ROTORUA LAKES COUNCIL
Te kaunihera o ngā roto o Rotorua

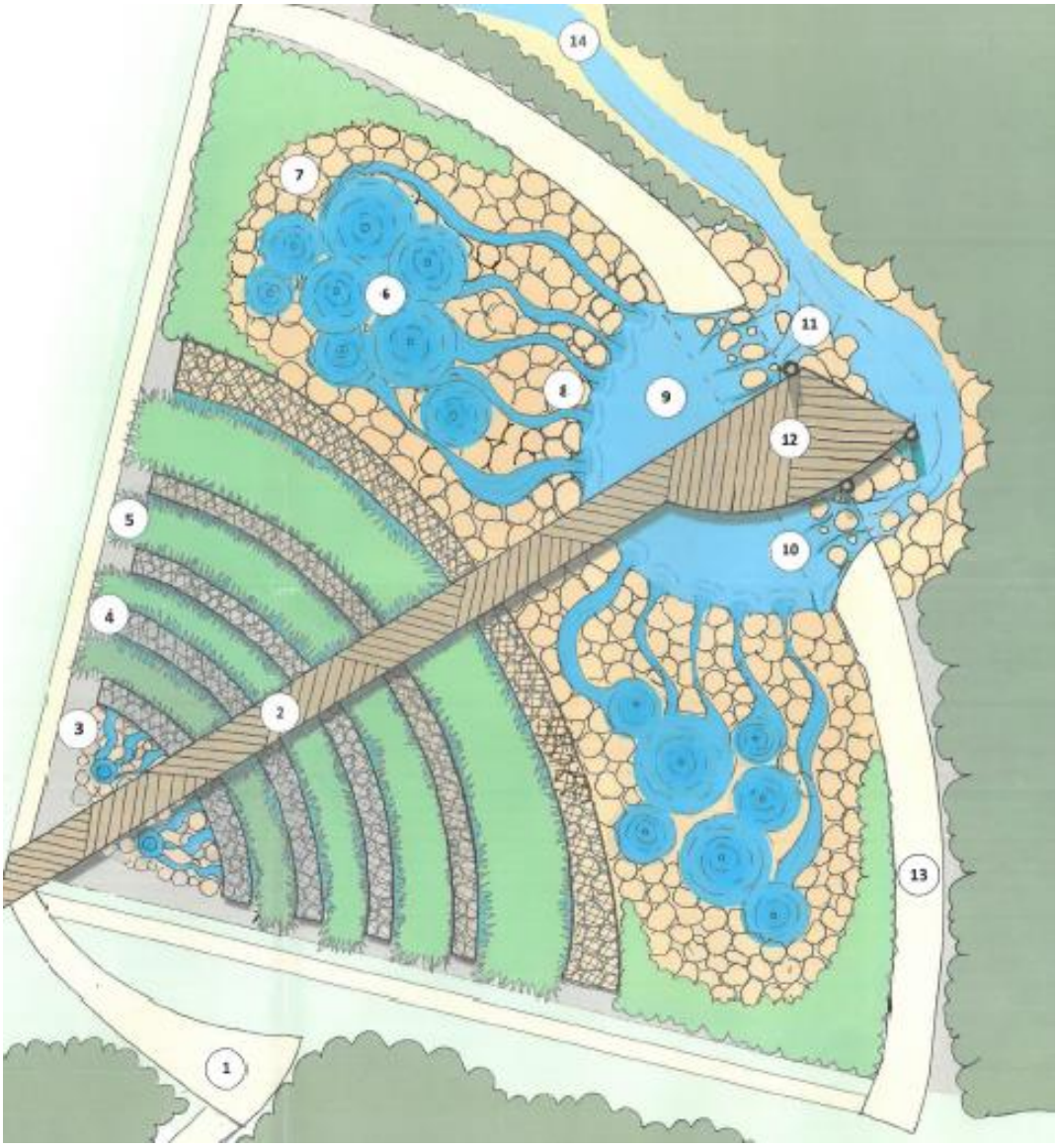
# ROTORUA WASTEWATER TREATMENT PLANT

# APPLICATIONS FOR RESOURCE CONSENTS AND ASSESSMENT OF ENVIRONMENTAL EFFECTS

## COMPANION DOCUMENT NO. 2

# Cultural Impact Assessment

## of a discharge of treated wastewater to Lake Rotorua through a land contact bed at Puarenga Bay, Rotorua




April 2018

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TE ONEWA
CONSULTANTS

# Contents

# 1.0 INTRODUCTION

## 1.1 Purpose

The purpose of this report is to provide an independant assessment of the cultural effects of a proposal to discharge treated wastewater from the upgraded Rotorua Wastewater Treatment Plant. This report is supplementary to the Impact Assessment of Rotorua Land Treatment System Alternatives May 2017.

## 1.2 Brief

A brief of work was agreed between Te Onewa Consultants and Rotorua Lakes Council in early November 2017.

This cultural impact assessment for the land contact bed proposal is supplementary to the cultural impact assessment prepared in April 2017 for the upgrade of the water treatment plant. In April 2017 a detailed proposal for the discharge was not developed. It was agreed that a new assessment be prepared, following the development of a discharge concept.

The report noted that "*The only discharge options remaining 'live' were a rapid infiltration bed to be a located at a place yet to be determined, commercial re-use of the treated wastewater, and a diffused discharge of treated wastewater to Lake Rotorua in the vicinity of Puarenga Bay.*[1]

This draft cultural impact assessment was ratified by the Cultural Assessment Subcommittee (CAS) in November 2017 and included as a draft in the draft applications for resource consent reviewed by Bay of Plenty Regional Council. A peer review was conducted of the draft cultural impact assessment in March 2018. Amendments were made in April 2018 and the final report was ratified by the CAS in April and May 2018.

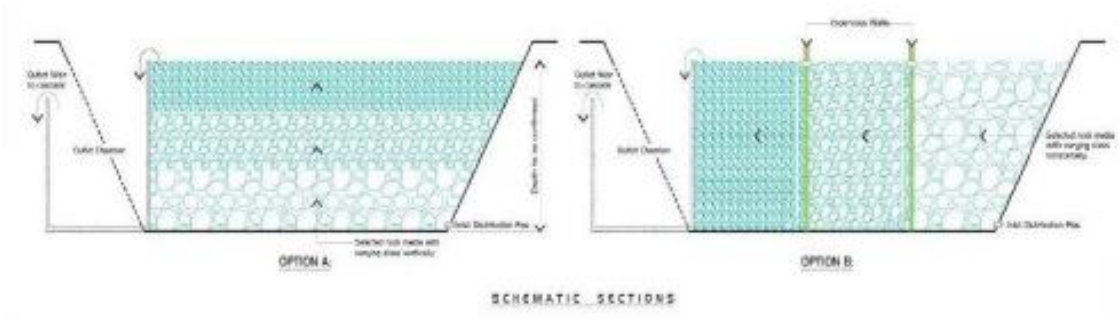
## 1.3 Proposal

The proposal to establish a land contact bed has its genesis with meetings of the cultural assessment sub-committee of the Rotorua Project Steering Group[2]. Mr Peter Staite of Ngāti Te Kahu and Ngāti Hurunga Te Rangi[3] suggested the idea of a bed of different types of aggregate of which the treated wastewater could pass through as a spiritual cleansing before entering Lake Rotorua. The idea received some consideration with rough sketch and concept images being produced and workshopped. The idea then was parked while other alternative land based discharge locations were being investigated.

[1] Coffin. Cultural Impact Assessment of Rotorua Land Treatment System Alternatives. April 2017. Section 2.3, page 11

[2] List of members included in Appendix 3

[3] Sometimes referred to as Ngāi Hurunga Te Rangi



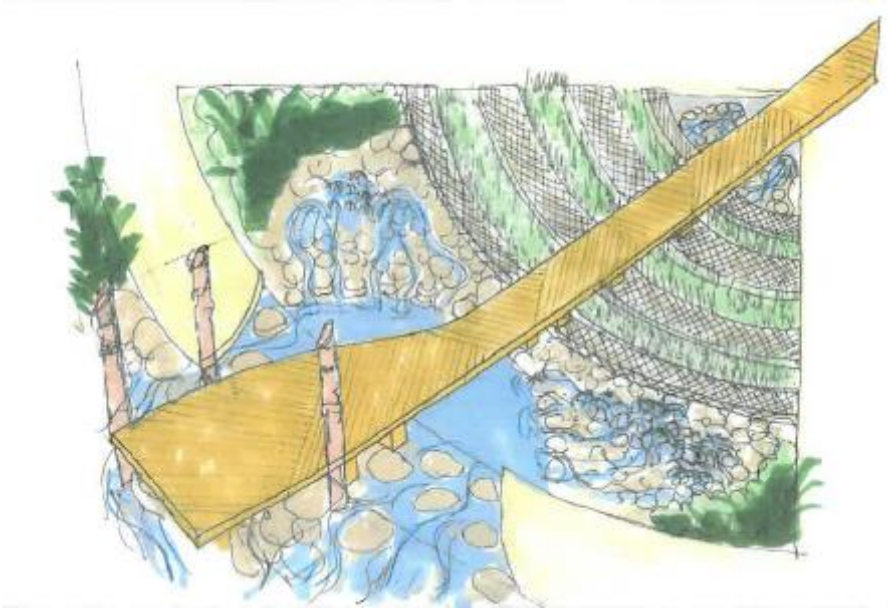

The draft cultural assessment (April 2017) for the wastewater treatment plant upgrade, recommended that further work should be done to develop a 'land contact' proposal in the vicinity of the treatment plant. Rotorua Lakes Council set out to conceptualise the idea with workshops and applying some technical assistance. Workshops were held with members of the CAS including Peter Staite, Wally Lee, Geoff Rice, Gina Mohi, Antoine Coffin and Rotorua Lakes Staff (3). The result was a concept design giving an impression of what a land contact bed might look like and the component experiences. The early proposal shown on a A3 sheet showed treated wastewater leaving the plant through a fountain, bubbling and spilling into a causeway and entering a large containment area with a series of pebble, stone, rock, and planted belts that created a range of natural water qualities such as welling up (puna), bubbling (puawai), seeping (papī), flow (rere), meandering (rere), pausing (mauri tau), falling (tāheke), etc.

The land contact bed proposal was amended and developed in consultation with a Mātauranga Māori Experts Group.[4] Mātauranga Māori Experts Group includes a wide range of Māori cultural experts with associations to Te Arawa and Lake Rotorua. The current proposal developed from those discussions involves:

- Constructing a cultural treatment facility that incorporates Mātauranga and Matapono Māori. The facility involves a range of aggregate and wetland type sections representing natural and cultural environments;
- The re-purposing of an existing rention pond within the wastewater treatment plant for this purpose;
- The treated wastewater is directed to this new facility and following treatment is discharged into Lake Rotorua in Puarenga Bay via a water fall/spillway structure; and
- The flow follows the path of an existing rivulet.

[4] Wānanga held on 18 May 2017 and 7 July 2017.


Land Contact Bed Concept from above



Land Contact Bed Concept from the north

As mentioned above the water traverses a number of segments or experiences. In the concept these segments and eleemnts are numbered 1-14. A short description is provided of each segment.

1. Water enters the land contact bed via a causeway from the Sanitorium Reserve.

2. A walking platform provides pedestrian access and observation from the entry point of water to the discharge point.
3. This is the water springs to the surface (punawai).
4. Gabian baskets filled with local stone.
5. Bands of wetland planting.
6. Sculptural water fountains to create turbulance and aeration.
7. Locally sourced loose rock; placed to create mounds to replicate Rotorua landform.
8. Rills; shallow water channels with carefully designed surfaces which create different water movement and sounds.
9. Calm water; pond containing aquatic life.
10. Weir with stepping stones.
11. Waterfall.
12. Compacted lime chip path.
13. Create natural looking stream with planting (watercourse connects into Lake Rotorua).

A video has been developed to explain the cultural meaning and objectives of the land contact bed.[5]

## 1.4 Alternatives Considered

The May 2017 cultural impact assessment sets out the journey of the project which identified, investigated, assessed and considered a range of alternative discharge locations and methods. Potential irrigable areas of land within 10 kilometres of the plant were also identified. These options were included options contained in two reports prepared by Mott MacDonald.[6] In summary the alternative options considered included:

- **Retaining the discharge in the Whakarewarewa Forest.** This option was unable to be considered further due to the agreement between Rotorua Lakes Council and CNI Forests to cease wastewater treatment discharge to the forest by 2019.
- **Discharge to smaller areas in the Whakarewarewa Forest using rapid infiltration beds.** These options were discounted due to the agreement between Rotorua Lakes Council and CNI Forests to remove wastewater treatment discharge to the forest by 2019, the high cost and challenge of establishing infrastructure.
- **Discharge to an adjacent block to Whakarewarewa Forest.** These options were discounted due to the high number of streams, hilly, complex irrigation arrangement and ability to consent the activity.
- **Discharge to land on the eastern side of Lake Rotorua (Whakapoungakau).** These options involved significant risks due to sandy soils, proximity to Lake Rotorua, likely to have relatively high land value and ability to consent the activity. Landowners were not in a position to accept the discharge at this time. Some of these options were close to known wāhi tapu.

[5] https://letstalk.rotorualakescouncil.nz/rotorua-wastewater-treatment-plant
[6] Mott MacDonald. Alternative Land Treatment Sites 2015 and Alternative Land Treatment Sites – Supplementary Report 2015.

- **Discharge to land adjacent to SH 5**. This option was geotechnically challenging due to steep land, unsuitable ground, and ability to consent the activity. It involved a very long distance, being more than 10km from the treatment plant.
- **Discharge to the Puarenga Stream.** Three potential sites were identified along the lower section of the Puarenga Stream. All options were discounted as highly offensive and culturally unacceptable to tangata whenua. This rejection in particular, acknowledged the historic grievances held by the Ngapuna community.
- **Discharge to Lake Rotorua.** Three potential options were identified. Two options involved a piped discharge near Hinemoa Point. The proximity to Hinemoa Point and known wāhi tapu discounted these options due to being culturally unacceptable. One other option involved a discharge 2 km offshore in Lake Rotorua. This option involved a submerged pipe and diffuser. This option was considered to be a direct discharge to the lake, and as such was deemed culturally offensive and unacceptable.
- **Discharge to the Kaituna River**. This option was rejected by RPSC due to the Waitangi Tribunal recommendation in 1984 and being cultural unacceptable (outside of the catchment) .
- **Discharge to Lake Rotoiti**. Rejected by RPSC due to Waitangi Tribunal recommendation in 1984 and cultural unacceptable (outside the catchment).
- **Discharge to Tikitapu (Blue Lake) and Lake Tarawera**. These options involved a pipeline from the wastewater treatment plant to the westerrn shore of Lake Tarawera. This was considered culturally unacceptable and discounted by RPSC.
- **Re-use of treated wastewater in industrial processes and for non-domestic users.** This option received support from the RPSC members and tangata whenua. It has been provided for by constructing an accessible valve that would allow a significant proportion of the treated wastewater will be utilised for fire service, industrial cooling processes, dust suppression, concrete, non-food irrigation and washing.
- **Discharge to land not yet identified**. The RPSC has not rejected the idea of a land based discharge but has been unable to identifiy a suitable and acceptable location.
- **Discharge via a land contact bed**. This option is the subject of the cultural impact assessment and has been proposed in the applications for resource consent. It has received majority support from RPSC but a number of hapu strongly oppose the 'location' of the discharge at Puarenga Bay.

## 1.5 Summary of Engagement

Rotorua Lakes Council initiated an engagement with pūkenga (cultural experts) through a Mātauranga Māori Experts Group[7], and following this embarked on a further round of consultation with Lake Rotorua iwi and hapū and stakeholders during June, July, August, September and November 2017, the notes and minutes of these meetings are appended to this assessment.[8]

The following groups have been engaged specifcally on this proposal between June and September 2017.

- Te Maru o Kaituna, 14 June 2017 (20+pp)
- Ngāti Uenukukopako, 30 July 2017 (16pp)
- Ngāti Pikiao (12pp)

[7] List of experts is included in Appendix 3

[8] Appendix 1 – notes and minutes of meetings

- Ngāti Rangiteaorere, 17 August 2017 (10pp)
- Ngāpuna hapū/Iwi, 23 August 2017 (13pp)
- Te Pukenga Koeke o Te Arawa, 25 August 2017 (50+pp)
- Te Arawa Lakes Trust, 25 August 2017 (9pp)
- Industry, 30 August 2017 (70pp)
- Operations & Monitoring Committee inlcuding representatives of Te Tatau o Te Arawa, 7 September 2017 (20+pp)
- Rotorua Te Arawa Lakes Strategy Group, 8 September 2017 (20pp)
- Ngāti Whakaue, 10 September 2017 (40+pp)
- Bay of Plenty Design and Delivery Committee, 14 September 2017 (26pp)
- Ngāti Pikiao Koeke, 14 Sepetmber 2017 (32+pp)
- Tuhourangi, 30 September 2017 (24+pp).
- Ngāti Rangiwewehi, Sunday 5th November 2017 (30pp)

A presentation of the proposal was given to each group at a venue of their choosing.[9] Most meetings were held at marae and well attended. The presentation group normally consisted of the Rotorua Lakes Council Project Manager - Greg Manzano, Māori Liaison Officer - Jenny Riini, and support staff. During and following the presentation, audiences were provided time to ask questions and give feedback.

A further meeting was held with Ngāti Uenukukopako and Roro-o-te-rangi representatives at Owhata Marae on 27 November 2017. The notes of this meeting are included in Appendix 1.

The findings of this cultural assessment were presented to the cultural assessment sub-committee of the Rotorua Project Steering Group on 28th November 2017.

The views and feedback of engagement are contained in a Appendix 1 of this report. A summary of the key issues and opportunities is provided in the next section.

## 2.0 Key Issues and Opportunities

In this section I identify key concerns and opportunities identified during the consultation period. The majority of issues and opportunities did not have context and detail. The author has provided an interpretation and where appropriate a discussion of each matter.

*Discharge to Lake Rotorua*[10]

The April 2017 CIA concluded that a proposal to discharge to Puarenga Bay will need to overcome significant thresholds as a result of the Rotorua Geothermal Field and Lake Rotorua being recognised as taonga to Te Arawa. For the geothermal field, particular sensitivity needs to be given to surface expression of the resource such as baths and named features. A discharge to Lake Rotorua will need to be of the highest quality, through appropriate land contact and a diffused or indirect discharge. The Rotorua Lakes Trust has stated that it is opposed to any direct discharge of treated wastewater into Lake Rotorua.[11]

[9] Appendix 2 – presentation of land contact bed proposal
[10] Coffin. Cultural Impact Assessment of Land Treatment System Alternatives. April 2017. Section 7.3, page 57.
[11] Letter from Te Arawa Lakes Trust.

*Capacity to deal with severe weather events*[12]

A concern of tangata whenua is the capacity of the plant to deal with the increased water entering the plant during severe weather events. The wastewater treatment plant experiences significant increases of input as a result of storwater entering the municipal wastewater network. The upgrade of the plant is understood to have some 70 M litres of capacity, which is based on a worst case scenario.

*Blood and body fluids, medical waste*[13]

Tangata whenua have raised the concern of a range of human wastes associated with medical practise entering the plant. The presence of human blood in the natural environment, particularly in proximity of any food resources is highly sensitive. There is also a concern regarding potential pathogens, viruses and bacteria.

It is understood that medical waste goes to an independant company and once treated is sent to landfill. Filtration and ultra violet treatment at the plant addresses viruses and bacteria. Biosolids go to Kawerau for vermicomposting.

*Hard to trust Rotorua Lakes Council*[14]

This concern is expressed in many different forms, but reflects a mood or theme of distrust among Māori community members and tangata whenua representatives to decisions and decision-making processes of the Council.

The Council embarked on a second round of consultation regarding the land contact bed and the location of its discharge. It is acknowledged that there is both support and opposition to the proposal, in particular opposition to the location of the discharge to Lake Rotorua.

The Council should continue to engage with as many groups as possible throughout the decision-making process, even though some tangata whenua groups remain strongly opposed to the discharge location. This application reflects a point in time. The medium to long-term success of the project will involve a strategic and critical perspective that tests assumptions and assesses the feasibility of future options.

*Increased flow of water from land contact bed at Puarenga. 6 inches deep flow.*

There has been some conjecture over how deep the flow of treated wastewater entering Lake Rotorua would be. It has often been described in physical terms with an indication using hands (6-10 inches). Some accuracy of the range of volumes/flows expected and how deep and wide the water would be should be gained. This could be easily shown in a table.

*Treated wastewater discharged to the lake is horrifying*[15]

Notwithstanding the broad support for the upgrade of the wastewater treatment plant, there is a concern among tangata whenua regarding the discharge of treated wastewater to the lake as a matter of principle, regardless of the quality of its treatment. This is emphasised by the Te Arawa Lakes Trust opposing a 'direct' discharge of the treated wastewater into the lake and local

[12] Te Maru o Kaituna 14 June 2017, Ngāti Uenukuōpako 30 July 2017, Ngāpuna hapū 23 August 2017, Te Pukenga Koeke o Te Arawa 25 August 2017
[13] Ngāti Uenukukōpako 30 July 2017
[14] Ngāti Uenukukōpako 30 July 2017
[15] Ngāti Rangiteaorere 17 August 2017

manawhenua opposing the discharge location. This concern is challenging to overcome. It is acknowledged that the discharge of treated wastewater to Lake Rotorua is a sensitive matter as a discharge of treated wastewater to waterways is abhorrent to tangata whenua. The Council has sought to address this by finding a treatment and disposal process that is acceptable from a matauranga Māori perspective, through an investigation and design process led by tangata whenua.

There are also a number of opportunities that have been identified by tangata whenua during the consultation. Some of these matters are described further.

*Integration of Mātauranga Māori*[16]

The new conceptual proposal for a land contact bed is innovative. It incorporates Mātauranga and Matapono Māori at the core of the concept, adding layers of meaning and understandings from pukenga and tangata whenua representatives.

The particular emphaisis of the land contact bed is the primacy of the spiritual cleansing of the water, as a transition from the treatment process in the plant to the natural environment.

This concept has involved the input of a great number of Te Arawa experts. A list of these experts is provided in Appendix 3. The process of spiritually cleansing is well supported by tangata whenua, however, local manawhenua, in particular, Ngāti Hurunga Te Rangi, Ngāti Uenukukopako, Ngāti Rangiteaorere and Roro-o-te-rangi are opposed to the discharge location at Puarenga Bay.

*Dewatering*[17]

A number of people during consultations have suggested de-watering the wastewater and recycling or re-using this resource. This is already occurring and may not have been widely known. De-watered sludge is sent to a Vermi-composting facility in Kawerau. This is expected to contunue.

*Double UV treatment*[18]

The use of ultra-violet light is considered an effective treatment of bacteria and viruses as a tertiary treatment. Whilst very expensive, the proposal inlcudes double ultra-violet treatment for the upgraded wasewater treatment plant.

*Acknowledgement of the time, thought and effort to find a solution*[19]

Whilst this not an opportunity per se, there has been broad acknowledgement of the second round of consultation and the efforts of Lake Rotorua Council to find a solution that meets cultural needs. This is not to say everyone supports the proposal as several hapu do not, but the process of engagement has been acknowledged. As mentioned above the on-going engagement with as many people as possible during the decision-making process is recommended. This could include specific and formal relationship agreements with manawhenua groups.

[16] Te Maru o Kaituna 14 June 2017, BOPRC Design & Delivery Committee 14 September 2017
[17] Ngāti Pikiao 14 August 2017,
[18] Ngāti Rangiteaorere 17 August 2017,
[19] Ngāpuna hapū 23 August 2017, Te Pukenga Koeke o Te Arawa 25 August 2017, Te Arawa Lakes Trust 25 August 2017, Rotorua Te Arawa Lakes Strategy Group 8 September 2017, Ngāti Whakaue 10 September 2017

*Monitoring*[20]

A number of people have identified potential indicator species to monitor the success or otherwise of the proposal over time. There are also opportunities to create and formalise a cultural monitoring framework that can have broader application across the lakes.

- Koura[21]
- Use of kakaho and inanga as indicator species
- Use of kokopū, inanga, watercress as indicators
- Use of presence of frogs as an indicator
- Alignment with Te Mana o te Wai
- Encourage children to visit the area while doing waka ama. They can observe changes (if any) and report this to Kaitiaki.

*Alternative sites for land discharge*[22]

There have been a number of sites explored as part of the project, these being detailed in the primary CIA (May 2017). Some of these sites were physically suitable but were discounted for one reason or another. The primary CIA recommended that medium to long-term opportunities for a land based discharge and/or commercial uses should not be discarded out of hand due to the land contact bed proposal, rather discrete and specific investigation and feasibility should be ongoing. This could potentially be included as a condition of consent.

*Resident time of one day*[23]

The Cultural Assessment Sub-committee members recommended that the treated wastewater water rests (mauri tau) before discharging into the Puarenga Bay. It was suggested that this would be one day to reflect the movement of the sun rising in the east (birth) and setting in the west (death). This relates to the tradition of Tamanui te ra (the sun) rising in the east and setting in the west in the waters of Tane. This would require a resident time of the daylight hours. The normal operation of the plant is understood to provide for some 18 hours of resident time in the land contact bed.

*Support hapu water improvement projects*[24]

A number of hapū have indicated that they are undertaking or have plans to undertake a range of water improvement projects. These range from restoration activities to water conservation and community infrastructure projects. Support of these projects may reduce water usage, wastewater production and improve water quality.

There is an opportunity to identify water improvement projects as potential mitigation or off-set mitigation. These could be included as conditions of consent or as part of agreements with specific hapu groups.

*Geothermal energy to evaporate the water*[25]

[20] Ngāti Uenukuōpako 30 July 2017, Ngāti Pikiao 14 August 2017, Rotorua Te Arawa Lakes Strategy Group 8 September 2017
[21] Te Tūāpapa o ngā wai o Te Arawa – Te Arawa Cultural Values Framework. p7
[22] Ngāti Uenukuōpako 30 July 2017
[23] Antoine Coffin. Cultural Impact Assessment of 5.20
[24] Ngāti Rangiteaorere 17 August 2017
[25] Te Pukenga Koeke o Te Arawa 25 August 2017, Ngāti Whakaue 10 September 2017

This suggestion was raised by the late Mr Whetu o te Uru Whata, member of the RPSC, with a slight variation (induction). The evaporation of wastewater suggestion was raised during the second round of consultation and although there does not appear to be any tangible proposal, there is a very large and active geothermal resource that is easily accessed. The feasibility of such a proposal would need to be prepared before any assessment of cultural effects can be conducted. The use of geothermal energy for treatment or potentially power supply could be investigated further as part of a range of medium to long-term options.

*Mitigation*[26]

Apart from general comments on the improvements or enhancements of the environment generally there was one suggesstion that riparian planting along the channel would encourage the return of frogs. Riparian planting is often seen as a pragmatic and tangible method of gaining a number of environmental and cultural benefits. The Matauranga Māori experts have recomemnded riprain planting along the banks of the proposed discharge to Lake Rotorua. Riparian planting could be considered as one of a number of mitigation measures and/or part of landscaping of the area to improve amenity. Landscaping is proposed for the discharge area, and this could include the lower parts of the Puarenga Streama nd Bay.

*Reduction of wastewater at the source*[27]

An obvious and apparent method to reduce the volume of wastewater is at its source, i.e, domestic, municipal and commercial users. This could include a range of strategies and programmes that implement new systems, education and awareness and encourage community and industry reductions in wastewater production. Reductions in wastewater production reduce costs and prolong the capacity of the plant. It is understood that a main contributor to wastewater inputs is stormwater entering the network during weather events.

*Health and Safety of land contact bed to the public including children*[28]

This singular comment should be contextualised. The areas adjacent to the proposed contact bed area are dangerous with multiple hazards. Nonetheless, consideration should be given to the risks and safety concerns of the new bed, in particular any ponding of water, crevices and sharp material. Health and safety should be a consideration in the more detailed plans and drawings of the land contact bed.

*Remediate the forest once discharge to Whakarewarewa concludes*[29]

This suggestion relates to the current area that receives treated wastewater in Whakarewarewa Forest. Pond infrastructure and a system of pipes and sprayers support the discharge. This suggestion would involve the removal of this network and the restoration of the land to its former state following the change to a new discharge location and method. It is not known by the author what, if any arrangements have been agreed upon between Rotorua Lakes Council (owners and operators of the network) and CNI Land Holdings (the owners of the forest). It is appropriate that the system of pipes and sprayers be removed if they cannot be re-used or re-purposed by the landowners.

[26] Operations and Monitoring Committee 7 September 2017
[27] Ngāti Whakaue 10 September 2017,
[28] Tuhourangi 30 September 2017
[29] Tuhourangi 30 September 2017

## 3.0 Performance Expectations

The Cultural Assessment Sub-committee have through discussion and input into the Project Steering Group focussed on several operational expectations. These are not necessarily 'cultural' in nature but reflect practical and implementation issues of importance to meet cultural expectations. These include:

- **Certainty** of the technology to meet performance standards.
- **Reliability** of the technology to perform at optimal levels in a range of conditions.
- **Avoidance of failure** as a result of flow spikes, accidents, storm events and human error that would lead to untreated wastewater being released into the environment.
- **Upgrading and improvements** are possible over the duration of the consent.
- **Effectiveness** of the technology and processes to remove and minimise contaminants in the wastewater and meet tangata whenua expectations.
- There is **capacity for storage** (related to avoidance of failure and meeting optimum operational performance).[30]

The proposed land contact bed is a new innovation and should where relevant meet the criteria above. To ensure these expectations are met, a process should be undertaken to test the proposal, either by conducting a multi-discplinary workshop and/or risk assessment. This work could form the basis of on-going monitoring of the effectiveness of the land contact bed.

## 4.0 Potential effects

The cultural impact assessment of the wastewater treatment upgrade (April 2017) sets out a great number of concerns, issues, opportunities and potential effects of the proposals in their entirety. It is not my intention to re-litigate the merits or otherwise of each and every matter contained in that report.

In this assessment I turn my attention to the discharge proposal as a discrete and important part of the project.

I consider the effects are caused by the change of the current activity where treated wastewater is pumped from a holding pond within the wastewater treatment plant to a holding pond in the Whakarewarewa Forest, and in turn irrigate parts of the forest. This activity has remained mostly unchanged since 1984. As I understand the irrigation is causing a loss of forestry and reducing tree growth. There are also issues of nutrient load whereby the land is now saturated with nutrients leaching into nearby streams and into the Puarenga Stream. The treated wastewater is diluted in the Puarenga catchment and eventually makes its way down the Puarenga Stream and into Lake Rotorua.

The new proposal will cease all pumping of water to Whakarewarewa Forest, its irrigation and flow to the Puarenga Stream. It is estimated that within 5 years or so, all residual flows of water and nutrients in groundwater will dissipate.

The new proposal will involve re-use and retrofitting of existing infrastructure at the wastewater treatment plant. The land contact bed will be established within the existing holding ponds. A new discharge point will be constructed at the interface with the Puarenga stream, likely a concrete structure that will resemble a waterfall with an earth bund to direct a chanel of water to Puarenga

[30] Design Objectives Workshop, Rotorua Wastewater Treatment Plant, 16 February 2016

Bay and Lake Rotorua. Landscaping and planting will be undertaken to provide an aesthetically pleasing and accessible area.

The existing environment at Puarenga Bay immediately adjacent to the water treatment plant is described in the April 2017 CIA and the Fisheries report of Mr Kusabs. The area was visited by the author on several occasions and is noted as a harsh and dangerous environment with little signs of fauna, but there are a few hardy species of flora.

The values of Lake Rotorua are well known and recognised in published, statutory and planning documents. Recently Te Arawa Lakes Trust published a document that sets out the special Te Arawa values of the lakes including Lake Rotorua. The document is Te Tūāpapa o ngā wai o Te Arawa – Te Arawa Cultural Calues Framework 2015 and sets out overall objectives and guiding principles of Te Arawa. These values and principles informed the development of the land contact bed proposal. The framework makes special mention of koura, as an indicator species. The Puarenga Bay is currently not a high quality habitat for koura due particularly to the hostile characteristics of the geothermal environment.

## Ancestral land

The land contact bed is located on ancestral land of Ngāti Whakaue iwi and hapu of the Ngapuna and Puarenga Bay, including Ngāti Hurunga Te Rangi, Ngāti Te Kahu and Ngāti Te Roro-o-Te-Rangi.

There are no plans to expand the wastewater treatment plant outside of the current property. There are no plans to acquire further lands for the land contact bed. The historic taking of Māori land for public infrastructure has been the source of resentment and mistrust among Māori across the country including Rotorua.

Once the treated wastewater leaves the land contact bed, it will flow across the bed of Lake Rotorua. It is likely an earth bund or similar barrier will be required to direct water to the lake and avoid overflow towards the Puarenga Stream. The lake bed is owned by Te Arawa Lakes Trust on behalf of Te Arawa people.[31] Te Arawa lakes Trust have stated that they do not support a 'direct discharge of treated wastewater into Lake Rotorua'.

## Water

The waters potentially affected by the proposal are the receiving waters of Lake Rotorua (when discharged to Puarenga Bay), and downstream; Ohau Channel, Okere Arm of Lake Rotoiti, and the Kaituna River.

In 1840, lakes Ngāhewa, Ngāpouri, Ōkareka, Ōkaro, Ōkataina, Rerewhakaaitu, Rotoehu, Rotoiti, Rotomā, Rotomahana, Rotorua, Tarawera, Tikitapu, and Tutaeinanga provided food, shelter, economic resources, and primary transport routes for Te Arawa. To Te Arawa, the lakes were taonga, and their relationship with the lakes and environs was, and continues to be, the foundation of their identity, cultural integrity, wairua, tikanga, and kawa.[32]

The wastewater is conveyed from the Rotorua District to the plant 24 hours a day, 365 days a year, in perpetuity.

The discharge from the land contact bed to Puarenga Bay will affect Lake Rotorua and the geothermal resource as a taonga. Members of Ngāti Hurunga Te Rangi, Uenukukopako and Te Roro-o-te-rangi have expressed strong opposition to the discharge of treated wastewater at this location.

[31] The Te Arawa Lakes Settlement Act 2006 vested some 13 lakes with Te Arawa Lakes Trust.
[32] Te Arawa Lakes Settlement Act 2006. Preamble (2) Background.

It is considered by the members of the hapū to be culturally offensive. Whilst the Waitangi Tribunal in 1984 recommended Puarenga Bay as a (second choice) potential discharge point, it stated that this would be a compromise and only if a preferred land-based option was not available. An alternative land-based option has not been secured.

Treated wastewater could pool and overflow into the Puarenga Stream. This is quite possible as the gradient across the bay is very low. This would be contrary to the intention to avoid a discharge to the Puarenga Stream. There are a number of geothermal expressions on the eastern side of the Puarenga Stream, which should be avoided. If a discharge here was to proceed, a physical structure such as a bund will need to be constructed to direct flow to Lake Rotorua. The sensitivity of this area to Te Arawa Lakes Trust and tangata whenua would suggest that an 'unobstrusive' and 'natural looking' structure would be required. Equally, geothermal waters in surface expressions (ngawha) may be affected. Again, a structure such as a bund may prove useful in avoiding known ngawha with geothermal activity.

The mixing of water is often viewed by Māori as offensive and affecting the mauri (life-force) of a water body. Examples given are where there is a visual and material effect to the mixing, such as changing of colour, effects on special fauna, and changes in physical character of the water body. The mixing needs to have a practical and material effect. It is understood that the quality of the water will be higher than the receiving environment from a western science point of view and the characteristics identified by the RPSC. From a matauranga Māori perspective, the treated water remains culturally offensive unless it has been subject to land-based process.

The land contact bed has incorporated Mātauranga and Matapono Māori in its concept. Matauranga Maori experts agree that it does have positive effects on the mauri of the treated wastewater, however some hapū do not agree. This will involve the spiritual cleansing of the treated wastewater as it passes through the various experiences and contexts within the land contact bed. The state of the water following the land contact bed will be 'mauri tau', still, calm and tranquil.

There will be positive effects on water quality at the point of discharge, Puarenga Bay from a western science view and in regard to the characteristics identified by the RPSC. The current wastewater discharged to the upper catchment of the Puarenga Stream will caese. The water and environment at Puarenga Bay is toxic to most aquatic life and hazardous to humans. The treated water being discharged is a higher quality than the receiving environment.

## Fisheries

The taonga fish species of Te Arawa are the tuna (eel), koura (freshwater crayfish) and kakahi (freshwater mussels), koaro, kokopu and piharau (lamprey), and morihana.

A fisheries survey of Puarenga Bay has not identified any species present. The harsh environment of Puarenga Bay and better habitat in other parts of lake Rotorua supports a view there will be negligible effect on fisheries. There may be some improvement in habitat quality where the treated wastewater is discharged however, it may not have any material impact on habitat quality in Lake Rotorua.

## Wāhi tapu and Sites of Significance

A small number of sites have been identified in the proposal area. These are listed in the CIA (April 2017) with known recorded significance.

The sites and areas affected by the proposal to discharge to Puarenga Bay include:

- the proposed wastewater discharge will enter Puarenga Bay and may contact geothermal surface expressions (ngawha). The Rotorua Geothermal area is recognised as a taonga to Te Arawa. Ngawha should be protected and avoided.
- the proposed wastewater discharge may overflow to the Puarenga Stream due to the low gradient and/or because of circulation within Puarenga Bay. The Puarenga Stream is of high significance to Ngāti Hurunga Te Rangi and Ngāti Te Kahu. A discharge to the stream would be offensive to the tangata whenua where it may come into contact with food preparation areas.
- the proposed wastewater discharge will enter Lake Rotorua via Puarenga Bay. Lake Rotorua is recognised as a taonga to Te Arawa.
- the current wastewater treatment plant and proposed discharge location at Puarenga Bay is within close proximity to or located on the former bird harvesting areas such as Te Mapou and a wāhi tapu Te Waiwhitiinanga associated with a battle. The battle site appears to be buried under a former landfill and Te Mapou are is part of the existing wastewater treatment lands where the existing retention ponds and facilities are located.
- The foreshore in this area is known as Te Arikiroa and is associated with the tradition of Ngatoroirangi bringing the 'fire' from Hawaiki to Tongariro.
- Effects on the relationship between local resident hapū members and Lake Rotorua expressed through the activities of fishing and harvesting, cooking and healing. The association of wastewater and the lake as a food basket is anathema to having a kitchen in the toilet/bathroom. This affects the perception of Te Arawa whanau, in particular local resident hapū members to discontinue harvesting of kai and cooking in the lake in proximity to the discharge area (Puarenga). The abundance and physical health of these species is not affected, but gathering at this site for kai purposes will not likely occur due to the association and proximity to the treated wastewater discharge.
- Effects on the natural character of the Puarenga environment. The introduction of some 20 million litres of treated wastewater a day represents a significant change to the natural environment. This change is likely to be reflected in a steady stream of water entering the Puarenga Bay and meandering across the Purenga Bay flats towards the lake.
- Positive effects on the quality of the amenity of the local area. The contact bed and the discrge point will be a high quality landscaped area that will improve public access, education and visual attractiveness.

## Forests

The proposals involve Whakarewarewa forests that are part of the Central North Island Forests (CNI). The forest provides economic benefits to beneficial members of Tuhourangi and Ngāti Whakaue. One of the key elements of the proposals is the termination of the discharge arrangements to the Whakarewarewa Forest around 2019. It is expected that this will have a significant positive economic effect on the forest and an environmental benefit to the Puarenga stream through a reduction of irrigation and nutrients.

## Flora

It is expected that some vegetation clearance may be necessary as part of the construction works associated with a Puarenga Bay discharge. This issue could also be an opportunity for landscaping, removal of invasive weed species and revegetation of native's endemic to the area.

## Kaitiakitanga

Kaitiakitanga is defined in the RMA 1991 as the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship. The project has achieved a high level of participation and engagement of iwi/hapu in decision-making processes and exploration of options. The project will need to involve tangata whenua in resource consent applications, conditions and monitoring, potentially as part of a formal monitoring role.

This will most likely require a new committee or forum that is made up of most affected iwi and hapū members, that is, those closest to the wastewater treatment plant and the final discharge location. This forum or committee would have a role that recognises their kaitiaki responsibilities and oversight of the project as it goes through its phases of consent, and if achieved, monitoring.

There are understood to be taniwha associated with the Puarenga Stream.[33] The avoidance of a wastewater discharge in any form to the Puarenga stream would be considered a significant positive effect on the sanctity of the taniwha and effect the relationship between tangata whenua and the taniwha. Taniwha are metaphysical beings that often represent a particular locality and a resource, such as a river or a spring. They can manifest themselves as a natural phenomenon or tohu (sign).

## Principles of the Treaty of Waitangi

The Treaty of Waitangi provides for the exercise of kawanatanga, while actively protecting tino rangatiratanga of tangata whenua in respect of their natural, physical and spiritual resources. All persons acting under the RMA (including applicants, councils and tangata whenua) must take into account the principles of the Treaty of Waitangi (section 8). Similar obligations are imposed on councils under the Local Government Act 2002 (LGA).

The Courts/Waitangi Tribunal have confirmed the following core principles;

- Partnership
- rangatiratanga
- active protection
- duty to act in good faith
- duty to make informed decision through consultation
- principle of redress and a duty not to create new grievances
- principle of reciprocity
- principle of mutual benefit.

The partnership is between the Crown and Iwi/hapu. The principle of this partnership is manifested in the matters of mutual benefit for Councils and tangata whenua. Successful partnerships require willing participants, leadership and important matters of substance. The wastewater treatment plant upgrade and the discharge proposal are a significant issue to tangata whenua and Council. The expression of the partnership may take the forms of governance and management arrangements but equally it will be in the way the parties engage and treat with each other. Partners are friends who can have courageous discussions, support each other to understand their point of view and work together to resolve differences. A related principle to partnership is of rangatiratanga, the ethic of chieftainship where traditional systems of decision-making and mandated representatives have authority to ensure the best interests of the iwi/hapū are maintained and not eroded. There were historic decisions made together by officials and Ngāti Whakaue rangatira in the late 19th and

[33] Email correspondence from Tamara Mutu 25 October 2016 and site visit to Puarenga Bay on 23 March 2016.

early 20th centuries. These decisions were relevant to that time and have facilitated the establishment of community infrastructure, facilities and activities on those lands. Today, the discharge location is not supported by a number of local hapū. This proposal in light of current opposition is in conflict with the historic decisions.

The principle of active protection usually involves the conservation, preservation and protection of tangible and intangible taonga (treasures). This can include physical places such as wāhi tapu and sites of significance, special resources, the Māori language and culture. The discharge location is a challenge for the Council as it has a large number of discharge points that have been discounted and avoided due to the presence of taonga and other important cultural attributes. Lake Rotorua is considered a taonga, its active protection is the objective of a raft of statutory and planning documents, environmental programmes and projects. The discharge proposal seeks to spiritually cleanse the treated wastewater after it has been treated to a high standard. The discharge to the lake is seen by some tangata whenua as highly offensive and a step too far.

The principles of reciprocity and mutual benefit are closely related, the former expressing well known Pacific tradition of 'utu', where trade and obligation are important social customs. The later principle implores Council to think wider than the transaction of the proposal, to explore future scenarios, identify and invest in opportunities to gain broader and specific benefits.

The Treaty of Waitangi Settlements between the Crown and Te Arawa have been largely completed. The settlements of particular note are the:

- Central North Island Forests
- Agreements between the Crown and Pukeroa-Oruawhata Trust and proprietors of Ngāti Whakaue Lands Inc.
- The Te Arawa Affiliates Settlement Deed and legislation
- The Te Arawa Lakes Settlement Deed and legislation.

There is no effect on the redress returned to either Pukeroa-Oruawhata Trust or Te Pumautanga o Te Arawa through their settlements. However, there is an effect on Te Arawa Lakes Trust (as owner of the lake bed) through works that will need to undertaken to construct a discharge channel, and on CNI Iwi (as owner of forestry lands) where the current discharge will cease.

## 5.0 Appropriate measures to avoid, mitigate and remedy

This assessment has identified a number of measures that may avoid, mitigate or remedy the effects of the discharge proposal. These are a combination of those measures identified through consultation with tangata whenua and stakeholders as well as measures considered to be good practise in New Zealand.

The current operation of the wastewater treatment plant has treated wastewater pumped to and discharged on lands in the Whakarewarewa Forest, a catchment of the Puarenga Stream and Lake Rotorua. The new proposal avoids a discharge of treated wastewater to the Puarenga Stream and tributaries, the Kaituna River and other Rotorua lakes.

There are a range of mitigations and remedial works that could be applied to this proposal. These include:

- bunding of the flow in Puarenga Bay (may only require a low but wide bund to retain a natural look to avoid looking like a 'curb'.

- Reducing the amount of wastewater being discharged by reducing the inputs into the plant. This could be through education and awareness programmes, interventions at source such as metering, and the improvements in separating wastewater and stormwater networks.
- Provision of and access to a water connection for users such as fire trucks, dust suppression tankers, and commercial users.
- Off-set mitigation or environmental enhancement involving riparian planting at the lake edge and along the Puarenga Stream.
- Remedial works could be possible in the Whakarewarewa Forest following abandonment of the discharge in the forest. This may include the removal of the network of pipes, sprayers and support infrastructure.

In the medium to long-term a land-based discharge in close proximity to lake Rotorua could be avoided by finding an appropriate land based discharge area. This would involve the support of a programme to explore potential sites and areas over a longer term horizon. Several alternatives such as geothermal induction and commercial re-use have also been suggested. These alternatives could also be part of an on-going programme of investigation that could be reported at regular intervals.

A full set of recommended actions and mitigation measures is included in section 8.0 Recommendations later in this report.

# 6.0 Alternatives

A significant amount of time and resource has been expended on finding alternative land disposal options. These are provided in the cultural impact assessment of the upgrade project and summatrised in section 1.4 of this report. These include a range of large scale and intensive rapid infiltration bed options. All of these were discounted due to a range of factors including cultural unacceptability, physical constraints, unavailability of the lands and cost.

During consultation for the discharge proposal, several iwi members identified other potential alternatives. These are identified and discussed here.

**A geothermal heating facility**: a proposal to use geothermal energy in the Rotorua field to heat and evaporate the wastewater.[34] This proposal is not new having been raised by one member at a Rotorua Project Steering Committee meeting. This option has not been investigated further as part of this proposal due to the likely time required, unknown benefits or contraints to treatment and uncertainty of the achieveability. It is potentially a long-term solution for water treatment that could be considered.

**Re-use of the treated wastewater**: iwi members have identified the potential re-use options such as fire trucks, nursery water and the like.[35] It is understood and should be confirmed that a valve and tap will be accessible at the treatment plant for fire trucks and tankers to take water.

**A discharge to a land-based area**: a number of sites and areas have been investigated and are either not feasible or unavailable at the present time. There are likley to be alternative land based sites that are potentially a long-term solution for water treatment that could be considered.

[34] Hui with Ngāti Whakaue. 10 September 2017.
[35] Hui with Te Maru o Kaituna. 14 June 2017.

# 7.0 CONCLUSIONS

The proposed discharge of treated wastewater to Lake Rotorua is controversial. This is reflected in the amount of time a proposal has taken to be developed, consulted and now included in an application for consent. Whilst the proposals to upgrade the Rotorua Wastewater Treatment Plant received unanimous support among iwi and hapū, community and Rotorua Lakes Council representatives, there is no consensus among Te Arawa iwi, hapū and whanau regarding the discharge proposal. It has received both broad support and local condemnation.

In 1984, the decision to discharge wastewater to Whakarewarewa Forest following the Waitangi Tribunal decision and recommendation to desist plans to discharge wastewater into the Kaituna River, was a watershed case. It set the scene nationally for the preference of Māori for the discharge of wastewater to land - Papatūānuku. More than 30 years has passed since that decision. The land resource around Lake Rotorua is a finite resource which Māori land owners derive significant economic returns from. The Whakarewarewa Forest owners and managers have rejected the continuation of treated wastewater discharge to land and agreed to the removal of the operation by the end of 2019. Some land based treatment systems in New Zealand and overseas are now failing to deliver community and indigenous expectations of treatment. Wastewater treatment systems have improved with significant technological improvements in water supply treatment now common in wastewater treatment. Several countries in Asia and the Pacifc now recycle wastewater, some even use and sell it as drinking water. Whilst it is within living memory of most New Zealanders of systems that only involved primary screening (poo coming out of the pipe), those days are at an end. But perceptions of wastewater prevail and are not easily changed.

The overall assessment of cultural effects of this proposal do not sit nicely on one side or the other. The proposal cannot be neatly described as having effects less than minor or having significant adverse effects. That would be simplistic and convenient. The proposal exhibits a number of positive and negative cultural effects, the weighing of these by decision-makers will be a difficult and fraught task. Nevertheless, a decision must be made and the assessment here has endevoured to articulate accurately the concerns of tangata whenua and provide an assessment of the cultural effects within the context of the Resource Management 1991.

The proposal to contruct a land contact bed with a range of segmented wetland and aggregate environments for treated wastewater to flow through is not new in New Zealand. However, this proposal is considered to be innovative and meaningful due to the primacy of cultural concerns and incorporation of Māori concepts and values into the conceptualisation and design. These concepts and designs have been developed by Matauranga Māori experts.

As mentioned earlier there is both broad support and local condemnation for the discharge proposal. Among those who support the proposal are significant entities with important roles in the well-being of Lake Rotorua and its people. These include the Te Arawa Lakes Trust[36], Te Tatau o Te Arawa, Te Pukenga Koeke o Te Arawa[37] and Pukeroa-Oruawhata Trust. Wider iwi and hapū groups are either neutral, supportive or opposed to the proposal. It is understood that the support or neutrality of most parties is based on the effort to find a 'innovative cultural solution' for the proposed discharge. There is however, strong opposition to the proposal from hapū who have what could be considered to have primary or close relationships with the land in which the treatment plant is located and the areas proposed for the discharge. This opposition is not unanimous, but

[36] Hui with Te Arawa Lakes Trust. Friday 25 August 2017.
[37] Hui with Te Pukenga Koeke o Te Arawa. 25 August 2017

nevertheless should not be discounted. The opposition of these groups to any discharge proposal at Puarenga Bay has been consistent and well recorded. The group of oppositon includes Ngāti Hurunga Te Rangi, Ngāti Uenukukōpako, Ngāti Te Roro-o-Te-Rangi and Ngāti Te Rangiteaorere. These hapū have marae and resident communities at Ngapuna, Puarenga and Ohinemutu, all within close proximity to the proposal area.

This assessment concludes that the proposal to discharge treated wastewater to Lake Rotorua will have some significant adverse effects. Those effects are deemed to be:

- A loss of mana among local hapū who are strongly opposed to the discharge to the Rotorua-nui-a-Kahumatamomoe as a matter of principle. This loss of mana could be described as a belittling of Rangātiratanga (authority of chiefs) by perpetuating an unacceptable activity.
- A loss of mana resulting from the discharge of a wastewater regardless of the quality of treatment to an ancestral icon, Rotorua-nui-a-Kahumatamomoe. The lake is synonymous with Te Arawa ancestors and the association of the lake with wastewater is perceived as an offense.
- Effects on the relationship between local resident hapū members and the lake expressed through the activities of fishing and harvesting, cooking and healing. The association of wastewater and the lake as a food basket is anathema to having a kitchen in the toilet/bathroom. This affects the perception of Te Arawa whanau, in particular local resident hapū members to discontinue harvesting of kai and cooking in the lake in proximity to the discharge area (Puarenga). This effect does not extend to the abundance of kai or the quality of the kaimoana.

There are also some negative effects of a low to moderate nature that are likely. These include:

- Effects on the natural character of the Puarenga environment. The introduction of some 20 million litres of treated wastewater a day represents a significant change to the natural environment.

This assessment also concludes that the proposal to discharge treated wastewater to Lake Rotorua will have some significant positive effects. These are deemed to be:

- Positive effects on the mauri of the treated wastewater. This will involve the spiritual cleansing of the treated wastewater as it passes through the various experiences and contexts within the land contact bed and be in a state of ‘mauri tau’.
- Positive effects on water quality at the point of discharge, Puarenga Bay. The water and environment is toxic to most aquatic life and hazardous to humans. The water being discharged is a higher quality than the receiving environment from a western science perspective and the characteristics identified as important to the RPSC (clarity, smell, colour, etc).
- Positive effects on the quality of the amenity of the local area. The contact bed and the discharge point will be a high quality landscaped area that will improve public access, education and visual attractiveness.
- Positive effects on the Whakarewarewa Forest through reductions in water inundation and nutrient saturation resulting in improved growth of trees. This will provide increased economic returns to Māori landowners.
- Positive effects on the mana and mauri of Te Puarenga Stream, through the cessation of treated wastewater discharge to the upper catchment and tributaries of the Puarenga Stream.

A final note is to state that proposal as currently understood will allow for alternative uses of the treated watsewater and future sites should they be practical and feasible. This is provided for through the construction and maintenance of a valve that can be accessed by heavy vehicles such as tankers and fire trucks.

## 8.0 RECOMMENDATIONS

The upgrading of the wastewater treatment plant and the discharge of treated wastewtaer is of strategic importance to the ditrict and the region. The resource consents reqpresent a once in a generation opportunity to improve on the previous generation.

A range of recommendations are provided here to give meaning and weight to the committments and expectations of tangata whenua.

In the first instance ongoing consultation is recommended with affected iwi and hapu groups for the purpose of keeping tangata whenua informed of the project and key milestones in decision-making process. In the second instance the Rotorua Lakes Council should look to establishing and maintaining relationship agreements with hapū that share manawhenua with the site of the wastewater treatment plant, either collectively or individually. These relationship agreements could address mana whenua concerns with the ongoing operations of the treatment plant but also wider concerns that may not be able to be addressed in consent conditions. As recommended in the cultural impact assessment for the treatment plant (April 2017), the establishment of a wastewater treatment Tangata Whenua Committee should recognise the primary interests of mana whenua groups.

This project has not identified feasible and acceptable land discharge locations or methods for treated wastewater. This is not to say they may not be available in the future. Medium to long-term alternatives should be explored and subject to feasibility, investigated.

The conservation of water at its source (of use) has been a common theme throughout engagement. This assessment recommends that investigating and implementing measures to reduce wastewater being discharged by reducing the inputs into the plant at their source would have beneficial outcomes. This could include education and awareness programmes, metering, and improvements in the separation of stormwater and wastewater networks.

Rotorua Lakes Council should consider potential applications of geothermal energy for treatment and energy efficiency in the future operations of Council infrastructure and facilities. Considerations could include research, feasibility, and consultation with the geothermal industry sector.

If the application is granted consent the further measures are recommended to be implementated as part of the consent conditions or programmes of Council:

- The establishment of a Tangata Whenua Monitoring Forum to oversee the monitoring of the land contact bed and its performance. This forum should reflect the nature of close relationships of hau kainga with the wastewater treatment plant site in its composition and role.
- A reference group of pūkenga (Māori experts) be established to provide advice and direction in the delivery of a land contact bed.
- At appropriate time periods (such as every 5 years) a mauri monitoring report be prepared and presented to a forum of iwi and hapu representatives. The mauri monitoring report should set out results and any key issues with the performance of the land contact bed.

- A mauri monitoring programme be established to monitor the performance of the land contact bed. This monitoring programme should link to the Te Arawa Values Framework, include relevant Mātauranga Māori indicators and involve the participation of Kaitiaki from directly affected hapū.
- There should be a reporting function for monitoring reports and updates to hapū and groups such as Te Arawa Lakes Trust.
- In recognition of the significant adverse effects of the proposal, a nominal sum be set aside to fund a restoration and enhancement projects which includes the participation of tangata whenua in the improvement of water quality. This fund should involve hapu representatives in its administration and distribution. This fund could support hapu water improvement projects.
- Detailed drawings and plans are produced for the land contact bed that reflect the consultation conceptual images.
- Establish performance standards for the land contact bed.
- The construction of a natural looking bund to direct treated wastewater to lake Rotorua and to avoid overflow to the Puarenga Stream.
- Confirm the ranges of depth and width of a flow exiting the land contact bed into the Puarenga Bay.
- Medium to long-term alternatives should be explored and subject to feasibility investigated.
- Ensure health and safety considerations are provided for in design and delivery through conducting a risk management workshop and preparing suitable health and safety plans for its operation.
- Remedial measures and monitoring of the nutrients at the Whakarewarewa Forest as agreed with CNI Forest owners and managers.

# Appendix 1 – Notes and Minutes of Meetings

**Feedback from Meetings Held for WWTP Upgrade Cultural Treatment Design 2017**

1. Te Maru o Kaituna (incl reps from Tapuika and TKNONW (incl Ngāti Whakaue ki Maketū))
   Date/Location: Weds 14 June @ RLC
   # Engaged: 20
   Issues / Questions raised by Audience (our answers/comments in italics):
   - Dosing in the plant for P - does that mean there will be a reduced need for dosing in the waterbodies? *Yes, in terms of the water that leaves the LCB and enters Lake Rotorua.*
   - Will the upgrade deal with severe weather events? *Capacity will increase from about 20,000,000 litres/day to about 70,000,000 to help deal with those events.*

   Suggestions for improvement:
   - Should promote alternative uses of water between the plant and the LCB to reduce amount going through LCB. *This was also suggested by a MM expert, and a tap where fire trucks etc can fill up from, or where water can be taken/diverted to be used at the RLC nursery or on our reserves is also being considered as part of the plan*

   Other kōrero:
   - Liked process to integrate Mātauranga Māori, would like to see more of the 'how to'info shared by RLC to other Councils.

2. Ngāti Uenukukōpako
   Date/Location: Sun 30 July @ Ruamata Marae
   # Engaged: 16
   Issues / Questions raised by Audience (our answers/comments in italics):
   - How long it would take for water to flow through the land contact bed. *¾ of a day –about 18 hours.*

     Please note the following Q&As could not be fully answered at the hui, however answers were sought and sent to Uenukukōpako and were added to the FAQs online.
   - Would the rate of flow change if more houses got reticulated in to the plant? Capacity roughly allows for 7,000 more homes. *If this occurs the rate of flow will be about 15 hours*
   - If the plant (once upgraded) will be able to work with 70+ million litres per day what effect will that have on the LCB flow rate? *It would take about 5 hours for water to flow through the LCB at maximum capacity.*
   - How much water can the land contact bed hold/deal with? What are its dimensions/its capacity? *About 15,000m3 of water*
   - Blood (menses) and other body fluids can come through wastewater – how effectively does the proposed upgrade deal with those? *UV deals with virus and bacteria removal, and bio-solids go to Kawerau for vermicomposting. Alison L also gave an excellent breakdown of the process which can be seen in our FAQs online.*
   - What about medical waste from the hospital? Do we deal with that at the WWTP? *No. It is dealt with by an independent company, and once treated by them goes to landfill.*

   Suggestions for improvement:

- Industry is also loading nutrients into the lake not just Farmers or the general population. BOPRC has its processes but what will RLC do to encourage them to reduce nutrient levels?
- Can RLC look at supporting certain activities that help build kaitiakitanga with tamariki (children/young people) - e.g. funding support for children's waka ama? Because while they're doing the activity they will notice changes to the lake/water and can be part of reporting issues through to the kaitiaki of the land contact bed.
- Ika taketake important indicator - kakaho & inanga

Other kōrero:

- Even if it (LCB) looks alright it's hard to trust RLC.
- Need time to process info, may need to come back

3. Ngāti Pikiao

   Date/Location: Tue 14 Aug @ Te Takinga Marae

   # Engaged: 12

   Issues / Questions raised by Audience (our answers/comments in italics):

   - De-watering necessary to separate water from other material and that other material can become compost. *Yes, and it currently gets shipped to the worm farms in Kawerau for that purpose.*
   - What are the changes (percentage wise) to the water? *Estimates given at hui for N, P and pathogen levels. However, have since been more accurately determined by Alison L and have been added to our FAQs online.*
     What other land based treatments were considered? *Whakapoungakau Hills & Oturoa were two areas in Rotorua experts identified as physically suitable as an alternative land based solution. However, both of these areas bring/brought with them additional technical, cultural and financial considerations. Koro/Uncle Fred also said that Māori have given enough land for this kaupapa which started the kōrero about discharge to the lake.*
   - How will the channel (post land contact bed) be affected with the increased amount of water that will flow through it? *Some work will need to be done to join the water flow coming from the land contact bed to the existing channel/drain. Regardless, analysis indicates that the channel/drain will be the same width, but water flow will be up to 6 inches deeper. If the channel does ever overflow, it will only spill out on to the sulphur flats.*

   Suggestions for improvement:

   - Trial native fish like kokopū, inanga would be good.
   - Add a watercress patch – that's a good indicator too

   Other kōrero:

   - Papawhero from Waitaha made the first repo at Rotomā. Built a natural repo. This design is just history repeating.

4. Ngāti Rangiteaorere

   Date/Location: Thur 17 Aug @ Mataikotare Marae

   # Engaged: 10

   Issues / Questions raised by Audience (our answers/comments in italics):

- Any iwi would be hard pressed to challenge the thinking of the RPSC and the Mātauranga Māori experts considering the calibre of the people who were in both pools. However, tikanga is one thing, knowing that this will actually work as planned is altogether something else. Having the treated water going into the lake is horrifying. *The reality is that treated water is currently ending up in the lake - it gets sprayed up into the forest, but it sloughs off the whenua and into the Puarenga and into the lake - but the whenua, the awa and the lake are all worse as a result.*
- What is being done to clean up the Puarenga? It's in a terrible state. *This land contact bed with channel to lake is totally about improving the Puarenga.*
- Who was the Hurunga Te Rangi Representative on the MME rōpu? *Selwyn Insley.* How was he selected? *Jenny came to a hui-ā-hapū at Hurunga Marae to give the hapū a briefing on the kaupapa and to tono for a rep/reps. Was invited back to a Marae Trust hui to answer more questions on the kaupapa, and to see if the hapū wanted to participate in the process. At that stage two names were identified as possibilities - Matua George & Selwyn. Following up a couple of weeks later was told that Matua George didn't want to participate but he was/they were okay for Selwyn to do so.*
- Why is Peter Staite not included in the list of Mātauranga Māori experts? *Ae, kia ora. It might be helpful to remember that the MME group was additional to the expertise already provided by the iwi reps on the whole project. The mātauranga group was focused specifically on one part of the project only - the design of the land contact bed cultural treatment.*
- Rangiteaorere offered land early on for vermicomposting that came to nothing, yet it's being transported to Kawerau.

Suggestions for improvement:

- Be like Tauranga – double UV treatment

Other kōrero:

- Rangiteaorere has the largest amount of iwi owned whenua bordering the lake, and as such is majorly affected by these plans. While the iwi can't question the work done and the calibre of the advice received to develop the design, Rangiteaorere support is not a given. We would expect to be supported in our own water improvement projects before commending or offering support to Council on this kaupapa. Rangiteaorere has wetlands plans, the Roto-ora project etc that could do with some support and what about rates rebates - especially if we're all in to cleaning up our water.

5. Ngāpuna Hapū/Iwi
   Date/Location: Wed 23 Aug @ Hurungaterangi Marae
   # Engaged: 13
   Issues / Questions raised by Audience (our answers/comments in italics):
   - Interest more in the improvement to quality rather than quantity
   - How did the mātauranga Māori expert for Hurungaterangi get chosen? *Hui-ā-hapū at Hurunga Marae to explain the situation and ask for an MME, invited back to a hui with the Marae Trust to provide a briefing on the project and asked again if they'd been able to determine an MME - two potential names raised. Followed up and Selwyn had been okayed to participate. Made clear that participation in the process did not mean agreement with any outcome.*

Suggestions for improvement:

- Messages regarding overflow during severe weather events should be worded differently – to ensure people know the flow is controlled rather than uncontrolled

Other kōrero:

- Positive reaction to seeing the number of Ngāpuna Iwi/Hapū in the project steering committee
- General acceptance of the inevitable, however low numbers may not be an indication of the whole hapū.
- Acknowledgement of how much time, thought and attention had gone into getting to this decision.

6. Te Pukenga Koeke o Te Arawa

   Date/Location: Fri 25 Aug @ Kearoa Marae

   # Engaged: 50+

   Issues / Questions raised by Audience (our answers/comments in italics):

   - Will the upgrade deal with severe weather events? *Capacity will increase from about 20,000,000 litres per day to about 70,000,000 to help deal with those events.*

   Suggestions for improvement:

   - Can geothermal energy be integrated somehow to help with faster evaporation of the treated water?

   Other kōrero:

   - Applause received at the end of the video and at the end of the presentation

7. Te Arawa Lakes Trust

   Date/Location: Fri 25 Aug @ Nukuteapiapi

   # Engaged: 9

   Issues / Questions raised by Audience (our answers/comments in italics):

   - What is the cost of the cultural treatment? *Around $30,000,000 for the total project (in recent meetings a figure of $40,000,000 has been given by GM Infrastructure) but the cost of the LCB itself hasn't yet been costed.*
   - Has Te Tatau o Te Arawa received a similar briefing? *Te Taru has been across design devt. Offered to come to TTOTA to brief, however they felt that board were well briefed/aware.*

   Suggestions for improvement:

   - .

   Other kōrero:

   - Full endorsement by Te Arawa Lakes Trust.
   - Considers the way that this kaupapa has been worked through as an exemplar of how Council can engage and work with iwi through difficult kaupapa.

8. Industry Briefing

   Date/Location: 30 Aug, RLC

   #Engaged: 70

   This hui, facilitated by Stavros, was a briefing for the Wastewater sector made up of 70 high level attendees (representing 37 companies) from the industry – a consortium/consortiums of whom may in the future work with Council to operate our wastewater system. While the hui was presented with technical and operational information, further presentation and

emphasis was put on the uniqueness of Rotorua and the importance of culture and cultural requirements/expectations here. The video was played and Te Taru also gave knowledgeable kōrero on connection and reconciliation of water. All those in the feedback session expressed that it was the first time in their experience in NZ and overseas where the connection between science and iwi/Māori/indigenous spirituality and culture was well covered. They left feeling richer and better with an overwhelmingly favourable opinion on the design.

9. Operations and Monitoring Committee
   Date/Location: 7 Sept, RLC Chamber
   # Engaged: 20+ (Councillors, TTOTA & Comm Board reps, Exec, Governance staff, few public)
   Issues / Questions raised by Audience (our answers/comments in italics):
   - Although the innovative, cultural integration is a world first for tertiary systems is appreciated and impressive - there are still objections amongst the people. How do members of the community/whānau/hapū still get heard? Because with all the notable rangatira involved in getting this kaupapa to where it is, it is hard for the younger ones/rangatahi to put their objections out in front of their rangatira. How can you ensure that if there are objections that we keep bringing them out / keep having these discussions? For rangatira this has been a long process but for rangatahi this is a much shorter process. There are pockets of rangatahi who are upset and need clarity. *Hui at Te Papaiōuru this Sunday, and Te Pakira at the end of the month. The Chairperson stopped any further discussion because of time, so, straight after the hui an email was sent to the Te Tatau reps (who raised the question) explaining that by request specific rangatahi were included in the MME group; that although we haven't had huge rangatahi numbers at the hui already held (except ironically for the Pukenga Koeke o Te Arawa hui) that we've used social media and worked with the hapū/iwi themselves to get the pānui out to everyone; that the information is available on the RLC website (let's talk / kōrero mai portal) with space for rangatahi and others to give comment and ask questions; and that if asked am happy to come to any rōpu rangatahi to kōrero with them before the engagement period ends.*

   Suggestions for improvement:
   - Riparian planting along the channel, to encourage the return of frogs. It's a small thing but just like TALT wanting to see the footprints of koura on the lake bed, whānau in Ngāpuna have said an indicator for them is listening to the frogs at night. The sounds of frogs have been gone for a generation. Frogs are vital in eco-systems. *Planting alongside the channel and the importance of indigenous aquatic species did come out during the MME wānanga and hui with hapū/iwi and so will look to implement.*

   Other kōrero:
   - It is good to see the Māori world view being taken into account in the upgrade
   - Congratulations on this. Important to remember that 20 years ago the Awahou, the Utuhina and the Ngongotahā looked like what is planned before the environmental people got involved with it and put up fences around it and filled it with blackberry and gorse. It was pristine for watercress and koura etc back then. Lost the whole lot.

10. Rotorua Te Arawa Lakes Strategy Group
    Date/Location: Fri 8 Sept @ RLC
    # Engaged: 20

Issues / Questions raised by Audience (our answers/comments in italics):

- What improvements will be made to the water? *This will be more appropriately addressed in the RC application, however once the water leaves the plant we will likely see a 90% reduction in phosphates; 99% reduction in viruses; 99% reduction in e-coli bacteria and although we're already a leader in reducing nitrogen we should still get a 30% improvement from the upgrade.*

Suggestions for improvement:

- Measurement/monitoring of results/indicators should be widely shared

Other kōrero:

- Peter shared some of his experience of the process.
- There seems to be alignment with Te Mana o te Wai outcomes
- RLC's opposition to Plan Change 10 was raised.
- Resolved that a copy of the presentation be sent to Ministry for the Environment
- After the hui Ian McLean (Lakes Water Quality Society) came out to give congratulations on the process used to develop the design. Particularly impressed with the partnership with hapū/iwi.

11. Ngāti Whakaue

Date/Location: Sun 10 Sept @ Te Papaiōuru Marae

# Engaged: 40+

Issues / Questions raised by Audience (our answers/comments in italics):

- How will the lake be affected by 20 million up to 70 million litres coming into it per day? *It's still the same volume of water as what is coming out of the forest it's just that instead of coming down paru through the Puarenga, it'll be coming through clean through the land contact bed and channel to the lake.*
- Jenny said that we (Uenukukōpako & Te Roro) would get a copy of the Cultural Impact Assessment and we haven't got it. *It hasn't been finished yet, it will be completed after these engagement rounds are done and a copy will be given to you and Ngāpuna hapū/iwi (and any others) before the RC application is submitted.*
- Hapū/Iwi should write CIAs not councils.

Suggestions for improvement:

- Terry Tapsell presented an alternative option using the geothermal field beneath Ngāpuna and the WWTP area to heat the recovered water before injecting it into the field for it to become steam and either exit perhaps as a geyser or over terraces.

  *Taken from Peter's email sent after the hui:*

"This Sunday 10th Sept. the 6th of 7 presentation hui for mātauranga Māori designed "Earth Contact Beds" has attracted an 11th hour recovered water re-use proposal.
The geothermal proposal seems to have nothing to do with the WWTP upgrade to full MBR / UV disinfection, but suggests a bypass discharge point along the length of the "discharge pipe" before entering the ECB.

- The door to enabling public access to reuse options was left open.
- The door to considering new, suitable and proven technological advancements sewerage filtration was also left open.

The reuse proposal option should be received in good faith from Ngāti Whakaue members, the mana whenua."

*A hui with Stavros mā has since been held with Terry Tapsell and Colin Bennett. The potential of the project was acknowledged, however, it was agreed that the time it would take to just determine its feasibility will likely take us beyond the Dec 2019 deadline. The consent application will therefore continue with the LCB option only. The geothermal project can still be worked on and developed until feasible - especially if the industry consortia that will be brought on to manage the project are willing to get on board as well.*

- Leo Rika spoke about a product option that could be added to the wastewater treatment. *A hui with Stavros and Alison mā was held with the group who are behind the products and while the products won't add value to what will be achieved with the plant upgrade, there are other upstream applications of the products (e.g. at Marae, industry, septic tanks etc) that could benefit. Contacts were given to the group. The group may also become bacteria suppliers to the plant.*

Other kōrero:

- Uenukukōpako (& Te Roro) were represented by Uncle Arama in the RPSC - He did not support the discharge option and we will still be saying no to the discharge option. We don't have an issue with the process that's been used here, but we don't agree with the solution. On top of that Council is asking to increase its nitrogen levels and has opposed Plan Change 10. *Thank you for tabling your opposition to the application. Re: nitrogen increase, RLC asked for and has signed with BOPRC on an Accounting Mechanism which would give some nitrogen credit to RLC and not just to farmers if, say, they changed their land use from cows to houses and those houses were to be reticulated. RLC is still committed to reduce its nitrogen but having the credit is like a back stop to let us manage growth better. Re: PC10 opposition, one major reason we oppose is that we are working with iwi/land owners – CNI and Te Tumu Paeroa (and earlier TALT who now have a different haerenga) who find it unfair that they don't have rangatiratanga over land use decision making for lands returned under settlement (PC10 gives allowance to 800ha of Ture Whenua Māori land but not settlement lands).*

12. BOPRC Design & Delivery Committee

    Date/Location: Thur 14 Sept @ BOPRC office Tauranga

    # Engaged: 26 (BOPRC Councillors & staff)

    Issues / Questions raised by Audience (our answers/comments in italics):

    - Are there other projects similar to this in operation? *Internationally there are similar sized and larger projects that incorporate the running of treated water through landscaped areas. They have not been built however with indigenous knowledge as the primary driver.*
    - What are the expected nutrient improvements? *Once the water leaves the plant we will likely see a 90% reduction in phosphates; 99% reduction in viruses; 99% reduction in e-coli bacteria and although we're already a leader in reducing nitrogen we should still get a 30% improvement from the upgrade.*
    - How do you know that you'll achieve that level of improvement? *Apart from all the independent research that the RPSC considered that said that significant improvement will be achieved with the change, it's good to remember that we're already running 1/3 of our water through a membrane bio-reactor, and so have been able to measure and compare our own results and will continue to do so with the upgrade.*

- Can you build it and how do you know it (the design) will work? *Elements of the design have already been tested to some degree – Rotorua has for example got floating wetlands in place on the lake, so it's not too much of a stretch to do the same in the holding ponds; our water team including engineers seem confident with the other elements. We are a bit worried about trying to keep indigenous fish species alive in the water, and the impact of wetlands and fish on the water so we will have to monitor and manage that too.*
- How much will it cost? *The amount budgeted for the whole project is $30 – 40 million.*
- Where is the funding coming from? *It will be achieved within the funding envelope agreed to by Council through the LTP process.*

Suggestions for improvement:

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Other kōrero (Have separated out the kōrero of the two Māori Ward Councillors present):

- Cr Marr (Kohi Ward Cr): Remains unconvinced by this plan, has whakapapa to some of the affected iwi and it still seems too risky. Believes that RLC is in this trouble because it reticulated Rotoiti and Hamurana and it's not coping, and now it wants to add more. How many have been spoken to in these hui rounds? *About 200 people have been at the hui so far and we have a couple more to do, possibly more if they confirm with us.*
- Cr McDonald (Mauao Ward Cr): Ka nui ngā mihi. Great to see a project of this nature that values mātauranga Māori from the outset and integrates it throughout. We know how difficult it is to get iwi to agree to something like this. You said that there were iwi who did not agree with the discharge option. Have they changed their position since? *The reality is we will never get 100% agreement on a kaupapa like this. What has been clear as we've gone around is that many people have come in thinking one way and have left thinking differently. We've even had spontaneous applause erupt at hui. At the very least we've helped dispel a lot of the rumours that have been going around on this kaupapa. Significantly, Te Arawa Lakes Trust has changed their position from disagreeing to unanimous agreement with the cultural treatment design. On the other hand, at our last hui, one hapū/iwi let us know that they are still going to oppose our consent application.*

13. Ngāti Pikiao Koeke Hui

    Date/Location: Thur 14 Sept @ BOPRC office Tauranga

    # Engaged: 32+

    *Taken from Joe's email sent later that same day:*

    - It was well attended by Ngāti Pikiao Koeke / Kaumātua, Jenny [presented the kaupapa] supported by Peter and myself when required. The proposal was put to the floor for a vote with an overwhelming support for the proposal and 1 vote against from Dr Ken Kennedy. So, for Ngāti Pikiao in terms of the proposed resource consent application - this conversation is now over.

14. Tūhourangi

    Date/Location: Sat 30 Sept @ Te Pakira Marae

    # Engaged: 24+

    Issues / Questions raised by Audience (our answers/comments in italics):

    - How do you know the land contact bed is going to work and clean the water? *The plant will clean the water and will remove nitrogen, phosphorous and pathogens. The*

*recommendations the RPSC made to upgrade the plant were based on lots of research and evidence and were made after arguing and debating for 2 ½ years to make sure they were making the best evidence based decision they could. The land contact bed is a complementary cultural treatment, based on our mātāpono, mātauranga and following our tikanga - what our people need to have in place to have their cultural concerns about the water met.*

- What is the pH level of the water when it leaves the plant, and after it goes through the land contact bed? *While we don't know the exact answer, what we do know is that the lead scientist/head of the plant Alison has said that she will drink it as soon as it leaves the plant, but wouldn't be willing to after it goes through the land contact bed – because with wetlands comes lake fowl and other manu that, along with the ika, all add their tiko to the water. However, what measurements the scientists etc use to know how clean the water is, is different from what our people need to have in place to know that the water is clean. NB while the pH levels are unknown atm, Greg/Alison have since been asked for the answers and, as promised to the whānau, the answers will go on to the FAQs online.*
- How big is the land contact bed? *It holds 15,000,000 litres.*
- How long would it take for water to flow through the land contact bed? *At current levels, ¾ of a day –about 18 hours.*
- Won't the water spill over if the land contact bed can only flow through at that rate and you might have to deal with storms? *The plant will be able to deal with up to 70,000,000 litres to get through major weather events. If this does happen the rate of flow through the land contact bed will speed up – it will only take 5 or 6 hours to flow through the land contact bed. It won't spill over the sides and into the Puarenga, it'll just flow faster down into the channel and into the lake.*
- What does 20,000,000 litres look like / what effect will 20,000,000 litres have on the channel? *The channel will likely be about the same width as it is now, but a little bit deeper. 20,000,000 litres is about 800 milk tankers.*
- Have you considered health and safety issues? *Yes by taking down the fence and being a public space, we'll have to think about H&S. We've already had to reconsider where children might be able to interact with the wai because of H&S concerns.*

Suggestions for improvement:

- Ensure the resource consent application has RLC's commitment to remediation of the mess that will be left behind in the forest written into it.

Other kōrero:

- This is better than the status quo
- Why wasn't Wally included in the Mātauranga Māori experts group? *He should have been. Wally along with Peter and Joe and others should have all been in the rōpu. It was a terrible mistake on my/our part. They all brought cultural expertise as well as environmental and scientific and other expertise and definitely belonged in the group. I focused on reaching out to the initial 9 or 10 names which led to other names and we didn't stop to check or think until it was too late. Apologies were given to Wally mā but it had already been done. What is recognised though is that it is thanks to their expertise that we are where we are, and we now have a solution. The MME rōpu were an additional reference group that looked at the design only - one part of the project only. Whereas our CAS reps were across*

*the whole project. Although we can't undo the mistake I/we made, we can only apologise again to everyone.*

- The deadline of Dec 2019 to get out of the forest by is still locked in.

15. Ngāti Rangiwewehi

Date/Location: Sun 5th November @ Tarimano Marae

# Engaged: 30pp

Issues / Questions raised by Audience (our answers/comments in italics):

- .Ngāti Rangiwewehi have been regularly updated over the past three years via their iwi representative. Two kaumatua participated in the Matauranga Māori workshops

Suggestions for improvement:

- Full support for the recommendation tabled on 5th November.

Meeting with Roro-o-te-rangi and Ngāti Uenukukopako representatives at Owhata Marae 27 November 2017

27 November 2017

Hui with Uenukukopako/Roro-o-Te-Rangi

Owhata Marae

Attending #4

- Antoine Coffin provided background to production of CIA, establishment of Cultural Assessment Subcommittee
- 2 draft CIAs have been prepared. They are independent
- Has there been input into the current proposal? - *Consultation has occurred throughout the project but formally in two phases,* 13 iwi and hapu representatives on RPSC, consultation on the proposal in 2016 and second round in July-September 2017
- Uenukukopako/Roro-o-Te-Rangi happy with the process but not where the water ends up (location)
- What is consultation? (provided a sheet)
- Acknowledge the water is cleaner. Concerned about N and P.
- Haven't addressed waste at the source, not wider effects from a tikanga point of view
- Need to follow effects from the start to the [sea]
- Wind may blow the water across the lake to us
- Koura are gone, kakahi are hardly here
- Inputs [N & P] cannot be blamed on farms
- We have the ability to make a change now. Once it is in, it will stay. Our alternatives won't be looked at
- Arama felt he wasn't being heard. We believe he wasn't heard. There were meeting for 12 months, every 2 weeks with us.
- Prevailing winds and currents affect the whole lake.
- Our hapu voice is lost in a large group. We should have primacy, 2 reps.
- Our preferences are a smaller holding pond and discharge at Whakarewarewa Forest or alternative land discharge. We don't believe these have been explored enough. They have been dropped due to cost. Cost was major factor. *There were may sites looked at including Whakapoungakau, Peka, Whakarewarewa. And were discounted for many different reasons. Acknowledge cost is part of the factors.*

- The Whakapoungakau Trust is looking for funds from TPK to do a feasibility
- Feel is has been rushed, should take time to consider things, happy with process but it's the discharge to the lake.
- Consent for forest expires is in 2021. Agreement to get out of forest by end of 2019. *Not sure of the exact words – can check.*
- 500ha of forestry can be found at Whakarewarewa. The cost is not big.
- Have a problem with consultation. *Can we look at engaging in the New Year and keeping dialogue going. It is acknowledged you are opposed to the location of the discharge but we can keep talking.*
- What happened to geothermal proposal? Can we have a condition to invest in feasibility? *Jenny outlined genesis and current status.*
- Minimising P is biggy. Talked to Stavros.

# Appendix 2 – Presentation provided to each group

# Appendix 3 – List of members of committees and groups

Rotorua Project Steering Committee (RPSC)

- Warren Webber (Chairperson)
- Jim Bradley (facilitator)
- Alamoti Te Pou (CNI Holdings Ltd) John Hura (alternate)
- Piripi Jennings (Timberlands)
- Roku Mihinui (Te Arawa Lakes Trust) Leilani Ngawhika (alternate)
- Fred Whata (Ngati Pikiao) Joe Tahana (alternate)
- Morris Meha (Ngati Makino) Hare Wiremu (alternate)
- Rangitihi Pene (Tuhourangi Tribal Authority) Shane Gibbons (alternate)
- Gina Mohi (Ngati Rangiwewehi Iwi Authority) Rikihana Hancock (alternate)
- Anaru Te Amo (Ngati Whakaue) Katie Paul (alternate)
- Geoff Rice (Tapuika Iwi Authority) Dean Flavell (alternate)
- Arama Pirika (Owhata/Rotokawa Iwi) Hera Naera (alternate)
- Wally Lee (Tuhourangi / Ngati Wahiao)
- Piripi Mutu (Ngapuna iwi)
- Irihapeti Wineera (Ngapuna iwi)
- Peter Staite (Ngapuna iwi)
- Ngapuna iwi alternates – Ana Wilson, Marama Meikle, Te Atatu Epapara, Katarina Epapara, Carol Leonard, Louise Kirk
- Hone Newton Jnr (Ngongotaha iwi) Guy Ngatai (alternate)
- Deputy Mayor Dave Donaldson (RLC) Cr Peter Bentley (alternate)
- Cr Neil Oppatt (BOPRC) Cr Lyall Thurston (alternate)

**Mātauranga Māori Expert Group**

- Andrew Te Amo – N. Whakaue
- Selwyn Insley – N. Hurungaterangi
- Kingi Biddle – N. Whakaue
- Cora Stenning – N. Tura N. Te Ngākau HT
- Waereti Tait – N. Rangiteorere KC
- Hakopa Paul – N. Pikiao
- Arapeta Tahana – N. Pikiao
- Te Taru White – TTOTA
- N. Raerino – N. Rangiwewehi
- Te Ariki Morehu
- Tawhiri Morehu – TPK
- Anaru Rangiheuea – Tūhourangi
- Rauroha Clarke – N. Rangiwewehi
- Te Ara Groot – Mokoia Island Trust
- Hariata Kohunui – N. Uenukukōpako