OIR: 2324/801

11 March 2024

[redacted]

Tēnā koe [redacted]

Request for Information under the Local Government Official Information and Meetings Act 1987 (the Act) (the LGOIMA)

Thank you for your email of **10 February 2024** requesting the following information:

Could you please provide consents relating to any stockpiling or activities resulting in stockpiling at the closed landfill site at Otaihanga outside of Composting NZ lease area.

Council holds a consent [WGN060027] for permanent disposal of cleanfill material on the Otaihanga Landfill, however this activity is not currently taking place. The Consent is attached for reference as *Attachment 1.*

Most material stockpiled around the Otaihanga Landfill is temporary. "Temporary" material for diversion is defined by Ministry for the Environment as follows:

"Gross waste must be processed in one of the following ways within six months of receipt at your disposal facility:
• reused or recycled, or
• recovered or treated on the land and removed from the land for deposit elsewhere, or
• removed from the land for any other reason"

If a material is accepted for recycling or reuse this must be completed within 6 months of acceptance, or it triggers the obligation to pay the Waste Levy on the relevant tonnages.

Peat Stockpile:

Extraction of the material referred to as the "Peat Stockpile" was included in the M2PP Expressway construction consents by NZTA. This material was accepted to the Otaihanga Landfill under the *Landfill Management Plan (2015)* to topsoil completed areas of capping as outlined in **Section10.1** A*ttachment 2:*

Final Landfill Cap

The final landfill cap comprises (from top to bottom) the following:
a) A topsoil layer at least 150 mm thick that is capable of sustaining plant growth.

Mills Albert Gravel:

The material in the area referred to as Mills Albert Gravel is the result of a GWRC consent and is temporarily stockpiled to be reused in other projects. This consent is not owned by Council and is unable to be provided at this stage.

Mills Albert Lease Area:

Material on the area referred to as the Mills Albert Lease Area is covered in the Amohia Stormwater works consent (*Attachment 3*) and is temporarily stockpiled until it can be reused in other projects.

Also within this lease area are small quantities of asphalt/bitumen which are consolidated before being sent for recycling.

Transfer Station Cleanfill:

The Otaihanga Transfer Station receives small non-commercial cleanfill loads which is stockpiled then reused around the landfill for capping remediation. This stockpile is cleared every 2-3 months.

List of attachments with this letter:

- Attachment 1: Cleanfill Consent [WGN060027]
- Attachment 2: Landfill Management Plan (2015)
- Attachment 3: Amohia Stormwater Consent

Ngā mihi,

Sean Mallon
Group Manager Infrastructure and Asset Management
Te Kaihautū Ratonga Pakiaka

Quality for Life

greater WELLINGTON
REGIONAL COUNCIL

Resource Consent

RESOURCE MANAGEMENT ACT 1991

Consent No. WGN060027 [32326]
Change of condition 7

Category: Discharge Permit

Pursuant to sections 104B, 105, 108 and 127, and subject to all the relevant provisions of the Resource Management Act 1991 and any regulations made thereunder, a consent in respect of a natural resource is hereby granted to:

Name	Kapiti Coast District Council	
Address	Private Bag 60601, Paraparaumu 5254	
Term of consent	Effective: 31 August 2005	Expires: 31 August 2040
Purpose for which right is granted	Discharge permit to discharge contaminants to air from the operation of a cleanfill	
Location	Otaihanga Landfill, Otaihanga Road, Otaihanga at or about map reference NZMS 260:R26;803.327	
Legal description of land	Pt Lot 2 DP 2241	
Conditions	1-13 as attached	

For and on behalf of
WELLINGTON REGIONAL COUNCIL

Manager, Consents Management

Date: 26 / 8 / 2013.

Summary of your rights and responsibilities

(Not part of the resource consent)

This resource consent gives you the right to use a public resource (e.g. water, air, the coastal marine area) in the manner specified in the consent.

You may exercise the resource consent as you see fit provided that you comply with all the conditions of your resource consent and all other laws of the land.

If you wish to change the way you operate under this resource consent or if you wish to change or cancel any consent conditions, please contact the Wellington Regional Council (hereafter referred to as Greater Wellington) prior to making the changes. You may need a formal change to your resource consent conditions.

You may transfer your coastal, discharge, or water permit to any other person. If you sell your operation please contact Greater Wellington and we will arrange the transfer. The service is free of charge.

If your resource consent application contained inaccurate or misleading information, Greater Wellington may cancel or alter the resource consent.

Your resource consent does not:

- provide any warranty of any structure or process;
- provide any guarantee that the resource will be available at all times;
- provide any right of access through or over public or private land;
- negate the need for any approvals necessary under other legislation.

You, as the holder(s) of this resource consent and your agents (including contractors and employees), are jointly and severally liable for compliance with the conditions of this consent. It is important that anyone operating on your behalf fully understands and complies with the conditions of the resource consent.

You are required to pay any relevant charges that are associated with the consent. Greater Wellington fixes these charges under section 36 of the Resource Management Act 1991. The Act allows you to comment on any proposed charges *prior to them being fixed*. Charges may be reviewed every year. If you would like a copy of our current Resource Management Charging Policy please ask us.

You are required to allow Greater Wellington Enforcement Officers access to your site and operation at any reasonable time so that we can inspect your operation and confirm that it is complying with the resource consent.

Your resource consent will lapse if you do not give effect to it within five years of the date it was granted (unless otherwise specified in the resource consent conditions). If you wish to apply for an extension of this lapse date please contact Greater Wellington before the lapse date.

If you stop using your resource consent for a continuous five-year period, Greater Wellington may cancel your resource consent. We will advise you in advance if we propose to cancel your consent. You have the right to object to your consent being cancelled.

This consent is issued without prejudice to any claim that is lodged with the Waitangi Tribunal in relation to the customary ownership of natural resources, whether it be a claim that is awaiting hearing or awaiting settlement by the Crown.

Conditions to Resource Consent WGN060027 [32326]

(1) The location, design, implementation and operation of the works shall be in accordance with the consent application and its associated plans and documents lodged with the Wellington Regional Council on 11 August 2005, and the additional information received by email on 19 August 2005.

(2) The permit holder shall pass a copy of this consent including any relevant site plans and attachments to the operator undertaking the works.

(3) Only material such as clay, soil, glass, rock, concrete, weathered (cured) asphalt or brick that are free of combustible or putrescible components or hazardous substances or materials likely to create a hazardous leachate by means of biological breakdown, shall be deposited within the cleanfill site.

Materials considered to meet the above definition are outlined in Table 4.1 of the publication A Guide to the Management of Cleanfills by Ministry for the Environment (2002).

(4) Reinforcing steel may only be deposited within the cleanfill site provided it is fully encased in intact concrete and provided that protruding reinforcing steel is cut off at the concrete face.

(5) The permit holder shall ensure that there shall be no discharges to air resulting from the exercise of this permit that are noxious, dangerous, offensive or objectionable at or beyond the legal boundary of the property where the activity is to be carried out, being Pt Lot 2 DP 2241.

(6) All work areas associated with the operation of the cleanfill are to be managed in such a way as to keep fugitive dust emissions to a minimum. This shall include, but not be limited to wetting unsealed areas with sufficient water as required.

(7)[1] The consent holder shall prepare and submit a final Landfill Management Plan to the Manager, Environmental Regulation, Wellington Regional Council by 30 September 2013 for approval.

The consent holder shall ensure the operation of the Otaihanga Landfill is in accordance with the Operative Otaihanga Landfill Management Plan which shall include but not be limited to:

- The management of leachate discharges
- Stormwater diversions
- The final capping layer for the landfill, and
- The final landfill design

No changes shall be made to the Landfill Management Plan or the way in which the Landfill is operated until the consent holder has received written notification that the Landfill Management Plan is to the satisfaction of the Manager, Environmental Regulation, Wellington Regional Council.

(8) Upon achieving the desired completion levels cleanfilled areas shall be topsoiled and planted upon completion. The topsoil shall be of sufficient depth such that no concrete or other rubble is visible. Vegetation shall be established as soon as practical after topsoiling.

(9) The permit holder shall record details of each load of material that is deposited within the cleanfill, including:

(a) the date and time of receipt of the material at the cleanfill site;

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[1] Condition changed under section 127 of the Act. granted 26 August 2013

26/2/13.

(b) quantity;

(c) source;

(d) description of material deposited (e.g. soil, concrete, bricks);

(e) name of the contractor depositing the material;

A summary of this information shall be forwarded to the Manager, Consents Management, Wellington Regional Council at periods ending 31 March and 30 September each year, and shall be made available for inspection when requested.

(10) The permit holder shall keep a permanent record of any complaints received alleging adverse effects from the permit holder's operations. The complaints record shall contain the following where practicable:

(a) the name and address of the complainant, if supplied;

(b) identification of the nature of the complaint;

(c) date and time of the complaint and alleged event;

(d) weather conditions at the time of the alleged event;

(e) results of the permit holder's investigations; and,

(f) any mitigation measures adopted.

The complaints' record shall be made available to the Wellington Regional Council on request.

The permit holder shall notify the Manager, Consents Management, Wellington Regional Council, of any complaints received, which relate to the exercise of this permit, within 24 hours of being received, or the next working day.

(11) The permit holder shall keep a record of any incident that has or could have resulted in a condition of this permit being contravened. The incident record shall be made available to the Wellington Regional Council upon request.

The permit holder shall notify the Manager, Consents Management, Wellington Regional Council of any such incident, within twenty four hours of the incident being brought to the attention of the permit holder, or the next working day.

(12) The Wellington Regional Council may review any or all conditions of this permit by giving notice of its intention to do so pursuant to section 128 of the Resource Management Act 1991, at any time within three months of the first, third, fifth, tenth and fifteenth anniversaries of the date of the granting of this permit for any of the following purposes:

(a) To deal with any adverse effects on the environment which may arise from the exercise of this permit, and which are appropriate to deal with at a later stage.

(b) To review the adequacy of any plans and/or monitoring requirements prepared in relation to closure of the landfill so as to incorporate into the permit any modification which may become necessary to deal with any adverse effects on the environment arising from the exercise of this permit.

(13) The Wellington Regional Council shall be entitled to recover from the permit holder the actual and reasonable costs of the conduct of any review, calculated in accordance with, and limited to, that council's scale of charges in-force and applicable at that time pursuant to Section 36 of the Resource Management Act 1991.

26/2/13.

Otaihanga Landfill Management Plan

OTAIHANGA LANDFILL, KĀPITI COAST DISTRICT COUNCIL

- Revision - Final
- September 2015

Kāpiti Coast
DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Contents

Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
Draft A	19/04/2013	N Conland	Walter Starke	19/04/2013	Draft- for Client review
Draft B	26/08/2013	N Conland	Walter Starke	26/08/2013	Draft- revision 2- for Client review
Draft C	04/12/2013	N Conland	Walter Starke	04/12/2013	Draft- revision 3- for Client review- no appendices
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Draft E	20/02/2014				Draft- revision 5- for Client Review- no appendices
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Rev.3 – Final	May – August 2015	N. Itjeshorst (Council)	Sean Mallon		Revision updating the plan since submission in March 2014 – operational changes
Rev. 4- Final	Sep 2015	N. Itjeshorst (Council)	Walter Starke (author)		Update landfill gas management & monitoring

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A	1	1	Nienke Itjeshorst- Solid Waste Manager, Kāpiti Coast District Council, via email
B	1	1	Nienke Itjeshorst- Solid Waste Manager, Kāpiti Coast District Council, via email
C	1	1	Nienke Itjeshorst- Solid Waste Manager, Kāpiti Coast District Council, via email- no appendices
D	2	1	Nic Conland- SKM Wellington Nienke Itjeshorst- Solid Waste Manager, Kāpiti Coast District Council, via email- no appendices
E	1	1	Nienke Itjeshorst- Solid Waste Manager, Kāpiti Coast District Council, via email- no appendices
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1. Introduction

1.1. Purpose

The purpose of the Otaihanga Landfill Management Plan (LMP 2014) is to provide Kāpiti Coast District Council (COUNCIL), the landfill owner and operator, with a good practice document that contains operational and management procedures to minimise environmental risks and meet the existing resource consent conditions. It supersedes the existing LMP that was prepared in 1994 (Royds, 1994).

The LMP 2015 has been prepared in general accordance with the New Zealand document *Landfill Guidelines* prepared by the Centre for Advanced Engineering (CAE, 2000).

It is a living document which is meant to be updated to reflect procedural changes as necessary, as well as being reviewed at regular intervals.

A first revision has been carried out in May 2015, to reflect operational decision making since the plan was submitted for review in March 2014.

A second revision (rev. 4, this LMP) has been made primarily to describe the landfill gas (LFG) management and monitoring as discussed with GWRC in the period May to August 2015.

1.2. Summary of Reasons for Updating the LMP

A summary of the reasons of updating the existing LMP are as follows:

a) The landfill operations have significantly changed since 1994 when the landfill still accepted municipal solid waste (household refuse) and other waste streams. Since 2007 the landfill has accepted mainly cleanfill with limited amount of specified wastes such as dried biosolids from the adjacent COUNCIL operated wastewater treatment plant (Paraparaumu Sewerage Treatment Plant).

b) Some of the resource consent specified environmental monitoring locations are either obsolete or inadequate due to the increase in landfill footprint (compared to the 1994 landfill footprint).

c) Areas within the landfill footprint are used by third parties, for example, a commercial composting operation leases the south-eastern area of the landfill land.

d) The construction of the New Zealand Transport Agency (NZTA) MacKays to Peka-Peka (M2PP) Expressway located immediately west of the landfill (and located within the western wetland).

e) A construction yard for NZTA's M2PP Expressway has been located on the northern part of the landfill since December 2013.

f) A large M2PP Pre-Cast Construction Yard is located in the south-western part of the landfill (but outside the landfill footprint).

g) COUNCIL proposes to provide an improved and engineered final landfill cap for long term after-closure management of environmental discharges.

Further details for the reasons to update the LMP are presented in the sections below.

1.3. Background

1.3.1. History

Otaihanga Landfill is currently designated in the Kāpiti Coast District Plan, under map reference D1119. Its shared purpose with all COUNCIL designations is the "*development and operation of facilities and activities for which the District COUNCIL has financial responsibility*".

The landfill started accepting municipal solid waste from much of the Kāpiti Coast District in the 1970s. Waste was placed directly onto the ground with few environmental controls such as the construction of base and sidewall clay liners (to contain leachate) prior to refuse placement. The absence of landfill liners and leachate collection/management was not unusual in the 1970s.

In 1994, Greater Wellington Regional Council (GWRC) granted a number of resource consents formalising the environmental discharges from the landfill. One of the recurring consent conditions requires *that "The location, design, construction and operation of the Otaihanga Landfill shall be as generally described in… Management Plan Otaihanga Landfill and Compost Management Plan."* We understand that the management plan referenced in the consent conditions is the Management Plan for the Otaihanga Landfill prepared in June 1994 (Royds, 1994). In terms of the composting aspect of the LMP, the 1994 LMP states that *"The composting area and operation will be subject to a separate management plan."*

The 1994 LMP was prepared at a time when the landfill was still accepting household waste from the general public. This practice was stopped in around 2007 and since that time the landfill has only accepted limited amounts of COUNCIL generated wastes, such as dried biosolids.

1.3.2. Changes to Height and Monitoring System

Two other significant changes have been proposed since the 1994 LMP; the environmental monitoring system and future final height of the landfill. While it was considered appropriate in 1994, the leachate monitoring system is no longer deemed adequate for assessing the environmental discharges from the landfill.

The future final height of the landfill was not specifically referenced in the resource consent conditions of the 1994 consents; however there was a reference to Relative Level (RL) 16 m in the 1994 LMP. This level has been inadvertently overfilled and the current average landfill height is approximately RL 17 m.

Two additional factors have resulted in a requirement for an increased height limit. Firstly, it is proposed to provide an engineered landfill cap and shape the final landfill in accordance with contemporary good practice guidelines, in order to minimise future landfill discharges and stormwater run-off. Secondly, it would not be optimum operational practice to open up previously filled areas in order to lower the current height (in certain places).

Consequently, an application was made to GWRC to change some of existing resource consent conditions. This is further described in Section 1.4 below.

1.3.3. Update to 1994 Landfill Management Plan

In order to ensure the appropriate and consistent operation of the landfill, COUNCIL considered that an updated LMP was required to take the changes (in waste streams, monitoring system, and the future height) fully into account. Sinclair Knight Merz Limited (SKM), now Jacobs New Zealand Limited (Jacobs), was consequently engaged by COUNCIL to prepare the updated LMP in July 2012 to reflect the changes in operation and activities undertaken at the site. During 2014 further operational decision making has led to a further update of the LMP that was submitted to GWRC in March 2014.

1.4. Existing Resource Consents

The Otaihanga landfill operates under seven existing resource consents granted by GWRC in May 1994 and an additional cleanfill consent granted in August 2005. A summary of these seven consents is presented in Table 1 below.

In December 2012 SKM, on behalf of COUNCIL, submitted a variation to the existing resource consent to allow for a change in the final height of the landfill and an improved leachate, stormwater and groundwater monitoring regime. GWRC approved the application in August 2013 by way of changing and/or removing consent conditions in the exiting eight resource consents.

Appendix A contains a copy of the August 2013 GWRC approved resource consent.**Table 1: Otaihanga Landfill Resource Consents held by COUNCIL**

Item	Consent No.	Purpose	Issued	Expiry
1	WGN 930177(01) [2341]	Discharge contaminants to land for the purposes of Landfilling municipal solid wastes and composting	May 1994, Variation granted Feb 2000 and August 2013	Jun 2029
2	WGN 930177(02) [1371]	To discharge landfill and compost gases to air from the Otaihanga Landfill	May 1994	Jun 2029
3	WGN 930177(03) [2342]	To discharge contaminants to groundwater, namely leachate from the landfill and compost operations	May 1994	Jun 2029
4	WGN 930177(04)	To divert stormwater from around Otaihanga Landfill	May 1994	Jun 2029
5	WGN 930177(05) [2343]	To discharge stormwater diverted from around the Otaihanga Landfill	May 1994	Jun 2029
6	WGN 930177 (07)	To take groundwater affected by leachate for treatment and monitoring as required	May 1994	Jun 2029
7	WGN 060027 [24657](01)	To discharge contaminants to air from the operation of a cleanfill (granted in August 2005, expiry of consent 31st August 2040	Aug 2005	Aug 2040

2. Site Description

The Otaihanga landfill site is located between Paraparaumu and State Highway 1 with approximate grid coordinates 5,471,000 m North and 1,770,700 m East.

Kāpiti Coast District Plan classifies the site in the Rural Zone and designated for general purposes. The natural environment of the landfill site is low lying wetland.

The site address is 160 Otaihanga Road and the landfill is accessed via Otaihanga Road.

The landfill footprint is approximately 24 hectares (ha) and is bounded by the following:

a) North: the Otaihanga Resource Recovery Facility (ORRF), operated by Mid-West Disposals Ltd. This facility processes waste including recycling from the Kāpiti area. Beyond the ORRF is Otaihanga Road.

b) East: the Eastern Mazengarb Drain and immediately beyond that the North Island Main Trunk railway line. In the north-east there is a dog training area used by local community groups.

c) South: the southern wetland, sand dunes with pine trees. Further south and south-east the COUNCIL operated wastewater treatment plant (WWTP), namely, the Paraparaumu Sewerage Treatment Plant, and further south again residential properties located on Waterstone Avenue.

d) West: (the remainder of) the Western landfill treatment wetlands and the MacKay's to Peka Peka Expressway. Beyond this residential properties/lifestyle blocks located around Killalea Place.

Appendix B contains site plans illustrating the existing LIDAR topography, location of wetlands, etc. Appendix D provides a site plan showing the approximate footprint of the proposed M2PP Expressway.

2.1. Land Uses on Landfill Site

2.1.1. Within the Landfill Footprint

A description of the land uses within the 24 ha landfill footprint is as follows:

a) 15.2 ha (Main Landfill Area): The main landfill area and located in the central, western and south-western part of the site. The main landfill area is relatively level with an approximate average RL 17 m. There are three key activities within this area:

   i. Storage of capping and composting materials (topsoils; gravels and clay) in a dedicated zones (2.3 ha or 15% of main landfill area)

   ii. Active biosolids and cleanfill l drop off area (0.8 Ha or 5% of main landfill area) (to be terminated in September/October 21015

   iii. The biosolids composting trial (Biobagga) area – an area where the final cap has been constructed to accommodate the composting of biosolids in agricultural bags

b) 4.5 ha (CNZ): Composting New Zealand's composting operation site. They occupy the southern to south-eastern area of the landfill site where the average height is approximately RL 10 m. CNZ has a lease to occupy the land until 2022 and is leasing additional land on a year to year basis (1 to 1.5 ha of the main landfill area, see item a) above).

c) 2 ha (M2PP Construction Yard): A construction yard for the M2P Expressway has been constructed by New Zealand Transport Agency (NZTA) in late 2012. It is located in the northern part of the landfill footprint. This part of the landfill has an average height of approximately RL 9 m. It is anticipated that the construction yard will be used for a period of 5-7 years.

A site plan showing these three areas is presented in Appendix C. (updated May 2015)

CNZ has been on the site since 1999 with permission from COUNCIL to operate an open air composting and mulching operation. This has more than 12 windrows of composting and rejects material. The area has a stormwater (leachate) treatment pond designed to collect the runoff from the upper section of the compost business and treat in a pond. The pond has a float operated pump discharging to the wetland at the southern end of the site.

CNZ also has permission from COUNCIL to operate a firewood milling and sales business to manage the oversize wood waste which is delivered to them. This area is located on the southern part of the main landfill area and is on a capped section of the fill and former dune ridge.

2.1.2. Outside the Landfill Footprint

The ORRF is located north of the landfill footprint but within the overall landfill site boundary and is operated by Midwest Ltd. Midwest has a 15 year lease with end date 2023.
A stormwater pond is located immediately north of the landfill footprint, to the south of Otaihanga Road and west of the ORRF. This pond was constructed as a stormwater pond for the run off of the ORRF during its construction. The pond was lined with clay.

The M2PP Pre-Cast Construction Yard is located west of the landfill (see site plan contained in Appendix B).

2.2. Staging of Landfill Operations

Staging of landfilling operations has been identified in the NZ landfill guidelines (CAE, 2000) as an important factor since large open operational landfill areas or 'working faces' would allow rainfall to come into contact with the refuse and thus create landfill leachate.

For the Otaihanga landfill the staging process is less important for two main reasons:

a) The landfill has not accepted municipal solid waste since 2007 and has since than it only accepted a limited amount of COUNCIL generated dried biosolids; screenings and cleanfill on a day to day basis. Wet sludge has been accepted in emergencies for the last and final time in August 2014, when the drier at the WWTP was not operational. The biosolids are immediately covered with cleanfill, thus limiting the amount for future leachate generation. The decision was made during the 14/15 financial year to stop landfilling dried biosolids and screenings in the early 15/16 year. The landfill remains open for the acceptance of cleanfill that meets the capping criteria. This cleanfill will not be landfilled (buried). A site

plan showing the disposal location for the dried biosolids is contained in Appendix B (updated July 2015)
The landfilling of dried biosolids has stopped end September 2015 due to the start of the Biobagga Trial (see Section 5.1.2).

b) The remainder part of the landfill surface contains a cover layer that can be considered a temporary cap thus limiting the amount of surface water and rainfall coming into contact with the underlying refuse.

The proposed final landfill capping works will essentially be undertaken when budget and capping materials are available. Details about the proposed capping works are described in Section 10 of this LMP.

2.3. Operational Timeframe

The operational timeframe of the landfill, in terms of accepting limited amount of COUNCIL generated dried biosolids, will end early in the 15/16 year (see Section 5.1.2). This is before the resource consents of the landfill will expire, which is in 2029 as discussed in Section 1.4. Acceptance of cleanfill will continue as the cleanfill is used for shaping and capping of the landfill.

It is likely that in the future after landfill capping is complete, the capped site will be used for (continued) waste regeneration/recovery/recycling activities and/or for recreation activities; however more precise details will be determined before applying for consent for the closure of the landfill (see Section 10).

The consent for the landfill requires regular compliance reporting and annual inspections. The outcomes and actions from these regulatory activities will inform decisions for ongoing management of the landfill.

3. Landfill Management

3.1. Site Owner and Operator

The landfill site is owned by COUNCIL and operated on behalf of COUNCIL by a landfill contractor who is responsible for the day to day operation. COUNCIL is responsible for the overall operation (long term and short term) of the landfill, via the COUNCIL Solid Waste Services Manager (SWSM).

The landfill contractor is appointed on an annual contract. The current landfill contractor is CNZ. The landfill contractor's operation is based on the landfill site so the contractor is present at all times. On average about 15 to 20 hours a week is used for operational and maintenance work on site under the contract.

3.2. Landfill Operations Contract

The current Landfill Operations Contract can be extended on an annual basis up to 1 July 2017. As long as biosolids and cleanfill are accepted in the landfill there will be an operational contract in place for a (limited) number of hours per week.

3.3. Right of Access

There are three permanent roads providing access to the landfill:

a) Via the ORRF, i.e. the western-most access off Otaihanga Road.

b) Via CNZ, used by greenwaste drop off customers, CNZ staff and contractors, i.e. the eastern-most access off Otaihanga Road.

c) Via the WWTP, used by COUNCIL and their contractors only, for the COUNCIL generated wastes such as the dried biosolids

There are two temporary access ways onto the landfill in connection with the construction of the M2PP Expressway:

a) Access from the fenced M2PP construction yard onto the landfill.

b) Access from the expressway designation onto the landfill site, constructed for temporary use for removal of trees and transport of mulch into the designation.

These access roads are shown on a site plan contained in Appendix D.

The public can dispose of cleanfill at the Otaihanga Landfill via the ORRF where they have to enter via the ORRF weighbridge. After payment they are directed by kiosk staff or the Landfill Operator to the landfill area where they can drop off cleanfill. This prevents unauthorised vehicle entry to the landfill.

Currently large quantities of cleanfill materials that meet the capping material criteria are accepted for free if pre-approved for that purpose by the Solid Waste Services Manager (SWSM). Users that have been pre-approved are listed in a register maintained by the SWS Manager. Small quantities of cleanfill or cleanfill that does not meet the capping material criteria, is accepted at a COUNCIL set cleanfill gate fee and dropped off at the current fill area.

The landfill internal roads have been metalled/gravelled and are maintained in good condition by the landfill operator and CNZ. Metalled ground cover on the vehicle turning area shall be maintained by the landfill operator.

All incoming vehicles will at all times be required to report to the weighbridge or reception office before proceeding further to waste reception or working areas.

3.4. Operating Hours

The site is supervised during opening hours of the ORRF which are between 8am and 5pm Monday to Saturday and between 9am and 5pm on Sundays and Public Holidays. The site is closed on Good Friday and Christmas Day.

The CNZ site has independent, monitored access to the landfill and similar operating hours.

There is also independent internal access from the WWTP facility and Council's Operations site onto the landfill site. There is no unauthorised access onto the WWTP facility.

3.5. Training

Management and operating personnel must be familiar with the landfill facilities, operational practices, the status of site activities, and resource consent conditions. As a minimum, staff training should ensure that:

a) Staff who that inspect or direct the placement of incoming clean fill are capable of accurate data recording and skilled at identifying wastes that are unacceptable.

b) All staff are familiar with site safety practices and procedures.

c) ORRF staff training is a responsibility of the ORRF operator under the contract with COUNCIL and under Health & Safety requirements that the Operator is required to meet as an employer. COUNCIL monitors that the Operator adheres to its obligations on an on-going basis. Staff is familiar with site emergency procedures and copies of these procedures are displayed on the site.

d) Landfill operator staff training is a responsibility of the Landfill operator under the contract with COUNCIL. The site emergency procedures form part of the Health and Safety for the Site that the Operator was required to provide. This is monitored by COUNCIL under the contract. Section 9 provides further details on the landfill's Health & Safety requirements.

e) Documentation of all training is made available to COUNCIL by the landfill operator.

3.6. Occupational Safety and Health

The landfill operator will comply with the regulations under the Health and Safety in Employment Act 1992. On 13 December 2014 COUNCIL has adopted a Contractor's Health and Safety Policy. This policy introduces an approved contractor register, in which contractors are registered that have been assessed by COUNCIL, following due diligence, to be health and safety competent. For the Otaihanga Landfill Operation Contract, registration as an A-grade contractor (potential high risk contracts) is required. CNZ has been registered as an A-grade contractor before the current contract commenced on 1 July 2014. Their H&S procedures will be reviewed annually by the SWSM to ensure A-grade as part of the annual review for extension of the contract. The

operations contract lists the hazards on site and requires the operator to submit a site specific health and safety plan. This plan addresses:

a) The identification of hazards present on the site. Examples include traffic (including landfill compaction equipment), landfill gas (LFG), potentially hazardous refuse (biosolids), steep and uneven terrain.

b) Hazard control, including elimination of the hazard where possible, isolation where elimination is not practicable or not complete, or minimisation (including use of personal protective equipment) where elimination and isolation are not practicable.

c) The provision of information concerning identified hazards, control procedures, and possible emergency occurrences to employees engaged on the site.

d) Appropriate training and supervision of employees at the site, including provision and use of safety equipment.

e) Recording, reporting and investigation of accidents.

3.7. Review and Reporting

This management plan is a flexible document and should be adjusted to reflect procedural changes in landfill management, operational techniques, and community expectations as required.

An operational review should be undertaken every five years or on a shorter timeframe when deemed appropriate. The review undertaken in August/ September 2015 was deemed appropriate because of the operational changes since the draft was first submitted in March 2014 and because of the amended LFG management and monitoring discussed and agreed with GWRC (discussed further in Section 8.4). The next review shall be undertaken in 2020.

4. Landfill Operations

4.1. Site Preparation

4.1.1. Signs

Signs advising of the tipping hours and other information are prominently displayed at the Otaihanga Road entrance and on the weighbridge/kiosk fees board. The entrance road towards the tipping area shall continue to be sign-posted and the following information shall be discernible at all times:

a) Contact details for the owner and operator, including an emergency contact number(s) for the facility operator.

b) Hazards and Safety rules on the site.

c) Other advisory signs are in place to direct users to the tipping area.

4.1.2. Screens

For safety reasons the screen of trees parallel to the railway line at the south east end of the landfill (CNZ site) has been largely removed in 2014. A soil bund has been constructed and has been planted in July 2015. Large trees remain at the north end parallel to the railway line, reducing visibility of the site from State Highway 1.

On the northern side alongside Otaihanga Road, the site is screened by large sand dunes.

On the western boundary of the landfill the trees have been removed for the construction of the M2PP Expressway. Landscaping in the Expressway designation will reduce visibility towards the landfill site. Final cap construction and grassing/planting has commenced on the western slopes of the landfill.

Large pine trees reduce visibility at the southern end of the landfill.

Reviews of the remaining screens shall be undertaken regularly to investigate gaps and dead trees in the screen.

4.1.3. Perimeter Fencing

The active zones within the landfill are marked by a combination of earth bunds and large concrete blocks. The capping material collection area will be marked and sign posted to avoid cross-contamination with unwanted materials.

4.2. Disposal

4.2.1. Access Roads

The access road and turning area at the disposal area shall be kept in good condition, compacted and gravelled as required and free of potholes to provide an all-weather access and turning area.

4.2.2. Method of disposal

Until end September 2015, the biosolids and screenings are being delivered daily from the WWTP to the active disposal area by separate access road from the west as shown in Appendix D. Daily cover (cleanfill) is collected from the drop off zone and brought into the biosolids disposal zone as required for mixing and covering. On occasions before and during August 2014, when the WWTP drier performance was reduced, wet sludge was buried in separate cells outside the active disposal area for dried biosolids. The drop off zone for clean fill is accessed by the public via a road to the south of the active tip area, see site plan contained in Appendix D.

4.2.3. Active Fill Area

The active fill drop-off area until end September 2015 for cleanfill and dried biosolids is approximately 0.8 ha and is shown in Appendix D. There is clear signage on site providing navigation to this area. Cleanfill is tipped on a flat area where it is moved or used by the landfill operator for mixing and covering operations. Biosolids are delivered on a daily basis under direction of the operator to specified areas within the overall drop-off area. Biosolids disposal and cleanfill disposal areas are completely separated.

4.2.4. Height

The final landfill height shall not exceed RL 18 m in order to retain space for the final capping layer. The landfill capping design is further discussed in Section 10.

A framework for the final landfill shape and capping layer is indicated onsite (main landfill area) with a grid of marker poles. These poles, identified as W1 to W16 on a site plan contained in Appendix E, are positioned along the crest of the central ridge and around the perimeter where the slope changes from the main landfill surface 1:50 to the final batters of approx. 1:4 along the western boundary and 1:5 along the eastern boundary. These locations are shown on the site plan in Appendix B.

The final shape for the car track area follows the natural contour of the site, stormwater running across the site from North in South-East direction.

4.3. Cover Material

4.3.1. Daily Cover Requirements for biosolids

All biosolids deposited will be covered on the same day that it is unloaded and no waste will be left exposed overnight. Biosolids shall be covered at the end of each day's operation with between 150 mm and 200 mm thickness of soils, sand, silt or clay.

4.3.2. Final Cover Requirements

The operational decision was made during 2014 that final cap construction would commence during the 14/15 year in accordance with the grid set out by marker poles on the main landfill area. The landfill cap compromises a topsoil layer, underlain by a compacted earth layer, underlain by a permeable layer to control LFG (landfill gas) emissions. The LFG venting layer is proposed to be constructed on the top of the Main Landfill Area only, over the full length and 50 m wide. The proposed landfill cap is described in more detail in Section 10.

The cap construction shall be undertaken under supervision by COUNCIL, with records kept of the characteristics of each cover layer and forwarded to the COUNCIL officer responsible for the operation of the landfill.

The majority of the landfill capping works will take place between March 2015 and 2020, driven by the local availability of clay capping material and COUNCIL budgets. A small section of cap was constructed early 2014 on the top of the landfill when material was available. Cap construction on the western slopes of the landfill started in March 2015 with cap construction on the North-West slopes and the former car track area. During the 13/14 year, COUNCIL started accepting large volumes of cleanfill that is of the correct quality for capping and/ or shaping free of charge. This enables COUNCIL to obtain the required material and make the construction of an engineered cap more affordable.

4.3.3. Importing of Landfill Cover Material

Daily cover material for biosolids will be accumulated for that purpose up to end September 2015. Cleanfill will continue to be accepted for shaping of the landfill where this is needed before the final cap can be constructed. This is further discussed in Section 10 of the LMP.

4.3.4. Stockpiling of Cover Material

The landfill operator will maintain stockpiles of cleanfill at the current disposal area, readily available for covering biosolids until the end of September 2015.

Areas on top of the main landfill area have been designated and are in use for stockpiling of capping materials to provide for capping operations. The top of the landfill has reduced access and traffic management requirements are discussed with operators bringing in large volumes of material for capping and/or stockpiling.

The capping stockpiles are in principle windrows not exceeding 4 metres above the final landfill shape (RL17 to RL18). Locations of current stockpiles and areas available for stockpiling are presented on a site plan contained in Appendix D.

The landfill Closure and Aftercare section of this LMP (Section 10) provides further detail about the anticipated volumes of final landfill cover material required.

4.3.5. Vegetation

The final landfill cap will be vegetated where appropriate. Once capped, the area will be used for recovery or recycling operations, and some recreational land-uses maybe planned on certain areas of the capped landfill.

Vegetation shall be appropriate to the climate and soil characteristics of the site. Appendix E of '*A Guide for the Management of Closing and Closed Landfills in New Zealand'* (MfE, 2001) contains a list of quick growing, native, and versatile plants which may be used as guidance.

4.4. Control of Nuisances

The control of nuisances will be managed as set out in Table 2 below.

Table 2: Control of Nuisances

Nuisance	Control Method
Odour	Until end September 2015: Shall be controlled by keeping biosolids covered with an appropriate cover layer. If odours persist, greenwaste mixing or deodorant chemicals may be used. After end September 2015: shall be controlled during the mixing of biosolids with greenwaste and wood waste and insertion into the agricultural bags for composting Excavations in old refuse should be kept to a minimum. Weekly monitoring should occur to assess whether offensive odour can be detected at the boundary of the landfill. If offensive odour is detected, this shall be recorded and appropriate remedial actions undertaken.
Dust	Dust shall be controlled by keeping access roads and turning areas metalled and working areas and disturbed areas to a minimum. A water cart could be kept available during summer months to control dust on access-ways.

4.5. Complaints

All staff operating at the landfill should provide a helpful and friendly service to users.

If a complaint is received by post, it is to be brought to the attention of the SWSM as soon as possible during normal working hours, dependant on the nature of the complaint.

If a complaint is received by telephone, the call will be directed to the SWSM at the COUNCIL, and if they are unavailable the call will be directed to the Group Manager Infrastructure Services at the COUNCIL.

The complaint will be registered by the COUNCIL call centre staff into COUNCIL's customer services system. The following details (when relevant) will be recorded:

a) Name, address and telephone number of complainant

b) Nature of complaint and the effect detected

c) Time and date of occurrence that gave rise to the complaint

d) Time of complaint registration

The SWSM will contact the plaintive to discuss the complaint and obtain further details that will be recorded in the complaint system:

a) Weather, wind direction and rainfall at the time the effect was detected

b) Most likely cause of effect

c) Response made

d) Corrective action taken or proposed to avoid, remedy or mitigate the effect

The SWSM will respond to the complaint within 24 hours.

The register of complaints will be provided to GWRC annually, unless no complaints have been made during the preceding year. The register will be available for inspection by GWRC and COUNCIL at all times during working hours.

4.6. Incident Records

The permit holder shall keep a record of any incident that has, or could have, resulted in a condition of consent or any statutory requirement being contravened.

The incident record shall be made available to GWRC upon request.

The landfill operator's specific Health and Safety Plan provides for recording requirements for health and safety incidents.

5. Waste Acceptance

5.1. Acceptable Wastes

5.1.1. Cleanfill for Daily Cover and Landfill Shaping

Designated cleanfill for daily cover is an acceptable waste stream. The cleanfill is used for daily cover and for shaping of the landfill in advance of final cap construction. The cleanfill may be stockpiled at the landfill. A description of the acceptable materials for daily cover cleanfill is presented in Table 3 below.

Table 3: Daily Cover Cleanfill and Description of Acceptable Materials

Description of Daily Cover Cleanfill: Acceptable Materials
Should consist of soils, sand, silt and clay. Construction and granular materials (such as broken concrete or large gravel) should not be accepted as daily cover but can be pre-approved for acceptance for shaping works. The daily cover material should also be free from: a) Combustible materials b) Hazardous substances c) Materials likely to create a hazardous leachate by means of biological breakdown

A description of the acceptable landfill capping materials is presented in the Closure and Aftercare section of this LMP (Section 10).

Council is currently considering accepting concrete (cleanfill) for crushing at the landfill. The crushed concrete would be used to construct the gas venting layer for final cap construction as there is an ongoing local shortage of gravel material that can be used for this purpose.

5.1.2. Biosolids

Biosolids from the WWTP are classed as an acceptable waste stream. We note that the landfilling of biosolids is unlikely to occur from September 2015 onwards since a GWRC approved Biobagga trial has started on-site and this trial converts all the WWTP dried biosolids into compost/topsoil, anticipated to be used as the topsoil layer for the landfill capping works (see Section 10).

The dried solids get tested at the WWTP to understand their make-up and the results of this testing is available to COUNCIL and to the landfill operator so their acceptability can be checked and monitored.

The dried biosolids must meet at least ‘Grade B’ criteria for their stabilisation and ‘Grade b’ for the chemical contamination, in accordance with the assessment criteria in Guidelines for the Safe Application of Biosolids to Land in New Zealand, Ministry for the Environment (2003).

5.2. Prohibited Wastes Including Hazardous Waste and Liquid Waste

Apart from waste specifically identified in section, no (potentially) hazardous waste is accepted for disposal at the Otaihanga Landfill.

The Waste Water Treatment Plant's screenings and grit are no longer accepted for landfilling and have been disposed elsewhere since August 2015.

Road sweepings and offal have not been accepted since 2013.

'Liquid' wastes (for example, cesspits waste mixed with water brought in by sucker trucks) are no longer accepted into the landfill per 1st October 2013.

If the landfill operator identifies hazardous waste while it is in the possession of the transporter, the load shall be rejected and will remain the responsibility of the transporter.

If hazardous waste is discovered during random inspections (see Section 5.5), the material will be reloaded onto the delivery vehicle for return and a copy of the waste inspection sheet will be sent by the landfill operator, along with a description of the action taken, to the COUNCIL officer with responsibility for such wastes.

If wastes are undergoing a reaction, releasing toxic gases or are on fire, the relevant emergency services will be called.

5.3. Disposal Methods

Cleanfill entering the site will be weighed on the weighbridge and the documentation checked. If the acceptance criteria are met, drivers will be directed to the either the active disposal area (until end September 2015) or to a stockpiling area on the site.

As described in section 4.2.2., the daily operation for the landfilling of biosolids includes mixing soils/sands with the dried biosolids and laying the biosolids, then covering this layer with compacted cleanfill. At the end of each day, the ratio and quantity of cleanfill shall be adequate to ensure that offensive odours are suppressed.

The capping materials will be delivered to the cap construction area or to a stockpile area (separate areas for each layer), if sufficient materials are received. Care shall be taken to ensure the stockpiles do not exceed 4.0 m above the final landfill height, i.e. stockpile height shall not exceed RL 23 m.

5.4. Weighbridge Records

A record in the weighbridge software system is kept of:

a) Date and time of receipt of cleanfill at the landfill site.

b) Quantity (via the weighbridge).

c) Type of waste (cleanfill or special waste).

A summary of this information is available to GWRC upon request.

Please note that pre-approved cleanfill for use as capping material is in general not weighed and is used for shaping and capping (no landfilling).

5.5. Random Load Inspections

The landfill operator will undertake regular inspections of incoming waste. This will involve detailed screening of loads to confirm the nature of the waste. Loads shall be selected on a random basis and the frequency of inspections should be based on the type and quantity of wastes received and findings from previous inspections.

6. Stormwater Management

6.1. Existing Surface Water Flows

The onsite stormwater is managed via surface water flow pathways across the partially vegetated site. The landfill has an undulating surface with sections of coarsely compacted materials. This roughness will attenuate the flow runoff's to control areas.

The surface water flowing in a westerly direction is collected in the western leachate drain. The western leachate drain is connected to the western wetland.

The surface water flowing to the east and off the access roads onsite is directed to the southern wetland.

A site plan showing the existing surface water runoff catchments is presented in Appendix F.

6.2. Future Surface Water Flows

The future stormwater flows from the landfill are also shown indicatively on site plans contained in Appendix F. Approximately half the stormwater run-off will be treated by the western wetland and the other half by the southern wetland (likely to be via overland flow, or piped along the site access road to and from the southern end of the landfill, i.e. the CNZ site.

The northern catchment is directed to the western wetland via the proposed landfill shape and the existing topography. This includes the watershed from the ORRF, located north of the landfill footprint. The total northern catchment area is circa 13.3 ha.

The western wetland which receives this surface water and leachate migration was estimated to be 3.5 ha prior to the start of the Expressway construction. The wetland area has now been reduced to an estimated 1.3 ha following the construction of the base layer of the Expressway in the last 18 months.

6.3. Discharge Management

The current area of the eastern wetland (1.3 ha) is approximately 10%, by area, of the contributing catchment (13.3 ha) and is therefore above the minimum allowable value recommended in the Technical Publication #10, "Stormwater Treatment Devices Design Guideline Manual" (TP 10)-Stormwater management devices: Design guidelines manual 2003, by the former Auckland Regional Council (now Auckland Council).

The size of the western wetland has also been checked to be able to hold the water quality volume as specified by TP10. The western leachate drain along the western perimeter of the landfill acts as a forebay and filter for larger sediments in the stormwater runoff and helps to prolong the life of the western wetland by reducing the potential for sedimentation build up.

A similar assessment has been undertaken for the southern catchment which is sized at approximately 14.8 ha. The southern wetland which receives surface water runoff and leachate migration is estimated to be 1.5 ha. This provides a potential treatment of around 10% (by area) of the contributing catchment which is also above the minimum allowable value recommended in the TP10 guidelines. The size of the southern wetland has also been checked to be able to hold the water quality volume as specified by TP10. This includes the catchment area occupied by the

Composting New Zealand operation which has a separate treatment pond. The main catchment has pre-treatment in the form of a settling pond prior to the wetland.

The above proposed capped landfill stormwater catchments are based on an 'area percentage' perspective and are also capable of capturing the runoff from the water quality volume event.

6.4. Key Risks

The risks surrounding utilising the existing wetlands to manage and treat the stormwater runoff revolve mainly around the potential inability to function properly to improve the quality and reduce the quantity of stormwater runoff which can then result in contaminated stormwater overflowing into receiving environments. This can be as a result from:

a) Inadequate wetland and forebay sizing

b) Poor health of wetland plants

c) Poor maintenance of wetland

The surface of the landfill is to be shaped to ensure no ponding occurs on the landfill.

6.5. Mitigation of Risks

To prolong the life and efficiency of a wetland, regular functional maintenance is necessary. Establishing a monitoring plan that incorporates the maintenance process is a good way to ensure that the wetland functions properly throughout its lifetime. It is also important to ensure that the pre-treatment and wetland is sized correctly to handle the projected stormwater runoff.

6.6. Monitoring & Maintenance

The Otaihanga Leachate Management Plan (LMP) will provide valuable data as to whether or not the western and southern wetlands will require an improvement to treat the current and future surface water (including the control of leachate migration). A copy of the Otaihanga Leachate MP is provided in Appendix G.

The management of stormwater shall ensure that its discharge to surface water does not cause the management triggers in the monitoring plan to be exceeded in natural water after reasonable mixing. When the triggers are met or exceeded, the landfill operator shall review the causes and take appropriate actions to investigate the causes and avoid repeat occurrences.

Additionally, inspection of the cut-off drain, the health of the plant life, and of the wetland water quality should be undertaken annually and a report highlighting any degradation and follow up actions produced.

Sand, litter and other debris shall be removed from the surface drainage network on a monthly basis and any scour or damage to the drains shall be repaired immediately.

At the landfill, the management of stormwater shall ensure that any off site discharges during rain events does not cause any of the following effects in natural water:

a) The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials.

b) Any conspicuous change in colour or visual clarity.

c) Any emission of objectionable odour.

d) The rendering of freshwater unsuitable for consumption by farm animals.

e) Any significant adverse effect on aquatic life.

If any of these conditions occur, the landfill operator shall review the causes and take appropriate actions to avoid repeat occurrences.

TP10 provides checklists for preventative maintenance, which should be carried out on a regular basis. These involve checking how well the wetland complies with guidelines, including:

a) checks on the embankments and slope batters

b) emergency spillways and pipe networks

c) the permanent pools and pre-treatment areas

It is important to have a maintenance crew able to undertake maintenance in any weather conditions. This allows issues to be addresses before substantial damage is done in storm or high flow conditions.

The role the wetland plants play is vital to improving water quality, should deterioration be seen in the plants, direction on which plants are most effective in a wetland can be found in in the Greater Welling ton Regional Council Guideline “Planting zones and plant examples for wetland planting” [http://www.gw.govt.nz/What-to-plant/].

7. Leachate Management

The leachate generated through rainfall infiltration is currently managed through collection in the western leachate drain along the western bank (boundary) of the landfill. This is based on the leachate concept model of leachate moving across the site in a westerly direction.

There is no direct leachate control and rainfall infiltration through the existing cover stimulates on-going leachate production. This requires the careful control of site works to minimise groundwater isn't recharged causing the levels to rise into the fill at any time.

The development of the final capping shape to improve surface water runoff (rather than infiltration) and the capping of the landfill will significantly reduce infiltration. The proposed capping will improve ability to control leachate generation and overall management.

The records of the filling design indicate that leachate subsurface drains feed directly into the western leachate cut off drain and the wetland area.

The future management of leachate is described in this section of the LMP.

7.1. Aim

The aim for leachate management is:

a) To provide a framework to monitor and manage changes in leachate concentration over time

b) The minimisation of leachate generation by control of surface and groundwater inputs

c) The minimisation of the amount of precipitation coming into contact with waste by increasing the low permeability cap coverage

d) Shaping of the final landform to encourage controlled surface water runoff

A copy of the Leachate MP is contained in Appendix G.

7.2. Key Receptors of Leachate

The key receptors identified at the Otaihanga Landfill are:

a) The Mazengarb Drain network – this flows through a mix of semi-rural / lifestyle properties before it eventually flows into the Waikanae River

b) Down gradient groundwater users – the shallow Kāpiti aquifer system is utilised by a number of residential and commercial properties for irrigation and other permitted activity uses

7.3. Current Leachate Control

There is no dedicated leachate collection system at the Otaihanga Landfill, however, a number of systems have been implemented at the site in order to control leachate, shallow groundwater and surface water on the site. These systems are described in detail in the Leachate MP and summarised below:

a) The Glass Toe drain – this intercepts a portion of western flowing leachate & groundwater and diverts it into the Western Leachate Drain

b) The Western Leachate Drain captures a portion of shallow leachate, shallow groundwater and surface water on the western side of the landfill. This water is currently retained in the western wetlands for natural treatment, before it flows toward the Western Mazengarb Drain

c) The pipe bedding material around the pipe in the Eastern Mazengarb Drain area- drains a portion of shallow leachate and groundwater along the eastern perimeter of the landfill.

d) A pumping station is located adjacent to the Western Leachate Drain. This was originally intended to be the main control for leachate from the landfill. It pumps 'leachate' to the WWTP where it is treated. It only operates for a short period once a day.

7.4. Key Risks

A number of risks related to the on-going management and control of leachate (including leachate, shallow groundwater and surface water runoff) have been identified and are summarised below:

a) The unlined nature of the landfill

b) Limited impermeable capping resulting in on-going leachate production

c) Offsite migration of leachate contaminated groundwater

d) Vertical migration of leachate / shallow groundwater

e) Offsite migration of leachate contaminated surface water

f) Changes to the hydrological system as a result of the proposed M2PP Expressway Construction

Each of these risks is discussed in the following sections along with how each risk will be mitigated.

7.4.1. No landfill lining

The lack of a landfill lining is the single biggest barrier to the control of leachate at the Otaihanga Landfill. Unlined landfills were common in New Zealand pre 1990s. Without a base lining, leachate generated by the landfill cannot be collected and treated separately. Leachate now mixes with shallow groundwater – the resultant diluted leachate is currently monitored, as discussed in the Leachate MP contained in Appendix G.

The fact that there is no base or sidewall linings cannot be changed, which is why other controls, become more important than they may be in a situation where a lined landfill is being managed. Typically, when there is no lining beneath the landfill, the focus must be on reducing leachate generation by:

a) Monitoring the Western wetland surface water level so that the groundwater level in the landfill does not build up the groundwater table below the base of the waste

b) Minimising infiltration of surface water into the waste

Groundwater levels beneath the waste are in part currently controlled by the Eastern and Western Mazengarb Drains, the Leachate Toe Drain and the Glass Drain. Infiltration into the landfill cap is discussed in the next section.

7.4.2. Limited Impermeable Cover

Capping reduces the infiltration of rainwater into the landfill and therefore reduces leachate generation. Because the base of the landfill waste at Otaihanga is in contact with the shallow groundwater table above the peat layer, a cap would be effective in reducing leachate production.

Approximately 15% of the landfill (as of 2013) is covered by a low permeability cover that is (still) fit for purpose. The cover constructed over the past 21 years when fill areas were closed was generally in accordance with consent conditions and consisted of a 300mm compacted layer, but was compromised in various places over the years. That is the same for some areas at the Southern End of the landfill, which area received a final cap that was approved by GWRC.

Increasing the percentage of impermeable cover of the landfill is planned as part of future final landform contouring. This is discussed in more details in the Proposed Future Height of Landfill report (SKM, 2012a).

7.4.3. Offsite migration of contaminated groundwater

A major risk associated with the unlined landfill is that contaminated groundwater may migrate offsite, and also beneath the aquifer.

Currently groundwater at the western boundary of the property is monitored at bores D1 (BH10) and D2 (BH11). However, the elevation of the screens in these two monitoring bores is very high in the aquifer; as a result it is likely that they are not deep enough to monitor potential contaminated groundwater in the Holocene Sands. The Leachate MP requires groundwater level monitoring and actions in response to trends in this data. After observing the groundwater level results for 48 months it is recommended that the D2 well suitability is reviewed to determine if a second piezometer is installed to the appropriate depth.

7.4.4. Vertical groundwater migration

A review of the available groundwater level data has shown uncertainty regarding hydraulic gradients at the site. Certainty over gradients is required in order to confirm whether groundwater beneath the landfill also migrate vertically i.e. is there a downward or upward gradient from the wetland/peat aquifer into the shallow Holocene Sand aquifer. It is possible that there is a component of flow that goes vertically beneath the landfill. This question can be addressed by confirming hydraulic gradients at the clustered boreholes BH305, BH306 and BH307. The locations of these boreholes are contained in the Leachate MP contained in Appendix G.

7.4.5. Offsite migration of leachate contaminated surface water

The offsite migration of surface water from the Eastern and Western Mazengarb drains is monitored as part of the Leachate Monitoring Programme implemented in 2012, and described in the Leachate MP contained in Appendix G.

7.4.6. M2PP Expressway Construction

The construction of the M2PP Expressway very close to the landfill site will alter both surface water drainage and shallow groundwater flow within the landfill. The M2PP Expressway construction has led to a reduction in size of the western wetlands (approximately 60%), and the low permeability base course material used for construction has the potential to act as a barrier to shallow groundwater flow. Potential changes as a result of the Expressway construction include localised increases in groundwater level and localised changes to groundwater flow direction. This could include increased leachate generation from prolonged exposure of waste to increased groundwater levels.

NZTA has installed a culvert under the Expressway to convey flood flows (100RI, i.e. 100 year recurrence interval or return period) from the landfill wetlands into the Western Mazengarb Drain. The pipe drains into the remainder of the original wetland, which is now located on the west of the Expressway. This wetland has been re-instated and re-planted. The invert level of this pipe will be critical in controlling the water level within the wetlands.

NZTA have developed a groundwater level monitoring programme to monitor the effects of the M2PP Expressway construction. The bores monitored as part of this programme are BH305 (S&D), BH306 (S&D) and BH307 (S&D). Note: the "S&D" notation indicates "shallow and deep" bores. These will be monitored on a quarterly (3 monthly) basis. The level monitoring is proposed to continue in the Leachate MP after the Expressway construction is completed.

7.5. Preferred Future Leachate Management Option

The changes that will occur as a result of the Expressway have been researched and summarised in a report in 2012 that was produced as a 'starting document' for the 'Otaihanga landfill project' that now includes the new leachate monitoring plan, the variation to the landfill consents, this new landfill management plan and forms the basis for the on-going management of the landfill (SKM, 2012a).

In summary, the preferred leachate management option based on the 2012 research was:

"The preferred option, based on the currently available information is to re-circulate the leachate and pass the leachate through a formalised wetland system, taking into consideration item c) above, in combination with appropriate landfill capping (discussed in more detail in Section 7). It is likely that this is the most cost effective solution to addressing an improvement of leachate quality discharging from the Site.

a) *(.....)*

b) *It may be possible to divert the southern end of the western leachate drain to the Eastern Mazengarb Drain (EMD) south of Composting New Zealand, via the south-western toe of the landfill, i.e. outside the landfill footprint. The western leachate drain has an RL of 7.89 m and the EMD has an RL 7.02 m.*

c) *Ideally this drain would flow under gravity (from RL 7.89 m to RL 7.02 m), however, the approximately length of the drain, 500 m, may require some pumping.*

d) *Further, to assist with the leachate treatment, it is recommended to create two new wetlands, the 1st wetland immediately south of the "End of Leachate Stream", and the 2nd larger wetland south of CNZ.*

We note that leachate from relatively recently placed waste contains a different elevated contaminants/parameters, in particular readily biodegradable material. This type of leachate responds reasonably well to biological treatment including wetland treatment. In the future, as the waste gets older, other or a combination of processes (e.g. disposal to a waste water treatment plant) may be required for effective leachate treatment."

As further mitigation options for leachate management are developed onsite the results from the monitoring programme will need to be consulted to inform the management actions and performance of the leachate mitigation.

7.6. Monitoring

Monitoring of Leachate, Surface Water and Groundwater at the Otaihanga Landfill is undertaken in accordance with the Leachate MP contained in Appendix G.

Additional level, annual and 5-yearly sampling programmes are presented in Appendix G.

7.7. Leachate Contingency Options

Regular monitoring will be carried out to ensure that leachate impacts on groundwater and the drains are not causing significant adverse effects.

If water quality deteriorates to unacceptable levels, a number of options are available to ameliorate effects.

a) Increasing the size and performance capacity of the onsite wetlands to improve the level of treatment available.

b) Groundwater: recovery wells could be installed to intercept leachate for pumping to irrigate onsite or for treatment if necessary.

c) Surface water: a weir could be installed in the southern wetlands to prevent discharge and water treated to an appropriate standard.

Further drains could be installed, for example, between the western leachate drain and the southern and eastern margin of the landfill, to intercept groundwater before it discharges to surface water.

Other options such as tracking leachate off-site or pumping to sewer would be investigated if necessary.

Recirculation would involve use of moveable perforated discharge pipes and the existing pump station. Leachate would be pumped and discharged by surface flooding over grassed areas of mature landfill. There would be no public access to these areas.

8. Landfill Gas Management

8.1. Existing LFG Management

The current LFG management at the Otaihanga Landfill is broadly described in the existing LMP (Royds, 1994) which states that:

> *"There are no control measures for the production of methane gas. The shallow depth will minimise the quantity of methane likely to be produced. Gas that does form should escape through the outside edge of the landfill where it abuts natural ground and through cover material."*

The existing LMP is referenced in the resource consent conditions addressing the discharge of LFG, namely resource consent number WGN 930177 (02), issued by GWRC in 1994. This consent includes a number of LFG consent conditions such as the absence of offence odour at the boundary of the landfill, maintaining a register of odour complaints and capping the landfill with a minimum of 300 mm of low permeability material.

In addition consent condition 19 requires the grantee (COUNCIL) to

> *"… take all practicable measures to minimise the discharge of landfill gases, including the investigation at five year intervals after the issuance of this consent, if appropriate, installation of a gas interception and recovery system."*

In terms of current LFG management practice, there have been no odour complaints at the site boundary and the southern part of the part of the landfill has been capped with 300 mm of low permeability material (SKM, 2012a). A site plan showing the approximate extent of the previously capped area is presented in Appendix B (the site plan showing the M2PP Pre-Cast Concrete Yard).

Similarly with regards to the five-yearly investigation into the discharge of LFG, this information is presented in a qualitative form to GWRC via the *Landfill Monitoring Programme Annual Report*, prepared by Montgomery Watson Harza (MWH), on behalf of COUNCIL (MWH, 2011) which states that:

> *"Observations of the presence of landfill gas are made during every sampling round. No significant landfill gas odours have been recorded in the monitoring bores during sampling. It is possible that landfill gas occurs within the fill but significant horizontal migration is unlikely as a result of rapid vertical dispersion from the sandy soils surrounding the site."*

In summary, no significant LFG discharges issues or odour issues have been reported in the last twenty years. To assist COUNCIL with future LFG management, in particular in relation to the proposed landfill capping, a quantitative LFG survey was carried out in 2012.

8.2. Quantitative LFG Survey

COUNCIL commissioned SKM to carry out a quantitative LFG survey in Jun 2012. The survey comprised the measurement of LFG emissions immediately above the landfill surface by traversing the whole landfill footprint area via a regular grid. The results of the survey are presented in the report titled *Landfill Gas Surface Walk-Over Survey- Otaihanga Landfill* (SKM, 2012c).

The survey resulted in fifty nine test locations and at all locations the test results were below the commonly used 5000 parts per million (ppm) emission criteria (SKM, 2012c).

Typical resource consent criteria at modern solid waste landfills (i.e. municipal solid waste landfills) state that the methane (one of the major LFG constituents) surface emissions shall be less than 5000 ppm. Based on the 2012 survey the Otaihanga landfill complies with these criteria.

8.3. Key LFG Risks

The landfill volume is estimated to be around 1.7 million m^3, based on:

a) The base of the landfill is at the former swamp level at approx. RL 7.5 m.

b) The main landfill area (around 15 ha) having an average waste thickness of 9.5 m (RL 17 m – RL 7.5 m).

c) The remaining part of the landfill footprint is 9 ha (=24 ha – 15 ha) and has an average waste thickness of 2.5 m (RL 10 m – RL 7.5 m).

LFG generation typically peaks one to two years after a landfill has stopped receiving putrescible waste (year 2007, see Section 2.2). Therefore the Otaihanga landfill is expected to continue to generate LFG for many years, probably decades.

However, both the qualitative LFG investigation (Section 8.1) and the quantitative LFG survey (Section 8.2) do not report significant LFG emissions. It is therefore reasonable to assume that the LFG discharges via a number of preferential pathways from the landfill surface.

The primary LFG risks for the Otaihanga landfill can be summarised as follows:

a) Uncontrolled migration of LFG through the landfill cap.

b) Site users being exposed to LFG.

These LFG risks can be mitigated via the construction of an engineered landfill cap, as proposed in the future management of the site.

It is unlikely that there is significant lateral migration of LFG due to the high groundwater table (approximately at RL 7.5 m) and the sandy nature of the surrounding site soils (see also Section 8.1 above).

8.4. LFG Risk Assessment

The following information was supplied to GWRC on 08 July 2015 and 04 August 2015 and is considered to constitute a broad LFG risk assessment for the site:

a) Landfill operations started in the 1970s and waste, mainly municipal solid waste, was placed directly on the natural ground. The natural ground was swampy in many parts as evidenced by the existing wetlands located west of the landfill (between the landfill and the M2PP Expressway) and south of the landfill (immediately south of the area occupied by CNZ) and as shown on site plans contained in the LFMP dated 1994 (Royds, 1994). We note that old landfills, such as those that started in the 1970s, rarely had base and sidewall liners to capture the leachate and LFG within the landfill.

b) In 1994 GWRC granted COUNCIL a number of consents, essentially formalising the operations and discharges to air, land and water.

c) In 2007 the Site stopped receiving municipal waste and continued to landfill the COUNCIL's dried biosolids and cleanfill. Cleanfill consent was granted by GWRC to cap the landfill. However, only the southern portion of the landfill, covering an area of approximately 200 m by 150 m, has a GWRC approved landfill cap. A site plan showing the location of the approved cap area is presented in Appendix B. A copy of the GWRC letter approving the landfill cap is contained in Appendix A.

d) Annual landfill monitoring reports prepared by MWH, on behalf of COUNCIL and submitted to GWRC (MWH, 2011) made qualitative statements about the presence of LFG as follows:

"Observations of the presence of landfill gas are made during every sampling round. No significant landfill gas odours have been recorded in the monitoring bores during sampling. It is possible that landfill gas occurs within the fill but significant horizontal migration is unlikely as a result of rapid vertical dispersion from the sandy soils surrounding the site."

e) A LFG site walk-over survey was carried out by SKM (now part of Jacobs), on behalf of COUNCIL in June 2012 and noted that (SKM, 2012c);

i. The survey measured the methane concentrations on a 60 m grid at the landfill and the highest concentration measured on the 60 m grid was 80 ppm, i.e. 80 parts of methane per million parts of air (ppm).

ii. the resource consent did not specify maximum allowable methane concentrations at the landfill but the LFG site walk-over survey suggested a criteria of 5000 ppm be adopted based on the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 which states *"…that any discharge of gas from the surface of the landfill does not exceed 5000 parts of methane per million parts of air .."*.

iii. LFG was observed bubbling in standing water and the LFG probe reported 3500 ppm at this location (note: this standing water/pond area was closed and capped in October 2013).

iv. LFG monitoring was carried out in two existing boreholes located immediately west of the landfill footprint which were constructed by NZTA as groundwater monitoring wells for the abovementioned construction of the expressway and the maximum methane reported was 540 ppm.

f) The ground conditions at the landfill comprise sandy soils with peat layers/lenses, based on the borehole logs for the expressway. A copy of the borehole logs and a site plan showing the location of the boreholes is presented in Appendix I.

g) The groundwater table surrounding the landfill is very high, < 1-2 m below ground level.

h) A site plan showing the Otaihanga Landfill footprint, landfill site boundary and surrounding area is presented in Appendix C.

i) The landfill will be capped with an at least 600 mm thick compacted low permeability soil layer, including a 50 m wide and at least 300 mm thick granular/gravel gas venting layer located below the low permeability soil layer along the future landfill crest of the Main Landfill Area (an approximately 400 m long, 50 m wide section trending north-south).

In terms of the relevance of the proposed capping layer we note the following:

i. The closed landfill guidelines, titled *A Guide to the Management of Closing and Closed Landfills in New Zealand*, produced by the Ministry for the Environment in May 2001, reference ME 390, provides a recommended final cap design in Section 5.2.2 of the guidelines as follows (from top to bottom): 150 mm topsoil, 600 mm barrier layer with a permeability of less than 1 x 10-7 m/s, 300 mm “cleanfill” or natural soil subgrade layer, underlain by refuse.

ii. This is what is being constructed as a cap at the Otaihanga landfill, except that in addition, there will be a50 m wide, approximately 400 m long gravel gas venting layer at the highest point of the landfill, with perforated pipe system leading to passive vents, as a ‘contingency’ layer to manage the controlled migration of LFG near the top of the landfill. The CAE guidelines do include the perforated pipe system and passive vents.

iii. Therefore the final cap including a 50 m wide gravel, 300 mm thick gravel gas layer with passive vent system is a combination of what is recommended in the NZ closing and closed landfill guidelines and the NZ CAE guidelines (for operative landfills)

There will be regular vent pipes from granular layer and these vent pipes will be monitored for LFG (see Section 8.6).

The capping layer is further discussed in Sections 8.5 and 10

j) Future LFG surface emission monitoring, similar to that carried out in 2012, will also be carried out, see Section 8.6.

k) Two ground profile cross sections (North to South and East to West) across the landfill are presented in Appendix B, including a site plan showing the location of these cross sections.

l) With respect to the potential for lateral LFG migration we note the following:

i. North (Long Section A): limited potential for LFG migration due to the high groundwater table. The nearest off-site receptor is a residential house located on the other site of Otaihanga Road, located approximately 200 m north of the landfill footprint (see site plan contained in Appendix J).

ii. South (Long Section A): limited potential for LFG migration due to the high groundwater table and sandy environment. The southern wetland and groundwater entering the wetland, is also anticipated to act as a natural barrier to LFG migration to the south (this is not shown on the Long Section A as the location of the section is further north, see site plan of sections). The nearest properties are located approximately 160 m south of the landfill footprint (see site plan contained in Appendix J).

iii. East (Long Section B): limited potential for LFG migration due to high groundwater table and Eastern Mazengarb Drain (acting as a cut-off barrier). A site plan showing the nearest properties, located approximately 100 m east of the landfill footprint, is presented in Appendix J.

iv. West (Long Section B); limited potential for LFG migration due to high groundwater table, the western wetland (acting as a cut-off barrier) and the M2PP Expressway, constructed on engineered and compacted fill material. A site plan showing the nearest properties, located approximately 300 m west of the landfill footprint, is presented in Appendix J.

m) Perimeter LFG monitoring probes will be installed; this is discussed further in Section 8.6.2 below.

8.5. Future LFG Management

The future LFG management at the site will be via a landfill cap that is in accordance with good practice guidelines in New Zealand (CAE, 2000) and meeting the New Zealand closed landfill guidelines (MfE, 2001) as previously discussed in Section 8.4, item i).

The CAE guidelines recommended the landfill cap includes a LFG venting layer followed by a low permeability layer and finally a vegetation layer. For the Otaihanga landfill the gas venting layer is will be presented at the highest point of a the landfill, a 50 m wide and 400 m long area of the Main Landfill Area, as described in Section 8.4, item i) above.

A schematic of the Otaihanga landfill cap system is presented in Appendix H (with the absence of an FML or Flexible Membrane Layer, as it is believed that an FML would be relatively expensive for the Otaihanga landfill, in terms of the benefits gained).

The vent layer in particular, enables controlled collection of LFG within the landfill footprint, thereby minimising the risk of uncontrolled migration of LFG through the landfill cap and reducing the risk of LFG gas to site occupiers.

If odour issues result from the passive vent schematically indicated in Appendix H then a carbon filter or similar device could be included in the passive vent prior to discharge to air.

8.6. Monitoring

COUNCIL intends to carry out LFG monitoring as follows:

a) Surface Emission Monitoring

b) Perimeter Probe Monitoring

c) Granular Layer Vent Pipe Monitoring

8.6.1. Surface Emission Monitoring

Otaihanga Landfill is an old ‘closing’ landfill with no base and sidewall liner. In New Zealand there is no standard or guidance document that provides maximum allowable LFG emissions for old closed and closing landfills.

In order to adopt a suitable LFG emissions criteria for the Otaihanga Landfill it is considered appropriate to use the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 which states *"…that any discharge of gas from the surface of the landfill does not exceed 5000 parts of methane per million parts of air .."*

It is therefore proposed to use 5000 ppm (= 0.5%) methane surface emission level as a trigger criteria for the Otaihanga Landfill.

The following surface emission monitoring is intended:

a) Carry out the monitoring at 6 monthly intervals for a period of 5 years after which discussions will be held with GWRC as to the option of reducing the monitoring frequency to annually.

b) Over the landfill footprint at a 60 m grid, similar to that carried out in 2012 (SKM, 2012c).

c) On the side slopes/edges of the landfill footprint at 30 m intervals.

d) It will include the monitoring of cracks and penetrations in the landfill cap.

e) It will be carried out with similar equipment to that used in the 2012 survey (SKM, 2012), i.e. a RKI Eagle or other suitable portable LFG monitoring equipment. The reading range and error will be reported, in particular the LFG calibration results both pre-sampling and post sampling, to ensure that the equipment used on site produces reliable results.

f) The monitoring will be planned to occur during low or falling atmospheric pressure times.

g) Records of monitoring will be forwarded to the Manager, Consents and Investigations, GWRC on an annual basis.

8.6.2. Perimeter Probe Monitoring

Council will be installing five perimeter LFG monitoring probes at the locations shown on a site plan in Appendix J.

The probes will be installed 1m below the lowest seasonal groundwater table.

The following perimeter LFG probe monitoring will be carried out:

a) Monitoring at 3 monthly intervals for a period of 2 years after which discussions will be held with GWRC as to the option of reducing the monitoring frequency.

b) The LFG will be monitored using a portable landfill gas analyser such as a GA2000 or similar equipment.

c) LFG that will be monitored are methane, carbon dioxide, carbon monoxide and hydrogen sulphide

d) The trigger level for methane will be 10,000 ppm or 1% v/v (volume percent) above local background value.

e) The monitoring will be planned to occur during low or falling atmospheric pressure times.

f) Records of monitoring will be forwarded to the Manager, Consents and Investigations, GWRC on an annual basis.

Table 4 below provides a summary of the monitoring probe location and the nearest residential receptor, the depth to groundwater, the number of perimeter monitoring wells, the trigger levels for methane and carbon dioxide and monitoring frequency.

Table 4: Summary of Perimeter LFG Probe Monitoring

Description	Location relative to Otaihanga Landfill			
	North	East	South	West
Nearest receptor (see site plan in Appendix J)	200 m	100 m	200 m	300 m
Groundwater table depth	High (<1-2m)	High (<1-2m)	High (<1-2m)	High (<1-2m)
Number of perimeter LFG probes/wells	1x	2x	2x	Not proposed
Trigger level methane (ppm)	10,000	10,000	10,000	-
Monitoring frequency, per year (for two years)	4x	4x	4x	n/a

8.6.3. Granular Layer Vent Pipe Monitoring

A granular layer will be installed as described in 8.5. Within the gas venting layer vent pipes at 50 m intervals resulting in approximately eight vent pipes will be installed.

The following granular vent pipe monitoring will be carried out once the pipe network has been installed:

a) Monitoring at 3 monthly intervals for a period of 2 years after which discussions will be held with GWRC as to the option of reducing the monitoring frequency.

b) LFG will be monitored using a portable landfill gas analyser such as a GA2000 or similar equipment.

c) The trigger level for methane will be 10,000 ppm or 1% v/v above local background value.

Note: it is considered that this is an on-site operational issue, and that the NES (2004) regulations do not apply to this.

8.7. Contingency Action Plan

8.7.1. Surface Emission Monitoring

In the event that the surface emission monitoring exceeds the 5000 ppm methane threshold criteria the following shall be adopted:

a) Determine the likely cause of the exceedance (e.g. settlement within the landfill causing the landfill cap to crack and methane exceedance occurs within crack).

b) Monitor in a 5 m grid or at 5 m spacing to determine the extent of the exceedance.

c) Cracks and penetrations in the landfill cap should be addressed in each monitoring round.

d) Recap the area of the exceedance with low permeable soil and re-test the area on a daily basis for the next 7 days. The use of biofilters will be assessed.

e) Retesting the area shall be carried out during low or falling atmospheric pressure.

f) If the exceedance cannot be repaired on continues, excavate the affected area to an appropriate depth (minimising the exposure of buried waste), placing a gravel venting layer with venting pipe, and replace the clay/low permeable soil capping layer. Re-test the area for the next 7 days.

g) The installation of alternative venting systems will be considered if item f) above is not appropriate to reduce the LFG emissions.

8.7.2. Perimeter Probe Monitoring

In the event that the perimeter monitoring exceeds the 10,000 ppm methane threshold criteria the following shall be adopted:

a) Retest the monitoring well twice daily for the next three days.

b) Retesting shall be carried out during low or falling atmospheric pressure.

c) Following confirmation of high values, a succinct LFG Remedial Plan with options (include a refreshed LFG RA) will be prepared and submitted to GWRC.

9. Emergency Procedures

In addition to its general role, this LMP is approved as an Emergency Plan for the purposes of Condition 12 of Consent *WGN 930177(01)*.

The emergency contact list is presented in Table 5 below and is also displayed at the Transfer Station kiosk at the ORRF, the CNZ site and is provided to the landfill operations contractor.

Table 5: Emergency Contact List

Contact	Telephone No.- Daytime	Telephone No.- After Hrs
Poisons Hotline	i. 0800 764 766	ii. 0800 764 766
Rural Fire Officer	iii. 04 296 1162	iv. 04 296 1162
Police	v. 04 2966822	vi. 04 2966822
Landfill Contractor	vii. 021 620190	viii. same
COUNCIL SWSM	ix. 04 296 4700 (call centre)	x. Mobile number via call centre after hours
GWRC	xi. 0800 496734	xii. 0800 496734
Civil Defence (Regional Officer)	xiii. 04 3845708, 0800 20 90 20	xiv. -
Hospital	xv. 04 385 5999	xvi. 04 385 5999
Worksafe NZ	xvii. 0800 030 040	xviii. 0800 030 040

9.1. Fire

There is a water supply on the eastern boundary of the site at the CNZ site. In a fire fighting emergency, water from the sand borrow area can also be pumped and used.

The lighting of fires at the landfill is prohibited. The fire brigade shall be supplied with the operator's name and telephone number to allow contact to be made in the event of a fire when the site is closed.

GWRC will be informed immediately in the case of a serious fire.

9.2. First Aid

Procedures for first aid emergencies are contained in the Site Specific Health & Safety Plan provided by the contracted operator which forms part of the operational contract of the landfill.

Operating staff have access to mobile phone or site telephone that is provided by the contracted operator. A first aid kit and emergency horn are supplied by the contractor operator for their staff and are stocked and available on site at all times.

9.3. Civil Emergency Responses

Indication from COUNCIL is that in the event of a civil emergency that the landfill will be utilised to receive temporary putrescible material and/or building waste materials/debris. This has been incorporated in the draft Emergency Management Plan that will form part of a Wellington Region Emergency Plan.

9.4. Spillages of Hazardous Wastes

There is a fuel tank on the CNZ leased site which is not part of the landfill operation. Under the lease agreement CNZ is required to have appropriate spillage response procedures in place.

9.5. Emergency & Evacuation Plan

As available on site and displayed:

In case of emergency requiring evacuation being fire, earthquake, serious accident, structural collapse, tsunami, explosion, aviation incident, hazardous spill or practice evacuation, SHUT DOWN all plant and equipment.

All personnel on the landfill are to proceed IMMEDIATELY by the SAFEST IDENTIFIABLE ROUTE to the SAFE ASSEMBLY POINT, outside of the front gate of the Otaihanga Resource Recovery Facility, and REMAIN there, so ALL personnel can be ACCOUNTED FOR.

DO NOT RETURN to the landfill until the Solid Waste Service Manager has given the OFFICIAL CLEARANCE.

MEDICAL FACILITIES LOCATED AT Team Medical Coastlands Paraparaumu.

When calling 111, READ THE FOLLOWING TO THE DISPATCHER:

'We have an emergency at Otaihanga Landfill, Otaihanga Road, and Paraparaumu'

'We need help from Ambulance/Fire'

Directions to the emergency are SH1 north through Paraparaumu, on roundabout exit west onto Otaihanga Road. Over railway second exits/access on left is Otaihanga landfill.

Our phone number is 021 967 881 or 04 298 5207 (Kiosk at Otaihanga Resource Recovery Facility). The medical problem seems to be ….

Send someone out to meet the emergency services

10. Closure and Aftercare

10.1. Final Landfill Cap

The final landfill cap comprises (from top to bottom) the following:

a) A topsoil layer at least 150 mm thick that is capable of sustaining plant growth.

b) A compacted earth layer at least 600 mm thick and with a low permeability.

c) A 300mm minimum thickness high permeable layer (for example gravel-with-no-fines layer) with perforated pipe network (located near the elevated point of the landfill) venting to the atmosphere.

Section 10.2 provides a description of acceptable landfill capping materials. Section 10.3 provides a description of the volumes of capping material required.

10.2. Description of Acceptable Landfill Capping Materials

A description of the acceptable landfill capping material is presented in Table 6.

Table 6: Description of Acceptable Landfill Capping Materials

Landfill Capping Material Category	Description of Acceptable Materials
Topsoil	Should consist of upper soil horizon to promote growth. Clay, rock and granular material should be excluded
Compacted Earth	Should consist of clay or clay-like silt blends and should exclude sand and granular or rocky materials
Gas Drainage	Should consist of rock, gravel, crushed glass(preferably 5-30 mm in diameter) or crushed concrete (preferably 30-50mm) Clay, soils, sand and silt should not be used

All landfill capping material should also meet the following criteria:

a) Free of combustible and putrescible components

b) Free of hazardous substances

c) Free of materials likely to create a hazardous leachate by means of biological breakdown

10.3. Volumes of Capping Materials

The landfill footprint is approximately 24 ha as described in Section 2. For the purpose of estimating volumes of landfill capping material it is proposed to constructed a landfill cap on the Main Landfill Area (15.2 ha) and the Car Track (2.5 ha).

The 4.5 ha CNZ site has been excluded as it is understood that this area already has an approximately 1 m thick compacted hardfill raft over the area. The 2 ha NZTA construction yard near Otaihanga Road is a concrete yard, located outside the former fill areas. Should at any time in the future these two areas within the landfill footprint show signs of significant settlement/subsidence, leachate breakouts or LFG emissions, these areas can be included in the landfill capping programme as required.

The Main Landfill Area and Car Track area have a combined footprint of approximately 17.7 ha, say 18 ha or 180,000 m^2. Therefore the estimated volumes of the three categories of capping material are presented in Table 7.

Table 7: Estimated Quantities of Landfill Capping Materials

Material	Area required (m^2)	Thickness required (m)	Volume Required (m^3)
Topsoil	180,000	0.15	27,000
Compacted Earth	180,000	0.6	140,400 (loose material) 108,000 (compacted clay)
Gas Drainage	180,000	0.3	54,000

The volumes presented in Table 7 are relatively large volumes and it is anticipated that the landfill cap will be constructed over several years. The majority of the cap construction works will take place between March 2015 and 2020, based on annual delivery of clay volumes that COUNCIL has managed to secure locally for the full volume required. The programming of the cap construction on the crest of the landfill is partly dependent on availability of gravel material required for the LFG venting layer over the crest of the landfill, which needs to be installed first.

10.4. First Stage of Final Cap

The first stage of the final cap was constructed on an approximately 50 m long by 50 m wide section in the northern part of the Main Landfill Area in the period mid-2013 to early-2014. The reason for selecting this area was to investigate whether the locally available low permeable soils would be suitable as a capping material. The location of the 50 m by 50 m area is presented on a site plan contained in Appendix B (the site plan also showing the M2PP Pre-Cast Construction Yard).

The low permeable capping layer comprised roadside slip debris and used a tracked excavator to compact the soil in layers. The permeable/gas drainage layer underlying the low permeable capping layer was constructed from previously stored recycled glass that was crushed using a commercially available glass crushing equipment from EnviroWaste Services Ltd. The final topsoil layer has not yet been constructed.

10.5. Landfill Cap Permeability Testing

In March 2014 a permeability test was performed on a compacted earth layer constructed from clay type material from the local quarry. The compacted earth layer was approximately 5 m wide, 5 m

long and 600 mm thick, constructed by placing the soil in layer and compacting the soil with a 10 ton excavator.

Four double head in-situ Guelph Permeameter tests were carried out in four boreholes and the test results are presented in Table 9.

The four test results show that the overburden soil can be compacted to create a low permeable soil layer with an average permeability of 1 x 10^{-6} m/sec. Whilst this permeability is slightly less than the desired 1 x 10^{-7} m/sec referenced in the New Zealand Landfill Guidelines (CAE, 2000) it is considered suitable for the Otaihanga landfill as the primary purpose of the low permeable soil layer is to minimise surface water infiltration into the landfill. In addition it is very difficult to source suitable low permeable soils in the Kāpiti Coast area and using the overburden soil for the low permeable soil layer is considered a pragmatic solution for the Otaihanga landfill.

Table 9: In-Situ Permeability Testing of Compacted Soil Layer

Location	Permeability (m/sec)
BH1	1.6 E-06
BH2	3.9E-07
BH3	7.7E-07
BH4	7.2E-07
Average	8.6E-0.7

10.6. Final Landform

Finished areas, as they are brought up to final level, shall be provided with falls toward the boundaries and the wetland area. All finished slopes will be graded to ensure long term stability. This requirement will extend to covering old landfill slopes where present cover is not sufficient.

Grass shall be established by sowing grass seed and fertiliser on a properly prepared surface to allow a grass cover to be established. Planting will be carried out to stabilise slopes, reduce run-off and enhance evapotranspiration.

The overall final shape of the landfill should be such that it facilitates controlled surface water run-off to avoid ponding of water. The shape of the final surface should be a bowl/hump rectangular shape with a ridge/high point trending north-east to south-west. The surface gradients of the final landfill should in principle be a minimum of 1(v):20(h) near the top of the landfill and a maximum of 1(v):3(h) near the sides/edges of the landfill footprint. Some flexibility to this requirement may be required in places where the (older) finished filled slopes do not meet the preferred 1:3 measurement. Digging into old fill and removing fill is not considered good practice and steeper slopes will be managed by providing appropriate planting.

Appendix F shows the proposed stormwater catchment of the final landform and the cross sections showing the proposed final shape of the landfill. The cross sections are obtained from the Proposed Future Height of Landfill- Consent Variation report (SKM, 2012a).

10.7. Maintenance

All landfills, especially recently closed landfills, undergo settlement. The location, rate and period of future settlement are very difficult to predict. Therefore, the landfill will require on-going landfill cap maintenance and repair, such as re-levelling and/or repair of the landfill cap to ensure that surface water does not pond on top of the landfill cap.

After closure, annual inspections of the site will be carried out to identify any necessary changes to the operation of the closed landfill. This will include inspections of:

a) The leachate/stormwater system

b) The final cover and vegetation of the landfill

c) Cracking and scouring of the landfill cap

d) Subsidence and slope stability

In collation with the annual inspections, routine maintenance should be undertaken, including:

a) Maintaining and removing sediments from stormwater cut-off drains and any treatment devices

b) Maintaining the LFG venting system

c) Vegetation management (including any necessary irrigating, mowing and planting) and repair of any cap subsidence

In addition to the annual inspections/maintenance, the landfill should be inspected following severe weather events, such as drought or flood.

If significant issues are found during inspections, this LMP shall be updated to address these issues.

10.8. Monitoring

Water quality monitoring will be continued after closure of the site at reduced frequency, but at least once per year. Monitoring will continue as long as significant impacts are identified.

LFG monitoring has been addressed in Section 8.6.

10.9. Land Use

The use of the final landfill area is yet to be finalised. It is likely that the site will be used for recovery and recycling activities, for recreation activities (when appropriate and safe) and for emergency management purposes.

Both the landfill and LMP shall be assessed one year prior to full closure (cleanfill) to consider the need for additional measures to ensure the landfill is in an appropriate condition for its future use.

11. Abbreviations

ALUR: Approved Landfill Users Register

CAE: Centre for Advanced Engineering

CNZ: Compost New Zealand Ltd

COUNCIL: Kāpiti Coast District Council

EMD: Eastern Mazengarb Drain

FML: Flexible Membrane Layer/Liner

GWRC: Greater Wellington Regional Council

ha: hectare, i.e. 10,000 m^2

Jacobs: Jacobs New Zealand Ltd

LFG: Landfill gas

LMP: Landfill Management Plan

M2PP: MacKays to Peka-Peka

MfE: Ministry for the Environment

MP: Management Plan

MWH: Montgomery Watson Harza Ltd

NZTA: New Zealand Transport Agency

ORRF: Otaihanga Resource Recovery Facility

ppm: parts per million

RL: Relative Level

Royds: Royds Consulting Ltd- Environmental Services

SKM: Sinclair Knight Merz Ltd

SWSM: Solid Waste Services Manager

WWTP: Waste Water Treatment Plant

12. References

a) ARC, 2003, Stormwater management devices: Design guidelines manual 2003, Auckland Regional Council

b) CAE, 2000, *Landfill Guidelines- Towards Sustainable Waste Management in New Zealand*, prepared by Centre for Advanced Engineering, University of Canterbury, Christchurch, New Zealand, April 2000.

c) MfE, 2001, *A Guide for the Management of Closing and Closed Landfills in New Zealand*, prepared by the Ministry for the Environment, May 1999.

d) Royds, 1994, Management Plan for the Otaihanga Landfill, prepared for Kāpiti Coast District Council, Royds Consulting Ltd- Environmental Services, June 1994.

e) SKM, 2012a*, Proposed Future Height of Landfill- Consent Variation- Otaihanga Landfill,* for Kāpiti Coast District Council, November 2012, revision 1, SKM ref. AE04286.

f) SKM, 2012b*, Otaihanga Leachate Monitoring Plan*, appendix of a Landfill Management Plan of a consent variation prepared by SKM, on behalf of Kāpiti Coast District Council, to Greater Wellington Regional Council, November 2012, SKM ref. AE04286.

g) SKM, 2012c, *Landfill Gas Surface Walk-Over Survey, Otaihanga Landfill*, for Kāpiti Coast District Council, revision 2, July 2012.

h) MWH, 2011, *Landfill Monitoring Programme, Annual Report 2010-2011*, prepared for Kāpiti Coast District Council, MWH report ref. Z7043709, July 2011.

13. Limitations

This report ("Report") has been prepared by Jacobs, formerly SKM for the sole use of Kāpiti Coast District COUNCIL ("the Client") and in accordance with the scope of services detailed in the agreement between COUNCIL and Jacobs.

Undertaking an assessment or study of the on-site conditions may reduce the potential for exposure to the presence of contaminated ground. All reports and conclusions that deal with sub-surface conditions are based on interpretation and judgement and as such have uncertainty attached to them. You should be aware that this report contains interpretations and conclusions which are uncertain, due to the nature of the investigations. No study can completely eliminate risk, and even a rigorous assessment and/or sampling programme may not detect all problem areas within a site. The following information sets out the limitations of the Report.

This Report should only be presented in full and should not be used to support any objective other than those detailed within the Agreement. In particular, the Report does not contain sufficient information to enable it to be used for any use other than the project specific requirements for which the Report was carried out, which are detailed in our Agreement. Jacobs accepts no liability to the Client for any loss and/or damage incurred as a result of changes to the usage, size, design, layout, location or any other material change to the intended purpose contemplated under this Agreement.

It is imperative to note that the Report only considers the site conditions current at the time of investigation, and to be aware that conditions may have changed due to natural forces and/or operations on or near the site. Any decisions based on the findings of the Report must take into account any subsequent changes in site conditions and/or developments in legislative and regulatory requirements. Jacobs accepts no liability to the Client for any loss and/or damage incurred as a result of a change in the site conditions and/or regulatory/legislative framework since the date of the Report.

The Report is based on an interpretation of factual information available and the professional opinion and judgement of Jacobs. Unless stated to the contrary, Jacobs has not verified the accuracy or completeness of any information received from the Client or a third party during the performance of the services under the Agreement, and Jacobs accepts no liability to the Client for any loss and/or damage incurred as a result of any inaccurate or incomplete information.

The Report is based on assumptions that the site conditions as revealed through selective sampling are indicative of conditions throughout the site. The findings are the result of standard assessment techniques used in accordance with normal practices and standards, and (to the best of our knowledge) they represent a reasonable interpretation of the current conditions on the site. However, these interpretations and assumptions cannot be substantiated until specifically tested and the Report should be regarded as preliminary advice only.

Any reliance on this report by a third party shall be entirely at such party's own risk. Jacobs provides no warranty or guarantee to any third party, express or implied, as to the information and/or professional advice indicated in the Report, and accepts no liability for or in respect of any use or reliance upon the Report by a third party.

This report makes no comment on the presence of hazardous materials, unless specifically requested.

Appendix A: GWRC Approved Consent Variation- August 2013

Appendix B: Site Plan: Existing Site Layout & Surrounding Area

Appendix C: Site Plan: Main Landfill, CNZ, Car Track, Construction Yard

Appendix D: Site Plan: Access Roads to the Landfill

Appendix E: Site Plan: Marker Poles W1-W16

Appendix F: Site Plans: Stormwater Management

Appendix G: Leachate Management Plan

Appendix H: Landfill Gas- Figures 4.5 & 4.7 (CAE, 2000)

Appendix I: Borehole Logs

Appendix J: Site Plan- Proposed Perimeter LFG Monitoring Probes

Resource Consent

RESOURCE MANAGEMENT ACT 1991

Summary of decision

Consent No.	WGN220051	
Consent ID(s)	[37788] LUC – Streamworks	
Name	Kāpiti Coast District Council	
Address	175 Rimu Road, Private Bag 60601, Paraparaumu 5254	
Decision made under	Section 104, 104B, 105, 107 and 108 of the Resource Management Act 1991	
Duration of consent	Granted: 21 January 2022	Expires: 21 January 2057
	Lapses: 21 January 2027 (if consent not given effect to)	
Purpose for which consent(s) is granted	To construct a stormwater outlet in the bed and banks of an unnamed tributary of the Wharemaukū Stream, including earthworks and vegetation clearance within 5 metres of the streambed.	
Location	Tributary of the Wharemaukū Stream, Iver Trask Place, Paraparaumu at or about map reference NZTM 1768621.5468788	
Legal description of land	Lot 4 DP 470759	
Conditions	See below	

Decision recommended by:	Alice Bird	Resource Advisor, Environmental Regulation	
Decision peer reviewed by:	Kirsty van Reenen	Resource Management Consultant for Environmental Regulation	
Decision approved by:	Jude Chittock	Team Leader, Environmental Regulation	

Processing timeframes:

Application lodged:	30/08/21	**Application officially received:**	30/08/21
Application stopped (s92):	15/09/21	**Application started (s92):**	10/12/21
Applicant to be notified of decision by:	21/01/22	**Applicant notified of decision on:**	21/01/21
Time taken to process application:	25 working days		

Consent conditions

Interpretation

Canopy cover means the percentage of ground area covered by planted native vegetation as viewed from vertically above the planted area. It includes all plant tiers (that is, it may be a mix of low growing species plus tree and shrub species).

Wellington Regional Council Officer means any Enforcement, Compliance or Duty Officer, Environmental Regulation, Greater Wellington Regional Council.

Notification or notice means email of notification to notifications@gw.govt.nz. Please include the consent reference number (WGN220051) and the name and phone number of a contact person responsible for the proposed works.

Stabilised means inherently resistant to erosion or rendered resistant, such as by using indurated rock or by the application of basecourse, colluvium, hydroseeding, grassing, mulch, or another method to the reasonable satisfaction of the Manager and as specified in Wellington Regional Council's *Erosion and Sediment Control Guidelines for the Wellington Region*, September 2002. Where seeding or grassing is used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once, on reasonable visual inspection by the Manager an 80% vegetative cover has been established.

The Manager means the Manager, Environmental Regulation, Greater Wellington Regional Council.

ESC Guidelines for Wellington Region means the current revision of the *Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region*, available on the Wellington Regional Council's website at the following link: http://www.gw.govt.nz/assets/Resource-Consents/Erosion-and-Sediment-Control-Guide-for-Land-Disturbing-Activities-in-the-Wellington-Region.pdf

Water body means 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

Standard conditions

1. The location, design, implementation, and operation of the activity shall be in general accordance with the consent application and its associated plans and documents lodged with the Wellington Regional Council on *30 August 2021* and:

    - *Further information received on 20 September 2021;*
    - *The Cultural Impact Assessment and further response received on 9 December 2021; and*
    - Further information regarding the size of the outlet structure received on 20 January 2022.

Where there may be contradiction or inconsistencies between the application and further information provided by the applicant, the most recent information applies. In addition, where there may be inconsistencies between information provided by the applicant and conditions of the consent, the conditions apply.

Note: Any change from the location, design concepts and parameters, implementation and/or operation may require a new resource consent or a change of consent conditions pursuant to section 127 of the Resource Management Act 1991.

2. The consent holder shall provide a copy of this consent and any documents and plans referred to in this consent to each operator or contractor undertaking works authorised by this consent, prior to the works commencing. In addition to this, a copy of this consent and all documents and plans referred to in this consent, are kept on site at all times and presented to any Wellington Regional Council officer on request.

   Note: It is recommended that the contractors also be verbally briefed on the requirements of the conditions of this consent prior to works commencing.

3. The Manager, Environmental Regulation, Wellington Regional Council, shall be given a minimum of two working days (48 hours) notice prior to the works commencing.

   Note: Notifications can be emailed to notifications@gw.govt.nz. Please include the consent reference WGN220051 and the name and phone number of a contact person responsible for the proposed works.

Construction methodology

4. The consent holder shall provide a final Construction Management Plan (CMP) to the Manager for certification at least 20 working days prior to the commencement of works.

   No works may commence on site until the consent holder has received written notice that the CMP has been certified by the Manager. The consent holder shall undertake the works in accordance with the approved CMP.

   The CMP shall be designed in consultation with the contractor undertaking the works and shall include (but not be limited) details of the following;

   a) The final design of the outlet structure;

   b) Detailed construction methodology;

   c) Details of erosion and sediment control measures;

   d) Methods to prevent other contaminants on the works site from entering water;

   e) Details of fish refuge to be constructed downstream of the stormwater outlet;

   f) Details of fish relocation to be undertaken before and after works;

   g) Details of all riparian planting to be undertaken; and

   h) Any other relevant matters to ensure compliance with all conditions.

5. The consent holder shall submit a final Erosion Sediment Control Plan to the Manager for certification at least 20 working days prior to the commencement of works. No works may commence on site until the consent holder has received written notice that the ESCP has been certified by the Manager. The consent holder shall undertake the works in accordance with the approved ESCP.

   The ESCP shall be in general accordance with the ESC guidelines and shall be prepared in consultation with the contractor undertaking the works and a suitably qualified and experienced person and include:

   a) Methods for minimising sediment release during rainfall;

   b) The use of silt fences around the perimeter of the site;

   c) The location of proposed ESC measures;

   d) The design criteria and dimensions of all erosion and sediment control devices;

   e) Details on how erosion and sediment control devices will be maintained during construction; and

   f) Timetable and nature of site rehabilitation and vegetation.

Reducing effects on water quality

6. The consent holder shall minimise sediment discharges and impacts on instream habitats and ecology during the works, including but not limited to:

   a) Completing all works in the minimum time practicable;

   b) Undertaking works in dry weather conditions, as far as practicable;

   c) Avoiding the placement of construction or excavated material in the wetted channel;

   d) Separating all construction activities from flowing water;

   e) Installing appropriate sediment control and treatment measures;

   f) Minimising crossing of the streambed and keeping crossings to one path only; and

   g) Minimising machinery in the streambed and undertake works from the banks where practicable.

7. The consent holder shall ensure that prior to entering a water body that all vehicles and equipment are inspected for the presence of invasive or pest aquatic species including *Didymosphenia geminata* (didymo). In the event that an invasive or pest aquatic species is discovered upon any vehicle or equipment it shall be cleaned, to ensure that no invasive or pest aquatic species are released as a result of these works.

   Note: The machinery shall be cleaned in accordance with the Ministry for Primary Industries cleaning methods which can be found at http://www.mpi.govt.nz/travel-and-recreation/outdoor-activities/check-clean-dry/

8. The consent holder shall ensure that no dry cement product, unset concrete, concrete wash water or any water contaminated with concrete enters water as a result of the works.

Freshwater fish and rescue

9. The consent holder shall ensure that fish passage is maintained through the Wharemaukū Stream tributary at all times during and after construction.

10. The consent holder shall engage a suitably qualified and qualified person to undertake fish rescue prior to installing the erosion and sediment control devices along the streambank margin and prior to removing these devices, in accordance with the certified CMP. The purpose of the fish rescue and relocation activities is to identify and rescue any native fish species that may be affected by the proposed activity. All native fish species captured during fish rescue shall be relocated to the affected tributary upstream of the works site within 1 hour.

    Note: It is the responsibility of the Consent holder to ensure that they secure any necessary authorisations from the Department of Conservation, the Ministry of Primary Industry and Fish and Game New Zealand, prior to the commencement of any fish rescue.

11. The consent holder shall invite Te Ātiawa ki Whakarongotai Charitable Trust to be involved in the fish rescue programme at least ten working days prior to the consent holder's intended date to commence fish rescue (noting the date will be weather dependent).

12. The consent holder shall install a fish refuge area in the streambank downstream of the stormwater outlet. The location, size and details of the fish refuge area shall be based on the advice of a suitably qualified freshwater ecologist. The purpose of the fish refuge area is to provide a resting place for native fish, if required, when the stormwater pipe is in operation (i.e. during high rainfall events).

Erosion/scour and revegetation

13. The consent holder shall ensure that any areas of the stream banks that are cut or disturbed as a result of the works are stabilised and grassed or replanted with native vegetation as soon as practicable following completion of the works, to prevent erosion and scour and to enhance riparian habitat qualities/reinstate shade habitat.

14. The consent holder shall attempt to re-plant the Tī Kōuka tree at the works site following the completion of works. If this is not possible, the consent holder should re-plant two Tī Kōuka trees in a suitable location.

15. The consent holder shall engage with Te Ātiawa ki Whakarongotai Charitable Trust when determining what native plants are suitable to plant in this location and in regards to the replanting of the Tī Kōuka tree. A record of this consultation shall be maintained and available to the Manager on request.

Maintenance and removal of structures

16. The consent holder shall remain responsible for the structure and shall ensure that it is maintained at all times, so that:

    a) Any erosion, scour or instability of the stream bed or banks that is attributable to the works carried out as part of this consent is remedied by the consent holder; and

    b) Any adverse effects caused by the presence of the structure that limit, restrict or prevent fish passage through the Wharemaukū Stream tributary shall be rectified by the consent holder; and

c) The structural integrity of the outlet remains sound in the opinion of a Professional Chartered Engineer

d) The waterway within or around the structure remains clear of debris.

Note: Maintenance does not include any works outside of the scope of the application. Further resource consents may be required for any additional works (including structures, reshaping or disturbance to the bed of the watercourse).

17. If the structure is no longer required, and/or the structure is not being maintained in accordance with condition 15 of this consent, or sustains irreparable damage then the consent holder shall remove and/or, in the case of damage, reinstate the structure following discussion with the Manager.

Note: Removal/reinstatement does not include any works outside of the scope of the application. Further resource consents may be required for any additional works.

Complaints

18. At all times from the commencement of works authorised by this consent until the works are complete and the site is stabilised, the consent holder shall maintain a permanent record of any complaints received alleging adverse effects from, or related to, the exercise of this consent. The record shall include:

a) The name and address of the complainant;

b) The nature of the complaint;

c) Location, date and time of the complaint and of the alleged event;

d) Weather conditions at the time of the complaint (as far as practicable), and including wind direction and approximate wind speed if the complaint relates to air quality;

e) The outcome of the consent holders investigation into the complaint;

f) Measures taken to respond to the complaint; and

g) Any other activities occurring in the area at the time of the complaint.

The consent holder shall also keep a record of any remedial actions undertaken. This record shall be maintained on site and shall be made available to the Manager, upon request. The consent holder shall notify the Manager of any such complaints as soon as practicable and within 24 hours after the complaint is received by the consent holder.

Discovery of artefacts

19. If kōiwi (human remains including bones), taonga (treasures), wāhi tapu (sacred sites) or other archaeological material is discovered in any area during the works, work shall immediately cease and the consent holder shall notify Greater Wellington Regional Council, Te Rūnanga o Toa Rangatira Inc, Te Ātiawa ki Whakarongotai Charitable Trust and Heritage New Zealand as soon as possible but within twenty-four hours. If human remains are found, the New Zealand Police shall also be contacted. The consent holder shall allow the above parties to inspect the site and in consultation with them, identify what needs to occur before work can resume.

Notification must be emailed to;

- Greater Wellington Regional Council, notifications@gw.govt.nz
- Heritage New Zealand, information@heritage.org.nz
- Te Rūnanga o Toa Rangatira Inc, resourcemanagement@ngatitoa.iwi.nz
- Te Ātiawa ki Whakarongotai Charitable Trust, taiao@teatiawakikapiti.co.nz

Heritage New Zealand must also be contacted by phone on 04 472 4341 (National Office).

No works may resume on site until the consent holder has received written notification that consultation with the parties identified above has been undertaken to the satisfaction of the Manager.

Note: Evidence of archaeological material may include burnt stones, charcoal, rubbish heaps, shell, bone, old building foundations, artefacts and human burials.

Review condition

20. The Wellington Regional Council may review any or all conditions of this consent by giving notice of its intention to do so pursuant to section 128 of the Resource Management Act 1991, at any time for the duration of this consent, for the following purposes:

    a) To review the adequacy of any report and/or monitoring requirements, and if necessary, amend these requirements outlined in this consent

    b) To deal with any adverse effects on the environment that may arise from the exercise of this consent; and which are appropriate to deal with at a later stage

    c) To enable consistency with any relevant Regional Plans or any National Environmental Standards or Regulations

    The review of conditions shall allow for the deletion or amendment of conditions of this consent; and the addition of such new conditions as are shown to be necessary to avoid, remedy or mitigate any significant adverse effects on the environment.

Notes:

a. A resource management charge, set in accordance with section 36(2) of the Resource Management Act 1991 shall be paid to the Wellington Regional Council for the carrying out of its functions in relation to the administration, monitoring, and supervision of resource consents and for the carrying out of its functions under section 35 (duty to gather information, monitor, and keep records) of the Act.

b. The Wellington Regional Council shall be entitled to recover from the consent holder the costs of any review, calculated in accordance with and limited to the Council's scale of charges in force and applicable at that time pursuant to section 36 of the Resource Management Act 1991.

c. The granting of this resource consent does not provide you with the right to access private properties. Landowner entry requirements need to be gained and be in place before you may exercise this consent.

d. Additional permits may be requiring for the handling of fish or temporary blockage of fish passage from the Ministry for Primary Industries, Department of Conservation or Fish and Game.

Reasons for decision report

1. Background and proposal

Kāpiti Coast District Council (KCDC or 'the applicant') has applied for resource consent to:

- Install a new stormwater discharge outlet within the bed of a tributary of the Wharemaukū Stream; and
- Undertake earthworks and vegetation clearance within 5 metres of the tributary associated with stormwater upgrades.

KCDC manage the stormwater network within the Kāpiti Coast District and they are progressively upgrading their stormwater network due to climate change impacts, historical flooding issues and to serve the needs of their communities. The Amohia and Ruahine sub-catchments have been identified by KCDC as being at high risk of flooding due to extreme rainfall. To manage this risk, KCDC propose to upgrade the stormwater network in this vicinity. The proposal is to:

- Install a stormwater bypass from Ruahine and Amohia Streets to the proposed stormwater outlet on the Wharemaukū Stream tributary. This will allow the existing system to overflow into the bypass pipeline during high rainfall events. There are no consenting requirements associated with this.
- Install a new stormwater discharge outlet within the bed of a tributary of the Wharemaukū Stream, as shown on Figure 1. This will be a DN1600 pipe with a prefabricated concrete wingwall. The outlet will be set back 1 metre from the stream bed, and this section is proposed to be comprised of rip-rap laid over filter fabric. This structure is the subject of this consent application.

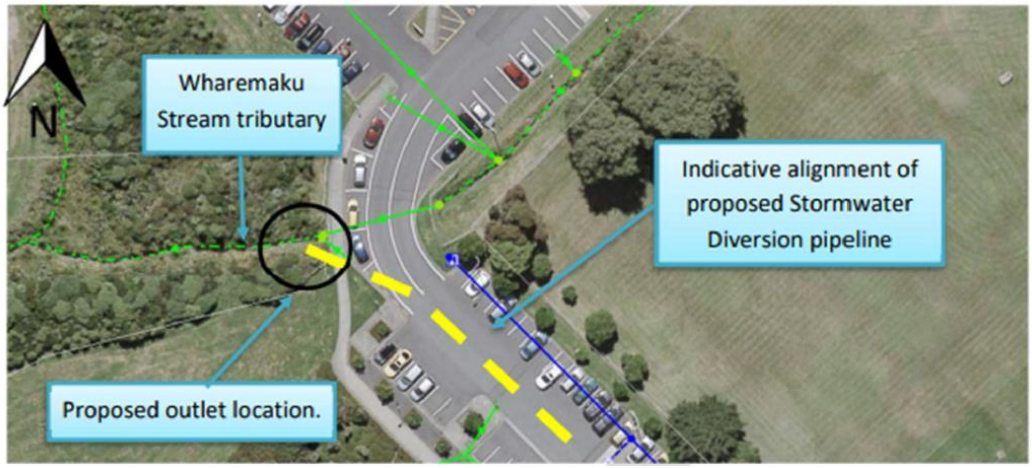

Figure 1. Proposed outlet location

The applicant has stated:

- The activity will be undertaken in accordance with a Construction Management Plan (CMP).

- Machinery will not enter the streambed or flowing channel during works.

- The approximate earthworks volume is 44m^3 over an area of 33.7m^2; this area will also be cleared of vegetation.

- As the outlet will be set back from the streambed, the stream will not be diverted or dammed. Therefore, fish passage will not be impeded. Nonetheless, in the response to the request for further information, the applicant has proposed conditions to relocate native fish species if necessary.

The works will be undertaken in accordance with the GWRC Erosion and Sediment Control Guidelines for the Wellington Region, this will include:

- Silt fences around the perimeter of the site;

- Completing works within the minimum time practicable (up to 2 weeks) and during dry conditions;

- Avoiding the placement of construction or excavated material in the stream channel; and

- Sediment control devices will be installed including silt fences and/or sandbag filters, re-stabilising and grassing/replanting exposed areas and stabilising the bank with biodegradable matting, if required, until vegetation has established.

- An Archaeological Discovery Protocol will be adhered to during works.

The applicant notes that the discharge of stormwater will be authorised by resource consent WGN160316, this consent authorises the discharge of stormwater throughout the Kāpiti Coast district.

2. Reasons for resource consent

2.1 Operative Regional Freshwater Plan

RMA section	Rule	Status	Comments
S13 – uses of beds of rivers	Rule 49	Discretionary	No rules specifically provide for the construction of stormwater outlet structures in the stream bed. The construction of the proposed structure, including disturbance of and deposition onto the stream bed, is therefore discretionary under the catch-all Rule 49.

The proposed activity is not located within or near a site identified in the appendices of the operative Regional Freshwater Plan (RFP). The Wharemaukū Stream, located 200m from the proposed works, is identified as a waterbody with nationally threatened indigenous fish.

2.2 Proposed Natural Resources Plan

The Council's decision on the Proposed Natural Resources Plan (PNRP) was publicly notified on 31 July 2019. All rules in the PNRP (decisions version) have immediate legal effect under section 86B(1) of the Act. As the application was lodged after 31 July 2019, the PNRP (decisions version) is relevant to determining the resource consents required, their activity status, and the substantive assessment of the proposal under section 104(1)(b) of the Act. The provisions of the PNRP as notified on 31 July 2015 have been superseded by the decisions version of the PNRP for assessing this proposal.

This is in addition to any consents required under the operative plans. Noting that under section 86F if there are no appeals on a relevant rule, the rule in the PNRP is treated as operative and the rule in the operative plan is treated as inoperative.

RMA section	Rule	Status	Comments
S13 – uses of beds of rivers	R117	Permitted	Rule R129 relates to all other uses of river and lake beds. The applicant originally assessed the installation of the stormwater outlet as being permitted pursuant to Rule R117 of the PNRP as the structure will not be installed in the bed of the stream, but away from it and then earthworks will be undertaken to connect the stream and the outlet structure Following further information on the location and size of the outlet structure, it was determined that the proposal cannot meet the permitted rule R117 as the structure is within the bed of the stream according to the definition in the RMA. Additionally, the size of the structure may not meet the permitted condition (i).Therefore, the proposal needs consent under rule R129 which is a discretionary activity.
	R129	Discretionary	
S9 – use of land and S15 – discharges	R99	Permitted	Rule R99 relates to the use of land and the associated discharge of sediment-laden runoff into water or onto or into land where it may enter water from earthworks of up to a total area of
	R101	Discretionary	

			3,000m^2 is a permitted activity provided the conditions are met. The applicant has stated that the activity will occur within 5 m of a surface waterbody (does not comply with Condition (e)). Therefore, a resource consent is required as a discretionary activity pursuant to Rule R101 of the PNRP.

The proposed activity is located within a scheduled site of the PNRP, the Wharemaukū Stream and its tributaries are listed in Schedule F1: Rivers and lakes with significant indigenous ecosystems - Habitat for 6 or more migratory indigenous fish species.

The Wharemaukū Stream, which the tributary connects to (is located 200 m downstream), is also listed in the following schedules of the PNRP:

- Schedule B: Ngā Taonga Nui a Kiwa; and
- Schedule C2: Sites of significance to Te Ātiawa ki Whakarongotai, with the following values of importance: mahinga kai, kānga wai, pātaka kai.

2.3. Overall activity status

Overall, the activity must be assessed as a discretionary activity under the operative Regional Freshwater Plan and a discretionary activity under the Proposed Natural Resources Plan (decisions version).

3. Consultation

Iwi authority	Comments
Te Ātiawa ki Whakarongotai Charitable Trust	Te Ātiawa ki Whakarongotai Charitable Trust provided a cultural impact assessment in regards to the proposal, this is available at file reference: WGN220051-1622664941-37. in summary, the Trust expressed concerns regarding: • The potential effect of the activity on native species that reside in the stream; • The potential effects of sediment entering the stream and the use of erosion and sediment control measures; and • The removal of native vegetation on the streambanks. The recommendations of Te Ātiawa ki Whakarongotai Charitable Trust are discussed in full in Section 5.5 of this report, including the mitigation proposed by the applicant in response to these concerns.

	Following this, the Trust indicated they are satisfied with the response of the applicant (file reference: WGN220051-1622664941-38).
Ngāti Toa Rangatira	Ngāti Toa Rangatira were informed of the application via the Te Wāhi platform. No comments have been received.
Other parties or persons	**Comments**
Department of Conservation (DoC)	The applicant provided the application to the Department of Conservation (DoC) for comment on 2 August 2021. DoC had no comments regarding the proposal (file reference: WGN220051-1622664941-3)
Wellington Fish and Game Council	As the application is not within a waterbody list in Appendix 4 of the RFP or Schedule I of the PNRP, Fish & Game was not consulted as an interested party.
GWRC Flood Protection Department	Advice was sought from Mr Hamish Smith, Senior Engineer, Flood Protection. He noted that he was generally comfortable with the rip-rap and erosion and protection works provided detailed design drawings are provided. I have recommended a condition to this effect. Mr Smith also requested further information regarding the flood modelling undertaken by the applicant. However, as noted in Section 5.4 of this report, the discharge is already consented through resource consent WGN160316, and therefore, it was not considered necessary to obtain this for the purpose of this consent application (to install the structure and undertake earthworks and vegetation removal within 5 m of the stream).

4. Notification decision

A decision was made to process the application on a non-notified basis on 10 December 2021. Further information on the notification decision is provided in document WGN220051-1622664941-10.

5. Environmental effects

The applicant provided an Assessment of Environmental Effects (AEE) with the application. This section provides an assessment of the effects of the proposed activity on the environment. Information has been drawn from the application provided by the applicant and other information sourced during the processing of the application.

5.1 Effects on water quality

During construction works in or near the bed of any watercourse, sediment has the potential to be discharged, causing a local and temporary increase in turbidity and suspended solid concentrations, reducing water quality. High

suspended solid concentrations can have adverse effects on the instream ecology, especially if these conditions persist over a long period of time. This has the potential to be harmful to the current fish population as many fish are visual feeders. Furthermore, works in the bed of any water body is likely to directly affect benthic fauna and flora.

The applicant has stated that the construction will be undertaken from the stream bank, with no machinery required to enter the stream. Effects on water quality will also be minimised through the implementation of erosion and sediment control measures during construction. In addition, the applicant proposes to re-establish exposed areas following works with the use of biodegradable matting to stabilize the site in the meantime.

I am satisfied that the potential and actual effects on water quality can be appropriately managed through the recommended consent conditions in Attachment 1, particularly conditions which require:

- The works to be undertaken in accordance with a Construction Management Plan;
- The works will be undertaken in accordance with an erosion and sediment control plan developed in accordance with the GWRC Erosion and Sediment Control Guidelines;
- Works will not be undertaken directly in the streambed;
- Works to be undertaken during a predicted dry weather period and in the minimum time practicable; and
- The site will be re-established following works with the use of biodegradable matting to stabilise the site in the meantime.

Provided the applicant adheres to the recommended conditions, I consider that the potential effects on water quality will be adequately managed and mitigated to a level no more than minor.

5.2 Effects on aquatic ecology and fish passage

Works in the bed of a stream have the potential to result in a loss of habitat for aquatic organisms (both fish species and macroinvertebrates), while structures that fully cross the bed of the stream can provide significant barriers to fish passage if fish passage is not provided for in their design, installation and maintenance. In addition, discharges of sediment to the stream has the potential to adversely affect aquatic ecology in the stream.

I note that no works will be undertaken in the stream bed. Therefore, fish passage will not be impeded during or after construction works. I have recommended a condition to this effect.

Nonetheless, based on the concerns expressed by Te Ātiawa ki Whakarongotai Charitable Trust, the applicant has proposed to undertake fish rescue prior to works commencing and has suggested conditions to this effect, including that these works are undertaken by a suitably and qualified person. I adopt these conditions and consider that they will adequately manage the potential effects of the proposed activity on aquatic ecology and fish passage.

In addition to the above, as described in Section 5.1, the applicant proposes to utilise erosion and sediment control measures, undertake works in the minimum time practical and re-establish the site following works. I consider the combination of these mitigation tools will ensure that the potential effect on aquatic ecology will be adequately managed and thus no more than minor.

5.3 Effects on erosion and scour

Any structure placed in the bed and banks of a stream has the potential to cause erosion and scour of the stream bed and banks, particularly at the ends of the structure, and the stream bed below the structure. Areas that are disturbed during construction are highly vulnerable to erosion and scour and need to be managed appropriately.

The proposed earthworks and vegetation clearance area will be exposed during works. The works area will be stabilized following works. Biodegradable matting is proposed to ensure stabilization before plants have been established. Once plants have been established, the site will be stabilized in the long term. The applicant has proposed a condition of consent requiring the site to be stabilised with native vegetation following works.

I am satisfied that the environmental effects from the proposed works on erosion and scour of the stream bed and banks can be appropriately managed through the recommended consent conditions in Attachment 1, particularly conditions requiring areas that are cut and disturbed as a result of the works shall be stabilised as soon as practicable following completion of the works; and the works to be maintained and any erosion and scour attributable to the works are remedied.

5.4 Effects on flooding

Works and structures within the bed and banks of rivers and streams have the potential to exacerbate flooding effects by altering the cross sectional area of the stream and therefore the flooding spread. Works in the bed and banks of rivers and streams can also result in floodwaters being diverted, and reduce the ability of the stream to convey flood waters.

As the outlet structure is connected to a pipe in the streambed, the outlet structure has not altered the cross-sectional area of the channel. I also note that the operational discharge of stormwater is authorised by resource consent WGN160316. As such, the effects of flooding from the discharge are not within scope of this resource consent application.

I am satisfied that the environmental effects from the proposed works on flooding can be appropriately managed through the recommended consent conditions in Attachment 1.

5.5 Potential effects on Tangata Whenua values

The Wharemaukū Stream has cultural significance to Te Ātiawa ki Whakarongotai Charitable Trust. Therefore, any works within or next to the Wharemaukū Stream must be managed appropriately to ensure that adverse cultural effects do not arise as a result of the proposed activity.

The Trust undertook a Cultural Impact Assessment, and this identified the concerns regarding the proposed works as well as their recommendations. In summary, the Trust expressed concerns about the potential effects on water quality, aquatic ecology and erosion of the watercourse, as noted in Section 3 of this report. The Trust made the following recommendations in the Cultural Impact Assessment:

- That monitoring of both the water quality and fish health is undertaken prior to works, including fishing the stream to ensure fish passage is not obstructed;

- That silt fencing is placed around the perimeter of the site and that the ESC demonstrate clearly that the banks of the stream will be not eroded; and

- That the site is revegetated with native species and that the mature Tī Kōuka and harakeke should be replanted. If this is not possible, the planting plan should include twice as many of these plants to make up for loss of habitat.

In response to this, the applicant proposes to:

- Undertake fish capture and relocation and extend an invitation to the Trust to be involved in the fish refuge programme;

- Undertake works with an ESCP that has been approved by GWRC, including the use of silt fences around the perimeter of the site; and

- Replant the stream banks with native vegetation.

Based on this, the Trust has stated that they have no further concerns regarding the works (file reference: WGN220051-1622664941-38).

I have recommended conditions to give effect to the above mitigation proposed by the applicant. The applicant has stated that they will attempt to replant the Tī Kōuka. Prior to the removal of the plant, the Council will identify a suitable location for it to be replanted. If this is not successful, the applicant proposes to plant at least two Tī Kōuka. The applicant also proposes to seek advice from the Trust regarding the planting at the site. I consider that these concerns are somewhat outside the scope of the applicant; nonetheless, as the applicant as

indicated that this is the method they will adhere to, I have recommended conditions to this effect.

I have not recommended conditions relating to monitoring of the stream, as works will not be undertaken within the stream bed itself and provided the ESC measures are implemented, I consider that the potential entrainment of sediment into the watercourse will be minimal.

Based on the mitigation proposed by the applicant and provided the recommended conditions are adhered to, I consider the potential effect on cultural values will be appropriately managed and mitigated so that effects on mana whenua values will be less than minor.

5.6 Summary of effects

Given the assessment above, it is considered that the proposed activity will not result in any more than minor effects when undertaken in accordance with the recommended consent conditions.

6. Statutory assessment

6.1 Part 2

Part 2 of the Act outlines the purposes and principles of the Act. Section 5 defines its purpose as the promotion of the sustainable management of natural and physical resources. Sections 6, 7 and 8 of Part 2 define the matters a consent authority shall consider when achieving this purpose.

I am satisfied that the granting of the application is consistent with the purpose and principles in Part 2 of the Act.

6.2 Matters to be considered – Section 104-108AA

Section 104-108AA of the Act provides a statutory framework in which to consider resource consent applications. All relevant matters to be considered for this application are summarised in the table below:

RMA section	Matter to consider	Comment
104(1)(a)	Actual or potential effects on environment	See Section 5 of this report.
104(1)(ab)	Measures to offset or compensate for adverse effects on the environment	The applicant has not proposed any measures to offset or compensate for adverse effects on the environment.
104(b)(i)	National Environmental Standards for Freshwater 2020	There are no regulations of relevance to this application.

RMA section	Matter to consider	Comment
104(1)(b)(iii)	National Policy Statement for Freshwater Management 2020	The NPS-FM sets out objectives and policies that direct local government to manage fresh water through regional policy statements, regional plans and in the consideration of resource consent applications. The NPS-FM prioritises the concept of Te Mana o te Wai (the integrated and holistic well-being of a freshwater body). Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the water and restores and preserves the balance between the water, the wider environment, and the community. The NPS-FM 2020 also sets out a hierarchy ('the objective') 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.* The proposal is unlikely to affect the health and well-being of waterbodies and freshwater ecosystems. Further to this, it is unlikely to affect the health needs of people. Finally, the proposal will allow people and communities to provide for their social, economic and cultural well-being. Therefore, I consider that the proposal gives effect to the Objective and Policy 1 of the NPS-FM as freshwater will be managed in a way that gives effect to Te Mana o te Wai. In addition, the proposal is also consistent with Policy 15. Overall, I conclude that the proposal is consistent with the NPS-FM.
104(1)(b)(v)	**Regional Policy Statement**	I consider that, with the application of the recommended conditions of consent, the proposed activity is consistent with the RPS.

RMA section	Matter to consider	Comment
	Objective/Policy	*Comment*
	Objective 12, Policies 40, 41, 43, 47	These provisions aim to ensure that the quality and quantity of freshwater meets a range of uses and values, supports the life supporting capacity of water bodies, meet the reasonably foreseeable needs of future generations; and that water bodies support healthy functioning ecosystems. As there will be minimal works within the channel, I consider that provided the recommended conditions are adhered to, that the proposal will be consistent with these provisions.
	Policy 48 & 49	The principles of the Treaty of Waitangi and matters of significance to tangata whenua have been recognised and provided for. The application was sent to the relevant iwi via Te Wāhi. In addition to this, Te Ātiawa ki Whakarongotai Charitable Trust provided a cultural impact assessment in relation to the application. The applicant has proposed mitigation in response to these concerns. I consider the proposal is consistent with these provisions.
104(1)(b)(vi)	**Regional Freshwater Plan**	I consider that, with the application of the recommended conditions of consent, the proposed activity is consistent with the RFP.
	Objective/Policy	*Comment*
	Objectives 4.1.1, 4.1.2, 4.1.3, Policy 4.2.1	These objectives relate to recognising and providing for the relationship of tangata whenua with water, protecting the mauri of water bodies, and taking into account the principles of the Treaty of Waitangi. The application was sent to the relevant iwi via Te Wāhi. As noted above, Te Ātiawa ki Whakarongotai Charitable Trust provided a cultural impact assessment and the applicant has proposed additional mitigation in response to the concerns expressed in this.

RMA section	Matter to consider	Comment
	Objectives 4.1.4, 4.1.5, 4.1.6 Policies 4.2.9, 4.2.11, 4.2.12	These provisions aim to protect the natural character, life-supporting capacity and significant freshwater biodiversity from inappropriate subdivision, use and development. Provided the recommended conditions are adhered to, I consider the proposal will be consistent with these objectives and policies.
	Policy 4.2.33	This policy provides for those activities which have no more than minor adverse effects on the environment. As discussed above, this proposal is likely to have no more than minor effects on the environment.
	Objectives 5.1.1, 5.1.2, 5.1.3 Policy 5.2.1	These objectives and policies aim to safeguard the life supporting capacity of water and aquatic ecosystems from discharges to freshwater. Based on the mitigation proposed by the applicant, including the use of erosion and sediment control measures, I consider the proposal will be consistent with these objectives and policies.
	Objectives 7.1.1 – 7.1.4	The proposed activity is: • an appropriate use of the river bed • does not increase risk of flooding or erosion • does not damage existing lawful flood mitigation works • consistent with tangata whenua values
	Policy 7.2.1 & 7.2.2	The proposed activity fits with uses of Policy 7.2.1 does not have significant adverse effects on matters identified in Policy 7.2.2
104(1)(b)(vi)	**Proposed Natural Resources Plan (decisions version)**	I consider that, with the application of the recommended conditions of consent, the proposed activity is consistent with the PNRP.
	Objective/Policy	*Comment*
	Objectives O1, O2, O3, O4	These objectives relate to the holistic and integrated use and management of resources. I have recognised and considered these objectives while assessing this consent application.

RMA section	Matter to consider	Comment
	Objectives O14, O15 Policies P17, P18	These provisions relate to recognising kaitiakitanga and Māori relationships with the environment and protecting sites with significant mana whenua values. The application was sent to the local iwi via Te Wāhi. Te Ātiawa ki Whakarongotai Charitable Trust provided a cultural impact assessment and the applicant has proposed additional mitigation in response to the concerns expressed in this.
	Objectives O23, O24 O25, O27 and O47 Policies P31, P32	These provisions relate to maintaining or improving water quality, safeguarding aquatic ecosystem health and mahinga kai. Provided the recommended conditions are adhered to, I consider the proposal will likely be consistent with these provisions.
	Objective O29 Policy P34	The proposed activity avoids the creation of new barriers to passage of fish & koura.
	Objective O35 Policies P40, P41, P41A, P42	Ecosystems and habitats with significant biodiversity values are protected and restored, and effects of the proposed activity are managed. Although the site is not listed in Schedule F1, the Wharemaukū Stream located 200 m from the location of works is. I consider that provided the mitigation tools are utilised on site, that the proposed activity will be consistent with these provisions.
	Policy P106	The introduction/removal of plants will be appropriately managed to meet the requirements of this policy.
104(1)(c)	Any other matter	There are no other matters relevant to this application.
104B	The consent authority may grant or refuse the application	If it grants the application, conditions may be imposed under section 108.
108 – 108AA	Conditions on resource consents	Standard conditions of consent for this activity type are recommended. All standard conditions of consent meet the requirements of s108AA. Any additional conditions are outlined in Section 5 of this report. I have assessed the additional conditions against the criteria in s108AA as follows:

RMA section	Matter to consider	Comment
		• Recommended conditions have been agreed to by the applicant so meet 108AA(1)(a) • Recommended conditions are directly connected to an adverse effect of the activity on the environment, a regional rule or an NES so meet 108AA(1)(b) • Recommended conditions relate to an administrative matter of the resource consent so meet 108AA(1)(c) All conditions are documented in this report.

6.3 Weighting of the Proposed Natural Resources Plan

As the conclusion reached under the Regional Freshwater Plan assessment is consistent with that reached under the Proposed Natural Resources Plan (decisions version) there is no need to undertake a weighting exercise between the two Plans.

7. Main findings

In conclusion:

1. The proposed activity is consistent with the Purposes and Principles of the Resource Management Act 1991.

2. The proposed activity is consistent with the relevant objectives and policies of the Regional Policy Statement and the Regional Freshwater Plan and the Proposed Natural Resources Plan.

3. The proposed activity is not contrary to the objectives and policies of the National Policy Statement for Freshwater Management, the Regional Policy Statement and the Regional Freshwater Plan and the Proposed Natural Resources Plan.

4. The actual or potential adverse effects of the proposed activity on the environment will be or are likely to be no more than minor.

5. Conditions of the consent(s) will ensure that the effects of the activity on the environment will be appropriately avoided, remedied or mitigated.

6. The proposal incorporates appropriate mitigation measures, to ensure the adverse effects are or are likely to be no more than minor.

8. Duration of consent

The applicant has not requested a specific consent duration for the proposed activity. I consider that a 35 year duration is appropriate for the nature of the works.

9. Monitoring

The following compliance monitoring programme will be undertaken during the consent term:

Monitoring assessment:	☐ Annual	☐ Three-yearly	☑ Other: One off
Monitoring input:	☐ Audit	☐ Site inspection	☑ Other: Check off CMP and ESCP plans for approval (conditions 4 and 5)
Other notes			
Compliance group	River works		

9.1 Monitoring charges

Consent monitoring charges apply for the consent approved. Charges are normally invoiced on an annual basis. Your consent monitoring charge is made up of two components:

1. **Customer service charge** – every consent incurs an annual charge of $50. This covers costs associated with the administration of your consent.

2. **Compliance monitoring charge** – the cost associated with our staff monitoring the compliance of your consent.

An estimate of your annual consent monitoring charge is provided below:

		Amount	Charge code(s)
Customer service charge	1 consent	$50	
Monitoring charge	Variable		LU1
Further notes (if applicable)	No inspection required. Requires approval of plans prior to works commencing. One-off charge.		

*Variable charges will alter from year to year and are based on the actual and reasonable amount of time required to monitor your consent

The GWRC Resource Management Charging Policy is reviewed on an annual basis, and may alter these charges