Boffa Miskell

Shotover WWTP

Landscape and Natural Character Effects Assessment
Prepared for Queenstown Lakes District Council

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Cover photograph: Liz Gavin view from true left bank of the Kawarau Riverbank towards the proposed Outfall Site

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Appendices

1.0 Executive Summary

The project introduces localised landscape change associated with the installation of approximately 1.3 km of conveyance pipeline and a small-scale outfall structure at the Kawarau River margin. The works sit within landscape influenced by river training works, stopbanks, existing wastewater infrastructure, gravel extraction activity and informal recreation, while still forming part of a wider ONF riverscape and landscape where river processes and the mountain setting remain dominant.

The environment is a high-value riverscape at the Shotover–Kawarau confluence where the Kimiākau/Shotover ONF and the Kawarau River ONF coincide, and where landscape values are strongly derived from the legibility of fluvial processes, dynamic confluence patterns (including mixing waters and sediment processes), and the wider Whakatipu Basin setting. The project is located within both the Shotover and the Kawarau ONF, with the Kawarau River subject to Water Conservation (Kawarau) Order 1997, which requires the river's waterbody values (including natural and scenic characteristics and recreation) to be sustained and preserved as far as possible in its natural state. While the wider river corridor expresses high natural character values, the immediate confluence reach assessed in this report is also characterised by existing modification (river training works/stopbanks, infrastructure, gravel extraction influences, and informal recreation), which forms an important part of the baseline context against which effects are assessed.

Natural character effects are localised and primarily associated with minor physical modification to the Kawarau River edge/bed at the outfall. Works associated with the outfall structure include rock protection and buried/submerged pipe elements and (short-term) construction disturbance. Up to **moderate** adverse experiential effects are associated with the construction activity. Water-quality related natural character effects are most evident within the immediate mixing zone, effects spatially confined and rapidly reduced through dilution and confluence mixing, with effects diminishing to **very low** at reach scale. Overall, the effect on natural character is "**Low (adverse)**", with reach-scale natural character values maintained due to the limited footprint and the dominance of existing river processes and patterns.

Physical effects are primarily related to temporary ground disturbance along the pipeline corridor (trenching, stockpiling, reinstatement) and localised permanent modification at the outfall interface (minor bank regrading and replacement of existing gravels with engineered rock material). Along most of the conveyance pipeline route, the pipeline is trenched and reinstatement is intended to largely restore pre-existing landform and surface patterns so that long-term landform change becomes largely indiscernible over time. The most pronounced physical change is confined to the immediate river edge where the outfall introduces a small area of altered bank form and bed substrate; however, its footprint is limited and occurs within a reach already influenced by river engineering, meaning the overall magnitude of permanent physical change is assessed as **low (adverse minor)**.

Landscape Visual Effects are greatest at close range and during construction. While **moderate** temporary adverse landscape amenity and visual effects may occur within approximately 0–100 m of the outfall during construction, these are short term and very localised, reducing to **low**

(adverse) effects at operational phase due to the low-profile outfall design, with pipes submerged or buried, and rock and earthworks being the main visual effect that will visually be integrated through use of locally sourced rock and topsoil. Beyond the immediate vicinity, visual effects diminish quickly to **very low/neutral** due to distance, screening vegetation and landform, and the project reading as a minor component within expansive ONF views where the dominant elements remain the river systems, confluence dynamics and the wider mountain backdrop. If an underwater piped outfall is used (rather than an outfall structure), then the landscape visual effects are likely to be significantly less[1].

Perceptual and amenity effects are most evident during construction due to machinery, earthworks, temporary access disruption and a reduction in perceived naturalness for users in close proximity—particularly anglers and river-margin users near the outfall and trail users along the adjoining corridor. These effects are assessed as **moderate** (adverse) at the construction-phase but very short-term within the immediate vicinity of works, reducing quickly as construction activity ceases and reinstatement occurs. In the operational phase, perceptual effects are assessed as **low** and highly localised because the pipeline is buried and the outfall is designed to integrate with the river margin through natural materials and reinstatement planting, without materially altering the broader coherence, openness and dynamic qualities of the river corridor.

The river system is identified as holding **very high** associative values for Mana whenua, as the discharge of treated wastewater to the river is culturally unacceptable, with a preference for land-based treatment expressed in available cultural information. Adverse effects on mana whenua associative values are at least **high and potentially very high**.

Cumulative landscape effects are considered in relation to the project occurring within an already modified river margin environment. Overall cumulative landscape effects are assessed as **low** in magnitude and **less than minor** in landscape terms, while recognising that cultural associations remain a distinct and higher order consideration.

2.0 Introduction

2.1 Scope of the report

Boffa Miskell Limited has been engaged by Queenstown Lakes District Council (**QLDC**) in April 2026 to undertake a Landscape and Natural Character Effects Assessment (**LNCEA**) for a proposed conveyance pipe[2] within the context of the true right of the Shotover River; and a proposed outfall for the Shotover Wastewater Treatment Plant (**Shotover WWTP**) on the true left bank of the Kawarau River (otherwise referred to as The Site in this report). The conveyance pipe works of the Site is within the Informal Recreation Zone (I**RZ**) with a sewage treatment Designation and the Rural Zone (**RZ**) in the Queenstown Lakes Proposed District Plan (**PDP**)[3]. The Site also has an Outstanding Natural Feature (**ONF**) overlay, as the

[1]Based on advice received, there would likely be substantially less rock and surface structure required for a pipe only outfall scenario.

[2] Appendix 4 figure 5

[3] Appendix 4 figure 2

conveyance pipe is located within the Kimiākau Shotover ONF and the outfall structure is located within the Kawarau River ONF[4].

QLDC commenced the option development for a new long-term disposal solution in October 2024, to replace the discharge of effluent from the treatment plant that was occurring via the Dose and Drain (**DAD**) disposal field. This field is not fit for purpose due to deterioration and non-compliances that has led to an enforcement order requiring a consent lodged for a long-term effluent disposal solution by 31st March 2026 (this project). The disposal solution will replace the current effluent discharge to the Kimiākau/Shotover River and will cater for the long-term effluent disposal requirements (to Year 2060). While QLDC explored MCA[5] outcomes on four options for treated disposal, (as outlined in the Short-list Report[6], this Assessment considers landscape, natural character effects of Option A – land flow path to the Kawarau River. This option was approved by Council on 19th March 2026, as the currently recommended preferred option for the Shotover WWTP long-term effluent disposal strategy[7], to meet timeframes set by the Environment Court Enforcement Order[8].

2.2 Other Relevant Technical Reports

The following technical reports were referenced as part of preparing this assessment:

Boffa Miskell Limited. 2026. *Shotover WWTP: Ecological Impact Assessment.* Report prepared for Queenstown Lakes District Council.

Boffa Miskell Limited. 2026. *Shotover WWTP: Periphyton Risk Assessment.* Report prepared for Queenstown Lakes District Council.

GHD Limited. 2026. *Shotover WWTP Surface Water and Groundwater Assessment.* Prepared for Queenstown Lakes District Council.

GHD Limited. 2026. *Shotover WWTP Disposal Field Alternative Discharge – Surface Water and Groundwater Assessment* (Project No. 12645246). Prepared for Queenstown Lakes District Council, May 2026.

Thrive Spaces and Places. 2026. *Shotover WWTP Recreation Assessment.* Prepared for Queenstown Lakes District Council

Landpro Limited. 2026. Application for Resource Consent (AEE): Shotover WWTP Discharge Project. Prepared for Queenstown Lakes District Council.

[4] Appendix 4 figure 1

[5] Multi Criteria Analysis

[6] Short-list Report: Shotover WWTP alternative disposal solution

[7] QLDC workshop papers of February 19th. Noting that the design will be further refined to reduce overall impacts at detailed design phase.

[8] Ibid.

2.3 Assessment Process

A Site visit was undertaken by the author on the 3rd and 4th May 2026 in sunny conditions, where the Site and surrounding landscape was visited, and representative photographs were taken. A selection of the photographs are included in the **Graphic Supplement (Appendix 3)**.[9]

Visual Simulations[10] have been produced to show the visual effects of the proposed activity from two key viewing areas. These are included in the Graphic Supplement, along with a landscape mitigation plan[11]. The Methodology and approach to assessment is outlined in the effects assessment under Section 5.1 of this report. A Landscape Concept Plan is included in the Graphic Supplement, outlining the proposed remediation and mitigation of the outfall pipe.

3.0 Existing Environment

3.1 Landscape Context

The Site is located on the true left margin of the Kawarau River at its confluence with the Outstanding Natural Feature (**ONF**) of Kimiākau/Shotover River, within the Shotover Delta in the Whakatipu Basin[12]. The Site occupies a low-lying alluvial floodplain environment at the interface between the braided Shotover River system and the incised Kawarau River, immediately downstream of the Shotover River bridge and adjacent to existing infrastructure including the Shotover Wastewater Treatment Plant and associated stopbanks and training works. The surrounding context includes the developed terrace landforms of Frankton Flats to the west and northwest, with the airport runway and Glenda Drive industrial area located in an elevated location west of the Site, with residential development at Shotover Country and Quail Rise to the north and east[13]. The Remarkables mountain range forms a prominent southern backdrop. The Kawarau River is recognised as an **ONF** within a highly dynamic hydrological environment where river processes, floodplain landforms and human modification are interrelated and vary along the river corridor, with its waters protected under Schedule 2 of the Water Conservation (Kawarau) Order 1997[14].

At the wider landscape scale, the Kawarau and Kimiākau/Shotover river systems collectively express **very high** physical values identified in the QLDC PDP landscape schedules (**The Landscape Schedules**) for the 21.22.3 Kimiākau (Shotover River) PA; and the 21.22.9 Kawarau River PA: Schedule of Landscape Values. This is associated with their hydrological, geomorphic and ecological characteristics. The Kawarau River is described as an incised, narrow river system with high flows and clear waters, while the Shotover River forms a largely intact braided system with a wide catchment and legible channel patterns. The confluence of these rivers is characterised by the interaction of contrasting river forms and water qualities, including the mixing of clear and turbid flows, and by the presence of flat alluvial floodplains shaped by sediment transport, channel migration and flood processes. These features

[9] See the Site Photographs (A-P) within the Graphic Supplement.

[10] Appendix 4, Visual Simulations 1-2.

[11] Appendix 4, Figure 7.

[12] See Appendix 4.

[13] Appendix 4, figure 5

[14] Appendix 4, Figure 4.

contribute to a landscape that is highly expressive of its formative processes, with coherent landform patterns framed by terrace risers and the wider basin margins.

Vegetation patterns and land use within the wider river corridor reflect both natural and modified components identified in The Landscape Schedules. These schedules identify landscape values and attributes found at a river / landscape scale[15]. The river margins along both rivers include a mix of pasture, grassland, matagouri scrub, willows and pockets of indigenous vegetation, with areas of regenerating native species within the broader catchment. Land use includes pastoral farming, infrastructure corridors and urban development on the basin floors, particularly in the vicinity of Frankton Flats, alongside recreation trails and river access routes. The **very high** perceptual values of the landscape are associated with the strong legibility and coherence of the river systems, the expressiveness of geomorphic and hydrological processes. A strong perception of naturalness and wildness is found in the Shotover Gorge section of the Kimiākau/ Shotover[16]; approximately 10km upstream, and through the Kawarau Gorge Section of the Kawarau east of the Kawarau Bungy[17] (12 km downstream). A high perception of naturalness is also associated with the presence of framed views along the river corridor with a consistent relationship between water, landform and vegetation patterns[18], and the dominance of more natural elements and processes and the appealing composition of natural and cultural landscape elements[19].

The associative values of the wider landscape are identified as **very high**, reflecting cultural, historical and shared meanings attributed to the rivers and their margins. The Kawarau and Shotover Rivers are recognised as wāhi tūpuna, with associations relating to Kāi Tahu whakapapa, mahika kai (including the gathering of species such as tuna, weka and other fauna), and traditional travel routes connecting Lake Whakatipu and the Clutha River system[20]. Historic associations are also present through evidence of gold mining activity within the catchment, contributing to the cultural and heritage attributes of the river corridor. These values are further reflected in the strong shared and recognised importance of the rivers for recreation and their identification in statutory schedules and the Water Conservation Order.

Within this broader context, the Project Area forms part of the confluence environment where the defining characteristics of both river systems are present at a local scale. Physical attributes include gravel floodplains, braided channels associated with the Shotover Delta, and the incised edge of the Kawarau River, with ongoing expression of hydrological and geomorphic processes such as sediment movement and channel change. The Site is also characterised by existing modifications, including stopbanks, river training works, gravel extraction, roads and informal recreation features, as well as exotic riparian vegetation such as willow, buddleia, broom and tree lupin.

3.1.1 Landscape Values at a local level

The Site occupies a more localised part of the confluence, where the defining physical values and characteristics remain evident but are influenced by a greater degree of modification. The

[15] 21.22.9 Kawarau River PA Schedule of Values and 21.22.3 Kimiākau (Shotover River) Schedule of Landscape Values. **Note** PA in the Landscape Schedule title stands for “Priority Area”. In both instances found in paragraph 7; and within Plan and Pest Species at the end of the schedule.

[16] 21.22.3 Kimiākau (Shotover River) PA paragraph 72 and 79

[17] 21.22.9 Kawarau River PA, para 47.

[18] 21.22.9 Kawarau River PA Schedule of Values and 21.22.3 Kimiākau (Shotover River) Schedule of Landscape Values paragraph 47

[19] 21.22.3 Kimiākau (Shotover River) PA paragraph 79

[20] 21.22.9 Kawarau River PA page 3; 21.22.3 Kimiākau (Shotover River) PA page 4

Project Area sits to the west of the active Shotover River margin behind the 2m high bund of the training works, running parallel to the Shotover River Delta and the edge of the Kawarau River, where braided river processes, gravel floodplains and channel dynamics continue to be expressed at a local scale but have a greater degree of human introduced change, including the shifting of the true right extent of the Shotover delta eastwards through river engineering. The landscape has been shaped by human intervention, including stopbanks, river training works, gravel extraction activities, and the presence of infrastructure such as the wastewater treatment plant adjoining the Shotover river margin. The current emergency discharge of treated wastewater into the Shotover River above the Kawarau confluence affects the water quality in this localised area as set out in the GHD documentation. Other modifications include roads, domestic gravel extraction, car access and dirtbike trails and jumps; as well as exotic vegetation including willow, buddleia, tree lupin, broom within the terrestrial area, and largarosiphon[21] within the riverbed.

The associative values of the Project Area reflect those of the wider river system but are expressed locally through both cultural and historic associations. The Kawarau and Shotover Rivers are recognised as wāhi tūpuna, embodying Kāi Tahu whakapapa connections, mahika kai resources and traditional travel routes[22]. These values apply across the entire river corridor and therefore extend through the Project Area, where the relationship between whenua and wai remains integral to the landscape. In addition, the Site lies within a landscape shaped by historic gold mining and contemporary recreational use[23], contributing to strong shared and recognised values. Recreational use includes active recreation (biking, running and walking along the Twin Rivers Trail); Kayaking, jetboating, angling and rafting activities on the river; and car access/ dogwalkers, dirtbike/motorcross activities on the flat gravels, trails and tracks at the Delta. Passive recreation with regards to picnicking and potentially swimming also occurs[24].

At the Site/ river reach landscape scale, perceptual values include natural processes and human activity. The immediate river margins and floodplain exhibit active geomorphic patterns, including shifting gravels, vegetation succession and visible flood processes, contributing to a strong sense of dynamism and naturalness. Underlying perceptual qualities—present at the local Site scale, include values associated with the legibility of river processes, the visual prominence of water, and the wider scenic backdrop of the Remarkables and the river systems. Modifications include the presence of informal recreation (including trails and off-road vehicle use), including the use of the training line as part of the Twin Rivers Trail. Infrastructure and modified vegetation patterns introduce a more managed and disturbed character compared to less accessible parts of the river corridor.

Table 1 below, lists landscape values and attributes found at a Project Area level, where the Site is experienced within the local environment. Values and attributes that are experienced at the Project level that are identified in The Landscape Schedules as well as those observed on Site are summarised in Table 1. The Project Area has been identified as the area from SH6 Shotover Bridge south to the confluence where it is contained by the Remarkables, and approximately 1km up and downstream from the outfall site as identified in figure 5 of Appendix 4.

[21] EcIA section 6.3.3

[22] 21.22.9 Kawarau River PA page 3; 21.22.3 Kimiākau (Shotover River) PA page 4

[23] Thrive Spaces and Places. 2026. *Shotover WWTP Recreation Assessment.* Prepared for Queenstown Lakes District Council; Section 6.2 pages 28-30

[24] Ibid page 48

Table 1: Localised Landscape attributes and Values Key Landscape attributes: Kimiākau/Shotover and Kawarau River and Tributaries	
Kimiākau / Shotover River Localised Landscape attributes and Values	
Physical Attributes and Values	The Lower reach of the Kimiākau / Shotover River is characterised by a broad, braided gravel schist river system with dynamic gravel beds, alluvial terraces and active channel migration near the delta and downstream[25]. Flood prevention works have modified and confined the Shotover Delta along its true right margins through training lines[26]. Scientific rarity of the potential reverse flow of the river towards Whakatipu-Waimāori (Lake Whakatipu) when the Kawarau and Kimiākau (Shotover) rivers are in flood. River training earthworks at the confluence of the rivers is designed to prevent/reduce this occurring in the future[27]. Largely intact braided river and wider catchment with historic modifications associated with gold mining is associated with the lower reaches of the Shotover River. Gravel extraction is located near the confluence with the Kawarau; with informal gravel trails and vehicular tracks and the Queenstown Airport runway and Runway End located at the southern end of the Landscape Schedule (west of the Delta)[28]. The Shotover WWTP influences the landscape character of the river corridor due to its scale, as does the gravel processing area adjoining this. Some reduction of water quality associated with current treated wastewater discharge[29]. Lower reaches in the vicinity of the Site are characterised by exotic trees within the River Margins, mainly Willow and Poplar, with patches of grey shrubland species and conservation reserves –as well as riparian weed species[30]. Ecological values within the Shotover Delta include significant bird habitat (black-fronted tern, black-billed gull, banded dotterel) and the Shotover Confluence Swamp wetland mosaic, along with fish habitat[31]. The Shotover River is highly expressive of its formative processes with legible fast flowing waters of a gravel shist substrate and braided river channels[32].
Associative Attributes and Values	The Shotover River is ancestral land to Kāi Tahu Whānui and all of its landscape is significant. Kāi Tahu whakapapa connections to whenua and wai generate a kaitiaki duty to uphold mauri. The river is a wāhi tūpuna and part of mahika kai networks, with a nohoaka at Tucker Beach and long-standing customary use and travel associations. Kimiākau is the Māori name for the Shotover River and was a kāinga mahinga kai (food-gathering place).[33] Highly memorable river within the Queenstown context for its history and vast catchment. The Shotover River is associated with 1860s Otago Gold Rush with remnants of this activity still present today.

[25] 21.22.3 Kimiākau (Shotover River) PA paragraph 2-3

[26] Site observation

[27] 21.22.9 Kawarau River PA Paragraph 5d.

[28] 21.22.3 Kimiākau (Shotover River) PA paragraph

[29] GHD Water Quality Report Section 3.6 and Section 7

[30] 21.22.3 Kimiākau (Shotover River) PA page 2 and 7

[31] 21.22.3 Kimiākau (Shotover River) PA page 2

[32] 21.22.3 Kimiākau (Shotover River) PA paragraph 47

[33] 21.22.3 Kimiākau (Shotover River) PA page 3 and 6

	Highly valued for recreation, with high public accessibility. Uses including trails (Queenstown Trail network), jet boating, rafting, swimming and fishing (angling), and frequent use by dirt bike/ motorcross of the floodplains. Also, inspiration of art, photography.[34]
Perceptual Attributes and Values	Strong legibility of fluvial processes, particularly visible in braided channels, gravel bars and shifting river morphology across the lower reaches. Highly attractive views associated with the open braided plains, with the river forming a distinct natural corridor separating developed areas. Highly attractive mid and long-range views from tracks and trails, reserve land and water, as well as SH6 and settlements. Within close range these views include gravel works and Sewage Ponds along the true right of the Shotover Delta river corridor, at the confluence, are influenced by the presence of the dirt bikes, jet boats and airplanes, as well as the physical works associated with tracks and earthworks at the Queenstown Airport Runway End which reduce sense of remoteness and wildness[35]. Views include the broader Mountain setting of the enclosing mountains around the Whakatipu Basin, and in particular, the Remarkables. Views include attractive exotic vegetation dominated river corridor and dynamic riverbeds. Dominant vegetation (Willow and Poplar) has scenic value with its seasonal colour change. Sewage works form part of this view from many locations. High perceived naturalness, within the braided riverbed despite nearby infrastructure, due to dominance of river processes, vegetation and screening by landforms, with naturalness diminishing in the margins and river context. Memorability derives from braided patterns, seasonal colour changes, and dynamic flows, with a moderate sense of wildness where vegetation and landforms obscure development
Kawarau River Localised Landscape attributes and Values	
Physical Attributes and Values	The Kawarau River is characterised by high volume, fast flow and distinctive turquoise clarity, with a gravel/schist bed[36]. Scientific rarity of the potential reverse flow of the river towards Whakatipu-Waimāori (Lake Whakatipu) when the Kawarau and Kimiākau (Shotover) rivers are in flood. River training earthworks at the confluence of the rivers are designed to prevent/reduce this occurring in the future[37]. The Water Conservation (Kawarau) Order 1997 requires the outstanding amenity and intrinsic values afforded by the river waters to be protected[38]. The confluence with the Shotover (Kimiākau) is a defining geomorphic feature, with dynamic braiding, gravel shoals and mixing water colours, including flood-driven variability. Immediate context includes alluvial floodplains of the Shotover Delta and terraces near the confluence, framed downstream/upstream by steep escarpments and containing landforms that express active geomorphic processes. Vegetation includes willow-lined margins, grey shrubland on scarps (more prevalent on true right bank), and habitat for native fish (eel, kōaro) and birdlife, with ecological values linked to the river corridor[39].

[34] 21.22.3 Kimiākau (Shotover River) PA page 6

[35] 21.22.9 Kawarau River PA Page 5-6

[36] 21.22.9 Kawarau River PA Page 1, 5

[37] 21.22.9 Kawarau River PA Paragraph 5d.

[38] 21.22.9 Kawarau River PA page 2, 4 & 6

[39] 21.22.9 Kawarau River PA Page 2

	Highly legible and coherent feature within the eastern extent of the Whakatipu Basin[40].
Associative Attributes and Values	Kāi Tahu whakapapa connections to whenua and wai generate a kaitiaki duty to uphold the mauri of all important landscape areas. The mana whenua values associated with the Kawarau ONF include, but may not be limited to, ara tawhito, mahika kai, nohoaka, kāika and tauraka waka. The Kawarau River was a traditional travel route between Lake Whakatipu and the Clutha River (Mata-au). The river is also recorded as a kāinga mahinga kai (food-gathering place) where weka, kākāpō, kea, and tuna (eel) were gathered[41]. Nationally recognised values set out in the Water Conservation Order that apply to the river (with its wild and scenic characteristics; natural characteristics; scientific values and recreational purposes specifically identified). Very strong shared and recognised values as a popular recreational destination. Uses including trails (Queenstown Trail network), jet boating, rafting, swimming and fishing (angling), and frequent use by dirt bike/ motorcross of the floodplains.[42]
Perceptual Attributes and Values	Highly attractive mid and long-range views along the predominantly exotic vegetation clad river corridor. Vegetation and landform patterns together with the winding corridor contain and frame views, contributing a highly variable albeit generally relatively enclosed character to the outlook. In places, the roche moutonnée of Morven Hill and/or the mountain slopes of the Remarkables add a sense of drama and grandeur[43]. The dynamic river waters are a dominant visual element. The mixing of different water colours at the Kimiākau (Shotover) confluence, particularly when the Kimiākau is in flood, adds to the appeal an interest of the views in this section of the Kawarau[44]. Close range views are influenced by earthworks at the Queenstown Airport Runway End, and dirtbike activity, tracks and trails, and jumps as well as more formalised river training[45]. Appealing mid and long-range views from Shotover Country, and the Queenstown Trail to discreet sections of the Kawarau River and its predominantly exotic vegetation clad banks and floodplains. In such views, the rugged mountain backdrop of the Remarkables and other enclosing mountains adds to the appeal of the outlook[46]. Strong sense of enclosure within the river corridor to the west and east of the Shotover Delta/Kawarau confluence[47]. Dominant vegetation (Willow and Poplar) has scenic value with its seasonal colour change[48]. From some proximate vantage points, the vegetation fringed, dynamic waters of the Kawarau River are seen alongside the more domesticated pastoral flood plains and terraces[49].

[40] Site observation and 21.22.9 Kawarau River PA Page 4

[41] 21.22.9 Kawarau River PA Page 3

[42] Site observation and 21.22.9 Kawarau River PA Page 4

[43] 21.22.9 Kawarau River PA Page 4

[44] ibid

[45] Site observation

[46] 21.22.9 Kawarau River PA Page 4

[47] Site observation, 21.22.9 Kawarau River PA Page 6

[48] 21.22.9 Kawarau River PA Page 5

[49] 21.22.9 Kawarau River PA Page 2

3.1.2 Summary of local Landscape Values

Kimiākau / Shotover River (SH6 Bridge to Delta) Localised Landscape Values

At a local level, The physical attributes and values of the Shotover River in this reach reflect a **moderate–high** to **high** level of naturalness, driven by the strong expression of braided river processes, dynamic gravel systems, and important ecological habitats (including nationally significant bird species and wetland features), although this is locally reduced by modification associated with the SH6 bridge, the primary electricity transmission line[50] flood protection works, gravel extraction, wastewater infrastructure and river-edge activities[51], particularly around the Delta. The associative attributes and values are assessed as **high to very high**, reflecting the river's strong Kāi Tahu cultural associations (wāhi tūpuna and mahika kai), its nationally important gold mining history, and its high shared and community value as a widely used recreational landscape within the Queenstown context. The perceptual attributes and values are **moderate–high** overall, with high scenic quality, legibility and memorability derived from the braided river form, mountain setting and dynamic flows; however, these values (and the associate values) are locally moderated by visible infrastructure, operational activities (e.g. aircraft, dirt bikes), and urban-edge influences that reduce perceived naturalness, remoteness and wildness in parts of the lower reach.

Kawarau River Localised Landscape Values

The physical attributes and values of the Kawarau River at the confluence reach are **high,** reflecting the dominance of the powerful, fast-flowing river system, its distinctive turquoise water, the geomorphic significance of the confluence (including mixing waters and dynamic sediment processes), and its recognised national importance under the Water Conservation Order, with only minor local modification arising from river training and adjacent land uses. The associative attributes and values are **very high**, underpinned by strong and enduring Kāi Tahu cultural relationships, the river's role as a traditional travel route and mahika kai resource, national-level recognition of its outstanding values, and its widespread recreation use and public appreciation. The perceptual attributes and values are also **high** to **very high**, characterised by strong naturalness, coherence and visual appeal, including the dramatic expression of river dynamics, experience of enclosure along the River corridor that opens up at the confluence, the impressive visual form of the Remarkables at close proximity which contributes to the corridor character, and visually distinctive confluence effects; while some localised detractors (e.g. nearby earthworks, tracks and activity) are present, they do not substantially diminish the overall high level of perceived naturalness within this reach.

3.1.3 Engagement with tāngata whenua

Ka Rūnaka (via Aukaha and Te Ao Marama) have provided a statement of cultural values associated with the short-term emergency discharge application to the Kimiākau/Shotover River, that also has relevance to this application to discharge to the Kawarau River. This Cultural Position Statement is appended to the AEE. The position statement outlines that treated human waste that has not been through a treatment, and discharge process is culturally unacceptable[52]. Manawhenua preference is for polluted water (wai-kino) to be filtered and

[50] Cromwell–Frankton A 110 kV overhead transmission line (National Grid)

[51] Thrive Spaces and Places. 2026. *Shotover WWTP Recreation Assessment.* Prepared for Queenstown Lakes District Council; Section 6.2 pages 28-30

[52] AEE section 3.10 Cultural and Heritage Values

transformed through natural elements and processes (vegetation, microorganisms, wind and sunlight) to change the Tapu nature of the polluted water to a natural unpolluted state[53].

Information included on Manawhenua values, that have been drawn on in this assessment relate to values that are part of the landscape schedules, which are detailed under the landscape, effects section of this assessment.

3.2 Natural Character

Natural character is a specific matter addressed under Section 6(a) of the RMA. Under the RMA, sustainable management of natural and physical resources includes the preservation of natural character within wetlands, rivers, lakes and their margins. However, the term 'natural character' is not defined. The degree or level of natural character depends on:

a. The extent to which the natural elements, patterns and processes occur;
b. The nature and extent of modification to the ecosystems and landscape;
c. The degree of natural character is highest where there is least modification;
d. The effect of different types of modification upon natural character varies with context and may be perceived differently by different parts of the community

The definition within Te Tangi a te Manu, states:

> *'Natural character is an area's distinctive combination of natural characteristics and qualities, including degree of naturalness'.*[54]

The assessment of river natural character has been framed in accordance with a principles-based approach that recognises natural character as arising from the interplay of the physical components of the river environment and the attributes through which these components are expressed. The following considers the natural character condition at a local Reach level. The local scale relates largely to the confluence area and the Shotover Delta, with an area extending 700m-1km upstream and downstream of the Site, confined to the south by the Remarkables (Coneburn Station) and to the north by the SH6 Shotover Bridge.

In this context, components refer to the underlying elements and processes of the river system—such as the active riverbed/ river channel, river margin and river context that together represent the river system. Attributes describe the observable characteristics and qualities of those components, including their form, pattern, condition, and degree of naturalness. These are further broken down into abiotic, biotic and experiential attributes (refer to Table 2 below). Natural character values are therefore understood as being embodied in, and dependent on, these attributes, which together express the degree to which the river environment remains natural, intact, and influenced by natural processes. This framework provides a structured basis for identifying, describing, and evaluating river natural character values in the following sections.

[53] ibid

[54] Te Tangi a te Manu, paragraph 9.04

3.2.1 Attributes Applied to Natural Character Assessment

Table 2 Attributes applied to Natural Character of River and Stream types	
River/Lake component	**Natural Character Attributes**
River channel (May include dry margins that form part of the active river channel)	**Abiotic** • **Physical features and processes**- Channel shape, bed substrate, Natural patterns and processes (seasonal flows/floods, erosion), Degree of modification (bridges, irrigation takes, groynes, stopbanks and gauges) and activities (gravel extraction). • **Flow regime** modified/natural, degree of change to levels (based on hydrological and irrigation take data). The flow regime characteristics of a river with a given catchment size and location. Change to critical flow statistics relative to naturalised flow. Inflow/outflow controlled. • **Water quality** - Water quality and aquatic habitat quality; clarity, nutrient and bacterial levels etc.
	• **Biotic-** Presence of exotic aquatic flora and fauna within the river channel or lateral habitats (including waterweeds, exotic fish, and invasive alga e.g. didymo) can reduce the natural character of the river. Habitat changes due to fine sediment, stock trampling or choking by exotic trees/ shrubs.
Margin (vegetation beyond active river channel)	**Abiotic-** Physical substrate, degree of modification, landuse, man-made structures (bridges, stopbanks, diversions, boat ramps, transmission lines and roads/ tracks)
	Biotic- extent of exotic vegetation, land use, degree of modification. Ecological health/habitat and value, quality of habitat. Natural patterns and processes such as native regeneration. Bird Habitat that river and lake margins provide for resident and migratory bird populations.
River Context	**Land use degree of modification** of adjacent land – land use and vegetation, character modifications (Broader scale landscape modification beyond the immediate river margin). Patterns of human modification (landuse boundaries, shelterbelts). Roads, structures and buildings occurring further from the river on adjacent land may also have effects on the natural character of a water body, including denser settlement (e.g urban).
River and margins considered as one	**Experiential Characteristics –** Human perception of how natural a place appears, underpinned by the biotic and abiotic attributes(above) of the river. It includes the remote/ untamed experience a place may provide and experiential attributes such as sounds and smells.

3.2.2 Natural Character River Components

The components are: the channel/ river bed, the riparian margin/ banks and the adjacent landscape context. These components are illustrated in the cross section of the different types of rivers and streams:

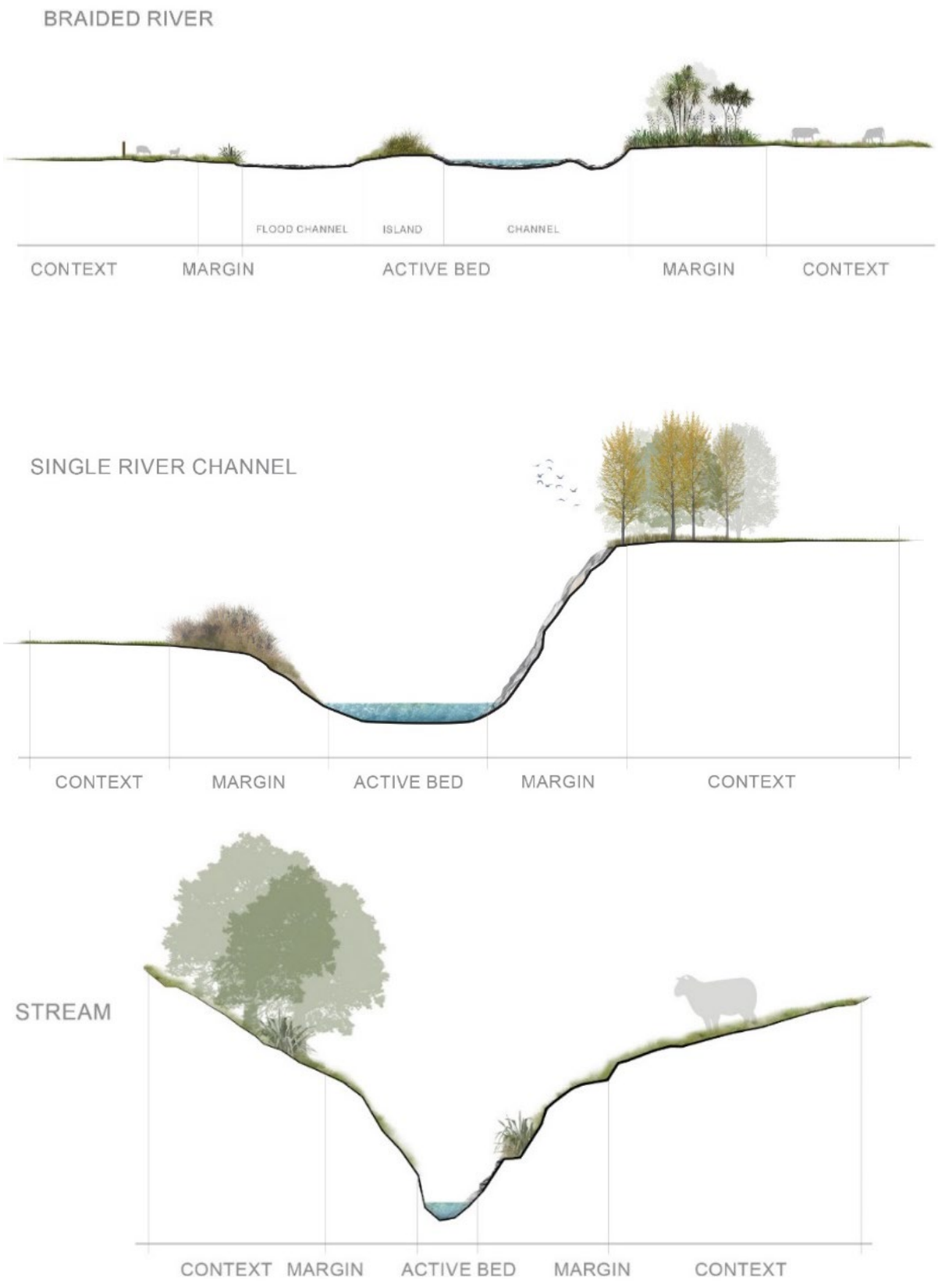

Figure 1: *Natural Character River Components*

3.2.3 Shotover River Natural Character Description

The following describes the natural character attributes across the length of the Shotover River, from the upper headwaters, where the waters flow rapidly across steeper gradients, through the middle section, which is more confined by the Shotover Gorge, down to the flatter and wider braided river system that has a shallower gradient, where the Shotover joins the Kawarau. The natural character attributes are divided into those within the active bed/ river channel of the river, as well as the river margins, which have different influences and attributes.

3.2.3.1 Shotover Active River Channel/ Bed

Within the active riverbed, at the head waters, the waterbody is pristine or largely unmodified where it originates in DOC Conservation land of the Harris and Richardson Mountains, including alpine tarns, streams and wetlands. The Headwaters of the Shotover River include Lochnagar, a large lake formed through a natural rockslide. The upper catchments are characterised by being steep catchments, with streams weed-free and free of man-made structures.

As the River travels down the catchment, the active riverbed varies between braided sections in the upper catchment; a distinctive incised gorge (the Shotover Gorge) where the river transitions from the mountains into the Wakatipu Basin; and another braided section in the lower catchment where it extends into a wide delta at the Kawarau confluence, in the vicinity of the Site. In the braided sections the river frequently changes its active channel following flood events when the entire braid plain is submerged. The 10-year mean flow measured at Bowens Peak is 36.2m^3/s.[55]

After precipitation in the upper catchment the waters of the Shotover River are naturally discoloured/ turbid, which leads to a distinctive contrast with the clear waters of the Kawarau at the confluence.

Gravel extraction occurs in the lower riverbed, in particular the Shotover Delta area where willow islands have been removed over the years and the active channel trained onto the eastern side. Machinery is often present in the riverbed during gravel extraction, which can also have a localise effect on water discolouration/turbidity.

Across the length of the catchment there is very high-water quality throughout the area; however, the current emergency discharge of treated wastewater into the Shotover River above the Kawarau confluence impacts the water quality in this localised area. Gold mining took place in the past in the Skippers area where localised impact has occurred.

Unmodified flow regimes, include the absence of water takes and bores, which are outlined in the AEE under section 3.11.

3.2.3.2 Shotover Margins/ banks

In the headwaters and along incised steep streams in the mountains, the stream margins/banks predominantly consist of native vegetation including sub-alpine scrub, cushionfield, tall tussock grassland, and snow tussock. Grey shrublands, particularly those in steep, shaded gullies unaffected by fire and browsing animals, are important wildlife habitats.

[55] GHD Ltd (2026). *Shotover WWTP Disposal Field Alternative Discharge – Surface Water and Groundwater Assessment* (Project No. 12645246). Table 2 page 35

Farming occurs from Branches Station downstream on the lower-lying slopes with pastoral improvement and stands of poplars which often mark the locations of past human habitation for gold mining (in particular in the Branches, Skippers and Arthurs Point area).

The sluiced terraces and remaining historic buildings/ bridges around the Skippers area are remnants of the goldmining history in the area. The level of modification increases on the higher-lying terraces above the Shotover River from Arthurs Point downstream, where settlements are present throughout the Wakatipu Basin. Conifers, willows, poplar, sycamores, and a wide range of other weedy vegetation is present on the margins adjacent to the active bed, including the confined floodplains and on the steep eroding terrace escarpments.

Few small-scale modifications, such as cycling and walking tracks/ bridge are located in vicinity of the river margins between Arthurs Point and the SH6 bridge.

The margins in the Shotover Delta near the Shotover/Kawarau confluence have been modified through the use of off-road motorbikes that have created numerous informal trails in this area, and both commercial and informal gravel extraction. The river margins near the delta can be accessed by car, bike and walking trails, with kayaking possible along the river margins and Jetboat activity (commercial and private) common.

Willows are widespread in the lower catchment, particularly along the delta area below the SH6 bridge where the Kawarau confluence is located. The Shotover delta has undergone substantial modifications, (see context below) with flood protection and erosion control around the SH6 bridge and along the true right bank of the delta. Structures on the margins and in the riverbed include transmission lines, bridges and river protection works.

Other large-scale modifications that materially change the biophysical landform include the redirecting of the bed of the Shotover River along the true right bank, with the stop banks/ river training providing a manmade edge to the Shotover River when in flood and changing the extent of the margins of the river.

3.2.3.3 Context

The Shotover catchment is experienced in a highly natural landscape context within the headwaters and alpine valley floors. Conservation areas in the catchment area sit adjacent to the highly natural area that falls within Mt Aspiring National Park. In this area, snow tussock, cushionfield, and alpine herb fields are prevalent on upper and mid mountain slopes.

The upper catchment between Branches Station and Arthurs Point contains high-country farming uses with extensive pastoral grazing. The valley floors have been modified in terms of land cover, and the low-lying land is dominated by exotic grassland. The slopes contain predominantly tussock grassland with a mix of native grey shrubland and exotic weed species, while the upper slopes and ridges are largely in native herb and cushion field vegetation.

The context around Skippers contains a number of historic buildings from goldmining days with a few more recent structures. The Skippers bridge and cableway are structures visually associated with the river corridor. The wider context has experienced modification through sluicing from gold mining.

In and below the upper Shotover Gorge, conifers become more prevalent and the settlement of Arthus Point marks the entry of the river into the more modified, lower elevated Wakatipu Basin landscape. The settlements of Arthus Point, Tucker Beach and Shotover Country are in the immediate context of the river, while not intruding into the margins of the largely incised riverbed.

The highway crossing at the SH6 bridge is where the incised character of the river changes to the wide delta. The true right bank of the delta contains a wide variety of human modifications, including the Cromwell–Frankton A 110 kV overhead transmission line, gravel extraction storage/ processing; and the existing wastewater treatment plant (WWTP) of Queenstown.

The training of the Shotover in this area further modifies the geology and hydrology through a stop bank that extends from the WWTP southwards, angling towards the active riverbed in its lowest section to train the active channel in an easterly direction. This occurred in 2011, with the remnant of the far right Shotover braid still evident in aerial photographs, illustrating the flow of the river below ground level.

Below the WWTP a now redundant dispersal field is located in the immediate context of the river, with discharged wastewater flowing through sub-surface gravels towards the Kawarau River.

A cycling trail (the Twin Rivers trail) follows the alignment of the stop bank and in the lowest part of the delta, motor-cross activity is present with a variety of informal trails throughout the floodplain forest and on the riverbanks, leading to damage and disturbance of landform and vegetation as a result of offroad activities.

The delta is framed to the west by the extension of the airport runway that protrudes into the delta and the Glenda Drive Industrial Area on the elevated river terrace. Adjacent to the River margin on the true right are the Shotover Wastewater Ponds and treatment plant to the south of the Shotover Bridge/SH6, and west of Shotover Delta Road, with gravel extraction and storage adjoining this to the east on the true right bank; and bike trails and motorbike use occurs in vicinity of the river margins in the delta area, with the Shotover Delta Road providing access down to the Kawarau/Shotover confluence.

On the true left the Shotover Country residential subdivision occupies the lower and mid terraces with a number of residential dwellings located in vicinity of the river around the SH6 and Old Shotover Bridge, with the Twin Rivers trail extending along the true left from Shotover Country to join the true left of the Kawarau River at the delta.

3.2.4 Kawarau River Natural Character Description

3.2.4.1 Kawarau Active River Channel/ Bed

The Kawarau River is the sole outflow of the Wakatipu, drains Lake Wakatipu with its headwaters at the main divide (including the Dart and Reese River catchments to the northwest), draining Lake Wakatipu via the Frankton Arm, running generally eastwards to Join Lake Dunstan near Cromwell. Within the upper catchment, pristine or largely unmodified waterbodies in the headwater of Lake Wakatipu result in very high-water quality throughout the area.

The active bed of the Kawarau River is an incised single channel that generally covers its bed bank to bank due to its high flow. The outflow from Lake Wakatipu leads to attenuation of flood flows which means that the volume of water is relatively constant, apart from in times of high lake levels (predominantly in spring). Any sediment brought into the lake from its headwater tributaries falls out (into the bed of the Lake), providing for high water clarity that contrast with the turbid waters of the Shotover River during flood events. Below the confluence a distinctive mixing zone between the two rivers is often distinguishable.

The Kawarau outflow/outlet from the lake has been modified through the presence of the weir (built in the past for a failed goldmining effort). In this area a historic single land bridge (now foot/cycle bridge) and a new SH6 bridge are located. The weir serves as a base for the historic

bridge, and a number of pylons are located downstream in the riverbed to support the current Kawarau Falls SH6 bridge.

While pristine in the upper catchment, the waters of the Lake within Frankton Arm below is influenced by stormwater run-off from Queenstown CBD and residential areas, which can lead to temporary contamination following rainfall. However, water quality remains generally high in the Kawarau River.

While the upper section of the Kawarau River has unmodified flow regimes throughout, the natural flow from Bannockburn is influenced by the managed flow of Clyde Dam below the Clutha River confluence. Otago Regional Council Environmental Data portal states the Kawarau River yearly variation in surface level to sits between 308 – 310masl.[56]

Lagarosiphon[57] has detected in the upper part of the Kawarau River, which has been successfully managed over the past years. However, didymo remains present[58], in particular along the margins, and the substrate is generally stable due to attenuated flood flows.

3.2.4.2 Kawarau Bank/ Margins

In the headwaters predominantly native vegetation including tall tussock grassland, snow tussock, and in the upper reaches of herbfield, mossfield and sedgeland, including intact alpine seepages. These areas contain only a few small-scale modifications, such as tracks.

Headwaters of the Nevis (which feed into the Kawarau near Nevis Bluff) encompass extensive alpine wetlands in the Garvie Mountains that drain into Roaring Lion Creek, containing meanders and oxbows in an upland valley with a mixture of bogs and fens on the valley floor.

Headwaters of the Rastus burn, and Kawarau Falls and Owens Creek run down the northern face of Ben Cruachan and the western face of the Remarkables, with some modification to the upper catchment of the Rastus burn through manmade ponds and utilities including carparking areas and buildings associated with the Remarkables Ski field. The unmodified alpine headwaters of the Doolans (left and right Branch) also feeding into the Nevis River then the Kawarau at Victoria flats.

The margins of the Kawarau River around the Lake Wakatipu outflow/outlet area have been modified by greater human activity and settlement, with a number of residential dwellings in close proximity to the river. Otherwise, the river corridor of the upper section of the Kawarau River is generally free of man-made structures, apart from a dwelling near Boyd Road.

Small-scale man-made modifications such the Twin Rivers cycling track from the outlet to the Shotover River and onwards to Arrowtown, gravel road on the true right joining on to the Chard Farm Road and further to Gibbston Valley on the true left margin, with the Gibbston River Trail running along the true right bank of the Kawarau at Gibbston. Other modifications include electricity lines, as well as historic features such as the old cableway across the river near Chard Farm. In the vicinity of Chard Road, at the start of Gibbston Valley, is the Kawarau Bridge and historic Kawarau Suspension Bridge (including Hackett Bungee activity), and small quarries (i.e. at Victoria Flats).

The vegetation on the margins of the upper section of the Kawarau River is dominated by crack willows that line the majority to the floodplain.

[56] Otago Regional Council: https://envdata.orc.govt.nz/AQWebPortal/Data/Dashboard/213

[57] EcIA Section 6.3

[58] Ibid

The margins in the Shotover Delta near the Shotover/Kawarau confluence have been modified through the use of off-road motorbikes that have created numerous informal trails in this area. The river margins near the delta can be accessed by car, bike and walking trails, with kayaking possible along the river margins and Jetboat activity (commercial and private) common. On the true right bank, there is a small jetty of the Kawarau against the base of the Remarkables; and downstream of the confluence there are local transmission lines.

The valley floors have been modified in terms of land cover, and the low-lying land is dominated by exotic grassland. In the Kawarau Gorge the steeply incised banks contain native grey shrubland interspersed with exotic species.

3.2.4.3 Context

While the Kawarau River catchment sits in a highly natural landscape context; including the mountainous headwaters and alpine valley floors, the context at Kawarau outlet is dominated by the urban development of Frankton/ Kawarau Falls, with exotic vegetative cover reflecting the long settlement along this section of the river.

Below Kawarau Falls, urban development is confined to the high-lying terrace above the river where it is not visually prominent from within the river, however, modifications the extent of Frankton Flats along the eastern edge of the flats is perceptible as a largescale modification to the landscape.

There are old cableways spaced sporadically along the banks of the river margins at pinch points, that marked places where historically travellers could cross the river on constructed structures. Other than this, there are three points where SH6 crosses the river: at Kawarau Falls Bridge, the Kawarau Bridge, the Victoria Bridge near Victoria Flats.

The training of the Shotover River braid has modified the true right bank of the Shotover Kawarau confluence. This change to the natural character of the riverbed is noticeable through associated stopbanks and exotic vegetation.

Further east, downstream from Arrowtown, old mining activity is old mining huts and workings are evident along Kawarau Gorge, especially near and south of Roaring Meg, with a visitors' centre, located on the true right bank providing an experience of the past mining history. The terrace where the airport runway is located extends into the Shotover Delta on a man-made extension area, clearly detectable from the Kawarau confluence.

Below the Shotover River confluence the residential developments of Shotover Country and Lake Hayes Estate are in the context of the river but not extending onto the margins of the Kawarau River.

Recreational infrastructure, such as trails and horse paddocks, are located within the lower floodplain in proximity to the river margins.

3.2.5 Reach scale Natural Character condition

The following considers the natural character condition at a local Reach level and is based on the natural character attributes found at each level table in **Appendix 3**. The level of natural character currently present within both the Shotover and Kawarau River, has been outlined separately, due to the attributes present in two river systems. The local scale relates largely to the confluence area and the Shotover Delta, with an area extending 700m upstream and

downstream of the Site, confined to the south by the Remarkables (Coneburn Station) and to the north by the SH6 Shotover Bridge[59].

The local natural character condition are discussed below, relating to natural character found at a reach level. This allows for a consideration of the level of effects on natural character at a local scale.

3.2.6 Riverbed Natural Character at Reach Scale

3.2.6.1 Riverbed Abiotic Natural Character Attributes:

Shotover Delta: Highly dynamic braided river system with intact geomorphic processes (channel migration, sediment transport, other than where training line has constrained width). Localised modification from gravel extraction, machinery presence, river training, and WWTP discharge effects have historically impacted on water quality[60]. Informal 4WD tracks, dirt bike tracks and trails present. Natural Character Level: **Moderate.**

Kawarau River: Single incised channel with stable, lake-fed flow regime and high-water clarity, and locally virtually no structural modification apart from a small jetty on the true right bank and river training on the true left. Flood attenuation from Lake Wakatipu results in more controlled hydrology but still fundamentally natural drainage patterns. The mixing zone at the confluence is a distinctive natural feature. Natural Character Level: **High**

3.2.6.2 Riverbed Biotic Natural Character Attributes:

Shotover Delta: Ecological condition influenced by turbidity, disturbance and localised water quality effects; exotic species present moderate ecological integrity. Natural Character Level: **Moderate**.

Kawarau: High-quality aquatic habitat with stable substrate and flow; presence of didymo/largarosiphon indicates some modification but overall ecological function remains largely intact. Natural Character Level: **High**.

3.2.6.3 Experiential Natural Character Attributes:

Shotover Delta: Perception influenced by visible human activity (machinery, river works, nearby land use), despite large natural scale of braidplain. Experience strongly elevated by the Remarkables ONL backdrop, contributing scale, drama and coherence. Natural Character Level: **Moderate**.

Kawarau: Strong sense of naturalness from clear water, coherent channel form and near absence of visible modification in this reach. Experience strongly elevated by the Remarkables ONL backdrop, contributing scale, drama and coherence. Natural Character Level: **High**.

3.2.7 River Margins Natural Character at Reach Scale

3.2.7.1 Natural Character Attributes:

Shotover Delta: Margins retain natural braid plain in parts but are constrained by stopbanks, river training and access tracks. With WWTP and gravel areas excluded (treated as context – refer to section below), modification access tracks and river training works, creating engineered

[59] See Graphic Attachment, figure 5: Site Context Plan that shows the Reach level area relating to the Kawarau and Shotover Delta relating to local natural character values.

[60] See Shotover WWTP Surface Water and Ground Water Assessment Executive Summary

edges to the river. Abiotic Natural Character Level: **Moderate**. Biotic Natural Character Attributes for Shotover Delta: Exotic willow dominance with disturbed vegetation patterns and limited indigenous regeneration due to ongoing disturbance. Shotover Delta: **Moderate–Low**

Kawarau River: Margins are largely unmodified within this reach, with only a small jetty on the true right and no significant structural encroachment; river edge remains natural in form other than change to Shotover Delta width and some terrestrial modification by dirt bikes. Abiotic Natural Character Level: **Moderate-High.** Biotic Natural Character Attributes for Kawarau River: Also influenced by exotic species (willows), especially along the true left, with brown top and grey shrubland more characteristic on the true right. Kawarau River: **Moderate.**

3.2.7.2 Experiential Natural Character Attributes:

Shotover Delta: Margins read as modified but recognisably riverine, with evident human use and flood control structures reducing perceived naturalness. Adjacent Sewage Ponds, Airport, jetboat activity and noise and dirtbike /car recreational use influence natural character. Changes to landform reduce experiential qualities, with willow/poplar trees introducing exotic vegetative character. Remarkables ONL backdrop significantly enhances experiential naturalness. Experiential Natural Character Level: **Moderate.**

Kawarau River: Margins read as predominantly natural, with margins modified through river training and exotic vegetation, and changes to the terrain through dirt biking, which, if present as a recreational activity also reduces enjoyment. The views are experienced as strong visual coherence with the river corridor. Airport and changes to landform reduce experiential qualities, Airport, jetboat activity and noise and dirtbike /car recreational use also reduce natural experiential values, with willow/poplar trees introducing exotic vegetative character. Remarkables ONL backdrop significantly enhances experiential naturalness. Experiential Natural Character Level: **Moderate - High.**

3.2.1 River Context Natural Character at Reach Scale

3.2.1.1 Landuse Degree of Modification

Shotover Delta: Context is strongly modified, including SH6 Bridge, transmission lines, WWTP, gravel storage, airport extension, industrial land, and stopbanks, representing substantial alteration of floodplain landform and processes. Dominance of modified vegetation, with fragmented indigenous ecosystems. Biotic Natural Character Level: **Moderate-Low** Abiotic Natural Character Level: **Moderate**.

Kawarau River: Context includes Twin Rivers Trail, the training wall along the true left and the extension into the river context by the Frankton Flats terrace. Natural landform still present but moderated by change. Modified vegetation present but greater continuity and less intensive land use influence within the immediate context. Biotic Natural Character Level: **Moderate** Abiotic Natural Character Level: **Moderate**.

3.2.1.2 Experiential Natural Character Attributes:

Shotover Delta: Perceived as a working / peri-urban floodplain landscape, with infrastructure clearly evident. Noise and activity from both the Airport and from heavy industrial truck movements (deposing gravel and fill) reduce experiential qualities, as well as noise and activity associated with dirtbike recreational use. Remarkables ONL is reinforces a strong sense of naturalness and landscape scale. Experiential Natural Character Level: **Moderate-Low**.

Kawarau River: Perceived as a coherent natural river corridor, with limited intrusion from built elements in this reach. Noise and activity from both the Airport and from heavy industrial truck

movements (deposing gravel and fill) reduce experiential qualities, as well as noise and activity associated with dirtbike recreational use. Remarkables ONL is reinforces a strong sense of naturalness and landscape scale. Experiential Natural Character Level: **Moderate-High**.

3.3 Visual Catchment

As part of preparation for the Site visit, a desktop study of topographic maps was undertaken, analysing the likely extent of visibility based on the existing landform, followed by fieldwork to identify the viewing audience and representative photos from public areas. Private properties were not visited. During the Site visit, representative viewpoints were taken of the publicly accessible areas that have views of the Project.[61] These represent a range of viewpoints, to capture the different areas and range of views of the activity, experienced in the landscape.

Both topography and vegetation restrict the extent of the visual catchment, with representative views from the catchment area included in the Graphic Supplement (**Appendix 4**).

The river terrace landforms associated with both the Frankton Flats (west) and the Shotover Park (east) terraces limit views from the Whakatipu Basin floor to the east and north; and from Frankton Flats and the southern bypass to the west, with main views relating to the southern banks of the Kawarau/Shotover and the immediate shore of the Kawarau River. Some views from the Remarkables Ski field accessway are also possible within this catchment.

Potential viewers include both residents and commuters, as well as visitors (cars and cyclists) for mid distant views and users of the recreation reserve (swimmers/kayakers/rafter/ anglers/ dirt bike enthusiasts/ picnickers and pedestrians) using the tracks, trails and recreational areas on the shore of the Kawarau River. On the Site visit, cyclists and runners were noted on the Twin Rivers Trail, with anglers along the Kawarau River true left bank, and jet boats (public and private) were also seen on the river. During the weekends, the Site can become very popular with dirt/trail bike users, with jumps created in the gravel along the Shotover Delta Road, and at the confluence. Evidence of fire pits associated with picnics and parties were located along the bank of the Kawarau and Shotover[62].

3.3.1 Residential visual catchment

The residential visual catchment is very limited due to the surrounding topography that restrict views towards the Site and vegetation within the Shotover River margins, which screen views. While not visited, one private farm road was noted as part of the site visit (on Coneburn Station[63]). Long distance views from Shotover Country have also been included in the assessment.

3.3.2 Public visual catchment

The public visual catchment includes a local catchment near the Site that relates to:

Public areas

- Views from the Kawarau Riverbed, and its margins.

[61] Refer Figures 14 to 21 of the Graphic Supplement which show the 12 different viewpoints and 12 different viewing areas.

[62] Appendix 4 Site photograph I.

[63] Ibid Site Photographs C-D.

- Views from the Shotover Delta, including the braided riverbed.
- Views from the Twin Rivers Trail.
- General views from the recreational area at the Shotover/ Kawarau Margins.
- General views from Shotover Country settlement.

Public Roads

- Views from Shotover Delta Road.
- Views from Hawthorne Drive.
- Views from the Remarkables accessway.

4.0 Relevant Statutory Provisions

The Site is located within an outstanding natural landscape, and part of the activity is located on the shores and within the bank and waters of the Kawarau River, and therefore Section 6(a) of the RMA is relevant, which requires persons acting under the RMA to provide for:

> *(a) the preservation of the natural character of... rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
>
> *(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*

National Policy Statement – Freshwater Management:

Policy 7: The loss of river extent and values is avoided to the extent practicable.

Policy 8: The significant values of outstanding water bodies are protected.

Proposed Otago Regional Policy Statement 2021

Integrated Management (IM)

Objectives:

IM-O1- Long term vision (mō tatou, ā, mō kā uri ā muri ake nei) - The management of natural and physical resources, by and for the people of Otago, in partnership with Kāi Tahu, achieves a healthy and resilient natural environment, including the ecosystem services it provides and supports the well-being of present and future generations.

IM-O3 – Sustainable impact - Otago's communities provide for their social, economic, and cultural well-being by using, developing or protecting natural and physical resources in ways that support or restore the life-supporting capacities of air, water, soil, and ecosystems, for future generations.

Policies:

IM-P5 – Managing environmental interconnections - Manage the use and development of interconnected natural and physical resources by recognising:

(1) situations where the value and function of a natural or physical resource extends beyond the immediate, or directly adjacent, area of interest,

(2) situations where effects of an activity extend to a different part of the environment, and

(3) the impacts of management of one natural or physical resource on the values of another, or on the environment.

IM-P13 – Managing cumulative effects - In resource management decision-making, recognise and manage the impact of cumulative effects on the form, functioning and resilience of Otago's environment (including resilience to climate change) and the opportunities available for future generations.

LAND AND FRESHWATER (LF) - Te Mana o te Wai (WAI) & Freshwater (FW)

LF-FW-O1A - Visions set for each FMU and rohe - In each FMU and rohe in Otago and within the timeframes specified in the freshwater visions in LF-VM-O2 to LF-VM-O6:

(1) healthy freshwater and estuarine ecosystems support healthy populations of indigenous species (including non-diadromous galaxiids and Canterbury mudfish) and mahika kai that are safe for consumption,

(2) the interconnection of land, freshwater (including springs, groundwater, ephemeral water bodies, wetlands, rivers, and lakes) and coastal water is recognised,

(3) fish passage within and between catchments is provided for except where it is desirable to prevent the passage of some fish species in order to protect desired fish species, their life stages, or their habitats,

(4) the form, function and character of water bodies reflects their natural characteristics and natural behaviours to the extent reasonably practicable,

(5) the ongoing relationship of Kāi Tahu with wāhi tūpuna, including access to and use of water bodies, is sustained,

(6) the health of the water supports the health of people and their connections with water bodies,

(7) sustainable land and water management practices:

  (a) support food and fibre production and the continued social, economic, and cultural well-being of Otago's people and communities, and

  (b) improve the resilience of communities to the effects of climate change, and

  (c) ensure communities are appropriately serviced by community water supplies, and other three waters infrastructure,

(8) direct discharges of wastewater to water bodies are phased out to the extent reasonably practicable, and

(9) freshwater is managed as part of New Zealand's integrated response to climate change and renewable electricity generation activities are provided for.

LF-FW-O8 – Fresh water - In Otago's water bodies and their catchments, the significant and outstanding values of Otago's outstanding water bodies are identified and protected.

LF-FW-O10 – Natural Character - The natural character of wetlands, lakes and rivers and their margins is preserved and protected from inappropriate subdivision, use and development.

LF-WAI-P3 – Integrated management/ki uta ki tai - Manage the use of fresh water and land, using an integrated approach that is consistent with tikaka and kawa, that:

(1) sustains and, to the greatest extent practicable, restores or improves:

(a) the natural connections and interactions between water bodies (large and small, surface and ground, fresh and coastal, permanently flowing, intermittent and ephemeral),

(b) the natural connections and interactions between land and water, from the mountains to the sea,

(c) the habitats of mahika kai and indigenous species, including taoka species associated with the water bodies,

(4) manages the effects of the use and development of land to maintain or enhance the health and wellbeing of freshwater, coastal water and associated ecosystems,

(5) encourages the coordination and sequencing of regional or urban growth to ensure it is sustainable,

(6) has regard to foreseeable climate change risks, and the potential effects of climate change on water bodies, including on their natural functioning,

(7) has regard to cumulative effects, and

(8) applies a precautionary approach where there is limited available information or uncertainty about potential adverse effects, in accordance with IM-P6

Policies:

LF-FW-P11 – Otago's outstanding water bodies - Otago's outstanding water bodies are:

(1) the Kawarau River and tributaries described in the Water Conservation (Kawarau) Order 1997,

(2) Lake Wanaka and the outflow and tributaries described in the Lake Wanaka Preservation Act 1973, and

(4) any other water bodies identified in accordance with APP1.

LF-FW-P12 – Identifying and managing outstanding water bodies - Identify outstanding water bodies and their significant and outstanding values in the relevant regional plans and district plans and protect those values.

LF-FW-P13 – Preserving natural character and instream values - Preserve the natural character and instream values of lakes and rivers and the natural character of their beds and margins by:

(1) avoiding the loss of values or extent of a river, unless:

(a) there is a functional need for the activity in that location, and

(b) the effects of the activity are managed by applying the effects management hierarchy (in relation to natural inland wetlands and rivers),

(2) not granting resource consent for activities in (1) unless the consent authority is satisfied that:

(a) the application demonstrates how each step of the effects management hierarchy (in relation to natural inland wetlands and rivers) will be applied to the loss of values or extent of the river, and

(b) any consent is granted subject to conditions that apply the effects management hierarchy (in relation to natural inland wetlands and rivers) in respect of any loss of values or extent of the river,

(c) if aquatic offsetting or aquatic compensation is applied, the applicant has complied with principles 1 to 6 in Appendix 6 and 7 of the NPSFM, and has had to regard to the remaining principles in Appendix 6 and 7 of the NPSFM, as appropriate, and

(d) if aquatic offsetting or aquatic compensation is applied, any consent granted is subject to conditions that will ensure that the offspring or compensation will be maintained and managed over time to achieve the conservation outcomes,

(3) establishing environmental flow and level regimes and water quality standards that support the health and well-being of the water body,

(4) to the extent practicable, sustaining the form and function of a water body that reflects its natural behaviours,

(5) recognising and implementing the restrictions in Water Conservation Orders,

(6) preventing the impounding or control of the level of Lake Wanaka,

(7) preventing modification that would permanently reduce the braided character of a river,

(8) controlling the use of water and land that would adversely affect the natural character of the water body, and

(9) maintaining or enhancing the values of riparian margins to support habitat and biodiversity, reduce contaminant loss to water bodies and support natural flow behaviour.

Water Conservation Order

Schedule 2 Waters to be protected (Kawarau)

(c) wild and scenic characteristics;

(c) natural characteristics, in particular the return flow in the upper section when the Shotover River is in high flood;

(d) scientific values, in particular the return flow in the upper section when the Shotover River is in high flood;

(e) recreational purposes, in particular rafting, jetboating, and kayaking.

Queenstown Lakes Proposed District Plan – particularly:

21.22.9 Kawarau River PA Landscape Schedule as this provides a good description of the identified values of the Shotover/Kawarau River and surrounding landscape.

5.0 Project Description

This section provides a summary of the works proposed for the construction and operation of a treated effluent discharge system from the WWTP to the Kawarau River. A full technical description, including detailed design, construction methodology, and environmental effects, is provided in the AEE and supporting technical documentation.

Construction activities include installation of the rock outfall structure on the true left bank of the Kawarau River immediately upstream of the Shotover River confluence, along with approximately.1.3 km of pipeline to convey treated wastewater from the SWWTP to the outlet structure[64]. Engineering design for the works outlined below is required to be completed by 31 December 2027 and construction completed by 31 December 2030. The construction activity is expected to occur over approximately a 6–8-month period, with construction at the riverbed and margin (at the outfall site) expected to last approximately 2-3 weeks.

Both of these pipelines are partly buried, with the southern extent that runs parallel to the Kawarau River being located above ground but contained within an earth bund.

Kawarau River via a rock outfall.
A conceptual design of the rock outfall has been developed to meet the following objectives:

- Dispersion of treated effluent into the Kawarau River;
- A passive structure that blends in with the surrounding environment; and
- Minimised exposure of the public to treated effluent prior to adequate mixing in the river.

A recent river bathymetry survey during low-flow conditions (Earth Sciences New Zealand, March 2026) has indicated that optimum dispersion into the river is achieved with an outfall that extends approximately 10 metres into the wetted riverbed. The Civil Drawings show an indicative general arrangement for the rock outfall, which utilises landscaping[65] to integrate the outfall structure and discourage public interaction with the structure.

The conveyance pipeline terminates at a new manhole located near an existing river access track, which connects to the rock outfall structure. Treated effluent will be conveyed to the river via corrugated HDPE pipes within an extended rock structure. The rock outfall structure would require an anchoring system, whose the details of which will be further developed during detailed design.

Large rocks, layering of rocks, and the geometry of the rock channel have been selected to provide resilience during high-flow and flood events, while remaining compatible with the dynamic river delta environment, and to limit public exposure to treated effluent prior to adequate mixing in the river. The outfall is designed as a passive structure with no moving parts, reducing operational complexity and maintenance requirements.

The anchoring system may consist of concrete blocks covered with riprap and embedded into the ground to sufficient depth with straps around the pipes. This will be confirmed once further

[64] Appendix 4 figure 5

[65] Ibid figure 7

design, and field investigations are completed during the detailed design. The outlet pipes will be protected from high-velocity flows and debris via placement of larger rocks. Planned monitoring and routine maintenance activities for the proposed system are required. Key maintenance activities to the rock outfall system include potential rehabilitation of riprap or protective rocks following flood events, vegetation maintenance, and removing any debris accumulated at the outfall termini.

Alternative outfall

Preliminary design discussions have highlighted the potential for an alternative outfall design to be investigated and developed. While the details of this design are yet to be determined, it is understood that the outfall may instead consist of an extension of the discharge pipeline into or onto the wetted bed of the Kawarau River, to a point where flows in the river would promote optimum treated effluent mixing. It is not yet known whether the outfall pipe would be buried for any of its length within the wetted bed, nor what diffuser infrastructure would be utilised, if any. This alternative outfall design has not been assessed in the body of this report.

1. Earthworks and Construction Activities

Construction will involve trenching, excavation, and placement of fill along the pipeline route and at the outfall. Construction machinery will consist of a long reach excavator, as well as truck movements.

Key aspects include:

- Short-term disturbance associated with pipeline installation and reinstatement;
- Localised earthworks within the river margin and wetted bed to construct the outfall;
- Placement of engineered fill over sections of pipeline where required;
- Working around existing vegetation (including planted willows), with retention wherever practicable and management under arboricultural guidance.
- Implementation of a landscape plan that reintroduces planting into the Site, to mitigate and reduce effects associated with the outfall structure.

The overall extent of disturbance is localised and related to construction only, with reinstatement proposed following works.

2. Operation and Maintenance

The discharge system is passive in operation (no moving parts at the outfall). Ongoing activities will include:

- Routine inspection and maintenance of the pipeline and outfall;
- Removal of debris and repair of rock armouring following flood events; and
- Vegetation management as required.

6.0 Assessment of Effects

The RMA requires that persons exercising functions and powers under the RMA recognise and provide for *'the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development'*. Therefore, natural character effects have been assessed by examining the proposed changes to natural elements, patterns and processes which may occur in the landscape context because of the Project.

Landscape and visual impacts result from natural or induced change in the components, character, or quality of the landscape. Usually these are the result of landform or vegetation modification or the introduction of new structures, facilities, or activities. All these impacts are assessed to determine their effects on character and quality, amenity as well as on public and private views. The assessment of natural character, landscape effects (including visual effects) are separate yet linked assessments.

- **Natural character effects** derive from changes in physical condition and characteristics of waterbodies encompassing their elements, patterns and processes and how these are experienced.
- **Landscape effects** derive from changes to the physical landscape, which may impact on its character and value.
- **Visual effects** relate to change to views or parts of views as experienced by people.

The methodology used to determine and assess these effects is based on the method statement in **Appendix 1** and involved the following process:

- Identification of the landscape character, values and viewing audience.
- Description of the proposed development.
- Assessment of the magnitude of landscape and visual change resulting from the proposed development (the Effects Assessment).

6.1 Approach and Methodology

This assessment considers the potential landscape and natural character effects of the Project in the immediate surrounds and wider receiving environment, together with effects on views. The methodology used for the assessment has involved a combination of desktop research, fieldwork, visibility analysis and indicative visual simulations[66] prepared from key representative viewpoints. The findings of this assessment are set out below and adopt the following seven-point scale (from very low to very high) to determine the overall **significance of effect** (i.e. whether an effect is less than minor, minor, more than minor or significant).[67]

[66] Graphic Supplement figure 39 and VS1-2B

[67] This 7-point scale is taken from Te Tangi a te Manu, page 151.

***Figure 2**: Effects levels and levels of significance from Appendix 1 Method*

The full methodology used to assess and identify the significance of natural character, landscape and visual effects is set out in **Appendix 1: Method Statement**.

Potential effects are assessed based on a combination of the landscape's sensitivity and visibility together with the nature and scale of the development project.

The effects of the Project are set out below in the following order:

- natural character effects;
- landscape effects;
- visual amenity effects from public and private locations; and
- potential cumulative effects.

Effects are assessed at Site level (within approximately 100m of the activity) and Reach level (up to 1km from the Site, taking in the Shotover Delta up to the SH6 Bridge, the river escarpments and terrace edges to the west and east, and the Kawarau River corridor up and downstream). Values have been described at River and Landscape scale and effects on these values have also been considered as part of the assessment.

6.1.1 Approach to Assessing Landscape Effects

A landscape effect relates to the change on a landscape's character and its inherent values. These values can include associative values that relate to current and past use of the area, including manawhenua connections to the land and rivers. The level of effect is influenced by the size or spatial scale, geographical extent, duration and reversibility of landscape change on the characteristics and values within the specific context in which they occur.

In identifying landscape values, value descriptions focus on the following three attributes or dimensions in line with best practice guidance[68]. This includes recognition of mana whenua values under associative values; however, these would need to be provided through engagement with rūnaka:

- Physical
- Perceptual
- Associative

In seeking to clarify the relationship between natural character and landscape, natural character can essentially be conceived of as a measure of the condition of biophysical landscape attributes. Such condition can vary as a result of levels of human modification and takes

[68] NZILA (2022) Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines.

account of the way biophysical attributes are experienced i.e. the 'feeling' of being in a wild unmodified environment. By comparison, landscape evaluation considers a broader suite of biophysical, sensory / perceptual and associative attributes including aesthetic and scenic qualities alongside other shared and recognised values.

6.1.2 Approach to assessing Natural Character Effects

The RMA considers as a matter of national importance "the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development."

There is no definitive definition of natural character in the legislation. Nevertheless, it is generally accepted that natural character is a term used to describe the naturalness of river environments and has both ecological and landscape connotations. A definition that has been adopted by some landscape architects and other resource management practitioners is:

> *'Natural character is a term used to describe the naturalness of river environments.*
>
> *The degree or level of natural character within an area depends on:*
>
> 1. *The extent to which natural elements, patterns and processes occur*
> 2. *The nature and extent of modifications to the ecosystems and landscape/riverscape.*
>
> *The highest degree of natural character (greatest naturalness) occurs where there is least modification. The effect of different types of modification upon the natural character of an area varies with the context and may be perceived differently by different parts of the community.'*[69]

The natural character of rivers may be affected by structural modifications (e.g. the construction of groynes, stop banks or bridges), changes in appearance resulting from particular flows (in the most extreme case a dewatered river channel), or by longer term effects of flow regime changes such as vegetation encroachment onto riverbeds, or the loss of river braids.

Natural elements incorporate all key river attributes, such as the water, the riverbed and banks, as well as particular attributes occurring within the river environment, such as geological formations, native vegetation and fauna. Natural patterns take the outline of the channel and the riparian edge into account, as well as the effects of patterns created by humans on adjacent land, such as shelterbelts. Natural processes include river dynamics, such as erosion and floods, and regeneration processes of riparian vegetation. Bridges, stopbanks and groynes are examples of built modifications that may be in or close to the riverbed. Roads, structures and buildings occurring further from the river on adjacent land may also have effects on the natural character of a water body, through disrupting natural patterns and processes and through changing how the water body is experienced.

In the following assessment of natural character effects, the following elements are considered:

- Shape of riverbed and channel
- River flow
- Water quality

[69] Boffa Miskell (2009): Riverscape and Flow Assessment Guidelines, section 4.2.

- Riparian vegetation
- Man-made structures in and adjacent to the riverbed.

6.2 Natural Character Effects

Below is an assessment of potential modifications and activities that may occur as a result of the Project within the Kawarau River and its margins that could have the potential to temporarily or permanently degrade a waterbody to a degree where natural character values are compromised. The following sections are structured under modifications to the active bed, margins and context, and include changes to biotic and abiotic components of the rivers.

6.2.1 Active Bed

6.2.1.1 Channel Shape

The outfall is located within a part of the confluence that has been notably influenced by past and present modification through river engineering. This human intervention has changed the abiotic natural condition, and the fluvial pattern and processes associated with the outfall part of the Site, from being part of the active bed of the Shotover, to being within the river margin and active bed of the Kawarau. The stopbanks present in the Kawarau River context, sit along the true right bank of the Shotover Delta, and along the true left bank to the west of the Site. Within the local area, there are no structures such as groynes, or rock riprap, with the exception of a small jetty on the true right bank, approximately 700m upstream of the outfall Site.

The proposed works introduce a localised physical change to the channel shape of the Kawarau River through the installation of submerged outfall pipes, and associated rock riprap modifications to the active riverbed. This activity results in a localised modification to the cross section of the river where the proposed outfall meets the active channel. These works extend a short distance into the wetted channel and are confined to the true left margin. This would include a very minor, localised change to the riverbed where rock and the outfall structure would extend approximately 10m into the active channel.

While the works represent a permanent alteration of bed material and local morphology, this area has already been modified by river works that constrained the Shotover Delta extent and reduced natural abiotic morphological attributes at a Site scale. The spatial extent of the proposed change is very limited relative to the width and scale of the Kawarau River, and does not materially alter channel form, sediment transport processes, or hydraulic connectivity at a reach scale. The proposed changes to the river[70] bed width and the associated narrowing of the channel through placement, undertaken to protect the outfall area from erosion, are very limited.

The proposed outfall structure will lead to small changes to the natural abiotic processes, such as erosion and sedimentation, in the immediate context of the structure. However, these effects are confined to a very localised area. The outfall pipes have been designed to ensure that the pipes remain covered by rock and the waters of the river channel. Flow characteristics of the Kawarau River are described in GHD (2026), which identifies a relatively stable, lake-buffered flow regime with a mean annual low flow of approximately 83 m^3/s[71] and seasonal high flows

[70] GHD Effluent Discharge Pipeline Outfall Plan CI-00013

[71] GHD. 2026.*Shotover WWTP – Surface Water and Groundwater Assessment.* Section 3.3.3

driven by snowmelt and rainfall events[72]. Climate impacts and rainfall variability are covered under Section 3.2 Climate, with snowmelt and high rainfall events driving high river flows.

The introduction of an unnatural, constructed element in the form of rock riprap and an outfall pipe within the active channel of the Kawarau River are expected to lead to **low**, localised **abiotic adverse effects** at Site scale on the natural patterns in this area. While the change is discernible at a site scale, the natural biotic condition of the site has been changed through past river engineering (especially the training line); and fluvial processes that underpin the current natural character remain intact. This change is localised and will be **very low[73]** at a reach level.

6.2.1.2 Water Quality

Water quality is a critical aspect of a river's health and can impact on abiotic and biotic natural character values.

The discharge of treated wastewater introduces a new input to the active channel, with measurable changes in water quality occurring within the immediate mixing zone (approximately 0–40 m downstream of the outfall[74]). Within this zone, the Water Quality report[75]confirms that:

- Nutrient concentrations can reach elevated levels (including Attribute Band D for some parameters), and
- Some contaminants (e.g. metals) may exceed guideline thresholds[76].

However, these effects are highly localised spatially, confined to the near-field mixing area at the Site (0-40m), and are rapidly reduced through dilution, particularly following mixing with the Shotover River. The effects rapidly dilute and are ecologically moderated by existing conditions, including a community already dominated by tolerant taxa and a physically dynamic river system. Beyond the reasonable mixing zone (e.g. downstream of RS10[77]), water quality and biotic aspects are predicted in the EcIA to return close to baseline conditions, with **very low effects** predicted at a reach scale[78].

As noted in the EcIA[79], construction activities including installation of the discharge outfall and associated activities, may generate short-term increases in suspended sediment. This is already a natural pattern within the Kawarau active bed downstream of the confluence due to sediment loads during Shotover flood events. With appropriate erosion and sedimentation control guidelines, sediment mobilisation will be minimised, with any pulses expected to be small scale, short lived and potentially during periods when suspended sediment is naturally elevated. Overall, with appropriate controls, sediment release during construction is assessed as having a **very low level[80]** of effect.

Construction activities within the riverbed to install or maintain the proposed structures and cross section modification can affect fish and invertebrates and need to be considered

[72] GHD. 2026.*Shotover WWTP – Surface Water and Groundwater Assessment.* Section 3.3.3

[73] EcIA Section 7.3.1

[74] Boffa Miskell. 2026, Periphyton Risk Assessment Section 5.4

[75] GHD. 2026.*Shotover WWTP – Surface Water and Groundwater Assessment.* Section 5.4.1 and 5.4.2

[76] Ibid section 3.6.2.4

[77] EcIA Section 7.5.2.2

[78] Executive Summary

[79] EcIA section 7.5.2.3

[80] Ibid section 7.3.1

separately, despite their temporary nature. The temporary construction-related disturbance of the Kawarau River bed and banks is addressed in the EcIA in Section 7.4.1, the potential for localised injury or mortality of fish in Section 7.4.2, construction-related sediment discharges in Section 7.4.3, and the risk of spreading aquatic weeds from the Kawarau River to other waterbodies during or following construction is discussed in Section 7.4.4.

Within the freshwater EcIA, the receiving environment is recognised as having high ecological value[81], but is not pristine, with evidence of existing modification (e.g. periphyton variability and macroinvertebrate community structure reflecting disturbance and historic influences). The biotic level of effect at operational phase is recognised as having a **very low adverse effect[82]** overall at Reach level, with a higher level of adverse effects on water quality localised and contained to Site level to within the 40m near-field mixing area.

6.2.1.3 Experiential effects on Active Bed values

Active Bed change includes rockwork and the inclusion of outfall pipes, with both attributes extending 10m into the bed of the Kawarau. The effects on natural character and riverscape values can be reduced by sensitive placement of rocks and by implementation of native protection planting on the exposed ground along the banks. The proposed landscape plan[83] will form part of the associated experiential effects from the riverbed, with recommendations associated with rock type and character proposed, to ensure that the introduced rockworks will be appropriately integrated into the receiving riverbed environment. The introduction of the rockwork associated with the discharge structure and localised changes to water condition result in a minor reduction in perceived naturalness at close proximity to the outfall (this would likely reduce if a fully piped option was utilised).

However, the Kawarau River's large scale, high flow energy and cohesive natural patterns remain dominant, and the visible influence of the discharge is confined to a narrow margin and short downstream extent, within a part of the confluence that has been modified through river training works. The outfall site is experienced as part of the Kawarau Riverbed separate (west) of the Delta, however, will be able to be experienced from the Delta edge, with **moderate** experiential effects during construction (Site level – within 100m of the activity), and **low** experiential effects at the Reach scale. This changes once construction phase is complete to a **very low** level of effect. Suggested mitigation measures including appropriate rock provenance, and the buried nature of the pipe components of the outfall, with natural weathering and integration through shifting of gravel into the introduced rocks will soften and naturalise the outfall structure appearance, adverse experiential effects will be **low** and localised to Site level, and **very low** to **negligible** at Reach level.

6.2.2 Margins

6.2.2.1 Waste Water Pipe and Outfall Structures

Currently a large stopbank/training line is present on the western floodplain of the Shotover Delta that was installed to protect the disposal field. This structure extends into and artificially reduces the physical extent of the delta area, removing terrain that was in the river margin into the river context via a training line. This training line will be utilised to align the proposed

[81] EcIA section 7.3.1

[82] EcIA Executive Summary

[83] Appendix 4 Figure 7

wastewater pipe in its vicinity. The stopbank / training line is approximately 1.5-2m high and is lined by exotic trees[84].

6.2.2.2 Riparian Earthworks on Riverbanks

While the lower reach of the Shotover River (below SH6 bridge) has already experienced modification to its banks, where it is modified by erosion control and flood protection measures in the past, the Kawarau banks between Kawarau Falls and the Shotover confluence are generally not modified through structures, with the exception of the small jetty on the true right approximately 900m upstream, and one area of signage on the true right approximately 200m upstream of the outfall site. The effects of earthworks required for construction of the proposed outfall will include earthworks and vegetation removal, stockpiling soil, then burying the conveyance pipe (with some areas of fill sitting above ground) and including introduced rocks and a mixture of native and exotic planting within a small section of the river margin. The earthworks will temporarily occur within the context of an extensive network of tracks, including dirtbike/motorcross trails and jumps as well as the river training which have led to a moderate level of modification in this area. Physical modification of the river margin includes the construction of the rock outfall, terminal structure, and minor regrading of the bank interface.

These changes occur within a restricted footprint adjacent to an already modified margin, influenced by the training line – that have changed the course of the Shotover River away from the outfall site; as well as access tracks and existing infrastructure.

The extent of permanent landform change is limited, and broader margin processes and floodplain dynamics remain unaffected. With appropriate construction, sediment and landscape management plans, the level of adverse effect on abiotic values is **Low** at Site level and **Very Low** at Reach level.

6.2.2.3 Vegetation on Banks

Proliferation of exotic flora, in particular species that can spread such as willows and poplars, already reduces the natural character of the river margins. The dominance of introduced trees that follow the alignment of the existing stopbanks reinforce the unnatural patterns in this area. Presence of trees along the Shotover Delta constricts the braided river, while the recent removal of willow islands has enabled more channel movement across the eastern part of the delta.

Some willows along the true left bank of the Kawarau will have to be removed for the installation of the outfall, but this is not considered to be an adverse natural character effect, since planting of native species as well as re-establishing some (sterile) willow into the Site will be implemented following construction. Plants to be introduced include sterile willow as a fast-growing species that will provide fast cover; paired with native riparian species such as kowhai, muehlenbeckia, coprosma sp. and matagouri, which will establish over time and contribute ecologically to the sit[85]e.

River margins in the project area are predominantly dominated by exotic vegetation with low ecological value and are subject to ongoing disturbance. Vegetation clearance and disturbance associated with the works therefore result in very limited loss of ecological values, and effects are consistent with a highly modified baseline condition.

[84] See Appendix 4 Graphic Supplement General Context Photograph 5

[85] Appendix 4 figure 7

The low effect conclusion does not rely on planting, given their very limited scale. The level of effect on biotic values is considered to be **low a**t Site scale (**very low** at reach scale) initially, trending to **very low/ neutral** once construction complete.

With regards to experiential values in the river margins, at a local Site scale, the works introduce a discrete area that contains engineered elements into the river margin, including rock rip rap and structural components. This is experienced in the context of existing modifications and a managed environment, with infrastructure and recreational use, as well as the flight path of the Queenstown airport influencing human perception. The works are also partially contained to the point where they will only be noticeable within the immediate environment. Mitigation measure associated with the landscape plan will reduce the perception of the outfall area and conveyance pipe as the construction activity completes and the area is revegetated. The installation of the wastewater conveyance pipe adjacent to the training line will not lead to more than **low** adverse experiential effects at Site level and **very low** experiential natural character effects at reach level in this already modified environment. The proposed rock outfall will continue in a southerly direction towards the Kawarau River from the terminal of the stopbank with **moderate** experiential effects during construction (Site level – within 100m of the activity), and **low** experiential effects at the Reach scale, trending to **low** at Site level and **very low** at Reach scale at operational phase; where the conveyance pipe and outfall area will become integrated into the riparian area.

6.2.3 Context

The wider Kawarau/ lower Shotover River context already contains broader scale landscape modification beyond the immediate river margin, including urban areas that impact on natural character, landscape and ecological values. The wastewater treatment plant and airport runway extension, and training line activity in the floodplain of the Shotover River delta have substantially modified the immediate context for the proposed outfall structure, with further modifications occurring at the Airport Runway End[86]. The existing patterns of human modification (transmission lines, roads, bridges, stopbank, oxidation ponds) are in stark visual contrast to the active bed of the Shotover River delta where natural patterns dominate. Roads, structures and buildings occurring on the upper terrace along Glenda Drive are located along the edge of the escarpment where they are visible from the riverbed and floodplain of the delta area.

The experiential aspects of natural character and that associated with natural landscapes include natural quiet and remoteness of the river reach which has been heavily compromised in the Shotover Delta area due to the common presence of motor bikes/cars. Given the small scale of the change when experiencing the wider landscape, the limited abiotic and biotic effects on the Context area due to current levels of modification, and the Sewage Designation area through which the conveyance pipe runs, as well as the distance at which the outfall structure is viewed from the Context, overall effects from components (construction and operational) are no greater than **very low** (adverse).

6.3 Cumulative Effects

While individual activities, including any of the above-mentioned modifications to the channel, banks or context, may be of a limited scale individually, they occur in proximity to each other, and cumulative effects on natural character values have the potential arise with the proposed

[86] See Appendix 4 Site Photograph P

modifications on this stretch of the Kawarau River immediately above the Shotover river confluence.

Cumulative effects on natural character arise from the interaction of the project with existing modification and influences within the Kawarau–Shotover river system, including historical wastewater inputs (Dose and Drain and interim discharge), river training works, gravel extraction, and ongoing recreational use. The Ecological Impact Assessment (EcIA) confirms that while the Kawarau River is of high ecological value, the environment at and near the confluence already reflects a degree of ecological modification, including nutrient influences and macroinvertebrate communities dominated by tolerant taxa (refer EcIA Sections 6.3 and 7.5). The proposed discharge will introduce a localised increase in effects within the near-field mixing area; however, these effects are rapidly reduced through dilution and mixing, with conditions returning to near-baseline downstream of reasonable mixing zone (RS10), and overall ecological effects assessed as negligible at a reach scale (refer EcIA Section 7.4.2). Abiotic change occurs within an area where river training has already affected bank and river areas. Sedimentation levels already are impacted by the Shotover sedimentation load when the river is in flood, and species have adapted to this.

Cumulative effects on natural character are **low** and geographically confined to the Site, and do not result in a measurable increase in adverse effects at a reach scale, consistent with the EcIA conclusion of **very low** ecological effects following reasonable mixing (refer EcIA Table 13 and Section 7.6), therefore less than minor at Reach level.

6.3.1 Summary on Natural Character Effects

In summary, natural character effects associated with the Project are localised in their extent to the Kawarau River active bed and immediate margin at the outfall site, including downstream into the confluence with the Shotover. Adverse ecological effects are most evident within the immediate mixing zone, and character effects within the immediate location of the discharge structure. These rapidly diminish beyond the near-field area, with very low ecological and character effects at a reach scale

Table 3 Summary of Effect on Natural Character Values at Reach Level

Component	Natural Character Rating (before introduced change)	Natural Character level of effect	Natural Character Rating (after change)
Active bed	**High** (Kawarau at reach scale) **Moderate** (Shotover Delta at Reach Scale)	Biotic –**low**, Abiotic **very low** at Reach, **Low**, (construction experiential) **Low** trending t**o Very Low** (operational experiential)	**High** (Kawarau at reach scale) **Moderate** (Shotover Delta at Reach Scale
River margin	**Moderate – High natural character** (Moderate – High abiotic	Abiotic **negligible at Reach**, Biotic **negligible** at Reach, very **low -**	**Moderate-High**

	and Moderate biotic at reach scale)	**negligible** at reach (experiential)	
Context	**Moderate** (Kawarau/Shotover Reach context)	**Very Low** across all attributes	**Moderate**
Overall effect on Natural Character	Overall effect on Natural Character: **Low – negligible** (adverse), with no change to the level of natural character expressed at a reach scale.		

6.4 Landscape Effects

A landscape effects is an outcome for a landscape value[87]. While effects are consequences of changes to the physical environment, they are the outcomes for a landscape's values that are derived from each of its physical, associative, and perceptual dimensions[88]. As stated, the Site is also within an Outstanding Natural Feature (**ONF**) overlay, with the conveyance pipe within the Kimiākau Shotover ONF and the outfall structure located within the Kawarau River ONF.

6.4.1 Physical Effects

Direct landscape effects of the project primarily relate to physical modification of the landform, ground surface and river edge associated with the installation of the effluent discharge pipeline and outfall. The conveyance pipeline (approximately 1.3 km in length) will largely be installed below ground through trenching and backfilling, with localised placement of engineered fill where required to maintain adequate cover and reinstate surface levels. These works will result in a temporary disturbance to the land surface along the alignment, including modification of existing (modified) topography and ground cover, although the intent is to reinstate pre-existing contours along most of the pipeline length. As such, the permanent landform effects along most of the route are expected to be limited and largely indiscernible over time.

More pronounced direct effects occur at the river margin and active bed interface, where the outfall structure is located. Construction of the rock outfall will involve localised excavation within the riverbank and wetted edge, placement of riprap and large rock, and installation of an anchored discharge structure extending into the river (approximately 10 m). This will introduce a permanent, albeit small-scale, modification to the riverbank form and bed substrate, including replacement of existing gravels with engineered rock materials and a slight localised alteration to the natural edge condition. While designed to be visually recessive and resilient to flood events, this represents a permanent change to a small part of the river margin, which has already been changed by the training line.

The project also gives rise to direct effects on exotic vegetation and surface patterns, including localised disturbance of existing vegetation (predominantly exotic plantings along the stopbank and informal river margin species) and infilling around established trees where practicable. This will temporarily disrupt the existing pattern of vegetation and ground cover, with a proposed Landscape Concept Plan showing a mixture of native and exotic riparian species that will replace the current character at the outfall site. Overall, the direct landscape effects are

[87] Te Tangi a te Manu, paragraph 6.01.

[88] Te Tangi a te Manu, paragraph 6.02.

localised in extent, largely confined to the pipeline corridor and outfall area, and sit within an already modified floodplain environment, such that the magnitude of permanent change is low, and effects on the immediate landscape are **low (adverse minor)**.

6.4.2 Perceptual and Sensory (Associative Values)

During construction, amenity effects will arise from temporary disturbance to the river margin and trail environment, including visible earthworks, machinery, sediment control measures and partial access restrictions. These effects will be most noticeable to proximate users, including cyclists and walkers on the Twin Rivers Trail, as well as anglers and other close-range river margin users occupying areas within approximately 50–100 m of the outfall site, where activity will temporarily reduce naturalness, visual coherence and perceived water-edge amenity. Kayakers and jet boat users in proximity to the site may also be aware of construction activity, although this will be experienced briefly and typically from mid-channel.

The most affected area will be the section of the Twin Rivers Trail along the Shotover training line adjoining the pipeline route, where excavation and reinstatement will temporarily alter landscape character and amenity values. It is noted, however, that this section of the works is largely located within an existing designation that provides for sewage treatment and disposal infrastructure, and therefore aligns with the anticipated character and use of this corridor. Effects will also be evident for anglers and river margin users accessing the immediate outfall area, where construction activity will temporarily disrupt access and the usability of the river edge. By contrast, more distant users (approximately 400 m–1.5 km away) will experience construction as a minor component of a broader view within an already modified environment.

Overall, construction effects are **moderate (adverse) but very short-term** in nature, for close-range users such as anglers and trail users within 0-100m of the works, with effects diminishing quickly to low when experienced from greater distances. These effects occur within a baseline environment already influenced by disturbance (e.g. gravel extraction, vehicles and active recreation), and will reduce rapidly following completion of earthworks, removal of machinery, and reinstatement of surfaces and vegetation, at which point adverse effects will be **low**.

In the operational phase, amenity effects are **low and highly localised**. The pipeline will be buried and not perceptible, while the rock outfall will be largely submerged and designed to integrate with the existing river edge using natural materials. For most users—including walkers, cyclists and river users at mid-distance—the project will have minimal visual presence and will not alter key amenity attributes such as the coherence, openness and dynamic qualities of the river corridor. Close-range users (particularly anglers) may perceive a small change in bank character at the outfall, including a band of larger rocks. However, this effect is limited in extent and moderated by the already modified character of the delta margins. Overall, the project will not materially diminish recreational experience or amenity values, with effects assessed as **low and less than minor in the long term.**

6.4.2.1 Manawhenua Associative values

Mana whenua associative values for the Kawarau River are recognised as **very high**, reflecting its status as a wāhi tūpuna and a significant cultural landscape where whakapapa, whenua and wai are intrinsically connected. The river is identified as a mahika kai resource, traditional travel route, and part of a wider network of culturally significant places associated with Kāi Tahu, including ara tawhito, nohoaka and tauraka waka. These associations reflect an enduring

kaitiaki responsibility to uphold the mauri of the awa, and the wider intergenerational relationship between mana whenua and freshwater bodies.

Available information from iwi engagement indicates that cultural values place importance on the state and treatment of water, including the recognition of wastewater as tapu and the preference for treatment through natural land-based processes to restore water to a state of noa. This reflects a broader cultural framework in which the health of water is not solely defined by measurable environmental parameters, but also by tikanga, customary practice and spiritual integrity. These values inform expectations for how water bodies are managed and protected.

In the absence of a formal Cultural Impact Assessment, this summary relies on publicly available information and the Cultural Position Statement associated with the short-term emergency discharge application to the Kimiākau/Shotover River. While other values may become known, the Cultural Impact Statement provides a clear position on the discharge of treated sewage into the local river system. This is appended to the AEE. While the statement provides some understanding of the cultural context, it does not purport to represent a comprehensive or definitive statement of mana whenua values. Further assessment through iwi-led processes would be required to fully understand the depth and site-specific expression of these values in relation to the project, however adverse effects on Manawhenua values are understood from QLDC to be likely to be at least **high, potentially - very high** (adverse) in nature.

6.4.3 Summary of Landscape Effects

The project results in localised physical modification to the river and floodplain margins associated with installation of the buried conveyance pipeline and construction of the rock outfall. Along most of the pipeline route, effects are limited to temporary disturbance from trenching, with ground levels largely reinstated, such that long-term landform change is largely imperceptible, noting that the conveyance pipeline occurs mostly within the area designated for Sewage treatment, and the landscape effects associated with the trenching and remediation are consistent with this designation. More noticeable change occurs at the Kawarau River edge, where the outfall introduces a small area of modified bank form and bed substrate through placement of engineered rock riprap and localised excavation, reinstated with topsoil stockpiled from the Site. Vegetation disturbance is similarly confined and temporary, relating to exotic vegetation with opportunities for reinstatement and riparian planting. Overall, these landscape effects are spatially contained within the immediate works area and occur within an already modified floodplain environment.

During construction, landscape and amenity effects will arise from temporary earthworks, machinery and access disruption, particularly for users of the Kawarau Riverbank and margins and immediate area of the Shotover Delta/confluence, with intervening vegetation restricting viewing areas to localised areas. With regards to amenity effects of the outfall site from the Twin Rivers Trail users at its southernmost extent (near the Kawarau River), the trail is at a distance of approximately 400m west of the outfall the structure, with distance and intervening vegetation minimising landscape and amenity effects on this trail.

Landscape effects are confined to nearby river margins, where naturalness and visual coherence are reduced at close range. These effects are short-term local moderate adverse effects (within 100m of the outfall Site) and diminish following reinstatement, where the use of natural locally sourced rocks and vegetation reduce the level of effect. In the operational phase, the pipeline will not be perceptible, with any change in landform, seen as part of the existing floodplain modifications. With reinstating topsoil sourced from the Site and with the proposed integration with the existing beach area and replanting, the outfall (being largely submerged) will

integrate with the river edge, resulting in **low and localised** adverse landscape effects, with only minor changes to the immediate bank condition for close-range users. While biophysical and perceptual effects are limited, the project intersects with very high associative (cultural) values, where the discharge of treated wastewater to the river is anticipated from discussions with QLDC to have at **least high-very high adverse effects** on mana whenua associative values, reflecting the importance of avoiding a wastewater discharge so as to maintain the mauri and cultural integrity of the waterbody.

6.5 Visual Effects

A visual effect is a kind of landscape effect. It is a consequence for landscape values as experienced in views. Visual effects are a subset of landscape effects[89]. Visual effects are also influenced by a number of factors including the nature of the project, the landscape absorption capability and the character of the Site and the surrounding area. Visual effects are also dependent on distance between the viewer and the project, the complexity of the intervening landscape and the nature of the view.

6.5.1 Effects from public vantage points

6.5.1.1 Views from the Kawarau River and its Margins

From immediate viewpoints within the Kawarau River channel and along its margins[90], the proposed works result in a localised and small-scale visual change to the river edge, associated with the introduction of a rock outfall and modified bank treatment. Immediate views are within 0-100m of the proposed rockfall structure, with the southern (end) extent of the conveyance pipeline and the associated earthworks visible from the western delta margin.

Visibility from within the western extent of the Delta margins, is a changeable mixture of open or restricted views, depending on the location and orientation of the viewer, and the level of intervening riparian vegetation, that consists of a mixture of willows and weed species, with open unimpeded views possible when closer to both the earthworks associated with the conveyance pipe and the outfall Site, and from immediate views along the beach edge. Viewing areas include more open beach areas (in the vicinity of the old Shotover river braid that is now a shallow pond[91]), as well as informal tracks and trails within the exotic vegetation.

At close range, visibility of this change can be moderate particularly for users in proximity to the outfall such as anglers or river-edge users, where the contrast between the texture and bulk of the larger riprap rock material compared to the finer beach gravel will be more noticeable, as well as the linear form of the rockfall structure. The earthworks associated with the conveyance pipe will be noticeable as a moderate change from immediate views (within 100m), and perceptible as a temporary effect during construction phase. Northern views are restricted by topography and vegetation.

For in-channel users, including kayakers and jet boat passengers, the view corridor is confined by the channelised riverbed, with viewing area approximately 600m upstream, as well as 600m downstream of the outfall site (with the conveyance pipe screened by the intervening beach

[89] Te Tangi a te Manu, paragraph 6.08.

[90] Appendix 4 Site Photographs E-F

[91] Appendix 4 Site Photograph P

edge[92]), The outfall is experienced as a brief, peripheral feature within a wider river landscape, where the dominant visual elements remain the flowing water, landform enclosure and broader river context.

Visual change is most noticeable during the construction phase, when the noise, presence of heavy machinery and the physical works will increase both the visibility and the perception of the change, introducing a **moderate** temporary adverse effect, which will reduce to **low** once the outfall is built and operational, due to the natural appearance of the outfall structure.

The outfall is designed to be visually recessive, utilising locally sourced rock that is consistent in colour and geology with the existing river gravels, thereby reducing visual contrast and aiding integration with the surrounding substrate. While the rock used is larger in scale than natural gravels and introduces a degree of geometric order, this is read as a continuation of river-edge materials rather than a visually discordant element. The outfall pipe itself will be buried and not visible from terrestrial viewpoints from land. Within the river, the pipe systems are submerged through the use of rock riprap, with any visible effects limited to a physical reforming of the riverbank and the introduction of larger rocks. Given its marginal location and recessive design, the project does not interrupt key sightlines or the legibility of the river corridor.

Mitigation planting within the riparian margin will replace disturbed vegetation, with earthworks and riprap forming the main along the river corridor. The use of rock of the same geology as the beach and Site, combined with the low-profile design and containment of works to the river margin, limit the visual influence of the project to a discrete section of the river edge.

The combination of the project's limited scale, the use of locally sourced rock consistent in colour and geological character with the Kawarau River margins, and the integration of the outfall design, together with reinstatement planting, results in a **low level of visual effect**. These effects are confined to the immediate vicinity (largely within 100m of the outfall and where relevant the conveyance earthworks) and diminish rapidly with distance along the river margins to very low then neutral. Again, these effects would likely reduce, should a piped discharge be utilised.

6.5.1.2 Views from the Shotover Delta, including the braided riverbed.

Views from the Shotover Delta north of the site are confined by intervening vegetation, with views constrained to the delta confluence with the Kawarau[93]. The viewer is at a similar elevation to the project. Views from the Shotover Delta margins and riverbed include views directly north at the true right edge of the delta (within approximately 20 - 200m of the outfall Site), as well as some more distant views (of around 800m[94]). Vegetation restricts views upstream of the Project area, and, due to intervening vegetation, the conveyance pipe earthworks will not be screened from this view.

From this more distant area, (on the true left of the Shotover) the change will be difficult to discern – with the exception of when heavy machinery are constructing the outfall (where adverse visual effects would be **very low**). Long term adverse visual effects will be very low/neutral. Given the expansive scale of the river corridor and the distance of the viewer, the as well as the presence of existing modified elements within the wider landscape (including infrastructure and altered riverbanks upstream and downstream and vegetation), the introduction of the outfall will not noticeably alter landscape character from these more distant

[92] Ibid

[93] Ibid Site Photograph D

[94] Ibid Site Photograph H

views. This would be the case also for any views Shotover Country also, where intervening vegetation (within the Shotover Delta) would further limit visibility.

From the closer views east of the project area (within 100m of the outfall Site), the outfall will be seen in the context of modification including dirtbike tracks and jumps, cars, and the eastern extent of the training line[95]. Some vegetation along the Kawarau River limit views to the construction area, with greater visibility in the southernmost section of the true right Delta margin (at the confluence)[96].

Visual change is most noticeable during the construction phase, when the noise, presence of heavy machinery and the physical works will increase both the visibility and the perception of the change, introducing a moderate temporary adverse effect, which will reduce to **low** once the outfall is built and operational, due to the natural appearance of the outfall structure.

The combination of the project's limited scale, the use of locally sourced rock consistent in colour and geological character with the Kawarau River margins, and the integration of the outfall design, together with reinstatement planting, results in a **low level of visual effect**. These effects are confined to the immediate vicinity (largely within 100m of the outfall and where relevant the conveyance earthworks) and diminish rapidly with distance along the river margins to very low past 100m then neutral past 400-600m viewing distance.

6.5.1.3 Views from the Twin Rivers Trail.

With regards to visual effects of the outfall from The Twin Rivers Trail, these are experienced by users at its southernmost extent (near the Kawarau River). The trail is at a distance of approximately 400m west of the outfall the structure, with distance and intervening vegetation minimising landscape and amenity effects on this trail[97]. The trail here runs along a stopbank.

6.5.1.4 Twin Rivers Trail (adjoining Hawthorne Drive, and Hawthorne Drive).

Views down across the Kawarau Riverbed and Shotover/Kawarau Confluence are available from a section of the upper Twin Rivers Trail where it is co-located with Hawthorne Drive, in the area where it traverses around the eastern extent of the Airport Runway (on the airport extension) lesser views are possible from Hawthrone Drive in the same area. The Site is also within views from the upper Twin Rivers Trail (the cycle trail) west of this[98]. The viewer has elevated views from the eastern and southern edge of the Frankton Flats across the Project area. Views are wide and panoramic, including views to the east across the Shotover Delta and south/southwest towards the Remarkables/Coneburn Station and the Kawarau River.[99] Viewing distance between the viewer and the visual effect is 400m – 700m to the conveyance pipe (with more southwest views of the conveyance pipe screened by intervening topography), and over 700m to 1.5km to the outfall site. Most views are from the cycle trail which follows the edge of the terrace riser (whereas Hawthorne Drive is inland from this apart from its deviation around the Airport Runway).

From the Hawthorne Drive area, on the eastern edge of Frankton Flats, views include the Queenstown wastewater treatment plan, gravel stockpiles and other utility storage areas, with the exotic vegetation forming the predominant vegetative cover that screens and limits views of

[95] Ibid Site Photographs A-D

[96] Ibid Site Photograph D.

[97] Ibid General Context Photograph 3

[98] See Appendix 4 Graphic Attachment photographs

[99] See Appendix 4 Graphic Attachment: photographs H-O and photographs 6 and 4.

the proposed conveyance pipe and outfall area[100]. Visibility of the outfall site and the southern extent of the conveyance pipe become more visible from the cycleway at the southern extent of Frankton Flats, where the outfall site is a small mid-distant component of a much wider expansive panoramic view[101]. Other aspects within this view initially include the Sewage ponds, gravel stockpiles and disposal fields set amongst willow and poplar trees; the Shotover Delta and the Shotover Country settlement, as well as the enclosing mountains of the Whakatipu Basin. Further south, the attributes include the fill site at the base of the Frankton terrace riser[102], and a small Jetty on the true right of the Kawarau[103].

Visual change is most noticeable during the construction phase, when the noise, presence of heavy machinery and the physical works will increase both the visibility and the perception of the change. Any temporary visual effects from this viewing area associated with construction activity will be **low** adverse effect, which will reduce to **very low** once the outfall is built and operational, due to the use of locally sourced rock, the recessive design, mitigation through planting which will reduce the linear nature and will increase the natural appearance of the outfall structure. Views further southwest will reduce in visibility as the outfall structure diminishes further (to neutral) with increased distance[104].

From these distant views, the outfall and conveyance works would visually read as a naturalistic component of the wider gravel, and braided river forms, rather than as a discrete or prominent built element, and changes to the riverbank would not be overly discernible.

6.5.1.5 Views from Shotover Delta Road.

The cadastral maps reveal that the Shotover Delta Road (in an unformed state) departs from the river plains south of the sewage ponds and is mapped as extending across the Frankton Flats terrace riser to a point just below Hawthorne Drive. Most views relate to the unformed track that appears as an extension of Shotover Delta Road, that provides access to the confluence area south of the Shotover Delta Road. Views from this road are restricted to the conveyance pipe along the training line (within proximity to the informal road, with the alignment of both running generally parallel to the western and southern batters of ORC's training line); and views towards the outfall structure at the southern extent of the unformed road[105]. With the engineering drawings illustrating the retention of the trees along the training line, adverse visual effects are contained to visual effects associated with construction activity and earthworks of the conveyance line. Earthworks associated with the conveyance pipe will be visible in immediate views however, this is located within the designation area and is an anticipated change to the landscape character. These adverse effects will be short in duration, relating to the construction phase, and are considered to be **low** in nature. Views of the outfall pipe are generally over 400m and mitigated by both distance and intervening vegetation and in part topography associated with training lines, with no greater than low adverse effects during construction, and very low adverse effects during operational phase.

6.5.1.6 Views from Shotover Country residential settlement

Views are typically over a distance of 900m, with the viewer being elevated on river terraces to the northeast of the Site. Any views of the conveyance pipe earthworks will be screened by intervening vegetation within the Shotover Delta. Views towards the outfall pipe will similarly be

[100] See Appendix 4 Site Photograph O and general context photograph 6

[101] See Appendix 4 Site photograph J & K.

[102] See Appendix 4 Site photographs M & N

[103] See Appendix 4 Site photograph L

[104] See Appendix 4 Site photographs L

[105] Ref civil drawings

largely screened by intervening vegetation, with potential views of machinery during construction. Given the small level of change within an expansive panoramic view, and the long distance between the viewer and the change, the Project area will have **very low to neutra**l visual effects on views from this area. The introduction of the outfall would not fundamentally alter landscape character from these views.

6.5.1.7 Views from Remarkables Access Road

From elevated viewpoints from the Remarkables Access Road (approximately 0.9 – 1.2km from the Site), the visual prominence of the outfall is expected to be low. The form and materiality of a rock outfall would closely match the existing river margin textures and tones, particularly if constructed using locally sourced rock and shaped to follow natural edge conditions. Given the expansive scale of the river corridor and the presence of existing modified elements within the wider landscape (including infrastructure and altered riverbanks upstream and downstream), the introduction of the outfall would not fundamentally alter landscape character. Overall, the visual effects are assessed as **very low** and localised, with the structure likely to assimilate over time as sediment deposition, vegetation colonisation, and weathering further integrate the outfall into the surrounding river environment.

6.5.2 Private Effects from private vantage points

6.5.2.1 Views from Coneburn Station private accessway (and wider station)

From Coneburn the outfall Site seen in the context of wider development including the Airport, Hawthorne Drive and the sewage ponds to the and earthworks associated with the fill site and Airport extension at Frankton Flats (northwest of the Site) and Shotover Country to the northeast. Within the Delta, visible modification includes stop banks/ river training earthworks long the Kawarau and Shotover margins, tracks and trails within the delta, and the exotic vegetation (willows and weeds). Views of the Site will be below the viewer in most views (including the access road) and are likely to be greatest when opposite the Site (with closest views approximately 100m from the outfall) with greatest during construction activity. Views from a private access road are considered less important from an amenity perspective, compared to views from an amenity area adjoining a dwelling, or views experienced from a dwelling. The extent of change relates to a small component of a wider view.

Visibility will be greatest when construction activity occurs, where up to low visual effects will be experienced reducing further on completion to the point where visual effects will be low/very low. The form and materiality of a rock outfall would closely match the existing river margin textures and tones, particularly if constructed using locally sourced rock and shaped to follow natural edge conditions. Given the expansive scale of the river corridor and the presence of existing modified elements within the wider landscape (including infrastructure and altered riverbanks upstream and downstream), the introduction of the outfall would not fundamentally alter landscape character. Overall, the noticeable visual effects are assessed as and **very low** and localised to within 100-150m of the Site, with the structure likely to assimilate over time as sediment deposition, vegetation colonisation, and weathering further integrate the outfall into the surrounding river environment.

6.5.3 Summary of Visual Effects

Overall, visual effects greater than low are limited to **temporary construction-phase effects** and **immediate close-range views** within approximately 100 m of the outfall, where moderate adverse effects can occur. These effects are short-term and reduce to **low or very low in the operational phase**, with the project having minimal influence on wider public or private visual amenity due to its contained extent, recessive design and integration with the existing river environment.

6.6 Potential Cumulative Landscape Effects

Cumulative landscape effects are: "*the effects of a proposal in combination with those of previous developments*". Cumulative effects should be considered carefully because in one sense all effects are cumulative. Previous lawfully established activities are part of the existing environment against which the effects of a new activity are assessed. So, mostly the effects of a project are simply the effects on the existing environment. However, cumulative effects can come into play where the additional effects of a project take a landscape beyond a 'tipping point ', or beyond its capacity to absorb change.

Cumulative landscape effects arise from the addition of the project to an already highly modified river margin environment, where existing influences include stopbanks, gravel extraction, infrastructure corridors, recreational tracks and widespread exotic vegetation. The project introduces localised modification to the Riverbed and margin through small scale earthworks, vegetation disturbance and the presence of a small-scale rock outfall structure at the Kawarau River edge. This localised change is viewed in conjunction with modifications to the landscape that are in the immediate site (such as tracks, jumps and roads, gravel extraction pits), and the wider change to the edge extent of Frankton Flats with the Airport Runway extension. These changes incrementally add to the built and managed character of the delta margins, particularly at the confluence where natural patterns remain an important component of landscape values.

However, the scale and extent of the project is limited and contained, with most infrastructure buried and the outfall designed to integrate with the existing river edge. While modification within the lower Shotover Delta and Kawarau margin has occurred, naturalness remains dominant with the effect of the change confined to a discrete location and not extending along the wider river corridor.

Overall, while there is a discernible incremental effect on landscape and natural character values—particularly at the immediate outfall location—these effects are low in magnitude and do not materially erode the broader wild, scenic or recreational qualities of the Kawarau River system. As such, cumulative effects are assessed as **less than minor**, with no evidence that the project contributes to a tipping point in the overall landscape condition.

6.7 Effects in Relation to Statutory Provisions

LF-FW-P11 – Otago's outstanding water bodies

Based on Policy LF–FW–P11 (3) it is understood that *any water bodies identified as being wholly or partly within an outstanding natural feature or landscape in accordance with NFL–P1*.

The value descriptions would be focussed on the following three attributes which are in line with best practice guidance:

- Physical;
- Perceptual; and
- Associative (mana whenua values to be provided through engagement with rūnaka).

These values have been identified through the Schedule of Landscape Values, as well as those within the natural character attributes of both the Shotover and Kawarau River and effects on those values have been considered under the assessment of effects section of the report. It is noted that cultural (both tāngata whenua) values form part of the associative attributes to be considered under landscape values. While cultural values from a landscape perspective can be assessed, engagement with mana whenua are relevant to a greater understanding of effects on associative values.

LF-FW-P13 – Preserving natural character and instream values

The project has been assessed against LF-FW-P13, which seeks to preserve the natural character and instream values of rivers and their margins by avoiding loss of values, sustaining natural form and function, and recognising the restrictions of the Water Conservation Order. In this regard, the works associated with the outfall comprise a small-scale, localised modification to the river margin and bed, principally limited to the installation of a submerged pipeline, a discrete rock outfall structure, and minor bank reinstatement[106]. The receiving environment at the Shotover/Kawarau confluence is already subject to a notable degree of human modification, including stopbanks, gravel extraction, training of the Shotover River braid, recreational tracks and the presence of extensive exotic vegetation. Within this context, the project maintains and does not alter the overall extent and broad values of the river and does not give rise to a loss of river form or character that would be inconsistent with Policy LF-FW-P13(1).

In relation to sustaining the form and function of the river to reflect its natural behaviour (LF-FW-P13(4)), the proposed discharge infrastructure is designed to be largely embedded within the bank and bed, avoiding prominent protrusions or structures that would alter channel alignment or the geomorphic processes that characterise the confluence[107]. While there will be a small scale and localised modification to bed substrate and the bank associated with the rock armouring and discharge manifold, these changes are confined to a very limited footprint and do not extend along the river reach. They occur in a dynamic braided/incised interface where sediment movement, channel adjustment and turbidity are already highly variable and modified. Consequently, the project will not diminish the ability of the river to express its natural processes, nor will it diminish the instream expression of the confluence. Human activity including small scale gravel extraction, and landform modification (in terms of dirtbike trail modifications and jumps) are occurring within the bank's landward margins (controlled by the training line), which are influenced by metal roads, stop banks and exotic vegetation (predominantly willows and weeds such as buddleia and tree lupin and exotic broom) in this location. The level of change proposed will not diminish experiential qualities associated with this section of the Kawarau/ Shotover river system.

With respect to the preservation of natural character and protection of riparian margins (LF-FW-P13(8) and (9)), any disturbance associated with construction is temporary and will be followed by reinstatement, with removal of some exotic vegetation. The project will introduce a further human modification within the already modified river margin; however, it is of limited

[106]Civil Drawings (GHD 2026c – Preliminary Design Drawings)

[107] Ibid

scale, recessive in form, and co-located within an already modified corridor. Importantly, the design approach avoids extending modification into the active channel in a manner that would reduce braided character or impede natural flow dynamics, consistent with LF-FW-P13(7).

Otago Regional Policy Statement: Effect on Cultural values:

From a cultural and associative values perspective, the project gives rise to a fundamental tension with mana whenua values, as recorded through iwi engagement to date[108], and reflected in the AEE. Kāi Tahu have clearly articulated that wastewater is considered tapu and that discharge to water bodies does not restore the state of noa, instead preferring land-based treatment processes that utilise natural systems.

In terms of the **proposed Otago Regional Policy Statement**, objectives **IM-O1** and **IM-O3** emphasise integrated management and intergenerational wellbeing, including the need to manage resources in partnership with Kāi Tahu and to support the life-supporting capacity of water. The chosen disposal pathway does not give effect to iwi aspirations for land-based treatment and avoidance of discharge to water. As such, there remains some inconsistency with the intention of these objectives.

With respect to **LF-FW-O1A and LF-WAI-P3**, which require recognition of the interconnectedness of land, water and cultural values (ki uta ki tai), and the protection of mahika kai and the relationship of Kāi Tahu with freshwater, the project is similarly constrained. The discharge represents a direct input to the awa that is not aligned with the policy direction to phase out wastewater discharges to water bodies where practicable and may adversely affect the perception of water quality and cultural health, irrespective of measured ecological performance. While the design seeks to minimise physical effects and includes opportunities for restoration planting and improved management of an already degraded delta margin, these measures do not fully address the cultural offence associated with discharge itself.

Water Conservation (Kawarau) Order 1997 (WCO)

Schedule 2 Waters to be protected (Kawarau)

a) wild and scenic characteristics;

The Kawarau River at the Shotover confluence derives its wild and scenic qualities from the dynamic meeting of two contrasting river systems, the legibility of braided versus incised channel forms, and the strong visual expression of flow, colour and geomorphic processes. The proposed outfall introduces a small area of rock armouring and a submerged discharge structure along the true left bank, as indicated in the civil drawings[109]. These works will constitute a localised and largely recessive intervention within an already modified reach influenced by stopbanks, gravel extraction, vehicle tracks and exotic vegetation.

b) natural characteristics, in particular the return flow in the upper section when the Shotover River is in high flood;

The WCO places particular emphasis on the natural hydrological behaviour at the confluence, including the distinctive return flow phenomenon during Shotover flood events which may now be avoided/reduced by the training wall. The proposed works involve only minor physical encroachment into the river margin and does not introduce structures of a scale or alignment that would materially alter channel hydraulics or the interaction between the Kawarau and Shotover flows. While the outfall and localised bed protection will slightly modify immediate edge conditions (including bed substrate and micro-scale erosion/sedimentation patterns),

[108] AEE

[109] Civil Drawings (GHD 2026c – Preliminary Design Drawings)

these changes are confined to a small footprint and sit within a receiving environment already subject to engineered training works and altered braid dynamics. Accordingly, any effects on natural flow behaviour, including return flow processes, are expected to be negligible.

c) scientific values, in particular the return flow in the upper section when the Shotover River is in high flood;

Scientific values associated with the confluence—particularly the observable mixing of contrasting water qualities and the functioning of a relatively unmodified large river system—are linked to water clarity, flow regime and geomorphic expression. The return flow is commented on in (b) above. The project does not introduce large-scale structures or channel diversions that would diminish these attributes, and the submerged nature of the discharge is such that physical expression is minimal.

d) recreational purposes, in particular rafting, jetboating, and kayaking*.*

From a recreational perspective (rafting, kayaking, jetboating), the outfall is located at the river margin and designed to be low-profile, avoiding protrusions into navigable channels. Given the existing modified context (including active recreation, vehicle access and infrastructure within the delta), effects on experiential river use and perception are expected to be less than minor, subject to appropriate construction management and restoration of disturbed margins.

National Policy Statement for Freshwater Management (NPS-FM)

Both Policies 7 and 8 of the NPS-FM relate to LF-FW-P12 and LF-FW-13 of the ORPS 2021. The project is consistent with **Policy 8 of** NPS-FM, which requires that the *significant values of outstanding water bodies are protected*. The Kawarau River is expressly identified as an outstanding water body, with its protected values defined through the WCO, including wild and scenic characteristics, natural hydrological behaviour (including confluence dynamics), scientific values, and recreation (commented on above).

From a landscape and natural character perspective, the project does not result in the loss of those values. The discharge infrastructure is confined to a **small, localised footprint at the river margin**, with the outfall largely submerged and the pipeline buried along an already modified corridor. In the context of the Shotover Delta and confluence, where existing modifications include stopbanks, gravel extraction, river training, informal vehicle access and extensive exotic vegetation, the receiving environment already exhibits a reduced level of naturalness compared to upstream reaches. Within this more modified setting, the project does not erode the key attributes that make the Kawarau River outstanding at a reach or catchment scale and therefore does not undermine the integrity of those values. In particular, the **hydrological, geomorphic and experiential qualities** underpinning the river's outstanding status are maintained. The works do not alter the overall channel form, the interaction between the Kawarau and Shotover Rivers, or the legibility of flow processes that contribute to scientific and scenic values. Equally, the design avoids intrusion into the active channel that could affect recreation (rafting, kayaking and jetboating), with structures recessed and peripheral to primary river use areas. While there is a small scale and localised introduction of built form (rock outfall and pipe), this is visually and physically contained and does not diminish the broader wild and scenic qualities experienced within the river corridor. Key findings in the recreational assessment is that he design of the rock outfall does not inhibit access to the majority of the study area and does not interfere with terrestrial recreation or in river activities such as jetboating or kayaking. The proposed rock outfall structure and the river

margin immediately adjacent to it are not, and have not historically been, used as a primary contact recreation site[110].).

Overall, the **scale, placement and design of the project ensures that adverse effects are avoided or minimised to a low and localised level**, such that the identified outstanding values are **maintained and effectively protected**. This is consistent with the intent of Policies 7 and 8, which does not preclude all development, but requires that such values are not compromised. In this case, the project achieves that outcome within an already modified part of the river environment.

Effects on wild and scenic attributes are assessed as **low** and highly localised, with the design (buried pipe, natural rock treatment and reinstated planting) ensuring that the broader scenic coherence and legibility of the river corridor remains intact.

Effects on experiential river use and perception are expected to be **low less than minor**, subject to appropriate construction management and restoration of disturbed margins, with the exception of manawhenua cultural and associative values above.

7.0 Recommendations

- Sediment entering the waterway during construction will need to be managed through a construction sediment control plan.
- The type of rock and placement both influence the aesthetic impacts and potential habitat value of the area of modified flow around the outfall structure. Design using locally sourced rock of geological similarity to the beach and river stone located at the Delta. Any anchoring system, further developed during detailed design, shall be designed in collaboration with the landscape architects to ensure that the design does not detract from visual or natural character values present at the Site.
- Stockpile and repurpose topsoil[111] sourced from the site to create the substrate that plants are to be planted into at the Outfall Site to ensure visual effects are mitigated. Some imported topsoil can be located at the base of planting pits to provide additional boost to establish plants.
- The Earthworks Contractor to receive clear instructions to reduce/minimise damages to existing trees, especially those trees adjacent to the stopbank/ training line that have been planted for river engineering purposes. Removal of trees shall be minimised to those required for trench line and conveyance pipe implementation.
- Earthworks associated with the conveyance pipeline will be re-grassed exotic grass species already present in the area suitable to surviving in the permeable gravelly substrates of the Site that are prone to drought conditions, for example brown top; to enable disturbed soil and earthworks to integrate into the site.
- Plants sourced locally and hardened off prior to planting.

[110] Thrive Recreational Assessment 7.3, 7.1.1, 7.1.2

[111] Topsoil in this instance relates to river alluvium rather than organic topsoil. Replacing disturbed materials in situ as well as any material imported

- Landscape management plan required –planting regime/ pest control/ care after flood events.

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Method Statement

22 November 2023

This assessment method statement is consistent with the methodology (high-level system of concepts, principles, and approaches) of 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines', Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022. The assessment provides separate chapters to discuss landscape, visual and natural character effects where relevant, but is referred to throughout as a Landscape Effects Assessment in accordance with these Guidelines. Specifically, the assessment of effects has examined the following:

- The existing landscape;
- The nature of effect;
- The level of effect; and
- The significance of effect.

The Existing Landscape

The first step of assessment entails examining the existing landscape in which potential effects may occur. This aspect of the assessment describes and interprets the specific landscape character and values which may be impacted by the project alongside its natural character where relevant as set out further below. The existing landscape is assessed at a scale(s) commensurate with the potential nature of effects. It includes an understanding of the visual catchment and viewing audience relating to the project including key representative public views. This aspect of the assessment entails both desk-top review (including drawing upon area-based landscape assessments where available) and field work/site surveys to examine and describe the specific factors and interplay of relevant attributes or dimensions, as follows:

- **Physical** –relevant natural and human features and processes;
- **Perceptual** –direct human sensory experience and its broader interpretation; and
- **Associative** – intangible meanings and associations that influence how places are perceived.

Engagement with tāngata whenua

As part of the analysis of the existing landscape, the assessment should seek to identify relevant mana whenua values (where possible) and describe the nature and extent of engagement, together with any relevant sources informing an understanding of the existing landscape from a Te Ao Māori perspective.

Statutory and Non-Statutory Provisions

The relevant provisions facilitating change also influence the consequent nature and level of effects. Relevant provisions encompass objectives and policies drawn from a broader analysis of the statutory context and which may anticipate change and certain outcomes for identified landscape values.

The Nature of Effect

The nature of effect assesses the outcome of the project within the landscape. The nature of effect is considered in terms of whether effects are positive (beneficial) or negative (adverse) in the context within which they occur. Neutral effects may also occur where landscape or visual change is benign.

It should be emphasised that a change in a landscape (or view of a landscape) does not, of itself, necessarily constitute an adverse landscape effect. Landscapes are dynamic and are constantly changing in both subtle and more dramatic transformational ways; these changes are both natural and human induced. What is important when assessing and managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate adverse effects. The aim is to maintain or enhance the environment through appropriate design outcomes, recognising that both the nature and level of effects may change over time.

The Level of Effect

Where the nature of effect is assessed as 'adverse', the assessment quantifies the level (degree or magnitude) of adverse effect. The level of effect has not been quantified where the nature of effect is neutral or beneficial. Assessing the level of effect entails professional judgement based on expertise and experience provided with explanations and reasons. The identified level of adverse natural character, landscape and visual effects adopts a universal seven-point scale from very low to very high consistent with Te Tangi a te Manu Guidelines and reproduced below.

Landscape Effects

A landscape effect relates to the change on a landscape's character and its inherent values and in the context of what change can be anticipated in that landscape in relation to relevant zoning and policy. The level of effect is influenced by the size or spatial scale, geographical extent, duration and reversibility of landscape change on the characteristics and values within the specific context in which they occur.

Visual Effects

Visual effects are a subset of landscape effects. They are consequence of changes to landscape values as experienced in views. To assess where visual effects of the project may occur requires an identification of the area from where the project may be visible from, and the specific viewing audience(s) affected. Visual effects are assessed with respect to landscape character and values. This can be influenced by several factors such as distance, orientation of the view, duration, extent of view occupied, screening and backdrop, as well as the potential change that could be anticipated in the view as a result of zone / policy provisions of relevant statutory plans.

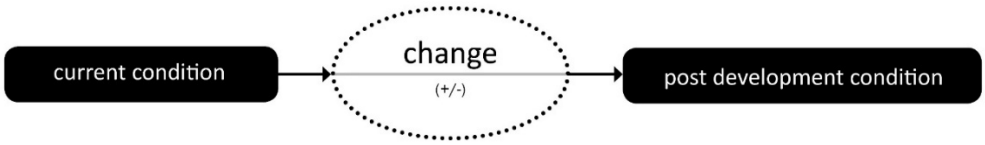
Natural Character Effects

Natural Character, under the RMA, specifically relates to 'the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development'. Therefore, the assessment of natural character effects only involves examining the proposed changes to natural elements, patterns and process which may occur in relevant landscape / seascape contexts.

As with assessing landscape effects, the first step when assessing natural character effects involves identifying the relevant physical and experiential characteristics and qualities which occur and may be affected by a proposal at a commensurate scale. This can be supported through the input of technical disciplines such as geomorphology, hydrology, marine, freshwater, and terrestrial ecology as well as input from tāngata whenua. An understanding of natural character considers the level of naturalness and essentially reflects the current condition of the environment assessed in relation to the seven-point scale. A higher level of natural character means the waterbody and/or margin is less modified and vice versa.

A natural character effect is a change to the current condition of parts of the environment where natural character occurs. Change can be negative or positive. The resultant natural character effect is influenced by the existing level of naturalness within which change is proposed; a greater level of effect will generally occur when the project reduces the naturalness of a less modified environment. In short, the process of assessing natural character effects can be summarised as follows:

- Identify the characteristics and qualities which contribute to natural character within a relevant context and defined spatial scale(s), including the existing level of naturalness;
- Describe the changes to identified characteristics and qualities and the consequent level of natural character anticipated (post project); and
- Determine the overall level of effect based on the consequence of change.



The Significance of Effects

Decision makers assessing resource consent applications must evaluate if the effect on individuals or the environment is less than minor[112] or if an adverse effect on the environment is no more than minor[113]. For non-complying activities, consent can only be granted if the s104D 'gateway test' is satisfied, ensuring adverse effects are minor or align with planning objectives. In these situations, the assessment may be required to translate the level of effect in terms of RMA terminology.

This assessment has adopted the following scale applied to relevant RMA circumstances[114] (refer to diagram below), acknowledging low and very low adverse effects generally equate to 'less than minor' and high / very high effects generally equate to significant[115].

[112] RMA, Section 95E

[113] RMA, Section 95E

[114] Seven-point level of effect scale. Source: Te tangi a te Manu, Pg. 151

[115] The term 'significant adverse effects' applies to specific RMA situations, including the consideration of alternatives for Notices of Requirement and AEEs, as well as assessing natural character effects under the NZ Coastal Policy Statement.

Appendix 2: Schedule 21.22 landscape attributes and values

Schedule 21.22: Schedule of landscape Values		
QLDC Landscape Schedule attributes and values **21.22.9 Kawarau River PA: Schedule of Landscape Values**		**Boffa Miskell Comments relating to Site Context (attributes and values)**
Physical Attributes and Values	**Description**	**Comments:**
Landform and Landtypes:	2. Flat alluvial floodplains between the confluence with Kimiākau (Shotover) and Chard Farm. 3. Confluence of the Kawarau and Kimiākau (Shotover) rivers and the dynamic changes in river braids and shoals in this area.	The design is low-profile (buried pipe/outfall rockwork), with main introduced features being rockwork, changes to the bank form, and vegetation. The project will result on a localised disturbance to riverbed/banks and floodplain edge during construction. The modification introduced will result in a very small but permanent change to a part of the Riverbank that is active and dynamic in terms of gravel movement. This gravel movement will naturalise the edges and form of the Riverbank where it has been modified. The River margins of the Shotover and the Kawarau and adjoining landscape adjoining the floodplains have already been modified by earthworks for river training, that has reduced the Shotover Delta width and added landforms (including training lines and Frankton Terrace modifications) into the landscape, with the land utilised for gravel storage as well as Waste WWTP ponds and for engineered fill.
Hydrological features:	5. The Kawarau River, in particular the following features and attributes:	Potential for short-term construction effects on river character; long-term effects relate to presence/visibility of outfall and any discernible surface expression at discharge point. As stated above,

	a Waterbody notable for its volume and fast flow, with a gravel and schist bed. b Clarity and distinctive turquoise colour of the waters. c Presence of white-water rapids d Scientific rarity of the potential reverse flow of the river towards Whakatipu-Waimāori (Lake Whakatipu) when the Kawarau and Kimiākau (Shotover) rivers are in flood. River training earthworks at the confluence of the rivers may prevent this occurring in the future. e The Water Conservation (Kawarau) Order 1997 requires the outstanding amenity and intrinsic values afforded by the river waters to be sustained and the water body preserved as far as possible in its natural state.	this will naturalise in appearance through natural gravel movement that will soften edges and integrate the introduced rocks; with vegetation softening the change to the landform created through earthworks. Intrinsic values of the Kawarau identified in the WCO are protected. Wild characteristics occur and are experienced more in the Kawarau Gorge, between Gibbston and Lake Dunstan, with the site located in an area where development is a visible part of the experience, which also includes aircraft and machinery movement. The rock outfall is a small change to the riverbank, with outstanding amenity values sustained.
Vegetation patterns:	6. Particularly noteworthy indigenous vegetation features include: a Pockets of indigenous grey shrubland (often mixed with sweet briar) border the river along its entire length, particularly on scarps. b Valued habitat for eel, kōaro and rare native fish, trout and salmon. c Numerous rocky outcrops and bluffs that characterise the river corridor are refugia for specialist indigenous plants.	Vegetation clearance likely limited and localised; relating to the clearance of willow trees at the river margin and scrubby weeds along the training line separate from the river margin (in the River Context). Reinstatement/planting is recommended to strengthen riparian margin and screen any above-ground elements. No natural flora were identified in the terrestrial construction zone, with no rocky outcrops or bluffs near the Site.
Landuse Patterns and Features:	9. Pastoral land use dominates the floodplain areas between Whakatipu-Waimāori (Lake Whakatipu) and the Kawarau Bridge Bungy. Nearly all the vegetation immediately flanking this section of the river is exotic, including, extensive willows, stands of poplars, pine woodlots and shelterbelts, and pockets of broom and gorse The Cromwell-Frankton A 110kV overhead transmission line that forms part of the National Grid are transmission lines, located generally parallel to the river	The Project introduces additional utility infrastructure within an already modified area that sees frequent activity from dirt bikes and freedom campers, as well as people taking (as a permitted activity) up to $10m^3$ of gravel for personal use. The existing activities located at the Site and within the adjoining environment has modified the floodplain visually and is part of how people see and associate activity with this part of the Kawarau/ Shotover.

	between the Kawarau Bridge and Lake Hayes Estate and are in or over the ONF at some points.	
Archaeological and heritage features and their locations:	14. Various inter-related complexes of gold sluicings, tailings, water races, dams and associated domestic sites along the riverbanks. 15. Numerous pre-European archaeological sites along the river, including the Owens Ferry moa hunter site (archaeological sites F41/1 and F41/66) and the former natural bridge access across the river (now widened by floods) near Roaring Meg.	Archaeological risk may be present in alluvial margins; construction should include accidental discovery protocol and avoid known sites where relevant.
Mana whenua features and their locations:	16. The entire area is ancestral land to Kāi Tahu whānui and, as such, all landscape is significant, given that whakapapa, whenua and wai are all intertwined in te ao Māori. 17. The Kawarau River is mapped as a wāhi tūpuna. The ONF also overlaps with the mapped wāhi tūpuna Tititea. Tititea was a pā located on the south side of the Kawarau River near Whakatipu-Waimāori. 18. Ōterotu is the traditional Māori name for the Kawarau Falls. 19. Potiki-whata-rumaki-nao is the name for the former natural bridge over the Kawarau, which was a major crossing point for Kāi Tahu whānui.	Cultural manawhenua values are likely to be influenced by the proposed change, with a strong preference expressed in information available to date (in the Position Statement) for disposal to ground rather than disposal into the river system.
Associative Attributes and Values	**Description**	**Comments:**
Mana whenua associations and experience:	20. Kāi Tahu whakapapa connections to whenua and wai generate a kaitiaki duty to uphold the mauri of all important landscape areas. 21. The Kawarau River was a traditional travel route that provided direct access between Whakatipu- Waimāori (Lake Whakatipu) and Mata-au (the Clutha River).	Outfall/discharge is highly sensitive from a Kai Tahu perspective. It is unlikely that mana whenua will be supportive of the location. ensure design minimises effects on wai where possible. Recommendations on construction should include accidental discovery protocol and avoid known sites where relevant

	22. The Kawarau is a significant kāika mahika kai where weka, kākāpō, kea and tuna (eel) were gathered. 23. Kāi Tahu tradition tells of an incident where a 280 strong war party was repelled from the Tititea area and chased to the top of the Crown Range, which is now named Tititea in memory of this incident. 24. The mana whenua values associated with the Kawarau ONF include, but may not be limited to, ara tawhito, mahika kai, nohoaka, kāika and tauraka waka.	
Historic Attributes and values:	25. The historic and contextual values of gold mining in and alongside the river and associated physical remnants. 26.The historic and contextual values of the feature as a factor shaping early European transport in the District, including historic roads, bridges, ferry sites, and associated infrastructure. 27. The historic significance of the river and its tributaries as a source of water and power.	historic values are maintained due to the confined footprint; manage construction to protect any heritage fabric and avoid inducing new access/erosion.
Shared and recognised attributes and values:	28. Nationally recognised values set out in the Water Conservation Order that applies to the river (with its wild and scenic characteristics; natural characteristics; scientific values and recreational purposes specifically identified). 29. Very strong shared and recognised values as a popular recreational destination.	Recommendations have been included regarding the management of visibility, construction duration, and to ensure any above-water elements remain modest and recessive, with mitigation proposed at outfall site with landscape plan.
Recreation attributes and values:	30. Kayaking, jetboating (both commercial and private), rafting, swimming, and fishing on the river. 31. Walking and cycling on the popular Twin Rivers and Gibbston trails alongside the river, and occasional recreational events on the southern side of the river between Whakatipu-Waimāori (Lake Whakatipu) and Chard Farm.	Temporary disruption to trail/river access during construction works; operational phase however should maintain safety and avoid creating new obstacles or visual distractions for river users.

Perceptual (Sensory) Attributes and Values	Description	Comments:
Legibility and expressiveness attributes and values	33. Clearly legible, glacial and alluvial / hydrological processes that have shaped the river valley landscape and which continue to add to its dynamic qualities. These are evident in the scarps, floodplains and the changing patterns of channels and gravel banks at the confluence with the Kimiākau (Shotover) and along the river course.	The floodplains associated with the Shotover Delta have already been changed by the river training work. The river landscape including the dynamic processes associated with flow will remain highly legible. Gravel banks at the confluence have already been influenced with changes to the Shotover Delta through the river training.
Particularly important views to and from the area:	34. Highly attractive close, mid and long-range views along the predominantly vegetation clad river corridor. Vegetation and landform patterns together with the winding corridor contain and frame views, contributing a highly variable albeit generally relatively enclosed character to the outlook. In places, the roche moutonnée of Morven Hill and/or the mountain slopes of the Remarkables add a sense of drama and grandeur. The dynamic river waters are a dominant visual element. The mixing of different water colours at the Kimiākau (Shotover) confluence, particularly when the Kimiākau is in flood, adds to the appeal an interest of the views in this section of the Kawarau. 35. Appealing mid and long-range views from Remarkables Park, Shotover Country, Lake Hayes Estate, Bridesdale, SH6 and the Queenstown Trail to discreet sections of the Kawarau River and its predominantly vegetation clad banks and floodplains. In such views, the rugged mountain backdrop of the Remarkables and other enclosing mountains adds to the appeal of the outlook. 36. From some proximate vantage points, the vegetation fringed, dynamic waters of the Kawarau River are seen alongside the more domesticated pastoral flood plains and terraces.	Above-ground visibility has been mitigated by burying and earthworks, with close views temporarily affected by construction works. Long term change; outfall rockwork may be visible from proximate viewpoints (trail/river), with increased visibility at low river flows, however the proposed outfall pipes will always be covered. The use of natural rock form/colour and the low elevation of the rock outfall will marry into the Kawarau bank. Mid and long-range views from Remarkables Park, Shotover Country, Lake Hayes Estate, Bridesdale, SH6 are unaffected, and current scenic components within the views (such as the vegetation fringing the dynamic waters) will remain dominant attributes, with the introduced change associated with the earthworks and outfall structure not detracting from these views.

Naturalness attributes and values:	37. Generally, there is a high perception of naturalness throughout the river corridor due to the dominance of the waterbody and its vegetated margins. Whilst boating activity and trails are evident in the corridor, these activities indicate the high recreational values of the ONF. Where evident, structures are modest in scale and/or sympathetic character and remain subservient to the natural landscape. 38. Between Whakatipu-Waimāori (Lake Whakatipu) and the Kawarau Bridge Bungy, pastoral land use dominates the floodplain areas and nearly all the vegetation flanking the river is exotic. Even so, there remains a perception of significant naturalness within the river landscape. The very limited visibility of built development on the Remarkables side of the river contributes to this, even if pasture, farm tracks, fencing, power lines and the margins of the Kawarau Heights, Lake Hayes Estate and Bridesdale settlements are evident. However, the confined, often intimate nature of the river corridor provides terrain shielding and limits exposure to such elements.	Recreational values will not be diminished as a result of the project. Introduced structures are very modest in scale, and will read as sympathetic and subservient to the natural character, with the dominant attributes of the landscape remaining the fast flowing incised and turquoise colour of the Kawarau River and its gravel river bank along the true left (where the proposed outfall site is located) and the dominant and highly legible landform of the Remarkables, as well as the surrounding mountain landscape that enclose the Wakatipu Basin remains highly legible.
Memorability attributes and values:	40. Views of the dramatic river scarps and gorges east of Morven Ferry Road are highly memorable, as is the distinctive turquoise colour of the water and notable volume and flow of the river through the gorges and rapids.	The dramatic river scarps and gorges are separate from the Site and remain unaffected. The distinctive turquoise colour of the river will remain a memorable attribute.
Transient attributes and values:	41. Transient attributes include the fluctuations and changing patterns of the river waters and flood plain gravel banks, flood-related changes in the confluence with the Kimiākau (Shotover), and the seasonal changes evident in the vegetation – most notably in the stands of willows and poplars.	Fluctuations and changing patterns of river patterns will not be changed by the project, and the transient attributes associated with the seasonal change of the exotic vegetation will remain a dominant attribute of the Shotover Delta/Kawarau River values.

Remoteness and wildness attributes and values:	42. Visitors on the surface of the river east of the Kawarau Bridge Bungy are enclosed within the gorge and experience a strong sense of remoteness. In addition, the river corridor east of the Gibbston Valley and Victoria Flats has a high level of wildness and remoteness, although SH6 and the historic Roaring Meg Power Station also influence the perception of this riverscape. Much of this river corridor comprises a steep V-shaped valley that is both deep and sinuous – winding its way eastward past Mt Allen and Mt Difficulty.	The areas where remoteness and wildness attributes are experienced are separate from the Site. The Site context is within a more accessible/managed reach that are influenced by activities such as the Airport Runway and associated air traffic, transmission lines, heavy machinery associated with the Frankton Flats terrace extension, and frequent jetboat movements. Shotover Delta river training works has also modified that natural width and location of the Delta, shifting the watercourse east, away from the site. Consent conditions and design will ensure works do not expand perceived development footprint beyond the local site, which is perceived within existing modified corridors.
Aesthetic Attributes and Values:	43. The experience of the values identified above from a wide range of public viewpoints. 44. More specifically, this includes: a. Strong sense of enclosure within the river corridor, defined by escarpments or gorges and the surrounding mountain ranges and roches moutonées. b. Coherence and distinctiveness of the waterway as a feature. c. Highly picturesque and aesthetically appealing views. d. Ability to travel along the river on trails, roads, or the water itself and to be immersed in the scenic and remoteness attributes of the river corridor.	The experience of the river and the wider landscape from public viewpoints will not be diminished, with the landscape values relating to the river corridor and surrounding mountain ranges maintained. The coherence, distinctiveness and picturesque qualities of the waterway as a feature will be maintained. Access along the river will be maintained, and while remoteness values are not attributed to this section of the river, the scenic attributes of the riverscape (for the Delta and for Kawarau River) will be maintained.
Summary of Landscape Values:	**Rating scale:** seven-point scale rating from Very Low to Very High	**BM scale:**
Physical values	45. **Very high physical values** relating to the volume, flow and clarity of the waters, the dynamic attributes of the confluence with the Kimiākau (Shotover), the scarps, gorges and floodplains shaped by the river habitat values	**Very high physical values:** Physical values associated with the Kawarau River relating to the volume, clarity of waters and dynamic attributes of the confluence will retain high physical values due to the limited scale of activity and maintenance of the physical quality

	for native and introduced fauna, the areas of indigenous vegetation, and the mana whenua features associated with the area, acknowledging that these attributes are counterbalanced by the presence of pastoral land use, fencing, tracks, powerlines.	of the attributes. There will however be an impact on manawhenua values, due to the incompatibility of the proposed activity with core cultural beliefs.
Associative values	46. **Very high associative values** relating to the Kāi Tahu associations with the river, the rich history of gold mining and early European settlement, the significant recreational attributes, and the strong shared and recognised values, as evidenced by the 2013 Water Conservation Order.	Associative sensitivity is high; given the concept of disposing treated sewage into the water is not compatible with core cultural beliefs. The current associative values linked to early European settlement and significant recreational values remain very high. The values associated with the Water Conservation Order are maintained. There will be an adverse effect on Kāi Tahu associations with the river with at least a **high and potentially very high (adverse)** effect on those values.
Perceptual values	47. **Very high perceptual values** relating to the expressiveness of the river landforms, the memorability of the spectacular gorges and fast flowing turquoise waters, the high level of naturalness, the scenic views available to and within the corridor, and the sense of remoteness and wildness experienced east of the Kawarau Bungy.	Perceptual effects likely confined to a short section of river margin within 100m of the outfall structure, which is mitigated through recessive design and use of recessive elements (including use of local rock) as well as landscape planting overtop of earthworks that will both integrate the area and deter access across the outfall structure to prevent damage. **Perceptual values remain high.**
Landscape Capacity:	v. **Earthworks — limited** landscape capacity for earthworks and tracks and trails for recreational use or works that are necessary to mitigate natural hazard risks that protect naturalness and expressiveness attributes and values and are sympathetically designed to integrate with existing natural landform patterns. ix. **Utilities and regionally significant infrastructure — limited** landscape capacity for infrastructure that is co-located with existing facilities. In the case of utilities such as overhead lines or cell phone towers which cannot be screened, these should be designed and located so that they are not visually prominent. In the case of the National Grid there is limited landscape capacity for the	The proposed change introduces both earthworks and a utility structure (the outfall structure) designed to align with existing track/stopbank corridor, with the design minimising above-ground elements, and providing enhancement through planting that acts as both riparian restoration and public access management. The outfall structure is designed in a way that minimises effects on naturalness and expressiveness attributes and values, with the design incorporating natural material, rocks that blend in with the existing geology in terms of colour and provenance. The project maintains naturalness and expressiveness values that are present within the landscape currently, with the design of the

	upgrade of existing infrastructure within the same corridor and limited landscape capacity in circumstances where there is a functional or operational need for the particular location and structures are designed and located to limit their visual prominence, including associated earthworks.	outfall pipe and associated earthworks for mitigating the conveyance pipeline designed and located so that they are not visually prominent. From a visual perspective they are capable of being absorbed into the landscape, with the main adverse effect associated with adverse effects on cultural naturalness values that will be at least **high and potentially very high (adverse).** Other adverse effects on naturalness relating to the operational term of the sewage outfall will be no greater than **low.**

Appendix 3: Natural Character Matrix

DEGREE OF NATURAL CHARACTER	VERY HIGH	HIGH	MODERATE - HIGH	MODERATE	MODERATE - LOW	LOW	VERY LOW
ACTIVE BED							
ABIOTIC • **Physical features** and processes- Channel shape, bed substrate, natural patterns and processes (seasonal flows/floods, erosion), degree of modification (bridges, jetties, boat ramps, takes, stop banks, dams? and weir structures) (BORPC water body management GIS data) • **Flow regime** modified/natural, degree of change to levels (based on hydrological and water take data) • **Water quality** (if available)	*Rare modification / structures. Dynamic processes virtually Intact* *Overwhelmingly natural with no / very limited evidence of human interference. Any water takes are groundwater takes outside the channel.* *Highly natural water and lateral habitat quality. Displaying no human induced changes.*	*Very small scale of modification / isolated structures. Dynamic processes largely intact. Freshwater quality very slightly modified.* *Relatively low levels of modified or diverted flow (e.g. few water takes taking a minor proportion of low surface water takes <50% of take limit, or no takes focussed on flood harvest.* *A highly natural river / lake with limited human intervention (i.e. occasional bridge abutments / power pole within the river channel); water monitoring devices / weirs with very localised effect.*	*Small scale modification / limited structures.* *Dynamic processes generally intact with some interference. Freshwater quality slightly modified.*	*Moderate scale modification / several structures.* *Dynamic processes still apparent. Freshwater quality moderately modified.* *Moderately modified or diverted flow (e.g. several waters takes taking a moderate proportion or targeting flood flows. Moderate alteration of flow statistics. Generally natural. Occasional 'sections' with human modifications (i.e. a settled rural landscape with bridge / aqueduct supports, pylon footing, long stretches of stop banks, groynes).*	*Frequent modification /several structures. Some natural processes capable of recovery.* *Freshwater quality markedly modified.*	*Large areas of modification / structures and or reclamation.* *Some key natural processes are no longer able to operate.* *Freshwater quality highly modified. Highly modified or diverted flow. High level of alteration to flood, fresh and low flow statistics relative to naturalised flows. (e.g. through the introduction of small scale dams, substantial flood harvest water takes, races or flood bypass channels. Surface water takes at or close to allocation.* *Highly modified. Semi natural reaches or channel shapes in*	*Very extensive modification / large reclamation* *Few or no natural elements, patterns, processes remain Freshwater quality extremely modified* *Very highly modified or diverted flow/water take (e.g. no natural flow regime through the obstruction by large-scale dams and diversions that drastically alter flood, fresh and low flow statistics relative to naturalised flows. Surface water takes over-allocated.* *Very highly contaminated or permanently discoloured water displaying very high levels of human induced changes to*

DEGREE OF NATURAL CHARACTER	VERY HIGH	HIGH	MODERATE - HIGH	MODERATE	MODERATE - LOW	LOW	VERY LOW
		Natural dynamic processes largely intact. *Relatively high levels of water quality with small or rare amounts of impurities caused further upstream (e.g. by occasional stock crossing or forest harvesting). Lateral habitats in good condition despite occasional stock ingress or exotic vegetation. Lateral habitats subject to active channel migration and flooding.*		*Structures that modify the active bed in localised areas.* *Moorings in lakebed.* *Water displaying reasonable levels of naturalness although contains occasional high-moderate levels of human induced changes to part of the waterway or infrequent times. Some impact on habitat quality but lateral habitats generally intact and subject to active surface migration and flooding.* *Most natural dynamic processes generally intact with some interference.*		*some areas.* *Significant parts have been affected or by human intervention, modification (i.e. suburban / intensive Ag/hort landuse: gravel extraction, channel diversions and reshaping. Long stretches of flood protection structures (stop banks, groynes, riprap). Substantial water take structure / physical modifications that modify the active bed in localised areas. Jetties in lakebed.* *Water usually displaying high levels of contamination mainly from adjacent diffuse sources from land use activities (agricultural leaching etc). Lateral streams and wetlands are diminished in area, unnaturally silted and / or choked with exotic weeds. Lateral channels not exposed to lateral migration of flooding by the active surface.* *Some key natural processes are no longer able to operate.*	*the water quality with limited life supporting capacity (e.g. within polluted urban/industrialised areas or intensive farming); Lateral habitats drained, removed or separated from the active channel.* *Few or no natural elements, patterns, processes remain*

DEGREE OF NATURAL CHARACTER	VERY HIGH	HIGH	MODERATE - HIGH	MODERATE	MODERATE - LOW	LOW	VERY LOW
BIOTIC • Presence of indigenous aquatic flora / fauna (if available), ecological health / habitat.	*Exotic biota rare / may occur but virtually no invasive species.* *Virtually all expected species present and their population structure virtually unmodified.* *Contains species and habitats of high conservation value.* *All ecosystem functions virtually intact.* *No evidence of introduced flora or fauna within the Active Bed.*	*Exotic biota may occur and invasive biota rare.* *Virtually all expected species present and population structure is largely unmodified.* *Very likely to contain species and habitats of high conservation value.* *Almost all ecosystem functions intact.* *Small, often isolated pockets of introduced flora and fauna evident (less than 20% of total ecosystem), however river displaying very high levels of naturalness, Fish communities dominated by native species.*	*Exotic biota common with few invasive species.* *Virtually all expected species present with slight modification to population structure.* *Some species and habitats of high conservation value.* *Most ecosystem functions intact.*	*Exotic and invasive biota regularly present.* *Some expected species absent with moderate modification to population structure* *A few species and habitats of high conservation value.* *Some ecosystem functions intact?* *Occasional stretches (some quite long) of introduced flora and fauna evident within waterway (approx. 50% of water body).*	*Exotic and invasive biota common.* *Many expected species absent with marked modification to population structure.* *Species and habitats of high conservation value rare.* *Most ecosystem functions varying well outside natural range.*	*Exotic and invasive biota very common.* *Most expected species absent with remnant population structure highly modified.* *Species and habitats of high conservation value absent.* *Few original ecosystem functions remain.* *Large areas of introduced flora and fauna (including exotic fish) evident (in approximately 75% of water body).*	*Exotic and invasive biota dominate.* *Expected species virtually absent.* *Only the most hardy or adaptable species occur.* *Original ecosystem functions rare or absent.* *Water body system choked with exotic aquatic flora and fish communities dominated by exotic species.*
EXPERIENTIAL • Views, sounds and smells of the waterbody. • Human perception of how natural a place appears, underpinned by the biotic and abiotic attributes (above) of the water body. • Hydrological intactness	*Overwhelming sense of wildness and remoteness.* *Rare human influence.*	*Predominantly wild and remote.* *Limited human interference.*	*Frequent sense of wildness and remoteness.* *Some human interference.*	*Opportunities to experience wildness and remoteness.* *Obvious human influence.*	*Limited sense of wildness or remoteness.* *Strong human influence.*	*Rare sense of wildness or intact ecosystems.* *Built environment clearly apparent.*	*No sense of wildness, remoteness or intact ecosystem.* *Built environment dominates.*

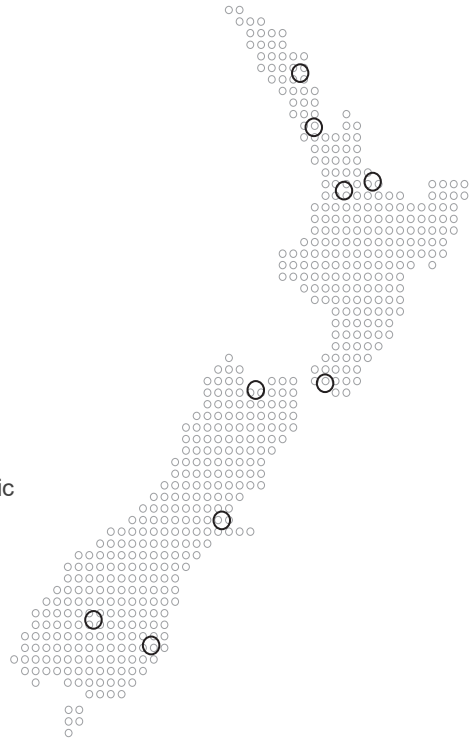
DEGREE OF NATURAL CHARACTER	VERY HIGH	HIGH	MODERATE - HIGH	MODERATE	MODERATE - LOW	LOW	VERY LOW
MARGIN							
ABIOTIC • Physical substrate, degree of modification, landuse, artificial structures (bridges, jetties. boat ramps/, stop banks, dams and weir structures).	*Overwhelmingly natural with no / very limited evidence of human interference.*	*Limited human intervention (i.e. occasional bridge abutments / power pole within the river channel).*	*Small scale human modification in isolated nodes*	*Occasional 'reaches' with human modifications (i.e. a settled rural landscape with bridge / aqueduct supports, pylon footings across river corridor).* *Occasional localised water takes and pump stations. Informal occasional 4 WD track or walking trails on banks. Boat ramps on lake edge.*	*Human modifications are largely present, but elements, patterns, and processes still legible*	*Significant parts of the margins have been affected or encroached upon by human intervention (i.e. suburban / highly managed agricultural land, including gravel workings, part channelisation). Roads or railway lines immediately adjacent to the banks requiring protection.*	*Completely modified or artificial (i.e. by a dam, weir or flood defence structure such as extensive stop banks or groynes).*
BIOTIC • Extent of indigenous vegetation, land use, degree of modification and ecological health and habitat.	*Overwhelmingly indigenous vegetation with no or few introduced species. Contains species and habitats of high conservation value.*	*Native vegetation, including connected wetlands and the predominant species. All expected species present with slight modification to population structure. Very likely to contain species and habitats of high conservation value.*	*Fragmented areas of native and exotic vegetation in natural patterns. Native species are the most prominent.*	*Mixture of exotic and native vegetation in natural patterns, including the under growth mix of native and introduced species in connected wetlands. Some expected species absent with moderate modification to population structure.*	*Exotic vegetation is prominent (e.g. gorse and willows) with isolated areas of remnant indigenous vegetation present. Expected species largely absent with some still remaining.*	*Sporadic vegetation or predominance of managed exotic vegetation such as plantations / woodlots, pest plant species with predominant absence of native species.* *Most / many expected species absent with remnant population structure highly modified.*	*Absence of vegetation due to human induced changes or limited presence (in pockets) of managed exotic vegetation.* *Expected species virtually absent.*
EXPERIENTIAL	*Overwhelming sense of wildness and remoteness.*	*Predominantly wild and remote.*	*Frequent sense of wildness and remoteness.*	*Opportunities to experience wildness and remoteness.*	*Limited sense of wildness or remoteness.*	*Rare sense of wildness or intact ecosystems.*	*No sense of wildness, remoteness or intact ecosystem.*

DEGREE OF NATURAL CHARACTER	VERY HIGH	HIGH	MODERATE - HIGH	MODERATE	MODERATE - LOW	LOW	VERY LOW
• Sense of wildness, geological, and ecological intactness) • Human perception of how natural a place appears, underpinned by the biotic and abiotic attributes (above) of the water body. • Includes the remote / untamed experience a place may provide	*Rare human influence.*	*Limited human interference.*	*Some human interference.*	*Obvious human influence.*	*Strong human influence.*	*Built environment clearly apparent.*	*Built environment dominates.*
CONTEXT							
ABIOTIC • Modification of landforms and physical features such as stop banks, gravel extraction. Agricultural use intensification of land use, including urban areas. Recreational facilities (carparks, campgrounds toilets, mown grass, signage, cycleways and paths). Roads and State Highways. • Include catchment modifications if ecologically linked to the waterway. Protected natural areas such as reserves, parks and estates managed by DoC may indicate a higher natural character.	*Natural landforms remain entirely intact with no or very little human modification.* *Rare presence of structures.* *Natural drainage patterns virtually intact with no or very little presence of human influence.*	*Natural landforms remain largely free of modification.* *Very small levels of modification / isolated structures.* *Natural drainage patterns largely intact and show little evidence of human influence.*	*Natural landforms remain clearly apparent.* *Small scale modification / limited structures.* *Relatively unmodified natural patterns.* *Small modification to landform patterns.* *Natural drainage patterns generally intact with some interference.*	*Some modification to natural landforms.* *Modification is apparent / structures frequently occur.* *Natural landforms remain apparent with several earthworks / built influences.* *Natural drainage patterns still present but somewhat modified.*	*Natural landforms remain present albeit modified.* *Landform modification is common / several structures.* *Frequent earthworks linear/ built influences.* *Some natural processes capable of recovery.* *Natural drainage patterns remain legible albeit modified.*	*Largely modified natural landforms.* *Large areas of modification / reclamation and/or structures.* *Earthworks and built influences are common.* *Some key natural processes are no longer able to operate.* *Natural drainage patterns are largely modified.*	*Natural landforms rarely occur.* *Very extensive modification / reclamation.* *Earthworks or reclamation dominant.* *Highly engineered forms.* *Few or no natural processes remain.* *Natural drainage patterns are not immediately evident or present.*

DEGREE OF NATURAL CHARACTER	VERY HIGH	HIGH	MODERATE - HIGH	MODERATE	MODERATE - LOW	LOW	VERY LOW
• Land use of adjacent land and the extent of human modifications that may impact the abiotic attributes of the waterbody.							
BIOTIC • Use of adjacent land and the extent of human modifications that may impact the biotic attributes of the waterbody.	*Exotic biota may occur but virtually no invasive species.* *All ecosystem functions virtually intact* *Contains species and habitats of high conservation value.*	*Presence of indigenous vegetation remains largely free from modification.* *Most ecosystem functions intact. Very likely to contain species and habitats of high conservation value.*	*Indigenous patterns partially removed, with introduced vegetation in harmony with the landscape.* *Virtually all expected species present with slight modification to population structure*	*Exotic and invasive biota regularly present, pockets of intact indigenous ecosystems.* *Extensive pastoral farming.* *Informal occasional 4WD track or walking trails.*	*Settled pastoral landscape with areas of commercial forestry and pockets of indigenous vegetation.* *Road, rail, transmission line infrastructure crosses river corridor.*	*Exotic and invasive biota very common.* *Few / small areas of indigenous ecosystem functions remain.* *Large areas of suburban / residential development, or large scale areas of intensive agriculture forestry, orchards, vineyards. Road, Rail, transmission line infrastructure follows river corridor.*	*Exotic and invasive biota dominate. Indigenous ecosystem functions rare or absent.* *Heavily modified landscape (urban) with limited vegetation.*
EXPERIENTIAL • Sense of wildness, geological, and ecological intactness) • Human perception of how natural a place appears, underpinned by the biotic and abiotic attributes (above) of the water body. • Includes the remote / untamed experience a place may provide.	*Overwhelming sense of wildness and remoteness.* *Rare human influence.*	*Predominantly wild and remote.* *Limited human interference.*	*Frequent sense of wildness and remoteness.* *Some human interference.*	*Opportunities to experience wildness and remoteness.* *Obvious human influence.*	*Limited sense of wildness or remoteness. Strong human influence.*	*Rare sense of wildness or intact ecosystems. Built environment clearly apparent.*	*No sense of wildness, remoteness or intact ecosystem.* *Built environment dominates.*

Appendix 4: Graphic Supplement

(bound separately)



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