MAKAURI MANAGED AQUIFER RECHARGE STAGE 2 TRIAL

CULTURAL IMPACT ASSESSMENT

RONGOWHAKAATA IWI TRUST

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Makauri Managed Aquifer Recharge Project: Cultural Impact Assessment for Rongowhakaata Iwi Trust

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Background

Rongowhakaata iwi have a long horticultural tradition that has included the acclimatisation of tropical Polynesian food and fibre crops to the temperate climate of Aotearoa and, during the nineteenth century, the successful commercial scale cultivation of crops introduced from Europe and elsewhere. Today, horticulture provides a key focus for whanau, hapū and iwi aspirations for economic development.

The innovation and success of Rongowhakaata horticulture has been underpinned by an evolving body of knowledge and understanding (mātauranga Maori) and an associated framework of values and customary practices (tikanga). One of these values specifically prescribes avoidance of the unnatural mixing of waters of fundamentally different types.

This value provides the primary ground for Rongowhakaata opposition to the Makauri managed aquifer recharge project (MAR), where the young, oxygen-rich water of the Waiapaoa River with its entrainment of sediment and potential chemical and microbial contaminants, is to be injected into the older (80-120 years), anoxic and relatively microbe-free water of the Makauri Aquifer. Acknowledging that the current Stage 2 trial may indicate that such mixing may be achieved without significant adverse effects, Rongowhakaata maintain the relevance of avoiding the mixing of such waters as a precautionary approach to management of an important natural resource.

In this context, and at this point in the development of the MAR project, Rongowhakaata maintain their position that a reduction in water takes is the preferred method of providing for restoration of the aquifer's water levels and hydrological resilience.

The trial, and ultimately any substantive MAR project, is dependent on harvesting water from the Waipaoa River when flows are above 4000L/sec (the 'B' Flow allocation). Rongowhakaata have identified that this activity also raises important concerns. These are summarised as:

1. Potential impacts on the ecology and hydrological integrity of the Waipaoa River itself from the reduction of a specific flow range, should the full allocation of 2000L/sec be undertaken);
2. Socio-economic effects on potential downstream water users from removing significant volumes of the last remaining Waipaoa River allocation, should a substantive MAR be undertaken;
3. Potential adverse effects on the interrelationships between river flows and the associated matrix of shallow aquifers (and hence their water users) and the wetland Te Maungarongo o Te Kooti Rikirangi Reserve.

These areas of concern have led to Rongowhakaata requesting, in their submission on the Stage 2 Trial, for a series of actions to be undertaken by GDC in order to avoid, remedy or mitigate the potential for adverse environmental effects that these concerns signpost. The independent commissioner hearing the GDC consent application for the Trial noted that some of these requests would be more appropriately addressed at a hearing for any substantive MAR consent application. He did, however, require GDC to undertake specific actions to address Rongowhakaata and other iwi concerns. These include:

1. ‘Within four weeks of granting the consent, the consent holder shall commence a collaborative process with mana whenua that will ensure mana whenua input into decisions regarding the design, implementation and evaluation of the monitoring programme for the trial. The monitoring and evaluation programme shall include the development and implementation of a process for monitoring and assessing the cultural health of the Makauri Aquifer and Waipaoa River’ (Decision, condition 38).
2. ‘Within three months of completing the post-trial monitoring, the consent holder shall convene a workshop to consider methods for assessing changes in cultural health of waterbodies potentially affected by the Managed Aquifer Recharge injection trial. Following the workshop, and within one month, the consent holder shall provide a report to the Community Liaison Group, providing recommendations for monitoring the cultural health of waterbodies should a more comprehensive Managed Aquifer Replenishment programme be promoted or instigated by the consent holder’ (ibid, condition 41).
3. ‘Prior to the commencement of this consent, the consent holder shall commission a cultural impact assessment [CIA] of the proposed Phase 2 trial, taking into account recommendations provided in the review by Dr Nick Roskruge (Land Management Group 2017) and to be undertaken in collaboration with Rongowhakaata Iwi Trust. Amongst other matters the cultural impact assessment shall set out the formal relationship between the consent holder and the Rongowhakaata Iwi Trust and the manner in which representatives of the Rongowhakaata Iwi Trust are to participate in the implementation of the cultural impact assessment with respect to implementation, monitoring and reporting on outcomes’ (ibid, condition 46).

The production of this CIA has been derived from two knowledge streams. These are: 1) A review of six pieces of literature including four reports relating specifically to such assessments of the Tūranga environment (including the Makauri MAR activities), one collection of papers providing a generic overview of mātauranga Maori in an Aotearoa context, and one summary of evidence relating to a CIA for a Lyttleton Port proposal; and 2) Input from Rongowhakaata whanau and Rongowhakaata Iwi Trust board, representatives and staff. This latter input has been gleaned from discussions and hui over a period of five years and made tacit in the two formal submissions produced by RIT on the Makauri MAR proposals and in this CIA.

Mātauranga Maori and cultural impact assessments

Drs Severne and Tipa have written in their analysis of methods for establishing cultural flows:

> Mātauranga Māori is place-based, dynamic, and responsive to ecosystem changes when and where they happen. Environmental knowledge, or more specifically knowledge of Te Arai River, refers to the subset of Mātauranga Māori that is specific to Te Arai environs and the relationship of whānau, hapū and iwi to it. This is broadly conceived as encompassing knowledge of entities (sites, species, eco-regions), components (e.g. soils, waters, geology, climate), the interrelationships among these, and the processes affecting them (including human-made impacts). Because such knowledge is geared toward the practical engagement of it, it is often bound together with resource utilization behaviours.
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> At the same time, vital aspects of it may be intimately associated with spiritual beliefs, notions of health and wellness, social behaviours, and symbolic expressions… (Tipa and Severne, 2010)

It is important to recognise the significance of mātauranga Māori from the perspective of whānau and hapū as, for many, mātauranga Māori is the time-tested basis for decision-making and integrated with our total way of life. This includes the right to have healthy waterbodies that enable us to keep our mātauranga as an essential part of our culture, organization, spirituality, and identity.

> In such a context, when Rongowhakaata participants in the information gathering hui talk of their personal experiences of the waterbodies in their rohe, their interactions with these waterbodies, and how this compares with their understandings of the environment that earlier generations lived and interacted with, they in fact present their Mātauranga as it has evolved (ibid).

The current CIA needs to be considered as a primary tool to consolidate a partnership approach to a proposal (MAR) that affects both parties, in this case Rongowhakaata and GDC. Generally, the CIA will assist in the determination on the effect of any proposed activity on the environment, culture or values as they might be understood by Rongowhakaata. Whilst this might raise issues of concern, there is also a need to recognise that the relationship basis of the CIA means that continued dialogue is core to the process and that the CIA merely positions the iwi/hapū at a stage in the proceedings (Roskruge, 2017).

In this context, there is a need for the CIA to recognise and provide for the unique relationship which the Treaty of Waitangi (Te Tiriti) affords Maori, and in this case, Rongowhakaata, in the resource space. This applies regardless of any claims processes with the Waitangi Tribunal that might exist. The principles of the treaty are relevant at all times. Whilst the CIA refers to a relatively discrete activity, the emerging issues relative to the fresh water resource and its economic and cultural value needs to be explored and better understood before more of these projects, such as the Makauri MAR, become needed (ibid).

From the literature reviewed for the MAR CIA, we conclude that there are very strong synergies amongst all authors, and most strongly in the concept of a CIA as providing a structured framework whereby the specific values, relationships, rights, responsibilities and needs and aspirations of the relevant whanau/hapu/iwi can be expressed and recorded, and the potential impacts and scale of impact in the context of a specific proposed activity can be accurately assessed.

Paramount to this process are certain foundational components i.e:

- That it is the nature of the locality and the impacts of any proposed activities specifically on this locality and any interrelated environments and resources, and the mana whenua who relate to these environments and resources that is to be assessed;
- That the infilling of the framework of the CIA with the range of values, relationships, and all of our interests and the potential impacts of the proposed activity/ies on these, can only be achieved by the mana whenua, in a discursive, participatory process;
- Once the suite of mana whenua interests is established, a cultural impacts monitoring program is established, consistent with the principles of mātauranga Maori and utilising utilising tohu taiao (traditional indicators of environmental well-being) and, where appropriate, western science measures.

Makauri Aquifer and the MAR project

The Makauri aquifer is a high yielding water resource of significance economically, socially and culturally. Due primarily to overuse for horticultural irrigation, however, the aquifer's average annual water level has been in an overall state of decline since records began in 1982.

The Makauri aquifer has a water level variation of approximately five metres from the winter high to the summer low at Makauri School. The decline in winter high water levels in the Makauri aquifer appears to be approximately 1.5 metres every five years at the same site. The decline in summer low water levels is approximately 3 metres every 5 years. This would indicate serious decline in the aquifer's overall recharge capacity at current allocation levels.

In order to address the serious ongoing decline in groundwater levels, while seeking to maintain or enhance economic returns from the availability of an abundant source of irrigation water, GDC have implemented a series of restrictions on water allocation from the aquifer, alongside a trial to explore the potential for a managed aquifer recharge (MAR). MAR involves the injection of water extracted from elsewhere (including recycled water) into declining groundwater systems, and is a technology widely used in Australia, the Netherlands and the USA for aquifer replenishment.

For the Tūranganui a Kiwa Gisborne MAR Stage 2 Trial, water will be taken from the Waipoaoa river via an infiltration unit submerged in the river-bed gravels when river flows at Kanakanaia and Matawhero are above 4000L/sec (the B Flow allocation). The water will then pass through a filter bank closer to the injection site to further remove sediment and other contaminants before being injected into the Makauri aquifer, with a small amount used for flushing the pipe system, to a maximum limit of 378,000m³ per year for 2 years (2019 to 2021).

The Waipaoa River is believed to be the main natural source of the Makauri Aquifer water, possibly entering somewhere around Kaitaratahi (and/or further north at Te Karaka) approximately 8km NNW of where the current injection into the aquifer will take place (Kaiaponi Farms). This river water is expected to leak from the bed of the Waipaoa River through overlying silts, sands and gravels into the groundwater under pumping stress from out of the Makauri aquifer. Secondly, there appears to be a component of flow from the hills to the northeast of the flats between Snowsill Road and Waimata-Hokoroa Road (Waihirere to Hexton). This component may only be leakage from overlying aquifers, however. Thirdly, during summer water may flow through the Waipaoa Gravel Aquifer, in the Caesar Road area, directly into the Makauri Gravel Aquifer.

Despite being the primary source for the Makauri Aquifer, and sharing certain base chemical attributes, the river water also has quite different characteristics from the groundwater in the aquifer: the former being rich in oxygen, sediment and microbial life, while the groundwater is anoxic (without oxygen), more highly mineralised and largely microbiota-free.

Contour lines of hydraulic head indicate a general down valley flow movement through the Makauri Gravel aquifer. At the south-east end of the Poverty Bay flats the contours indicate an area of upwelling. It would appear that the Makauri Gravel Aquifer has an outlet via such movement upward into the bed of the Taruheru River in the area south of Pilmer Road to at least Lytton Road bridge. Although it has generally been considered that the Makauri Aquifer does not have an outlet to the sea, the consultants overseeing the trials, Golder Associates have also identified the potential for saltwater intrusion under high levels of water extraction if in fact the aquifer is not 'blind'.

During 2017, the Stage I trial for MAR in 2017 (13th June – 13th September) successfully placed approximately 75,000m3 of river water into the aquifer with no long-lasting, adverse environmental effects evident. However, Golder Associates have identified several risks and issues that will need to be addressed prior to any larger scale application of the MAR. In the context of sustainable management, they also identify the need for a greater understanding of the interrelationships between the Waipaoa River, it's associated shallow aquifers, other waterbodies in the area such as the Western Saline Aquifer and potentially Te Maungarongo o Te Kooti Rikirangi wetland, and the Makauri Aquifer itself.

Three new dedicated monitoring bores have been drilled, and monitoring equipment installed in these. Monthly monitoring of the injection plume (the body of water injected into the aquifer) will continue to track its movement through the aquifer. The draft Monitoring plan for stage 2 has been developed, and the Phase 2 pre-injection environmental monitoring has commenced. Before injection into the aquifer from the river takes place, this cultural impact assessment prepared on behalf of Rongowhakaata Iwi Trust will need to be complete and available to GDC. A program for the monitoring of potential cultural impacts will also need to be developed and implemented.

Proposed allocation models for the MAR

Although GDC has not yet decided what its ongoing role with the project will be after the current trial has been completed, it has commissioned some external expertise to develop options. GDC has indicated that this process will be a consultative one, with input from stakeholders, Eastland Community Trust, Activate Tairawhiti and iwi. A preliminary look (based on what has been done elsewhere) has, however, highlighted some potential options. These include:

- A council owned and run scheme;
- A private company owned by irrigators or those with a special interest in the aquifer;
- A regional commercial entity owned and run scheme;
- A regional public good entity owned and run scheme;
- Some combination of the above (e.g. part ownership by council and another entity, potentially including iwi).

Similarly, at the time of production of this CIA, GDC had not considered in depth the statutory matters relevant to questions of a MAR and associated allocations. Nevertheless, it is envisaged that any proposed option will involve either a change to the Tairawhiti Resource Management Plan, Te Papa Tipu Taunaki o te Tairāwhiti (TRMP) or the provision for a MAR allocation as a 'Non-complying' activity in the context of the Resource Management Act 1991 (RMA).

Despite the range of potential options, RIT technical advice suggests that all scenarios could require firstly, that existing users have their collective, actual water takes reduced to sustainable levels in the context of the Makauri aquifer decline, as currently being determined by GDC. When these individual reductions have been met, and a sustainable water inflow for the Makauri Aquifer implemented, at this point water users might apply for an allocation from the MAR. Such allocation requests would, conceivably need to be placed alongside other potential water users. MAR allocation applicants would then be subject to the criteria for allocation as set out in TRMP, C6.1.1 Policies Water Quantity and Allocation.

Rongowhakaata Cultural Impacts Assessment

Background

The information gathering process underpinning the production of the CIA has been undertaken over a period of five years, commencing during 2015 with initial discussions amongst Rongowhakaata Iwi Trust members and staff and the wider Rongowhakaata community relating to the initial MAR trial.

More recently, with the advent of proposals for a second, more extensive trial, RIT have conducted a range of activities to research whanau and the wider community's perspectives on the potential impacts on Rongowhakaata values and relationships, rights, responsibilities and needs and aspirations for the land and waters potentially affected by both the proposed Stage 2 Trial, but also a more extensive substantive MAR program. These activities have included:

a. A review of the relevant literature, both from Rongowhakaata and other Tūranga experts, and those from across the motu (all the islands of Aotearoa);
b. A series of six in-house hui relating to the MAR project amongst RIT board members and staff over the four months from the start of January to the end of April 2019;
c. Participation with GDC in the development of a monitoring program to assess the potential presence of anthropogenic contaminants (microbial, emerging contaminants, pesticides) in the inflow river water;
d. A meeting of the Rongowhakaata Taiao Focus Group on April 24, 2019;
e. A hui-a-iwi on May 1, 2019 at Manutuke Marae;
f. The design of an ongoing project providing information material relating to the MAR to be placed on the Rongowhakaata website and social media platforms, to gather ongoing input from Rongowhakaata whanau and hapū.

The outcomes of this extended process of information gathering can be described under the following headings.

Interconnectedness

Freshwater, Te Wai Maori, is the fundamental cultural component for Rongowhakaata, imbuing every aspect of life and death. This relationship with freshwater encapsulates the intrinsic and undifferentiated combination of the spiritual and physical and the traditional and contemporary, that underpins all relationships within the everyday and metaphysical worlds of Rongowhakaata. Such interconnectedness and the range of Rongowhakaata relationships with their natural resource base should be a key focus for environmental and cultural monitoring. In such a context, the presence and movement of water and other materials between the land and waterbodies, and amongst the waterbodies themselves, and the importance of these movements from ecological, geophysical, economic and cultural perspectives, remain key factors in Rongowhakaata foci relating to the Makauri MAR project.

Such interconnectedness has particular relevance to the Makauri Aquifer, but also to the morphology and ecology of the Waipaoa River and its associated tributaries, wetlands and groundwater systems, and the use of these as traditional and contemporary mahinga kai, mahinga toi, mahinga raranga and whare whakahou sites along the reaches of the river below the MAR water intake. This is seen as being especially relevant should a substantive MAR project proceed,

and increased volumes of B flow water may be extracted over an extended time frame when flows are between 4000 and 6000L/sec.

In order to identify sites and assess potential impacts, ongoing wānanga (discussion forums) and hikoi (treks where information gathering and sharing is undertaken) are seen as key tools to measure potential impacts of the MAR trials on matters of cultural significance for Rongowhakaata, and potentially provide an assessment platform should a more substantive MAR program proceed.

Rongowhakaata have also made clear the perspective that the MAR project raises certain questions for the interrelationships amongst the various iwi and hapu groups that meet around this area of the Makauri Aquifer and Waipaoa River, including the relationships between economic and cultural interests, the effects of upstream water takes and discharges on downstream users, and the complexity of the interconnectedness amongst the river, the Makauri Aquifer, and the range of associated lands and waterbodies.

Rongowhakaata authors and members of the Taiao Focus Group consider that there is significant value to be had in the development of a discursive relationship, 'he mahi tatou', amongst the iwi and hapu groups with interests associated with the specific environments and natural and cultural resources of the area, and potentially affected by a substantive MAR project.

Values and relationships of Rongowhakaata

Whilst the interdependent relationships of Rongowhakaata iwi with their waterbodies provides a key expression of the overall spiritual relationship of Rongowhakaata to the natural world, it also needs to be recognised that this relationship is accompanied by a series of similarly interrelated components, including Whakapapa, Kaitiakitanga, Manaakitanga and Rangatiratanga[1]. While colonisation has severely impacted on these relationships, it has not removed them, and it was the strong feeling of both the Focus Group and whanau participants at the hui-a-iwi, that monitoring of the impacts of the MAR and related activities on these specific relationships needs to be a strong focus of the CIA ongoing monitoring project.

Kaitiakitanga

The Focus Group members were unanimous in the identification of kaitiakitanga as an essential tool in giving effect to the spiritual and physical relationship of Rongowhakaata with Te Ao Māori. Although kaitiakitanga is often described as 'guardianship', and frequently in reference to natural and physical resources, the term also embodies a significantly more complex and multi-layered system of behaviour and ways of being.

[1] Wairuatanga: spirituality. Whakapapa: genealogy, genealogical table, lineage, descent – central to all Maori institutions. Kaitaikitanga: guardianship, stewardship, trusteeship. Manaakitanga: hospitality, kindness, generosity, support - the process of showing respect, generosity and care for others. Rangatiratanga: chieftainship, right to exercise authority, chiefly autonomy, chiefly authority, ownership, leadership of a social group, domain of the *rangatira*, noble birth, attributes of a chief; kingdom, realm, sovereignty, principality, self-determination, self-management - connotations extending the original meaning of the word resulting from Bible and Treaty of Waitangi translations. See also Tino Rangatiratanga: self-determination, sovereignty, autonomy, self-government, domination, rule, control, power. (Maori Dictionary)

Thus, Rongowhakaata and the whanau and hapū within the wider iwi grouping who have mana (rightful authority) relating to specific freshwater bodies and related resources are expected to exercise their kaitiakitanga in managing these water bodies. This is to ensure that waterbodies per se are effectively protected, enhanced or restored, as are the associated cultural values and relationships.

While the exercise of kaitiakitanga is frequently focussed on the relevant ecosystems and natural resources themselves, and in the context of freshwater management is to some degree at least encapsulated in the concept of Te Mana o te Wai[2], kaitiakitanga also has other important related foci.

These foci include the value of manaakitanga, often referred to as hospitality or the process of showing respect, generosity, and care for others. In order to provide for manaakitanga, the natural resources belonging to the relevant tribal group must be in a high state of health and abundance to be able to accommodate periodic harvesting for specific social and cultural events, such as tangi or hui, or during periods of climatic or social pressure.

Providing an important overarching context for kaitiakitanga is the concern for future generations and the maintenance of the whakapapa links between human lineage and the natural world around. Reinforcing this context is the experienced reality that tribal landscapes are not transferrable. That is, the values and relationships for each particular group are place-specific and rooted in whakapapa and tribal history and identity.

Rāhui

Within the scope of kaitiakitanga, rāhui is seen by Rongowhakaata as an important resource management tool. Rāhui involves the placing of a temporary ritual prohibition, closed season or reservation over an area, resource, or stretch of water, as a resource conservation measure, protection against pollution through tapu (e.g. if there has been death in the vicinity) or as a means of social and/or political control.

Throughout the discussions in both the Taiao Focus Group and the initial hui-a-iwi, a strong preference was put forward for the placing of a rāhui on the taking of the volumes of water from the Makauri Aquifer that has led to the aquifers decline and potential demise (Golder 2017). This was a key focus of RIT's initial submission on the MAR Stage 1 Trial. It has also been reiterated by participants in other forums (including at a combined RIT/GDC hui, Whakato Marae March 15, 2019).

Participants also felt that it was important that GDC do not allow such a situation as the decline in the Makauri Aquifer to occur again, either at the aquifer or any other waterbody, but rather that GDC needs to restore the stability and integrity of natural freshwater systems and processes by implementing Te Mana o te Wai (National Policy Statement for Freshwater Management 2014) as a

[2] 'Each community will decide what Te Mana o te Wai means to them at a freshwater management unit scale, based on their unique relationship with fresh water in their area or rohe. The Statement of National Significance in the Freshwater NPS describes the concept of Te Mana o te Wai as the integrated and holistic well-being of the water. It is up to communities and councils to consider and recognise Te Mana o te Wai in their regions (Changes to Freshwater NPS –2017: Te Mana o te Wai. Fact sheet, Ministry for the Environment). See also: 'NATIONAL POLICY STATEMENT for Freshwater Management 2014' (Updated August 2017 to incorporate amendments from the National Policy Statement for Freshwater Amendment Order 2017).

primary freshwater management objective. In this context, natural recharge is viewed as the preferred method of restoring the well-being of the Makauri Aquifer.

Rangatiratanga

Rangatiratanga can be translated as chieftainship or the right to exercise authority (Māori Dictionary). In a post-Te Tiriti environment, this concept has been extended to include sovereignty and self-determination, or at the least, a high level of self-management and control of those things of value to tangata whenua. These valued states of being are often referred to as essential components of Tino Rangatiratanga.

That is, without the ability to exercise rangatiratanga, the use of kaitiaki implementation tools such as rāhui, or other methods traditionally available to tangata whenua for the protection or restoration of a given site or resource, may be impeded by either:

- Lack of local or central government support for the implementation of effective methods deriving from rangatiratanga; or
- A 'balancing' approach that considers the well-being of the site or resource against economic drivers, or as mentioned above, by some offsetting mechanism.

Access and reconnection

In the two recent Rongowhakaata forums relating to freshwater and the MAR, the question of access has been a major theme. This is consistent with discussions in iwi forums elsewhere, identifying the significance of physical access in recognising and providing for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga (RMA1991, s6e), and indeed with their physical, mental and spiritual well-being. Renowned Māori academic and teacher, Dr Mason Durie, has identified that a lack of access to tribal lands or territories is regarded by tribal elders as a sure indicator of poor health, given that the natural environment is considered integral to tangata whenua identity and fundamental to their sense of well-being.[3]

Discussions around the contemporary use of, and relationship to sites of cultural value frequently highlight the widespread importance of access to waterbodies, including rivers and streams, wetlands, lakes and springs and the coastal environment. Indeed, questions of physical access are also intrinsically bound up in the ability of Rongowhakaata to re-establish our tikanga and mātauranga at the forefront of natural resource planning and decision making within our rohe in Tūranganui a Kiwa.

[3] (Durie M 1994. Whaiora. Māori health development. Auckland, Oxford University Press. 238 p71, quoted in Harmsworth GR, Awatere S 2013. Indigenous māori knowledge and perspectives of ecosystems. In Dymond JR ed. Ecosystem services in New Zealand – conditions and trends. Manaaki Whenua Press, Lincoln, New Zealand).

Rongowhakaata tikanga and mātauranga

The re-establishment of essential Rongowhakaata values of tikanga and mātauranga is described by Rongowhakaata CIA participants as the corollary of a series of recommendations for action, involving Rongowhakaata with, in particular, GDC and the Crown. These recommendations for action, as outlined during our hui, are as follows:

- Rongowhakaata iwi and hapu must be at the table in relation to natural resource planning and management, in a co-operative process with GDC, as acknowledged Te Tiriti partners with the Crown;
- Rongowhakaata need to consider their past roles in terms of tikanga and mātauranga around practical resource management and focus on the restoration within our contemporary socio-political environment of a natural resource base that is abundant and thriving. Such an approach will reposition the discussion around the mitigation of adverse impacts as one simultaneously of leadership and governance;
- The nature of the Te Tiriti relationship between Rongowhakaata and the Crown as Te Tiriti partners needs to be reiterated in a more public forum, so that GDC (and its changing staff) and other local and regional organisations, are fully cognisant of the Te Tiriti principle of partnership, and how this needs to be reflected in joint decision making across a broad range of contexts.

Rongowhakaata, Te Tiriti and freshwater allocation

Rights to use and manage water

In relation to freshwater resources, consultation undertaken amongst Rongowhakaata participants in the production of this CIA has identified the understanding that, embodied in the rightful exercise of kaitiakitanga, manaakitanga, whakapapa and rangatiratanga, are the ongoing rights to use and manage freshwater and associated resources within our tribal rohe. Indeed, iwi Maori rights in general relating to fresh and other waters as enshrined in Article 2 of Te Tiriti as part of 'the unqualified exercise of their chieftainship over their lands, villages and all their treasures', appear to have never been extinguished (Ruru, J, 2009).

Nevertheless, in the context of the current Gisborne Tairawhiti water allocation policies, including the rights to use, transfer and retain water allocations as conferred within the scope of the TRMP[4], participants in our hui felt that a series of potentially intergenerational property rights have been effectively created within Te Tairāwhiti in all but name.

Further, the concept of a decision making and allocation controlling body for the Makauri MAR project that is comprised solely of those parties who have been, and are directly involved in the exploitation of the resource and which has led to its chronic decline and potential demise (Golder Associates, 2017), is unacceptable to the Rongowhakaata members surveyed. Similarly, the potential for overarching management of any MAR and associated B Flow Waipaoa River allocation solely by GDC or its subsidiary entities, given the inability or unwillingness of GDC to address the threats to the aquifer inherent in their previous dispensation of freshwater allocation volumes, is similarly unacceptable.

[4] Tairawhiti Resource Management Plan, sC6.1.

Rongowhakaata have indicated across numerous forums that the question of a just freshwater allocation framework, including iwi rights and responsibilities to the waterbodies currently in scope, are key factors in the cultural well-being of Rongowhakaata, and the ecological health, landscape and amenity values of the waterbodies themselves. This perspective is in the context of pervasive and on-going post-colonial impacts on waterbodies in Tūranganui a Kiwa, including landscape and waterbody modification, general allocation mismanagement, and environmental degradation: all of which have made it extremely difficult for the effective maintenance of Rongowhakaata cultural traditions with these taonga (Coombes, B., 2000).

Thus, given the importance of freshwater to Rongowhakaata, and our aspirations to manage waterbodies in a manner consistent with our key values (including kaitiakitanga and whakapapa), and the overriding purpose of sustainable management (RMA1991, Part 2), an essential request of this CIA is that GDC and RIT will work collaboratively to establish a partnership in relation to the management of freshwater bodies in the rohe of Rongowhakaata that reflects Rongowhakaata's role as Te Tiriti partner around all questions of water management and allocation.

Partnership

Recognition of the special place that Rongowhakaata iwi and hapū (and other iwi and hapū) occupy in relationship with the Crown, reflecting in particular Te Tiriti principles of 'Partnership, Reciprocity and Active Protection', is viewed as critical to the recognition and provision for our values and relationships, rights, responsibilities, and needs and aspirations as regards freshwater. Rongowhakaata are not simply stakeholders, but partners with the Crown in all matters relating to natural resource management.

Despite some hurdles and discussions to be had, the opportunity remains for a regional reconciliation between the interests of the Crown and Rongowhakaata in the form of a partnership between iwi and GDC in relation to the management of freshwater. Giving effect to such a partnership is viewed by iwi members as a critical component of the overall MAR project, existing as the project does as a unique deviation from the current water use and allocation context.

Specific foci for a cultural impacts assessment and monitoring program

During our consultation and information gathering processes, reference was made by participants to specific sites and activities where Rongowhakaata cultural, social, ecological and economic values and relationships are or were evident. Almost all of these are traditional activities that are still undertaken by individuals or whanau, although the sites and to some extent the methods of the activities may have changed.

It has also become evident during the consultative processes undertaken, that there resides a considerable body of traditional knowledge and contemporary practice around the sites and activities referred to above and, we are confident, to a range of further areas of significance to Rongowhakaata that can be outlined within an appropriate monitoring and assessment program.

A holistic approach to assessing economic impacts

Many, if not all resource management decisions made where a 'weighting' of values is required, and typically a weighting of economic as against environmental or cultural values, rely on questions relating to the amount of revenue, employment, or associated economic activity (e.g. from service industries) that a proposal is believed to be likely to create in contrast with those environmental or cultural values to be protected.

Not uncommonly, persons without specific economic or interdisciplinary expertise will make initial decisions in the context of potential adverse environmental or cultural impacts. It may even be that RMA hearings commissioners may make such decisions from a relatively inexperienced standpoint.

Rongowhakaata are thus requesting that when natural resource management concerns, including cultural concerns, are triggered by an activity, and in the overall context of sustainable management and Part 2 of the RMA1991, a truly holistic approach to evaluating such an activity be established. This relates specifically to the MAR where there may be a range of potentially competing economic outcomes along with cultural and ecological values evident. That is, that the outcomes of such a proposal need to be seriously investigated from the range of relevant standpoints. Such a range of physical, ecological, landscape, amenity and socio-economic standpoints is outlined in detail in Section 7, 'Recommendations for action no.9'. Overarching cultural considerations as identified throughout our consultation processes are summarised as:

- Te Mana o te Wai;
- Impacts on cultural landscapes;
- Spiritual and whakapapa foundations of the relationship of Rongowhakaata to the natural world;
- Interconnectedness of the whole;
- Physical, spiritual, socio-economic and cultural well-being of the people;
- Kaitiakitanga;
- Access and riparian restoration;
- Reestablishment of rangatiratanga, tikanga and mātauranga;
- Rongowhakaata and Te Tiriti based partnership with GDC;
- Te Tiriti and freshwater allocation;
- Site specific cultural monitoring foci;
- Need for ongoing engagement with mana whenua through monitoirng, assessment and natural resource management decision making.

Ongoing assessment and monitoring

It is the belief of Rongowhakaata participating in our hui that the effects of activities on the overall well-being of a given waterbody or ecosystem is a state that needs to be re-evaluated on an ongoing basis, and that this should include the presence of Rongowhakaata tohu taiao (environmental indicators, signs) as well as western science indicators.

Similarly, the process of assessing impacts on Rongowhakaata interests should be based on a Te Tiriti partnership, ongoing, and involve robust forums for participation. Our initial hui have identified that the elements underlying a mana whenua sustainable management of freshwater resources are complex, and reflect an overarching world view of the interrelatedness of the spiritual and physical, the traditional and contemporary, and the everyday and metaphysical realms. Further, that the management of natural resources will ultimately derive from and be interwoven with whakapapa as a key guiding principle.

Section 1: Tūranganui a Kiwa, what Cook didn't see

Te Tūranganui a Kiwa: state of the environment prior to 1769

The state of the environment of Tūranganui a Kiwa (Tūranga, the resting place of the Polynesian navigator and ancestor Kiwa) prior to British colonisation has been identified for the purposes of this assessment through two primary sources. These are:

- Native Land Court and other records to which Tūranga tangata whenua[5] have contributed their views and understanding of the local environment and natural resources; and
- The oral transmission of knowledge amongst generations of whanau and hapū relating to their traditional natural resource base, and the effects of British colonisation on this.[6]

A third, more recent source, has been the collation in 2010 of over 10 years of geophysical research undertaken by an international team of scientists, based around the recent and geological histories of the Waipaoa River and its catchment, the embayment of Tūranganui a Kiwa, and the wider Te Moananui a Kiwa.[7]

Drawing from the oral and written records of the tangata whenua, Anne Salmond has produced a comprehensive snapshot of the Tūranga environment prior to 1769:

> Inland, the bay was sheltered by ranges covered with thick forest, while the hills nearer the flats were sparsely clad in scrub, with fern and grasses on the ridges. The central plains were braided by the courses and fertile fans of three major rivers, where taro, kuumara, gourds and probably yams flourished in sunlit gardens. Gardens were also cleared on frost-free hillsides near the rivers, and fernroot diggings were scattered around the bay. Grasslands, wetlands, swamps, scrub and great stands of kahikaatea, pukatea, and tawa trees on the flats provided a variety of foods and materials for weaving and building… Pigeons, kākā, pukeko and parakeets were plentiful on the plains, and thousands of ducks lived by the rivers and the Awapuni Lagoon. Creeks leading into the main rivers on either side of the central plain were crossed by eel weirs with names such as Makaroro, Te Rua-o-Mapewa, Arowhati, built and maintained by particular families. Mullet, eels and whitebait swarmed in season in the tidal waterways.
>
> The bay was famous for its crayfish, caught off Titirangi or further north along the coast, and the reefs and tidal flats harboured quantities of shellfish. Paua were plentiful off Onepoto (now Kaiti), and there were beds of white pipi off Oneroa, where the tamure (snapper) came to feed, crunching the shells in their powerful jaws. Sharks, kahawai, kingfish, flounder and many other species of fish were caught in the bay, and there were a number of favourite fishing grounds, including Te-Wai-o-Hii-Harore at Waikanae, where a spring seeped into the ocean, attracting kahawai, which, according to one early Land Court witness, came there to drink the fresh water. Now and then whales stranded on the

[5] Literally 'people of the land', often used as a synonym for 'mana whenua' i.e. as having specific rights and responsibilities to a given area and set of natural resources.
[6] Coombes, 2000.
[7] 'Marine Geology'. Issue 270. 2010.

> beaches, to be claimed by the chiefly leaders of whichever kin-group controlled that part of the shoreline.[8]

Such descriptions combine to provide an ecological and cultural baseline against which the transformation of Tūranga wrought by the British colonial system of land use and land administration and model of natural resource management can be measured.[9] In this context, Te Tūranganui a Kiwa and particularly the Waipaoa River catchment is often held up as an extreme example of the effects of inappropriate land use, the Waipaoa now boasting possibly the highest sediment loadings of any river in the world.

In his history of the effects on local iwi of such impacts, of what he has identified as 'the transformation or despoilment of important resource spaces', Coombes points out that:

> All attempts to reconstruct historical landscapes and to assess their evolution are restricted by the range of available records. In the case of this project, there is a discernible bias towards recent change in the environment and recent planning decisions. This reflects not only the loss of authorisations for early developmental projects, it is suggestive of the fact that few of the ecological transformations before the Second World War required authorisation. The way in which the European legal and cultural doctrines of ownership provided landowners with near to sovereign rights to transform their property without reference to Maori attachments to ancestral lands and ecological taonga is a recurring theme in this report.[10]

Nevertheless, despite the levels of land aggrandisement and natural resource despoliation, Tūranganui and the wider Tairawhiti region remain a stronghold of iwi Maori[11], and the associated exercise of kaitiakitanga, where remaining resources are highly prized and vigorously protected, is a dominant theme in regional socio-cultural, political and legal contexts. The findings of the Waitangi Tribunal, the various courts of Aotearoa NZ, the Privy Council of England (and more lately the Supreme Court of NZ), and the subsequent settlements between the Crown and local iwi, have created new and diversely textured platforms from which the protection or restoration of such prized resources are able to be addressed.

> The Crown's management of water resources and foreshore areas has required the Waitangi Tribunal's attention on many occasions. The *Mohaka River report*, for example, criticised the way in which s 21 of the WASCA [Water and Soil Conservation Act] abrogated existing rights to river water and gifted them to the Crown. The WASCA and its amendments in 1971, 1973 and 1981 did not allow for the exercise of kaitiakitanga by Maori nor for their participation in decision-making. It was concluded, therefore, that the Act impacted upon the tino rangatiratanga of tangata whenua over water resources. The Waitangi Tribunal has also found that dividing rivers into units of management under English common law was a foreign concept to Maori. Rather than believing that rivers can be divided into riverbed and foreshore, in Maori terms the river is a resource; a single indivisible entity, which cannot be divided for management purposes.
>
> Similarly, the tribunal has been asked to comment upon the validity of the Crown's assertion of management powers over foreshores in the coastal marine area. In respect of

[8] Salmond, 1991, quoted in Coombes, 2000, p2.
[9] Coombes, 2000, p2
[10] Ibid, p4.
[11] A generic reference to Maori presence and culture.

> rock and water extraction in the present casebook area [Tūranga], there are several examples which reinforce the claim that the Crown either over-stepped its Treaty mandate in these areas or failed to prevent their mismanagement by catchment and harbour boards.[12]

Participation in decision making around natural resource management is thus frequently seen as a key mechanism in recognising and providing for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga, and giving particular regard to kaitiakitanga.[13] As Coombes has stated, 'The degree to which tangata whenua view an environmental transformation as negative is inversely proportionate to their ability to influence the decision-making for that transformation.'[14] Such considerations provide the background context to the current cultural impact assessment of the Makauri managed aquifer recharge project trial.

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Salmond, 1991, quoted in Coombes, 2000, p2.

[12] Ibid., p210.

[13] RMA1991, Part 2. Kaitiakitanga is often referred to simply as guardianship, stewardship or trusteeship (Maori Dictionary). The RMA1991 further defines kaitiakitanga in terms of the act as 'the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Maori in relation to natural and physical resources; and includes the ethic of stewardship.' Kaitiakitanga is, however, an extremely important component of Te Ao Maori, the Maori world, and kaitiaki (the guardian or custodian) of an area or resource can be either from the human or non-human realm.

[14] Coombes, 2000, p4.

Section 2: Rongowhakaata, a brief history

Rongowhakaata rohe

Figure 2.1: The lower Waipaoa, Awapuni and Taruheru catchments, coastal environment and urban landscape components of Rongowhakaata tribal estate. Also pictured to the south, Te Wherowhero Lagoon and the adjacent lands of Ngai Tāmanuhiri. To the north and NW, lands of Te Aitanga a Mahaki, Te Whanau a Kai and Nga Ariki Kaiputahi.

Ko Rongowhakaata te Iwi

Ko Te Amorangi ki mua,
Ko Te Hapai o ki muri

Te Wairua Pani O Te Ora (Ruapani) Te Arikinui is the principal ancestor of Turanganui a Kiwa the Paramount Chief from whom all lines of Mana descend. Ruapani today is the core bloodline consolidated into all Whanau and Hapu of Rongowhakaata.

Rongowhakaata descends from the three sons of Paikea: Rongomaituahu, Marupapanui and Pouheni. He was also a descendant of Ruakapanga of Parinuitera. Through his whakapapa he was connected to Toitehuatahi, Porourangi and many other ancestors of notable rank on the Tairawhiti.[15]

There are nine generations between Paikea and Rongowhakaata. Rongowhakaata was born and raised at Uawa (Tolaga Bay) by his parents Tūmaurirere (father) and Haupunake (mother). Both his parents were descendants of ancestors who came on the Horouta waka. For a time Rongowhakaata

[15] Rongo Halbert, *Horouta: The History of the Horouta Canoe, Gisborne and East Coast* (Auckland: Reed, 1999).

lived on the coast at Puatai, north of Whangara, before moving to Tūranganui-a-Kiwa, settling at Pātutahi and later at the Pāokahu block.[16]

He married three sisters in Tūranga, the first and youngest being Turahiri, producing a son named Rongomairatahi. After Turahiri died he married her sister, Uetupuke. A third sister, Moetai also wished to marry Rongowhakaata, but Uetupuke objected to this. Uetupuke moved away to Ohiwa in the Bay of Plenty and conceived another son of Rongowhakaata there named Rongopopoia.[17]

There are three main hapū of Rongowhakaata: Ngāti Maru, Ngāti Kaipoho and Ngai Tawhiri. Rongowhakaata also have very strong connections through these hapū to both their neighbours Ngai Tamanuhiri to the south and Te Aitanga-ā-Mahaki to the north. Most of the hapū of Rongowhakaata descend from Rongowhakaata's son to Turahiri, Rongomairatahi, however the descendants of his daughter Rongokauae from Moetai are also very important.

Rongowhakaata currently have five marae in their estate. These include, Manutuke, Whakato, Te Pāhou, Ohako and Te Kuri-ā-Tuatai. At the last Census, Rongowhakaata had a population of over 5000 people with 54% female and 46 % male. Thirty eight percent of Rongowhakaata iwi currently live in the Gisborne region.

The rohe or tribal estate of Rongowhakaata extends generally speaking across much of the Waipaoa and Tūranga flats, including the Puhikaiiti (Kaiti) block in the north, to the Matawhero, Tūranganui 1, Waiohiharore, Awapuni, Pāokahu, Te Kaiparo, Whenuakura and other blocks dotted between the Te Arai and Waipaoa River. To the east and north, Rongowhakaata interests overlap with those of Te Aitanga-a-Mahaki and take in the hill country to the west of Rakaukākā, Arai Matawai, Whakaongaonga and Waihau blocks. Rongowhakaata also have strong interests in the confiscated Pātutahi block. The Pākowhai block to the south is seen as an area of overlapping interest with Ngai Tamanuhiri.[18]

Tūranganui-a-Kiwa 1830-1868

Until 1865, Tūranganui-a-Kiwa was a domain characterised by almost complete Māori autonomy. European settlement had begun in the early 1830s with the arrival of whalers, traders, and later in the decade, missionaries. During this early period, Pākehā survived in Tūranga under the patronage of the Māori chiefs, and frequently intermarried, producing children to whom land was given.

With European settlement came the perceived benefits of trade and commerce, and Tūranga Māori flourished in both the local and national economies, buying ships, setting produce prices and, during the 1860's, were considering the feasibility of establishing a flour mill to process the wheat they were growing. At this time, the Crown considered Tūranga a 'Native District' and had little if anything to do with the day-to-day administration of the region.

During the years immediately before and after the signing of Te Tiriti, however, tensions did arise between Māori and the European settlers over issues such as land and trade, but for the most part the two groups peacefully coexisted. Notwithstanding, while being accommodating of Pākehā settlers, Tūranga Māori remained staunchly independent and fiercely protective of their lands and autonomy.

[16] Tūranga Tangata Tūranga Whenua. 2004 p. 32
[17] Ibid.
[18] 'Ko Rongowhakaata te Iwi' was produced by Jody Wylie, research lead for Rongowhakaata Iwi Trust, May 2019.

During this period Tūranga Māori rightfully believed that they were in full control of their affairs. They looked to the government for economic advice and help when tensions arose with settlers but did not anticipate the Crown's authority as ever supplanting their own. The failure of Herbert Wardell, resident magistrate from 1855, to establish effective administrative control in the region provides further evidence that Tūranga Māori maintained full rangatiratanga during these times.

Until 1865, autonomy for Tūranga iwi remained relatively unchallenged, the Crown wielding only nominal sovereignty (kawanatanga) over the region. This was to change, however, with the arrival in early 1865 of Pai Mārire supporters (a new Māori religious faith that came to be associated with an anti-Crown uprising) to the Tairāwhiti region. The perceived threat of an expanding Māori resistance to colonial expansion was perceived by the Crown as justification to move its troops into Tūranga and attempt to expel the Pai Mārire followers from the district.

With the presence of their troops in Tūranga, and under pressure from the settler population for improved access to Maori lands, the Crown recognised an opportunity to achieve a more substantive level of sovereignty in Tūranga. This was ultimately given effect to through armed conflict.

Initially, this was through siege by the Crown of Waerenga-a-Hika pa (about 12km from the current city of Gisborne), the resistance by the Tūranga tribes, and the subsequent loss of life and looting that occurred. This was swiftly followed by the deportation without trial of Tūranga Maori to Wharekauri (Chatham Islands) in 1866.

> The Crown's move on Tūranga was convenient rather than necessary and conflict in Tūranga was avoidable right up until the last minute. From the arrival of Pātara and Kereopa [Pai Marire leaders who were accused of the murder of Rev. Volkner at Opotiki on March 2 1865] in March up until the siege of Waerenga-a-Hika, Tūranga Pai Mārire had not committed any violent crimes and Rukupō offered to compensate for any plundering or damage to property. He even offered to bring in the Ngāti Porou refugees [Ngati Porou people who had joined the Pai Marire movement and left the body of the tribe who were kawana or Crown supporters] whose presence had enraged [Ngati Porou chiefs] Mōkena and Henare, but no one was willing to talk peace terms with him, not even McLean. Rukupō[19] and the other Pai Mārire rangatira wanted McLean to make peace with them first but he was not willing to negotiate. The determination of Mōkena and Henare to chase their people who had fled south, coupled with McLean's inflexible approach, sealed the fate of Tūranga Māori. McLean wanted to crush the influence of Pai Mārire on the East Coast while he had the chance and Mōkena and Henare were eager to gain advantage over their long-standing [Tūranga] rivals. The battle at Waerenga-a-Hika was relatively small-scale in comparison to conflicts in other parts of the North Island, but the repercussions for Tūranga Māori were immense.[20]

[19] Raharuhi Rukupo was a major chief of Rongowhakaata during this time, and an exceptional master of whakairo (traditional carving). His meeting house, Te Hau ki Tūranga, stolen during the latter part of the conflicts in Tūranga, and recently returned to Rongowhakaata iwi, although still standing in Te Papa National Museum in Wellington, is the oldest wharenui in Aotearoa.

[20] Waigth, 2009, pp37-38.

Despite their population decimated by armed conflict and imprisonment at Wharekauri[21], and with the pending threat of Ngati Porou aggression from the north (Ngati Porou had been supporting the crown throughout the conflict), combined with the intransigence of the Crown agents to actively protect the interests of the Tūranga people but rather undertake a series of attempts at quasi-legal land confiscation, Tūranga Maori remained steadfast in their opposition to alienation of their lands.

> In July 1868 the Rongowhakaata prophet leader Te Kooti Rikirangi seized the schooner *Rifleman* and escaped from Wharekauri with 289 other prisoners who were dedicated followers of his Ringatū religion…
>
> On the night of 9 November 1868 Te Kooti and his men attacked Matawhero, a small settlement ten kilometres inland from Tūranga. Biggs was slain as revenge for his part in exiling Te Kooti, as well as for the murder of Rukupō's protégé Pita Tamaturi, and for living on land in Matawhero which Te Kooti had interests in. The attack on Matawhero, as well as subsequent attacks in the area, left Tūranga Māori in a vulnerable position. The Crown threatened to withdraw military protection from the district and in December 1868 Tūranga Māori (including Raharuhi Rukupō) signed a deed of cession that transferred over 1,000,000 acres of land to the Crown. After almost thirty years the Crown finally got its hands on land in Tūranga. In 1870 the government purchased land for a European township and the small settlement of Tūranga was renamed Gisborne.
>
> After existing as an autonomous district for decades, Tūranga Māori finally felt the full power of British imperialism when the Crown attacked Waerenga-a-Hika Pā in November 1865. For both Pai Mārire and kāwanatanga Māori[22] in Tūranga it was a war they did not want. Fighting was avoidable but the involvement of Ngāti Porou on the one hand, and the determination of McLean to crush the influence of Pai Mārire on the other, rendered conflict almost inescapable. The independent spirit and mindset of Tūranga Māori was broken, and the power relations changed forever. Land confiscation opened up the district to European settlement and the tables were now turned. Prominent New Zealand historian James Belich argues that it was the New Zealand Wars, not the Treaty of Waitangi, that finally broke Māori independence in New Zealand.[23]

[21] 'The Waitangi Tribunal has estimated that between 1865 and 1869, around 240 adult males were killed in battle with Crown forces at Tūranga. That constitutes 16 per cent of the total population or 43 per cent of adult males, based on the 1860 figure. And it does not include the many women and children also killed, or others who were indirect victims of the wars, such as those prisoners who died when imprisoned without trial at the Chatham Islands. Added to further casualties, the death rate alone could easily have exceeded 20 per cent of the total population. Total casualties could have been around 40 per cent of all Tūranga Māori once the wounded are included. That is an almost incomprehensible level of loss.' (pers comm Manu Caddie, 17.5.2019)

[22] Supporters of the Treaty and Crown kawanatanga 'governance', who became Crown loyalists during the conflicts.

[23] Waigth, 2009, pp40-41. 'Tūranganui-a-Kiwa 1830-1868' is based on material from Kasaia L. Waigth. 2009. 'Stolen from its people and wrenched from its roots'? A Study of the Crown's 1867 Acquisition of the Rongowhakaata Meeting House Te Hau ki Tūranga'. Auckland University.

Rongowhakaata whakapapa with Te Wai Maori

'Haramai a Paoa i runga i tona waka i a Horouta
Ka pakaru ki Tuaranui o Kanawa
Ka haramai ki uta ki te rapa haumi, ki te rapa punaki
Ka kitea te haumi, ka kitea te punaki
E kai kamakama, ka miia tona mimi
Rere ana Motu, rere ana Waipaoa
Ko Kopututea te putanga ki waho
Ki a unu mai tona kuri, e pakia mai nei
E nga ngaru o te moana, e takoto nei
Ka huri ka huri te haere a Paoa
Ki te Tairawhiti e!'

The above moteatea recounts the story of one of the ancestors of Rongowhakaata, Paoa, coming to these lands on the Horouta waka and the feats he achieved. One of these was the creation of the Waipaoa and Motu rivers, important water bodies and sources in the Tūranganui-a-Kiwa district.

In May 1840, 24 chiefs of the tribes of Tūranganui-a-Kiwa signed the Treaty of Waitangi at Taurangakoau Pa in Manutuke. Fourteen of these chiefs were of Rongowhakaata descent. Article 2 of the Treaty covered the protection of Rongowhakaata hapū rights in water and other taonga.

From 1840 – 1860 saw a period of rapid European settlement and growth in the Tūranganui-a-Kiwa region. Large scale arrival of new migrants from Europe meant radically increased demand for land which resulted in conflict over land sales. This inevitably led to the start of the East Coast Land wars during the late 1860's with the siege of Waerenga-a-Hika in 1865, deporting of Rongowhakaata prisoners illegally to the Chatham's in 1866, and the siege of Ngatapa in 1868 where many Rongowhakaata prisoners were executed by the Crown and its allies.

In 1869, 1.25 million acres of land was ceded by Rongowhakaata and the other tribes of Tūranga to the Crown. This was known as the Deed of Cession. This had an enormous impact on Rongowhakaata mana and sovereignty and has had a ripple effect for future generations of Rongowhakaata.

Important water bodies for the iwi of Rongowhakaata include the Waipaoa River, Te Arai river, Awapuni Moana, Te Wherowhero lagoon and the many springs and water sources dotted across the Waipaoa and Tūranganui-a-Kiwa plains.

The Waipaoa River has always been of great significance to Rongowhakaata and its lower reaches around the Te Arai. Rongowhakaata have always known this area as Kopututea. This has been of huge spiritual and cultural significance to Ngati Maru hapū of Rongowhakaata.

Awapuni Moana is another body of water of important historical significance to the tribe. In 1769, Cook and the crew of the HMS

Endeavour tried unsuccessfully to land adjacent to Awapuni Moana, a heavily populated coastal lake. The Ngati Maru hapū of Rongowhakaata relied heavily upon the Moana for fish, eels, fresh water mussels and other species. It was also the area where the ancestor Rongowhakaata finally resided before dying and being buried on its shores. In 1953, the Poverty Catchment Board drained the lagoon to make way for farmland. This was done without the consent of the original owners, the hapū of Rongowhakaata. Further to this a rubbish dump was added during the 1970-80 period by the then Cook County Council.

Other important water sources to Rongowhakaata included the Waikanae stream where Tuna (freshwater eel) and Kanae (mullet) were harvested in large quantities by the hapū of Rongowhakaata, Ngai Tawhiri. This is reflected in the abundance of Pa Tuna (eel weirs) that were located along the stream's reaches.[24]

Figure 2.2: The eastern aspect of Rongowhakaata rohe. From the maunga Titirangi, looking to Waikanae Stream (left of the photo), the Taruheru River (to the back right) and the Turanganui River estuary, 1885 (Courtesy Tairawhiti Museum)

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[24] 'Rongowhakaata whakapapa with Te Wai Maori' was also produced by Jody Wylie.

Section 3: Rongowhakaata Iwi Trust's opposition to the Makauri managed aquifer recharge project

Background

During June 2018, Rongowhakaata Iwi Trust (RIT) made a formal submission in opposition to the resource consent application for the second stage of the Makauri managed aquifer recharge trials (MAR). The Trust's concerns relating to the aquifer recharge project included:

- That the mixing of differing forms of water, in this case the injection of significant volumes of young, oxygen-rich Waipaoa River water with the older (80-120 years) anoxic groundwater in the Makauri aquifer, is contrary to widely accepted Rongowhakaata tikanga. Examples of different types of water to Māori are provided in the water classification summary in Table 1.

Table 3.1: A Rongowhakaata water classification framework (including material from 'Water and health: a Maori context', Mason Durie, 1998, and the Parliamentary Commissioner for the Environment, 2000.)

Classification	*Source*	*Uses*
Waiora	Rainwater	Rituals and rongoa Symbolic cleansing Drinking
Waipuna	Hillside and lowland springs	Rituals and rongoa Drinking Cooking
Waimaori	Running streams	Drinking Cooking Washing Healing
Waikino	Stagnant pools[25]	Unfit for human use
Waimate	Sites downstream from human impacts	Unfit for human use
Waitai	Salt water	Source of food Bathing Healing
Waipiro	Slow moving, typical of repo (swamps)	Source of a range of food and other resources
Waitapu	Where an incident has occurred in association with water (eg drowning)	No resources may be gathered or activities undertaken until the tapu is lifted

[25] Other sources characterise waikino as water that has become 'dangerous' in either a physical or spiritual sense (Douglas, 1984; pers. com. Perak Nikora, 2011).

- The potential for contamination of the aquifer through the injection of river water that contains sediment, microorganisms and potentially other contaminants derived from surface water run-off.

- The potential for production of undesirable by-products from both the mixing the oxic river water with the largely anaerobic (anoxic) aquifer water, or from artificial chlorination of the water injected into the aquifer.

- Impacts on the ecology of the Waipaoa River through the taking water from river flows greater than 4000L/sec[26], especially if a major aquifer recharge program was to go ahead.

- Questions about equitable and ongoing access to both the Makauri aquifer water resource and the Waipaoa River 'B' flow allocation (this is a total allocation of 2000L/sec when the river flow is above 4000L/sec and currently represents the last allocable volume of water from the Waipaoa River).[27]

Specifically, the RIT submission requested the following relief:

> In the context of our fundamental and long standing tikanga to avoid the mixing of differing waters, and on assessing the available information, identifying what we perceive as the gaps and conflicts in the information provided, and considering the potential costs to both Rongowhakaata whanau and the wider community, it is incumbent on us to submit the following requests for relief.
>
> 1. RIT oppose the current resource consent in its entirety as it has not been identified how Te Mana o te Wai, and our iwi and hapū rights and interests in the water bodies in our rohe, and our's and the wider communities' social, economic, cultural and environmental well-being, will be provided for by the MAR project in the context of RMA ss5, 6, 7 and 8.
> 2. RIT seek that the current application for resource consent variation is denied.
> 3. If the consent is to be granted, RIT request that:
>   a. The consent is viewed as a new consent application and is publicly notified.
>   b. The applicant commissions a cultural impact assessment of the proposed project, taking into account recommendations provided in the review by Dr Nick Roskruge (Land Management Group 2017) and to be undertaken in collaboration with RIT, including the employment of Rongowhakaata experts in these matters.
>   c. GDC establish and resource a formal relationship with RIT, as distinct from the MAR stakeholder group, to participate in and oversee the project research, implementation, monitoring and outcomes.
>   d. In collaboration with RIT, the applicant undertakes an expert independent assessment of the flows required for positive riverine hydrological and ecological functioning, including sediment flushing, habitat diversity, and fish spawning and migration.
>   e. In collaboration with RIT, the applicant commissions an independent study of the interrelationships amongst Waipaoa River flows and associated aquifers (Waipoa Shallow Fluvial, Waipaoa Gravels and Te Hapara Sands aquifers), and the potential impact of 'B' flow water extraction on these.

[26] Or >4100L/sec when the river flow has been at or below 4100L/sec for five or more consecutive days (Consent Decision, 2018).
[27] Personal communications: Paul Murphy and Lois Easton, 2019.

f. The period of any 'B' flow take from the river is restricted to 'wet season' high flows (typically June to September, although exact dates will ultimately be identified through the study commissioned as at d. and e. above), to assist with providing for positive riverine functioning and to avoid impacts on related ground water systems and resource users.
g. The anticipated impacts of climate change and variability on the Waipaoa River and associated aquifers are identified, and the effects B flow abstractions might have in this context, including river aggradation, are assessed and reported on.[28]

Although the independent commissioner hearing the application for the stage two MAR trial agreed to grant consent to GDC for the trial, he made clear that the consent was solely for the purposes of a trial, and that several of RIT's expressed concerns will likely be more relevant to any major recharge program.

Amongst other conditions, the commissioner also required a cultural impact assessment (CIA) be undertaken prior to the recharge program commencing.[29] The purpose of this assessment is to help all parties better understand the impacts of the proposed Makauri aquifer recharge trial on Rongowhakaata values and relationships relating to the aquifer and the lower Waipaoa River, and the associated waterbodies and surrounding lands within this area of our rohe (tribal estate).

A related consent condition requires:

> Within four weeks of granting the consent, the consent holder shall commence a collaborative process with mana whenua that will ensure mana whenua input into decisions regarding the design, implementation and evaluation of the monitoring programme for the trial. The monitoring and evaluation programme shall include the development and implementation of a process for monitoring and assessing the cultural health of the Makauri Aquifer and Waipaoa River.[30]

References

Gisborne District Council. August 2018. Makauri managed aquifer recharge trial stage 2: Variations and amended Resource Consent Decision. file:///C:/Users/Murray/Downloads/MAR-Variation-2-Decision-and-Amended-conditions-GDC-DW-2018-107113-02....pdf

Murphy, Paul and Easton, Lois. 2019. Reference to the Waipaoa River water allocation status.

Rongowhakaata Iwi Trust. Submission re Makauri MAR Stage 2 Trial. August 2018.

[28] Rongowhakaata submission re Makauri MAR Stage 2 Trial, August 2018.
[29] Makauri managed aquifer recharge trial stage 2: Variations and amended Resource Consent Decision. August 2018.
[30] Ibid.

Section 4: Methodology for a cultural impact assessment of the Makauri managed aquifer recharge project

Background

Gisborne District Council (GDC) has commissioned Rongowhakaata Iwi Trust (RIT) to undertake a cultural impact assessment (CIA) of the proposed Makauri managed aquifer recharge (MAR) project stage 2 trials on the values and relationships, rights and responsibilities, and needs and aspirations (our 'interests') of Rongowhakaata iwi:

> The Makauri Aquifer is the largest aquifer underlying the Turanga Flats and is between 15-90 metres deep. The ultimate source of water in the aquifer is the Waipaoa River – where water infiltrates the subsoils and moves into the aquifer around Kaitaratahi.
>
> Because the aquifer is in decline, a trial has been held over 2017, and is proposed to be repeated again in 2019 and 2020, to take water out of the Waipaoa River when river levels are high, run it through filters and put it down into the aquifer through a recharge bore.
>
> There is considerable western science research which has been undertaken before and during the 2017 trial and this project seeks to augment that with Mātauranga Maori to enable an understanding of the cultural impacts of the trial.
>
> *Description of Services*
>
> To undertake a Mātauranga Maori Assessment of the cultural health of the Makauri Aquifer/Waipaoa River in relation to the Makauri Aquifer Recharge Trial.[31]

The methodology for the cultural impact assessment derives primarily from five literature sources, the authors' personal experiences in this field, and input from Rongowhakaata members. The written sources are as follows:

- Tipa, G. and Severne, C. 2010. 'Methodology and analysis tool to identify tangata whenua cultural flows for the Te Arai river catchment.' NIWA Client Report: HAM2010-036.
- N and T Moetara. 2016. 'Çultural Limits: Te Arai'.
- Dr Nick Roskruge (Te Atiawa/Ngati Porou). 2017. 'Peer review of the Gisborne Managed Aquifer Recharge Cultural Impact Assessment.' LMG Land Management Group.
- Joanne Clapcott (Ngāti Porou), Jamie Ataria (Rongomaiwahine, Ngāti Kahungunu, Ngati Raukawa), Chris Hepburn, Dan Hikuroa (Ngāti Maniapoto, Tainui, Te Arawa), Anne-Marie Jackson (Ngāti Whātua, Ngāti Kahu o Whangaroa, Ngāpuhi, Ngāti Wai), Rauru Kirikiri (Te Whānau a Āpanui) & Erica Williams (Ngāti Whakaue, Ngāti Pikiao, Te Whanau a Maruhaeremuri) (2018). 'Mātauranga Māori: shaping marine and freshwater futures', New Zealand Journal of Marine and Freshwater Research, 52:4, 457-466, DOI: 10.1080/00288330.2018.1539404.
- Jolly, D. 2017. 'Statement of evidence (Cultural Impact Assessment): re applications to reclaim land and construct a wharf in Awaparahi Bay, Lyttelton Harbour.'

[31] MAR CIA Contract for service (GDC, 2019).

This CIA also aims to complement that produced for Te Runanga o Turanganui a Kiwa, 'Managed Aquifer Recharge Cultural Impact Assessment Report', September 2015. We believe that all of the documents reviewed are relevant to the work at hand.

Further, the methodology we have adopted reflects input received from RIT board members and staff, and from the wider Rongowhakaata community during hui, and has been reshaped to reflect that input. It is also anticipated to be iterative, that is, subject to adaption as further engagement is undertaken with Rongowhakaata whanau, hapu and iwi, and other participants relevant to the MAR project. In essence, the methodology for our MAR CIA reflects a journey underpinned by ongoing Rongowhakaata participation and direction. As such, the first stage is embodied in the series of recommendations for the development of a cultural monitoring program that have arisen out of our initial processes of engagement.

Tipa and Severne, 2010

In 2010, Drs Gail Tipa and Charlotte Severne of NIWA produced a report for GDC and Rongowhakaata Iwi Trust, 'Methodology and analysis tool to identify tangata whenua cultural flows for the Te Arai river catchment'. The report explores ways in which council could effectively incorporate the knowledge or Mātauranga Maori held within whānau, hapū and iwi, to inform the Gisborne District's Regional Water Plan, and in particular the plan's water allocation provisions.

The authors point out that initiatives to document Mātauranga Māori had grown exponentially in the twenty years to 2010. These initiatives are seen as reflecting a parallel increase in the perceived value of Mātauranga as a contributor to sustainable management of New Zealand's natural and physical resources, and providing a system of knowledge, belief and practice that represents a richness of basic, practical information about the environment, its components and the relationships among them.

> For many indigenous communities this knowledge constitutes a major 'asset' … But determining how Mātauranga Māori can inform development of a responsive regional water plan framework is a challenge confronting the project team.
>
> It will be necessary to identify explicitly for the GDC, whānau, hapū and iwi how it is possible to accommodate Mātauranga Māori within the regional water plan framework including providing a clear and systematic basis for tracking implementation over time.[32]

The authors continue:

> The challenge Māori confront is to convey to decision makers how allocative decisions affect their cultural interests since many of the existing methods of assessing flows are dominated by western science techniques which emphasise physical and biological values rather than specifically responding to cultural needs. If the needs of Māori are to be seriously considered and weighed alongside the needs of other populations, and if environmental flow assessments and allocative decision-making are to benefit from the knowledge of whānau, hapū and iwi, new techniques are needed to assess the appropriateness of flows in culturally sensitive ways.[33]

[32] Tipa and Severne, 2010, p3.
[33] Ibid, p1.

Figure 4.1: An attempt to identify the characteristics of indigenous knowledge

Criteria used to define indigenous knowledge include the following - 1. Local: It is rooted to a particular place and set of experiences and is generated by the people living in those places. 2. Oral and Visual transmission: It is transmitted orally or through imitation and demonstration, and also may be acquired through personal observations and experience. The mode of transmission is usually informal, based on participation in a range of customary activities, closely tied to the cultural and ecological context(s) in which it occurs. 3. Practical: It is the consequence of practical engagement in everyday life and is adapted or reinforced by experience, trial and error, and experiment. The lessons learned from these experiences are often accumulated and passed along from one generation to the next. 4. Repetitive: This is a defining characteristic, aiding retention and reinforcing ideas. 6. Dynamic: It changes, being produced as well as transformed, discovered or lost. This represents its practical responsiveness and connection to other characteristics of the surrounding social and physical environment. When the environmental context changes, indigenous knowledge like Matauranga Māori will usually be impacted. 7. Shared: It is characteristically shared to a greater degree than other forms of knowledge even though its distribution within communities is uneven with some types of knowledge more widely disseminated than others. 8. Fragmentary: It is differentially distributed among community members. 9. Functional: It is organized and oriented toward the pragmatic fulfillment of identifiable goals, which specific to this project include health and well-being. 10. Holistic: It is integrated and situated within broader cultural traditions. (Menzies, 2006)

Tipa and Severne did not attempt to define 'Mātauranga Maori' in absolute terms, rather leaving it to whānau and hapū attending the hui they conducted to describe, and in effect define their relationship with Te Arai. In following this course, the authors identify how Mātauranga Maori can be appropriately articulated and given effect to in the specific social, cultural and environmental contexts of Rongowhakaata whanau, hapu and iwi, and the river and its catchment.

> When participants talk of their personal experiences of Te Arai, their interactions, and how this compares with their understandings of Te Arai environment that earlier generations lived and interacted with, they in fact present their Mātauranga that has evolved. Mātauranga Māori is place-based, dynamic, and responsive to ecosystem changes when and where they happen. Environmental knowledge, or more specifically knowledge of Te Arai River, refers to the subset of Mātauranga Māori that is specific to Te Arai environs and the relationship of whānau, hapū and iwi to it. This is broadly conceived as encompassing knowledge of entities (sites, species, eco-regions), components (e.g. soils, waters, geology, climate), the interrelationships among these, and the processes affecting them (including human-made impacts). Because such knowledge is geared toward the practical engagement of it, it is often bound together with resource utilization behaviours. At the same time, vital aspects of it may be intimately associated with spiritual beliefs, notions of health and wellness, social behaviours, and symbolic expressions…

Mātauranga Māori is place-based, dynamic, and responsive to ecosystem changes when and where they happen.

> Finally, the utilisation of participatory methods reflects the preference of the Project Team to understand the significance of Mātauranga Māori from the perspective of whānau and hapū as for many, Mātauranga Māori is the time-tested basis for their decision-making. The initial hikoi and the written statements that were provided to Severne & Tipa at the hui confirm the integration of Mātauranga Māori with their total way of life, and their belief that it is their right to have a healthy river that enables them to keep their Mātauranga as an essential part of their culture, organization, spirituality, and identity.[34]

In such a context, when Rongowhakaata participants in the information gathering hui talk of their personal experiences of the waterbodies in their rohe, their interactions with these waterbodies, and how this compares with their understandings of the environment that earlier generations lived and interacted with, they in fact present their mātauranga as it has evolved.

Two further points that Tipa and Severne make in relation to Te Arai River flow setting process are equally applicable to the MAR project as a whole. These are:

> 1. We have assumed that the concept of national, regional and local significance will not be acceptable as some river reaches are of significance to particular whanau, hapu and iwi. It is difficult and inappropriate to impose national regional or local significance based on non-cultural criteria. We propose discussing with tangata whenua means of according significance.
>
> 2. We believe that whanau and hapu will be the primary beneficiaries of an integrative and responsive flow setting process for the regional water plan framework. Dissemination of the pilot in Te Arai will help raise their awareness of the links between tangata whenua values and flow setting processes. Early engagement in the formulation of statutory plans is recognised as best practise. The methods that we recommend we believe will aid communication between tangata whenua and the GDC.[35]

Clapcott et al., 2018

Adopting a somewhat different approach from Tipa and Severne, in a recent special edition of the Royal Society Journal of Marine and Freshwater Science, editors Joanne Clapcott et al. collated a series of papers focussing specifically on describing and exploring the concept of mātauranga Maori in traditional and contemporary contexts. In their introductory paper, 'Mātauranga Māori: shaping marine and freshwater futures', the editors write:

> Mātauranga Māori is a continuum of distinct knowledge with Polynesian origins that grew in Aotearoa New Zealand, including Māori worldview, values, culture and cultural practice, and perspectives that establish Māori identity, responsibilities, and rights to manage and use resources (Mead 2012; Mercier et al. 2011; Mikaere 2011; Royal 2012). As such, mātauranga Māori is considered the ūkaipō (source) of knowledge in Aotearoa New Zealand (Hikuroa 2017). Mōhiotanga (understanding), Indigenous Knowledge (IK) or Traditional Ecological Knowledge (TEK) are all part of mātauranga Māori but defining it as knowledge alone is inadequate. Mātauranga Māori is understood within Te Ao Māori, a Māori worldview, that has at its foundation relationships between everything seen and

[34] Ibid, pp3-4.
[35] Ibid, p23.

unseen, humans and more-than humans, the natural and spiritual world, and in turn shapes the Māori way of doing things…

Ka mua, ka muri–we look to the past as we move forward into the future.[36]

The editors go on to reaffirm the understanding that mātauranga originates, and is specific to geographic place and local context, and that it is emblematic also of its origins and formative human contexts through time: 'The whakapapa of knowledge is important'.[37]

They then outline examples of mātauranga-informed tools for assessing the mauri of waterbodies and informing river flow setting to achieve cultural values. These examples are:

- The Mauri Model (Morgan 2006). This is a tool that has been developed to afford iwi/hapū greater participation and tino rangatiratanga in environmental monitoring and management. In their paper, Hikuroa et al. (2018) outline use of the tool to demonstrate how a depletion in the mauri of Te Awa o te Atua (known today as the Tarawera River) correlates to major anthropogenic impacts in the catchment. By assessing indicators of cultural, environmental, social and economic well-being, Hikuroa and colleagues demonstrate the relative effect of major disturbances in the River catchment over the last 100 years. Results showed that the re-routing of Te Awa o te Atua had effectively 'severed the head of the river' and had the most signficant impact on mauri. The analysis has aided local iwi to quantify and communicate the concept of mauri and strengthen their role as kaitiaki.[38]

- An alternative approach to assessing the mauri of awa developed by Waikato-Tainui hapū Ngaati Hine, Ngaati Naho and Ngaati Pou (Hopkins, 2018). Here, the participants use a combination of 'moohiotanga tuku iho' (a coined term that captures local oral histories, songs, prayers and carvings), contemporary mātauranga and western science to classify the mauri of Matahuru River in North Waikato. Where previously they have been prevented from undertaking their kaitiakitanga and manaakitanga responsibilities, mainly due to significant landuse changes and land alienation preventing access, the use of modern technology (e.g. Google Earth) and bird habitat modelling exercises have allowed hapū to reconnect to their whenua (land) and better understand the beneficial and negative impacts of anthropocentric influences in the landscape (Hopkins 2018).

- Finally, Crow et al. (2018) outline a tool for incorporating cultural values into decision making about river flows. A Cultual Flow Preference Study, where Māori repeatedly visit rivers during a range in river flows, and linear mixed modelling were undertaken to demonstrate how river flows contributed to overall river health as defined by local hapū in Canterbury. The relationship between changes in river flow and river health was shown to vary among river sites, and individual assessors were relatively consistent in their assessments within rivers. Crow et al. (2018) suggest that the approach is transferrable and could be calibrated by Māori elsewhere to examine and communicate the influence of flow allocation on their cultural values.

[36] Clapcott et al, 2018, pp457-458
[37] Kitson et al, 2018, p459.
[38] Clapcott et al, 2018, p461.

In the MAR CIA we have utilised the work provided in the recent journal to help inform our approach to the development of a monitoring program to assess the impacts of the MAR project as a whole, both during the trial and potentially at a substantive stage. The structure of this monitoring program is outlined in detail in the recommendations at Section 7 of this report.

The validity of mātauranga Māori to contribute to aquatic management has never been questioned by Māori, but importantly, this special issue of the Journal of Marine and Freshwater Research has clearly illustrated the positive gains to be achieved when mātauranga Māori and Māori principles, values and approaches are at the heart of environmental decision-making in Aotearoa.

> The recent legislative recognition of the Whanganui River as its own legal entity is acknowledgement of significant positive transformation for Aotearoa New Zealand's environmental laws. Enabling this new respectful engagement are modern Treaty of Waitangi reconciliation settlement statutes between the Crown and Māori. These settlements are endorsing Māori tribal visions for knowing and caring for Papatūānuku (our Earth mother) and reasserting a founding place for tikanga Māori (Māori law) to once again guide regional natural resource governance and management. This new national recognition of tikanga Māori for the environment ought to be at the forefront of any significant foreseeable review and reform of the principal national statute concerning natural resources, including water.[39]

[39] Ruru, J. 2018.

Ngapaki and Teina Moetara, 2016

In 2016, Ngapaki and Teina Moetara of Rongowhakaata produced 'Cultural Limits: Te Arai', an important report identifying key considerations in relation to GDC and Rongowhakaata's role in decision making around the Te Arai River. In their report, they outline methods relating to the potential alignment of GDC actions with Tangata Te Arai values, relationships and aspirations for their river.

We believe that many of Ngapaki and Teina's perceptions and conclusions relating to this specific relationship are also relevant to the relationship of Rongowhakaata with the lower Waipaoa River (of which Te Arai is currently a tributary) and the Makauri Aquifer, and we have included these in Section 6 of our report, 'Rongowhakaata iwi consultation outcomes'. Indeed, the MAR project is specifically referred to by Ngapaki and Teina throughout their work.

The authors identify a range of considerations and methods they consider relevant and appropriate to the development of cultural limits for Te Arai, and those that they do not:

- The river and the people of the river are one and the same. 'Every action considered by GDC to 'do' to the Te Arai River and her surrounding whenua: Whether it is to manage, to take, to add, to monitor, to enhance, to share, to direct, to re-direct, to store, to study, to test, and/or to improve, they also 'do' to TANGATA TE ARAI[40].'[41]
- GDC's methods of engaging with Rongowhakaata and specifically Te Tangata Te Arai are not appropriate.
  'There are specific policies and rules that define how GDC will engage with TANGATA TE ARAI as having mana wai. This is not a direct communication, as GDC seeks Iwi guidance of these policies from representatives who hold positions of responsibility on council advisory groups. GDC also engage with mandated *iwi* organisations such as Te Runanga o Turanganui-a-Kiwa (TROTAK) or Rongowhakaata Iwi Trust (RIT) perhaps with an idea that these institutions would communicate with TANGATA TE ARAI. In reality this communication is not happening well, because the engagement strategies that are used are NOT based primarily on the traditional frameworks of Maori.'[42]

And later:

> GDC need some up-skilling around how to hold holistic frames of management and governance to engage with Tangata Whenua as a partner. A shared learning space becomes possible…
>
> How council will work with iwi and all of its complexity is of concern. If 'iwi' is defined by mandated iwi representation, GDC must consider are these the right people needed to achieve a desired response? Tanagata Te Arai are essentially different to Rongowhakaata Iwi Trust or TROTAK, although some who are trustees, could also be Tangata Te Arai. What changes to GDC's approach could open up conversations to include more diversity in response, therefore open up new possibilities and deeper relationships?[43]

[40] The people who belong to Te Arai River.
[41] N. and T. Moetara, 2016, p9.
[42] Ibid, p9.
[43] Ibid, p16.

Rather, the authors point to the need for the application of traditional methods of engagement:

> This paper will therefore follow protocols of engagement, **powhiri**, developed and practiced by the ancestors of Manutuke, which places philosophical inquiry (RONGO) at its heart, and manifests as an applied practice (WHAKAATA) of *tikanga marae.*
>
> We invite you explicitly into this framing and highlight it as the core thread of our report. This framing directly speaks to engagement and how it can not only enhance but reveal the core issues that concern us with a way forward of how to collaborate across our cultural differences…
>
> We are both opposed to 'us' delineating the Cultural Limits of a complex set of relationships. This writing aims to stimulate curiosity around the process of engagement, as a means to encourage council to consider relooking at its current practises of meeting. If council approaches the question of engagement from our indigenous world-view, cultural limits will be established, with Tangata Te-Arai being able through their role of *kaitieki to* uphold and protect them.[44]

Ngapaki and Teina also provide us examples of how such a progressed process of engagement can enhance understanding between both GDC and Rongowhakaata of key iwi values and interrelationships:

> Mauri shifts. Mauri is completely interconnected to the people as much as it is referencing the life source of a water body. The problem in 'fixing' descriptions of Mauri undoes and underestimates its complexity. As opposed to delineating meaning of Mauri, seek to stimulate curiosity around how to engage. Through engagement real and authentic experiences of Mauri can emerge.[45]

Finally, by way of recommendations for action and change, the authors provide us with 9 'Considerations'. These are:

1. GDC understand, approaches and applies Maori frames of engagement as the process to explore responsive CULTURAL LIMITS for TANGATA TE ARAI.
2. Iwi Representative Groups and their representatives (Te Runanga o Turanganui a Kiwa, Rongowhakaata Iwi Trust) make movements to re-engage with TANGATA TE ARAI through tikanga marae processes with attempt to strengthen mangai[46] responsibilities and diversify the mangai perspectives.
3. For GDC to build an ongoing learning relationship with and respond to the specific complexities present in the TANGATA TE ARAI collective.
4. For GDC to establish continual learning opportunities engaging with and applying tikanga marae engagement frameworks specific to Rongo Whakaata (Ruapani & Nga Tamanuhiri where appropriate) to establish collectively owned and appropriate Cultural limits.
5. GDC representatives regularly approach TANGATA TE ARAI with the aim to build long-term meaningful and authentic relationships.
6. Council invest in up-skilling in the area of engagement.
7. GDC establishes an engagement research branch focussing on engagement practices and supports the practice of engagement across council.

[44] Ibid p11-12
[45] Ibid p15.
[46] Mangai: representative, spokesperson.

8. Make contact with Ruku Ao co-ordinator Adam Cooper to discuss possibilities to support development within this area.
9. GDC must cease actions for future development or work on the Te Arai River including work on the Makauri Aquifer Recharge. GDC seeks immediately to engage in a layered process that is neither consultation nor advisory.

Figure 4.2: Cultural limits for Te Arai: summary

CULTURAL LIMITS for TE ARAI: Summary

- A people driven engagement process.
- Not one person to define the limits.
- The limits are not pre-defined and not replicable on any other site however Maori frames of engagement could be applied when dealing with other sites and iwi.
- The frames for engagement can be explored deeper, in order to understand and really flesh out what appropriate limits are.
- A living conversation and practice that emerges out of appropriate engagement with TANGATA TE ARAI.
- A value for having ongoing conversations, building relationship as well (N. and T. Moetara, 2016, p21).

Dr Nick Roskruge, 2017

At the request of RIT, Dr Nick Roskruge was commissioned by GDC to provide a peer review of the MAR CIA prepared for TROTAK (Ruru, 2015) and to provide some guidelines for GDC in the development of cultural impact assessments in general.[47] In terms of the first objective of the review, Dr Roskruge indicates that there are several ways of implementing the outcomes of the TROTAK CIA for the benefit of all parties. These are:

- To involve iwi representatives more formally and ongoing in this project going forward.
- To create a collaborative approach to getting all local iwi to work with council on their understanding of culture and values.
- To continue to build a publicly available library of information that all applicants to council (and council themselves) can access to assist their processes and to ensure Maori interests are accorded recognition as appropriate.
- To determine clear timeframes and expectations of all parties when CIA are requested, so as to ensure their full effectiveness and uptake is gained.

In terms of recommendations useful for future CIA, Dr Roskruge has indicated the following:

- That the first task is to understand the intent of a CIA, and that both parties, council and iwi, need to be beneficiaries of the process. Clarity around the interpretation of terms such as cultural, impact and assessment is of key importance.
- A relationship between council and tangata whenua should allow the two parties to formally agree on what a CIA should address so that no ambiguity exists. A template for the structure of CIA supported by all parties should be determined irrespective of issues under review.

[47] Roskruge, 2017.

- The preparation of the CIA needs to be undertaken independently by the Maori interest group/entity allowing frank discussion in the process. A CIA should not have to teach cultural values, rather it should be able to build on an existing understanding of values within the institution.
- Both parties should ensure the proposal or activity is properly understood, especially where technical information is provided. Experts or consultants should be sought if needed.
- A CIA should look to include an assessment of the cultural safeguards that might be applied should the proposal succeed or not i.e. both scenario need to be addressed.
- The assessment should also clearly identify the effects and impact on tangata whenua and their values/value systems including the strength of each impact. Contemporary tools for assessing impact on values are becoming available and should be applied discretely.
- Where significant impacts are apparent then some discussion needs to be made around the risk management such impacts carry.
- Recommendations should be made for the other party to counter adverse impacts, or assist positive impacts, as appropriate. The bigger picture apparent from both the proposed MAR project and the current TROTAK CIA response is the relationship of iwi to the freshwater resource, and the clear difference in all value systems which seek to exploit the water resource for the benefit of the community at large. 'Herein lies a separate kaupapa to be considered by all parties before the resource itself becomes over compromised.'[48]

> No single tool will singularly capture the measure of Mauri as understood by individuals and groups who associate to the resource as their relationships are often on a very personal level. (Roskruge, 2017, p4)

Dr Roskruge identifies more specifically what a CIA should contain:

- Whilst any CIA is presented from a specifically Maori or culturally driven space, it is important to ensure the messages contained within it are read as intended and that the council (or its representative) do not perceive any ambiguity. The use of language, recognition of the intended audience and peer review is therefore imperative.

- At all times and as a primary purpose, the CIA needs to enunciate and promote the cultural relationship that exists between the hapū/iwi associated with the activity under review. This can be achieved in many ways, but it is important the reader of the CIA understands the information as presented, so it must be presented in such a way as to be fully valued and understood by external parties. The term 'Cultural' therefore needs to effectively use tools from within the culture to make a statement to the reader: whakapapa, whakatauaki, purakau are examples of the cultural tools available. The presentation of the CIA must recognise the intended audience which is primarily non-Maori. A document which cannot stand alone in its interpretation does not achieve its intended endpoint. Those who prepare the CIA should consider how parties will read and understand its content away from the presentation hui/process.

- If a CIA is requested to consider the impact of an activity on a resource (and therefore the people who relate to that resource) then some commentary needs to be provided that indicates discussion on the activity, especially in the future context, has been undertaken.

[48] Roskruge, 2017, p1.

This discussion process, i.e. the methodology inclusive of technology or the various hui, needs to be representative and again, the reader needs to get the message on how the impact statements have been derived.

- It is also important to acknowledge both positive and negative impacts that may occur. Not all activities have an exclusively negative outcome, and there is a clear responsibility to consider the social value of the proposal for people generally recognising the diversity of Maori interests in this contemporary world.
- The assessment element follows on from the understanding of the 'impact' of a proposed activity. Often the assessment of impact will require the collation of information from various experts to be able to make a qualified (or even a quantified) response. Experts in the cultural knowledge, resource factors, or activity under discussion are all potential contributors to the assessment process and need not necessarily come from within the tribal grouping.
- An assessment must consider all the impacts identified and present the information in language which is acceptable to both the iwi/hapu community and the council.
- Where significant impacts are apparent then some discussion needs to be made around the risk management such impacts carry. Recommendations should be made for the other party to counter adverse impacts, or assist positive impacts, as appropriate.
- The final report should identify how the response to the CIA should be taken back to tangata whenua.
- A CIA needs to be considered as a primary tool to consolidate a partnership approach to a proposal that affects both parties, in this case iwi and council. Generally, the CIA will assist in the determination on the effect of any proposed activity on the environment, culture or values as they might be understood by the Maori interest. Whilst this might raise issues of concern, there is also a need to recognise that the relationship basis of the CIA means that continued dialogue is core to the process and that the CIA merely positions the iwi/hapu at a stage in the proceedings.
- A CIA must show that a process has been applied within the cultural grouping which allowed for a robust and frank discussion relative to the issue under assessment. As in all consultation processes there is a need to recognise that divergent views can and will exist and that not necessarily everyone will be in agreement with the outcome. Clearly there is a need for the CIA to recognise the unique relationship which the Treaty of Waitangi affords Maori in the resource space. This applies regardless of any claims processes with the Waitangi Tribunal that might exist for iwi. The principles of the treaty are relevant at all times.
- The emerging issues relative to the fresh water resource and its economic and cultural value needs to be explored and better understood before more of these projects [e.g. the Makauri MAR] become needed.[49]

[49] Roskruge, 2017, pp7-9.

Figure 4.3: Notes to the structure of cultural impact assessments

Some clarity on terms used and discussed needs to be made prior to any CIA. For example, guidelines suggested under legislation for undertaking a risk analysis of effects lists 'effects' (on the environment or particular resource) as meaning:
• Any potential or probably effect; and
• Any positive or adverse effect; and
• Any temporary or permanent effect; and
• Any past, present or future effects; and
• Any acute or chronic effect; and
• Any cumulative effect that arises over time in combination with other effects.
Furthermore effects can be presented in a myriad of ways (as above) but ultimately they need to be considered from the cultural perspective which is defined by four 'pou' that uphold our modern world; environmental, cultural, social and economic. This information therefore suggests that an agreement between parties – council and iwi – on the structure of a CIA should be determined independently of any issues under review. If this can be achieved then the evolution of CIA and their positive impact for all parties can be achieved. It should be remembered that any template agreed upon would be the beginning of the exercise not the end (Roskruge, 2017).

Concluding comments

From the literature reviewed for the MAR CIA, we conclude that there are very strong synergies amongst all authors, and most strongly in the concept of a CIA as providing a structured framework whereby the specific values, relationships, rights, responsibilities and needs and aspirations of the relevant whanau/hapu/iwi can be expressed and recorded, and the potential impacts and scale of impact in the context of a specific proposed activity can be accurately assessed.

Paramount to this process are certain foundational components i.e:

- That it is the nature of the locality and the impacts of any proposed activities specifically on this locality and any interrelated environments and resources, and hence on the mana whenua who relate to these environments and resources that is to be assessed;
- That the infilling of the framework of the CIA with the range of values, relationships, and all of their interests, and the potential impacts of the proposed activity/ies on these, can only be achieved by the mana whenua, in a discursive, participatory process;
- Once the suite of mana whenua interests is established, a cultural impacts monitoring program is established, consistent with the principles of mātauranga Maori and utilising tohu taiao (traditional indicators of environmental well-being) and, where appropriate, western science measures.

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Appendix 1

An example of the relationship between river functions and processes and tangata whenua values (Tipa and Severne 2010).

Table 2: The relationship between river functions and processes & tangata whenua values.

Navigation	Navigation is important for boating, waka ama, waka taua, mokihi. Māori are able to advise where navigation is problematic and describe the nature of the problem.
Riverbank occupation – historic and contemporary	Historically settlements (pa, kainga, nohoanga) were found alongside or on islands in rivers and on adjacent plains. Many whānau still live alongside rivers. These sites can be impacted by both hydrological and morphological processes.
Coastline stabilisation and river mouth dynamics	Coastal environments remain of fundamental importance to Māori. Māori can identify sites along coastlines and rivers and historic patterns of erosion, accretion, and changes they attribute to changing flows.
Harvesting high flows	Land use intensification (especially conversion to dairying) is a major concern, so Māori will be seeking certainty with respect to the impacts of harvesting on long-term river health.
River fisheries	Synexe (2009) describe the value of fishers ecological knowledge which they believe is a akin to Mātauranga Māori and propose tools for collecting data from tangata whenua.
Coastal fisheries	These sites are also highly valued by tangata whenua.
Estuarine and lagoon integrity	Some estuaries (e.g. lowland streams in Canterbury and Otago) may be temporarily closed during summer by a sand bar, which is pushed away during high flows in winter and spring.
Ecosystem integrity	An issue for Māori may be that the key species investigated may not align with the taonga species as defined and prioritised by tangata whenua.
Miscellaneous cultural materials -	Rivers and associated (vegetated) floodplains, wetlands and river mouths provide a multitude of products that are collected by Māori for personal use or semi-commercial uses. Examples include plants (flax, raupo, kiekie), clays, dyes, gravels, sands and rongoa (medicinal species) etc. The relationship between the health of these species and flow requirements is complex as it involves many different species each with its own habitat requirement.
Water quality	Māori believe that the source of contamination is an issue to be managed directly and do not support the strategy of using "dilution as the solution".
Flood mitigation	In many forums tangata whenua identify the need for floods and freshes to "flush clean Te Arai system"
Health	The long-term interaction of Māori with catchments enables them to identify health concerns.
Wellbeing	River ecosystems continue to serve various functions for Māori living alongside and interacting with rivers, e.g. for drinking, baptism, washing, bathing, but also for fish and the collection of other food, of construction materials, or for recreation. Changes in the flow regime could have an impact on the lives of Māori
Hydrological cycle	Māori can identify what they believe are recharge zones, important wetlands, springs etc and describe the interconnections. They can also advise of the impacts that they believe will result from modified flows.
Salinity and salt water intrusion	Māori have identified changes in lower reaches of rivers, e.g. the Taieri, brackish waters are being experienced further upstream, species composition is changing e.g. tidal mudflats & crabs replacing vegetated riverbanks & eels, salt intolerant plants are dying.
Sediment and suspended matter	For example the IFIM for the Waitaki considered sediment movement and maintenance of the braided character of Te Arai resulting in a flow regime that incorporates a minimum flow with seasonal variation, flushing flows and a flood flow. In the contrast, the Opihi only has a minimum flow and is one of the most armoured riverbeds in the country. As the changes of river morphology are due to the erosion, transport and settling of sediment, the largest amounts of sediment are transported by Te Arai during high-flows and not at average or low-flow conditions.

Section 5: Summary of MAR monitoring outcomes to date

Makauri aquifer and the recharge project: summary to date (GDC, April 2019; Golder Associates, 2017)

A brief summary of the nature of the MAR, and what has been undertaken and learnt so far, has been provided below by GDC management overseeing the current trial (presented by Dr Graeme Card) with review from Rongowhakaata Iwi Trust (RIT) technical advisor, M. Palmer. The following has been provided as part of the communications available as background information to the Rongowhakaata hui-a-iwi:

- The Makauri aquifer is a water resource of regional significance economically, socially and culturally.

Table 5.1: Tūranganui a Kiwa aquifer water usage (Golder, 2017)

Table 3: Poverty Flats aquifer water usage.

Aquifer	Consented volume (m^3 per day)	Consented Rate of take (L/s)	Actual total use (m^3/year)	Daily consented x 120 days (m^3/year)	Use compared to allocation (%)
Shallow Fluvial	8,975	156	112,119	1,077,000	19
Te Hapara	5,846	111	80,890	701,520	17
Waipaoa	2,747	48	116,380	329,640	25
Makauri	33,794	491	1,472,020	4,055,220	33
Matokitoki	18,350	222	77,664	2,202,000	7
Unknown	745	12	24,312	89,400	38
Total	**70,457**	**1,040**	**1,883,386**	**8,454,780**	**25**

Note: Source GDC (2013).

- Due primarily to overuse for horticultural irrigation, the aquifer's average annual water level has been in an overall state of decline since records began in 1982.

Figure 5.2: Groundwater level trends Makauri aquifer, July 1982 to July 2017 (Golder, 2017).

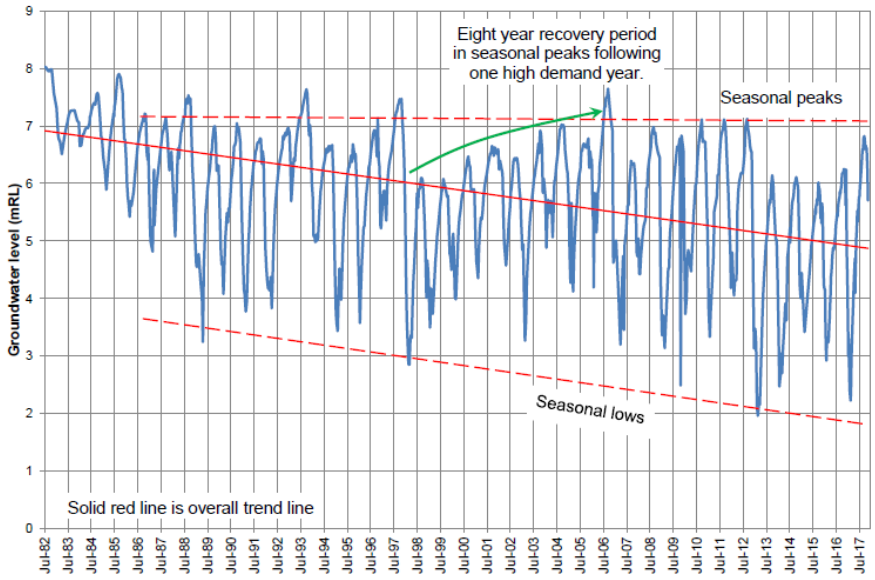
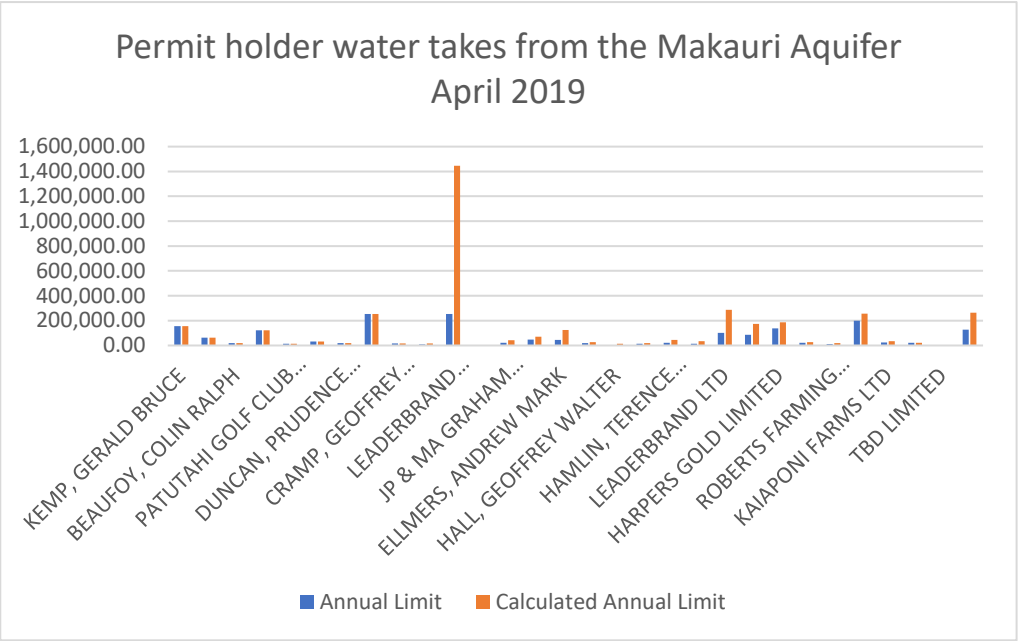


Figure 6: Long-term groundwater level trend in Makauri Aquifer well GPJ040.

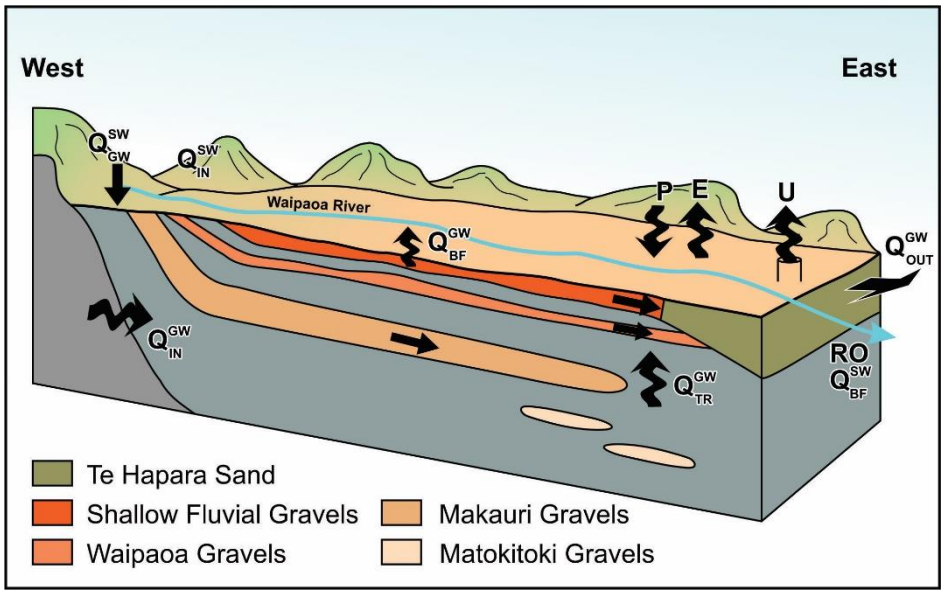
Figure 5.3: Permit holder water takes from the Makauri Aquifer April 2019 (Murphy, 2019)



- The injection of water extracted from elsewhere, including recycled water, into declining aquifer groundwater supplies (managed aquifer recharge or MAR) is a technology widely used in Australia, Netherlands and the USA for aquifer replenishment.
- For the Tūranganui a Kiwa Gisborne MAR Stage 2 Trial, water will be taken from the Waipoaoa river during river flows at Kanakanaia and Matawhero of above 4000L/sec[50] and injected into the Makauri aquifer, with a small amount used for flushing the pipe system, to a maximum limit of 378,000m³ per year for 2 years. The fundamental Stage 2 Trial parameters remain the same as those for Stage 1 (i.e. location of injection point, rate of abstraction and injection) except that the allowable volume of water taken from the river is to be increased from 140,000m³ (2016/17).
- The Waipaoa River is believed to be the main natural source of the Makauri aquifer water, probably entering somewhere around Kaitaratahi (or possibly further north at Te Karaka) approximately 8km NNW of where the current injection into the aquifer will take place. Inflow sources may also be present adjacent to the ridgeline to the NE stretching from Waihirere to Hexton. Nevertheless, the river water has certain quite different characteristics from the groundwater in the aquifer.[51]

[50] When the Waipaoa River has been at 4100L/s or less for five days, the MAR take must cease until river flows have elevated (Consent Decision, 2018).
[51] Golder Associates, 2017.

Figure 5.4: Groundwater system of Tūranganui a Kiwa alluvial plains groundwater systems



- The river water will be taken via an infiltration unit submerged in the river bed gravels, then pass through a filter bank closer to the injection site to further remove sediment and other contaminants.

Figure 5.5: From river to aquifer

- During 2017, the Stage I trial for MAR in 2017 (13th June – 13th September) successfully placed approximately 75,000m^3 of river water into the aquifer with no long-lasting, adverse environmental effects. However, the consultants overseeing the trials, Golder Associates, have identified several risks and issues that will need to be addressed prior to any larger scale application of the MAR. These derive in large part from the mixing of the oxygen-rich (oxic) river water with the anaerobic (anoxic) groundwater, and include clogging and the potential presence or formation of undesirable materials.
- Golder Associates have also identified the need for a greater understanding of the interrelationships between the Waipaoa River, it's associated shallow aquifers, other waterbodies in the area such as the Western Saline Aquifer and potentially Te Maungarongo o Te Kooti Rikirangi Reserve wetland, and the Makauri Aquifer itself.

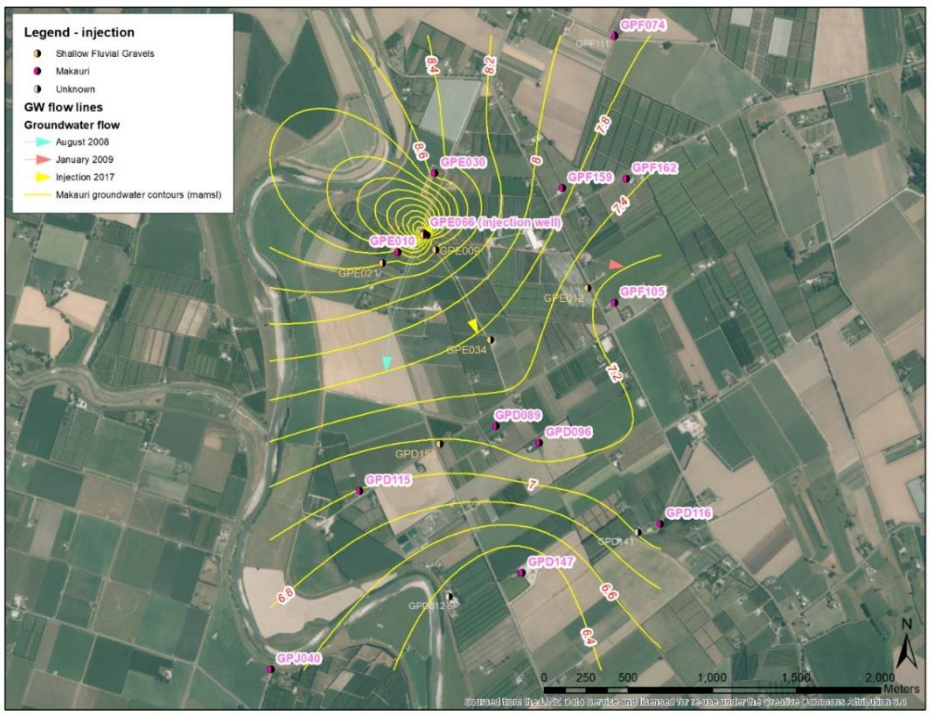
- Three new dedicated monitoring bores have been drilled, and monitoring equipment installed in these. Monthly monitoring of the injection plume (the body of water injected into the aquifer) will continue to track its movement through the aquifer.
- The draft Monitoring plan for stage 2 has been developed, and the Phase 2 pre-injection environmental monitoring has commenced. Before injection into the aquifer from the river takes place, this cultural impact assessment by RIT will need to be complete and available to GDC.

More details of the physical effects of the MAR identified so far (GDC, 2019; Golder Associates, 2017; M. Palmer, 2019)

Effect on Aquifer water level

- Water levels in the aquifer rose in response to the MAR injection trial and were clearly visible in the Makauri aquifer monitoring wells. Bore GPEP065, (a MAR monitoring well 14m from injection bore) showed the water level in the aquifer rise 1.3m, Bore GPE010 at 190m distance from the site rose 1.2m and Bore GPE030 at 364m distance from the site rose 0.9m. No response was seen in monitoring wells beyond 1,500m from the injection site and none in the Shallow Fluvial Aquifer which lies above the Makauri aquifer. In summary the water injected was available to the aquifer and moved a certain distance and direction through it.

Figure 5.6: Direction of movement of seasonal groundwater flows at Makauri aquifer



Water quality summary

The results of the groundwater quality monitoring undertaken during the MAR trial are summarized as follows:

- The Waipaoa River injection water and Makauri Aquifer groundwater originate from the same source and have some similarity in their chemistry, with neutral to alkaline pH and the same levels of 'hardness' and calcium bicarbonate. However, the groundwater contains much higher concentrations of most major ions, particularly chloride, compared to the river water. This is probably due to the long residence time of the water (80-120 years) in the aquifer gravels. River water injected during the trial diluted most salts in the water around the injection bore and at the monitoring bore (GPE065).

- The Makauri Aquifer groundwater is anoxic (it does not contain oxygen) whereas the Waipaoa River water is oxic (contains oxygen). However, monitoring of the site of the injected river water during the initial trial did not show any problems with clogging or the creation and/or deposition of potentially problematic materials at the area where the two waters mixed.

- The observed changes in water quality during the MAR trial were limited to the MAR injection well (GPE066) and the MAR monitoring well (GPE065). Although some individual constituents changed in concentration at GPE010 and other wells, they were unique and did not confirm that the presence of injection water had reached those locations by October 2017. Monitoring well GPE069 is now showing full native groundwater, which would indicate that if a plume was ever present here, it has now returned to native groundwater as the plume has moved away and been replaced by this water.

- Moderate numbers of Escherichia coli >100CFU/100ml (E.coli is a genus of bacteria commonly found in the lower intestine of warm blooded animals and is used as an indicator of fecal contamination) in the river water were introduced once to the aquifer groundwater during the MAR trial. Lesser but identifiable amounts were introduced at two other times. However, monitoring showed that in the absence of oxygen the bacteria quickly died off, and concentrations of E. coli in groundwater at the MAR injection well had returned to a non-detectable level at the end of the trial. With a substantive trial and greater volumes of river water injected creating a larger oxygen-rich plume, however, it could be that microorganisms such as E. coli are able to survive for longer periods.[52]
- For a short period of time (less than 3 weeks) the river water was chlorinated before being injected into the aquifer. Limited formation of disinfection by-products occurred in the Makauri Aquifer during the MAR trial. Only one volatile organic compound (VOC, known as 1-2-4- trimethylbenzene) was detected at a very low concentration. Because all the E. coli died off during the trial once they reached the anoxic environment in the aquifer, the chlorinator has been decommissioned and no chlorination is planned for the Phase 2 trial.

[52] ~1 month; Golder Associates, 2017.

Murphy, 2019

Paul Murphy, senior water conservator for GDC, has produced an updated Technical Report summarising the Makauri and Matokitoki Gravel Aquifers hydrogeology, chemistry and monitoring data. Because of the Report's current status, sections from it are reproduced here in detail.

- Deeper aquifers discharge their groundwater upwards into overlaying aquifers (Barber, 1993).
- The groundwater resource as a whole is an important water resource on the flats. However, most interest lies with the Makauri Gravel Aquifer. The Makauri Gravel Aquifer is the only source of water for a large area of the Poverty Bay flats. The depth to the gravel and its ability to yield large volumes of water from properly constructed wells is advantageous for users with submersible pumps. The groundwater quality of the Makauri Gravel Aquifer is not consistent and can vary laterally and vertically from layer to layer. For irrigation the localised variation of poor quality water and the added seasonal variance within the aquifer, plus the decline in water levels during summer are disadvantageous factors of the use of this aquifer (Barber, 1993).
- There is no clear evidence of surface water loss to groundwater (White et. al, 2012)[53].
- Contour lines of hydraulic head indicate a general down valley flow movement through the Makauri Gravel aquifer. At the south-east end of the Poverty Bay flats the contours indicate an area of upwelling. It would appear that the Makauri Gravel Aquifer, although blind to the sea, has an outlet via movement upward into the bed of the Taruheru River in the area south of Pilmer Road to at least Lytton Road bridge. This upward movement of water from the Makauri Gravel Aquifer is supported by isotope evidence from the work of Taylor 1994.
- Potential sources of recharge are firstly through leakage from the bed of the Waipaoa River through overlying silts, sands and gravels into the Makauri Gravel Aquifer under pumping stresses. Secondly there appears to be a component of flow from the hills to the northeast of the flats between Snowsill Road and Waimata-Hokoroa Road. This component may only be leakage from overlying aquifers. Thirdly during summer water may flow through the Waipaoa Gravel Aquifer, in the Caesar Road area, into the Makauri Gravel Aquifer. If the aquifer were isolated or sealed off from a recharge water source, there would be a gradual decline in water levels as the groundwater is 'mined'.
- The existing Makauri Gravel Aquifer annual allocation as of April 2019 is 1, 877, 495 m^3. The 2017 annual allocation was 7,369,120m^3. Actual use over the previous irrigation seasons in:
    i. 2014/15 was 928, 602m^3
    ii. 2015/16 was 832, 465m^3
    iii. 2016/17 was 923, 739m^3
    iv. 2017/18 was 879, 513m^3

- From recent reports, there have been a number of recommendations for further work, for example:
    - To better assess the nature of the Makauri and Matokitoki Gravel Aquifers.

[53] Except presumably at the outflow and inflow points identified (including throughout this CIA).

    - There is a lack of information regarding potential linkages between the shallow and deep aquifers, and the potential for saltwater intrusion if in fact the Makauri Aquifer is not 'blind'.
    - An assessment of the distribution of these aquifers, initially based on existing wells that penetrate gravel.
- The Makauri aquifer is high yielding, with transmissivities increasing up-valley to perhaps as much as 4000m^2/day, from 750m^2/day near Makauri School. The average storage coefficient is about 5 x 10^{-4}, with some wells near the Waipaoa River having coefficients as high as 10^{-3}.
- The Makauri aquifer has a water level variation of approximately five metres from the winter high to the summer low at Makauri School. The decline in winter high water levels in the Makauri aquifer appears to be approximately 1.5 metres every five years at the same site. The decline in summer low water levels is approximately 3 metres every 5 years (Reynolds, 1990). This would indicate serious decline in the aquifer's overall recharge capacity at current allocation levels[54].
- The concept of a sustainable resource encompasses the use, development, and protection of its natural and physical properties in a way, or at a rate, which enables people to meet their needs without unduly compromising the needs of future generations. Today's management of water resource not only affects today's communities but those of the future and therefore the sustainability of the resource must be reconciled with present demands. The resource is often of limited availability and therefore promotion of an efficient and fair utilisation of the resource is paramount (Barber, 1993).
- The Gisborne District Council is responsible under statute for the conservation and most efficient use of groundwater. Gisborne District Council has developed the Proposed Gisborne Regional Freshwater Plan which proposes no new allocation from the Makauri Gravel Aquifer. In addition, the plan sets reduction targets;
    1. Reduce total annual allocation.
    2. Review total allocation.

GDC's ongoing role with the project, and options for management, ownership and allocation, should a substantive MAR project go ahead (Dr Graeme Card, GDC, April 2019; M. Palmer, 2019)

- Council has not yet decided what its ongoing role with the project will be after the current trial has been completed. As part of the work funded for Phase 2 of the trial, a comprehensive look at the options for ongoing management, ownership and allocation will be undertaken. GDC plans to commission some external expertise to develop options, and to look at their pros and cons, and have indicated that this process will be a consultative one, with input from stakeholders, ECT, Activate Tairawhiti and iwi (MAR Advisory Group hui, March 27).

- GDC have, however, undertaken a preliminary look (based on what has been done elsewhere) at potential options. The ones identified as feasible in the Tūranganui a Kiwa Gisborne context (in no order of preference) are:

[54] M. Palmer comment on data provided, July 2019 .

- A council owned and run scheme (similar to how GDC provides the city water supply to Gisborne i.e. the council charges water users of the MAR for the costs of developing and operating the scheme).
- A private company owned by irrigators or those with a special interest in the aquifer (e.g. the current MAR Ltd).
- A regional commercial entity owned and run scheme (e.g. Eastland group or Gisborne Holdings Limited, similar to how the Ruataniwha scheme was proposed to be managed).
- A regional public good entity owned and run scheme (e.g. ECT).
- Some combination of the above (e.g. part ownership by council and another entity, potentially including iwi).

- GDC have not considered in depth the statutory matters relevant to questions of a MAR and associated allocations, and anticipate the study referred to above will look at this in more detail. Nevertheless, GDC have suggested that at a high level, the options could be:
  - A change to the Tairawhiti Resource Management Plan, Te Papa Tipu Taunaki o te Tairāwhiti (TRMP) is undertaken adopting a comprehensive approach that specifically relates to the Makauri aquifer and how the MAR might fit into this. No details have been considered at this stage however such a change would presumably put in place policies and rules to manage water allocation associated with any ongoing MAR scheme, which might then also influence how existing consent holders interact with the aquifer.
  - An application from the developer of any ongoing scheme for a 'Non-complying' resource consent to provide for a 'MAR allocation' to be in addition to the existing allocation by users of the aquifer.
  - In relation to the above proposals, RIT technical advice indicates that the above scenarios could require firstly, that all existing users have their collective, actual water takes reduced to sustainable levels in the context of the Makauri aquifer decline, as currently being determined by GDC. When these individual reductions have been identified, and potentially met, at this point they might apply for an allocation from the MAR, however such allocation requests would need to be placed alongside other potential water users. RIT advice further suggests that, should such an aquifer recharge program be established, if all of those potential aquifer water users wished to apply for MAR water, they would then be subject to the criteria for allocation from the MAR in a similar manner as set out in the TRMP for natural groundwater and surface water flows (TRMP, C6.1.1 Policies Water Quantity and Allocation) unless alternative allocation policies were specifically established by way of a plan change for the Makauri Aquifer per se.

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Palmer, Murray. Reviews of MAR monitoring to date and initial consideration of options for a MAR allocation.

Section 6: Information gathering from whanau and hapu of Rongowhakaata relating to the Waipaoa River, Makauri Aquifer and the MAR proposals

E rere kanapu, e rere huatau, e rerehua mahora roa ki nga kopikopiko, e koiri te manawataki o Hine-Arai-Awa! He aha ra te awa? Ko au te awa, ko te awa ko au!

Shimmering, elegant as she meanders. Her beauty reflected gently along the curves, swaying to and from. This is the natural rhythm of Arai-The River Maiden!
What is the river? I am the river, and the river is me!
(Tu te Manawa Maurea Kapa Haka – Te Matatini 2015)

Background

The information gathering process underpinning the production of this cultural impact assessment (CIA) has so far included the following:

- Over the five years since the inception of the Makauri Managed Aquifer Recharge (MAR) project, a series of hui have been held amongst Rongowhakaata Iwi Trust (RIT) board members and staff, members of Rongowhakaata whanau whānui (the broader tribal grouping) and the local community, to discuss the potential impacts and implications of both the first and second MAR trials, and the potential for a major MAR program. The outcomes of these meetings catalysed into the two RIT submissions on the MAR Trials Stage 1 and 2 resource consent applications, and Rongowhakaata participation in a series of discussion forums around the current proposed project.

- A review of the relevant literature, which has included the 'MARCIA MAR Cultural Impact Assessment' (Ruru, September 2015), 'Methodology and analysis tool to identify tangata whenua cultural flows for the Te Arai river catchment' (Severne and Tipa, 2010), 'Cultural Limits: Te Arai', (Moetara and Moetara, 2016), special edition of the Journal of Marine and Freshwater Research 'Mātauranga Māori: shaping marine and freshwater futures' (Clapcott et al, 2018), and Dr Roskruge's peer review of the 2015 MARCIA and his recommendations for ongoing cultural impacts assessment work. Four of these five resources directly refer to the Makauri Aquifer, the Waipaoa River or Te Arai River (currently a tributary of the lower Waipaoa).

- Review of other case studies and literature relating to mātauranga Maori and cultural impact assessment methodologies.

- A series of six in-house hui relating to the MAR project amongst RIT board members and staff over the four months from the start of January to the end of April 2019.

- Participation with GDC in the development of a monitoring program to assess the potential presence of anthropogenic contaminants (microbial, emerging contaminants, pesticides) in the inflow river water.
- A meeting of the Rongowhakaata Taiao Focus Group on April 24, 2019 to identify key themes underpinning Rongowhakaata values and relationships, rights and responsibilities

and needs and aspirations (our 'interests') that are held by Rongowhakaata relating to the Waipaoa River, Makauri Aquifer and other associated waterbodies and lands.

- A hui-a-iwi on May 1, 2019 at Manutuke Marae to explore the interests that Rongowhakaata hold for the areas in question.

- An ongoing project providing information material relating to the MAR will be placed on the Rongowhakaata website and social media, and input sought from Rongowhakaata iwi whanau and hapū via these media.

MAR Cultural impact assessment: Outcomes to date and framework for the future

Overview

The outcomes of the previous five years discussions were revisited, with updated information relating to the MAR project provided by GDC, and overall iwi participation in the project provided during the Taiao Focus Group and wider iwi hui on April 24 and May 1 2019 respectively. There was a strong overarching direction from both of these recent hui for the need for targeted engagement, information gathering and relationship building amongst all current participants in the MAR project and our wider local communities including iwi, GDC, agriculturalists, and experts in freshwater ecology, hydrology, law and economics. A further call was made for ongoing monitoring and wānanga (collaborative forums) to be undertaken relating to the project and to the quiver of Rongowhakaata interests present for this area of our tribal rohe.

Specific issues and outcomes were also identified at these hui in terms of the potential for adverse impacts and the need for targeted interventions by the relevant parties. These issues and outcomes are outlined here in further detail, and summary recommendations for ongoing monitoring and assessment contained in the text boxes highlighted in green.

Ongoing monitoring and wānanga (collaborative forums) to be undertaken relating to the project and to the quiver of Rongowhakaata iwi values and relationships, rights, responsibilities and needs and aspirations present in this area of their tribal rohe. These wānanga will provide opportunities for the development of the mātauranga relating to the area.

Interconnectedness

Te Tangata

Freshwater, Te Wai Maori, is the fundamental cultural component for Rongowhakaata, imbuing every aspect of life and death. An expression of the essential relationship of Rongowhakaata iwi with the freshwater bodies in their rohe is held in the whakatauki quoted at the start of this section.

> E rere kanapu, e rere huatau, e rerehua mahora roa ki nga kopikopiko, e koiri te manawataki o Hine-Arai-Awa! He aha ra te awa? Ko au te awa, ko te awa ko au! Shimmering, elegant as it meanders. Her beauty reflected gently along the curves, swaying to and from. This is the natural rhythm of Arai-The River Maiden! What is the river? I am the river, and the river is me! (In Moetara and Moetara, 2016).

Develop tools for monitoring the well being of Rongowhakaata iwi values and relationships, rights, responsibilities and needs and aspirations, relating to the water bodies in our rohe and in the context of the MAR project.

This relationship with freshwater encapsulates the intrinsic and undifferentiated combination of the spiritual and physical, the traditional and contemporary, that underpins all relationships within the everyday and metaphysical worlds of Rongowhakaata. Such interconnectedness is directly embodied in Rongowhakaata values and relationships, rights, responsibilities, and needs and aspirations for and with our natural resource base and should be a key focus for environmental and cultural monitoring.

The reality of an interconnected world is embodied in all Rongowhakaata values and relationships with our natural resource base and should be a key focus for cultural and environmental monitoring and management.

Ecology, Geophysical

On a geophysical plane, such interconnectedness is also of particular relevance to the MAR project. The presence and movement of water and other materials between the land and waterbodies, and amongst waterbodies themselves, and the importance of these movements from ecological, geophysical, economic and cultural perspectives, remain key factors in Rongowhakaata iwi foci relating to the project.

This has relevance to the deposition or formation of undesirable materials in the aquifer from the inflow of oxygen-rich river water, and the subsequent potential for adverse impacts on the groundwater resource for meeting the needs of the community and future generations. The strong Rongowhakaata tikanga to avoid the mixing of different types of waters, where these do not naturally mix, remains a major element of Rongowhakaata opposition to the trials as they stand. The risk in this process is seen to increase with the potential increase in volumes of river water injected into the aquifer.

In the context of the tikanga to avoid the unnatural mixing of different types of water, RIT and GDC continue working collaboratively to identify effective measures of potential anthropogenic impact and contamination and the implemention of an appropriate monitoring program.

However, RIT and GDC are currently engaged in a collaborative process of assessing the potential for such impacts from the artificial changes to the hydrological functioning of both the Makauri Aquifer and the Waipaoa River, and the potential for the introduction of anthropogenically derived materials into the aquifer, including microbiological and emerging contaminants and pesticides.

Such interconnectedness also has particular relevance to the morphology and ecology of the Waipaoa River and associated tributaries and wetlands, and the use of both traditional and contemporary mahinga kai, mahinga toi, mahinga raranga and whare whakahou sites along the reaches of the river below the MAR water intake. While the consent decision identifies the significance of these river takes for the MAR Stage 2 trial as being likely to have only minor (or less than minor) effects, given the scale of the take and its timing (i.e. when flows at Kanakanaia and

Matawhero are >4000L/sec[55]). Nevertheless, such a perspective Rongowhakaata believe, has not been proven for a substantive MAR project when increased volumes of B flow water may be extracted over an extended time frame, and particularly when flows are between 4000 and 6000L/sec.

Concerns around the potential impacts are particularly relevant as the Waipaoa Awa is also considered by Rongowhakaata as currently being under extreme stress, given that the irrigation season flow allocation cap (1350L/sec at Kanakanaia[56]) is able to lower the river's summer flow to 46% of the Waipaoa Mean Annual 7 day Low Flow (MALF) of 2009L/sec, that is, the river's 'natural' average annual 7-day low flow level (after Jacobs, 2017).

Reference has also been made by Rongowhakaata whanau to the importance of high, 'flushing' flows in removing sediment, excess periphyton and debris that may have built up during low flows, and be impacting on their use of the river and its overall morphology and ecological functioning.

Produce an iterative resource identifying areas of traditional and contemporary cultural significance, including areas of mahinga kai, mahinga toi, mahinga raranga, tauranga waka, ecosystem functioning, recreation, historic heritage and cultural significance. Establish a program for monitoring the well being of these specific areas alongside the overarching well-being of the aquifer and river in the context of the MAR project.

It is expected that further engagement with those whanau and hapū who have mana over the reaches of the river and associated waterbodies in question will continue to identify more specifically mahinga kai and other cultural sites and riverine processes, and the associated values and relationships relevant to these. This process of engagement and wānanga will enable the iterative development and implementation of a monitoring program to assess the actual or potential impacts on these values, sites and relationships as per Consent Decision 38.

> Condition 38. Within four weeks of granting the consent, the consent holder shall commence a collaborative process with mana whenua that will ensure mana whenua input into decisions regarding the design, implementation and evaluation of the monitoring programme for the trial. The monitoring and evaluation programme shall include the development and implementation of a process for monitoring and assessing the cultural health of the Makauri Aquifer and Waipaoa River.[57]

[55] The Consent Decision further requires the MAR ('B' flow) take from the Waipaoa River to cease when river flows have been <4100L/sec for 5 consecutive days.
[56] A further allocation of water below the 1350L/sec cut-off is available for a short period for 'emergency irrigation' purposes.
[57] Consent Decision, August 2018.

Related waterbodies.

The interconnectedness of the Makauri Aquifer, Waipaoa River and the shallow aquifers believed to be closely linked to the river, are also important considerations in the context of water levels in these aquifers. Further investigation into this interconnectedness was identified as a key recommendation in the Golder Associates 2017 report considering the outcomes of the Stage 1 MAR trial.[58] Potentially reduced levels in these aquifers and the closely linked Regionally Significant Wetland Te Maungarongo o Te Kooti Rikirangi have the potential to impact on the socio-economic and cultural values associated with these aquifers, and the biodiversity and cultural values associated with Te Maungarongo. Interestingly, some parts at least of Te Hapara Sands Aquifer appear to also be intimately hydraulically linked to the Waipaoa River and/or the shallow river related aquifers (Palmer, 2017).

An in depth analysis of the interconnectedness of the waterbodies in the rohe (rivers, streams, aquifers, springs and wetlands) will help to identify where impacts on socio-economic, cultural and ecological values and relationships may be likely to become evident, and provide the platform for a targetted monitoring program. RIT and GDC will collaborate on the terms of reference and production of such a report.

Figure 6.1: Te Maungarongo o Te Kooti Rikirangi wetland at Matawhero (Te Puna Ltd 2017)

[58] Golder Associates, 2017.

Figure 5.2: Relationship between water levels at Te Maungarongo and the Waipaoa River (Palmer 2017)

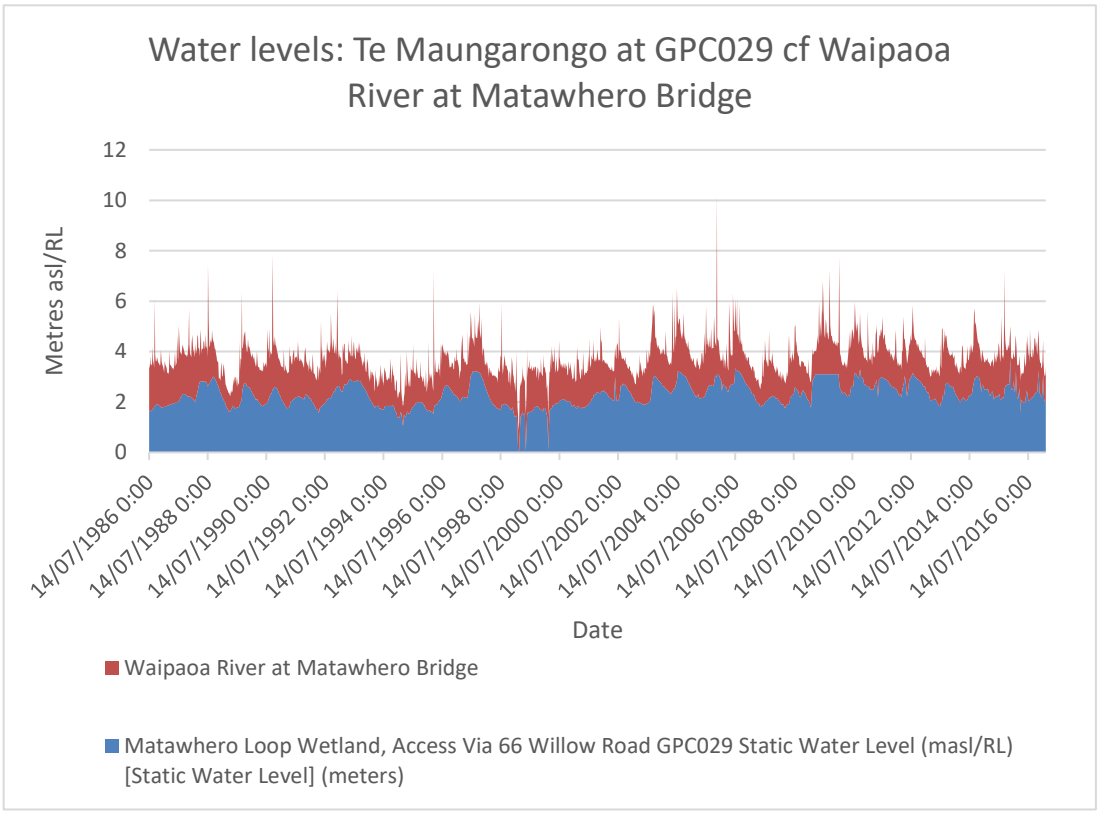
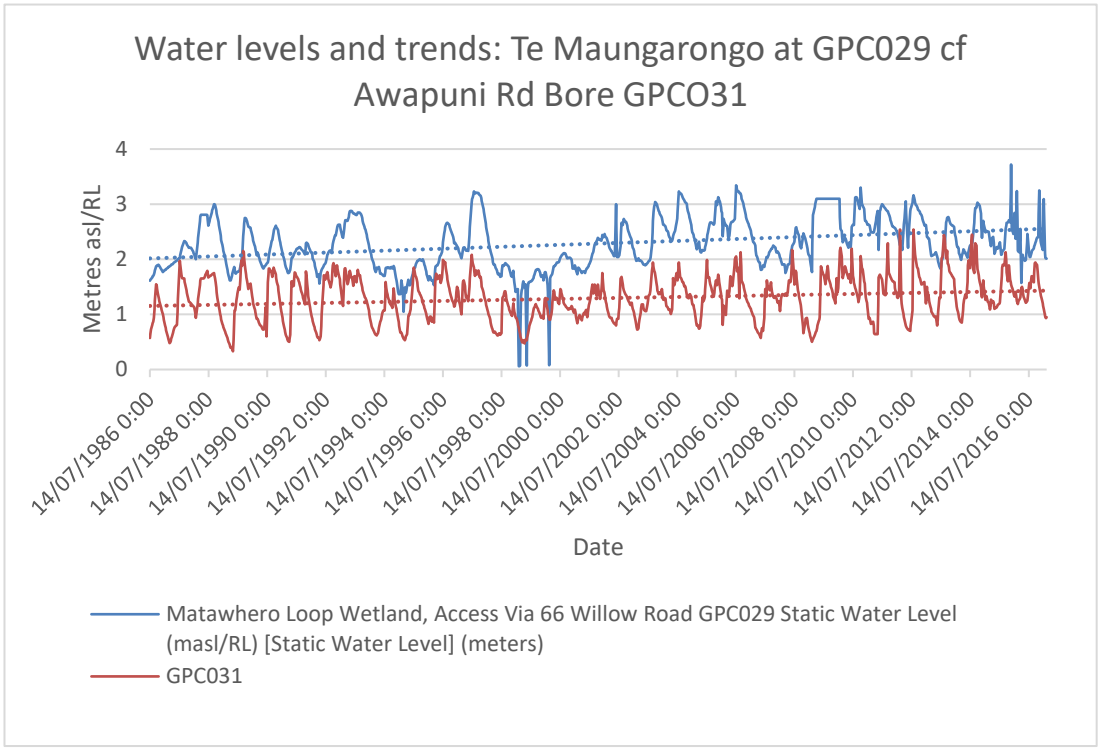


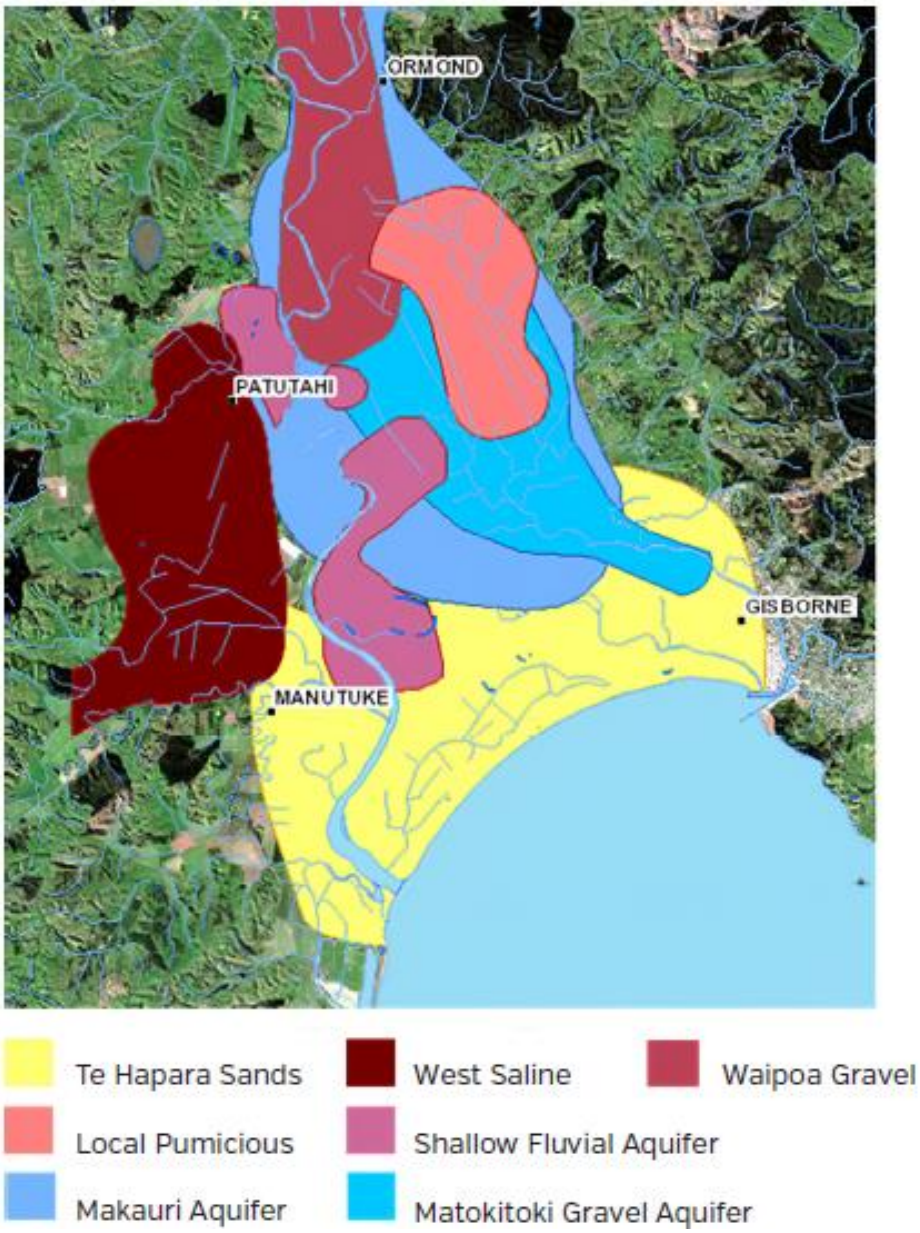
Figure 5.3: Water levels and trends Te Maungarongo and Awapuni GPC031 (Palmer, 2017)



Puna (freshwater springs) dependent on these shallow aquifers and the Makauri Aquifer are also expected to be closely related with water levels in their ambient aquifer environments, such springs typically having cultural significance. One example is the spring that feeds the Makowiriwiri stream flowing past Tarere Marae and into the Taruheru River. Other similar environments are present across the Waipaoa alluvial plains and to the ridgelines NE of the Taruheru River.

Similarly, the relationship between this matrix of waterbodies, the Makauri Aquifer and the West Saline Aquifer needs to be more clearly understood. The relationship between the West Saline and Makauri aquifers was also a specific focus of the Golder Associates (2017) report. Rongowhakaata believe that such research should also consider the potential impacts on the values and relationships that whanau hold for this area of our tribal rohe.

Figure 6.4: Approximate extent of the Tūranga aquifer complex (Gisborne Chamber of Commerce, 2019)



We have referred to the spiritual, physical, geophysical, ecological, economic and cultural components of an overall interconnectedness between landscape, ecology and Rongowhakaata in the area around the lower reaches of the Waiapaoa River. At the Taiao Focus Group Hui on April 24, reference was also made to the relationships amongst the various iwi and hapu groups that meet and interrelate around this area of the Makauri Aquifer and Waipaoa River. Rongowhakaata have made clear the perspective that the MAR project raises certain questions for these interrelationships, including the relationships between economic and cultural interests, the effects of upstream water takes and discharges (including the Te Karaka wastewater discharge) on downstream users, and the complexity of the interconnectedness amongst the river, the Makauri Aquifer, and the range of associated waterbodies and lands.

Relationships amongst key participants in the MAR project, including the various iwi and hapu, need to be considered in the context of impacts, and similarly reported on.

While TROTAK have completed a CIA for the MAR (Ruru, 2015), members of the Taiao Focus Group consider that there is significant value to be had in the development of a discursive relationship amongst the iwi and hapu groups with interests, values and relationships associated with the natural and cultural resources of the area, 'he mahi tatou', and potentially affected by a substantive MAR project.[59]

> The role of *whakapapa* here is important and its purpose is to make connection, not to sever it by claiming others do not have a connection. What is vital though is to engage in a process where space to make connection is provided. A space where all people enter in as learners not experts. The protocols of engagement for this context, developed and practiced by the ancestors of Manutuke, places philosophical inquiry RONGO at its heart, and manifests as an applied practice of *tikanga marae.* This is a specific sequence of steps, ideal in creating perfect conditions for generating environments of philosophical discovery, leading onward as an innovation ground for transformative action and as a place to show, to WHAKAATA.
>
> The sequence of *tikanga marae* allows space for orientation, to acknowledge and to name the interconnected threads of identity and purpose, working the elements present in a 'live' moment. Entering into philosophical inquiry is synonymous to entering into the *wharenui* a gathering space of Rongo and potential is explored. Once an inquiry is completed, it then manifests into action, to *whakaata,* and the philosophy becomes lived.
>
> Colonisation has hit Rongowhakaata hard and our disconnection to this art of who we are is widening. The frequency, capacity and capability for Rongowhakaata to enter into philosophical spaces with sophistication, happen less and less. Our tendency is to state objectives and aims and no longer from the space of RONGO.
>
> We have begun to think progressively, but often with aggression, defending and proving what is known. We have learned to lean towards western frames of engagement on our traditional spaces. Our inherent connection to our environment and to each other is not being represented in our WHAKAATA, or in our daily 'walk'. We rarely challenge ourselves to question our identity as part of a greater evolving whole anymore. To exacerbate further, this is not unique to Rongowhakaata, indeed other tribes from the wider Maori culture have similar experiences. Every Maori has been affected and continues to be

[59] Moetara and Moetara, 2016.

> affected by some degree of colonisation. This also means that *all Maori* suffer degrees of disconnection whether we are conscious of that disconnection or not.[60]

In the context of Te Arai, Ngapaki and Teina indicate that the health of the river is essentially the health of the people as a whole.

> As *tangata whenua* specific to Te Arai, we are suspicious, and wary of intention of council and her experts and scientists. We see the direct effect of council actions on the river such as the over-allocation of permits for water to be taken, the amount of water taken and diverted for the river, especially at the headwaters, which are largely inaccessible to us, the Makauri Aquifer Recharge conversation and the effect of mixing *mauri,* the planting of willow along the banks, the high turbidity of the water caused by bank erosion, the deterioration of water quality as it passes Manutuke, the effects of farming, and forestry. Much of these actions are in conflict to our role as kaitieki, and our nature of being indigenous.
>
> We know our river is sick, and if the river is unwell, so are we. Marsden's writing highlights our first stance, 'If you don't know how to fix it, then stop breaking it!'[61]

These authors make important points that have been reiterated continually through our information gathering forums:

> TE ARAI TANGATA perspective for GDC i.e. they:
>
> - Will make decisions that are NOT conducive to the needs of the environment.
> - There will always be some economic gain in their decision making.
> - Do not know how to look after mana and tapu of wai.
> - Do not engage with the real people of Te Arai.
> - Are not operating as a good partner to Te Tiriti o Waitangi.[62]

Although relating specifically to Te Arai, Ngapaki and Teina's summary of the perceptions of Rongowhakaata 'tangata Te Arai' relates also to other waterbodies in Rongowhakaata's wider rohe, and in particular the lower Waipaoa River. Because of its relevance and succinctness, the following quotation is provided in full:

> To achieve real and authentic Cultural Limits for the Te Arai, changes of process need to happen, and approaches need to be made. Tangata Te Arai Cultural Limits have always been in existence, but because they do not hold economic value, they have often been ignored. The current state of our river is a read-out of indigenous values not being understood, explored and valued.
>
> The river is not healthy. From a Tangata Te Arai perspective, a healthy river would look different to what it is now. In living memory Manutuke people still remember drinking water directly from the river. The water was clearer, and colder. The build up of sediment is significant. Taking water from the river directly affects this. A river breathes. If we take water from it at its high seasons, it is unable to naturally clear out debris. High water also

[60] Ibid, p7.
[61] Ibid, pp13-14.
[62] Ibid, p15.

aids spawning of certain species to reach the sea, a delicate balance of the life of the river, and the life of those who live within and around her. These are small but significant examples. Changes need to happen. We are getting the same result, a steady decline in the health of our river.[63]

Spiritual foundations of relationship of Rongowhakaata to the natural world, Te Ao Maori

Whilst the interdependent spiritual relationship of Rongowhakaata iwi with their waterbodies provides a key expression of the overall relationship of Rongowhakaata to the natural world, it also needs to be recognised that this relationship is accompanied by a series of similarly interrelated components, including Whakapapa, Kaitiakitanga, Manaakitanga and Rangatiratanga.

While colonisation has severely impacted on these relationships, it has not removed them, and it was the strong feeling of both the Focus Group and whanau participants at the hui-a-iwi, that monitoring of the impacts of the MAR and related activities on these relationships needs to be a key focus of the CIA ongoing monitoring project.

Kaitiaki role of Rongowhakaata

The Focus Group members were also unanimous in the identification of kaitiakitanga as an essential tool in giving effect to the spiritual and physical relationship of Rongowhakaata with the natural world. Kaitiakitanga is often described as 'guardianship', and frequently in reference to natural and physical resources. While such an interpretation is within the gamut of the term, kaitiakitanga is a significantly more complex concept and way of being.

The right to exercise kaitiakitanga derives directly from whakapapa and belongs to those people, and indeed other entities, that have mana relating to a particular area or natural resource, or to a particular socio-cultural context. Thus, Rongowhakaata and the whanau and hapu within the wider iwi grouping who have mana relating to specific freshwater bodies and related resources are expected to exercise our kaitiakitanga in managing these water bodies. This is to ensure that waterbodies are effectively protected, enhanced or restored, as are the associated cultural values and relationships.

Determine if the Makauri Aquifer and Waipaoa River ecosystems and resources are currently being managed in a way that embodies Rongowhakaata's kaitiakitanga responsibilities.

While the exercise of kaitiakitanga is frequently focussed on the relevant ecosystems and natural resources themselves, and in the context of freshwater management is to some degree at least encapsulated in the concept of Te Mana o te Wai[64], kaitiakitanga also has other important related foci.

[63] Ibid, p15.

[64] 'Each community will decide what Te Mana o te Wai means to them at a freshwater management unit scale, based on their unique relationship with fresh water in their area or rohe. The Statement of National Significance in the Freshwater NPS describes the concept of Te Mana o te Wai as the integrated and holistic well-being of the water. It is up to communities and councils to consider and recognise Te Mana o te Wai in their regions (Changes to Freshwater NPS –2017: Te Mana o te Wai. Fact sheet, Ministry for the Environment). See also: 'NATIONAL POLICY STATEMENT for

These foci include the value of manaakitanga, often referred to as hospitality or the process of showing respect, generosity, and care for others. In order to provide for manaakitanga, the natural resources belonging to a tribal group must be in a high state of health and abundance, able to accommodate periodic harvesting for large social and cultural events, such as tangi or hui, or during periods of climatic or social pressure. The floods of Bola in March 1988 provided an opportunity for marae and whanau across the region to exercise their ability to manaaki many people displaced during the flooding and subsequent inundation period.

Are the Makauri Aquifer and Waipaoa River ecosystems and resources currently being managed at a satisfactory state of well being and abundance to enable Rongowhakaata to exercise our manaakitanga responsibilities?

Providing an overarching context for kaitiakitanga is the concern for future generations, and the maintenance of the whakapapa links between human lineage and the natural world around. Reinforcing this context is the experienced reality that tribal landscapes are not transferrable. That is, the values and relationships for each particular group are place-specific and rooted in whakapapa and tribal history and identity. For iwi Maori, there is no such place as 'away'. Thus, the concept of environmental impacts 'off setting', i.e. where adverse environmental effects in one area may be balanced by enhancement of environmental values in another, often distant area, is typically viewed as anathema to Rongowhakaata and other hapū and iwi.

Determine if the Makauri Aquifer and the Waipaoa River and associated waterbodies are being managed at a satisfactory state of well being, abundance and hydrological integrity, so that the values they have provided for Rongowhakaata will be available for future generations.

> We have assumed that the concept of national, regional and local significance will not be acceptable as some river reaches are of significance to particular whanau, hapu and iwi. It is difficult and inappropriate to impose national regional or local significance based on non-cultural criteria. We propose discussing with tangata whenua means of according significance.[65]

In practical resource management terms, the value considerations referred to above require:

- Maintenance of a higher level of abundance that might otherwise be understood in reference to 'sustainable management', including full provision for Te Mana o Te Wai;
- A precautionary approach to the avoidance of adverse effects[66], including the provision of flow 'buffers'; and

Freshwater Management 2014' (Updated August 2017 to incorporate amendments from the National Policy Statement for Freshwater Amendment Order 2017).

[65] Moetara and Moetara, p23.

[66] Some clarity on terms used and discussed needs to be made prior to any CIA. For example, guidelines suggested under legislation for undertaking a risk analysis of effects lists 'effects' (on the environment or particular resource) as meaning:

- Any potential or probably effect; and
- Any positive or adverse effect; and
- Any temporary or permanent effect; and
- Any past, present or future effects; and
- Any acute or chronic effect; and
- Any cumulative effect that arises over time in combination with other effects. (Roskruge, 2017).

- A reluctance to accept mitigation or remedial actions as appropriate tools for addressing impacts on important socio-economic, ecological and cultural values and relationships, where avoidance will instead be considered the appropriate option.

Rāhui

Rāhui is seen by Rongowhakaata as an important resource management tool. Rāhui involves the placing of a temporary ritual prohibition, closed season or reserve, over an area, resource, or stretch of water. The implementation of such rāhui may provide a resource conservation measure, protection against pollution through tapu (e.g. if there has been death in the vicinity) or means of social and/or political control.

Throughout the discussions in both the Taiao Focus Group and the initial hui-a-iwi, a strong preference was put forward for the placing of a rāhui on the taking of the volumes of water from the Makauri Aquifer that has led to the aquifers decline and potential demise (Golder 2017). This was a key focus of RIT's initial submission on the MAR stage 1 trial. It has also been reiterated by participants in other forums (including at a combined RIT board/GDC councillors hui, Whakato Marae March 15, 2019).

GDC, RIT and other effected iwi and hapu groups explore how rahui might be implemented to enable the kaitiaki role of mana whenua and restore the mauri and ongoing hydrological integrity of the Makauri Aquifer and associated lands and waterbodies (Tairāwhiti Resource Management Plan – Part B1).

That is, when a freshwater resource is overallocated (through too much water being taken, or too great a level of contaminants being discharged) the most straightforward, risk-free and ultimately effective method to bring the waterbody back within sustainable levels is seen to be a reduction in the allocation that is causing the decline or degradation: in this case, reducing groundwater takes from the Makauri Aquifer[67].

Although participants acknowledged the important role the horticultural industry in the area served by the Makauri Aquifer plays in the district's economy, nevertheless, all participants at our hui over the last four months strongly expressed the belief that it is GDC's role to ensure sustainable management of the resource, and that they appear not to have done so in this case. This has been despite GDC being advised of the problems during the 1980's and in a major groundwater report provided to them in 1993 (Barber, 1993). Participants also acknowledged the positive moves current GDC staff have been making to bring water allocation from the Makauri Aquifer back within sustainable limits.

Participants also felt that it was important that GDC do not allow such a situation to occur again, either at the Makauri Aquifer or any other waterbodies, but rather that GDC needs to restore the stability and integrity of natural freshwater systems and processes by implementing Te Mana o te Wai (National Policy Statement for Freshwater Management 2014) as a primary freshwater management objective. In this context, natural recharge is viewed as the preferred method of restoring the well-being of the Makauri Aquifer.

GDC commit to not allowing the ecological decline or degradation of thte mana o te wai of fresh waterbodies, as required by the NPSFM, 2014.

[67] Cf. Golders Associates, 2017.

Rangatiratanga

Rangatiratanga can be translated as chieftainship or the right to exercise authority, and in a post Te Tiriti o Waitangi environment, has been extended to include sovereignty and self-determination, or at least, a high level of self-management and control of those things of value to tangata whenua. These latter are often referred to as essential components of tino rangatiratanga.

While the exercise of kaitiakitanga is often acknowledged by local authorities and other governmental organisations as an important value or role within the field of environmental management, significantly less note is given in their deliberations to the importance of rangatiratanga. Yet without proper acknowledgement and provision for rangatiratanga, the implementation of kaitiakitanga by mana whenua may be extremely difficult, if not ultimately impossible to put into effect.

That is, without the ability to exercise rangatiratanga, the use of kaitiaki implementation tools such as rāhui, or other methods traditionally available to tangata whenua for the protection or restoration of the mauri of a given site or resource, may be impeded by either:

- Lack of statutory or local or central government support for the implementation of effective methods;
- A 'balancing' approach that considers the well-being of the site or resource against economic drivers, or as mentioned above, by some offsetting mechanism.

RIT and GDC work collaboratively to ensure that rangatiratanga is recognised and provided for through all aspects of the management of freshwater bodies in the rohe of Rongowhakaata.

An important factor underpinning such collaboration is the development of a partnership approach between RIT and GDC that derives from Te Tiriti principles. This partnership approach is viewed by iwi members as a critical component of the overall MAR project.

Access and reconnection

In the two most recent Rongowhakaata forums relating to freshwater and the MAR, the question of access was a major theme. This is consistent with discussions in iwi forums elsewhere, identifying the significance of physical access in recognising and providing for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga (RMA1991, s6e), and indeed with their physical, mental and spiritual well-being per se:

> A lack of access to tribal lands or territories is regarded by tribal elders as a sure sign of poor health since the natural environment is considered integral to identity and fundamental to a sense of well-being' (Durie M 1994. Whaiora. Māori health development. Auckland, Oxford University Press. 238 p71, quoted in Harmsworth GR, Awatere S 2013. Indigenous māori knowledge and perspectives of ecosystems. In Dymond JR ed. Ecosystem services in New Zealand – conditions and trends. Manaaki Whenua Press, Lincoln, New Zealand).

Discussions around the contemporary use of, and relationship to sites of cultural value frequently highlight the widespread importance of access to waterbodies, including rivers and streams, wetlands, lakes and springs, and the coastal environment. Specific points raised relating to physical access during our hui include the following:

- Ability to gather kai (mahinga kai sites for fish, invertebrates and plant foods) and rongoa;
- Ability to gather cultural materials (e.g. harakeke, raupo, toitoi, kuta, wiwi) for e.g. mahinga raranga, mahinga toi and whare whakahou;
- Access for swimming and paddling waka;
- Access for cultural, religious and ritual activities, and the ability to use certain waters for such purposes (e.g. the lifting of tapu);
- The ability to manage and restore native flora and fauna (including plants, trees, invertebrates, reptiles, fish and birds);
- The ability to manage and restore aquatic ecosystems, and the well-being and safety of sites for whanau use and enjoyment (e.g. drinking, swimming, kai gathering);
- The ability to regain and maintain Rongowhakaata mātauranga around the use and management of indigenous natural resources, and the intergenerational transfer of this learning;
- Where ancestral lands are not in Rongowhakaata ownership, some landowners have provided access freely, whilst others have not. Thus, when ownership changes, access for iwi may be enhanced or placed at risk. Measures to mitigate against this would be an issue to be addressed.

In the context of providing for the suite of Rongowhakaata values and relationships, and particularly the tikanga and matauranga around freshwater, that RIT and GDC work collaboratively to establish usable riparian corridoors along the rivers and streams, and around the springs, lakes and wetlands within the Rongowhakaata rohe. In relation to the MAR project, this relates specifically to the lower Waipaoa and associated waterbodies.

The significance of the discussions around access were encapsulated within a single, overarching objective, common to several values and relationships identified i.e: The reestablishment of Rongowhakaata tikanga and mātauranga at the forefront of natural resource planning and decision making within their rohe in Turanganui a Kiwa.

The reestablishment of Rongowhakaata tikanga and matauranga at the forefront of natural resource planning and decision making within our rohe in Tūranganui a Kiwa.

Rongowhakaata tikanga and matauranga

The reestablishment of Rongowhakaata tikanga and mātauranga is described by participants as the corollary of a series of recommendations for action, involving in particular GDC and the Crown. These recommendations for action, as outlined during our hui, are as follows:

- Rongowhakaata iwi and hapu must be at the table in relation to natural resource planning and management, in a co-operative process with GDC, as acknowledged Te Tiriti partners with the Crown.

- To support this, Rongowhakaata need to re-define themselves as leaders in the environmental and natural resource management space, rather than reactionary participants to proposed activities and processes within their rohe that have been imposed externally.

- Thus, Rongowhakaata need to consider their past roles in terms of tikanga and mātauranga around practical resource management and focus on the restoration within a

contemporary socio-political environment of a natural resource base that is abundant and thriving. Such an approach will reposition the discussion around the mitigation of adverse impacts as one simultaneously of leadership and governance.

- The protection and restoration of indigenous plants and animals, ecosystems and landscapes, and the unfettered access of Rongowhakaata to these, in order to experience tohu taiao (environmental indicators) at first hand and maintain the ongoing integrity and whakapapa of Rongowhakaata mātauranga.

- The provision of protected corridors or riparian esplanade zones along streams and rivers, and around wetlands, lakes and springs, for access by Rongowhakaata and others, thus allowing mātauranga, tikanga and kawa to be maintained and shared.

- The nature of the Te Tiriti relationship between Rongowhakaata and the Crown as Te Tiriti partners needs to be reiterated in a more public forum, so that GDC (and its changing staff) and other local and regional organisations, are fully cognisant of the Te Tiriti principle of partnership, and how this needs to be reflected in joint decision making across a broad range of contexts.

RIT and GDC establish defined platforms whereby Rongowhakaata iwi values and relationships, interests, rights and responsibilities and needs and aspirations can be given effect to, as Te Tiriti partner with the Crown.

This will involve all questions of water management and allocation as regards freshwater bodies in the rohe of Rongowhakaata that reflects Rongowhakaata's unique role as Te Tiriti partner.

Rongowhakaata, Te Tiriti and freshwater allocation

Rights to use and manage water

In relation to the freshwater resources in the rohe of Rongowhakaata, and embodied in the rightful exercise of kaitiakitanga and rangatiratanga, and the enabling of manaakitanga and whakapapa, are the rights to use and manage freshwater and associated resources. Indeed, iwi Maori rights relating to fresh and other waters are enshrined in Article 2 of Te Tiriti as part of 'the unqualified exercise of their chieftainship over their lands, villages and all their treasures', and appear to never have been statutorily extinguished[68].

Although the traditional exercise of iwi and hapu rights to water has been described as exhibiting the characteristics of a proprietary right, the concept of ownership of water in the strict western sense appears to have been unknown prior to European colonisation[69]. Rather, the interdependent nature of rivers and freshwater bodies was acknowledged, and an all of catchment approach, 'ki uta ki tai, from the mountains to the sea', adopted as the norm[70].

[68] Ruru, J., 2009.
[69] Ibid.
[70] Harmsworth and Awatere, 2013.

Nevertheless, in the context of the overall MAR project and the current Gisborne Tairawhiti water allocation policies, including the rights to use, transfer and retain water allocations as conferred by the policies and rules of the TRMP[71], participants in our hui felt that a series of potentially intergenerational property rights have effectively been created in all but name.

Further, the concept of a decision making and allocation controlling body for the Makauri MAR project that is comprised solely of those parties who have been, and are directly involved in the exploitation of the resource (and which has led to its chronic decline and potential demise[72]) is unacceptable to members of Rongowhakaata.

Similarly, the potential for overarching management of any MAR and associated B Flow Waipaoa River allocation solely by GDC or its subsidiary beneficial or commercial entities, given the inability of GDC to address the threats to the aquifer inherent in their previous dispensation of freshwater allocation volumes, is similarly unacceptable to Rongowhakaata.

Rongowhakaata have indicated across numerous forums that the question of a just freshwater allocation framework, including iwi rights and responsibilities to the waterbodies in question, are key factors in the cultural well-being of Rongowhakaata, and the ecological health and landscape and amenity values of the waterbodies themselves. This is in the context of pervasive and on-going post-colonial impacts on waterbodies in Tūranganui a Kiwa, including landscape and waterbody modification, general allocation mismanagement, and ecological degradation: all of which have made it extremely difficult for the effective maintenance of Rongowhakaata cultural traditions.[73]

Thus, given the importance of freshwater to us, and our aspirations to manage waterbodies in a manner consistent with our key values (including kaitiakitanga and whakapapa) and the overriding purpose of sustainable management (RMA1991, Part 2), an essential request of this CIA is that GDC and RIT will work collaboratively to establish a partnership in relation to the management of freshwater bodies in the rohe of Rongowhakaata that reflects our role as Te Tiriti partner around all questions of water management and allocation.

Partnership

Recognition of the special place that Rongowhakaata occupy in relationship with the Crown, reflecting in particular Te Tiriti principles of 'Partnership, Reciprocity and Active Protection', is viewed by us as critical to the recognition and provision for our values and relationships, rights and responsibilities, and needs and aspirations as regards freshwater. Rongowhakaata are not simply stakeholders, but partners with the Crown in all matters relating to natural resource management.

Unfortunately, the importance of this relationship for Rongowhakaata and other Tūranga iwi has largely been ignored. Part of this process of disenfranchisement may derive from the de facto transfer of much of the Crown's responsibility for resource management, and in particular freshwater management, to catchment and harbour boards, and more recently to regional and unitary authorities. Nevertheless, the opportunity remains for a regional reconciliation between the interests of the Crown and Rongowhakaata in the form of a partnership between Rongowhakaata and GDC in relation to the management of freshwater. Giving effect to such a partnership is viewed by iwi members as a critical component of the overall MAR project, existing as it does as a unique deviation from the current water use and allocation context.

[71] Tairawhiti Resource Management Plan, sC6.1.
[72] Golders, 2017.
[73] Coombes, 2000.

Specific foci for a cultural impacts assessment and monitoring program

During our consultation and information gathering processes, reference was made to specific sites and activities where cultural, social, ecological and economic values and relationships were evident. Almost all of these are traditional activities that are still undertaken by individuals or whanau, although the sites may have changed. These values and relationships include:

- Mahinga kia. Fishing and the gathering of freshwater aquatic species. The animals and plants frequently referred to include:
    - Freshwater eels (tuna), grey mullet (kanae) and yellow eye mullet, kahawai, flounder (patiki), herrings, whitebait, inanga.
    - Freshwater mussels (kakahi) and crayfish (koura, kerewai).
    - Watercress and raupo.
- Mahinga raranga (weaving), mahinga toi (general artistic activities) and whare whakahou (building maintenance and restoration). Resources for these activities were significant and varied. Streams and rivers were often used for transporting materials such as totara, and wetlands for a wide range of uses for these, and other cultural purposes.
- Rongoa. Sphagnum moss, harakeke, kahikatea.
- Areas for swimming or bathing.
- Springs (puna) and sites on the rivers and streams where spiritual or cultural activities were and may still be undertaken, or where the water from these sites was taken and utilised. One site identified was where water is taken to be used for the uplifting of tapu.
- Taniwha and their places of residence.
- Burial grounds. These may derive from conflicts that occurred along the rivers' riparian zones, or from burials that occurred in certain areas as part of traditional Rongowhakaata burial practices.
- Pa or villages (temporary or longstanding).
- The confluence of other waters with the Waipaoa River or the Makauri Aquifer, e.g:
    - Te Arai, which has moved up and down the Waipaoa and foreshore (Moetara and Moetara, 2016).
    - Te Whatatuna.
    - Te Awapuni Moana.
    - Te Waikanae.
    - Taruheru River and tributaries.
- Associated aquifers, springs and wetlands.
- Other sites and activity types to be further identified.

GDC and RIT work collaboratively to develop a resource inventory of sites of ecological, cultural, social and economic importance to Rongowhakaata. This may be provided by RIT to GDC on request as a protected GIS layer.

Need for ongoing engagement with mana whenua

It has become evident during the consultative processes undertaken, that there resides a considerable body of traditional knowledge and contemporary practice around the sites and activities referred to above and to a range of further areas of significance to Rongowhakaata.

Nevertheless, these areas and hence this body of knowledge has been significantly impacted by decisions and activities undertaken by agencies acting under Crown authority, but without Rongowhakaata mandate or input, or even in very many cases, without iwi, hapu or whanau being

made aware of the proposals until they were being physically undertaken (Coombes, 2000; Moetara and Moetara, 2016).

The development of a cultural resource against which to assess potential and ongoing impacts will require further investigation and verification. This should be based on a wānanga approach to engage more widely whanau and individuals who might hold such knowledge. Such an approach would include hikoi to explore the presence and condition of such sites associated with the lower Waipaoa River and Makauri Aquifer and adjacent lands and waterbodies.

A holistic approach to assessing economic impacts

Many, if not all resource management decisions made where a 'weighting' of values is required, and typically a weighting of economic as against environmental or cultural values, rely on questions relating to the amount of revenue, employment, or associated economic activity (e.g. from service industries) that a proposal is believed to be likely to create.

Not uncommonly, persons without specific economic or interdisciplinary expertise will make initial decisions in the context of potential adverse environmental or cultural impacts. It may even be that RMA hearings commissioners may make such decisions from a similarly inexperienced standpoint. Indeed, it has been suggested within the consultation and information sharing forums amongst Rongowhakaata, that such decision making may often be based on simplistic information from an unspecified source.

Rongowhakaata are requesting that when natural resource management concerns are triggered by an activity, and in the overall context of sustainable management and Part 2 of the RMA1991, a truly holistic approach to evaluating such an activity be established. This relates to the MAR where there may be a range of potentially competing economic outcomes along with cultural and ecological values evident.

That is, Rongowhakaata request that in order to undertake an assessment of the level of sustainable management exhibited by a proposal, then the outcomes of such a proposal need to be investigated from a range of relevant standpoints. In relation to the use of freshwater, such physical standpoints would include:

GDC and RIT adopt a collaborative approach to a holistic, 'all of cost' approach to assessing the appropriateness of proposals in relation to the use of freshwater. This is so in the case of the MAR, where there may be a range of potentially competing economic outcomes along with cultural and ecological values evident.

- Impacts of any water take on the waterbody itself, i.e. Te Mana o te Wai;
- Impacts of any take or discharge on other life forms and resources associated with the waterbody;
- Impacts on the surrounding landscape and amenity;
- Impacts on the long-term health of soils;
- Potential for any increase in the volume or quality of discharges.

More directly socio-economic standpoints include:

- Effects on other water users;
- Effects on whanau, hapū, iwi;
- Employment values compared with alternative (including existing) land use options;
- Social and economic effects at a community scale.

For such a holistic assessment approach, overarching cultural considerations as identified throughout our consultation processes are summarised as:

- Spiritual and whakapapa foundations of the relationship of Rongowhakaata to the natural world;
- Interconnectedness of the whole;
- Physical, spiritual, socio-economic and cultural well-being of the people;
- Kaitiakitanga, whakapapa, manaakitanga;
- Access and riparian restoration;
- Reestablishment of rangatiratanga, tikanga and mātauranga;
- Rongowhakaata and Te Tiriti based partnership with GDC;
- Te Tiriti and freshwater allocation;
- Site specific cultural monitoring foci;
- Need for ongoing engagement with mana whenua through monitoirng, assessment and natural resource management decision making.

Positive impacts

In his peer review, Dr Nick Roskruge reminds us that there are likely to be positive as well as adverse effects deriving from the undertaking of activities relating to the use of natural resources. Rongowhakaata acknowledge this, and have identified areas where impacts assessment and monitoring, and a shared approach alongside GDC to management of the waterbodies in our rohe, is expected to create a platform for the identification and development of such positive impacts for both parties and the wider community.

Ongoing assessment and monitoring

It is the belief of Rongowhakaata participating in our hui that the effects of activities on the overall well-being of a given waterbody or ecosystem is a state that needs to be re-evaluated on an ongoing basis, and that this should include the presence of Rongowhakaata tohu taiao (environmental indicators, signs) as well as western science indicators.

Similarly, the process of assessing impacts on Rongowhakaata values and relationships, rights and responsibilities, and needs and aspirations, should be ongoing and involve a robust forum for participation. Our initial hui have identified that the elements underlying tangata whenua sustainable management of freshwater resources are complex, and reflect an overarching world view of the interrelatedness of the spiritual and physical, the traditional and contemporary, and the everyday and metaphysical realms. Further, that the management of natural resources will ultimately derive from and be interwoven with whakapapa as a key guiding principle.

Assessment of impacts on the cultural components of the MAR project needs to adopt a holistic approach, including all aspects of Te Ao Maori, be in a collaborative partnership with Rongowhakaata, and be ongoing.

He huahua te kai? E, he wai te kai!
Are preserved birds the best food? Ah no! water is.
(Whakatauki)

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Section 7: Rongowhakaata impact assessment recommended actions for monitoring and assessment

Background to the recommendations

Below are a series of recommendations for action that have been distilled from the information gathering processes undertaken with Rongowhakaata participants. These recommendations should be seen as part of a strategy to address potential impacts on the values and relationships, rights, responsibilities and needs and aspirations of Rongowhakaata (our 'interests') relating to the proposed MAR trial, including the take of Waipaoa River water to inject into the Makauri Aquifer.

This suite of Rongowhakaata interests reflects the broad spectrum of activities that comprise our cultural landscape in a contemporary context. Some of the potential impacts of the trial on these interests, with an eye to the potentially greater impacts of a substantive aquifer recharge program, exist in an environment of uncertainty. This is because of a need for:

- More specific identification of the cultural, geophysical and ecological landscape in the area potentially affected by the recharge program;
- Further collaboration with tangata whenua groups, both within Rongowhakaata and also adjacent iwi and hapū, that may be directly affected by the program, and the extensive knowledge that may be held collectively;
- The legal context relating to freshwater allocation and tangata whenua rights and responsibilities relating to freshwater;
- The levels of anthropogenic contaminants present in the river inflow water, and the potential for increased impacts with injection of greater volumes of the oxic river water into the anoxic Makauri Aquifer;
- The interconnectedness of the land and waterbodies, rivers, wetlands, groundwater systems and springs, that comprise the lower Waipaoa River environment.

Such levels of uncertainty, however, provide the ideal context for an ongoing, iterative, wānanga approach to monitoring, assessing the significance, and then addressing the potential impacts of the program on Rongowhakaata interests in this area of their tribal rohe. As Dr Roskruge has indicated, rather than being simply a 'one-off' destination, the cultural impact assessment should be a point of departure that works to address shared concerns around resource management by establishing a new, Te Tiriti based partnership between GDC and Rongowhakaata. This is anticipated in the MAR Resource Consent Condition 46.

Recommendations for action

Background: fundamental considerations

1. Recognition that the reality of an interconnected world is embodied in all Rongowhakaata values and relationships, and all our interests relating to our natural resource base and cultural landscape. Interrelatedness should thus comprise a key focus for environmental and cultural monitoring and assessment, and subsequent management practice.

2. Such monitoring, assessment and management components of the overall MAR project should also adopt a holistic approach, including all aspects of Te Ao Maori (the natural and

metaphysical worlds), be in a collaborative partnership with Rongowhakaata, and be ongoing. This level of collaboration will be as Te Tiriti partners; RIT and GDC co-developing platforms to enable Rongowhakaata rangatiratanga within the wider collaborative iwi Maori landscape.

Current shared programs under way

Some recommendations of this CIA have already begun as shared initiatives between Rongowhakaata and GDC, or amongst the iwi participants as a whole and GDC, or have been discussed positively amongst the parties:

3. In the context of the tikanga to avoid the unnatural mixing of different types of water, RIT and GDC continue working collaboratively to identify effective measures of potential human impacts and contamination, and the implementation of an appropriate monitoring program. This is a reflection of Rongowhakaata's ongoing participation with GDC and other participants in current processes.

4. Targeted engagement, information gathering and relationship building amongst all current participants in the MAR project and our wider local communities including iwi, GDC, agriculturalists, experts in freshwater ecology, hydrology, and law and economics. This will include and build on the work currently undertaken by GDC, the MAR Advisory Group and RIT, and include the development of a library of relevant resource material.

5. Produce an in depth analysis of the interconnectedness of the waterbodies in the rohe (rivers, streams, aquifers, springs and wetlands) in order to help to identify where potentially unanticipated impacts on socio-economic, cultural and ecological values and relationships may be likely to become evident, and to assist with providing the platform for a targeted monitoring program. RIT and GDC will collaborate on the terms of reference and production of such a report.
    i. This is also a recommendation of the Golder 2017 report and it is anticipated that GDC are committed to such an undertaking.
    ii. Relationships amongst key participants in the MAR project, including the various iwi and hapu, need to be considered in the context of impacts, and similarly reported on.

Monitoring tools

6. In collaboration with GDC, tools are developed for monitoring the wellbeing of Rongowhakaata values and relationships and all our interests relating to the water bodies in our rohe in the context of the MAR project. These will include:
    i. Ongoing monitoring and wānanga (collaborative forums) to be undertaken relating to the project and to the quiver of Rongowhakaata values, relationships and other interests present in this area of our tribal rohe. These wānanga will provide opportunities for the development of the mātauranga (knowledge, understanding, traditional Maori science) relating to the area while helping inform GDC's understanding of the cultural landscape of Rongowhakaata.

ii. This wānanga process will also involve hikoi (treks, walk) along the lower Waipaoa and Taruheru[74] catchments at varying seasons/river flows to identify cultural sites and, where relevant, cultural/ecological flow requirements. These hikoi will also include the identification of puna (springs) and other aquifer-related sites of significance.

Cultural resource inventory

7. With support from GDC, Rongowhakaata Iwi Trust (RIT) will produce an iteratively developing resource identifying areas of traditional and contemporary cultural significance, including (but not confined to) areas of water extraction and use by Rongowhakaata whanau and marae, mahinga kai, mahinga toi, mahinga raranga, whare whakahou, tauranga waka, ecosystem functioning, recreation, historic heritage and overall cultural importance. This will provide the spatial framework for monitoring the well being of these specific areas, alongside the overarching well being of the aquifer and river in the context of the MAR project, and be ongoing.

    i. Such an inventory may be provided by RIT to GDC on request as a protected GIS layer. Some specific sites that whanau request are further protected from external view may be identified within a wider 'area of cultural alert' that will links the area by way of notiication directly to such whanau.

    ii. The wānanga and hikoi referred to above will be key tools informing the cultural values and relationships resource inventory.

Access and riparian protection and restoration

8. In the context of providing for the suite of Rongowhakaata interests, and particularly our tikanga (correct procedure, customary practice, lore[75]) and mātauranga around freshwater, RIT and GDC work collaboratively to establish usable riparian corridors along the rivers and streams, and around the springs, lakes and wetlands within the Rongowhakaata rohe. In the context of the MAR project, for Rongowhakaata this relates specifically to the lower Waipaoa, Te Arai, Awapuni (including Waikanae), Taruheru and associated waterbodies, and should include exploring opportunities for stream, wetland and spring restoration.

A holistic assessment of the costs and values in relation to the use of freshwater

9. GDC and RIT adopt a collaborative approach to a holistic, 'all of cost' method of assessing the appropriateness of proposals in relation to the use of freshwater. This is particularly so in the case of the Makauri MAR where, in a district-wide environment of both acute and chronic freshwater shortage, there may be a range of potentially competing economic

[74] The Taruheru River is believed to be hydraulically linked to the Makauri aquifer (Murphy, 2019).
[75] Maori Dictionary.

outcomes along with the cultural and ecological values present. Examples of such cultural and ecological values include:

i. Impacts of any water take on the waterbody itself, i.e. Te Mana o te Wai;

ii. Impacts of any take or discharge on other life forms and resources associated with the waterbody;

iii. Impacts on potentially associated waterbodies;

iv. Impacts on the surrounding landscape and amenity;

v. Impacts on the long-term health of soils;

vi. Potential for any increase in the volume or quality of discharges.

Socio-economic standpoints include:

vii. Effects on other water users;
viii. Employment values compared with alternative (including existing) land use options;
ix. Social and economic effects at a community scale.

Effects on tangata whenua. For Rongowhakaata, these include the overarching cultural considerations as identified throughout our consultation processes:

x. Spiritual and whakapapa foundations of the relationship of Rongowhakaata to the natural world;
xi. Interconnectedness of the whole;
xii. Physical, spiritual, socio-economic and cultural well-being of the people;
xiii. Kaitiakitanga and manaakitanga;
xiv. Access and riparian restoration;
xv. Reestablishment of rangatiratanga, tikanga and mātauranga;
xvi. Rongowhakaata and Te Tiriti based partnership with GDC;
xvii. Te Tiriti and freshwater allocation;
xviii. Site specific cultural monitoring foci;
xix. Need for ongoing engagement with mana whenua through monitorng, assessment and natural resource management decision making.

Rangatiratanga and Te Tiriti

10. RIT and GDC co-develop platforms to enable Rongowhakaata rangatiratanga as Te Tiriti partner.

i. GDC and RIT work collaboratively in relation to the management of freshwater bodies in the rohe of Rongowhakaata that reflects Rongowhakaata's role as Te Tiriti partner;

ii. Rongowhakaata tikanga and mātauranga is placed at the forefront of natural resource planning and decision making within our rohe in Tūranganui a Kiwa;

iii. RIT and GDC establish defined platforms whereby iwi values and relationships, rights, responsibilities, and needs and aspirations can be given effect to, as Te Tiriti partners with the Crown. This suite of interests includes the values of Wairuatanga, Whakapapa, Kaitaikitanga, Manaakitanga, and Rangatiratanga[76]. Thus, these platforms will:

- Determine if the Makauri Aquifer and Waipaoa River ecosystems and resources are currently being managed in a way that embodies Rongowhakaata's kaitiakitanga obligations;
- Determine if the Makauri Aquifer and Waipaoa River ecosystems and resources are currently being managed at a satisfactory state of well being and abundance to enable Rongowhakaata to exercise our manaakitanga obligations;
- Determine if the Makauri Aquifer and the Waipaoa River and associated waterbodies are being managed at a satisfactory state of well being, abundance and hydrological integrity, so that the values they have traditionally provided for Rongowhakaata whanau and hapū are available for future generations;
- GDC, RIT and other effected iwi and hapū groups explore how rahui might be implemented to enable the kaitiaki role of mana whenua, and restore the ongoing hydrological, ecological, cultural and landscape integrity of the Makauri Aquifer and Waipaoa River and associated lands and waterbodies;
- GDC commit to not allowing the further decline or degradation of the mauri and Te Mana o te Wai of fresh waterbodies, as required by the NPSFM 2014, but rather work collaboratively with iwi and hapū to protect, restore or enhance these values.

[76] Wairuatanga: spirituality. Whakapapa: genealogy, genealogical table, lineage, descent – central to all Maori institutions. Kaitaikitanga: guardianship, stewardship, trusteeship. Manaakitanga: hospitality, kindness, generosity, support - the process of showing respect, generosity and care for others. Rangatiratanga: chieftainship, right to exercise authority, chiefly autonomy, chiefly authority, ownership, leadership of a social group, domain of the *rangatira*, noble birth, attributes of a chief; kingdom, realm, sovereignty, principality, self-determination, self-management - connotations extending the original meaning of the word resulting from Bible and Treaty of Waitangi translations. See also Tino Rangatiratanga: self-determination, sovereignty, autonomy, self-government, domination, rule, control, power. (Maori Dictionary)

Figure 7.1: Makauri managed aquifer recharge project: Stage 2 trials Assessment of effects on Rongowhakaata and recommended mitigation outcomes: summary