Cultural Impact Assessment: Cold Gold Clutha Suction Dredging on the Mata-au

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

For us, and for our children after us.

Aukaha
Level 2, 266 Hanover Street, P O Box 446,
Dunedin 9054, New Zealand
Phone - 03 477 0071
www.aukaha.co.nz

Acknowledgement:

The preparation of this report was undertaken with assistance from the following rūnaka:

- Te Rūnanga o Moeraki
- Kāti Huirapa Rūnaka ki Puketeraki
- Te Rūnanga o Ōtākou
- Hokonui Rūnanga

Front cover photo: The Mata-au. Source: Aukaha (1997) Ltd.

Version (Final): [22.3.2023]

Aukaha Ltd. 268 Stuart Street PO Box 446 Dunedin 9054 Phone 03-477-0071	**Prepared by:** Kate Timms-Dean, Gabby Golding, and Tim Vial
	Reviewed by: Te Rūnanga o Moeraki Kāti Huirapa Rūnaka ki Puketeraki Te Rūnanga o Ōtākou Hokonui Rūnanga
	Report 1 of 1 For Cold Gold Clutha Limited and Terramark

Aukaha
Level 2, 266 Hanover Street, P O Box 446,
Dunedin 9054, New Zealand
Phone - 03 477 0071
www.aukaha.co.nz

Contents

Toitū te Mana, Toitū te Whenua: Kā Rūnaka

There are four papatipu rūnaka with shared authority in the Mata-au area affected by the activity proposed by Cold Gold Clutha Ltd.[1]

Te Rūnanga o Moeraki

The takiwā of Te Rūnanga o Moeraki centres on Moeraki and extends from the Waitaki to the Waihemo, and inland to the Main Divide. The interests of Te Rūnanga o Moeraki are concentrated on the Moeraki Peninsula area and surrounds, including Rakahineatea Pā, Koekohe, and Te Kai Hīnaki with its boulders. In addition, the interests of the rūnaka extend north and south of the Moeraki Peninsula to the boundaries of their takiwā.

Kāti Huirapa Rūnaka ki Puketeraki

The takiwā of Kāti Huirapa Rūnaka ki Puketeraki centres on Karitāne and extends from the Waihemo to Purehurehu, north of Heyward Point. Their takiwā extends inland to the Main Divide, sharing interests in the lakes and mountains to Whakatipu-wai-māori.

Te Rūnanga o Ōtākou

The coastal rūnaka of takiwā of Te Rūnanga o Ōtākou centres on Ōtākou on the Otago Peninsula and extends from Purehurehu to Te Mata-au. The inland reaches of their takiwā includes shared interests in the lands and mountains to the western coast with rūnaka to the north and south.

Hokonui Rūnanga

The takiwā of Hokonui Rūnanga centres on the Hokonui region and includes shared interests in the lakes and mountains between Whakatipu-waitai and Tawhititarere with other Murihiku rūnaka, and those located from Waihemo south.

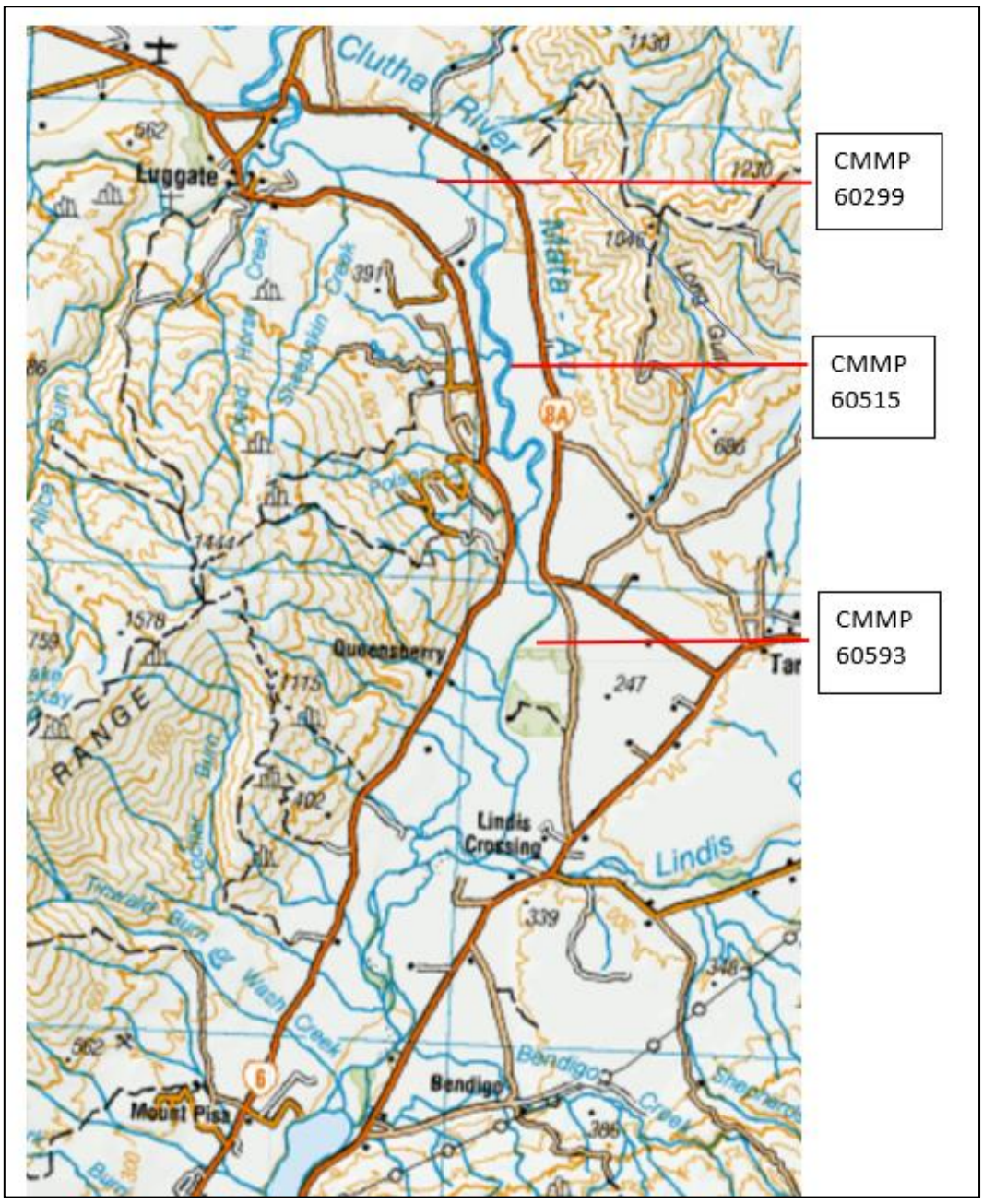
Te Rūnanga o Moeraki, Kāti Huirapa Rūnaka ki Puketeraki, Te Rūnanga o Ōtākou, and Hokonui Rūnanga (referred to as Kāi Tahu ki Otago or Kā Rūnaka) collectively represent whānau and hapū who are mana whenua within the Otago region. The interests of Kāi Tahu ki Otago along the Mata-au are shared with Ngāi Tahu ki Murihiku.

[1] See Appendix 1 for a glossary of Māori terms.

1.0 He Reo Arataki: Introduction

Cold Gold Clutha Limited (CGCL) has operated suction dredge mining for gold along 66kms of the Mata-au riverbed between the Roxburgh Dam and Tuapeka Mouth for the last ten years under an existing mining permit.[2] CGCL recently purchased further mining permits[3] to enable the relocation of dredging into the upper reaches of the Mata-au between Luggate and the top of Lake Dunstan, as shown by Whakaahua 1.

Whakaahua 1: Combined area of mining permits 60299, 60515 and 60593[4]



[2] CMMP 53215.
[3] CMMP 60299, 60515, 60593 (refer to Appendix 2).
[4] NZ Topo Map, 2023; NZPAM, 2023.

CGCL holds existing resource consents associated with mining permit 53215 for the lower Mata-au, as shown by Tūtohi 1:

Tūtohi 1: Existing consents and concessions – Lower Mata-Au[5]

Terretorial authority	Consent number	Activity
CODC	RC 130219	Land use consent: - Operation of a dredge - Commercial vessel in a waterbody - Exceeding noise thresholds - Earthworks/vegetation clearance for construction of a slipway
ORC	RM20.087.01	Discharge permit - To discharge contaminants, namely sediment to water for the purpose of operating a suction dredge during alluvial gold mining
ORC	RM20.087.02	Land use / structure - To disturb the bed of the Clutha River/ Mata-Au for the purpose of operating a suction dredge or bucket ladder dredge
ORC	RM20.087.03	Water permit – To take and use surface water from the Clutha River/ Mata-Au for the purpose of operating a suction dredge for alluvial gold mining
ORC	RM20.325	Land use consent – To excavate a slipway and place concrete blocks and soil armouring on the bed of the Clutha River/Mata-Au for the purpose of maintaining a dredge vessel
DOC	-	Concession to construct a slipway in the marginal strip for the purpose of extracting a dredge from the river for transport, maintenance, and maritime survey.

CGCL are seeking resource consents for the relocation of dredging to the Upper Mata-au associated with mining permits 60299, 60515, 60593, as shown by Tūtohi 2:

Tūtohi 2: Consents being sought – Upper Mata-Au[6]

Terretorial authority	Activity
ORC	The disturbance of the bed of the river for the mining activity The disturbance of the bed of the river for construction of slipways The take of water; and The discharge of sediment to water
QLDC	Mineral extraction within a watercourse Storage of hazardous goods (fuels and oils)
CODC	The use of a maritime vessel for commercial use Earthworks and vegetation clearance within 10m of the margin of a waterbody Earthworks exceeding 20m^3 To enable more than three persons to operate a commercial activity.
DOC/LINZ	Consessions: - Use of land and river margins - Creation of slipways in marginal strip - Transportation of the dredge within the roading network

[5] Sycamore, 2021, p. 3.
[6] Ibid, pp. 3-4.

2. Summary of the proposed activity

CGCL propose relocating the suction dredge to the Upper Mata-au and will operate within both the Central Otago and Queenstown Lakes Districts. The key elements of the proposed dredging activity are summarised below.

2.1 The Location

The dredging area is prescribed by the combined mining permits and commences just south of Luggate Bridge and continues downstream to the confluence with Lake Dunstan. An area of the bed in the vicinity of the Luggate Creek confluence and Devil's Nook has been excluded from the application due to the ecological sensitivity of these areas and the potential for adverse effects from suction dredging.[7] These areas are identified in red in Whakaahua 2 below:

Whakaahua 2: Exclusion area highlighted in red[8]

CGCL have further proposed as a condition of consent that a 20m exclusionary zone be established around tributary confluences of greater than 1m width, as the confluence of lower order streams with the Mata-au provides important ecological habitat.[9]

2.2 The Dredging Activity

Dredging is a long-standing method of mining in waterways and has been used for such purposes on the Mata-au extensively in the past, as illustrated by Whakaahua 3:

[7] Ibid, p. 5.
[8] Ibid, p. 5.
[9] Ibid, p. 4.

Whakaahua 3: Historic approach to mining in the Mata-au near Cromwell, 1890s [10]

CGCL utilises a suction type dredge that uses hydraulically driven high-pressure water pumps to generate water flow and suction in the main pipe via venturi induction jets. The main suction pipe has an internal diameter of 350mm and is controlled by an operator located in the wheelhouse.

The pipe is lowered to the river bottom by hydraulic winches and river gravels are entrained into the main pipe as a slurry. The gravels are discharged onto a classification screen at the rear of the dredge where all oversize material and excess water is discharged immediately back into the river. Classified material is pumped on board and fed through gold recovery systems comprising standard gold riffle tables. All fines and water are discharged back into the river. There are no chemical processes involved in the activity.

Areas are 'spot mined' where a site is identified that is favourable for gold accumulation, and then worked. In this context parts of the riverbed are discretely mined rather than blanket mining the entire riverbed throughout the entire mining permit area. As the dredge moves forward, any depressions are progressively reinstated by gravels returned to the watercourse.

CGCL has found that gold in the mid-reaches of the Clutha does not lie uniformly in the gravels from bank to bank, rather it is located in narrow non-contiguous longitudinal bands. These areas are found by spot dredging until an economic band is found and then mined.

No more than a hectare will be mined anywhere within the permit areas in any given month. Over any calendar year the mining area is not likely to exceed more than 10ha. Mining will only occur in an area once which limits the extent of effects in any particular site.

The rate of mining is self-limiting, and areas will not be re-worked because there will be minimal gold within them.

[10] Ibid, p. 5.

Maximum depths will depend on the depth to bedrock where the gold either sits on the basement rock or is contained within crevasses or depressions, ranging from 2m to 15m in depth.

Surface water will be taken at a maximum rate of 400 litres per second, with a daily maximum take of 18,720m^3 based on a maximum 13-hour working day. This take represents the maximum rate, and it is unusual to operate the dredge at full speed as it greatly reduces the chances of retaining the gold in the riffles.

All water will be returned directly to the Mata-au at the point of take and as such, is considered non-consumptive, and therefore not subject to assessment to allocation, metering, minimum flow or and efficiency assessment.[11]

2.3 The Dredge Vessel

The dredge is a Maritime NZ registered vessel No MNZ 134266 named "CGC1". The dredge operates in accordance with Maritime Transport Operating Rules, has a valid Maritime Transport Operator Certificate (MTOC) and a comprehensive and audited Maritime Transport Operator Plan (MTOP).[12]

The dredge is a self-powered commercial vessel being a steel pontoon catamaran 23.9 metres in length with a beam of 6.6 metres. Propulsion is via twin 550hp Detroit Diesel engines driving Ultrajet 375 waterjets. Dredging power is hydraulic, powered by an Isuzu 600hp 6WG1TC marine diesel engine.

The main propulsion engines are used to manoeuvre the dredge about the river to position for dredging, re-fuelling and for retreat during flood events. Such manoeuvring occurs a maximum of once a week for refuelling and otherwise only very occasionally. The dredge is normally static for dredging operations.

The dredge utilises two 500kg main mooring anchors to position itself in the river. These anchors are located within the river wet bed with the anchor warps crossed over for stability. This means that the anchor warps are immediately in front of the dredge (not out to the sides) and typically submerge within 10-20m. To minimise the risk of anchor failure (slippage), the anchors themselves are also tied back with wire rope to the riverbank where possible usually to a large willow tree or rock protrusion. There is no impediment to river users and minimum risk to other vessels.

The dredge also occasionally requires two 150kg stern anchors where necessary for stability.

Due to the size of the Clutha River and the bespoke anchoring system, substantial clear passage is provided down at least one side and normally both sides for other river users to pass. On occasion where side lines are utilised, typically when moored against the riverbank during a flood event or for maintenance, these are highlighted with marking tape and/or marker buoys.

[11] Ibid, pp. 4-5.

[12] The MTOP is a live document specific to the dredge that is audited and approved by Maritime NZ. The MTOP outlines all aspects of the vessel including management, operational procedures, crew, crew training, reporting, safety systems and procedures, maintenance plans and procedures, safety, and environmental risk assessment and management; ibid.

Whakaahua 4: CGCL's river dredge[13]

Crew access to the dredge is by way of a service tender. This craft is a 200hp 5.5m RIB jet boat which falls within Maritime NZ survey and operational requirements for the dredge. The tender is launched and retrieved at either public boat access points or via private property with landowner permission. The tender is typically moored just off the riverbank at night. When on board, the tender is tethered alongside the dredge. Safe operation and maintenance of the tender is included in the Maritime Transport Operating Plan. Cold Gold maintains easement concessions with LINZ & DOC where relevant.[14]

2.4 Refuelling and Hazardous Materials

A self-bunded fuel storage tank owned and supplied by South Fuels will be located well above maximum flow levels on private property adjacent to the river. The location is not yet confirmed and is likely to move between several properties as the dredge moves within the river.

Weekly refuelling of up to 5,000L of diesel fuel is a strictly monitored procedure to avoid any spillage. Refuelling will be direct shore to ship. Cold Gold maintains (or will seek any additional) easement concessions with LINZ and DOC where relevant with respect to landing and refuelling.

The hydraulic process involves the use of hydraulic oils. These are contained within the dredge by tray bunds in the event a line was to burst. Continuous maintenance is carried out on the plant to ensure no pipes or connections are compromised to limit the risk of failure.

[13] Ibid.
[14] Ibid.

In-water hydraulic systems are separate from on-board systems in that they utilise biodegradable-oil which, in the event of a leak or spillage, break down far faster than mineral oils and are non-toxic. The risk of failure for the in-water system has been assessed as low.

The Maritime Transport Operator Plan (MTOP) specifies all procedures for the safe operation, maintenance, and management of potential contaminants along with all other aspects of the vessel and its operation. Maritime NZ assessed and considered the dredging operation "has a low-risk profile" and "continues to hold a risk rating of Low".[15]

[15] Ibid.

3.0 He Kaupapa Mahi: Methodology

The key elements of the project methodology are set out below.

3.1 Review of literature

A desktop review of the project area was undertaken, focusing on detailed documentary research, to inform the drafting of a cultural values assessment related to the proposed dredging activity. Reference material has been derived from the following key sources:

a. The Kāi Tahu ki Otago NRMP[16]
b. Ngāi Tahu cultural maps[17]
c. District Plan wāhi tūpuna mapping
d. Recorded archaeological sites via ArchSite,[18] and
e. Available ecological and environmental monitoring data and reports.

Other relevant policies, plans, government and industry literature and reports, and academic research publications were identified as further source material during the review of literature.

3.2 Cultural values assessment

A cultural values assessment identifies key mana whenua values in the area affected by the proposed activity, particularly focused on the affected reach of the Mata-au from Te Wairere (Lake Dunstan) to Luggate.

The cultural values statement provided below was drafted by Aukaha kaimahi, and 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 statement accurately reflects the position of Kā Rūnaka.

3.3 Cultural impact statement

A cultural impact statement identifies the impacts of the proposed activities 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:

1. Mana whenua values
2. Wāhi tūpuna and ara tawhito values
3. Wai māori values
4. Ecological and native biodiversity values
5. Māori archaeological values
6. Equity of Environmental Outcomes

[16] KTKO, 2005.
[17] TRONT, 2023.
[18] NZAA, 2023.

4.0 Ko te Manawa Kāi Tahu: Cultural Values Framework

4.1 Whakapapa Relationship with Te Taiao

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:

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 and are therefore connected to all things by whakapapa. Kāi Tahu tribal whakapapa thus links the cosmological world of the atua to present and future generations, giving rise to a spiritual relationship with te taiao and a respect for the mauri of that environment.

Similarly, whakawhanaukataka is expressed in the resource management approach “Ki Uta Ki Tai”, which emphasises the holistic management of the interrelated elements within the natural

environment. Water released by Raki makes its way into rivers, which in turn connect the entire landscape from the mountains to the sea. From the sea, water evaporates, condenses, and falls again on Papatūānuku, an eternal holistic cycle.

4.2 Mauri

Mauri flows from our living world and down through whakapapa, linking all aspects of our world. The mauri of water represents the essence that binds all things, acting as a life-giving force, and connecting the environment, from the mountains to the sea.

Mauri is an observable measure of environmental health and well-being. Waterbodies with an intact and strong mauri are characterised by good quality waters that flow with energy and life, 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 is unable to protect itself against unnatural actions and interventions such as damming, diversions, altered flow regimes, discharges, and activities that impact on the riverbed. 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 still in evidence today. For the Mata-au, this history is implicitly linked to the impacts of mining, damming, abstraction, and land use practices.

4.3 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 mātauranga 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.

4.4 Mahika Kai

Mahika kai practices underpin the Kāi Tahu relationship with Otago's rivers, lakes, wetlands, moana and the broader environment. Our cultural identity as whānau and hapū is tied to our resources. Fundamental to our culture is our 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 inland lakes and waterways of the Otago region once supported rich and healthy mahika kai resources. The lakes, waterways and their surrounds attracted Kāi Tahu hunter-gatherer parties that

would travel inland from the coast to camp at nohoaka often located adjacent to lakes and waterways to engage in mahika kai activities.

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.

4.5 Wāhi Tūpuna

Wāhi tūpuna are interconnected ancestral places, landscapes and taoka that reflect the history and traditions associated with the long settlement of Kāi Tahu whānui in Otago. Wāhi tūpuna are characterised not only by natural and physical aspects, but also by the place names and associated traditions and events that bind us to the landscape, just as the landscape itself is a part of us. Such landscapes are linked by whakapapa in our creation traditions, underpinning our mana whenua status, and breathing life into our mātauraka and tikaka. Such ancestral landscapes are treasured places that transcend the generations.

4.6 Wāi Māori

Wai is an integral and enduring part of our wāhi tūpuna. The Otago landscape is criss-crossed by many and varied waterbodies, from many sources, including lakes, awa and their tributaries, puna, and groundwater. Water is the lifeblood of the environment and of the many life forms that depend on it. Water, as a result, is of high significance for Kāi Tahu, both for its practical applications and for the spiritual meaning it embodies. Rivers are a symbol of permanence and a source of spiritual meaning.

Water was, and is, used extensively by mana whenua for spiritual and common uses. Wai is used to remove tapu, and in ceremonies. Waterways like the Mata-au were important pathways, whether traversed by waka or mōkihi, or followed on foot and they are often still recognised as ara tawhito.

4.7 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, rather than an economic model of ownership. Thus, when the health of a waterway is degraded, the impacts are far-reaching, for the waterway, for the ecosystems, habitats, and species it supports, and for the people.

5.0 He taura whiri kotahi: Mana whenua associations with the Mata-au

5.1 Wai Māori

The wai that descends from the mountains to the great inland lakes is tapu, reflecting the mana of the mountains and carrying an intact mauri. The Mata-au, linking the pure waters of the Upper Lakes with the bountiful coastal environment, is an awa of status and significance for Kāi Tahu. The awa as it flows from Lake Wānaka to the outlets of the Matau and Kōau branches at Tauhinu is joined by significant tributaries, including the Ōrau, Paetarariki, Lindis, Kawarau, Ōtewhata, Manuherekia, Poumahaka, Tuapeka, Waitāhuna and the Waiwera, which increase its size and volume.

Whakaahua 5: Red bridge across the Mata-au at Luggate [19]

5.2 Wāhi Tūpuna

The Mata-au is a significant component of an integrated cultural landscape. The awa was an ara tawhito that provided access from the coast to the upper lakes of Wānaka, Hāwea, and Whakatipu-wai-māori. The entire system acted as a significant wāhi mahika kai. Weka, kōura, and tuna were key food sources collected along its length, and there were bountiful stands of tī kōuka from which to source kāuru.

Along its length, a myriad of wāhi tūpuna are recorded, attesting to the long-standing importance of the Mata-au as a food source, a place of travel and activity, and reflecting the physical and spiritual connection between the mountains and the coast. The recorded wāhi tūpuna in the reach of the river over which CGCL proposes to operate are described in Tūtohi 3.

[19] Verduyn-Cassels, 2008.

Tūtohi 3: Wāhi tūpuna in the area of the dredging activity (north to south)[20]

Ikoa Māori	Location/Ikoa Pākehā	Description
Te Rua Tūpāpaku	Luggate	A kāika mahika kai located on the Mata-au where weka, tuna and kāuru were gathered. It is also recorded as a fortified permanent pā, and that Rāwiri Te Maire and Te Maihāroa lived there.
Autāia	Near Queensbury	A kāika mahika kai located on the Mata-au where weka, tuna, and kāuru were gathered.
Te Kōareare o Te Pāhi	Downstream from Queensbury	A wāhi mahika kai located on the Mata-au where tuna and weka were gathered.
Kā Iwi o te Weka	Downstream of Lindis Crossing	A wāhi mahika kai on the Mata-au where tuna and weka were gathered.
Mahaka Katia	Northern end of Lake Dunstan	A wāhi mahika kai located on the Mata-au where tuna and weka were gathered.
Otakihia	Northern end of Lake Dunstan	Rapids that were located at what is now the northern end of Lake Dunstan

Recorded archaeological sites in the area provide further evidence of this connection, with finds of a rock shelter (G40/119), and an oven with moa bones (G40/67) located near Luggate. The archaeological record for this second site references moa leg bones that had been broken open for human consumption, as well as tracheal bones and eggshell fragments.[21] These taoka signify that this area has a long history of occupation and use, including a period before the extinction of the moa over 500 years ago.

Tūtohi 4: Recorded Māori archaeological sites in area of proposed activity [22]

Site number	Description	Details
G40/67	Umu	Oven with moa bones, indications of human interaction. Included large bones, tracheal bones, and fragments of eggshell mixed with ashes
G40/119	Rock shelter	A large shelter (4m x 4m x 1.3m) 10m above Luggate Creek. Charcoal stains on the ceiling. Northeast facing, likely site for habitation.
G41/10	Artefact – toki	Find of a dark grey toki with black lines running through it.
G41/283	Artefact	Find of a patu onewa.
G41/287	Umu	Find of a scattering of burnt stones and blackened soil covering about 0.2ha.
G41/288	Umu	Find of a pile of burnt greywacke boulders with large pieces of charcoal. No bone or other midden was found.
G41/298	Umu	Find of fragments of burnt greywacke pebbles in an irrigation ditch bank.

[20] TRONT, 2023.
[21] Ritchie, 1978.
[22] NZAA, 2023.

Downstream of Luggate, identified Māori archaeological sites are absent through to the area surrounding Lindis Crossing, although the reason for this absence is unclear. Further south around Te Kōareare o Te Pāhi, several sites have been recorded including ovens and artefacts.

The recorded archaeological sites in the reach of the river over which CGCL proposes to operate are described in Tūtohi 4 above.

5.3 Mahika Kai and Biodiversity

Historical vegetation records and research indicates that the flora of area was most likely dominated by stands of tawai and tawairauriki interspersed with thickets of mānuka and kānuka. Valleys such as that in the vicinity of modern-day Luggate were likely to be dominated by tussock grasslands interspersed with wetland areas.

Native beeches like tawai and tawairauriki provide an important habitat for the beech scale insect or honeydew, a native species of aphid that is a vital food source for many native birds and insects. It lives in the bark of most types of native beech, providing a high-sugar, high-energy food source for tūī, korimako, and kākā.[23]

Certain mahika kai species were crucial to ensuring food security for southern Māori. The river itself is recorded as having been a source of weka and tuna, which are referenced throughout the district as significant and plentiful food sources. Not only were populations of weka and tuna bountiful, but their meat was also easily processed for long-term storage; tuna by drying over racks, and weka by preserving in their own rendered fat within pōhā bags. Umu such as the site recorded at Luggate were used during the preservation process for weka, moa, and kāuru. Kāuru was extensively gathered and cooked along the Mata-au in the past, evidenced by the many umu tī identified in the archaeological layer along the river's length. Kāuru was cut into logs and cooked in umu within baskets made from tī kōuka leaves. The logs were then beaten on a flat stone and then strung in pairs on a drying rack for storage. To prepare for eating, the logs were soaked and twisted to separate the fibre from the porridge called waitau kāuru. It tasted sweet and could be mixed with berries or harakeke honey to enhance the flavour.[24] Kāuru could also be eaten fresh by cutting branches or the root and peeling back the outer bark to expose the sweet inner flesh.[25]

Locations such as Te Rua Tūpāpaku were preferred sites for settlements and campsites by whānau in the past, due to the natural features that signified it as a suitable site for economic activity. As well as providing a ready source of food and access to transportation and trade, the looping nature of the awa creates a highly defensible position, making it the perfect spot for a pā such as Te Rua Tūpāpaku. Further downstream, mana whenua have identified further wāhi tūpuna, similarly referencing the mahika kai values linked to cornerstone species of tuna, weka, and kāuru.

[23] DOC, 2022; Orwin, 2007.
[24] Scheele, 2007.
[25] Beattie, 1994.

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

6.1 The Kāi Tahu Deeds

Te Tiriti o Waitangi was signed by representatives of Kāi Tahu whānui in late May and early June of 1840.[26] Subsequently, between 1844 and 1864, Kāi Tahu agreed a series of land sales with the Crown. The Crown defaulted on key elements of these agreements, resulting in widespread land alienation and economic deprivation for mana whenua.[27]

The 1848 Kemp's Deed was the largest of the Crown land purchases, comprising 13,551,400 acres for which £2,000 was paid. Although the deeds promised a tenth of the land would be retained as reserves for Kāi Tahu, less than 6,500 acres were allocated within the footprint of the deed.[28]

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

6.2 Impacts of Infrastructure

The development of roads, towns, and infrastructure caused physical changes to the landscape and adverse impacts on the cultural values of significant landmarks and wāhi tūpuna. Activities that significantly modified rivers and tributaries proliferated, including mining, irrigation, damming, dredging and the draining of wetlands and lakes. These activities had significant impacts on mana whenua values, wāhi tūpuna, biodiversity, and the mauri of our rivers. This disregard of mana whenua values, and the needs of awa as entities in their own right, reflects the pattern of settlement throughout Aotearoa.

The impacts of dams on migratory species and the health of waterways were particularly severe. Damming has effectively disrupted the migratory paths of taoka species that evolved in the waterways of Otago. The impact of this and other pressures are clear in the decline in the populations, for example, of tuna, which have been reduced by up to 90%.[29] The loss of access to the bountiful harvests of tuna from the Upper Lakes that whānau and hapū once enjoyed was significant and pronounced after the dams were built.[30]

Damming of the Mata-au at Hāwea in the 1950s raised the water level of the lake by 20m, later providing storage for the Roxburgh and Clyde power stations. Large fluctuations in lake level have significant ecological impacts on waterways, including shoreline erosion, inundation and mortality of terrestrial vegetation, and a decrease in light available to littoral and benthic plant communities.[31]

[26] Waitangi Tribunal, 1991, s4.2.
[27] Ibid.
[28] TRONT, 1997.
[29] Clucas, 2019.
[30] Jellyman & Harding, 2012.
[31] Young, Smart, & Harding, 2004.

6.3 Impacts of Mining

Gold mining had a myriad of impacts on the relationship of mana whenua with their ancestral landscapes and mahika kai resources. When gold was struck in Otago in 1862, thousands flocked to the goldfields of Te Waipounamu. A number of Kāi Tahu people saw the benefits to be had from joining the gold rush, as well as engaging in other paid work like shearing and labouring. In 1862, Māori gold miners were recorded as catching weka and whekau.[32]

Nevertheless, the influx of people, and the wealth that the gold rush produced, created a further wedge between Kā Rūnaka and the hinterland. Kāi Tahu whānau increasingly faced barriers to accessing customary landscapes and resources in Central Otago and the Upper Lakes. When a group of mana whenua from the coast undertook a heke inland in an attempt to retain access to their traditional land and resources, they were unable to progress past Ōmārama. They stayed there until 1879, when they were forcibly ejected. From that point onwards, the primary economic activity available to mana whenua in the Upper Lakes region was as labourers.[33]

The growth of Luggate during the Gold Rush is a good example of the way this period drove settlement and environmental modification. The number of heritage sites around this stretch of the Mata-au is considerable, referencing a range of economic and social activities in the area prior to 1900. Archaeological sites significantly reference mining activities including evidence of tailings, damming, water races, pipework, and sluicing. [34] Gold dredging began operating in the area in 1890, and at one stage, there were four dredges operating between the Luggate Punt and Albert Town.

6.4 Impact of Pastoralism

Agriculture and pastoralism imposed significant barriers for mana whenua accessing the inland areas of Otago. Access to the sites associated with mahika kai was inhibited, both through fencing by landowners, and as a result of the environmental impacts on the resources themselves. The result of this separation has been far-reaching for mana whenua.

The introduction of rabbits to Te Waipounamu for meat and hunting in the 1830s saw the explosion of their population. From the 1870s, rabbit plagues became a concern, leading to major impacts for farming. Weka and kāhu were their only natural predators, but they were unable to keep up with the spread of rabbit numbers.[35]

Farmers used a variety of methods of control rabbits, with poisons and toxins being employed from the 1880s. Native species like weka became significant victims of poisoning, and rabbit populations continued to soar. In the same decade, stoats, and other mustelids were released as a further rabbit control measure, but immediately began to prey on native species.[36] The impact of these introduced species on native species has been profound and continues to hamper their survival today due to habitat loss and predation.

Whereas historic vegetation was heavily weighted towards beech forest and tussock lands, vegetation is now dominated by exotic grasslands for agriculture. Limited remnant stands of tawai, and tōtara are still present in pockets, mainly in gorges and on spurs in areas like Luggate Creek.[37]

[32] Beattie, 1945.
[33] Kleinlangevelsloo & Clucas, 2017.
[34] Upper Clutha Historical Records Society, 2022.
[35] Peden, 2008.
[36] Ibid; Brockie, 2007.
[37] Wardle, 2010.

6.5 Impacts on Mahika Kai

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 a significant means of actioning rakatirataka and mana, but also provided opportunities for reconnection with the actions, stories, and knowledge of atua and 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 hunting grounds, but the loss of a spiritual connection to te taiao, and the ability to exercise rakatirataka, a fundamental building block of Kāi Tahu life and identity, and the transmission of mātauraka.[38]

Modification and loss of habitat that began in the 19th Century and the introduction of freshwater fish species including trout and salmon has impacted significantly on indigenous fisheries. While native freshwater fish species are present in this reach of the Mata-au, including bullies, tuna, galaxiids, and kōura, the area is also known for as brown and rainbow trout fisheries and spawning areas. Limited spawning areas for kōaro are also present, with presence of chinook salmon and perch having also been identified.[39]

The modification of the land and environment and the impacts on mahika kai continues through practices that include dredging. For mana whenua, this is a history that replays over and over, with echoes of the losses of the past reverberating through to the future. The resulting legacy issues and cumulative effects have contributed to significant inequities in environmental outcomes. This includes the continued degradation of waterways and the associated impact on the indigenous species that they support.[40]

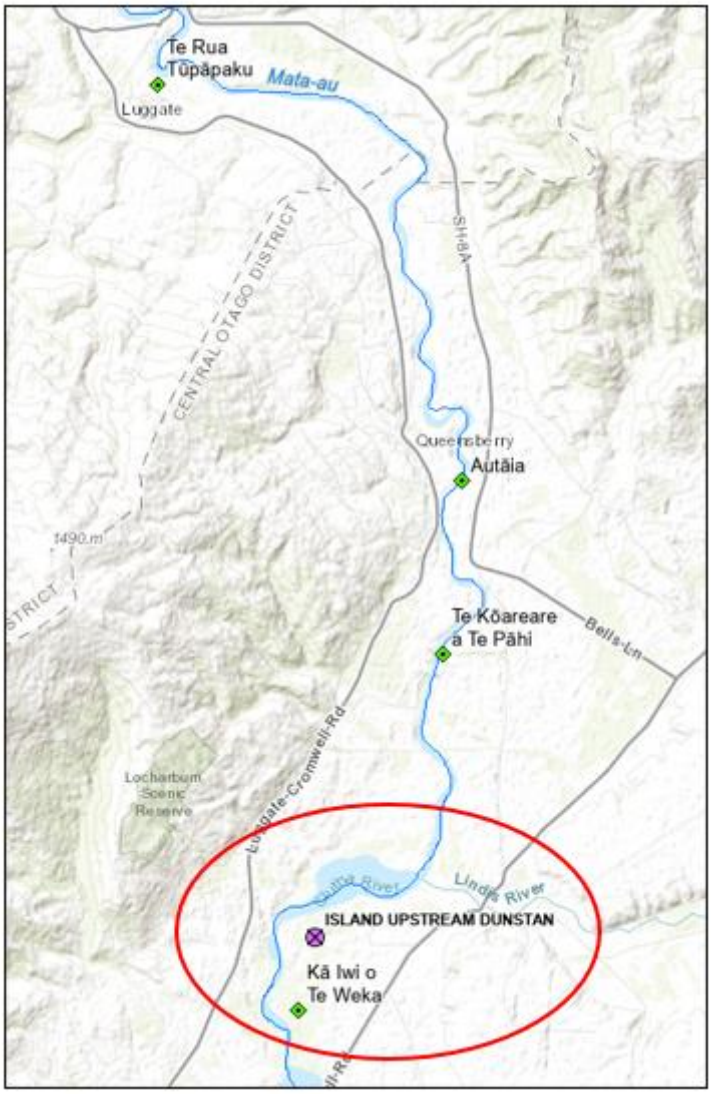
[38] Waitangi Tribunal, 1991.
[39] Jager & Millar, 2021.
[40] See Section 6.8 for discussion regarding equity of environmental outcomes.

7.0 He ara poutama: Statutory framework

7.1 Ngāi Tahu Claims Settlement Act 1998 (NTCSA 1998)

The NTCSA 1998 was enacted to settle the historical Ngāi Tahu claims against the Crown and provides redress under Te Tiriti o Waitangi. The Crown apology in section 4 explicitly recognises the rakatirataka of Kāi Tahu within its takiwā. The Act provides specific provisions that provide for the exercise of rakatirataka and kaitiakitaka by mana whenua in relation to mahika kai, taoka species, and other resource management matters. These include rights in relation to the management of specified significant areas such as statutory acknowledgement areas, tōpuni, and nohoaka.

Whakaahua 7: Nohoaka in the Dredging Area [41]



Under Schedule 40 of the NTCSA 1998, the Mata-au is recognised as a statutory acknowledgement area and the Crown has acknowledged the cultural, spiritual, historic, and traditional association of Kāi Tahu with the Mata-au. Statutory acknowledgements aim to improve opportunities for mana whenua engagement in resource management processes.

[41] Ngāi Tahu Claims Settlement Act 1998.

Nohoaka entitlements were created and granted under Schedule 95 of the NTCSA 1998, providing for seasonal occupation and use by Kāi Tahu whānui on specific areas of Crown-owned land near waterbodies for the harvest of natural resources. These sites are intended as partial redress for the loss of mahika kai through the alienation of land. There is a nohoaka site located on an island upstream of Lake Dunstan within the area of the proposed dredging activity, as shown by Whakaahua 7 above.

7.2 Resource Management Act 1991

The Resource Management Act 1991 recognises and provides for the Kāi Tahu values and interests in the Mata-Au.

The relationship of Kā Rūnaka with the Mata-au catchment is a matter of national importance that must be recognised and provided for in managing natural and physical resources.[42] The depth and breadth of the relationship of mana whenua with wai māori and the Mata-au are discussed in Section 5.0.

In achieving the purpose of the Act particular regard is required to kaitiakitaka.[43] 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.

7.3 National Policy Statement for Freshwater Management 2020 (NPSFM 2020)

Te Mana o te Wai is a fundamental concept in the NPSFM 2020 and 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."*[44]

The concept of Te Mana o te Wai represents a significant paradigm shift in freshwater management. The previous focus on the scale and significance of the effects of resource use is now redirected onto the mauri or life-force of water and the enquiry becomes how do users of resources protect the water's health and well-being?

Mana whenua have undertaken a robust process to define Te Mana o te Wai in Otago. Our definition of Te Mana o te Wai is informed and framed by our vision for freshwater and aligns with the central elements of our creation traditions. This definition is informed by our knowledge and mātauraka about te taiao and wai māori.

The objective of the NPSFM is to ensure that natural and physical resources are managed in a way that prioritises:

- first, the health and well-being of water bodies and freshwater ecosystems.
- second, the health needs of people (such as drinking water).
- third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

[42] Resource Management Act 1991, section 6(e)
[43] Resource Management Act 1991, section 7(a)
[44] NPSFM 2022, s.1.3.

7.4 Proposed Regional Policy Statement 2021 (PORPS)

The PORPS vision for the Clutha Mata-Au Freshwater Management Unit (FMU) is that:

- Management of wai māori recognises that the Clutha Mata-au is a single connected system ki uta ki tai, and that the source of the wai is pure, coming directly from Tawhirimatea to the top of the mauka and into the awa.
- The ongoing relationship of Kāi Tahu with wāhi tūpuna is sustained.
- Water bodies support thriving mahika kai and Kāi Tahu whānui have access to mahika kai:
- Indigenous species migrate easily and as naturally as possible along and within the river system; and
- In the Upper Lakes rohe, the high quality waters of the lakes and their tributaries are protected, recognising the significance of the purity of these waters to Kāi Tahu and to the wider community.[45]

The PORPS provides for Te Mana o te Wai and recognises that:

- *water is the foundation and source of all life - na te wai ko te hauora o ngā mea katoa.*
- *there is an integral kinship relationship between water and Kāi Tahu whānui, and this relationship endures through time, connecting past, present and future,*
- *each water body has a unique whakapapa and characteristics,*
- *water and land have a connectedness that supports and perpetuates life, and*
- *Kāi Tahu exercise rakatirataka, manaakitaka and their kaitiakitaka duty of care and attention over wai and all the life it supports.* [46]

[45] Proposed Regional Policy Statement, LF–VM–O2 – Clutha Mata-au FMU vision.
[46] Proposed Regional Policy Statement, LF–WAI–O1 – Te Mana o te Wai.

8.0 Mauri Tū, Mauri Ora: Cultural Impact Assessment

This cultural impact assessment evaluates the potential impact that the proposed activity may have on mana whenua cultural values as identified by Kā Rūnaka. On the basis of this assessment, Kā Rūnaka provide the following responses to the proposal from CGCL.

8.1 Wāhi Tūpuna and Ara Tawhito values

The Mata-au is a significant waterway to Kāi Tahu, connecting the mountainous regions of the heartland with the life-giving ecosystems of the coast. The headwaters are located amongst mountains often named for significant tūpuna, with the waters flowing from them being considered the purest. As the wai of the Mata-au travels through the whenua, it is fed by uncountable tributaries and streams, combining to create an awa of huge might and strength. This comprises the whakapapa of the river, a source of life and well-being, a wellspring of knowledge, memory, and connection, and a focus for identity.

Mana whenua associations with the Mata-au are found all along its length, including stories and memories, original placenames, and the archaeological evidence found in these places. The Mata-au was part of an ara tawhito that provided access for Kā Rūnaka from the coast to the upper lakes of Wānaka, Hāwea, and Whakatipu-wai-māori. The entire system acted as a significant wāhi mahika kai, with weka and tuna key food sources that were collected along its length. It is through these associations that whānau connect with the ancestral landscape experienced by the tūpuna.

However, the Mata-au has suffered significant modification. The "*power and movement of the Clutha/Mata-au rushing through restrictive gorges with many rapids",* has changed to smooth, slow water."[47] The mana and mauri of the Mata-au has consequently been degraded.

Today the awa is recognised as a statutory acknowledgement area, and as such, has legal recognition as a place of importance to Kā Rūnaka, and to Kāi Tahu whānui.[48] The Mata-au is also mapped as a wāhi tūpuna under the QLDC District Plan.[49]

Mana whenua aspirations and intentions for the Mata-au in terms of wāhi tūpuna and ara tawhito values include:

- Recognition of wāhi tūpuna and ara tawhito, and the values associated with them.
- Reconnecting whānau to the awa.
- Enabling access to, and use of, wāhi tūpuna and nohoaka sites.

The resource consent application does not provide adequate information to explain how the impacts of this dredging activity on wāhi tūpuna and ara tawhito values will be mitigated by CGCL. The Mata-au has been significantly modified and degraded by mining and dredging in the past and further modification is not supported by mana whenua.

8.3 Wai Māori values

Wai māori is a taoka that has a central place in the whakapapa of creation. The waters that feed major rivers like the Mata-au contribute to the whakapapa of this awa as it travels from the mountains to the sea. Different waterbodies were seen for their intrinsic values by tūpuna, each

[47] KTKO, 20005, p. 133.
[48] Te Rūnanga o Ngāi Tahu Act 1996, Schedule 40.
[49] QLDC, 2021.

having its own mana and mauri. The ecological services provided by waterways were well recognised by tūpuna and are valued as a taoka. Waterways were significant sources of food and resources for mana whenua in the past, which became a driver for cultural practices related to learning, knowledge, and intergenerational well-being. Safeguarding the mauri of the Mata-au and restoring mahika kai and taoka values is a priority for Kā Rūnaka.

However, current data for the Mata-au at Luggate Bridge suggests, in almost all cases, that water quality is degrading, or at best water quality trends are indeterminate, as shown Tūtohi 5:

Tūtohi 5: Water quality at Luggate Bridge [50]

Measure	E. coli	Clarity	Turbidity	Total Nitrogen	Total Phosphorous
State	In the best 25% of all sites	In the best 50% of all sites	In the best 50% of all sites	In the best 25% of all sites	In the best 25% of all sites
Trend	Very likely degrading	Likely degrading	Indeterminate	Very likely degrading	Indeterminate

The trends for clarity and turbidity particularly concern mana whenua given the nature of the proposed dredging activity.

The application takes an effects-based approach to dredging and proposes the adoption of conditions to manage those effects. The application concludes, without any supporting evidence, that there will be no discernible adverse effects on water quality beyond the zone of reasonable mixing. No monitoring is proposed as part of the application to manage the effects of dredging on water quality. Overall, mana whenua are unable to assess whether the proposed dredging activity provides for the mauri of the Mata-au and gives effect to Te Mana o te Wai due to the paucity of the information provided in the application.

8.4 Ecological and biodiversity values

The protection of ecological and biodiversity values is strongly associated with the protection of mana whenua values for freshwater. Retention and restoration of indigenous freshwater ecosystems is a crucial element of upholding Te Mana o te Wai. The Mata-au provides an important habitat for many native species, including fish, bird, and plant species.

In the past, mahika kai and taoka species including tuna, weka, and kāuru were significant food sources for whānau. Modification of the awa, changes in land usage practices, and the introduction of exotic species has significantly influenced the distribution and abundance of these mahika kai species, contributing to the disconnection between whānau and the awa. Consequently, the restoration of habitats for mahika kai species and the reinvigoration of indigenous biodiversity is a significant aspiration for Kā Rūnaka.

It is noted that the freshwater assessment undertaken by E3 Scientific only included macroinvertebrate sampling in three locations in the Central Otago district.[51] There were no sampling sites within the Queenstown Lakes District and the effects on ecological values in that reach of the Mata-au are unknown. Moreover, all samples were taken from wadeable depths,

[50] LAWA, 2022b.
[51] Jager & Millar, 2021.

whereas it is proposed that dredging will occur on the riverbed at depths between 2m and 15m. This raises the question of whether the freshwater assessment is fit for purpose. [52]

The identification of tributaries of wider than 1m as exclusion zones for the proposed activities is welcomed, but this does not go far enough to support mana whenua values related to ecology and biodiversity. Disturbance of the bed and sedimentation should be avoided in the vicinity of all tributaries in the area of proposed activity.

Kā Rūnaka believe that there is insufficient evidence on the effects of gold mine dredging on instream benthic environments and therefore, on taoka species and their survival. Of most concern are the effects on sediment dwelling species such as ammocoetes, as well as the eggs of kanakana, bully, and galaxiid species, and juvenile kōura and tuna.

The application concludes that any elvers or mature eel drawn through the dredge would survive unharmed and that the impact on the tuna population will be inconsequential. The conclusions reached by the applicant are not supported by evidence. The potential effects of dredging on the tuna population above Lake Dunstan concerns mana whenua. Overall, mana whenua are unable to assess the effects of this application on ecological and biological values.

8.5 Archaeological values

Archaeological sites provide further evidence of mana whenua associations with the Mata-au catchment and the surrounding cultural landscape. Sites referencing habitation and food gathering are common, indicating that the awa was a place where whānau lived and worked.[53]

Māori archaeology provides evidence of mana whenua associations and connections beyond the mātauraka and kōrero passed down from tūpuna and through whānau. However, these sites can be difficult to identify. Given the history of mana whenua associations with this area other sites may be present that have not been identified. Changes to the awa through damming and other modification may mean that these sites are not restricted to the land surrounding the awa, but may also be present in the river itself, either on the bed or the banks.

The draft consent application places significant emphasis on archaeology related to goldmining activities within the catchment, with a strong focus on dredging relics. Māori archaeology is not discussed.

The resource consent application does not recognise and provide for Māori archaeological values. Given the significant mana whenua associations and long history of occupation along the awa in the past, the adoption of an accidental discovery protocol may not be sufficient to identify and protect Māori archaeological sites.

8.6 Equity of Environmental Outcomes

Throughout the Kāi Tahu history of loss, a significant feature of the social and political landscape was the lack of equity in environmental outcomes. For mana whenua, this has resulted in significant loss of mahika kai and taoka species and the modification of wāhi tūpuna with consequential impacts on Kāi Tahu communities. The current dredging proposal perpetuates a pattern of extractive use of the Mata-au. The application does not propose environmental mitigation to off-set the effects of the

[52] Further queries and concerns with the contents of the freshwater assessment are provided in Appendix 3.
[53] See section 5.2 above.

dredging proposal. Overall, the proposal is focused on economic use of the Mata-au to the detriment of environmental outcomes.

9.0 He kupu whakamutuka: Conclusion

This CIA has been prepared to assess the cultural impacts associated with the proposed dredging of the Mata-au between Luggate and Lake Dunstan.

The Mata-au is a significant waterway for Kāi Tahu, connecting the mountainous regions of the inland area with the life-giving ecosystems of the coast. Mana whenua associations with the Mata-au are found all along its length, including stories and memories, original placenames, and archaeological evidence of the long history and occupation of this area. The awa has its own whakapapa, is a source of life and well-being, a wellspring of knowledge, memory, and connection, and is a focus for identity.

The whakapapa connection with the Mata-au imposes a kaitiakitaka obligation on mana whenua to protect the awa and all the life it supports for future generations, as expressed in the whakataukī mō tātou, ā, mō kā uri a muri ake nei.

Kā Rūnaka believe that there is insufficient evidence on the effects of gold mine dredging on instream benthic environments and therefore, on taoka species and their survival. Hokonui Rūnanga have taken the firm stance of opposing any suction dredge mining due to the unknown effects on benthic species, including ammocoetes (juvenile kanakana that live 3-4 years in the sediment after their larval stages), Kākahi from spat to adult, eggs of multiple fish species including kanakana and galaxiids and also migrating elver.[54] An ecological management plan prepared by a suitably qualified freshwater ecologist should form part of the application and be reviewed annually.

Mana whenua are unable to assess whether the proposed dredging activity provides for the mauri of the Mata-au and gives effect to Te Mana o te Wai. The application is focused on the economic benefits of gold dredging and does not address the effects of this activity on the health and wellbeing of the Mata-au. Further, inadequate information has been provided to enable mana whenua to assess whether the effects of dredging on wāhi tūpuna and ara tawhito, ecology and biodiversity, and archaeology will be addressed. Overall, mana whenua are concerned that the current dredging proposal perpetuates existing inequities in environmental outcomes.

[54] See Appendix 4 for a summary of the position of Hokonui Rūnaka on gold dredging applications.

References

Beattie, H. (1945). *Māori lore of lake, alp and fiord: Folk lore, fairy tales, traditions and placenames of the scenic wonderland of the South Island*. Dunedin, New Zealand: Otago Daily Times and Witness Newspapers, Co.

Beattie, J.H. (1994). *Traditional lifeways of the Southern Māori*. Dunedin, New Zealand: University of Otago Press & Otago Museum.

Brockie, B. (2007). Introduced animal pests. Retrieved from Te Ara, the encyclopedia of New Zealand: https://teara.govt.nz/en/introduced-animal-pests

Clucas, R. (2019). Statement of evidence of Dr Rosemary Clucas for Te Rūnanga o Ōtākou, Kāti Huirapa Rūnaka ki Puketeraki and Te Rūnanga o Moeraki. Retrieved from Otago Regional Council: https://www.orc.govt.nz/media/7464/aukaha-expert-evidence-rosemary-clucas-15-oct-19.pdf

Department of Conservation (2022). Beech forest: Native plants. Retrieved from https://www.doc.govt.nz/nature/native-plants/beech-forest/

Hale, P. (2019). Cultural values statement: Queenstown Lakes District Council wastewater overflow discharge, Queenstown Lakes District [report]. Dunedin, New Zealand: Aukaha (1997) Ltd.

Jager, M., & Millar, B. (2021). Suction dredge mining Upper Clutha River freshwater assessment [unpublished report]. Arrowtown, New Zealand: E3 Scientific.

Jellyman, P.G., & Harding, J.S. (2012). The role of dams in altering freshwater fish communities in New Zealand. In *New Zealand journal of marine and freshwater research*, 46 (4): 475-489.

Kāi Tahu ki Otago (2005). Kāi Tahu ki Otago natural resource management plan 2005. Dunedin, New Zealand: author.

Kleinlangevelsloo, M., & Clucas, R. (2017). Cultural values report: Arrow River / Wakatipu Basin aquifers, Cardrona River. Retrieved from Otago Regional Council: https://www.orc.govt.nz/media/4196/cultural-value-report-aukaha.pdf

Land Air Water Aotearoa (2022). Clutha River/Mata-au at Luggate Bridge. Retrieved from https://www.lawa.org.nz/explore-data/otago-region/river-quality/clutha-rivermata-au/clutha-rivermata-au-at-luggate-bridge/

Marquet, S., & Otago Daily Times (2012, November 9) Cold Gold Clutha's dredge [image credit]. Retrieved from https://www.odt.co.nz/regions/central-otago/job-losses-gold-dredging-operation-ceases

Ministry for the Environment (2021). Irrigated land in New Zealand. Retrieved from https://environment.govt.nz/facts-and-science/land/irrigated-land-in-new-zealand/

National Institute of Water and Atmospheric Research (2013). Kanakana: Sniffing out a place to spawn. Retrieved from https://niwa.co.nz/sites/niwa.co.nz/files/niwa_2013_kanakana_research.pdf

National policy statement for freshwater management (2020). Retrieved from Ministry for the Environment: https://environment.govt.nz/assets/publications/National-Policy-Statement-for-Freshwater-Management-2020.pdf

New Zealand Archaeological Association (2023). ArchSite. Retrieved from https://archsite.eaglegis.co.nz/NZAA

New Zealand Petroleum and Minerals (2023). Minerals permit webmaps. Retrieved from https://www.nzpam.govt.nz/maps-geoscience/minerals-webmaps/

New Zealand Topo Maps (2023). Retrieved from https://www.topomap.co.nz/

Ngāi Tahu Claims Settlement Act 1998. Retrieved from https://www.legislation.govt.nz/act/public/1998/0097/latest/DLM429090.html

Orwin, J. (2007). Southern beech forest. Retrieved from Te Ara: the encyclopedia of New Zealand: https://teara.govt.nz/en/southern-beech-forest

Peden, R. (2008). Rabbits. Retrieved from Te Ara, the encyclopedia of New Zealand: https://teara.govt.nz/en/rabbits

Proposed Otago Regional Policy Statement 2021. Retrieved from Otago Regional Council: https://otago.isoplan.co.nz/eplan/rules/0/224/0/0/0/47

Queenstown Lakes District Council (2023). Operative District Plan. Retrieved from https://www.qldc.govt.nz/your-council/district-plan/operative-district-plan

Resource Management Act 1991. Retrieved from https://www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html

Ritchie, N.A. (1978). Site record form for G40/67. Retrieved from ArchSite: https://archsite.eaglegis.co.nz/NZAA

Scheele, S. (2007). The Banks Memorial Lecture: Cultural uses of New Zealand native plants. In *New Zealand garden journal*, 10 (2): 10-16. Retrieved from Royal New Zealand Institute of Horticulture: https://www.rnzih.org.nz/RNZIH_Journal/Pages_10-16_from_2007_Vol10_No2.pdf

Sycamore, D. (2021). Application for Resource Consent: Cold Gold Clutha Ltd. [consent application].

Te Rūnanga o Ngāi Tahu (1997). Kemp's Deed, 1848. Retrieved from https://ngaitahu.iwi.nz/our_stories/kemps-deed-1848/

Te Rūnanga o Ngāi Tahu (2023). Kā Huru Manu atlas. Retrieved from https://www.kahurumanu.co.nz/atlas

Te Rūnanga o Ngāi Tahu Act 1996. Retrieved from https://www.legislation.govt.nz/act/private/1996/0001/latest/DLM117218.html

Upper Clutha Historical Records Society (2022). Timeline. Retrieved from http://www.uppercluthahistory.org/timeline/

Verduyn-Cassels, L. (2008). Red bridge across the Clutha River at Luggate [image]. Retrieved from https://commons.wikimedia.org/wiki/File:Red_Bridge_across_the_Clutha_River_at_Luggate.jpg#/media/File:Red_Bridge_across_the_Clutha_River_at_Luggate.jpg

Waitangi Tribunal (1991). *The Ngāi Tahu Report 1991*. Wellington, New Zealand: GP Publications.

Wardle, P. (2010, March 17). Distribution of native forest in the Upper Clutha district, Otago, New Zealand. In *New Zealand journal of botany*, 39 (3): 435-446. Retrieved from Taylor & Francis: https://www.tandfonline.com/doi/pdf/10.1080/0028825X.2001.9512747

Young, R., Smart, G., and Harding, J. (2004). Impacts of hydro dams, irrigation schemes and river control works. Retrieved from ResearchGate: https://www.researchgate.net/profile/Roger-Young-5/publication/238668681_Chapter_37_Impacts_of_hydro-dams_irrigation_schemes_and_river_control_works/links/0deec528a87adb7188000000/Chapter-37-Impacts-of-hydro-dams-irrigation-schemes-and-river-control-works.pdf

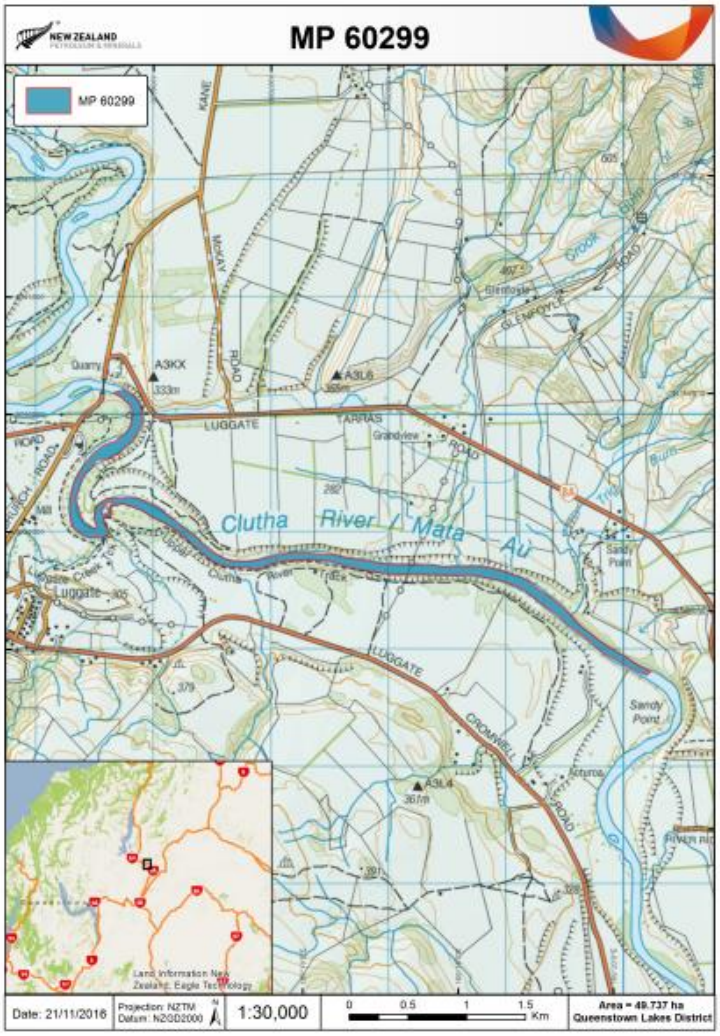
Appendix 1: Glossary of Māori terms

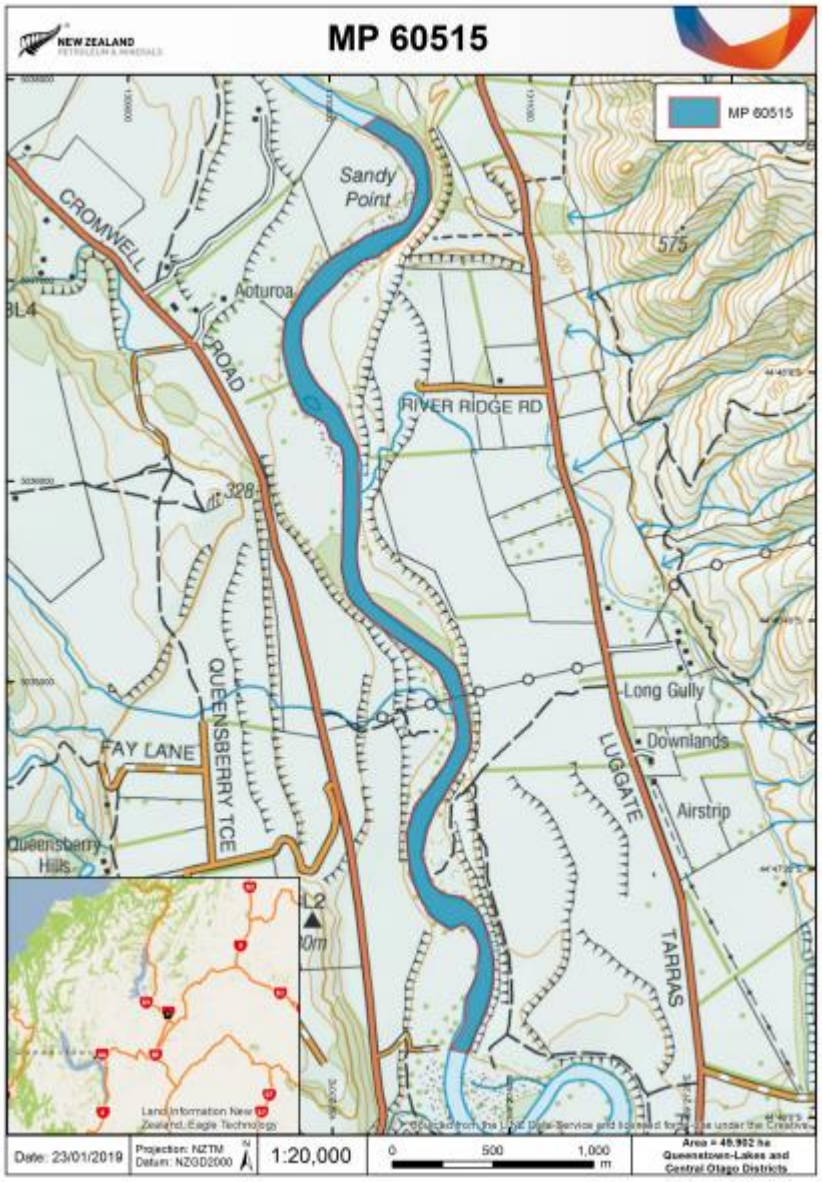
Ahikāroa	The long-burning fires of occupation
Ara tawhito	Ancestral trails
Atua	Deity, early ancestor
Awa	River
Hapū	Kinship group, clan
Harakeke	New Zealand flax
Heke	Migration, movement
Kai Tahu whānui	The collective of the individuals who descend from one or more of the five primary hapū of Hāwea, Rapuwai, Waitaha, Kāti Māmoe and Kāi Tahu
Kāika mahika kai	Food gathering settlement
Kaitiaki whenua	Environmental protectors
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
Kāuru	The edible part of the tī kouka or cabbage tree
Kawa	Protocol
Koekohe	Hampden Beach
Kō	Digging stick
Kōau	The south branch of the Mata-au downstream from Balclutha
Kōura	Freshwater crayfish
Korimako	Bellbird
Mātauraka	Knowledge, wisdom
Mahika kai	Practices, knowledge, and activities related to food gathering, including food gathering resources and species
Mamae	Pain, distress
Mana	Status, prestige, honour
Mana whenua	Customary authority exercised by an iwi or hapū in an identified area, and the people mandated to exercise it on their behalf
Mata-au	Clutha River
Matau	The north branch of the Mata-au downstream from Balclutha
Mauri	Life force, life essence
Mokopuna	Grandchildren, descendants

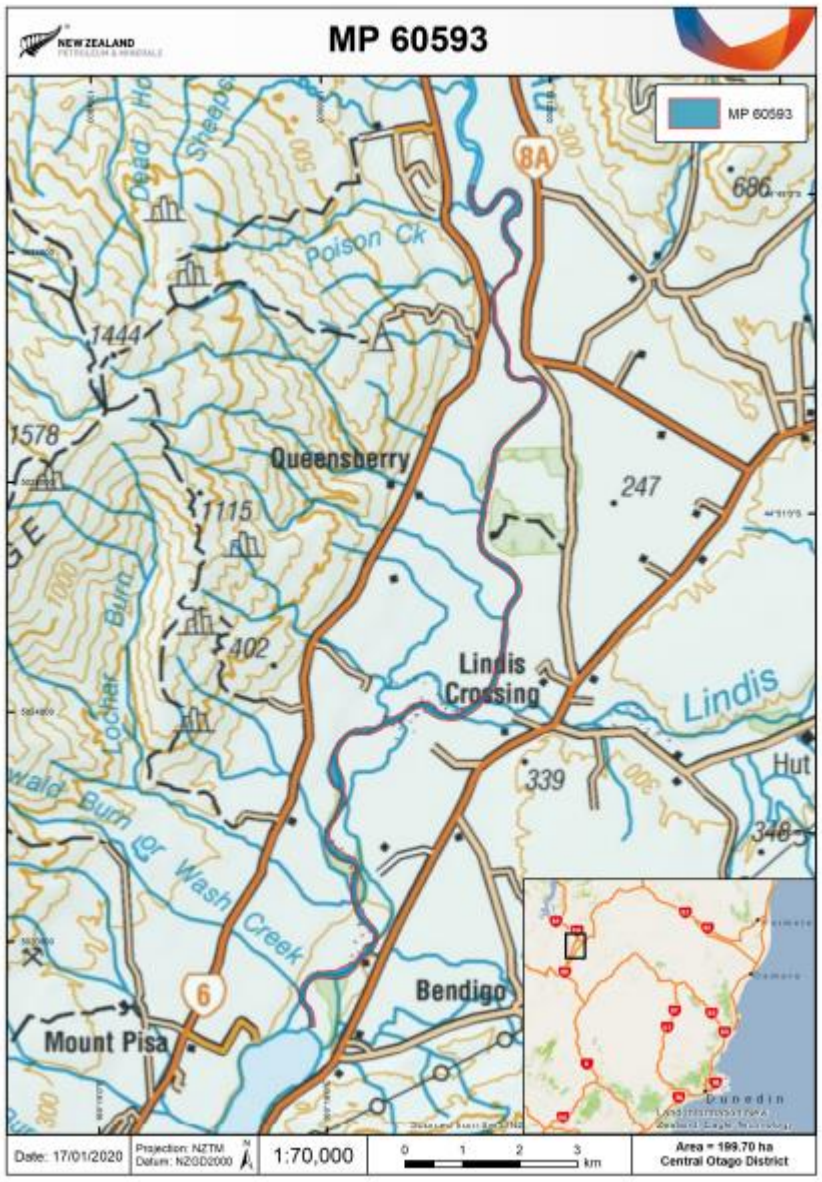
Mōkihi	Reed raft
Murihiku	The area of Te Waipounamu south of the Waitaki River
Nohoaka	Seasonal occupation sites
Ōrau	Cardrona River
Ōtewhata	Fraser River
Paetarariki	Hāwea River
Pā	Fortified settlement
Papatipu rūnaka	Tribal councils
Pōhā	Kelp bag; a receptacle to hold preserved birds
Rakatirataka	Chiefly authority
Takiwā	Territory
Taoka	Treasure
Tapu	Spiritual restrictions
Tauhinu	Inch Clutha
Tawai	Silver beech
Tawairauriki	Black beech, Mountain beech
Te taiao	The natural environment
Te Tiriti o Waitangi	The Treaty of Waitangi
Tī kōuka	Cabbage tree
Tikaka	Correct procedure
Toki	Adze, adzes
Tōpuni	Recognition of Kāi Tahu connection to prominent landscape features and conservation areas under the Ngāi Tahu Settlement Act 1998
Tuna	Eel, long-finned eel
Tūpuna	Ancestor
Umu	Earth oven
Umu tī	Earth ovens for processing kāuru
Wāhi mahika kai	Places where mahika kai was practiced
Wāhi tūpuna	Ancestral landscape of significance to iwi
Wai	Water
Wai māori	Freshwater
Waitau kāuru	A porridge made from reconstituted preserved kāuru
Waka	Canoe
Whakapapa	Genealogy

Whakataukī	Proverb
Whakatipu-wai-māori	Lake Whakatipu
Whānau	Extended family
Whanaukataka	A sense of family connection
Whekau	Laughing owl
Whenua	Land

Appendix 2: Cold Gold Clutha Limited – Upper Clutha Mineral Permits

<u>Term</u> 10 years commencing on 8 February 2017 <u>Land Area</u> 49.737 hectares <u>Regional Council:</u> Otago Regional Council <u>Territorial Authority</u> Queenstown-Lakes District *Source: New Zealand Petroleum & Minerals, Minerals Permit Webmaps*	

Term 10 years commencing on 4 June 2019. Land Area 49.902 hectares Regional Council: Otago Regional Council Territorial Authority Queenstown-Lakes District, Central Otago District Council *Source: New Zealand Petroleum & Minerals, Minerals Permit Webmaps*	

Term 10 years commencing on 26 February 2021. Land Area 199.70 hectares Regional Council: Otago Regional Council Territorial Authority Central Otago District Council *Source: New Zealand Petroleum & Minerals, Minerals Permit Webmaps*	

Appendix 3: Responses to the freshwater assessment report[55]

Summary of report content	Aukaha response
"Upland bully and common bully prefer gentle flowing, stream margins. These species and their habitat will be protected as the dredge cannot enter water shallower than 0.8m."[56]	Areas to avoid should be based on presence of suitable habitat rather than depth. Although a depth of 0.8m and shallower will cover some habitat, there may be exceptions along this stretch of the river, which includes habitat for tuna, kanakana, and common and upland bully.
"No lamprey are recorded in the Upper Clutha / Mata-au."[57]	The presence of kanakana cannot be ruled out due to a lack of surveying.
"The juvenile lamprey, ammocoetes in the Mataura River, show a preference for sandy spots at the banks of the rivers" (DoC, 2008).[58]	More recent research indicates that kanakana have also been identified nesting under large boulders. [59]
"… the fish are more likely to pass through [sluicing equipment] unharmed and will be returned back to the Clutha River / Mata-au with the tailings."[60]	There is no evidence provided to support this claim.
"Gravels and cobbles will settle immediately behind the dredge reinstating and backfilling the substate as works are occurring."[61]	There is no evidence provided to support this claim.
Information about the annual work programme. [62]	The annual work programme must be reviewed by a suitably qualified ecologist with knowledge of fish spawning and feeding habitats, to ensure that none of the sections will disturb indigenous fish habitat.

[55] Jager & Millar, 2021.
[56] Ibid, p. 24
[57] Ibid, p. 25
[58] Ibid, p. 25.
[59] NIWA, 2013.
[60] Jager & Millar, p. 25.
[61] Ibid, p. 29.
[62] Ibid, p. 33.

Appendix 4: The position of Hokonui Rūnaka on instream gold dredging applications

The Hokonui Rūnanga in the first instance will oppose all instream gold dredging applications. Hokonui Rūnanga believe there is insufficient evidence on the effects of gold dredge mining on instream benthic environments and therefore to taonga species and their survival. Of most concern are the effects on sediment dwelling species, i.e., kākahi and ammocoetes, along with the eggs of kanakana, bully and *galaxiids* species, and juvenile koura and tuna. With the nation-wide push for te mana o te wai, this activity does not comply with national and Ngai Tahu ki Murihiku freshwater directives.

In certain circumstances, Hokonui may administer conditions to resource consents for a dredging activity. These may include the following conditions and is not an exhaustive list:

Proposed consenting conditions:

- Sufficient assessment of Te Tangi a Tauira and the cultural significance of the waterway and area where the activity is taking place.
- Abide by the maps provided by the Conservation Department to exclude the areas which have been identified for non-migratory species and kākahi habitat;
- If kākahi are discovered during mining, works in the area the kākahi was discovered shall cease immediately. Conservation Department will be advised;
- No mining in slack water (pools) where sediment has accumulated as a likely habitat for ammocoetes (juvenile lamprey).
- Mining only outside of elver migration time. Elver migration times are from December 1st – March 31st.
- Mining only outside of kanakana spawning time. Kanakana spawning times are from December 1st – February 31st.
- Ensure that any dredging activity should not undermine riverbanks, a 2-metre buffer is recommended;
- Fish found entrained in the machinery should be returned to the river if alive; if deceased, they should be reported to DOC and Hokonui Rūnanga.
- Survey and assess if any visible bird nesting sites are present. If present provide an appropriate agreed setback from site.
- Biosecurity measures e.g., check, clean, dry as well as avoid disturbing Lagarosiphon beds;
- No refuelling would occur in the waterbody or in areas where fuel can enter the waterbody
- Conspicuous discolouration should not exceed 50 m past the zone of reasonable mixing;
- A condition limiting the timing or distance that one area can be actively dredged e.g. A distance no more than 100 m or 4 x the rivers width (whichever is smaller) and a time period of two months or more must elapse before an area can be disturbed within 100m of a previously disturbed area in the same river or stream.
- Monitoring and review conditions as feasible.
- Small nozzle size up to (51/2 inch or 139 mm) only to be used on any smaller waterways.