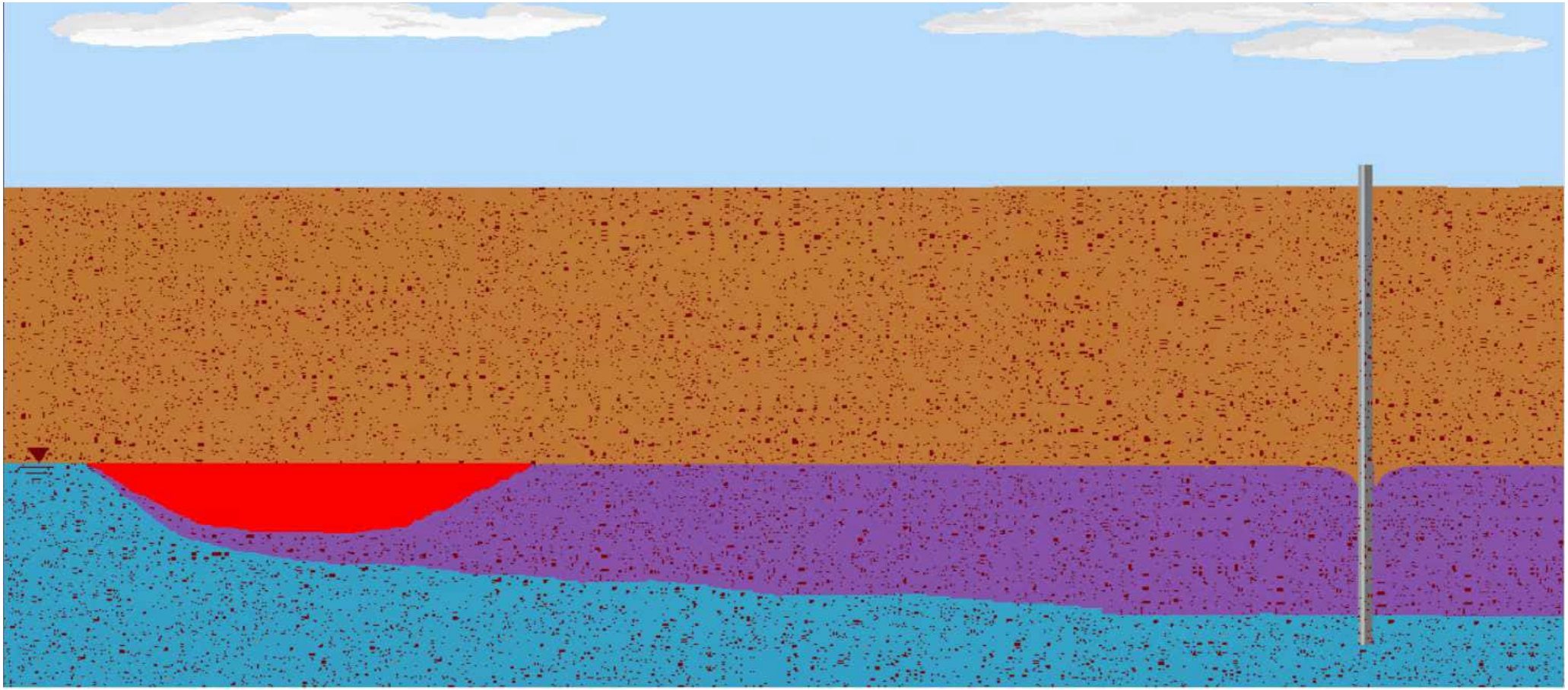
Chemical Properties	Units	Aluminium	Ammonium-N	Arsenic	Chromium (VI)	Copper	Lead	Manganese	Nickel (soluble salts)	Nitrate-N
Diffusion coefficient in air	cm2/s	ND	4.2E-02	ND	ND	ND	ND	ND	ND	ND
Diffusion coefficient in water	cm2/s	ND	7.7E-06	ND	ND	ND	ND	ND	ND	ND
Solubility	mg/l	1.3E+03	4.2E+00	1.8E+04	1.7E+06	0.0E+00	0.0E+00	0.0E+00	ND	1.0E+04
Kd (total soil partition coefficient)	L/kg	ND	ND	2.9E+01	1.9E+01	2.9E+01	4.5E+01	9.9E+00	6.5E+01	ND
KOC (organiChem carbon partition coefficient	L/kg	ND	7.1E+03	ND	ND	ND	ND	ND	ND	ND
Henry's Law coefficient	m3-H2O)/(m3-air	0.0E+00	6.4E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	ND	ND
Molecular weight	g/mol	ND	1.5E+02	7.8E+01	5.2E+01	6.4E+01	8.2E+01	2.5E+01	5.9E+01	6.5E+01
Degradation rate, saturated zone	1/d	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Well -- groundwater concentration (mg/l)

Time (year)	Aluminium (mg/l)	Ammonium-N (mg/l)	Arsenic (mg/l)	Chromium (VI) (mg/l)	Copper (mg/l)	Lead (mg/l)	Manganese (mg/l)	Nickel (soluble salts) (mg/l)	Nitrate-N (mg/l)
[MAX]	**3.1E-04**	**5.7E-09**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**0.0E+00**	**6.8E-13**	**0.0E+00**	**5.0E-04**
0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
0.1	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
0.2	6.0E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.8E-13
0.3	1.9E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-09
0.4	1.1E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-07
0.5	1.2E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-06
0.6	5.9E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E-06
0.7	1.8E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-05
0.8	4.0E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.5E-05
0.9	7.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-04
1	1.2E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-04
1.1	1.7E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-04
1.2	2.2E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.5E-04
1.3	2.6E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-04
1.4	2.9E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-04
1.5	3.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-04
1.6	3.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.0E-04
1.7	3.0E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-04
1.8	2.9E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-04
1.9	2.8E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.5E-04
2	2.6E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-04
2.1	2.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.8E-04
2.2	2.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-04
2.3	1.9E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-04
2.4	1.7E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-04
2.5	1.5E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-04
2.6	1.3E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.1E-04
2.7	1.1E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-04
2.8	9.6E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-04
2.9	8.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-04
3	7.1E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-04
3.1	6.1E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.9E-05
3.2	5.2E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.4E-05
3.3	4.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.2E-05
3.4	3.8E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.1E-05
3.5	3.2E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.2E-05
3.6	2.7E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.4E-05
3.7	2.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.7E-05
3.8	1.9E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-05
3.9	1.6E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-05
4	1.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-05
4.1	1.2E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-05
4.2	9.8E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-05
4.3	8.3E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-05
4.4	7.0E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-05
4.5	5.8E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.5E-06
4.6	4.9E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.0E-06
4.7	4.1E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.7E-06
4.8	3.5E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.6E-06
4.9	2.9E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-06
5	2.4E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-06
5.1	2.0E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-06
5.2	1.7E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-06
5.3	1.4E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-06
5.4	1.2E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-06
5.5	1.0E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-06
5.6	8.5E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-06
5.7	7.1E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-06
5.8	5.9E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E-07
5.9	5.0E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.1E-07
6	4.2E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.8E-07
6.1	3.5E-07	2.2E-14	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-07
6.2	2.9E-07	6.0E-14	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-07
6.3	2.5E-07	1.2E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-07
6.4	2.1E-07	2.1E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-07
6.5	1.7E-07	3.3E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-07
6.6	1.4E-07	4.9E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-07
6.7	1.2E-07	7.2E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-07
6.8	1.0E-07	1.1E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-07
6.9	8.5E-08	1.6E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-07
7	7.1E-08	2.3E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-07
7.1	5.9E-08	3.3E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E-08
7.2	5.0E-08	4.8E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.0E-08
7.3	4.2E-08	6.8E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.7E-08
7.4	3.5E-08	9.6E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.6E-08
7.5	2.9E-08	1.3E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-08
7.6	2.4E-08	1.8E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-08
7.7	2.0E-08	2.5E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-08
7.8	1.7E-08	3.4E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-08
7.9	1.4E-08	4.6E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-08
8	1.2E-08	6.2E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-08
8.1	1.0E-08	8.2E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-08
8.2	8.4E-09	1.1E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-08

8.3	7.1E-09	1.4E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-08
8.4	5.9E-09	1.8E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-15	0.0E+00	9.6E-09
8.5	5.0E-09	2.4E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.8E-15	0.0E+00	8.0E-09
8.6	4.2E-09	3.0E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.4E-15	0.0E+00	6.7E-09
8.7	3.5E-09	3.9E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-14	0.0E+00	5.6E-09
8.8	2.9E-09	4.9E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-14	0.0E+00	4.7E-09
8.9	2.4E-09	6.2E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.4E-14	0.0E+00	4.0E-09
9	2.0E-09	7.8E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.4E-14	0.0E+00	3.3E-09
9.1	1.7E-09	9.7E-10	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.8E-14	0.0E+00	2.8E-09
9.2	1.4E-09	1.2E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.7E-14	0.0E+00	2.3E-09
9.3	1.2E-09	1.5E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.0E-13	0.0E+00	2.0E-09
9.4	1.0E-09	1.8E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-13	0.0E+00	1.6E-09
9.5	8.5E-10	2.2E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-13	0.0E+00	1.4E-09
9.6	7.1E-10	2.7E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-13	0.0E+00	1.1E-09
9.7	5.9E-10	3.3E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-13	0.0E+00	9.6E-10
9.8	5.0E-10	4.0E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-13	0.0E+00	8.1E-10
9.9	4.2E-10	4.8E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.3E-13	0.0E+00	6.8E-10
10	3.5E-10	5.7E-09	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.8E-13	0.0E+00	5.7E-10


[COC] at Downgradient Receptor (310 m)
6.0E-04
5.0E-04
4.0E-04
3.0E-04
2.0E-04
1.0E-04
0.0E+00
0
1
2
3
4
5
6
Aluminium (mg/l)
Ammonium-N (mg/l)
Arsenic (mg/l)
Chromium (VI) (mg/l)
Copper (mg/l)
Lead (mg/l)
Manganese (mg/l)
Nickel (soluble salts) (mg/l)
Nitrate-N (mg/l)



Appendix 4

Rules Assessment

B&A

Urban & Environmental

Rules Assessment

Proposal:	Temporary discharge from retention pond to land, via a soakage area
Address:	Taylorville Resource Park, Taylorville Road, Coal Creek 7802
Regional Plan:	Regional Land and Water Plan (27 May 2014)
Proneness to Erosion:	The application site is located within the 'Non Erosion Prone Area', which is defined as 'land not in the Greymouth Earthworks Control Area with a dominant slope angle less than 12 Degrees (or a 1:4.7 ratio)'. The application site is not located within the Greymouth Earthworks Control Area, contained at Schedule 4.

Regional Rules	Compliance or Non-Compliance
18.1 ACTIVITIES ON LAND	
18.1.1 Permitted Activities on Land	
Rule 2 Earthworks in riparian margins	
Earthworks within riparian margins, and any associated discharge of sediment are a permitted activity if all of the following conditions are met	N/A – There will be no earthworks within a riparian margin.
Rule 3 Earthworks in the Non Erosion Prone Area, outside riparian margins	
Earthworks in the Non Erosion Prone Area (less than 120 slope or a 1:4.7 ratio), and outside any riparian margin, and any associated discharge of sediment is a **permitted activity** if all of the following conditions are met:	Complies - The proposed earthworks associated with the construction of the soakage area will be within a non-erosion prone area and outside of any riparian margin.
(a) Earthworks either: i) Are for the formation, construction, or reconstruction of roads, tracks, railway lines, landings, firebreaks, and network utility lines, pipes, or cables; or ii) Do not exceed an annual volume of 5,000m^3 per landholding or hectare, whichever is the smaller; and	Complies - The proposed volume of earthworks for the construction of the soakage area will be 200m^3 (10m x 10m x 2m deep).
(b) Sufficient sediment control is constructed so that the activity does not either: i) Decrease the visual clarity of any receiving water by more than 40% as measured by black disc; or ii) Alter the natural turbidity in the receiving water by more than 1 Nephelometric Turbidity Unit (NTU) where the natural turbidity upstream from the discharge is less than or equal to 10 NTU; or iii) Alter the natural turbidity in the receiving water by more than 10 NTU where the natural turbidity upstream from the discharge is greater than 10 NTU; as measured beyond 12 times the river's width or 200m of the activity, whichever is the lesser; and	Complies - The proposed earthworks associated with the construction of the soakage area will be within a non-erosion prone area and outside of any riparian margin.

Regional Rules	Compliance or Non-Compliance
(c) No soil or debris is placed directly in any river or lake bed; and	Complies -The proposed earthworks will comply as the area is not located near any surface waterbodies.
(d) There is no conspicuous deposition of sediment on the bed of any water body, or on land beyond the boundary of the subject property; and	Complies -The proposed earthworks will comply as the area is not located near any surface waterbodies.
(e) The activity does not affect any surface water take; and	Complies -The proposed earthworks will comply as the area is not located near any surface waterbodies or take.
(f) The activity is not within: i) 50m of the Coastal Marine Area on the open coast line; or ii) 20m of the Coastal Marine Area elsewhere; or iii) Any wetland identified in Schedule 1; or iv) Any wetland identified in Schedule 2 unless it meets the requirements of Rule 7; and	Complies -The proposed area for the soakage pit will not be located within any of these areas.
(g) Where earthworks are for the formation, construction, or reconstruction of any road, track, firebreak, landing, line, pipe, or cable: i) Formed surfaces with an inward cross fall must have a constructed form of drainage control such as a water table, kerb and channel, swale, channel/ditch, or sumps and pipes to avoid causing erosion; and ii) Any culverts, or cut and fill batters are designed and constructed or installed so as to prevent their failure and avoid causing erosion; and iii) Trenches for the purpose of installing lines, pipes, or cables are backfilled and compacted as soon as practicable; and	N/A
(h) The activity does not cause or contribute toward any slope or land surface instability, including subsidence or other erosion; and	Complies -The proposed earthworks will not cause or contribute to this as the proposed area is reasonable flat.
(i) All areas of bare ground created by the activity and any stockpiles of material are protected from soil erosion as soon as practicable; and	Complies -This will be undertaken.
(j)[1] Where earthworks are for the purpose of forming a drain[2]…	N/A

[1] For condition (j) the quality of any discharged drainage water must comply with the conditions of the permitted activity Rule 64 in Chapter 18.4 Discharges to Water.

[2] Refers to an artificial channel or subsurface conduit (e.g. mole drain, tile drain or drainage tunnel, or roadside swale) constructed for the purpose of:

- Collecting and diverting surface runoff, but also includes water collected from sealed surfaces with no associated reticulated stormwater system such as roadside swales and concrete dish swales, or
- Intercepting groundwater in order to lower the water table or divert water (excluding a water race), and directing it to a receiving water body.

Regional Rules	Compliance or Non-Compliance
(k) Where the earthworks are for the purpose of constructing a water supply bore…	N/A
18.4 DISCHARGES TO WATER[3]	
18.4.1 Permitted Discharges to Water	
Rule 63 Discharge of stormwater[4] from reticulated systems[5]	
The discharge of stormwater from any reticulated stormwater system to water is a permitted activity if all of the following conditions are met…	N/A – the liquid within the retention pond cannot be classified as stormwater.
Rule 64 - Discharge from any drain	
The discharge from any drain to a water body, or another drain beyond the property boundary, is a permitted activity if all of the following conditions are met…	N/A – the discharge from the retention pond will be via a new onsite soakage area.
Rule 67 - Discharge of water to water excluding activities permitted by Rules 63, 64, 65, or 66	
Excluding the activities permitted by Rules 63, 64, 65, or 66 any discharge of water to water is a **permitted activity** if all of the following conditions are met.	N/A - Defaults to discretionary activity under Rule 71. Note: Proposal relates to the discharge of water from the retention pond to ground, which daylights via Noname Creek and a roadside drain, and may ultimately discharge to the Grey River.
(a) The discharge contains no contaminants beyond trace concentrations[6], or hazardous substances[7]; and	Consent required - Engeo have advised that the proposed discharges will contain contaminants exceeding this standard.
(b) Beyond a mixing zone of 12 times the width of the receiving water body, or 200m, whichever is the lesser, the discharge does not:	N/A – The discharge will be to land via a soakage pit.

The channel must not incorporate the bed of an existing river or creek, or the water from the bed of an existing river or creek. The hollows of humped and hollowed land are considered drains.

[3] Means water in all its physical forms whether flowing or not and whether over or under the ground. Includes fresh water, coastal water and geothermal water; but does not include water in any form while in any pipe, tank or cistern.

[4] No definition of stormwater within the RLWP.

[5] A reticulated stormwater system is any system that collects water from impervious surfaces such as roofs, buildings and other structures. A drain is a collection and delivery system that collects water from generally unsealed surfaces (e.g. on farm or rural roadside drains) but also includes water collected from sealed surfaces with no associated reticulated stormwater system such as roadside swales and concrete dish swales. The hollows of humped and hollowed land are considered drains.

[6] In terms of Rule 64 means the presence of a contaminant in concentrations that will not alter the background concentration in receiving waters by more than 20% or exceed the ANZECC aquatic ecostystem guidelines. Note: The Australian and New Zealand Guidelines for Freshwater Quality are produced by the Australian and New Zealand Environmental and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.

[7] Defined as "(a) With one or more of the following intrinsic properties: (i) Explosiveness; (ii) Flammability; (iii) A capacity to oxidise; (iv) Corrosiveness; (v) Toxicity (including chronic toxicity); (vi) Ecotoxicity, with or without bioaccumulation; or (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."

Regional Rules	Compliance or Non-Compliance
i) Change the pH of the receiving water by more than 0.5 pH units where the pH is above 8 or below 6.5; or ii) Raise the temperature in the receiving water by more than 3 degrees Celsius, or cause the temperature to rise above 25 degrees Celsius; and	
(c) The discharge does not cause flooding of another person's property, erosion, land instability, sedimentation or property damage.	N/A - The proposed discharge will be controlled so as to not cause flooding of another person's property, erosion, land instability, sedimentation or property damage.
18.4.2 Discretionary Discharges to Water	
Rule 71 - Discharge of any contaminant, or water to water, not complying with Rules 63 to 70	
Unless permitted by Rules 63, 64, 65, 66, 67, 68, 69 or 70 the discharge of any contaminant or water to water is a discretionary activity	Consent required - Non-compliance with Rule 67(a) and therefore is classified as a Discretionary Activity under Rule 71. Discretionary Activity
18.5 DISCHARGES TO LAND	
18.5.1 Permitted Discharges to Land	
Solid waste[8] and offal pits	
The discharge of any contaminants into or onto land in connection with the disposal of solid waste, including offal, on production land is a permitted activity, provided that all of the following conditions are met:	N/A – This proposal relates to the discharge of water from the retention pond to land, via a soakage area.
Rule 81 - Discharge of stormwater runoff[9]	
The discharge of collected stormwater runoff into or onto land is a permitted activity provided that all of the following conditions are met…	N/A – This proposal relates to the discharge of water from the retention pond to land, via a soakage area and the proposal does not meet the definition of 'stormwater'.

[8] Solid waste is defined to mean the solid residue of domestic, industrial and commercial waste that excludes green waste, hazardous waste, and organic waste.

[9] Stormwater runoff is defined to refer to the overland flow of rainwater not contained within or forming part of a water body. Waterbody is defined as "fresh water or geothermal water in a river, lake, stream, pond, wetland, or aquifer or any part thereof, that is not located within the coastal marine area".

Regional Rules	Compliance or Non-Compliance
Rule 86 - The discharge of cleanfill[10] into or onto land in the Non Erosion Prone Area, outside riparian margins	
The discharge of cleanfill into or onto land in the Non Erosion Prone Area, outside riparian margins is a permitted activity subject to the following conditions…	N/A – This proposal relates to the discharge of water from the retention pond to land, via a soakage area.
18.5.2 Controlled Discharges to Land	
Rule 90 - Discharge of stormwater runoff not permitted by Rule 81	
The discharge of any contaminant into or onto land in connection with the discharge of stormwater runoff is a **controlled activity** unless permitted by Rule 81, and shall comply with the following standards and terms…	N/A – This proposal relates to the discharge of water from the retention pond to land, via a soakage area and the proposal does not meet the definition of 'stormwater'.
18.5.3 Discretionary Discharges to Land	
Rule 91 - Discharge to land discretionary activity Rule	
Unless permitted by Rules 72 to 86, or controlled by Rules 87 to 90, any discharge of contaminants into or onto land is a discretionary activity.	Consent required - The proposed temporary discharge from the retention pond to land via a soakage area is not covered by Rules 72 to 86, or controlled by Rules 87 to 90 and therefore would be classified as a Discretionary Activity under Rule 91. Discretionary Activity

[10] Cleanfill is defined as "material that when buried will have no adverse effect 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:
(a) combustible, putrescible, degradable or leachable components
(b) hazardous substances
(c) products or materials derived from hazardous waste treatment, hazardous waste stabilisation or hazardous waste disposal practices
(d) materials that may present a risk to human or animal health such as medical and veterinary waste, asbestos or radioactive substances
(e) liquid waste
(f) Protruding reinforcing, any reinforcing must be cut off from the concrete face."

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Telephone (03) 768 0466
Toll free 0508 800 118
Email info@wcrc.govt.nz
www.wcrc.govt.nz

21 October 2024

Taylorville Resource Park Ltd
c/o Barker & Associates
KerstinG@barker.co.nz

Enquiries to: Michael Durand

Dear Ms Ghisel

RC-2024-0122 – DISCHARGES OF CONTAMINANTS AT TAYLORVILLE RESOURCE PARK
Further information request under section 92(1) of the Resource Management Act 1991

Thank you for your application to discharge collected leachate and stormwater to land (RC-2024-0122) from the Taylorville Resource Park Ltd landfill.

The application is being assessed against relevant provisions of the RMA, regulations and regional plans and policy statements. It is also being assessed for any gaps in the information provided and in your assessments of that information. As a result of these assessments further information is requested under section 92(1) of the RMA as follows.

Leachate generation

The application states (pg. 8) that:

> *"the site operations also include two large water treatment / retention devices with a combined capacity of approximately 15,000m^3 for treated leachate and stormwater captured by the onsite operations."*

TRPL stated in its 2021 application for RC-2021-0097 (16 July 2021 site assessment) that the proposed methodology included *"installation / creation of surface water and potentially leachate treatment systems (e.g. containment / settlement / treatment ponds)"*. WCRC sought by section 92(1) information about that, to which TRPL replied:

> *"the Davis Ogilvie report states potential leachate is highly unlikely, but, if possible, it will be captured by the cell/pit sump. From there it will be piped into the water management system (attached). Treatment can only be confirmed upon leachate detection. If there are leachate present, they will be collected via a Hydra-Vac Truck and taken to the appropriate dump site"*.

RC-2021-0097 was granted with an explicit condition prohibiting contamination of surface water and groundwater as a result of the exercise of the consent (Condition 11). None of the subsequent changes made to RC-2021-0097 concerned leachate or its management.

Nevertheless, and contrary to TRPL's expectation, the landfill has produced leachate.

Questions:

1. Why is leachate being generated?

2. How long has it been known that leachate is being generated?

3. Why has 15,000 m^3 of leachate mixed with stormwater been able to accumulate on site?

4. Why has leachate not been "collected via a Hydra-Vac Truck and taken to the appropriate dump site" as described in the 2021 consent application and instead been allowed to accumulate over time?

5. Is leachate likely to continue to be generated, and if so at what quality?

6. Is TRPL making or planning steps to reduce or avoid future leachate generation?

7. If yes, please explain steps, set out a timetable for their implementation and provide an assessment of their efficacy.

8. In relation to any future leachate generated, what steps is TRPL making to "collect this via a Hydra-Vac Truck and taken to the appropriate dump site"?

9. What, if any, steps is TRPL taking now or planning to take in the future to reduce or avoid the mixing or leachate with stormwater?

Discharge and rationale

The application AEE states (pg. 11) that:

> *"the devices are currently at capacity and with heavy rainfall predicted for the coming months, the applicant is seeking temporary consent to discharge water to land, to help in creating a freeboard within the retention pond."*

The AEE does not state how much freeboard is intended to be created, nor the total volume of leachate proposed to be discharged. It does however, state that the discharge will contribute 800m^3 of water per day to the unconfined aquifer.

Questions:

10. Please confirm TRPL's intentions for the temporary discharge subject to the requested resource consent:

    a. What is considered to be a sufficient leachate retention pond freeboard and why?

    b. What volume of leachate is required to be removed from the pond "to help in creating a freeboard"?

    c. What is the daily volume, weekly volume, monthly volume and total expected volume of leachate TRPL is seeking to discharge?

    d. Is this volume more than, or less than, what is required to "to help in creating a freeboard"?

We understand that collected stormwater and leachate flows through the system of pond in series. The application states (pg. 9) that *"the first stage of the settlement pond has a capacity of approximately 2,700m^3, allowing for an approximate residence time of 135-180 days."* However, the need for the discharge permit is predicated on 50 mm/day of rain feeding 800 m^3 of water into the water management system. By our calculations the first stage pond residence time would be 3.4 days if there were three consecutive days with 50 mm of rain each day.

Questions:

11. Please reconcile and further explain:

    a. The expected volumetric inputs into the system under anticipated rainfall events;

    b. The residence time in each pond resulting from these anticipated rainfall events.

Answers to these questions should be given in conjunction with answers to questions above relating to freeboard sought to be created and the volume of water to be removed from the water management system to achieve this.

Material that is, or may be, generating leachate

The site is authorised to receive material as follows:

- Under condition 5: *"The Consent Holder shall only deposit fill material initially in the area outlined in red and labelled Dump Cells Stage 1,2,3 on the attached aerial photograph labelled Annexure 1 "RC-2021-0097 Application Area" or asbestos and coal tar or coal pitch only in the areas labelled Existing Lines ACM Cell and new application area lined ACM Cell on the attached aerial photograph titled "RC-2021-0097 Annexure 3. Variation September 2022";* and

- Under Condition 9: *"Only demolition waste (including clean fill) and whole or shredded tyres, but not including the disposal of asbestos or other hazardous materials may be disposed of in the location identified in Annexure 1. Asbestos and other hazardous materials approved by the Consent Authority can only be disposed of in the dedicated, lined cells identified in Annexure 3."*

Questions:

12. WCRC understands that the site has received other materials that have the potential to generate leachate. Please confirm:

    a. Whether any other materials have been discharged into the cells;

    b. If they have, please confirm:

        i. what these materials are;

        ii. their volumes;

        iii. their source(s);

        iv. their potential for leachate generation when placed in a cell on their own;

v. their potential for leachate generation when placed in a cell with other materials;

vi. the expected characteristics of leachate arising from the presence of these materials in cells, including (but not limited to) the expected values for analytes listed in Table A6.1 of Appendix 5 of the AEE (of the Hydrological Assessment by ENGEO);

c. Whether the analytes measured in leachate are consistent with that expected from the materials that have been discharged to the cells;

13. Please provide an assessment of whether the contaminants expected to be found in leachate are likely to be present in leachate over:

    a. the period between now and in 6 months' time

    b. the period of 6-12 months from now.

These questions are asked so that WCRC has sufficient information to understand the actual and possible constituents of the leachate that will, or may, be discharged over the term of any consent granted.

Groundwater and surface water dynamics and environmental risk

The assessment of effects is predicated on groundwater flow presented in Figure 6 (pg. 12) being correct. Technical reviews of the available information, however, suggest data on groundwater dynamics is sparing and subject to some uncertainty. We are particularly mindful of the following:

- the high potential impact on the GDC water supply if the discharge were to flow directly via groundwater under Taylorville Road (e.g. via a fracture network in the Kaiata mudstone).

- that the application assesses daylighting of groundwater in Noname Creek and elsewhere to the western margins of the site, but there is some uncertainty over whether groundwater currently, and under the scenario in the application, daylights from the Taylorville Road roadcut as well or instead.

- any potential for unmitigated surface or subsurface flow of the discharge outside of the area of flow identified in Figure 6 (pg. 12).

<u>Questions:</u>

14. In light of the above points, please re-assess and describe whether there are any potential pathways for water to flow from the discharge site to the GDC water intake by:

    a. Overland flow;

    b. Groundwater flow;

    c. A combination of overland flow and groundwater flow.

This assessment should include a statement from a suitably qualified expert that identifies the nature and extent of uncertainties in any of the scientific information used in the assessment,

and the analyses relied on in making the assessment. It should also identify the potential implications of any uncertainty.

Consideration of possible alternatives

WCRC must have regard to any possible alternative methods of discharge, including discharge into any other receiving environment (section 105). Sufficient information is required by WCRC before due regard can be given to this matter.

Questions:

15. Please provide an assessment of all possible combinations of the following methods to help in creating freeboard:
    a. Extraction by pump into tank wagons or removable tanks;
    b. Discharge to an offsite location with lower environmental risk to the proposed site;
    c. Discharge to a licenced facility;
    d. Pumping and discharge to another environment;
    e. Alternative methods of discharge, such as via irrigation to land within or outside of TRPL's property boundary, or a discharge to water.
16. Based on responses to Question 10, please provide interpretation and supporting information on:
    a. The daily volume of water that would need to be removed from the retention pond, on average, to
        i. maintain static water level; and
        ii. create freeboard;
    b. The volumes of tank wagons that could reach the site by road. (We note that there may be large tank wagons licenced for road transport of bulk liquids in New Zealand – potentially between 22,000 and 45,000 litres capacity.);
    c. The rate of loads carried by these tank wagons that would be required, on average, to:
        i. maintain static water level; and
        ii. create freeboard;
    d. The total number and rate of tank wagon loads that would be required to empty the storage pond within the six-month period of the requested resource consent.
17. For each of the possible alternatives identified, please provide an assessment of:
    a. Their technical feasibility;
    b. The costs and benefits of each relative to the proposed land discharge;

c. The environmental effects.

Site contamination

Questions:

18. Please provide an assessment of the environmental fate of contaminants in the discharge.

19. Please provide an assessment of whether the discharge will create a contaminated site in the discharge area and anywhere downstream.

20. Please identify whether any remedial works are planned to address site contamination, and if so a description of the works and an assessment of their effectiveness in remedying site contamination.

Condition 11 of RC-2021-0097

WCRC has considered the interrelationship between Condition 11 of RC-2021-0097 and RC-2024-0122, including how Condition 11 might affect any decision made on RC-2024-0122, including the exercise of any consent that may be granted.

The factual background is that:

- Condition 11 states: *The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265) as a result of the exercise of this consent*.

- The landfill has produced leachate, contrary to TRPL's expectation.

- If any of the leachate is discharged, this discharge will contaminate groundwater and/or surface water and this contamination will, by definition, be "*as a result of the exercise of this consent* [RC-2021-0097]*"*.

Furthermore:

- The terms of RC-2021-0097 are an "other matter" that the consent authority must have regard to when determining RC-2024-0122.

- Condition 11 as currently worded prohibits contamination of surface water and groundwater by any discharge of the leachate being generated by the landfill.

- A consent authority cannot issue a consent with condition(s) that directly contradict another consent.

- Condition 11 of RC-2021-0097 as currently worded precludes RC-2024-0122 from being granted.

We note that TRPL made application under section 127 (RC-2021-0097-V9) to change Condition 11 of RC-2021-0097 as follows:

> *"The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (~~Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265~~Lot 1-2 DP584105) as a result of the*

exercise of this consent, unless a separate discharge permit has been obtained from the West Coast Regional Council."

As noted in WCRC's section 88 letter to TRPL on 2 October 2024, if approved this change would authorise contamination of groundwater and surface water by leachate from sources other than the short-term discharge. The application was incomplete in that regard and was returned to TRPL on that basis. No further application has been received to date.

Questions:

21. Does TRPL agree that RC-2024-0122 cannot be granted to discharge leachate to surface water and groundwater whilst Condition 11 of RC-2021-0097 is in force (which prohibits the contamination of groundwater and surface water)?

22. If not, on what basis is it suggested that a resource consent can be issued that directly contradicts another?

23. Does TRPL consider that, to remove the prohibition of contamination of groundwater and surface water of Condition 11 of RC-2021-0097:

    a. an application to change Condition 11 could be made within the scope of section 127?; or

    b. such an application would be beyond the scope of RC-2021-0097 and therefore that RC-2021-0097 would need to be replaced with a new permit of wider scope and absent any such prohibition?

Answers to these questions may be accompanied by a further application(s) for resource consent as deemed necessary by TRPL.

Next steps

The steps set out in section 92A(1) apply to this request. TRPL must take one of the options in section 92(1) by 12 November 2024, which is 15 working days from the date of this request.

Decisions under sections 95A and 95B of the RMA are postponed until receipt of this information, unless section 95C applies.

If you have any queries regarding this matter, please contact Michael Durand on 021 035 2593 or e-mail on michael@planzconsultants.co.nz .

Yours faithfully,

Michael Durand
Consultant Planning Officer
West Coast Regional Council

1 November 2024

Taylorville Resource Park Limited
Attn: Bruce Tinnelly
P O Box 2103
Washdyke
Timaru

Dear Bruce,

Request For Information – 287 Taylorville Road, Coal Creek, Greymouth

(Our Reference: 026200.000.001_07)

ENGEO has reviewed the further information request relating to Taylorville Resource Park Limited's (TRPL) the application to discharge collected leachate and stormwater to land (RC-2024-0012). The further information request was issued by the West Coast Regional Council (WCRC, dated 21-Oct-24) under section 92(1) of the Resource Management Act 1991.

WCRC's questions (in grey) and ENGEO responses (in blue) are provided below.

1. Why is leachate being generated?

Leachate is generated when groundwater or surface water (i.e., stormwater) interacts with fill materials and extracts solutes. The generation of some leachate is anticipated at any outdoor operation where fill materials are received. In facilities that have been consented to accept construction & demolition (C&D) waste, leachate may include soluble heavy metals, inorganic nutrients, and ions in solution.

2. How long has it been known that leachate is being generated?

The generation of leachate with concentrations that contravene Condition 11 of RC-2021-0097 was first suspected on 4 May 2023, when TRPL received an abatement notice (Reference Number RC-2021-0097) from the West Coast Regional Council.

3. Why has 15,000 m^3 of leachate mixed with stormwater been able to accumulate on site?

The on-site settlement and retention devices were constructed in response to concerns regarding off-site discharges of leachate, to allow for investigation and implementation of on-site treatment methods.

4. Why has leachate not been "collected via a Hydra-Vac Truck and taken to the appropriate dump site" as described in the 2021 consent application and instead been allowed to accumulate over time?

On the date of the abatement notice (4 May 2023), the former sediment pond contained approximately 1,000 m^3, with additional daily inflow on the order of 100–200 m^3. Based on the size of a standard sucker truck (3–5 m^3) and the fact that an authorised off-site facility had not been identified, on-site retention and treatment was deemed the most practicable response to the abatement notice. The on-

site retention pond was completed in November 2023 and began accepting leachate that had been treated with a flocculant. Following advice from the Environmental Protection Authority (EPA), TRPL constructed on-site settlement devices to allow for the treatment of leachate generated in the waste cells.

5. Is leachate likely to continue to be generated, and if so at what quality?

As stated, leachate is generated at any outdoor operation where fill materials are received. It is anticipated that leachate will continue to be generated during the active use of Cell A and Cell C; however, leachate is and will be captured for settlement and treatment.

It is also anticipated that the untreated leachate will have generally the same characteristics as the water currently stored on-site, which contains concentrations of heavy metals and ammoniacal-nitrogen at levels that exceed the human health-based drinking water standards and one or more of the water quality standards (levels of protection) for aquatic protection. However, we note that concentrations are generally within one magnitude of order relative to the standards, as such minimal dilution would be required to mitigate concentrations in the receiving environment.

TRPL is currently investigating upgrades and modifications to the water treatment system. It is anticipated that after the modifications are implemented and necessary adjustments are made to maximise efficacy, discharge of the treated leachate will not have an off-site effect.

6. Is TRPL making or planning steps to reduce or avoid future leachate generation?

As stated, leachate is generated at any outdoor operation where fill materials are received. It is anticipated that leachate will continue to be generated during the active use of Cell A and Cell C; however, leachate is and will be captured for settlement and treatment.

TRPL is currently investigating upgrades and modifications to the water treatment system. It is anticipated that after the modifications are implemented and necessary adjustments are made to maximize efficacy, discharge of the treated leachate will not have an off-site effect.

7. If yes, please explain steps, set out a timetable for their implementation and provide an assessment of their efficacy.

Pilot testing of upgrades and modifications to the water treatment system commenced on 25 September 2024 with the installation of an aeration fountain in the settlement pond. Additional changes (e.g., alterations to the treatment train and flocculation dosing) are currently being implemented and will be assessed early November (depending on external suppliers) using the laboratory analysis of water samples collected from multiple stages in the treatment train.

8. In relation to any future leachate generated, what steps is TRPL making to “collect this via a Hydra-Vac Truck and taken to the appropriate dump site”?

As discussed in the ENGEO (2024) *Preliminary Hydrogeological Assessment*, removal via sucker truck is not deemed a practicable or sustainable alternative to the works proposed in application RC-2024-0122 due to the volume of water and number of truck movements. Further to this, and subsequent to delivery of this report, TRPL have been notified that treated leachate cannot be received at any wastewater treatment plants (WWTP) owned by the Grey District Council. Refer response to item number 15(a).

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9. What, if any, steps is TRPL taking now or planning to take in the future to reduce or avoid the mixing or leachate with stormwater?

As stated, leachate is generated at any outdoor operation where fill materials are received. It is anticipated that leachate will continue to be generated during the active use of Cell A and Cell C; however, leachate is and will be captured for settlement and treatment. Once waste cells have reached capacity, they will be capped in accordance with WasteMINZ (2023) *Technical Guidelines for Disposal to Land* to reduce the infiltration of stormwater through the waste cell.

10. Please confirm TRPL's intentions for the temporary discharge subject to the requested resource consent:

    a. What is considered to be a sufficient leachate retention pond freeboard and why?

    Based on climate data (NIWA [2016] *The Climate and Weather of West Coast, 2nd Edition*), the average annual rainfall is 2,800 – 3,000 mm, which contributes approximately 46,200 – 49,500 m^3 of water per annum to Cell A, Cell C, the settlement pond, and the retention pond.

    The current freeboard in the retention pond is approximately 0.2 m. Dam safety observations have been undertaken at site and it is recommended that the pond maintain a freeboard of at least 0.5 m. Based on the retention pond measurements, to achieve this freeboard and accommodate one month of heavy rainfall (300 mm), the pond needs to maintain a water level that is approximately 3.3 m lower than the current water level (assuming negligible evaporation and no discharges to the proposed soakage area during this time).

    b. What volume of leachate is required to be removed from the pond "to help in creating a freeboard"?

    Initially (to achieve the desired water level), approximately 5,500 m^3 of water needs to be removed from the retention pond.

    c. What is the daily volume, weekly volume, monthly volume and total expected volume of leachate TRPL is seeking to discharge?

    As stated in the application, the objective of the proposed temporary discharges is to achieve and maintain adequate freeboard in the retention pond. Initially, a total volume of approximately 5,500 m^3 of water needs to be removed from the retention pond. To conservatively assess for potential effects, the preliminary hydrogeological assessment modelled for a maximum volume of 800 m^3/day; however, the actual discharge volumes will depend on the infiltration capacity in the soakage area, rainfall and evaporation rates.

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d. Is this volume more than, or less than, what is required to "to help in creating a freeboard"?

As stated in the application, the objective of the proposed temporary discharges is to achieve and maintain adequate freeboard in the retention pond. Initially, a total volume of approximately 5,500 m^3 of water needs to be removed from the retention pond. To conservatively assess for potential effect, the preliminary hydrogeological assessment modelled for a maximum volume of 800 m^3/day; however, the actual discharge volumes will depend on the infiltration capacity in the soakage area, rainfall and evaporation rates.

TRPL is amenable to a condition of consent that limits discharges to the volume required to maintain a freeboard of 3.3 m.

11. Please reconcile and further explain:

a. The expected volumetric inputs into the system under anticipated rainfall events.

We note that the residence time calculation in the ENGEO (2024) *Preliminary Hydrogeological Assessment* did not include the average contribution of leachate from Cell A; as such, the correct residence time is approximately 16 – 23 days. However, we note that this query appears to reflect a misunderstanding of "residence time".

Residence time is defined as:

"..the time water spends in the pond's still-water environment while floating from the inlet to the outlet"
(Ferguson [1998] *Introduction to Stormwater.* John Wiley & Sons, Inc.)

The residence time of a settlement pond is calculated to ensure that water in the pond has sufficient time for suspended sediment to settle out of the water column; it is not intended to represent the time required for a device to reach capacity, as that is dependent on other factors (e.g., climate, discharge rate). We further note that sufficient residence time for fine sediment (i.e., silt) is generally measured on the scale of minutes to hours (ibid); as such, even during a 2% AEP storm event, the pond will provide an adequate residence time (~4.1 days) for the sufficient removal of suspended sediment from the waters originating from Cell A and Cell B/C (estimated as 570 m^3/day for 50 mm of rainfall over an area of 11,400 m^2).

b. The residence time in each pond resulting from these anticipated rainfall events.

Residence time is measured by the volume of the storage device divided by the volume of inflow.

Including the waters originating from Cell A and Cell B/C (570 m^3/day) and rainfall on the settlement pond (82 m^3/day), the residence time in the settlement pond will be approximately 4.1 days during a 2% AEP storm event.

Including the waters originating from Cell A and Cell B/C, rainfall on the settlement pond, and rainfall on the retention pond (200 m^3/day), the residence time in the retention pond will be approximately 16 days during a 2% AEP storm event.

We note again that residence time is not intended to represent the time required for a device to reach capacity.

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12. WCRC understands that the site has received other materials that have the potential to generate leachate. Please confirm:

a. Whether any other materials have been discharged into the cells.

Under Condition 5 and Condition 9 of RC-2021-0097 V3, TRPL accepts the following materials:

Cell	Received Materials
Cell A	Demolition waste (including cleanfill), whole or shredded tyres.
Cell C (aka. *Lined ACM Cell*)	Demolition waste (including cleanfill), whole or shredded tyres, asbestos, coal tar and coal pitch, other hazardous materials approved by the Consent Authority.

Following receipt of written approval by WCRC, the site has received materials that do not meet the definition of *"Demolition waste (including cleanfill), whole or shredded tyres, asbestos, coal tar and coal pitch"* (refer Appendix 1).

No materials have been deposited at the site that do not comply with Condition 5 and Condition 9 of RC-2021-0097 V3.

Materials that do not meet the definition of *"Demolition waste (including cleanfill), whole or shredded tyres, asbestos, coal tar and coal pitch"* but deposited at the site following approval by the Consent Authority are discussed in the items below.

b. If they have, please confirm:

i. what these materials are:

Refer Appendix 1 for details of other potentially hazardous materials deposited at the site following approval by the Consent Authority.

ii. their volumes:

Refer Appendix 1 for details of other potentially hazardous materials deposited at the site following approval by the Consent Authority.

iii. their source(s):

Refer Appendix 1 for details of other potentially hazardous materials deposited at the site following approval by the Consent Authority.

iv. their potential for leachate generation when placed in a cell on their own:

Of all material received at the site under Condition 9— "*other hazardous materials approved by the Consent Authority*"—greenwaste has the most significant potential to generate leachate. The site accepted 560 tonnes of greenwaste (virus-infected Solanaceous plants and growing medium) under WCRC approval (Clark, R. 'RE: Taylorville Resource Park – MPI Clean-out'.

Received by Wayne O'Keefe, 5 December 2022), which allowed for the disposal of:

"…approximately 450 Tons (possibly more) of greenwaste and growing medium that needs disposal via burial."

Greenwaste generates leachate while organic matter decomposes, with ammonia being the primary contaminant of concern. We note that the greenwaste accepted at the site was placed in Cell C with other waste materials (e.g., C&D waste), not on its own.

v. their potential for leachate generation when placed in a cell with other materials:

To assess the likely interactions between greenwaste and other waste types, it is helpful to look at the general evolution of leachate composition in a municipal solid waste (MSW, Class 1) landfill. As shown in Figure 1, the decomposition of organic waste can cause a reduction in pH, which may mobilise heavy metals; however, this effect is likely mitigated by the presence of C&D wastes (e.g., concrete), which will increase the alkalinity of the leachate.

The anticipated duration of this effect is measured on the scale of months to approximately two years. As greenwaste has not been deposited at the site since January 2023, it is likely that leachate generation at the site is post-peak (late Stage III / Stage IV) and concentrations will further reduce.

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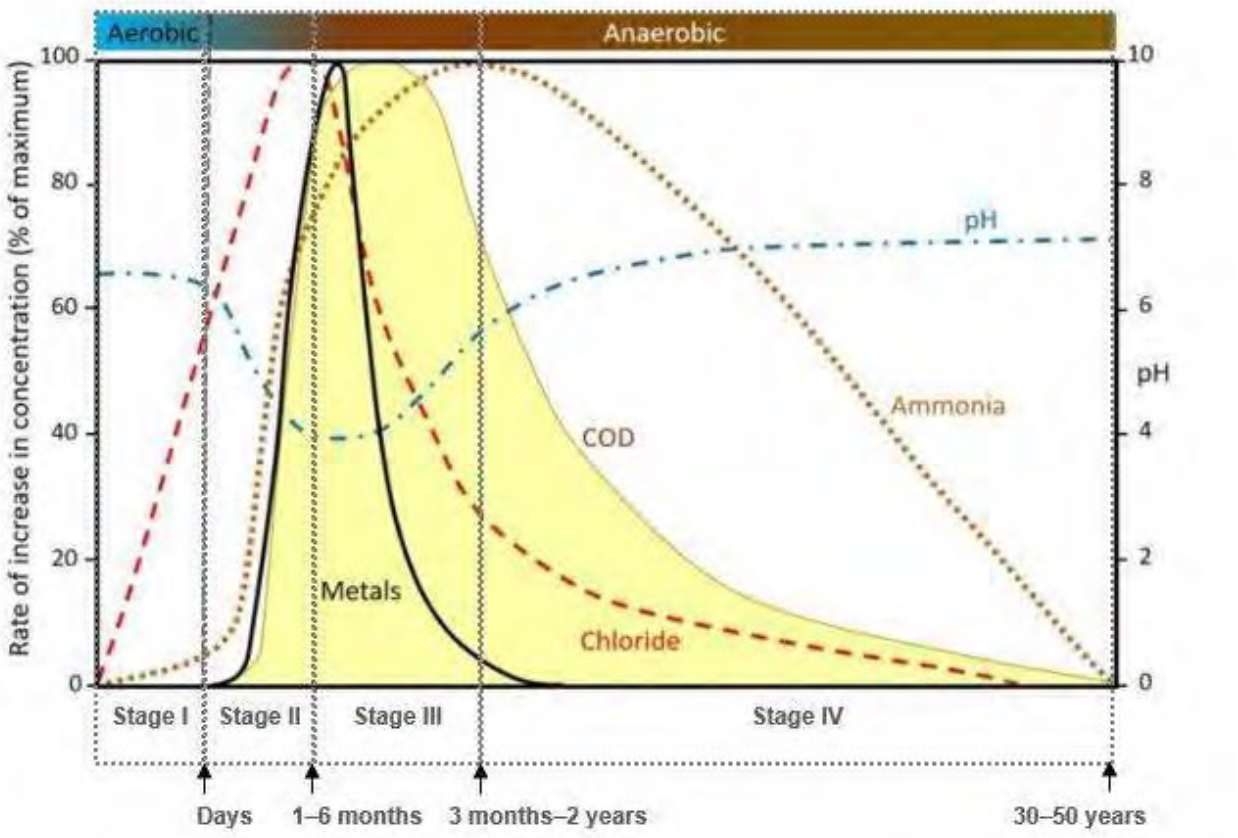

Figure 1: Stages of landfill leachate generation (modified from Earle, Steven [undated] Environmental Geology [https://environmental-geol.pressbooks.tru.ca] and MfE [2001] Guide for the Management of Closing and Closed Landfills])

vi. the expected characteristics of leachate arising from the presence of these materials in cells, including (but not limited to) the expected values for analytes listed in Table A6.1 of Appendix 5 of the AEE (the Hydrological Assessment by ENGEO).

As stated, it is likely that leachate generation at the site is post-peak (late Stage III / Stage IV) and concentrations will further reduce. As such, concentrations listed in Table A6.1 of ENGEO (2024) *Preliminary Hydrogeological Assessment* suitably and conservatively characterise the concentrations of greenwaste mixed with other fill materials.

c. Whether the analytes measured in leachate are consistent with that expected from the materials that have been discharged to the cells.

The analytes measured in leachate are consistent with that expected from the materials consented for disposal at the site, including *"Demolition waste (including cleanfill), whole or shredded tyres, asbestos, coal tar and coal pitch, other hazardous materials approved by the Consent Authority"* As stated in WasteMINZ (2023):

"Class 2 C&D Landfill leachate is typically characterised by mildly acidic pH, and the presence of ammoniacal nitrogen and soluble metals, including heavy metals."

13. Please provide an assessment of whether the contaminants expected to be found in leachate are likely to be present in leachate over:

    a. the period between now and in 6 months' time.

    As stated, it is likely that leachate generation at the site is post-peak (late Stage III / Stage IV) and concentrations will further reduce.

    b. the period of 6-12 months from now.

    As shown in Figure 1, concentrations in leachate are expected to decrease with time.

14. In light of the above points, please re-assess and describe whether there are any potential pathways for water to flow from the discharge site to the GDC water intake by:

    a. Overland flow:

    There is no reasonably practicable overland flowpath from the discharge site to the GDC water intake. As discussed in Section 5 of ENGEO (2024) *Preliminary Hydrogeological Assessment*, the soakage area will be excavated to a depth of at least 2 m and water will be pumped at a flow that is no greater than the infiltration capacity of the basin. As such, there will be no surface flow of water from the soakage area.

    b. Groundwater flow:

    There is no reasonably practicable groundwater flowpath from the discharge site to the GDC water intake. As discussed in Section 6 of ENGEO (2024) *Preliminary Hydrogeological Assessment*, water discharged into the soakage area will infiltrate to the water table (in the Pleistocene glacial outwash sandy gravel) and migrate west-southwest with a horizontal conductivity on the order of 10^{-3} m/s (Fetter [2021] *Applied Hydrogeology*. Prentice-Hall, Inc.). At the west-southwest extents of the Pleistocene gravels (refer Figure 8, ENGEO [2024]), the water daylights in the springs along Taylorville Road.

    We understand that there is concern regarding the potential for the flow of leachate-impacted groundwater through fractures in the mudstone to within the radius of influence of the GDC abstraction wells. As discussed in Section 2.2 of ENGEO (2024) *Preliminary Hydrogeological Assessment*, the Pleistocene gravels are underlain by the Paleogene Kaiata Formation (Rapahoe Group), comprising brown carbonaceous mudstone, with a formation thickness on the order of hundreds of meters. Based on published studies, the anticipated horizontal hydraulic conductivity in the mudstone is on the order of 10^{-8} to 10^{-6} m/s (Bishop & McCarthy [2004] *Hydraulic conductivity of mudstone formations in the West Coast region, South Island, New Zealand,* New Zealand Journal of Geology and Geophysics, 47(3), 421-432), with a ratio of horizontal to vertical conductivity of 10:1 (Domenico [1990] *Physical and Chemical Hydrogeology*. John Wiley & Sons, Inc.)

    Mudstone is considered an excellent rock type for geological containment due to very low permeability, even when faulted (Ozaki, *et al*, [2022] *Variation in fault hydraulic connectivity with depth in mudstone: An analysis of poroelastic hydraulic response to excavation in the Horonobe URL*, Geomechanics for Energy and the Environment, Volume 31:100311). Clay minerals comprising mudstone will expand when they encounter water, thus infilling the

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fracture and blocking the transmission of water (Baker & Grath [2005] *Hydraulic properties of a fractured mudstone*. Hydrogeology Journal, 13(3), 344-358).

Based on fundamental hydrogeological concepts developed by Henry Darcy (ca. 1856) it is highly unlikely that any greater-than-minor quantity of groundwater will naturally migrate from an unconfined, high-permeability aquifer down through a mudstone aquitard with a hydraulic conductivity that is lower by 3–5 orders of magnitude (i.e., groundwater flow will principally be horizontal within the overlying, high permeability sandy gravel aquifer).

c. A combination of overland flow and groundwater flow.

Ground water that daylights in the springs along Taylorville Road is piped under the road to the unnamed tributary / wetland on the south side of Taylorville Road, before joining with the Grey River approximately 550 m downstream. Any water that infiltrates to ground into the Holocene gravel and sand deposits adjacent to and underlying the unnamed tributary / wetland will be captured by the flow of groundwater in these river deposits, which flow parallel to the direction of flow in the Grey River. The Holocene gravels estimated hydraulic conductivity is anticipated in the order of 10^{-3} to10^{-4} m/sec, based on unconsolidated ranges (Fetter [1994] *Applied Hydrogeology.* Macmillian College Publishing Company).

We have requested but not been provided with any details of the GDC abstraction wells (e.g., pump test results, abstraction rates); however, based on the distance of the point of discharge into the unnamed tributary / wetland relative to the GDC intake (~250 m) the flow in the Grey River, and the estimated hydraulic conductivity in the Holocene gravels, there is no reasonably practicable overland / groundwater flowpath from the discharge site to the GDC water intake.

15. Please provide an assessment of all possible combinations of the following methods to help in creating freeboard:

a. Extraction by pump into tank wagons or removable tanks.

This alternative is discussed in Section 8 of ENGEO (2024) *Preliminary Hydrogeological Assessment.* As stated in that report, based on the number of required truck movements to transport the water (whether by a sucker truck or tank wagon / removable tank), this alternative is not deemed practicable.

Following submission of the application for RC-2024-0122, we received confirmation from GDC (Aaron Haymes, Group Manager Operations) that the treated leachate cannot be received at any GDC wastewater facility. This is due to the highly disruptive effect of fresh water (i.e. with low carbon content) on the efficacy of wastewater treatment plant operations. As such, the water would likely need to be transported to a facility in Canterbury or Southland. TRPL have identified a subcontractor that has a 30 m^3 tanker truck (located in Canterbury) that would be able to transport the water. This would require at least 186 truck movements and a rate of one load per day.

This would generate approximately 2000 kg of greenhouse gas emissions (Ministry of Transport [2020] *Green Freight – Strategic Working Paper*) at an indicative cost of approximately $3 – 6 million dollars, based on cost estimates provided by likely vendors. This is not a financially realistic option.

b. Discharge to an off-site location with lower environmental risk to the proposed site.

Discharge to an off-site location would require investigation works to identify an off-site location, negotiations with off-site property owners, and the preparation / lodgement / approval of a resource consent to discharge to land. Additionally, there would be feasibility limitations related to the piping / trucking of the water to another location. Due to operational practicalities and the timeframes required to obtain a consent, this alternative is not reasonably practicable.

c. Discharge to a licenced facility.

Refer response to item number 15(a).

d. Pumping and discharge to another environment.

This alternative is discussed in Section 8 of ENGEO (2024) *Preliminary Hydrogeological Assessment.* As stated in that report, due to the very low flow in the roadside drain (0.001 – 0.002 m3/s), this is not considered a suitable receiving environment as the receiving waters will likely be unable to attenuate changes in water quality. Based on estimates of diluted concentrations, direct discharge to Noname Creek would likely result in an exceedance of one of more of the assessment criteria. While it is highly unlikely that this water is being used as a source of potable water, there is potential for an effect to ecological health. As such, discharge to Noname Creek is not deemed a suitable alternative to the proposed discharge to land.

There are no other reasonably practicable receiving environments for the discharges.

e. Alternative methods of discharge, such as via irrigation to land within or outside of TRPL's property boundary, or a discharge to water.

Refer responses to item number 15(b) and item number 15(d) for responses to irrigation to land outside TRPL's boundary and discharge to water, respectively.

Irrigation to land within TRPL's boundary would be technically feasible; however, the proposed method (discharge to a soakage area) is preferable due to the following considerations:

- The proposed soakage area has been sited to prevent short-circuiting into the catchment of Noname Creek. Due to the hump and hollow topography across the wider area, there is greater potential that diffuse discharges (e.g., via drip irrigation) will accumulate in the low-lying hollows and result in overland flow.
- The loading of contaminants to land will be the same regardless of the site of the application area. Discharging to a defined area will result in a smaller footprint of activities.
- It would not be practicable to monitor for the effects of irrigation to land. Three monitoring wells have been installed between potential points of exposure and the discharge area (refer MB13, MB12, MB17, Figure 10 in ENGEO [2024] *Preliminary Hydrogeological Assessment)* to intercept groundwater migrating from the discharge area. Water samples collected from these locations will be used to calibrate the fate and transport model and serve as an "early warning

system" if concentrations vary from the model. This ongoing evaluation would not be possible if discharges are distributed across a wide area.

16. Based on responses to Question 10, please provide interpretation and supporting information on:

a. The daily volume of water that would need to be removed from the retention pond, on average, to:

i. maintain static water level.

It is not possible to provide a precise daily average discharge volume that will be required to maintain a static water level, as this will be depended on weather conditions (i.e., precipitation, evaporation). Based on climate data (NIWA [2016]), the average annual rainfall is 2,800 – 3,000 mm, which contributes approximately 46,200 – 49,500 m^3 of water per annum to Cell A, Cell C, the settlement pond, and the retention pond. This equates to an average of 125–135 m^3 of water per day that could accumulate from Cell A, Cell C, the settlement pond, and the retention pond.

However, this amount will be reduced by evaporation from the waste cells, settlement pond, retention pond, and discharge area. The anticipated evaporation is on the order of 700 – 800 mm per annum (NIWA [2016]), resulting in an anticipated average of 90–100 m^3 of water per day that will require removal to maintain static water level.

As modelled in Section 6 of ENGEO (2024) *Preliminary Hydrogeological Assessment*, there will not be a greater than minor effect of discharging at a rate of 800 m^3 of water per day.

ii. create freeboard.

Approximately 600 m^3 needs to be removed to create the recommended freeboard of 0.5 m. The daily volume will depend on the infiltration capacity in the soakage area, rainfall and evaporation rates.

As modelled in Section 6 of ENGEO (2024) *Preliminary Hydrogeological Assessment*, there will not be a greater than minor effect of discharging at a rate of 800 m^3 of water per day.

b. The volumes of tank wagons that could reach the site by road. (We note that there may be large tank wagons licenced for road transport of bulk liquids in New Zealand – potentially between 22,000 and 45,000 litres capacity).

Refer response to item number 15(a).

c. The rate of loads carried by these tank wagons that would be required, on average, to:

i. maintain static water level; and

Based on the volumes in the response to item number 16(a[i]) and information in the response to item number 15(a), approximately 3–4 truck movements would be required per day to maintain static water level.

ii. create freeboard;

Based on the volumes in the response to item number 16(a[ii]) and information in the response to item number 15(a), approximately 20 truck movements would be required per day to create the recommended freeboard of 0.5 m.

d. The total number and rate of tank wagon loads that would be required to empty the storage pond within the six-month period of the requested resource consent.

TRPL is not seeking consent to empty the retention pond.

17. For each of the possible alternatives identified, please provide an assessment of:

a. Their technical feasibility.

Irrigation to land within TRPL's boundary would be technically feasible; however, the proposed method (discharge to a soakage area) is preferable (refer response to item number 15[e]).

b. The costs and benefits of each relative to the proposed land discharge.

The cost to irrigate to land within TRPL's boundary would be marginally higher due to material costs for irrigation piping and emitters; however, it is not preferable due to potential short-circuiting to surface water and the inability to monitor effects (refer response to item number 15[e]).

c. The environmental effects.

Refer response to item number 15(e).

18. Please provide an assessment of the environmental fate of contaminants in the discharge.

This was discussed at length in Section 6 of ENGEO (2024) *Preliminary Hydrogeological Assessment*, there will not be a greater than minor effect of discharging at a rate of 800 m^3 of water per day. As stated in that report:

> *"Based on the modelling results (refer Appendix 8b), contaminants in discharges to the soakage area will generally be attenuated through dilution / dispersion in the unconfined aquifer. Very low concentrations of aluminium, ammoniacal-N, manganese, and nitrate-N may reach the point of discharge (hypothetical well), with the concentration maximum in 1.6 years. The highest modelled concentrations are for aluminium and nitrate-N; however, these concentrations are negligible (0.00031 mg/L and 0.00050 mg/L, respectively) and below the range of natural variability or analytical error."*

19. Please provide an assessment of whether the discharge will create a contaminated site in the discharge area and anywhere downstream.

There is potential that gravels in the discharge area may accumulate low concentrations of ammoniacal nitrogen and heavy metals; however, the ammoniacal nitrogen will undergo natural attenuation via nitrification and it is highly unlikely that the concentrations of heavy metals in leachate (< 1 g/m^3) will adsorb at concentrations that exceed either human or ecological-health based standards.

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We note that the site is currently consented under Condition 5 and Condition 9 of RC-2021-0097 to receive *"Demolition waste (including cleanfill), whole or shredded tyres"* in unlined waste cells. It is highly unlikely that discharge of leachate to the discharge area will result in ground contamination above what is expected from demolition waste (including cleanfill), whole or shredded tyres.

20. Please identify whether any remedial works are planned to address site contamination, and if so a description of the works and an assessment of their effectiveness in remedying site contamination.

Refer response to item number 19(a). No remedial works are planned or deemed necessary.

21. Does TRPL agree that RC-2024-0122 cannot be granted to discharge leachate to surface water and groundwater whilst Condition 11 of RC-2021-0097 is in force (which prohibits the contamination of groundwater and surface water)?

Agreed, which is why an application was made pursuant to section 127 of the RMA to change condition 11. That application was rejected by WCRC so will be re-submitted.

22. If not, on what basis is it suggested that a resource consent can be issued that directly contradicts another?

Refer response to item number 21.

23. Does TRPL consider that, to remove the prohibition of contamination of groundwater and surface water of Condition 11 of RC-2021-0097:

    a. an application to change Condition 11 could be made within the scope of section 127?; or

    Refer to pending re-submitted section 127 application.

    b. such an application would be beyond the scope of RC-2021-0097 and therefore that RC-2021-0097 would need to be replaced with a new permit of wider scope and absent any such prohibition?

    Refer to pending re-submitted section 127 application.

Prepared by

Lyn Nugent, CEnvP

Senior Environmental Scientist

Reviewed by

Dave Robotham, CEnvP SC

Principal Environmental Consultant

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APPENDIX 1

DATE	JOB NO	SOURCE ADDRESS	MATERIALS		TOTAL (T)	Manifest Dkt No.	WeighBridge Facility	Date Waste Measured	Time Waste Measured (24 hr)	Weighbridge Ticket No.	Invoice No.	Approved by
12/06/2023	CH4311 - 16565	32 Tuam Street	Contaminated		16.34	2601	Fulton Hogan	12/06/2023	8:06	94117155	10125	Chris Barnes
12/06/2023	CH4311 - 16565	32 Tuam Street	Contaminated		11.60	0969	Frews	12/06/2023	7:12	C31463	10125	Chris Barnes
					27.94							
15/12/2022	CH4095 - 16533	Johns Road	Contaminated Spoil		29.01	0601	T Croft	15-Dec	19:11	120834	10044	Colin Helem
20/02/1904	CH4095 - 16533	Johns Road	Contaminated Spoil		22.74	0751	T Croft	16-Dec	6:26	120836	10044	Colin Helem
20/12/2022	CH4095 - 16533	Johns Road	Tree Stumps		3.62	0086	Road Metals	20-Dec	6:21	815384	10044	Colin Helem
					55.37							
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		29.16	4004	T Croft	30/11/2023	17:58:00	128438	10201	Chris Barnes
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		28.74	1278	T Croft	30/11/2023	16:44:00	128437	10201	Chris Barnes
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		28.48	1164	T Croft	30/11/2023	20:56:00	128440	10201	Chris Barnes
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		23.38	1877	Road Metals	30/11/2023	12:42:00	851807	10201	Chris Barnes
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		26.86	2678	Road Metals	30/11/2023	12:28:00	851803	10201	Chris Barnes
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		29.81	1976	T Croft	1/12/2023	07:19:00	128442	10201	Chris Barnes
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		29.17	2729	Road Metals	30/11/2023	14:57:00	851843	10201	Chris Barnes
1/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		41.54	1279	GVT	1/12/2023	09:05:00	25037	10201	Chris Barnes
5/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		26.59	3955	T Croft	5/12/2023	06:33:00	128462	10201	Chris Barnes
5/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		30.14	4101	T Croft	5/12/2023	11:50:00	128477	10201	Chris Barnes
5/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		37.20	1280	Road Metals	5/12/2023	10:50:00	852074	10201	Chris Barnes
5/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		27.72	1977	Fulton Hogan	4/12/2023	13:42:00	96217195	10201	Chris Barnes
5/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		24.03	1351	T Croft	5/12/2023	07:11:00	128464	10201	Chris Barnes
5/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		24.64	2679	Road Metals	4/12/2023	15:43:00	852038	10201	Chris Barnes
5/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		21.24	1878	Road Metals	4/12/2023	15:46:00	852039	10201	Chris Barnes
6/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		27.68	1281	Road Metals	5/12/2023	15:48:00	852125	10201	Chris Barnes
6/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		35.58	1283	GVT	5/12/2023	06:35:00	25188	10201	Chris Barnes
6/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		21.70	1978	Fulton Hogan	5/12/2023	14:33:00	96217817	10201	Chris Barnes
6/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		13.36	3855	Road Metals	5/12/2023	15:02:00	852121	10201	Chris Barnes
6/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		26.55	3826	T Croft	5/12/2023	15:13:00	128495	10201	Chris Barnes
6/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		22.70	1879	Road Metals	5/12/2023	13:40:00	852110	10201	Chris Barnes
6/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		25.92	2680	Road Metals	5/12/2023	13:35:00	852106	10201	Chris Barnes
7/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		21.96	1165	T Croft	7/12/2023	10:54:00	128531	10201	Chris Barnes
7/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		25.38	1979	Fulton Hogan	6/12/2023	13:25:00	96218289	10201	Chris Barnes
7/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		26.40	3856	Road Metals	6/12/2023	12:53:00	852177	10201	Chris Barnes
7/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		23.18	2681	Road Metals	6/12/2023	14:47:00	852175	10201	Chris Barnes
7/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		26.61	2730	Road Metals	6/12/2023	16:06:00	852206	10201	Chris Barnes
7/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		20.74	1880	Road Metals	6/12/2023	12:21:00	852172	10201	Chris Barnes
7/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		36.60	1285	GVT	7/12/2023	11:42:00	25273	10201	Chris Barnes
8/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		24.38	2682	Road Metals	7/12/2023	12:30:00	852272	10201	Chris Barnes
8/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		27.55	2731	Road Metals	7/12/2023	12:35:00	852275	10201	Chris Barnes
8/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		21.10	1881	Road Metals	7/12/2023	12:50:00	852280	10201	Chris Barnes
8/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		38.10	1284	GVT	7/12/2023	17:01:00	25296	10201	Chris Barnes
8/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		26.12	3857	Road Metals	7/12/2023	12:59:00	852282	10201	Chris Barnes
8/12/2023	CH4334 - 16574	205 Gloucester Street	Contaminated		9.38	1980	Fulton Hogan	7/12/2023	13:56:00	96218937	10201	Chris Barnes
					929.69							
1/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.82	2658	Road Metals	31/10/2023	14:02	848844	10181	Chris Barnes
1/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.42	0137	Road Metals	31/10/2023	17:08	848875	10181	Chris Barnes
1/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.80	1955	Road Metals	1/11/2023	6:56	848881	10181	Chris Barnes
1/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.85	2708	Road Metals	31/10/2023	14:07	848845	10181	Chris Barnes
1/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		23.52	3951	T Croft	1/11/2023	7:46	127869	10181	Chris Barnes
1/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.20	1264	T Croft	31/10/2023	19:44	127868	10181	Chris Barnes
1/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.56	1025	T Croft	1/11/2023	11:13	127873	10181	Chris Barnes
2/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.00	2709	Road Metals	1/11/2023	15:48	849014	10181	Chris Barnes
2/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		21.36	0138	T Croft	2/11/2023	7:47	127904	10181	Chris Barnes
2/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.82	2659	Road Metals	1/11/2023	13:32	848980	10181	Chris Barnes
2/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.61	1057	T Croft	1/11/2023	15:47	127892	10181	Chris Barnes
2/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.10	1157	T Croft	2/11/2023	14:50	127917	10181	Chris Barnes
3/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.44	1158	T Croft	3/11/2023	14:21	127945	10181	Chris Barnes
3/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.82	2660	Road Metals	2/11/2023	13:36	849108	10181	Chris Barnes
3/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.68	0139	T Croft	3/11/2023	7:40	127929	10181	Chris Barnes
3/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		32.06	2710	Road Metals	2/11/2023	14:37	849123	10181	Chris Barnes
3/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.80	1957	Road Metals	3/11/2023	6:45	849145	10181	Chris Barnes
6/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		15.82	1958	Road Metals	6/11/2023	7:33	849282	10181	Chris Barnes
6/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		23.44	2661	Road Metals	3/11/2023	14:11	849225	10181	Chris Barnes
6/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		23.30	0140	Road Metals	6/11/2023	6:23	849274	10181	Chris Barnes
6/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.47	2711	Road Metals	3/11/2023	14:27	849229	10181	Chris Barnes
7/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.62	1266	T Croft	7/11/2023	6:53	127979	10181	Chris Barnes
7/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.68	2662	Road Metals	6/11/2023	15.45	849389	10181	Chris Barnes
7/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		23.38	0141	Road Metals	6/11/2023	15:27	849384	10181	Chris Barnes
7/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.87	2712	Road Metals	6/11/2023	15.03	849380	10181	Chris Barnes
7/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.68	1159	T Croft	7/11/2023	14.44	127988	10181	Chris Barnes
8/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.98	2801	Birchfield Energy Darfield	8/11/2023	11.03	111294	10181	Chris Barnes
8/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.62	1961	Road Metals	8/11/2023	6.47	849574	10181	Chris Barnes
8/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.17	2713	Road Metals	7/11/2023	15.49	849555	10181	Chris Barnes
8/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		24.42	0142	Road Metals	7/11/2023	13.24	849507	10181	Chris Barnes
8/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.00	2901	T Croft	8/11/2023	6.50	128008	10181	Chris Barnes
8/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.08	2663	Road Metals	7/11/2023	13.12	849504	10181	Chris Barnes
9/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.70	1962	Road Metals	9/11/2023	7.55	849768	10181	Chris Barnes
9/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		23.72	0143	Road Metals	9/11/2023	7.42	421211	10181	Chris Barnes
9/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.85	2714	Road Metals	8/11/2023	14.36	849700	10181	Chris Barnes
9/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.86	2664	Road Metals	8/11/2023	26.86	849676	10181	Chris Barnes
10/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.41	2715	Road Metals	9/11/2023	14.08	849890	10181	Chris Barnes
10/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		33.23	1267	T Croft	9/11/2023	18.27	128059	10181	Chris Barnes
10/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.44	2665	Road Metals	9/11/2023	13.50	849884	10181	Chris Barnes
10/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.26	0144	Fulton Hogan	10/11/2023	7.48	57090632	10181	Chris Barnes
10/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.10	1963	Road Metals	10/11/2023	7.47	849937	10181	Chris Barnes
13/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.97	2851	T Croft	10/11/2023	14.27	128077	10181	Chris Barnes

13/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.38	2666	Road Metals	13/11/2023	8.15	850109	10181	Chris Barnes
13/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		24.94	0145	Road Metals	13/11/2023	8.31	850111	10181	Chris Barnes
13/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.06	1059	T Croft	13/11/2023	12.55	128103	10181	Chris Barnes
13/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.64	1964	Road Metals	13/11/2023	6.47	650092	10181	Chris Barnes
13/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.35	2716	Road Metals	10/11/2023	14.47	850037	10181	Chris Barnes
14/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		11.02	0146	Road Metals	14/11/2023	8.43	422034	10181	Chris Barnes
14/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.48	2667	Road Metals	14/11/2023	7.56	850261	10181	Chris Barnes
14/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.59	2717	Road Metals	13/11/2023	15.42	850227	10181	Chris Barnes
14/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		24.10	1965	Road Metals	14/11/2023	8.05	850263	10181	Chris Barnes
14/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.17	1160	T Croft	14/11/2023	15.12	128149	10181	Chris Barnes
15/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.26	1701	Fulton Hogan	15/11/2023	16.14	57090657	10181	Chris Barnes
15/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.15	0753	T Croft	15/11/2023	13.28	128165	10181	Chris Barnes
15/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.66	2668	Road Metals	15/11/2023	8.11	850393	10181	Chris Barnes
15/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		24.28	1966	Road Metals	15/11/2023	15.11	850398	10181	Chris Barnes
15/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.55	2718	Road Metals	14/11/2023	15.48	850356	10181	Chris Barnes
15/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		32.83	3501	T Croft	14/11/2023	17.32	128156	10181	Chris Barnes
16/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.84	2669	Road Metals	16/11/2023	8.02	850541	10181	Chris Barnes
16/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.17	3502	T Croft	15/11/2023	19.27	128189	10181	Chris Barnes
16/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.97	2719	Road Metals	15/11/2023	14.45	850496	10181	Chris Barnes
16/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.76	1967	Road Metals	16/11/2023	6.54	850524	10181	Chris Barnes
20/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.51	2720	Road Metals	20/11/2023	15.05	850656	10181	Chris Barnes
20/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.20	2670	Road Metals	20/11/2023	7.59	850702	10181	Chris Barnes
20/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.00	1269	T Croft	20/11/2023	15.35	128253	10181	Chris Barnes
20/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.84	1702	Birchfield Energy Darfield	20/11/2023	12.06	111412	10181	Chris Barnes
21/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		24.54	2671	Road Metals	21/11/2023	7.50	850821	10181	Chris Barnes
21/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.08	1968	Road Metals	21/11/2023	7.48	850820	10181	Chris Barnes
21/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		33.25	2721	Road Metals	20/11/2023	15.29	850796	10181	Chris Barnes
22/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.30	1161	T Croft	22/11/2023	14.53	128311	10181	Chris Barnes
22/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.79	0754	T Croft	22/11/2023	11.47	128305	10181	Chris Barnes
22/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.73	4001	T Croft	21/11/2023	18.29	128297	10181	Chris Barnes
22/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.58	2672	Road Metals	22/11/2023	7.51	850908	10181	Chris Barnes
22/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.74	1969	Road Metals	22/11/2023	8.03	850911	10181	Chris Barnes
22/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.39	2722	Road Metals	21/11/2023	15.31	850887	10181	Chris Barnes
22/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		21.56	0150	Fulton Hogan	22/11/2023	7.48	57090746	10181	Chris Barnes
24/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.58	3952	T Croft	23/11/2023	21.32	128355	10181	Chris Barnes
23/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.62	2673	Road Metals	23/11/2023	8.12	851021	10181	Chris Barnes
23/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		31.47	2723	Road Metals	22/11/2023	14.36	850974	10181	Chris Barnes
23/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		33.65	4051	T Croft	23/11/2023	6.32	128325	10181	Chris Barnes
23/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.04	1970	Road Metals	23/11/2023	7.48	851016	10181	Chris Barnes
23/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.04	1162	T Croft	23/11/2023	14.49	128339	10181	Chris Barnes
24/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.10	0431	Road Metals	23/11/2023	13.17	851075	10181	Chris Barnes
24/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.71	1026	T Croft	24/11/2023	9.24	128357	10181	Chris Barnes
24/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		31.27	2724	Road Metals	24/11/2023	6.22	851128	10181	Chris Barnes
24/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.88	1971	Road Metals	24/11/2023	6.41	851129	10181	Chris Barnes
27/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.62	3851	Road Metals	27/11/2023	10.18	423539	10181	Chris Barnes
27/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.52	1972	Road Metals	27/11/2023	6.51	851280	10181	Chris Barnes
27/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		31.47	2725	Road Metals	24/11/2023	15.42	851243	10181	Chris Barnes
27/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.00	2674	Road Metals	24/11/2023	14.26	851224	10181	Chris Barnes
27/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.01	3824	T Croft	27/11/2023	14.13	128378	10181	Chris Barnes
27/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.32	1163	T Croft	27/11/2023	11.40	128376	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		32.10	1271	Road Metals	27/11/2023	14.22	851415 | 851416	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.55	2726	Road Metals	27/11/2023	15.38	851441	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.28	1973	Road Metals	28/11/2023	6.47	851461	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.10	1874	Road Metals	28/11/2023	6.26	851458	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.34	3852	Road Metals	28/11/2023	8.07	423729	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		31.00	1027	T Croft	28/11/2023	13.59	128392	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.32	2675	Road Metals	27/11/2023	12.38	851373	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.88	3953	T Croft	28/11/2023	7.21	128386	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		37.10	1270	GVT Landline	27/11/2023	15.41	24840	10181	Chris Barnes
28/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		36.92	1272	GVT Landline	28/11/2023	8.16	24860	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		23.72	1875	Road Metals	28/11/2023	16.53	851616	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.00	3853	Fulton Hogan	29/11/2023	8.10	57090879	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.31	2727	Road Metals	28/11/2023	14.43	851589	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.12	1974	Road Metals	29/11/2023	8.26	851641	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.54	2676	Road Metals	28/11/2023	13.01	851562	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		33.98	1275	GVT Landline	29/11/2023	9.35	24919	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.60	1274	GVT Landline	29/11/2023	4.00	24898	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.92	0756	T Croft	29/11/2023	12.03	128409	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.09	4002	T Croft	28/11/2023	18.12	128396	10181	Chris Barnes
29/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		32.01	1028	T Croft	29/11/2023	11.25	128401	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		39.10	1276	GVT Landline	29/11/2023	10.23	CB10	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.89	3903	T Croft	30/11/2023	11.08	128426	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.40	3954	T Croft	30/11/2023	7.39	128422	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		31.69	2728	Road Metals	29/11/2023	14.58	851719	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		39.58	1277	GVT Landline	29/11/2023	15.38	24960	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.92	1975	Road Metals	30/11/2023	8.12	851755	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.21	3825	T Croft	30/11/2023	13.48	128429	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.48	2677	Road Metals	30/11/2023	12.50	851692	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.38	4003	T Croft	29/11/2023	19.44	128418	10181	Chris Barnes
30/11/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.26	1876	Road Metals	29/11/2023	14.42	851715	10181	Chris Barnes
					3396.73							

20/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.98	2652	Road Metals	20/10/2023	6:34	847908	10167	Chris Barnes
20/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.12	1551	Road Metals	20/10/2023	10:36	848001	10167	Chris Barnes
20/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.26	0130	Road Metals	20/10/2023	7:46	847936	10167	Chris Barnes
20/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.82	2702	Road Metals	20/10/2023	7:37	847933	10167	Chris Barnes
24/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		24.88	2653	Road Metals	24/10/2023	6:24	848105	10167	Chris Barnes
24/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.68	0131	Road Metals	24/10/2023	6:26	848106	10167	Chris Barnes
24/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.58	1951	Road Metals	24/10/2023	6:50	848115	10167	Chris Barnes
24/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.82	2703	Road Metals	24/10/2023	8:06	848135	10167	Chris Barnes
24/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.23	1054	T Croft	24/10/2023	5:16	127676	10167	Chris Barnes
25/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		21.28	0132	Road Metals	24/10/2023	16:14	848271	10167	Chris Barnes
25/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.86	1952	Road Metals	25/10/2023	6:58	848288	10167	Chris Barnes
25/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		21.18	2654	Road Metals	25/10/2023	6:33	848277	10167	Chris Barnes
25/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.56	2704	Road Metals	25/10/2023	7:58	848297	10167	Chris Barnes
25/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.62	1055	T Croft	25/10/2023	15:21	127721	10167	Chris Barnes
25/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.32	1155	T Croft	25/10/2023	15:24	127722	10167	Chris Barnes
26/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.96	0133	Road Metals	25/10/2023	14:29	848370	10167	Chris Barnes
26/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.96	1953	Road Metals	26/10/2023	6:54	848406	10167	Chris Barnes
26/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		36.43	3901	T Croft	25/10/2023	17:38	127729	10167	Chris Barnes
26/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		37.28	0752	T Croft	25/10/2023	21:26	127732	10167	Chris Barnes

26/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.08	2951	T Croft	26/10/2023	12:42	127747	10167	Chris Barnes
26/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.06	2655	Road Metals	26/10/2023	10:32	848452	10167	Chris Barnes
27/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.76	0134	Road Metals	27/10/2023	16:05	848524	10167	Chris Barnes
27/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		32.63	2705	Road Metals	27/10/2023	6:30	848531	10167	Chris Barnes
27/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		26.76	3902	T Croft	26/10/2023	22:21	127762	10167	Chris Barnes
27/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.89	1023	T Croft	27/10/2023	15:37	127783	10167	Chris Barnes
30/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		33.06	2656	Road Metals	27/10/2023	16:35	848630	10167	Chris Barnes
30/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		28.50	0135	Road Metals	30/10/2023	8:33	848661	10167	Chris Barnes
30/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		32.99	2705	Road Metals	27/10/2023	16:14	848626	10167	Chris Barnes
30/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		29.98	1954	Road Metals	30/10/2023	6:59	848649	10167	Chris Barnes
31/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.76	2657	Road Metals	30/10/2023	15:27	848744	10167	Chris Barnes
31/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		30.33	2707	Road Metals	30/10/2023	15:49	848750	10167	Chris Barnes
31/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.38	0136	Road Metals	31/10/2023	7:56	848773	10167	Chris Barnes
31/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		24.29	1265	T Croft	30/10/2023	19:12	127843	10167	Chris Barnes
31/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		25.13	1056	T Croft	31/10/2023	15:16	127857	10167	Chris Barnes
31/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		22.66	1156	T Croft	31/10/2023	15:09	127856	10167	Chris Barnes
31/10/2023	CH4334 - 16574	205 Gloucester Street	Contaminated Soil		27.26	1024	T Croft	31/10/2023	11:16	127850	10167	Chris Barnes
					1010.34							
		Superlot 2 - Ch4334	Total for 16574		**5336.76**							
6/11/2023	CH4083 - 16536	56 Langdons Road	Contaminated Soil		9.08	1959	Road Metals	6/11/2023	7:31	849281	10189	Chris Barnes
					9.08							
9/10/2023	CH4083 - 16536	56 Langdons Road	Contaminated		18.46	2651	Road Metals	6/10/2023	15:09	846441	10169	Chris Barnes
9/10/2023	CH4083 - 16536	56 Langdons Road	Contaminated		15.80	0001	Road Metals	6/10/2023	15:39	846448	10169	Chris Barnes
9/10/2023	CH4083 - 16536	56 Langdons Road	Contaminated		16.58	2701	Road Metals	6/10/2023	16:02	846453	10169	Chris Barnes
					50.84							
5/07/2023	CH4083 - 16536	30 Langdons Road	Asbestos		2.88	0127	Frews	4/07/2023	15:50	C31977	10134	Chris Barnes
					2.88							
11/01/2023	CH4083 - 16536	Papanui High School	Contaminated		20.65	0469	T Croft	11/01/2023	17:55	121057	10056	Chris Barnes
12/01/2023	CH4083 - 16536	Papanui High School	Contaminated		26.56	1451	Fulton Hogan	12/01/2023	13:03	57085567	10056	Chris Barnes
25/01/2023	CH4083 - 16536	Papanui High School	Contaminated		10.00	1862	No weigh docket				10056	Chris Barnes
31/01/2023	CH4083 - 16536	Papanui High School	Contaminated		18.48	0904	Fulton Hogan	30/01/2023	16:38	94111851	10056	Chris Barnes
					75.69							
7/03/2023	CH4083 - 16536	Langdons Road - PHS	Contaminated		22.40	1872	Road Metals	7/03/2023	8.25	822867	10080	Chris Barnes
7/03/2023	CH4083 - 16536	Langdons Road - PHS	Contaminated		27.86	0965	Road Metals	7/03/2023	8.05	822860	10080	Chris Barnes
7/03/2023	CH4083 - 16536	Langdons Road - PHS	Contaminated		27.50	0922	Road Metals	7/03/2023	7.37	822855	10080	Chris Barnes
16/03/2023	CH4083 - 16536	Langdons Road - PHS	Contaminated		27.90	0126	Road Metals	15/03/2023	14.06	823982	10080	Chris Barnes
					105.66							
2/09/2024	CH4083 - 16536	Papanui High School	Coal Tar		26.54	1985	Road Metals	2/09/2024	06:57:00	869147	10323	Chris Barnes
2/09/2024	CH4083 - 16536	Papanui High School	Coal Tar		19.76	3002	Road Metals	30/08/2024	15:38:00	869110	10323	Chris Barnes
2/09/2024	CH4083 - 16536	Papanui High School	Coal Tar		23.38	3864	Road Metals	2/09/2024	07:48:00	869154	10323	Chris Barnes
2/09/2024	CH4083 - 16536	Papanui High School	Coal Tar		17.88	4959	Road Metals	2/09/2024	08:04:00	869157	10323	Chris Barnes
3/09/2024	CH4083 - 16536	Papanui High School	Coal Tar		13.52	3865	Road Metals	3/09/2024	06:47:00	869275	10323	Chris Barnes
6/09/2024	CH4083 - 16536	Papanui High School	Contaminated Spoil		23.36	6502	Road Metals	6/09/2024	07:52:00	869607	10323	Chris Barnes
12/09/2024	CH4083 - 16536	Papanui High School	Contaminated Spoil		28.34	3866	Road Metals	6/09/2024	06:09:00	869610	10323	Chris Barnes
					152.78							
29/08/2024	CH4083 - 16536	Papanui High School	Coal Tar		25.70	1983	Chch Readymix	29/08/2024	08:25:00	1035633	10316	Chris Barnes
29/08/2024	CH4083 - 16536	Papanui High School	Coal Tar		26.02	3862	Road Metals	29/08/2024	08:06:00	868931	10316	Chris Barnes
30/08/2024	CH4083 - 16536	Papanui High School	Coal Tar		20.00	3001	Road Metals	29/08/2024	15:51:00	869010	10316	Chris Barnes
30/08/2024	CH4083 - 16536	Papanui High School	Coal Tar		22.06	1984	Chch Readymix	30/08/2024	07:42:00	1035762	10316	Chris Barnes
30/08/2024	CH4083 - 16536	Papanui High School	Coal Tar		22.94	3863	Chch Readymix	30/08/2024	07:30:00	1035763	10316	Chris Barnes
30/08/2024	CH4083 - 16536	Papanui High School	Coal Tar		23.24	4958	Chch Readymix	30/08/2024	06:38:00	1035761	10316	Chris Barnes
					139.96							
		Papanui High School - Ch4083	Total for 16536		**536.89**							
7/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		29.66	1051	T Croft	7/02/2023	16:38	121589	10071	Chris Barnes
7/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		24.32	1002	T Croft	7/02/2023	15:37	121583	10071	Chris Barnes
8/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		25.62	0953	Road Metals	8/02/2023	9:23	819059	10071	Chris Barnes
7/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		27.56	1101	T Croft	7/02/2023	20:00	121599	10071	Chris Barnes
8/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		25.29	1052	T Croft	8/02/2023	15:41	121616	10071	Chris Barnes
8/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		32.71	1003	T Croft	8/02/2023	14:38	121615	10071	Chris Barnes
8/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		29.50	0118	Frews	8/02/2023	6:58	P28718	10071	Chris Barnes
8/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		26.41	1868	T Croft	9/02/2023	10:03	121636	10071	Chris Barnes
8/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		27.25	1102	T Croft	8/02/2023	19:23	121624	10071	Chris Barnes
9/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		30.05	0119	Frews	9/02/2023	7:03	P28740	10071	Chris Barnes
9/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		31.82	0954	Road Metals	9/02/2023	9:37	819301	10071	Chris Barnes
9/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		25.28	1151	T Croft	9/02/2023	15:26	121651	10071	Chris Barnes
9/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		27.18	1053	T Croft	9/02/2023	14:27	121649	10071	Chris Barnes
9/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		25.62	1004	T Croft	9/02/2023	11:47	121643	10071	Chris Barnes
13/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		33.22	0120	Road Metals	10/02/2023	14:53	819683	10071	Chris Barnes
13/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		25.80	1869	Fulton Hogan	3/02/2023	15:13	96100451	10071	Chris Barnes
13/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		30.50	0955	Road Metals	10/02/2023	16:21	819703	10071	Chris Barnes
13/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		32.26	1005	T Croft	13/02/2023	12:40	121709	10071	Chris Barnes
13/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		27.58	1152	T Croft	13/02/2023	13:43	121710	10071	Chris Barnes
21/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		24.40	1153	T Croft	21/02/2023	14:41	121858	10071	Chris Barnes
21/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		31.95	1006	T Croft	21/02/2023	14:38	121857	10071	Chris Barnes
27/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		23.85	1007	T Croft	27/02/2023	11:28	121980	10071	Chris Barnes
27/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		22.31	1154	T Croft	27/02/2023	11:32	121981	10071	Chris Barnes
27/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		30.20	0705	T Croft	27/02/2023	16:45	121997	10071	Chris Barnes
28/02/2023	CH4204 - 16549	208 Montreal Street	Contaminated		25.98	706	T Croft	28/02/2023	15:08	122019	10071	Chris Barnes
					696.32							
28/02/2023	CH4247 - 16548	30 Quaifes Road	Contaminated		26.68	0919	Fulton Hogan	21/02/2023	14:58	96105681	10070	Chris Barnes
28/02/2023	CH4247 - 16548	30 Quaifes Road	Contaminated		23.18	1474	Road Metals	28/02/2023	10:27	822148	10070	Chris Barnes
28/02/2023	CH4247 - 16548	30 Quaifes Road	Contaminated		10.40	0963	Frews	1/03/2023	8:29	C28839	10070	Chris Barnes
					60.26							
7/06/2023	16531	49 Blackbyre Road, Appleby	Tomato Waste		21.94	2654	Sollys	6/06/2023	14:44	81251	10119	Rachel Clarke
8/06/2023	16531	49 Blackbyre Road, Appleby	Green Waste		19.44	2655	Sollys	8/06/2023	11:13	81286	10119	Rachel Clarke
21/06/2023	16531	49 Blackbyre Road, Appleby	Green Waste		22.45	2656	Sollys	21/06/2023	9:06	81430	10119	Rachel Clarke
					63.83							
1/05/2023	16531	Pugh Road, Hope	Greenwaste & Slabs		21.54	2652	Sollys - Richmond	28/04/2023	14.02	80815	10114	Rachel Clarke
23/05/2023	16531	49 Blackbyre Road, Appleby	Tomato Waste		29.44	1260	Sollys - Richmond	23/05/2023	Unknown	WB # 1034829	10114	Rachel Clarke
25/05/2023	16531	49 Blackbyre Road, Appleby	Tomato Waste		23.79	1261	Sollys - Richmond	25/05/2023	9.16	81104	10114	Rachel Clarke

					74.77							
9/01/2023	16531	Tailored Energy Solution	Capsicum Waste		13.24	0951	Fulton Hogan	9/01/2023	10:31	57085506	10062	Rachel Clarke
10/01/2023	16531	Tailored Energy Solution	Capsicum Waste		8.75	0802	Sollys	10/01/2023	12:32	79646	10062	Rachel Clarke
10/01/2023	16531	Tailored Energy Solution	Capsicum Waste		21.57	0801	Sollys	10/01/2023	10:29	79644	10062	Rachel Clarke
					43.56							
30/12/2022	16531	Tailored Energy Solution	Contaminated		9.84	0901	Sollys	29/12/2022	17:05	79624	10049	Rachel Clarke
30/12/2022	16531	Tailored Energy Solution	Contaminated		13.15	0902	Sollys	29/12/2022	12:53	79623	10049	Rachel Clarke
					22.99							
3/03/2023	16531	49 Blackbyre Road, Appleby	Green Waste		23.34	2651	Sollys	2/03/2023	14.20	80184	10078	Rachel Clarke
14/03/2023	16531	49 Blackbyre Road, Appleby	Green Waste		20.93	1257	Sollys	13/03/2023	15.37	80308	10078	Rachel Clarke
14/03/2023	16531	37 Blackbyre Road, Appleby	Green Waste		24.52	1258	Sollys	13/03/2023	13.47	80306	10078	Rachel Clarke
27/03/2023	16531	49 Blackbyre Road, Appleby	Green Waste		28.18	2653	Sollys	24/03/2023	16.38	80430	10078	Rachel Clarke
					96.97							
			Total for 16531		**302.12**							
24/01/2023	16538	Nelson / Appleby	Green Waste		24.9	1251	Sollys	24/01/2023	7:28	79751	10057	Rachel Clarke
26/01/2023	16538	Nelson / Appleby	Green Waste		25.48	1254	Sollys	25/01/2023	16:03	79765	10057	Rachel Clarke
26/01/2023	16538	Nelson / Appleby	Green Waste		24.04	1255	Sollys	26/01/2023	1:57	79768	10057	Rachel Clarke
27/01/2023	16538	Nelson / Appleby	Green Waste		26.79	1256	NFL Belgrove	27/01/2023	11:36	126326	10057	Rachel Clarke
25/01/2023	16538	Nelson / Appleby	Green Waste		30.92	1252	Sollys	25/01/2023	6:27	79760	10057	Rachel Clarke
25/01/2023	16538	Nelson / Appleby	Green Waste		30.97	1253	Sollys	25/01/2023	10:05	79761	10057	Rachel Clarke
					163.10							

SUMMARY:

CH4311 - 16565	27.94
CH4095 - 16533	55.37
CH4334 - 16574	5336.76
CH4083 - 16536	536.89
CH4204 - 16549	696.32
CH4247 - 16548	60.26
16531	302.12
16532	163.10

S127 to RC-2021-0097

To vary consent condition 11

Taylorville Road - Lot 1-2 Deposited Plan 584105

Assessment of Environmental Effects and Statutory Analysis

13 November 2024

B&A
Urban & Environmental

Prepared for:
Taylorville Resource Park Limited

FORM C:
CHANGE OR CANCELLATION OF CONSENT CONDITIONS

Office Use Only

THE WEST COAST REGIONAL COUNCIL

Notes

- You must **fully** complete this form. Provide as much detail as you can.
- **You must pay the required initial deposit/fee ($862.50 incl GST) when you submit your consent application form, or your application will be returned to you.**
- Failure to provide the required information and payment will delay the processing of your application. If you do not provide adequate information then we will not be able to process your application, and will return it to you.
- Remember to sign and date all forms. A signature is not required if you email or submit your application by electronic means.

If you need any further help, please phone a member of the Consents team on **(03) 768 0466 or 0508 800 118.**

Office use only

Application Number:

_____

Deposit Fee Paid:

$_____

Date Deposit Fee Paid:

_____

Current File Number:

Contact details

Applicant details

For **individuals**, you must provide the full names of all individuals (such as John Robert Smith and Mary Jane Williams).
For **companies and other incorporated entities** you must provide the company name and you must also provide the name of a person or persons who will represent your company and be responsible for the application.
For **partnerships, groups** and **unincorporated entities** (such as private or family trusts or unincorporated societies) we must have the details of all authorised partners, trustees, members or officers. We may also request a copy of your society's rules to verify your status as a formal body or society.

Full name/s of applicant/s This is the name/s that the consent will be issued to. We will not accept applications made in the name of unregistered companies.	Taylorville Resource Park Limited			
Applicant's postal address	PO Box 2103 Washdyke Timaru 7941			
Applicant's residential address If different from postal address				
Primary contact person/s	Ray Singer			
Email address	[redacted]			
Phone number/s	Home:		Business:	
	Mobile: [redacted]		Fax:	

Partnership / Groups / Unincorporated entity details

For **partnerships, groups** or **unincorporated entities** (such as private or family trusts or unincorporated bodies or societies) you must provide details of all authorised partners, trustees or members. Any consent granted will then include these names, and all individuals will be legally responsible for the consent and any associated costs. Should these persons change, then you must notify us.

Name of person: **Status** (such as partner, member or trustee): **Residential address:**	
Name of person: **Status** (such as partner, member or trustee): **Residential address:**	
Name of person: **Status** (such as partner, member or trustee): **Residential address:**	
Name of person: **Status** (such as partner, member or trustee): **Residential address:**	

Include details of any further partners/trustees/members on a separate page if necessary.

Application consultant/agent details (if applicable)

Name/company name	Barker & Associates			
Contact person	Kerstin Ghisel			
Postal address	Level 3, 61 Cambridge Terrace, Christchurch Central 8011			
Email address	kersting@bark.er.co.nz			
Phone number/s	Home:		Business:	
	Mobile:	027 203 0901	Fax:	

Who should we send application correspondence to?

☑ Applicant ☑ Consultant/Agent

Have you discussed this application with a West Coast Regional Council staff member: ☑ Yes ☐ No

Name of staff member(s):

Michael Durand

Consultation

Please list the persons that you believe to have an interest in, or that may be affected by, the proposed change or cancellation of conditions.

Affected Party name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	
Affected Party name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	
Affected Party name/s				
Postal address				
Email address				
Phone number/s	Home:		Business:	
	Mobile:		Fax:	

Have you discussed your proposal with your neighbours and other parties who may be affected, eg, Fish & Game, Department of Conservation, Iwi, New Zealand Transport Agency, user groups and interest groups:

☐ Yes ☐ No

If yes, who was consulted (Attach any correspondence if appropriate):

Do they have any concerns:

How can these concerns be met:

Location

Property address / Location:	Taylorville Road
Legal description / Site description:	Lot 1-2 Deposited Plan 584105 contained within Record of Title 1097679
Name of closest road/street or nearest settlement/town	Taylorville
Map reference (NZTM):	

Territorial Authority in which the activity will be located

☐ Buller ☑ Grey ☐ Westland

List the Conditions that you wish to change or cancel:

Please see attached AEE

Describe any change to Conditions that you wish to make:

Please see attached AEE

Describe any changes to documents referred to in the Resource Consent (Please attach amended documents, eg, maps, aerial photographs):

Please see attached AEE

Describe the changes in circumstances that has caused the need to change the Conditions:

Please see attached AEE

Provide information to demonstrate that the degree of adverse environmental effect of the activity is likely to be unchanged or decreased as a result of any such change or cancellation:

Please see attached AEE

Provide information to demonstrate that the degree of adverse environmental effect of the activity is likely to be unchanged or decreased as a result of any such change or cancellation. The following information requirements were introduced by the Resource Management Amendment Act 2013 and took effect on 3 March 2015. These are mandatory requirements for all applications. The sections require varying degrees of familiarity with the RMA and documents produced under the RMA. If you need any further help, please phone a member of the Consents team.

Part 2 of the RMA

Part 2 of the RMA is attached at the end of this document.

Provide an assessment of your proposed activity/activities against the matters set out in Part 2.

Please see attached AEE

Other policies, rules and requirements

Assess your proposal against any relevant provisions of:

- national environmental standards
- other regulations
- national policy statements
- the West Coast Regional Policy Statement (RPS)
- Regional Air Quality Plan, the Regional Coastal Plan for the West Coast and the Regional Land and Water Plan

Please see attached AEE

Please complete an assessment of environmental effects in the detail that corresponds with the scale and significance of the effects that a change to, or cancellation of, the activity may have on the environment.

Advice Note: Please attach a separate sheet(s) if required.

Schedule 4 of the RMA is attached at the end of this document.

Application deposit / fees

Initial deposit

You will be charged the West Coast Regional Council's full actual and reasonable costs for processing this application. An initial deposit is required when you submit your application forms. This deposit helps cover our initial processing costs and will also help offset the total cost of your application/s.

For complex proposals, you will generally receive an invoice on a monthly basis. This invoice will be for costs incurred in the previous month. For simple consents that are processed quickly, you will generally only receive one invoice. This will be sent to you after you receive the final decision on your application.

Please refer to the table below for the **deposit fee required for your application** (updated 25 August 2023)

Application type	Charge (excl GST)	Charge (incl GST)
Application for a Change or Cancellation of consent conditions	$750	$862.50

Payment can be made in the following ways:

- **at the West Coast Regional Council Office by cash or cheque**
- **by post by cheque**
- **by electronic banking using the details below:**

WEST COAST REGIONAL COUNCIL

WESTPAC BANK ACCOUNT NUMBER:

0	3	0	8	4	6		0	1	2	1	5	0	0		0	0	
Bank		Branch Number					Account Number								Suffix		

Payer particulars – **Name of applicant**

Payer reference - **RCAPPLN**

Payer particulars (max 12 characters)	*Payer code (max 12 characters)*	*Payer reference (max 12 characters)*

Declaration

"I/the applicant, hereby certify that, to the best of my knowledge and belief, the information given in this application is true and correct. I/the applicant, agree to pay all actual and reasonable costs incurred by the West Coast Regional Council in processing the consent application/s regardless of whether or not the application is granted. I/the applicant, also agree to pay 10% penalty interest on amounts not paid within 30 days of the due date. This also applies to any subsequent compliance monitoring charges relating to the resource consent.

A signature is not required if the application is made by electronic means.

Signature of applicant or applicant's agent | Date

	18.11.24

Print Name (BLOCK CAPITALS)

KERSTIN GHISEL

Final Checklist

Have you?

Please tick

- [x] Filled in all parts of this form.
- [x] Included a sketch or location map that shows us exactly where your changed activity will take place.
- [x] Attached any written approvals obtained from parties potentially affected by your proposed change of conditions.
- [ ] Paid the required deposit/fee.

Important information – please read carefully

Public information

The information you provide with your application is public information. It is used to help process your resource consent application and assess the impact of your activity on the environment and other people.

Your information is held and administered by the West Coast Regional Council in accordance with the Local Government Official Information and Meetings Act 1987 and the Privacy Act 1993. This means that your information may be disclosed to other people who request it in accordance with the terms of these Acts. It is therefore important you let us know if your application includes trade secrets, commercially sensitive material or any other information you consider should not be disclosed.

Consent holder costs – Ongoing responsibilities

Consent conditions will be monitored. Monitoring will incur additional fees which will be charged to the Consent Holder. Please contact us if you have any queries regarding your deposit/fee or processing costs or the monitoring charges for your activity.

Consultation

Consultation with other parties who may be interested in or affected by your activity is encouraged. This involves discussing your activity with others who may have some concerns, listening to what others have to say, considering their responses and deciding what will be done.

More information

For more information on the application process or resource consents, visit our website at **www.wcrc.govt.nz** or phone the Consents team on (03) 768 0466 or 0508 800 118.

Form updated 25 August 2023

THE WEST COAST REGIONAL COUNCIL

388 Main South Road, Paroa, Greymouth 7805
PO Box 66, Greymouth 7840
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Toll Free 0508 800 118
Facsimile (03) 768 7133
Email info@wcrc.govt.nz
Website www.wcrc.govt.nz

Part 2 of the Resource Management Act 1991

Purpose and principles

5 Purpose

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, *sustainable management* means managing 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.

6 Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

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

(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

(f) the protection of historic heritage from inappropriate subdivision, use, and development:

(g) the protection of protected customary rights.

7 Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—

(a) kaitiakitanga:

(aa) the ethic of stewardship:

(b) the efficient use and development of natural and physical resources:

(ba) the efficiency of the end use of energy:

(c) the maintenance and enhancement of amenity values:

(d) intrinsic values of ecosystems:

(e) [Repealed]

(f) maintenance and enhancement of the quality of the environment:

(g) any finite characteristics of natural and physical resources:

(h) the protection of the habitat of trout and salmon:

(i) the effects of climate change:

(j) the benefits to be derived from the use and development of renewable energy.

8 Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Schedule 4
Information required in application for resource consent

1 Information must be specified in sufficient detail

Any information required by this schedule, including an assessment under clause 2(1)(f) or (g), must be specified in sufficient detail to satisfy the purpose for which it is required.

2 Information required in all applications

(1) An application for a resource consent for an activity (the *activity*) must include the following:

- (a) a description of the activity:
- (b) a description of the site at which the activity is to occur:
- (c) the full name and address of each owner or occupier of the site:
- (d) a description of any other activities that are part of the proposal to which the application relates:
- (e) a description of any other resource consents required for the proposal to which the application relates:
- (f) an assessment of the activity against the matters set out in Part 2:
- (g) an assessment of the activity against any relevant provisions of a document referred to in section 104(1)(b).

(2) The assessment under subclause (1)(g) must include an assessment of the activity against—

- (a) any relevant objectives, policies, or rules in a document; and
- (b) any relevant requirements, conditions, or permissions in any rules in a document; and
- (c) any other relevant requirements in a document (for example, in a national environmental standard or other regulations).

(3) An application must also include an assessment of the activity's effects on the environment that—

- (a) includes the information required by clause 6; and
- (b) addresses the matters specified in clause 7; and
- (c) includes such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

3 Additional information required in some applications

An application must also include any of the following that apply:

- (a) if any permitted activity is part of the proposal to which the application relates, a description of the permitted activity that demonstrates that it complies with the requirements, conditions, and permissions for the permitted activity (so that a resource consent is not required for that activity under section 87A(1)):
- (b) if the application is affected by section 124 or 165ZH(1)(c) (which relate to existing resource consents), an assessment of the value of the investment of the existing consent holder (for the purposes of section 104(2A)):
- (c) if the activity is to occur in an area within the scope of a planning document prepared by a customary marine title group under section 85 of the Marine and Coastal Area (Takutai Moana) Act 2011, an assessment of the activity against any resource management matters set out in that planning document (for the purposes of section 104(2B)).

4 Additional information required in application for subdivision consent

An application for a subdivision consent must also include information that adequately defines the following:

- (a) the position of all new boundaries:
- (b) the areas of all new allotments, unless the subdivision involves a cross lease, company lease, or unit plan:
- (c) the locations and areas of new reserves to be created, including any esplanade reserves and esplanade strips:
- (d) the locations and areas of any existing esplanade reserves, esplanade strips, and access strips:
- (e) the locations and areas of any part of the bed of a river or lake to be vested in a territorial authority under section 237A:
- (f) the locations and areas of any land within the coastal marine area (which is to become part of the common marine and coastal area under section 237A):
- (g) the locations and areas of land to be set aside as new roads.

5 Additional information required in application for reclamation

An application for a resource consent for reclamation must also include information to show the area to be reclaimed, including the following:

- (a) the location of the area:
- (b) if practicable, the position of all new boundaries:
- (c) any part of the area to be set aside as an esplanade reserve or esplanade strip.

Assessment of environmental effects

6 Information required in assessment of environmental effects

(1) An assessment of the activity's effects on the environment must include the following information:

- (a) if it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:
- (b) an assessment of the actual or potential effect on the environment of the activity:
- (c) if the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment that are likely to arise from such use:
- (d) if the activity includes the discharge of any contaminant, a description of—
  - (i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
  - (ii) any possible alternative methods of discharge, including discharge into any other receiving environment:
- (e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:
- (f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted:
- (g) if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved:
- (h) if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).

(2) A requirement to include information in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

(3) To avoid doubt, subclause (1)(f) obliges an applicant to report as to the persons identified as being affected by the proposal, but does not—

- (a) oblige the applicant to consult any person; or
- (b) create any ground for expecting that the applicant will consult any person.

7 Matters that must be addressed by assessment of environmental effects

(1) An assessment of the activity's effects on the environment must address the following matters:

- (a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:
- (b) any physical effect on the locality, including any landscape and visual effects:
- (c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:
- (d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:
- (e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants:
- (f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.

(2) The requirement to address a matter in the assessment of environmental effects is subject to the provisions of any policy statement or plan.

B&A reference:

CH025279

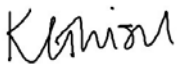
Status:

Final Revision

Date:

13 November 2024

Prepared by:



Kerstin Ghisel

Senior Associate, Barker & Associates Limited

Reviewed by:

Karl Cook

Director, Barker & Associates Limited

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Appendices

Appendix 1 Record of Title and Interests

Appendix 2 RC-2021-0097-V3

1.0 Applicant and Property Details

To:	West Coast Regional Council
Site Address:	Taylorville Road
Applicant Name:	Taylorville Resource Park Limited
Address for Service:	Barker & Associates Ltd Level 3, 61 Cambridge Terrace Christchurch Central City Christchurch 8013 Attention: Kerstin Ghisel
Legal Description:	Lot 1-2 Deposited Plan 584105 contained within Record of Title 1097679 (refer to Record of Title as Appendix 1)
Site Area:	19.342 ha
Site Owner:	Taylorville Resource Park Limited
Regional Plan:	Regional Land and Water Plan (RLWP)
District Plans:	Operative Grey District Plan Proposed Te Tai o Poutini Plan
GDP Zoning:	Rural Environmental Area
Locality Diagram:	Refer to Figure 1
Brief Description of Proposal:	s127 application to vary condition 11 of RC-2021-0097.
Summary of Reasons for Consent:	S127: Discretionary Activity

2.0 Introduction and Background

2.1 Introduction

This report has been prepared to address a resource consent application submitted by Taylorville Resource Park Limited (hereafter referred to as 'TRPL') for a S127 application to vary an existing consent condition in regard to a regional consent for the site located at Lot 1-2 DP 584105 at Taylorville. This report is intended to address the relevant matters under the Resource Management Act 1991 ('RMA').

The proposed change seeks to amend Condition 11 of RC-2021-0097, which effectively imposes blanket restriction on contamination of groundwater or surface water outside of the site from the exercise of the consent. The amendment would enable application(s) to be made, and if duly granted in accordance with the requirements of Resource Management Act 1991 (RMA), for such discharges to take place without contravening Condition 11. Importantly, however, the amendment to Condition 11 would not, of itself, enable any contamination of groundwater or surface water outside of the site from the exercise of the consent which would remain expressly excluded unless subject to a separate discharge permit being obtained. The proposal will also update the application site's legal description.

2.2 Background

The application site, which is known as the 'Taylorville Resource Park', is a demolition and clean fill disposal facility. Consents granted for activities on the site are outlined below.

2.2.1 Approved Regional Resource Consents

The onsite operations were originally consented by the West Coast Regional Council (WCRC) in August 2021, involving the following consents:

- RC-2021-0097-01 Land Use Consent - To undertake earthworks, including land-based gravel extraction to construct, operate and rehabilitate a demolition fill site, Taylorville.
- RC-2021-0097-02 Discharge Permit - To discharge demolition waste to land, Taylorville.

Consent was granted for a 20-year term from August 2021. Subsequent variations to the above consents have allowed asbestos and coal tar contaminated material to also be accepted in two lined cells. Consent conditions also allow for 'other hazardous materials' at the discretion of the WCRC. The latest variation (RC-2021-0097-V3) is subject to the consent conditions outlined at Appendix 2.

2.2.2 Lodged Regional Discharge Applications

TRPL lodged an application for the temporary discharge of collected leachate and stormwater to land in September 2024 (Council reference RC-2024-0122).

2.2.3 Approved District Resource Consents

Land use resource consent was obtained from the Grey District Council (GDC) in 2022 (reference LU3084/22) to undertake the discharge of demolition waste to land that does not comply with the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) 2011.

2.2.4 Planned Further Works

In terms of planned further works the applicant is continuously exploring options to improve the water management system at the site. Current planned upgrades include the installation of an aeration fountain in Stage 2 of the settlement pond (anticipated completion in late 2024) and assessing the feasibility of reconfiguring the sequence of the treatment train to allow for flocculation prior to Stage 1 of the settlement pond.

3.0 Site Context

3.1 Site Description

The application site is located to the west of the township of Taylorville and approximately 3.5km east of Greymouth. The application site is legally described as Lot 1-2 DP 584105 and is contained within one Record of Title (1097679) and the overall site area is over 19ha. The application site is positioned on the northern side of Taylorville Road (Figure 1). The Grey River is located to the south of the application site and is the source of water for the GDC water treatment plant on the opposite side of Taylorville Rd.

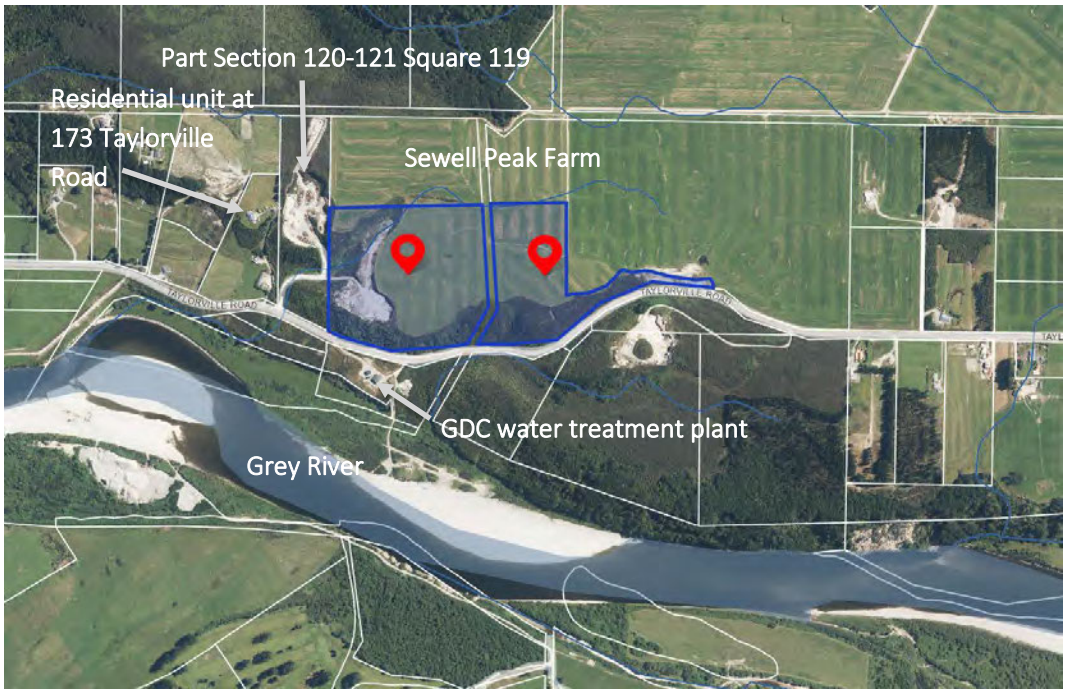


Figure 1: Application site outlined in blue (Source: EMaps)

The application site is located in a flat to gently undulating area between Mount Buckley and Cobden Hill, on the northern side of the Grey River. The local topography dips gently to the southwest with an average grade of approximately 1.6% (1:64). The application site is located between the floodplain of the Grey River and the channel of Noname Creek, which forms a downstream tributary of the Grey River and flows through the eastern portion of the application site (Figure 2).

Noname Creek flows in a southwest direction approximately 15m from the north-northeast boundary of the site. The creek receives water from the fill operation located on the adjacent landholding to the west of the application site. Noname Creek runs through a culvert under

Taylorville Road and discharges into an unnamed tributary/wetland on the south side of the road, before joining with the Grey River approximately 350m westward (downstream) of the confluence with the wetland. Downstream of the site, the Grey River meanders westward in a wide channel for approximately 7km before discharging onto the Tasman Sea.

The western portion of the application site (approximately 12.5ha) has been developed with three waste cells (Cells A–C), with one cell (Cell D) identified for a future development (Figure 2). Cell B is closed and capped; Cells A and C are active.

Figure 2: Layout of application site

As noted above, regional consent reference RC-2021-0097-V3, allows for the disposal to land of demolition waste (including cleanfill), asbestos, coal tar and coal pitch, shredded tyres, and other hazardous materials approved by the Consent Authority (Figure 3).

Cell	Aerial Extent	Approximate Depth	Approximate Volume	Received Materials	Cell Construction
Cell A	5,000 m²	~10–15 m (to mudstone)	~40,000–60,000 m³	Demolition waste (including cleanfill), whole or shredded tyres	Unlined cell.
Cell C	6,400 m²	10 m	37,000 m³	Demolition waste (including cleanfill), whole or shredded tyres, asbestos, coal tar and coal pitch, other approved hazardous materials	Cell is lined with geomembrane underlain with geofabric.

Figure 3: Cell descriptions and received material types (Source Engeo Hydrogeological Assessment)

The site operations also include two large water treatment / retention devices with a combined capacity of approximately 15,000m^3 for treated leachate and stormwater captured by the onsite operations (Figure 4).

Figure 4: Retention pond

3.2 Surrounding Locality

The immediate adjoining neighbour to the north and east is a dairy farm (Sewell Peak Farm). The immediately adjoining neighbour to the west (legally described as being Part Section 120-121 Square 119) has a regional discharge permit (RC-2019-0024-01) for the discharge of demolition waste and cleanfill to land.

The closest residential unit to the application site is located to the west at 173 Taylorville Road, which is approximately 170m east of the application site's western boundary.

The GDC's water treatment plant is located opposite the application site, on the southern side of Taylorville Road (Lot 1 Deposited Plan 343801) (Figure 5). This networked public drinking water supply (GRE001) is located approximately 430m south of the application site. The supply provides drinking water to approximately 10,000 people in the area. The source of the water supply (RC01092.3) is a subsurface infiltration system that takes water from the Grey River for treatment and distribution from bores located 320m - 420m to the south-southeast from the application site.

Figure 5: Grey District Council's water treatment plant

GDC's waste management centre, 'McLean's Pit Landfill and Recycling Centre' is located approximately 900m (as the crow flies) to the north of the application site, at 142 McLeans Pit Road.

4.0 Proposal

A change to consent condition 11 of RC-2021-0097 is needed so that the existing application for a temporary discharge of leachate and stormwater from the existing onsite retention pond to land via a soakage area can be given effect, if granted. The proposed amendment could also allow other discharges but only if they are duly consented. No unconsented discharges would be authorised by the amendment. The current wording of condition 11 is:

- The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265) as a result of the exercise of this consent.

This section 127 application seeks to change condition 11 of RC-2021-0097-03 to enable the following:

- To enable any authorised discharge consents granted by the WCRC for contamination of groundwater or surface water outside of the site as a result of the exercise of consent RC-2021-0097; and
- To update the application site's legal description.

4.1 Proposed Changes to Consent Conditions

The proposed amendments to condition 11 is to provide for the changes outlined above are detailed as follows (deletions shown as ~~strikethrough~~ and additions as **bold underlined**):

- The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (~~Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265~~Lot 1-2 DP584105) as a result of the exercise of this consent

unless, and only to the extent that, a separate discharge permit has been obtained from the West Coast Regional Council.

5.0 Reasons for Consent

The proposal involves changes to condition 11 of RC-2021-0097. The proposed changes are considered to be within the scope of the original resource consent as the proposal remains the same in terms of the activity and its scale. It does not have materially different adverse effects from that originally consented. Furthermore, the proposed change will enable the exercising of any regional discharge consent(s) duly granted by the WCRC.

The proposal does not seek to amend the duration of consent.

As an application to change conditions under section 127 of the Act, the proposal is treated as if it were a **discretionary** activity, and the relevant matters for consideration are the proposed change and its effects.

5.1 Section 127 of the Resource Management Act 1991

The proposal involves changes to the conditions of regional resource consent RC-2021-0097.

Section 127 of the Act allows for the change or cancellation of a condition or conditions of resource consent (other than a condition as to the duration of the consent).

Sections 88 to 121 of the Act apply to the consideration of the application, with all necessary modifications, as if:

a) the application was for resource consent for a discretionary activity; and

b) the references to the resource consent and the activity were references only to the change or cancellation of a condition and the effects of the change or cancellation respectively.

c) For the purposes of determining who is adversely affected by the change or cancellation of condition, a local authority must consider, in particular, every person who:

d) made a submission on the original application; and

e) may be affected by the change or cancellation of condition.

The main point to consider when assessing whether an application should be processed as a section 127 change of conditions or a new application, is whether the proposed change in conditions will result in a "fundamentally different activity" or "an activity having materially different adverse effects" to those that lawfully exist or that were assessed under the original application.

In this instance, the proposed changes to conditions are required to enable the exercising of a new discharge consent if granted by the WCRC to facilitate the temporary discharge to land associated with an approved landfill activity on the site.

As noted, under section 127 of the Act, resource consent for the change is required as a **discretionary** activity.

6.0 Public Notification Assessment (Sections 95A, 95C and 95D)

6.1 Assessment of Steps 1 to 4 (Sections 95A)

Section 95A specifies the steps the council is to follow to determine whether an application is to be publicly notified. These are addressed in statutory order below.

6.1.1 Step 1: Mandatory public notification is required in certain circumstances

Step 1 requires public notification where this is requested by the applicant; or the application is made jointly with an application to exchange of recreation reserved land under section 15AA of the Reserves Act 1977.

The above does not apply to the proposal.

6.1.2 Step 2: If not required by step 1, public notification precluded in certain circumstances

Step 2 describes that public notification is precluded where all applicable rules and national environmental standards preclude public notification; or where the application is for a controlled activity; or a restricted discretionary, discretionary or non-complying boundary activity.

In this case, the applicable rules do not preclude public notification, and the proposal is not a controlled activity or boundary activity. Therefore, public notification is not precluded.

6.1.3 Step 3: If not required by step 2, public notification required in certain circumstances

Step 3 describes that where public notification is not precluded by step 2, it is required if the applicable rules or national environmental standards require public notification, or if the activity is likely to have adverse effects on the environment that are more than minor.

As noted under step 2 above, public notification is not precluded, and an assessment in accordance with section 95A is required, which is set out in the sections below. As described below, it is considered that any adverse effects will be no more than minor.

6.1.4 Step 4: Public notification in special circumstances

If an application is not required to be publicly notified as a result of any of the previous steps, then the council is required to determine whether special circumstances exist that warrant it being publicly notified.

Special circumstances are those that are:

- Exceptional or unusual, but something less than extraordinary; or
- Outside of the common run of applications of this nature; or
- Circumstances which make notification desirable, notwithstanding the conclusion that the adverse effects will be no more than minor.

The modifications proposed are considered to be within the scope of the original application. The proposed amendments to the conditions will not materially alter the approved development.

It is considered that there is nothing noteworthy about the proposal. It is therefore considered that the application cannot be described as being out of the ordinary or giving rise to special circumstances.

6.2 Section 95D Statutory Matters

In determining whether to publicly notify an application, section 95D specifies a council must decide whether an activity will have, or is likely to have, adverse effects on the environment that are more than minor.

In determining whether adverse effects are more than minor:

- Adverse effects on persons who own or occupy the land within which the activity will occur, or any land adjacent to that land, must be disregarded.

  The land to be excluded from the assessment is listed in section 6.3 below.

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded.

  It is considered that there is no permitted baseline that can be usefully applied in this case. However, the approved resource consents referred to in Section 2.2. are part of the receiving environment against which any adverse effects from this proposal should be assessed.

- Trade competition must be disregarded.

  This is not considered to be a relevant matter in this case.

- The adverse effects on those persons who have provided their written approval must be disregarded.

  No persons have provided their written approval for this proposal.

The sections below set out an assessment in accordance with section 95D, including identification of adjacent properties, and an assessment of adverse effects.

6.3 Land Excluded from the Assessment

In terms of the tests for public notification (but not for the purposes of limited notification or service of notice), the adjacent properties to be excluded from the assessment are shown in Figure 6, and include:

- North and West – Lot 3-4 Deposited Plan 584105
- East – Part Section 120-121 Square 119

- South – Section 2-3 Survey Office Plan 338671, Lot 1 Deposited Plan 343801, Lot 4 Deposited Plan 2432

Figure 6: Adjacent properties (coloured in blue) in relation to application site (coloured in red) (Source: Emaps)

6.4 Assessment of Effects on the Wider Environment

In terms of an assessment of wider effects of the proposal, and it is considered that effects in regards to the following matters are less than minor:

- Effects on groundwater quantity and quality;
- Effects on surface water quality and aquatic ecosystems;
- Effects on the quality and safety of human and animal drinking water; and
- Effects on Tangata Whenua Values.

This application relates to the rewording of consent condition 11 of RC-2021-0097 to provide for the exercising of any separately obtained discharge consent by the WCRC. If no separate discharge consents have been granted by the regional council, then there are no additional authorisations in place. Furthermore, all potential adverse effects on the wider environment will be assessed by the regional council through the processing of these applications.

Furthermore, the application site is not listed as a site of significance to Ngāi Tahu, nor is it located within a Statutory Acknowledgement Area, a silent file, or within an archaeological site. Furthermore, there are no Heritage New Zealand sites or New Zealand Archaeological Association sites registered on the property. Consequently, there are no specifically identified cultural values associated with this site. However, below the site there is groundwater aquifers and surface water bodies that may have cultural value to Ngāi Tahu. For the reason that the proposed change to Condition 11 will in no way authorise a discharge of contaminants to groundwater or surface water that is not expressly approved by a separate consent, there will be no adverse effects relating to tangata whenua values.

This application relates to the rewording of consent condition 11 of RC-2021-0097 to provide for the exercising of any separately obtained discharge consent by the WCRC. The primary reasoning behind seeking the amendment it to enable the temporary discharge from the existing onsite retention pond to land, via a proposed soakage area which is currently being sought by RC-2021-0097-V9. Any potential adverse effects relating to that discharge consent application is currently being assessed by Council as part of the resource consenting process for RC-2021-0097-V9.

For the reason that the proposed change to Condition 11 will in no way authorise a discharge of contaminants to groundwater or surface water that is not expressly approved by a separate consent, or that exceeds the extent of such a consent. Therefore, there will be no adverse effects relating to groundwater quantity and quality and surface water quality.

6.5 Summary of Effects

Overall, it is considered that there will be no adverse effects on the environment relating to this proposal.

6.6 Public Notification Conclusion

Having undertaken the section 95A public notification tests, the following conclusions are reached:

- Under step 1, public notification is not mandatory;
- Under step 2, public notification is not precluded;
- Under step 3, public notification is not required as it is considered that the activity will result in less than minor adverse effects; and
- Under step 4, there are no special circumstances.

Therefore, based on the conclusions reached under steps 3 and 4, it is recommended that this application be processed without public notification.

7.0 Limited Notification Assessment (Sections 95B, 95E to 95G)

7.1 Assessment of Steps 1 to 4 (Sections 95B)

If the application is not publicly notified under section 95A, the council must follow the steps set out in section 95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

7.1.1 Step 1: Certain affected protected customary rights groups must be notified

Step 1 requires limited notification where there are any affected protected customary rights groups or customary marine title groups; or affected persons under a statutory acknowledgement affecting the land.

The above does not apply to this proposal.

7.1.2 Step 2: If not required by step 1, limited notification precluded in certain circumstances

Step 2 describes that limited notification is precluded where all applicable rules and national environmental standards preclude limited notification; or the application is for a controlled activity (other than the subdivision of land).

In this case, the applicable rules do not preclude limited notification and the proposal is not a controlled activity. Therefore, limited notification is not precluded.

7.1.3 Step 3: If not precluded by step 2, certain other affected persons must be notified

Step 3 requires that, where limited notification is not precluded under step 2 above, a determination must be made as to whether any of the following persons are affected persons:

- In the case of a boundary activity, an owner of an allotment with an infringed boundary;
- In the case of any other activity, a person affected in accordance with s95E.

The application is not for a boundary activity, and therefore an assessment in accordance with section 95E is required and is set out below.

Overall, it is considered that any adverse effects on persons will be less than minor, and accordingly, that no persons are adversely affected.

7.1.4 Step 4: Further notification in special circumstances

In addition to the findings of the previous steps, the council is also required to determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined as eligible for limited notification.

In this instance, having regard to the assessment in section 6.1.4 above, it is considered that special circumstances do not apply.

7.2 Section 95E Statutory Matters

If the application is not publicly notified, a council must decide if there are any affected persons and give limited notification to those persons. A person is affected if the effects of the activity on that person are minor or more than minor (but not less than minor).

In deciding who is an affected person under section 95E:

- Adverse effects permitted by a rule in a plan or national environmental standard (the 'permitted baseline') may be disregarded;
- Only those effects that relate to a matter of control or discretion can be considered (in the case of controlled or restricted discretionary activities); and
- The adverse effects on those persons who have provided their written approval must be disregarded.

These matters were addressed in section 6.2 above, and no written approvals have been sought.

Having regard to the above provisions, an assessment is provided below.

7.3 Assessment of Effects on Persons

Any adverse effects on persons at adjacent properties are considered to be less than minor as the rewording of condition 11 is to provide for the exercising of any separate discharge permits authorised by the WCRC.

7.3.1 Summary of Effects

Taking the above into account, it is considered that there will be no adverse effects on persons at the aforementioned properties in relation to this proposal.

7.4 Limited Notification Conclusion

Having undertaken the section 95B limited notification tests, the following conclusions are reached:

- Under step 1, limited notification is not mandatory;
- Under step 2, limited notification is not precluded;
- Under step 3, limited notification is not required as it is considered that the activity will not result in any adversely affected persons; and
- Under step 4, there are no special circumstances.

Therefore, it is recommended that this application be processed without limited notification.

8.0 Consideration of Applications (Section 104)

8.1 Statutory Matters

Subject to Part 2 of the Act, when considering an application for resource consent and any submissions received, a council must, in accordance with section 104(1) of the Act have regard to:

- Any actual and potential effects on the environment of allowing the activity;
- Any relevant provisions of a national environmental standard, other regulations, 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 a council considers relevant and reasonably necessary to determine the application.

As a discretionary activity, section 104B of the Act states that a council:

(a) may grant or refuse the application; and

(b) if it grants the application, may impose conditions under section 108.

9.0 Effects on the Environment (Section 104(1)(A))

Having regard to the actual and potential effects on the environment of the activity resulting from the proposal, it is concluded that there will be no adverse effects from the proposed change. Subsequent applications are required to be granted before the propose change has any actual impact and that impact is limited to allowing any granted discharge consent to be implemented.

Furthermore, it is considered that the proposal will result in positive effects through enabling, in the event the separate temporary discharge consent application (at least) is granted, manging the discharge from the retention pond in a controlled manner and avoid the uncontrolled overtopping of the pond.

Overall, it is considered that there are no actual and potential adverse effects on the environment of allowing the proposed change.

10.0 Regional and District Plan and Statutory Documents (Section 104(1)(B))

10.1 National Policy Statement For Freshwater Management 2020

It is noted that the new Government, has agreed to replace the National Policy Statement for Freshwater Management 2020 (NPS-FM) and work on the replacement was due to commence at the end of last year[1]. Notwithstanding this, below is an assessment against the NPS-FM for completeness.

The National Policy Statement for Freshwater Management 2020 sets out the objectives and policies for freshwater management under the Resource Management Act 1991. The objective of the policy statement is as follows:

> *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.*

Fifteen policies support this objective, with the following being of relevance to the proposal:

- Policy 1: Freshwater is managed in a way that gives effect to Te Mana o te Wai.
- Policy 2: Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for. The application site is not located within a statutory acknowledgement area, rūnanga sensitive area or silent file area.

[1] https://www.beehive.govt.nz/release/government-takes-first-steps-towards-pragmatic-and-sensible-freshwater-rules

- 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 5: Freshwater is managed (including through a National Objectives Framework) to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.
- Policy 15: Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

It is considered that the proposal is consistent with the relevant provisions of the NPS:FM because it would enable application(s) to be made, and if duly granted in accordance with the requirements of Resource Management Act 1991 (RMA), for such discharges to take place without contravening Condition 11. But the amendment to Condition 11 would not, of itself, enable any contamination of groundwater or surface water outside of the site from the exercise of the consent as it would remain expressly subject to a separate discharge permit being obtained.

10.2 Objectives and Policies of the West Coast Regional Policy Statement (2020)

Below is an assessment against the relevant objectives and policies within Chapter 6 and 8 of the West Coast Regional Policy Statement (RPS). Consideration has also been given to other objectives and policies within the RPS, including Chapters 7 and 7A, however for the reasons that there are no direct effects on any indigenous biodiversity, that ecosystems will be protected from treatment of the discharge and dilution, and there will be no additional impacts on natural character beyond the current landfill operation.

Chapter 6 - Regionally Significant Infrastructure (RSI)

Chapter 6 outlines that there is a need to recognise the social, economic, and environmental benefits that accrue locally, regionally and nationally from the establishment and continued operation of regionally significant infrastructure (RSI), which is defined within the RPS to include 'public or community solid waste storage and disposal facilities'.

The key objective of this chapter is to enable the safe, efficient and integrated development, operation, maintenance, and upgrading of regionally and nationally significant infrastructure. This objective is supported by a number relevant policies which seek to:

- Policy 1 - Provide for the development, operation, maintenance and upgrading of new and existing RSI…
- Policy 4 - Recognise that RSI important to the West Coast's wellbeing needs to be protected from the reverse sensitivity effects arising from incompatible new subdivision, use and development, and the adverse effects of other activities, which would compromise the effective operation, maintenance, upgrading, or development of the infrastructure.
- Policy 5 - When considering any adverse environmental effects of RSI that cannot be avoided, remedied or mitigated, other than effects on indigenous biological diversity, decision-makers must have regard to any offsets and compensation proposed which benefit the natural environment or the community affected.

- Policy 8 - Land use and infrastructure should be integrated to avoid as much as practicably possible the constraints through the lack of supporting infrastructure; unsustainable demands being placed on infrastructure to meet new growth; and significant adverse effects on existing land uses.

Chapter 8 – Land and Water

- Objective 1 - The life-supporting capacity of freshwater is maintained or improved.
- Objective 2 - Provide for a range of land and water uses to enable the economic, social and cultural wellbeing of West Coast communities while maintaining or improving water quality and aquatic ecosystems.
- Objective 3 - Determine allocation of water within environmental controls.
- Objective 4 - Identify and protect the significant values of wetlands and outstanding freshwater bodies.
- Objective 5 - Achieve the integrated management of water and the subdivision, use and development of land within catchments, recognising the interconnections between land, fresh water, and coastal water, including by managing adverse effects of land and water use on coastal water quality.

The policies seek to:

- Policy 1 - Adverse effects on fresh and coastal water quality and aquatic ecosystems arising from:
    - Subdivision, use or development of land;
    - Discharges of contaminants to water and to land in circumstances which may result in contaminants entering water;
    - Water use and take; and
    - Activities in, or on, water including damming and diversion, will be avoided, remedied or mitigated, to ensure that water quality and aquatic ecosystems are maintained or improved.
- Policy 2 - To give effect to Objective 2 of Chapter 3, the adverse effects of subdivision, use and development on Poutini Ngāi Tahu cultural values will be avoided, remedied or mitigated taking into account the following matters:
    - A preference by Poutini Ngāi Tahu for discharges to land over water where practicable;
    - The value of riparian margin vegetation for water quality and aquatic ecosystems; and
    - Effects on the sustainability of mahinga kai, and protection of taonga areas.
- Policy 3 - To give effect to Objective 2 of Chapter 3, manage land and water use in a way that avoids significant adverse effects (other than those arising from the development, operation, maintenance, or upgrading of RSI and local roads) and avoids, remedies or mitigates other adverse water quality effects on sites that are significant to Poutini Ngāi Tahu, including the following:
    - Estuaries, hāpua lagoons, and other coastal wetlands; and

- Shellfish beds and fishing areas.

- Policy 4 - Until priority frameworks for water take and use are developed through the FMU processes and added to a regional plan, consent applications will be processed on a "first-come, first served'' basis, and in making decisions, the following matters must be considered:
  - The reasonably foreseeable future requirements for domestic and community water supply needs, stock drinking, and firefighting;
  - The degree of community, regional or national benefit from the take, use, damming or diversion of water;
  - Any adverse environmental effects from the take, use, damming or diversion of water will be avoided, remedied or mitigated including where applicable by applying provisions of the regional plan;
  - Applying rates of take, volume limits and residual flows at the point of take to ensure that there is enough water for the purpose of the take, and to maintain or improve water quality and aquatic ecosystems;
  - The extent to which the proposal maximises the efficient allocation and efficient use of water; and
  - The reasonable needs of other water users.
- Policy 5 - Maintain or improve water quality within freshwater management units.
- Policy 6 - Identify the significant values of wetlands and outstanding freshwater bodies in regional plans and protect those values.
- Policy 7 - Encourage the coordination of urban growth, land use and development including the provision of infrastructure to achieve integrated management of effects on fresh and coastal water.
- Policy 8 - Provide for the social, economic and cultural wellbeing derived from the use and development of land and water resources, while maintaining or improving water quality and aquatic ecosystems.
- Policy 9 - Implement the National Policy Statement for Freshwater Management including the National Objectives Framework.

Comments:

Having resilient regionally significant infrastructure is important for the region and the application site, which currently operates as a landfill, assists in providing for the social and economic wellbeing of the West Coast.

The proposed change to condition 11 cannot be contrary to the objectives and policies within the regional policy statement. The rewording of condition 11 is only to enable the exercising of any separate discharge consent granted by the WCRC. Any subsequent discharge proposal would need to mitigate any potential adverse effects through the treatment and dilution of the discharged water, along with potentially a monitoring programme and ensure it is consistent with the objectives and policies of the regional policy statement.

10.3 Objectives and Policies of the Regional Land and Water Plan

3 - Natural and Human Use Values

- Objective 3.2.1 - To provide for the sustainable use and development of land and water resources.
- Objective 3.2.2 - To protect water bodies from inappropriate use and development by maintaining and where appropriate enhancing their natural and amenity values including natural character and the life supporting capacity of aquatic ecosystems.
- Policy 3.3.1 In the management of any activity involving water to give priority to avoiding, in preference to remedying or mitigating:
    - Adverse effects on:
        - The habitats of threatened species identified in Schedule 7A;
        - Water supply values identified in Schedule 7B;
        - Spiritual and cultural values and uses of significance to Poutini Ngäi Tahu identified in Schedule 7C;
        - The significant natural character of wetlands, and lakes and rivers and their margins;
        - Outstanding natural features and landscapes;
        - Significant indigenous vegetation and significant habitat of indigenous fauna assessed in accordance with Policy 9.2 of the West Coast Regional Policy Statement;
        - Existing public access to and along lakes and rivers;
        - Significant historic heritage;
    - Adverse effects which cause or exacerbate flooding, erosion, land instability, sedimentation or property damage;
    - Adverse effects on existing lawful uses including regionally significant infrastructure.
- Policy 3.3.7 - In the management of any activity involving water, to avoid, remedy, or mitigate adverse effects on:
    - Water quality;
    - Amenity values;
    - Indigenous biological diversity;
    - Intrinsic values of ecosystems;
    - The natural character of wetlands, and lakes and rivers and their margins, not described in 3.3.1(1)(d); and
    - Historic heritage not described in 3.3.1(1)(h).
- Policy 3.3.8 - To recognise Poutini Ngäi Tahu's interests by promoting opportunities for their involvement in resource consent processing.

10 – Groundwater

Objective 10.2.1 - To sustain existing uses of the West Coast's groundwater, by protecting water quantity and quality and avoiding depleting surface water flows.

14 - Solid Contaminants

- Objective 14.2 - To ensure that the adverse effects from the discharge of solid contaminants into or onto land, on water and soil quality, social, cultural and amenity values, and human health are avoided, remedied or mitigated.
- Policy 14.3 - To ensure that solid waste disposal facilities are sited, designed, constructed and managed to avoid, remedy, or mitigate any adverse effects on the environment

Comments:

It is recognised that groundwater is an important resource to many West Coast communities, where it serves a number of recognised uses, including domestic and public water supply, stock drinking water, irrigation and industrial uses. This water is largely accessed from shallow aquifers. High rainfall on the West Coast assists recharge of these aquifers. There is often a hydrological connection between surface water and groundwater. Furthermore, the effects of inappropriate land, water use and development on groundwater quantity and quality are often long term, and in some cases may be permanent.

The proposed change to condition 11 does not, in and of itself, enable the discharge of contaminants to groundwater or surface water outside of the application site. The only means by which such a discharge would be authorised is as a result of obtaining a separate discharge permit from the WCRC. That discharge consent will be assessed to determine whether it is contrary to the objectives and policies within Chapter 14. The rewording of condition 11 only enables the exercising of any separate discharge consent granted by the WCRC. Such a discharge proposal would need to demonstrate the mitigation of any potential adverse effects through the treatment and dilution of the discharged water, along with potentially a monitoring programme.

10.4 Summary

It is considered that the proposed discharge is appropriate in terms of the objectives and policies of the RPS and RLWRP.

11.0 Part 2 Matters

Section 5 of Part 2 identifies the purpose of the RMA as being the sustainable management of natural and physical resources. This means managing the use, development and protection of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being and health and safety while sustaining those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding, remedying or mitigating adverse effects on the environment.

Section 6 of the Act sets out a number of matters of national importance including (but not limited to) the protection of outstanding natural features and landscapes and historic heritage from inappropriate subdivision, use and development.

Section 7 identifies a number of "other matters" to be given particular regard by Council and includes (but is not limited to) Kaitiakitanga, the efficient use of natural and physical resources, the maintenance and enhancement of amenity values, and maintenance and enhancement of the quality of the environment.

Section 8 requires Council to take into account the principles of the Treaty of Waitangi.

Overall, as the proposal will have no adverse effects, and accords with the relevant RLWP objectives and policies, it is considered that the proposal will not offend against the general resource management principles set out in Part 2 of the Act.

12.0 Other Matters (Section 104(1)(C))

12.1 Record of Title Interests

The Record of Title for the site are subject to a number of interests (refer Appendix 1). None of these are anticipated to affect the resource consent application as discussed in Table 1 below:

Table 1: Record of Title interests

Interest	Comment
Land Covenant in Covenant Instrument 12630203.5	Relates to a no objection and support of activities and development on the application site.
12630203.3 Consent Notice pursuant to Section 221 Resource Management Act 1991	Relates to the following: • Site being used for either farming and landfill activities and not residential development. • Prior to the construction of any building, a minimum storage of 20,000l of water for fire-fighting purposes is required. • At the time of constructing any building development, a stormwater disposal system needs to be designed and consented. • Prior to the construction of a residential unit a sewage disposal system has to be designed and constructed. • At the time of subdivision, the site is not serviced by way of electricity or telecommunications.
12630203.2 Consent Notice pursuant to Section 221 Resource Management Act 1991	This relates to the NESCS on the application site. The NESCS is administered by the district council and is not applicable to this application.

12.2 Non-Statutory Documents

12.2.1 Paetae Kotahitanga ki Te Tai Poutini Partnership Protocol

This agreement is for a partnership between Council and iwi, however, as it informs the way in which Council make resource consent decisions, we have had regard to this. With regard to consent processing, the partnership document notes that the practice of granting retrospective consents for unlawful activities or breaches of consent conditions is not consistent with a Treaty partnership approach to resource management, as the ability of Poutini Ngāi Tahu to influence the

activity is greatly diminished, and undesirable consent holder/applicant behaviour is rewarded. In this case, Taylorville Resource Park has been operating for several years and is subject to existing regional and district consents. We are not aware of any previous objection by iwi to these applications or approvals.

The Partnership also states that Council will support the development of iwi management plans. These will inform the development of Council policies, planning frameworks and resource consent decisions. In this participation agreement the parties agree that acting in accordance with iwi management plans is a primary means by which a Treaty partnership approach to resource management can be achieved.

12.2.2 Iwi Management Plans

In addition to the Partnership Protocol, the RMA requires that Council take into account any relevant planning document recognised by an iwi authority and lodged with the council. There are two iwi management plans relevant to this application site, Te Rūnanga o Makaawhio Pounamu Management Plan and Ngāti Waewae Pounamu Resource Management Plan. These are considered below:

These iwi management plans address how Te Runanga o Ngāi Tahu can best look after pounamu allowing for on-going use and ensuring its sustainability for the future. This application relates to an existing Taylorville Resource Park and the iwi management plans are of limited specific relevance to the proposal. The iwi management plans require the use of accidental discovery protocol which will be adopted for the application site. Therefore, the application is considered to be consistent with the iwi management plans.

12.3 District Plans

12.3.1 Grey District Plan

Under the provisions of the Grey District Plan (GDP) the application site is located within the Rural Environmental Area. The rural environments of the Grey District contain extensive resources, including indigenous forest, exotic forest, farmland, minerals, rivers, lakes, buildings and infrastructure. They are all used to a greater or lesser extent to provide social, economic and cultural wellbeing of the community.

The proposed change to Condition 11 will have no impact on the provisions of the GDP.

12.3.2 Proposed Te Tai o Poutini Plan

The Proposed Te Tai o Poutini Plan (PTTPP) is the combined District Plan for the Buller, Grey and Westland District Councils. It will replace the current individual district plans. The PTTPP sets out the objectives, policies, rules and methods to manage land use activities and subdivision across the districts. The hearing on the PTTPP commenced in October 2023 and it is envisaged hearings will be held through to November 2024.

The application site is zoned 'General Rural' within the PTTPP, which recognises that rural land is an important resource as it underpins the social and economic well-being of the West Coast/Te Tai o Poutini. Furthermore, the rural area is a dynamic environment, influenced by changing farming practice and by a wide range of productive activities.

Under the PTTPP, the application site is not located within the following areas:

- Site of significance to Maori;
- Aotea Management Area;
- Contain any notable trees, Historic Heritage Items and Areas or Archaeological Areas; or

Furthermore, the application site is not subject to any hazard or risk overlays or any natural environment overlays.

The site is located within the 'Pounamu Management Area', which are meant to be given priority as areas of protection and 'Poutini Ngāi Tahu[2]' whānui access, including through the use of local planning instruments.

The proposed change to Condition 11 will have no impact on the provisions of the PTTPP.

13.0 Conclusion

The proposal involves an application for resource consent under s127 to change condition 11 of RC-2021-0097.

Based on the above report it is considered that:

- Public notification is not required as there are no adverse effects in relation to groundwater quality and quantity, surface water quality and mana whenua values as a result of the proposed change. There are, however, positive effects in terms of enabling consents that may be granted by WCRC.
- Limited notification is not required as there will be no adverse effects on any persons from the proposed change;
- The proposed change has no effect on the relevant RLWP objectives and policies; and
- The proposal is considered to be consistent with Part 2 of the Act.

It is therefore concluded that the proposal satisfies all matters the consent authority is required to assess, and that it can be granted on a non-notified basis.

[2] Means the members of the two Ngāī Tahu hapū from the West Coast/Tai o Poutini - Ngāti Waewae and Ngāti Mahaki.

Appendix 1

Record of Title

B&A

Urban & Environmental

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **1097679**

Land Registration District **Westland**

Date Issued 25 January 2023

Prior References

WS8A/1037 WS8A/1038 WS8B/1265
WS8B/1266

Estate Fee Simple

Area 19.3420 hectares more or less

Legal Description Lot 1-2 Deposited Plan 584105

Registered Owners

Taylorville Resource Park Limited

Interests

Subject to Section 8 Coal Mines Amendment Act 1950 (affects part Lot 1 DP 584105 formerly Lot 3 DP 2432)

Subject to Section 8 Atomic Energy Act 1945 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 3 Geothermal Energy Act 1953 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 3 Petroleum Act 1937 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 6 Mining Act 1971 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 8 Mining Act 1971 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934)

Subject to Section 5 Coal Mines Act 1979 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 261 Coal Mines Act 1979 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Part IV A Conservation Act 1987 (affects part Lot 1 DP 584105 formerly Section 1 SO 3934 and part Lot 2 DP 584105 formerly Section 1 SO 3935)

Subject to Section 241(2) Resource Management Act 1991 (affects DP 584105)

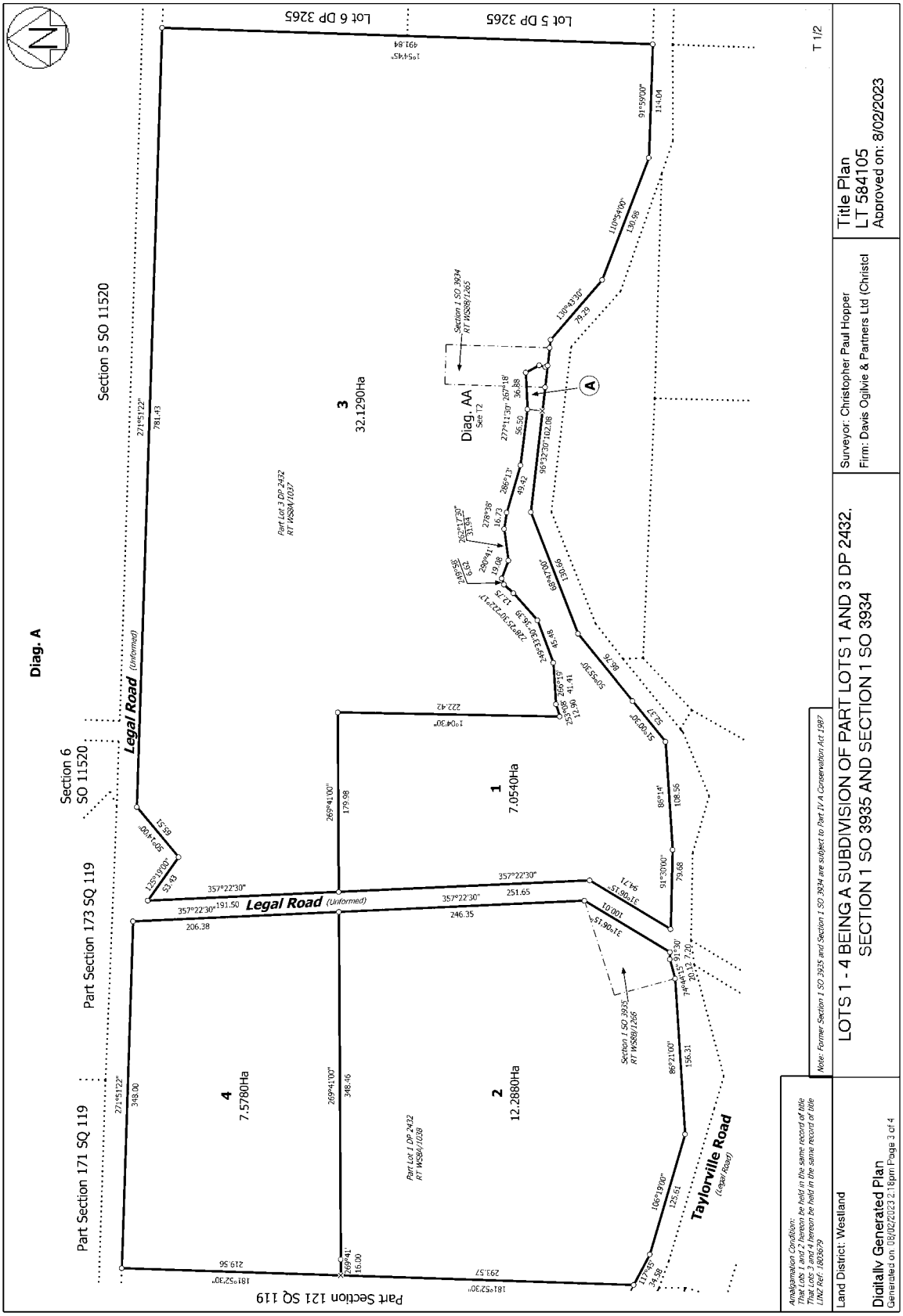
12630203.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 25.1.2023 at 8:27 am

12630203.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 25.1.2023 at 8:27 am

Subject to a right of way over part Lot 1 DP 584105 marked A on DP 584105 created by Easement Instrument 12630203.4 - 25.1.2023 at 8:27 am

The easements created by Easement Instrument 12630203.4 are subject to Section 243 (a) Resource Management Act 1991

Land Covenant in Covenant Instrument 12630203.5 - 25.1.2023 at 8:27 am


Lot 5 DP 3265
Lot 6 DP 3265
Part Section 121 SQ 119
Part Section 171 SQ 119
Part Section 173 SQ 119
Section 5 SO 11520
Section 6 SO 11520
Legal Road (Unformed)
Legal Road (Unformed)
Taylorville Road (Upper Road)
Diag. A
Diag. AA See T2
1 7.0540Ha
2 12.2880Ha
3 32.1290Ha
4 7.5780Ha
Part Lot 3 DP 2432 RT WS8A/1037
Part Lot 1 DP 2432 RT WS8A/1038
Section 1 SO 3934 RT WS29B/1265
Section 1 SO 3935 RT WS29B/1266
T 1/2
Title Plan LT 584105 Approved on: 8/02/2023
Surveyor: Christopher Paul Hopper
Firm: Davis Ogilvie & Partners Ltd (Christcl
LOTS 1 - 4 BEING A SUBDIVISION OF PART LOTS 1 AND 3 DP 2432, SECTION 1 SO 3935 AND SECTION 1 SO 3934
Note: Former Section 1 SO 3935 and Section 1 SO 3934 are subject to Part IV A Conservation Act 1987
Amalgamation Condition: That Lots 1 and 2 hereon be held in the same record of title That Lots 3 and 4 hereon be held in the same record of title LINZ Ref: 1803679
Land District: Westland
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Appendix 2

RC-2021-0097-V3

B&A

Urban & Environmental

RC-2021-0097-V3 Consent Conditions

(1) The deposition/discharge shall be carried out in general accordance with the details contained in the consent application and the applications to change or cancel consent conditions received 23 March 2022, and 4 July 2022 and 29 September 2022 submitted to the Consent Authority, except where inconsistent with these conditions.

(2) The Consent Holder shall supply any agent or contractor working under this consent with a copy of the consent.

(3) Any person working under this consent shall have a copy of the consent conditions on site and present it to an officer of the Consent Authority upon request.

(4) Any refuelling, lubrication or mechanical repairs shall be undertaken in such a manner so as to ensure that no spillages of hazardous substances onto the land surface or into water occur. If a fuel spillage in excess of 20 litres occurs, the Consent Holder shall inform the Consent Authority immediately.

(5) The Consent Holder shall only deposit fill material initially in the area outlined in red and labelled Dump Cells Stage 1,2,3 on the attached aerial photograph labelled Annexure 1 "RC-2021-0097 Application Area" or asbestos and coal tar or coal pitch only in the areas labelled Existing Lined ACM Cell and New Application Area Lined ACM Cell on the attached aerial photograph titled RC-2021-0097 Annexure 3. Variation September 2022. Should an "Expansion of Fill Area Report" be supplied to and approved by the Consent Authority then filling may occur within the wider area outlined in maroon on the attached aerial photograph.

(6) The "Expansion of Fill Area Report" required by Condition 5 shall contain the following as a minimum:-

- The location, size and approximate development time for any new cells to accept fill material;
- The base material present and the porosity of that material;
- How the leachate system will be extended into the new areas;
- Type and location of monitoring and sediment control for the new areas to be developed.

(7) The Consent Holder shall:

- Ensure all works are undertaken in such a manner so as to minimise soil erosion and to avoid slope instability;
- Ensure the works do not cause or exacerbate flooding of another person's property, erosion, land instability, sedimentation or property damage;
- Ensure that surface water is diverted around the fill site, as far as practicable.

(8) In addition to Condition 7, the Consent Holder shall install an appropriate sediment pond in the approximate location and constructed in the manner detailed in the attached annexure titled "Infrastructure Consultants Water Management Structure July 2021".

(9) Only demolition waste (including clean fill) and whole or shredded tyres, but not including the disposal of asbestos or other hazardous materials may be disposed of in the location

identified in Annexure 1. Asbestos and other hazardous materials approved by the Consent Authority can only be disposed of in the dedicated, lined cells identified in Annexure 3.

(10) The volume of deposited demolition waste shall not exceed a maximum volume of 30,000m_3 per calendar year.

(11) The Consent Holder shall ensure that there is no contamination of groundwater or surface water outside of the site (Secs 1-3 5-6 Pt Secs 4 & 8 SO 11520 Sec 1 SO 3935 Sec 1 SO 3934 Lots 1 3 DP 2432 Lots 1-5 DP 3265) as a result of the exercise of this consent.

(12) Notwithstanding Condition 11 the Consent Holder shall install and maintain a groundwater monitoring bore in the approximate location identified in the annexure title "Infrastructure Consultants Water Management Structure July 2021" and attached to this consent. The Consent Holder shall monitor that groundwater bore annually for the following parameters:

- Groundwater level
- pH
- Turbidity
- Conductivity
- BOD
- Nitrate Nitrogen
- Ammoniacal Nitrogen
- Chloride
- Manganese
- Zinc (total)
- Iron
- Chromium IV (total)
- Copper (total)
- Lead (total)
- Arsenic (total)
- Aluminium (total)
- Cadmium (total)
- Mercury (total)
- Benzo(A)pyrene

(13) The Consent Holder shall conduct annual surface water monitoring at the locations identified on the annexure titled "Sewell Peak Farm Sampling Areas June 2021 – For Infrastructure Consultants" and attached to these consents. The Consent Holder shall monitor for the following parameters:

- pH
- Conductivity

- Turbidity
- Dissolved oxygen
- BOD
- Nitrate Nitrogen
- Ammoniacal Nitrogen
- Chloride
- Dissolved reactive phosphorus
- Zinc
- Chromium
- Arsenic
- Lead
- Aluminium
- Manganese

(14) Macroinvertebrate monitoring shall be undertaken at the request of the Consent Authority.

(15) When material is received for deposition onsite:

- The volume of all material shall be recorded before deposition;
- For each load, delivery documentation shall include confirmation that the material is consistent with what is consented;
- The delivery documentation shall clearly identify:
  - The contractor delivering the material;
  - The physical address of the original source of the material;
  - That the material is not contaminated.

(16) The Consent Holder shall undertake an inspection of the site and the material which has been deposited at least once every 30 days or before any deposited material is covered, whichever is the lesser. Confirmation that the material deposited is consistent with what is consented is to be documented for each inspection undertaken.

(17) Should the inspection undertaken in accordance with Condition 16 indicate materials deposited on site are not consistent with what is consented, these should be removed from the site immediately and deposited at an appropriate facility that is authorised to receive such material and the actions recorded.

(18) All documentation and information recorded regarding consented materials delivered to the consent holder's site, and regarding site inspections, is to be retained by the Consent Holder and provided in an electronic format to the Consent Authority on request.

(19) The management on site shall include:

- The site shall be surrounded by fencing and lockable gates to prevent, as far as practicable, the unauthorised deposition of material;

- All entrances to the site shall be securely locked when the site is not supervised unless monitored in a way that can identify responsibility for any deposition/discharge that is contrary to these consent conditions.
- Notwithstanding Condition 19 b) all entrances to the site shall be securely locked at the completion of each day's deposition/discharge activities.

(20) The Consent Holder shall compile and supply the Consent Authority with an annual monitoring report at intervals no greater than 12 months. As a minimum the report shall include the following information:

- A summary of all monitoring results obtained in accordance with the conditions of these consents supported by analysis and discussion by a suitably qualified person;
- The effectiveness of any treatment method in meeting the compliance limits of the consents;
- The environmental implications of any significant trends in monitoring data gathered with respect to the consented activities;
- Any incidences or problems experienced with achieving consent compliance;
- The summary of any complaints received and any mitigation measures that were adopted;
- Any maintenance works needed, proposed or that have been undertaken to ensure compliance with consent conditions;
- (g) Any modifications to more effectively control the quality of the discharge; and
- (h) Adverse effects from the discharge and the steps taken or proposed to be taken to
- correct or mitigate these effects.

(21) At the completion of filling activities the fill material shall be compacted, covered with a suitable growing medium and grassed, as soon as practicable.

(22) Pursuant to Section 128 of the Resource Management Act 1991, the Consent Authority may review the conditions of this consent by serving notice within a one month period of each anniversary of the date of commencement of the consent for any of the following purposes:

- To deal with any adverse effect on the environment which may arise from the exercise of this consent and which it is appropriate to deal with at a later stage.
- To require the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment.