

RESTORING THE MAURI OF THE WAI – USING CO-MANAGEMENT TO DETERMINE WASTEWATER TREATMENT AND DISPOSAL

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ABSTRACT (500 WORDS MAXIMUM)

The discharge of human waste into a waterbody from a Western sense is challenging to te ao Māori as it compromises the mauri of the wai. In addition, there are often concerns within local communities over the health of the waterbodies receiving these discharges. Therefore, applications for resource consent renewal for wastewater treatment plants (WWTPs) discharging to water have been strongly opposed by local hapū and community representatives who seek meaningful alternatives to these discharges. However, finding appropriate treatment and discharge solutions is often limited not only by a lack of funding but also, in some cases, by the long, difficult histories between the community, tangata whenua and district authorities.

In the Far North of New Zealand, Far North District Council (FNDC) have been working towards more meaningful engagement with tangata whenua when it comes to the future of their wastewater assets. FNDC subsequently engaged Beca as independent consultants to assist them with this process, which acknowledges the conflict of the past and starts with trust building and whakawhanaungatanga. In person 'round the table' workshops with an established Working Group (typically consisting of hapū representatives, local community members, and district authority staff) are used as a tool for first defining the nature of the issue and the core beliefs and priorities of each party. Hapū, district authority personnel and the environmental and engineering consultants are all considered subject matter experts (SMEs), each adding a different type of expertise that is used to come up with a long list of acceptable options. The final development of the Best Practicable Option (BPO) is a product of kotahitanga between the various groups. This has been successfully completed for the Taipa WWTP Kaikohe WWTP in the Far North.

With the National Policy Statement for Freshwater Management 2020 placing greater emphasis on the incorporation of Te Mana o Te Wai into decision making, water managers need to seek meaningful engagement to ensure our solutions are working towards restoring mauri to the wai. This paper explores the success factors, challenges and broader applications of this process and presents tangible lessons that can be adopted by others seeking to undertake meaningful co-management.

KEYWORDS

Wastewater, co-management, restoring mauri, te mana o te wai

NOMENCLATURE

Many kupu (words) take on subtle or distinctly different meanings depending on context within concepts. They can be both a noun and a verb depending on that context. For this glossary the English translations are taken directly from Te Aka – Māori dictionary <https://maoridictionary.co.nz/>

Awa	River, stream, creek
Awheawhe	Workshop, working party
Hapū	Māori kinship groups or subtribes that make up an iwi
Hui	Meeting or gathering
Iwi	Māori tribal groups
Kai	Food
Kaitiaki	Guardian or custodian
Kanohi ki te kanohi	Face to face
Kaumātua	Māori elder, person of status within the whānau
Kaupapa	Plan or purpose
Kotahitanga	Unity
Mana	Authority, influence, status
Mana whenua	Territorial rights, authority of Māori over their land
Mauri	Life force / essence
Mātauranga	Māori knowledge or understanding
Pono	True/Genuine
Pūkenga	Skills, expertise, and knowledge
Tamariki	Children
Tapū	Sacred, special and to be protected
Tāngata whenua	Māori with ancestral relationships/rights to an area, indigenous people
Tika	Correct
Te mana o te Wai	Recognising the vital importance of the water
Pūkenga	Expertise
Tupuna	Ancestor
Wai	Water
Wai-kino	Dangerous/polluted water
Wai-mate	Dead water
Wairua	Spirit, aura, attitude
Whakapapa	Genealogy – connection
Whakawhanaungatanga	The process of establishing good relationships
Whānau	Family group (extended family)

PRESENTER PROFILE (50 WORDS MAXIMUM)

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1. INTRODUCTION

Far North District Council (FNDC) have been undertaking investigations into long term wastewater treatment options for a number of the Council's aging wastewater treatment plants (WWTPs) and have committed funding to expand the options assessments and engage with tāngata whenua to inform the process (Beca, 2021). This comes in response to the need to manage freshwater in a way that 'gives effect' to Te Mana o te Wai as set out in the National Policy Statement for Freshwater Management 2020 as well as a greater recognition of the role of tāngata whenua in managing water.

FNDC engaged Beca to assist them in undertaking investigations and completing high level concept designs of WWTP upgrades for a number of their WWTPs as part of the process of resource consent renewal for those plants. As previously approved, and contested, resource consents approach their expiry dates there is an opportunity for FNDC to engage in a meaningful way with tāngata whenua to establish wastewater outcomes that address the concerns of all parties.

This paper outlines the decision-making process applied for the re-consenting of Taipa and Kaikohe WWTPs and provides feedback on some of the key learnings as well as some of the limitations. It also discusses the role of subject matter experts and reveals learnings on why water managers should consider mātauranga in the decision-making process to give effect to Te Mana o te Wai.

It is also acknowledged that the authors of this paper are te ao Pākeha, and the purpose of this paper is to share learnings from engaging with Māori as part of a co-management process. It is not intended to be a true and complete representation of te ao Māori ideas. However, this paper has been peer reviewed by members of Te Ahi Tutata (the Beca Māori Advisory Business) from a te ao Māori perspective.

2. THE BEGINNING (OR THE END)

The subject of this paper is the co-management process that has been applied in the Far North when undertaking an assessment of the options for a WWTP that is coming up for consent renewal; however, it is acknowledged that in many cases, years, if not decades, of work by both tāngata whenua and local authorities has been undertaken prior to this point. As such, this is not really the beginning.

2.1 RESOURCE CONSENT RENEWALS

This paper will draw from the work undertaken in 2022 and 2023 for the Taipa and Kaikohe WWTPs. To provide context for these case studies, this section outlines the background of these resource consents and why working groups were established as part of the resource consenting process.

In the case of Taipa WWTP, FNDC previously held resource consent AUT.004007.01.03 which authorised the discharge of treated wastewater from

Taipa WWTP to the unnamed tributary of Parapara Stream. This consent expired in 2008. For renewal of the resource consent, a hearing was held in August 2019 and a consent order (ENV-2019-AKL-00018) was issued in March 2021. The order sets out a number of amended conditions provided in Attachment 1 to the order which included establishing a Working Group (Condition 7) to determine the BPO for the Taipa WWTP (Condition 10). The Working Group was to consist of members from the Te Mana o Te Wai Hapū Integration Roopu Charitable Trust, one of the listed Appellants to the resource consent as set out in the consent order, as agreed during resolution of the appeal and their Terms of Reference were set out in Schedule 2 of the Consent Order. Condition 7 also required that the group be supported by an independent person qualified and specialising in wastewater engineering and land discharge systems (appointed by the Consent Holder and certified by the Northland Regional Council's Compliance Manager as being independent and having no conflict of interest). As such, Beca were engaged as the independent wastewater specialists in April 2022.

The resource consent for the discharge of treated wastewater from Kaikohe WWTP to the Wairoro Stream (consent number CON20100241701) expired on 30 November 2021 and FNDC applied for a new discharge consent in August 2021; this application is currently on hold with Northland Regional Council (NRC) to allow FNDC to engage with tāngata whenua on the future of the WWTP. In response to concerns with the continued discharge of treated wastewater to the Wairoro Stream, the Kaikohe WWTP Consent Renewal Working Group was formally established. The purpose of the Working Group was to forge a pathway forward for the relationship and partnership between ngā hapū o Kaikohe and the Far North District Council with respect to the Kaikohe WWTP. The Terms of Reference for the establishment of the Working Group set out the Kaupapa [purpose] which included a number of work streams including:

- To lead the investigation, supported by technical expertise, into discharging treated wastewater to land from the Kaikohe WWTP.
- To lead the investigation, supported by technical expertise, into the Best Practicable Option (BPO) for upgrading the plant to further improve the standard of the discharge.

In August 2022, following the signing of the terms of reference between ngā hapū o Kaikohe and the Far North District Council in June 2022, Beca were engaged as the independent wastewater engineers to assist with the establishment of the BPO and to provide support to both FNDC and hapū representatives who formed part of the working group for the project.

2.2 WHAT IS A BPO?

The Resource Management Act (RMA) 1991, as amended, defines BPO as follows:

"the best method for preventing or minimising the adverse effects on the environment having regard, amongst other things, to –

- a) *The nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and*
- b) *The financial implications, and the effects on the environment, of that option when compared with other options; and*
- c) *The current state of technical knowledge and the likelihood that the option can be successfully applied"*

This definition puts emphasis on preventing or minimising the adverse environmental effects of the discharge, when having regard to the sensitivity of the receiving environment, and the costs (or affordability of the option) with respect to technical understanding and the likelihood of successfully implementing that option. In terms of environmental assessment, this means the consent holder needs to demonstrate that the selected option will not cause an exceedance, or exasperate an existing upstream exceedance, in water quality standards as set out in regional plans and national policies. This may also mean an improvement in water quality from a currently degraded state. What the BPO definition does not include is a hierarchy of obligations, for example, the definition does not say that the 'financial implications' outweigh the 'sensitivity of the receiving environment'.

The definition also does not include a specific reference to mātauranga ideas of environmental impact and environmental sensitivity (although the definition of 'environment' within the RMA 1991 refers to 'cultural conditions'), and how the discharge of wastewater to a waterbody, even when in compliance with environmental standards, may impact other less measurable components of the environment including the mauri [life force] of the wai [water]. This is where the National Policy Statement for Freshwater Management 2020 (as amended) (NPS:FM 2020) and its emphasis on Te Mana o Te Wai provides further guidance for decision makers.

2.3 TE MANA O TE WAI AND THE NPS:FM 2020

The concept of Te Mana o te Wai has been gaining traction in environmental legislation and policy in New Zealand since its inclusion in the NPS:FM 2014 and is relevant to all aspects of water management (MfE, 2020). The concept has been further clarified and strengthened as part of NPS:FM 2020 (MfE, 2020). This document states that Te Mana o te Wai is:

"a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community" (NPS:FM 2020, p.5).

The NPS:FM 2020 sets out the policies and required actions that apply to all local authorities to ensure that *"freshwater is managed in a way that gives effect to Te Mana o te Wai"* (Policy 1, NPS:FM 2020, p.10). Giving effect to Te Mana o te Wai

means that local authorities must actively involve tāngata whenua (to the extent they wish to be involved) in freshwater management including identify matters of importance to tāngata whenua and outcomes they want for the relevant water body (MfE, 2020). The requirement to take a local approach when giving effect to Te Mana o Te Wai is also set out in Part 3, Subpart 1, '3.4 Tāngata whenua involvement' of the NPS:FM 2020.

The principle of mana whakahaere or "*the power, authority, and obligations of tāngata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater*" is one of the six principles of Te Mana o te Wai as set out in the NPS:FM 2020 (p. 5). A Te Mana o Te Wai report prepared for Kāhui Wai Māori on the concept of mana whakahaere (Sykes, 2021) notes that Mana whakahaere essentially enables tāngata whenua to fully achieve their kaitiaki obligations including the obligation to maintain and ensure the mauri of the wai. Therefore, giving effect to Te Mana o te Wai involves empowering Māori to restore mauri to their locally significant waterbodies.

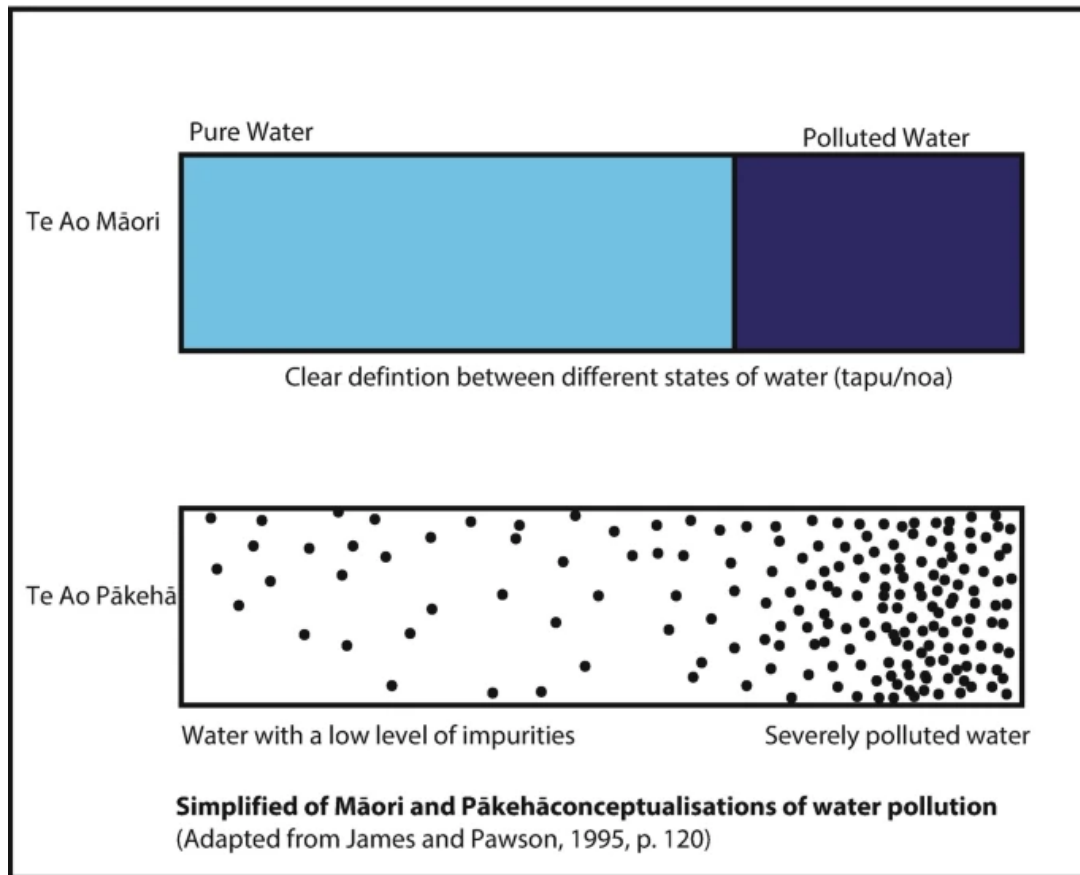
Furthermore, '*preventing or minimising the adverse effects on the environment*' under Te Mana o Te Wai would include preventing or minimising the impact on the mauri of the receiving environment and is therefore relevant to the establishment of a BPO under the definition set out in the RMA 1991. As the NPS:FM 2020 puts the onus on regional authorities to review resource consent applications and impose resource consent conditions to give effect to Te Mana o te Wai there is a necessity to ensure that the BPO meets these requirements.

3. UNDERSTANDING THE IMPACT ON THE MAURI OF THE WAI

At a high level it is recognised that the discharge of treated human effluent into a waterbody is seen differently by the two world views of te ao Pākeha and te ao Māori. This is because such discharges go against fundamental Māori beliefs around the spirit or essence of water as well as their traditional cultural practices of water management (Ataria et al., 2016; Pauling & Ataria, 2010; Parsons et al., 2021). This section of the paper outlines some of the current understandings as to why and how mātauranga belief systems differ to western scientific understandings and approaches.

Parsons et al. (2021) provide some insight into the differing ways that environmental effect may be perceived between western science and mātauranga mindsets. They note that the way te ao Māori and te ao Pākeha understand the concept of clean or contaminated water is fundamentally different based on differing ontologies and epistemologies. This is depicted in Figure 1 which is taken from Parsons et al., 2021, as adapted from James and Pawson, 1995, p. 120.

Figure 1: Understandings of Water Pollution (Parsons et al., 2021, p. 203)



Parsons et al. (2021) note that “from a tikanga perspective, human waste products (even if treated using the best scientific and technological methods) should always be kept away from bodies of water (be it a river, harbour, or sea)” (p. 201). This is because human waste is tapū (sacred or taboo) and the discharge of wastewater into both freshwater and saltwater environments is a fundamental breach of the traditional Māori rules around tapū. They explain that for Māori the discharge of waste products into water “result(s) in both the receiving waters as well as all those beings that are connected to those waters (through whakapapa) become unhealthy; their mauri (life force) and wairua (spiritual integrity) diminished by the tapu of human waste” (p. 201). Therefore, to understand Te Mana o te Wai is to firstly understand the inter-relationships between Mana and Tapū (see insert 1 from John Blyth, Māori Business Advisory Lead for Beca, who has provided commentary on this matter).

Insert 1: A note from John Blyth, Te Ahi Tutata (Beca Māori Advisory Business)

Tapū is considered and understood as sacred, special and to be protected. It comes in many forms and could be considered to be a protection mechanism to ensure safety and sacredness in perpetuity.

Mana: Putting it simply everything has mana and defining mana, whilst complex, can be framed in the context of everything has a purpose. Purpose has meaning and impact and the ability to maintain and/or reach that purpose ensures the behaviour of respecting that purpose and meaning.

In the context of Wai [water], Wai has purpose and meaning. The purpose of water is diverse and inter-connected and its purpose is protected by Tapū to ensure its potential is reached. Conversely when we think about human waste, this is itself a form of water when carried in a water body. It is **Wai-mate** [dead water] or **Wai-kino** (dangerous/polluted water) in a Māori context. Dangerous/Polluted water or dead water than cannot sustain life and is dangerous to living things.

In that overall context mixing human waste with a water body disrupts that purpose of the receiving environment (e.g. the river). That water's purpose (Mana) may be to sustain a fishery or to support Mahika kai, which in itself has Tapū in order to protect those living entities that rely on it. Therefore, Te Mana o te Wai could also be interrupted as helping first and foremost to ensure the purpose of water is upheld and respected. In a great many instances, the purpose of water needs to be disrupted and this is sometimes unavoidable. Disrupting water must be acknowledged and a method of returning its purpose would be the first concept to consider. If that purpose cannot be restored in its disrupted journey, say a WWTP, then the concepts of **Tika** [correct] and **Pono** [True/Genuine] can be applied. A process to acknowledge that is correct and true to allow for that disruption. A good example is the potential for land discharge to wrap that wai-mate in the protective and restorative properties offered by Papatūānuku to return that life force, the Mauri, to that water. Iwi/Hapū and the experts to help restore that Mauri.

Lastly, Mana and Tapū are always matched. If Mana is low then Tapū is low, and vice versa. So elevating Mana of water via Te Mana o Te Wai will automatically elevate Tapū. Conversely if we don't acknowledge the Tapū by effecting protective measures in design we are not addressing its Mana as the Mana will be low.

Parsons et al. (2021) go on to say that this is also connected to traditional kai [food] gathering and the ways that the tapū of human waste polluted the kai, which carries its own tapū. As such, even if the wastewater is treated to scientifically determined environmental standards it would still be unacceptable. Parsons et al. (2021) conclude that because of this, the way that the tapū of wastewater affects waterbodies and subsequently kai gathering cannot be quantified using Western scientific knowledge.

In light of these understanding of mātauranga versus western science it is necessary to assess any wastewater treatment solution with both mindsets, but also recognising that any views of mātauranga should be reflected on at the hapū

level. Co-management therefore needs to create a forum for both disciplines to be applied to the assessment of environmental effects, in order to develop a BPO that meets the RMA definition and the requirements of Te Mana o Te Wai.

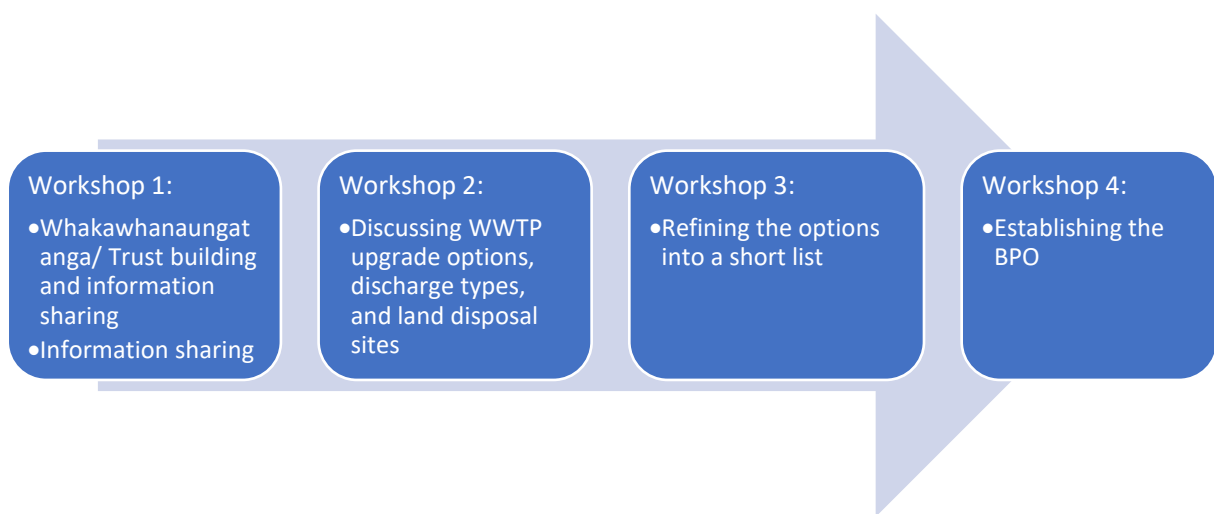
4. CO-MANAGEMENT PROCESS

The decision-making process for Taipa WWTP was undertaken from May 2022 to August 2022 whilst the Kaikohe decision making process was undertaken from August 2022 to June 2023. Whilst not without its limitations, we have found this approach has helped the groups come up with meaningful solutions for these WWTPs that support the values of tāngata whenua and the wider community.

4.1 AWHEAWHE (WORKSHOPS)

The co-management process is based on a series of kanohi ki te kanohi [face to face] workshops or hui, which are used as a vehicle for having open discussions about wastewater treatment and land discharge options, providing technical advice to the Working Group, and guiding them towards a decision for the BPO within the consent timeframes. The value of face-to-face hui following the period of pandemic disruption cannot be understated. These workshops follow the following pattern:

Figure 2: Workshop Purpose and Process



This process is typically undertaken over a period of six months and allows time for the consultants to complete the required work, for hapū to korero [discuss], and for decisions to be made between hui. In some instances, such as at Taipa, the timeframe has had to be reduced due to the deadline as set out in Condition 10 of the Consent Order (ENV-2019-AKL-000181).

Whilst these four workshops form the pillar of the methodology that has been applied, it is often the case that decisions are not made at the hui. Rather, the hui provide an opportunity for the consultants, the local authority, and hapū to present information, discuss options, ask questions and provide feedback. Each workshop

is therefore followed up 1-2 weeks later with an online korero in which Working Group clarify their preferred approach from the information presented that the last hui. This approach also allows for the hapū representatives to take information back to their wider hapū and receive feedback before confirming their decision.

4.2 WHAKAWHANAUNGATANGA (TRUST BUILDING)

It is important to acknowledge that consulting engineers and planners are often invited into the process when a resource consent for a wastewater discharge plant is coming up for renewal. They are not usually privy to the histories that have existed between tāngata whenua and local authorities which is both a blessing and a curse: they are intended to be independent. However with matters that are so intrinsically significant to those persons in the room it is important that core values and grievances are expressed.

As such, the start of any good co-management approach begins without premise. The first workshop is always in-person and involves whakawhanaungatanga or trust building. It is important to start out by first listening to hapū speak on their aspirations for the project, to hear the stories and understand the reasons why they are in the room. In most instances this connects back to the importance of the awa [river/stream], the loss of kai [food] that was once available within living memory, and the need to protect tamariki [children] who swim there. Hapū may also have their own preferred treatment and discharge methods. The consultant's role is to listen and record those values as they will form part of the objectives for the development of the BPO on the project.

Setting out clear objectives at the start of the project is also key. As consultants we may have some idea based on our pre-work, but ultimately these objectives need to be defined and agreed at the first workshop. These may include, for example, a preference for discharge of treated wastewater to land, a requirement for high quality treated wastewater, the need to incorporate Mātauranga into the final solution, and / or to restore the awa to allow it for use as a kai basket again.

4.3 DISCUSSING THE WWTP OPTIONS

Whilst it is our experience that tāngata whenua have typically sought to change WWTPs away from discharge to water and towards discharge to land, as aligns with the cultural concepts of tapū and the mauri of the wai, we have noted some nervousness around discharging partially treated wastewater from traditional oxidation pond systems to land. In most instances a WWTP upgrade has therefore also been sought from hapū along with a discharge to land scheme to ensure the discharge of wastewater does not have a negative impact on the soil micro-biology of the receiving site or on the underlying groundwater and downgradient receiving environments. Because discharge to land schemes often need a partial water discharge as a form of contingency, such as a relief valve from a treated wastewater storage pond to protect from overtopping, developing a wastewater treatment solution that would be acceptable from a western science perspective

of 'managing adverse effects' for a continued discharge to water is compatible with this aspiration.

The selection of WWTP options to be presented to the working group can be influenced by a number of factors. These include previous work already undertaken by the local authority, existing technologies applied within the district, consideration of the existing WWTP flows and loads, as well as local knowledge on options that have worked well in the area. For example, in Taipa there has been a strong hapū and community preference to consider electrocoagulation technology as part of the WWTP upgrade and the project team worked with the Working Group to incorporate that technology into the solution, whilst managing risks to FNDC.

After preparing a report outlining the long list options including high level concept design and proposed discharge quality from the WWTP, the working group is presented with the options in a second in-person workshop. A high-level qualitative traffic light assessment (see Figure 3) is used to go over each of the WWTP upgrade options and determine the most preferred options based on the working groups understanding of these systems and more importantly, the possible results. This is a very simple process that allows multiple factors and preferences to be considered at the same time and prevents the selection of a short list of options from becoming overly cumbersome.

Once a short list of options has been determined, these are assessed against a more extensive set of criteria ranging from reliability and ease of operation to the potential for the option to restore water quality and improve ecological health. The exact nature of these criteria is very much determined by the aspirations of the Working Group as set out in the objectives at the start of the process.

To ease this process, an initial list of criteria is prepared along with qualifying factors based on the values and objectives previously identified by the Group in order to undertake a Multi Criteria Analysis (MCA). These are then discussed and refined, usually during Workshop 3. Qualifying factors for each of the colours (green, orange, red) are determined in advance. Figure 3 shows the way the traffic light system is used for the long list options assessment and the short list options (i.e. MCA) assessment.

For example, where there has been hapū aspiration to see water quality improved in the awa so that tamariki [children] can swim safely and kai can be gathered then we may include a criteria on drinking water quality and how close the treatment plant can get the treated wastewater to drinking water standards. In this way the assessment aims to incorporate Mātauranga into the assessment process rather than compartmentalise the assessment of cultural matters.

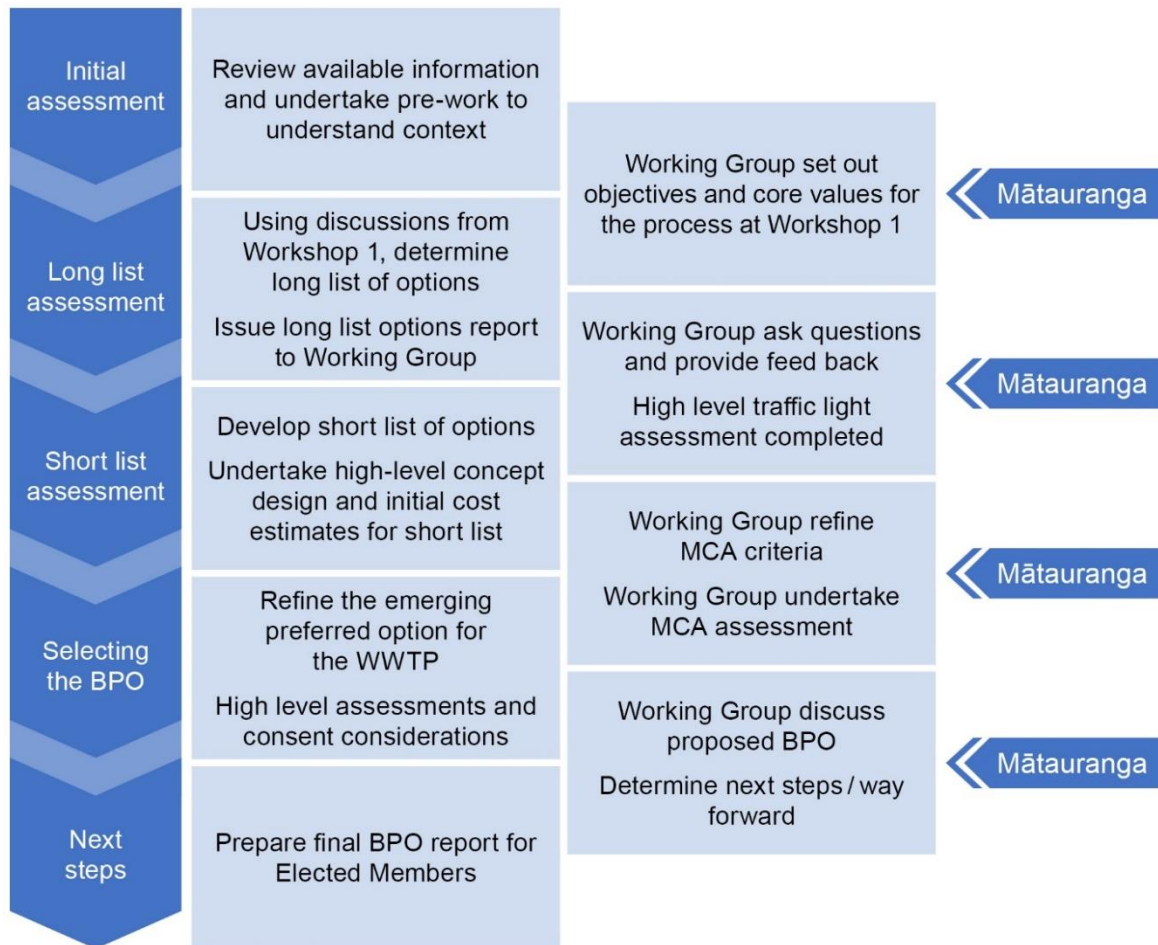
Figure 3: Traffic Light Assessment

Traffic Light	Assessment for Shortlisting WWTP Upgrade Options	Assessment for use in MCA
Green	Preferred	Meets criteria
Yellow	Less Preferred	Partially meets criteria
Red	Not Preferred	Does not meet criteria

This was the case for the Kaikohe Working Group where hapū has an aspiration to see the Wairoro Stream be drinkable. Whilst it was noted that the water quality of the Wairoro upstream of the discharge did not meet the New Zealand Drinking Water Standards, including the maximum acceptable value of less than 1 Escherichia coli (E.coli) per 100mL, the group concluded that under the 'drinking water standards' criteria, red would apply to any options where the improved wastewater quality was not sufficient to result in improved stream water quality when compared to upstream quality; orange would apply to any discharge that resulted in a significant improvement in quality but did not meet drinking water standards; green would apply only to a wastewater discharge that met the drinking water standards at the point of discharge. Although it was also noted that the discharge of treated wastewater into the awa in any instance was not achieving the restoration of mauri.

Once the criteria have been selected, these are rated using the traffic light system during a follow up online hui or workshop. This process is used to establish an emerging BPO for the WWTP upgrade. Figure 4 provides a summary.

Figure 4: Process for Selected a WWTP Upgrade Option for the BPO



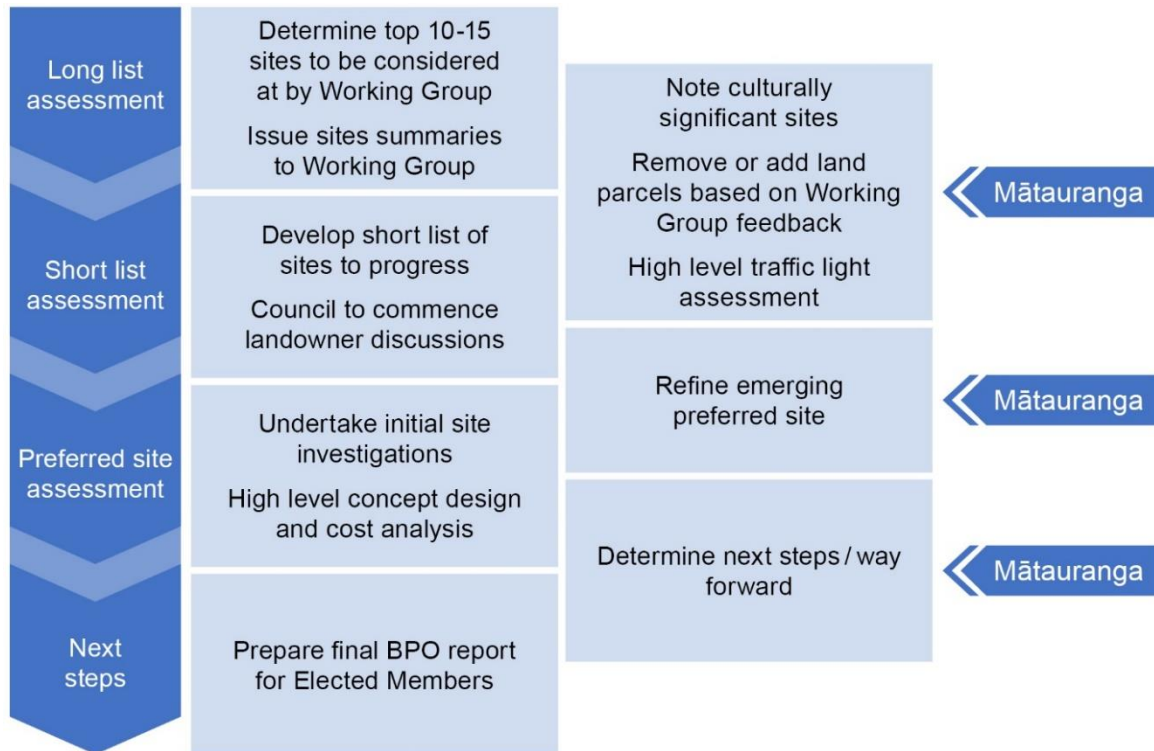
4.4 ASSESSING DISCHARGE TO LAND SITES

In Northland, the Proposed Regional Plan for Northland 2023 sets out a number of key policies that must be considered in determining an application for a resource consent to discharge from a WWTP. Policy D.4.3 sets out a requirement to consider a discharge to land scheme in the first instance before considering a discharge to water.

When considering a discharge to land (DtL) scheme, one of the key limitations is available suitable land within proximity to the WWTP. FNDC therefore undertook a desktop assessment of possible sites includes a review of the online GIS (geographic information systems) maps and data. The results of the assessment undertaken by FNDC for the top 10 to 15 sites are then provided to the Working Group. During the workshops, the Working Group go over each of the top 15 sites and discuss the benefits and limitations of each. They also set out if there are any connections between the Working Group members and the landowners, or if there are any cultural sites of significance known to the Working Group on those land parcels. This is completed to eliminate certain sites and move towards a preferred site. When assessing the suitability of land parcels for a DtL scheme, Kaikohe hapū have noted the need to consider the wairua [spirit] of the land. As such, sites are also eliminated or added based on hapū considerations and preferences.

Following selection of the preferred land parcel, it was progressed either to a high-level concept design for that site or proceed to site investigations, depending on the preference of the Working Group. A summary of this process is provided in Figure 5 below.

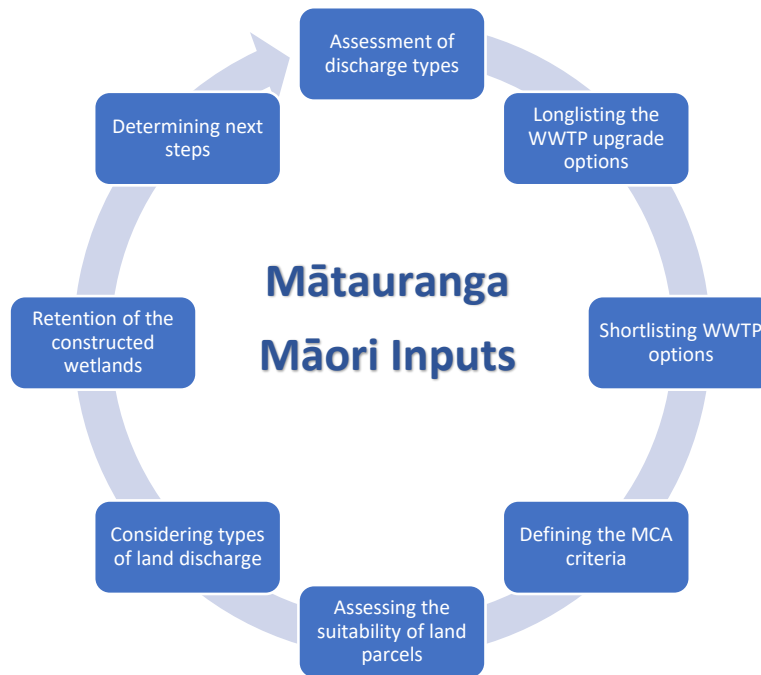
Figure 5: Process for Selected a Land Application Site for the BPO



4.5 INCORPERATING MĀTAURANGA MAORI

A key part of this process is that mātauranga (māori knowledge or understanding) is incorporated into all components of the process. This includes, but is not limited to, the stages set out in Figure 6.

Figure 6: Ways in Which Mātauranga Can Be Incorporated into BPO Selection



We have found that in order to develop a BPO that meets the requirements of the NPS:FM 2020 and Te Mana o te Wai, hapū need to be able to flesh out their thoughts and understandings of the options and decide on a way forward. In some instances, these mātauranga reflections meant that certain options were taken off the table (for example, a full discharge to water scheme with an improved wastewater quality discharge was excluded early on for both Kaikohe and Taipa) whilst other options were morphed from the original option presented (for example, the MCA criteria for the Kaikohe short list assessment were altered from the original criteria proposed). This process of incorporating Mātauranga is important for achieving Te Mana o te Wai in the proposal. The way that this is achieved is through the decisions that occur at the Workshops and the ideas that are minuted as part of those Workshops.

5. KEY LEARNINGS

This section summarises the key lessons that we have learnt through applying this methodology at both Kaikohe and Taipa.

5.1 HOW YOU PORTRAY INFORMATION IS KEY

It is acknowledged that Working Group members may not be experienced in wastewater technologies and engineering processes. As such, it is important to ensure that information is portrayed in a way that can be understood by the Working Group and relates to / connects to their values. In this instance PowerPoints were prepared in advance of each workshop as the main medium for presenting the data; whilst an agenda for each workshop was provided in advance, the workshops themselves were not simply a presentation but an opportunity for

the consultants, the local authority, and hapū to present information, discuss options, ask questions and provide feedback.

5.2 HOLISTIC APPROACH TO WASTEWATER MANAGEMENT

One of the key learnings from this methodology was the need to consider a holistic approach to wastewater management. On numerous occasions during the Workshops, hapū raised matters outside the immediate Kaupapa of establishing a preferred option of the WWTP in question. That is, hapū did not see the WWTP or DTL scheme in isolation from other key issues in the management of wastewater in their area. This holistic approach ties in the concepts of Mana Whakahaere and Kaitiakitanga, which are part of the principles of Te Mana o te Wai in the NPS:FM 2020, and the ability and way for iwi/hapū to consider governing water outcomes in the broader context of the overall water cycle within their rohe [region]. For the Kaikohe Working Group, for example, there was continual emphasis on other components of wastewater management including, but not limited to, water saving solutions / reducing wastewater volumes, wastewater re-use options and sludge management strategy for the Kaikohe WWTP and the wider district.

In particular, hapū have continually raised the issue of discharging crematory waste into the municipal sewer and have expressed ongoing concerns around discharge of wastewater to land resulting in blood/fluids from embalming making their way into the food chain, even just as fodder for beasts. The selection of the BPO therefore needed to include a list of additional projects or aspirations for wastewater management in the Kaikohe area in order to achieve support from hapū. The project team is therefore looking into ways that these can be incorporated as part of the resource consent application (including proposed consent conditions around the types and quality of trade waste that can enter the municipal sewer and end up in the WWTP).

5.3 HAPŪ TIME

One of the lessons we have learnt from undertaking this process is that decisions are typically not made at the main workshops. Whilst the workshops act as a vessel for communicating ideas and sharing opinions, they are seldom where final decisions are made. Hapū have often requested that they be allowed to go away, confer with each other and their wider hapū, and come back to present their opinions. This 'hapū time' as it has been termed by some of our working groups is an important part of the process. A key learning from this methodology is that a decision should not be pushed or forced at the workshops. Time to digest is key to ensuring the correct decision is made and has hapū support.

5.4 MAKING CONCESSIONS

Another learning from this process is that concessions needed to be made to come up with a workable solution for the WWTP within the given timeframes. These concessions were made by the Working Group but were documented in the minutes as concessions. For the Kaikohe Working Group, there was a strong

preference for a discharge to land scheme. However, due to the nature of the soils in the Kaikohe area (thick clay soils with E horizons / hard clay pans (McLeod, 2023)) it has proved difficult to establish a method in which treated wastewater can be applied to land all year round. Non deficit discharge options were ruled out due to the potential for leaching and run-off into local waterways and swimming holes. The Working Group has therefore committed to continuing to work on a land solution for the WWTP whilst also progressing with a membrane based WWTP to ensure the highest level of treatment (within reason and appropriate costs) would be achieved for the existing discharge to water.

However, one of the benefits of this methodology is its ability to achieve community buy in on a preferred option for these aging WWTPs, even where concessions have had to be made. Especially in areas where the relationship between local authorities and local hapū has been tense, going through a selection process that engages a Working Group in a meaningful way results in a solution that the Group can own. Continual involvement in the development of the solution past the initial BPO development stage will therefore be key to maintaining that trust and ownership.

5.5 ASSESSING COSTS

Cost estimates are prepared for each of the short-listed options as well as for a discharge to land scheme however costs are typically excluded from the decision-making process. This is so that the selected BPO is not simply the cheapest option meeting legislative requirements but is rather the option that best accounts for the values and preferences of the Working Group. With this in mind, all short-listed options presented typically fit within the scope of acceptable costs; in order to meet the definition of a BPO under the RMA 1991, the selected option needs to account for the financial implications, and what is reasonable in order to achieve the purpose of preventing or minimising the adverse effects on the environment (including the mauri of the wai). The result is that the preferred option is typically not the cheapest but is not unreasonably priced.

However, what we have noted is that whilst the process of determining a BPO is undertaken by the Working Group through co-management, the final decision including the allocation of funds to a WWTP upgrade and / or land discharge scheme falls with the Elected Members of Council. As such, the final decision ultimately comes down to Council rather than the Working Group. This has been one of the key limitations because Council also need to consider costs and available budget when making their decision. Further, cost estimations at the early concept design phase come with a wide range of variability (typically -30% to +50%), as is standard industry practice, which doesn't give the decision makers much certainty on the total overall cost. In places like the Far North with small population sizes and a greater number of individual assets needing to be upgraded, allocating a large amount of funding to any one WWTP is fraught with its own issues and can be a limitation of this process.

6. SUBJECT MATTER EXPERTS

In section 3 of this paper we outlined how interpretations of the effects on the environment and water quality from a mātauranga Māori approach are different to western science interpretations. Whilst scientific understandings are based on assessing concentrations of contaminants in the environment against regional (for example, the water quality standards set out in the Northland Regional Plan 2023) and national (for example, the chronic toxicity limits set out in the Australia and New Zealand Guidelines for Fresh & Marine Water Quality, 2018; the attribute band limits set out in the NPS:FM 2020) standards and policies to determine whether the level of effect is acceptable or not, assessments guided and informed by mātauranga Māori are based on inherent understandings of non-western concepts that are built on observations of the natural world and the methods that are applied to protect all things. Hapū are the holders of this knowledge; within each hapū there are kaitiaki [guardians] who have specific skills or expertise, or Pūkenga, and hold the responsibility to provide stewardship for the integration and implementation of mātauranga Māori. As such, they are considered to be subject matter experts in the same way that independent wastewater engineers and water quality scientists are specialists in their respective fields, and Council SMEs hold local, operational and political expertise. Effective co-management considers each of these subject matter experts (SMEs) as having equal footing and as such equal contributions into the final decision (see Figure 7).

Figure 7: A Co-Management Framework for Engaging SMEs



7. DISCUSSION AND CONCLUSIONS

7.1 RESTORING MAURI TO THE WAI

Whilst restoring mauri to the wai is the objective of many of the hapū representatives we have worked with to date, whether or not hapū will see restoration of mauri after the implementation of the BPO's for Taipa and Kaikohe is still unknown. As hapū representatives have stated, any discharge of wastewater to water is not restoring the mauri as it is fundamentally against the ideas of tapū as outlined in Section 3 above. Hapū from Kaikohe noted in workshop 3 that as kaitiaki their role is to hold the mauri to its highest standard. However, because in many cases concessions need to be made to come up with a workable municipal scale solution (such as a partial water discharge due to poor soils in the areas and therefore limitations in the DtL scheme) the emphasis in our experience has been get the wastewater as clean as possible and get the wastewater onto land to minimize contamination of the waterbody. However, it is understood that this is still not restoring mauri to its highest standard.

7.2 CONCLUSIONS

With the NPS:FM 2020 placing greater emphasis on the incorporation of Te Mana o Te Wai into decision making, water managers need to seek meaningful engagement to ensure solutions are working towards restoring mauri to the wai. A method for undertaking engagement with tāngata whenua and local communities that is meaningful and incorporates both western science and mātauranga is therefore required. The result of applying this at Taipa and Kaikohe has been an improvement in trust between tāngata whenua and the Council as well as by-in from local communities who have ownership over the process. However, because concessions have had to be made it is unclear yet whether the final outcomes will meet the expectations of iwi and hapū. Nevertheless, by working towards solutions that improve wastewater management in the Far North it is with hopeful anticipation that mauri will start to be restored.

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