# Appendix 11: Cultural Impact Assessment Green Island Landfill Operation, Closure and Aftercare

# Cultural Impact Assessment
# Green Island Landfill
# Operation, Closure and Aftercare

***Mō tātou, ā, mō kā uri a muri ake nei.***

*For us, and for our children after us.*

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**Front cover photo:** View from the Green Island Landfill across the Kaikarae Estuary to Pukemakamaka, April 2022. Source: Aukaha.

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## Contents

# Toitū te Mana, Toitū te Whenua: Te Rūnanga o Ōtākou

*Whakaahua 1: Ōtākou Marae, showing the Wharenui, Tamatea, and Wharekai, Hakuiao*[1]

Our people are descended from Waitaha, Kāti Māmoe and Kāi Tahu. Waitaha is used to describe, collectively, all the ancient indigenous groups who lived in Te Waipounamu prior to the migrations of Kāti Māmoe from Heretaunga in the early 17th century, and the later migration of Kāi Tahu. By the time Kāi Tahu arrived, Kāti Māmoe, through a combination of inter-marriage and conquest, had largely merged with the resident hapū of Waitaha. Again, through warfare and intermarriage, Kāi Tahu merged with the resident Waitaha and Kāti Māmoe peoples.

When we refer to ourselves as Kāi Tahu or Kāi Tahu Whānui we also refer inclusively to our Waitaha and Kāti Māmoe whakapapa.

Our hapū affiliations at Ōtākou come out of Te Ruahikihiki whakapapa, with the principal hapū being Kāi Taoka and Moki II, while an Ōtākou-specific hapū, Kāi Te Pahi also has special significance within our takiwā.

The coastal takiwā of Te Rūnanga o Ōtākou centres on Ōtākou Marae on the Otago Peninsula and extends from Purehurehu to Te Mata-au. The hapū of Te Rūnanga o Ōtākou are mana whenua for the Kaikarae Estuary.

[1] Image credit: Connagh Wesley, Whakaahua Studios, 2023.

*Whakaahua 2: Ngāi Tahu Treaty Festival 2023, Ōtākou Marae*[2]

[2] Image credit: Connagh Wesley, Whakaahua Studios, 2023.

# 1.0 He Reo Arataki: Introduction

## 1.1 Overview of the Waste Futures Programme

The Dunedin City Council (DCC) has embarked on the Waste Futures Programme to develop an improved waste management and diverted material system for Ōtepoti. The Waste Futures Programme includes an enhanced kerbside recycling and waste collection service from July 2024 that will include the collection of food and green waste.

The DCC are planning changes to the use of Green Island landfill site to support the implementation of the new kerbside collection service. The proposed changes include:

- planning for the closure of the Green Island landfill, which is coming to the end of its operational life.
- developing an improved Resource Recovery Park (RRP) to process recycling and green waste.
- providing enhanced waste transfer facilities to service a new Class 1 landfill currently planned for a site south of Dunedin at Smooth Hill.

The resource consents for the new landfill facility at Smooth Hill are subject to appeal. Depending on the outcome of the appeal process, DCC anticipate that the new Smooth Hill facility will not be able to accept waste until 2027/2028 at the earliest.

In the interim, the Green Island landfill will continue to be used for waste disposal. Based on Dunedin's current waste disposal rates, it is likely that that the Green Island landfill can keep accepting waste for another six years (until about 2029). The landfill will be closed and capped in stages over that period, as it continues to fill up.

When the landfill closes completely, opportunities will open up for public recreational use around the perimeter of the site and environmental enhancements, which could include planting restoration projects and new walking and biking tracks beside the Kaikarae Estuary. Long term use and public access to the landfill site post closure will be determined in consultation with Te Rūnanga o Ōtākou, the local community and key stakeholders.

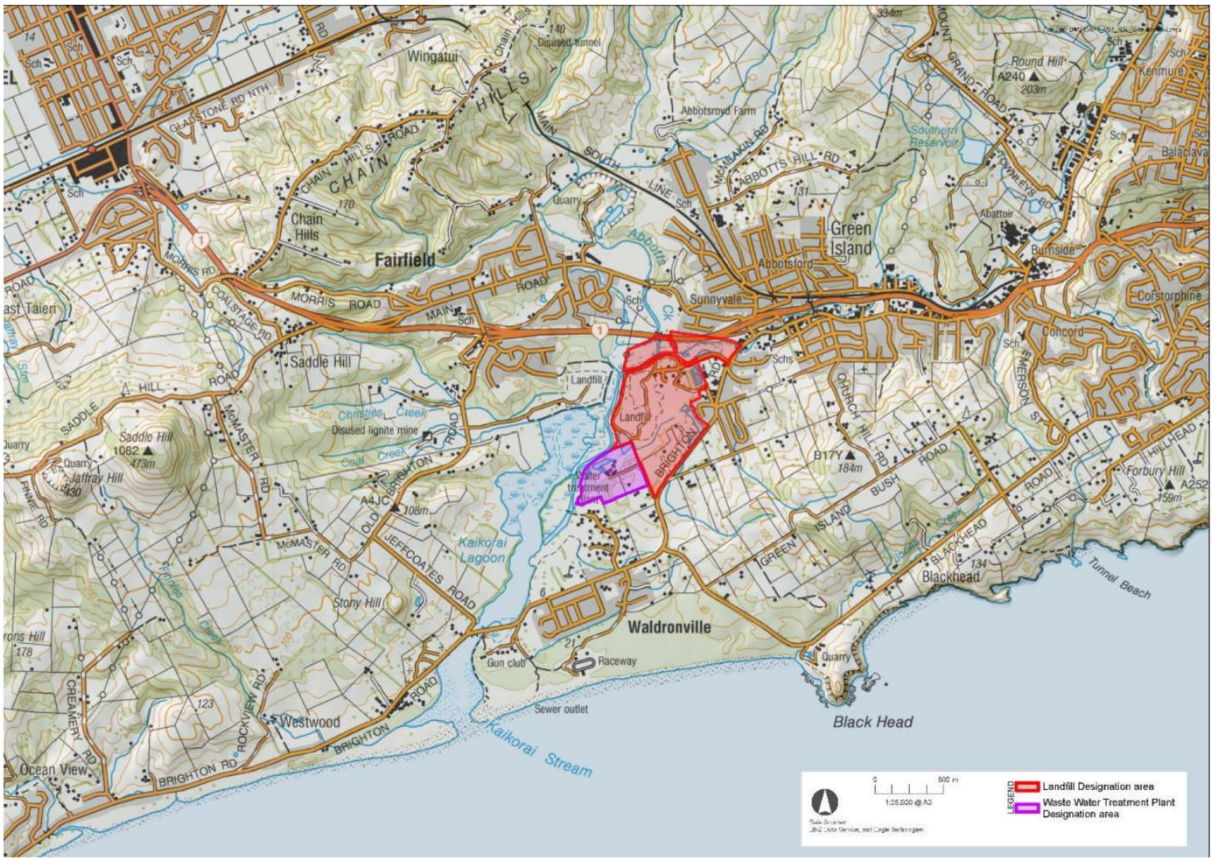
The current resource consents for the Green Island landfill expire in October 2023. The DCC is now applying to the Otago Regional Council (ORC) for replacement resource consents to continue to use the landfill until it closes completely, and waste disposal can be transferred to a new landfill facility. The replacement consents relate to ground disturbance, flood defence and discharges to land, water, and air.

The development of the new Resource Recovery Park (RRP) and waste transfer facilities do not form part of the replacement consent applications. Resource consents for the development and operation of the RRP will be applied for following the completion of design work and technical assessments.

## 1.2 Green Island Landfill site location and surrounds

The Green Island landfill site is located between State Highway 1 to the north, the Kaikarae Stream and Estuary to the west, the Green Island Wastewater Treatment Plant (GIWWTP) and Brighton Road to the south, and the Clariton Avenue residential area and Brighton Road industrial area to the east. Primary access to the site is via Brighton Road.

The landfill site is designated in the Proposed Second-Generation Dunedin City District Plan (2GP) for the purpose of Landfilling and Associated Refuse Processing Operations and Activities.[3] The designation is subject to a single condition imposing noise limits on any activity on the site. The site comprises a total designated area of approximately 75.6 hectares. The maximum extent of the landfill is 38 hectares within the designated area owned by the DCC.




*Whakaahua 3: Location of the Green Island Landfill*[4]

The Kaikarae Stream flows from the Chain Hills upstream of the landfill to the northeast, flowing through Green Island, before entering the Kaikarae Estuary to the west of Green Island landfill. Abbotts Creek enters the Kaikarae Stream to the north of the landfill. The estuary is shallow (0.5 m – 2 m deep) and water levels are tidally influenced due to its proximity to the ocean. Surface water in the Kaikarae Stream, Abbotts Creek, and estuary has been impacted by past and current land uses practices, which include industrial discharges, landfilling, quarrying, and agricultural activities.

The margins of the Kaikarae Stream and Estuary bordering the landfill to the north and west are identified as a Regionally Significant Wetland in the Otago Regional Plan: Water; and an Area of Significant Biodiversity Value, and a Wāhi Tupuna of cultural significance to mana whenua in the 2GP. Low lying areas around the stream and estuary are also identified as being within a Hazard 2 Flood overlay at moderate risk of flooding in the 2GP.

[3] DCC, 2021, D658.

[4] Image credit: Boffa Miskell, 2023 [unpublished material].

The cone of Pukemakamaka to the west is identified as an Outstanding Natural Feature (ONF), and its higher slopes identified as a Significant Natural Landscape (SNL) in the 2GP. Pukemakamaka and Turi-makamaka are identified in the 2GP as wāhi tūpuna of cultural significance to mana whenua.

## 1.3 History of the Green Island Landfill

The historical placement of waste and its distribution across the site is described in detail in Appendix D of the Groundwater Technical Report (GHD 2023A).

Waste disposal first occurred at the Green Island site in 1954 with the disposal of industrial waste and has been used for municipal waste disposal since that time. The waste was placed on a tidal estuary associated with the upper reaches of the Kaikarae Estuary. The site became Dunedin's main municipal landfill in 1981 after the closure of Forrester Park landfill in North East Valley.


*Whakaahua 4: 1958 aerial photograph showing the beginning of waste disposal activity at Green Island site*[5]

Landfilling began at the south-eastern corner of the site, progressing to the north until the eastern portion of the property was covered with fill in the late 1960's. From there, filling advanced to the west over time.

A soil bund was constructed in the 1990s around the north and western sides of the landfill to confine the waste from the adjacent Kaikarae Stream and estuary. Landfilling has continued to the west, with waste placement in this area confined over recent decades within the constructed soil bund. However, prior to the construction of the bund waste had been placed across much of the landfill operational area.

[5] Image credit: Retrolens, 2023.

The eastern portion of the landfill has a relatively shallow depth of waste of around 3 m to 6 m thickness and is currently used for facilities and waste transfer station operations. This area is proposed to be developed soon into a new Resource Recovery Park. No further waste disposal is proposed to occur in this area.

The existing consent conditions do not impose any specific limit on the overall finished height, shape, or contour of the landfill. The most recent capping in December 2022 has raised the height of the landfill to 25m above mean sea level (AMSL).

## 1.4 Current resource consents

The operation of the Green Island Landfill including associated waste processing operations and facilities is currently subject to existing resource consents granted by Otago Regional Council (ORC) in 1993-1994. The consents cover landfill operation activities relating to discharges to land, water, and air, taking and / or diverting water, and disturbance of a contaminated site. All consents expire on 1 October 2023.

The consent conditions require the development of a Landfill Work Programme (LWP), which is to be reviewed annually. A Landfill Development and Management Plan (LDMP) was developed following the issuing of the consents to form the basis of the LWP. An updated LDMP that reflects the current operation of the landfill was provided to ORC in February 2023.

## 1.5 Current Green Island Landfill Operation


*Whakaahua 5: Green Island landfill site plan (2023)*[6]

[6] Image credit: Boffa Miskell, 2023 [unpublished material].

The Green Island landfill site comprises a 'Rummage' shop building for resale of preowned and reusable household goods, an existing Resource Recovery Park, where people can drop off their recyclable material and green waste, and a waste transfer station. General waste dropped off by the public is consolidated, prior to transfer to the landfill tip face and the landfill itself. Green waste is currently shredded and composted on site.

Whakaahua 5 above shows the general layout of the site.

The key site facilities that support the operation of the landfill and waste diversion and transfer activities are shown by Tūtohi 1:

| | |
|---|---|
| **Waste** | • Waste transfer station for drop-off of general waste, prior to transfer to the landfill.<br>• Household hazardous substances drop-off area and dangerous goods store |
| **Resource recovery** | • Rummage shop building for resale of preowned and reusable household goods.<br>• Recycling drop-off area for scrap steel, glass, cans, cardboard, paper, plasterboard, polystyrene, children's car seats, E-waste, and whiteware.<br>• Green-waste drop-off and shredding pad, and composting maturation area |
| **Leachate** | • Leachate collection system, consisting of a perimeter leachate collection trench, drains within the waste, surface drain (along the southern side of the landfill), and pump stations connecting via a pipeline to the adjacent Green Island Wastewater Treatment Plant. |
| **Landfill gas (LFG)** | • Landfill gas collection and destruction system, consisting of wells and pipes connecting to solar flares on the landfill site, and an engine (for electricity generation) and flares located at the adjacent Green Island Wastewater Treatment Plant. |
| **Stormwater** | • Landfill stormwater systems, consisting of drains, pipes, and sediment ponds to intercept, divert and treat stormwater prior to discharge to the Kaikarae Estuary. Stormwater that has the potential to come into contact with waste is treated as leachate and is not discharged to the Kaikarae Estuary. |
| **Monitoring** | • Groundwater and surface water monitoring.<br>• Landfill gas monitoring stations. |
| **Planting** | • Existing screen planting around the perimeter of the site. |

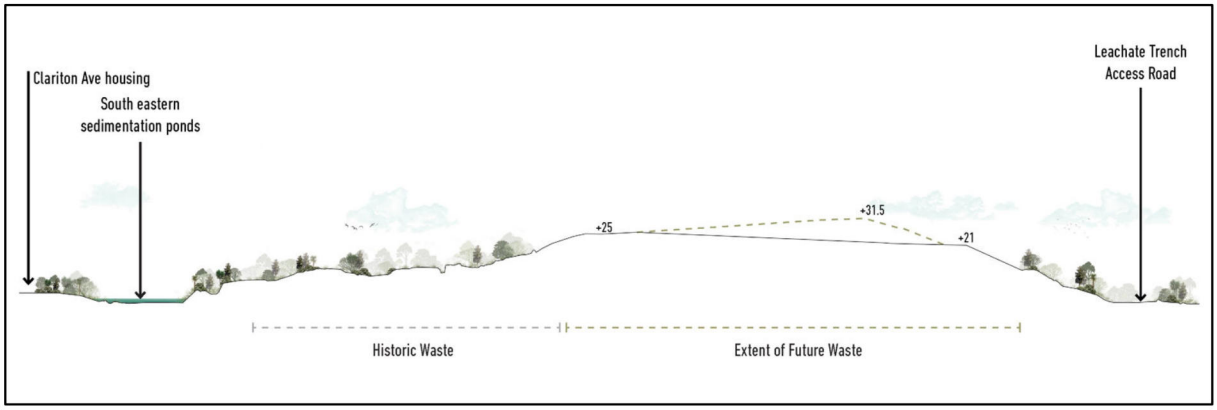
*Tūtohi 1: Green Island landfill, key site facilities and mitigation*[7]

[7] Boffa Miskell, 2023 [unpublished material].

## 1.6 Overview of the proposed resource consents

DCC is applying for replacement resource consents to enable the continued operation, closure, and aftercare of the landfill and waste diversion and transfer facilities at Green Island landfill. This includes the ultimate closure of the landfill in approximately December 2029 depending on waste disposal rates, and ongoing aftercare of the landfill post closure. The general arrangement and profile of the landfill at closure is shown in Whakaahua 6 and 7 below.


*Whakaahua 6: Green Island landfill – general arrangement plan at closure (approximately 2029)*[8]




Whakaahua 7: Green Island landfill – Green Island landfill – final landfill cap landform at closure (illustrative cross-section)[9]

[8] Image credit: Boffa Miskell, 2023 [unpublished material].
[9] Image credit: Boffa Miskell, 2023 [unpublished material].

The key elements of the current application for the landfill are summarised below. More detail is provided in the *Waste Futures - Green Island Landfill Closure Design Report (GHD 2023)*:

- The continued operation of the landfill for the disposal of municipal solid waste, and hazardous waste through to closure.
- Landfill infrastructure improvements including extension of the existing perimeter leachate collection trench along the southern side of the landfill, installation of internal leachate drainage in the landfill, flood and earthquake resilience upgrades of the leachate collection infrastructure.
- Additional landfill gas (LFG) flares/engines at the Green Island Wastewater Treatment Plant
- The continued operation of the waste diversion and transfer facilities until which time these are replaced by new Resource Recovery Park facilities.
- Closure of the landfill in 2029 depending on waste disposal rates. Any remaining open areas of the landfill will be capped and planted, final landfill gas wells installed, and any infrastructure not required for the ongoing aftercare of the landfill removed or modified.
- Ongoing aftercare of the landfill, including continued operation and maintenance of leachate collection, landfill gas collection/destruction, and stormwater infrastructure; maintenance of the landfill cap; and environmental monitoring in accordance with the conditions of the resource consents.

The development of the Resource Recovery Park does not form part of the consent applications. Resource consents for the development and operation of the Resource Recovery Park will be applied for following the completion of design work and technical assessments.

# 2.0 He Kaupapa Mahi: Methodology

Aukaha was contracted by DCC to prepare a cultural impact assessment to support replacement consents for the operation, closure and aftercare of the Green Island landfill. Mana whenua understand that the closure will be undertaken in phases, with waste disposal ceasing in approximately 2029 followed by final capping. The key elements of the project methodology are set out below.

## 2.1 Review of literature

A desktop review was undertaken, focusing on detailed documentary research, to inform the drafting of a cultural values statement related to the proposed closure of the Green Island Landfill. Reference material has been derived from the following key sources:

a. The Kāi Tahu ki Otago NRMP[10]
b. Ngāi Tahu cultural maps[11]
c. District wāhi tūpuna mapping
d. Recorded archaeological sites via ArchSite[12]
e. Available ecological and environmental monitoring data and reports
f. Literature review.

Other relevant policies, plans were identified as further source material during the review of literature.

## 2.2 Cultural values assessment

A cultural values assessment identifies key mana whenua values in the area affected by the proposed activity. The cultural values assessment provided below in Section 3.0 was drafted following a workshop with a mana whenua panel.

## 2.3 Cultural impact statement

A cultural impact statement identifies the impacts of the proposal on the cultural values identified, and proposes recommended actions and expectations to protect these values. In the case of this application, cultural impacts in terms of the following will be a focus of the assessment:

i. Wai māori values
ii. Mahika kai and biodiversity values
iii. Wāhi tūpuna

The final assessment and recommendations were presented to mana whenua representatives for review, comment, and amendment. All material released by Aukaha has been assessed and approved by mana whenua, to ensure that the final report accurately reflects the position of Te Rūnanga o Ōtākou.

[10] KTKO, 2005.
[11] TRONT, 2023.
[12] NZAA, 2023.

## 3.0 Ko te Manawa Kāi Tahu: Cultural Values Assessment

### 3.1 Introduction

Only mana whenua have the expertise to identify values, sites, histories, and processes of cultural significance. Through a co-design process mana whenua will guide how these values and associations can be represented in culturally meaningful ways while keeping the interpretation and development in the hands of its custodians.

Mana Whenua and the combined Mana Taiao and Mana Ahurea teams of Aukaha draw from Kāi Tahu cultural values and narrative documents as valuable taoka that are full of inherited cultural knowledge. This mātauraka Kāi Tahu comes under the custodianship of mana whenua.

The following cultural values and concepts have been specifically identified by mana whenua to inform the progressive closure of the Green Island Landfill, restoration of the Kaikarae Estuary and Stream, and future opportunities to strengthen intergenerational knowledge, community and place-based identity. These values and concepts are purposefully broad to allow design responses that retain flexibility and adaptability within a co-design process that is guided by mana whenua.

Four core values lie at the core of a mana whenua worldview, namely whakapapa, mauri, mana, and tapu. Related values are shown in Whakaahua 8 and discussed below in Sections 4.0 and 5.0.


*Whakaahua 8: Cultural values and associations with the Kaikarae Estuary and Stream*[13]

### 3.2 Whakapapa

> *"Creation and the introduction of all elements into the universe is genealogical or whakapapa-based meaning that ultimately all things in the universe are interconnected and they also share a single source of spiritual authority."*[14]

Kāi Tahu are bound to the land, water and all life supported by them by whakapapa. The following account of Kāi Tahu whakapapa and creation stories is sourced from the words of Rāwiri Te Mamaru, a rakatira of Moeraki in the mid-1800s following the death of the famed Kāi Tahu leader, Matiaha Tiramōrehu:

[13] Mana Ahurea, 2023 [unpublished material].
[14] Pōtiki, 1996.

| | |
|---|---|
| Nā Te Pō, ko Te Ao | *From eternity came the Universe* |
| Nā Te Ao, ko Te Ao Marama | *From the Universe, the bright clear light* |
| Nā Te Ao Marama, ko Te Ao Tūroa | *From the bright clear light, the enduring light* |
| Nā Te Ao Tūroa, ko Te Kore Te Whiwhia | *From the enduring light, the void unattainable* |
| Nā Te Kore Te Whiwhia, ko Te Kore Te Rawea | *From the void unattainable, the void intangible* |
| Nā Te Kore Te Rawea, Ko Te Kore Te Tamaua | *From the void intangible, the void unstable* |
| Nā Te Kore Te Tamaua, ko Te Kore Matua | *From the void unstable, the void endowed with paternity* |
| Nā Te Kore Matua, Ko Te Mākū | *From the void of paternity came moisture* |
| Nā te Mākū, ka noho i a Mahoranui ātea | *From the moisture came limitless thought.* |
| Ka puta ki waho ko Raki | *Then came the visible heavens* |
| Nā Raki, ka noho i a Poko haru a te Pō | *The visible heavens combined with the great abyss to produce the numberless sorceries and the ultimate calamity!* |
| Ko Aoraki me Rakamaomao, tana a Tāwhirimātea | *Thence to Aoraki and the winds and weather* |
| Ka tū te Rakiwhānoa | *To the creator of land* |
| Ui rā ki Te Maha-a-nui ā Māui | *And the canoe of Māui.* |
| Ko te Ao Tākata! | *And finally, to people!* |
| Tīhei mauri ora! | *I cough, the breath of life.* |

Wai is a central element in our creation traditions and is present very early in the whakapapa of the world. In this kōrero, darkness gives rise to the light, and through an abyss of nothingness, moisture materialises as the first iteration of wai.

The whakapapa continues down to Rakinui and his wives, Pokoharua-i-te-Pō and Papatūānuku. The children of Rakinui and his wives created the elements of te taiao, including mountains, rivers, forests, and seas, and all living things. Kāi Tahu claim the same descent from Raki and his wives.

Everything in existence is acknowledged and connected through whakapapa. Whakapapa establishes the ancestral rights which give mana whenua the mana and kaitiaki responsibilities over their takiwā. It is important that opportunities to uncover, reference and share the whakapapa of place and people be explored through this project, to enhance a collective sense of place and identity.

## 3.3 Mauri

Mauri is a life-giving force that flows from our living world and down through whakapapa, connecting and binding together all aspects of our world.

Mauri is an observable measure of environmental health and well-being. Waterbodies and estuaries with an intact and strong mauri sustain healthy ecosystems and support mahika kai and other cultural values. The primary resource management principle for Kāi Tahu is the protection of mauri. Concepts such as tapu, noa and rāhui are therefore applied by mana whenua to protect the mauri of a resource.

However, the mauri of a waterway or estuary is unable to protect itself against unnatural actions and interventions such as damming, diversions, altered flow regimes, discharges, and reclamation. Kā Rūnaka have seen this pattern take place over and over throughout the history of European settlement in Te Waipounamu, with many behaviours and actions that undermine and degrade the mana and the mauri of our waterways and estuaries still in evidence today. For the Kaikarae Estuary this history is implicitly linked to the construction of the Green Island and the Maxwell landfills on the estuary and a long history of industrial discharges into the Kaikarae Stream higher up the catchment.

The protection of mauri should inform the project design and particular consideration should be given to protection and enhancement of water quality, biodiversity, and social wellbeing.

### 3.4 Mana

Mana is often loosely translated to mean the 'authority' or 'prestige' that mana whenua hold over their takiwā. Through the recognition of mana, mana whenua have the 'authority' to make decisions over the whenua and waterways (both wai māori and wai tai) within their takiwā. The mana of Kāi Tahu in Ōtepoti will be elevated when the Council, as a treaty partner ensures that the status of mana whenua is recognised, respected, and represented within the project. Mana will be recognized through working relationships where mana whenua values, concepts, tikaka, pūrākau and visual identity is appropriately expressed throughout all aspects of the project.

### 3.5 Rakatirataka and Kaitiakitaka

Rakatirataka refers the exercise of mana in order to give effect to Kāi Tahu culture and traditions. In the management of the natural world, rakatirataka is underpinned by the obligations placed on mana whenua as kaitiaki. Kaitiakitaka is an expression of rakatirataka. Wai māori is a taoka that is governed under the domain of rakatirataka, in accordance with Kāi Tahu tikaka and the principles of kaitiakitaka.

The whakapapa connection with te taiao imposes a kaitiakitaka obligation on mana whenua to protect wai and all the life it supports, in accordance with customs, knowledge, and mātauraka developed over many generations. The duty of kaitiakitaka is not merely about guarding or caretaking but involves acting as an agent for environmental protection and decision-making, on behalf of tūpuna and mokopuna. The focus of kaitiakitaka is to ensure environmental sustainability for future generations, as expressed in the whakataukī mō tātou, ā, mō kā uri a muri ake nei.

### 3.6 Tapu

Mana Whenua should guide discussions and lead the appropriate procedures and protocols regarding wāhi tapu sites, archaeological findings, and the treatment of, and knowledge relating to, taoka. Tapu provides an element of safety and direction where there are restrictions. The Māori world is guided completely by tapu and noa.

### 3.7 Mātauraka

The body of Māori knowledge and understanding which encompasses (among other things) the Māori world view and perspectives, traditional knowledge, and practices.

### 3.8 Tikaka

Tikaka is derived from the word 'tika' meaning right or correct, and therefore in this context references behaviour and design outcomes that are culturally appropriate. In this context we have applied tikaka as a core value as it fits with the values and general aspirations for a well thought-out and executed project. Mana whenua engagement throughout all development phases of the closure of the Green Island landfill will allow them to guide culturally appropriate actions at the correct times.

### 3.9 Utu

Utu in this context is about an intent to redress historical and current imbalances in ecological and built forms through design. The Green Island landfill was progressively built on the Kaikarae Estuary resulting in a significant loss of ecological and cultural values. The closure of the Green Island provides an opportunity to restore ecological balance to this degraded estuary.

### 3.10 Maumaharataka

Historical events regarding Māori are often excluded from the public narrative, or not fairly or correctly recorded. Maumaharataka emphasizes the importance of upholding memories of the past and communicating Kāi Tahu pūrākau of place, including place names, cultural heritage, and narratives. This strengthens intergenerational knowledge, community, and place-based identity. The closure of the Green Island Landfill creates opportunities for interpretation of pūrākau of place, including place names, cultural heritage and narratives associated with the Kaikarae Estuary.

### 3.11 Tapatapa

Tapatapa is a manifestation of mana through the naming of landscapes by our tūpuna. The placenames Rākaihautū left behind as he laid claim to many areas in the South Island are an example of tapatapa. Placenames are important as they are from the earliest migrations and people. These placenames must always be referred to and never replaced with others if the original name is available. Tapatapa provides opportunities for strengthening intergenerational memory, and cultural and place-based identity.

### 3.12 Oraka

Oraka represents the act of resting or an area of rest. This value is of significance due to the environmental regeneration of the Kaikarae Estuary that is both required and proposed following closure of the Green Island landfill.

### 3.13 Taoka

Indigenous species are valued as taoka by Kāi Tahu, as are the habitats through which taoka species survive and thrive. The ecosystems provided by wai māori, in lakes, rivers, wetlands, estuaries, and at the coast, offer lifegiving habitats for indigenous species. Whanaukataka is at the heart of this relationship. Thus, when the health of a waterway or estuary is degraded, the impacts are far-reaching, for the waterway, for the ecosystems, habitats, and species it supports, and for the people.

## 4.0 He taura whiri kotahi: Mana whenua associations with the Kaikarae Estuary

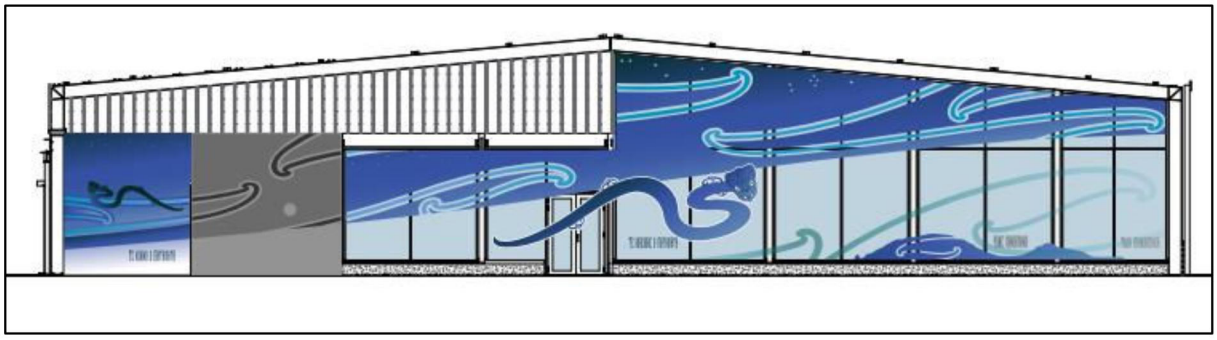
### 4.1 Wāhi Tūpuna

Wāhi tūpuna are interconnected ancestral places, landscapes and taoka that reflect the histories and traditions of mana whenua. Wāhi tūpuna are characterised not only by natural and physical aspects, but also by the place names and associated traditions and events that bind mana whenua to the landscape. The Kaikarae Estuary is part of an integrated cultural landscape for mana whenua, as described by Tūtohi 2:

| Ikoa Māori | Location/Ikoa Pākehā | Description |
|---|---|---|
| **Pakaru** | Kaikarae Lagoon | Pakaru is the traditional Māori name for the Kaikarae Lagoon, near the mouth of the Kaikarae stream. Along with Kaikarae, Pakaru was an important kāika mahinga kai for local Kāi Tahu. During the 1879 Smith-Nairn Royal Commission of Inquiry into the Ngāi Tahu land claims, local Ngāi Tahu kaumātua recorded Pakaru as a kāika mahika kai where tuna and pātiki were gathered. |
| **Kaikarae** | Kaikarae Lagoon and Stream | Kaikarae is associated with the Waitaha explorer Rākaihautū. Upon arriving at Whakatū in the Uruao waka, Rākaihautū divided his people into two groups. His son, Rakihouia, took one party to explore the coastline, and Rākaihautū led the other party through the interior of Te Waipounamu and down to Murihiku, using his kō named Tūwhakaroria to dig out most of the fresh-water lakes of Te Waipounamu. While travelling back up the island, Rākaihautū and his party stopped at the mouth of a stream to eat, and their food was a seabird known as karae. This particular location and stream was named Kaikarae. |
| **Pukemakamaka** | Saddle Hill | Matamata was the kaitiaki of Kāti Māmoe chief Te Rakitauneke and is attributed to carving out the Ōtākou harbour and the Taiari river in search of his lost master when they became separated. The taniwha finally resting where Saddle Hill is now, becoming the peaks Turi-makamaka and Pukemakamaka. |

*Tūtohi 2: Wāhi Tūpuna in the area surrounding the Green Island Landfill site*[15]

[15] TRONT, 2023.



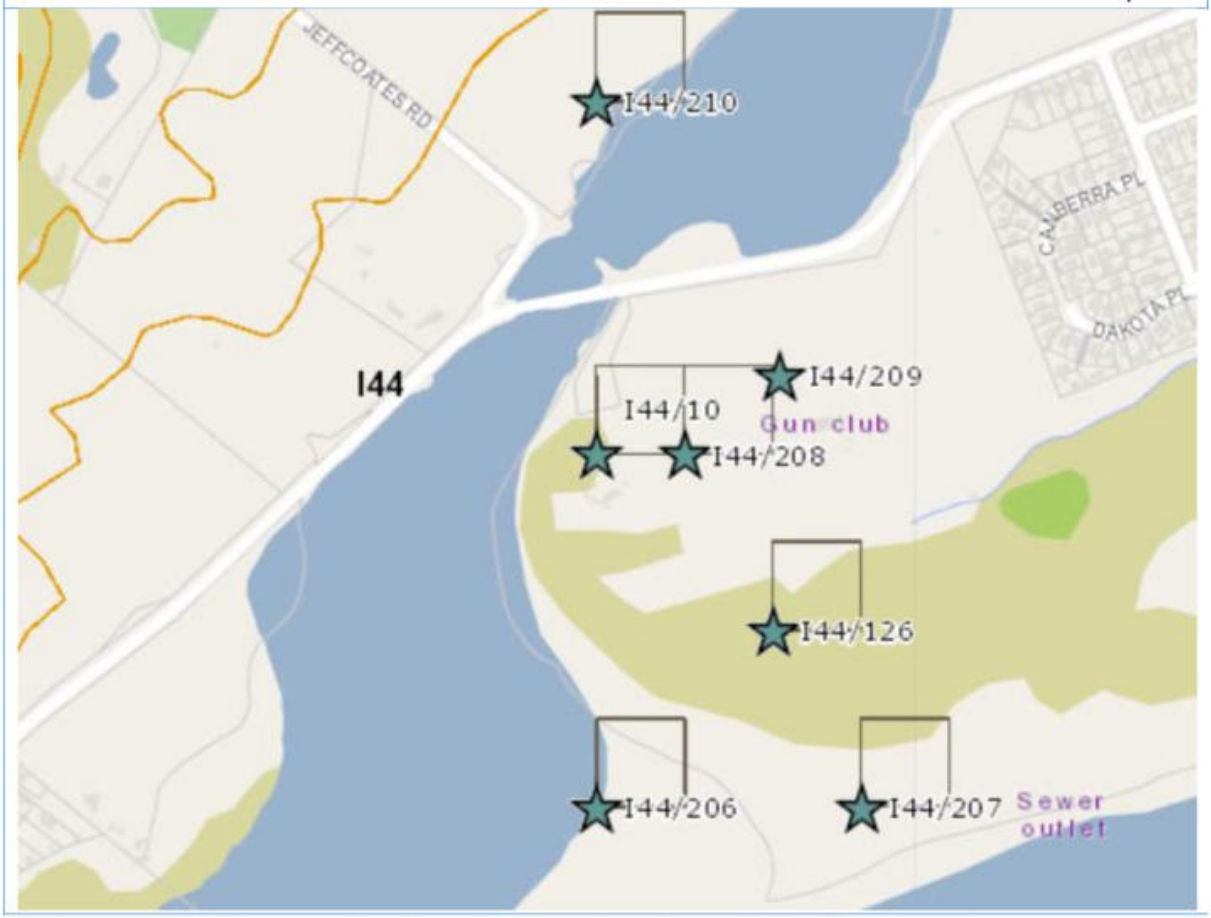
*Whakaahua 9: Matamata design by Ephraim Russell for the Taiari Aquatic Centre*[16]

*Whakaahua 10: Kaikarae Estuary 1926*[17]

Recorded archaeological sites in the area provide further evidence of a long history of occupation and use of the Kaikarae Estuary, with finds of a moa hunter camp at the mouth of the Kaikarae Stream (I44/206), middens and artefacts, as described in Tūtohi 3 below.

[16] Image credit: Mana Ahurea & Russell, 2022 [unpublished material].
[17] Image credit: Hocken Library, 2023.

| Site number | Description | Details |
|---|---|---|
| **I44/10** | Midden / Oven | Midden (mainly pipi, with cockle and mudsnail), hangi stones. Findspot for a saw-like abrader and a small adze. |
| **I44/126** | Midden / Oven | Midden with stone flakes, charcoal, shell, and moa bone. |
| **I44/206** | Nohoaka / Kaika | A moa hunter camp which was washed away in the early 1950s with the change of course at the mouth of the Kaikarae Stream. The site had included a shell midden with stone lined hearths, moa bones and artefacts. |
| **I44/207** | Artefact | Find of adzed wooden object. |
| **I44/208** | Midden | Midden of cockle and pipi. |
| **I44/209** | Midden | Midden that included cockle, pipi and mudsnail. |
| **I44/210** | Artefact | Cache of adzes of grey basalt located on the south side of the Kaikarae Estuary. |




*Tūtohi 3: Recorded Māori archaeological sites on the Kaikarae Estuary*[18]

[18] NZAA, 2023.

## 4.2 Ara Tāwhito and Ara Hikoi

Traditional travel routes through the interior and along the coast connected Kāi Tahu to places of importance for gathering and harvesting mahika kai and connected sites of permanent and seasonal occupation. Kāi Tahu rakatira Te Raki provided instructions about kā ara tawhito to early Pākehā officials who sought to traverse Otago by foot.[19] Old tracks followed *"along the western hill-tops, the line of Kaikarae Valley, and the seacoast"*.[20] Other Kāi Tahu trails proceeded from Kaikarae over Whakaari or Whānau-paki, to Waikōuaiti.[21]

*Whakaahua 11: Kaikarae Estuary and Pukemakamaka 1951*[22]

## 4.3 Mahika Kai

Mahika kai practices underpin the Kāi Tahu relationship with Otago's rivers, lakes, wetlands, and estuaries. Cultural identity as whānau and hapū is tied to resources, which are significant taoka. Fundamental to the culture of mana whenua is their ability to learn and practise customary gathering of food and other resources, to put kai on the table at the marae and at home and to ensure that the knowledge of customary practices is passed on from generation to generation.

The coastal estuaries, lakes and wetlands of the Otago region once supported rich and healthy mahika kai resources, including a range of shellfish, sea fishing, eeling and harvest of other freshwater fish in

[19] Shortland, 1851.
[20] Griffiths & Goodall, 1980, p. 21.
[21] Pybus, 1954, p. 117.
[22] Image credit: White Aviation Ltd., 1951.

lagoons, wetlands, and rivers; waterfowl, sea bird egg gathering, forest birds; and a variety of plant resources including harakeke, fern and tī kōuka root. The Kāi Tahu reliance on these coastal resources increased even further after the land sales of the 1840s and 1850s, and the associated loss of access to much traditional land-based mahika kai.

For mahika kai to be sustained, populations of species must be present across all life stages and must be plentiful enough for long term sustainable harvest. Safe access to mahika kai sites must be available, kai must be safe to gather, safe to harvest and safe to eat and management and harvesting practices must be able to be carried out in accordance with tikaka.

The transmission of mātauraka necessitates whānau being able to access healthy mahika kai to carry out customary practices. The restoration of the mauri of Kaikarae estuary to provide healthy habitat for mahika kai and taoka species is a long-term vision for Ōtākou whānau.[23] The closure of the Green Island Landfill is significant step towards achieving that vision.

[23] Consultation with Ōtākou whānau as part of the development of the Proposed Otago Land and Water Regional Plan. Whānau acknowledged that this was long-term vision given the current degraded state of the estuary.

## 5.0 E rite ana ki te karo o te moa: The Kāi Tahu history of loss

Te Tiriti o Waitangi was signed by representatives of Kāi Tahu whānui in late May and early June of 1840.[24] Subsequently, in 1844 and 1864, Kāi Tahu agreed a series of land sales with the Crown.

The Otago Deed was signed at Kōpūtai Port Chalmers on the 31st of July 1844. The terms of the purchase agreement provided for the sale of more than 400,000 acres of Kāi Tahu land to the New Zealand Company for £2,400.[25] The Deed includes reference to Kaikarae as a boundary of the land sale, indicating its broader significance within the rōhe for the rakatira present.

Kāi Tahu withheld from sale lands at Taiari, Ōtākou and Te Kāroro, an area totalling approximately 9,600 acres[26] In addition, Kāi Tahu understood that they would retain their valued lands, mahika kai, and sea fisheries, in addition to "ample reserves" for their present and future needs.[27] Such promises were not fulfilled, and further lands were not reserved to Kāi Tahu.[28]

Over time the ancestral lands were surveyed, sold, and settled and it was increasingly difficult to follow kā ara tawhito and to access wāhi tūpuna and wāhi mahika kai. Changes in the ancestral landscape and the loss of mahika kai resources impacted on Kāi Tahu communities, contributing to the displacement of whānau, loss of knowledge and identity, and economic hardship.

The significance of mahika kai as a cornerstone of Kāi Tahu kawa and tikaka cannot be overstated. It was through these practices that knowledge and skills were handed down, and through the seasonal practice of heke that the relationship with whenua and wai māori was sustained. This continued reaffirmation of ahikāroa across the seasons was required to affirm rakatirataka and mana, but also provided opportunities for reconnection with the deeds, stories, and learning of tūpuna.

Thus, the deprivation suffered by Kāi Tahu over this time encompassed not only the material loss of land as an asset base and seasonal mahika kai resources, but the loss of a spiritual connection to te taiao, of the ability to exercise rakatirataka, a fundamental building block of Kāi Tahu life and identity, and the transmission of mātauraka.[29]

The loss of connection to the whenua that took place as a result of the Otago Deed, coupled with the visible deterioration, degradation and modification of lakes, rivers, waterways, and estuaries since that time, is a source of great mamae for mana whenua. This is particularly true given the obligations on mana whenua as kaitiaki whenua in their takiwā, mō tātou, ā, mō kā uri a muri ake nei.

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[24] Waitangi Tribunal, 1991, s4.2.

[25] When the land was surveyed in the following years, the actual extent of the Otago Block came to 534,000 acres. Rakiura Māori Land Trust, 2013, p. 26.

[26] Waitangi Tribunal *The Ngāi Tahu Report* (Wai 27, 1991) vol. 1, pp. 30-31.

[27] Several witnesses also recalled that Kāi Tahu were promised 'tenths', in a similar scheme to the 'tenths' allocations that were sanctioned at the Whakatū sale and at other sales in the North Island. Evison, 2007; see also Dacker, 1994.

[28] Dacker, 1994, p. 21.

[29] Waitangi Tribunal, 1991.

## 6.0 He ara poutama: Statutory framework

There are a number of statutory and policy frameworks that are relevant to this application. This section is not exhaustive but provides a brief description of specific guidance in the statutory frameworks with respect to the cultural values discussed above.

### 6.1 Resource Management Act (RMA) 1991

The management of natural and physical resources in New Zealand is governed by the Resource Management Act (RMA) 1991. Part 2 of the RMA specifically speaks to the importance of recognising tangata whenua values.

The relationship of Kā Rūnaka with the Kaikarae estuary is a matter of national importance that must be recognised and provided for in managing natural and physical resources.[30] The depth and breadth of the deep and longstanding relationship of mana whenua with the Kaikarae Estuary and the surrounding area is discussed in Section 5.0.

In achieving the purpose of the Act particular regard must be had to kaitiakitaka.[31] Kāi Tahu whānau exercise kaitiakitaka in this catchment. Maintaining a balance between the right to access and use natural resources, and the responsibility to care for te taiao, with a focus on providing a sustainable base for future generations is implicit in kaitiakitanga. This is the underpinning meaning of the whakataukī, Mō tātou, ā, mō kā uri a muri ake nei.

The principles of the Treaty of Waitangi (Te Tiriti o Waitangi), including the principles of active protection of mana whenua interests,[32] recognition of rakatirataka[33] and partnership[34] must also be taken into account.[35] Involvement of mana whenua in the future management of the landfill site, including co-design of rehabilitation and restoration of the estuary, is an important means of implementing these principles.

### 6.2 Kāi Tahu ki Otago Natural Resource Management Plan 2005 (NRMP)

The NRMP is the operative Iwi Management Plan which sets out Otago Papatipu Rūnaka aspirations in relation to natural resource management in their takiwā (area). The NRMP is founded in the concept of 'Ki Uta ki Tai,' which emphasises the holistic te ao Māori.

The provisions of the NRMP provide important guidance as to what is needed to fulfil the obligations of sections 6(e), 7(a) and 8 of the RMA. Relevant provisions of the NRMP are set out in Appendix 2. The provisions are wide-ranging, but emphases include:

- Recognition of the spiritual and cultural significance of wai to Kāi Tahu.
- Reduction in contaminants being discharged directly or indirectly to water.
- Restoration of the mauri of wai māori and coastal waters.
- Rehabilitation of contaminated environments.

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[30] Resource Management Act 1991, section 6(e)
[31] Resource Management Act 1991, section 7(a)
[32] *New Zealand Māori Council v Attorney-General [1987] 1 NZLR 641 at 664.*
[33] *Waitangi Tribunal, Motunui-Waitara Report, pg 51.*
[34] *Te Rūnanga o Wharekauri Rekohu v Attorney-General [1993] 2 NZLR 301, Cooke J.*
[35] Resource Management Act 1991, section 8.

- Protection of wetlands.
- Protection of the habitats and wider needs of mahika kai and taoka species, and restoration and enhancement of indigenous biodiversity.
- Recognition and support for the rakatirataka and kaitiakitaka of Kāi Tahu in resource management, including through:
    - involvement in development of monitoring programmes,
    - collaborative research and participation in management of mahika kai, and
    - recognition of rakatirataka by empowering mana whenua interpretation of their histories and associations with wāhi tūpuna.

## 6.3 National Policy Statement for Freshwater Management 2020 (NPSFM 2020)

The concept of Te Mana o te Wai has been part of the NPSFM since 2014. However, Te Mana o te Wai was brought to the forefront of freshwater management in Aotearoa through NPSFM 2020.

Te Mana o te Wai recognises that protecting the health of freshwater (te hauora o te wai) protects the health and wellbeing of the wider environment (te hauora o te taiao). The NPSFM 2020 recognises the relationship of mana whenua with freshwater and requires that Māori freshwater values are provided for and that mana whenua are actively involved in freshwater management processes.[36]

Policy 6 requires that there is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted. The NPSFM 2020 and the related National Environmental Standards for Freshwater 2020 (NESF) provide for operation of landfills in and near wetlands in some circumstances, but require that, if adverse effects on the wetland cannot be avoided, they are managed in accordance with an effects management hierarchy.[37]

## 6.4 Proposed Otago Regional Policy Statement (PRPS)

The objectives relating to Te Mana o te Wai in the PRPS was developed in consultation with mana whenua, as required by the NPSFM 2020, and reflects the Kāi Tahu ki Otago perspective on wai māori as follows:

### *LF-WAI-O1 Te Mana o te Wai*

The mauri of Otago's water bodies and their health and well-being is protected, and restored where it is degraded, and the management of land and water recognises and reflects that:

1. water is the foundation and source of all life - na te wai ko te hauora o ngā mea katoa,
2. there is an integral kinship relationship between water and Kāi Tahu whānui, and this relationship endures through time, connecting past, present and future,
3. each water body has a unique whakapapa and characteristics,
4. water and land have a connectedness that supports and perpetuates life, and
5. Kāi Tahu exercise rakatirataka, manaakitaka and their kaitiakitaka duty of care and attention over wai and all the life it supports.

[36] NPSFM 2020 Clause 1.3(4)(a)-(c), Policy 2, Clause 3.4.
[37] NPSFM 2020 Clause 3.22(1)(f); NESF Clause 45B.

Te Mana o te Wai policies require that:

- The environmental, social, cultural and economic relationships of Kāi Tahu with water bodies are sustained and mātauraka is incorporated into freshwater decision-making, management and monitoring processes (LF-WAI-P2)
- The habitats of mahika kai and taoka species associated with water bodies are sustained and restored (LF-WAI-P3).

This policy direction is also reflected in the long-term freshwater vision for the Dunedin & Coast Freshwater Management Unit (FMU),[38] and in the objective for natural wetlands (LF-FW-O9).

The PRPS objectives for wāhi tūpuna are also relevant, requiring protection of the values of wāhi tūpuna (HCV-WT-O1) and recognition and provision for rakatirataka and kaitiakitaka over these areas (HCV-WT-O2).

## 6.5 Regional Plans

Both the Regional Plan: Water and Regional Plan: Waste are relevant to this application.

### *Regional Plan: Waste*

The provisions for landfills in the Regional Plan: Waste do not refer to Kāi Tahu values, but Chapter 3 Manawhenua Issues describes mana whenua concerns about waste management and includes objectives requiring that:

- The quality of Otago's natural and physical resources is not degraded by wastes (3.3.1)
- The mauri of waste-affected resources is restored (3.3.2)
- Waste management practices are compatible with Kai Tahu values (3.3.3)
- A holistic approach is taken to waste management (3.3.4).

The policies for contaminated sites are relevant to guide longer term management of the site. Policy 5.4.1 requires recognition of the relationship of Kai Tahu with natural and physical resources by:

- Carrying out remediation and mitigation of contaminated sites in a manner that takes into account Kāi Tahu cultural values;
- Protecting wāhi tapu and wāhi taoka, and access to them by Kāi Tahu, from the effects of contamination;
- Acknowledging that future generations will inherit the results of work carried out to remedy or mitigate contaminated sites; and
- Consultation with Kāi Tahu on issues relating to site contamination.

Policy 6.3.2 requires that effects of hazardous substances and hazardous wastes on traditional water, land and mahika kai values of importance to Kāi Tahu are avoided, remedied or mitigated, and Policy 6.4.12 includes similar direction to that in Policy 5.4.1 for contaminated site management.

[38] Proposed Regional Policy Statement, 2022, see LF-VM-O5 (2) and (3).

### *Regional Plan: Water (RPW)*

Schedule 1D in the RPW identifies spiritual and cultural beliefs, values and uses of significance to Kai Tahu in respect to specified water bodies, and these are required to be maintained or enhanced.[39] Schedule 1D identifies the following values associated with Kaikarae Stream:

- Kaitiakitaka
- Mauri
- Wāhi tapu and/or waiwhakaheke (wāhi tūpuna)
- Wāhi taoka
- Mahika kai
- Kohanga (nursery/spawning areas for indigenous species)
- Trails
- Cultural materials.

Kaikorai Lagoon Swamp is also identified in the RPW as a Regionally Significant Wetland. The values and uses of such wetlands must be recognised and sustained.[40]

## 6.6 Dunedin Second Generation District Plan (2GP)

The Green Island Landfill is provided for by a designation (D658) in the 2GP and so is not subject to resource consent requirements under that plan. However the values identified and protected in the 2GP are relevant considerations for management of the landfill and its closure.

The wāhi tūpuna values of the Kaikarae estuary are recognised in the 2GP, with reference specifically to mahika kai and archaeological values.[41] The area is also subject to an archaeological alert layer. The estuary and lagoon are identified as an Area of Significant Biodiversity Value (C106) with regional significance, highlighting the importance of the habitat for mahika kai and other taoka species.

Objective 14.2.1 in the 2GP requires that the relationship between mana wheua and the natural environment, including the cultural values and traditions associated with wāhi tūpuna and mahika kai, is maintained or enhanced. Policies for achieving this objective require that adverse effects of the following are addressed:

- Effects of activities in or adjacent to wetlands on mahika kai values, where these wetlands are identified as wāhi tūpuna
- Effects of landfills on mana whenua values.

[39] Regional Plan: Water, Objective 5.3.2.
[40] Regional Plan: Water, Objective 10.3.2.
[41] DCC, 2021, Schedule A4, A4.51.

# 7.0 Cultural Impact Assessment

## 7.1 Introduction

The Kaikarae Estuary and its associated waterways hold great significance for mana whenua. Mana whenua have longstanding concerns over the degradation of the Estuary due to past and current land uses which include landfilling and industrial discharges. The on-going operation of the landfill until 2029 and closure requires careful management to mitigate potential adverse effects on wai māori, taoka species and indigenous biodiversity.

The long-term aspiration of mana whenua is to restore the Kaikarae Estuary and surrounding waterways to their traditional state as abundant mahika kai sources and a place where taoka species thrive, and to reflect mana whenua values and pūrākau associated with the Kaikarae Estuary in a tangible way through a co-design process.

## 7.2 Wai Māori

Wai Māori – Impacts on Mana, Mauri, Whakapapa, Rakatirataka and Kaitiakitaka, Tapu, Utu, Taoka

To Kāi Tahu, wai is a taoka under their mana and rakatirataka. Rather than implying an economic model of ownership, mana whenua view the protection and enhancement of wai as part of their role as katiaki, a role which is inherited through whakapapa. While few restrictions existed around placing landfills within and adjacent to waterways in the 1950s, the concept of 'Te Mana o Te Wai' now pervades freshwater management in Aotearoa. This concept places the health and well-being of the waterway as the first priority. Involvement of takata whenua is vital to the implementation of Te Mana o Te Wai and mana whenua have had input into the PRPS which affirms the Kāi Tahu ki Otago interpretation of Te Mana o Te Wai in their takiwā.

The Kaikarae Estuary, Stream and other associated waterways make up an area which has immense traditional significance to mana whenua. As stated previously, mana whenua today seek to restore the Estuary and its associated waterways to its traditional state. Embarking on a journey of restoration is embodied by the mana whenua value, utu. Utu is realised through the proposed measures which enable the rehabilitation of the Stream, Estuary and associated waterways. This starts with ensuring leachate and contaminants are not able to enter the waterways during all phases of the landfill operation and beyond its closure. The impact of leachate on the Stream, Estuary and associated waterways is one of the principal concerns that mana whenua have in relation to the operation and existence of the landfill. The construction of the landfill and its continued operations on the Kaikarae Estuary, in combination with other industrial discharges, has degraded the mauri of the Kaikarae Stream and surrounding area across decades and has made the area tapu, so that it cannot be used for mahika kai.

Groundwater is hydraulically connected with surface water from the Kaikarae Stream. This means that the water level of the Stream decreases when groundwater is abstracted from the leachate collection trench. The AEE states that the volume of the groundwater-connected surface water extraction is estimated to be less than 0.5 L/s for the entire length of the trench and any effect is said to be negligible when considering the stream flows and volumes in the estuary. Mauri and whakapapa are integrally connected to the natural behaviour of the waterway, and change to the natural hydrology, even if this is small, is one of the many factors that affects mauri and the whakapapa of the waterway. (The natural hydrology has also been affected in a significant way by encroachment of the landfill into the wetland; the loss of wetland extent is discussed in 7.3 below.)

If contaminants from leachate or sediment enter groundwater or surface water, this would further degrade the mauri of the Stream and surrounding area, hindering the restoration efforts of both mana whenua and Council. Contaminants can have negative impacts on the water quality, as well as on the ecosystems and all life that is sustained within that waterway. This includes avifauna, aquatic fish, invertebrates, vegetation, and riparian vegetation.

The technical reports also state that low lying areas adjacent to the landfill site are at risk of flooding and storm surge from the Kaikarae Stream and Estuary. These risks will be further exacerbated by climate change and sea level rise. Monitoring and providing for the impacts of climate change are a key focus for mana whenua. It is vital that there are robust mitigation and monitoring measures in place to ensure that the landfill does not become inundated, causing leachate and other contaminants to flow into the Kaikarae stream and surrounding waterways.

Groundwater modelling undertaken by DCC demonstrates that the leachate trench system is effective at creating a barrier and intercepting leachate flowing from the landfill. It is also said to be effective in drawing in groundwater from outside the trench and preventing the movement of potentially contaminated groundwater from historic waste located outside of the trench into surface water. Water monitoring has also shown that the trench is effective in intercepting leachate, and that there is no discernible adverse effect on water quality resulting from the landfill, including from the surface water discharges. Although DCC do not expect any discernible adverse effects on water quality resulting from the landfill, it has proposed that an interim Human Health Risk Assessment (HHRA) is undertaken alongside other structural improvements. These improvements include:

- Extension to the leachate collection trench.
- Repair of the culvert between the south eastern and eastern constructed wetlands.
- The fitting of outlets to the eastern and western sedimentation ponds.
- Raising of the berm of the landfill perimeter road and pump station components to minimise the risk of floodwater inundation.

Mana whenua understand that the primary way that leachate will be contained and controlled will be through the collective function of the leachate collection trench with the proposed extensions, the gravel drains at the base of the perimeter bund and additional leachate drains in the landfilled waste.

Mana whenua understand that the DCC is confident that the leachate collection trench is fit-for-purpose and able to withstand predicted leachate flows as well as forecasted sea level rise and climate change impacts. Council has confirmed that the existing management measures for groundwater, leachate and stormwater will continue to be implemented during the continued operation, closure, and aftercare of the landfill. These measures are set out in the Landfill Development Management Plan (LDMP) and include:

- Maintaining the efficient function of the leachate collection system
- Stormwater cut-off drains and diversions to minimise stormwater reaching the active tip face and daily cover areas
- Avoiding excavations that cause stormwater to drain to underlying waste
- Placing, maintaining, and repairing intermediate and final cover as soon as possible and at appropriate grades
- Mowing to increase evapotranspiration.
- Separation of clean runoff from contaminated runoff and treating contaminated runoff as leachate
- Provide adequate grades to minimise ponding on the landfill

- Keeping surface drains free of obstructions including litter
- Maintenance of stormwater infrastructure, including desilting of sediment ponds
- Line surface drains with an impermeable material and where necessary to avoid erosion damage
- Repair and reinstatement of eroded areas and drains
- Monitoring of water quality and eco-toxins

If the potential adverse impacts described above were to occur, this would further degrade waterways which are already currently in poor health. It is the aspiration and duty of mana whenua to enhance the health and wellbeing of all bodies of water as kaitiaki.

**Recommendations: Wai Māori**

- That all practicable measures are taken to prevent discharges entering water, including preventing, where possible, leachate from entering groundwater and surface water.
- That effects on mauri and whakapapa from alteration of the existing hydrology and contaminants entering water are offset by mitigation measures, including riparian planting and pest management. Proposed offsetting or mitigation management plans need to be provided to mana whenua for review and consultation prior to implementation. While these measures do not directly address the adverse effects on mauri, they will contribute to enhancement of the mauri of the area.

The recommendations of both the Groundwater Technical Assessment, Surface Water Report and Ecological Report, and those set out in the Assessment of Environmental Effects (AEE) and Landfill Management and Development Plan are supported by mana whenua.

Values: Mana, Mauri, Whakapapa, Rakatirataka and Kaitiakitaka, Tapu, Utu, Taoka.

## 7.3 Mahika Kai and Biodiversity Values

Prior to European settlement, the Kaikarae Stream catchment would have supported large wetland areas surrounding several defined streams, with hillslopes and elevated areas supporting mixed podocarp hardwood forest, with mataī, tōtara, rimu, māhoe and narrow-leaved houhere dominant on coastal hills. In the lower catchment, freshwater wetland and forest areas would have graded to intertidal / saltmarsh areas.[42]

Kaikarae Lagoon is listed as an Area of Significant Biodiversity Value (ASBV) in the DCC 2GP. The indigenous vegetation and habitats of the lagoon are of regional significance and include estuary mudflat, saltmarsh, reed swamp, and succulent herb swamp.[43] Kaikarae Lagoon is also listed as a regionally significant wetland by ORC in the Water Plan.[44] [EIA]

The habitats and species of Abbotts Creek, Kaikarae Stream and Lagoon are assessed and described in the Ecological Impact Assessment. The indigenous vegetation of the lagoon is largely saltmarsh, ribbonwood, pūrei, and oioi rush. However, much of the former indigenous vegetation such as the

[42] Green Island Landfill, Ecological Impact Assessment Section 4.1 [unpublished material].
[43] Dunedin Section Generation District Plan, Schedule A1.2
[44] Regional Plan Water, Schedule 9 Regionally Significant Wetlands and Wetland Management Areas.

succulent herb swamp has been replaced by weedy exotic species, particularly cocksfoot, gorse and crack willow.[45] Six native fish species were observed during sampling across all sites, including black flounder, common bully, inanga, longfin eel, shortfin eels, and upland bully. [46]The Landscape and Visual Assessment proposes development of a Vegetation Management and Restoration Plan to provide opportunities for riparian ecological enhancement and a more natural sequence of indigenous vegetation types in the area, enhancing ecological connectivity.[47] A transition to eco-sourced native tree species within the existing screen planting around the perimeter of the landfill is recommended.[48] Further, mana whenua understand that ecological enhancement is proposed within the borrow pit following closure of the landfill.

**Recommendations: Mahika Kai and Biodiversity Values**

The protection of habitats and the wider needs of mahika kai and taoka species is sought by mana whenua, including:

- Indigenous plant and animal communities and the ecological processes that ensure their survival are recognised and protected to restore and improve indigenous biodiversity.
- Creating networks of linked ecosystems.
- Protecting and enhancing wetlands
- Requiring the management of hazardous operations to avoid impacts on mahika kai values.

The recommendations of both the Ecological Impact Assessment and the Landscape and Visual Assessment are supported by mana whenua.

It is recommended that the Vegetation Management and Restoration Plan is developed in partnership with mana whenua to restore the ecological values of the Kaikarae Estuary, provide habitat for taoka species and rebalance mauri.

Values: Mana, whakapapa, wāhi tūpuna, mauri, utu, mahika kai and taoka

## 7.4 Wāhi Tūpuna

When the landfill closes there will be opportunities for public recreational use around the perimeter of the site and environmental enhancements, which could include planting restoration projects and new walking and biking tracks beside the Kaikarae Estuary. The aspiration of Te Rūnanga o Ōtākou is to incorporate mana whenua values and pūrākau associated with the Kaikarae Estuary in a tangible way and to restore the values of this wāhi tūpuna.

Recommendations:

The protection of the values of wāhi tūpuna is sought by mana whenua, including:

- Protecting the full range of landscape features of significance.
- Ensuring that the interpretation of Kāi Tahu histories associated with the Kaikarae Estuary and Pukemakamaka is undertaken by Te Rūnanga o Ōtākou.

[45] Green Island Landfill, Ecological Impact Assessment, Section 4.5.3 Kaikarae Lagoon
[46] Green Island Landfill, Ecological Impact Assessment, Executive Summary
[47] Landscape and Visual Assessment, Section 2.1.4
[48] Landscape and Visual Assessment, Section 6.0 Recommendations

- Encouraging the use of traditional place names.
- Requiring site rehabilitation plans for land contaminated by landfills.

It is recommended that a co-design process is undertaken with mana whenua to incorporate mana whenua values and pūrākau associated with the Kaikarae Estuary following closure of the Green Island landfill, as discussed in Appendix 3.

Values: Mana, Whakapapa, Rākaihautu, Matamata, Wāhi Tūpuna, Mauri, Utu, Oraka, Tapu, Tikaka, Tapatapa, Kaika, Ara Hikoi, Ara Tawhito, Mahika Kai, Taoka

## 8.0 He kupu whakamutuka: Conclusion

The Dunedin City Council is applying for replacement resource consents to enable the continued operation, closure, and aftercare of the landfill and waste diversion and transfer facilities at Green Island.

The mauri of the Kaikarae Estuary and the associated waterways is unable to protect itself against unnatural actions and interventions such as diversions, altered flow regimes, discharges, and reclamation. This history is implicitly linked to the construction of the Green Island and the Maxwell landfills on the estuary and a long history of industrial discharges into the Kaikarae Stream higher up the catchment.

A collaborative process of engagement with the Dunedin City Council has enabled Te Rūnanga o Ōtākou to identify potential impacts on cultural values from the operation, closure and aftercare of the Green Island landfill. The aspiration of Te Rūnanga o Ōtākou is to incorporate mana whenua values and pūrākau associated with the Kaikarae Estuary in a tangible way through restoration of mahika kai and biodiversity values and through design opportunities following closure of the Green Island landfill.

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## Appendix 1: Glossary of Māori terms

| | |
|---|---|
| Ahikāroa | The long-burning fires of occupation |
| Ara hikoi | Traditional travel routes |
| Ara tawhito | Ancient trails and networks of significance that provided connections to places of importance for gathering, harvesting, producing, tribal sustenance and economy. The trails connected significant sites of permanent and seasonal occupation. |
| Hapū | Clan, sub-tribe |
| Harakeke | New Zealand flax |
| Heke | Migration, movement |
| Heretaunga | Hastings |
| Kāi Tahu whānui | The collective hapū that make up the Kāi Tahu iwi, including the Waitaha, Kāti Māmoe, and Kāi Tahu lines of migration and settlement |
| Kāika mahika kai | Settlements associated with food-gathering practices |
| Kai | Food |
| Kaikarae | Correct nomenclature for the stream commonly referred to as the 'Kaikorai' |
| Kaitiaki / Kaitiaki whenua | Trustees, guardians recognised by mana whenua as having a mandate for environmental protection in their takiwā |
| Kaitiakitaka | The exercise of guardianship by the mana whenua of an area in accordance with tikaka Māori in relation to natural and physical resources, and includes the ethic of stewardship |
| Karae | Seabird, petrel |
| Kaumātua | Elders |
| Ki Uta ki Tai | From the mountains to the sea |
| Kō | Digging stick |
| Kōrero | Story, oral history, conversation |
| Mahika kai | Practices, knowledge, and activities related to food gathering, including food gathering resources and species |
| Mamae | Pain, distress |
| Mana | Influence, Authority, Prestige, Power |
| Mana whenua | Customary authority exercised by an iwi or hapū in an identified area, and the people mandated to exercise it on their behalf |
| Mātauraka | Indigenous knowledge, wisdom, skill |

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|---|---|
| Maumaharataka | Memorial, memory, recollection |
| Mauri | Life giving force, life essence |
| Mokopuna | Grandchildren, descendants |
| Murihiku | The area of Te Waipounamu south of the Waitaki River |
| Noa | Free from the extension of tapu, unrestricted |
| Oraka | Shelter, Rest, Recuperation |
| Ōtepoti | Dunedin |
| Pātiki | Flounder |
| Pukemakamaka | Saddle Hill |
| Purehurehu | Haywards Point |
| Pūrākau | Stories and narratives |
| Rāhui | A temporary ritual prohibition, closed season, or reservation placed on an area, resource, or waterway as a conservation method |
| Rakatira | Chief |
| Rakatirataka | Chiefly authority |
| Takaroa | Atua or deity of the sea and fish |
| Takiwā | District, territory |
| Taoka | Treasure |
| Tapatapa | Protocols associated with naming |
| Tapu | Sacred state, Be Sacred, Prohibitive, Restrictive |
| Tauraka waka | Canoe mooring site |
| Te ao Māori | Māori worldviews |
| Te Kāroro | Molyneux |
| Te taiao | The natural environment |
| Tī kōuka | Cabbage tree |
| Tikaka | Appropriate actions, correct procedures |
| Tuna | Eel |
| Turi-makamaka | Jaffrays Hill |
| Tūpuna | Ancestor |
| Utu | Reciprocity, redressing imbalances |
| Wāhi mahika kai | Places where food-gathering practices were undertaken |
| Wāhi tūpuna | Ancestral landscape of significance to iwi |
| Wai | Water |
| Wai māori | Freshwater |

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| Waka | Canoe |
| Whānau-paki | Flagstaff |
| Whakaari | The correct nomenclature for the place now known as 'Wakari' |
| Whakapapa | Genealogy or lineage, layers. Whakapapa literally translates to 'place in layers' and refers to both human genealogical connections and the connections between humans and ecosystems. |
| Whakataukī | Proverb |
| Whakatipu-wai-māori | Lake Wakatipu |
| Whakatū | Nelson |
| Whanaukataka | A sense of family connection |
| Whenua | Land |

## Appendix 2: Kāi Tahu ki Otago Natural Resource Management Plan 2005

| ***SECTION 5 OTAGO REGION TE ROHE O OTAGO*** | |
|---|---|
| **Section 5.2 Overall Objectives** | |
| i. | The rakatirataka and kaitiakitaka of Kāi Tahu ki Otago is recognised and supported. |
| ii. | Ki Uta Ki Tai management of natural resources is adopted within the Otago region. |
| iii. | The mana of Kāi Tahu ki Otago is upheld through the management of natural, physical and historic resources in the Otago Region. |
| iv. | Kāi Tahu ki Otago have effective participation in all resource management activities within the Otago Region. |

| **Section 5.3 Wai Māori** |
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| **Section 5.3.2 Wai Māori General Issues** |
| • Current water management does not adequately address Kāi Tahu ki Otago cultural values.<br>• Cross mixing of water.<br>• Deteriorating water quality.<br>• Lack of consideration given to Kāi Tahu ki Otago cultural values in water research.<br>• Lack of adequate minimum flows that provide for Kāi Tahu ki Otago cultural values.<br>***Discharges:***<br>• Cumulative effects of discharges.<br>Discharge of human waste and other contaminants from point and non-point source discharges to water.<br>• Discharge of human waste and other contaminants from point and non-point source discharges to water.<br>***Land Management and Use including:***<br>• Draining of wetlands.<br>• Lack of proper riparian management throughout an entire catchment.<br>• Sedimentation from land use and development.<br>• Accidental discovery of cultural materials or sites from changed land use. |
| **Section 5.3.3 Wai Māori General Objectives** |

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| i. | The spiritual and cultural significance of water to Kāi Tahu ki Otago is recognised in all water management. |

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| ii. | The waters of the Otago Catchment are healthy and support Kāi Tahu ki Otago customs. |
| iv. | Contaminants being discharged directly or indirectly to water are reduced. |
| v. | Flow regimes and water quality standards are consistent with the cultural values of Kāi Tahu ki Otago and are implemented throughout the Otago Region and lower Waitaki Catchment. |
| **Section 5.3.4 Wai Māori General Policies** | |
| 1. | To require an assessment of instream values for all activities affecting water. |
| 2. | To promote the cultural importance of water to Kāi Tahu ki Otago in all water management within the Otago Region and Lower Waitaki Catchment. |
| 4. | To protect and restore the mauri of all water. |
| 5. | To encourage the use of the Cultural Health Index as a tool for monitoring waterways. |
| ***Discharges:*** | |
| 10. | To encourage all stormwater be treated before being discharged. |
| 11. | To encourage identification of non-point source pollution and mitigate, avoid or remedy adverse effects on Kāi Tahu ki Otago values. |
| 12. | To encourage Kāi Tahu ki Otago input into the development of monitoring programmes. |
| 13. | To require monitoring of all discharges be undertaken on a regular basis and all information, including an independent analysis of monitoring results, be made available to Kāi Tahu ki Otago. |
| 14. | To encourage Management Plans for all discharge activities that detail the procedure for containing spills and including plans for extraordinary events. |
| 15. | To require all discharge systems be well maintained and regularly serviced. Copies of all service and maintenance records should be available to Kāi Tahu ki Otago upon request. |
| 16. | To require re-vegetation with locally sourced indigenous plants for all disturbed areas. Re-vegetation should be monitored by an assessment of the vegetative cover at one growing season after establishment and again at three seasons from establishment. |
| 17. | To require visible signage informing people of the discharge area; such signs are to be written in Māori as well as English. |
| 18. | To require groundwater monitoring for all discharges to land. |
| ***River and Instream Works:*** | |

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| 36. | To require that any works be undertaken either before or after spawning season of potentially affected species as identified by the affected Papatipu Runaka. |
| 37. | To require that all practical measures are taken to minimise sedimentation or discharge of sedimentation. |
| 38. | To require that all practical measures are undertaken to minimise the risk of contamination to the waterway. |
| 40. | To require that machinery enters the dry bed of the waterway only to the extent necessary, to carry out as much of the work as possible, using one corridor for entering and exiting. |
| 41. | To discourage machinery operating in flowing water. |
| 42. | To require that all machinery is clean and well maintained before entering the work site; refuelling is to be done away from the waterway. |
| ***Bank Erosion:*** | |
| 44. | To encourage the planting of indigenous vegetation from the local environs to help reduce continual erosion of the edge of rivers. |
| ***Land Use and Management:*** | |
| 54. | To promote land use that suits the type of land and climatic conditions. |
| 56. | To oppose the draining of wetlands. All wetlands are to be protected. |
| 58. | To promote integrated riparian management throughout entire catchments. |
| 59. | To oppose the indiscriminate use of chemicals or poisons in or near waterways. |

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| **Section 5.4 Wāhi Tapu** | |
| **Section 5.4.2 Wāhi Tapu General Issues** | |
| • Destruction and modification of wāhi tapu through the direct and indirect effects of development and resource use.<br>• Contamination by discharges and other activities seriously erodes the cultural value and integrity of wāhi tapu.<br>• The resurfacing of kōiwi takata through natural and human-induced processes.<br>• Access to culturally important sites has been impeded.<br>• Misinterpretation of the status and importance of wāhi tapu.<br>• Inappropriate and inaccurate recording of wāhi tapu and the use of such information. | |
| **Section 5.4.3 Wāhi Tapu Objectives** | |
| i. | i. All wāhi tapu are protected from inappropriate activities. |

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| ii. | Kāi Tahu ki Otago have access to wāhi tapu. |
| iii. | Wāhi tapu throughout the Otago region are protected in a culturally appropriate manner. |
| **Section 5.4.4 Wāhi Tapu General Policies** | |
| 1. | To require consultation with Kāi Tahu ki Otago for activities that have the potential to affect wāhi tapu. |
| 2. | To promote the establishment of processes with appropriate agencies that:<br>i. enable the accurate identification and protection of wāhi tapu.<br>ii. provide for the protection of sensitive information about the specific location and nature of wāhi tapu.<br>iii. ensure that agencies contact Kāi Tahu ki Otago before granting consents or confirming an activity is permitted, to ensure that wāhi tapu are not adversely affected. |
| Earth Disturbance | |
| 5. | To promote the use of Accidental Discovery Protocols for any earth disturbance work. |
| 6. | To require all Mäori archaeological finds to remain the cultural property of Kāi Tahu ki Otago. |
| ***Discharges*** | |
| 7. | To discourage all discharges near wāhi tapu. |
| ***Historic Places Trust (HPT):*** | |
| 11. | To require the HPT to inform the appropriate Rūnaka and/or whānau where there is the potential for any activity to result in the disturbance of wāhi tapu , including:<br>i. an archaeological find; and/or<br>ii. the disturbance of any archaeological site; and/or<br>iii. the discovery of human remains.<br>Further disturbance should be prohibited until clearance has been obtained from the Papatipu Rūnaka. |
| 12. | To require HPT to implement enforcement provisions to discourage fossicking and prosecute those who destroy wāhi tapu; and |
| 13. | To recognise Kāi Tahu ki Otago kaitiakitaka over the protection and recording of archaeological sites. |

| Section 5.5 Mahika Kai and Biodiversity | |
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| **Section 5.5.2 Mahika Kai and Biodiversity General Issues** | |
| • Point and non-point source discharges impacting on mahika kai.<br>• Continued urban spread encroaching on mahika kai sites.<br>• Access for Kāi Tahu ki Otago to mahika kai sites.<br>• Customary accessibility of mahika kai species.<br>• Research undertaken in isolation from Kāi Tahu ki Otago interests has had the effect of marginalising cultural interests.<br>• Loss of indigenous biodiversity in the region.<br>• Loss of species of particular importance.<br>• Loss of indigenous flora and fauna remnants and lack of co-ordinated management of native corridors.<br>• Poorly managed landfills, industrial sites and waste disposal sites have created contaminated soils.<br>• Kā Paptipu Rūnaka believe that inappropriate use and development will adversely impact on:<br>▪ the diversity & abundance of terrestrial and aquatic species;<br>▪ the ability to access & gather mahika kai resources; and<br>▪ the ability to educate future generations in significant mahika kai practices | |
| **Section 5.5.3 Mahika Kai and Biodiversity Objectives** | |
| i. | Habitats and the wider needs of mahika kai, taoka species and other species of importance to Kāi Tahu ki Otago are protected. |
| ii. | Mahika kai resources are healthy and abundant within the Otago Region. |
| iii. | Mahika kai is protected and managed in accordance with Kāi Tahu ki Otago tikaka. |
| iv. | Mahika kai sites and species are identified and recorded throughout the Otago Region. |
| v. | Indigenous plant and animal communities and the ecological processes that ensure their survival are recognised and protected to restore and improve indigenous biodiversity within the Otago Region. |
| vi. | To restore and enhance biodiversity with particular attention to fruiting trees so as to facilitate and encourage sustainable native bird populations. |
| ix. | To create a network of linked ecosystems for the retention of and sustainable utilisation by native flora and fauna. |
| **5.5.4 Mahika Kai and Biodiversity General Policies** | |

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| 1. | To promote catchment-based management programmes and models, such as Ki Uta Ki Tai. |
| 3. | To encourage collaborative research into indigenous biodiversity. |
| 4. | To require Kāi Tahu ki Otago participation in the management of mahika kai, both introduced and indigenous. |
| 5. | To identify mahika kai sites and species of importance to Kāi Tahu ki Otago. |
| 6. | To protect and enhance physical access for Kāi Tahu ki Otago to mahika kai sites. |
| 7. | To require that all assessments of effects on the environment include an assessment of the impacts of the proposed activity on mahika kai. |
| 8. | To promote the protection of remaining indigenous fish habitat by:<br>i. Identifying waterways that exclusively support indigenous fish.<br>ii. Prohibiting the introduction of exotic species where they currently do not exist.<br>iii. Ensuring fish passage (both ingress and egress).<br>iv. Removing exotic species from waterways of particular importance where this is achievable and appropriate according to Kāi Tahu ki Otago. |
| 9. | To promote the protection of traditional breeding stocks. |
| 10. | To encourage the transfer of knowledge through generations. |
| 12. | To protect and enhance existing wetlands, support the reinstatement of wetlands and promote assistance for landowners for fencing-off wetlands. |
| 13. | To promote the development of a cultural monitoring tool for vegetation and ecosystem health. |
| 15. | To promote the reintroduction of locally extinct species of importance to Kāi Tahu ki Otago to the region. |
| 16. | To require that hazardous operations and the use, transportation and storage of hazardous substances are not to impact mahika kai and other cultural values. |
| 18. | To promote best-practice methodologies for drain maintenance or diversions to ensure minimal damage to ecosystems with no further adverse effects on mahika kai and other cultural values. |

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| **Section 5.6 Cultural Landscapes** |
| **Section 5.6.2 Cultural Landscapes General Issues** |
| • There is a prevailing view that Kāi Tahu ki Otago interests are limited to Statutory Acknowledgements, Tōpuni, and Nohoaka sites. |

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| • Land management regimes have failed to adequately provide for Kāi Tahu ki Otago interests in cultural landscapes.<br>• Impact of intensified land use on cultural landscapes.<br>• Extension and maintenance of infrastructure (e.g. transport, telecommunications) can affect cultural landscapes.<br>• The lack of use of traditional names for landscape features and sites.<br>• The building of structures and activities in significant landscapes.<br>• Inability to address indirect and/or cumulative effects means that many issues of significance to Kāi Tahu ki Otago, such as linkages, are not addressed during resource management processes. | |
| **Section 5.6.3 Cultural Landscapes Objectives** | |
| i. | The relationship that Kāi Tahu ki Otago have with land is recognised in all resource management activities and decisions. |
| ii. | The protection of significant cultural landscapes from inappropriate use and development. |
| iii. | The cultural landscape that reflects the long association of Kāi Tahu ki Otago resource use within the Otago region is maintained and enhanced. |
| **Section 5.6.4 Cultural Landscapes General Policies** | |
| 1. | To identify and protect the full range of landscape features of significance to Kāi Tahu ki Otago. |
| 4. | To require that the interpretation of Kāi Tahu ki Otago histories for either public or commercial reasons is undertaken by the appropriate Rūnaka and/or whānau. |
| 6. | To promote the identification of areas of historic heritage in collaboration with Local Government Agencies. |
| ***Place names:*** | |
| 7. | To encourage and promote the importance of traditional place names. |
| 8. | To promote the use of traditional place names through official name changes. |
| 9. | To encourage consultation with Kāi Tahu ki Otago over the naming of new reserves and areas of significance. |
| ***Earth Disturbance:*** | |
| 19. | To require all earthworks, excavation, filling or the disposal of excavated material to:<br>i. Avoid adverse impacts on significant natural landforms and areas of indigenous vegetation;<br>ii. Avoid, remedy, or mitigate soil instability; and accelerated erosion; |

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| | iii. Mitigate all adverse effects. |
| ***Roading:*** | |
| 20. | To require an accidental discovery protocol for all road realignments and widening and forest harvest roads and to avoid any sediment run-off during earthworks and road construction to avoid contamination of waterways. |
| 21. | To require indigenous re-vegetation with locally sourced species for all disturbed areas. Revegetation should be monitored by an assessment of the vegetative cover at one growing season after establishment and again at three seasons from establishment. |
| ***Landfills:*** | |
| 22. | To require site rehabilitation plans for land contaminated by landfills, tip sites, treatment plants, industrial waste, and agricultural waste. |
| 23. | To require monitoring of methane levels for all closed landfills and that analysed data be sent to KTKO Ltd. |
| ***Structures:*** | |
| 24. | To discourage the erection of structures, both temporary and permanent, in culturally significant landscapes, lakes, rivers or the coastal environment. |

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| **Section 5.7 Air and Atmosphere** |
| **Section 5.7.1 General Issues** |
| • The cultural impacts of air pollution and discharges to air are poorly understood and seldom recognised.<br>• Discharges to air can adversely affect health and can be culturally offensive.<br>• Motor vehicle emissions have serious cumulative effects that call for the adoption of higher emission control standards.<br>• Insufficient data has been collected and distributed about the effects of air discharges.<br>• Depletion of the ozone layer and high levels of solar radiation. |
| ***Mahika Kai and Biodiversity*** |
| • Clean air is important to the health of mahika kai |
| ***Cultural Landscapes:*** |
| • Impact of urban settlement and discharges to air on the visibility of cultural landscape features including the moon, stars and rainbows.<br>• Dust and the impact on people's health and traditional Māori rock art. |
| **Section 5.7.2 Objectives** |

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| i. | Kāi Tahu ki Otago sites of significance are free from odour, visual and other pollutants. |
| ii. | Kāi Tahu ki Otago are meaningfully involved in the management and protection of the air resource. |
| iii. | The life supporting capacity and mauri of air is maintained for future generations. |
| **Section 5.7.3 Policies** | |
| 1. | To require earthworks and discharges to air consider the impact of dust and other air-borne contaminants on health, mahika kai, cultural landscapes, indigenous flora and fauna, wāhi tapu and taoka. |
| 2. | To encourage early consultation with Kāi Tahu ki Otago in the development of air research proposals. The level of participation will be decided by Kāi Tahu ki Otago. |
| 3. | To require Cultural Assessments for any discharges to air including agrochemical. |
| 4. | To encourage reduced vehicle emissions. |
| 5. | To promote the planting of indigenous plants to offset carbon emissions. |

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| **Section 5.8 Coastal Environment** | |
| **Section 5.8.2 Taku Tai Moana Me Wai Māori Issues** | |
| • Artificial opening of river mouths, estuary and lagoon systems and limited recognition of species migration.<br>• Modifications to a waterway, such as damming, can affect the coastal environment and natural systems.<br>• Reclamation has a negative impact on water quality and flow in enclosed harbours and estuarine ecosystems.<br>• Land use activities adjoining the coast adversely affect localised coastal water quality, for example from devegetation and poor riparian management. | |
| ***Discharge and Waste:*** | |
| • Leachate from inappropriately sited landfills, casual disposal sites and potentially from landbased treatment of biosolids.<br>• Stormwater discharges e.g. from urban roads containing contaminants such as oil, carbon particles.<br>• Bilge and ballast water discharges, including contaminated water. | |
| **Section 5.8.3 Taku Tai Moana Me Wai Māori Objectives** | |
| i. | The spiritual and cultural significance of taku tai moana me te wai māori is recognised in all management of the coastal environment. |

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| ii. | Te Tai o Arai Te Uru is healthy and supports Kāi Tahu ki Otago customs. |
| iii. | There is no direct discharge of human waste to Te Tai o Arai Te Uru and other contaminants being discharged directly or indirectly to the coastal environment are remedied. |
| **Section 5.8.4 Taku Tai Moana Me Wai Māori Policies** | |
| 1. | To encourage the integrated management of the coastal environment. |
| 2. | To require Kāi Tahu ki Otago input into any artificial openings or works in river mouths, estuary or lagoon systems. |
| 5. | To discourage any further reclamation within the coastal environment. |
| ***Discharges:*** | |
| 8. | To require that leachate from disposal sites adjacent to coastal environments is monitored and contaminated environments rehabilitated. |
| 11. | To encourage the retention of waters within catchments to reduce runoff to the coastal environment. |
| Section 5.8.6 Wāhi Tapu Issues | |
| Protection of:<br>o the abode of Takaroa | |
| 5.8.7 Wāhi Tapu Objectives | |
| i. | Wāhi tapu are protected from inappropriate activities. |
| ii. | Kāi Tahu ki Otago access to sites and species of significance is protected. |

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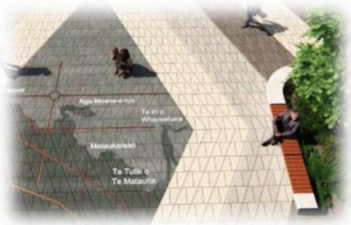
| **Section 5.8.10 Mahika Kai (Kai Moana) & Biodiversity Issues** |
| • Impact on coastal kai moana, associated habitats and sites from:<br>o dredging and dumping<br>o reclamation<br>o activities occurring in the catchment<br>o artificial openings of river mouths and lagoons<br>o adjacent industrial activity as associated discharges, both point and non-point sources<br>• Loss of natural habitat for indigenous marine species. |
| **5.8.11 Mahika Kai (Kai Moana) & Biodiversity Objectives** |
| i. The Marine Environment is managed in a holistic way. |
| ii. Te Tai o Arai Te Uru supports the full range of healthy ecosystems and species. |
| iii. There is an abundance of healthy kai moana. |

| 5.8.12 Mahika Kai (Kai Moana) & Biodiversity Policies | |
|---|---|
| 1. | To require that greater provision is made for input from takata whenua across central and local government in the development of integrated policy for the coastal environment. |
| 11. | To promote that artificial openings of river mouths and lagoons need to be aligned with natural cycles and migrations of mahika kai species. |
| 5.8.14 Cultural Landscapes Issues | |
| • Marine aquaculture in culturally significant landscapes.<br>• Access to some tauraka waka and associated trails has been impeded.<br>• The cumulative effect of incremental, uncoordinated land use change and building within the coastal environment.<br>• Protection of cultural landscapes and seascapes such as reef systems and other sites with associated mana.<br>• Failure to provide for changing coastal landscapes resulting from changing sea levels.<br>• Reclamation impacting on cultural landscapes.<br>• Integrity of cultural information and interpretation pertaining to the coastal environment. | |
| 5.8.16 Cultural Landscapes Policies | |
| 1. | To encourage access and protection of coastal landscapes. |
| 9. | To encourage the correct use of Kāi Tahu place names associated with the coastal environment. |
| 10. | To oppose any further reclamation of the coastal marine area. |
| 11. | To protect the integrity of highly sensitive wildlife sanctuaries and wāhi tapu within the coastal environment through the prevention of inappropriate land use within significant natural and cultural areas, e.g., licensed premises. |

## Appendix 3: Incorporation of Mana Whenua Values through Design

The aspiration of Te Rūnanga o Ōtākou is to incorporate mana whenua values and pūrākau associated with the Kaikarae Estuary in a tangible way through design opportunities following closure of the Green Island landfill. Examples of how design can reflect and provide for mana whenua values and pūrākau are outlined below but should be considered as indicative. Through a co-design process mana whenua will guide how these values and associations can be represented in a culturally meaningful way while keeping the interpretation and development in the hands of its custodians.

| Values and Customary Practices | How this could be integrated | Examples |
|---|---|---|
| **Mana** | The inclusion of cultural markers such as Pou Whenua or Tohu Whenua, or significant entrances to reinstate Mana Whenua presence in the landscape |  |
| **Whakapapa, Rākaihautū, Matamata, Wāhi Tūpuna** | Inclusion of interpretation panels to share narratives.<br><br>Incorporation of quotes in low lying walls<br><br>Highlighting/mapping areas that are part of Kāi Tahu traditions |  |
| **Mauri, Utu, Oraka** | Riparian Planting to restore original landscapes and rebalance mauri<br><br>Historical information about the site and future management for the community |  |
| **Tapu, Tikaka** | Indications of restrictions with markers, panels, entrance markers.<br><br>Explanation of kawa within the area – why is it restricted? |  |

| | | |
|---|---|---|
| **Tapatapa** | Signage and Naming Opportunities. Celebrating original names. |  |
| **Kaika, Ara Hikoi, Ara Tawhito** | Highlighting narrative in pathways, panel information, wayfinding, map features |  |
| **Mahika Kai** | Incorporation of visual design of important species in various elements such as paving, low lying walls, interpretation panels. |  |
| **Taoka** | Features which might celebrate particular Taoka |  |